

# Flow Energy Calculator

## FEC920

### User Guide

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## FEC920 Flow Energy Calculator

### User Guide

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#### Associated documents

- HA028838 Printable version of iTools Help
- HA025464 EMC installation guidelines
- HA027962 Printable version of 'Review' Help

#### Software effectivity

This manual refers to instruments fitted with software version 8.0x.  
 Software versions 2.20 onwards are 'backwards compatible' so that it can be used on all hardware versions of the unit.  
 Previous software versions are not compatible with instruments with hardware status greater than 2.  
 The status level may be found on the instrument label and consists of a letter indicating software status followed by a numeral indicating the hardware status (e.g. 'B2')

# FEC920 - Flow Energy Calculator

## User Guide

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## 1 SAFETY NOTES



**Warning:** Any interruption of the protective conductor inside or outside the apparatus, or disconnection of the protective earth terminal is likely to make the apparatus dangerous under some fault conditions. Intentional interruption is prohibited.



**Warning:** Live sensors: The unit is designed to operate if the temperature sensor is connected directly to an electrical heating element. It must be ensured that service personnel do not touch connections to such inputs whilst the inputs are live. With live sensors, all cables, connections and switches for connecting the sensor must be mains rated for use in 240V Cat II.



**Warning:** Grounding the temperature sensor shield: Where it is common practice to replace the temperature sensor whilst the instrument is live, it is recommended that the shield of the temperature sensor be grounded to safety earth, as an additional protection against electric shock.



**Warning:** The instrument must not be wired to a three-phase supply with an unearthed star connection, because, under fault conditions, such a supply could rise above 240V RMS with respect to ground, thus rendering the instrument unsafe.



**Note:** Safety requirements for permanently connected equipment state:

- a. A switch or circuit breaker shall be included in the building installation.
- b. It shall be in close proximity to the equipment and within easy reach of the operator.
- c. It shall be marked as the disconnecting device for the equipment.



**Note:** Recommended external fuse ratings are: 2A Type T 250V.

1. This instrument is intended for industrial temperature and process control applications within the requirements of the European directives on safety and EMC.
2. Installation may be carried out only by qualified personnel.
3. To prevent hands or metal tools coming into contact with parts that are electrically live the instrument must be installed in an enclosure.
4. Where conductive pollution (e.g. condensation, carbon dust) is likely, adequate air conditioning/filtering/sealing etc. must be installed in the enclosure.
5. The mains supply fuse within the power supply is not replaceable. If it is suspected that the fuse is faulty, the manufacturer's local service centre should be contacted for advice.
6. Whenever it is likely that protection has been impaired, the unit shall be made inoperative, and secured against accidental operation. The manufacturer's nearest service centre should be contacted for advice.
7. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment might be impaired.
8. The unit must be wired according to the instructions in this manual.
9. Before any other connection is made, the protective earth terminal shall be connected to a protective conductor. The mains (supply voltage) wiring must be terminated in such a way that, should it slip, the Earth wire would be the last wire to become disconnected. The protective earth terminal must remain connected (even if the equipment is isolated from the mains supply), if any of the I/O circuits are connected to hazardous voltages\*.  
The protective earth connection must always be the first to be connected and the last to be disconnected. Wiring must comply with all local wiring regulations, e.g. in the UK, the latest IEE wiring regulations (BS7671) and in the USA, NEC class 1 wiring methods.
10. Signal and supply voltage wiring should be kept separate from one another. Where this is impractical, shielded cables should be used for the signal wiring.
11. The maximum continuous voltage applied between any of the following terminals must not exceed 240Vac.
  1. Relay output to logic, dc or sensor input connections.
  2. Any connection to ground.The ac supply must not be connected to sensor input or low-level inputs or outputs.
12. Over temperature protection: A separate over-temperature protection unit (with an independent temperature sensor) should be fitted to isolate the process heating circuit should a fault condition arise. Alarm relays within the recorder/controller do not give protection under all fault conditions.
13. In order to allow the power supply capacitors to discharge to a safe voltage, the supply must be disconnected at least two minutes before the instrument is removed from its sleeve. The touching of the exposed electronics of an instrument which has been removed from its sleeve should be avoided.
14. Instrument labels may be cleaned using iso-propyl alcohol, or water or water-based products. A mild soap solution may be used to clean other exterior surfaces.

\* A full definition of 'Hazardous' voltages appears under 'Hazardous live' in BS EN61010. Briefly, under normal operating conditions, hazardous voltages are defined as being > 30V RMS (42.2V peak) or > 60Vdc.

### 1.1 USB DEVICE PRECAUTIONS



**Note:** The use of U3 USB Flash drives is not recommended.

1. Precautions against electrostatic discharge should be taken when the instrument terminals are being accessed. The USB and Ethernet connections are particularly vulnerable.
2. Ideally, the USB device should be plugged directly into the instrument, as the use of extension leads may compromise the instrument's ESD compliance. Where the instrument is being used in an electrically 'noisy' environment however, it is recommended that the user brings the USB socket to the front of the panel using a short extension lead. This is because the USB may 'lock up' or reset in noisy environments and the only means of recovery is to remove the device, then re-insert it. For memory sticks, EMC-related failure during a write operation might cause corruption of the data held on the stick. For this reason, the data on the memory stick should be backed up before insertion and checked after removal.
3. When using a USB extension cable, a high quality screened cable must be used. The total length of USB cable between the device and the USB port must not exceed 3m (10ft).
4. Most barcode readers and keyboards are not designed for use in industrial EMC environments, and their operation in such environments may result in impaired performance of the recorder/controller.

### 1.2 32-BIT RESOLUTION

Floating point values are stored in IEEE 32-bit single precision format. Values which require greater resolution than is available in this format are rounded up or down.

### 1.3 SYMBOLS USED ON THE RECORDER LABELLING

One or more of the symbols below may appear as a part of the recorder labelling.

	Refer to manual for instructions		Risk of electric shock
	This unit is CE approved		Precautions against static electrical discharge must be taken when handling this unit
	C-Tick mark for Australia (ACA) and New Zealand (RSM)		Ethernet connector
	Underwriters laboratories listed mark for Canada and the U.S.A.		USB connector
	For environmental reasons, this unit must be recycled before its age exceeds the number of years shown in the circle.		Protective conductive terminal (Safety Earth)

## 2 CYBERSECURITY

### 2.1 WHAT'S IN THIS CHAPTER

This chapter outlines some good practice approaches to cybersecurity as they relate to use of the FEC920 instrument, and draws attention to several FEC920 features that could assist in implementing robust cybersecurity.

### 2.2 INTRODUCTION

When utilising the FEC920 in an industrial environment, it is important to take 'cybersecurity' into consideration: in other words, the installation's design should aim to prevent unauthorized and malicious access. This includes both physical access (for instance via the front panel or HMI screens), and electronic access (via network connections and digital communications).

### 2.3 SECURE NETWORK TOPOLOGIES AND GOOD PRACTICES

Overall design of a site network is outside the scope of this manual. The Cybersecurity Good Practices Guide, Part Number HA032968 provides an overview of principles to consider. This is available from [www.eurotherm.co.uk](http://www.eurotherm.co.uk).

Typically, an industrial controller such as the FEC920 together with any associated HMI screens and controlled devices should not be placed on a network with direct access to the public Internet. Rather, good practice involves locating the devices on a fire-walled network segment, separated from the public Internet by a so-called 'demilitarized zone' (DMZ).

### 2.4 SECURITY FEATURES

The sections below draw attention to some of the cybersecurity features of the FEC920.

#### 2.4.1 Principle of Secure by Default

Some of the digital communication features on the FEC920 can provide greater convenience and ease-of-use (particularly in regards to initial configuration), but also can potentially make the controller more vulnerable. For this reason, some of these features are turned off by default. In particular, ID061 (the BACnet port is closed unless the BACnet option is enabled).

#### 2.4.2 HMI Access Level / Comms Config Mode

As described in Section 5.3.8, the FEC920 device features tiered, password-restricted operator levels, so that available functions and parameters can be restricted to appropriate personnel.

##### 2.4.2.1 Logged Out Access Level

Logged out mode allows the user to select viewing mode, to view history, to view alarms, to toggle faceplate cycling on and off, to send notes, to suspend/resume USB archiving and to access the login process.

##### 2.4.2.2 Operator Access Level

In addition to the logged out features, Operator access level allows the user to acknowledge alarms, to edit notes and to perform demand archive operations. By default, no password is required in order to enter Operator level, but a password can be set either at Supervisor level or at Engineer level.

If the Auditor feature is enabled, the Operator user is disabled and instead replaced by the 25 User accounts.

##### 2.4.2.3 Supervisor Access Level

In addition to the logged out features, this access level allows the user to view the recorder's configuration, and to edit some values (such as alarm thresholds).

##### 2.4.2.4 Engineer Access Level

This allows full access to all areas of the recorder configuration.

### 2.4.3 HMI Passwords

When entering passwords via the HMI, the following features help protect against unauthorized access:

- Each digit is obscured (replaced with an asterisk character) after entry, to help protect against an unauthorized person seeing the password as it is typed in.
- Password entry is locked after a configurable number of invalid attempts (if Auditor option is enabled). If this number of attempts is exceeded, the User account is disabled. This helps protect against “brute force” attempts to guess the password.
- The controller records the number of successful and unsuccessful login attempts for each level of password. This is recorded in the History. Regular auditing of this History is recommended, as a means to help detect unauthorized access to the controller.

### 2.4.4 Ethernet security features

Ethernet connectivity is available on the FEC920. The following security features are specific to Ethernet:

#### 2.4.4.1 Ethernet rate protection

One form of cyberattack is to try to make a controller process so much Ethernet traffic that this drains systems resources and useful control is compromised. For this reason, the FEC920 device includes an Ethernet rate protection algorithm, which will detect excessive network activity and help to ensure the controller’s resources are prioritized on the control strategy rather than the Ethernet. If this algorithm is activated, a message will be entered into the History.

#### 2.4.4.2 Broadcast Storm protection

A ‘broadcast storm’ is a condition which may be created by cyberattack: spurious network messages are sent to devices which cause them to respond with further network messages, in a chain reaction that escalates until the network is unable to transport normal traffic. The FEC920 device includes a broadcast storm protection algorithm, which will automatically detect this condition, stopping the controller from responding to the spurious traffic. If this algorithm is activated, a message will be entered into the History.

### 2.4.5 Configuration backup and recovery

Using the iTools software, you can ‘clone’ a FEC920 device, saving all its configuration and parameter settings to a file. This can then be copied onto another controller, or used to restore the original controller’s settings. Clone files are digitally signed using an SHA-256 cryptographic algorithm, meaning that if the file contents is tampered with, it will not load back into a controller.

## 2.5 MEMORY INTEGRITY

When a FEC920 device powers up, it automatically performs an integrity check on the contents of its internal non-volatile memory devices. Additional periodic integrity checks are performed during normal runtime and when non-volatile data is being written. If any integrity check detects a difference from what is expected, the controller enters Standby mode and a message is displayed on then screen.

## 2.6 FIRMWARE

From time to time, to provide new functionality or address known issues, Siemens may make new versions of the FEC920 firmware available.

This firmware may be downloaded from the Siemens website, and transferred to a FEC920 instrument in the field, via a USB memory stick (or FTP server).



### **Caution:** Non-Schneider Electric firmware

There is a potential risk that an attacker could upgrade a FEC920 with non-genuine firmware that contains malicious code. To mitigate this potential risk, genuine FEC920 firmware upgrade utility executables are always supplied digitally signed with the publisher as Schneider Electric. Do not use a firmware upgrade utility if it has not been signed by Schneider Electric.

**Failure to follow these instructions can result in injury or equipment damage.**

## 2.7 SUPPORTED PROTOCOLS AND THREAT MITIGATIONS

The FEC920 supports the following protocols on Ethernet. For each protocol, a list of mitigations are provided. As a general comment, the firewall is configured to block all ports **except** those required for installed/enabled options.

### 2.7.1 FTP Client

An external FTP client can access the FTP server on the instrument. This FTP server has default remote username & password for each of the default users, passwords can be modified. Additional users can be added with configurable remote username and passwords.

To mitigate threats:

1. Physically protect access to subnet(s) in use.
2. Firewall to block TCP port 21.
3. It is recommended that user's should change their passwords regularly, this could be done manually or by using the password expiry feature.

### 2.7.2 FTP Server

Up to two external FTP servers can be configured. The FEC920 will then connect to these servers as an FTP client and push archive files to the servers.

Threat mitigation as for FTP Client.

### 2.7.3 ICMP (ping)

The FEC920 will respond to a ping to aid network diagnostics.

To mitigate threats:

1. Physically protect access to subnet(s) in use.
2. Use a firewall to block ICMP / ping.

### 2.7.4 DHCP

The FEC920 can allocate its IP address using DHCP; however this is typically set to fixed IP address allocation by configuration. The DHCP server could be spoofed allocating an invalid IP address to the instrument.

To mitigate threats:

1. Use fixed IP address allocation.
2. Physically protect access to subnet(s) in use.

### 2.7.5 SNTP

The FEC920 can support SNTP for network time synchronisation.

To mitigate threats:

1. Physically protect access to subnet(s) in use.
2. Firewall to block UDP port 123.

### 2.7.6 ModBus

The FEC920 supports ModBus, which can be configured to act as Master via TCP and Slave via serial or TCP.

To mitigate threats:

1. Physically protect access to subnet (or serial cabling) in use.
2. Firewall to block TCP port 502 (or alternate non-standard port if so configured).

### 2.7.7 HTTP (Web Server)

To mitigate threats:

1. Physically protect access to subnet(s) in use.
2. Firewall to block TCP port 80.

### 2.7.8 UHH Navigator

To mitigate threats:

1. Physically protect access to subnet(s) in use.
2. Firewall to block TCP port 50010.

### 2.7.9 Ethernet IP

To mitigate threats:

1. Physically protect access to subnet in use.
2. Firewall to block TCP port 2222. This port is opened when Ethernet IP option is enabled.

### 2.7.10 BACnet

To mitigate threats:

1. Physically protect access to subnet in use.
2. Firewall to block UDP port 47808. This port is opened when BACnet option is enabled.

## 2.8 DECOMMISSIONING

When a FEC920 instrument is at the end of its life and being decommissioned, Siemens advises reverting all parameters to their default settings using the Engineer Password 'reset' or via iTools (see Section 6.1.6 and Section 9 for instructions). This can help to protect against subsequent data and intellectual property theft if the controller is then acquired by another party.

### **3 INTRODUCTION**

This document describes the installation, operation and configuration of a paperless graphic recorder/controller. The instrument comes, as standard, with four input channels and is equipped for secure archiving via FTP transfer and/or to USB memory stick.

#### **3.1 UNPACKING THE INSTRUMENT**

The instrument is despatched in a special pack, designed to give adequate protection during transit. Should the outer box show signs of damage, it should be opened immediately, and the contents examined. If there is evidence of damage, the instrument should not be operated and the local representative contacted for instructions. After the instrument has been removed from its packing, the packing should be examined to ensure that all accessories and documentation have been removed. The packing should then be stored against future transport requirements.



## 4 INSTALLATION



**Caution:** Before installation, ensure that the specified instrument supply voltage matches the facility supply.

### 4.1 MECHANICAL INSTALLATION

Figure 1 gives installation details.

#### 4.1.1 Installation Procedure

1. If it is not already in place, fit the IP65 sealing gasket behind the front bezel of the instrument.
2. Insert the instrument through the panel cutout, from the front of the panel.
3. Spring the retaining clips into place, and secure the instrument by holding it firmly in place whilst pushing both clips towards the rear face of the panel.
4. The protective membrane can now be removed from the display.

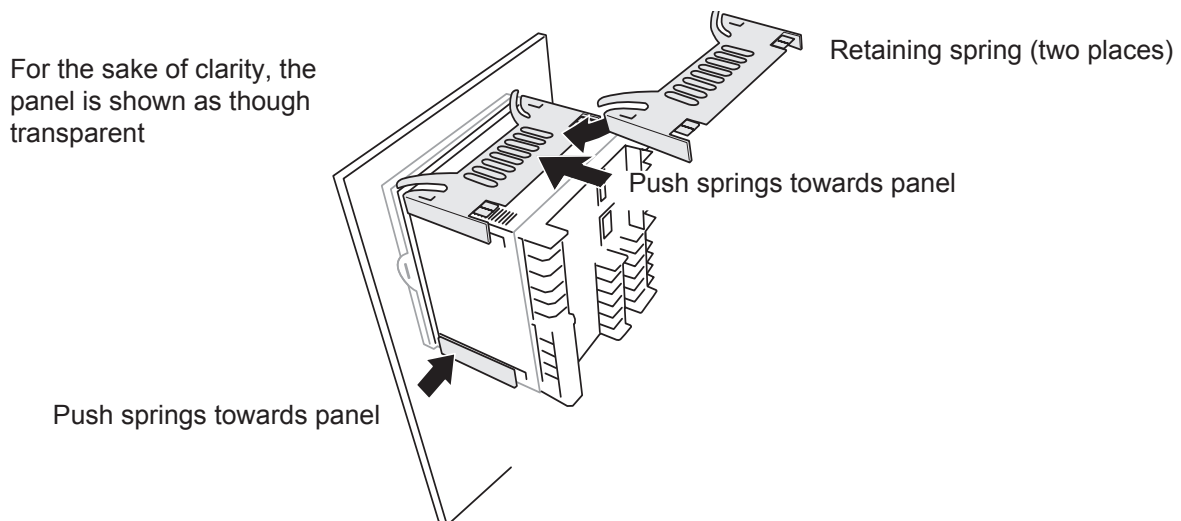


Figure 1 Securing the Instrument

#### 4.1.2 Demounting



**Warning:** Before removing the supply voltage wiring, isolate the supply voltage and secure it against unintended operation.

1. Isolate the mains supply and secure it against accidental operation. Remove all wiring and the USB device and Ethernet cable (if any).
2. Remove the retaining springs by unhooking them from the sides using a small flat-blade screwdriver.
3. Pull the instrument forwards out of the panel.

### 4.1.3 Removing the Instrument from its Sleeve

The instrument is designed to be removed from its sleeve from the front panel. However, if a USB memory stick or the Ethernet cable is fitted then this must be removed first.

When the instrument is shipped from the factory it is fitted with two small red clips, one in the top side of the sleeve and the other below. These are intended as a safeguard against removal of the instrument from its sleeve when an Ethernet cable is fitted. These clips must also be removed, using a small screwdriver, before the instrument can be taken out of its sleeve.

Ease the latching ears (Figure 2) outwards and pull the controller forward.

When plugging back in ensure that the latching ears click into place to maintain the panel sealing.

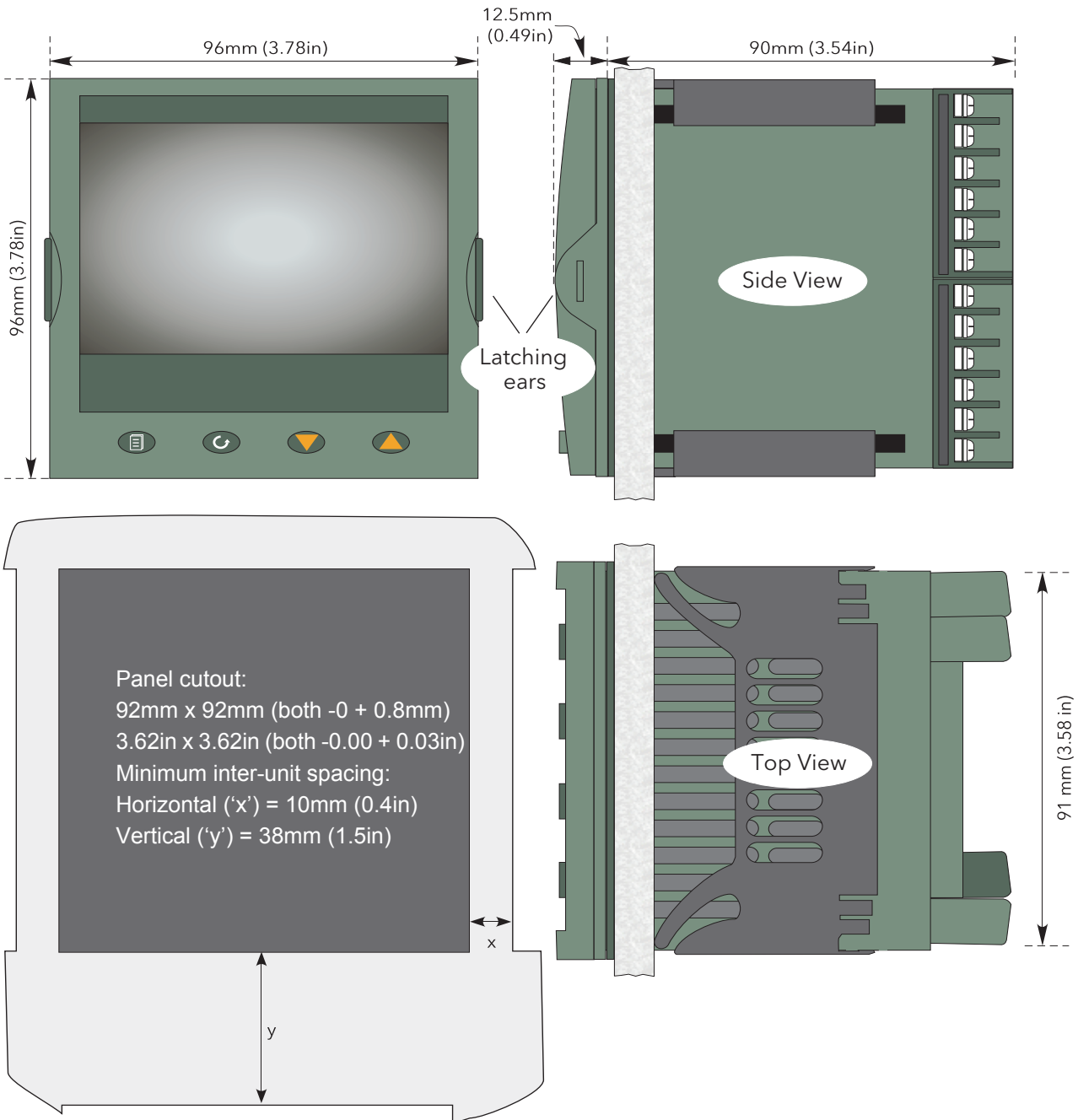


Figure 2 Mechanical installation details (standard case)

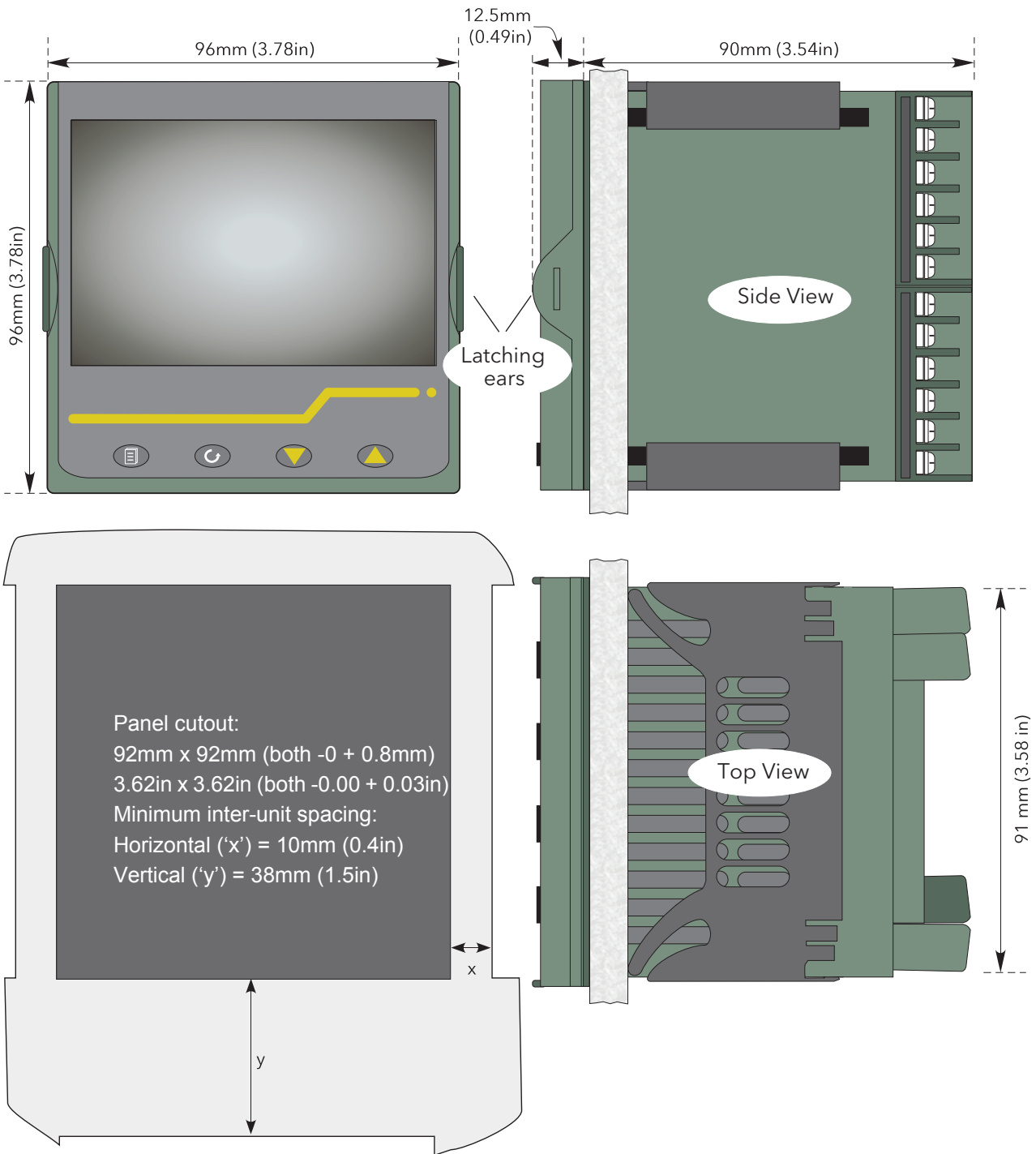


Figure 3 Mechanical installation details (wash down case option)

## 4.2 ELECTRICAL INSTALLATION

Figure 4 shows the locations of the various user terminations along with signal and supply wiring pinouts.

### 4.2.1 Termination details

The screw terminals accept single wires in the range 0.21 to 2.08mm<sup>2</sup> (24 to 14 AWG) inclusive, or two wires each in the range 0.21 to 1.31mm<sup>2</sup> (24 to 16 AWG) inclusive.

Screw terminals should be tightened to a torque not exceeding 0.4Nm (3.54lb in).

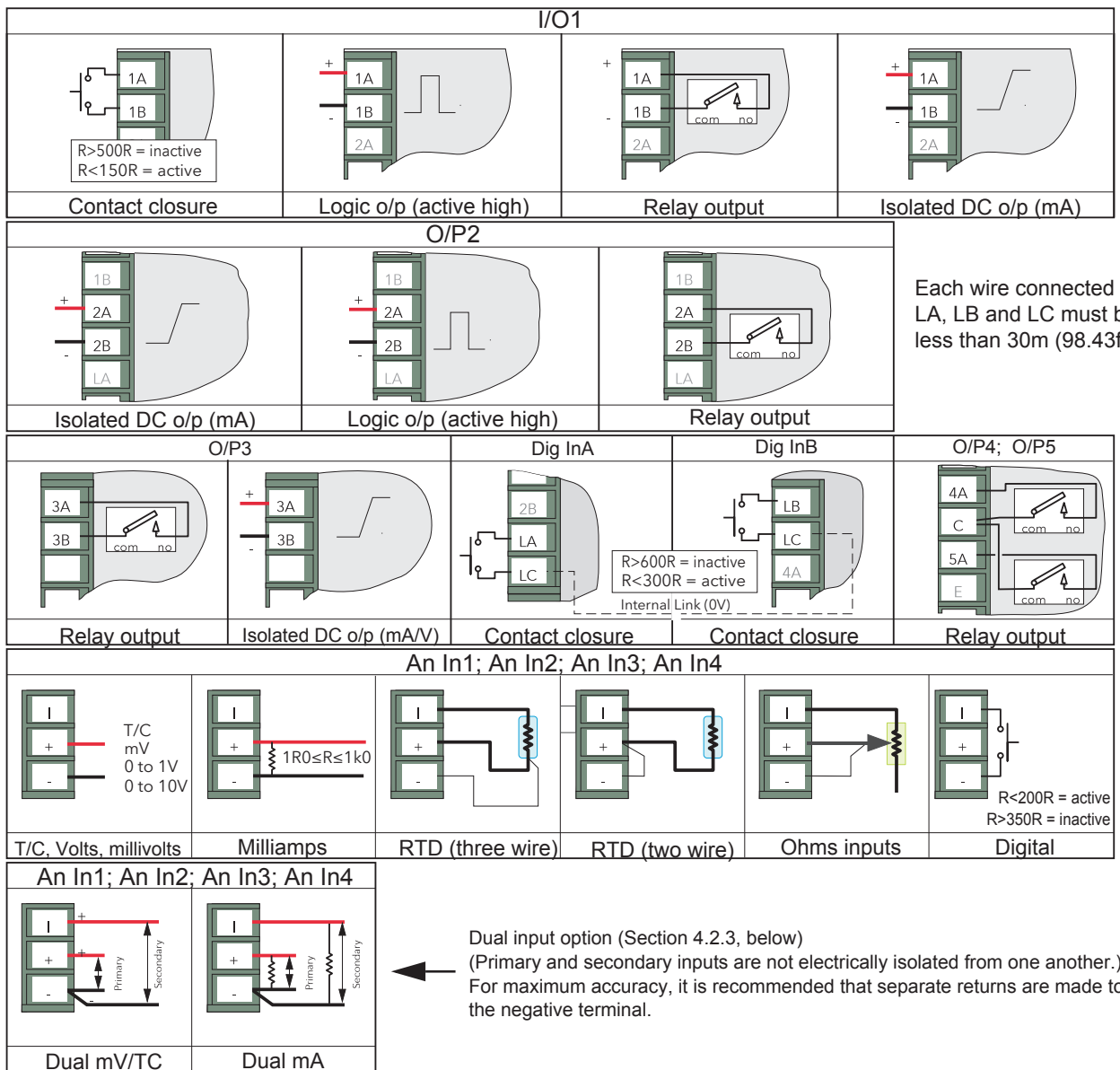
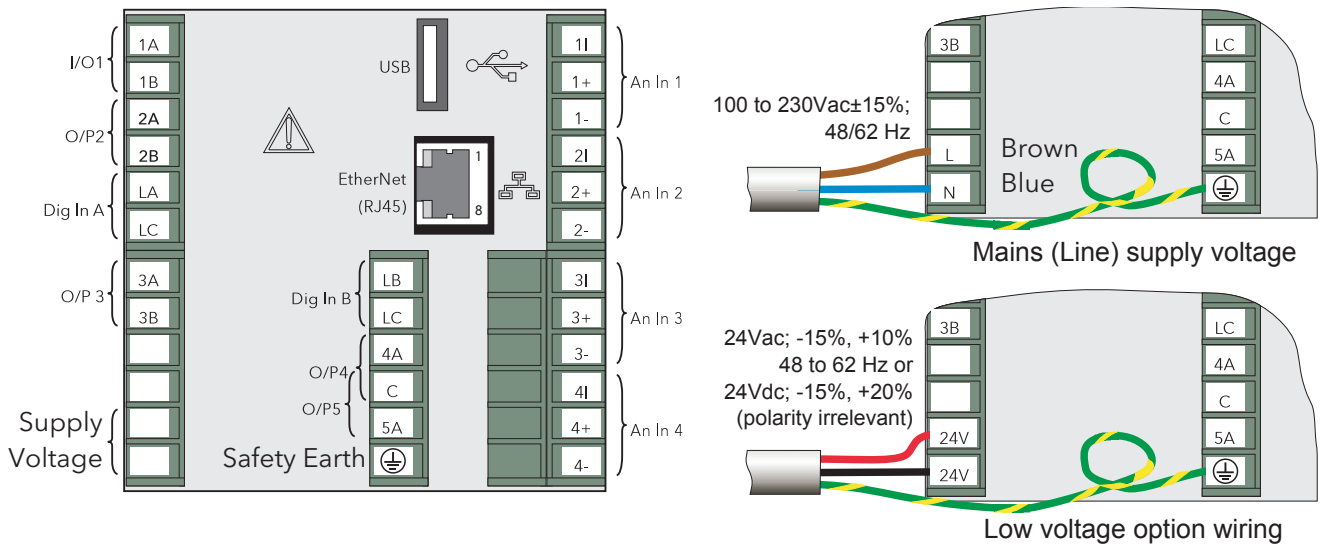


Figure 4 Connector locations and pinouts (rear panel)

### 4.2.2 Low Voltage Option

This option allows the use of a low voltage ac or dc 24V supply. The specification in Appendix A gives full details. The polarity of the dc supply connection is not important - it may be connected either way round.

### 4.2.3 Dual Input Option

This is a cost option, enabled on a channel-by-channel basis by means of entering the relevant password in the 'Feature3 Pass' field in Instrument.Security menu described in Section 6.1.6.

For each enabled channel, a pair of thermocouple, mV or mA inputs can be connected to the instrument. These inputs are called 'primary' and 'secondary', and are terminated at the analog input terminals (An In1 to An In 4) as shown in Figure 4, above. The primary inputs 1 to 4 are assigned to channels 1 to 4, as normal. Each secondary input must be soft wired to a maths channel configured as Operation = 'Copy' if it is to be recorded/displayed/alarmed etc.



**Note:** Due to the nature of the input circuit, a large offset may appear for secondary thermocouple inputs. This offset can be removed only by using the input adjust feature described in Section 6.1.9. Because of this offset, the dual thermocouple input option is not suitable for AMS2750D applications.

Soft wiring is described in Section 9.

Maths channels are described in Section 6.5.1.

Channel configuration is described in Section 6.4.1.

Input adjust is carried out as described in Section 6.1.9.

#### 4.2.3.1 Sample Rate

For dual input channels, both primary and secondary sample rate is reduced to 4Hz (250ms) from the normal 8Hz (125ms).

#### 4.2.3.2 Sensor Break Detection

Input sensor break detection is not supported for secondary inputs. The internal circuit acts as a 'pull up' on the secondary input which therefore saturates high in the event of a sensor break.

#### 4.2.3.3 Dual Milliamp Offset Correction

If 'Dual mA' is selected as input type, then an automatic offset correction will be made, according to the shunt value entered in channel configuration. Refer to Section 6.4.1 for further information.

#### 4.2.3.4 Input Range Limitation

There is no 10V range associated with the secondary input. Any input greater than +2V or less than -2V is deemed to be 'bad range'.

### 4.2.4 Modbus Master communications

The master instrument can be connected directly to up to two slaves using standard Ethernet network cable either directly (single slave only) or via a hub or switch (one or two slaves). In either case, 'straight through' or 'crossover' cable may be used. The cable is terminated at the RJ45 socket at the rear of the unit.

### 4.2.5 EtherNet/IP

The Client and Server are connected in the same way as described above for Modbus Master communications, except that there can be only one client and one server.

## 5 OPERATION

On power up a default or custom splash screen appears and remains visible whilst the unit is initialising. If during this process a network broadcast storm is detected, the unit stops, displaying a network failure icon until the broadcast storm has cleared, after which the initialisation process resumes.



### 5.1 INTRODUCTION

The operator interface consists of a display screen and four push buttons.

#### 5.1.1 Display Screen

The display screen is used both to display channel information (in one of a number of display modes), and to display the various configuration screens which allow the user to setup the recorder to display the required channels, to set up alarms and so on. Display modes are described in Section 5.4 below; configuration is described in Section 6.

In display mode, the screen is split horizontally into three areas (Figure 5):

1. a faceplate giving channel details.
2. the main display screen showing channel traces etc.
3. the status area, displaying instrument name, the current time and date and any system icons.

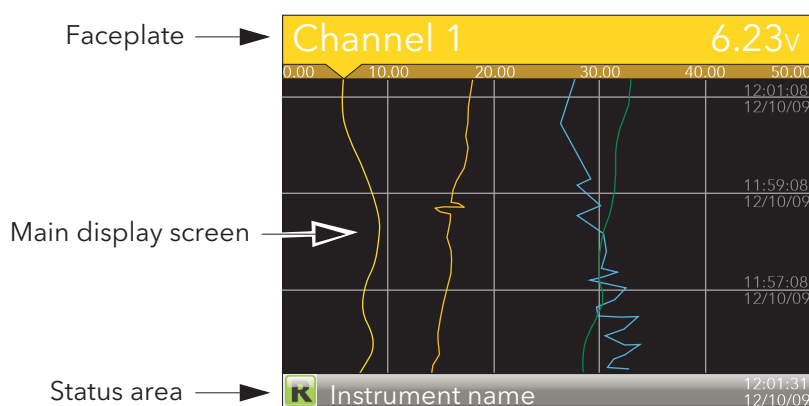


Figure 5 Display mode screen (vertical trend)

In configuration mode, the entire display screen is devoted to the selected configuration menu.

#### 5.1.2 Navigation Pushbuttons

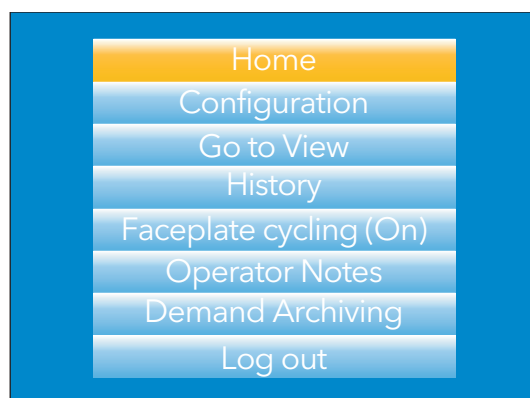


Figure 6 Top level menu (Engineer level access)

There are four navigation buttons, called 'Page', 'Scroll', 'Lower' and 'Raise' located below the screen. The general properties of these buttons are described in the remainder of this section, but some have additional, context sensitive functions, which, for the sake of clarity are not described here but in the relevant sections (e.g. 'Message summary') of the manual.

**PAGE BUTTON** 

From any non-configuration page, pressing this push button causes the top level menu (Figure 6) to appear. The figure shows the menu for a user logged in with 'Engineer' level access. Other access levels may have fewer menu items.

Within configuration pages, the Scroll button can be used as an enter key to select lower menu levels. In such cases the page button is used to reverse this action, moving the user up one menu level per operation.

**SCROLL BUTTON** 

From trending pages, operation of the scroll push-button scrolls through the channels enabled in the group. The Faceplate cycling 'Off' selection can be used to keep a particular channel permanently displayed, and the scroll pushbuttons can then be used to select channels manually.

In configuration pages, the scroll key operates as an 'enter' key to enter the next menu level associated with the highlighted item. Once the lowest menu level is reached, operation of the scroll key allows the value of the selected item to be edited by the relevant means (for example, the raise/lower keys, or a keyboard entry).

The 'Page' key is used to move the user back up the menu structure, until the top level menu is reached, when the scroll key can be used again to return to the Home page.

The scroll button is also used to initiate user wiring as described in Section 9.

**RAISE/LOWER BUTTONS**  

Within trending displays, the Raise and Lower keys can be used to scroll through the enabled display modes in the sequence: vertical trend, horizontal trend, vertical bargraph, horizontal bargraph, numeric, vertical trend, and so on.

Within configuration pages, these pushbuttons act as cursor keys, allowing, for example, the user to highlight menu items for selection using the scroll button, and in many cases allowing the user to select one from a number of alternative values within menu items. These keys are also used to navigate through the virtual keyboards (Section 5.6) and number pads used to enter text or numeric strings.

**5.1.3 On Screen Help**

The top level configuration menu includes contextual help text on the right-hand half of the screen. Mostly this text fits within on screen height. Where this is not the case, the text can be moved up or down the screen by holding the Page button operated whilst using the up and down arrows to move the text.

The down arrow moves the text upwards on the screen; the up arrow moves it downwards.

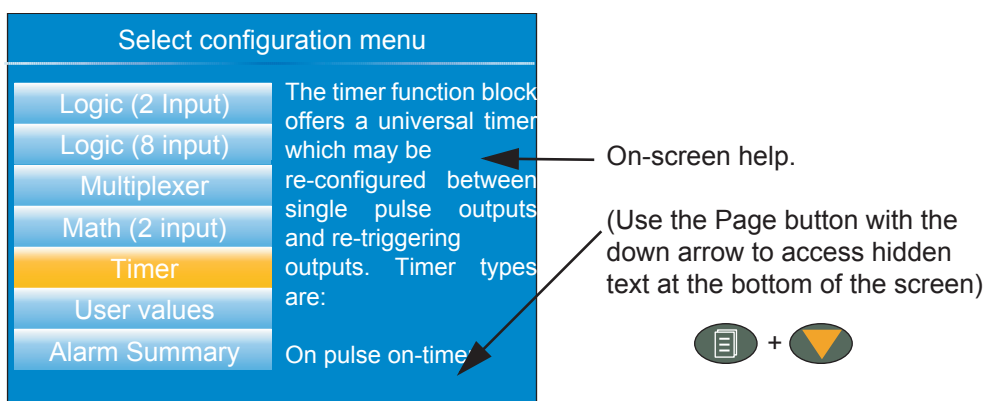


Figure 7 On-screen help (typical)



## 5.2 PROCESS VARIABLE DISPLAY

As discussed above, the operator interface consists of a display screen and associated push buttons. The display screen shows process variables in one of a number of formats, or operational details (notes or alarm history for example), or configuration details for use in setting up the recorder to produce the required displays and history formats. The remainder of this section discusses the process variable displays, alarm displays and so on; configuration details are to be found in Section 6.



**Note:** Some of the items below can be selected for use only by users with a suitable permission level as set up in the 'Instrument' 'Security' menu described in Section 6.1.6.

Figure 8 depicts a typical trend display and gives details of the various areas of the display page.

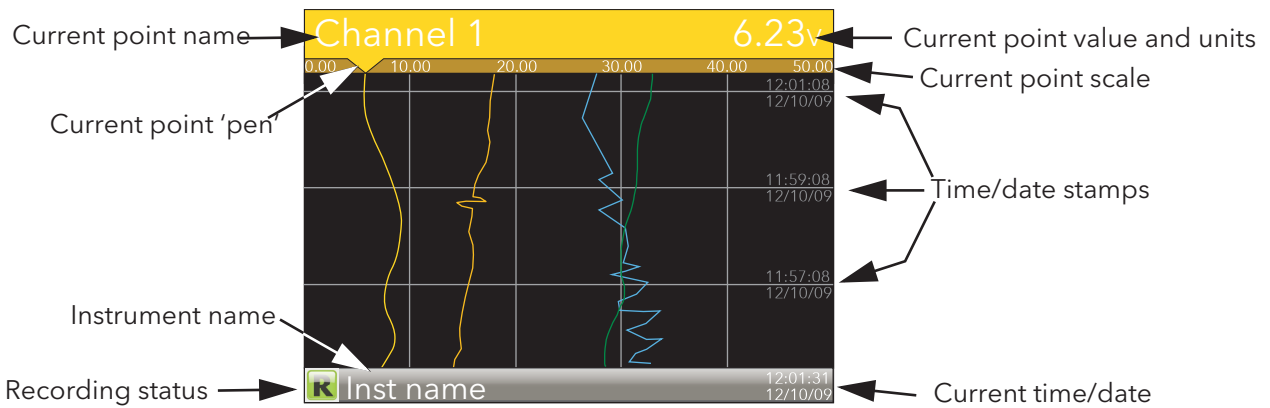


Figure 8 Typical display screen (Vertical trend)

Figure 8 shows a vertical trend page. Operating the Raise/Lower push-buttons allows the user to scroll through the other display modes: Horizontal trend, Vertical bargraph, horizontal bargraph, numeric, vertical trend, and so on. All these display modes are described in Section 5.4, below.

A display mode can also be selected from the Top level menu 'Go To View' item which appears when the 'Page' key is operated.

The scroll button can be used to scroll through the points in the group, overriding the 'Faceplate Cycling' on or off selection

### 5.2.1 Alarm Icons



**Note 1:** A full discussion of alarms is given in the Channel Configuration section of this manual, Section 6.4.3.

**Note 2:** Trigger alarms do not display threshold marks or bars, or faceplate symbols.

The alarm icons shown below appear in some display modes. The icons on a channel faceplate show the status of that channel's alarm(s), as follows:

- Icon is flashing                      alarm is active but unacknowledged or it is an Auto alarm which is no longer active but which has not been acknowledged.
- Icon steadily illuminated        the alarm is active and has been acknowledged.

Alarm thresholds and deviation alarm bars appear for horizontal and vertical trend modes. For deviation bars, the bar stretches from (Reference - Deviation) to (Reference + Deviation). Vertical and Horizontal bargraph modes display only absolute alarm symbols.










	Absolute High
	Absolute Low
	Deviation High
	Deviation Low
	Deviation Band
	Rising Rate of change
	Falling Rate of change
	Digital High
	Digital Low

Figure 9 Alarm icons

### 5.2.2 Status Bar Icons

The following items can appear in a dedicated window immediately to the left of the time and date, at the bottom right-hand corner of the display. The width of this window expands as the number of icons increases, and the instrument name is truncated, as necessary, to make room.

#### SYSTEM ALARMS

This indicator appears, flashing, if any one or more of the alarms listed below is active. The System Alarms summary page (accessed from 'Go to View in the top level menu) allows the user to view such system alarms as are active. It is not possible to 'acknowledge' system alarms.

Archive Disabled	An unattended archiving strategy has temporarily been disabled.
Archiving Failed	An unattended archiving strategy has failed to complete.
Archiving Timeout	A configured archiving strategy has timed out.
Battery failure	Indicates that the battery is approaching the end of its useful life, or that it is missing or is completely exhausted. Immediate battery replacement is recommended (Appendix B, Section B1).
Broadcast Storm detected	Networking is limited until the storm has passed.
Clock failure	The internal clock was found to be corrupt at power up, or that the time has never been set. Time is forced to 00:00 1/1/1900. Can be caused by battery failure, in which case a battery failure message appears. The error is cleared by setting the time and date.
Channel error	Indicates a hardware failure in the channel circuit or in the internal cold junction temperature measurement.
Database failure	Corrupted EEPROM or flash memory.
DHCP Server failure	For units with 'IP Type' set to 'DHCP' (Network.Interface configuration) this alarm occurs if the instrument is unable to obtain an IP address from the server.
FTP Archiving file lost	A file has been deleted that had not yet been archived. Possible causes: Communications with the server could not be established,; archive is disabled; archive rate too slow.
FTP Archiving too slow	The archive rate is too slow to prevent the internal memory from overflowing. The recorder effectively switches to 'Automatic' (Section 6.2.2) to ensure that data is not lost.

---

FTP Primary Server Failure	This error occurs if the recorder fails to establish connection with the primary server, after two attempts. After the second attempt fails, the recorder attempts to establish connection with the secondary server instead. Primary and secondary server details are entered in the Network. Archiving area of configuration (Section 6.2.2).
FTP Secondary Server Failure	This error occurs if the recorder fails to establish connection with the secondary server, after two attempts. Primary and secondary server details are entered in the Network. Archiving area of configuration (Section 6.2.2).
Maths channel failure	Appears if, for example, the divisor of a divide function is zero.
Media archiving file lost	A file has been deleted that had not yet been archived. Possible causes: memory stick missing, full or write protected; archiving has been disabled; archiving rate too slow.
Media archiving too slow	The archive rate is too slow to prevent the internal memory from overflowing. The recorder effectively switches to 'Automatic' (Section 6.2.2) to ensure that data is not lost.
Media full	Archive storage device is full. The alarm becomes active only when an archive is in progress.
Media missing	No archive storage device present when archive attempted.
Non-volatile memory failure	RAM copy of non-volatile parameters is corrupted.
Non-volatile Write Frequency warning	One or more parameters are being written frequently to non-volatile memory. If this continues, it may lead to 'memory depletion' (i.e. the memory will no longer be able to store values correctly). A common cause of this problem is frequent writes over Modbus comms.
Recording failure (message)	Message explains reason for failure.
SNTP failure	Invalid data received from SNTP server, for example, the year received from the server is <2001 or >2035, or the server cannot be accessed.
Time synchronization failure	Instrument time has failed to synchronize with SNTP server. If more than 5 'Time change events' occur within 24 hours a 'Time synchronization failure' alarm is set. The alarm occurs 24 hours after the first event. Once synchronization is re-established, the alarm self-clears within 24 hours. A 'Time change event' occurs whenever the recorder time is found to be more than two seconds different from the server time. If the instrument time differs from the SNTP time by less than two seconds, the instrument time is updated gradually (1ms, eight times a second) to prevent time changes being recorded. SNTP time is based on elapsed seconds since 00:00 hours on 1st January 1900. The time is not affected by time zones or daylight saving adjustments.
USB overcurrent	USB power fault - too much current (i.e. >100mA) is being drawn by a USB device.
Wiring failure	The user wiring has failed to verify, i.e. one or more wires has been detected that does not have both a source and a destination defined. This may be the result, for example, of power loss during a download from iTools.

**CHANNEL ALARM** 

This indicator appears if any channel (including channels not in the display group) is in an alarm state. The symbol is illuminated continuously if all alarms are acknowledged or flashes if any one or more alarms is unacknowledged. Alarms are acknowledged from the Root menu 'Alarm summary' item as described in Section 5.3.3 or in the Channel configuration area (Section 6.4.3) if the user's access permission is appropriate.

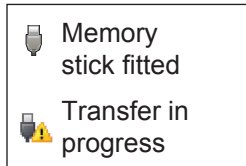
**USB**

This icon appears whenever a memory stick (max. capacity 8GB) or other supported USB device (Section 11) is plugged into the USB port at the rear of the recorder.

When data transfer is in progress between the instrument and the memory stick, the icon changes to a 'busy' version.



**Caution:** The Memory stick must not be removed while archiving (demand or automatic) is in progress, as to do so may irreparably damage the file system of the memory stick, rendering it unusable. It is recommended that all archiving is suspended before the memory stick is removed.

**FTP ICON** 

The FTP icon appears whenever transfer activity is taking place.

**RECORD ICON**


One of four icons appears at the bottom left corner of the display to indicate recording status.

Record 


This indicates that the recorder is recording the items selected in the Group Recording area of configuration (Section 6.3).

Stopped 

This means that 'Enable' has been set to 'no' in the Group Recording area of configuration (Section 6.3). Trending is not affected.

Paused (Suspended) 

This means that recording has been paused by a wire to the Suspend parameter (Group Recording area of configuration (Section 6.3) going true (high). Trending is not affected.

In Configuration 

The recorder has been placed in configuration mode either at the user interface, or via iTools. Recording is stopped until the recorder is no longer in configuration mode. For each non-recording state (Stopped, Paused or In Configuration). A new history file is created when the unit comes out of configuration mode.



**Note:** For recording to be enabled, configuration status must be 'logged out' both at the instrument and at iTools.

**MESSAGE ICON** 

This 'envelope' icon appears when a message is generated and it remains on display until the Message Summary (see Message Summary on page 24) is accessed, when it is removed from the display until the next new message is generated.

**AUTOTUNE ICON** 

For instruments fitted with the Loop option, this symbol appears during the Autotune process.

### 5.2.3 Breaks in recording

Breaks in recording can be caused by the unit being powered down, by the user entering configuration mode or when the recorder time is changed manually. In vertical and horizontal trend modes, a line is drawn across the width/height of the chart to indicate that recording has been interrupted.

On power up, a red line is drawn across the chart. In 'History', if messages are enabled the message:

Date Time System power up

is printed on the chart, together with the configuration and security revisions.

On exiting configuration mode, a blue line is drawn on the chart and in 'History', if messages are enabled, the messages:

Date Time Logged out.

Date Time Config Revision: N was N-1 (assuming a configuration change was made)

Date Time Logged in as: Engineer

appear on the chart.

When the instrument time is changed (manually - not through daylight saving action) a green line is drawn on the chart and in 'History', if messages are enabled, the message:

Date Time Time/Date changed

appears on the chart.

### 5.3 TOP LEVEL MENU

This menu appears when the page key is operated from any non-configuration page. The menu items displayed depend on the access permission of the user. One of the menu items is highlighted, and if the scroll key is operated, then it is the highlighted item that is 'entered'.

Figure 10 shows the top level menu for Engineer level access.

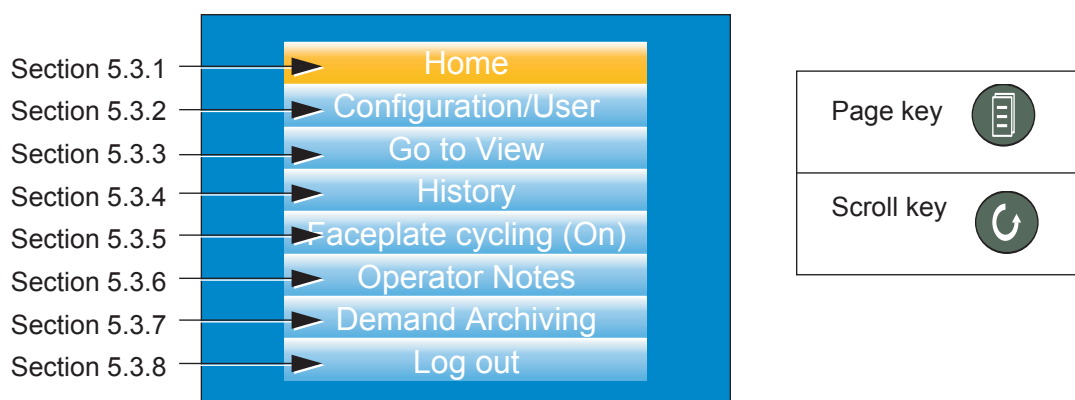


Figure 10 Top level menu

#### 5.3.1 Home

Operating the scroll key whilst 'Home' is highlighted causes a return to the 'Home' page. By default, this is the vertical trend mode, but the mode can be changed in 'Instrument.Display' configuration (Section 6.1.3).

#### 5.3.2 Configuration

Operating the down arrow key highlights the 'Configuration' item. Operating the Scroll key enters the configuration submenu described in Section 6.



**Note 1:** 'Configuration' appears only if the user has an appropriate access level.

**Note 2:** If the Auditor feature is enabled, additional user accounts are available. If one of these users are logged in, the 'Configuration' menu option is replaced by the 'User' menu option instead (see Section 5.3.2.1).

### 5.3.2.1 User menu

If the Auditor feature is enabled, up to 25 additional user accounts are available with configurable access permissions and passwords. If one of these users are logged in, the 'Configuration' menu option is replaced by a 'User' menu option which provides the ability for the user to change their password and set the Archive Interval (if the user has appropriate permissions).

Operating the scroll key whilst the 'User' item is highlighted, displays the individual user account menu, as shown in the following figure. The menu title matches that of the username used to log in.

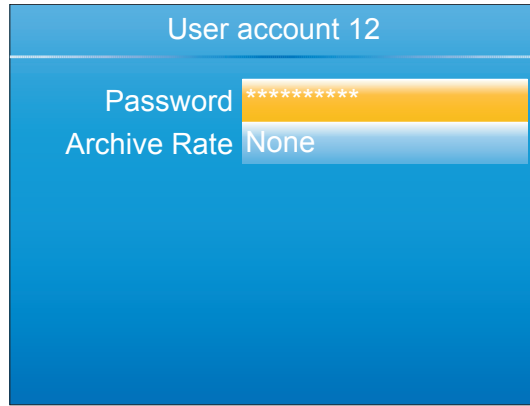


Figure 11 User menu

- Password** Allows the user to change their password (up to a maximum of 20 characters). The minimum password length can be configured using the Min Password Len parameter in the Security menu (see Section 6.1.6).
- Archive Rate** Allows the user to specify the frequency at which the contents of the flash memory are archived to the USB port, or via FTP to a PC. Scrollable settings are:

  - None:** Automatic archiving is disabled. Any archiving must be initiated by the user using Demand Archiving.
  - Minute:** Archive is initiated on the minute, every minute.
  - Hourly:** Archive is initiated at 00:00 each day.
  - Weekly:** Archive is initiated at midnight every Sunday.
  - Monthly:** Archive is initiated at 00:00 on the 1st of every month.
  - Automatic.** The recorder selects the least frequent of the above archive periods which is guaranteed not to lose data as a result of the internal flash memory running out of space.

This field is editable if the logged in user has appropriate permissions to adjust the archive interval (see Section 6.1.11). For further information on archiving, refer to Section 6.2.2.

### 5.3.3 Go to View

Operating the scroll key whilst the 'Go to view' item is highlighted, calls the Go to view submenu (Figure 12). This allows the user to view channel alarms, system alarms, messages or to select a different display mode.

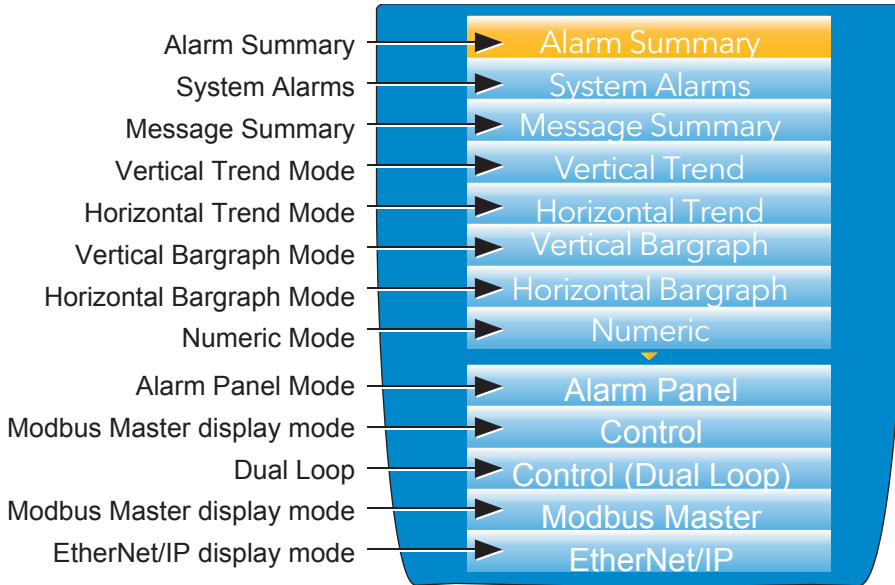


Figure 12 Go to view submenu



**Note 1:** If an option is not fitted, its display mode does not appear in the list.  
**Note 2:** Some display modes must be enabled in Instrument.View configuration (Section 6.1.3) before they become available.

### ALARM SUMMARY

For each active alarm, this page displays the channel identifier with alarm number (e.g. C1(2) = channel 1; alarm 2), the channel descriptor, the alarm threshold the current process value and an alarm type symbol. To return to the top level menu, operate the Page key.



**Note 1:** The background color to the channel ID is the same as that chosen for the channel.  
**Note 2:** A prefix 'C' in the channel ID means that this is a measuring channel; A prefix 'V' means that this is a virtual channel (i.e. a totalizer, counter or maths channel).

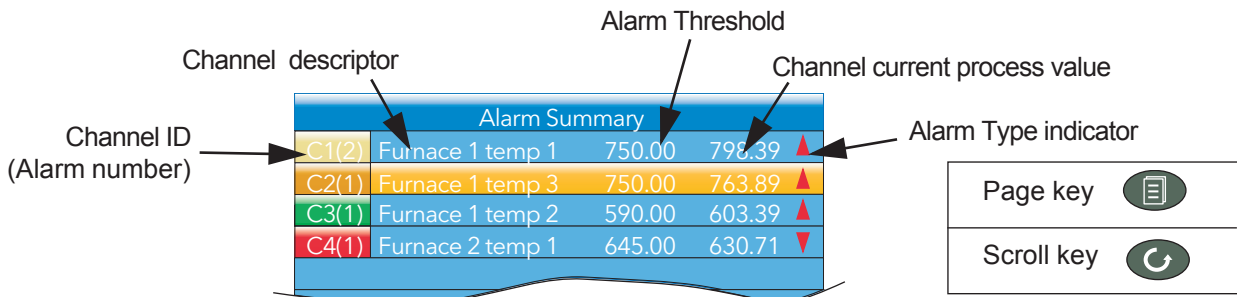
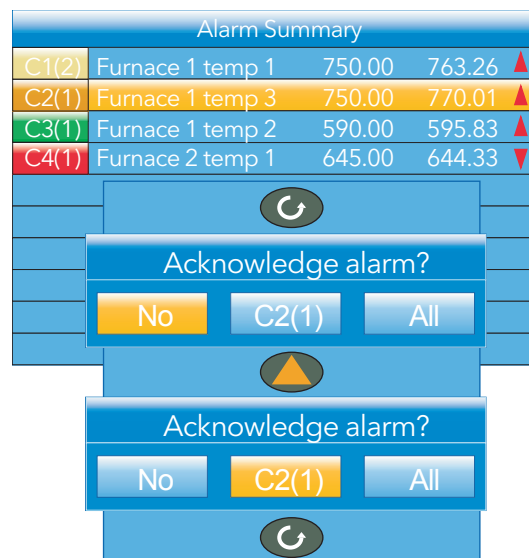


Figure 13 Alarm summary page with acknowledge confirmation display

## ALARM ACKNOWLEDGEMENT

To acknowledge an alarm from this view:

1. Use the up and down arrows to highlight the required alarm.
2. Operate the scroll button. The 'Acknowledge alarm' window appears.
3. Use the up arrow to highlight the relevant field (C2(1) in this example), or 'All' if all alarms are to be acknowledged.
4. Operate the scroll key to confirm. If the alarm fails to respond, this may be due to the fact that it has been configured as a 'Manual' alarm, and the trigger has not yet returned to a 'safe' (non-alarm) state, or it could be that the instrument is in a logged out state.



## SYSTEM ALARMS

Operating the scroll button whilst the 'System Alarms' field is highlighted displays a list of all currently active system alarms. Section 5.2.2 contains a list of system alarms and their interpretations. To return to the top level menu, operate the Page key.

A further operation of the scroll button displays a 'Help Information' page, giving the reason for the highlighted alarm.

Operate the scroll button again to return to the system alarm display.

## MESSAGE SUMMARY

Operating the scroll key whilst the 'Message summary' field is highlighted displays the ten most recent messages.

Operating the scroll key whilst a message is highlighted shows the selected message in more detail (and using the up/down keys allows the other messages to be scrolled through). Whilst in this mode, operating the scroll key again, allows the user to choose to jump to the message's location in trend history mode (Section 5.5) or to return to the summary page.

By default, the interface is set up such that:

1. all message types are included.
2. the up and down arrow keys cause the highlighted selection to move up or down by one message at a time.



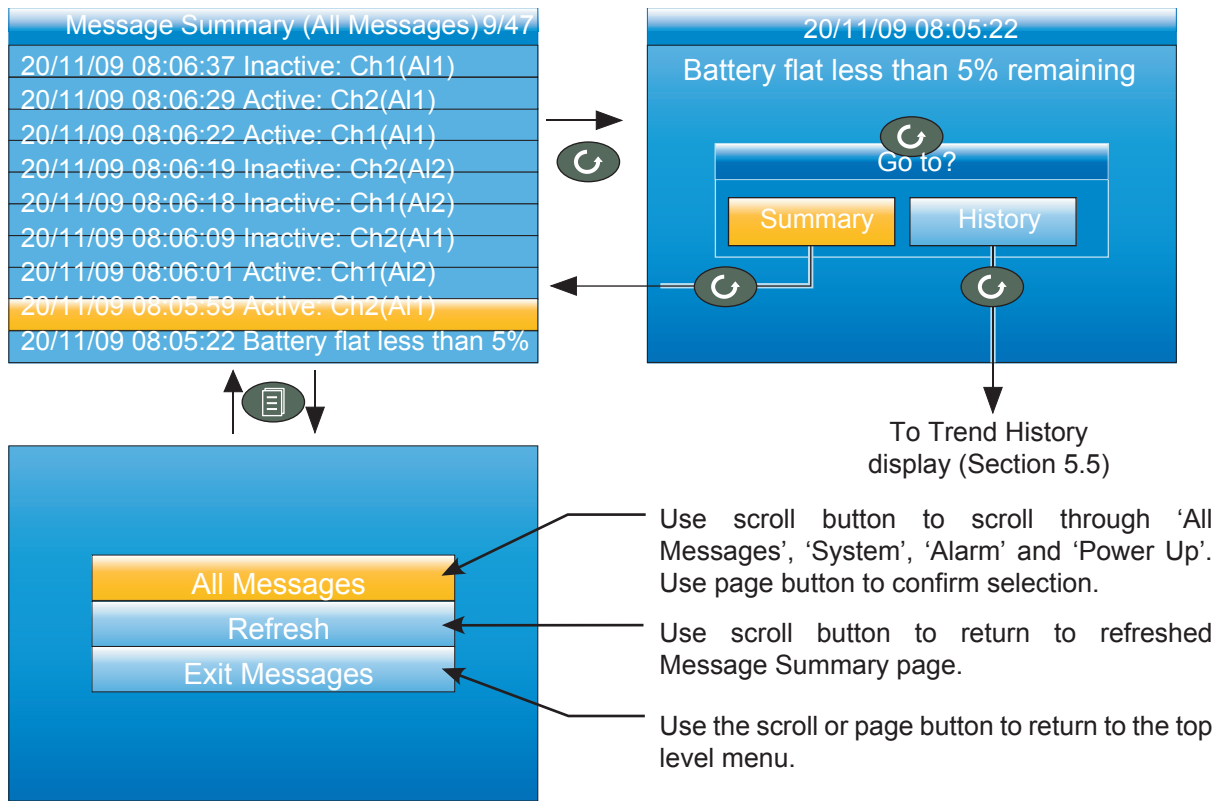


Figure 14 Message summary features

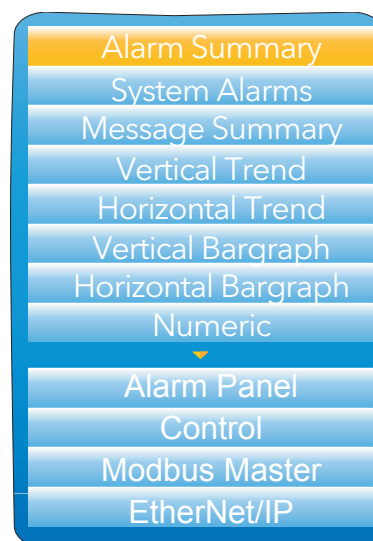
MESSAGE FILTERS

- |              |                                                    |
|--------------|----------------------------------------------------|
| All Messages | Causes all messages to be displayed on the screen. |
| System       | Shows only system alarms.                          |
| Alarm        | Shows only channel alarms.                         |
| Power up     | Shows only power up messages.                      |
| Login/out    | Limits the display to Log in and Log out events.   |

## DISPLAY MODE SELECTION

Use the up/down arrow buttons to highlight the required display mode. Once the required display mode is highlighted, operation of the scroll button causes the recorder to leave the 'Go to View' menu and to display channel values in the selected mode. See Section 5.4 for a description of the various display modes.

Alternatively the up and down arrow buttons can be used from any of the display modes to cycle through the available modes in the order listed in the figure.



**Note 1:** If an option is not fitted, its display mode is not available for selection.

**Note 2:** Some display modes must be enabled in Instrument. Display configuration (Section 6.1.3) before they become available.

### 5.3.4 History

This top level menu item allows the user to switch from real-time trending to review mode, where channel values, messages, alarm triggers, etc. can be viewed back as far as the last significant configuration change. History mode is fully discussed in Section 5.5.

### 5.3.5 Faceplate Cycling on/off

For the purposes of this document the channel whose faceplate is currently displayed and whose 'pen' symbol is visible is called the 'Active' channel.

By default, the recorder scrolls through all the channels in the display group, with each channel becoming the active channel in turn. This top level menu 'Faceplate Cycling' item allows the user to inhibit this scrolling action such that the currently active channel remains active permanently, or until a manual scroll is performed using the scroll button (or until Faceplate Cycling is re-enabled).

'Faceplate Cycling' is highlighted by using the up/down arrow buttons. Once highlighted, the status can be changed from 'On' to 'Off' or *vice-versa* using the scroll button. Operation of the 'Page' button returns to the trend display.

### 5.3.6 Operator Notes

This area allows up to 10 notes to be created when logged in as Engineer, using either the text entry techniques described in Section 5.6, or 'iTOOLS' described in Section 9. Once logged out, operating the scroll button whilst a note is highlighted calls a selection box allowing the user either to send that note to the chart, or to write a Custom Note.

#### CUSTOM NOTE

The Custom Note is written using the text entry techniques described in Section 5.6. Once the note is complete, operation of the page button calls a confirmation display. The down arrow is used to highlight 'Yes', and when the scroll key is then operated, the message is sent to the chart. The user name is added to the start of the custom note when saved. This custom note is not retained for further use, so if it is required on a regular basis, it is suggested that one of the Operator Notes 1 to 10 be configured (Engineer access level required) so that it may be used instead.



**Note:** Each note can contain up to 100 characters.

### 5.3.7 Demand Archiving

This allows a user, with a high enough access level, to archive a selected portion of the recorder history, either to a 'memory stick' plugged into the USB port at the rear of the recorder (Local Archiving), or to a PC, by means of the FTP protocol (Remote Archiving). The archived data remains in the flash memory of the instrument. When the flash memory is full, new data causes the oldest file(s) to be discarded.

The up and down arrow keys are used to navigate to the required field.

**ARCHIVE MENU**

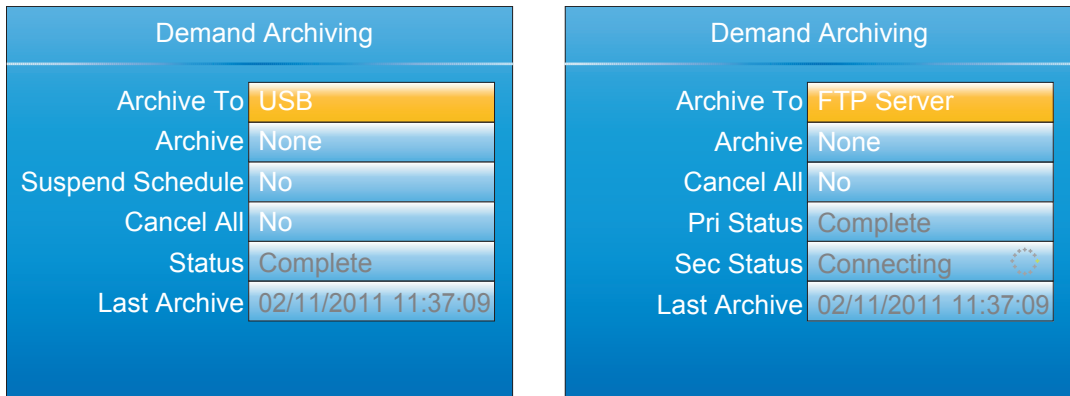


Figure 15 Demand Archiving menu (Local Archiving on left; Remote Archiving on right)

Archive To	With this item highlighted, the scroll button and the up/down arrows can be used to select 'USB' or 'FTP Server'. For 'USB', the archive will be made to the rear USB memory stick. For 'FTP Server' the archive will be made to the Primary or Secondary server (configured in the Network.Archive area of configuration described in Section 6.2.2. For more details about remote archiving, see 'Remote archiving', below.
Archive	In a similar way, select the archive period: None: No archiving to take place. (Not editable when logged out). Last Hour: Archives all files created within the last 60 minutes. Last Day: Archive all files created in the last 24 hours. Last Week: Archives all files created in the past seven days. Last Month: Archives all files created in the past 31 days. Archive All: Archives all the files in the recorder's history. Bring To Date: Archives all files created or updated since the 'Last Archive' date and time.
Suspend Schedule	When set to 'Yes', automatic (scheduled) archiving is stopped, once the transfer of the current file is complete. Suspend Schedule must be set to 'No' again, to restart the suspended archive. Suspend can be used to allow the memory stick to be removed and re-fitted safely.
Cancel All	When set to 'Yes', this cancels USB archiving activity immediately, or cancels FTP archiving once transfer of the current file (if any) is complete.
Last Archive	Shows the date and time at which the last archive (demand or automatic) was attempted. If a demand archive is requested, or is in operation when an automatic archive is triggered, the automatic archive takes precedence.
Status	For Archive to USB only: 'Complete' means that no archiving is currently taking place. 'Transferring' indicates that an archiving is in progress. Accompanied by an animated circular display. 'Suspended' means that archiving has been suspended as requested.
PriStatus	For Archive to FTP Server only, this shows the transfer status between the instrument and the primary host computer.
SecStatus	For Archive to FTP Server only, this shows the transfer status between the instrument and the secondary host computer.

**FTP SERVER ARCHIVING**

This allows the archiving of recorder files to a remote computer via the RJ45 type connector at the rear of the recorder, either directly or via a network.

In order to carry out a successful transfer:

1. Details of the remote host must be entered in the Network.Archive area of configuration (Section 6.2.2).

2. The remote computer must be set up as an FTP server. Help from the user's IT department may be necessary in order to achieve this. Appendix B, Section B2 to this manual suggests one way, using Filezilla.
3. The remote computer must also be set up to respond to 'pings'. This is because the instrument pings the host whilst establishing connection, and if it does not receive a response the archive attempt fails.

When accessing files using Microsoft® Internet Explorer, the address (URL) field can be in one of two formats:

1. ftp://<instrument IP address>. This allows a user to log in as the anonymous user (if the recorder has any account with the user name set to 'anonymous' with a blank password).
2. ftp://<user name>:<password>@<instrument IP address> to log in as a specific user.

Microsoft® Internet Explorer displays, by default, history files only. To quit the history folder, either uncheck the Tools/Internet Options/Advanced/Browsing/'Enable folder view for FTP sites' option, or check the Tools/Internet Options/Advanced/Browsing/'Use Web based FTP' option.

## REVIEW SOFTWARE

'Review' is a proprietary software package which allows the user to extract 'archive' data from one or more suitable instruments\* and to present this data on a host computer, as if on a chart, or as a spreadsheet. The host computer must be set up as an FTP server (see Appendix B, Section B2 for a description of one way of doing this).

As described in the Review help system, 'Review' allows the user to set up a regular transfer of data (using FTP) from connected instruments into a database on the PC, and then from this database to the chart or spreadsheet. The chart/spreadsheet can be configured to include one or more 'points' from one or all connected instruments (where a 'point' is an umbrella term for channel, totalizer, counter etc.).

It is also possible to archive instrument history files to a memory stick, Compact Flash card etc. (depending on instrument type) and to use this to transfer the data to the PC.

Each type of instrument has its own remote user name and password configuration - for this instrument, the user name and password are both 'history'.

\*Suitable instruments are connected instruments, the archive files of which have the suffix '.uhh'.

### 5.3.8 Login

Login allows the user to enter a password in order to gain access to areas of the unit's configuration which are not available when the user is logged out.

Passwords can be assigned to the Supervisor and Engineering level accounts, and it is recommended these be set with a strong password that is difficult to guess. Passwords are also assigned to the additional 25 user accounts if the Auditor feature is enabled. Failed login attempts are recorded in the history.

## LOGGED OUT ACCESS LEVEL

Logged out mode allows the user to select viewing mode, to view history, to view alarms, to toggle faceplate cycling on and off, to send notes, to suspend/resume USB archiving and to access the login process.

## OPERATOR ACCESS LEVEL

In addition to the logged out features, Operator access level allows the user to acknowledge alarms, to edit notes and to perform demand archive operations.

By default, no password is required in order to enter Operator level, but a password can be set either at Supervisor level or at Engineer level.

If the Auditor feature is enabled, the Operator user is disabled and instead replaced by the 25 User accounts (see section User Access Level below). However, the User 1 account defaults to a user with a user name of "Operator" in this instance (with no additional permissions), which can be kept, disabled, modified or overridden if necessary or desired.

## SUPERVISOR ACCESS LEVEL

In addition to the logged out level function, this access level allows the user to view the recorder's configuration, and to edit some values (such as alarm thresholds). By default, the default password for the Supervisor level is '100' and this password can be changed in the Instrument area of configuration, either at Supervisor level or at Engineer level.

When the Auditor feature is enabled, it is regarded as best practise that the Supervisor level is not used at all, or, at the very least, locked down with a strong password. This can be enforced by disabling the Supervisor level altogether (refer to the 'Sup Log Disabled' parameter in Section 6.1.6). With the Supervisor disabled, only the Engineer level can view (and change) the instrument's configuration.

## ENGINEER ACCESS LEVEL

This allows full access to all areas of the recorder configuration. The default password is 100, but this can – and should – be edited in the Instrument area of configuration (Section 6.1.5). It is recommended that a strong password be used.



**Note:** Recording is stopped for as long as the user is logged in at Engineer level, even if the recorder is not being configured. This is indicated by the Record icon at the bottom left corner of the process value display screen being replaced by the Configuration (wrench) icon.



Record icon



Configuration icon

If the Auditor feature is enabled, it is recommended to only use the Engineering level within the context of a formal change control procedure.

## USER ACCESS LEVEL

If the Auditor feature is enabled, an additional 25 user accounts are available which can be configured to provide customisable levels of permission on a per-account basis. When this is done, the standard Operator Access Level is disabled, and the Logged Out user has no permissions. When logging in as one of these 25 user accounts, the account number (1 to 25) is prefixed to the user name. Refer to Section 6.1.11 for details on how to configure these user accounts and the permissions available to be assigned to each. Failed login attempts are written to the history, as is the user being disabled if a maximum number of failed login attempts is exceeded.

## LOGIN PROCEDURE

From the top level menu, use the up or down arrow keys as often as necessary in order to highlight 'Login', and then operate the Scroll key to produce the 'Access Logged out' display.



**Note:** This procedure describes how to login to an access level with a password associated with it. For non-password protected logins, the user needs only to select the required access level, and press the scroll key.

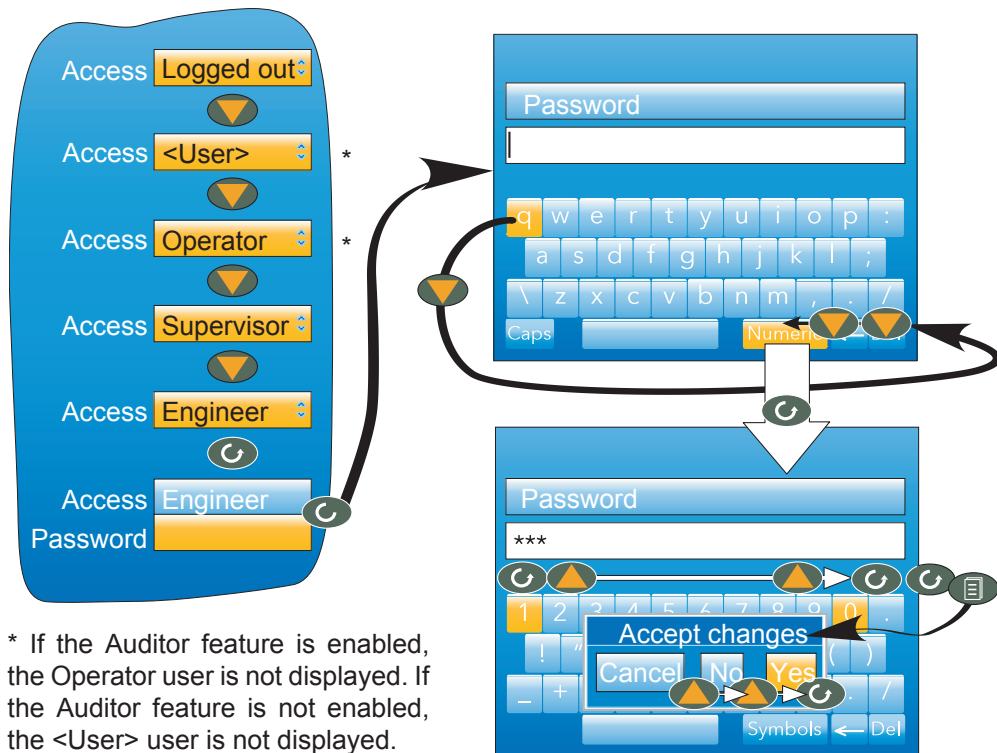


Figure 16 Log in Menu

**To log in as Engineer (default password = 100):**

1. Operate the up arrow key three times, to display 'Engineer'.
2. Press the scroll key to call the 'alpha' keyboard, with the letter 'q' highlighted.
3. Use the down arrow key three times to highlight 'Numeric'.
4. Operate the scroll key to display the numeric keyboard (numeral '1' highlighted.)
5. Operate the scroll key to enter '1', then use the up arrow key nine times to highlight numeral '0' and use the scroll key twice to enter '0' '0', completing the password of 100.
6. Use the Page key to call the confirmation display.
7. If the password entry is as required, use the up arrow twice (or the down arrow once) to highlight the word 'Yes' and operate the scroll key to confirm. The top level configuration menu appears. Otherwise, 'Cancel' can be used to clear the entry in order to start again, or 'No' can be used to quit login.

**5.4 DISPLAY MODES**

The following subsections describe the various display modes available to the user. By default, the 'Home' display mode is 'Vertical Trend', but this can be edited as a part of 'Instrument.Display' configuration (Section 6.1.3). This configuration area also allows the user to disable one or more display modes should they not be required.

The current display mode can be chosen either by using the top level menu 'Go to View' item or, from any display mode, by scrolling through the enabled modes using the up or down arrow buttons.

Details of the various display modes are to be found in the following subsections:

Vertical trend .....	Section 5.4.1	Numeric .....	Section 5.4.5
Horizontal trend .....	Section 5.4.2	Alarm panel .....	Section 5.4.6
Vertical bargraph .....	Section 5.4.3	Modbus Master .....	Section 5.4.7
Horizontal bargraph .....	Section 5.4.4	EtherNet/IP .....	Section 5.4.8

### 5.4.1 Vertical Trend Mode

In this mode, channel values are traced as though on a chart rolling downwards (i.e with the latest data at the top). The chart speed, and the number of major divisions are configured in the 'Group.Trend' area of configuration (Section 6.3.1). By default, the chart background is black, but this can be changed to white or gray in the 'Instrument' 'Display' area of configuration (Section 6.1.3).

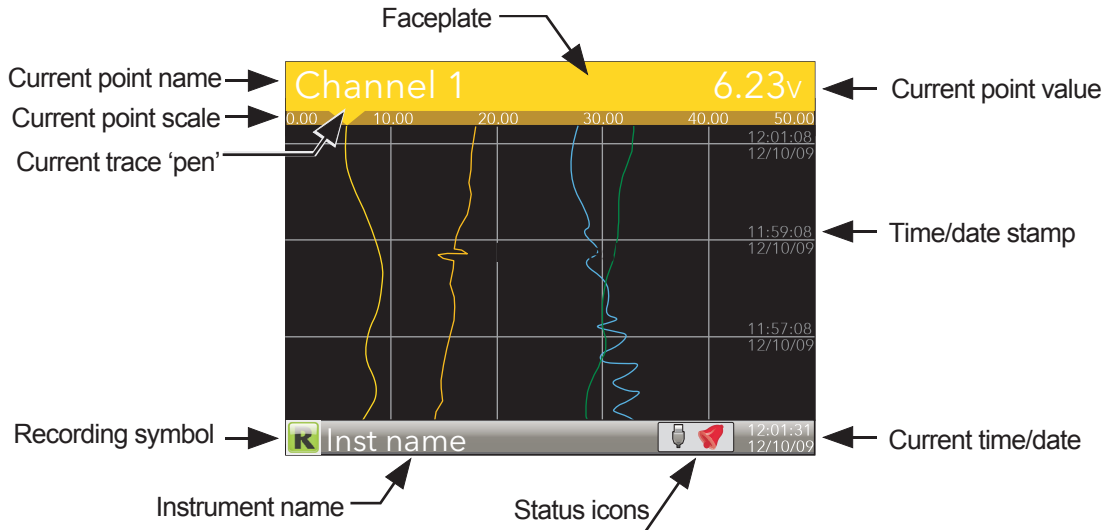


Figure 17 Vertical trend mode display elements

One of the channels is said to be the 'current' or 'scale' channel. This channel is identified by its pen icon being displayed, and by the channel descriptor, dynamic value and its scale being displayed on a 'faceplate' across the width of the display, above the chart.

Each channel in the Group becomes the 'current' channel in turn, for approximately five seconds -i.e. the channels are cycled through, starting with the lowest numbered channel. Once the final channel in the Group has been displayed for five seconds, the first channel is returned-to and the process repeats. This scrolling behavior can be enabled/disabled from the top level menu 'Faceplate Cycling (Off)' item described in Section 5.3.5.

The scroll button can be used to cycle through the channels manually in both Faceplate cycle on and off modes. Use of the up arrow button causes the next enabled display mode to be entered (default = horizontal trend). The page key calls the top level menu.

### 5.4.2 Horizontal Trend Mode

This view is similar to the vertical trend mode described in Section 5.4.1 above, except that the traces are produced horizontally rather than vertically. Initially, as each channel appears, its scale appears at the left edge of the display (as shown below), but in order to show the maximum amount of trend data, the scale is overwritten after a few seconds.

By default, after a few seconds, the 'chart' expands leftwards to hide the scale. This feature can be disabled in the Instrument.Display area of configuration (Section 6.1.3, H.Trend scaling) so that the scale is permanently on display.

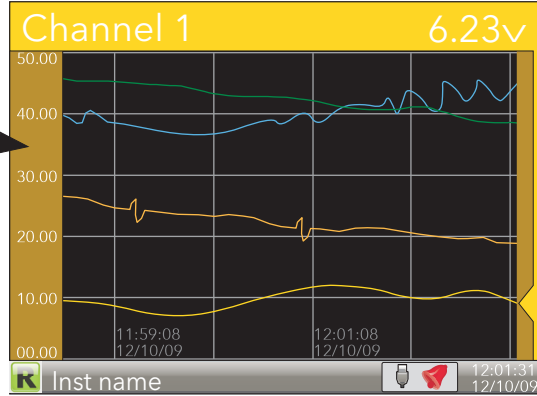


Figure 18 Horizontal trend display mode



**Note:** Timestamps appear to the right of the gridline to which they relate.

Use of the up arrow button causes the next enabled display mode to be entered (default = vertical bargraph). Use of the page key calls the top level menu.

### 5.4.3 Vertical Bargraph Mode

This display mode shows the channel values as a histogram. Absolute alarm threshold values appear as lines across the bars, gray if the alarm is not triggered; red if the alarm is triggered. Alarm symbols appear for active alarms.

Bargraph widths for four to six channels divide the width of the display screen equally between them. For one and two channels, the width is fixed, and the bars are centred on the screen. Figure 19 shows some examples (not to the same scale).

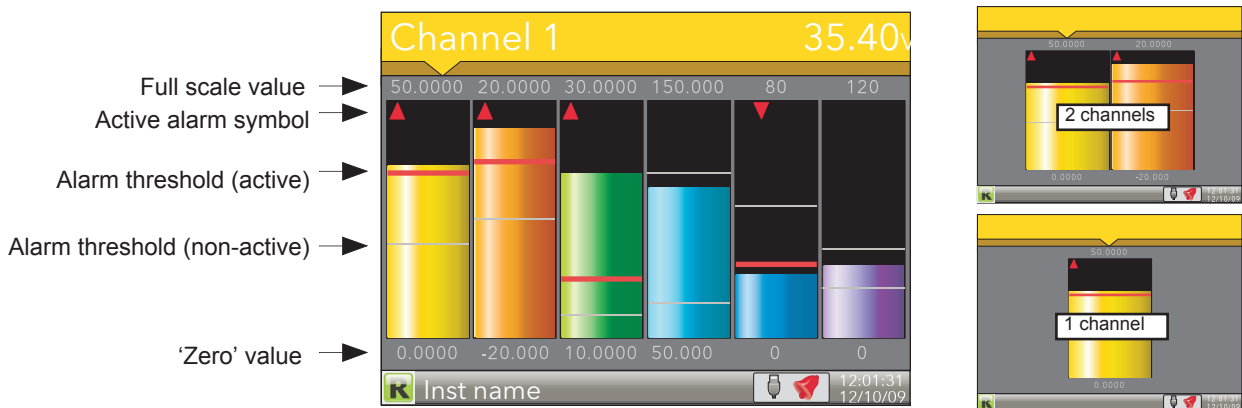


Figure 19 Vertical bargraph display mode

Use of the up arrow button causes the next enabled display mode to be entered (default = horizontal bargraph). Use of the page key calls the top level menu.



### 5.4.4 Horizontal Bargraph Mode

Similar to the Vertical bargraph mode described in Section 5.4.3, above, but includes channel descriptors.

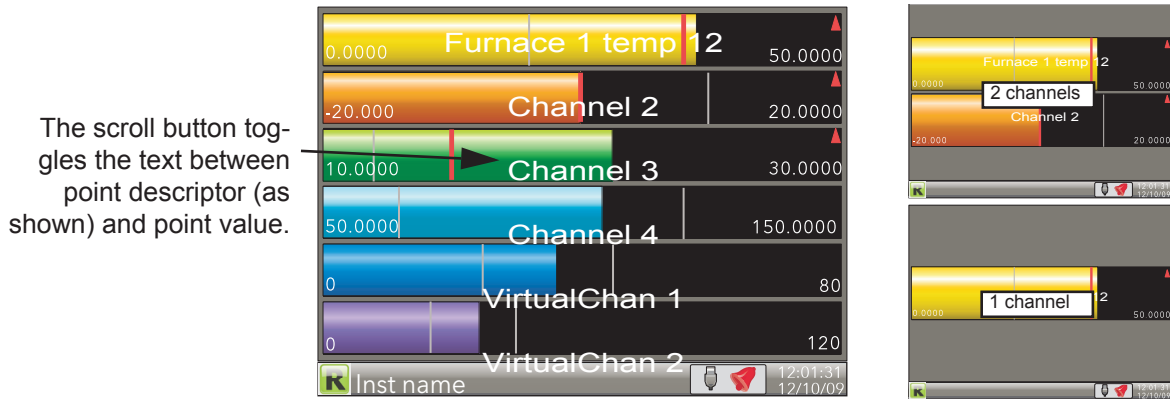


Figure 20 Horizontal bargraph mode

Use of the up arrow button causes the next enabled display mode to be entered (default = numeric).  
Use of the page key calls the top level menu.

### 5.4.5 Numeric Mode

Shows the enabled channels' values along with their descriptors and with indications of the type(s) of alarm configured for each channel.

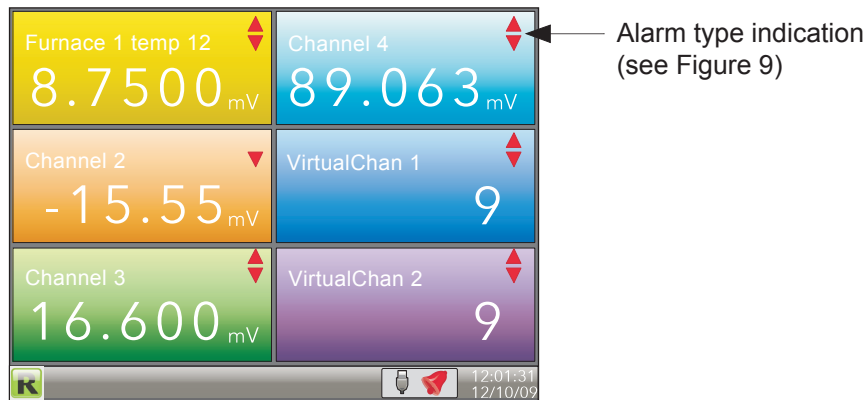


Figure 21 Numeric display mode (six enabled channels)

The figure above shows an example where the Trend group contains six channels. Figure 22 shows how the display appears for trend groups with fewer than six channels configured.

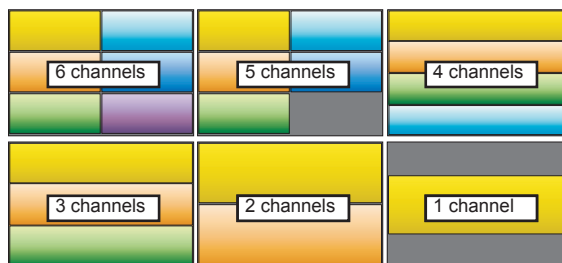


Figure 22 Display layout for different numbers of channels

The up arrow button returns to the vertical trend display mode; the page key calls the top level menu.

### 5.4.6 Alarm Panel Mode

This display appears only if enabled in the Instrument Display configuration (Section 6.1.3). Alarm panel mode shows current value and alarm status for each channel enabled in the Trend Group. The status is shown in two ways, by the color of the relevant bar, and by the alarm status indicators.

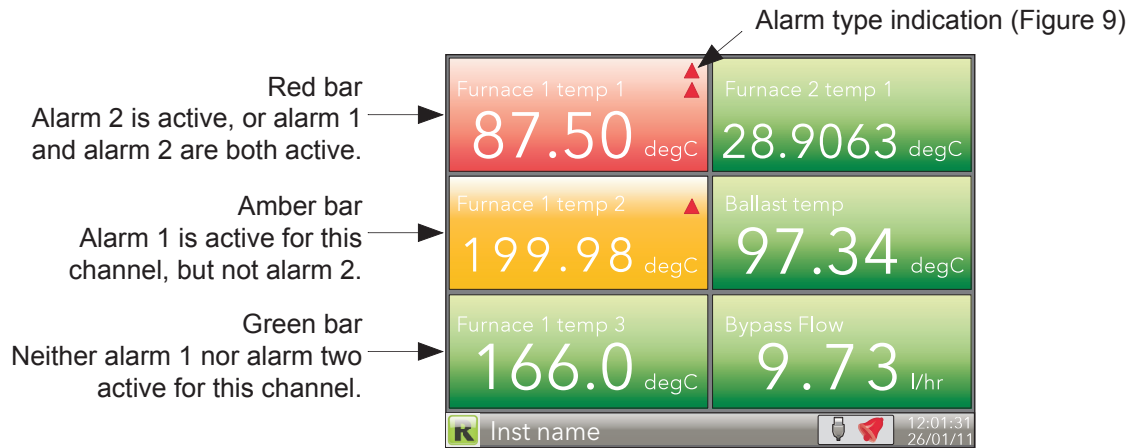


Figure 23 Alarm panel display (six channels)

The figure above shows an example where the Trend group contains six channels. Figure 24 shows how the display appears for trend groups with fewer than six channels configured.

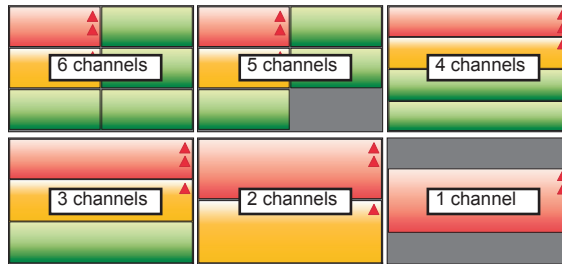


Figure 24 Alarm panel display layouts for trend groups with fewer than six channels

### 5.4.7 Modbus Master display mode

This display mode consists of two pages, as shown in Figure 25.

Page one opens by default and shows the first eight parameters being read from (left pointing arrow) or written to (right pointing arrow) the relevant slave. These items are configured in the Modbus Master configuration described in Section 6.6. Hidden parameters may be viewed by operating the scroll key, then using the arrow keys to scroll through the list. A green arrow means that the item may be edited by the user when logged in.

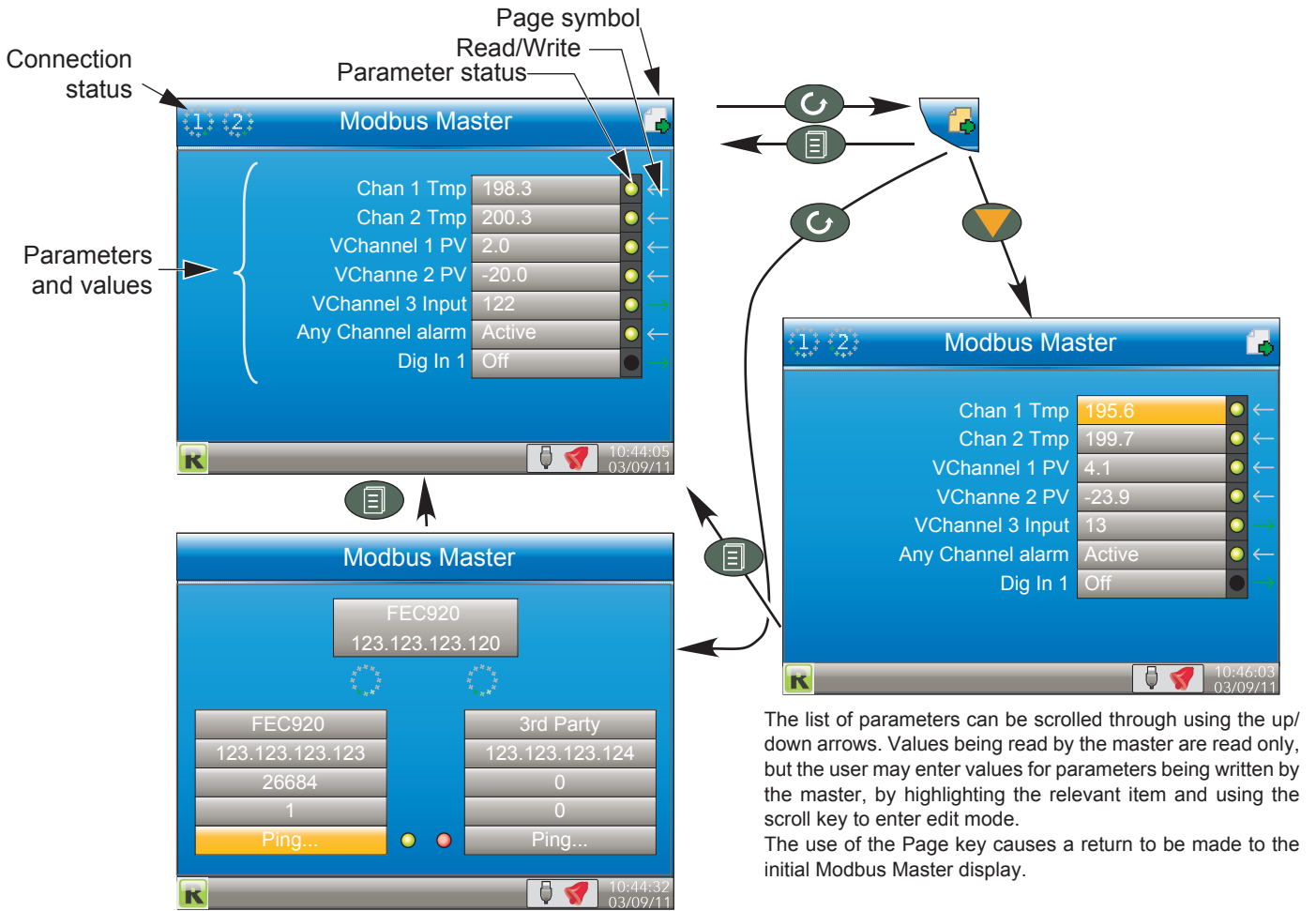
A pair of animated indicators in the top left-hand corner of the screen show the connection status of the two possible slaves. A green moving 'streak' indicates that successful communications are being carried out. A red flashing circle indicates that there is a break in the transmission line or that the slave is switched off. A gray, non-animated display indicates that the slave has not yet been configured as a part of the communications link (i.e it is 'off line').

A 'traffic light' indicator appears to the right of each parameter. Green indicates that the parameter is being read from or written to successfully. Orange indicates that a write of the value is pending. Red indicates that there is an error and that no value is currently being read or written; the value displayed is the last good value read or written depending on whether the data item is a read or write. If the indicator is black, the parameter is 'off'.

Operation of the scroll key highlights the page symbol in the top right-hand corner of the screen, and a further operation of the scroll key calls page two to the screen.



Page two contains the IP address of the Modbus master and of any slaves connected to it, together with some diagnostic information, as described in 'Ping Details', below.



The list of parameters can be scrolled through using the up/down arrows. Values being read by the master are read only, but the user may enter values for parameters being written by the master, by highlighting the relevant item and using the scroll key to enter edit mode. The use of the Page key causes a return to be made to the initial Modbus Master display.

Figure 25 Modbus Master display pages

**PING DETAILS**

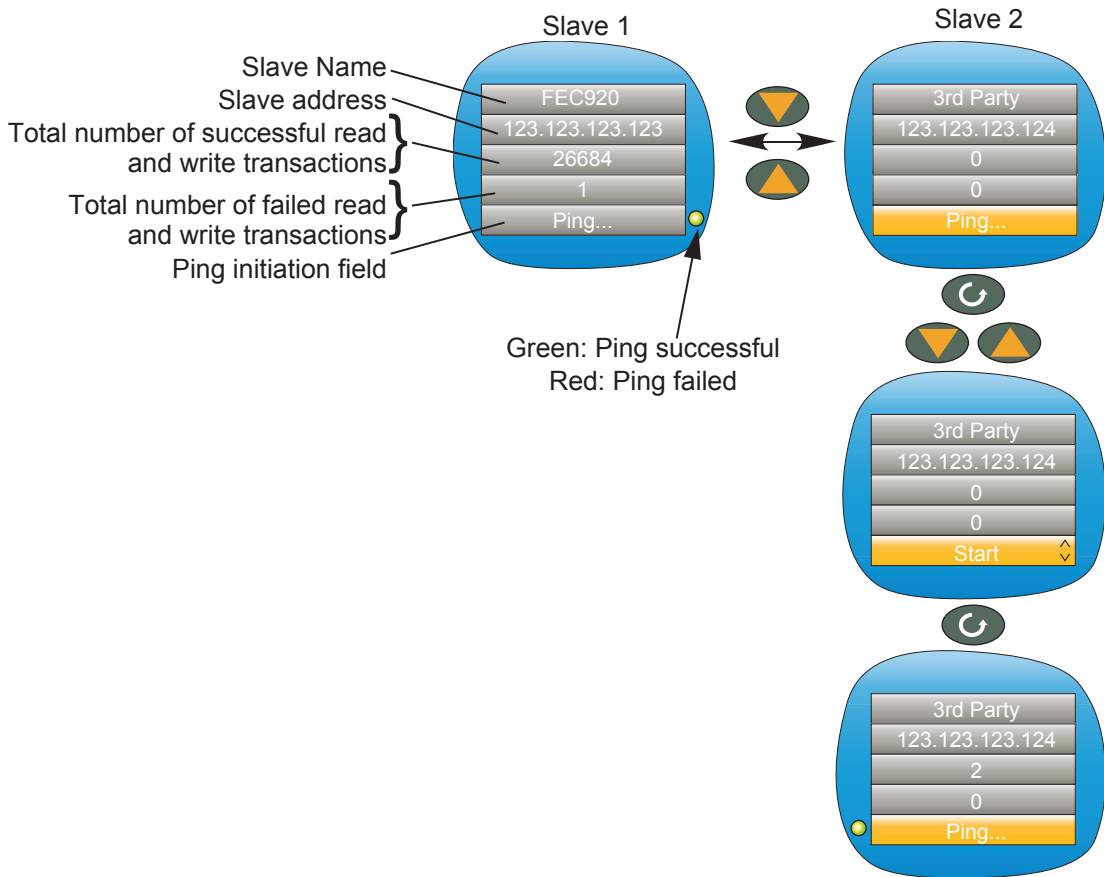


Figure 26 Slave 2 ping initiation (Slave 1 similar)

The 'Ping...' field of the first slave is highlighted by default. As shown above, the down (or up) arrow can be used to highlight the 'Ping...' field of the other slave instead.

Once the relevant 'Ping...' field is highlighted, the scroll key can be used to enter edit mode and the up/down arrow key used to select 'Start'. A further operation of the scroll key initiates the 'Ping' and if this is successful, a green indicator appears alongside the field (and the text returns to 'Ping...'). If the Ping is unsuccessful, then the indicator is colored red.

The up or down arrow can now be used to return to slave 1, or the page key can be used to return to the previous parameter display page.

As shown in the figure above, some diagnostic information is given. This includes the total number of successful attempts that the master has made to communicate with the relevant slave, and the total number of failed attempts. Fuller diagnostic details are to be found in the Modbus Master Communications configuration description (Section 6.6).

### 5.4.8 EtherNet/IP display mode

This display mode appears only if enabled in Instrument.Display configuration (Section 6.1.3) and is used to display the input and output parameters assigned to the Client and Server input and output tables. Parameters which have been configured with descriptors are identified by these descriptors instead of their 'opc' names (shown in Figure 27).

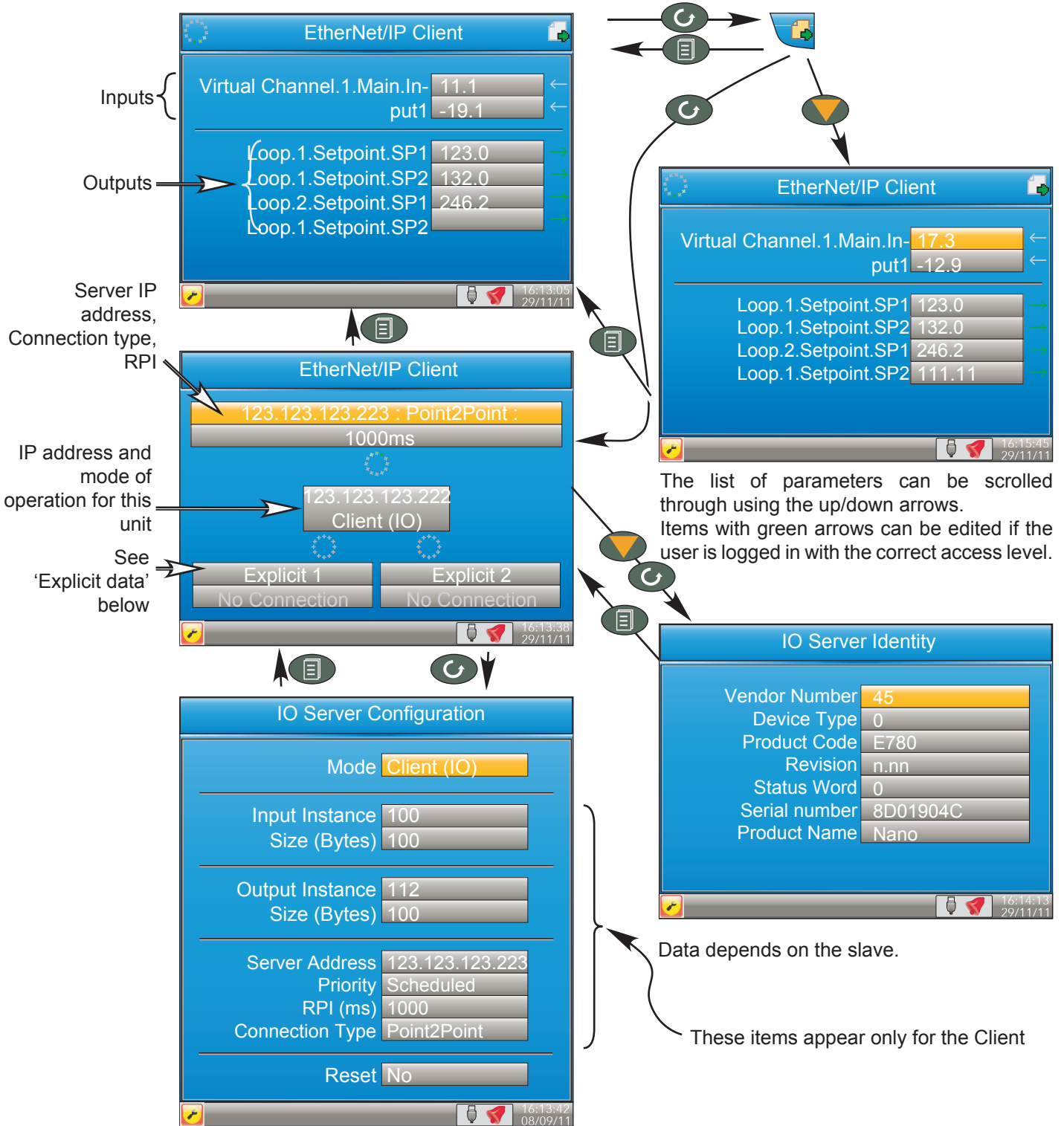


Figure 27 Typical EtherNet/IP display

If the EtherNet/IP option has been ordered and enabled, the FEC920 can be configured as either a client (master) or a server (slave) (see Section 6.7). The client and server displays are identical except that the configuration area of the client display is more extensive than that of the server display.

Figure 27, above shows a typical set of display pages for an EtherNet/IP client.

**CONFIGURATION OF IMPLICIT INPUT/OUTPUT TABLES**

Configuration of the input and output tables is carried out via iTools drag and drop only by:

- a. Entering the parameters to be read by the client into the server output table.
- b. Entering the destination parameter into the equivalent location in the client input table.
- c. Entering the parameters to be written by the client into the client output table.
- d. Entering the destination parameter into the equivalent location in the server input table.

The example in Figure 28 shows this (using the FEC920 as the client) in graphical form, using just a few parameters (there can be up to 50 in each table).

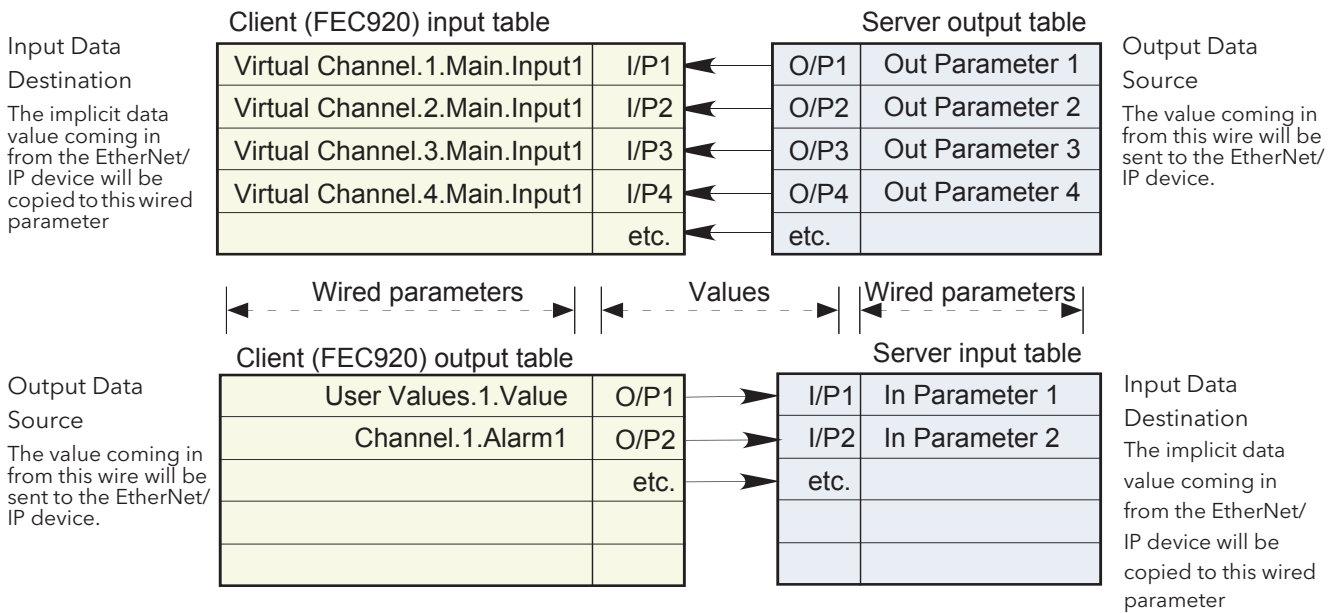



Figure 28 Input/Output table entries



**Note:** 1. Channel values from the Server can be 'wired' into FEC920 Virtual channel inputs (as shown above) so that they can be traced and/or recorded. In such cases the virtual channel 'Operation' must be set to 'Copy' (see Section 6.5.1).

**Note:** 2. Inputs and outputs would normally be given suitable descriptors (e.g. 'Reset timer' instead of 'Channel.1.Alarm1').

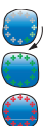
**CONNECTION STATUS INDICATOR**

A circular status indicator appears in a number of the EtherNet/IP display pages. This indicator can indicate the following states:

Green rotating 'flash': the instrument is on line and at least one CIP connection is established.

Green flashing circle: the instrument is on line but no CIP connections have been established.

Red flashing circle: there is a break in the physical connection between the client and the server, or the remote unit is switched off or is initialising.



Adding parameters to the input and output tables can be achieved only through the proprietary software package 'iTools', running on a PC. It cannot be configured through the user interface. The following description assumes that the user is familiar with 'iTools'. Section 9 of this manual shows how to set up an iTools link to the unit and the iTools on-line help system and its PDF version (HA028838) should be referred-to as necessary.



**Note:** The client/server and the PC must all be on the same network.

Once iTools has started up and the 'Scan' process has 'found' the relevant instrument, the scan process should be stopped and the instrument (s) allowed to synchronize. (The scan may be left to run its course, but the speed at which iTools operates is reduced for the duration of the scan process.)



**EXAMPLE**

To add Loop 2 Setpoint 2 to Output 4 of the Client Output table.

In the example shown below, the instruments have both synchronized, and the 'Access' tool button clicked-on for both instruments to set them into configuration mode.

With the client selected, expand the EtherNet/IP folder in the Browse list, then double-click on the 'ImplicitOutputs' folder.

Locate and expand the Loop 2 SP folder in the Browse window, and click-drag SP2 to 'Output 4' and release.

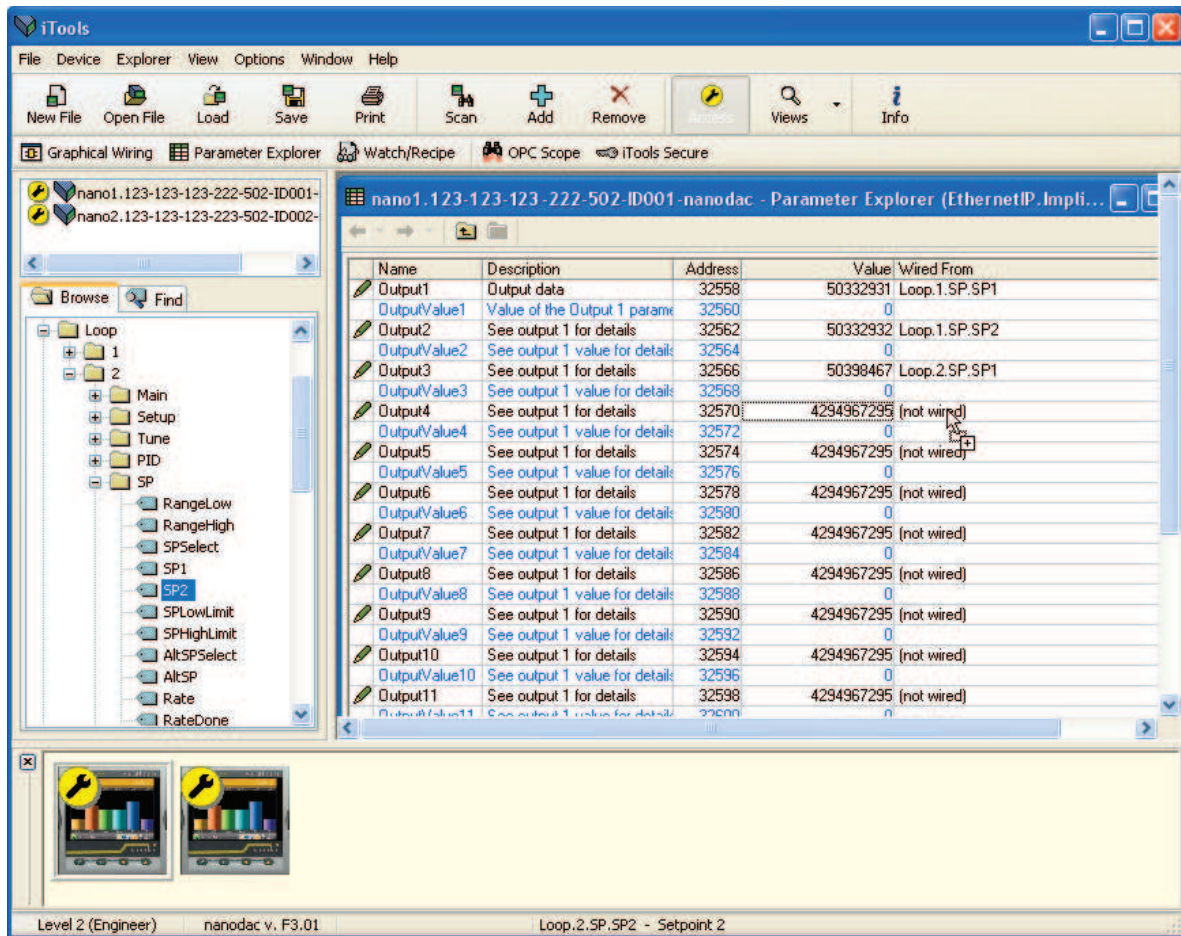
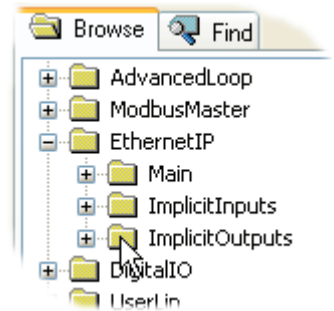


Figure 29 Dragging a parameter to the Output table

An alternative to the click-drag technique is to right click on the required output (five in the example below), and select 'Edit Wire...' from the context menu that appears. A browse window pops up, allowing the user to navigate to the required parameter. This technique can be used both on previously empty inputs or outputs and on those previously filled.

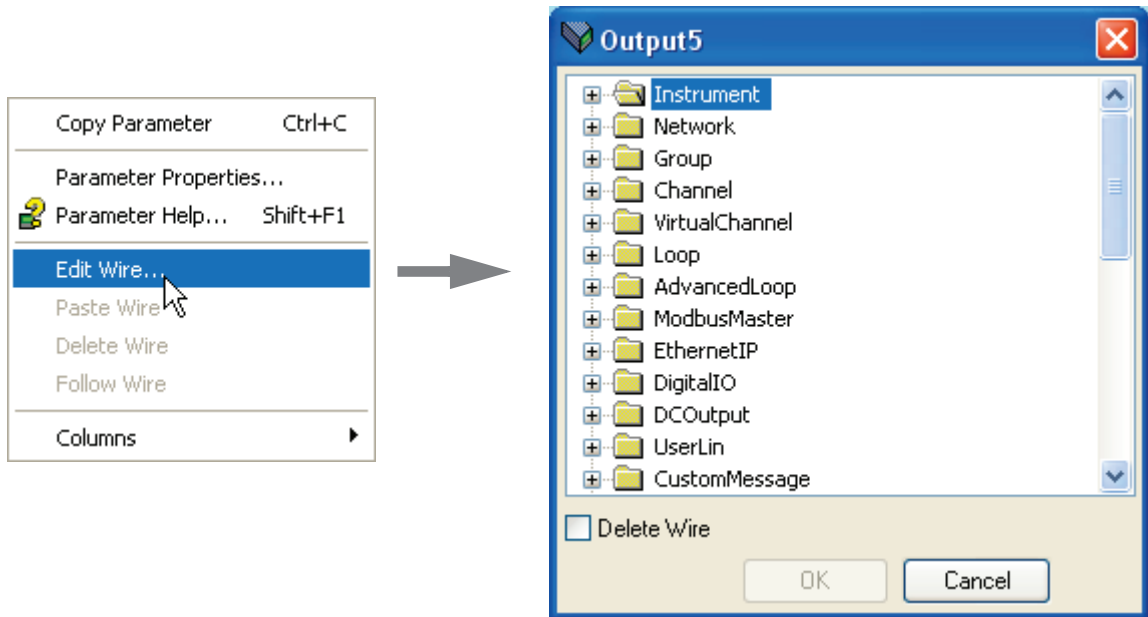


Figure 30 Context menu details

**EXPLICIT DATA**

As shown in Figure 31, when configured as a server, there is only one explicit application object, and that has the class ID= A2 (162 decimal). The instance ID is the Modbus address of the parameter and the Attribute is always = 1. Explicit service codes hex10 (decimal 16) and 0E (14) are both supported, for writing and reading single attributes respectively.

Service code		Class ID		Instance ID	Attribute
Hex	Dec	Hex	Dec	Decimal	
0010	16	A2	162	1-65535	1
000E	14	A2	162	1-65535	1

Figure 31 Explicit data specification

When configured as a client, two separate connections are available allowing the user to produce two independent explicit read or write messages to different server devices.

Figure 32, shows an example of how to configure an explicit message request. The instance ID and the data type are taken from the server manufacturer’s data. In this example a read request is configured to determine the Group recording status of a FEC920 server, and it can be seen from the table in Section 7.3 on page 132 that the decimal Modbus address for this parameter is 4150 and the data type is int16. It is this address which is used as the instance ID.

Once all the information has been entered, the read is requested by setting ‘Send’ to ‘Yes’. The Data field changes to ‘3’ for this example and from the table in Section 7.3 on page 132 it can be seen that the recording status is ‘Recording enabled’.

**Note:** The FEC920 supports only 16 bit data types for reading and writing of explicit messages.



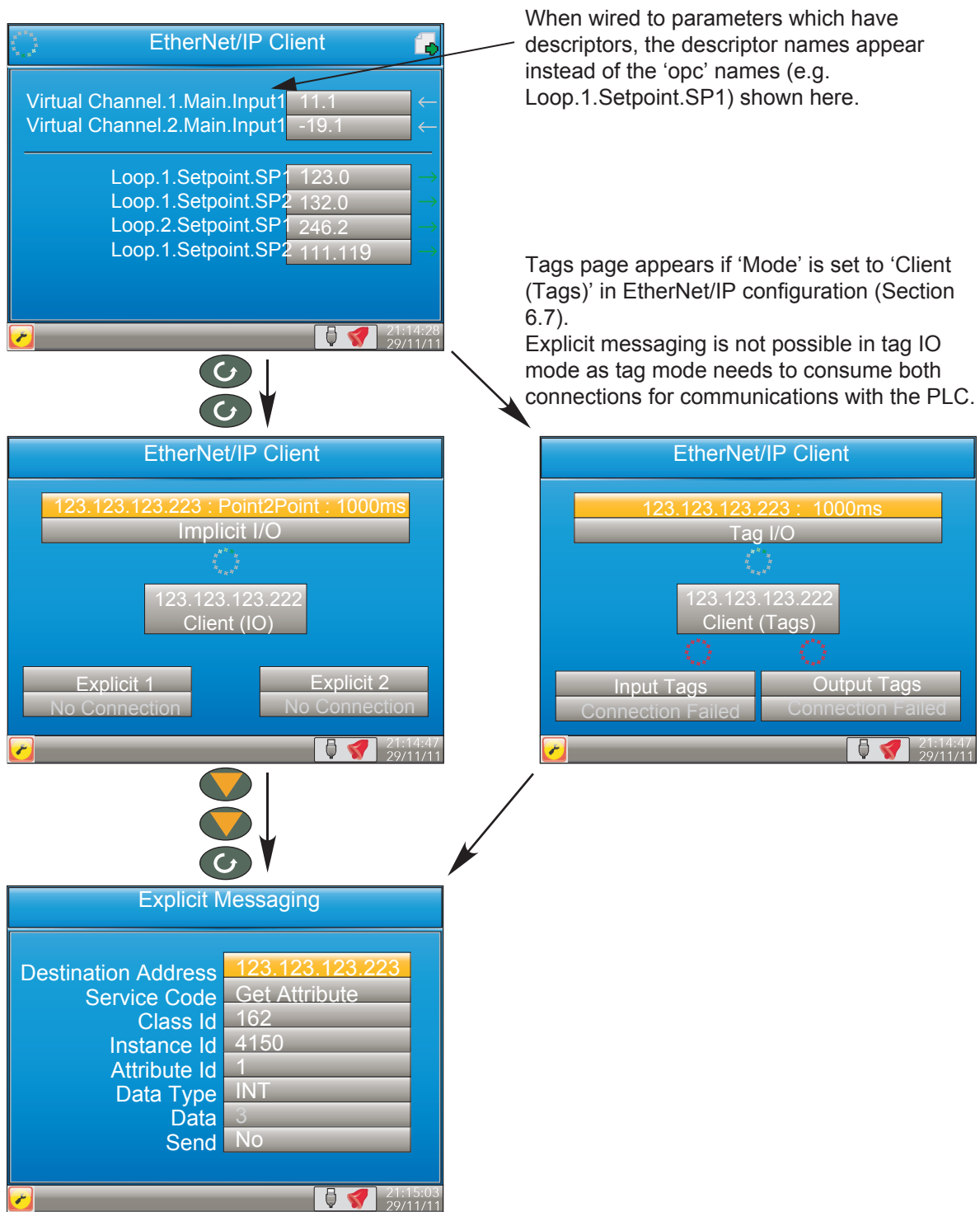


Figure 32 Explicit messaging example

**USING TAGS**

When acting as servers, many PLCs present their data in a tag format instead of implicit data format. For this reason, when the client is configured as 'Client (Tags)', (see Section 6.7) 30 input and 30 output tags become available to the user via iTools (Figure 33).

This allows tag names to be typed in, input tags 1 to 30 being associated with implicit inputs 1 to 30 respectively and output tags 1 to 30 being associated with implicit outputs 1 to 30 respectively.

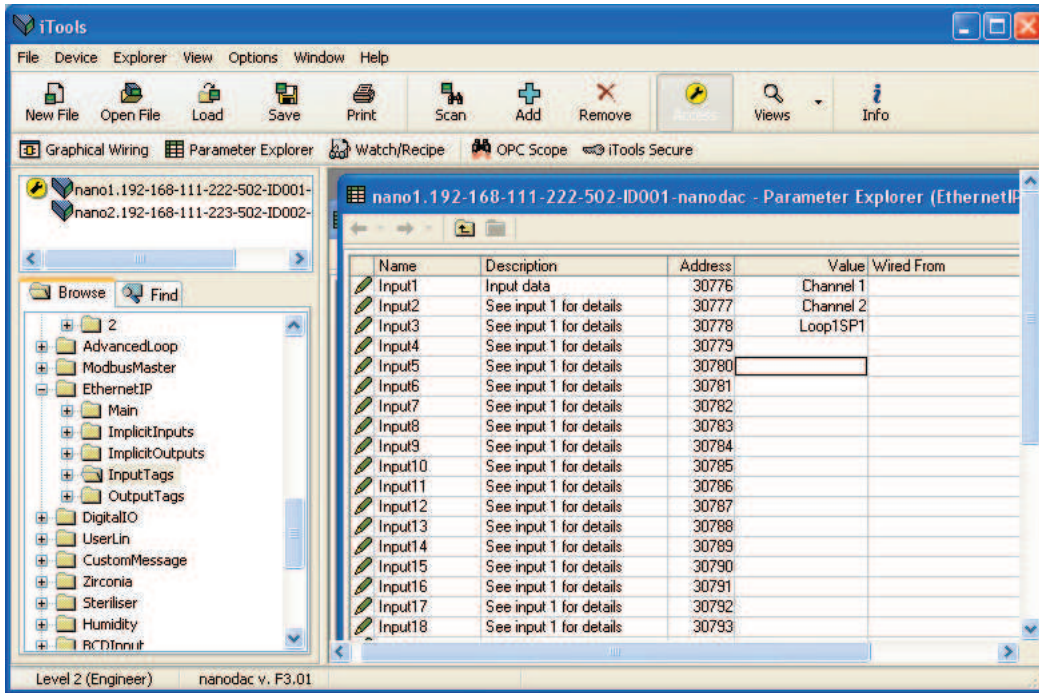


Figure 33 iTools display showing input tags.

In the example above, the value of the parameter with the tag 'Channel 1' will be written to implicit input 1.



- Note:** 1. Most PLCs have a data buffer limit of 500 Bytes. The total number of bytes being used is given by the equation: Total number of data bytes = (tag length + 10) × the number of requested tags.
- Note:** 2. Input data direction is always to the FEC920:  
 in server mode input data is written to the FEC920 from the client  
 in client mode, input data is read by the FEC920 from the server device.
- Note:** 3. Output data direction is always from the FEC920:  
 in server mode output data is written to the client from the FEC920.  
 in client mode, output data is read by the server from the FEC920.

## 5.5 TREND HISTORY

Entered from the top level menu (Section 5.1), this allows vertical and horizontal traces to be reviewed for Trend group channels. The amount of data displayed in one screen depends on the 'Zoom In/Out' setting in the History menu (Section 5.5.2) and on the recording interval selected in Group Recording configuration (Section 6.3.2). It is also possible to enter a time and date to which the history then jumps.

The history display is identical in appearance with the trend display except:

1. History displays can include messages if so configured in the History menu.
2. For horizontal trends, the scale is displayed permanently at the left edge of the display.

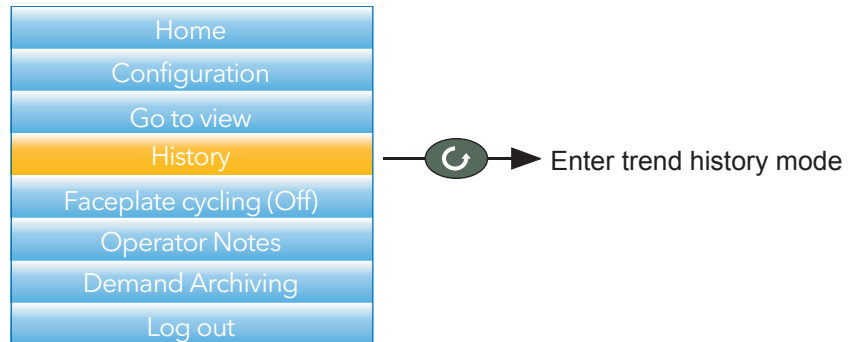






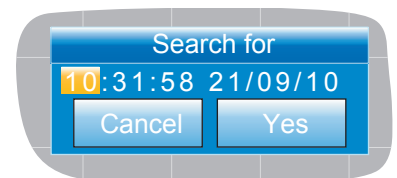
Figure 34 Top level menu

### 5.5.1 Navigation

-  The down arrow button moves the display backwards in time by  $\frac{1}{3}$  screen-full per operation (assuming that the current display is not the earliest). See also 'SEARCH FOR', below.
-  The up arrow button moves the display forwards in time by  $\frac{1}{3}$  screen-full per operation (assuming that the current display is not the latest). See also 'SEARCH FOR', below.
-  The scroll key scrolls through the trend group channels, emphasizing each channel (and displaying its faceplate) as it is selected.
-  The page key calls the History Menu, described in Section 5.5.2, below.

### SEARCH FOR

In the history display, holding the up or down arrow key operated for approximately two seconds produces a 'Search for' display which allows the user to enter a time and date. Once a time and date have been entered, 'Yes' then causes the history display to jump to that time and date (if such history exists).



To enter a time and date:

1. Use the up/down arrows to highlight the item to be edited.
2. When highlighted (orange background), operate the scroll button. The highlighted text turns black.
3. Use the up and down arrow keys to scroll to the required value for the field, then operate the scroll button again. The text goes white.
4. Repeat the above editing process for all the remaining items which are to be edited.
5. Use the up/down keys to select 'Yes'. The 'Search for' window closes, and the history display jumps to the selected time and date.



**Note:** 1. If no history exists for the selected time and/or date 'No History Available' is displayed.  
**Note:** 2. The time and date format and Daylight Savings Time (DST) effects are as set in the 'Locale' area of Instrument configuration. See Section 6.1.2 for further details.

## 5.5.2 History Options Menu

Operating the page key from within a history display, causes the History Options menu to appear.

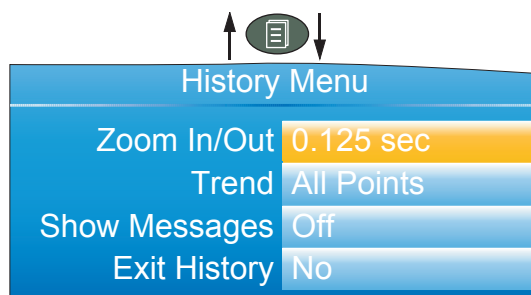


Figure 35 History Options menu

### PARAMETERS

Zoom In/out	Allows the user to select the amount of history displayed on the screen.
Trend	Select either 'All Points' or 'Each Point'. 'All points' displays all channels in the trend group, with the first channel emphasized on the screen and its faceplate displayed. The Scroll button is used to select the next channel in the group. 'Each Point' initially displays only the first point in the trace group. The scroll key is used to cycle through individual group channels in turn.
Show Messages	'Off' disable the inclusion of messages in history display. 'On' causes messages to appear, superimposed upon the point traces (vertical trend mode only).
Exit History	Selecting 'Yes' for this item causes a return to the top level menu or to the message summary page.



**Note:** Operating the page key from the History menu causes a return to the history display.

## 5.6 TEXT ENTRY

The user is often required to enter text characters or numbers (when editing operator notes, for example). This is done using the pop-up keyboards which are displayed when required. When only numerals are required a special keyboard is presented which contains only numerals.

Figure 36 shows the three standard keyboards, along with a 'scan' direction for operations of both up arrow and down arrow keys. To change keyboards, use the arrow pushbuttons to highlight the keyboard name ('Numeric', 'Symbols' or 'Alpha'), and then operate the scroll button.

Generally, to enter text, the required character is highlighted using the up and down arrows and the scroll button is used as an 'Enter' key. Once text entry is complete, the Page button is used to confirm the edit (use the down arrow to select 'Yes' then operate the scroll button).

Pressing and holding the scroll button and then immediately operating the up or down arrow, causes the character insertion point to move to the left (down arrow) or to the right (up arrow).

The user can press and hold the scroll key to display variations on certain characters (the letter 'e' in the figure). Once displayed, the up and down arrows can again be used to scroll through auxiliary list, allowing capital letters, and characters with diacriticals (e.g. accents, umlauts, tildes, cedillas) to be selected and entered using the scroll button.

The backarrow key is used as a back space key - i.e. it deletes the character to the left of the cursor position. The 'Del' key deletes the character to the right of the cursor.



**Note:** Leading and trailing space characters are automatically removed from text strings.

Press and hold scroll button for alternative character set.

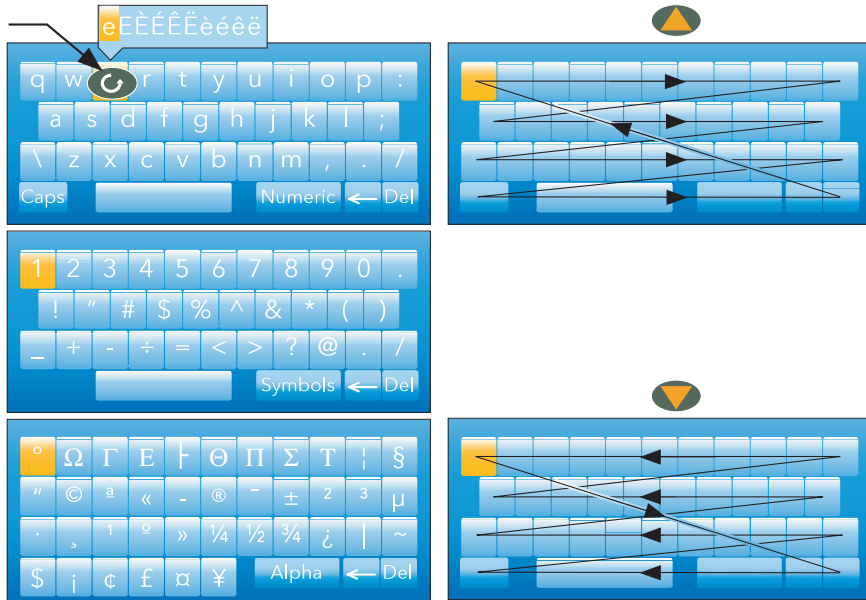


Figure 36 Standard Keyboards

### 5.6.1 Numeric keyboard

As mentioned previously, for functions which can take only numerals, a special numeric keyboard appears, as depicted in Figure 37.



Figure 37 Numeric keyboard

### 5.6.2 USB keyboard

Text and numeric entry can also be carried out using a USB keyboard as described in Section 11.3.

## 6 CONFIGURATION

Entered from the top level menu (Section 5.3) this allows the instrument configuration to be accessed and edited ('Engineer' access level required for full editing).



**Caution:** Recording is stopped for as long as the instrument login is at Engineer level. This means that Input/output circuits are switched off during configuration.

As shown in Figure 38, below, the instrument configuration is arranged in a number of 'areas', each of which is allocated its own sub-section within this Section.

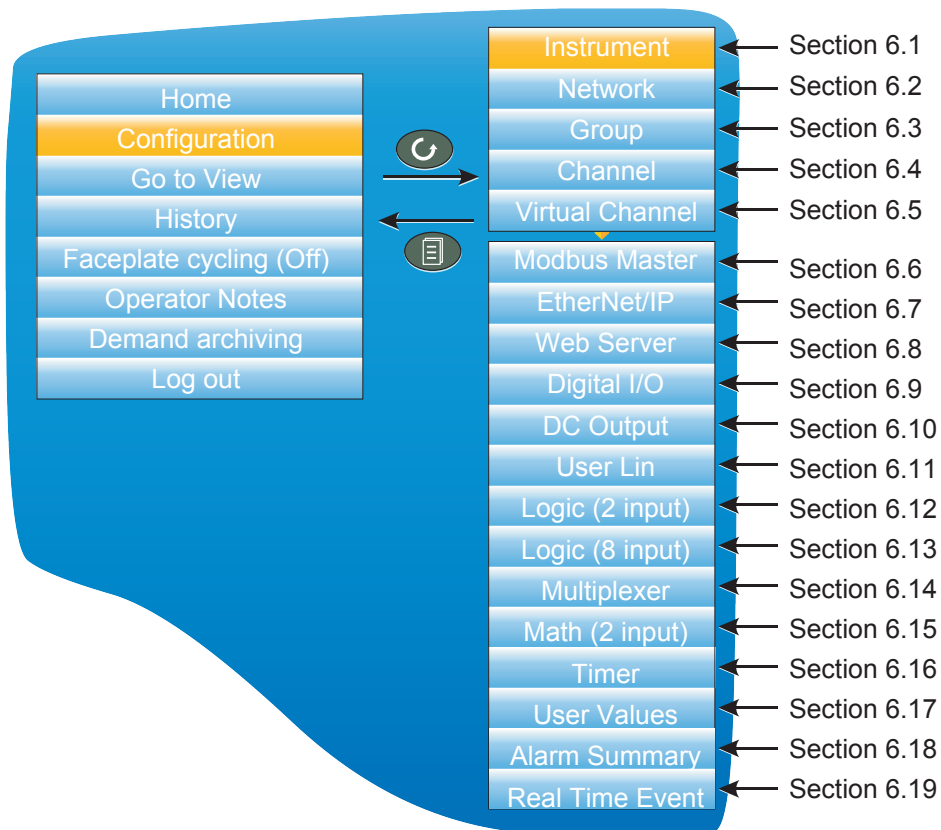
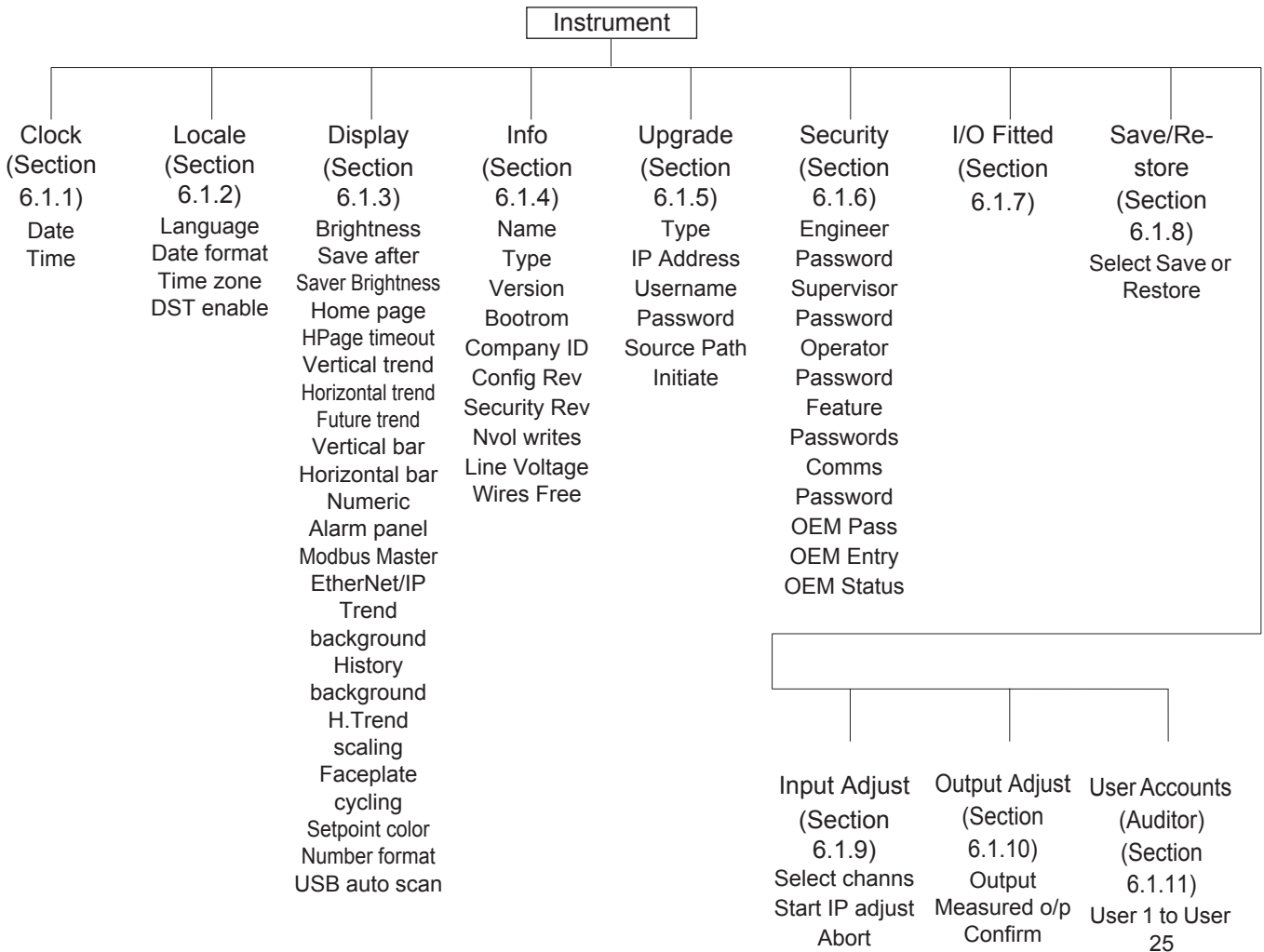


Figure 38 Top level configuration menu

The factory default configuration can be returned to, if required, by entering a special Engineer password, as described in Section 6.1.6.

6.1 INSTRUMENT MENU



6.1.1 Clock

The up and down arrows are used to highlight 'Date' (default) or 'Time'.

To set the date, the scroll button is used to display the numeric keyboard described in Section 5.6.1. The up and down arrows are used to highlight the relevant numeral or separator ('/' or ':') and the scroll key used to enter it into the display window.

To set the time, the scroll button is operated to enter edit mode, then the up and down buttons are used to scroll to display a time, say 15 seconds later than the current time. Once the current time matches the display, the scroll button is pressed to confirm the time and to start the clock.



Figure 39 Clock menu

The 'DST' field appears only if 'DST Enable' is selected 'Yes', in 'Locale' (Section 6.1.2). If the 'box' contains a cross (as shown) then Daylight Saving Time (DST) is not currently active. A 'tick' means that the time shown has been advanced by an hour because DST is active.

**6.1.2 Locale**

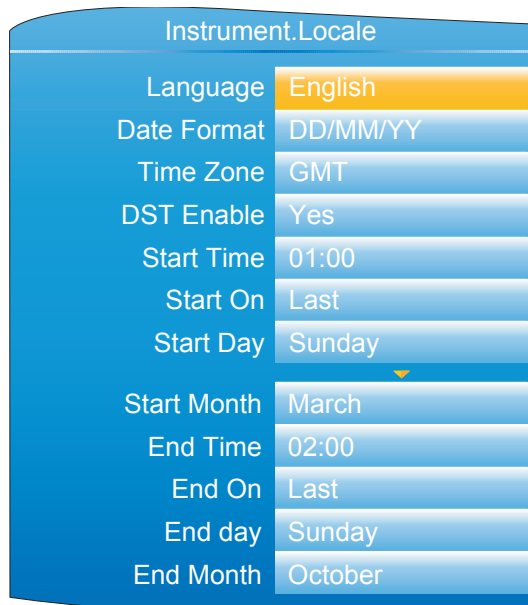


Figure 40 Typical Instrument configuration menu (expanded to show all fields)

Language	Select the language to be used for displays etc.
Date format	Select either DD/MM/YY, MM/DD/YY, or YY/MM/DD as the required format.
Time Zone	Select the required offset from GMT (UTC). This setting affects only the displayed time. Archiving, recording etc. times remain in GMT.
DST Enable	Daylight Saving Time enable. Once the selection is enabled, the following (previously hidden) fields appear, allowing the start and end dates for Daylight Saving Time (DST) to be configured. DST affects only the displayed time. Archiving, recording etc. times remain in GMT.
Start Time	Appears only when 'DST Enable' (above) is set to 'Yes'. Use the up/down keys to scroll to the required start time.
Start On	Select 'Last', 'First', 'Second', 'Third' or 'Fourth' as the required week. Used in conjunction with the 'Start Day' and 'Start Month' entries following.
Start Day	Select the day of the week on which DST is to commence.



Start Month                    Select the month in which DST is to commence.  
 End Time, End On, End Day, End Month  
                                     As for 'Start Time' etc. above, but specifies the end time and date for daylight savings.

### 6.1.3 Display configuration

This allows the user to set display brightnesses and screen saver details, to select a display mode as the 'Home' page, and to enable/disable the various display modes. The normal 'Select, Scroll, Enter' editing technique is used as has been previously described.

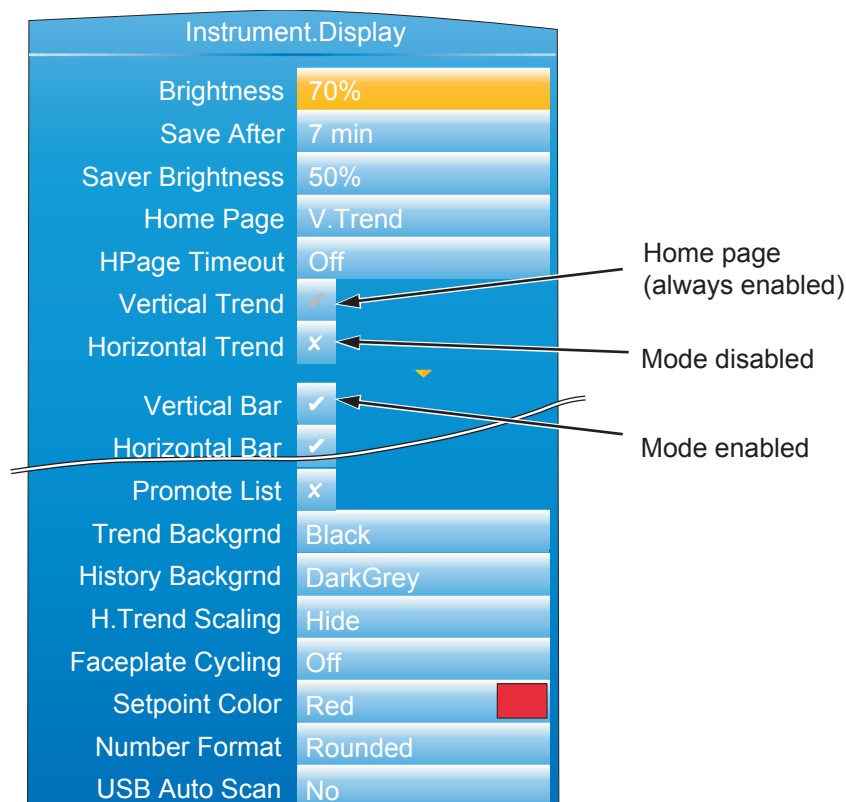


Figure 41 Display menu (expanded to show all fields)

- Brightness                    Allows the user to select a normal operating brightness for the screen from 10% to 100%, in 10% steps.
- Save After                    The elapsed time (since last button press) before the screen switches from 'Brightness' to 'Saver Brightness'. (Off = saver function disabled).
- Saver Brightness            The screen saver brightness. Valid entries are 10% to 100% inclusive, in 10% steps. Using a lower power when not 'in use' not only saves power, but also increases display life. Typical screen power consumption is 0.5W at 100%, falling in a linear fashion to 0.05W at 10%.
- Home page                    Allows any display mode to be chosen as the 'Home' page. This is the page that the instrument displays at power up, and also the page displayed when the 'Home' key is selected from the top level menu (Section 5.3). The selected display mode (vertical trend in Figure 41) is always enabled in the following display mode enable fields (its 'tick' is grayed out and cannot be edited). See Section 5.4 for a description of the available modes.
- HPage Timeout              The elapsed time (since last button press) before the display returns to the home screen. (Off = disabled).
- Vertical Trend                This is the default home page, and its tick is grayed. If this is not the home page, the tick can be changed to a cross, by highlighting it and operating the scroll button.

Horizontal Trend, Vertical Bar, Horizontal bar, Numeric, Alarm Panel, Dual Loop, Cascade, Modbus Master, EtherNet/IP.

As for Vertical Trend, above. By default some display modes are disabled (gray cross). In order to enable such display modes the relevant cross is highlighted using the up/down arrow buttons, and the scroll button then used to change the gray cross to a white tick. The tick associated with the selected home page is always gray.



**Note:** Some display modes are available only if the relevant option is fitted.

Trend Background	Allows the user to select black (default), white dark gray or light gray as the 'chart' color.
History Background	As above for 'Trend background', but for history displays.
H.Trend Scaling	As described in Section 5.4.2, by default, the scale for horizontal trends appears at the left edge of the chart for a few seconds before the chart expands leftwards to occupy the scale area. Setting 'H.Trend Scaling' to 'Permanent', ensures that the scale remains permanently on display.
Faceplate cycling	Allows the default faceplate cycling state to be defined as 'On' or 'Off' (Section 5.3.5)
Number Format	Rounded: Truncated:
USB Auto Scan	If set to 'Yes', bar code data messages are automatically generated and appear on the display and in the Message list without operator intervention. If set to 'No', the Message appears on the screen for editing and/or confirmation, before being displayed, etc. Section 11.2 provides further details.

There is a new parameter been added to the Instrument. Display list - Number format.

The options are to 'Round' or 'Truncate' values. On the previous firmware releases of the FEC920, numbers were truncated (in the same way as the 6000).

From firmware versions V3.01 and above there is an option to allow numbers to be rounded. The reason for this is driven primarily from a control point-of-view. With truncation, it is quite likely that the PV will look as though it never settles onto setpoint. The rounding/truncation affects the UI display and MODBUS scaled integers, the underlying numbers are not affected, nor the values saved in the history files. Over MODBUS comms, all floating point parameters that are read via scaled integer comms will take note of the configured setting for rounding or truncating and reflect this. On the UI, ALL floating point values rendered will adhere to the configured setting of rounding or truncating.

### 6.1.4 Info menu

Gives information about the instrument hardware and software, and allows the user to enter a descriptor for the instrument. The normal ‘Select, Scroll, Enter’ editing technique, previously described) is used to edit those fields that are not read-only.

Instrument.Info	
Name	FEC920
Type	FEC920
Version	2.0
Bootrom	1.8
Company ID	1280
Config Rev	10
Security Rev	2
Nvol writes	339
Line Voltage	239.2 v
Wires Free	240

Figure 42 Info menu (expanded to show all fields)

Name	Allows the user to enter a descriptor of up to 20 characters, using the text entry techniques described in Section 5.6. The number of characters visible in the display mode pages varies according to the number of alarm symbols on display.
Type	Nano. Read-only display of the instrument model (used by ‘iTools’).
Version	Read-only. The software version of the instrument.
Bootrom	Read-only. Instrument software Boot ROM version
Company ID	Read-only. For CNOMO <sup>1</sup> purposes over Modbus (1280 decimal; 0500 hex).
Config Rev	Read-only. This value is updated, and a message including this value generated, every time configuration is exited, if any one or more configuration parameter has been changed.
Security Rev	Read-only. This number is incremented every time configuration is exited, if any one or more passwords has been changed, or if the FTP Server username has been changed, or if the Comms Enable field has been edited.
Nvol writes	Number of non-volatile write operations for diagnostic purposes.
Line voltage	The instantaneous value of the supply voltage applied to the instrument. Used in some control loop operations.
Wires Free	This shows the number of wires free to be used. The value takes into account all user wiring whether carried out at the instrument or downloaded from the iTools graphical wiring editor.

### 6.1.5 Upgrade



- Caution:**
1. Power must not be removed from the unit whilst upgrade is in progress, as to do so will cause permanent damage to the unit.
  2. For USB upgrades, the memory stick must not be removed whilst upgrade is in progress or the instrument will be permanently damaged.

This item allows the user to update the instrument firmware, either from a memory stick in the USB socket at the rear of the unit, or via FTP transfer from a host computer. Firmware upgrade files are downloaded from the instrument manufacturer and transferred to the instrument by memory stick or by FTP transfer. Splash screens are prepared by the user and transferred using a memory stick. The unit restarts automatically after an upgrade or splash screen replacement.

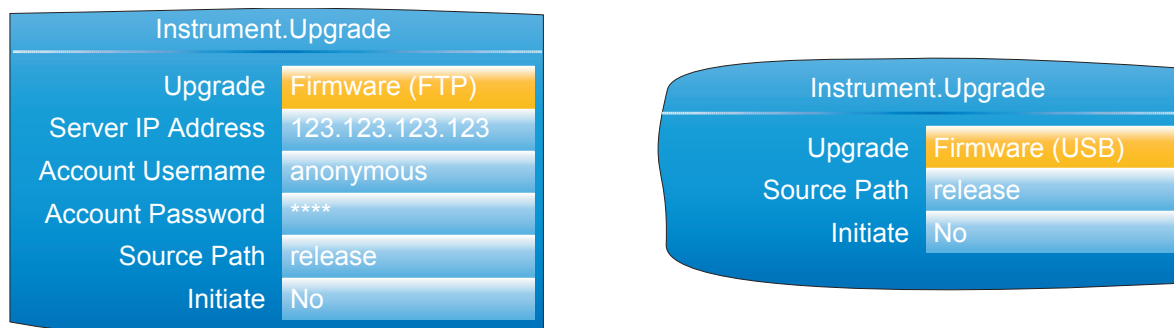


Figure 43 Typical Upgrade menus

Upgrade	Select 'Firmware (USB)', 'Firmware (FTP)', 'Bootrom (USB)' or 'Splash (USB)' as the source of the upgrade.
Server IP Address	For 'Upgrade' = 'Firmware (FTP)' only, this field must contain the IP address of the PC which is to supply the upgrade file.
Account Username	For 'Type' = 'Firmware (FTP)' only, the username set up in the host FTP server.
Account Password	For 'Type' = 'Firmware (FTP)' only, the password set up in the host FTP server.
Source Path	The name of the directory from which the upgrade file is to be read. This is only the name of the directory without any path elements (e.g. '/') included unless the path is 'release/upgrade/files'.
Initiate	Select 'Yes' to initiate the upgrade.

### CUSTOMISING THE SPLASH SCREEN

'Splash (USB)' allows the user to select a new image for the splash screen (i.e. the screen that appears at power up or restart). When 'Initiate' is set to 'Yes', the instrument searches the USB device for a file called 'splash.bmp' located in the 'release' folder. If such a file is found, it is loaded, and the instrument re-starts with the new image as the 'splash' screen. If no file is found, the request is ignored. If the image is not of the correct type or size, the instrument re-starts with the default splash screen.

The original splash screen is included on the 'tools' DVD, so that it can be restored if required.

Rules:

1. This feature is available only with Bootrom versions 2.0 and above.
2. The file must be located in a folder called 'release' and the file name must be 'splash.bmp'.
3. The image must be 320 x 240; 24-bit resolution.
4. The image must be in bitmap (suffix.bmp) format.
5. The image may not exceed 256kB.

**6.1.6 Security menu**

This allows the user to enter passwords for all security levels (except logged out), and to enable/disable serial communications security.

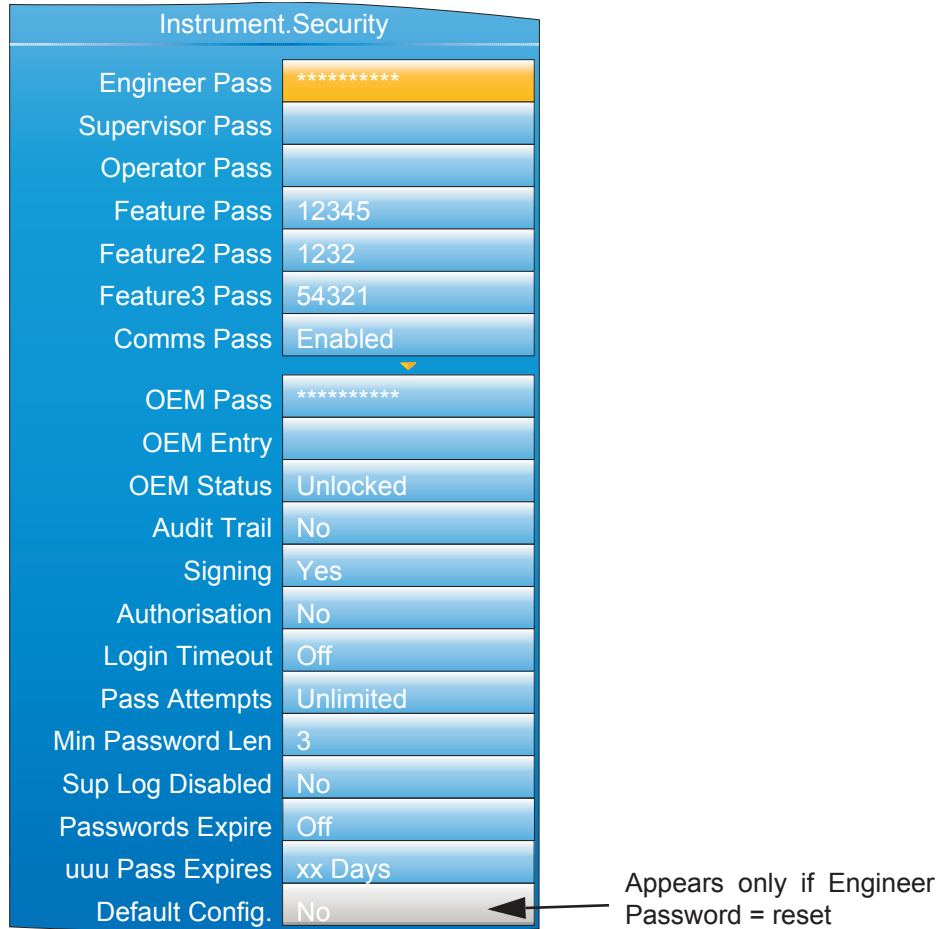


Figure 44 Security menu

- Engineer Pass** Gives access to configuration menus. Set to '100' when despatched, but can be edited here, if required, by entering an alternative of up to 20 characters (note 1). If 'reset' (case sensitive) is entered as the Engineer Password, the 'Default Config.' field appears allowing the instrument default configuration to be restored (note 2).
- Supervisor Pass** A password (default is '100') of up to 20 characters can be entered here to protect Supervisor level access.
- Operator Pass** A password (none by default) of up to 20 characters can be entered here to protect Operator level access. If the Auditor (auditor) feature is enabled, this option is not available as Operator level access is replaced by Users 1 to 25.
- Feature Pass** This is a password supplied by the manufacturer to enable the software options (e.g. Loop, Zirconia block, Toolkit blocks, Batch, 21CF11, etc.). When applying for this password, the manufacturer will require the instrument's MAC address (Network.Interface menu Section 6.2.1) and the instrument's firmware Version (Instrument.info menu - Section 6.1.4). The password is MAC address dependent so that it cannot be used on any other instrument.



**Note:** When the Auditor feature is enabled, entry of an invalid feature password will result in the feature codes becoming read-only for a period of 30 minutes. This is to discourage multiple attempts to guess a feature password. This period cannot be shortened.

- Feature2/3 Pass      Similar to 'Feature Pass' above, but for additional features.
- Comms Pass          Enables/disables password security for external communications (including via iTools). If set to 'Enabled', the Engineer level password will be required if an attempt is made to enter the configuration menus from a remote PC. If set to 'Disabled', then access to configuration can be gained over a communications link, without a password. If enabled, then entry to configuration mode via the Instrument Mode (IM) parameter must be completed within 5 seconds of entering the password, or the attempt will fail.



**Note:** 1. It is recommended that only such characters as appear on the user's PC keyboard be used in the Engineer password. The use of other characters makes it necessary to use 'Escape' codes (e.g. Alt 0247 for the '+' sign) when trying to enter configuration mode from iTools, for example.

**Note:** 2. Restoring factory default configuration can also be carried out in iTools, using the Engineer password 'reset' and selecting Default Config to 'Yes'.

- OEM Pass            The configured pass phrase used to enable / disable the OEM security option. This field is editable whilst the OEM Status is 'Unlocked' and the user has 'Engineer' access.
- OEM Entry          To lock or unlock the OEM security feature, the user must enter the pass phrase entered in 'OEM Pass' above. The default pass phrase is 'OEM' (in capitals).
- OEM Status         Read only 'Locked' or 'Unlocked' status display.
- Audit Trail          Determines whether an audit trail is written to the history file (when set to 'Yes'). When enabled, all configuration parameter changes, operator alarm acknowledgements, and cloning status changes are recorded in the history. Note that during iTools and USB cloning, the audit trail is temporarily disabled since, potentially, every parameter could change. However, the fact that a clone has been loaded will be written to the history by the audit trail. This field appears only if the Auditor feature is enabled.
- Signing             When enabled (set to 'Yes'), if a user tries to enter a signable menu or edit a signable parameter, the signing dialog will appear (see below). For the required action to proceed, the selected signing user must enter their password and a note (which cannot be blank), and then set Accept to 'Yes'. If signing is accepted, messages are added to the history along with the entered note. This field appears only if the Auditor feature is enabled.

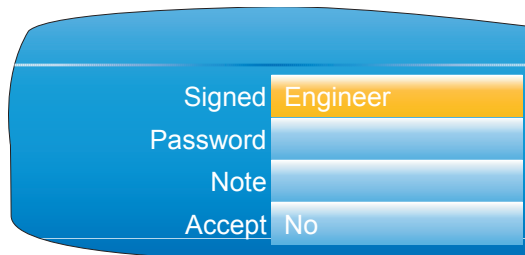


Figure 45 Signing dialog

- Authorisation        When enabled (set to 'Yes'), similar to the Signing parameter above, an additional user (the authorizer) will need to enter their password to approve the operation. Other than the built-in Engineer or Supervisor accounts, an authorizer will need to have Authorizing

permissions assigned to him or her. Refer to section User Accounts (Auditor) to assign this permission to a user. This field appears only if the Auditor feature is enabled.

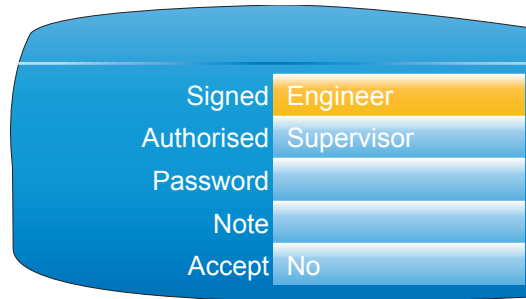


Figure 46 Authorising dialog

Login Timeout	Provides the option to log out an inactive (no key-presses detected) user when a preset number of minutes have elapsed. This can be set to 'Off' for no automatic timeout, or between 1 and 99 minutes. This field appears only if the Auditor feature is enabled.
Pass Attempts	Specifies whether a user has unlimited attempts of logging in ('Unlimited') or only three attempts before their account is disabled from logging in ('3'). This field only appears if the Auditor feature is enabled.
Min Password Len	Specifies the minimum number of characters allowed for a password, between 3 and 9 characters. This field appears only if the Auditor feature is enabled.
Sup Log Disabled	Determines whether the Supervisor level login is permitted ('No') or disabled ('Yes'). It is recommended that this be set to 'Yes' if the Auditor feature is used. This field only appears if the Auditor feature is enabled.
Passwords Expire	Provides the option to specify the number of days before a password will expire. This can be set to 'Off' for no expiring passwords, or between 1 and 999 days. The expiry counter is reset when the password is changed. When the password expires, it will not work any more. The engineer's password never expires so as not to block all access. This field appears only if the Auditor feature is enabled.
{uuu} Pass Expires	If the Passwords Expire parameter is set to any number (other than 'Off'), indicating that passwords will expire after a set number of days, a list of all configured (and enabled) users is displayed next to the Pass Expires parameter, showing the number of days remaining before each account's password will expire. These are read-only and cannot be altered here. This field appears only if the Auditor feature is enabled, and the Passwords Expire parameter is set to anything other than 'Off'.
Default Config	This field appears only if 'reset' has been entered as the Engineer Password. Selecting 'Yes' Causes the instrument to restart with default configuration (i.e. the instrument 'cold starts'). See Note 2 above.

**OEM SECURITY**

In products that incorporate user wiring, the value of an application may lie more in the user wiring (connecting the function blocks together) than in the configuration of the instrument's parameters.

OEM Security allows the user to prevent the application from being copied either via comms (by iTools or a third party comms package) or via the instrument's user interface.

When OEM security is enabled, users are prevented from accessing wiring (for reading or writing) from any source (comms or user interface), and it is not possible to Load or Save the configuration of the instrument via iTools or by using the Save/Restore facility (Section 6.1.8).

From firmware version V5.00 onwards OEM Security is enhanced by providing an option, enabled by a new parameter 'Instrument.Security.OEMParamLists. This parameter is available only through iTools and allows the OEM to:-

1. Make all parameters that are read/write in Engineer access level only, read only when the instrument is OEM locked AND it is in Engineer access level. It is possible for the OEM to select up to 100 parameters which are to remain read/write in Engineer access level.

2. Make up to 100 parameters that are read/write in Supervisor access level, read only when the instrument is OEM locked.

### 6.1.7 I/O fitted

This provides a read only display showing what type of input or output circuit is associated with each set of rear terminals.

Instrument I/O Fitted	
1A1B	(Dig.IO)
2A2B	(Relay)
LALC	(Dig.In)
3A3B	(Relay)
LBLC	(Dig.In)
4AC	(Relay)
5AC	(Relay)

Figure 47 I/O fitted display

#### I/O TYPES

Dig.IO	Digital input/output
Relay	Relay output
Dig.In	Digital input
Dig.Out	Digital output
DC.Op	DC output



**Note:** The I/O types fitted in locations LALC, LBLC, 4AC and 5AC are always as shown above. The types of I/O fitted in locations 1A1B, 2A2B and 3A3B depends on the options specified at time of order.

### 6.1.8 Save/Restore

This allows the user to save and/or restore instrument clone configurations to a memory stick inserted into the USB connector at the rear of the unit. The format of the saved/restored files is iTools clone files (\*.uic).

Selecting 'Restore' presents a list of clone files in the configured directory on the USB device. (In the example below, the file is located in the basic usb0 directory - it has not been saved to a particular configuration directory.)

When 'Save' is selected, the virtual keyboard must be used to enter the filename. If the file already exists on the USB device, a warning appears offering 'Cancel' or 'Overwrite' alternatives.



**Note:** 1. The ability to save and restore is disabled if OEM security is enabled.

**Note:** 2. Configuration save/restore is available only when the unit is logged into at 'Engineer' access level.

**Note:** 3. During USB cloning (USB save/restore), the priority of modbus slave comms is lowered. This allows the save/restore process to complete in a minimal time (around 60 seconds). During this period, Modbus slave comms response times will be extended and may result in the master device timing-out.



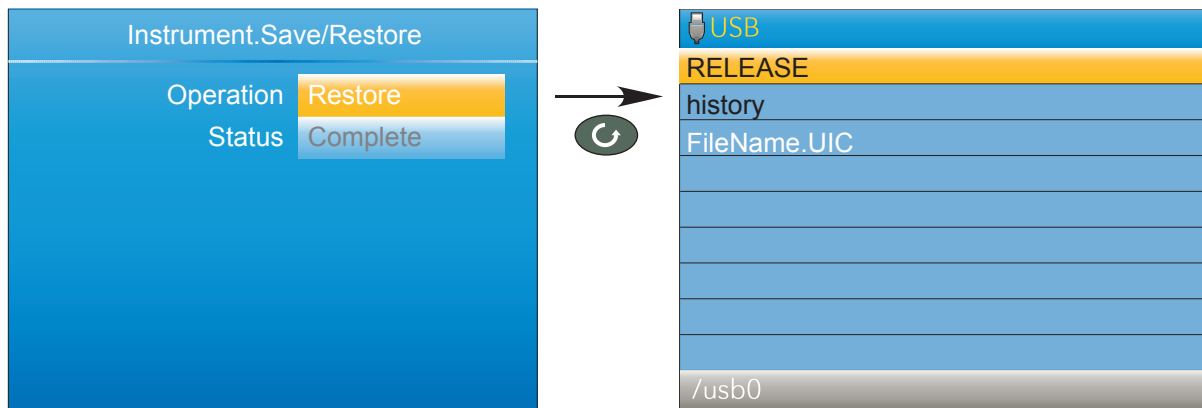


Figure 48 Save/Restore display

Operation	Select 'Save' or 'Restore'. Use the up/down arrow keys to highlight the required UIC file, then use the scroll key to initiate the operation.
Status	Shows the status of the operation, as follows: Inactive: Neither saving or restoring a clone file has occurred since the last time the instrument was power cycled. Complete: Indicates that the cloning process has completed. Restoring: Restore operation is currently in progress. Saving: A clone file is currently being saved. Cold started: A power-cycle of the product occurred whilst a Restore operation was in progress. The product configuration is unreliable and has been reset to factory default.

The 'Restoring' and 'Saving' status text is accompanied by an animated display (circling green 'flash') to indicate that the operation is in progress.

### 6.1.9 Input adjust

**Note:** 1. Input adjust cannot be applied to input channels with input type of 'Digital', 'Test' or 'Off'.

**Note:** 2. Input adjustments can be carried out only by users logged in as 'Engineer' (see Section 5.3.8).

**Note:** 3. The instrument must be powered for a sufficient time (e.g. 30 minutes) for it to reach thermal equilibrium before an input adjust is performed.

This facility allows the user to compensate for tolerance errors etc. The technique used is to select those channels to which adjust is to be applied, then for each channel to:

- a. apply a known low level signal (at or close to the low input range value) to the relevant input. When the instrument reading is steady, press 'Apply'.
- b. apply a known high level signal (at, or close to, the high input range value) to the relevant input. When the instrument reading is steady, press 'Apply'.

Figure 49 shows a typical display when 'Input adjust' is selected from the Instrument menu, and Apply Adjust has been selected. As can be seen, Channel 3 has previously been adjusted.

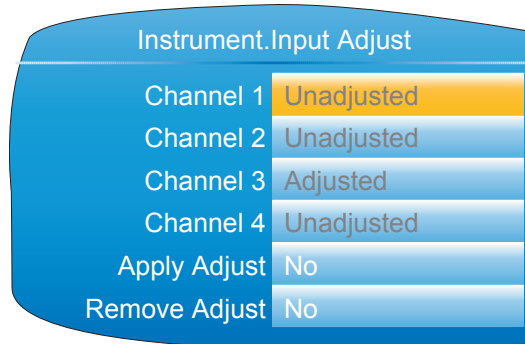


Figure 49 Input adjust top level display

- Channel 1 to 4      Shows the adjust status of each channel.
- Apply Adjust      Selecting 'Yes' initiates the adjustment procedure described below.
- Remove Adjust    Selecting 'Yes' initiates the adjustment removal procedure described below.
- Abort              Allows the user to abandon input adjustment at any point in the procedure.

**ADJUSTMENT PROCEDURE**

- As shown in Figure 50, highlight the 'Apply Adjust' field, and operate the scroll key to enter edit mode. Use the up or down arrow key to select 'Yes'. Use the scroll button to change Channel 1 'cross' to a 'tick' (check mark). Similarly select any other channels which require adjustment.

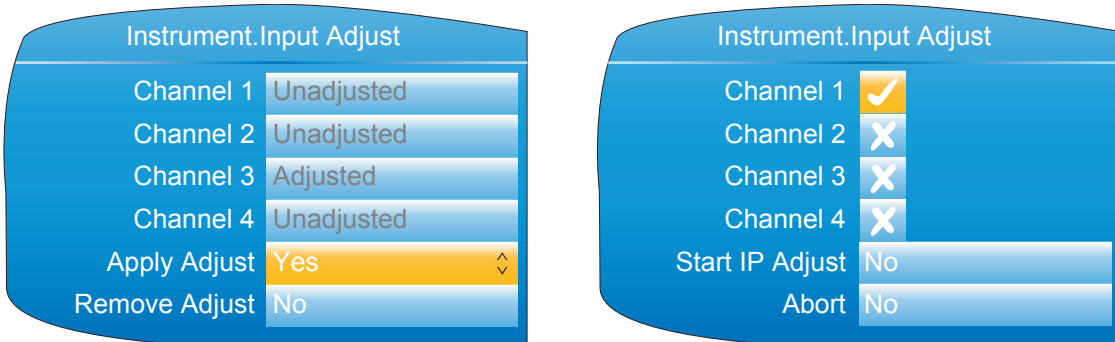


Figure 50 Channel adjustment procedure (1)

- Highlight the 'Start IP Adjust' field and use the scroll and up/down arrow to select 'Yes'. Use the scroll key again to enter the low value adjust page.
- Apply the known low value and wait for the value to stabilize. Enter the 'Low Target Value' (the value that the instrument is to read for the applied input). When all is steady, use the scroll and up/down arrow to set the 'Confirm Low' field to 'Yes', then operate the scroll button again.

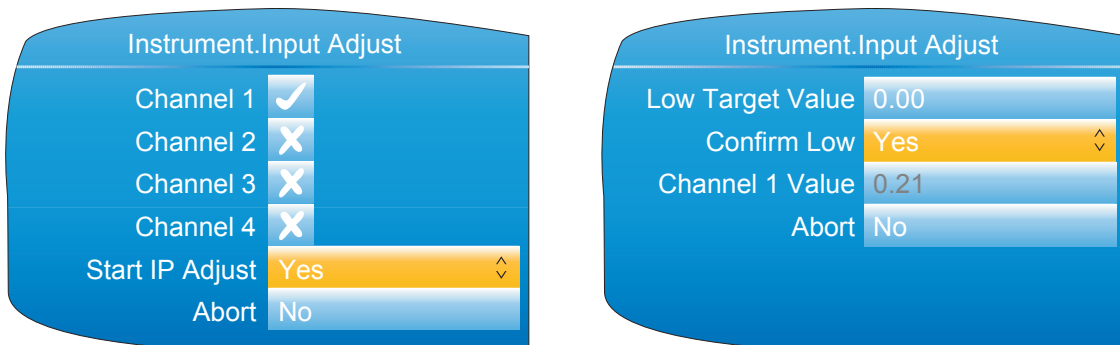


Figure 51 Channel adjustment procedure (2)

4. The display changes to the high value adjust page.
5. Apply the known high value and wait for the value to stabilize. Enter the High Target Value (the value that the instrument is to read for the applied input). When all is steady, set 'Confirm High' to 'Yes'.

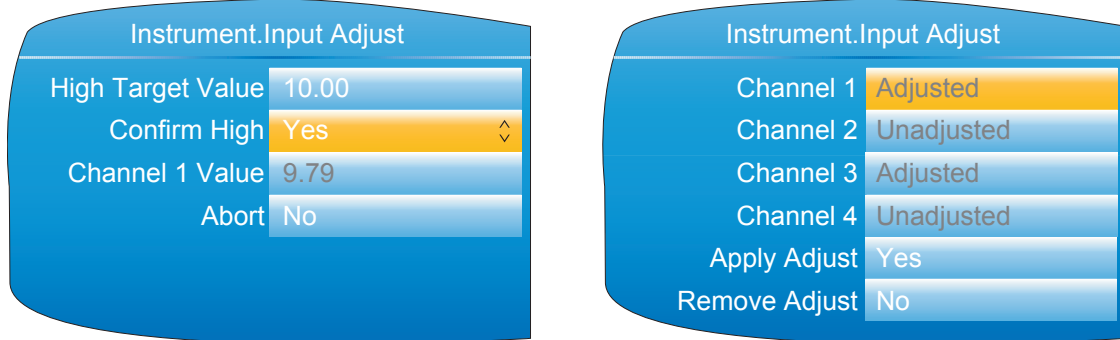


Figure 52 Channel adjustment procedure (3)

**REMOVAL PROCEDURE**

1. Set 'Remove Adjust' to 'Yes' and operate the scroll button.
2. Use the scroll and up/down arrow buttons to change the required channel icons from crosses to ticks.
3. Select Remove IP Adjust to 'Yes' and operate the scroll key. The adjustment is removed from all selected channels without further confirmation.

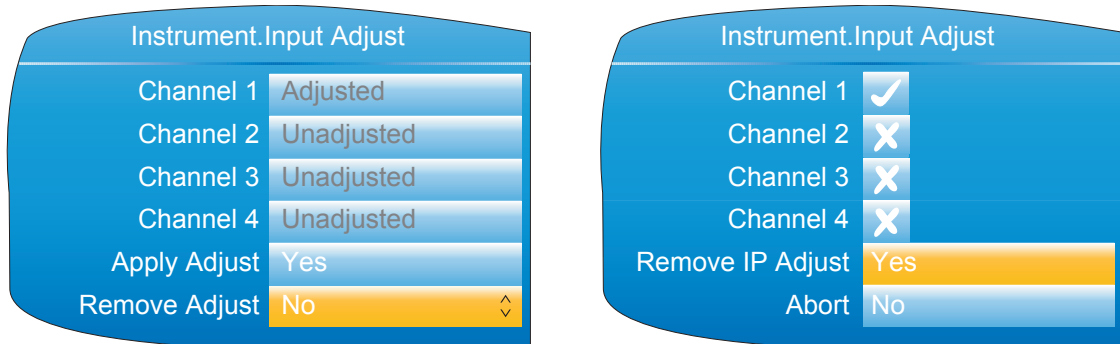
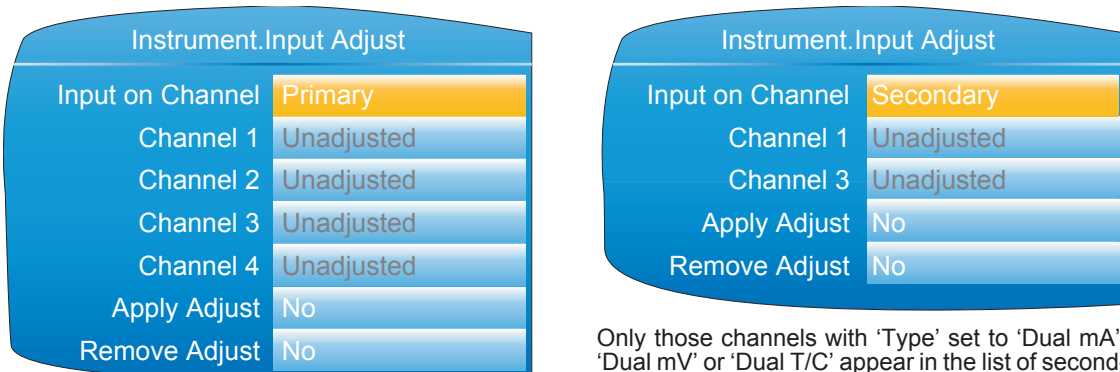


Figure 53 Channel adjustment removal

**DUAL INPUT CHANNELS**

For the dual input channel option, input adjust is carried out as described above, except that for any channel where dual inputs are configured, the user must initiate adjustment to primary and secondary inputs separately. As shown in Figure 54, a new field 'Input on Channel' is introduced for this purpose.



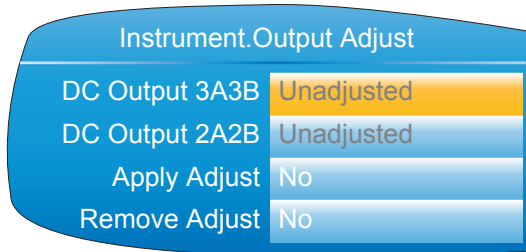
Only those channels with 'Type' set to 'Dual mA', 'Dual mV' or 'Dual T/C' appear in the list of secondary channels. In this example, only channels 1 and 3 are configured as dual input. (See Section 6.4.1 for channel Type configuration.)

Figure 54 Input adjust top level display (dual input channels)

For primary inputs, all four channels are included in the list and can therefore be selected for adjustment. For secondary inputs, only those channels which have been configured as dual input are included.

### 6.1.10 Output adjust

This item appears only if one or more of I/O type DC Output is fitted and allows the user to compensate for tolerance errors etc. in connected equipment.



1A1B and 2A2B can be configured only as mA outputs.  
 3A3B can be configured as mA or Volts.  
 See Section 6.10 for configuration details.

Figure 55 Output adjust initial display

#### ADJUST PROCEDURE

1. Highlight the 'Apply Adjust' field, and operate the scroll key to enter edit mode. Use the up or down arrow key to select the required output and confirm with the scroll key. The output adjust page appears for the low point.
2. Measure the output at the required point, and enter this value in the 'Measured Output' field using the text entry techniques described in Section 5.6. To skip this stage go to step 3.
3. Set 'Confirm Low' to 'Yes'. The output adjust page appears for the high point.
4. Measure the output at the required point, and enter this value in the 'Measured Output' field as described for the low point. To skip this stage go to step 5.
5. Set 'Confirm High' to 'Yes'. The output adjust initial display reappears, with the word 'Adjusted' in the relevant DC Output field.

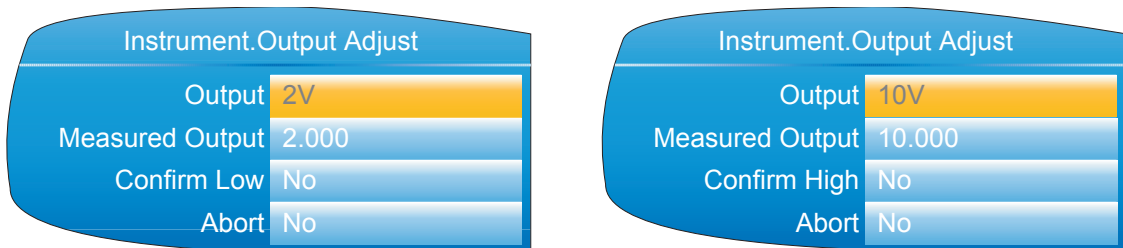


Figure 56 Low and High adjust point displays



**Note:** 1. The figures above show the displays when the DC output is set to 'Volts' (Section 6.10) (3A3B only). The mA displays are similar, but the fixed low and high values are 4mA and 20mA respectively

**Note:** 2. 'Abort' cancels operations so far and returns to the output adjust initial display (Figure 55).

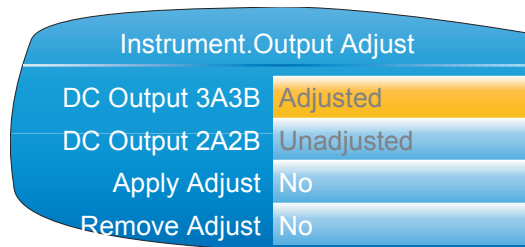


Figure 57 Adjusted display

## ADJUST REMOVAL

In the output adjust initial display (Figure 57) highlight the 'Remove Adjust' field, and operate the scroll key to enter edit mode. Use the up or down arrow key to select the required output and confirm with the scroll key. The output adjustment is removed, without confirmation. The initial display returns to 'Unadjusted' as in Figure 55.

### 6.1.11 User Accounts (Auditor)

The User 1 to User 25 options only appear if the Auditor feature is enabled. These parameters provide up to twenty five additional user accounts, each of which can be configured with customisable levels of permission. The built-in Operator account is disabled when this feature is enabled, but the default username for User 1 is set as 'Operator'. Note that when the Auditor feature is enabled, the Logged Out user has no permissions.

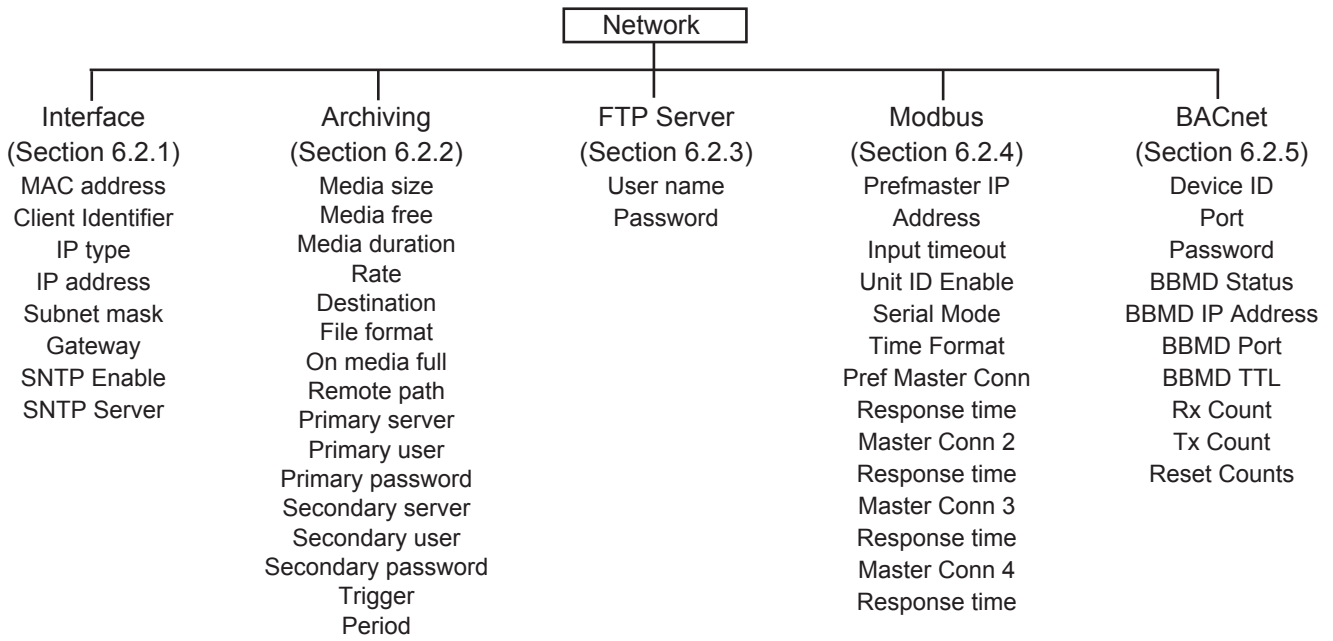
Select the user account you wish to configure and press the scroll key. The user configuration page appears.

Instrument.User 1	
Username	User 1
Password	*****
Ack Alarms	No
Demand Archiving	No
Login Disabled	Yes
Signing	No
Authorising	No
Archive Interval	No

Figure 58 User account configuration

Username	The username for the user (up to 20 characters). Typically only the first 12 characters are displayed in scroll lists (such as when logging on) due to space. User 1 defaults to the user called "Operator", which replaces the standard Operator account when the Auditor feature is enabled. This standard account has no additional permissions applied to it, however, and can be modified, disabled, or overwritten. When logging in, the user account number (1 to 25) is prefixed to the username so that each name is unique.
Password	The password for the user being edited (up to 20 characters).
Ack Alarms	When enabled (set to 'Yes'), the user can acknowledge alarms in the alarm summary page (refer to Alarm Summary - Section 5.3.3).
Demand Archiving	When enabled (set to 'Yes'), the user can access the Demand Archiving page (see Section 5.3.7 for further details).
Login Disabled	When enabled (set to 'Yes'), the user is disabled and cannot login, sign or authorize. Set to 'No' to enable the user. If the maximum number of login attempts has been exceeded for an account, this parameter is automatically set to 'Yes' to prevent further login attempts. The number of login attempts permitted is set using the 'Pass Attempts' parameter in the Security menu (refer to Section 6.1.6). Each failed login attempt is recorded in the history, as is the user's login being disabled after the specified number of failed login attempts.
Signing	When enabled (set to 'Yes'), the user will appear in the user scroll list of the signing dialog (refer to the Signing parameter in Section 6.1.6).
Authorising	When enabled (set to 'Yes'), the user will appear in the user scroll list of the authorizing dialog (refer to the Authorisation parameter in Section 6.1.6).
Archive Interval	When enabled (set to 'Yes'), the archive interval will be writeable in the user page; otherwise it will be read-only (refer to Section 5.3.2.1 for details).

## 6.2 NETWORK MENU



### 6.2.1 Interface

This area of configuration allows the user to set up an IP address for the instrument, either by typing one in (Fixed), or automatically (DHCP), assuming a DHCP server is running.

Network.Interface	
MAC	00:0A:8D:01:90:00
Client identifier	01000A8D019000
IP Type	DHCP
IP Address	123.123.123.123
Subnet Mask	255.255.248.0
Gateway	234.234.234.234
SNTP Enable	Yes
SNTP Server	192.168.111.123

Figure 59 Network Interface menu

MAC	Read only. Media Access Control. A unique address for each instrument, entered at the factory.
Client Identifier	The client identifier is a unique id used by DHCP servers that implement option 61. Each FEC920 product will have a unique ID built up from its MAC address. If the DHCP server is configured to use option 61, then it will use this ID instead of the MAC address to assign a dynamic IP address.
IP Type	If 'Fixed', the user needs to enter an IP address and Subnet Mask in the following fields, and a Gateway address if required. If 'DHCP' the subsequent fields become read only, with the entries automatically generated by the DHCP server. When set to DHCP, it takes several seconds before the IP address is obtained from the DHCP server.
IP Address	Read only if 'IP Type' = 'DHCP'. If 'IP Type' = 'Fixed', the user may enter an IP address (IPv4 dot notation). This would normally be supplied by the user's IT department, or from the Network supervisor.
Subnet Mask	Read only if 'IP Type' = 'DHCP'. If 'IP Type' = 'Fixed', this sets a range of IP addresses that can be accessed. Normally supplied by the user's IT department, or from the Network supervisor.
Gateway	Read only if 'IP Type' = 'DHCP'. If 'IP Type' = 'Fixed' this allows the user to enter a gateway address for use when the unit is to communicate outside the local network. Normally supplied by the user's IT department, or from the Network supervisor.
SNTP Enable	Select 'Yes' to allow time synchronization from a Simple Network Time Protocol (SNTP) server to be enabled. When enabled the instrument time is updated every 15 minutes. SNTP always works using UTC/GMT. Time zones are handled separately. SNTP is a protocol that allows clients on a TCP/IP network to synchronize the instrument clock with that of a server - port number 123. FEC920 can act only as a client. Servers such as Microsoft 'TimeServ' cannot be used with the FEC920 because they are not SNTP servers.
SNTP Server	The SNTP client used in FEC920 will not support stratum 15 server. The IP address of the SNTP Server. This only appears if the SNTP server is enabled. If 'IP Type' is set to 'DHCP', the SNTP Server address is automatically assigned. Although this address can be altered it will be overwritten once the instrument is power cycled. The SNTP address should only be entered manually if 'IP Type' is set to 'Fixed'.

For a description of SNTP alarms see Section 5.2.2.

### 6.2.2 Archiving

This area of configuration is used to set up the parameters for use during unattended archiving. Some of the fields appear only if other fields are set to a particular value. For example, the CSV fields appear only if 'File Format' is set to 'CSV' or to 'Both'.

The archived data is not removed from the flash memory of the instrument. When the flash memory is full, new data causes the oldest file(s) to be discarded.



**Note:** For remote archiving, the host computer must be set up to respond to 'pings'. This is because the FEC920 pings the host whilst establishing connection, and if it does not receive a response, the archive attempt fails.

Network.Archiving	
Media Size	1907.46 MB
Media Free	1902.90 MB
Media Duration	763.77 Days
Rate	Automatic
Destination	FTP server
File Format	Binary (UHH)
On Media Full	Overwrite
Remote Path	/archive
Primary Server	123.123.123.123
Primary User	history
Primary Password	*****
Sec. Server	234.234.234.234
Sec. User	anonymous
Sec. Password	****
Trigger	No
Period	None

Remote with Binary file format

Network.Archiving	
Rate	Monthly
Destination	USB
File Format	Both
CSV Values	Yes
CSV Messages	No
CSV Headers	No
CSV Headings	Yes
CSV Date Format	Text
CSV Tab Del	No
On Media Full	Overwrite
Remote Path	/archive
Primary Server	123.123.123.123
Primary User	history
Primary Password	*****
Sec. Server	234.234.234.234
Sec. User	anonymous
Sec. Password	****
Trigger	No
Period	None

Local with CSV files included

Figure 60 Unattended Archive configuration (typical settings)

- Media Size** Appears only for File Format = 'Binary (UHH)'. A read only value showing the capacity of the memory stick inserted in the USB port at the rear of the unit. Shows zero if no memory stick is present.
- Media Free** Appears only for File Format = 'Binary (UHH)'. A read only value showing the space remaining in the memory stick inserted in the USB port at the rear of the unit. Shows zero if no memory stick is present.
- Media Duration** Appears only for File Format = 'Binary (UHH)'. A read only value showing the time it will take to fill the Memory stick if the instrument configuration remains unchanged.



**Rate** Allows the user to specify the frequency at which the contents of the Flash memory are archived to the USB port or, via FTP, to a PC. Scrollable settings are:

None: Automatic archiving is disabled. Any archiving must be initiated by the user using Demand Archiving, as described in Section 5.3.7.

Hourly: Archive occurs on the hour, every hour.

Daily: Archive initiated at 00:00\* each day.

Weekly: Archive is initiated at midnight\* every Sunday.

Monthly: Archive is initiated at 00:00\* on the 1st of every month.

Automatic: The instrument selects the least frequent of the above archive periods which is guaranteed not to lose data as a result of the internal flash memory running out of space.



**Note:** \* Archive times are not adjusted for daylight saving time (DST). Thus, if the archive is set to 'Daily', 'Weekly' or 'Monthly', then during summer time, the archive will be triggered an hour late (i.e at 01:00 hours instead of midnight).

**Destination** Select 'FTP Server' for archive to a remote PC, or 'USB' to archive to the USB port device.

**File format** Select 'Binary (UHH)' 'CSV' or 'Both'.

**Binary (UHH):**  
A proprietary format used by the instrument that needs other software (e.g. Review', to interpret the data before it can be presented in spreadsheets etc. Binary files have the extension '.uhh'.

**CSV:** This format is a standard open-file format for numeric data. A simple ASCII-based format, it is readable by a wide range of pc applications as well as being suitable for direct import into many commercial databases. CSV files have the extension '.csv'.

**Both:** Archiving includes both .uhh and .csv files.



**Note:** CSV is ASCII based and cannot interpret Unicode characters. For this reason, some characters available to the user will not be displayed correctly in \*.csv files.

**CSV Values** Appears only if 'File Format' is set to 'CSV' or 'Both'. If 'Yes' is selected, then process values are included in the file (see Figure 61 for details).

**CSV Messages** Appears only if 'File Format' is set to 'CSV' or 'Both'. If 'Yes' is selected, then messages are included in the file (see Figure 61 for details).

**CSV Headers** Appears only if 'File Format' is set to 'CSV' or 'Both'. If 'Yes' is selected, then Header details are included in the file (see Figure 61 for details).

**CSV Headings** Appears only if 'File Format' is set to 'CSV' or 'Both'. If 'Yes' is selected, then column headers are included in the file (see Figure 61 for details).

**CSV Date Format** Appears only if 'File Format' is set to 'CSV' or 'Both'. Allows 'Text' or 'Spreadsheet' to be selected. Text causes a time/date to appear in the spreadsheet. 'Spreadsheet Nu' displays the number of days since December 30th 1899. The decimal part of the number represents the latest six hours. For example: DDD--- --DD.25 represents 06:00 hours and DDD--- --DD.5 represents 12:00 hours. Spreadsheet Numeric format is more easily interpreted than 'Text' by some spreadsheet applications.

**CSV Tab Del** Appears only if 'File Format' is set to 'CSV' or 'Both'.  
CSV (Comma Separated Variables) does not always use commas as separators. For example, in some countries the decimal point is represented by a full stop (period), whilst in others a comma is used. In order to avoid confusion between a comma as a decimal point and a comma as a separator, a different separator can be used. This field allows the 'tab' character (^t) to be used instead of a comma.

**On Media Full** For 'Destination' = 'USB' only, this allows the user to select 'Overwrite' or 'Stop' as the action to be taken when the memory stick is full. 'Overwrite' causes the oldest data to be discarded from the memory stick to make room for newer data. 'Stop' inhibits archiving activity.

- Remote Path           Left blank if the archive destination is the home folder. If the destination is to a subfolder within the home folder, then the name of the subfolder is entered here, preceded by a '/' character (e.g. '/history').
- Primary Server        Allows the user to enter the IP address for the PC to be used as the primary FTP server.
- Primary User/Password   These are the Login name and password of the remote host account, assigned either by the Network administrator, or set up in the 'Guest' account of the remote host's 'FTP server' or 'User Manager' configuration.
- Sec. Server/user/password   As Primary server details above, but for the secondary FTP server used when the primary is not available for any reason.
- Trigger               This parameter can be 'wired' to, say, an alarm going active, or a digital input, to allow an archive to be triggered remotely. Can also be set to 'yes' manually.
- Period                Appears only if 'Trigger' is wired (Section 9). Allows a period of history to be selected for archiving when 'Trigger' goes 'true. Selections are: None, Last Hour, Last Day, Last Week, Last Month, All, Bring to Date. ('Last Month' archives the last 31 days of history.)

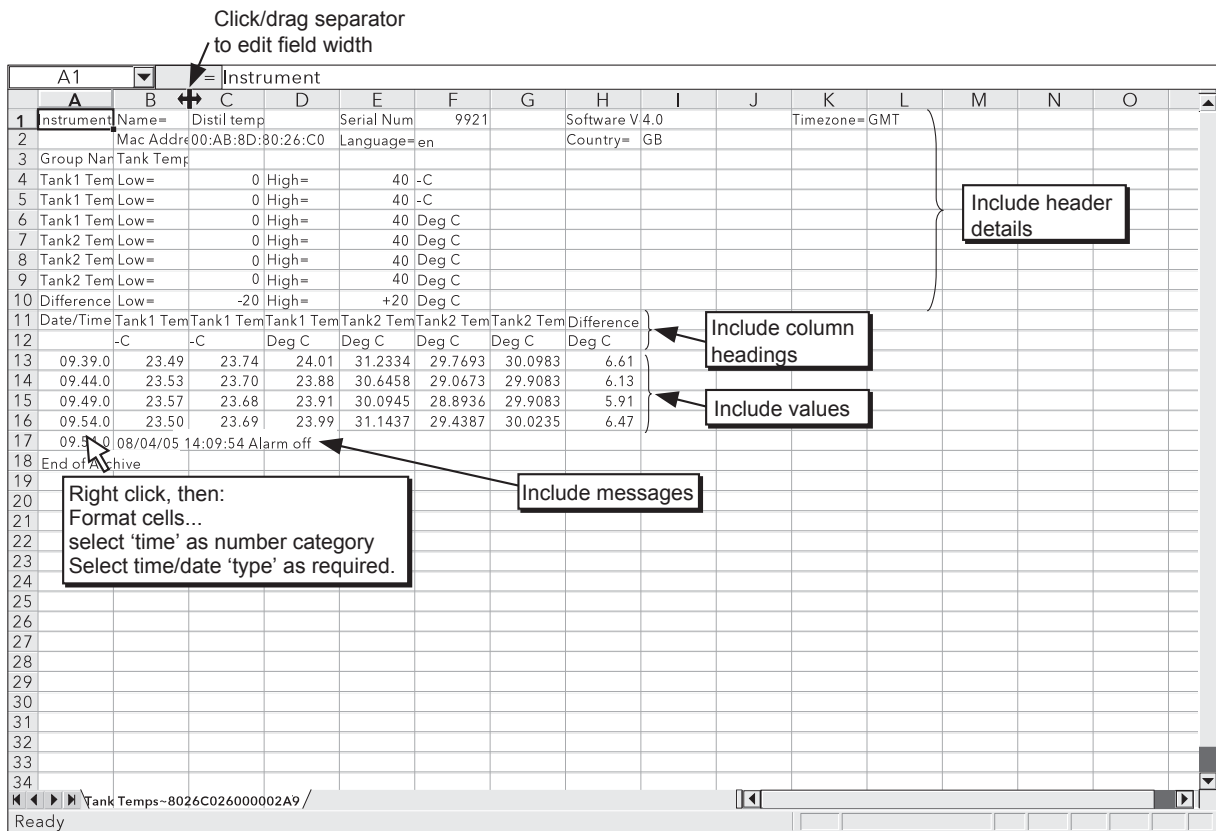


Figure 61 CSV data example

### 6.2.3 FTP Server

This area of configuration allows the user to enter the Username and Password used to access the instrument from a remote FTP client.

### 6.2.4 Modbus TCP

This allows the user to configure the instrument so as to allow it to communicate using Modbus Transmission Control Protocol.

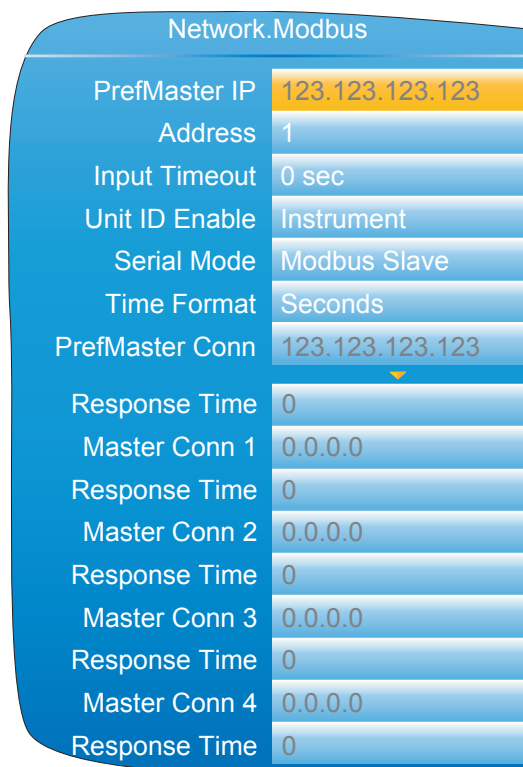


Figure 62 Modbus TCP configuration menu

PrefMaster IP	The IP address of the relevant Modbus master. The Preferred master is guaranteed to be able to connect, even if all slave connections (max. = 4 for TCP) are in use.
Address	The Modbus address for this slave. This address must be unique for the network to which it is attached. The instrument will respond to this address and to Address 255.
Input Timeout	Allows a value of between 0 and 3600 seconds to be entered to set the timeout period for modbus input channels. If a Modbus input is not written to within this period the value of the channel is set to -9999.0 with a 'No Data' status. A value of 0 disables the comms inactivity timeout feature.
Unit ID Enable	Enables/Disables the checking of the Modbus TCP unit identity field. Strict      The Modbus TCP Unit Identity Field (UIF) does not have to match the instrument address. The instrument responds only to Hex value FF in the UIF. iTools finds this instrument only at location 255, and then stops scanning. Loose      The Modbus TCP Unit Identity Field (UIF) does not have to match the instrument address. The instrument responds to any value in the UIF. Instrument      The Modbus TCP Unit Identity Field (UIF) must match the instrument address or no response will be made to messages.
Serial Mode	Slave communications via the side mounted configuration port interface (CPI) clip (for iTools use.) Parameters: Baud rate = 19,200; Parity = none; Number of data bits = 8; Number of stop bits = 1; no flow control. Can be set to 'Modbus Slave' or 'Off'. The unit must be restarted before any change takes effect.
Time Format	Allows the user to choose milliseconds, seconds, minutes or hours as the time format. Sets the resolution for the reading and writing of time format parameters.
PrefMaster Conn	Read only. Shows the IP address of the preferred master, when connected.
Response Time	Read only. Shows the response time for a single communications request to the relevant master.

Master Conn 1 to 4 Read only. Shows the IP addresses of any other masters connected to this instrument.

### 6.2.5 BACnet

This allows the user to configure the instrument so as to allow it to be used as a BACnet device on a BACnet/IP BMS network.

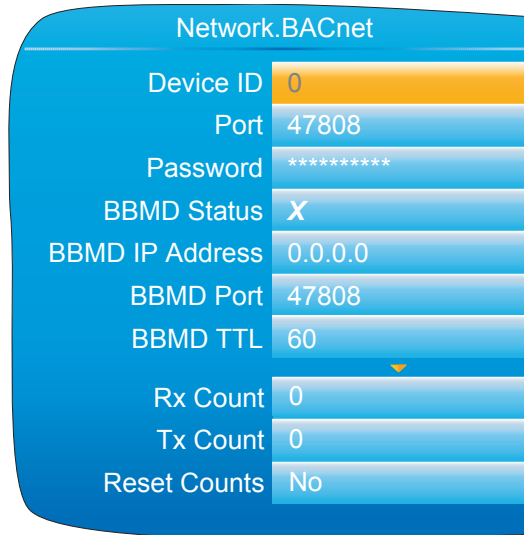


Figure 63 BACnet configuration menu

Device ID	The instance ID for this instrument. Must be unique on the network. Range is 0 - 4194302.
Port	The BACnet I/P standard port is 47808. Valid values are: 1024 - 65535.
Password	The BACnet password for Remote Device Management. Default is '100'. Maximum 20 characters.
BBMD Status	Enable or disable registration of the instrument as a foreign device. Default is 'x' (disabled).
BBMD IP Address	The IP address of this instrument as a BACnet/IP Broadcast Management Device. Default is 0.0.0.0.
BBMD Port	The port this instrument communicates through as a BACnet/IP Broadcast Management Device. Standard Port is 47808. Range is 1024 - 65535.
BBMD TTL	The Time to Live for this instrument as a BACnet/IP Broadcast Management Device. The default value is '60'. Range is 0 - 65535.
Rx Count	A count of messages received.
Tx Count	A count of messages transmitted.
Reset Counts	Set to 'Yes' and the Rx and Tx Counts are reset to zero. Once the counts are reset, this option reverts to 'No'.

### 6.3 GROUP CONFIGURATION

Group configuration is separated into two areas, one which defines trending characteristics (for display channels) the other defining the recording characteristics for saving data to the Flash memory ready for archiving.

### 6.3.1 Group Trend configuration

This allows the user to define which points are to be traced on the display and at what interval, and also allows the number of chart divisions to be set up. Figure 64 shows a typical configuration page.



**Note:** The background chart color is set up as a part of Instrument Display configuration (Section 6.1.3).

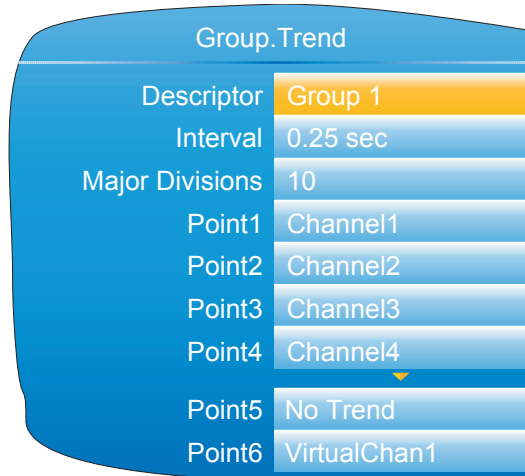


Figure 64 Group Trend Configuration

Descriptor	Allows the user to enter a descriptor (20 characters max.) for the group.
Interval	The trending interval which defines how much data appears on one screen height or width. A number of discrete intervals can be chosen between 0.125 seconds to 1 hour. The selection should be made according to how much detail is required, and how much data is to be visible on the screen.
Major Divisions	Allows the user to select the number of divisions into which the scale is divided and how many gridlines are displayed. Setting the value to 1 results in just the zero and full scale values appearing. Setting the value to 10 (the maximum) results in a scale with zero, full scale and nine intermediate values appearing, with associated grid lines.
Point1 to Point6	Allows the user to select which channels and virtual channels are to be traced. The maximum number of traces is six.

### 6.3.2 Group Recording configuration

Similar to Trend configuration, above, but for saving the data to Flash memory history files. Each point can individually be enabled or disabled for recording, or recording can be disabled for the whole group.

Figure 65 shows a typical page.

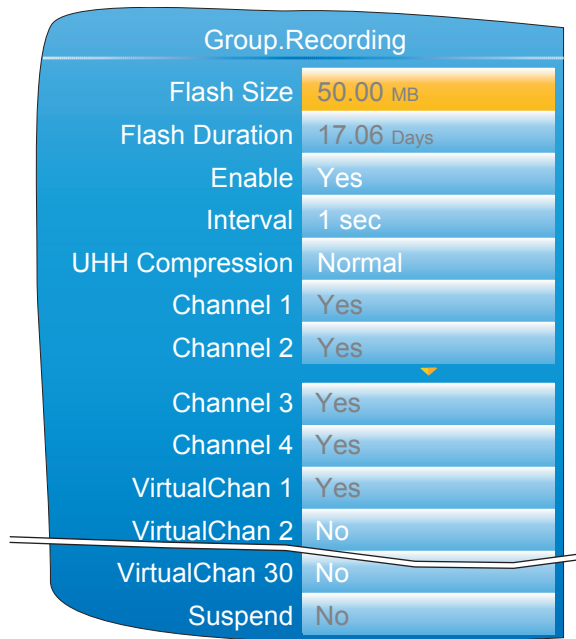


Figure 65 Group trend recording configuration

Flash Size	Read-only. Shows the size of the Flash memory fitted in MB.
Flash Duration	Read-only. Shows the time it will take to fill the Flash memory if the instrument configuration remains unchanged.
Enable	'Yes' enables group recording so that all points set to 'Yes' are stored in the instrument's flash memory. 'No' disables group recording.
Interval	Defines the rate at which data is saved to the instrument's Flash memory. The value affects how much trace history appears on the screen in trend history mode.
UHH Compression	Select 'Normal' or 'High'. 'Normal' compresses the data, but still provides an exact copy. 'High' compresses more, but values are saved only to 1 part in 10 <sup>8</sup> resolution. See also note 1, below.
Channel 1 to VirtualChan 30 (see note 2, below)	Read-only (grayed 'yes') for points being trended, (these are automatically recorded). For non-trending points the user may enable or disable each point individually.
Suspend	Ignored unless the user has wired to this field. If wired then when set to 'No' recording is active, when set to 'Yes' recording is paused.



**Note:** 1. Where very high values are involved, such as in some totalizer values, 'High' compression may cause the value displayed at the instrument, and held in the history file, to be incorrect. The problem may be resolved by changing to 'Normal' compression, or, in the case of a totalizer, by re-scaling it (for example from MegaWatt hours to TeraWatt hours).

**Note:** 2. Virtual channels 1 to 15 are included in the standard build. Channels 16 to 30 are included only if the Modbus Master and/or EtherNet/IP option is fitted.

## 6.4 INPUT CHANNEL CONFIGURATION

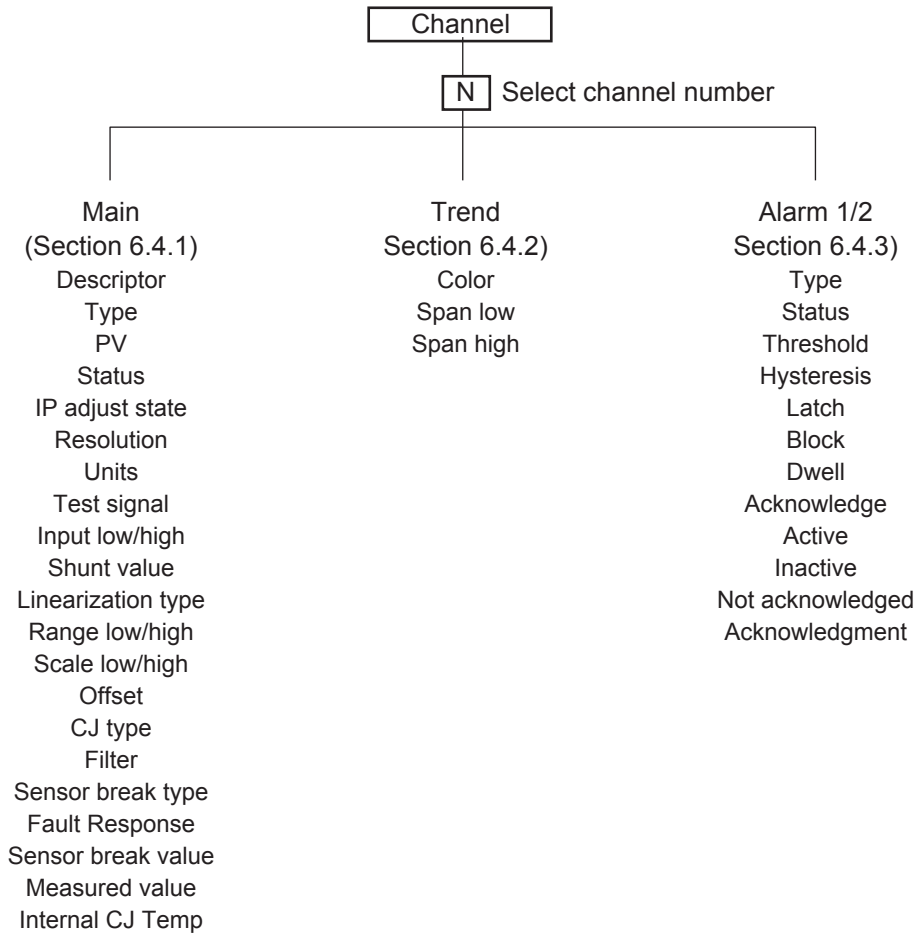


Figure 66 Channel configuration menu

### 6.4.1 Channel Main

This section describes all possible menu items, but it should be noted that some items are context dependent (e.g. Cold Junction settings appear only for Type = 'Thermocouple').

Channels one to four in the configuration relate to An In 1 (terminals 1I, 1+ and 1-) to An In 4 (terminals 4I, 4+ and 4-) respectively - see Figure 4, in Section "INSTALLATION" on page 9.

Channel.1.Main	
Descriptor	Channel 1
Type	Thermocouple
PV	197.35
Status	Good
IP Adjust State	Adjusted
Resolution	2
Units	°C
Test Signal	Triangle 5 Hr
Input Low	0
Input High	10
Shunt	2.49
Lin Type	Type K
Range Low	0.00
Range High	100.00
Range Units	°C
Scale Low	0.00
Scale High	100.00
Offset	0.000
CJ Type	External
Ext CJ Temp	0.00
Filter	1.0 sec
Sensor Break Type	Break High
Fault Response	Drive Low
Sensor Break Val	1%
Measured Value	0.2
Internal CJ Temp	35.1

Figure 67 Channel main menu (expanded)



**Note:** For the sake of completeness, the figure above shows all possible fields, even though many are mutually exclusive. For example, 'Test signal' appears only when 'Test' is selected as Type. It would never appear when Type = thermocouple (as shown). Similarly, 'Shunt' would appear only for Type = mA.

Descriptor	Allows a (20 character max.) descriptor to be entered for the channel. Some thought should be given to ensure that the descriptor is meaningful because in some display screens it is truncated. For example, 'Furnace 1 area 1' and 'Furnace 1 area 2' might both appear as 'Furnace 1 a' and thus be indistinguishable from one another, except in background color.
PV	Read-only. Displays the current value of the channel.



Status	Read-only. Shows the channel status as one of: 'Good', 'Channel Off', 'Over range', 'Under range', 'HW error', 'Ranging', 'HW (capability) exceeded'.
PV2	Read-only. For dual inputs only, displays the current value of the secondary input.
Status2	Read-only. For dual inputs only, shows the secondary input status (as 'Status' above).
IP Adjust State	Appears only for channels which have been included in the 'Adjust Input' procedure described in Section 6.1.9.
IP Adjust State2	As 'IP Adjust State', above but for secondary channels.
Resolution	Allows the number of decimal places to be defined for the channel. Valid entries are zero to six.
Units	Allows a units string of up to five characters to be entered.
Type	Allows the user to select an input type for the channel. Available selections are: 'Off', 'Thermocouple', 'mV', 'V', 'mA', 'RTD', 'Digital', 'Test' or 'Ohms'. If the Dual Input option is fitted, Dual mV, Dual mA, Dual T/C (if enabled) are also available.



**Note:** If Dual T/C is selected then it is essential that the secondary T/C input is field calibrated using the Input Adjust procedure (Section 6.1.9)

Test signal	Appears only if 'Test' is selected as 'Type'. Allows either a sinusoidal or a triangular waveform to be selected at one of a number of cycle times between 40 seconds and five hours.
Input Low*	For Type = mV, Dual mV, V, mA, Dual mA or Ohms, the lowest value of the applied signal in electrical units.
Input High*	As 'Input Low', but the highest value of the applied signal in electrical units.
Shunt value	For mA and Dual mA input types only, this allows the value of the shunt resistor (in Ohms) to be entered. The instrument does not validate this value - it is up to the user to ensure that the value entered here matches that of the shunt resistor(s) fitted. For Dual mA input type, both primary and secondary inputs must have independent shunts each of the same value.
Lin type	Linear, Square root, x3/2, x5/2, User Lin. Thermocouple types (alphabetical order): B, C, D, E, G2, J, K, L, N, R, S, T, U, NiMo/NiCo, Platinel, Ni/MiMo, Pt20%Rh/Pt40%Rh. User 1 to User 4 Resistance thermometer types: Cu10, Pt100, Pt100A, JPT100, Ni100, Ni120, Cu53. See Appendix A: TECHNICAL SPECIFICATION for input ranges, accuracies etc. associated with the above thermocouple and RTD types. See Section 6.11 for details of user linearizations.
Range Low*	For thermocouples, RTDs, User linearizations and retransmitted signals only, the lowest value of the required linearization range.
Range High*	For thermocouples, RTDs, User linearizations and retransmitted signals only, the highest value of the required linearization range.
Range Units	For thermocouples only and RTDs, Select °C, °F or K.
Scale Low/High	Maps the process value to (Scale High - Scale Low). For example, an input of 4 to 20mA may be scaled as 0 to 100% by setting Scale Low to 0 and Scale High to 100.
Scale Low2/High2	As 'Scale Low/High' but for the secondary input (PV2).
Offset	Allows a fixed value to be added to or subtracted from the process variable.



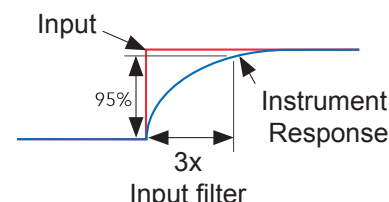
**Note:** \* See Section 6.11 for details of the configuration of Range High/Low and Input High/Low when 'Type' = User 1 to User 4.

Offset2	The nature of the secondary input results in an offset being introduced into the process variable value.
---------	----------------------------------------------------------------------------------------------------------

For mA inputs this offset is removed automatically, without user intervention. For mV inputs the offset depends on the value of the voltage source impedance and is equal to  $199.9\mu\text{V}/\Omega$ . This offset can be compensated for either by using this Offset2 parameter, or by carrying out the 'Input Adjust' procedure (Section 6.1.9). For Dual T/C inputs, it is recommended that the 'Input Adjust' procedure be used instead of Offset2 as the use of Offset2 results in an offset which is non-linear over the thermocouple range.

Input filter

Damping can be used to filter out noise from slowly changing signals so that the underlying trend can be seen more clearly. Valid input values are between 0 and 60 seconds.



i

**Note:** Applying a filter to an input channel can affect the operation of any Rate-of-change alarms configured to act on that channel.

CJC Type

For thermocouple input types only, this allows the user to select 'None', 'Internal', 'External' or 'Remote 1' to 'Remote 4'. For Dual T/C inputs, both primary and secondary inputs use the same cold junction.

None: No Cold junction compensation applied.

'Internal' uses the instrument's internal cold junction temperature measurement.

'External' means that the cold junction is to be maintained by the user, at a fixed, known temperature. This temperature is entered in the 'External CJ Temp' field which appears when 'External' is selected.

Remote 1 (2) (3) (4) means that the cold junction temperature is being measured by input channel 1 (2) (3) (4) respectively. (This must be a different channel from that currently being configured).

Ext. CJ Temp

Appears only if CJC type is set to 'External', and allows the user to enter the temperature at which the external cold junction is being maintained.

Sensor Break Type

Defines whether the sensor break becomes active for circuit impedances greater than expected.

'Off' disables Sensor Break detection.

Break Low: Sensor break active if measured impedance is greater than the 'Break Low impedance' value given in Figure 68.

Break High: Sensor break active if measured impedance is greater than the 'Break High Impedance' value given in Figure 68.

For mA inputs, limits are applied, such that if the process value lies outside these limits, a sensor break is assumed to have occurred. These limits are (Input lo - 4% Span) and (Input high + 6% Span). For example, for a 4 to 20mA signal, an input below 3.36mA or above 20.96mA will trigger a sensor break event.

Range	Break Low impedance	Break High Impedance
40mV	~5kΩ	~20kΩ
80mV	~5kΩ	~20kΩ
2V	~12.5kΩ	~70kΩ
10V	~12.5kΩ	~120kΩ

Figure 68 Minimum impedances for sensor break detection



**Note:** Break High impedance values would be used typically for sensors which have a high nominal impedance when working normally.

	Input sensor break detection is not supported for secondary inputs. The internal circuit acts as a 'pull up' on the secondary input which therefore saturates high in the event of a sensor break.
Fault Response	Specifies the behavior of the instrument if a sensor break is detected or if the input is over driven (saturated high or low). 'None' means that the input drifts, with the wiring acting as an aerial. 'Drive High' means that the trace moves to (Scale High +10%). 'Drive Low' means that the trace moves to (Scale Low -10%), where the 10% values represent 10% of (Scale High - Scale Low).
Sensor Break Val	A diagnostic representation of how close the sensor break detection circuitry is to tripping.
Measured Value	The (read-only) input channel measured value before any scaling or linearization is applied.
Measured Value2	As 'Measured Value', above but for the secondary input.
Internal CJ temp	The (read-only) temperature of the internal cold junction associated with this channel.

### 6.4.2 Channel Trend configuration

This area allows the configuration of channel color and span.

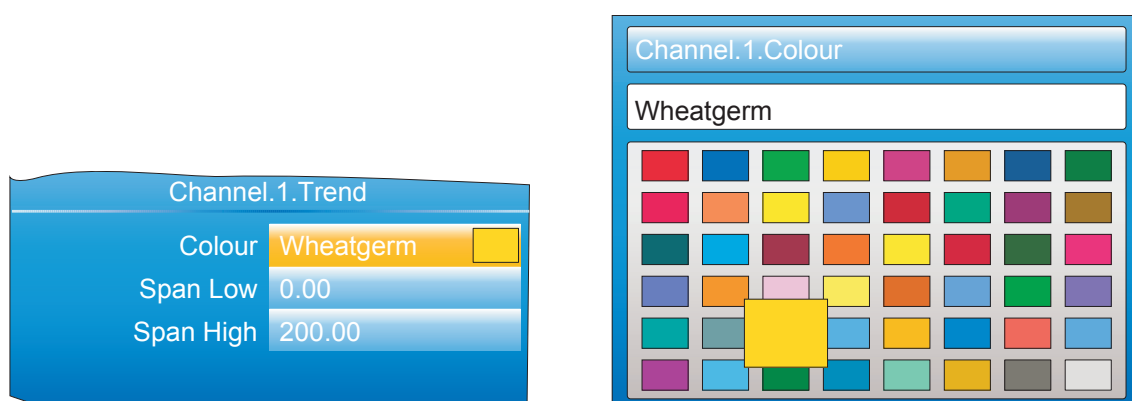


Figure 69 Channel Trend menu and Color selection

Colour	Allows a color to be specified for the channel. The Scroll key is used to enter the color swatch page. The up and down arrows are used to scroll through the available colors, with each color being enlarged for as long as it is 'selected'. Once the required color, is reached, the scroll key is used again to return to the Trend Configuration.
Span Low/High	Span low and high values.



**Note:** Trend colors and alarm settings for secondary inputs are configured in the maths channels to which they are wired.

### SPAN EXAMPLE

In an input range of 0 to 600 degrees C, the temperature range between 500 and 600 degrees is of most interest. In such a case, Span Low is set to 500 and Span High to 600 so that the instrument trends only the required part of the temperature range, effectively magnifying the area of interest.



**Note:** Trending is restricted to the PV range (Span High - Span Low), but the instrument can display values outside this range.

### CHANNEL CONFIGURATION EXAMPLE

A type J thermocouple is used to measure a temperature range of 100 to 200°C. This thermocouple output is transmitted to the instrument by a 4 to 20mA transmitter, for display as a value between 0 and 100%.

In Channel.Main, set the following for the relevant channel:

- Type = mA
- Units = %
- Input Low = 4.00
- Input high = 20.00
- Shunt = 250 Ohms
- Lin Type = Type J
- Range Low = 100.00
- Range High = 200.00
- Range Units = °C
- Scale Low = 0
- Scale High = 100

Other items may be left at their defaults.

#### 6.4.3 Alarm 1 menu

Allows the alarm characteristics for Alarm 1 to be configured. The figure below shows a typical configuration page (expanded for clarity). Actual configuration parameters are context sensitive.

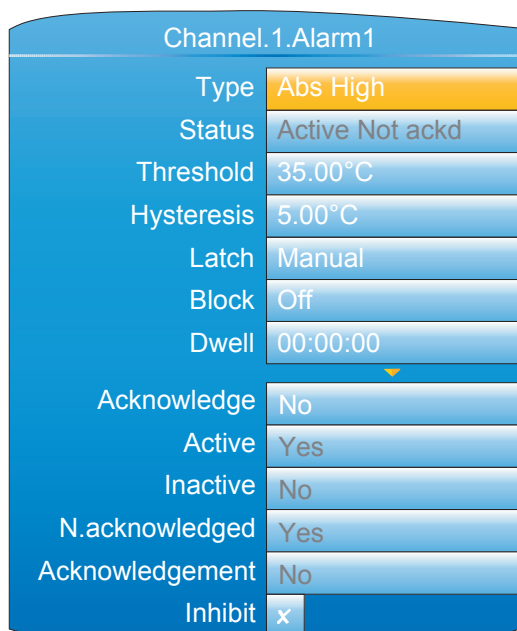


Figure 70 Typical alarm 1 configuration menu

Type Select an alarm type from: 'Off', 'Abs. High' (absolute high), 'Abs. Low' (absolute low), 'Dev. High' (deviation high), 'Dev. Low' (deviation low), 'Dev. Band' (deviation band), 'Rise

---

	ROC' (rate-of-change: rising), 'Fall ROC' (rate-of-change: falling), 'Digital High', 'Digital Low'. See 'Alarm types', below, for definitions.
Status	Read only. This shows that the alarm is Off, Active, SafeNotAcked or ActiveNotAcked. For 'Auto' and 'Manual' alarms only, 'SafeNotAcked' means that the alarm trigger source has returned to a non-alarm state, but the alarm is still active because it has not been acknowledged. Similarly, 'ActiveNotAcked' means that the source is still active and the alarm has not been acknowledged. Always shows 'Off' when the alarm is inhibited (see below).
Threshold	For absolute alarms only, this is the trip point for the alarm. For absolute high alarms, if the threshold value is exceeded by the process value (PV) of this channel, then the alarm becomes active, and remains active until the PV falls below the value (threshold - hysteresis). For absolute low alarms, if the PV of this channel falls below the threshold value, then the alarm becomes active and remains active until the PV rises above (Threshold + Hysteresis).
Reference	For deviation alarms only, this provides a 'centre point' for the deviation band. For 'deviation high' alarms, the alarm becomes active if the process value (PV) rises above the value (Reference + Deviation) and remains active until the PV falls below (Reference + Deviation - Hysteresis). For 'deviation low' alarms, the alarm becomes active if the process value (PV) falls below the value (Reference - Deviation) and remains active until the PV rises above (Reference - Deviation + Hysteresis). For 'deviation band' alarms, the alarm is active whenever the process value (PV) lies outside the value (Reference $\pm$ Deviation) and remains active until the PV returns to within the band, minus or plus Hysteresis as appropriate.
Deviation	For deviation alarms only, 'Deviation' defines the width of the deviation band, each side of the Reference value, as described immediately above.
Hysteresis	For absolute and deviation alarms, this provides a means of preventing multiple alarm triggering, if the process value is drifting close to the trigger value.
Amount	For rate-of-change alarms only. The alarm becomes active if the process value rises (Rise ROC) or falls (Fall ROC) by more than the specified 'Amount' within the time period defined in 'Change Time', below. The alarm remains active until the rate of change falls below the value (Amount/Change Time) in the relevant sense.
Change Time	Settable to 1 second, 1 minute or 1 hour. See 'Amount' (above).
Average Time	For rate-of-change alarms only. This allows an averaging period (for the process value) to be entered to reduce nuisance trips due to signal noise, or if the rate of change is hovering around the trip value.
Latch	None: The alarm remains active until the monitored value has returned to a non alarm state, when it becomes inactive. Auto: The alarm remains active until the monitored value has returned to a non alarm state and the alarm has been acknowledged. Acknowledgement can take place either before or after the value has returned a non alarm state. Manual: The alarm remains active until the monitored value has returned to a non alarm state and the alarm has been acknowledged. Acknowledgement is permitted only after the value has returned a non alarm state. Trigger: Not enunciated, this mode is used only to initiate an action defined by user wiring either using iTools or using the user interface.
Block	Alarms with 'Block' set to 'On' are inhibited until the monitored value has entered the 'safe' condition after a start-up. This prevents such alarms from becoming active whilst the process is brought into control. If a latching alarm is not acknowledged then the alarm is re-asserted (not blocked), unless the alarm's threshold or reference value is changed, in which case the alarm is blocked again.
Dwell	Initiates a delay between the trigger source becoming active, and the alarm becoming active. If the trigger source returns to a non alarm state before the dwell time has elapsed, then the alarm is not triggered and the dwell timer is reset.
Acknowledge	Select 'yes' to acknowledge the alarm. Display returns to 'No'.

---

Active	Read-only. Shows the status of the alarm as 'Yes' if it is active, or No, if inactive. The active/inactive state depends on the Latch type (above) and acknowledgment status of the alarm. Always shows 'No' if the alarm is inhibited (below).
Inactive	As for 'Active' above, but shows 'Yes' if the alarm is inactive and 'No' if the alarm is active. Always shows 'Yes' if the alarm is inhibited (below).
N.acknowledged	As for 'Active' above but shows 'Yes' for as long as the alarm is unacknowledged, and 'No' as soon as it is acknowledged. Always shows 'No' if the alarm is inhibited (below).
Acknowledgement	Fleetingly goes 'Yes' on alarm acknowledgement, and then returns to 'No'.
Inhibit	When 'Inhibit' is enabled, (tick symbol), the alarm is inhibited. Status is set to 'Off'; 'Active' and 'N.acknowledged' are set to 'No', and 'Inactive' is set to 'Yes'. If the alarm is active when inhibit is enabled, then it becomes inactive until inhibit is disabled, when its status depends on its configuration. Similarly if the alarm trigger becomes active when the alarm is inhibited, the alarm remains 'off' until inhibit is disabled, when its status depends on its configuration.

### 6.4.4 Alarm 2 menu

As above for Alarm 1 menu.



**Note:** The parameters 'Acknowledge', 'Active', 'Inactive', 'N(ot) Acknowledged' and, 'Acknowledgement' can all be 'wired' to other parameters, so, for example, a relay can be made to operate whilst the alarm is inactive or whilst it is active or on acknowledgement etc. by wiring the relevant parameter to the relay's 'PV' input. See Section 10 for details of user wiring.

### 6.4.5 Alarm types

The following figures attempt to show graphically the meanings of the alarm parameters which can be set for the various alarm types available.

#### ABSOLUTE ALARMS

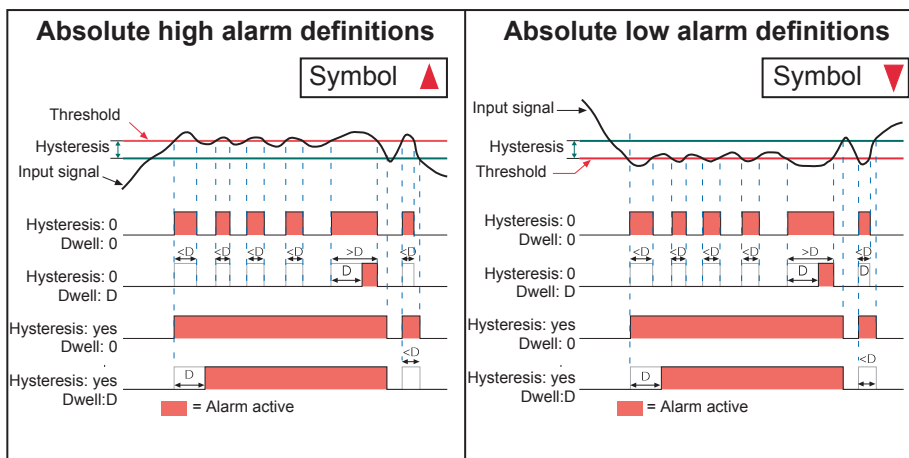


Figure 71 Absolute alarm parameters

DEVIATION ALARMS

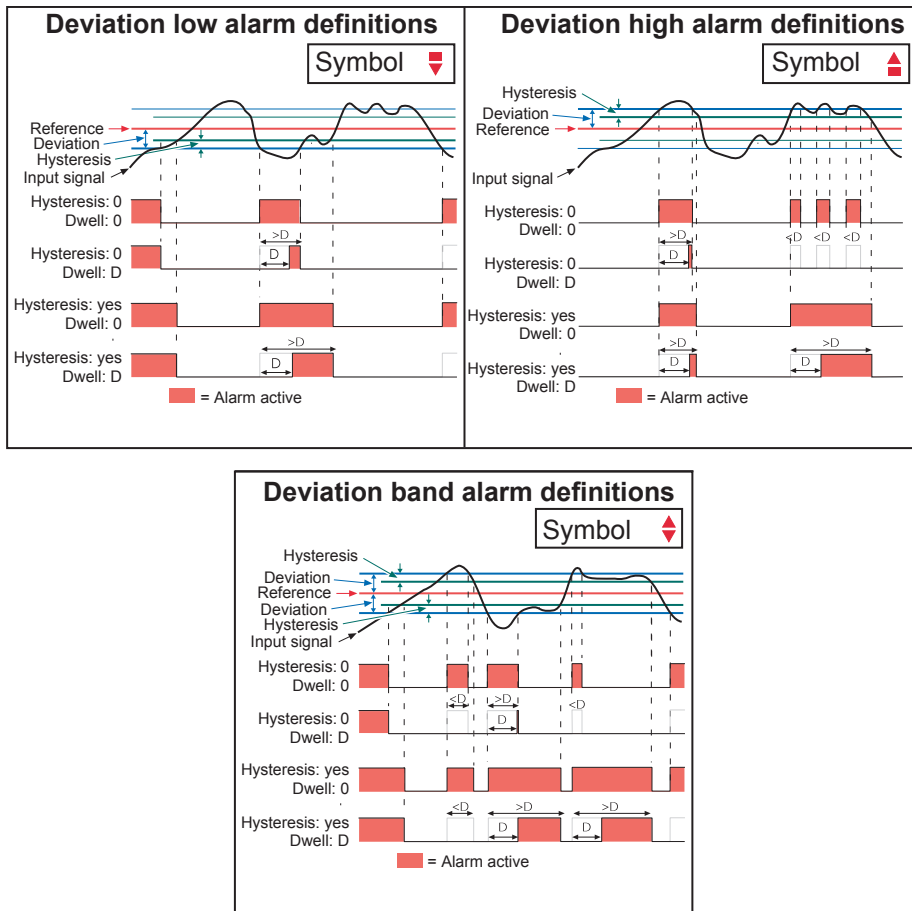


Figure 72 Deviation alarm parameters

RATE-OF-CHANGE ALARMS

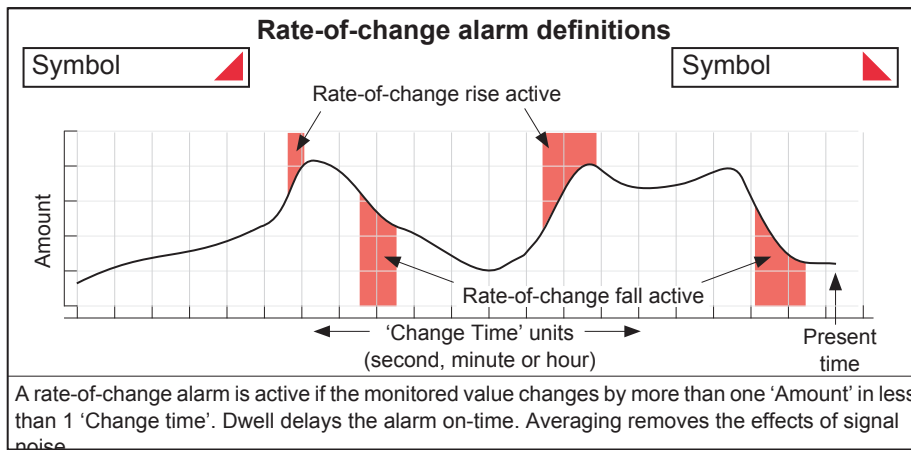


Figure 73 Rate-of-change alarm parameters



**Note:** Operation of rate-of-change alarms may be affected if an input filter (Section 6.4.1) is applied to the input signal.



## 6.5 VIRTUAL CHANNEL CONFIGURATION

This allows the configuration of maths channels, totalizers and counters. The configuration is divided into the following areas: 'Main', 'Trend', 'Alarm 1\*' and 'Alarm 2\*'. Items appearing in the 'Trend', 'Alarm 1' and 'Alarm 2' areas are identical with the equivalent items described in Section 6.4 (Input channels), above.



**Note:** \* Virtual channels 16 to 30 (supplied with Modbus Master and EtherNet/IP options only) come without alarms

### 6.5.1 Maths channel configuration

The following maths functions are available (listed in up-arrow scroll order)

Off, Add, Subtract, Multiply, Divide, Group Average, Group minimum, Group maximum, Modbus input, Copy, Group minimum (latch), Group maximum (latch), Channel maximum, Channel minimum, Channel Average, Configuration revision, Off.

Figure 74 shows a typical maths channel configuration.

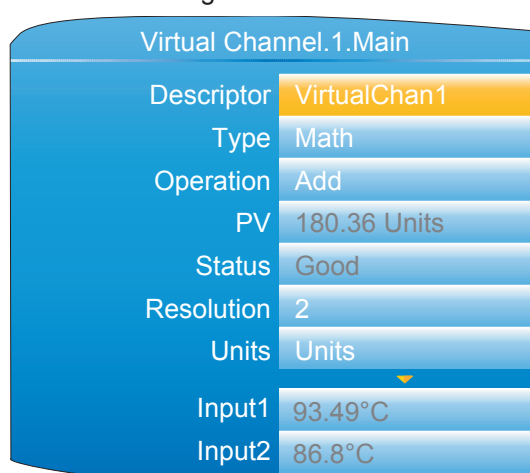


Figure 74 Maths channel configuration (typical)

Descriptor	Allows the user to enter a descriptor (20 characters max.) for the maths channel
Type	Math selected for this example. See Section 6.5.2 and Section 6.5.4 for totalizers and counters respectively.
Operation	Allows the user to select the required maths function. See 'Maths Functions', below.
PV	Read-only. Shows the dynamic value of this channel in the units entered in 'Units' below.
Status	Read-only. Shows the status of this channel, reflecting the status of the input sources.
Resolution	Enter the number of decimal places required
Units	Allows a five character string to be entered to be used as the channel units.
Input1	The value of input 1. May be entered manually, or it may be wired from another parameter (Section 9). Uses the resolution of the source.
Input 2	As for 'Input 1', Appears only when the operation requires two inputs.
Reset	Allows the user to reset latching functions (e.g. Channel Max) or averaging functions (e.g. Channel Avg). Reset is carried out by setting the field to 'Yes', then operating the scroll key. The display returns to 'No'. Alternatively the function can be reset by another parameter wired to 'Reset'.
Time Remaining	The period of time remaining before the virtual channel performs its operation. For example, the time remaining for the maths channel average operation to sample the input before performing the calculation.
Period	For averaging functions, this allows a period to be entered, over which the value is to be averaged. Selectable periods are: 0.125, 0.25, 0.5, 1, 2, 5, 10, 20, 30 seconds, 1, 2, 5, 10, 20, 30 minutes, 1, 2, 6, 12, 24 hours.

**MATHS FUNCTIONS**

Off	Out = -9999; status = Off
Add	Out = Input1 + Input2
Subtract	Out = Input1 - Input2
Multiply	Out = Input1 x Input2
Divide	Out = Input1 / Input2. If Input2 = 0, Out = -9999; Status = 'Bad'.
Group Avg*	Out = Instantaneous sum of all points in the recording group (except this one and any channel that has been configured with operation = group average, group minimum, group maximum, group minimum (latched), group maximum (latched), channel maximum or channel minimum), divided by the number of points in the group (excluding this one). Any point that has a status other than 'Good' is excluded from the calculation. If the group contains no channels, Out = -9999; Status = 'No data'.
Group Min*	Out = Instantaneous value of whichever point (except this one) in the recording group has the lowest value. Any point that has a status other than 'Good' is excluded from the calculation. If the group contains no channels, Out = -9999; Status = 'No data'.
Group Max*	Out = Instantaneous value of whichever point (except this one) in the recording group has the highest value. Any point that has a status other than 'Good' is excluded from the calculation. If the group contains no channels, Out = -9999; Status = 'No data'.
Modbus Input	Out = value written to this channel's Modbus input. If the comms timeout expires, Out = -9999; status = 'No data'.
Copy	Allows an input or other derived channel to be copied.
Grp Min Latch*	Out = Lowest value reached by any point in the recording group (except this one) since last reset. Any point that has a status other than 'Good' is excluded from the calculation. If the group contains no channels, Out = -9999; Status = 'No data'.
Grp Max Latch*	Out = Highest value reached by any point in the recording group (except this one) since last reset. Any point that has a status other than 'Good' is excluded from the calculation. If the group contains no channels, Out = -9999; Status = 'No data'.
Channel Max	Out = Highest value reached by Input1 since last reset. If Input1 has a status other than 'Good', then Out = -9999 and 'Status' depends on the status of Input1.
Channel Min	Out = Lowest value reached by Input1 since last reset. If Input1 has a status other than 'Good', then Out = -9999 and 'Status' depends on the status of Input1.
Channel Avg	Out = the average value of Input1 over the time specified in 'Period'. If Input1 has a status other than 'Good', then Out = -9999 and 'Status' depends on the status of Input1.
Config Revision	Out = current Configuration Revision value.



**Note:** \* All 'Group' functions operate on the 'Recording' group, not on the 'Trend' group.

## 6.5.2 Totalizer configuration

Totalizers allow the user to maintain a running total of any input channel, or of any maths channel. Using maths channels, it is possible to totalize combinations of input channels so that, for example, the sum of two channels or the difference between them could be totalized if required.

A totalizer is configured using Virtual Channels. This is in essence a way to convert an input signal representing a rate of change of some parameter, such as a fuel flow being measured, for example, in litres/minute into a cumulative flow. If the fuel flow is constant then, of course, the conversion would be simple, just multiply the flow rate by time and the answer comes out directly in litres. Provided, of course, that the time units of the flow rate and the time measurement are in the same units. Both need to be in Seconds, Minutes, Hours, etc. in order to get the correct answer.

If the flow rate is variable, the calculation has to be done repeatedly over the time period required and the results of the individual calculations must then be added together (totalized). In order to get reasonable accuracy it is important that the flow should be reasonably constant during each measurement period. This means that the sampling time for the measurements should be sufficiently frequent that significant changes in flow rate are not missed. If the sampling frequency is high enough, the totalization process is approximately equivalent to mathematical integration of the input signal.

The totalizer block in the FEC920 is intended to automate this process. It uses the built-in sampling rate of the FEC920 (125mSec) as the sampling period for the totalization process. In addition, it provides two separate parameters which can be used to adjust the results of the totalization process so that the output from the block is scaled in the correct units. Figure 76 shows the Main configuration parameter list when the Virtual Channel block is being configured as a totalizer.

Wiring is carried out either at the operator interface (Section 10), or in iTools (Section 9).

The totalizer equation is:

$$tot_t = tot_{t-1} + \frac{ma_t}{PSF \times USF}$$

where,

$tot_t$  = totalizer value this sample

$tot_{t-1}$  = totalizer value last sample

$ma_t$  = process value this sample

PSF = Period Scaling Factor (Period)

USF = Units Scaling Factor (Units scaler)



**Note:** The time between samples is 125ms.

Figure 76 shows a typical totalizer configuration page.

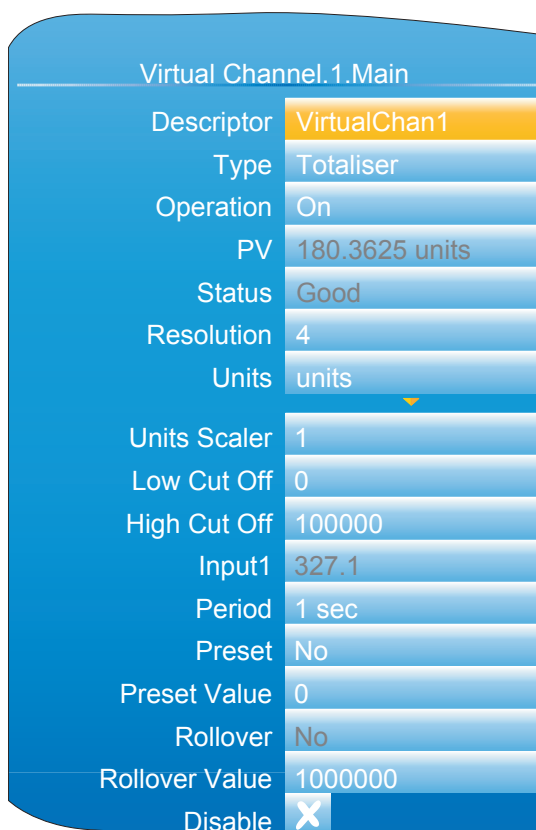


Figure 76 Typical totalizer configuration menu

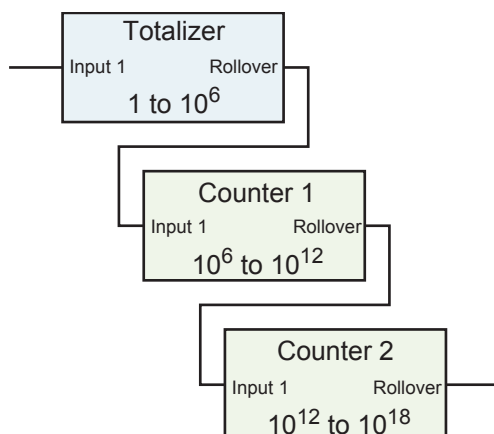


Figure 75 Using cascaded counters to expand the totalization range.

Descriptor	Allows the user to enter a descriptor (20 characters max.) for the totalizer.
Type	Select: Math, Counter or Totalizer.
Operation	Allows the user to enable ('On') or disable ('Off') the totalizer.
PV	Read-only. This is the dynamic output value of the totalizer.
Status	Read-only. Shows the status of the totalizer.
Resolution	The Resolution parameter allows the number of decimal places (up to six) to be set for the totalized value as displayed on the instrument panel. It does not affect the resolution of the totalization process. Up to six decimal places may be set for the totalized value.
Units	Allows a units string of up to five characters to be entered for the totalized value.
Units Scaler	Allows a units scaler to be selected. Typically this will be used to scale between unit types rather than to influence time period. One example of this would be when an input is measured in Litres/Minute, and Period has been set to 1Minute. If UnitsScaler is set to 1 then the total volume will be measured in Litres. If the volume is required in Cubic Metres then conversion of the total will be needed. There are 1000 Litres in a Cubic Metre so the UnitsScaler should be set to 1000. This produces an additional division of 1000 and results in a total output in Cubic Metres. Another example would be a requirement for the output in Gallons rather than litres, still with an input being measured in Litres/Minute. There are 4.54609 litres in an imperial gallon so the UnitsScaler would be set to 4.54609. (For a US Gallon the figure would be 3.78541.)
Low Cut Off	Used to restrict the input operating range of the totalizer. Minimum value = -100 000
High Cut Off	Used to restrict the input operating range of the totalizer. Maximum value = 100 000 Low Cut Off and High Cut Off are particularly important as they directly affect the totalization process. Together these two parameters define the range of valid inputs to the totalization process. If Input1 value lies between them, then the input is considered valid

and it contributes to the total for any period during which it remains valid. Negative input values are allowed and will cause the totalizer to decrease in value for negative values. The total increases with positive values.

If the input lies outside the region defined by these CutOff parameters then it will be ignored and not contribute to the total.

Many applications do not wish to use negative values and so LowCutOff would then normally be set to 0. Occasionally though, calibration errors at the low scale end could cause unacceptable errors in the total. In these circumstances, it may be necessary to consider setting LowCutOff to a small positive value.

An example where this may be needed is when a process has a very low input value for long periods of time interspersed with short periods of high input values. The cumulative effect of slightly inaccurate low input values for long periods could then reduce the accuracy of the overall total recorded.

Thoughtful use may produce an increase in the overall accuracy of the total; inappropriate use could introduce significant inaccuracy.

Input1	The value of the source. May be entered manually, or this parameter can be wired from an external channel PV. Input1 is the input signal representing an external measurement which is in the form of Units/Time-Unit, i.e. a rate. The sampling rate internal to the block is fixed at the instrument tick rate of eight times/second, taking one sample every 125ms.
Period	The Period parameter divides the signal being applied to Input1 by the number which is needed to generate a Total PV which is scaled in appropriate time units. There is a selection of preset values available for the Period parameter. These are listed in Table 1 below. The totalizer equation works in seconds. If the totalized channel units are other than 'per second', a period scaler different from the default (1 sec) must be used. The 'Period' field presents a number of fixed periods from 0.125 seconds to 24 hours for selection.
Preset	Setting this to 'Yes' causes the totalizer to adopt the Preset Value. The field returns immediately to 'No'. The totalizer can also be pre set by an external source 'wired' to this parameter.
Preset Value	Allows the entry of a value, from which the totalizer is to start incrementing or decrementing. The direction of the count is set by the sign of the units scaler: positive = increment; negative = decrement.
Rollover	This is the rollover output which will be set for one execution cycle when the totalizer rolls over. This output can be used to expand the range of the totalizer by wiring it to the Trigger input of a counter.
Rollover Value	<p>This is the value at which the totalizer will roll over to 0. It is configurable (default 1,000,000). When the totalizer rolls over the difference between the rollover value and the calculated output will be added to 0.</p> <p>Example 1: with a rollover value of 1000, a current output of 999 and an input of 5, then the output will become 4.</p> <p>Example 2: with a rollover value of -1000, a current output of -999 and an input of -5, then the output will become -4.</p> <p>In both examples, the Rollover output will be set for 1 execution cycle.</p> <p>Many applications do not require very large values to be totalized and can be scaled so that the Rollover Value will never be reached. The instrument default value of <math>10^6</math> is generally satisfactory for these. If, however, higher values are expected, a larger Rollover value than this will have to be used. When configuring very large values the number stored on the instrument display may be slightly larger or slightly smaller. This happens because the numbers are stored in the instrument in IEEE representation as used by all computing systems to save space. The trade-off is that very large values are stored with a small inaccuracy, which increases as the value being stored increases. As an example, if a value of 9,999,999,999,999 is entered into the instrument screen as the Rollover value, it is read back on the instrument panel as 9,999,999,827,968. The inaccuracy caused by the compression amounts to 0.02 parts per million, considerably smaller than the inaccuracy associated with the input channel which is being used to generate the input to the totalizer.</p>

Disable

Allows the user temporarily to suspend totalizing action. The totalizer is toggled between being enabled (cross symbol) and disabled (tick symbol) by means of the scroll key. The output retains the pre-disabled value until the totalizer is re-enabled, when it resumes from that value, or until the value is changed using the Preset parameter mentioned above. In the latter event, it will still be necessary to enable the totalization by setting the Disable parameter to the cross symbol again.

**Table 1: Period**

Sec	Divider	Sec	Divider	Min	Divider	Hour	Divider
0.125	1	<b>1</b>	<b>8</b>	<b>1</b>	<b>480</b>	<b>1</b>	<b>2880</b>
0.25	2	2	16	2	960	2	5760
0.5	4	5	40	5	2400	6	17280
		10	80	10	480	12	34560
		20	160	20	960	<b>24</b>	<b>69120</b>
		30	240	30	1440		

The selections in Bold Italic font are those which set the calculation into common time units, Second, Minute, Hour and Day (24Hours), and are probably going to be the most commonly selected. The other selections may be useful for more unusual applications.



**Note:** The formula linking Input1 and PV is:

PV Increment each 0.125Sec =  $\text{Input1} / (8 * \text{Period}(\text{Sec}) * \text{UnitsScaler})$ .

There is no reason why the Period and UnitsScaler parameters have to be used only in the way described above, one reflecting the units used by the input channel and the other linked directly to the output units required. There may be application where they may be used in other ways. Use Table 1, which shows the divisor associated with a particular selection for Period, in combination with a custom value as the UnitsScaler to generate a custom overall divisor.

### 6.5.3 Wiring Example using a counter in combination with a totalizer

Figure 77 shows how a counter and totalizer can be linked in a real application using the internal (soft) wiring in iTools. See also Section 9.3.

The application is to provide a running total of power being used by a process.

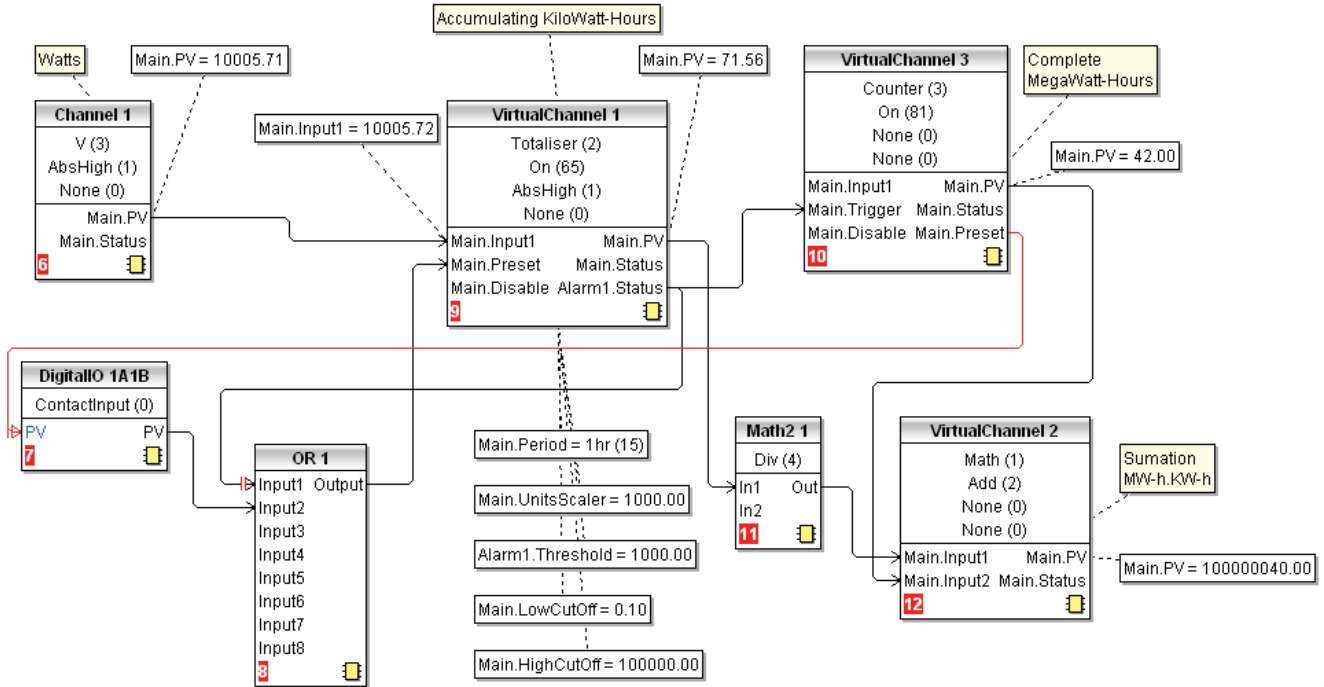


Figure 77 Linking a counter and totalizer

In this example

Channel 1 input is connected to a wattmeter.

Totalizer VC1 uses the period parameter to set the timescale of the units to hours. The UnitsScaler is set to 1000 to set the units of the total to Kilowatt-Hours.

Alarm 1 in VC1 is set as Absolute High and the Alarm Status output resets VC1 and increments the counter VC3 by 1.

Math2 1 takes the output from VC1 and converts it into MegaWatt-Hours so that it can be added to the count (also in MegaWatt-Hours) from VC2 to present a running total value.

Digital Input 1A1B is used to simultaneously reset both the count in VC2 and the total in VC1.

OR 1 is used to allow VC1 to be reset either by 1A1B or by the total reaching 1000.



**Note:** Firmware version 5.00 uses 64 bit IEEE calculations. Inputs and outputs from the block as wiring to and from other blocks is still in 32bit format, just like all other instrument parameters. Inside the totalizer block these are converted to 64bits and processed in the 64bit domain until their value has to be used by another block or has to be sent over comms, when it is converted back to 32bits.

### 6.5.4 Counter configuration

This allows the user to set up a counter to count trigger inputs (or it may be incremented from the Configuration page. The Rollover Value of the counter is configurable (default 1,000,000). Counters can be cascaded by wiring from 'Rollover' of one counter to 'trigger' of the next. Wiring is carried out from the operator interface (Section 10) or in iTools (Section 9).

For 'Trend', 'Alarm 1' and 'Alarm 2' configurations please see the relevant parts of Section 6.4.

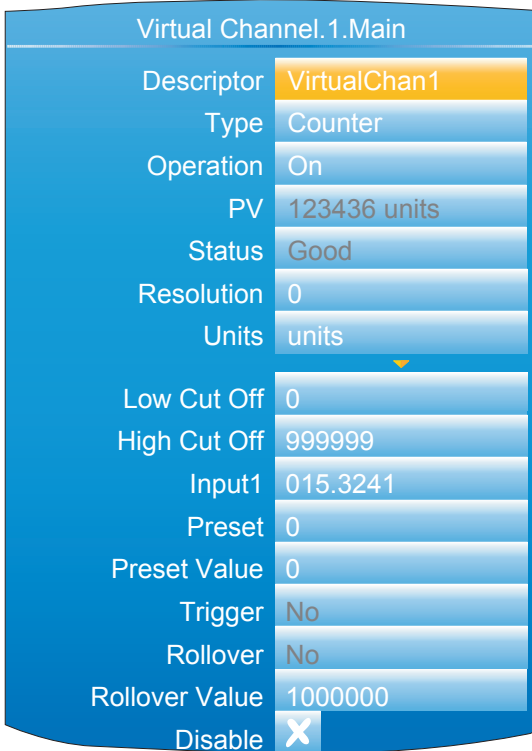


Figure 79 Typical Counter configuration

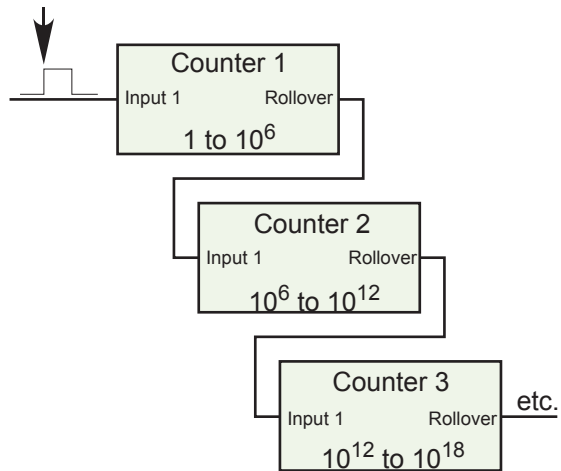


Figure 78 Cascading counters

Descriptor	Allows the user to enter a descriptor (20 characters max.) for the counter.
Type	Select: Math, Counter or Totalizer.
Operation	Allows the user to enable ('On') or disable ('Off') the counter.
PV	Read only. Shows the dynamic value of the counter.
Status	Read only. Reflects the status of the input channel.
Resolution	Allows the number of decimal places (up to six) to be defined for the channel.
Units	Allows a units string of up to five characters to be entered for the counter value.
Low Cut Off	Specifies a value below which the counter will not decrement.
High Cut Off	Specifies a value above which the counter will not increment.
Input1	The amount by which the counter is incremented each time 'Trigger' goes high. The value may be entered manually, or wired from another parameter. Negative values cause the counter to decrement.
Preset	Setting this to 'Yes' causes the counter to adopt its Preset Value. The field returns immediately to 'No'. The counter can also be preset by wiring from another parameter.
Preset Val	Allows the entry of a value, from which the counter is to start incrementing or decrementing.
Trigger	Setting this to 1, causes the current value of the input source to be added to the Counter value. This function can be carried out manually, or the input can be wired from another parameter (Section 10.2).



Rollover	This is the rollover output which will be set for one execution cycle when the counter rolls over. This output can be used to expand the range of the cascade counters by wiring it to the Trigger input of the next counter.
Rollover Value	<p>This is the value at which the counter will rollover and is configurable in the same way as the totalizer. When the counter rolls over the difference between the rollover value and the calculated output will be added to 0.</p> <p>Example 1: with a rollover value of 1000 and a current output of 999 and an input of 5, then the output will become 4 when the counter is next triggered.</p> <p>Example 2: with a rollover value of -1000 and a current output of -999 and an input of -5, then the output will become -4 when the counter is next triggered.</p>




**Note:** In both examples, the Rollover output will be set for one execution cycle.

Disable	Allows the user temporarily to suspend counting. The output retains the pre-disabled value until the counter is re-enabled, when it resumes counting from that value. The counter is toggled between being enabled (cross symbol) and disabled (tick symbol) by means of the scroll key.
---------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### 6.6 MODBUS MASTER CONFIGURATION

Modbus master configuration is divided into two areas: a) setting up the slave(s), including diagnostics, and b) defining the locations of the parameters to be read. Figure 80 shows an overview.

Section 5.4.7 shows the Modbus Master display page, and describes the configuration options available there.



**Note:** Versions 2.40 to 2.50 of the Mini8 Controller, and versions 2.70 to 3.20 of the Model 3550 controller are supported. It is not guaranteed that later software versions of these instruments will be fully compatible.

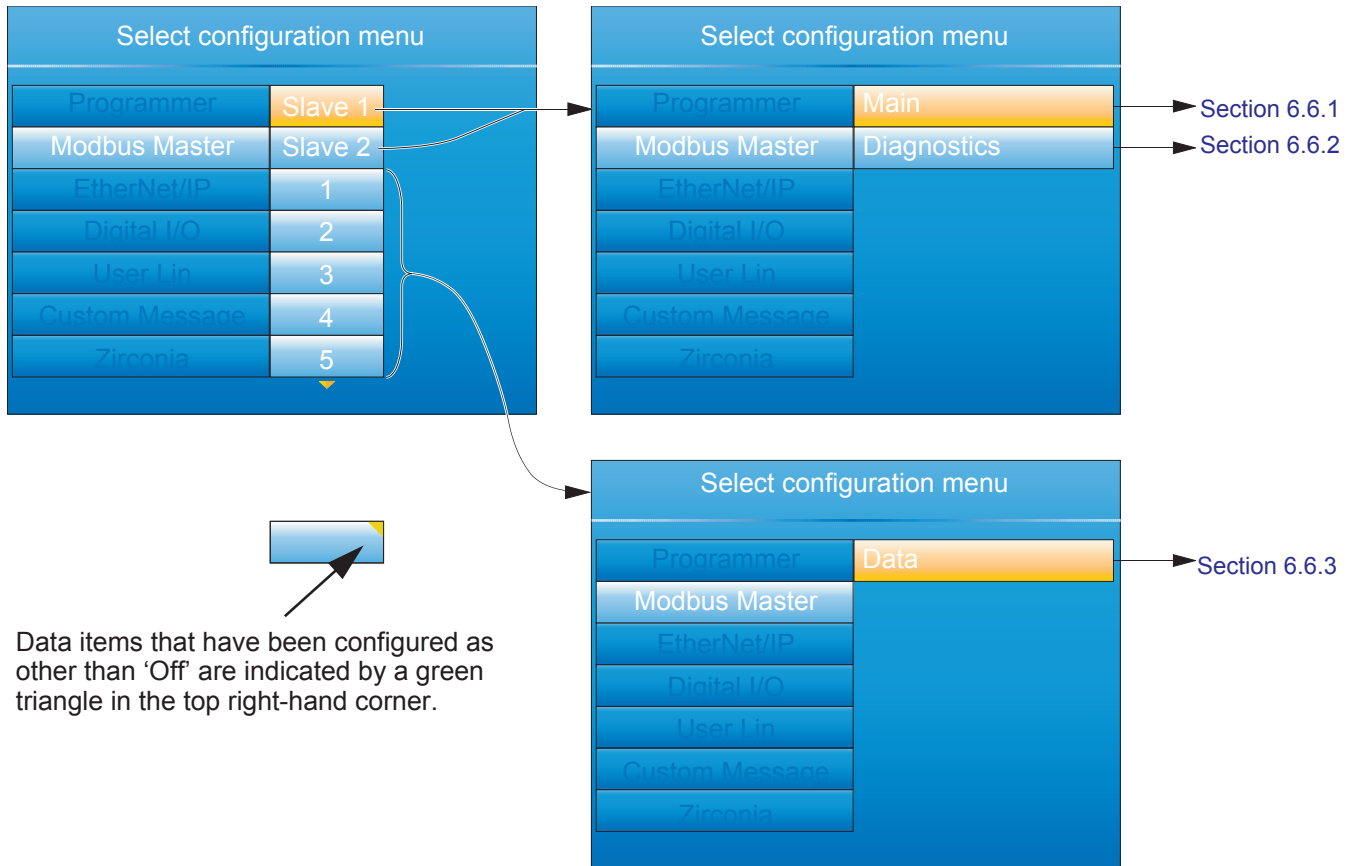


Figure 80 Modbus Master configuration top level menus

### 6.6.1 Slave Main menu

This allows the IP address, Unit ID and other communications parameters to be entered for Slaves 1 and 2.

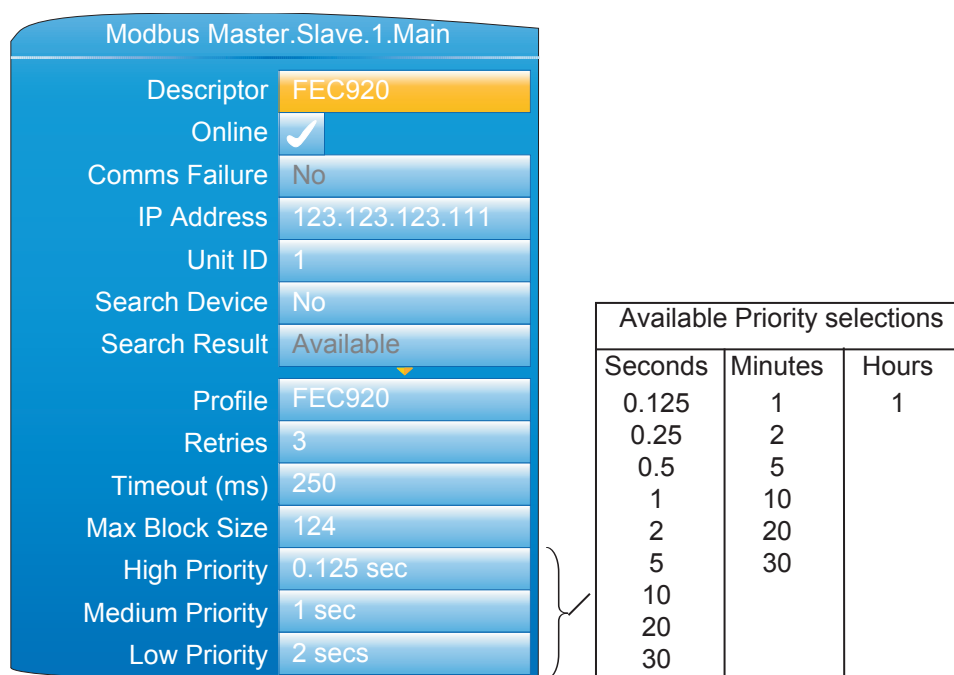


Figure 81 Modbus Master Slave 1 configuration (Slave 2 similar)

- Descriptor            A descriptor for this instrument. For use in Modbus communications, this is not the same as the 'Name' which appears in the Instrument Info configuration (Section 6.12).
- Online                Disabled by default (Cross symbol). Must be enabled (highlighted using the down arrow, then edited by the scroll button) to allow the remaining configuration items to appear and to allow data transactions be processed. Setting the slave offline temporarily disables data transactions - it does not reconfigure them.
- Comms Failure        Active (yes) if a data item has failed to respond after all retries.
- IP Address            The IP address of the Slave device.
- Unit ID                The Unit Id or Modbus address to use in each data transaction with the slave device. Limits are 1 to 255.
- Search Device        Setting this to 'Yes' searches the network to see if the device with the specified IP address and Unit ID is available. If so, the descriptor will be overwritten to indicate what type of device has been found.
- Search Result        The status of the selected 'Search Device' request (Searching, Available, Unreachable). Search activity is indicated by a rotating animated display in the 'Searching' field.
- Profile                A number of profiles are held within the instrument that match a selection of known devices. If the device is 'known', its type, model number etc. is displayed. If the device is unknown, '3rd Party' appears instead.
- Retries                The number of times (0 to 3) to re-send a data transaction to the device if no response is received within the configured timeout period (below).
- Timeout                The timeout period for each Modbus transaction in ms.
- Max Block Size        The maximum number of registers (16bit words) that a single data transaction is permitted to contain.
- High Priority         The interval rate between each high priority data transaction. Default = 0.125 second.
- Medium Priority        The interval rate between each medium priority data transaction. Default = 1 second.
- Low Priority            The interval rate between each low priority data transaction. Default = 2 seconds.


**PRIORITY LEVELS**

Three levels of update rate can be entered for use in data configuration (Section 6.6.3), to define how often a value is read or written. In order to optimize performance, it is recommended that the slowest rate consistent with requirements be selected. The intervals are selected from a scroll list see Figure 81 above.

**6.6.2 Slave Diagnostics menu**

Modbus Master Slave.1.Diagnostics	
Actual High	0.125
Actual Medium	1.000
Actual Low	2.000
Device Status	Success
Loopback Test	No
Total	15428
Successful	15428
Failures	0
Retries	0
Timeouts	0
Illegal Function	0
illegal Address	0
Illegal Data	0
Slave Failure	0
No Gateway Path	0
Reset	No

Figure 82 Diagnostics menu



**Note:** Diagnostic values are reset on power up.

- Actual High      The high priority rate that this slave is actually running at. This can never be faster than the high priority rate that was configured for this device (Slave Main menu, above), but if the master is heavily loaded the rate may be lower than that specified.
- Actual Medium      The medium priority rate that this slave is running at. This can never be faster than the medium priority rate that was configured for this device (Slave Main menu, above), but if the master is heavily loaded the rate may be lower than that specified.
- Actual Low      The actual low priority rate that this slave is running at. This can never be faster than the low priority rate that was configured for this device (Slave Main menu, above), but if the master is heavily loaded the rate may be lower than that specified.
- Device Status      The status of the last transaction to this slave.  
 Success: The transaction was successfully actioned by the slave device.  
 Timeout: There was no response from the slave device to a given request within the configured time.  
 Illegal Address: The request to the slave device contained an invalid Modbus address. The address may be for a read only parameter.  
 Illegal Value: The request to the slave device contained invalid data for the specified parameter.  
 Bad Sub: The sub function code in the request was invalid.  
 Idle: This data item is currently idle and not communicating with the slave device.

	Illegal Code: The slave does not support the function code transmitted by the master.
	Pending: The request is waiting to be sent, the most likely cause being that the slave device has not been set to online.
Loopback Test	If set to 'Yes', Sends a function code 8 transaction to the slave, and waits for a response.
Total	A count of all the transactions sent to the slave including reads, writes both good and failed transactions.
Successful	A count of all the successful transactions sent to the slave.
Failures	A count of all the unsuccessful (failed) transactions sent to the slave. May be caused by Illegal Function, Illegal Address etc. failures, as detailed below.
Retries	The number of transactions that were re-sent because of timed out responses from the slave devices.
Timeouts	A count of all the transactions sent to the slave for which no response was received within the configured timeout period.
Illegal Function	A count of all the transactions sent to the slave that the slave claimed contained an invalid function code. Exception code (1).
Illegal Address	A count of all the transactions sent to the slave that the slave claimed contained an invalid Modbus register address. Exception code (2).
Illegal Data	A count of all the transactions sent to the slave that the slave claimed contained an invalid value. Exception code (3).
Slave Failure	A count of all the times this slave device has failed to communicate. Exception code (4).
No Gateway Path	A count of all the times it has not been possible to access the slave device as it is on another network that requires a gateway for access.
Master Rejects	A count of all the transactions that the Modbus Master has refused to send to the slave due to invalid configuration data.
Reset	A one shot action that immediately resets all diagnostics counts.

**6.6.3 Modbus master data configuration**

This is the area of configuration in which the individual data items are selected for transmission across the Modbus master communications link. The configuration fields that appear depends on the parameter selected, so the examples given here will probably not match those that appear to the user. The parameters that appear in the 'Parameter List' scroll menu depends on the slave model.

**EXAMPLE 1: TARGET SP1 WITH FEC920 SLAVE**

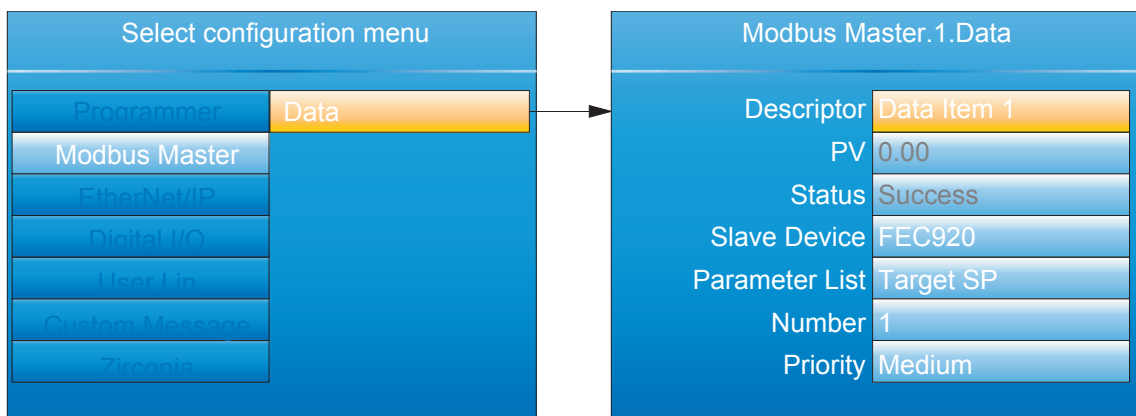


Figure 83 Target Setpoint

**EXAMPLE 2 USER DEFINED PARAMETER**

This allows the user to enter a Modbus address (decimal) and a data type in order to read the value of a parameter from or write a parameter value to the slave. Modbus address and data types must be obtained from

the documentation supplied with the slave device. For convenience, this example uses a FEC920 as the slave; the table in Section 7.3 of this document providing the required data.

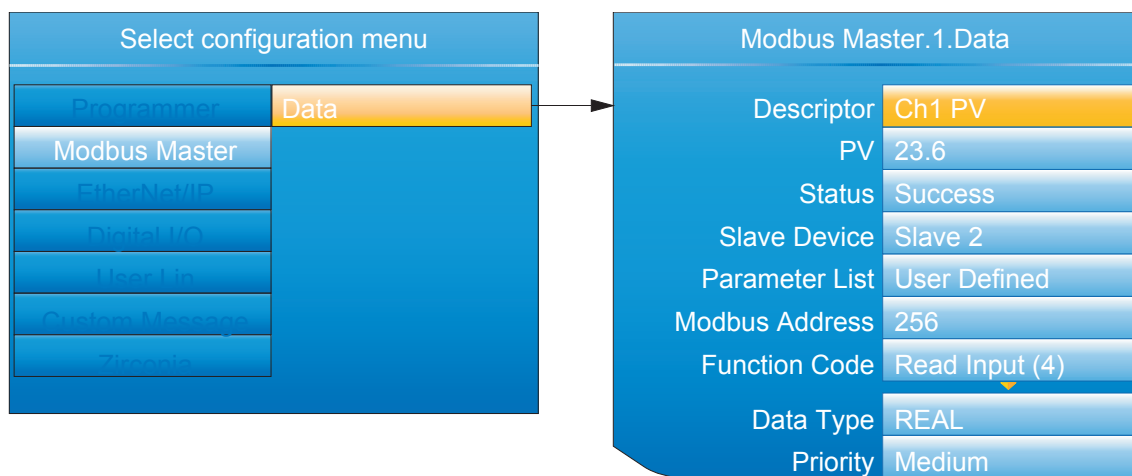


Figure 84 User defined parameters

## DATA PARAMETERS

This lists all possible configuration fields that might appear, not just those shown in the examples above.

Descriptor	Up to 20 characters used to describe the current data item (used in the Modbus Master user page (Section 5.4.7)).
PV	The process value currently being read from the selected slave. Visible only if data item is not an alarm type. The value must be wired to a virtual channel with 'Operation' = 'Copy' if it is to be trended and/or recorded.
Sys Alm status	The status (e.g. None, Active) of the data item. Visible only for specific read profiles. The value must be wired to a virtual channel with 'Operation' = 'Copy' if it is to be trended and/or recorded.
Chan. Alm Status	The status of the data item. Visible only for specific read profiles. The value must be wired to a virtual channel with 'Operation' = 'Copy' if it is to be trended and/or recorded.
Set	Allows the user to set an on/off value. Visible only for specific write profiles.
Mode	Allows the user to set an auto/manual value. Visible only for specific write profiles.
Value	Configured or wired value to be sent to the selected slave. This parameter is available only with function codes 6 & 16.
Fall Back Value	The value to be sent to the selected slave if the 'Value' parameter is wired and has a status other than GOOD_PV. This parameter is available only with function codes 6 & 16 It is not possible to wire Fall Back Value from another parameter and it can be configured only manually.
Send	A one shot action that sends the data in the 'Value' parameter or the 'Fall Back Value' parameter (depending upon the status of 'Value') to the selected slave. This is classed as an acyclic write and so is available only for function codes 6 & 16. The 'Priority' parameter must be set to 'Acyclic'.
Status	The status of the last transaction sent to the selected slave. Success: The transaction was successfully actioned by the slave device. Timeout: There was no response from the slave device to a given request within the configured time. Illegal Address: The request to the slave device contained an invalid Modbus address. The address may be for a read only parameter. Illegal Value: The request to the slave device contained invalid data for the specified parameter. Bad Sub: The sub function code in the request was invalid. Idle: This data item is currently idle and not communicating with the slave device Illegal Code: The slave does not support the function code transmitted by the master.

- Pending: The request is waiting to be sent, the most likely cause being that the slave device has not been set to online.
- Slave Device A list of available slaves that this data is to communicate with.
- Parameter List List of parameters available for the selected slave devices profile. These parameters require no user configuration.
- Number The channel, loop or group etc. instance.
- Modbus Address The Modbus register address that this data is to be read or written to. Limits are 0 - 65535.
- Function Code The function code to use, this determines if the data is going to be read or written to the selected slave. Supported function codes are:

Code	Description	Code	Description
1	Read contiguous status coils	5	Write a single coil on or off
2	Read contiguous discrete inputs	6	Write to a single register
3	Read contiguous holding registers	8	Loopback test
4	Read contiguous input registers	16	Write to contiguous registers

- Data Type The data type that defines how this data is going to be represented. The data types listed below are supported.
  - 8-bit signed byte (BYTE)
  - 8-bit unsigned byte (UBYTE)
  - 16-bit signed integer (INT)
  - 16-bit unsigned integer (UINT)
  - 32-bit signed long (DINT)
  - 32-bit unsigned long (UDINT)
  - 32-bit floating point IEEE (REAL)
  - 32-bit signed long (little Endian, word swapped) (DINT (Swap))
  - 32-bit unsigned long (little Endian, word swapped) (UDINT (Swap))
  - 32-bit floating point IEEE (little Endian, word swapped) (REAL (swap))
  - Bit from register (BIT)

By default all 16 & 32 bit data types (unless specified) will be transmitted in Big Endian format, where the most significant byte in the value is sent first. Byte Ordering: (for big Endian) (0x12 sent first)

  - 16-bit      0x1234                      0x12, 0x34
  - 32-bit      0x12345678              0x12, 0x34, 0x56, 0x78
- Bit Position The bit in the register to be extracted, this is only available if the 'Data Type' selected is 'BIT In Register'.
- Scaling The decimal placing for scaled 16 bit data types. Visible depending on the 'Data Type' selected.
- Priority The frequency with which this data will be managed. See 'PRIORITY LEVELS', in Section 6.6.1, above.

## 6.7 ETHERNET/IP CONFIGURATION

This area of configuration allows the 'Client' user to set up an EtherNet/IP communications link with up to two Server units. The 'Server' user has a more limited range of configurable items.



**Note:** Implicit I/O is used for continuous real-time transfer of multiple data items from instrument to instrument. Explicit I/O is used as a 'one-shot' transfer of a single data item. See Section 5.4.8 for further details.

Figure 85 shows that the configuration is split into three areas: Main, Implicit Inputs and Implicit Outputs, but it should be noted that the implicit inputs and implicit outputs are read only, as these can be configured only by using iTools, as described in the EtherNet/IP display mode description (Section 5.4.8).

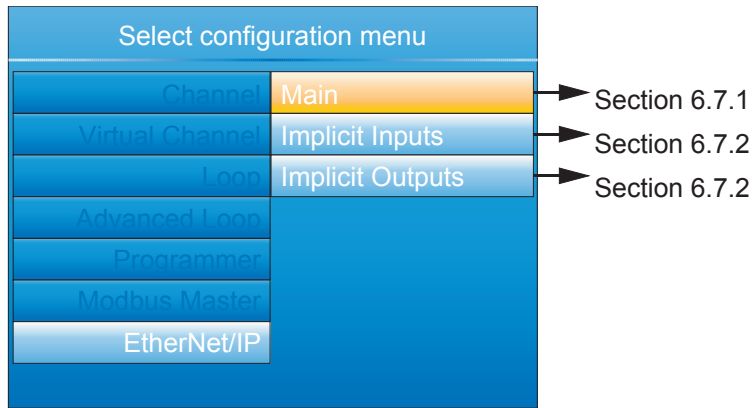


Figure 85 Client configuration

**6.7.1 Ethernet/IP Configuration Main menu**

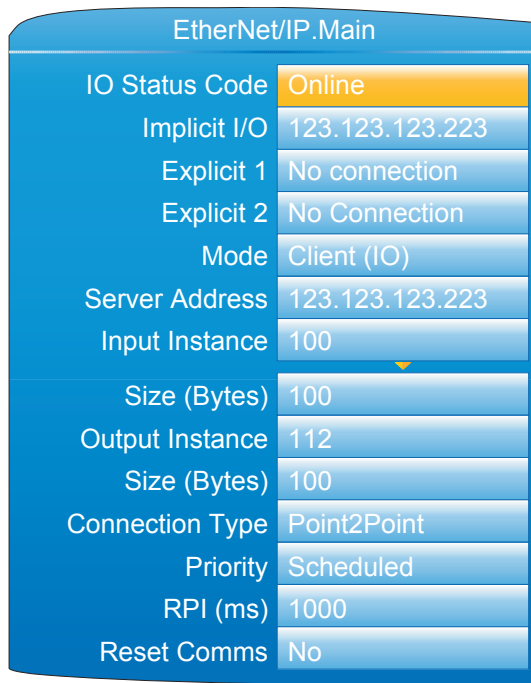


Figure 86 Ethernet/IP Main menu

Net Status Code	Network status (Server only) Offline: FEC920 online but there are currently no CIP connections Online: FEC920 online with at least 1 CIP connection Connection Timeout: The connection has timed out Duplicate IP: A duplicate IP address has been detected on the network Initialisation: FEC920 is initialising comms
IO Status Code	IO status (Client (IO) only). As above.
Tag Status code	Tag status (Client (Tags) only. See Figure 87, below.
Implicit I/O	Connected IO server IP address.
Multicast	Connected IO server IP address (only if multicast selected).
Explicit 1	Connected client/server IP address.
Explicit 2	Connected client/server IP address.



Mode	Modes of operation: Server, Client (IO) or Client (Tags).
Server Address	IO Server IP address (Client mode only).
Input Instance	Input class instance number (client mode only).
Size (bytes)	The size in bytes of data that the client is expecting to read from the implicit input.
Output Instance	Output class instance number (client mode only).
Size (bytes)	The size of data that the client is expecting to write to the server.
Connection Type	Connection type (client mode only).
Priority	Connection priority (client mode only).
Rpi	IO connection speed (client mode only).
Reset Comms	Applies all changes to the EtherNet/IP stack at the same time. Or can be used to reset communications using the current configuration.
Slot Number	PLC slot number (zero indexed) when communicating using tags.

### 6.7.2 Implicit inputs/outputs

This display provides a read-only display of the values in the input and output data tables. Parameters are placed in the input and output tables using the proprietary software tool called 'iTools', as described in Section 5.4.8.

### 6.7.3 Explicit inputs/outputs

See Section 5.4.8 for details.

0	Success. Service was successful
1	Connection Failed. A connection in the path failed
2	Invalid Parameter. A parameter associated with the request was invalid
3	Memory Unavailable. No available resources in the server to service the request
4	Path Segment Error. The syntax of all or some of the path was not understood
5	Path Dest. Error. The path references an unknown object, class or instance
6	Partial Transfer. Only part of the expected data was transferred
7	Connection Lost. The messaging connection was lost
8	Service Unsupported. Undefined service for requested object
9	Invalid Attribute. Invalid attribute data detected
10	Attribute Error. An attribute in the response has a non zero status
11	Already Requested. The object is already in the mode/state being requested
12	Object Conflict. The object cannot perform the requested service
13	Already Exists. The requested instance or object already exists
14	Attribute Error. Request to modify a non modifiable attribute received
15	No Privileges. Permission/Privilege check failed
16	State Conflict. The current state or mode prohibits the execution of the requested service
17	Reply To Large. Response buffer too small for response data
18	Fragmented Value. For example this service request will return only half a REAL data type
19	Not Enough Data. The service does not provide enough data to complete the request
20	Invalid Attribute. Requested attribute is not supported
21	Too Much Data. The service supplied more than was expected
22	Object Non-Exist. The object specified does not exist in the device
23	Seq. Fragmentation. The fragmentation sequence for this service is not active
24	No Attribute Data. The attribute data for this object was not saved at the server prior to this request service
25	Data Store Failure. The attribute data for this object was not saved due to a failure during the attempt
26	Routing Failed. The service request packet was too large for transmission on a network in the path to the destination. The routing device was forced to abort the service
27	Routing Failed. The service request packet was too large for transmission on a network in the path to the destination. The routing device was forced to abort the service
28	Missing Attribute. The service did not supply an attribute in a list of attributes that was needed by the service to perform the requested behavior
29	Invalid Attribute. The service is returning the list of attributes supplied with status information for those attributes that were invalid
30	Embedded Tag Error. An embedded service resulted in an error. This is most commonly an incorrectly formatted tag name
31	Vendor Error. A vendor specific error has encountered
32	Invalid Parameter. A parameter associated with the request was invalid
33	Write Once Error. An attempt to write to a write once only parameter occurred
34	Invalid Reply. An invalid reply was received
35	Buffer Overflow. The message received is larger than the receiving buffer
36	Format Error. The format of the received message is not supported
37	Key Path Failure. The key segment in the path does not match destination key
38	Path Size Error. The size of the path in the request is too large
39	Unexpected Attribute. Unable to set the attribute at this time
40	Invalid Member Id. The requested member id does not match class object
41	Member Is R/O. A request to modify a R/O member was received
42	Group 2 Server. Group 2 DeviceNet server response
43	Translation Error. A CIP Modbus translator request failed
44	Attribute Is R/O. A request to read a non readable attribute was received
64	No Tags Found. There were no tags configured in the input or output tables
65	Invalid Config. The total length in characters of all the tags in this table will cause the PLC to exceed its internal buffer of 500 bytes. To eliminate this problem, reduce the length of some or all tag names

Figure 87 Tag Status code definition

## 6.8 WEB SERVER

The Web Server has been added from firmware versions V5.00 onwards and provides the following features:

- Up to four unique client connections
- PC, Tablet and mobile phone client support (using appropriate browsers)
- Full URL translation support
- Runtime data
- Historical data
- Target information
- Alarm information
- Message log
- Promote page
- Full cookie support
- Safari, IE9 or greater and Google Chrome browser support

The web server provides visualisation only.

### 6.8.1 Configuration Display

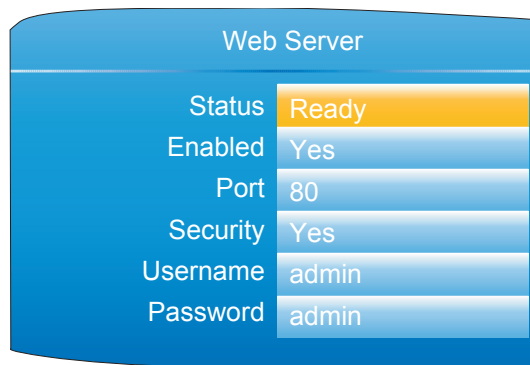


Figure 88 Web server configuration page

Status	Read-only. Ready - the web server is running. Inactive - the web server is not ready Connected - the web server is connected. It is possible that Status will flip between Ready and Connected during operation.
Enabled	Yes/No
Port	80 or 8080
Security	Yes/No. Yes is the default.
Username	Enter a customized user name. This will be required when logging in to the webserver. Default is 'admin'. Username is only shown when 'Security' is set to 'Yes'.
Password	Enter a customized password. This will be required when logging in to the webserver. Default is 'admin'. Password is only shown when 'Security' is set to 'Yes'

**Web Server pages are shown in Appendix C:.**

## 6.9 DIGITAL I/O

This area of configuration allows the digital I/O types to be selected.



**Note:** If 2A2B is set to 'Valve Raise', then 3A3B is set to 'Valve Lower'. Similarly, if relay 4AC is set to 'Valve Raise', then relay 5AC is set to 'Valve Lower'.  
When the loop channel output is wired to the PV input of a Valve Raise function, then the PV input of the associated Valve Lower function becomes unavailable for wiring, and both outputs are controlled by the loop as a pair, using only the single wire.

: Note: These fields do not appear if they contain I/O type 'DC Output'.

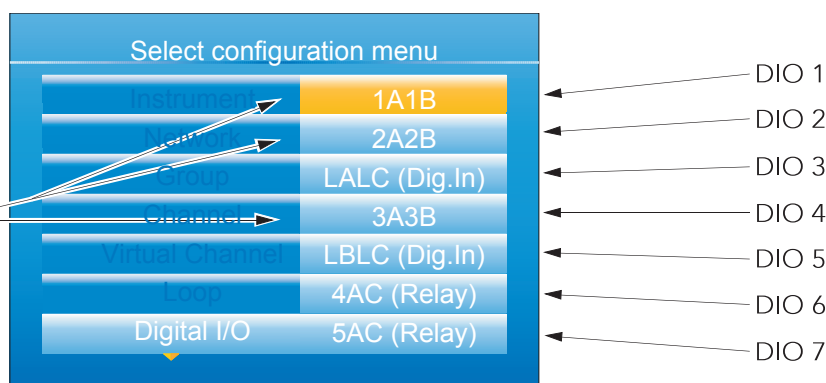


Figure 89 Digital I/O top level menu

### 6.9.1 Digital input/output

This applies to signals at terminals 1A/1B (Figure 4). Highlight '1A1B', then operate the scroll key to reveal the configuration menu.

Module Ident	Dig IO
Type	On Off O/P, Time Prop O/P or Contact I/P (default)
PV	For inputs, 0 = contact is open; 1 = contact is closed. For On Off O/P, a value $\geq 0.5$ drives the output high, otherwise, the output is driven low. For Time Prop O/P, the value is the demanded output percentage.
Min On Time	For Type = Time Prop O/P only, this allows a minimum on time to be specified. Configurable range = 0.1 to 150 seconds
Invert	Inverts the output sense for digital outputs; or the input signal for digital inputs.
Output	Off = output being driven low; On = output being driven high. Does not appear for Type = Contact I/P

### 6.9.2 Relay outputs

This may apply to terminal pairs 1A1B, 2A2B, 3A3B, 4AC, 5AC (Figure 4). Highlight the relevant terminal pair, then operate the scroll key to reveal the configuration menu.

Module Ident	Relay.
Type (2A2B, 4AC)	'On Off O/P' (default), Time Prop O/P, Valve Raise (not if DC output I/O fitted).
Type (3A3B, 5AC)	'On Off O/P' (default), 'Time Prop O/P'. The 3A3B relay is not fitted if 'DC Output' I/O is fitted (see Section 6.10.1).
PV	For On Off O/P, a value $\geq 0.5$ closes the relay contacts, otherwise, the contacts are open. For Time Prop O/P, the value is the demanded output percentage.
Min On Time	For Type = Time Prop O/P only, this allows a minimum on time to be specified to reduce relay wear. Configurable range = 0.1 to 150 seconds.
Invert	Inverts the output sense for the relays (not applicable if Type = Valve Raise).
Inertia	For Type = Valve Raise only, this allows a value to be entered (in seconds) to take into account valve run-on.
Backlash	For Type = Valve Raise only, this allows a value to be entered (in seconds) in order to compensate for backlash in the valve linkage.

Standby action	For Type = Valve Raise only, this specifies the valve action when the instrument is in standby mode. Continue: Output continues at the demanded level. Freeze: The valve stops being driven.
Output	Off = relay contacts open; On = relay contacts closed.

### 6.9.3 Digital inputs

This applies to terminal pairs LALC, LBLC (Figure 4). Highlight the relevant terminal pair, then operate the scroll key to reveal the configuration menu.

Module Ident	Dig.In
Type	Contact I/P
PV	0 = contact is open; 1 = contact is closed.
Invert	Inverts the sense of the input.

### 6.9.4 Digital outputs

This applies to terminal pair 2A2B (Figure 4). Highlight 2A2B, then operate the scroll key to reveal the configuration menu.

Module Ident	Dig.Out
Type	On Off O/P, Time Prop O/P or Valve Raise
PV	For On Off O/P, a value $\geq 0.5$ drives the output high, otherwise, the output is driven low. For Time Prop O/P, the value is the demanded output percentage.
Min On Time	For Type = Time Prop O/P only, this allows a minimum on time to be specified. Configurable range = 0.1 to 150 seconds
Invert	Inverts the output sense for digital outputs; or the input signal for digital inputs.
Inertia	For Type = Valve Raise only, this allows a value to be entered (in seconds) to take into account valve run-on.
Backlash	For Type = Valve Raise only, this allows a value to be entered (in seconds) in order to compensate for backlash in the valve linkage.
Standby action	For Type = Valve Raise only, this specifies the valve action when the instrument is in standby mode. Continue: Output continues at the demanded level. Freeze: The valve stops being driven.
Output	Off = output being driven low; On = output being driven high.

### 6.10 DC OUTPUT

This option provides a voltage (terminals 3A3B only) or mA output. Terminal location is shown in Figure 4.



**Caution:** There are no mechanical interlocks to prevent a chassis with the dc output option being fitted into a 'sleeve' or 'case' which has previously been wired for the standard relay output. Before fitting the chassis into the case, it should be ensured that the terminal wiring is not attached to live voltage supplies, as such voltages may cause permanent damage to the instrument.

### 6.10.1 Configuration display

As shown in Figure 90, highlight the required DC output, then operate the scroll button to reveal the configuration page.

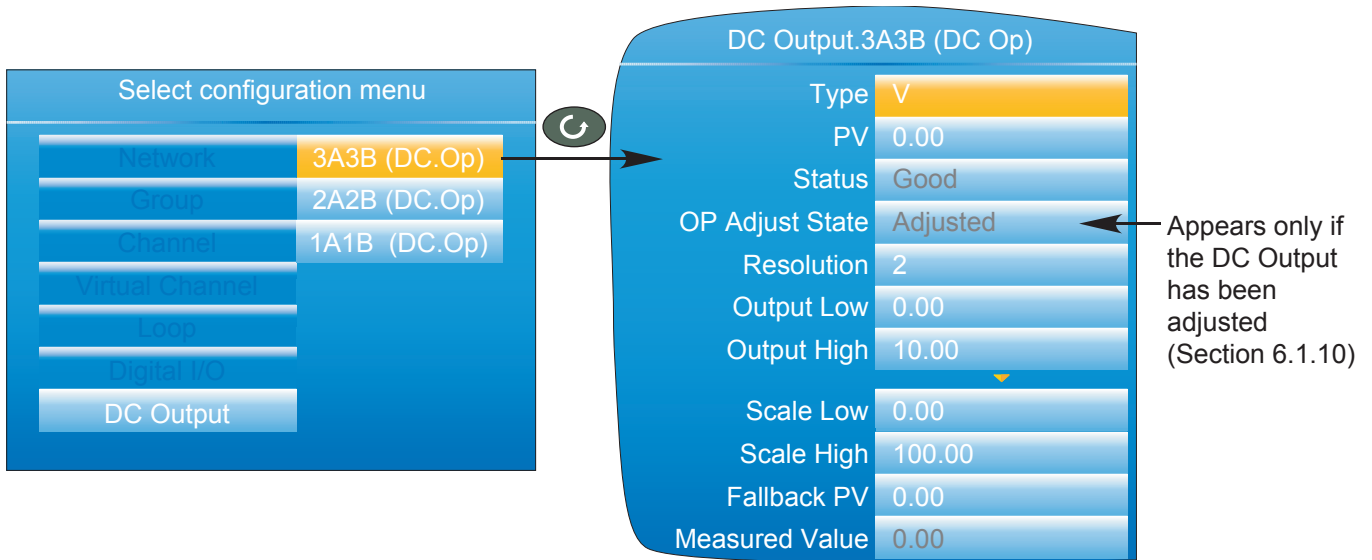


Figure 90 DC Output option configuration page (typical)

#### PARAMETERS

Type	Select V(olts) (3A3B only) or mA as the output type.
PV	Input value to the function. Normally 'wired' to a suitable parameter.
Status	The status of the input parameter.
OP Adjust State	Adjusted. Appears only if the Output Adjust facility (Section 6.1.10) has been used.
Resolution	The number of decimal places to be used for this configuration item.
Output Low	The minimum output value in Volts or mA as appropriate.
Output High	The maximum output value to be output in Volts or mA as appropriate.
Scale Low	See 'SCALING INFORMATION' below.
Scale High	See 'SCALING INFORMATION' below.
Fallback PV	The output value when the status of the input parameter is not 'good'.
Measured Value	The Voltage or mA value appearing at the output terminals



**Note:** The output voltage or current can be calibrated by using the output adjust procedure described in Section 6.1.10.

**SCALING INFORMATION**

When PV = Scale Low, Output = output low value. When PV = Scale high, Output = output high value. The PV is mapped via the scale range onto the output range according to the equation:

$$\text{Output} = \left( \frac{\text{PV} - \text{Scale Low}}{\text{Scale High} - \text{Scale Low}} \right) (\text{Output High} - \text{Output Low}) + \text{Output Low}$$

**6.11 USER LIN**

Allows the entry of up to four user linearization tables, any one of which can be selected as 'Lin Type' in Channel configuration (Section 6.4.1). Configuration consists of defining the number of points to be included (2 to 32) and then entering an X and a Y value for each point, where X values are the inputs and the Y values are the resulting outputs.

**6.11.1 User linearization table rules**

1. Tables must be monotonic - i.e. there may not be more than one X value with the same Y value assigned to it.
2. Each X value must be greater than the preceding one.
3. Each Y value must be greater than the preceding one.
4. If units other than temperature units are to be displayed, the channel scale high and scale low values should be set to the same as the range high and low values, and the required scale units entered.

Figure 91 shows the first part of the configuration table for an imaginary cylinder example.

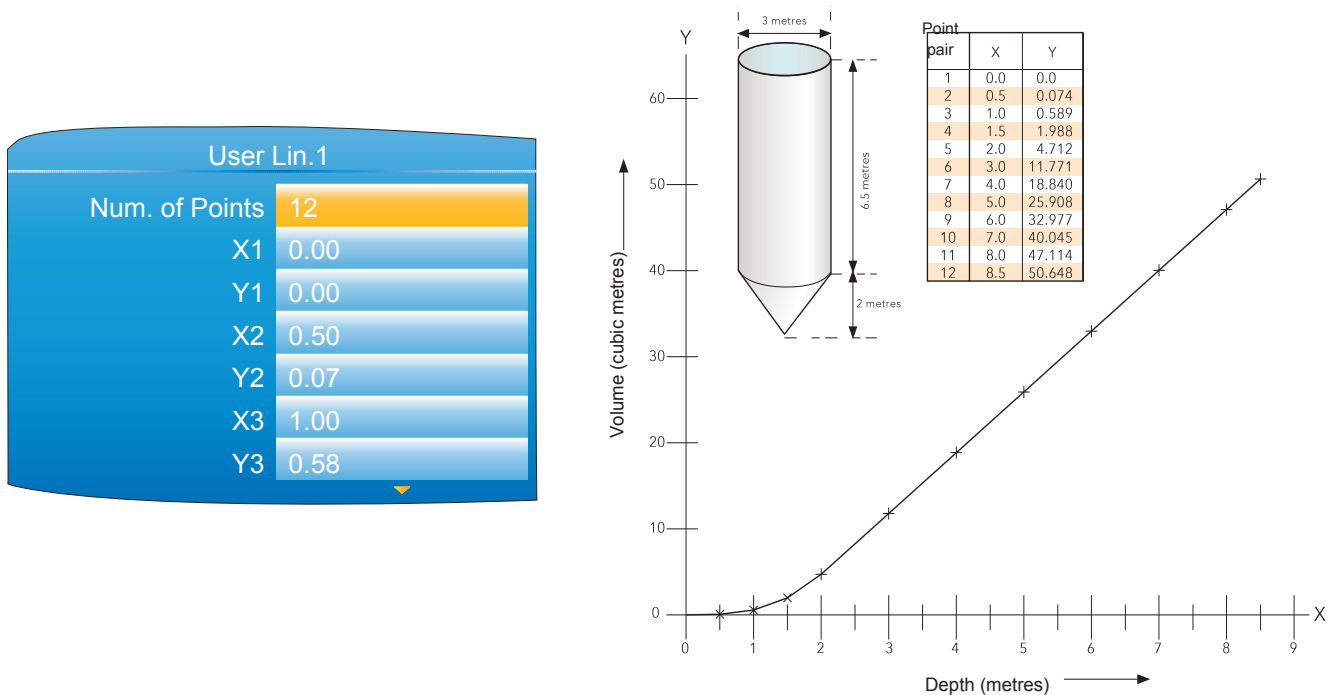


Figure 91 User Linearization table example

When configuring a channel (Section 6.4.1) to use a User linearization table:

If Type = Thermocouple or RTD, then Range High/Low must be set to the highest and lowest 'Y' values to be used, respectively. The instrument automatically looks up the associated 'X' mV or Ohms values.

If Type = mV, V or mA, then Range High/Low must be set to the highest and lowest 'Y' values to be used, respectively. Input High/Low should be set to the highest and lowest 'X' values in the table, respectively.

### 6.12 LOGIC (2 INPUT) BLOCK

Part of the 'Toolkit Blocks' option, this block allows a number of logic and comparison operations to be performed on a pair of inputs. For logic functions, the inputs can be inverted to allow, for example, a NOR function to be implemented by inverting the inputs to an AND function. 12 two-input logic blocks are available.

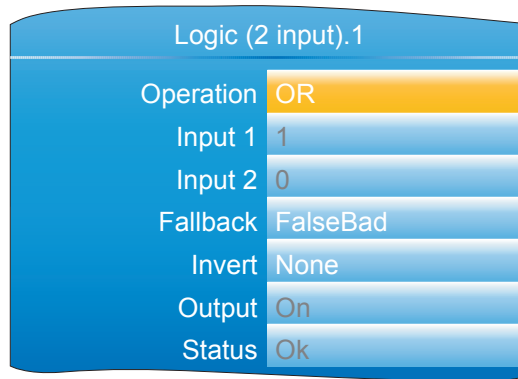


Figure 92 Two-input logic block configuration

#### 6.12.1 Parameters

Operation	AND, OR, XOR, LATCH (boolean values only) == (Input 1 = Input 2) <> (Input 1 ≠ Input 2) < (Input 1 < Input 2) <= (Input 1 ≤ Input 2) > (Input 1 > Input 2) => (Input 1 ≥ Input 2)
Input 1(2)	The inputs to the specified operation. For inverted inputs (below), this shows the 'real' (non-inverted) state.
Fallback	Configures the output and status values to be used if either input has a status other than 'Good'. FalseBad: Output = False; Status = Bad TrueBad: Output = True; Status = Bad FalseGood: Output = False; Status = Good TrueGood: Output = True; Status = Good
Invert	For logic operators only allows neither, either or both inputs to be inverted. Input 1 and Input 2 show the non-inverted state.
Output	On or Off depending on input states etc.
Status	The status of the result ('Ok' or 'Error').



### 6.13 LOGIC (8 INPUT) BLOCK

Part of the 'Toolkit Blocks' option, this block allows AND, OR and cascading\* XOR logic operations to be carried out on up to eight inputs.

\*Cascading XOR example for inputs 1 to 4:  $((\text{Input1} \oplus \text{Input2}) \oplus \text{Input3}) \oplus \text{Input4}$ .

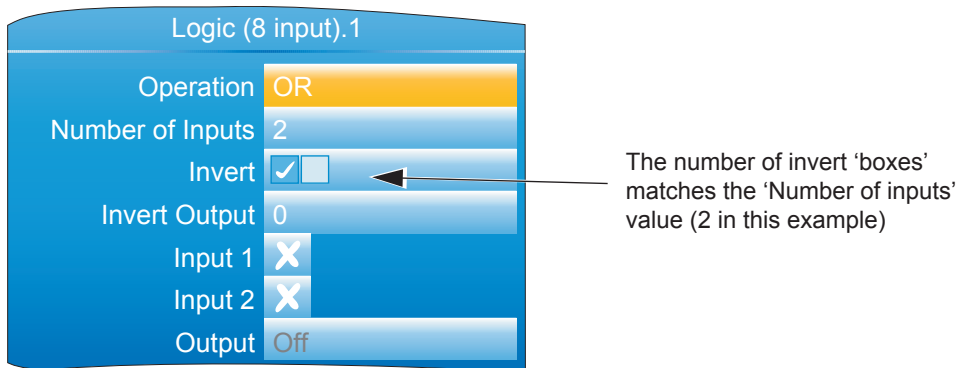


Figure 93 Eight input logic block configuration

#### 6.13.1 Parameters

Operation	AND, OR or XOR
Number of inputs	The number of inputs to the logic operator
Invert	Allows the user to invert individual inputs, as described below.
Invert Output	'Yes' inverts the output status
Input 1	The status of input 1, ignoring the Invert status. Cross = off; Tick = on.
Inputs 2 to N	As for input 1, where N = the value of the 'Number of Inputs' parameter.
Output	On or Off. Includes the effect of 'Invert Output' status.

#### INPUT INVERSION

1. Use the down arrow key to highlight the 'Invert' field and operate the scroll key to enter edit mode.
2. Use the up arrow key to highlight the first input to be inverted (the relevant input numbers appear in the display boxes for uninverted inputs when highlighted).
3. Once the required input box is highlighted, use the scroll key to change the numeric character to a tick symbol (to invert) or change the tick character to a numeric character (to remove a previous inversion).
4. Repeat for any further inputs, then operate the page key to confirm the changes and to quit edit mode.

#### 6.13.2 Schematic

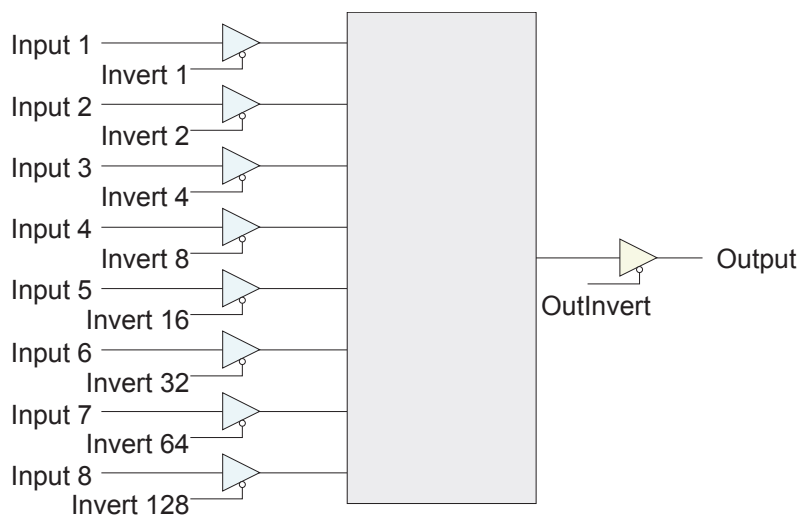


Figure 94 Logic (8 input) block schematic



## 6.14 Multiplexer block

This 'Toolkit' option block selects one of eight analog inputs to appear at its output.

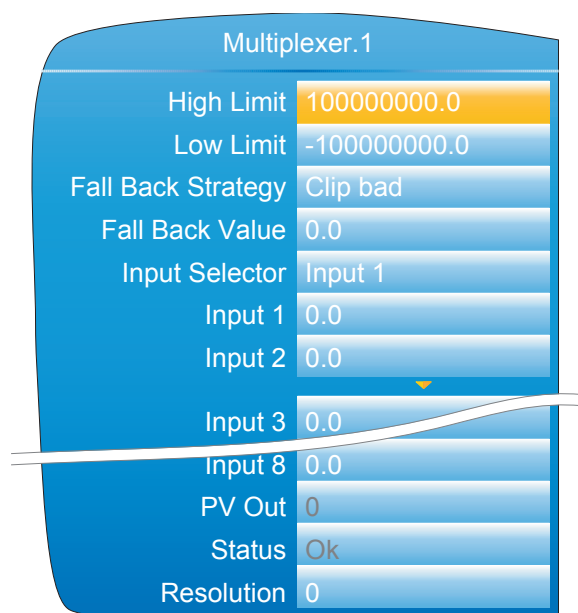


Figure 95 Multiplexer block configuration

### 6.14.1 Configuration parameters

High Limit	The high limit for input, output and fallback values. Minimum value is Low Limit.
Low Limit	The low limit for input and fallback values. Maximum value is High Limit.
Fallback Strategy	<p>Clip Bad: If the input value is above 'High Limit' or below 'Low Limit', then the output value is set to the appropriate limit, and the status is set to 'Bad'. If the input signal is within the limits, but its status is bad, the output is set to the Fallback value.</p> <p>Clip Good: If the input value is above 'High Limit' or below 'Low Limit', then the output value is set to the appropriate limit, and the status is set to 'Good'. If the input signal is within the limits, but its status is bad, the output is set to the Fallback value.</p> <p>Fall Bad: If the input value is above 'High Limit' or below 'Low Limit', then the output value is set to the Fallback value, and the status is set to 'Bad'</p> <p>Fall Good: If the input value is above 'High Limit' or below 'Low Limit', then the output value is set to the Fallback value, and the status is set to 'Good'</p> <p>Upscale: If the input status is bad, or if the input signal is above 'High Limit' or below 'Low Limit', the output value is set to the High limit.</p> <p>Downscale: If the input status is bad, or if the input signal is above 'High Limit' or below 'Low Limit', the output value is set to the Low limit.</p>
Fallback Value	The value to be adopted by the output, under error conditions, if 'Fallback Status' is set to 'Fall Good' or 'Fall Bad'.
Input Selector	Selects which of the eight inputs is presented at the output. When wired to a suitable parameter, Input Selector becomes read only. Input 1 is selected for an Input Selector value of 1, Input 2 for a value of 2 and so on. Input Selector values greater than 8 are ignored. If not wired, the user may select the required input using the scroll keys.
Input 1 to 8	Wired to the relevant analog inputs.
PV Out	The output from the multiplexer block.
Status	Indicates the status of the operation as 'Ok' or 'Error'.
Resolution	The number of decimal places for the output value (maximum = 6).

### 6.15 MATH (2 INPUT)

This 'Toolkit' option block allows one of a number of operations to be carried out using two input values which may be analog or digital in nature. Either or both of the inputs can be scaled, using a 'Multiplier'.

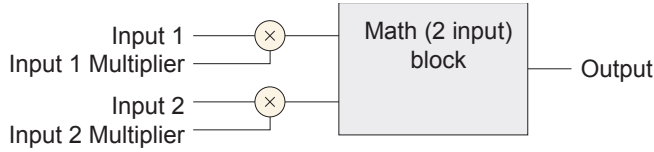


Figure 96 Block schematic

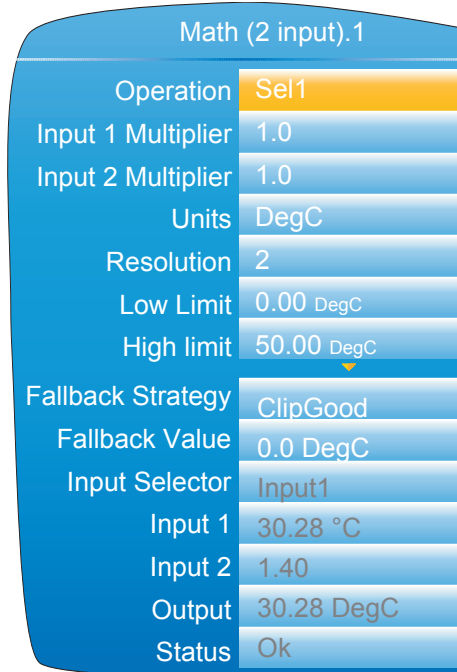


Figure 97 Block configuration (typical)

#### 6.15.1 Parameters

Operation		
Add		Output = Input 1 + Input 2
Subtract		Output = Input 1 - Input 2
Multiply		Output = Input 1 x Input 2
Divide		Output = Input 1 ÷ Input 2
Abs Diff		Output = the difference between Input 1 and Input 2, ignoring sign
Select Max		Output = whichever is the larger of Input 1 or Input 2
Select Min		Output = whichever is the smaller of Input 1 or Input 2
Hot Swap		Output = Input 2 if Input 1 is 'Bad'; otherwise Output = Input 1
Sample/Hold		Output tracks Input 1 whilst Input 2 = 1. Output value is held whilst Input 2 = 0 (See Section 6.15.2, below, for more details)
Power*		Output = Input 1 to the power of Input 2. (Output = Input 1 <sup>Input 2</sup> )
Square Root		Output = Sqrt Input 1 (Input 2 ignored)
Log Base 10		Output = Log <sub>10</sub> Input 1 (Input 2 ignored)
Log Base e		Output = Ln Input 1 (Input 2 ignored)
Exponential		Output = e <sup>Input 1</sup> (Input 2 ignored)
10 to the X		Output = 10 <sup>Input 1</sup> (Input 2 ignored)

Sel1                      Output = Input 1 if Input Selector = Input1  
                                  Output = Input 2 if Input Selector = Input2



**Note:** \* For this implementation:  
 0 to the power 0 = 1.  
 Negative values raised to any power result in bad status.  
 0 raised to a negative power results in bad status.

Input 1(2) Multiplier	The scaling factor for input 1(2). This multiplying factor is applied to the input of the function, but does not affect the displayed values of Input1 and Input 2 (below).
Units	Allows a five-character string to be entered for the function
Resolution	Sets the number of decimal places for the Output value. Input resolution (if applicable) is that of the relevant input.
High Limit	The high limit for input, output and fallback values. Minimum value is Low Limit.
Low Limit	The low limit for input and fallback values. Maximum value is High Limit.
Fallback Strategy	<p>Clip Bad: If the input value is above 'High Limit' or below 'Low Limit', then the output value is set to the appropriate limit, and the status is set to 'Bad'. If the input signal is within the limits, but its status is bad, the output is set to the Fall Back value.</p> <p>Clip Good: If the input value is above 'High Limit' or below 'Low Limit', then the output value is set to the appropriate limit, and the status is set to 'Good'. If the input signal is within the limits, but its status is bad, the output is set to the Fall Back value.</p> <p>Fall Bad: If the input value is above 'High Limit' or below 'Low Limit', then the output value is set to the Fall Back value, and the status is set to 'Bad'</p> <p>Fall Good: If the input value is above 'High Limit' or below 'Low Limit', then the output value is set to the Fall Back value, and the status is set to 'Good'</p> <p>Upscale: If the input status is bad, or if the input signal is above 'High Limit' or below 'Low Limit', the output value is set to the High limit.</p> <p>Downscale: If the input status is bad, or if the input signal is above 'High Limit' or below 'Low Limit', the output value is set to the Low limit.</p>
Fallback Value	The value to be adopted by the output, under error conditions, if 'Fallback Status' is set to 'Fall Good' or 'Fall Bad'.
Input Selector	For 'Select' operation only. When wired to a suitable parameter, Input Select becomes read only. Input 1 is selected if 'Input Select' = 1; Input 2 is selected if 'Input Select' = 2. Input Select values greater than 2 are ignored. If not wired, the user may select the required input using the scroll keys.
Input 1(2)	Wired to suitable input parameters. Displayed values ignore any input multiplier effects.
Output	Gives the output value for the operation.
Status	Shows the status of the output value, as 'Ok' or 'Error'.

**6.15.2 Sample and Hold details**

As described above, Output follows Input1 as long as Input 2 is 'High'. When Input 2 goes Low, the output adopts the instantaneous value of Input 1 until Input 2 goes High again. When Input 2 goes high the output jumps to the current value of Input 1 and tracks it until Input 2 goes low.

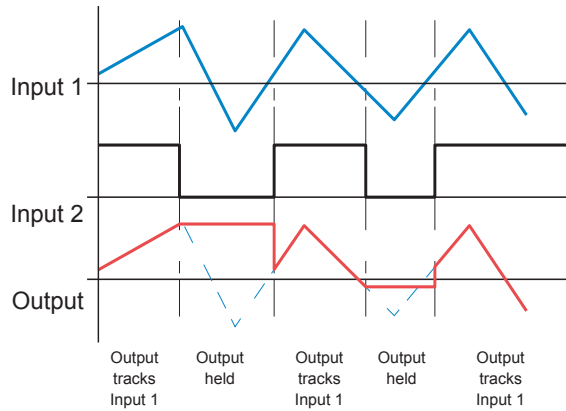


Figure 98 Sample and Hold example

**6.16 TIMER**

This 'Toolkit' option allows the user to configure up to four timers as: 'On Pulse', 'On Delay', 'One Shot' or 'Min On' types. The different types are described in Section 6.16.2, below.

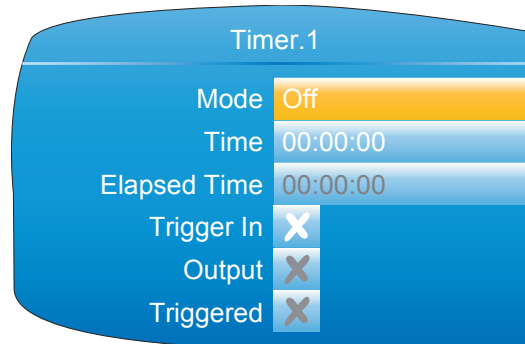


Figure 99 Timer configuration

**6.16.1 Parameters**

Mode	Select 'On pulse', 'On delay', 'One shot' or 'Min On'
Time	Allows the user to enter a period for the timer.
Elapsed time	This read-only parameter shows timing progress
Trigger in	Shows if the trigger source is active (tick) or inactive (cross)
Output	Shows if the output is on (tick) or off (cross)
Triggered	Shows if the timer is currently triggered (can remain triggered even after the trigger source has returned to off).

6.16.2 Timer modes

ON PULSE

Output goes 'on' as soon as the trigger input goes active, and remains on until the time period has elapsed. If the timer is re-triggered during the timing period, the timer restarts.

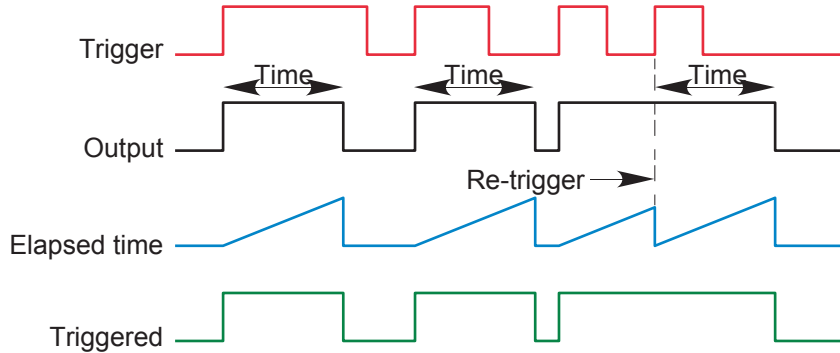


Figure 100 'On Pulse' definitions

ON DELAY  
Provides a delay between the trigger point and the timer output becoming active.

Rules

1. After the trigger goes active, the output switches on after the delay time has elapsed, and stays on until the trigger goes inactive.
2. If the trigger goes inactive before the delay time has elapsed, the output does not switch on.

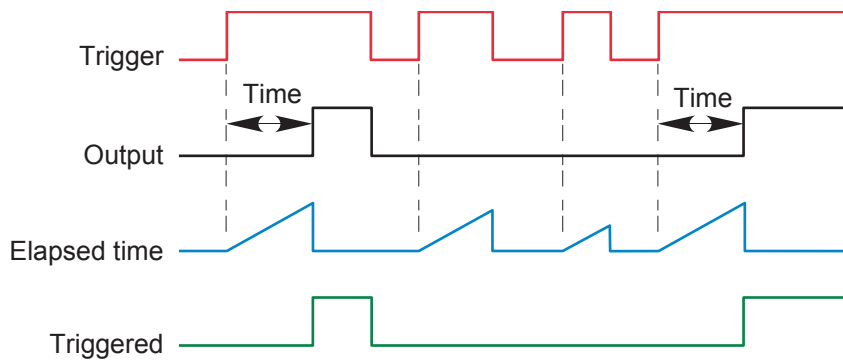


Figure 101 'On Delay' definitions

**ONE SHOT**

If the trigger input is active, countdown timing is initiated as soon as the entered time value is confirmed (scroll key). The entered time decrements to zero, and must be re-entered by the user before any further timer function can be initiated.

Rules

1. The time value decrements only when the trigger input is active.
2. The output is On only when the trigger value is active (and the entered time value has not elapsed).
3. The entered time value can be edited at any time to increase or decrease the remaining time period.

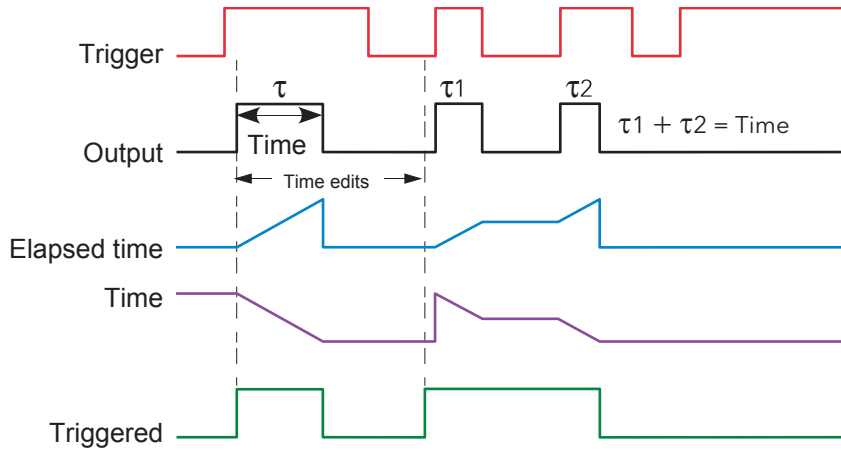


Figure 102 'One Shot' timer definitions

**MIN ON**



**Note:** For ease of comparison the two time edits in the figure above were both to the same value. This is not a necessary condition.

This 'Off delay' function provides an output signal that goes 'on' when the trigger goes active and remains on for a specified period after the trigger goes inactive.

If the trigger goes inactive, then active again before the time period has elapsed, then the elapsed time is reset to zero and the output remains on.

The 'Triggered' parameter is on whenever the elapsed time is counting down.

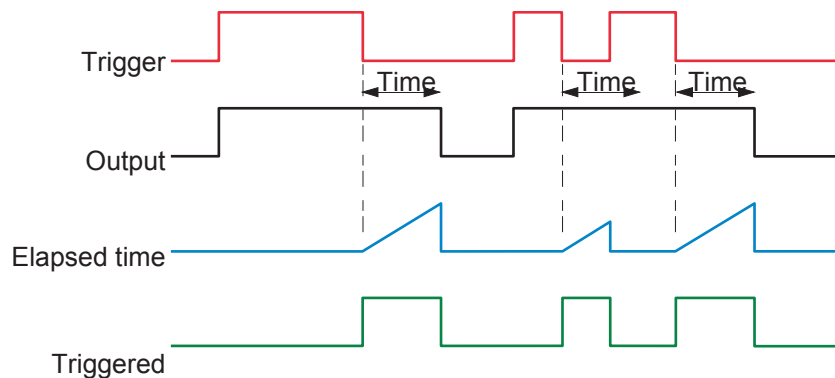


Figure 103 'Min On' timer definitions



### 6.17 USER VALUES

This 'Toolkit' option block allows up to 12 values to be configured for use as inputs to other parameters.

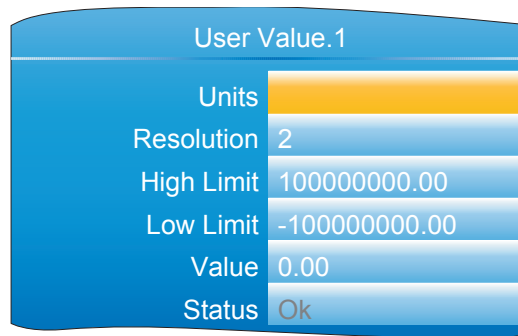


Figure 104 User value configuration

#### 6.17.1 Parameters

Units	Allows a five-character string to be entered for the user value units.
Resolution	The number of decimal places for the user value (max. = 6).
High/Low Limit	Sets maximum and minimum values to which the User value can be set.
Value	The user value, either entered manually, or wired to another appropriate parameter.
Status	The output status for the User Value.

### 6.18 ALARM SUMMARY

Allows the user to view the overall status of the unit's alarms, and to carry out a global acknowledgement of active alarms if required.

Global Ack	Allows the user to acknowledge all applicable alarms simultaneously. 'Manual' alarms must be non-active before they can be acknowledged.
Any Channel alarm	Indicates if there are any channel alarms active, acknowledged etc.
Any Sys Alarm	Indicates if there are any active system alarms.
Any Alarm	Indicates if there are any channel or system alarms active.

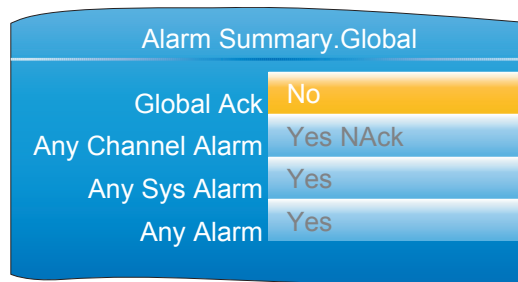


Figure 105 Alarm summary display

### 6.19 REAL TIME EVENT CONFIGURATION

This allows the user to configure up to two events to trigger at a specific time and date, or on a particular day, and to remain active for a configurable time, either measured as a duration, or as a specific 'Off' time.

Typical applications would be to start and/or stop a programmer at a particular time, or to act as an input to a 'Wait' segment.

Figure 106 shows the two types of timer: 'Time and Day', and 'Time and Date', for Event 1.

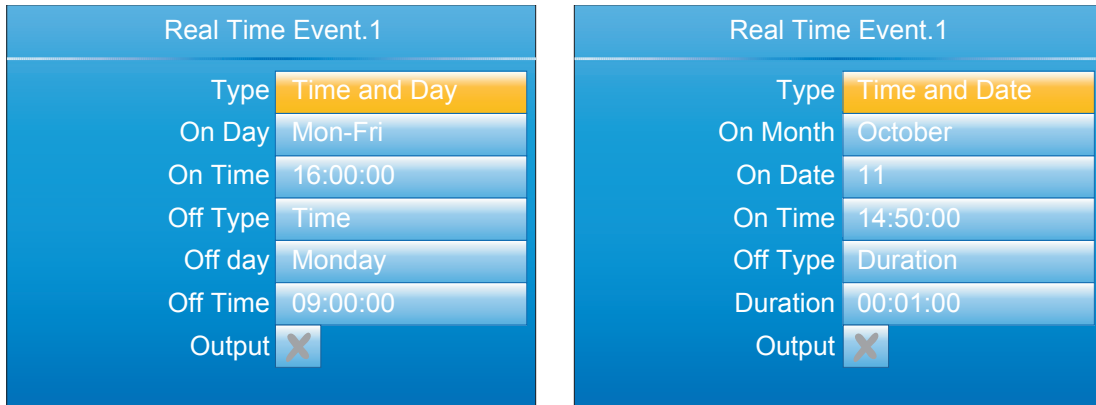


Figure 106 Real Time Events (typical)

Type	Selects the type of the real time event (Off, Time and Day, Time and Date.
On Month	For 'Time and Date' only, this is the month that the event is to switch on (January, ... December or Every Month). (Every Month was added in software version 5.5).
On Date	For 'Time and Date' only, this is the date in the month that the event is to switch on.
On Day	For 'Time and Day' only, this is the day(s) of the week that the event output is to switch on (Mon, Tue, Wed, Thu, Fri, Sat, Sun, Mon-Fri, Sat-Sun, Everyday).
On Time	The time of day that the event output is to switch on (00:00:00 to 23:59:59)
Off Type	Selects the action that will switch the event off (Duration, Time)
Off Month	For 'Time and Date' only and with 'Off Type' set to 'Time', this is the month that the event is to switch off. (January, ... December or Every Month). (Every Month was added in software version 5.5).
Off Date	For 'Time and Date' only and with 'Off Type' set to 'Time', this is the day number in the month that the event is to switch off.
Off Day	For 'Time and Day' only and with 'Off Type' set to 'Time', this is the day of the week that the event output is to switch off (Mon, Tue, Wed, Thu, Fri, Sat, Sun, Mon-Fri, Sat-Sun, Everyday).
Off Time	The time at which the event output is to switch off (00:00:00 - 23:59:59)
Duration	For 'Off type' set to 'Duration', this specifies the duration for which the event output is to remain on (00:00:01 to 23:59:59 for Time and Day, or 00:00:01 to 500:00:00 for Time and Date)
Output	The output for the real time event (Cross symbol = Off, Tick = On) (Read only)

## 7 MODBUS TCP SLAVE COMMS

### 7.1 INSTALLATION

The installation of the Modbus link consists of connecting a standard Ethernet cable between the RJ45 connector at the rear of the unit to a host computer either directly or via a network. A 'straight-through' cable can be used in either case (i.e. a cross-over cable is not required).

### 7.2 INTRODUCTION

MODBUS TCP allows the instrument to act as a 'slave' device to one or more host computers connected via the RJ45 connector at the rear of the recorder. Each recorder must have a unique Internet Protocol (IP) address, set up as described in Section 4.2.1 (Network.Interface).

MODBUS TCP (Transmission Control Protocol) is a variant of the MODBUS family of communications protocols intended for supervision and control of automated equipment specifically covering the use of MODBUS messaging in an intranet or internet environment, using TCP/IP protocols. Much of the MODBUS detail in this manual is derived from the document openmbus.doc, available at <http://www.modbus.org/default.htm>. The above mentioned document also includes implementation guidelines for users.



**Note:** The Modbus protocol allows a maximum of 255 data bytes to be read from or written to in one transaction. For this reason, the maximum number of standard (16 bit) registers that can be accessed in one transaction is  $255/2 = 127$  and the maximum number of IEEE (32-bit) registers is  $127/2 = 63$ .

#### 7.2.1 Function Codes

Modbus function codes 3, 4, 6, 8 and 16, defined in Figure 107, are supported and are fully described in Section 7.3, below.

Code	Modbus definition	Description
03	Read holding registers	Reads the binary contents of holding registers. In this implementation codes 3 and 4 are identical in operation.
04	Read input registers	Reads the binary contents of holding registers. In this implementation codes 3 and 4 are identical in operation.
06	Preset single register	Writes a single value to a single register.
08	Diagnostics	Performs a simple loop back test.
16	Preset multiple registers	Writes values to multiple holding registers.

Figure 107 MODBUS Function code definition

#### DIAGNOSTIC CODES

Function code 08, subfunction 00 (Return query data) echoes the query (Loop back).

**EXCEPTION CODES**

MODBUS TCP provides reserved codes used for exceptions. These codes provide error information relating to failed requests. Exceptions are signalled by hex 80 being added to the function code of the request, followed by one of the codes listed in Figure 108.

Code Dec   Hex		Modbus definition	Description (see Modbus specification for full details)
01	01	Illegal function	An invalid function code was received
02	02	Illegal Data Address	An invalid data address was received
03	03	Illegal Data Value	An invalid data value was received
04	04	Slave Device Failure	An unrecoverable error occurred in the instrument
09	09	Illegal Sub Function	An invalid sub function was received
10	0A	Gateway path unavailable	Gateway misconfigured or overloaded
11	0B	Gateway target device failed to respond	Device not present on the network

Figure 108 Exception codes

**7.2.2 Data types**

The following data types are supported:

1. 2's complement signed 16-bit analog values with implied decimal point. The decimal point position must be configured in both the recorder and the host computer.
2. 16, 32 and 64 bit signed integers.
3. 16-bit unsigned integer values.
4. 32 bit IEEE Floating point values.
5. Strings of limited size, can be transferred across Modbus TCP in Unicode format using a single non-multiplexed set of consecutive registers.

**DATA ENCODING**

MODBUS uses what is called a 'Big endian' representation for addresses and data items. This means that when a numerical quantity larger than a single byte is transmitted, the most significant byte is sent first. For example a 32-bit hex value of 12345678 would be transmitted as 12, followed by 34, followed by 56 and finally 78.

**7.2.3 Invalid multiple register writes**

When a recorder receives a multi-register write request, it is possible that one or more requests will be rejected. Under such a circumstance, the recorder accepts all valid write requests and ignores any invalid writes. No error response is produced.

**7.2.4 Master communications timeout**

Whilst the instrument is archiving, it is possible that communications responses slow sufficiently to cause communications timeouts. The Modbus master device should be configured with a timeout value large enough to ensure against nuisance timeouts during archiving.

**7.2.5 Non-volatile parameters in EEPROM**



**Caution:** The parameters in the following list must not be written-to on a continuous basis as to do so will damage the EEPROM, greatly shortening its useful life.

Channel.N.AlarmN.Amount  
 Channel.N.AlarmN.AverageTime  
 Channel.N.AlarmN.Block  
 Channel.N.AlarmN.ChangeTime  
 Channel.N.AlarmN.Deviation  
 Channel.N.AlarmN.Dwell  
 Channel.N.AlarmN.Hysteresis  
 Channel.N.AlarmN.Latch  
 Channel.N.AlarmN.Threshold  
 Channel.N.AlarmN.Type  
 Channel.N.Main.CJType  
 Channel.N.Main.CloseString  
 Channel.N.Main.Descriptor  
 Channel.N.Main.ExtCJTemp  
 Channel.N.Main.FaultResponse  
 Channel.N.Main.Filter  
 Channel.N.Main.InputHigh  
 Channel.N.Main.InputLow  
 Channel.N.Main.LinType  
 Channel.N.Main.Offset  
 Channel.N.Main.Offset2  
 Channel.N.Main.OpenString  
 Channel.N.Main.RangeHigh  
 Channel.N.Main.RangeLow  
 Channel.N.Main.RangeUnits  
 Channel.N.Main.Resolution  
 Channel.N.Main.ScaleHigh  
 Channel.N.Main.ScaleHigh2  
 Channel.N.Main.ScaleLow  
 Channel.N.Main.ScaleLow2  
 Channel.N.Main.SensorBreakType  
 Channel.N.Main.Shunt  
 Channel.N.Main.TestSignal  
 Channel.N.Main.Type  
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 DCOOutput.3A3B\_DCOP.Resolution  
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 DCOOutput.3A3B\_DCOP.ScaleLow  
 DCOOutput.3A3B\_DCOP.Type  
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 DigitalIO.1A1B.MinOnTime  
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 DigitalIO.1A1B.Type  
 DigitalIO.2A2B.Backlash  
 DigitalIO.2A2B.Inertia  
 DigitalIO.2A2B.Invert  
 DigitalIO.2A2B.MinOnTime  
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 DigitalIO.2A2B.Type  
 DigitalIO.3A3B.Backlash  
 DigitalIO.3A3B.Inertia  
 DigitalIO.3A3B.Invert  
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 DigitalIO.3A3B.StandbyAction  
 DigitalIO.3A3B.Type  
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 DigitalIO.DI\_LALC.Inertia  
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 DigitalIO.DI\_LBLC.Inertia  
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 DigitalIO.DI\_LBLC.MinOnTime  
 DigitalIO.DI\_LBLC.StandbyAction  
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 EthernetIP.Main.InputInstance  
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 Instrument.Display.FutureTrend1Colour  
 Instrument.Display.FutureTrend2Colour  
 Instrument.Display.HistoryBackground  
 Instrument.Display.HomePage  
 Instrument.Display.HorizontalBar  
 Instrument.Display.HorizontalTrend  
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 Instrument.Display.LoopControl  
 Instrument.Display.LoopSetpointColour  
 Instrument.Display.ModbusMaster  
 Instrument.Display.NumberFormat  
 Instrument.Display.Numeric  
 Instrument.Display.Programmer  
 Instrument.Display.PromoteListView  
 Instrument.Display.ScreenSaverAfter  
 Instrument.Display.ScreenSaverBrightness  
 Instrument.Display.SteriliserPage  
 Instrument.Display.TrendBackground  
 Instrument.Display.USBAutoScan  
 Instrument.Display.VerticalBar  
 Instrument.Display.VerticalTrend  
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 Instrument.Security.DefaultConfig  
 Instrument.Security.EngineerPassword  
 Instrument.Security.OEMParamLists  
 Instrument.Security.OEMPass  
 Instrument.Security.OperatorPassword  
 Instrument.Security.SupervisorPassword  
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 Lgc2.N.In2  
 Lgc2.N.Invert  
 Lgc2.N.Oper  
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 ModbusMaster.N.Data.Descriptor  
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 ModbusMaster.N.Data.FunctionCode  
 ModbusMaster.N.Data.ModbusAddress  
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 ModbusMaster.N.Data.Number  
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 ModbusMaster.SlaveN.Data.FallBackValue  
 ModbusMaster.SlaveN.Data.FunctionCode  
 ModbusMaster.SlaveN.Data.ModbusAddress  
 ModbusMaster.SlaveN.Data.Mode  
 ModbusMaster.SlaveN.Data.Number  
 ModbusMaster.SlaveN.Data.ParameterList  
 ModbusMaster.SlaveN.Data.Priority  
 ModbusMaster.SlaveN.Data.Scaling  
 ModbusMaster.SlaveN.Data.Set  
 ModbusMaster.SlaveN.Data.SlaveDevice  
 ModbusMaster.SlaveN.Data.Value  
 ModbusMaster.SlaveN.Main.Descriptor  
 ModbusMaster.SlaveN.Main.HighPriority  
 ModbusMaster.SlaveN.Main.IPAddress  
 ModbusMaster.SlaveN.Main.LowPriority  
 ModbusMaster.SlaveN.Main.MaxBlockSize  
 ModbusMaster.SlaveN.Main.MediumPriority  
 ModbusMaster.SlaveN.Main.Online  
 ModbusMaster.SlaveN.Main.Profile  
 ModbusMaster.SlaveN.Main.Retries  
 ModbusMaster.SlaveN.Main.Timeout  
 ModbusMaster.SlaveN.Main.UnitId  
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 Mux8.N.FallbackVal  
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 Mux8.N.LowLimit  
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Network.Archive.CSVIncludeValues  
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 Network.Archive.OnFull  
 Network.Archive.Period  
 Network.Archive.PrimaryPassword  
 Network.Archive.PrimaryUser  
 Network.Archive.PServerIPAddress  
 Network.Archive.RemotePath  
 Network.Archive.SecondaryPassword  
 Network.Archive.SecondaryUser  
 Network.Archive.SServerIPAddress  
 Network.FTPserver.Password  
 Network.FTPserver.Username  
 Network.Interface.DNSServer  
 Network.Interface.Gateway  
 Network.Interface.IPAddress  
 Network.Interface.IPType  
 Network.Interface.SubnetMask  
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 Network.Modbus.InputTimeout  
 Network.Modbus.PrefMasterIP  
 Network.Modbus.SerialMode  
 Network.Modbus.TimeFormat  
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 RealTimeEvent.N.OffDate  
 RealTimeEvent.N.OffDay  
 RealTimeEvent.N.OffMonth  
 RealTimeEvent.N.OffTime  
 RealTimeEvent.N.OffType  
 RealTimeEvent.N.OnDate  
 RealTimeEvent.N.OnDay  
 RealTimeEvent.N.OnMonth  
 RealTimeEvent.N.OnTime  
 RealTimeEvent.N.Type  
 Timer.N.In  
 Timer.N.Type  
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 UserLin.N.XN  
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 UsrVal.N.Units  
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 VirtualChannel.N.AlarmN.AverageTime  
 VirtualChannel.N.AlarmN.Block  
 VirtualChannel.N.AlarmN.ChangeTime  
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 VirtualChannel.N.AlarmN.Hysteresis  
 VirtualChannel.N.AlarmN.Latch  
 VirtualChannel.N.AlarmN.Threshold  
 VirtualChannel.N.AlarmN.Type  
 VirtualChannel.N.Main.Descriptor  
 VirtualChannel.N.Main.HighCutOff  
 VirtualChannel.N.Main.LowCutOff  
 VirtualChannel.N.Main.Operation  
 VirtualChannel.N.Main.Period  
 VirtualChannel.N.Main.PresetValue  
 VirtualChannel.N.Main.Resolution  
 VirtualChannel.N.Main.RolloverValue  
 VirtualChannel.N.Main.Type  
 VirtualChannel.N.Main.Units  
 VirtualChannel.N.Main.UnitsScaler  
 VirtualChannel.N.Trend.Colour  
 VirtualChannel.N.Trend.SpanHigh  
 VirtualChannel.N.Trend.SpanLow  
 WebServer.Enabled  
 WebServer.Password  
 WebServer.Port  
 WebServer.Security  
 WebServer.Username

### 7.3 PARAMETER LIST

This list is arranged in alphabetical block order and gives the memory address for each parameter in both hex and decimal.

The Modbus addresses, in the range 0x0001 - 0x3FFF, listed in the table below give access to the parameter values in a scaled integer format. It is possible to gain access to the parameter values in native format by using the following formula:

Native address = (scaled integer address x 2) + 0x8000

The blocks are ordered as follows:

Alarm summary	Multiplexer	Virtual chan 5	Virtual chan 20
Batch	Network	Virtual chan 6	Virtual chan 21
Channel 1	OR block	Virtual chan 7	Virtual chan 22
Channel 2	Program	Virtual chan 8	Virtual chan 23
Channel 3	Real Time Events	Virtual chan 9	Virtual chan 24
Channel 4	Timer	Virtual chan 10	Virtual chan 25
DC Output	User Lin 1	Virtual chan 11	Virtual chan 26
Digital I/O	User Lin 2	Virtual chan 12	Virtual chan 27
EtherNet/IP	User Lin 3	Virtual chan 13	Virtual chan 28
Group	User Lin 4	Virtual chan 14	Virtual chan 29
Instrument	User values	Virtual chan 15	Virtual chan 30
Logic (2 Input)	Virtual chan 1	Virtual chan 16	
Logic (8 input)	Virtual chan 2	Virtual chan 17	
Math (2 input)	Virtual chan 3	Virtual chan 18	
Modbus Master	Virtual chan 4	Virtual chan 19	

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AlarmSummary.AnyAlarm	0 = No active alarms; 1 = one or more alarms active	bool	01a2	418	Not applicable
AlarmSummary.AnyChanAlarm	0 = No channel alarms 1 = Channel alarm(s) active but all ack'd. 2 = Channel alarm(s) active but not all ack'd	uint8	01a0	416	Not applicable
AlarmSummary.AnySystemAlarm	0 = No system alarms; 1 = 1 or more system alm(s)	bool	01a1	417	Not applicable
AlarmSummary.Channel.Alarm1Ack	Acknowledge the most recent channel alarm	bool	1192	4498	Not applicable
AlarmSummary.Channel.Alarm1Num	Channel and alarm number of most recent alarm 0 = No alarm      4 = Ch1;AI1      5 = Ch1;AI2 8 = Ch2;AI1      9 = Ch2AI2      12 = Ch3;AI1 13 = Ch3;AI2      16 = Ch4;AI1      17 = Ch4;AI2 132 = VC1;AI1      133 = VC1;AI2      136 = VC2;AI1 137 = VC2;AI2      140 = VC3;AI1      141 = VC3;AI2 144 = VC4;AI1      145 = VC4;AI2      148 = VC5;AI1 149 = VC5;AI2      152 = VC6;AI1      153 = VC6;AI2 156 = VC7;AI1      157 = VC7;AI2      160 = VC8;AI1 161 = VC8;AI2      164 = VC9;AI1      165 = VC9;AI2 168 = VC10;AI1      169 = VC10;AI2      172 = VC11;AI1 173 = VC11;AI2      176 = VC12;AI1      177 = VC12;AI2 180 = VC13;AI1      181 = VC13;AI2      184 = VC14;AI1 185 = VC14;AI2      188 = VC15;AI1      189 = VC15;AI2	uint8	1190	4496	Not applicable
AlarmSummary.Channel.Alarm1Status	Status of most recent alarm 0 = Off   1 = Active   2 = Safe unack   3 = Active unack	uint8	1191	4497	Not applicable
AlarmSummary.Channel.Alarm2Ack	Acknowledge the 2nd most recent channel alarm	bool	1195	4501	Not applicable
AlarmSummary.Channel.Alarm2Num	As Alarm1Num, but for 2nd most recent alarm	uint8	1193	4499	Not applicable
AlarmSummary.Channel.Alarm2Status	As Alarm1Status, but for 2nd most recent alarm	uint8	1194	4500	Not applicable
AlarmSummary.Channel.Alarm3Ack	Acknowledge the 3rd most recent channel alarm	bool	1198	4504	Not applicable
AlarmSummary.Channel.Alarm3Num	As Alarm1Num, but for 3rd most recent alarm	uint8	1196	4502	Not applicable
AlarmSummary.Channel.Alarm3Status	As Alarm1Status, but for 3rd most recent alarm	uint8	1197	4503	Not applicable
AlarmSummary.Channel.Alarm4Ack	Acknowledge the 4th most recent channel alarm	bool	119b	4507	Not applicable
AlarmSummary.Channel.Alarm4Num	As Alarm1Num, but for 4th most recent alarm	uint8	1199	4505	Not applicable
AlarmSummary.Channel.Alarm4Status	As Alarm1Status, but for 4th most recent alarm	uint8	119a	4506	Not applicable
AlarmSummary.Channel.Alarm5Ack	Acknowledge the 5th most recent channel alarm	bool	119e	4510	Not applicable
AlarmSummary.Channel.Alarm5Num	As Alarm1Num, but for 5th most recent alarm	uint8	119c	4508	Not applicable
AlarmSummary.Channel.Alarm5Status	As Alarm1Status, but for 5th most recent alarm	uint8	119d	4509	Not applicable
AlarmSummary.Channel.Alarm6Ack	Acknowledge the 6th most recent channel alarm	bool	11a1	4513	Not applicable
AlarmSummary.Channel.Alarm6Num	As Alarm1Num, but for 6th most recent alarm	uint8	119f	4511	Not applicable
AlarmSummary.Channel.Alarm6Status	As Alarm1Status, but for 6th most recent alarm	uint8	11a0	4512	Not applicable
AlarmSummary.Channel.Alarm7Ack	Acknowledge the 7th most recent channel alarm	bool	11a4	4516	Not applicable
AlarmSummary.Channel.Alarm7Num	As Alarm1Num, but for 7th most recent alarm	uint8	11a2	4514	Not applicable
AlarmSummary.Channel.Alarm7Status	As Alarm1Status, but for 7th most recent alarm	uint8	11a3	4515	Not applicable
AlarmSummary.Channel.Alarm8Ack	Acknowledge the 8th most recent channel alarm	bool	11a7	4519	Not applicable
AlarmSummary.Channel.Alarm8Num	As Alarm1Num, but for 8th most recent alarm	uint8	11a5	4517	Not applicable
AlarmSummary.Channel.Alarm8Status	As Alarm1Status, but for 8th most recent alarm	uint8	11a6	4518	Not applicable
AlarmSummary.Channel.Alarm9Ack	Acknowledge the 9th most recent channel alarm	bool	11aa	4522	Not applicable
AlarmSummary.Channel.Alarm9Num	As Alarm1Num, but for 9th most recent alarm	uint8	11a8	4520	Not applicable
AlarmSummary.Channel.Alarm9Status	As Alarm1Status, but for 9th most recent alarm	uint8	11a9	4521	Not applicable
AlarmSummary.Channel.Alarm10Ack	Acknowledge the 10th most recent channel alarm	bool	11ad	4525	Not applicable
AlarmSummary.Channel.Alarm10Num	As Alarm1Num, but for 10th most recent alarm	uint8	11ab	4523	Not applicable
AlarmSummary.Channel.Alarm10Status	As Alarm1Status, but for 10th most recent alarm	uint8	11ac	4524	Not applicable
AlarmSummary.Channel.Alarm11Ack	Acknowledge the 11th most recent channel alarm	bool	11b0	4528	Not applicable
AlarmSummary.Channel.Alarm11Num	As Alarm1Num, but for 11th most recent alarm	uint8	11ae	4526	Not applicable
AlarmSummary.Channel.Alarm11Status	As Alarm1Status, but for 11th most recent alarm	uint8	11af	4527	Not applicable
AlarmSummary.Channel.Alarm12Ack	Acknowledge the 12th most recent channel alarm	bool	11b3	4531	Not applicable
AlarmSummary.Channel.Alarm12Num	As Alarm1Num, but for 12th most recent alarm	uint8	11b1	4529	Not applicable
AlarmSummary.Channel.Alarm12Status	As Alarm1Status, but for 12th most recent alarm	uint8	11b2	4530	Not applicable
AlarmSummary.Channel.Alarm13Ack	Acknowledge the 13th most recent channel alarm	bool	11b6	4534	Not applicable
AlarmSummary.Channel.Alarm13Num	As Alarm1Num, but for 13th most recent alarm	uint8	11b4	4532	Not applicable
AlarmSummary.Channel.Alarm13Status	As Alarm1Status, but for 13th most recent alarm	uint8	11b5	4533	Not applicable
AlarmSummary.Channel.Alarm14Ack	Acknowledge the 14th most recent channel alarm	bool	11b9	4537	Not applicable
AlarmSummary.Channel.Alarm14Num	As Alarm1Num, but for 14th most recent alarm	uint8	11b7	4535	Not applicable
AlarmSummary.Channel.Alarm14Status	As Alarm1Status, but for 14th most recent alarm	uint8	11b8	4536	Not applicable
AlarmSummary.Channel.Alarm15Ack	Acknowledge the 15th most recent channel alarm	bool	11bc	4540	Not applicable
AlarmSummary.Channel.Alarm15Num	As Alarm1Num, but for 15th most recent alarm	uint8	11ba	4538	Not applicable
AlarmSummary.Channel.Alarm15Status	As Alarm1Status, but for 15th most recent alarm	uint8	11bb	4539	Not applicable
AlarmSummary.Channel.Alarm16Ack	Acknowledge the 16th most recent channel alarm	bool	11bf	4543	Not applicable
AlarmSummary.Channel.Alarm16Num	As Alarm1Num, but for 16th most recent alarm	uint8	11bd	4541	Not applicable
AlarmSummary.Channel.Alarm16Status	As Alarm1Status, but for 16th most recent alarm	uint8	11be	4542	Not applicable
AlarmSummary.Channel.Alarm17Ack	Acknowledge the 17th most recent channel alarm	bool	11c2	4546	Not applicable
AlarmSummary.Channel.Alarm17Num	As Alarm1Num, but for 17th most recent alarm	uint8	11c0	4544	Not applicable
AlarmSummary.Channel.Alarm17Status	As Alarm1Status, but for 17th most recent alarm	uint8	11c1	4545	Not applicable
AlarmSummary.Channel.Alarm18Ack	Acknowledge the 18th most recent channel alarm	bool	11c5	4549	Not applicable
AlarmSummary.Channel.Alarm18Num	As Alarm1Num, but for 18th most recent alarm	uint8	11c3	4547	Not applicable
AlarmSummary.Channel.Alarm18Status	As Alarm1Status, but for 18th most recent alarm	uint8	11c4	4548	Not applicable
AlarmSummary.Channel.Alarm19Ack	Acknowledge the 19th most recent channel alarm	bool	11c8	4552	Not applicable
AlarmSummary.Channel.Alarm19Num	As Alarm1Num, but for 19th most recent alarm	uint8	11c6	4550	Not applicable
AlarmSummary.Channel.Alarm19Status	As Alarm1Status, but for 19th most recent alarm	uint8	11c7	4551	Not applicable
AlarmSummary.Channel.Alarm20Ack	Acknowledge the 20th most recent channel alarm	bool	11cb	4555	Not applicable
AlarmSummary.Channel.Alarm20Num	As Alarm1Num, but for 20th most recent alarm	uint8	11c9	4553	Not applicable
AlarmSummary.Channel.Alarm20Status	As Alarm1Status, but for 20th most recent alarm	uint8	11ca	4554	Not applicable
AlarmSummary.Channel.Alarm21Ack	Acknowledge the 21st most recent channel alarm	bool	11ce	4558	Not applicable
AlarmSummary.Channel.Alarm21Num	As Alarm1Num, but for 21st most recent alarm	uint8	11cc	4556	Not applicable
AlarmSummary.Channel.Alarm21Status	As Alarm1Status, but for 21st most recent alarm	uint8	11cd	4557	Not applicable
AlarmSummary.Channel.Alarm22Ack	Acknowledge the 22nd most recent channel alarm	bool	11d1	4561	Not applicable
AlarmSummary.Channel.Alarm22Num	As Alarm1Num, but for 22nd most recent alarm	uint8	11cf	4559	Not applicable
AlarmSummary.Channel.Alarm22Status	As Alarm1Status, but for 22nd most recent alarm	uint8	11d0	4560	Not applicable



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Parameter path	Description	Type	Hex	Dec	Resolution
AlarmSummary.Channel.Alarm23Ack	Acknowledge the 23rd most recent channel alarm	bool	11d4	4564	Not applicable
AlarmSummary.Channel.Alarm23Num	As Alarm1Num, but for 23th most recent alarm	uint8	11d2	4562	Not applicable
AlarmSummary.Channel.Alarm23Status	As Alarm1Status, but for 23rd most recent alarm	uint8	11d3	4563	Not applicable
AlarmSummary.Channel.Alarm24Ack	Acknowledge the 24th most recent channel alarm	bool	11d7	4567	Not applicable
AlarmSummary.Channel.Alarm24Num	As Alarm1Num, but for 24th most recent alarm	uint8	11d5	4565	Not applicable
AlarmSummary.Channel.Alarm24Status	As Alarm1Status, but for 24th most recent alarm	uint8	11d6	4566	Not applicable
AlarmSummary.Channel.Alarm25Ack	Acknowledge the 25th most recent channel alarm	bool	11da	4570	Not applicable
AlarmSummary.Channel.Alarm25Num	As Alarm1Num, but for 25th most recent alarm	uint8	11d8	4568	Not applicable
AlarmSummary.Channel.Alarm25Status	As Alarm1Status, but for 25th most recent alarm	uint8	11d9	4569	Not applicable
AlarmSummary.Channel.Alarm26Ack	Acknowledge the 26th most recent channel alarm	bool	11dd	4573	Not applicable
AlarmSummary.Channel.Alarm26Num	As Alarm1Num, but for 26th most recent alarm	uint8	11db	4571	Not applicable
AlarmSummary.Channel.Alarm26Status	As Alarm1Status, but for 26th most recent alarm	uint8	11dc	4572	Not applicable
AlarmSummary.Channel.Alarm27Ack	Acknowledge the 27th most recent channel alarm	bool	11e0	4576	Not applicable
AlarmSummary.Channel.Alarm27Num	As Alarm1Num, but for 27th most recent alarm	uint8	11de	4574	Not applicable
AlarmSummary.Channel.Alarm27Status	As Alarm1Status, but for 27th most recent alarm	uint8	11df	4575	Not applicable
AlarmSummary.Channel.Alarm28Ack	Acknowledge the 28th most recent channel alarm	bool	11e3	4579	Not applicable
AlarmSummary.Channel.Alarm28Num	As Alarm1Num, but for 28th most recent alarm	uint8	11e1	4577	Not applicable
AlarmSummary.Channel.Alarm28Status	As Alarm1Status, but for 28th most recent alarm	uint8	11e2	4578	Not applicable
AlarmSummary.Channel.Alarm29Ack	Acknowledge the 29th most recent channel alarm	bool	11e6	4582	Not applicable
AlarmSummary.Channel.Alarm29Num	As Alarm1Num, but for 29th most recent alarm	uint8	11e4	4580	Not applicable
AlarmSummary.Channel.Alarm29Status	As Alarm1Status, but for 29th most recent alarm	uint8	11e5	4581	Not applicable
AlarmSummary.Channel.Alarm30Ack	Acknowledge the 30th most recent channel alarm	bool	11e9	4585	Not applicable
AlarmSummary.Channel.Alarm30Num	As Alarm1Num, but for 30th most recent alarm	uint8	11e7	4583	Not applicable
AlarmSummary.Channel.Alarm30Status	As Alarm1Status, but for 30th most recent alarm	uint8	11e8	4584	Not applicable
AlarmSummary.Channel.Alarm31Ack	Acknowledge the 31st most recent channel alarm	bool	11ec	4588	Not applicable
AlarmSummary.Channel.Alarm31Num	As Alarm1Num, but for 31st most recent alarm	uint8	11ea	4586	Not applicable
AlarmSummary.Channel.Alarm31Status	As Alarm1Status, but for 31st most recent alarm	uint8	11eb	4587	Not applicable
AlarmSummary.Channel.Alarm32Ack	Acknowledge the 32nd most recent channel alarm	bool	11ef	4591	Not applicable
AlarmSummary.Channel.Alarm32Num	As Alarm1Num, but for 32nd most recent alarm	uint8	11ed	4589	Not applicable
AlarmSummary.Channel.Alarm32Status	As Alarm1Status, but for 32nd most recent alarm	uint8	11ee	4590	Not applicable
AlarmSummary.Channel.Alarm33Ack	Acknowledge the 33rd most recent channel alarm	bool	11f2	4594	Not applicable
AlarmSummary.Channel.Alarm33Num	As Alarm1Num, but for 33rd most recent alarm	uint8	11f0	4592	Not applicable
AlarmSummary.Channel.Alarm33Status	As Alarm1Status, but for 33rd most recent alarm	uint8	11f1	4593	Not applicable
AlarmSummary.Channel.Alarm34Ack	Acknowledge the 34th most recent channel alarm	bool	11f5	4597	Not applicable
AlarmSummary.Channel.Alarm34Num	As Alarm1Num, but for 34th most recent alarm	uint8	11f3	4595	Not applicable
AlarmSummary.Channel.Alarm34Status	As Alarm1Status, but for 34th most recent alarm	uint8	11f4	4596	Not applicable
AlarmSummary.Channel.Alarm35Ack	Acknowledge the 35th most recent channel alarm	bool	11f9	4600	Not applicable
AlarmSummary.Channel.Alarm35Num	As Alarm1Num, but for 35th most recent alarm	uint8	11f6	4598	Not applicable
AlarmSummary.Channel.Alarm35Status	As Alarm1Status, but for 35th most recent alarm	uint8	11f7	4599	Not applicable
AlarmSummary.Channel.Alarm36Ack	Acknowledge the 36th most recent channel alarm	bool	11fd	4603	Not applicable
AlarmSummary.Channel.Alarm36Num	As Alarm1Num, but for 36th most recent alarm	uint8	11f9	4601	Not applicable
AlarmSummary.Channel.Alarm36Status	As Alarm1Status, but for 36th most recent alarm	uint8	11fa	4602	Not applicable
AlarmSummary.Channel.Alarm37Ack	Acknowledge the 37th most recent channel alarm	bool	11fe	4606	Not applicable
AlarmSummary.Channel.Alarm37Num	As Alarm1Num, but for 37th most recent alarm	uint8	11fc	4604	Not applicable
AlarmSummary.Channel.Alarm37Status	As Alarm1Status, but for 38th most recent alarm	uint8	11fd	4605	Not applicable
AlarmSummary.Channel.Alarm38Ack	Acknowledge the 38th most recent channel alarm	bool	1201	4609	Not applicable
AlarmSummary.Channel.Alarm38Num	As Alarm1Num, but for 38th most recent alarm	uint8	11ff	4607	Not applicable
AlarmSummary.Channel.Alarm38Status	As Alarm1Status, but for 38th most recent alarm	uint8	1200	4608	Not applicable
AlarmSummary.GlobalAck	Acknowledge all alarms. 0=No;1 = yes	bool	01a3	419	Not applicable
AlarmSummary.StatusWord1	A summary of Channel 1-4 alarms Bit 0: 1 = Channel 1 Alarm 1 active Bit 1: 1 = Channel 1 Alarm 1 not acknowledged Bit 2: 1 = Channel 1 Alarm 2 active Bit 3: 1 = Channel 1 Alarm 2 not acknowledged Bit 4: 1 = Channel 2 Alarm 1 active Bit 5: 1 = Channel 2 Alarm 1 not acknowledged Bit 6: 1 = Channel 2 Alarm 2 active Bit 7: 1 = Channel 2 Alarm 2 not acknowledged Bit 8: 1 = Channel 3 Alarm 1 active Bit 9: 1 = Channel 3 Alarm 1 not acknowledged Bit 10: 1 = Channel 3 Alarm 2 active Bit 11: 1 = Channel 3 Alarm 2 not acknowledged Bit 12: 1 = Channel 4 Alarm 1 active Bit 13: 1 = Channel 4 Alarm 1 not acknowledged Bit 14: 1 = Channel 4 Alarm 2 active Bit 15: 1 = Channel 4 Alarm 2 not acknowledged	int16	01a4	420	Not applicable
AlarmSummary.StatusWord2	A summary of Virtual Channel 1 to 4 alarms Bit 0: 1 = Virtual channel 1 Alarm 1 active Bit 1: 1 = Virtual channel 1 Alarm 1 not ack'd Bit 2: 1 = Virtual channel 1 Alarm 2 active Bit 3: 1 = Virtual channel 1 Alarm 2 not ack'd Bit 4: 1 = Virtual channel 2 Alarm 1 active Bit 5: 1 = Virtual channel 2 Alarm 1 not ack'd Bit 6: 1 = Virtual channel 2 Alarm 2 active Bit 7: 1 = Virtual channel 2 Alarm 2 not ack'd Bit 8: 1 = Virtual channel 3 Alarm 1 active Bit 9: 1 = Virtual channel 3 Alarm 1 not ack'd Bit 10: 1 = Virtual channel 3 Alarm 2 active Bit 11: 1 = Virtual channel 3 Alarm 2 not ack'd Bit 12: 1 = Virtual channel 4 Alarm 1 active	int16	01a5	421	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
AlarmSummary.StatusWord3	Bit 13: 1 = Virtual channel 4 Alarm 1 not ack'd Bit 14: 1 = Virtual channel 4 Alarm 2 active Bit 15: 1 = Virtual channel 4 Alarm 2 not ack'd A summary of Virtual Channel 5 to 8 alarms	int16	01a6	422	Not applicable
AlarmSummary.StatusWord4	As for Status Word 2 but for virtual channels 5 to 8 A summary of Virtual Channel 9 to 12 alarms	int16	01a7	423	Not applicable
AlarmSummary.StatusWord5	As for Status Word 2 but for virtual channels 9 to 12 A summary of Virtual Channel 13 to 14 alarms	int16	01a8	424	Not applicable
AlarmSummary.System.Alarm1ID	As for Status Word 2 but for virtual channels 13 to 14 Most recent active system alarm 0 = No Alarm            1 = Low battery 2 = Battery failure    3 = System clock fail 4 = Channel error      5 = Channel fail 6 = DHCP server fail   7 = FTP Archive file lost 8 = FTP Archive slow   9 = FTP Primary server failure 10 = FTP Secondary server failure 11 = Insufficient non-volatile memory 12 = Maths channel failure   13 = Media archive file lost 14 = Media archive slow   15 = Network boot failure 16 = DC Output Cal. Error   17 = Recording failure 18 = Media failure       19: = Media full 20 =SNTP failure        21 = Time synchronisation failure 22 = Media missing      23: Archive disabled 24 = Archiving failed    25 = Archiving timed out 26 = USB Over Current   27 = USB unsupported 28 = Invalid parameter database 29 = Invalid non-volatile data 30 = Flash write failure   31 = Wiring failure 32 = Broadcast Storm 33 = Non-volatile memory write frequency warning	uint8	1210	4624	Not applicable
AlarmSummary.System.Alarm2ID	2nd most recent active system alarm (as Alarm1ID)	uint8	1211	4625	Not applicable
AlarmSummary.System.Alarm3ID	3rd most recent active system alarm (as Alarm1ID)	uint8	1212	4626	Not applicable
AlarmSummary.System.Alarm4ID	4th most recent active system alarm (as Alarm1ID)	uint8	1213	4627	Not applicable
AlarmSummary.System.Alarm5ID	5th most recent active system alarm (as Alarm1ID)	uint8	1214	4628	Not applicable
AlarmSummary.System.Alarm6ID	6th most recent active system alarm (as Alarm1ID)	uint8	1215	4629	Not applicable
AlarmSummary.System.Alarm7ID	7th most recent active system alarm (as Alarm1ID)	uint8	1216	4630	Not applicable
AlarmSummary.System.Alarm8ID	8th most recent active system alarm (as Alarm1ID)	uint8	1217	4631	Not applicable
AlarmSummary.System.Alarm9ID	9th most recent active system alarm (as Alarm1ID)	uint8	1218	4632	Not applicable
AlarmSummary.System.Alarm10ID	10th most recent active system alarm (as Alarm1ID)	uint8	1219	4633	Not applicable
AlarmSummary.System.Alarm11ID	11th most recent active system alarm (as Alarm1ID)	uint8	121a	4634	Not applicable
AlarmSummary.System.Alarm12ID	12th most recent active system alarm (as Alarm1ID)	uint8	121b	4635	Not applicable
AlarmSummary.System.Alarm13ID	13th most recent active system alarm (as Alarm1ID)	uint8	121c	4636	Not applicable
AlarmSummary.System.Alarm14ID	14th most recent active system alarm (as Alarm1ID)	uint8	121d	4637	Not applicable
AlarmSummary.System.Alarm15ID	15th most recent active system alarm (as Alarm1ID)	uint8	121e	4638	Not applicable
AlarmSummary.System.Alarm16ID	16th most recent active system alarm (as Alarm1ID)	uint8	121f	4639	Not applicable
AlarmSummary.System.Alarm17ID	17th most recent active system alarm (as Alarm1ID)	uint8	1220	4640	Not applicable
AlarmSummary.System.Alarm18ID	18th most recent active system alarm (as Alarm1ID)	uint8	1221	4641	Not applicable
AlarmSummary.System.Alarm19ID	19th most recent active system alarm (as Alarm1ID)	uint8	1222	4642	Not applicable
AlarmSummary.System.Alarm20ID	20th most recent active system alarm (as Alarm1ID)	uint8	1223	4643	Not applicable
AlarmSummary.System.Alarm21ID	21st most recent active system alarm (as Alarm1ID)	uint8	1224	4644	Not applicable
AlarmSummary.System.Alarm22ID	22nd most recent active system alarm (as Alarm1ID)	uint8	1225	4645	Not applicable
AlarmSummary.System.Alarm23ID	23rd most recent active system alarm (as Alarm1ID)	uint8	1226	4646	Not applicable
AlarmSummary.System.Alarm24ID	24th most recent active system alarm (as Alarm1ID)	uint8	1227	4647	Not applicable
AlarmSummary.System.Alarm25ID	25th most recent active system alarm (as Alarm1ID)	uint8	1228	4648	Not applicable
AlarmSummary.System.Alarm26ID	26th most recent active system alarm (as Alarm1ID)	uint8	1229	4649	Not applicable
AlarmSummary.System.Alarm27ID	27th most recent active system alarm (as Alarm1ID)	uint8	122a	4650	Not applicable
AlarmSummary.System.Alarm28ID	28th most recent active system alarm (as Alarm1ID)	uint8	122b	4651	Not applicable
AlarmSummary.System.Alarm29ID	29th most recent active system alarm (as Alarm1ID)	uint8	122c	4652	Not applicable
AlarmSummary.System.Alarm30ID	30th most recent active system alarm (as Alarm1ID)	uint8	122d	4653	Not applicable
AlarmSummary.System.Alarm31ID	31st most recent active system alarm (as Alarm1ID)	uint8	122e	4654	Not applicable
AlarmSummary.System.Alarm32ID	32nd most recent active system alarm (as Alarm1ID)	uint8	122f	4655	Not applicable
Channel.1.Alarm1.Acknowledge	1 = Acknowledge alarm	bool	01b0	432	Not applicable
Channel.1.Alarm1.Acknowledgement	1 = Alarm acknowledged	bool	1850	6224	Not applicable
Channel.1.Alarm1.Active	1 = Alarm source active, or safe but not ack'd	bool	184b	6219	Not applicable
Channel.1.Alarm1.Amount	Alarm amount	float32	1848	6216	Same as Channel.1.Main.PV
Channel.1.Alarm1.AverageTime	Average time	time_t	184a	6218	Set by Network.Modbus.TimeFormat
Channel.1.Alarm1.Block	Blocking enable (0 = Off; 1 = On)	uint8	1842	6210	Not applicable
Channel.1.Alarm1.ChangeTime	Change time (0 = Per second; 1= Per minute; 2 =Per hour)	uint8	1849	6217	Not applicable
Channel.1.Alarm1.Deviation	Alarm deviation	float32	1847	6215	Same as Channel.1.Main.PV
Channel.1.Alarm1.Dwell	Alarm dwell	time_t	1845	6213	Set by Network.Modbus.TimeFormat
Channel.1.Alarm1.Hysteresis	Alarm hysteresis	float32	1844	6212	Same as Channel.1.Main.PV
Channel.1.Alarm1.Inactive	1 = the alarm is safe and acknowledged	bool	184e	6222	Not applicable
Channel.1.Alarm1.Inhibit	1 = the alarm is inhibited	bool	1851	6225	Not applicable
Channel.1.Alarm1.Latch	Alarm latch type 0 = None            1 = Auto 2 = Manual        3 = Trigger	uint8	1841	6209	Not applicable
Channel.1.Alarm1.NotAcknowledged	1 = the alarm has not been acknowledged	bool	184f	6223	Not applicable
Channel.1.Alarm1.Reference	Alarm reference	float32	1846	6214	Same as Channel.1.Main.PV
Channel.1.Alarm1.Status	Alarm status 0 = Off            1 = Active	uint8	0102	258	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
Channel.1.Alarm1.Threshold	2 = Safe not acknowledged 3 = Active not acknowledged	float32	1843	6211	Same as Channel.1.Main.PV
Channel.1.Alarm1.Type	Alarm threshold Alarm type 0 = None 1 = Abs High 2 = Abs Low 3 = Dev high 4 = Dev Low 5 = Dev band 6 = ROC rising 7 = ROC falling 10 = Dig Off 11 = Dig high 12 = Dig Low	uint8	1840	6208	Not applicable
Channel.1.Alarm2.Acknowledge	1 = Acknowledge alarm	bool	01b1	433	Not applicable
Channel.1.Alarm2.Acknowledgement	1 = Alarm acknowledged	bool	1870	6256	Not applicable
Channel.1.Alarm2.Active	1 = Alarm source active, or safe but not ack'd	bool	186b	6251	Not applicable
Channel.1.Alarm2.Amount	Alarm amount	float32	1868	6248	Same as Channel.1.Main.PV
Channel.1.Alarm2.AverageTime	Average time	time_t	186a	6250	Set by Network.Modbus.TimeFormat
Channel.1.Alarm2.Block	Blocking enable (0 = Off; 1 = On)	uint8	1862	6242	Not applicable
Channel.1.Alarm2.ChangeTime	Change time (0 = Per second; 1 = Per minute; 2 = Per hour)	uint8	1869	6249	Not applicable
Channel.1.Alarm2.Deviation	Alarm deviation	float32	1867	6247	Same as Channel.1.Main.PV
Channel.1.Alarm2.Dwell	Alarm dwell	time_t	1865	6245	Set by Network.Modbus.TimeFormat
Channel.1.Alarm2.Hysteresis	Alarm hysteresis	float32	1864	6244	Same as Channel.1.Main.PV
Channel.1.Alarm2.Inactive	1 = the alarm is safe and acknowledged	bool	186e	6254	Not applicable
Channel.1.Alarm2.Inhibit	1 = the alarm is inhibited	bool	1871	6257	Not applicable
Channel.1.Alarm2.Latch	Configures the latching type of the alarm (As Alarm1.Latch)	uint8	1861	6241	Not applicable
Channel.1.Alarm2.NotAcknowledged	1 = the alarm has not been acknowledged	bool	186f	6255	Not applicable
Channel.1.Alarm2.Reference	Alarm reference	float32	1866	6246	Same as Channel.1.Main.PV
Channel.1.Alarm2.Status	As Alarm1.Status	uint8	0103	259	Not applicable
Channel.1.Alarm2.Threshold	Alarm threshold	float32	1863	6243	Same as Channel.1.Main.PV
Channel.1.Alarm2.Type	Alarm type (as Alarm1.Type)	uint8	1860	6240	Not applicable
Channel.1.Main.CJType	Cold junction compensation type 0 = None 1 = Internal 2 = External 3 = Remote (Ch1) 4 = Remote (Ch2) 5 = Remote (Ch3) 6 = Remote (Ch4)	uint8	180c	6156	Not applicable
Channel.1.Main.CloseString	Close String	string_t	4990	18832	Not applicable
Channel.1.Main.Descriptor	Text string to describe the channel	string_t	4900	18688	Not applicable
Channel.1.Main.ExtCJTemp	External CJ temperature	float32	180d	6157	1dp
Channel.1.Main.FaultResponse	Fault response. 0 = none; 1 = Drive high; 2 = Drive low	uint8	1810	6160	Not applicable
Channel.1.Main.Filter	Filter time constant	float32	180e	6158	1dp
Channel.1.Main.InputHigh	Input range high value	float32	1804	6148	1dp
Channel.1.Main.InputLow	Input range low value	float32	1803	6147	1dp
Channel.1.Main.InternalCJTemp	Channel internal cold junction temperature	float32	1815	6165	1dp
Channel.1.Main.IPAdjustState	Input Adjust state (0 = Unadjusted; 1 = Adjusted)	bool	1816	6166	Not applicable
Channel.1.Main.IPAdjustState2	Secondary Input Adjust state (0 = Unadjusted; 1 = Adjusted)	bool	181c	6172	Not applicable
Channel.1.Main.LinType	Linearization type 0 = Type B 1 = Type C 2 = Type D 3 = Type E 4 = Type G2 5 = Type J 6 = Type K 7 = Type L 8 = Type N 9 = Type R 10 = Type S 11 = Type T 12 = Type U 13 = NiMoNiCo 14 = Platinel 15 = NiNiMo 16 = Pt20RhPt40Rh 17 = User 1 18 = User 2 19 = User 3 20 = User 4 21 = Cu10 22 = Pt100 23 = Pt100A 24 = JPT100 25 = Ni100 26 = Ni120 27 = Cu53 28 = Linear 29 = Sqrt 30 = x <sup>3/2</sup> 32 = x <sup>5/2</sup>	uint8	1806	6150	Not applicable
Channel.1.Main.MeasuredValue	Input value before linearization, scaling, adjust etc.	float32	1814	6164	Set by Channel.1.Main.Resolution
Channel.1.Main.MeasuredValue2	Measured value of the secondary input	float32	1819	6169	Set by Channel.1.Main.Resolution
Channel.1.Main.Offset	Fixed value to be added to/subtracted from PV	float32	1817	6167	3dp
Channel.1.Main.Offset2	Secondary input offset (as above).	float32	1818	6168	3dp
Channel.1.Main.OpenString	Open String	string_t	496c	18796	Not applicable
Channel.1.Main.PV	The process variable (output) of the channel	float32	0100	256	Set by Channel.1.Main.Resolution
Channel.1.Main.PV2	The secondary input process variable (output) of the channel	float32	0110	272	Set by Channel.1.Main.Resolution
Channel.1.Main.RangeHigh	Range high value	float32	1808	6152	Set by Channel.1.Main.Resolution
Channel.1.Main.RangeLow	Range low value	float32	1807	6151	Set by Channel.1.Main.Resolution
Channel.1.Main.RangeUnits	Range units: 0 = °C; 1 = °F; 2 = Kelvins	uint8	1809	6153	Not applicable
Channel.1.Main.Resolution	Specifies the resolution/number of decimal places	uint8	1801	6145	Not applicable
Channel.1.Main.ScaleHigh	Scale high value	float32	180b	6155	Set by Channel.1.Main.Resolution
Channel.1.Main.ScaleHigh2	Scale high value for the secondary input	float32	181b	6171	Set by Channel.1.Main.Resolution
Channel.1.Main.ScaleLow	Scale low value	float32	180a	6154	Set by Channel.1.Main.Resolution
Channel.1.Main.ScaleLow2	Scale low value for the secondary input	float32	181a	6170	Set by Channel.1.Main.Resolution
Channel.1.Main.SensorBreakType	Sensor break type: 0 = Off; 1 = Low; 2 = High	uint8	180f	6159	Not applicable
Channel.1.Main.SensorBreakVal	Sensor break value	uint8	1811	6161	Not applicable
Channel.1.Main.Shunt	Shunt value (Ohms)	float32	1805	6149	2dp
Channel.1.Main.Status	The PV (output) status 0 = Good 1 = Off 2 = Over range 3 = Under range 4 = HW error 5 = Ranging 6 = Overflow 7 = bad 8 = HW exceeded 9 = No data 12 = Comm channel error	uint8	0101	257	Not applicable
Channel.1.Main.Status2	The secondary input PV (output) status (as above)	uint8	0111	273	Not applicable
Channel.1.Main.TestSignal	Channel test waveform 0 = Triangle 5hr 1 = Triangle 40 min 2 = Triangle 4 min 3 = Triangle 40 sec 4 = Sine 5 hr 5 = Sine 40 min 6 = Sine 4 min 7 = Sine 40 sec	uint8	1802	6146	Not applicable
Channel.1.Main.Type	Specifies the type of channel	uint8	1800	6144	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
Channel.1.Main.Units	0 = Off      1 = TC      2 = mV 3 = V        4 = mA      5 = RTD 6 = Digital   7 = Test    8 = Ohms 9 = Dual mV   10 = Dual mA   11 = Dual TC Units descriptor	string_t	4915	18709	Not applicable
Channel.1.Trend.Colour	Configures the trend colour for this channel 0 = Red      1 = Blue      2 = Green 3 = Honey    4 = Violet    5 = Russet 6 = Dark blue 7 = Jade      8 = Magenta 9 = Dusky rose 10 = Yellow   11 = Powder blue 12 = Dark red 13 = Avocado   14 = Indigo 15 = Dark brown 16 = Aegean   17 = Cyan 18 = Aubergine 19 = Dark orange 20 = Pale yellow 21 = Hyacinth 22 = Dark green 23 = Sugar pink 24 = Bluebell 25 = Orange   26 = Pink 27 = Buttersilk 28 = Terracotta 29 = Blue babe 30 = Lime      31 = Blue jive 32 = Cucumber 33 = Eurogreen 34 = Wheatgerm 35 = Sea Blue 36 = Ginger    37 = Aqua pool 38 = Pale red 39 = Pale blue 40 = Lilac      41 = Sky blue 42 = Wild moss 43 = Turquoise 44 = Pale green 45 = Coffee    49 = Dark Gray 53 = Light gray	uint8	1820	6176	Not applicable
Channel.1.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	1822	6178	Same as Channel.1.Main.PV
Channel.1.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	1821	6177	Same as Channel.1.Main.PV
Channel.2.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01b2	434	Not applicable
Channel.2.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	18d0	6352	Not applicable
Channel.2.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	18cb	6347	Not applicable
Channel.2.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	18c8	6344	Same as Channel.2.Main.PV
Channel.2.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	18ca	6346	Set by Network.Modbus.TimeFormat
Channel.2.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	18c2	6338	Not applicable
Channel.2.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	18c9	6345	Not applicable
Channel.2.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	18c7	6343	Same as Channel.2.Main.PV
Channel.2.Alarm1.Dwell	Alarm dwell time	time_t	18c5	6341	Set by Network.Modbus.TimeFormat
Channel.2.Alarm1.Hysteresis	Alarm hysteresis value	float32	18c4	6340	Same as Channel.2.Main.PV
Channel.2.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	18ce	6350	Not applicable
Channel.2.Alarm1.Inhibit	1 = Alarm inhibited	bool	18d1	6353	Not applicable
Channel.2.Alarm1.Latch	Alarm latch type (as for Channel.1.Alarm1)	uint8	18c1	6337	Not applicable
Channel.2.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	18cf	6351	Not applicable
Channel.2.Alarm1.Reference	Deviation alarm 'Reference' value	float32	18c6	6342	Same as Channel.2.Main.PV
Channel.2.Alarm1.Status	Alarm status (as for Channel.1.Alarm1)	uint8	0106	262	Not applicable
Channel.2.Alarm1.Threshold	Alarm trigger threshold	float32	18c3	6339	Same as Channel.2.Main.PV
Channel.2.Alarm1.Type	Alarm type (as for Channel.1.Alarm1)	uint8	18c0	6336	Not applicable
Channel.2.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01b3	435	Not applicable
Channel.2.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	18f0	6384	Not applicable
Channel.2.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	18eb	6379	Not applicable
Channel.2.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	18e8	6376	Same as Channel.2.Main.PV
Channel.2.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	18ea	6378	Set by Network.Modbus.TimeFormat
Channel.2.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	18e2	6370	Not applicable
Channel.2.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	18e9	6377	Not applicable
Channel.2.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	18e7	6375	Same as Channel.2.Main.PV
Channel.2.Alarm2.Dwell	Alarm dwell time	time_t	18e5	6373	Set by Network.Modbus.TimeFormat
Channel.2.Alarm2.Hysteresis	Alarm hysteresis value	float32	18e4	6372	Same as Channel.2.Main.PV
Channel.2.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	18ee	6382	Not applicable
Channel.2.Alarm2.Inhibit	1 = Alarm inhibited	bool	18f1	6385	Not applicable
Channel.2.Alarm2.Latch	Alarm latch type (as for Channel.1.Alarm1)	uint8	18e1	6369	Not applicable
Channel.2.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	18ef	6383	Not applicable
Channel.2.Alarm2.Reference	Deviation alarm 'Reference' value	float32	18e6	6374	Same as Channel.2.Main.PV
Channel.2.Alarm2.Status	Alarm status (as for Channel.1.Alarm1)	uint8	0107	263	Not applicable
Channel.2.Alarm2.Threshold	Alarm trigger threshold	float32	18e3	6371	Same as Channel.2.Main.PV
Channel.2.Alarm2.Type	Alarm type (as for Channel.1.Alarm1)	uint8	18e0	6368	Not applicable
Channel.2.Main.CJType	Cold junction compensation type (as for Channel.1.Main)	uint8	188c	6284	Not applicable
Channel.2.Main.CloseString	Close String	string_t	4999	18841	Not applicable
Channel.2.Main.Descriptor	Text string to describe the channel	string_t	491b	18715	Not applicable
Channel.2.Main.ExtCJTemp	External CJ temperature	float32	188d	6285	1dp
Channel.2.Main.FaultResponse	Input fault response	uint8	1890	6288	Not applicable
Channel.2.Main.Filter	Filter time constant	float32	188e	6286	1dp
Channel.2.Main.InputHigh	Input range high value	float32	1884	6276	1dp
Channel.2.Main.InputLow	Input range low value	float32	1883	6275	1dp
Channel.2.Main.InternalCJTemp	Channel 2 internal cold junction temperature	float32	1895	6293	1dp
Channel.2.Main.IPAdjustState	Input Adjust state (0 = Unadjusted; 1 = Adjusted)	bool	1896	6294	Not applicable
Channel.2.Main.IPAdjustState2	Secondary Input Adjust state (0 = Unadjusted; 1 = Adjusted)	bool	189c	6300	Not applicable
Channel.2.Main.LinType	Linearization type (as for Channel.1.Main)	uint8	1886	6278	Not applicable
Channel.2.Main.MeasuredValue	Input value before linearization, scaling, adjust etc.	float32	1894	6292	Set by Channel.2.Main.Resolution
Channel.2.Main.MeasuredValue2	Measured value of the secondary input	float32	1899	6297	Set by Channel.2.Main.Resolution
Channel.2.Main.Offset	Fixed value to be added to/subtracted from PV	float32	1897	6295	3dp
Channel.2.Main.Offset2	Secondary input offset	float32	1898	6296	3dp
Channel.2.Main.OpenString	Open String	string_t	4975	18805	Not applicable
Channel.2.Main.PV	The output (displayed) value of the channel.	float32	0104	260	Set by Channel.2.Main.Resolution
Channel.2.Main.PV2	The secondary input process variable (output) of the channel	float32	0114	276	Set by Channel.2.Main.Resolution

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Channel.2.Main.RangeHigh	Range high value	float32	1888	6280	Set by Channel.2.Main.Resolution
Channel.2.Main.RangeLow	Range low value	float32	1887	6279	Set by Channel.2.Main.Resolution
Channel.2.Main.RangeUnits	Range units (as channel.1.Main)	uint8	1889	6281	Not applicable
Channel.2.Main.Resolution	Specifies the resolution/number of decimal places	uint8	1881	6273	Not applicable
Channel.2.Main.ScaleHigh	Scale high value	float32	188b	6283	Set by Channel.2.Main.Resolution
Channel.2.Main.ScaleHigh2	Scale high value for the secondary input	float32	189b	6299	Set by Channel.2.Main.Resolution
Channel.2.Main.ScaleLow	Scale low value	float32	188a	6282	Set by Channel.2.Main.Resolution
Channel.2.Main.ScaleLow2	Scale low value for the secondary input	float32	189a	6298	Set by Channel.2.Main.Resolution
Channel.2.Main.SensorBreakType	Sensor break type (as for Channel.1.Main)	uint8	188f	6287	Not applicable
Channel.2.Main.SensorBreakVal	Sensor break value	uint8	1891	6289	Not applicable
Channel.2.Main.Shunt	Shunt value in Ohms	float32	1885	6277	2dp
Channel.2.Main.Status	Channel status (as for Channel.1.Main.Status)	uint8	0105	261	Not applicable
Channel.2.Main.Status2	The secondary input PV (output) status (as above)	uint8	0115	277	Not applicable
Channel.2.Main.TestSignal	Channel test waveform (as for Channel.1.Main)	uint8	1882	6274	Not applicable
Channel.2.Main.Type	Channel function (as for Channel.1.Main.Type)	uint8	1880	6272	Not applicable
Channel.2.Main.Units	Channel units string	string_t	4930	18736	Not applicable
Channel.2.Trend.Colour	Trend colour (as for Channel.1.Trend.Colour)	uint8	18a0	6304	Not applicable
Channel.2.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	18a2	6306	Same as Channel.2.Main.PV
Channel.2.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	18a1	6305	Same as Channel.2.Main.PV
Channel.3.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	1950	6480	Not applicable
Channel.3.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	194b	6475	Not applicable
Channel.3.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	1948	6472	Same as Channel.3.Main.PV
Channel.3.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	194a	6474	Set by Network.Modbus.TimeFormat
Channel.3.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on.	uint8	1942	6466	Not applicable
Channel.3.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1949	6473	Not applicable
Channel.3.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	1947	6471	Same as Channel.3.Main.PV
Channel.3.Alarm1.Dwell	Alarm dwell time	time_t	1945	6469	Set by Network.Modbus.TimeFormat
Channel.3.Alarm1.Hysteresis	Alarm hysteresis value	float32	1944	6468	Same as Channel.3.Main.PV
Channel.3.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	194e	6478	Not applicable
Channel.3.Alarm1.Inhibit	1 = alarm inhibited	bool	1951	6481	Not applicable
Channel.3.Alarm1.Latch	Alarm latch type (as for Channel.1.Alarm1)	uint8	1941	6465	Not applicable
Channel.3.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	194f	6479	Not applicable
Channel.3.Alarm1.Reference	Deviation alarm 'Reference' value	float32	1946	6470	Same as Channel.3.Main.PV
Channel.3.Alarm1.Status	Alarm status (as for Channel.1.Alarm1)	uint8	010a	266	Not applicable
Channel.3.Alarm1.Threshold	Alarm trigger threshold	float32	1943	6467	Same as Channel.3.Main.PV
Channel.3.Alarm1.Type	Alarm type (as for Channel.1.Alarm1)	uint8	1940	6464	Not applicable
Channel.3.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01b5	437	Not applicable
Channel.3.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	1970	6512	Not applicable
Channel.3.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	196b	6507	Not applicable
Channel.3.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	1968	6504	Same as Channel.3.Main.PV
Channel.3.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	196a	6506	Set by Network.Modbus.TimeFormat
Channel.3.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on.	uint8	1962	6498	Not applicable
Channel.3.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1969	6505	Not applicable
Channel.3.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	1967	6503	Same as Channel.3.Main.PV
Channel.3.Alarm2.Dwell	Alarm dwell time	time_t	1965	6501	Set by Network.Modbus.TimeFormat
Channel.3.Alarm2.Hysteresis	Alarm hysteresis value	float32	1964	6500	Same as Channel.3.Main.PV
Channel.3.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	196e	6510	Not applicable
Channel.3.Alarm2.Inhibit	1 = Alarm inhibited	bool	1971	6513	Not applicable
Channel.3.Alarm2.Latch	Alarm latch type (as for Channel.1.Alarm1)	uint8	1961	6497	Not applicable
Channel.3.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	196f	6511	Not applicable
Channel.3.Alarm2.Reference	Deviation alarm 'Reference' value	float32	1966	6502	Same as Channel.3.Main.PV
Channel.3.Alarm2.Status	Alarm status (as for Channel.1.Alarm1)	uint8	010b	267	Not applicable
Channel.3.Alarm2.Threshold	Alarm trigger threshold	float32	1963	6499	Same as Channel.3.Main.PV
Channel.3.Alarm2.Type	Alarm type (as for Channel.1.Alarm1)	uint8	1960	6496	Not applicable
Channel.3.Main.CJType	Cold junction compensation type (as for Channel.1.Main)	uint8	190c	6412	Not applicable
Channel.3.Main.CloseString	Close String	string_t	49a2	18850	Not applicable
Channel.3.Main.Descriptor	Text string to describe the channel	string_t	4936	18742	Not applicable
Channel.3.Main.ExtCJTemp	External CJ temperature	float32	190d	6413	1dp
Channel.3.Main.FaultResponse	Input fault response (As for Channel.1.Main)	uint8	1910	6416	Not applicable
Channel.3.Main.Filter	Filter time constant	float32	190e	6414	1dp
Channel.3.Main.InputHigh	Input range maximum value	float32	1904	6404	1dp
Channel.3.Main.InputLow	Input range minimum value	float32	1903	6403	1dp
Channel.3.Main.InternalCJTemp	Channel internal cold junction temperature	float32	1915	6421	1dp
Channel.3.Main.IPAdjustState	Input Adjust state (0 = Unadjusted; 1 = Adjusted)	bool	1916	6422	Not applicable
Channel.3.Main.IPAdjustState2	Secondary Input Adjust state (0 = Unadjusted; 1 = Adjusted)	bool	191c	6428	Not applicable
Channel.3.Main.LinType	Linearization type (as for Channel.1.Main.LinType)	uint8	1906	6406	Not applicable
Channel.3.Main.MeasuredValue	Input value before linearization, scaling, adjust etc.	float32	1914	6420	Set by Channel.3.Main.Resolution
Channel.3.Main.MeasuredValue2	Measured value of the secondary input	float32	1919	6425	Set by Channel.3.Main.Resolution
Channel.3.Main.Offset	Input offset	float32	1917	6423	3dp
Channel.3.Main.Offset2	Secondary input offset	float32	1918	6424	3dp
Channel.3.Main.OpenString	Open String	string_t	497e	18814	Not applicable
Channel.3.Main.PV	The output (displayed) value of the channel.	float32	0108	264	Set by Channel.3.Main.Resolution
Channel.3.Main.PV2	The secondary input process variable (output) of the channel	float32	0118	280	Set by Channel.3.Main.Resolution
Channel.3.Main.RangeHigh	Range high value	float32	1908	6408	Set by Channel.3.Main.Resolution
Channel.3.Main.RangeLow	Range low value	float32	1907	6407	Set by Channel.3.Main.Resolution
Channel.3.Main.RangeUnits	Range units	uint8	1909	6409	Not applicable
Channel.3.Main.Resolution	Specifies the resolution/number of decimal places	uint8	1901	6401	Not applicable
Channel.3.Main.ScaleHigh	Scale high value	float32	190b	6411	Set by Channel.3.Main.Resolution
Channel.3.Main.ScaleHigh2	Scale high value for the secondary input	float32	191b	6427	Set by Channel.3.Main.Resolution
Channel.3.Main.ScaleLow	Scale low value	float32	190a	6410	Set by Channel.3.Main.Resolution

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Parameter path	Description	Type	Hex	Dec	Resolution
Channel.3.Main.ScaleLow2	Scale low value for the secondary input	float32	191a	6426	Set by Channel.3.Main.Resolution
Channel.3.Main.SensorBreakType	Sensor break type (as for Channel.1.Main)	uint8	190f	6415	Not applicable
Channel.3.Main.SensorBreakVal	Sensor break value	uint8	1911	6417	Not applicable
Channel.3.Main.Shunt	Shunt value in Ohms	float32	1905	6405	2dp
Channel.3.Main.Status	Channel status (as for Channel.1.Main.Status)	uint8	0109	265	Not applicable
Channel.3.Main.Status2	The secondary input PV (output) status	uint8	0119	281	Not applicable
Channel.3.Main.TestSignal	Channel test waveform (as for Channel.1.Main)	uint8	1902	6402	Not applicable
Channel.3.Main.Type	Channel function (as for Channel.1.Main.Type)	uint8	1900	6400	Not applicable
Channel.3.Main.Units	Units descriptor	string_t	494b	18763	Not applicable
Channel.3.Trend.Colour	Trend colour (as for Channel.1.Trend.Colour)	uint8	1920	6432	Not applicable
Channel.3.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	1922	6434	Same as Channel.3.Main.PV
Channel.3.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	1921	6433	Same as Channel.3.Main.PV
Channel.4.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01b6	438	Not applicable
Channel.4.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	19d0	6608	Not applicable
Channel.4.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	19cb	6603	Not applicable
Channel.4.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	19c8	6600	Same as Channel.4.Main.PV
Channel.4.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	19ca	6602	Set by Network.Modbus.TimeFormat
Channel.4.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on.	uint8	19c2	6594	Not applicable
Channel.4.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	19c9	6601	Not applicable
Channel.4.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	19c7	6599	Same as Channel.4.Main.PV
Channel.4.Alarm1.Dwell	Alarm dwell time	time_t	19c5	6597	Set by Network.Modbus.TimeFormat
Channel.4.Alarm1.Hysteresis	Alarm hysteresis value	float32	19c4	6596	Same as Channel.4.Main.PV
Channel.4.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	19ce	6606	Not applicable
Channel.4.Alarm1.Inhibit	1 = alarm inhibited	bool	19d1	6609	Not applicable
Channel.4.Alarm1.Latch	Alarm latch type (as for Channel.1.Alarm1)	uint8	19c1	6593	Not applicable
Channel.4.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	19cf	6607	Not applicable
Channel.4.Alarm1.Reference	Deviation alarm 'Reference' value	float32	19c6	6598	Same as Channel.4.Main.PV
Channel.4.Alarm1.Status	Alarm status (as for Channel.1.Alarm1)	uint8	010e	270	Not applicable
Channel.4.Alarm1.Threshold	Alarm trigger threshold	float32	19c3	6595	Same as Channel.4.Main.PV
Channel.4.Alarm1.Type	Alarm type (as for Channel.1.Alarm1)	uint8	19c0	6592	Not applicable
Channel.4.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01b7	439	Not applicable
Channel.4.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	19f0	6640	Not applicable
Channel.4.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	19eb	6635	Not applicable
Channel.4.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	19e8	6632	Same as Channel.4.Main.PV
Channel.4.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	19ea	6634	Set by Network.Modbus.TimeFormat
Channel.4.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	19e2	6626	Not applicable
Channel.4.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	19e9	6633	Not applicable
Channel.4.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	19e7	6631	Same as Channel.4.Main.PV
Channel.4.Alarm2.Dwell	Alarm dwell time	time_t	19e5	6629	Set by Network.Modbus.TimeFormat
Channel.4.Alarm2.Hysteresis	Alarm hysteresis value	float32	19e4	6628	Same as Channel.4.Main.PV
Channel.4.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	19ee	6638	Not applicable
Channel.4.Alarm2.Latch	Alarm latch type (as for Channel.1.Alarm1)	uint8	19e1	6625	Not applicable
Channel.4.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	19ef	6639	Not applicable
Channel.4.Alarm2.Reference	Deviation alarm 'Reference' value	float32	19e6	6630	Same as Channel.4.Main.PV
Channel.4.Alarm2.Status	Alarm status (as for Channel.1.Alarm1)	uint8	010f	271	Not applicable
Channel.4.Alarm2.Threshold	Alarm trigger threshold	float32	19e3	6627	Same as Channel.4.Main.PV
Channel.4.Alarm2.Type	Alarm type (as for Channel.1.Alarm1)	uint8	19e0	6624	Not applicable
Channel.4.Main.CJType	Cold junction compensation type (as for Channel.1.Main)	uint8	198c	6540	Not applicable
Channel.4.Main.CloseString	Close String	string_t	49ab	18859	Not applicable
Channel.4.Main.Descriptor	Text string to describe the channel	string_t	4951	18769	Not applicable
Channel.4.Main.ExtCJTemp	External CJ temperature	float32	198d	6541	1dp
Channel.4.Main.FaultResponse	Input fault response (as for Channel.1.Main)	uint8	1990	6544	Not applicable
Channel.4.Main.Filter	Filter time constant	float32	198e	6542	1dp
Channel.4.Main.InputHigh	Input range maximum value	float32	1984	6532	1dp
Channel.4.Main.InputLow	Input range minimum value	float32	1983	6531	1dp
Channel.4.Main.InternalCJTemp	Channel internal cold junction temperature	float32	1995	6549	1dp
Channel.4.Main.IPAdjustState	Input Adjust state (0 = Unadjusted; 1 = Adjusted)	bool	1996	6550	Not applicable
Channel.4.Main.IPAdjustState2	Secondary Input Adjust state (0 = Unadjusted; 1 = Adjusted)	bool	199c	6556	Not applicable
Channel.4.Main.LinType	Linearization type (as for Channel.1.Main.LinType)	uint8	1986	6534	Not applicable
Channel.4.Main.MeasuredValue	Input value before linearization, scaling, adjust etc.	float32	1994	6548	Set by Channel.4.Main.Resolution
Channel.4.Main.MeasuredValue2	Measured value of the secondary input	float32	1999	6553	Set by Channel.4.Main.Resolution
Channel.4.Main.Offset	Fixed value to be added to/subtracted from PV	float32	1997	6551	3dp
Channel.4.Main.Offset2	Secondary input offset	float32	1998	6552	3dp
Channel.4.Main.OpenString	Open String	string_t	4987	18823	Not applicable
Channel.4.Main.PV	The output (displayed) value of the channel.	float32	010c	268	Set by Channel.4.Main.Resolution
Channel.4.Main.PV2	The secondary input process variable (output) of the channel	float32	011c	284	Set by Channel.4.Main.Resolution
Channel.4.Main.RangeHigh	Range high value	float32	1988	6536	Set by Channel.4.Main.Resolution
Channel.4.Main.RangeLow	Range low value	float32	1987	6535	Set by Channel.4.Main.Resolution
Channel.4.Main.RangeUnits	Range units (as channel.1.Main.RangeUnits)	uint8	1989	6537	Not applicable
Channel.4.Main.Resolution	Specifies the resolution/number of decimal places	uint8	1981	6529	Not applicable
Channel.4.Main.ScaleHigh	Scale high value	float32	198b	6539	Set by Channel.4.Main.Resolution
Channel.4.Main.ScaleHigh2	Scale high value for the secondary input	float32	199b	6555	Set by Channel.4.Main.Resolution
Channel.4.Main.ScaleLow	Scale low value	float32	198a	6538	Set by Channel.4.Main.Resolution
Channel.4.Main.ScaleLow2	Scale low value for the secondary input	float32	199a	6554	Set by Channel.4.Main.Resolution
Channel.4.Main.SensorBreakType	Sensor break type (as for Channel.1.Main)	uint8	198f	6543	Not applicable
Channel.4.Main.SensorBreakVal	Sensor break value	uint8	1991	6545	Not applicable
Channel.4.Main.Shunt	Shunt value in Ohms	float32	1985	6533	2dp
Channel.4.Main.Status	Channel status (as for Channel.1.Main.Status)	uint8	010d	269	Not applicable
Channel.4.Main.Status2	The secondary input PV (output) status	uint8	011d	285	Not applicable
Channel.4.Main.TestSignal	Channel test waveform (as for Channel.1.Main.TestSignal)	uint8	1982	6530	Not applicable

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Channel.4.Main.Type	Channel function (as for Channel.1.Main.Type)	uint8	1980	6528	Not applicable
Channel.4.Main.Units	Units descriptor	string_t	4966	18790	Not applicable
Channel.4.Trend.Colour	Trend colour (as for Channel.1.Trend.Colour)	uint8	19a0	6560	Not applicable
Channel.4.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	19a2	6562	Same as Channel.4.Main.PV
Channel.4.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	19a1	6561	Same as Channel.4.Main.PV
DCOutput.1A1B_DCOP.FallbackPV	Fallback PV value	float32	15c9	5577	Set by DCOutput.1A1B_DCOP.Resolution
DCOutput.1A1B_DCOP.MeasuredValue	Measured Value	float32	15ca	5578	2dp
DCOutput.1A1B_DCOP.OPAdjustState	0 = Unadjusted, 1 = Adjusted	bool	15c3	5571	Not applicable
DCOutput.1A1B_DCOP.OutputHigh	DC Output High value	float32	15c6	5574	2dp
DCOutput.1A1B_DCOP.OutputLow	DC Output Low value	float32	15c5	5573	2dp
DCOutput.1A1B_DCOP.PV	DC Output PV	float32	15c1	5569	Set by DCOutput.1A1B_DCOP.Resolution
DCOutput.1A1B_DCOP.Resolution	Specifies the resolution/number of decimal places	uint8	15c4	5572	Not applicable
DCOutput.1A1B_DCOP.ScaleHigh	Scale High value	float32	15c8	5576	Set by DCOutput.1A1B_DCOP.Resolution
DCOutput.1A1B_DCOP.ScaleLow	Scale Low value	float32	15c7	5575	Set by DCOutput.1A1B_DCOP.Resolution
DCOutput.1A1B_DCOP.Status	PV Status 0 = Good 1 = Off 2 = Over range 3 = Under range 4 = HW error 5 = Ranging 6 = Overflow 7 = Bad 8 = HW exceeded 9 = No data	uint8	15c2	5570	Not applicable
DCOutput.1A1B_DCOP.Type	DC Output Type (0 = Volts; 1 = mA)	uint8	15c0	5568	Not applicable
DCOutput.2A2B_DCOP.FallbackPV	Fallback PV value	float32	15b9	5561	Set by DCOutput.2A2B_DCOP.Resolution
DCOutput.2A2B_DCOP.MeasuredValue	Measured Value	float32	15ba	5562	2dp
DCOutput.2A2B_DCOP.OPAdjustState	0 = Unadjusted, 1 = Adjusted	bool	15b3	5555	Not applicable
DCOutput.2A2B_DCOP.OutputHigh	DC Output High value	float32	15b6	5558	2dp
DCOutput.2A2B_DCOP.OutputLow	DC Output Low value	float32	15b5	5557	2dp
DCOutput.2A2B_DCOP.PV	DC Output PV	float32	15b1	5553	Set by DCOutput.2A2B_DCOP.Resolution
DCOutput.2A2B_DCOP.Resolution	Specifies the resolution/number of decimal places	uint8	15b4	5556	Not applicable
DCOutput.2A2B_DCOP.ScaleHigh	Scale High value	float32	15b8	5560	Set by DCOutput.2A2B_DCOP.Resolution
DCOutput.2A2B_DCOP.ScaleLow	Scale Low value	float32	15b7	5559	Set by DCOutput.2A2B_DCOP.Resolution
DCOutput.2A2B_DCOP.Status	PV Status (as DCOutput.1A1B_DCOP.Status)	uint8	15b2	5554	Not applicable
DCOutput.2A2B_DCOP.Type	DC Output Type (0 = Volts; 1 = mA)	uint8	15b0	5552	Not applicable
DCOutput.3A3B_DCOP.FallbackPV	Fallback PV value	float32	15a9	5545	Set by DCOutput.3A3B_DCOP.Resolution
DCOutput.3A3B_DCOP.MeasuredValue	Measured Value	float32	15aa	5546	2dp
DCOutput.3A3B_DCOP.OPAdjustState	0 = Unadjusted, 1 = Adjusted	bool	15a3	5539	Not applicable
DCOutput.3A3B_DCOP.OutputHigh	DC Output High value	float32	15a6	5542	2dp
DCOutput.3A3B_DCOP.OutputLow	DC Output Low value	float32	15a5	5541	2dp
DCOutput.3A3B_DCOP.PV	DC Output PV	float32	15a1	5537	Set by DCOutput.3A3B_DCOP.Resolution
DCOutput.3A3B_DCOP.Resolution	Specifies the resolution/number of decimal places	uint8	15a4	5540	Not applicable
DCOutput.3A3B_DCOP.ScaleHigh	Scale High value	float32	15a8	5544	Set by DCOutput.3A3B_DCOP.Resolution
DCOutput.3A3B_DCOP.ScaleLow	Scale Low value	float32	15a7	5543	Set by DCOutput.3A3B_DCOP.Resolution
DCOutput.3A3B_DCOP.Status	PV Status (as DCOutput.1A1B_DCOP.Status)	uint8	15a2	5538	Not applicable
DCOutput.3A3B_DCOP.Type	DC Output Type (0 = Volts; 1 = mA)	uint8	15a0	5536	Not applicable
DigitalIO.1A1B.Backlash	Valve positioning backlash compensation (seconds)	float32	1508	5384	1dp
DigitalIO.1A1B.Inertia	Inertia value for the valve	float32	1507	5383	1dp
DigitalIO.1A1B.Invert	1 = Invert; 0 = Do not invert	bool	1503	5379	Not applicable
DigitalIO.1A1B.MinOnTime	Time proportioned output minimum on time	float32	1502	5378	2dp
DigitalIO.1A1B.ModuleIdent	Module Identification 0 = Digital I/O 1 = Relay output 2 = Triac output 3 = Digital input 4 = Digital output	uint8	150a	5386	Not applicable
DigitalIO.1A1B.Output	0 = Output off, 1 = Output on	bool	1504	5380	Not applicable
DigitalIO.1A1B.PV	For contact inputs, 0 = Open, 1 = Closed. For On Off outputs, <0.5 = Drive low, else drive high For Time Proportional outputs, PV = demanded output %	float32	1501	5377	0dp
DigitalIO.1A1B.StandbyAction	Valve positioning standby action (0 = Continue; 1 = Freeze).	uint8	1509	5385	Not applicable
DigitalIO.1A1B.Type	Specifies the type of the digital input / output 0 = Contact closure input 1 = On Off output 2 = Time proportioning output 3 = Valve raise 4 = Valve lower	uint8	1500	5376	Not applicable
DigitalIO.2A2B.Backlash	Valve positioning backlash compensation (seconds)	float32	1518	5400	1dp
DigitalIO.2A2B.Inertia	Inertia value for the valve	float32	1517	5399	1dp
DigitalIO.2A2B.Invert	1 = Invert; 0 = Do not invert	bool	1513	5395	Not applicable
DigitalIO.2A2B.MinOnTime	Time proportioned output minimum on time	float32	1512	5394	2dp
DigitalIO.2A2B.ModuleIdent	As DigitalIO.1A1B.ModuleIdent	uint8	151a	5402	Not applicable
DigitalIO.2A2B.Output	0 = Output off, 1 = Output on	bool	1514	5396	Not applicable
DigitalIO.2A2B.PV	Digital I/O process value (as DigitalIO.1A1B.PV)	float32	1511	5393	0dp
DigitalIO.2A2B.StandbyAction	Valve positioning standby action (0 = Continue; 1 = Freeze).	uint8	1519	5401	Not applicable
DigitalIO.2A2B.Type	Digital I/O type (as DigitalIO.1A1B.Type).	uint8	1510	5392	Not applicable
DigitalIO.3A3B.Backlash	Valve positioning backlash compensation (seconds)	float32	1538	5432	1dp
DigitalIO.3A3B.Inertia	Inertia value for the valve	float32	1537	5431	1dp
DigitalIO.3A3B.Invert	1 = Invert; 0 = Do not invert	bool	1533	5427	Not applicable
DigitalIO.3A3B.MinOnTime	Time proportioned output minimum on time	float32	1532	5426	2dp
DigitalIO.3A3B.ModuleIdent	As DigitalIO.1A1B.ModuleIdent	uint8	153a	5434	Not applicable
DigitalIO.3A3B.Output	0 = Output off, 1 = Output on	bool	1534	5428	Not applicable
DigitalIO.3A3B.PV	Digital I/O process value (as DigitalIO.1A1B.PV)	float32	1531	5425	0dp
DigitalIO.3A3B.StandbyAction	Valve positioning standby action (0 = Continue; 1 = Freeze).	uint8	1539	5433	Not applicable
DigitalIO.3A3B.Type	Digital I/O type (as DigitalIO.1A1B.Type).	uint8	1530	5424	Not applicable

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DigitalIO.DI_LALC.Backlash	Valve positioning backlash compensation (seconds)	float32	1528	5416	1dp
DigitalIO.DI_LALC.Inertia	Inertia value for the valve	float32	1527	5415	1dp
DigitalIO.DI_LALC.Invert	1 = Invert; 0 = Do not invert	bool	1523	5411	Not applicable
DigitalIO.DI_LALC.MinOnTime	Time proportioned output minimum on time	float32	1522	5410	2dp
DigitalIO.DI_LALC.ModuleIdent	As DigitalIO.1A1B.ModuleIdent	uint8	152a	5418	Not applicable
DigitalIO.DI_LALC.Output	0 = Output off, 1 = Output on	bool	1524	5412	Not applicable
DigitalIO.DI_LALC.PV	Digital I/O process value (as DigitalIO.1A1B.PV)	float32	1521	5409	0dp
DigitalIO.DI_LALC.StandbyAction	Valve positioning standby action (0 = Continue; 1 = Freeze).	uint8	1529	5417	Not applicable
DigitalIO.DI_LALC.Type	Digital I/O type (as DigitalIO.1A1B.Type).	uint8	1520	5408	Not applicable
DigitalIO.DI_LBLC.Backlash	Valve positioning backlash compensation (seconds)	float32	1548	5448	1dp
DigitalIO.DI_LBLC.Inertia	Inertia value for the valve	float32	1547	5447	1dp
DigitalIO.DI_LBLC.Invert	1 = Invert; 0 = Do not invert	bool	1543	5443	Not applicable
DigitalIO.DI_LBLC.MinOnTime	Time proportioned output minimum on time	float32	1542	5442	2dp
DigitalIO.DI_LBLC.ModuleIdent	As DigitalIO.1A1B.ModuleIdent	uint8	154a	5450	Not applicable
DigitalIO.DI_LBLC.Output	0 = Output off, 1 = Output on	bool	1544	5444	Not applicable
DigitalIO.DI_LBLC.PV	Digital I/O process value (as DigitalIO.1A1B.PV)	float32	1541	5441	0dp
DigitalIO.DI_LBLC.StandbyAction	Valve positioning standby action (0 = Continue; 1 = Freeze).	uint8	1549	5449	Not applicable
DigitalIO.DI_LBLC.Type	Digital I/O type (as DigitalIO.1A1B.Type).	uint8	1540	5440	Not applicable
DigitalIO.RELAY_4AC.Backlash	Valve positioning backlash compensation (seconds)	float32	1558	5464	1dp
DigitalIO.RELAY_4AC.Inertia	Inertia value for the valve	float32	1557	5463	1dp
DigitalIO.RELAY_4AC.Invert	1 = Invert; 0 = Do not invert	bool	1553	5459	Not applicable
DigitalIO.RELAY_4AC.MinOnTime	Time proportioned output minimum on time	float32	1552	5458	2dp
DigitalIO.RELAY_4AC.ModuleIdent	As DigitalIO.1A1B.ModuleIdent	uint8	155a	5466	Not applicable
DigitalIO.RELAY_4AC.Output	0 = Output off, 1 = Output on	bool	1554	5460	Not applicable
DigitalIO.RELAY_4AC.PV	Digital I/O process value (as DigitalIO.1A1B.PV)	float32	1551	5457	0dp
DigitalIO.RELAY_4AC.StandbyAction	Valve positioning standby action (0 = Continue; 1 = Freeze).	uint8	1559	5465	Not applicable
DigitalIO.RELAY_4AC.Type	Digital I/O type (as DigitalIO.1A1B.Type).	uint8	1550	5456	Not applicable
DigitalIO.RELAY_5AC.Backlash	Valve positioning backlash compensation (seconds)	float32	1568	5480	1dp
DigitalIO.RELAY_5AC.Inertia	Inertia value for the valve	float32	1567	5479	1dp
DigitalIO.RELAY_5AC.Invert	1 = Invert; 0 = Do not invert	bool	1563	5475	Not applicable
DigitalIO.RELAY_5AC.MinOnTime	Time proportioned output minimum on time	float32	1562	5474	2dp
DigitalIO.RELAY_5AC.ModuleIdent	As DigitalIO.1A1B.ModuleIdent	uint8	156a	5482	Not applicable
DigitalIO.RELAY_5AC.Output	0 = Output off, 1 = Output on	bool	1564	5476	Not applicable
DigitalIO.RELAY_5AC.PV	Digital I/O process value (as DigitalIO.1A1B.PV)	float32	1561	5473	0dp
DigitalIO.RELAY_5AC.StandbyAction	Valve positioning standby action (0 = Continue; 1 = Freeze).	uint8	1569	5481	Not applicable
DigitalIO.RELAY_5AC.Type	Digital I/O type (as DigitalIO.1A1B.Type).	uint8	1560	5472	Not applicable
EthernetIP.ImplicitInputs.Input1	Read only input from an EtherNet/IP client	eint32	7e66	32358	Not applicable
EthernetIP.ImplicitInputs.Input2	See input 1 for details	eint32	7e6a	32362	Not applicable
EthernetIP.ImplicitInputs.Input3	See input 1 for details	eint32	7e6e	32366	Not applicable
EthernetIP.ImplicitInputs.Input4	See input 1 for details	eint32	7e72	32370	Not applicable
EthernetIP.ImplicitInputs.Input5	See input 1 for details	eint32	7e76	32374	Not applicable
EthernetIP.ImplicitInputs.Input6	See input 1 for details	eint32	7e7a	32378	Not applicable
EthernetIP.ImplicitInputs.Input7	See input 1 for details	eint32	7e7e	32382	Not applicable
EthernetIP.ImplicitInputs.Input8	See input 1 for details	eint32	7e82	32386	Not applicable
EthernetIP.ImplicitInputs.Input9	See input 1 for details	eint32	7e86	32390	Not applicable
EthernetIP.ImplicitInputs.Input10	See input 1 for details	eint32	7e8a	32394	Not applicable
EthernetIP.ImplicitInputs.Input11	See input 1 for details	eint32	7e8e	32398	Not applicable
EthernetIP.ImplicitInputs.Input12	See input 1 for details	eint32	7e92	32402	Not applicable
EthernetIP.ImplicitInputs.Input13	See input 1 for details	eint32	7e96	32406	Not applicable
EthernetIP.ImplicitInputs.Input14	See input 1 for details	eint32	7e9a	32410	Not applicable
EthernetIP.ImplicitInputs.Input15	See input 1 for details	eint32	7e9e	32414	Not applicable
EthernetIP.ImplicitInputs.Input16	See input 1 for details	eint32	7ea2	32418	Not applicable
EthernetIP.ImplicitInputs.Input17	See input 1 for details	eint32	7ea6	32422	Not applicable
EthernetIP.ImplicitInputs.Input18	See input 1 for details	eint32	7eaa	32426	Not applicable
EthernetIP.ImplicitInputs.Input19	See input 1 for details	eint32	7eae	32430	Not applicable
EthernetIP.ImplicitInputs.Input20	See input 1 for details	eint32	7eb2	32434	Not applicable
EthernetIP.ImplicitInputs.Input21	See input 1 for details	eint32	7eb6	32438	Not applicable
EthernetIP.ImplicitInputs.Input22	See input 1 for details	eint32	7eba	32442	Not applicable
EthernetIP.ImplicitInputs.Input23	See input 1 for details	eint32	7ebe	32446	Not applicable
EthernetIP.ImplicitInputs.Input24	See input 1 for details	eint32	7ec2	32450	Not applicable
EthernetIP.ImplicitInputs.Input25	See input 1 for details	eint32	7ec6	32454	Not applicable
EthernetIP.ImplicitInputs.Input26	See input 1 for details	eint32	7eca	32458	Not applicable
EthernetIP.ImplicitInputs.Input27	See input 1 for details	eint32	7ece	32462	Not applicable
EthernetIP.ImplicitInputs.Input28	See input 1 for details	eint32	7ed2	32466	Not applicable
EthernetIP.ImplicitInputs.Input29	See input 1 for details	eint32	7ed6	32470	Not applicable
EthernetIP.ImplicitInputs.Input30	See input 1 for details	eint32	7eda	32474	Not applicable
EthernetIP.ImplicitInputs.Input31	See input 1 for details	eint32	7ede	32478	Not applicable
EthernetIP.ImplicitInputs.Input32	See input 1 for details	eint32	7ee2	32482	Not applicable
EthernetIP.ImplicitInputs.Input33	See input 1 for details	eint32	7ee6	32486	Not applicable
EthernetIP.ImplicitInputs.Input34	See input 1 for details	eint32	7eea	32490	Not applicable
EthernetIP.ImplicitInputs.Input35	See input 1 for details	eint32	7eee	32494	Not applicable
EthernetIP.ImplicitInputs.Input36	See input 1 for details	eint32	7ef2	32498	Not applicable
EthernetIP.ImplicitInputs.Input37	See input 1 for details	eint32	7ef6	32502	Not applicable
EthernetIP.ImplicitInputs.Input38	See input 1 for details	eint32	7efa	32506	Not applicable
EthernetIP.ImplicitInputs.Input39	See input 1 for details	eint32	7efe	32510	Not applicable
EthernetIP.ImplicitInputs.Input40	See input 1 for details	eint32	7f02	32514	Not applicable
EthernetIP.ImplicitInputs.Input41	See input 1 for details	eint32	7f06	32518	Not applicable







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Parameter path	Description	Type	Hex	Dec	Resolution
EthernetIP.InputTags.Input1	A read only input from a PLC device	string_t	7838	30776	Not applicable
EthernetIP.InputTags.Input2	See input 1 for details	string_t	7839	30777	Not applicable
EthernetIP.InputTags.Input3	See input 1 for details	string_t	783a	30778	Not applicable
EthernetIP.InputTags.Input4	See input 1 for details	string_t	783b	30779	Not applicable
EthernetIP.InputTags.Input5	See input 1 for details	string_t	783c	30780	Not applicable
EthernetIP.InputTags.Input6	See input 1 for details	string_t	783d	30781	Not applicable
EthernetIP.InputTags.Input7	See input 1 for details	string_t	783e	30782	Not applicable
EthernetIP.InputTags.Input8	See input 1 for details	string_t	783f	30783	Not applicable
EthernetIP.InputTags.Input9	See input 1 for details	string_t	7840	30784	Not applicable
EthernetIP.InputTags.Input10	See input 1 for details	string_t	7841	30785	Not applicable
EthernetIP.InputTags.Input11	See input 1 for details	string_t	7842	30786	Not applicable
EthernetIP.InputTags.Input12	See input 1 for details	string_t	7843	30787	Not applicable
EthernetIP.InputTags.Input13	See input 1 for details	string_t	7844	30788	Not applicable
EthernetIP.InputTags.Input14	See input 1 for details	string_t	7845	30789	Not applicable
EthernetIP.InputTags.Input15	See input 1 for details	string_t	7846	30790	Not applicable
EthernetIP.InputTags.Input16	See input 1 for details	string_t	7847	30791	Not applicable
EthernetIP.InputTags.Input17	See input 1 for details	string_t	7848	30792	Not applicable
EthernetIP.InputTags.Input18	See input 1 for details	string_t	7849	30793	Not applicable
EthernetIP.InputTags.Input19	See input 1 for details	string_t	784a	30794	Not applicable
EthernetIP.InputTags.Input20	See input 1 for details	string_t	784b	30795	Not applicable
EthernetIP.InputTags.Input21	See input 1 for details	string_t	784c	30796	Not applicable
EthernetIP.InputTags.Input22	See input 1 for details	string_t	784d	30797	Not applicable
EthernetIP.InputTags.Input23	See input 1 for details	string_t	784e	30798	Not applicable
EthernetIP.InputTags.Input24	See input 1 for details	string_t	784f	30799	Not applicable
EthernetIP.InputTags.Input25	See input 1 for details	string_t	7850	30800	Not applicable
EthernetIP.InputTags.Input26	See input 1 for details	string_t	7851	30801	Not applicable
EthernetIP.InputTags.Input27	See input 1 for details	string_t	7852	30802	Not applicable
EthernetIP.InputTags.Input28	See input 1 for details	string_t	7853	30803	Not applicable
EthernetIP.InputTags.Input29	See input 1 for details	string_t	7854	30804	Not applicable
EthernetIP.InputTags.Input30	See input 1 for details	string_t	7855	30805	Not applicable
EthernetIP.Main.ConfigInstance	Configuration assembly instance number	int16	7ffa	32762	Not applicable
EthernetIP.Main.ConfigSize	Configuration assembly data size in bytes	int16	7ffb	32763	Not applicable
EthernetIP.Main.ConnectionType	Implicit I/O connection type (0 = Point to point; 1 = Multicast)	uint8	7ffe	32766	Not applicable
EthernetIP.Main.Explicit1	Explicit TCP connection 1	string_t	65f1	26097	Not applicable
EthernetIP.Main.Explicit2	Explicit TCP connection 2	string_t	6601	26113	Not applicable
EthernetIP.Main.ImplicitIO	Implicit I/O data channel	string_t	65e1	26081	Not applicable
EthernetIP.Main.InputInstance	Implicit input assembly instance number	int16	7ff6	32758	Not applicable
EthernetIP.Main.InputSize	Implicit input assembly data size in bytes	int16	7ff7	32759	Not applicable
EthernetIP.Main.Mode	EtherNet/IP operation mode 0 = Server    1 = Client (IO)    2 = Client (Tags)	uint8	7fff	32767	Not applicable
EthernetIP.Main.Multicast	Implicit I/O data channel multicast address	string_t	6611	26129	Not applicable
EthernetIP.Main.NetworkStatusCode	EtherNet/IP communications network status 0 = Offline    2 = On line    3 = Connection timeout 4 = Duplicate IP address    5 = Initialisation	uint8	7e64	32356	Not applicable
EthernetIP.Main.OutputInstance	Implicit output assembly instance number	int16	7ff8	32760	Not applicable
EthernetIP.Main.OutputSize	Implicit output assembly data size in bytes	int16	7ff9	32761	Not applicable
EthernetIP.Main.Priority	Level of message priority 0 = Low    1 = High    2 = Scheduled    3 = Urgent	uint8	7ffc	32764	Not applicable
EthernetIP.Main.ResetComms	Resets the client or server communications (0 = No; 1 = Yes)	uint8	7e63	32355	Not applicable
EthernetIP.Main.Rpi	Requested Packet Interval (milliseconds)	int16	7ffd	32765	Not applicable
EthernetIP.Main.ServerAddress	IP address of a server device	string_t	7129	28969	Not applicable
EthernetIP.Main.SlotNumber	PLC slot number	int16	7e60	32352	Not applicable
EthernetIP.Main.TagStatusCode	EtherNet/IP Tag server status code (see Figure 87)	uint8	7e62	32354	Not applicable
EthernetIP.Main.UCMM	Unconnected Message Manager (UCMM)	string_t	65d1	26065	Not applicable
EthernetIP.OutputTags.Output1	Writeable output to the PLC device	string_t	7880	30848	Not applicable
EthernetIP.OutputTags.Output2	See output 1 for details	string_t	7881	30849	Not applicable
EthernetIP.OutputTags.Output3	See output 1 for details	string_t	7882	30850	Not applicable
EthernetIP.OutputTags.Output4	See output 1 for details	string_t	7883	30851	Not applicable
EthernetIP.OutputTags.Output5	See output 1 for details	string_t	7884	30852	Not applicable
EthernetIP.OutputTags.Output6	See output 1 for details	string_t	7885	30853	Not applicable
EthernetIP.OutputTags.Output7	See output 1 for details	string_t	7886	30854	Not applicable
EthernetIP.OutputTags.Output8	See output 1 for details	string_t	7887	30855	Not applicable
EthernetIP.OutputTags.Output9	See output 1 for details	string_t	7888	30856	Not applicable
EthernetIP.OutputTags.Output10	See output 1 for details	string_t	7889	30857	Not applicable
EthernetIP.OutputTags.Output11	See output 1 for details	string_t	788a	30858	Not applicable
EthernetIP.OutputTags.Output12	See output 1 for details	string_t	788b	30859	Not applicable
EthernetIP.OutputTags.Output13	See output 1 for details	string_t	788c	30860	Not applicable
EthernetIP.OutputTags.Output14	See output 1 for details	string_t	788d	30861	Not applicable
EthernetIP.OutputTags.Output15	See output 1 for details	string_t	788e	30862	Not applicable
EthernetIP.OutputTags.Output16	See output 1 for details	string_t	788f	30863	Not applicable
EthernetIP.OutputTags.Output17	See output 1 for details	string_t	7890	30864	Not applicable
EthernetIP.OutputTags.Output18	See output 1 for details	string_t	7891	30865	Not applicable
EthernetIP.OutputTags.Output19	See output 1 for details	string_t	7892	30866	Not applicable
EthernetIP.OutputTags.Output20	See output 1 for details	string_t	7893	30867	Not applicable
EthernetIP.OutputTags.Output21	See output 1 for details	string_t	7894	30868	Not applicable
EthernetIP.OutputTags.Output22	See output 1 for details	string_t	7895	30869	Not applicable
EthernetIP.OutputTags.Output23	See output 1 for details	string_t	7896	30870	Not applicable
EthernetIP.OutputTags.Output24	See output 1 for details	string_t	7897	30871	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
EthernetIP.OutputTags.Output25	See output 1 for details	string_t	7898	30872	Not applicable
EthernetIP.OutputTags.Output26	See output 1 for details	string_t	7899	30873	Not applicable
EthernetIP.OutputTags.Output27	See output 1 for details	string_t	789a	30874	Not applicable
EthernetIP.OutputTags.Output28	See output 1 for details	string_t	789b	30875	Not applicable
EthernetIP.OutputTags.Output29	See output 1 for details	string_t	789c	30876	Not applicable
EthernetIP.OutputTags.Output30	See output 1 for details	string_t	789d	30877	Not applicable
Group.Recording.Channel1En	Channel 1 enable (0 = Disabled; 1 = Enabled)	bool	1023	4131	Not applicable
Group.Recording.Channel2En	Channel 2 enable (0 = Disabled; 1 = Enabled)	bool	1024	4132	Not applicable
Group.Recording.Channel3En	Channel 3 enable (0 = Disabled; 1 = Enabled)	bool	1025	4133	Not applicable
Group.Recording.Channel4En	Channel 4 enable (0 = Disabled; 1 = Enabled)	bool	1026	4134	Not applicable
Group.Recording.Compression	The UHH file compression rate (0 = Normal; 1 = High)	uint8	1040	4160	Not applicable
Group.Recording.Enable	0 = Recording disabled; 1 = Recording enabled	uint8	1020	4128	Not applicable
Group.Recording.FlashDuration	Time in days until flash history files begin to be overwritten	float32	1039	4153	2dp
Group.Recording.FlashFree	Size of the internal flash in MBytes	float32	1038	4152	2dp
Group.Recording.FlashSize	Size of the internal flash in MBytes	float32	1037	4151	2dp
Group.Recording.Interval	Recording interval 0 = 0.125 secs    1 = 0.25 secs    2 = 0.5 secs 3 = 1Hz            4 = 2 sec            5 = 5 sec 6 = 10 sec        7 = 20 sec        8 = 30 sec 9 = 1 min         10 = 2 min        11 = 5 min 12 = 10 min      13 = 20 min      14 = 30 min 15 = 1 hr	int32	1022	4130	Not applicable
Group.Recording.Status	Recording status 0 = Not recording    1 = Disabled 2 = Messages only    3 = Recording enabled 4 = Recording paused	int16	1036	4150	Not applicable
Group.Recording.Suspend	1 = Suspend recording	bool	1035	4149	Not applicable
Group.Recording.VirtualChan1En	Virtual Channel 1 enable (0 = Disabled; 1 = Enabled)	bool	1027	4135	Not applicable
Group.Recording.VirtualChan2En	Virtual Channel 2 enable (0 = Disabled; 1 = Enabled)	bool	1028	4136	Not applicable
Group.Recording.VirtualChan3En	Virtual Channel 3 enable (0 = Disabled; 1 = Enabled)	bool	1029	4137	Not applicable
Group.Recording.VirtualChan4En	Virtual Channel 4 enable (0 = Disabled; 1 = Enabled)	bool	102a	4138	Not applicable
Group.Recording.VirtualChan5En	Virtual Channel 5 enable (0 = Disabled; 1 = Enabled)	bool	102b	4139	Not applicable
Group.Recording.VirtualChan6En	Virtual Channel 6 enable (0 = Disabled; 1 = Enabled)	bool	102c	4140	Not applicable
Group.Recording.VirtualChan7En	Virtual Channel 7 enable (0 = Disabled; 1 = Enabled)	bool	102d	4141	Not applicable
Group.Recording.VirtualChan8En	Virtual Channel 8 enable (0 = Disabled; 1 = Enabled)	bool	102e	4142	Not applicable
Group.Recording.VirtualChan9En	Virtual Channel 9 enable (0 = Disabled; 1 = Enabled)	bool	102f	4143	Not applicable
Group.Recording.VirtualChan10En	Virtual Channel 10 enable (0 = Disabled; 1 = Enabled)	bool	1030	4144	Not applicable
Group.Recording.VirtualChan11En	Virtual Channel 11 enable (0 = Disabled; 1 = Enabled)	bool	1031	4145	Not applicable
Group.Recording.VirtualChan12En	Virtual Channel 12 enable (0 = Disabled; 1 = Enabled)	bool	1032	4146	Not applicable
Group.Recording.VirtualChan13En	Virtual Channel 13 enable (0 = Disabled; 1 = Enabled)	bool	1033	4147	Not applicable
Group.Recording.VirtualChan14En	Virtual Channel 14 enable (0 = Disabled; 1 = Enabled)	bool	1034	4148	Not applicable
Group.Recording.VirtualChan15En	Virtual Channel 15 enable (0 = Disabled; 1 = Enabled)	bool	103a	4154	Not applicable
Group.Recording.VirtualChan16En	Virtual Channel 16 enable (0 = Disabled; 1 = Enabled)	bool	103b	4155	Not applicable
Group.Recording.VirtualChan17En	Virtual Channel 17 enable (0 = Disabled; 1 = Enabled)	bool	103c	4156	Not applicable
Group.Recording.VirtualChan18En	Virtual Channel 18 enable (0 = Disabled; 1 = Enabled)	bool	103d	4157	Not applicable
Group.Recording.VirtualChan19En	Virtual Channel 19 enable (0 = Disabled; 1 = Enabled)	bool	103e	4158	Not applicable
Group.Recording.VirtualChan20En	Virtual Channel 20 enable (0 = Disabled; 1 = Enabled)	bool	103f	4159	Not applicable
Group.Recording.VirtualChan21En	Virtual Channel 21 enable (0 = Disabled; 1 = Enabled)	bool	1041	4161	Not applicable
Group.Recording.VirtualChan22En	Virtual Channel 22 enable (0 = Disabled; 1 = Enabled)	bool	1042	4162	Not applicable
Group.Recording.VirtualChan23En	Virtual Channel 23 enable (0 = Disabled; 1 = Enabled)	bool	1043	4163	Not applicable
Group.Recording.VirtualChan24En	Virtual Channel 24 enable (0 = Disabled; 1 = Enabled)	bool	1044	4164	Not applicable
Group.Recording.VirtualChan25En	Virtual Channel 25 enable (0 = Disabled; 1 = Enabled)	bool	1045	4165	Not applicable
Group.Recording.VirtualChan26En	Virtual Channel 26 enable (0 = Disabled; 1 = Enabled)	bool	1046	4166	Not applicable
Group.Recording.VirtualChan27En	Virtual Channel 27 enable (0 = Disabled; 1 = Enabled)	bool	1047	4167	Not applicable
Group.Recording.VirtualChan28En	Virtual Channel 28 enable (0 = Disabled; 1 = Enabled)	bool	1048	4168	Not applicable
Group.Recording.VirtualChan29En	Virtual Channel 29 enable (0 = Disabled; 1 = Enabled)	bool	1049	4169	Not applicable
Group.Recording.VirtualChan30En	Virtual Channel 30 enable (0 = Disabled; 1 = Enabled)	bool	104a	4170	Not applicable
Group.Trend.Descriptor	Group descriptor	string_t	5b00	23296	Not applicable
Group.Trend.Interval	Trend interval. As Group.Recording.Interval, above	int32	1002	4098	Not applicable
Group.Trend.MajorDivisions	Number of major divisions	uint8	1004	4100	Not applicable
Group.Trend.Point1	1st point in the group (VCh = Virtual channel) 0 = No trend    1 = Channel 1    2 = Channel 2 3 = Channel 3    4 = Channel 4    5 = VCh1 6 = VCh2        7 = VCh3        8 = VCh4 9 = VCh5        10 = VCh6       11 = VCh7 12 = VCh8       13 = VCh9       14 = VCh10 15 = VCh11      16 = VCh12      17 = VCh13 18 = VCh14      19 = VCh15      20 = VCh 16 21 = VCh17      22 = VCh18      23 = VCh 19 24 = VCh20      25 = VCh21      26 = VCh 22 27 = VCh23      28 = VCh24      29 = VCh 25 30 = VCh26      31 = VCh27      32 = VCh 28 33 = VCh29      34 = VCh30	uint8	1006	4102	Not applicable
Group.Trend.Point2	As Group.Trend.Point1 but for 2nd point in group	uint8	1007	4103	Not applicable
Group.Trend.Point3	As Group.Trend.Point1 but for 3rd point in group	uint8	1008	4104	Not applicable
Group.Trend.Point4	As Group.Trend.Point1 but for 4th point in group	uint8	1009	4105	Not applicable
Group.Trend.Point5	As Group.Trend.Point1 but for 5th point in group	uint8	100a	4106	Not applicable
Group.Trend.Point6	As Group.Trend.Point1 but for 6th point in group	uint8	100b	4107	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
Instrument.Clock.Date	Local Date	string_t	4400	17408	Not applicable
Instrument.Clock.DST	1 = DST active; 0 = DST not active	bool	1082	4226	Not applicable
Instrument.Clock.Time	Local time (including Zone and DST effects)	time_t	1081	4225	Set by Network.Modbus.TimeFormat
Instrument.Display.AlarmPanel	1 = Alarm Panel display mode enabled	bool	10eb	4331	Not applicable
Instrument.Display.Brightness	Display brightness 10 = 10%; 20 = 20% etc. (whole decades)	uint8	1090	4240	Not applicable
Instrument.Display.Cascade	1 = Cascade control display mode enabled	bool	10f2	4338	Not applicable
Instrument.Display.DualLoopControl	1 = Dual loop control display mode enabled	bool	109b	4251	Not applicable
Instrument.Display.EIPServerPage	1 = EtherNet/IPdisplay mode enabled	bool	10ef	4335	Not applicable
Instrument.Display.FaceplateCycling	1 = Faceplate cycling On	bool	109e	4254	Not applicable
Instrument.Display.FutureTrend	1 = Future trend display mode enabled	bool	10fb	4347	Not applicable
Instrument.Display.FutureTrend1Colour	Future trend colour(1) (As Channel.1.Trend.Colour)	uint8	10fc	4348	Not applicable
Instrument.Display.FutureTrend2Colour	Future trend colour(2) (As Channel.1.Trend.Colour)	uint8	10fd	4349	Not applicable
Instrument.Display.HistoryBackground	History background colour 0 = Black; 1 = Dark gray; 2 = Light gray; 3 = White	uint8	10a8	4264	Not applicable
Instrument.Display.HomePage	Home page	uint8	1093	4243	Not applicable
Instrument.Display.HorizontalBar	1 = Horizontal bar mode enabled	bool	1098	4248	Not applicable
Instrument.Display.HorizontalTrend	1 = Horizontal trend mode enabled	bool	1096	4246	Not applicable
Instrument.Display.HPageTimeout	Home time out value in minutes (0 = no timeout)	int16	1094	4244	Not applicable
Instrument.Display.HTrendScaling	0 = hide horizontal trend scale; 1 = scale permanent	uint8	109d	4253	Not applicable
Instrument.Display.LoopControl	1 = Loop control display mode enabled	bool	109a	4250	Not applicable
Instrument.Display.LoopSetpointColour	Loop setpoint colour (As Channel.1.Trend.Colour)	uint8	109f	4255	Not applicable
Instrument.Display.ModbusMaster	1 = Modbus Master display mode enabled	bool	10ee	4334	Not applicable
Instrument.Display.NumberFormat	Number format (0 = Rounded; 1 - Truncated)	uint8	10fe	4350	Not applicable
Instrument.Display.Numeric	1 = Numeric display mode enabled	bool	1099	4249	Not applicable
Instrument.Display.Programmer	1 = Programmer interface display mode enabled	bool	10f3	4339	Not applicable
Instrument.Display.PromoteListView	1 = Promote list display mode enabled	bool	10ea	4330	Not applicable
Instrument.Display.ScreenSaverAfter	Screen save after (in minutes)	int16	1091	4241	Not applicable
Instrument.Display.ScreenSaverBrightness	Screen saver brightness 10 = 10%; 20 = 20% etc. (whole decades only)	uint8	1092	4242	Not applicable
Instrument.Display.SteriliserPage	1 = Steriliser display mode enabled	bool	10ec	4332	Not applicable
Instrument.Display.TrendBackground	Trend chart colour: 0 = Black; 1 = Dark Gray; 2 = Light gray; 3 = White.	uint8	109c	4252	Not applicable
Instrument.Display.VerticalBar	1 = Vertical bar display mode enabled	bool	1097	4247	Not applicable
Instrument.Display.VerticalTrend	1 = Vertical trend display mode enabled	bool	1095	4245	Not applicable
Instrument.Info.Bootrom	Instrument bootrom version	string_t	447a	17530	Not applicable
Instrument.Info.CompanyID	Company identification. Always returns 1280	int16	0079	121	Not applicable
Instrument.Info.ConfigRev	The instrument configuration revision number	int32	10a0	4256	Not applicable
Instrument.Info.IM	Instrument mode Operating: All algorithms and I/O active. Standby: Control o/p off. Absolute alarms active Engineer: All outputs inactive.	uint8	00c7	199	Not applicable
Instrument.Info.LineVoltage	Displays the current line voltage	float32	10a6	4262	1dp
Instrument.Info.MicroBoardIssue	Micro Board Issue	uint8	10aa	4266	Not applicable
Instrument.Info.Name	The instrument descriptor	string_t	445f	17503	Not applicable
Instrument.Info.NvolWrites	Displays the number of non-volatile writes performed	int32	10a5	4261	Not applicable
Instrument.Info.PSUType	PSU type. 0 = 240Vac; 1 = 24v ac/dc	uint8	10a9	4265	Not applicable
Instrument.Info.SecurityRev	The instrument security revision number	int32	10a4	4260	Not applicable
Instrument.Info.Type	Instrument type	uint8	10a2	4258	Not applicable
Instrument.Info.Version	Instrument version	string_t	4474	17524	Not applicable
Instrument.Info.WiresFree	Number of wires free	int16	10ab	4267	Not applicable
Instrument.IOFitted.1A1B	I/O fitted at terminals 1A1B 0 = Digital IO    1= Non-isolated dc op (mA only) 2 = Relay op     3 = TRIAC 1a1b 4 = Relay OP     5 = Isolated dc op (V/mA) 6 = Digital ip    7 = Isolated dc output (mA only) 8 = Digital op    9 = Relay op 10 = Triac 2A2B	uint8	10f4	4340	Not applicable
Instrument.IOFitted.2A2B	I/O fitted at terminals 2A2B (as for 1A1B above)	uint8	10f5	4341	Not applicable
Instrument.IOFitted.3A3B	I/O type fitted at terminals 3A3B (as for 1A1B above)	uint8	10f7	4343	Not applicable
Instrument.IOFitted.4AC	I/O type fitted at terminals 4AC (as for 1A1B above)	uint8	10f9	4345	Not applicable
Instrument.IOFitted.5AC	I/O type fitted at terminals 5AC (as for 1A1B above)	uint8	10fa	4346	Not applicable
Instrument.IOFitted.LALC	I/O type fitted at terminals LALC (as for 1A1B above)	uint8	10f6	4342	Not applicable
Instrument.IOFitted.LBLC	I/O type fitted at terminals LBLC (as for 1A1B above)	uint8	10f8	4344	Not applicable
Instrument.Locale.DateFormat	Date format (0 = DDMMYY. 1 = MMDDYY; 2 = YYMMDD)	uint8	10b1	4273	Not applicable
Instrument.Locale.DSTenable	1 = Daylight Saving Time enabled	bool	10b3	4275	Not applicable
Instrument.Locale.EndDay	Daylight savings: End day 0 = Sunday    1= Monday    2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday	uint8	10ba	4282	Not applicable
Instrument.Locale.EndMonth	Daylight savings: End month 0 = January    1= February    2 = March 3 = April       4 = May         5 = June 6 = July        7 = August      8 = September 9 = October    10 = November 11 = December	uint8	10bb	4283	Not applicable
Instrument.Locale.EndOn	Week for changing to/from DST 0 = First       1= Second      2 = Third 3 = Fourth      4 = Last        5 = Second to last	uint8	10b9	4281	Not applicable
Instrument.Locale.EndTime	DST end time in hours, minutes, seconds and milliseconds	time_t	10b8	4280	Set by Network.Modbus.TimeFormat
Instrument.Locale.Language	Language (0 = English)	uint8	10b0	4272	Not applicable
Instrument.Locale.StartDay	DST start day. As Instrument.Locale.EndDay, above	uint8	10b6	4278	Not applicable
Instrument.Locale.StartMonth	DST start month As Instrument.Locale.EndMonth, above	uint8	10b7	4279	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
Instrument.Locale.StartOn	Start DST on. As Instrument.Locale.EndOn, above	uint8	10b5	4277	Not applicable
Instrument.Locale.StartTime	DST start time. As Instrument.Locale.EndTime above	time_t	10b4	4276	Set by Network.Modbus.TimeFormat
Instrument.Locale.TimeZone	Time zone	uint8	10b2	4274	Not applicable
	0 = GMT - 12 hours                      1 = GMT - 11 hours				
	2 = GMT - 10 hours                     3 = GMT - 9 hours				
	4 = GMT - 8 hours                      5 = GMT - 7 hours				
	6 = GMT - 6 hours                      7 = GMT - 5 hours				
	8 = GMT - 4 hours                      9 = GMT - 3.5 hours				
	10 = GMT - 3 hours                     11 = GMT - 2 hours				
	12 = GMT - 1 hour                      13 = GMT				
	14 = GMT + 1 hour                      15 = GMT + 2 hours				
	16 = GMT + 3 hours                     17 = GMT + 3.5 hours				
	18 = GMT + 4 hours                     19 = GMT + 4.5 hours				
	20 = GMT + 5 hours                     21 = GMT + 5.5 hours				
	22 = GMT + 5.75 hours                23 = GMT + 6 hours				
	24 = GMT + 6.5 hours                 25 = GMT + 7 hours				
	26 = GMT + 8 hours                     27 = GMT + 9 hours				
	28 = GMT + 9.5 hours                 29 = GMT + 10 hours				
	30 = GMT + 11 hours                  31 = GMT + 12 hours				
	32 = GMT + 13 hours				
Instrument.Notes.Note	Operator Note	string_t	5500	21760	Not applicable
Instrument.Notes.Note1	Operator note 1	string_t	5580	21888	Not applicable
Instrument.Notes.Note2	Operator note 2	string_t	5600	22016	Not applicable
Instrument.Notes.Note3	Operator note 3	string_t	5680	22144	Not applicable
Instrument.Notes.Note4	Operator note 4	string_t	5700	22272	Not applicable
Instrument.Notes.Note5	Operator note 5	string_t	5780	22400	Not applicable
Instrument.Notes.Note6	Operator note 6	string_t	5800	22528	Not applicable
Instrument.Notes.Note7	Operator note 7	string_t	5880	22656	Not applicable
Instrument.Notes.Note8	Operator note 8	string_t	5900	22784	Not applicable
Instrument.Notes.Note9	Operator note 9	string_t	5980	22912	Not applicable
Instrument.Notes.Note10	Operator note 10	string_t	5a00	23040	Not applicable
Instrument.PromoteList.PromoteListName	Promote list (operator view) title	string_t	6d07	27911	Not applicable
Instrument.PromoteList.PromoteParam1	Promote parameter (1)	eint32	10e0	4320	Not applicable
Instrument.PromoteList.PromoteParam1Desc	Descriptor for promote parameter (1)	string_t	6300	25344	Not applicable
Instrument.PromoteList.PromoteParam2	Promote parameter (2)	eint32	10e1	4321	Not applicable
Instrument.PromoteList.PromoteParam2Desc	Descriptor for promote parameter (2)	string_t	6315	25365	Not applicable
Instrument.PromoteList.PromoteParam3	Promote parameter (3)	eint32	10e2	4322	Not applicable
Instrument.PromoteList.PromoteParam3Desc	Descriptor for promote parameter (3)	string_t	632a	25386	Not applicable
Instrument.PromoteList.PromoteParam4	Promote parameter (4)	eint32	10e3	4323	Not applicable
Instrument.PromoteList.PromoteParam4Desc	Descriptor for promote parameter (4)	string_t	633f	25407	Not applicable
Instrument.PromoteList.PromoteParam5	Promote parameter (5)	eint32	10e4	4324	Not applicable
Instrument.PromoteList.PromoteParam5Desc	Descriptor for promote parameter (5)	string_t	6354	25428	Not applicable
Instrument.PromoteList.PromoteParam6	Promote parameter (6)	eint32	10e5	4325	Not applicable
Instrument.PromoteList.PromoteParam6Desc	Descriptor for promote parameter (6)	string_t	6369	25449	Not applicable
Instrument.PromoteList.PromoteParam7	Promote parameter (7)	eint32	10e6	4326	Not applicable
Instrument.PromoteList.PromoteParam7Desc	Descriptor for promote parameter (7)	string_t	637e	25470	Not applicable
Instrument.PromoteList.PromoteParam8	Promote parameter (8)	eint32	10e7	4327	Not applicable
Instrument.PromoteList.PromoteParam8Desc	Descriptor for promote parameter (8)	string_t	6393	25491	Not applicable
Instrument.PromoteList.PromoteParam9	Promote parameter (9)	eint32	10e8	4328	Not applicable
Instrument.PromoteList.PromoteParam9Desc	Descriptor for promote parameter (9)	string_t	63a8	25512	Not applicable
Instrument.PromoteList.PromoteParam10	Promote parameter (10)	eint32	10e9	4329	Not applicable
Instrument.PromoteList.PromoteParam10Desc	Descriptor for promote parameter (10)	string_t	63bd	25533	Not applicable
Instrument.OEMConfigList.Parameter1	Parameter that is to be alterable	eint32	1230	4656	Not applicable
Instrument.OEMConfigList.Parameter2	Parameter that is to be alterable	eint32	1231	4657	Not applicable
Instrument.OEMConfigList.Parameter3	Parameter that is to be alterable	eint32	1232	4658	Not applicable
Instrument.OEMConfigList.Parameter4	Parameter that is to be alterable	eint32	1233	4659	Not applicable
Instrument.OEMConfigList.Parameter5	Parameter that is to be alterable	eint32	1234	4660	Not applicable
Instrument.OEMConfigList.Parameter6	Parameter that is to be alterable	eint32	1235	4661	Not applicable
Instrument.OEMConfigList.Parameter7	Parameter that is to be alterable	eint32	1236	4662	Not applicable
Instrument.OEMConfigList.Parameter8	Parameter that is to be alterable	eint32	1237	4663	Not applicable
Instrument.OEMConfigList.Parameter9	Parameter that is to be alterable	eint32	1238	4664	Not applicable
Instrument.OEMConfigList.Parameter10	Parameter that is to be alterable	eint32	1239	4665	Not applicable
Instrument.OEMConfigList.Parameter11	Parameter that is to be alterable	eint32	123a	4666	Not applicable
Instrument.OEMConfigList.Parameter12	Parameter that is to be alterable	eint32	123b	4667	Not applicable
Instrument.OEMConfigList.Parameter13	Parameter that is to be alterable	eint32	123c	4668	Not applicable
Instrument.OEMConfigList.Parameter14	Parameter that is to be alterable	eint32	123d	4669	Not applicable
Instrument.OEMConfigList.Parameter15	Parameter that is to be alterable	eint32	123e	4670	Not applicable
Instrument.OEMConfigList.Parameter16	Parameter that is to be alterable	eint32	123f	4671	Not applicable
Instrument.OEMConfigList.Parameter17	Parameter that is to be alterable	eint32	1240	4672	Not applicable
Instrument.OEMConfigList.Parameter18	Parameter that is to be alterable	eint32	1241	4673	Not applicable
Instrument.OEMConfigList.Parameter19	Parameter that is to be alterable	eint32	1242	4674	Not applicable
Instrument.OEMConfigList.Parameter20	Parameter that is to be alterable	eint32	1243	4675	Not applicable
Instrument.OEMConfigList.Parameter21	Parameter that is to be alterable	eint32	1244	4676	Not applicable
Instrument.OEMConfigList.Parameter22	Parameter that is to be alterable	eint32	1245	4677	Not applicable
Instrument.OEMConfigList.Parameter23	Parameter that is to be alterable	eint32	1246	4678	Not applicable
Instrument.OEMConfigList.Parameter24	Parameter that is to be alterable	eint32	1247	4679	Not applicable
Instrument.OEMConfigList.Parameter25	Parameter that is to be alterable	eint32	1248	4680	Not applicable
Instrument.OEMConfigList.Parameter26	Parameter that is to be alterable	eint32	1249	4681	Not applicable
Instrument.OEMConfigList.Parameter27	Parameter that is to be alterable	eint32	124a	4682	Not applicable
Instrument.OEMConfigList.Parameter28	Parameter that is to be alterable	eint32	124b	4683	Not applicable
Instrument.OEMConfigList.Parameter29	Parameter that is to be alterable	eint32	124c	4684	Not applicable







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Parameter path	Description	Type	Hex	Dec	Resolution
Instrument.OEMSupervisorList.Parameter92	Parameter that is to be read only	eint32	12ef	4847	Not applicable
Instrument.OEMSupervisorList.Parameter93	Parameter that is to be read only	eint32	12f0	4848	Not applicable
Instrument.OEMSupervisorList.Parameter94	Parameter that is to be read only	eint32	12f1	4849	Not applicable
Instrument.OEMSupervisorList.Parameter95	Parameter that is to be read only	eint32	12f2	4850	Not applicable
Instrument.OEMSupervisorList.Parameter96	Parameter that is to be read only	eint32	12f3	4851	Not applicable
Instrument.OEMSupervisorList.Parameter97	Parameter that is to be read only	eint32	12f4	4852	Not applicable
Instrument.OEMSupervisorList.Parameter98	Parameter that is to be read only	eint32	12f5	4853	Not applicable
Instrument.OEMSupervisorList.Parameter99	Parameter that is to be read only	eint32	12f6	4854	Not applicable
Instrument.OEMSupervisorList.Parameter100	Parameter that is to be read only	eint32	12f7	4855	Not applicable
Instrument.User1.Username	User username	string_t	6fc0	28608	Not applicable
Instrument.User1.Password	User password	string_t	6fe0	28640	Not applicable
Instrument.User1.BatchControl	Batch control permission	bool	040c	1036	Not applicable
Instrument.User1.AckAlarms	Acknowledge alarms permission	bool	040d	1037	Not applicable
Instrument.User1.DemandArchiving	Demand archiving permission	bool	040e	1038	Not applicable
Instrument.User1.LoginDisabled	Login disabled	bool	040f	1039	Not applicable
Instrument.User1.Signing	Signing permission	bool	0410	1040	Not applicable
Instrument.User1.Authorising	Authorising permission	bool	0411	1041	Not applicable
Instrument.User1.ArchiveInterval	Archive interval permission	bool	0412	1042	Not applicable
Instrument.User1.LoopControl	Loop control permission	bool	0413	1043	Not applicable
Instrument.User1.ProgramMode	Program mode permission	bool	0414	1044	Not applicable
Instrument.User1.ProgramEdit	Program edit permission	bool	0415	1045	Not applicable
Instrument.User1.ProgramStore	Program store permission	bool	0416	1046	Not applicable
Instrument.User2.Username	User username	string_t	6fc1	28609	Not applicable
Instrument.User2.Password	User password	string_t	6fe1	28641	Not applicable
Instrument.User2.BatchControl	Batch control permission	bool	0417	1047	Not applicable
Instrument.User2.AckAlarms	Acknowledge alarms permission	bool	0418	1048	Not applicable
Instrument.User2.DemandArchiving	Demand archiving permission	bool	0419	1049	Not applicable
Instrument.User2.LoginDisabled	Login disabled	bool	041a	1050	Not applicable
Instrument.User2.Signing	Signing permission	bool	041b	1051	Not applicable
Instrument.User2.Authorising	Authorising permission	bool	041c	1052	Not applicable
Instrument.User2.ArchiveInterval	Archive interval permission	bool	041d	1053	Not applicable
Instrument.User2.LoopControl	Loop control permission	bool	041e	1054	Not applicable
Instrument.User2.ProgramMode	Program mode permission	bool	041f	1055	Not applicable
Instrument.User2.ProgramEdit	Program edit permission	bool	0420	1056	Not applicable
Instrument.User2.ProgramStore	Program store permission	bool	0421	1057	Not applicable
Instrument.User3.Username	User username	string_t	6fc2	28610	Not applicable
Instrument.User3.Password	User password	string_t	6fe2	28642	Not applicable
Instrument.User3.BatchControl	Batch control permission	bool	0422	1058	Not applicable
Instrument.User3.AckAlarms	Acknowledge alarms permission	bool	0423	1059	Not applicable
Instrument.User3.DemandArchiving	Demand archiving permission	bool	0424	1060	Not applicable
Instrument.User3.LoginDisabled	Login disabled	bool	0425	1061	Not applicable
Instrument.User3.Signing	Signing permission	bool	0426	1062	Not applicable
Instrument.User3.Authorising	Authorising permission	bool	0427	1063	Not applicable
Instrument.User3.ArchiveInterval	Archive interval permission	bool	0428	1064	Not applicable
Instrument.User3.LoopControl	Loop control permission	bool	0429	1065	Not applicable
Instrument.User3.ProgramMode	Program mode permission	bool	042a	1066	Not applicable
Instrument.User3.ProgramEdit	Program edit permission	bool	042b	1067	Not applicable
Instrument.User3.ProgramStore	Program store permission	bool	042c	1068	Not applicable
Instrument.User4.Username	User username	string_t	6fc3	28611	Not applicable
Instrument.User4.Password	User password	string_t	6fe3	28643	Not applicable
Instrument.User4.BatchControl	Batch control permission	bool	042d	1069	Not applicable
Instrument.User4.AckAlarms	Acknowledge alarms permission	bool	042e	1070	Not applicable
Instrument.User4.DemandArchiving	Demand archiving permission	bool	042f	1071	Not applicable
Instrument.User4.LoginDisabled	Login disabled	bool	0430	1072	Not applicable
Instrument.User4.Signing	Signing permission	bool	0431	1073	Not applicable
Instrument.User4.Authorising	Authorising permission	bool	0432	1074	Not applicable
Instrument.User4.ArchiveInterval	Archive interval permission	bool	0433	1075	Not applicable
Instrument.User4.LoopControl	Loop control permission	bool	0434	1076	Not applicable
Instrument.User4.ProgramMode	Program mode permission	bool	0435	1077	Not applicable
Instrument.User4.ProgramEdit	Program edit permission	bool	0436	1078	Not applicable
Instrument.User4.ProgramStore	Program store permission	bool	0437	1079	Not applicable
Instrument.User5.Username	User username	string_t	6fc4	28612	Not applicable
Instrument.User5.Password	User password	string_t	6fe4	28644	Not applicable
Instrument.User5.BatchControl	Batch control permission	bool	0438	1080	Not applicable
Instrument.User5.AckAlarms	Acknowledge alarms permission	bool	0439	1081	Not applicable
Instrument.User5.DemandArchiving	Demand archiving permission	bool	043a	1082	Not applicable
Instrument.User5.LoginDisabled	Login disabled	bool	043b	1083	Not applicable
Instrument.User5.Signing	Signing permission	bool	043c	1084	Not applicable
Instrument.User5.Authorising	Authorising permission	bool	043d	1085	Not applicable
Instrument.User5.ArchiveInterval	Archive interval permission	bool	043e	1086	Not applicable
Instrument.User5.LoopControl	Loop control permission	bool	043f	1087	Not applicable
Instrument.User5.ProgramMode	Program mode permission	bool	0440	1088	Not applicable
Instrument.User5.ProgramEdit	Program edit permission	bool	0441	1089	Not applicable
Instrument.User5.ProgramStore	Program store permission	bool	0442	1090	Not applicable
Instrument.User6.Username	User username	string_t	6fc5	28613	Not applicable
Instrument.User6.Password	User password	string_t	6fe5	28645	Not applicable
Instrument.User6.BatchControl	Batch control permission	bool	0443	1091	Not applicable
Instrument.User6.AckAlarms	Acknowledge alarms permission	bool	0444	1092	Not applicable
Instrument.User6.DemandArchiving	Demand archiving permission	bool	0445	1093	Not applicable
Instrument.User6.LoginDisabled	Login disabled	bool	0446	1094	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
Instrument.User6.Signing	Signing permission	bool	0447	1095	Not applicable
Instrument.User6.Authorising	Authorising permission	bool	0448	1096	Not applicable
Instrument.User6.ArchiveInterval	Archive interval permission	bool	0449	1097	Not applicable
Instrument.User6.LoopControl	Loop control permission	bool	044a	1098	Not applicable
Instrument.User6.ProgramMode	Program mode permission	bool	044b	1099	Not applicable
Instrument.User6.ProgramEdit	Program edit permission	bool	044c	1100	Not applicable
Instrument.User6.ProgramStore	Program store permission	bool	044d	1101	Not applicable
Instrument.User7.Username	User username	string_t	6fc6	28614	Not applicable
Instrument.User7.Password	User password	string_t	6fe6	28646	Not applicable
Instrument.User7.BatchControl	Batch control permission	bool	044e	1102	Not applicable
Instrument.User7.AckAlarms	Acknowledge alarms permission	bool	044f	1103	Not applicable
Instrument.User7.DemandArchiving	Demand archiving permission	bool	0450	1104	Not applicable
Instrument.User7.LoginDisabled	Login disabled	bool	0451	1105	Not applicable
Instrument.User7.Signing	Signing permission	bool	0452	1106	Not applicable
Instrument.User7.Authorising	Authorising permission	bool	0453	1107	Not applicable
Instrument.User7.ArchiveInterval	Archive interval permission	bool	0454	1108	Not applicable
Instrument.User7.LoopControl	Loop control permission	bool	0455	1109	Not applicable
Instrument.User7.ProgramMode	Program mode permission	bool	0456	1110	Not applicable
Instrument.User7.ProgramEdit	Program edit permission	bool	0457	1111	Not applicable
Instrument.User7.ProgramStore	Program store permission	bool	0458	1112	Not applicable
Instrument.User8.Username	User username	string_t	6fc7	28615	Not applicable
Instrument.User8.Password	User password	string_t	6fe7	28647	Not applicable
Instrument.User8.BatchControl	Batch control permission	bool	0459	1113	Not applicable
Instrument.User8.AckAlarms	Acknowledge alarms permission	bool	045a	1114	Not applicable
Instrument.User8.DemandArchiving	Demand archiving permission	bool	045b	1115	Not applicable
Instrument.User8.LoginDisabled	Login disabled	bool	045c	1116	Not applicable
Instrument.User8.Signing	Signing permission	bool	045d	1117	Not applicable
Instrument.User8.Authorising	Authorising permission	bool	045e	1118	Not applicable
Instrument.User8.ArchiveInterval	Archive interval permission	bool	045f	1119	Not applicable
Instrument.User8.LoopControl	Loop control permission	bool	0460	1120	Not applicable
Instrument.User8.ProgramMode	Program mode permission	bool	0461	1121	Not applicable
Instrument.User8.ProgramEdit	Program edit permission	bool	0462	1122	Not applicable
Instrument.User8.ProgramStore	Program store permission	bool	0463	1123	Not applicable
Instrument.User9.Username	User username	string_t	6fc8	28616	Not applicable
Instrument.User9.Password	User password	string_t	6fe8	28648	Not applicable
Instrument.User9.BatchControl	Batch control permission	bool	0464	1124	Not applicable
Instrument.User9.AckAlarms	Acknowledge alarms permission	bool	0465	1125	Not applicable
Instrument.User9.DemandArchiving	Demand archiving permission	bool	0466	1126	Not applicable
Instrument.User9.LoginDisabled	Login disabled	bool	0467	1127	Not applicable
Instrument.User9.Signing	Signing permission	bool	0468	1128	Not applicable
Instrument.User9.Authorising	Authorising permission	bool	0469	1129	Not applicable
Instrument.User9.ArchiveInterval	Archive interval permission	bool	046a	1130	Not applicable
Instrument.User9.LoopControl	Loop control permission	bool	046b	1131	Not applicable
Instrument.User9.ProgramMode	Program mode permission	bool	046c	1132	Not applicable
Instrument.User9.ProgramEdit	Program edit permission	bool	046d	1133	Not applicable
Instrument.User9.ProgramStore	Program store permission	bool	046e	1134	Not applicable
Instrument.User10.Username	User username	string_t	6fc9	28617	Not applicable
Instrument.User10.Password	User password	string_t	6fe9	28649	Not applicable
Instrument.User10.BatchControl	Batch control permission	bool	046f	1135	Not applicable
Instrument.User10.AckAlarms	Acknowledge alarms permission	bool	0470	1136	Not applicable
Instrument.User10.DemandArchiving	Demand archiving permission	bool	0471	1137	Not applicable
Instrument.User10.LoginDisabled	Login disabled	bool	0472	1138	Not applicable
Instrument.User10.Signing	Signing permission	bool	0473	1139	Not applicable
Instrument.User10.Authorising	Authorising permission	bool	0474	1140	Not applicable
Instrument.User10.ArchiveInterval	Archive interval permission	bool	0475	1141	Not applicable
Instrument.User10.LoopControl	Loop control permission	bool	0476	1142	Not applicable
Instrument.User10.ProgramMode	Program mode permission	bool	0477	1143	Not applicable
Instrument.User10.ProgramEdit	Program edit permission	bool	0478	1144	Not applicable
Instrument.User10.ProgramStore	Program store permission	bool	0479	1145	Not applicable
Instrument.User11.Username	User username	string_t	6fca	28618	Not applicable
Instrument.User11.Password	User password	string_t	6fea	28650	Not applicable
Instrument.User11.BatchControl	Batch control permission	bool	047a	1146	Not applicable
Instrument.User11.AckAlarms	Acknowledge alarms permission	bool	047b	1147	Not applicable
Instrument.User11.DemandArchiving	Demand archiving permission	bool	047c	1148	Not applicable
Instrument.User11.LoginDisabled	Login disabled	bool	047d	1149	Not applicable
Instrument.User11.Signing	Signing permission	bool	047e	1150	Not applicable
Instrument.User11.Authorising	Authorising permission	bool	047f	1151	Not applicable
Instrument.User11.ArchiveInterval	Archive interval permission	bool	0480	1152	Not applicable
Instrument.User11.LoopControl	Loop control permission	bool	0481	1153	Not applicable
Instrument.User11.ProgramMode	Program mode permission	bool	0482	1154	Not applicable
Instrument.User11.ProgramEdit	Program edit permission	bool	0483	1155	Not applicable
Instrument.User11.ProgramStore	Program store permission	bool	0484	1156	Not applicable
Instrument.User12.Username	User username	string_t	6fcb	28619	Not applicable
Instrument.User12.Password	User password	string_t	6feb	28651	Not applicable
Instrument.User12.BatchControl	Batch control permission	bool	0485	1157	Not applicable
Instrument.User12.AckAlarms	Acknowledge alarms permission	bool	0486	1158	Not applicable
Instrument.User12.DemandArchiving	Demand archiving permission	bool	0487	1159	Not applicable
Instrument.User12.LoginDisabled	Login disabled	bool	0488	1160	Not applicable
Instrument.User12.Signing	Signing permission	bool	0489	1161	Not applicable
Instrument.User12.Authorising	Authorising permission	bool	048a	1162	Not applicable
Instrument.User12.ArchiveInterval	Archive interval permission	bool	048b	1163	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
Instrument.User12.LoopControl	Loop control permission	bool	048c	1164	Not applicable
Instrument.User12.ProgramMode	Program mode permission	bool	048d	1165	Not applicable
Instrument.User12.ProgramEdit	Program edit permission	bool	048e	1166	Not applicable
Instrument.User12.ProgramStore	Program store permission	bool	048f	1167	Not applicable
Instrument.User13.Username	User username	string_t	6fcc	28620	Not applicable
Instrument.User13.Password	User password	string_t	6fec	28652	Not applicable
Instrument.User13.BatchControl	Batch control permission	bool	0490	1168	Not applicable
Instrument.User13.AckAlarms	Acknowledge alarms permission	bool	0491	1169	Not applicable
Instrument.User13.DemandArchiving	Demand archiving permission	bool	0492	1170	Not applicable
Instrument.User13.LoginDisabled	Login disabled	bool	0493	1171	Not applicable
Instrument.User13.Signing	Signing permission	bool	0494	1172	Not applicable
Instrument.User13.Authorising	Authorising permission	bool	0495	1173	Not applicable
Instrument.User13.ArchiveInterval	Archive interval permission	bool	0496	1174	Not applicable
Instrument.User13.LoopControl	Loop control permission	bool	0497	1175	Not applicable
Instrument.User13.ProgramMode	Program mode permission	bool	0498	1176	Not applicable
Instrument.User13.ProgramEdit	Program edit permission	bool	0499	1177	Not applicable
Instrument.User13.ProgramStore	Program store permission	bool	049a	1178	Not applicable
Instrument.User14.Username	User username	string_t	6fcd	28621	Not applicable
Instrument.User14.Password	User password	string_t	6fed	28653	Not applicable
Instrument.User14.BatchControl	Batch control permission	bool	049b	1179	Not applicable
Instrument.User14.AckAlarms	Acknowledge alarms permission	bool	049c	1180	Not applicable
Instrument.User14.DemandArchiving	Demand archiving permission	bool	049d	1181	Not applicable
Instrument.User14.LoginDisabled	Login disabled	bool	049e	1182	Not applicable
Instrument.User14.Signing	Signing permission	bool	049f	1183	Not applicable
Instrument.User14.Authorising	Authorising permission	bool	04a0	1184	Not applicable
Instrument.User14.ArchiveInterval	Archive interval permission	bool	04a1	1185	Not applicable
Instrument.User14.LoopControl	Loop control permission	bool	04a2	1186	Not applicable
Instrument.User14.ProgramMode	Program mode permission	bool	04a3	1187	Not applicable
Instrument.User14.ProgramEdit	Program edit permission	bool	04a4	1188	Not applicable
Instrument.User14.ProgramStore	Program store permission	bool	04a5	1189	Not applicable
Instrument.User15.Username	User username	string_t	6fce	28622	Not applicable
Instrument.User15.Password	User password	string_t	6fee	28654	Not applicable
Instrument.User15.BatchControl	Batch control permission	bool	04a6	1190	Not applicable
Instrument.User15.AckAlarms	Acknowledge alarms permission	bool	04a7	1191	Not applicable
Instrument.User15.DemandArchiving	Demand archiving permission	bool	04a8	1192	Not applicable
Instrument.User15.LoginDisabled	Login disabled	bool	04a9	1193	Not applicable
Instrument.User15.Signing	Signing permission	bool	04aa	1194	Not applicable
Instrument.User15.Authorising	Authorising permission	bool	04ab	1195	Not applicable
Instrument.User15.ArchiveInterval	Archive interval permission	bool	04ac	1196	Not applicable
Instrument.User15.LoopControl	Loop control permission	bool	04ad	1197	Not applicable
Instrument.User15.ProgramMode	Program mode permission	bool	04ae	1198	Not applicable
Instrument.User15.ProgramEdit	Program edit permission	bool	04af	1199	Not applicable
Instrument.User15.ProgramStore	Program store permission	bool	04b0	1200	Not applicable
Instrument.User16.Username	User username	string_t	6fcf	28623	Not applicable
Instrument.User16.Password	User password	string_t	6fef	28655	Not applicable
Instrument.User16.BatchControl	Batch control permission	bool	04b1	1201	Not applicable
Instrument.User16.AckAlarms	Acknowledge alarms permission	bool	04b2	1202	Not applicable
Instrument.User16.DemandArchiving	Demand archiving permission	bool	04b3	1203	Not applicable
Instrument.User16.LoginDisabled	Login disabled	bool	04b4	1204	Not applicable
Instrument.User16.Signing	Signing permission	bool	04b5	1205	Not applicable
Instrument.User16.Authorising	Authorising permission	bool	04b6	1206	Not applicable
Instrument.User16.ArchiveInterval	Archive interval permission	bool	04b7	1207	Not applicable
Instrument.User16.LoopControl	Loop control permission	bool	04b8	1208	Not applicable
Instrument.User16.ProgramMode	Program mode permission	bool	04b9	1209	Not applicable
Instrument.User16.ProgramEdit	Program edit permission	bool	04ba	1210	Not applicable
Instrument.User16.ProgramStore	Program store permission	bool	04bb	1211	Not applicable
Instrument.User17.Username	User username	string_t	6fd0	28624	Not applicable
Instrument.User17.Password	User password	string_t	6ff0	28656	Not applicable
Instrument.User17.BatchControl	Batch control permission	bool	04bc	1212	Not applicable
Instrument.User17.AckAlarms	Acknowledge alarms permission	bool	04bd	1213	Not applicable
Instrument.User17.DemandArchiving	Demand archiving permission	bool	04be	1214	Not applicable
Instrument.User17.LoginDisabled	Login disabled	bool	04bf	1215	Not applicable
Instrument.User17.Signing	Signing permission	bool	04c0	1216	Not applicable
Instrument.User17.Authorising	Authorising permission	bool	04c1	1217	Not applicable
Instrument.User17.ArchiveInterval	Archive interval permission	bool	04c2	1218	Not applicable
Instrument.User17.LoopControl	Loop control permission	bool	04c3	1219	Not applicable
Instrument.User17.ProgramMode	Program mode permission	bool	04c4	1220	Not applicable
Instrument.User17.ProgramEdit	Program edit permission	bool	04c5	1221	Not applicable
Instrument.User17.ProgramStore	Program store permission	bool	04c6	1222	Not applicable
Instrument.User18.Username	User username	string_t	6fd1	28625	Not applicable
Instrument.User18.Password	User password	string_t	6ff1	28657	Not applicable
Instrument.User18.BatchControl	Batch control permission	bool	04c7	1223	Not applicable
Instrument.User18.AckAlarms	Acknowledge alarms permission	bool	04c8	1224	Not applicable
Instrument.User18.DemandArchiving	Demand archiving permission	bool	04c9	1225	Not applicable
Instrument.User18.LoginDisabled	Login disabled	bool	04ca	1226	Not applicable
Instrument.User18.Signing	Signing permission	bool	04cb	1227	Not applicable
Instrument.User18.Authorising	Authorising permission	bool	04cc	1228	Not applicable
Instrument.User18.ArchiveInterval	Archive interval permission	bool	04cd	1229	Not applicable
Instrument.User18.LoopControl	Loop control permission	bool	04ce	1230	Not applicable
Instrument.User18.ProgramMode	Program mode permission	bool	04cf	1231	Not applicable
Instrument.User18.ProgramEdit	Program edit permission	bool	04d0	1232	Not applicable

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Instrument.User18.ProgramStore	Program store permission	bool	04d1	1233	Not applicable
Instrument.User19.Username	User username	string_t	6fd2	28626	Not applicable
Instrument.User19.Password	User password	string_t	6ff2	28658	Not applicable
Instrument.User19.BatchControl	Batch control permission	bool	04d2	1234	Not applicable
Instrument.User19.AckAlarms	Acknowledge alarms permission	bool	04d3	1235	Not applicable
Instrument.User19.DemandArchiving	Demand archiving permission	bool	04d4	1236	Not applicable
Instrument.User19.LoginDisabled	Login disabled	bool	04d5	1237	Not applicable
Instrument.User19.Signing	Signing permission	bool	04d6	1238	Not applicable
Instrument.User19.Authorising	Authorising permission	bool	04d7	1239	Not applicable
Instrument.User19.ArchiveInterval	Archive interval permission	bool	04d8	1240	Not applicable
Instrument.User19.LoopControl	Loop control permission	bool	04d9	1241	Not applicable
Instrument.User19.ProgramMode	Program mode permission	bool	04da	1242	Not applicable
Instrument.User19.ProgramEdit	Program edit permission	bool	04db	1243	Not applicable
Instrument.User19.ProgramStore	Program store permission	bool	04dc	1244	Not applicable
Instrument.User20.Username	User username	string_t	6fd3	28627	Not applicable
Instrument.User20.Password	User password	string_t	6ff3	28659	Not applicable
Instrument.User20.BatchControl	Batch control permission	bool	04dd	1245	Not applicable
Instrument.User20.AckAlarms	Acknowledge alarms permission	bool	04de	1246	Not applicable
Instrument.User20.DemandArchiving	Demand archiving permission	bool	04df	1247	Not applicable
Instrument.User20.LoginDisabled	Login disabled	bool	04e0	1248	Not applicable
Instrument.User20.Signing	Signing permission	bool	04e1	1249	Not applicable
Instrument.User20.Authorising	Authorising permission	bool	04e2	1250	Not applicable
Instrument.User20.ArchiveInterval	Archive interval permission	bool	04e3	1251	Not applicable
Instrument.User20.LoopControl	Loop control permission	bool	04e4	1252	Not applicable
Instrument.User20.ProgramMode	Program mode permission	bool	04e5	1253	Not applicable
Instrument.User20.ProgramEdit	Program edit permission	bool	04e6	1254	Not applicable
Instrument.User20.ProgramStore	Program store permission	bool	04e7	1255	Not applicable
Instrument.User21.Username	User username	string_t	6fd4	28628	Not applicable
Instrument.User21.Password	User password	string_t	6ff4	28660	Not applicable
Instrument.User21.BatchControl	Batch control permission	bool	04e8	1256	Not applicable
Instrument.User21.AckAlarms	Acknowledge alarms permission	bool	04e9	1257	Not applicable
Instrument.User21.DemandArchiving	Demand archiving permission	bool	04ea	1258	Not applicable
Instrument.User21.LoginDisabled	Login disabled	bool	04eb	1259	Not applicable
Instrument.User21.Signing	Signing permission	bool	04ec	1260	Not applicable
Instrument.User21.Authorising	Authorising permission	bool	04ed	1261	Not applicable
Instrument.User21.ArchiveInterval	Archive interval permission	bool	04ee	1262	Not applicable
Instrument.User21.LoopControl	Loop control permission	bool	04ef	1263	Not applicable
Instrument.User21.ProgramMode	Program mode permission	bool	04f0	1264	Not applicable
Instrument.User21.ProgramEdit	Program edit permission	bool	04f1	1265	Not applicable
Instrument.User21.ProgramStore	Program store permission	bool	04f2	1266	Not applicable
Instrument.User22.Username	User username	string_t	6fd5	28629	Not applicable
Instrument.User22.Password	User password	string_t	6ff5	28661	Not applicable
Instrument.User22.BatchControl	Batch control permission	bool	04f3	1267	Not applicable
Instrument.User22.AckAlarms	Acknowledge alarms permission	bool	04f4	1268	Not applicable
Instrument.User22.DemandArchiving	Demand archiving permission	bool	04f5	1269	Not applicable
Instrument.User22.LoginDisabled	Login disabled	bool	04f6	1270	Not applicable
Instrument.User22.Signing	Signing permission	bool	04f7	1271	Not applicable
Instrument.User22.Authorising	Authorising permission	bool	04f8	1272	Not applicable
Instrument.User22.ArchiveInterval	Archive interval permission	bool	04f9	1273	Not applicable
Instrument.User22.LoopControl	Loop control permission	bool	04fa	1274	Not applicable
Instrument.User22.ProgramMode	Program mode permission	bool	04fb	1275	Not applicable
Instrument.User22.ProgramEdit	Program edit permission	bool	04fc	1276	Not applicable
Instrument.User22.ProgramStore	Program store permission	bool	04fd	1277	Not applicable
Instrument.User23.Username	User username	string_t	6fd6	28630	Not applicable
Instrument.User23.Password	User password	string_t	6ff6	28662	Not applicable
Instrument.User23.BatchControl	Batch control permission	bool	04fe	1278	Not applicable
Instrument.User23.AckAlarms	Acknowledge alarms permission	bool	04ff	1279	Not applicable
Instrument.User23.DemandArchiving	Demand archiving permission	bool	0500	1280	Not applicable
Instrument.User23.LoginDisabled	Login disabled	bool	0501	1281	Not applicable
Instrument.User23.Signing	Signing permission	bool	0502	1282	Not applicable
Instrument.User23.Authorising	Authorising permission	bool	0503	1283	Not applicable
Instrument.User23.ArchiveInterval	Archive interval permission	bool	0504	1284	Not applicable
Instrument.User23.LoopControl	Loop control permission	bool	0505	1285	Not applicable
Instrument.User23.ProgramMode	Program mode permission	bool	0506	1286	Not applicable
Instrument.User23.ProgramEdit	Program edit permission	bool	0507	1287	Not applicable
Instrument.User23.ProgramStore	Program store permission	bool	0508	1288	Not applicable
Instrument.User24.Username	User username	string_t	6fd7	28631	Not applicable
Instrument.User24.Password	User password	string_t	6ff7	28663	Not applicable
Instrument.User24.BatchControl	Batch control permission	bool	0509	1289	Not applicable
Instrument.User24.AckAlarms	Acknowledge alarms permission	bool	050a	1290	Not applicable
Instrument.User24.DemandArchiving	Demand archiving permission	bool	050b	1291	Not applicable
Instrument.User24.LoginDisabled	Login disabled	bool	050c	1292	Not applicable
Instrument.User24.Signing	Signing permission	bool	050d	1293	Not applicable
Instrument.User24.Authorising	Authorising permission	bool	050e	1294	Not applicable
Instrument.User24.ArchiveInterval	Archive interval permission	bool	050f	1295	Not applicable
Instrument.User24.LoopControl	Loop control permission	bool	0510	1296	Not applicable
Instrument.User24.ProgramMode	Program mode permission	bool	0511	1297	Not applicable
Instrument.User24.ProgramEdit	Program edit permission	bool	0512	1298	Not applicable
Instrument.User24.ProgramStore	Program store permission	bool	0513	1299	Not applicable
Instrument.User25.Username	User username	string_t	6fd8	28632	Not applicable
Instrument.User25.Password	User password	string_t	6ff8	28664	Not applicable

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Instrument.User25.BatchControl	Batch control permission	bool	0514	1300	Not applicable
Instrument.User25.AckAlarms	Acknowledge alarms permission	bool	0515	1301	Not applicable
Instrument.User25.DemandArchiving	Demand archiving permission	bool	0516	1302	Not applicable
Instrument.User25.LoginDisabled	Login disabled	bool	0517	1303	Not applicable
Instrument.User25.Signing	Signing permission	bool	0518	1304	Not applicable
Instrument.User25.Authorising	Authorising permission	bool	0519	1305	Not applicable
Instrument.User25.ArchiveInterval	Archive interval permission	bool	051a	1306	Not applicable
Instrument.User25.LoopControl	Loop control permission	bool	051b	1307	Not applicable
Instrument.User25.ProgramMode	Program mode permission	bool	051c	1308	Not applicable
Instrument.User25.ProgramEdit	Program edit permission	bool	051d	1309	Not applicable
Instrument.User25.ProgramStore	Program store permission	bool	051e	1310	Not applicable
Instrument.Security.CommsPass	1 = Password required for comms access	bool	10c1	4289	Not applicable
Instrument.Security.DefaultConfig	1 = set all parameters to factory settings	bool	10c2	4290	Not applicable
Instrument.Security.EngineerAccess	1 = Engineer access required	bool	10c0	4288	Not applicable
Instrument.Security.EngineerPassword	Engineer pass phrase (default 100)	string_t	63d3	25555	Not applicable
Instrument.Security.Feature2Pass	Features2 pass code	int32	10c4	4292	Not applicable
Instrument.Security.Feature3Pass	Features3 pass code	int32	10c5	4293	Not applicable
Instrument.Security.FeaturePass	Features pass code	int32	10c3	4291	Not applicable
Instrument.Security.OEMEntry	OEM pass phrase entry	string_t	6d61	28001	Not applicable
Instrument.Security.OEMParamLists	OEM Parameter Lists	bool	10c7	4295	Not applicable
Instrument.Security.OEMPass	OEM pass phrase	string_t	6d30	27952	Not applicable
Instrument.Security.OEMStatus	OEM status (0 = Unlocked; 1 = Locked)	bool	10c6	4294	Not applicable
Instrument.Security.OperatorPassword	Operator pass phrase (default = 100)	string_t	6437	25655	Not applicable
Instrument.Security.PassPhrase	The parameter to be written to if comms security is enabled	string_t	4416	17430	Not applicable
Instrument.Security.SupervisorPassword	Supervisor pass phrase (default = blank)	string_t	6405	25605	Not applicable
Lgc2.1.FallbackType	Fallback Condition 0 = Output False; Status Bad. 1 = Output True; Status Bad 2 = Output False; Status Good. 3 = Output True; Status good	uint8	2efb	12027	Not applicable
Lgc2.1.In1	Input Value 1	float32	2ef9	12025	Odp
Lgc2.1.In2	Input Value 2	float32	2efa	12026	Odp
Lgc2.1.Invert	Sense of Input Values 0 = Neither input inverted 1 = Input 1 inverted 2 = Input 2 inverted 3 = Both inputs inverted	uint8	2efc	12028	Not applicable
Lgc2.1.Oper	Logic Operation 0 = Off; 1 = AND; 2 = OR; 3 = XOR; 4 = 1 set2 reset 5 = Input 1 = Input 2 6 = Input 1 ≠ Input 2 7 = Input 1 > Input 2 8 = Input 1 < Input 2 9 = Input 1 ≥ Input 2 10 = Input 1 ≤ Input 2	uint8	2ef8	12024	Not applicable
Lgc2.1.Out	Output Value (0 = Off (false); 1 = On (true))	bool	2efd	12029	Not applicable
Lgc2.1.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2efe	12030	Not applicable
Lgc2.2.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f02	12034	Not applicable
Lgc2.2.In1	Input Value 1	float32	2f00	12032	Odp
Lgc2.2.In2	Input Value 2	float32	2f01	12033	Odp
Lgc2.2.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f03	12035	Not applicable
Lgc2.2.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2eff	12031	Not applicable
Lgc2.2.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f04	12036	Not applicable
Lgc2.2.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f05	12037	Not applicable
Lgc2.3.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f09	12041	Not applicable
Lgc2.3.In1	Input Value 1	float32	2f07	12039	Odp
Lgc2.3.In2	Input Value 2	float32	2f08	12040	Odp
Lgc2.3.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f0a	12042	Not applicable
Lgc2.3.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2f06	12038	Not applicable
Lgc2.3.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f0b	12043	Not applicable
Lgc2.3.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f0c	12044	Not applicable
Lgc2.4.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f10	12048	Not applicable
Lgc2.4.In1	Input Value 1	float32	2f0e	12046	Odp
Lgc2.4.In2	Input Value 2	float32	2f0f	12047	Odp
Lgc2.4.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f11	12049	Not applicable
Lgc2.4.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2f0d	12045	Not applicable
Lgc2.4.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f12	12050	Not applicable
Lgc2.4.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f13	12051	Not applicable
Lgc2.5.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f17	12055	Not applicable
Lgc2.5.In1	Input Value 1	float32	2f15	12053	Odp
Lgc2.5.In2	Input Value 2	float32	2f16	12054	Odp
Lgc2.5.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f18	12056	Not applicable
Lgc2.5.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2f14	12052	Not applicable
Lgc2.5.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f19	12057	Not applicable
Lgc2.5.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f1a	12058	Not applicable
Lgc2.6.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f1e	12062	Not applicable
Lgc2.6.In1	Input Value 1	float32	2f1c	12060	Odp

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Lgc2.6.In2	Input Value 2	float32	2f1d	12061	Odp
Lgc2.6.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f1f	12063	Not applicable
Lgc2.6.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2f1b	12059	Not applicable
Lgc2.6.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f20	12064	Not applicable
Lgc2.6.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f21	12065	Not applicable
Lgc2.7.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f25	12069	Not applicable
Lgc2.7.In1	Input Value 1	float32	2f23	12067	Odp
Lgc2.7.In2	Input Value 2	float32	2f24	12068	Odp
Lgc2.7.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f26	12070	Not applicable
Lgc2.7.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2f22	12066	Not applicable
Lgc2.7.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f27	12071	Not applicable
Lgc2.7.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f28	12072	Not applicable
Lgc2.8.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f2c	12076	Not applicable
Lgc2.8.In1	Input Value 1	float32	2f2a	12074	Odp
Lgc2.8.In2	Input Value 2	float32	2f2b	12075	Odp
Lgc2.8.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f2d	12077	Not applicable
Lgc2.8.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2f29	12073	Not applicable
Lgc2.8.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f2e	12078	Not applicable
Lgc2.8.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f2f	12079	Not applicable
Lgc2.9.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f33	12083	Not applicable
Lgc2.9.In1	Input Value 1	float32	2f31	12081	Odp
Lgc2.9.In2	Input Value 2	float32	2f32	12082	Odp
Lgc2.9.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f34	12084	Not applicable
Lgc2.9.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2f30	12080	Not applicable
Lgc2.9.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f35	12085	Not applicable
Lgc2.9.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f36	12086	Not applicable
Lgc2.10.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f3a	12090	Not applicable
Lgc2.10.In1	Input Value 1	float32	2f38	12088	Odp
Lgc2.10.In2	Input Value 2	float32	2f39	12089	Odp
Lgc2.10.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f3b	12091	Not applicable
Lgc2.10.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2f37	12087	Not applicable
Lgc2.10.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f3c	12092	Not applicable
Lgc2.10.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f3d	12093	Not applicable
Lgc2.11.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f41	12097	Not applicable
Lgc2.11.In1	Input Value 1	float32	2f3f	12095	Odp
Lgc2.11.In2	Input Value 2	float32	2f40	12096	Odp
Lgc2.11.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f42	12098	Not applicable
Lgc2.11.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2f3e	12094	Not applicable
Lgc2.11.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f43	12099	Not applicable
Lgc2.11.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f44	12100	Not applicable
Lgc2.12.FallbackType	Fallback Condition (as Lgc2.1.FallbackType)	uint8	2f48	12104	Not applicable
Lgc2.12.In1	Input Value 1	float32	2f46	12102	Odp
Lgc2.12.In2	Input Value 2	float32	2f47	12103	Odp
Lgc2.12.Invert	Sense of Input Value (as Lgc2.1.Invert)	uint8	2f49	12105	Not applicable
Lgc2.12.Oper	Logic Operation (as Lgc2.1.Oper)	uint8	2f45	12101	Not applicable
Lgc2.12.Out	The result of the logic operation (as Lgc2.1.Out)	bool	2f4a	12106	Not applicable
Lgc2.12.OutputStatus	Output Status (0 = Good; 1 = Bad)	uint8	2f4b	12107	Not applicable
Lgc8.1.In1	Input 1 Value (0 = Off; 1 = On)	bool	2f4f	12111	Not applicable
Lgc8.1.In2	Input 2 Value (0 = Off; 1 = On)	bool	2f50	12112	Not applicable
Lgc8.1.In3	Input 3 Value (0 = Off; 1 = On)	bool	2f51	12113	Not applicable
Lgc8.1.In4	Input 4 Value (0 = Off; 1 = On)	bool	2f52	12114	Not applicable
Lgc8.1.In5	Input 5 Value (0 = Off; 1 = On)	bool	2f53	12115	Not applicable
Lgc8.1.In6	Input 6 Value (0 = Off; 1 = On)	bool	2f54	12116	Not applicable
Lgc8.1.In7	Input 7 Value (0 = Off; 1 = On)	bool	2f55	12117	Not applicable
Lgc8.1.In8	Input 8 Value (0 = Off; 1 = On)	bool	2f56	12118	Not applicable
Lgc8.1.InInvert	Invert Selected Inputs (See also section 4.20.3)	uint8	2f4d	12109	Not applicable
	Hex0001 = Invert input 1	Hex0010 = invert input 5			
	Hex0002 = Invert input 2	Hex0020 = invert input 6			
	Hex0003 = Invert input 3	Hex0030 = invert input 7			
	Hex0004 = invert input 4	Hex0040 = invert input 8			
Lgc8.1.NumIn	Number of Inputs	uint8	2f4e	12110	Not applicable
Lgc8.1.Oper	Logic Operation (0 = Off; 1 = AND; 2 = OR; 3 = XOR)	uint8	2f4c	12108	Not applicable
Lgc8.1.Out	Output Value (0 = Off (false); 1 = On (true))	bool	2f57	12119	Not applicable
Lgc8.1.OutInvert	Invert the Output (0 = No; 1 = Yes)	bool	2f58	12120	Not applicable
Lgc8.2.In1	Input 1 Value (0 = Off; 1 = On)	bool	2f5c	12124	Not applicable
Lgc8.2.In2	Input 2 Value (0 = Off; 1 = On)	bool	2f5d	12125	Not applicable
Lgc8.2.In3	Input 3 Value (0 = Off; 1 = On)	bool	2f5e	12126	Not applicable
Lgc8.2.In4	Input 4 Value (0 = Off; 1 = On)	bool	2f5f	12127	Not applicable
Lgc8.2.In5	Input 5 Value (0 = Off; 1 = On)	bool	2f60	12128	Not applicable
Lgc8.2.In6	Input 6 Value (0 = Off; 1 = On)	bool	2f61	12129	Not applicable
Lgc8.2.In7	Input 7 Value (0 = Off; 1 = On)	bool	2f62	12130	Not applicable
Lgc8.2.In8	Input 8 Value (0 = Off; 1 = On)	bool	2f63	12131	Not applicable
Lgc8.2.InInvert	Invert Selected Inputs (as Lgc8.1.InInvert)	uint8	2f5a	12122	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
Lgc8.2.NumIn	Number of Inputs	uint8	2f5b	12123	Not applicable
Lgc8.2.Oper	Logic Operation (0 = Off; 1 = AND; 2 = OR; 3 = XOR)	uint8	2f59	12121	Not applicable
Lgc8.2.Out	Output Value (as Lgc8.1.Out)	bool	2f64	12132	Not applicable
Lgc8.2.OutInvert	Invert the Output (0 = No; 1 = Yes)	bool	2f65	12133	Not applicable
Math2.1.Fallback	Fallback strategy 0 = Clip Bad; 1 = Clip Good; 2 = Fallback Bad 3 = Fallback Good; 4 = Up scale; 5 = Down scale.	uint8	2faf	12207	Not applicable
Math2.1.FallbackVal	Fallback Value	float32	2fab	12203	Same as Math2.1.Out
Math2.1.HighLimit	Output High Limit	float32	2fac	12204	Same as Math2.1.Out
Math2.1.In1	Input 1 Value	float32	2fa7	12199	Odp
Math2.1.In1Mul	Input 1 Multiplier	float32	2fa6	12198	1dp
Math2.1.In2	Input 2 Value	float32	2fa9	12201	Odp
Math2.1.In2Mul	Input 2 Multiplier	float32	2fa8	12200	1dp
Math2.1.LowLimit	Output Low Limit	float32	2fad	12205	Same as Math2.1.Out
Math2.1.Oper	Operation 0 = Off 1 = Add 3 = Multiply 6 = Select Max 9 = Sample & Hold 12 = Log 15 = 10 to the X	uint8	2faa	12202	Not applicable
Math2.1.Out	Output Value	float32	2fae	12206	Set by Math2.1.Resolution
Math2.1.Resolution	Output Resolution	uint8	2fb2	12210	Not applicable
Math2.1.Select	Select Input 1 or Input 2	bool	2fb0	12208	Not applicable
Math2.1.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	2fb1	12209	Not applicable
Math2.1.Units	Output Units	string_t	6944	26948	Not applicable
Math2.2.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	2fbc	12220	Not applicable
Math2.2.FallbackVal	Fallback Value	float32	2fb8	12216	Same as Math2.2.Out
Math2.2.HighLimit	Output High Limit	float32	2fb9	12217	Same as Math2.2.Out
Math2.2.In1	Input 1 Value	float32	2fb4	12212	Odp
Math2.2.In1Mul	Input 1 Scale	float32	2fb3	12211	1dp
Math2.2.In2	Input 2 Value	float32	2fb6	12214	Odp
Math2.2.In2Mul	Input 2 Scale	float32	2fb5	12213	1dp
Math2.2.LowLimit	Output Low Limit	float32	2fba	12218	Same as Math2.2.Out
Math2.2.Oper	Operation (as Math2.1.Oper)	uint8	2fb7	12215	Not applicable
Math2.2.Out	Output Value	float32	2fbb	12219	Set by Math2.2.Resolution
Math2.2.Resolution	Output Resolution	uint8	2fbf	12223	Not applicable
Math2.2.Select	Select Input 1 or Input 2	bool	2bfd	12221	Not applicable
Math2.2.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	2fbe	12222	Not applicable
Math2.2.Units	Output Units	string_t	694a	26954	Not applicable
Math2.3.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	2fc9	12233	Not applicable
Math2.3.FallbackVal	Fallback Value	float32	2fc5	12229	Same as Math2.3.Out
Math2.3.HighLimit	Output High Limit	float32	2fc6	12230	Same as Math2.3.Out
Math2.3.In1	Input 1 Value	float32	2fc1	12225	Odp
Math2.3.In1Mul	Input 1 Scale	float32	2fc0	12224	1dp
Math2.3.In2	Input 2 Value	float32	2fc3	12227	Odp
Math2.3.In2Mul	Input 2 Scale	float32	2fc2	12226	1dp
Math2.3.LowLimit	Output Low Limit	float32	2fc7	12231	Same as Math2.3.Out
Math2.3.Oper	Operation (as Math2.1.Oper)	uint8	2fc4	12228	Not applicable
Math2.3.Out	Output Value	float32	2fc8	12232	Set by Math2.3.Resolution
Math2.3.Resolution	Output Resolution	uint8	2fcc	12236	Not applicable
Math2.3.Select	Select Between Input 1 and Input 2	bool	2fca	12234	Not applicable
Math2.3.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	2fcb	12235	Not applicable
Math2.3.Units	Output Units	string_t	6950	26960	Not applicable
Math2.4.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	2fd6	12246	Not applicable
Math2.4.FallbackVal	Fallback Value	float32	2fd2	12242	Same as Math2.4.Out
Math2.4.HighLimit	Output High Limit	float32	2fd3	12243	Same as Math2.4.Out
Math2.4.In1	Input 1 Value	float32	2fce	12238	Odp
Math2.4.In1Mul	Input 1 Scale	float32	2fcd	12237	1dp
Math2.4.In2	Input 2 Value	float32	2fd0	12240	Odp
Math2.4.In2Mul	Input 2 Scale	float32	2fcf	12239	1dp
Math2.4.LowLimit	Output Low Limit	float32	2fd4	12244	Same as Math2.4.Out
Math2.4.Oper	Operation (as Math2.1.Oper)	uint8	2fd1	12241	Not applicable
Math2.4.Out	Output Value	float32	2fd5	12245	Set by Math2.4.Resolution
Math2.4.Resolution	Output Resolution	uint8	2fd9	12249	Not applicable
Math2.4.Select	Select Between Input 1 and Input 2	bool	2fd7	12247	Not applicable
Math2.4.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	2fd8	12248	Not applicable
Math2.4.Units	Output Units	string_t	6956	26966	Not applicable
Math2.5.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	2fe3	12259	Not applicable
Math2.5.FallbackVal	Fallback Value	float32	2fdf	12255	Same as Math2.5.Out
Math2.5.HighLimit	Output High Limit	float32	2fe0	12256	Same as Math2.5.Out
Math2.5.In1	Input 1 Value	float32	2fdb	12251	Odp
Math2.5.In1Mul	Input 1 Scale	float32	2fda	12250	1dp
Math2.5.In2	Input 2 Value	float32	2fdd	12253	Odp

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Parameter path	Description	Type	Hex	Dec	Resolution
Math2.5.In2Mul	Input 2 Scale	float32	2fdc	12252	1dp
Math2.5.LowLimit	Output Low Limit	float32	2fe1	12257	Same as Math2.5.Out
Math2.5.Oper	Operation (as Math2.1.Oper)	uint8	2fde	12254	Not applicable
Math2.5.Out	Output Value	float32	2fe2	12258	Set by Math2.5.Resolution
Math2.5.Resolution	Output Resolution	uint8	2fe6	12262	Not applicable
Math2.5.Select	Select Between Input 1 and Input 2	bool	2fe4	12260	Not applicable
Math2.5.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	2fe5	12261	Not applicable
Math2.5.Units	Output Units	string_t	695c	26972	Not applicable
Math2.6.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	2ff0	12272	Not applicable
Math2.6.FallbackVal	Fallback Value	float32	2fec	12268	Same as Math2.6.Out
Math2.6.HighLimit	Output High Limit	float32	2fed	12269	Same as Math2.6.Out
Math2.6.In1	Input 1 Value	float32	2fe8	12264	0dp
Math2.6.In1Mul	Input 1 Scale	float32	2fe7	12263	1dp
Math2.6.In2	Input 2 Value	float32	2fea	12266	0dp
Math2.6.In2Mul	Input 2 Scale	float32	2fe9	12265	1dp
Math2.6.LowLimit	Output Low Limit	float32	2fee	12270	Same as Math2.6.Out
Math2.6.Oper	Operation (as Math2.1.Oper)	uint8	2feb	12267	Not applicable
Math2.6.Out	Output Value	float32	2fef	12271	Set by Math2.6.Resolution
Math2.6.Resolution	Output Resolution	uint8	2ff3	12275	Not applicable
Math2.6.Select	Select Between Input 1 and Input 2	bool	2ff1	12273	Not applicable
Math2.6.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	2ff2	12274	Not applicable
Math2.6.Units	Output Units	string_t	6962	26978	Not applicable
Math2.7.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	2ff0	12285	Not applicable
Math2.7.FallbackVal	Fallback Value	float32	2ff9	12281	Same as Math2.7.Out
Math2.7.HighLimit	Output High Limit	float32	2ffa	12282	Same as Math2.7.Out
Math2.7.In1	Input 1 Value	float32	2ff5	12277	0dp
Math2.7.In1Mul	Input 1 Scale	float32	2ff4	12276	1dp
Math2.7.In2	Input 2 Value	float32	2ff7	12279	0dp
Math2.7.In2Mul	Input 2 Scale	float32	2ff6	12278	1dp
Math2.7.LowLimit	Output Low Limit	float32	2ffb	12283	Same as Math2.7.Out
Math2.7.Oper	Operation (as Math2.1.Oper)	uint8	2ff8	12280	Not applicable
Math2.7.Out	Output Value	float32	2ffc	12284	Set by Math2.7.Resolution
Math2.7.Resolution	Output Resolution	uint8	3000	12288	Not applicable
Math2.7.Select	Select Between Input 1 and Input 2	bool	2ffe	12286	Not applicable
Math2.7.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	2fff	12287	Not applicable
Math2.7.Units	Output Units	string_t	6968	26984	Not applicable
Math2.8.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	300a	12298	Not applicable
Math2.8.FallbackVal	Fallback Value	float32	3006	12294	Same as Math2.8.Out
Math2.8.HighLimit	Output High Limit	float32	3007	12295	Same as Math2.8.Out
Math2.8.In1	Input 1 Value	float32	3002	12290	0dp
Math2.8.In1Mul	Input 1 Scale	float32	3001	12289	1dp
Math2.8.In2	Input 2 Value	float32	3004	12292	0dp
Math2.8.In2Mul	Input 2 Scale	float32	3003	12291	1dp
Math2.8.LowLimit	Output Low Limit	float32	3008	12296	Same as Math2.8.Out
Math2.8.Oper	Operation (as Math2.1.Oper)	uint8	3005	12293	Not applicable
Math2.8.Out	Output Value	float32	3009	12297	Set by Math2.8.Resolution
Math2.8.Resolution	Output Resolution	uint8	300d	12301	Not applicable
Math2.8.Select	Select Between Input 1 and Input 2	bool	300b	12299	Not applicable
Math2.8.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	300c	12300	Not applicable
Math2.8.Units	Output Units	string_t	696e	26990	Not applicable
Math2.9.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	3017	12311	Not applicable
Math2.9.FallbackVal	Fallback Value	float32	3013	12307	Same as Math2.9.Out
Math2.9.HighLimit	Output High Limit	float32	3014	12308	Same as Math2.9.Out
Math2.9.In1	Input 1 Value	float32	300f	12303	0dp
Math2.9.In1Mul	Input 1 Scale	float32	300e	12302	1dp
Math2.9.In2	Input 2 Value	float32	3011	12305	0dp
Math2.9.In2Mul	Input 2 Scale	float32	3010	12304	1dp
Math2.9.LowLimit	Output Low Limit	float32	3015	12309	Same as Math2.9.Out
Math2.9.Oper	Operation (as Math2.1.Oper)	uint8	3012	12306	Not applicable
Math2.9.Out	Output Value	float32	3016	12310	Set by Math2.9.Resolution
Math2.9.Resolution	Output Resolution	uint8	301a	12314	Not applicable
Math2.9.Select	Select Between Input 1 and Input 2	bool	3018	12312	Not applicable
Math2.9.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	3019	12313	Not applicable
Math2.9.Units	Output Units	string_t	6974	26996	Not applicable
Math2.10.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	3024	12324	Not applicable
Math2.10.FallbackVal	Fallback Value	float32	3020	12320	Same as Math2.10.Out
Math2.10.HighLimit	Output High Limit	float32	3021	12321	Same as Math2.10.Out
Math2.10.In1	Input 1 Value	float32	301c	12316	0dp
Math2.10.In1Mul	Input 1 Scale	float32	301b	12315	1dp
Math2.10.In2	Input 2 Value	float32	301e	12318	0dp
Math2.10.In2Mul	Input 2 Scale	float32	301d	12317	1dp
Math2.10.LowLimit	Output Low Limit	float32	3022	12322	Same as Math2.10.Out
Math2.10.Oper	Operation (as Math2.1.Oper)	uint8	301f	12319	Not applicable
Math2.10.Out	Output Value	float32	3023	12323	Set by Math2.10.Resolution
Math2.10.Resolution	Output Resolution	uint8	3027	12327	Not applicable
Math2.10.Select	Select Between Input 1 and Input 2	bool	3025	12325	Not applicable



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Parameter path	Description	Type	Hex	Dec	Resolution
Math2.10.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	3026	12326	Not applicable
Math2.10.Units	Output Units	string_t	697a	27002	Not applicable
Math2.11.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	3031	12337	Not applicable
Math2.11.FallbackVal	Fallback Value	float32	302d	12333	Same as Math2.11.Out
Math2.11.HighLimit	Output High Limit	float32	302e	12334	Same as Math2.11.Out
Math2.11.In1	Input 1 Value	float32	3029	12329	0dp
Math2.11.In1Mul	Input 1 Scale	float32	3028	12328	1dp
Math2.11.In2	Input 2 Value	float32	302b	12331	0dp
Math2.11.In2Mul	Input 2 Scale	float32	302a	12330	1dp
Math2.11.LowLimit	Output Low Limit	float32	302f	12335	Same as Math2.11.Out
Math2.11.Oper	Operation (as Math2.1.Oper)	uint8	302c	12332	Not applicable
Math2.11.Out	Output Value	float32	3030	12336	Set by Math2.11.Resolution
Math2.11.Resolution	Output Resolution	uint8	3034	12340	Not applicable
Math2.11.Select	Select Between Input 1 and Input 2	bool	3032	12338	Not applicable
Math2.11.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	3033	12339	Not applicable
Math2.11.Units	Output Units	string_t	6980	27008	Not applicable
Math2.12.Fallback	Fallback strategy (as Math2.1.Fallback)	uint8	303e	12350	Not applicable
Math2.12.FallbackVal	Fallback Value	float32	303a	12346	Same as Math2.12.Out
Math2.12.HighLimit	Output High Limit	float32	303b	12347	Same as Math2.12.Out
Math2.12.In1	Input 1 Value	float32	3036	12342	0dp
Math2.12.In1Mul	Input 1 Scale	float32	3035	12341	1dp
Math2.12.In2	Input 2 Value	float32	3038	12344	0dp
Math2.12.In2Mul	Input 2 Scale	float32	3037	12343	1dp
Math2.12.LowLimit	Output Low Limit	float32	303c	12348	Same as Math2.12.Out
Math2.12.Oper	Operation (as Math2.1.Oper)	uint8	3039	12345	Not applicable
Math2.12.Out	Output Value	float32	303d	12349	Set by Math2.12.Resolution
Math2.12.Resolution	Output Resolution	uint8	3041	12353	Not applicable
Math2.12.Select	Select Between Input 1 and Input 2	bool	303f	12351	Not applicable
Math2.12.Status	Status. 0 = Good (OK); 7 = Bad (Error)	uint8	3040	12352	Not applicable
Math2.12.Units	Output Units	string_t	6986	27014	Not applicable
ModbusMaster.1.Data.AlarmStatus	Alarm status (0 = No alarms; 1 = one or more alarms active)	uint8	7dbb	32187	Not applicable
ModbusMaster.1.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d4f	32079	Not applicable
ModbusMaster.1.Data.ChanAlarmStatus	Channel alarm status 0 = Off 1 = Active 2 = Safe Nackd 3 = Active Nackd	uint8	7ddb	32219	Not applicable
ModbusMaster.1.Data.DataType	Data type of the data being read/written 0 = Real 1 = DINT 2 = INT 3 = Byte 4 = UDINT 5 = UINT 6 = UBYTE 8 = Real (Swap) 9 = DINT (Swap) 10 = UDINT (Swap) 11 = BIT	uint8	7c06	31750	Not applicable
ModbusMaster.1.Data.Descriptor	Description for this data item	string_t	6687	26247	Not applicable
ModbusMaster.1.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e1b	32283	Not applicable
ModbusMaster.1.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c7e	31870	2dp
ModbusMaster.1.Data.FunctionCode	The Modbus function code 1 = Read coil 2 = Read discrete 3 = Read holding 4 = Read input 5 = Write coil 6 = Write single 16 = Write multiple	uint8	7be8	31720	Not applicable
ModbusMaster.1.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7b8c	31628	0dp
ModbusMaster.1.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7d9b	32155	Not applicable
ModbusMaster.1.Data.Number	Used for multiple instance parameters	uint8	7d13	32019	Not applicable
ModbusMaster.1.Data.ParameterList	Parameter list for a specific slave device	uint8	7cf5	31989	Not applicable
ModbusMaster.1.Data.Priority	Frequency at which the data is read/written 0 = High 1 = Medium 2 = Low 3 = Acyclic	uint8	7c24	31780	Not applicable
ModbusMaster.1.Data.PV	Process value received from slave device	float32	7b32	31538	2dp
ModbusMaster.1.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d31	32049	Not applicable
ModbusMaster.1.Data.Send	1 = send the write value to the slave	bool	7cb9	31929	Not applicable
ModbusMaster.1.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7dfb	32251	Not applicable
ModbusMaster.1.Data.SlaveDevice	Slave device to communicate with.	uint8	7b14	31508	Not applicable
ModbusMaster.1.Data.Status	Transaction status 0 = Success 1 = Illegal function 2 = Illegal address 6 = Slave busy 8 = Parity error 9 = Bad sub 10 = Bad gateway 11 = No response 12 = Idle 13 = Pending 14 = Timeout 15 = Unknown host 16 = Connect fail 17 = No sockets 18 = Loopback fail 19 = Login fail 20 = Unknown error 22 = Write fail 23 = Master reject	uint8	7cd7	31959	Not applicable
ModbusMaster.1.Data.Value	The value to be written to the slave device	float32	7c42	31810	2dp
ModbusMaster.2.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dbc	32188	Not applicable
ModbusMaster.2.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d50	32080	Not applicable
ModbusMaster.2.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7ddc	32220	Not applicable
ModbusMaster.2.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c07	31751	Not applicable
ModbusMaster.2.Data.Descriptor	Description for this data item	string_t	669c	26268	Not applicable
ModbusMaster.2.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e1c	32284	Not applicable
ModbusMaster.2.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c80	31872	2dp
ModbusMaster.2.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7be9	31721	Not applicable
ModbusMaster.2.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7b8e	31630	0dp
ModbusMaster.2.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7d9c	32156	Not applicable
ModbusMaster.2.Data.Number	Used for multiple instance parameters	uint8	7d14	32020	Not applicable
ModbusMaster.2.Data.ParameterList	Parameter list for a specific slave device	uint8	7cf6	31990	Not applicable

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ModbusMaster.2.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c25	31781	Not applicable
ModbusMaster.2.Data.PV	Process value received from slave device	float32	7b34	31540	2dp
ModbusMaster.2.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d32	32050	Not applicable
ModbusMaster.2.Data.Send	1 = send the write value to the slave	bool	7cba	31930	Not applicable
ModbusMaster.2.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7dfc	32252	Not applicable
ModbusMaster.2.Data.SlaveDevice	Slave device to communicate with.	uint8	7b15	31509	Not applicable
ModbusMaster.2.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cd8	31960	Not applicable
ModbusMaster.2.Data.Value	The value to be written to the slave device	float32	7c44	31812	2dp
ModbusMaster.3.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dbd	32189	Not applicable
ModbusMaster.3.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d51	32081	Not applicable
ModbusMaster.3.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7ddd	32221	Not applicable
ModbusMaster.3.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c08	31752	Not applicable
ModbusMaster.3.Data.Descriptor	Description for this data item	string_t	66b1	26289	Not applicable
ModbusMaster.3.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e1d	32285	Not applicable
ModbusMaster.3.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c82	31874	2dp
ModbusMaster.3.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bea	31722	Not applicable
ModbusMaster.3.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7b90	31632	0dp
ModbusMaster.3.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7d9d	32157	Not applicable
ModbusMaster.3.Data.Number	Used for multiple instance parameters	uint8	7d15	32021	Not applicable
ModbusMaster.3.Data.ParameterList	Parameter list for a specific slave device	uint8	7cf7	31991	Not applicable
ModbusMaster.3.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c26	31782	Not applicable
ModbusMaster.3.Data.PV	Process value received from slave device	float32	7b36	31542	2dp
ModbusMaster.3.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d33	32051	Not applicable
ModbusMaster.3.Data.Send	1 = send the write value to the slave	bool	7cbb	31931	Not applicable
ModbusMaster.3.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7dfd	32253	Not applicable
ModbusMaster.3.Data.SlaveDevice	Slave device to communicate with.	uint8	7b16	31510	Not applicable
ModbusMaster.3.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cd9	31961	Not applicable
ModbusMaster.3.Data.Value	The value to be written to the slave device	float32	7c46	31814	2dp
ModbusMaster.4.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dbe	32190	Not applicable
ModbusMaster.4.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d52	32082	Not applicable
ModbusMaster.4.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7dde	32222	Not applicable
ModbusMaster.4.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c09	31753	Not applicable
ModbusMaster.4.Data.Descriptor	Description for this data item	string_t	66c6	26310	Not applicable
ModbusMaster.4.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e1e	32286	Not applicable
ModbusMaster.4.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c84	31876	2dp
ModbusMaster.4.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7beb	31723	Not applicable
ModbusMaster.4.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7b92	31634	0dp
ModbusMaster.4.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7d9e	32158	Not applicable
ModbusMaster.4.Data.Number	Used for multiple instance parameters	uint8	7d16	32022	Not applicable
ModbusMaster.4.Data.ParameterList	Parameter list for a specific slave device	uint8	7cf8	31992	Not applicable
ModbusMaster.4.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c27	31783	Not applicable
ModbusMaster.4.Data.PV	Process value received from slave device	float32	7b38	31544	2dp
ModbusMaster.4.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d34	32052	Not applicable
ModbusMaster.4.Data.Send	1 = send the write value to the slave	bool	7cbc	31932	Not applicable
ModbusMaster.4.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7dfe	32254	Not applicable
ModbusMaster.4.Data.SlaveDevice	Slave device to communicate with.	uint8	7b17	31511	Not applicable
ModbusMaster.4.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cda	31962	Not applicable
ModbusMaster.4.Data.Value	The value to be written to the slave device	float32	7c48	31816	2dp
ModbusMaster.5.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dbf	32191	Not applicable
ModbusMaster.5.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d53	32083	Not applicable
ModbusMaster.5.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7ddf	32223	Not applicable
ModbusMaster.5.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c0a	31754	Not applicable
ModbusMaster.5.Data.Descriptor	Description for this data item	string_t	66db	26311	Not applicable
ModbusMaster.5.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e1f	32287	Not applicable
ModbusMaster.5.Data.FallBackValue	Fall back value to be written into the slave device	float32	7c86	31878	2dp
ModbusMaster.5.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bec	31724	Not applicable
ModbusMaster.5.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7b94	31636	0dp
ModbusMaster.5.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7d9f	32159	Not applicable
ModbusMaster.5.Data.Number	Used for multiple instance parameters	uint8	7d17	32023	Not applicable
ModbusMaster.5.Data.ParameterList	Parameter list for a specific slave device	uint8	7cf9	31993	Not applicable
ModbusMaster.5.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c28	31784	Not applicable
ModbusMaster.5.Data.PV	Process value received from slave device	float32	7b3a	31546	2dp
ModbusMaster.5.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d35	32053	Not applicable
ModbusMaster.5.Data.Send	1 = send the write value to the slave	bool	7cbd	31933	Not applicable
ModbusMaster.5.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7dff	32255	Not applicable
ModbusMaster.5.Data.SlaveDevice	Slave device to communicate with.	uint8	7b18	31512	Not applicable
ModbusMaster.5.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cdb	31963	Not applicable
ModbusMaster.5.Data.Value	The value to be written to the slave device	float32	7c4a	31818	2dp
ModbusMaster.6.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dc0	32192	Not applicable
ModbusMaster.6.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d54	32084	Not applicable
ModbusMaster.6.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7de0	32224	Not applicable
ModbusMaster.6.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c0b	31755	Not applicable
ModbusMaster.6.Data.Descriptor	Description for this data item	string_t	66f0	26352	Not applicable
ModbusMaster.6.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e20	32288	Not applicable
ModbusMaster.6.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c88	31880	2dp
ModbusMaster.6.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bed	31725	Not applicable
ModbusMaster.6.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7b96	31638	0dp

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ModbusMaster.6.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7da0	32160	Not applicable
ModbusMaster.6.Data.Number	Used for multiple instance parameters	uint8	7d18	32024	Not applicable
ModbusMaster.6.Data.ParameterList	Parameter list for a specific slave device	uint8	7cfa	31994	Not applicable
ModbusMaster.6.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c29	31785	Not applicable
ModbusMaster.6.Data.PV	Process value received from slave device	float32	7b3c	31548	2dp
ModbusMaster.6.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d36	32054	Not applicable
ModbusMaster.6.Data.Send	1 = send the write value to the slave	bool	7cbe	31934	Not applicable
ModbusMaster.6.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e00	32256	Not applicable
ModbusMaster.6.Data.SlaveDevice	Slave device to communicate with.	uint8	7b19	31513	Not applicable
ModbusMaster.6.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cdc	31964	Not applicable
ModbusMaster.6.Data.Value	The value to be written to the slave device	float32	7c4c	31820	2dp
ModbusMaster.7.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dc1	32193	Not applicable
ModbusMaster.7.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d55	32085	Not applicable
ModbusMaster.7.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7de1	32225	Not applicable
ModbusMaster.7.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c0c	31756	Not applicable
ModbusMaster.7.Data.Descriptor	Description for this data item	string_t	6705	26373	Not applicable
ModbusMaster.7.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e21	32289	Not applicable
ModbusMaster.7.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c8a	31882	2dp
ModbusMaster.7.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bee	31726	Not applicable
ModbusMaster.7.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7b98	31640	0dp
ModbusMaster.7.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7da1	32161	Not applicable
ModbusMaster.7.Data.Number	Used for multiple instance parameters	uint8	7d19	32025	Not applicable
ModbusMaster.7.Data.ParameterList	Parameter list for a specific slave device	uint8	7cfb	31995	Not applicable
ModbusMaster.7.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c2a	31786	Not applicable
ModbusMaster.7.Data.PV	Process value received from slave device	float32	7b3e	31550	2dp
ModbusMaster.7.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d37	32055	Not applicable
ModbusMaster.7.Data.Send	1 = send the write value to the slave	bool	7cbf	31935	Not applicable
ModbusMaster.7.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e01	32257	Not applicable
ModbusMaster.7.Data.SlaveDevice	Slave device to communicate with.	uint8	7b1a	31514	Not applicable
ModbusMaster.7.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cdd	31965	Not applicable
ModbusMaster.7.Data.Value	The value to be written to the slave device	float32	7c4e	31822	2dp
ModbusMaster.8.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dc2	32194	Not applicable
ModbusMaster.8.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d56	32086	Not applicable
ModbusMaster.8.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7de2	32226	Not applicable
ModbusMaster.8.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c0d	31757	Not applicable
ModbusMaster.8.Data.Descriptor	Description for this data item	string_t	671a	26394	Not applicable
ModbusMaster.8.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e22	32290	Not applicable
ModbusMaster.8.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c8c	31884	2dp
ModbusMaster.8.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bef	31727	Not applicable
ModbusMaster.8.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7b9a	31642	0dp
ModbusMaster.8.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7da2	32162	Not applicable
ModbusMaster.8.Data.Number	Used for multiple instance parameters	uint8	7d1a	32026	Not applicable
ModbusMaster.8.Data.ParameterList	Parameter list for a specific slave device	uint8	7cfc	31996	Not applicable
ModbusMaster.8.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c2b	31787	Not applicable
ModbusMaster.8.Data.PV	Process value received from slave device	float32	7b40	31552	2dp
ModbusMaster.8.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d38	32056	Not applicable
ModbusMaster.8.Data.Send	1 = send the write value to the slave	bool	7c0c	31936	Not applicable
ModbusMaster.8.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e02	32258	Not applicable
ModbusMaster.8.Data.SlaveDevice	Slave device to communicate with.	uint8	7b1b	31515	Not applicable
ModbusMaster.8.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cde	31966	Not applicable
ModbusMaster.8.Data.Value	The value to be written to the slave device	float32	7c50	31824	2dp
ModbusMaster.9.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dc3	32195	Not applicable
ModbusMaster.9.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d57	32087	Not applicable
ModbusMaster.9.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7de3	32227	Not applicable
ModbusMaster.9.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c0e	31758	Not applicable
ModbusMaster.9.Data.Descriptor	Description for this data item	string_t	672f	26415	Not applicable
ModbusMaster.9.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e23	32291	Not applicable
ModbusMaster.9.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c8e	31886	2dp
ModbusMaster.9.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bf0	31728	Not applicable
ModbusMaster.9.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7b9c	31644	0dp
ModbusMaster.9.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7da3	32163	Not applicable
ModbusMaster.9.Data.Number	Used for multiple instance parameters	uint8	7d1b	32027	Not applicable
ModbusMaster.9.Data.ParameterList	Parameter list for a specific slave device	uint8	7cfd	31997	Not applicable
ModbusMaster.9.Data.Priority	FRead/Write frequency (as for Modbus Master.1)	uint8	7c2c	31788	Not applicable
ModbusMaster.9.Data.PV	Process value received from slave device	float32	7b42	31554	2dp
ModbusMaster.9.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d39	32057	Not applicable
ModbusMaster.9.Data.Send	1 = send the write value to the slave	bool	7cc1	31937	Not applicable
ModbusMaster.9.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e03	32259	Not applicable
ModbusMaster.9.Data.SlaveDevice	Slave device to communicate with.	uint8	7b1c	31516	Not applicable
ModbusMaster.9.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cdf	31967	Not applicable
ModbusMaster.9.Data.Value	The value to be written to the slave device	float32	7c52	31826	2dp
ModbusMaster.10.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dc4	32196	Not applicable
ModbusMaster.10.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d58	32088	Not applicable
ModbusMaster.10.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7de4	32228	Not applicable
ModbusMaster.10.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c0f	31759	Not applicable
ModbusMaster.10.Data.Descriptor	Description for this data item	string_t	6744	26436	Not applicable
ModbusMaster.10.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e24	32292	Not applicable

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ModbusMaster.10.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c90	31888	2dp
ModbusMaster.10.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bf1	31729	Not applicable
ModbusMaster.10.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7b9e	31646	0dp
ModbusMaster.10.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7da4	32164	Not applicable
ModbusMaster.10.Data.Number	Used for multiple instance parameters	uint8	7d1c	32028	Not applicable
ModbusMaster.10.Data.ParameterList	Parameter list for a specific slave device	uint8	7cfe	31998	Not applicable
ModbusMaster.10.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c2d	31789	Not applicable
ModbusMaster.10.Data.PV	Process value received from slave device	float32	7b44	31556	2dp
ModbusMaster.10.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d3a	32058	Not applicable
ModbusMaster.10.Data.Send	1 = send the write value to the slave	bool	7cc2	31938	Not applicable
ModbusMaster.10.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e04	32260	Not applicable
ModbusMaster.10.Data.SlaveDevice	Slave device to communicate with.	uint8	7b1d	31517	Not applicable
ModbusMaster.10.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ce0	31968	Not applicable
ModbusMaster.10.Data.Value	The value to be written to the slave device	float32	7c54	31828	2dp
ModbusMaster.11.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dc5	32197	Not applicable
ModbusMaster.11.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d59	32089	Not applicable
ModbusMaster.11.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7de5	32229	Not applicable
ModbusMaster.11.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c10	31760	Not applicable
ModbusMaster.11.Data.Descriptor	Description for this data item	string_t	6759	26457	Not applicable
ModbusMaster.11.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e25	32293	Not applicable
ModbusMaster.11.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c92	31890	2dp
ModbusMaster.11.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bf2	31730	Not applicable
ModbusMaster.11.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bc0	31680	0dp
ModbusMaster.11.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7da5	32165	Not applicable
ModbusMaster.11.Data.Number	Used for multiple instance parameters	uint8	7d1d	32029	Not applicable
ModbusMaster.11.Data.ParameterList	Parameter list for a specific slave device	uint8	7cff	31999	Not applicable
ModbusMaster.11.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c2e	31790	Not applicable
ModbusMaster.11.Data.PV	Process value received from slave device	float32	7b46	31558	2dp
ModbusMaster.11.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d3b	32059	Not applicable
ModbusMaster.11.Data.Send	1 = send the write value to the slave	bool	7cc3	31939	Not applicable
ModbusMaster.11.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e05	32261	Not applicable
ModbusMaster.11.Data.SlaveDevice	Slave device to communicate with.	uint8	7b1e	31518	Not applicable
ModbusMaster.11.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ce1	31969	Not applicable
ModbusMaster.11.Data.Value	The value to be written to the slave device	float32	7c56	31830	2dp
ModbusMaster.12.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dc6	32198	Not applicable
ModbusMaster.12.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d5a	32090	Not applicable
ModbusMaster.12.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7de6	32230	Not applicable
ModbusMaster.12.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c11	31761	Not applicable
ModbusMaster.12.Data.Descriptor	Description for this data item	string_t	676e	26478	Not applicable
ModbusMaster.12.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e26	32294	Not applicable
ModbusMaster.12.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c94	31892	2dp
ModbusMaster.12.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bf3	31731	Not applicable
ModbusMaster.12.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bc2	31682	0dp
ModbusMaster.12.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7da6	32166	Not applicable
ModbusMaster.12.Data.Number	Used for multiple instance parameters	uint8	7d1e	32030	Not applicable
ModbusMaster.12.Data.ParameterList	Parameter list for a specific slave device	uint8	7d00	32000	Not applicable
ModbusMaster.12.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c2f	31791	Not applicable
ModbusMaster.12.Data.PV	Process value received from slave device	float32	7b48	31560	2dp
ModbusMaster.12.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d3c	32060	Not applicable
ModbusMaster.12.Data.Send	1 = send the write value to the slave	bool	7cc4	31940	Not applicable
ModbusMaster.12.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e06	32262	Not applicable
ModbusMaster.12.Data.SlaveDevice	Slave device to communicate with.	uint8	7b1f	31519	Not applicable
ModbusMaster.12.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ce2	31970	Not applicable
ModbusMaster.12.Data.Value	The value to be written to the slave device	float32	7c58	31832	2dp
ModbusMaster.13.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dc7	32199	Not applicable
ModbusMaster.13.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d5b	32091	Not applicable
ModbusMaster.13.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7de7	32231	Not applicable
ModbusMaster.13.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c12	31762	Not applicable
ModbusMaster.13.Data.Descriptor	Description for this data item	string_t	6783	26499	Not applicable
ModbusMaster.13.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e27	32295	Not applicable
ModbusMaster.13.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c96	31894	2dp
ModbusMaster.13.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bf4	31732	Not applicable
ModbusMaster.13.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bc4	31684	0dp
ModbusMaster.13.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7da7	32167	Not applicable
ModbusMaster.13.Data.Number	Used for multiple instance parameters	uint8	7d1f	32031	Not applicable
ModbusMaster.13.Data.ParameterList	Parameter list for a specific slave device	uint8	7d01	32001	Not applicable
ModbusMaster.13.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c30	31792	Not applicable
ModbusMaster.13.Data.PV	Process value received from slave device	float32	7b4a	31562	2dp
ModbusMaster.13.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d3d	32061	Not applicable
ModbusMaster.13.Data.Send	1 = send the write value to the slave	bool	7cc5	31941	Not applicable
ModbusMaster.13.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e07	32263	Not applicable
ModbusMaster.13.Data.SlaveDevice	Slave device to communicate with.	uint8	7b20	31520	Not applicable
ModbusMaster.13.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ce3	31971	Not applicable
ModbusMaster.13.Data.Value	The value to be written to the slave device	float32	7c5a	31834	2dp
ModbusMaster.14.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dc8	32200	Not applicable
ModbusMaster.14.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d5c	32092	Not applicable
ModbusMaster.14.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7de8	32232	Not applicable

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ModbusMaster.14.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c13	31763	Not applicable
ModbusMaster.14.Data.Descriptor	Description for this data item	string_t	6798	26520	Not applicable
ModbusMaster.14.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e28	32296	Not applicable
ModbusMaster.14.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c98	31896	2dp
ModbusMaster.14.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bf5	31733	Not applicable
ModbusMaster.14.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bc6	31686	0dp
ModbusMaster.14.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7da8	32168	Not applicable
ModbusMaster.14.Data.Number	Used for multiple instance parameters	uint8	7d20	32032	Not applicable
ModbusMaster.14.Data.ParameterList	Parameter list for a specific slave device	uint8	7d02	32002	Not applicable
ModbusMaster.14.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c31	31793	Not applicable
ModbusMaster.14.Data.PV	Process value received from slave device	float32	7b4c	31564	2dp
ModbusMaster.14.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d3e	32062	Not applicable
ModbusMaster.14.Data.Send	1 = send the write value to the slave	bool	7cc6	31942	Not applicable
ModbusMaster.14.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e08	32264	Not applicable
ModbusMaster.14.Data.SlaveDevice	Slave device to communicate with.	uint8	7b21	31521	Not applicable
ModbusMaster.14.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ce4	31972	Not applicable
ModbusMaster.14.Data.Value	The value to be written to the slave device	float32	7c5c	31836	2dp
ModbusMaster.15.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dc9	32201	Not applicable
ModbusMaster.15.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d5d	32093	Not applicable
ModbusMaster.15.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7de9	32233	Not applicable
ModbusMaster.15.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c14	31764	Not applicable
ModbusMaster.15.Data.Descriptor	Description for this data item	string_t	67ad	26541	Not applicable
ModbusMaster.15.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e29	32297	Not applicable
ModbusMaster.15.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c9a	31898	2dp
ModbusMaster.15.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bf6	31734	Not applicable
ModbusMaster.15.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bc8	31688	0dp
ModbusMaster.15.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7da9	32169	Not applicable
ModbusMaster.15.Data.Number	Used for multiple instance parameters	uint8	7d21	32033	Not applicable
ModbusMaster.15.Data.ParameterList	Parameter list for a specific slave device	uint8	7d03	32003	Not applicable
ModbusMaster.15.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c32	31794	Not applicable
ModbusMaster.15.Data.PV	Process value received from slave device	float32	7b4e	31566	2dp
ModbusMaster.15.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d3f	32063	Not applicable
ModbusMaster.15.Data.Send	1 = send the write value to the slave	bool	7cc7	31943	Not applicable
ModbusMaster.15.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e09	32265	Not applicable
ModbusMaster.15.Data.SlaveDevice	Slave device to communicate with.	uint8	7b22	31522	Not applicable
ModbusMaster.15.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ce5	31973	Not applicable
ModbusMaster.15.Data.Value	The value to be written to the slave device	float32	7c5e	31838	2dp
ModbusMaster.16.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dca	32202	Not applicable
ModbusMaster.16.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d5e	32094	Not applicable
ModbusMaster.16.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7dea	32234	Not applicable
ModbusMaster.16.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c15	31765	Not applicable
ModbusMaster.16.Data.Descriptor	Description for this data item	string_t	67c2	26562	Not applicable
ModbusMaster.16.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e2a	32298	Not applicable
ModbusMaster.16.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c9c	31900	2dp
ModbusMaster.16.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bf7	31735	Not applicable
ModbusMaster.16.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bca	31690	0dp
ModbusMaster.16.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7daa	32170	Not applicable
ModbusMaster.16.Data.Number	Used for multiple instance parameters	uint8	7d22	32034	Not applicable
ModbusMaster.16.Data.ParameterList	Parameter list for a specific slave device	uint8	7d04	32004	Not applicable
ModbusMaster.16.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c33	31795	Not applicable
ModbusMaster.16.Data.PV	Process value received from slave device	float32	7b50	31568	2dp
ModbusMaster.16.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d40	32064	Not applicable
ModbusMaster.16.Data.Send	1 = send the write value to the slave	bool	7cc8	31944	Not applicable
ModbusMaster.16.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e0a	32266	Not applicable
ModbusMaster.16.Data.SlaveDevice	Slave device to communicate with.	uint8	7b23	31523	Not applicable
ModbusMaster.16.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ce6	31974	Not applicable
ModbusMaster.16.Data.Value	The value to be written to the slave device	float32	7c60	31840	2dp
ModbusMaster.17.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dcb	32203	Not applicable
ModbusMaster.17.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d5f	32095	Not applicable
ModbusMaster.17.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7deb	32235	Not applicable
ModbusMaster.17.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c16	31766	Not applicable
ModbusMaster.17.Data.Descriptor	Description for this data item	string_t	67d7	26583	Not applicable
ModbusMaster.17.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e2b	32299	Not applicable
ModbusMaster.17.Data.FallBackValue	Fall back value to be written to the slave device	float32	7c9e	31902	2dp
ModbusMaster.17.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bf8	31736	Not applicable
ModbusMaster.17.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bcc	31692	0dp
ModbusMaster.17.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7dab	32171	Not applicable
ModbusMaster.17.Data.Number	Used for multiple instance parameters	uint8	7d23	32035	Not applicable
ModbusMaster.17.Data.ParameterList	Parameter list for a specific slave device	uint8	7d05	32005	Not applicable
ModbusMaster.17.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c34	31796	Not applicable
ModbusMaster.17.Data.PV	Process value received from slave device	float32	7b52	31570	2dp
ModbusMaster.17.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d41	32065	Not applicable
ModbusMaster.17.Data.Send	1 = send the write value to the slave	bool	7cc9	31945	Not applicable
ModbusMaster.17.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e0b	32267	Not applicable
ModbusMaster.17.Data.SlaveDevice	Slave device to communicate with.	uint8	7b24	31524	Not applicable
ModbusMaster.17.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ce7	31975	Not applicable
ModbusMaster.17.Data.Value	The value to be written to the slave device	float32	7c62	31842	2dp

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Parameter path	Description	Type	Hex	Dec	Resolution
ModbusMaster.18.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dcc	32204	Not applicable
ModbusMaster.18.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d60	32096	Not applicable
ModbusMaster.18.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7dec	32236	Not applicable
ModbusMaster.18.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c17	31767	Not applicable
ModbusMaster.18.Data.Descriptor	Description for this data item	string_t	67ec	26604	Not applicable
ModbusMaster.18.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e2c	32300	Not applicable
ModbusMaster.18.Data.FallBackValue	Fall back value to be written to the slave device	float32	7ca0	31904	2dp
ModbusMaster.18.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bf9	31737	Not applicable
ModbusMaster.18.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bce	31694	0dp
ModbusMaster.18.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7dac	32172	Not applicable
ModbusMaster.18.Data.Number	Used for multiple instance parameters	uint8	7d24	32036	Not applicable
ModbusMaster.18.Data.ParameterList	Parameter list for a specific slave device	uint8	7d06	32006	Not applicable
ModbusMaster.18.Data.Priority	FRead/Write frequency (as for Modbus Master.1)	uint8	7c35	31797	Not applicable
ModbusMaster.18.Data.PV	Process value received from slave device	float32	7b54	31572	2dp
ModbusMaster.18.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d42	32066	Not applicable
ModbusMaster.18.Data.Send	1 = send the write value to the slave	bool	7cca	31946	Not applicable
ModbusMaster.18.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e0c	32268	Not applicable
ModbusMaster.18.Data.SlaveDevice	Slave device to communicate with.	uint8	7b25	31525	Not applicable
ModbusMaster.18.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ce8	31976	Not applicable
ModbusMaster.18.Data.Value	The value to be written to the slave device	float32	7c64	31844	2dp
ModbusMaster.19.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dcd	32205	Not applicable
ModbusMaster.19.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d61	32097	Not applicable
ModbusMaster.19.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7ded	32237	Not applicable
ModbusMaster.19.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c18	31768	Not applicable
ModbusMaster.19.Data.Descriptor	Description for this data item	string_t	6801	26625	Not applicable
ModbusMaster.19.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e2d	32301	Not applicable
ModbusMaster.19.Data.FallBackValue	Fall back value to be written to the slave device	float32	7ca2	31906	2dp
ModbusMaster.19.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bfa	31738	Not applicable
ModbusMaster.19.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bd0	31696	0dp
ModbusMaster.19.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7dad	32173	Not applicable
ModbusMaster.19.Data.Number	Used for multiple instance parameters	uint8	7d25	32037	Not applicable
ModbusMaster.19.Data.ParameterList	Parameter list for a specific slave device	uint8	7d07	32007	Not applicable
ModbusMaster.19.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c36	31798	Not applicable
ModbusMaster.19.Data.PV	Process value received from slave device	float32	7b56	31574	2dp
ModbusMaster.19.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d43	32067	Not applicable
ModbusMaster.19.Data.Send	1 = send the write value to the slave	bool	7ccb	31947	Not applicable
ModbusMaster.19.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e0d	32269	Not applicable
ModbusMaster.19.Data.SlaveDevice	Slave device to communicate with.	uint8	7b26	31526	Not applicable
ModbusMaster.19.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ce9	31977	Not applicable
ModbusMaster.19.Data.Value	The value to be written to the slave device	float32	7c66	31846	2dp
ModbusMaster.20.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dce	32206	Not applicable
ModbusMaster.20.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d62	32098	Not applicable
ModbusMaster.20.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7dee	32238	Not applicable
ModbusMaster.20.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c19	31769	Not applicable
ModbusMaster.20.Data.Descriptor	Description for this data item	string_t	6816	26646	Not applicable
ModbusMaster.20.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e2e	32302	Not applicable
ModbusMaster.20.Data.FallBackValue	Fall back value to be written to the slave device	float32	7ca4	31908	2dp
ModbusMaster.20.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bfb	31739	Not applicable
ModbusMaster.20.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bd2	31698	0dp
ModbusMaster.20.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7dae	32174	Not applicable
ModbusMaster.20.Data.Number	Used for multiple instance parameters	uint8	7d26	32038	Not applicable
ModbusMaster.20.Data.ParameterList	Parameter list for a specific slave device	uint8	7d08	32008	Not applicable
ModbusMaster.20.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c37	31799	Not applicable
ModbusMaster.20.Data.PV	Process value received from slave device	float32	7b58	31576	2dp
ModbusMaster.20.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d44	32068	Not applicable
ModbusMaster.20.Data.Send	1 = send the write value to the slave	bool	7ccc	31948	Not applicable
ModbusMaster.20.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e0e	32270	Not applicable
ModbusMaster.20.Data.SlaveDevice	Slave device to communicate with.	uint8	7b27	31527	Not applicable
ModbusMaster.20.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cea	31978	Not applicable
ModbusMaster.20.Data.Value	The value to be written to the slave device	float32	7c68	31848	2dp
ModbusMaster.21.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dcf	32207	Not applicable
ModbusMaster.21.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d63	32099	Not applicable
ModbusMaster.21.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7def	32239	Not applicable
ModbusMaster.21.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c1a	31770	Not applicable
ModbusMaster.21.Data.Descriptor	Description for this data item	string_t	682b	26667	Not applicable
ModbusMaster.21.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e2f	32303	Not applicable
ModbusMaster.21.Data.FallBackValue	Fall back value to be written to the slave device	float32	7ca6	31910	2dp
ModbusMaster.21.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bfc	31740	Not applicable
ModbusMaster.21.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bd4	31700	0dp
ModbusMaster.21.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7daf	32175	Not applicable
ModbusMaster.21.Data.Number	Used for multiple instance parameters	uint8	7d27	32039	Not applicable
ModbusMaster.21.Data.ParameterList	Parameter list for a specific slave device	uint8	7d09	32009	Not applicable
ModbusMaster.21.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c38	31800	Not applicable
ModbusMaster.21.Data.PV	Process value received from slave device	float32	7b5a	31578	2dp
ModbusMaster.21.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d45	32069	Not applicable
ModbusMaster.21.Data.Send	1 = send the write value to the slave	bool	7ccd	31949	Not applicable
ModbusMaster.21.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e0f	32271	Not applicable
ModbusMaster.21.Data.SlaveDevice	Slave device to communicate with.	uint8	7b28	31528	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
ModbusMaster.21.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ceb	31979	Not applicable
ModbusMaster.21.Data.Value	The value to be written to the slave device	float32	7c6a	31850	2dp
ModbusMaster.22.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dd0	32208	Not applicable
ModbusMaster.22.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d64	32100	Not applicable
ModbusMaster.22.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7df0	32240	Not applicable
ModbusMaster.22.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c1b	31771	Not applicable
ModbusMaster.22.Data.Descriptor	Description for this data item	string_t	6840	26688	Not applicable
ModbusMaster.22.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e30	32304	Not applicable
ModbusMaster.22.Data.FallBackValue	Fall back value to be written to the slave device	float32	7ca8	31912	2dp
ModbusMaster.22.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bfd	31741	Not applicable
ModbusMaster.22.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bd6	31702	0dp
ModbusMaster.22.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7db0	32176	Not applicable
ModbusMaster.22.Data.Number	Used for multiple instance parameters	uint8	7d28	32040	Not applicable
ModbusMaster.22.Data.ParameterList	Parameter list for a specific slave device	uint8	7d0a	32010	Not applicable
ModbusMaster.22.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c39	31801	Not applicable
ModbusMaster.22.Data.PV	Process value received from slave device	float32	7b5c	31580	2dp
ModbusMaster.22.Data.Scaling	Scaling in decimal places for non floating point data types	uint8	7d46	32070	Not applicable
ModbusMaster.22.Data.Send	1 = send the write value to the slave	bool	7cce	31950	Not applicable
ModbusMaster.22.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e10	32272	Not applicable
ModbusMaster.22.Data.SlaveDevice	Slave device to communicate with.	uint8	7b29	31529	Not applicable
ModbusMaster.22.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cec	31980	Not applicable
ModbusMaster.22.Data.Value	The value to be written to the slave device	float32	7c6c	31852	2dp
ModbusMaster.23.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dd1	32209	Not applicable
ModbusMaster.23.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d65	32101	Not applicable
ModbusMaster.23.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7df1	32241	Not applicable
ModbusMaster.23.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c1c	31772	Not applicable
ModbusMaster.23.Data.Descriptor	Description for this data item	string_t	6855	26709	Not applicable
ModbusMaster.23.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e31	32305	Not applicable
ModbusMaster.23.Data.FallBackValue	Fall back value to be written to the slave device	float32	7caa	31914	2dp
ModbusMaster.23.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bfe	31742	Not applicable
ModbusMaster.23.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bd8	31704	0dp
ModbusMaster.23.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7db1	32177	Not applicable
ModbusMaster.23.Data.Number	Used for multiple instance parameters	uint8	7d29	32041	Not applicable
ModbusMaster.23.Data.ParameterList	Parameter list for a specific slave device	uint8	7d0b	32011	Not applicable
ModbusMaster.23.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c3a	31802	Not applicable
ModbusMaster.23.Data.PV	Process value received from slave device	float32	7b5e	31582	2dp
ModbusMaster.23.Data.Scaling	Scaling in decimal places for non floating point data types	uint8	7d47	32071	Not applicable
ModbusMaster.23.Data.Send	1 = send the write value to the slave	bool	7ccf	31951	Not applicable
ModbusMaster.23.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e11	32273	Not applicable
ModbusMaster.23.Data.SlaveDevice	Slave device to communicate with.	uint8	7b2a	31530	Not applicable
ModbusMaster.23.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7ced	31981	Not applicable
ModbusMaster.23.Data.Value	The value to be written to the slave device	float32	7c6e	31854	2dp
ModbusMaster.24.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dd2	32210	Not applicable
ModbusMaster.24.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d66	32102	Not applicable
ModbusMaster.24.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7df2	32242	Not applicable
ModbusMaster.24.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c1d	31773	Not applicable
ModbusMaster.24.Data.Descriptor	Description for this data item	string_t	686a	26730	Not applicable
ModbusMaster.24.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e32	32306	Not applicable
ModbusMaster.24.Data.FallBackValue	Fall back value to be written to the slave device	float32	7cac	31916	2dp
ModbusMaster.24.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7bff	31743	Not applicable
ModbusMaster.24.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bda	31706	0dp
ModbusMaster.24.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7db2	32178	Not applicable
ModbusMaster.24.Data.Number	Used for multiple instance parameters	uint8	7d2a	32042	Not applicable
ModbusMaster.24.Data.ParameterList	Parameter list for a specific slave device	uint8	7d0c	32012	Not applicable
ModbusMaster.24.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c3b	31803	Not applicable
ModbusMaster.24.Data.PV	Process value received from slave device	float32	7b60	31584	2dp
ModbusMaster.24.Data.Scaling	Scaling in decimal places for non floating point data types	uint8	7d48	32072	Not applicable
ModbusMaster.24.Data.Send	1 = send the write value to the slave	bool	7cd0	31952	Not applicable
ModbusMaster.24.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e12	32274	Not applicable
ModbusMaster.24.Data.SlaveDevice	Slave device to communicate with.	uint8	7b2b	31531	Not applicable
ModbusMaster.24.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cee	31982	Not applicable
ModbusMaster.24.Data.Value	The value to be written to the slave device	float32	7c70	31856	2dp
ModbusMaster.25.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dd3	32211	Not applicable
ModbusMaster.25.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d67	32103	Not applicable
ModbusMaster.25.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7df3	32243	Not applicable
ModbusMaster.25.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c1e	31774	Not applicable
ModbusMaster.25.Data.Descriptor	Description for this data item	string_t	687f	26751	Not applicable
ModbusMaster.25.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e33	32307	Not applicable
ModbusMaster.25.Data.FallBackValue	Fall back value to be written to the slave device	float32	7cae	31918	2dp
ModbusMaster.25.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7c00	31744	Not applicable
ModbusMaster.25.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bdc	31708	0dp
ModbusMaster.25.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7db3	32179	Not applicable
ModbusMaster.25.Data.Number	Used for multiple instance parameters	uint8	7d2b	32043	Not applicable
ModbusMaster.25.Data.ParameterList	Parameter list for a specific slave device	uint8	7d0d	32013	Not applicable
ModbusMaster.25.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c3c	31804	Not applicable
ModbusMaster.25.Data.PV	Process value received from slave device	float32	7b62	31586	2dp
ModbusMaster.25.Data.Scaling	Scaling in decimal places for non floating point data types	uint8	7d49	32073	Not applicable
ModbusMaster.25.Data.Send	1 = send the write value to the slave	bool	7cd1	31953	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
ModbusMaster.25.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e13	32275	Not applicable
ModbusMaster.25.Data.SlaveDevice	Slave device to communicate with.	uint8	7b2c	31532	Not applicable
ModbusMaster.25.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cef	31983	Not applicable
ModbusMaster.25.Data.Value	The value to be written to the slave device	float32	7c72	31858	2dp
ModbusMaster.26.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dd4	32212	Not applicable
ModbusMaster.26.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d68	32104	Not applicable
ModbusMaster.26.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7df4	32244	Not applicable
ModbusMaster.26.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c1f	31775	Not applicable
ModbusMaster.26.Data.Descriptor	Description for this data item	string_t	6894	26772	Not applicable
ModbusMaster.26.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e34	32308	Not applicable
ModbusMaster.26.Data.FallBackValue	Fall back value to be written to the slave device	float32	7cb0	31920	2dp
ModbusMaster.26.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7c01	31745	Not applicable
ModbusMaster.26.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7bde	31710	0dp
ModbusMaster.26.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7db4	32180	Not applicable
ModbusMaster.26.Data.Number	Used for multiple instance parameters	uint8	7d2c	32044	Not applicable
ModbusMaster.26.Data.ParameterList	Parameter list for a specific slave device	uint8	7d0e	32014	Not applicable
ModbusMaster.26.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c3d	31805	Not applicable
ModbusMaster.26.Data.PV	Process value received from slave device	float32	7b64	31588	2dp
ModbusMaster.26.Data.Scaling	Scaling in decimal places for non floating point data types	uint8	7d4a	32074	Not applicable
ModbusMaster.26.Data.Send	1 = send the write value to the slave	bool	7cd2	31954	Not applicable
ModbusMaster.26.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e14	32276	Not applicable
ModbusMaster.26.Data.SlaveDevice	Slave device to communicate with.	uint8	7b2d	31533	Not applicable
ModbusMaster.26.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cf0	31984	Not applicable
ModbusMaster.26.Data.Value	The value to be written to the slave device	float32	7c74	31860	2dp
ModbusMaster.27.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dd5	32213	Not applicable
ModbusMaster.27.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d69	32105	Not applicable
ModbusMaster.27.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7df5	32245	Not applicable
ModbusMaster.27.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c20	31776	Not applicable
ModbusMaster.27.Data.Descriptor	Description for this data item	string_t	68a9	26793	Not applicable
ModbusMaster.27.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e35	32309	Not applicable
ModbusMaster.27.Data.FallBackValue	Fall back value to be written to the slave device	float32	7cb2	31922	2dp
ModbusMaster.27.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7c02	31746	Not applicable
ModbusMaster.27.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7be0	31712	0dp
ModbusMaster.27.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7db5	32181	Not applicable
ModbusMaster.27.Data.Number	Used for multiple instance parameters	uint8	7d2d	32045	Not applicable
ModbusMaster.27.Data.ParameterList	Parameter list for a specific slave device	uint8	7d0f	32015	Not applicable
ModbusMaster.27.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c3e	31806	Not applicable
ModbusMaster.27.Data.PV	Process value received from slave device	float32	7b66	31590	2dp
ModbusMaster.27.Data.Scaling	Scaling in decimal places for non floating point data types	uint8	7d4b	32075	Not applicable
ModbusMaster.27.Data.Send	1 = send the write value to the slave	bool	7cd3	31955	Not applicable
ModbusMaster.27.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e15	32277	Not applicable
ModbusMaster.27.Data.SlaveDevice	Slave device to communicate with.	uint8	7b2e	31534	Not applicable
ModbusMaster.27.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cf1	31985	Not applicable
ModbusMaster.27.Data.Value	The value to be written to the slave device	float32	7c76	31862	2dp
ModbusMaster.28.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dd6	32214	Not applicable
ModbusMaster.28.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d6a	32106	Not applicable
ModbusMaster.28.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7df6	32246	Not applicable
ModbusMaster.28.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c21	31777	Not applicable
ModbusMaster.28.Data.Descriptor	Description for this data item	string_t	68be	26814	Not applicable
ModbusMaster.28.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e36	32310	Not applicable
ModbusMaster.28.Data.FallBackValue	Fall back value to be written to the slave device	float32	7cb4	31924	2dp
ModbusMaster.28.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7c03	31747	Not applicable
ModbusMaster.28.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7be2	31714	0dp
ModbusMaster.28.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7db6	32182	Not applicable
ModbusMaster.28.Data.Number	Used for multiple instance parameters	uint8	7d2e	32046	Not applicable
ModbusMaster.28.Data.ParameterList	Parameter list for a specific slave device	uint8	7d10	32016	Not applicable
ModbusMaster.28.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c3f	31807	Not applicable
ModbusMaster.28.Data.PV	Process value received from slave device	float32	7b68	31592	2dp
ModbusMaster.28.Data.Scaling	Scaling in decimal places for non floating point data types	uint8	7d4c	32076	Not applicable
ModbusMaster.28.Data.Send	1 = send the write value to the slave	bool	7cd4	31956	Not applicable
ModbusMaster.28.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e16	32278	Not applicable
ModbusMaster.28.Data.SlaveDevice	Slave device to communicate with.	uint8	7b2f	31535	Not applicable
ModbusMaster.28.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cf2	31986	Not applicable
ModbusMaster.28.Data.Value	The value to be written to the slave device	float32	7c78	31864	2dp
ModbusMaster.29.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dd7	32215	Not applicable
ModbusMaster.29.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d6b	32107	Not applicable
ModbusMaster.29.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7df7	32247	Not applicable
ModbusMaster.29.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c22	31778	Not applicable
ModbusMaster.29.Data.Descriptor	Description for this data item	string_t	70ff	28927	Not applicable
ModbusMaster.29.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e37	32311	Not applicable
ModbusMaster.29.Data.FallBackValue	Fall back value to be written to the slave device	float32	7cb6	31926	2dp
ModbusMaster.29.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7c04	31748	Not applicable
ModbusMaster.29.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7be4	31716	0dp
ModbusMaster.29.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7db7	32183	Not applicable
ModbusMaster.29.Data.Number	Used for multiple instance parameters	uint8	7d2f	32047	Not applicable
ModbusMaster.29.Data.ParameterList	Parameter list for a specific slave device	uint8	7d11	32017	Not applicable
ModbusMaster.29.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c40	31808	Not applicable



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Parameter path	Description	Type	Hex	Dec	Resolution
ModbusMaster.29.Data.PV	Process value received from slave device	float32	7b6a	31594	2dp
ModbusMaster.29.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d4d	32077	Not applicable
ModbusMaster.29.Data.Send	1 = send the write value to the slave	bool	7cd5	31957	Not applicable
ModbusMaster.29.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e17	32279	Not applicable
ModbusMaster.29.Data.SlaveDevice	Slave device to communicate with.	uint8	7b30	31536	Not applicable
ModbusMaster.29.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cf3	31987	Not applicable
ModbusMaster.29.Data.Value	The value to be written to the slave device	float32	7c7a	31866	2dp
ModbusMaster.30.Data.AlarmStatus	Alarm status (as for Modbus Master.1)	uint8	7dd8	32216	Not applicable
ModbusMaster.30.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d6c	32108	Not applicable
ModbusMaster.30.Data.ChanAlarmStatus	Channel alarm status (as for Modbus Master.1)	uint8	7df8	32248	Not applicable
ModbusMaster.30.Data.DataType	Type of data being read/written (as for Modbus Master.1)	uint8	7c23	31779	Not applicable
ModbusMaster.30.Data.Descriptor	Description for this data item	string_t	7114	28948	Not applicable
ModbusMaster.30.Data.Digital	Digital status (0 = Off, 1 = On)	bool	7e38	32312	Not applicable
ModbusMaster.30.Data.FallBackValue	Fall back value to be written to the slave device	float32	7cb8	31928	2dp
ModbusMaster.30.Data.FunctionCode	The Modbus function code (as for Modbus Master.1)	uint8	7c05	31749	Not applicable
ModbusMaster.30.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7be6	31718	0dp
ModbusMaster.30.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7db8	32184	Not applicable
ModbusMaster.30.Data.Number	Used for multiple instance parameters	uint8	7d30	32048	Not applicable
ModbusMaster.30.Data.ParameterList	Parameter list for a specific slave device	uint8	7d12	32018	Not applicable
ModbusMaster.30.Data.Priority	Read/Write frequency (as for Modbus Master.1)	uint8	7c41	31809	Not applicable
ModbusMaster.30.Data.PV	Process value received from slave device	float32	7b6c	31596	2dp
ModbusMaster.30.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d4e	32078	Not applicable
ModbusMaster.30.Data.Send	1 = send the write value to the slave	bool	7cd6	31958	Not applicable
ModbusMaster.30.Data.Set	Sets a digital value (1 = on; 0 = off)	bool	7e18	32280	Not applicable
ModbusMaster.30.Data.SlaveDevice	Slave device to communicate with.	uint8	7b31	31537	Not applicable
ModbusMaster.30.Data.Status	Transaction status (as for Modbus Master.1)	uint8	7cf4	31988	Not applicable
ModbusMaster.30.Data.Value	The value to be written to the slave device	float32	7c7c	31868	2dp
ModbusMaster.Slave1.Data.AlarmStatus	Alarm status (0 = none; 1 = one or more alarms active)	uint8	7db9	32185	Not applicable
ModbusMaster.Slave1.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d95	32149	Not applicable
ModbusMaster.Slave1.Data.ChanAlarmStatus	Channel alarm status 0 = Off 1 = Active 2 = Safe Nack'd 3 = Active Nack'd	uint8	7dd9	32217	Not applicable
ModbusMaster.Slave1.Data.DataType	Data type of the data being read/written 0 = Real 1 = DINT 2 = INT 3 = Byte 4 = UDINT 5 = UINT 6 = UBYTE 8 = Real (Swap) 9 = DINT (Swap) 10 = UDINT (Swap) 11 = BIT	uint8	7d7f	32127	Not applicable
ModbusMaster.Slave1.Data.Descriptor	Description for this data item	string_t	665d	26205	Not applicable
ModbusMaster.Slave1.Data.Digital	Digital status (0 = Off; 1 = On)	bool	7e19	32281	Not applicable
ModbusMaster.Slave1.Data.FallBackValue	Fall back value to be written to the slave device	float32	7d87	32135	2dp
ModbusMaster.Slave1.Data.FunctionCode	The Modbus function code 1 = Read coil 2 = Read discrete 3 = Read holding 4 = Read input 5 = Write coil 6 = Write single 16 = Write multiple	uint8	7d7d	32125	Not applicable
ModbusMaster.Slave1.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7d79	32121	0dp
ModbusMaster.Slave1.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7d99	32153	Not applicable
ModbusMaster.Slave1.Data.Number	Used for multiple instance parameters	uint8	7d91	32145	Not applicable
ModbusMaster.Slave1.Data.ParameterList	Parameter list for a specific slave device	uint8	7d8f	32143	Not applicable
ModbusMaster.Slave1.Data.Priority	Frequency at which the data is read/written 0 = High 1 = Medium 2 = Low 3 = Acyclic	uint8	7d81	32129	Not applicable
ModbusMaster.Slave1.Data.PV	Process value received from slave device	float32	7d73	32115	2dp
ModbusMaster.Slave1.Data.Scoring	Scaling in decimal places for non floating point data types	uint8	7d93	32147	Not applicable
ModbusMaster.Slave1.Data.Send	1 = send the write value to the slave	bool	7d8b	32139	Not applicable
ModbusMaster.Slave1.Data.Set	Sets a digital value to on (1) or off (0)	bool	7df9	32249	Not applicable
ModbusMaster.Slave1.Data.SlaveDevice	Slave device to communicate with.	uint8	7d71	32113	Not applicable
ModbusMaster.Slave1.Data.Status	Transaction status 0 = Success 1 = Illegal function 2 = Illegal address 3 = Illegal value 6 = Slave busy 8 = Parity error 9 = Bad sub 10 = Bad gateway 11 = No response 12 = Idle 13 = Pending 14 = Timeout 15 = Unknown host 16 = Connect fail 17 = No sockets 18 = Loopback fail 19 = Login fail 20 = Unknown error 22 = Write fail 23 = Master reject	uint8	7d8d	32141	Not applicable
ModbusMaster.Slave1.Data.Value	The value to be written to the slave device	float32	7d83	32131	2dp
ModbusMaster.Slave1.Main.CommsFailure	1 = a device communications failure	bool	7d97	32151	Not applicable
ModbusMaster.Slave1.Main.Descriptor	Device descriptor	string_t	6633	26163	Not applicable
ModbusMaster.Slave1.Main.HighPriority	High priority rate 0 = 125ms 1 = 250ms 2 = 500 ms 3 = 1 sec 4 = 2 secs 5 = 5 secs 6 = 10 secs 7 = 20 secs 8 = 30 secs 9 = 1 min 10 = 2 mins 11 = 5 mins 12 = 10 mins 13 = 20 mins 14 = 30 mins 15 = 1 hr	uint8	7b0c	31500	Not applicable
ModbusMaster.Slave1.Main.IPAddress	Internet Protocol (IP) address for a slave device	string_t	68d3	26835	Not applicable
ModbusMaster.Slave1.Main.LowPriority	Low priority rate (as 'high priority' above)	uint8	7b10	31504	Not applicable
ModbusMaster.Slave1.Main.MaxBlockSize	Maximum amount of data in a single transaction	uint8	7b0a	31498	Not applicable
ModbusMaster.Slave1.Main.MediumPriority	Medium priority rate (as 'high priority' above)	uint8	7b0e	31502	Not applicable
ModbusMaster.Slave1.Main.Online	Enables communications (0 = offline; 1 = online)	bool	7b00	31488	Not applicable
ModbusMaster.Slave1.Main.Profile	A profile that defines the device type 0 = 3rd party 1 = Mini8 2 = 3xxx 3 = 35xx 4 = 2xxx 5 = 2500 6 = 5000 7 = 6000 8 = FEC920 9 = EPower	uint8	7b12	31506	Not applicable
ModbusMaster.Slave1.Main.Retries	Transaction retries	uint8	7b04	31492	Not applicable

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ModbusMaster.Slave1.Main.SearchDevice	Initiates a slave search (0 = No; 1 = Yes)	bool	7d6d	32109	Not applicable
ModbusMaster.Slave1.Main.SearchResult	Current search status 0 = Searching 1 = Available 2 = Unavailable 3 = Unreachable 4 = Aborted	uint8	7d6f	32111	Not applicable
ModbusMaster.Slave1.Main.Timeout	Time in milliseconds the master will wait for a response	float32	7b06	31494	0dp
ModbusMaster.Slave1.Main.UnitId	Unit id for a slave device	uint8	7b02	31490	Not applicable
ModbusMaster.Slave2.Data.AlarmStatus	Alarm status (0 = none; 1 = one or more alarms active)	uint8	7dba	32186	Not applicable
ModbusMaster.Slave2.Data.BitPosition	Bit position of the bit of interest in a 16 bit data type	uint8	7d96	32150	Not applicable
ModbusMaster.Slave2.Data.ChanAlarmStatus	Channel alarm status (as Slave1.Data)	uint8	7dda	32218	Not applicable
ModbusMaster.Slave2.Data.DataType	Data type of the data being read/written (as Slave1.Data)	uint8	7d80	32128	Not applicable
ModbusMaster.Slave2.Data.Descriptor	Description for this data item	string_t	6672	26226	Not applicable
ModbusMaster.Slave2.Data.Digital	Digital status (0 = Off; 1 = On)	bool	7e1a	32282	Not applicable
ModbusMaster.Slave2.Data.FallBackValue	Fall back value to be written to the slave device	float32	7d89	32137	2dp
ModbusMaster.Slave2.Data.FunctionCode	The Modbus function code (as Slave1.Data)	uint8	7d7e	32126	Not applicable
ModbusMaster.Slave2.Data.ModbusAddress	Modbus register address of the data to be read/written	float32	7d7b	32123	0dp
ModbusMaster.Slave2.Data.Mode	Auto Manual mode selection (0 = Auto; 1 = Manual)	uint8	7d9a	32154	Not applicable
ModbusMaster.Slave2.Data.Number	Used for multiple instance parameters	uint8	7d92	32146	Not applicable
ModbusMaster.Slave2.Data.ParameterList	Parameter list for a specific slave device	uint8	7d90	32144	Not applicable
ModbusMaster.Slave2.Data.Priority	Frequency at which the data is read/written (as Slave1.Data)	uint8	7d82	32130	Not applicable
ModbusMaster.Slave2.Data.PV	Process value received from slave device	float32	7d75	32117	2dp
ModbusMaster.Slave2.Data.Scoring	Scoring in decimal places for non floating point data types	uint8	7d94	32148	Not applicable
ModbusMaster.Slave2.Data.Send	1 = send the write value to the slave	bool	7d8c	32140	Not applicable
ModbusMaster.Slave2.Data.Set	Sets a digital value to on (1) or off (0)	bool	7dfa	32250	Not applicable
ModbusMaster.Slave2.Data.SlaveDevice	Slave device to communicate with.	uint8	7d72	32114	Not applicable
ModbusMaster.Slave2.Data.Status	Transaction status (as for Slave 1)	uint8	7d8e	32142	Not applicable
ModbusMaster.Slave2.Data.Value	The value to be written to the slave device	float32	7d85	32133	2dp
ModbusMaster.Slave2.Main.CommsFailure	1 = a device communications failure	bool	7d98	32152	Not applicable
ModbusMaster.Slave2.Main.Descriptor	Device descriptor	string_t	6648	26184	Not applicable
ModbusMaster.Slave2.Main.HighPriority	High priority rate (as for Slave 1)	uint8	7b0d	31501	Not applicable
ModbusMaster.Slave2.Main.IPAddress	Internet Protocol (IP) address for a slave device	string_t	68e5	26853	Not applicable
ModbusMaster.Slave2.Main.LowPriority	Low priority rate (as for Slave 1)	uint8	7b11	31505	Not applicable
ModbusMaster.Slave2.Main.MaxBlockSize	Maximum amount of data in a single transaction	uint8	7b0b	31499	Not applicable
ModbusMaster.Slave2.Main.MediumPriority	Medium priority rate (as for Slave 1)	uint8	7b0f	31503	Not applicable
ModbusMaster.Slave2.Main.Online	Enables communications (0 = offline; 1 = online)	bool	7b01	31489	Not applicable
ModbusMaster.Slave2.Main.Profile	A profile that defines the device type (as Slave1.Data)	uint8	7b13	31507	Not applicable
ModbusMaster.Slave2.Main.Retries	Transaction retries	uint8	7b05	31493	Not applicable
ModbusMaster.Slave2.Main.SearchDevice	Initiates a slave search (0 = No; 1 = Yes)	bool	7d6e	32110	Not applicable
ModbusMaster.Slave2.Main.SearchResult	Current search status (as Slave1.Data)	uint8	7d70	32112	Not applicable
ModbusMaster.Slave2.Main.Timeout	Time in milliseconds the master will wait for a response	float32	7b08	31496	0dp
ModbusMaster.Slave2.Main.UnitId	Unit id for a slave device	uint8	7b03	31491	Not applicable
Mux8.1.Fallback	Fallback Strategy 0 = Clip Bad; 1 = Clip Good; 2 = Fallback Bad 3 = Fallback Good; 4 = Up scale; 5 = Down scale.	uint8	2f66	12134	Not applicable
Mux8.1.FallbackVal	Fallback Value	float32	2f67	12135	1dp
Mux8.1.HighLimit	High Limit	float32	2f69	12137	1dp
Mux8.1.In1	Input 1	float32	2f6b	12139	1dp
Mux8.1.In2	Input 2	float32	2f6c	12140	1dp
Mux8.1.In3	Input 3	float32	2f6d	12141	1dp
Mux8.1.In4	Input 4	float32	2f6e	12142	1dp
Mux8.1.In5	Input 5	float32	2f6f	12143	1dp
Mux8.1.In6	Input 6	float32	2f70	12144	1dp
Mux8.1.In7	Input 7	float32	2f71	12145	1dp
Mux8.1.In8	Input 8	float32	2f72	12146	1dp
Mux8.1.LowLimit	Low Limit	float32	2f6a	12138	1dp
Mux8.1.Out	Output	float32	2f73	12147	Set by Mux8.1.Resolution
Mux8.1.Resolution	Resolution	uint8	2f75	12149	Not applicable
Mux8.1.Select	Input Selection Switch 1 to 8 = input 1 to 8 (respectively) selected for output	uint8	2f68	12136	Not applicable
Mux8.1.Status	Status. 0 = Good (OK); 7 = Bad (Error)	bool	2f74	12148	Not applicable
Mux8.2.Fallback	Fallback Strategy (as Mux8.1.Fallback)	uint8	2f76	12150	Not applicable
Mux8.2.FallbackVal	Fallback Value	float32	2f77	12151	1dp
Mux8.2.HighLimit	High Limit	float32	2f79	12153	1dp
Mux8.2.In1	Input 1	float32	2f7b	12155	1dp
Mux8.2.In2	Input 2	float32	2f7c	12156	1dp
Mux8.2.In3	Input 3	float32	2f7d	12157	1dp
Mux8.2.In4	Input 4	float32	2f7e	12158	1dp
Mux8.2.In5	Input 5	float32	2f7f	12159	1dp
Mux8.2.In6	Input 6	float32	2f80	12160	1dp
Mux8.2.In7	Input 7	float32	2f81	12161	1dp
Mux8.2.In8	Input 8	float32	2f82	12162	1dp
Mux8.2.LowLimit	Low Limit	float32	2f7a	12154	1dp
Mux8.2.Out	Output	float32	2f83	12163	Set by Mux8.2.Resolution
Mux8.2.Resolution	Resolution	uint8	2f85	12165	Not applicable
Mux8.2.Select	Input Selection (as Mux8.1.Select)	uint8	2f78	12152	Not applicable
Mux8.2.Status	Status. 0 = Good (OK); 7 = Bad (Error)	bool	2f84	12164	Not applicable
Mux8.3.Fallback	Fallback Strategy (as Mux8.1.Fallback)	uint8	2f86	12166	Not applicable
Mux8.3.FallbackVal	Fallback Value	float32	2f87	12167	1dp

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Mux8.3.HighLimit	High Limit	float32	2f89	12169	1dp
Mux8.3.In1	Input 1	float32	2f8b	12171	1dp
Mux8.3.In2	Input 2	float32	2f8c	12172	1dp
Mux8.3.In3	Input 3	float32	2f8d	12173	1dp
Mux8.3.In4	Input 4	float32	2f8e	12174	1dp
Mux8.3.In5	Input 5	float32	2f8f	12175	1dp
Mux8.3.In6	Input 6	float32	2f90	12176	1dp
Mux8.3.In7	Input 7	float32	2f91	12177	1dp
Mux8.3.In8	Input 8	float32	2f92	12178	1dp
Mux8.3.LowLimit	Low Limit	float32	2f8a	12170	1dp
Mux8.3.Out	Output	float32	2f93	12179	Set by Mux8.3.Resolution
Mux8.3.Resolution	Resolution	uint8	2f95	12181	Not applicable
Mux8.3.Select	Input Selection (as Mux8.1.Select)	uint8	2f88	12168	Not applicable
Mux8.3.Status	Status. 0 = Good (OK); 7 = Bad (Error)	bool	2f94	12180	Not applicable
Mux8.4.Fallback	Fallback Strategy (as Mux8.1.Fallback)	uint8	2f96	12182	Not applicable
Mux8.4.FallbackVal	Fallback Value	float32	2f97	12183	1dp
Mux8.4.HighLimit	High Limit	float32	2f99	12185	1dp
Mux8.4.In1	Input 1	float32	2f9b	12187	1dp
Mux8.4.In2	Input 2	float32	2f9c	12188	1dp
Mux8.4.In3	Input 3	float32	2f9d	12189	1dp
Mux8.4.In4	Input 4	float32	2f9e	12190	1dp
Mux8.4.In5	Input 5	float32	2f9f	12191	1dp
Mux8.4.In6	Input 6	float32	2fa0	12192	1dp
Mux8.4.In7	Input 7	float32	2fa1	12193	1dp
Mux8.4.In8	Input 8	float32	2fa2	12194	1dp
Mux8.4.LowLimit	Low Limit	float32	2f9a	12186	1dp
Mux8.4.Out	Output	float32	2fa3	12195	Set by Mux8.4.Resolution
Mux8.4.Resolution	Resolution	uint8	2fa5	12197	Not applicable
Mux8.4.Select	Input Selection (as Mux8.1.Select)	uint8	2f98	12184	Not applicable
Mux8.4.Status	Status. 0 = Good (OK); 7 = Bad (Error)	bool	2fa4	12196	Not applicable
nano_ui.Access	Access level 0 = Logged out; 1 = Operator; 2 = Supervisor; 3 = Engineer	uint8	2c00	11264	Not applicable
nano_ui.Password	Password	string_t	5400	21504	Not applicable
Network.Archive.ArchiveRate	Rate at which to archive history files 0 = None      1 = Every minute      2 = Hourly 3 = Daily      4 = Weekly      5 = Monthly 6 = Automatic	uint8	1114	4372	Not applicable
Network.Archive.CSVDateFormat	Date/Time format (0 = Text; 1 = spreadsheet numeric)	uint8	111d	4381	Not applicable
Network.Archive.CSVHeaders	Include header details (0 = No; 1 = Yes)	bool	111b	4379	Not applicable
Network.Archive.CSVHeadings	Include headings (0 = No; 1 = Yes)	bool	111c	4380	Not applicable
Network.Archive.CSVIncludeValues	Include process values (0 = No; 1 = Yes)	bool	1119	4377	Not applicable
Network.Archive.CSVMessages	Include messages (0 = No; 1 = Yes)	bool	111a	4378	Not applicable
Network.Archive.CSVTabDelimiter	Use Tab delimiter instead of comma (0 = No; 1 = Yes)	bool	111e	4382	Not applicable
Network.Archive.Destination	Archive destination. 0 = USB; 1 = FTP Server	uint8	1111	4369	Not applicable
Network.Archive.FileFormat	Archive file format (0 = Binary; 1 = CSV; 2 = both)	uint8	1115	4373	Not applicable
Network.Archive.MediaDuration	Time in days until the USB is full	float32	1118	4376	2dp
Network.Interface.Gateway	Default gateway internet protocol address	string_t	4524	17700	Not applicable
Network.Interface.IPaddress	Internet Protocol (IP) address of this instrument	string_t	4500	17664	Not applicable
Network.Interface.IPType	IP Lookup. 0 = DHCP, 1 = Fixed	uint8	1102	4354	Not applicable
Network.Interface.MAC	Media Access Control (MAC) address of this instrument	string_t	4548	17736	Not applicable
Network.Interface.SubnetMask	Sub network identification mask	string_t	4512	17682	Not applicable
Network.Modbus.Address	Modbus address for this instrument	uint8	1140	4416	Not applicable
Network.Modbus.InputTimeout	Modbus Input inactivity timeout (in seconds)	int16	1141	4417	Not applicable
Network.Modbus.PrefMasterIP	Preferred master IP	string_t	469c	18076	Not applicable
Network.Modbus.SerialMode	Modbus serial port mode	uint8	1143	4419	Not applicable
Network.Modbus.TimeFormat	Time parameter comms resolution	uint8	1144	4420	Not applicable
Network.Modbus.UnitIdEnable	Unit ident enable	uint8	1142	4418	Not applicable
OR.1.Input1	OR Block 1, input 1. 0 = off; 1 = on	bool	2d00	11520	Not applicable
OR.1.Input2	OR Block 1, input 2. 0 = off; 1 = on	bool	2d01	11521	Not applicable
OR.1.Input3	OR Block 1, input 3. 0 = off; 1 = on	bool	2d02	11522	Not applicable
OR.1.Input4	OR Block 1, input 4. 0 = off; 1 = on	bool	2d03	11523	Not applicable
OR.1.Input5	OR Block 1, input 5. 0 = off; 1 = on	bool	2d04	11524	Not applicable
OR.1.Input6	OR Block 1, input 6. 0 = off; 1 = on	bool	2d05	11525	Not applicable
OR.1.Input7	OR Block 1, input 7. 0 = off; 1 = on	bool	2d06	11526	Not applicable
OR.1.Input8	OR Block 1, input 8. 0 = off; 1 = on	bool	2d07	11527	Not applicable
OR.1.Output	OR Block 1, output. 0 = off; 1 = on	bool	2d08	11528	Not applicable
OR.2.Input1	OR Block 2, input 1. 0 = off; 1 = on	bool	2d10	11536	Not applicable
OR.2.Input2	OR Block 2, input 2. 0 = off; 1 = on	bool	2d11	11537	Not applicable
OR.2.Input3	OR Block 2, input 3. 0 = off; 1 = on	bool	2d12	11538	Not applicable
OR.2.Input4	OR Block 2, input 4. 0 = off; 1 = on	bool	2d13	11539	Not applicable
OR.2.Input5	OR Block 2, input 5. 0 = off; 1 = on	bool	2d14	11540	Not applicable
OR.2.Input6	OR Block 2, input 6. 0 = off; 1 = on	bool	2d15	11541	Not applicable
OR.2.Input7	OR Block 2, input 7. 0 = off; 1 = on	bool	2d16	11542	Not applicable
OR.2.Input8	OR Block 2, input 8. 0 = off; 1 = on	bool	2d17	11543	Not applicable
OR.2.Output	OR Block 1, output. 0 = off; 1 = on	bool	2d18	11544	Not applicable
OR.3.Input1	OR Block 3, input 1. 0 = off; 1 = on	bool	2d20	11552	Not applicable
OR.3.Input2	OR Block 3, input 2. 0 = off; 1 = on	bool	2d21	11553	Not applicable
OR.3.Input3	OR Block 3, input 3. 0 = off; 1 = on	bool	2d22	11554	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
OR.3.Input4	OR Block 3, input 4. 0 = off; 1 = on	bool	2d23	11555	Not applicable
OR.3.Input5	OR Block 3, input 5. 0 = off; 1 = on	bool	2d24	11556	Not applicable
OR.3.Input6	OR Block 3, input 6. 0 = off; 1 = on	bool	2d25	11557	Not applicable
OR.3.Input7	OR Block 3, input 7. 0 = off; 1 = on	bool	2d26	11558	Not applicable
OR.3.Input8	OR Block 3, input 8. 0 = off; 1 = on	bool	2d27	11559	Not applicable
OR.3.Output	OR Block 3, output. 0 = off; 1 = on	bool	2d28	11560	Not applicable
OR.4.Input1	OR Block 4, input 1. 0 = off; 1 = on	bool	2d30	11568	Not applicable
OR.4.Input2	OR Block 4, input 2. 0 = off; 1 = on	bool	2d31	11569	Not applicable
OR.4.Input3	OR Block 4, input 3. 0 = off; 1 = on	bool	2d32	11570	Not applicable
OR.4.Input4	OR Block 4, input 4. 0 = off; 1 = on	bool	2d33	11571	Not applicable
OR.4.Input5	OR Block 4, input 5. 0 = off; 1 = on	bool	2d34	11572	Not applicable
OR.4.Input6	OR Block 4, input 6. 0 = off; 1 = on	bool	2d35	11573	Not applicable
OR.4.Input7	OR Block 4, input 7. 0 = off; 1 = on	bool	2d36	11574	Not applicable
OR.4.Input8	OR Block 4, input 8. 0 = off; 1 = on	bool	2d37	11575	Not applicable
OR.4.Output	OR Block 4, output. 0 = off; 1 = on	bool	2d38	11576	Not applicable
OR.5.Input1	OR Block 5, input 1. 0 = off; 1 = on	bool	2d40	11584	Not applicable
OR.5.Input2	OR Block 5, input 2. 0 = off; 1 = on	bool	2d41	11585	Not applicable
OR.5.Input3	OR Block 5, input 3. 0 = off; 1 = on	bool	2d42	11586	Not applicable
OR.5.Input4	OR Block 5, input 4. 0 = off; 1 = on	bool	2d43	11587	Not applicable
OR.5.Input5	OR Block 5, input 5. 0 = off; 1 = on	bool	2d44	11588	Not applicable
OR.5.Input6	OR Block 5, input 6. 0 = off; 1 = on	bool	2d45	11589	Not applicable
OR.5.Input7	OR Block 5, input 7. 0 = off; 1 = on	bool	2d46	11590	Not applicable
OR.5.Input8	OR Block 5, input 8. 0 = off; 1 = on	bool	2d47	11591	Not applicable
OR.5.Output	OR Block 5, output. 0 = off; 1 = on	bool	2d48	11592	Not applicable
OR.6.Input1	OR Block 6, input 1. 0 = off; 1 = on	bool	2d50	11600	Not applicable
OR.6.Input2	OR Block 6, input 2. 0 = off; 1 = on	bool	2d51	11601	Not applicable
OR.6.Input3	OR Block 6, input 3. 0 = off; 1 = on	bool	2d52	11602	Not applicable
OR.6.Input4	OR Block 6, input 4. 0 = off; 1 = on	bool	2d53	11603	Not applicable
OR.6.Input5	OR Block 6, input 5. 0 = off; 1 = on	bool	2d54	11604	Not applicable
OR.6.Input6	OR Block 6, input 6. 0 = off; 1 = on	bool	2d55	11605	Not applicable
OR.6.Input7	OR Block 6, input 7. 0 = off; 1 = on	bool	2d56	11606	Not applicable
OR.6.Input8	OR Block 6, input 8. 0 = off; 1 = on	bool	2d57	11607	Not applicable
OR.6.Output	OR Block 6, output. 0 = off; 1 = on	bool	2d58	11608	Not applicable
OR.7.Input1	OR Block 7, input 1. 0 = off; 1 = on	bool	2d60	11616	Not applicable
OR.7.Input2	OR Block 7, input 2. 0 = off; 1 = on	bool	2d61	11617	Not applicable
OR.7.Input3	OR Block 7, input 3. 0 = off; 1 = on	bool	2d62	11618	Not applicable
OR.7.Input4	OR Block 7, input 4. 0 = off; 1 = on	bool	2d63	11619	Not applicable
OR.7.Input5	OR Block 7, input 5. 0 = off; 1 = on	bool	2d64	11620	Not applicable
OR.7.Input6	OR Block 7, input 6. 0 = off; 1 = on	bool	2d65	11621	Not applicable
OR.7.Input7	OR Block 7, input 7. 0 = off; 1 = on	bool	2d66	11622	Not applicable
OR.7.Input8	OR Block 7, input 8. 0 = off; 1 = on	bool	2d67	11623	Not applicable
OR.7.Output	OR Block 7, output. 0 = off; 1 = on	bool	2d68	11624	Not applicable
OR.8.Input1	OR Block 8, input 1. 0 = off; 1 = on	bool	2d70	11632	Not applicable
OR.8.Input2	OR Block 8, input 2. 0 = off; 1 = on	bool	2d71	11633	Not applicable
OR.8.Input3	OR Block 8, input 3. 0 = off; 1 = on	bool	2d72	11634	Not applicable
OR.8.Input4	OR Block 8, input 4. 0 = off; 1 = on	bool	2d73	11635	Not applicable
OR.8.Input5	OR Block 8, input 5. 0 = off; 1 = on	bool	2d74	11636	Not applicable
OR.8.Input6	OR Block 8, input 6. 0 = off; 1 = on	bool	2d75	11637	Not applicable
OR.8.Input7	OR Block 8, input 7. 0 = off; 1 = on	bool	2d76	11638	Not applicable
OR.8.Input8	OR Block 8, input 8. 0 = off; 1 = on	bool	2d77	11639	Not applicable
OR.8.Output	OR Block 8, output. 0 = off; 1 = on	bool	2d78	11640	Not applicable
OR.9.Input1	OR Block 9, input 1. 0 = off; 1 = on	bool	2d80	11648	Not applicable
OR.9.Input2	OR Block 9, input 2. 0 = off; 1 = on	bool	2d81	11649	Not applicable
OR.9.Input3	OR Block 9, input 3. 0 = off; 1 = on	bool	2d82	11650	Not applicable
OR.9.Input4	OR Block 9, input 4. 0 = off; 1 = on	bool	2d83	11651	Not applicable
OR.9.Input5	OR Block 9, input 5. 0 = off; 1 = on	bool	2d84	11652	Not applicable
OR.9.Input6	OR Block 9, input 6. 0 = off; 1 = on	bool	2d85	11653	Not applicable
OR.9.Input7	OR Block 9, input 7. 0 = off; 1 = on	bool	2d86	11654	Not applicable
OR.9.Input8	OR Block 9, input 8. 0 = off; 1 = on	bool	2d87	11655	Not applicable
OR.9.Output	OR Block 9, output. 0 = off; 1 = on	bool	2d88	11656	Not applicable
OR.10.Input1	OR Block 10, input 1. 0 = off; 1 = on	bool	2d90	11664	Not applicable
OR.10.Input2	OR Block 10, input 2. 0 = off; 1 = on	bool	2d91	11665	Not applicable
OR.10.Input3	OR Block 10, input 3. 0 = off; 1 = on	bool	2d92	11666	Not applicable
OR.10.Input4	OR Block 10, input 4. 0 = off; 1 = on	bool	2d93	11667	Not applicable
OR.10.Input5	OR Block 10, input 5. 0 = off; 1 = on	bool	2d94	11668	Not applicable
OR.10.Input6	OR Block 10, input 6. 0 = off; 1 = on	bool	2d95	11669	Not applicable
OR.10.Input7	OR Block 10, input 7. 0 = off; 1 = on	bool	2d96	11670	Not applicable
OR.10.Input8	OR Block 10, input 8. 0 = off; 1 = on	bool	2d97	11671	Not applicable
OR.10.Output	OR Block 10, output. 0 = off; 1 = on	bool	2d98	11672	Not applicable
OR.11.Input1	OR Block 11, input 1. 0 = off; 1 = on	bool	2da0	11680	Not applicable
OR.11.Input2	OR Block 11, input 2. 0 = off; 1 = on	bool	2da1	11681	Not applicable
OR.11.Input3	OR Block 11, input 3. 0 = off; 1 = on	bool	2da2	11682	Not applicable
OR.11.Input4	OR Block 11, input 4. 0 = off; 1 = on	bool	2da3	11683	Not applicable
OR.11.Input5	OR Block 11, input 5. 0 = off; 1 = on	bool	2da4	11684	Not applicable
OR.11.Input6	OR Block 11, input 6. 0 = off; 1 = on	bool	2da5	11685	Not applicable
OR.11.Input7	OR Block 11, input 7. 0 = off; 1 = on	bool	2da6	11686	Not applicable
OR.11.Input8	OR Block 11, input 8. 0 = off; 1 = on	bool	2da7	11687	Not applicable
OR.11.Output	OR Block 11, output. 0 = off; 1 = on	bool	2da8	11688	Not applicable
OR.12.Input1	OR Block 12, input 1. 0 = off; 1 = on	bool	2db0	11696	Not applicable
OR.12.Input2	OR Block 12, input 2. 0 = off; 1 = on	bool	2db1	11697	Not applicable
OR.12.Input3	OR Block 12, input 3. 0 = off; 1 = on	bool	2db2	11698	Not applicable

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OR.12.Input4	OR Block 12, input 4. 0 = off; 1 = on	bool	2db3	11699	Not applicable
OR.12.Input5	OR Block 12, input 5. 0 = off; 1 = on	bool	2db4	11700	Not applicable
OR.12.Input6	OR Block 12, input 6. 0 = off; 1 = on	bool	2db5	11701	Not applicable
OR.12.Input7	OR Block 12, input 7. 0 = off; 1 = on	bool	2db6	11702	Not applicable
OR.12.Input8	OR Block 12, input 8. 0 = off; 1 = on	bool	2db7	11703	Not applicable
OR.12.Output	OR Block 12, output. 0 = off; 1 = on	bool	2db8	11704	Not applicable
Program.Ch1Holdback	Channel 1 holdback type 0 = Off 1 = Low 2 = High 3 = Band	uint8	3aa1	15009	Not applicable
Program.Ch1HoldbackVal	Channel 1 holdback value	float32	3aa3	15011	Same as Programmer.Setup.Ch1PVInput
Program.Ch1RampUnits	Channel 1 ramp units	uint8	3aa6	15014	Not applicable
Program.Ch2Holdback	Channel 2 holdback type (as for Program.Ch1, above)	uint8	3aa2	15010	Not applicable
Program.Ch2HoldbackVal	Channel 2 holdback value	float32	3aa4	15012	Same as Programmer.Setup.Ch2PVInput
Program.Ch2RampUnits	Channel 2 ramp units	uint8	3aa7	15015	Not applicable
Program.HoldbackStyle	Holdback style (0 = per segment; 1 = per program)	uint8	3aa0	15008	Not applicable
Program.Program	Program	string_t	6abb	27323	Not applicable
Program.RampStyle	Ramp style (0 = Time; 1 = Rate)	uint8	3aa5	15013	Not applicable
RealTimeEvent.1.Duration	Sets the duration for the event to remain On	time_t	30e6	12518	Set by Network.Modbus.TimeFormat
RealTimeEvent.1.OffDate	Sets the date in the month that the event is to switch off	uint8	30e8	12520	Not applicable
RealTimeEvent.1.OffDay	Sets the day the event is to switch Off 0 = Sunday 1 = Monday 2 = Tuesday 3 = Wednesday 4 = Thursday 5 = Friday 6 = Saturday 7 = Monday to Friday 8 = Saturday to Sunday 9 = Every day	uint8	30e9	12521	Not applicable
RealTimeEvent.1.OffMonth	The month number when the event is to switch off	uint8	30e7	12519	Not applicable
RealTimeEvent.1.OffTime	Sets the time that the event is to switch Off	time_t	30ea	12522	Set by Network.Modbus.TimeFormat
RealTimeEvent.1.OnDate	Sets the date in the month that the event is to switch on	uint8	30e5	12517	Not applicable
RealTimeEvent.1.OnDay	Sets the day on which event is to switch on (as 'OffDay', above)	uint8	30e2	12514	Not applicable
RealTimeEvent.1.OnMonth	The month number when the event is to switch on	uint8	30e3	12515	Not applicable
RealTimeEvent.1.OnTime	Sets the time that the event is to switch On	uint8	30e1	12513	Not applicable
RealTimeEvent.1.Output	The output from the real time event (0 = Off; 1 = On)	time_t	30e4	12516	Set by Network.Modbus.TimeFormat
RealTimeEvent.1.Type	Selects the type of Real Time Event 0 = Off 1 = Time and Day 2 = Time and Date	bool	30eb	12523	Not applicable
RealTimeEvent.2.Duration	Sets the duration for the event to remain On	uint8	30e0	12512	Not applicable
RealTimeEvent.2.OffDate	Sets the date in the month that the event is to switch off	time_t	30f6	12534	Set by Network.Modbus.TimeFormat
RealTimeEvent.2.OffDay	Sets the day the event is to switch Off (as for Event 1)	uint8	30f8	12536	Not applicable
RealTimeEvent.2.OffMonth	Sets the month that the event is to switch off	uint8	30f9	12537	Not applicable
RealTimeEvent.2.OffTime	Sets the time that the event is to switch Off	uint8	30f7	12535	Not applicable
RealTimeEvent.2.OffType	Selects the type that will switch off the event (as for Event 1)	time_t	30fa	12538	Set by Network.Modbus.TimeFormat
RealTimeEvent.2.OnDate	Sets the date in the month that the event is to switch on	uint8	30f5	12533	Not applicable
RealTimeEvent.2.OnDay	Sets the day the event is to switch on (as for Event 1)	uint8	30f2	12530	Not applicable
RealTimeEvent.2.OnMonth	Sets the month that the event is to switch on	uint8	30f3	12531	Not applicable
RealTimeEvent.2.OnTime	Sets the time that the event is to switch On	uint8	30f1	12529	Not applicable
RealTimeEvent.2.Output	The output from the real time event (0 = Off; 1 = On)	time_t	30f4	12532	Set by Network.Modbus.TimeFormat
RealTimeEvent.2.Type	Selects the type of Real Time Event 0 = Off 1 = Time and Day 2 = Time and Date 3 = Step 4 = Wait 5 = GoBack	bool	30fb	12539	Not applicable
Timer.1.ElapsedTime	Elapsed Time	uint8	30f0	12528	Not applicable
Timer.1.In	Trigger/Gate input	time_t	2ee0	12000	Set by Network.Modbus.TimeFormat
Timer.1.Out	Output (1 = On; 0 = Off)	bool	2ee5	12005	Not applicable
Timer.1.Time	Period for the timer (hh:mm:ss)	bool	2ee1	12001	Not applicable
Timer.1.Triggered	1 = Timer triggered; 0 = Timer not triggered	time_t	2ee2	12002	Set by Network.Modbus.TimeFormat
Timer.1.Type	Type of Timer 0 = Disabled (off) 1 = On Pulse2 = On delay 3 = One shot 4 = Min on.	bool	2ee3	12003	Not applicable
Timer.2.ElapsedTime	Elapsed Time	uint8	2ee4	12004	Not applicable
Timer.2.In	Trigger/Gate input	time_t	2ee6	12006	Set by Network.Modbus.TimeFormat
Timer.2.Out	Output (1 = On; 0 = Off)	bool	2eeb	12011	Not applicable
Timer.2.Time	Period for the timer (hh:mm:ss)	bool	2ee7	12007	Not applicable
Timer.2.Triggered	1 = Timer triggered; 0 = Timer not triggered	time_t	2ee8	12008	Set by Network.Modbus.TimeFormat
Timer.2.Type	Type of Timer (as Timer.1.Type)	bool	2ee9	12009	Not applicable
Timer.3.ElapsedTime	Elapsed Time	uint8	2eea	12010	Not applicable
Timer.3.In	Trigger/Gate input	time_t	2eec	12012	Set by Network.Modbus.TimeFormat
Timer.3.Out	Output (1 = On; 0 = Off)	bool	2ef1	12017	Not applicable
Timer.3.Time	Period for the timer (hh:mm:ss)	bool	2eed	12013	Not applicable
Timer.3.Triggered	1 = Timer triggered; 0 = Timer not triggered	time_t	2eee	12014	Set by Network.Modbus.TimeFormat
Timer.3.Type	Type of Timer (as Timer.1.Type)	bool	2eef	12015	Not applicable
Timer.4.ElapsedTime	Elapsed Time	uint8	2ef0	12016	Not applicable
Timer.4.In	Trigger/Gate input	time_t	2ef2	12018	Set by Network.Modbus.TimeFormat
Timer.4.Out	Output (1 = On; 0 = Off)	bool	2ef7	12023	Not applicable
Timer.4.Time	Period for the timer (hh:mm:ss)	bool	2ef3	12019	Not applicable
Timer.4.Triggered	1 = Timer triggered; 0 = Timer not triggered	time_t	2ef4	12020	Set by Network.Modbus.TimeFormat
Timer.4.Type	Type of Timer (as Timer.1.Type)	bool	2ef5	12021	Not applicable
		uint8	2ef6	12022	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
UserLin.1.NumberOfBreakpoints	Number of points in user linearization table 1	uint8	2900	10496	Not applicable
UserLin.1.X1	User linearization table 1 'X' value 1	float32	2901	10497	2dp
UserLin.1.X2	User linearization table 1 'X' value 2	float32	2903	10499	2dp
UserLin.1.X3	User linearization table 1 'X' value 3	float32	2905	10501	2dp
UserLin.1.X4	User linearization table 1 'X' value 4	float32	2907	10503	2dp
UserLin.1.X5	User linearization table 1 'X' value 5	float32	2909	10505	2dp
UserLin.1.X6	User linearization table 1 'X' value 6	float32	290b	10507	2dp
UserLin.1.X7	User linearization table 1 'X' value 7	float32	290d	10509	2dp
UserLin.1.X8	User linearization table 1 'X' value 8	float32	290f	10511	2dp
UserLin.1.X9	User linearization table 1 'X' value 9	float32	2911	10513	2dp
UserLin.1.X10	User linearization table 1 'X' value 10	float32	2913	10515	2dp
UserLin.1.X11	User linearization table 1 'X' value 11	float32	2915	10517	2dp
UserLin.1.X12	User linearization table 1 'X' value 12	float32	2917	10519	2dp
UserLin.1.X13	User linearization table 1 'X' value 13	float32	2919	10521	2dp
UserLin.1.X14	User linearization table 1 'X' value 14	float32	291b	10523	2dp
UserLin.1.X15	User linearization table 1 'X' value 15	float32	291d	10525	2dp
UserLin.1.X16	User linearization table 1 'X' value 16	float32	291f	10527	2dp
UserLin.1.X17	User linearization table 1 'X' value 17	float32	2921	10529	2dp
UserLin.1.X18	User linearization table 1 'X' value 18	float32	2923	10531	2dp
UserLin.1.X19	User linearization table 1 'X' value 19	float32	2925	10533	2dp
UserLin.1.X20	User linearization table 1 'X' value 20	float32	2927	10535	2dp
UserLin.1.X21	User linearization table 1 'X' value 21	float32	2929	10537	2dp
UserLin.1.X22	User linearization table 1 'X' value 22	float32	292b	10539	2dp
UserLin.1.X23	User linearization table 1 'X' value 23	float32	292d	10541	2dp
UserLin.1.X24	User linearization table 1 'X' value 24	float32	292f	10543	2dp
UserLin.1.X25	User linearization table 1 'X' value 25	float32	2931	10545	2dp
UserLin.1.X26	User linearization table 1 'X' value 26	float32	2933	10547	2dp
UserLin.1.X27	User linearization table 1 'X' value 27	float32	2935	10549	2dp
UserLin.1.X28	User linearization table 1 'X' value 28	float32	2937	10551	2dp
UserLin.1.X29	User linearization table 1 'X' value 29	float32	2939	10553	2dp
UserLin.1.X30	User linearization table 1 'X' value 30	float32	293b	10555	2dp
UserLin.1.X31	User linearization table 1 'X' value 31	float32	293d	10557	2dp
UserLin.1.X32	User linearization table 1 'X' value 32	float32	293f	10559	2dp
UserLin.1.Y1	User linearization table 1 'Y' value 1	float32	2902	10498	2dp
UserLin.1.Y2	User linearization table 1 'Y' value 2	float32	2904	10500	2dp
UserLin.1.Y3	User linearization table 1 'Y' value 3	float32	2906	10502	2dp
UserLin.1.Y4	User linearization table 1 'Y' value 4	float32	2908	10504	2dp
UserLin.1.Y5	User linearization table 1 'Y' value 5	float32	290a	10506	2dp
UserLin.1.Y6	User linearization table 1 'Y' value 6	float32	290c	10508	2dp
UserLin.1.Y7	User linearization table 1 'Y' value 7	float32	290e	10510	2dp
UserLin.1.Y8	User linearization table 1 'Y' value 8	float32	2910	10512	2dp
UserLin.1.Y9	User linearization table 1 'Y' value 9	float32	2912	10514	2dp
UserLin.1.Y10	User linearization table 1 'Y' value 10	float32	2914	10516	2dp
UserLin.1.Y11	User linearization table 1 'Y' value 11	float32	2916	10518	2dp
UserLin.1.Y12	User linearization table 1 'Y' value 12	float32	2918	10520	2dp
UserLin.1.Y13	User linearization table 1 'Y' value 13	float32	291a	10522	2dp
UserLin.1.Y14	User linearization table 1 'Y' value 14	float32	291c	10524	2dp
UserLin.1.Y15	User linearization table 1 'Y' value 15	float32	291e	10526	2dp
UserLin.1.Y16	User linearization table 1 'Y' value 16	float32	2920	10528	2dp
UserLin.1.Y17	User linearization table 1 'Y' value 17	float32	2922	10530	2dp
UserLin.1.Y18	User linearization table 1 'Y' value 18	float32	2924	10532	2dp
UserLin.1.Y19	User linearization table 1 'Y' value 19	float32	2926	10534	2dp
UserLin.1.Y20	User linearization table 1 'Y' value 20	float32	2928	10536	2dp
UserLin.1.Y21	User linearization table 1 'Y' value 21	float32	292a	10538	2dp
UserLin.1.Y22	User linearization table 1 'Y' value 22	float32	292c	10540	2dp
UserLin.1.Y23	User linearization table 1 'Y' value 23	float32	292e	10542	2dp
UserLin.1.Y24	User linearization table 1 'Y' value 24	float32	2930	10544	2dp
UserLin.1.Y25	User linearization table 1 'Y' value 25	float32	2932	10546	2dp
UserLin.1.Y26	User linearization table 1 'Y' value 26	float32	2934	10548	2dp
UserLin.1.Y27	User linearization table 1 'Y' value 27	float32	2936	10550	2dp
UserLin.1.Y28	User linearization table 1 'Y' value 28	float32	2938	10552	2dp
UserLin.1.Y29	User linearization table 1 'Y' value 29	float32	293a	10554	2dp
UserLin.1.Y30	User linearization table 1 'Y' value 30	float32	293c	10556	2dp
UserLin.1.Y31	User linearization table 1 'Y' value 31	float32	293e	10558	2dp
UserLin.1.Y32	User linearization table 1 'Y' value 32	float32	2940	10560	2dp
UserLin.2.NumberOfBreakpoints	Number of points in user linearization table 2	uint8	29c0	10688	Not applicable
UserLin.2.X1	User linearization table 2 'X' value 1	float32	29c1	10689	2dp
UserLin.2.X2	User linearization table 2 'X' value 2	float32	29c3	10691	2dp
UserLin.2.X3	User linearization table 2 'X' value 3	float32	29c5	10693	2dp
UserLin.2.X4	User linearization table 2 'X' value 4	float32	29c7	10695	2dp
UserLin.2.X5	User linearization table 2 'X' value 5	float32	29c9	10697	2dp
UserLin.2.X6	User linearization table 2 'X' value 6	float32	29cb	10699	2dp
UserLin.2.X7	User linearization table 2 'X' value 7	float32	29cd	10701	2dp
UserLin.2.X8	User linearization table 2 'X' value 8	float32	29cf	10703	2dp
UserLin.2.X9	User linearization table 2 'X' value 9	float32	29d1	10705	2dp
UserLin.2.X10	User linearization table 2 'X' value 10	float32	29d3	10707	2dp
UserLin.2.X11	User linearization table 2 'X' value 11	float32	29d5	10709	2dp
UserLin.2.X12	User linearization table 2 'X' value 12	float32	29d7	10711	2dp

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Parameter path	Description	Type	Hex	Dec	Resolution
UserLin.2.X13	User linearization table 2 'X' value 13	float32	29d9	10713	2dp
UserLin.2.X14	User linearization table 2 'X' value 14	float32	29db	10715	2dp
UserLin.2.X15	User linearization table 2 'X' value 15	float32	29dd	10717	2dp
UserLin.2.X16	User linearization table 2 'X' value 16	float32	29df	10719	2dp
UserLin.2.X17	User linearization table 2 'X' value 17	float32	29e1	10721	2dp
UserLin.2.X18	User linearization table 2 'X' value 18	float32	29e3	10723	2dp
UserLin.2.X19	User linearization table 2 'X' value 19	float32	29e5	10725	2dp
UserLin.2.X20	User linearization table 2 'X' value 20	float32	29e7	10727	2dp
UserLin.2.X21	User linearization table 2 'X' value 21	float32	29e9	10729	2dp
UserLin.2.X22	User linearization table 2 'X' value 22	float32	29eb	10731	2dp
UserLin.2.X23	User linearization table 2 'X' value 23	float32	29ed	10733	2dp
UserLin.2.X24	User linearization table 2 'X' value 24	float32	29ef	10735	2dp
UserLin.2.X25	User linearization table 2 'X' value 25	float32	29f1	10737	2dp
UserLin.2.X26	User linearization table 2 'X' value 26	float32	29f3	10739	2dp
UserLin.2.X27	User linearization table 2 'X' value 27	float32	29f5	10741	2dp
UserLin.2.X28	User linearization table 2 'X' value 28	float32	29f7	10743	2dp
UserLin.2.X29	User linearization table 2 'X' value 29	float32	29f9	10745	2dp
UserLin.2.X30	User linearization table 2 'X' value 30	float32	29fb	10747	2dp
UserLin.2.X31	User linearization table 2 'X' value 31	float32	29fd	10749	2dp
UserLin.2.X32	User linearization table 2 'X' value 32	float32	29ff	10751	2dp
UserLin.2.Y1	User linearization table 2 'Y' value 1	float32	29c2	10690	2dp
UserLin.2.Y2	User linearization table 4 'Y' value 2	float32	29c4	10692	2dp
UserLin.2.Y3	User linearization table 4 'Y' value 3	float32	29c6	10694	2dp
UserLin.2.Y4	User linearization table 4 'Y' value 4	float32	29c8	10696	2dp
UserLin.2.Y5	User linearization table 4 'Y' value 5	float32	29ca	10698	2dp
UserLin.2.Y6	User linearization table 4 'Y' value 6	float32	29cc	10700	2dp
UserLin.2.Y7	User linearization table 4 'Y' value 7	float32	29ce	10702	2dp
UserLin.2.Y8	User linearization table 4 'Y' value 8	float32	29d0	10704	2dp
UserLin.2.Y9	User linearization table 4 'Y' value 9	float32	29d2	10706	2dp
UserLin.2.Y10	User linearization table 4 'Y' value 10	float32	29d4	10708	2dp
UserLin.2.Y11	User linearization table 4 'Y' value 11	float32	29d6	10710	2dp
UserLin.2.Y12	User linearization table 4 'Y' value 12	float32	29d8	10712	2dp
UserLin.2.Y13	User linearization table 4 'Y' value 13	float32	29da	10714	2dp
UserLin.2.Y14	User linearization table 4 'Y' value 14	float32	29dc	10716	2dp
UserLin.2.Y15	User linearization table 4 'Y' value 15	float32	29de	10718	2dp
UserLin.2.Y16	User linearization table 4 'Y' value 16	float32	29e0	10720	2dp
UserLin.2.Y17	User linearization table 4 'Y' value 17	float32	29e2	10722	2dp
UserLin.2.Y18	User linearization table 4 'Y' value 18	float32	29e4	10724	2dp
UserLin.2.Y19	User linearization table 4 'Y' value 19	float32	29e6	10726	2dp
UserLin.2.Y20	User linearization table 4 'Y' value 20	float32	29e8	10728	2dp
UserLin.2.Y21	User linearization table 4 'Y' value 21	float32	29ea	10730	2dp
UserLin.2.Y22	User linearization table 4 'Y' value 22	float32	29ec	10732	2dp
UserLin.2.Y23	User linearization table 4 'Y' value 23	float32	29ee	10734	2dp
UserLin.2.Y24	User linearization table 4 'Y' value 24	float32	29f0	10736	2dp
UserLin.2.Y25	User linearization table 4 'Y' value 25	float32	29f2	10738	2dp
UserLin.2.Y26	User linearization table 4 'Y' value 26	float32	29f4	10740	2dp
UserLin.2.Y27	User linearization table 4 'Y' value 27	float32	29f6	10742	2dp
UserLin.2.Y28	User linearization table 4 'Y' value 28	float32	29f8	10744	2dp
UserLin.2.Y29	User linearization table 4 'Y' value 29	float32	29fa	10746	2dp
UserLin.2.Y30	User linearization table 4 'Y' value 30	float32	29fc	10748	2dp
UserLin.2.Y31	User linearization table 4 'Y' value 31	float32	29fe	10750	2dp
UserLin.2.Y32	User linearization table 4 'Y' value 32	float32	2a00	10752	2dp
UserLin.3.NumberOfBreakpoints	Number of points in user linearization table 32	uint8	2a80	10880	Not applicable
UserLin.3.X1	User linearization table 3 'X' value 1	float32	2a81	10881	2dp
UserLin.3.X2	User linearization table 3 'X' value 2	float32	2a83	10883	2dp
UserLin.3.X3	User linearization table 3 'X' value 3	float32	2a85	10885	2dp
UserLin.3.X4	User linearization table 3 'X' value 4	float32	2a87	10887	2dp
UserLin.3.X5	User linearization table 3 'X' value 5	float32	2a89	10889	2dp
UserLin.3.X6	User linearization table 3 'X' value 6	float32	2a8b	10891	2dp
UserLin.3.X7	User linearization table 3 'X' value 7	float32	2a8d	10893	2dp
UserLin.3.X8	User linearization table 3 'X' value 8	float32	2a8f	10895	2dp
UserLin.3.X9	User linearization table 3 'X' value 9	float32	2a91	10897	2dp
UserLin.3.X10	User linearization table 3 'X' value 10	float32	2a93	10899	2dp
UserLin.3.X11	User linearization table 3 'X' value 11	float32	2a95	10901	2dp
UserLin.3.X12	User linearization table 3 'X' value 12	float32	2a97	10903	2dp
UserLin.3.X13	User linearization table 3 'X' value 13	float32	2a99	10905	2dp
UserLin.3.X14	User linearization table 3 'X' value 14	float32	2a9b	10907	2dp
UserLin.3.X15	User linearization table 3 'X' value 15	float32	2a9d	10909	2dp
UserLin.3.X16	User linearization table 3 'X' value 16	float32	2a9f	10911	2dp
UserLin.3.X17	User linearization table 3 'X' value 17	float32	2aa1	10913	2dp
UserLin.3.X18	User linearization table 3 'X' value 18	float32	2aa3	10915	2dp
UserLin.3.X19	User linearization table 3 'X' value 19	float32	2aa5	10917	2dp
UserLin.3.X20	User linearization table 3 'X' value 20	float32	2aa7	10919	2dp
UserLin.3.X21	User linearization table 3 'X' value 21	float32	2aa9	10921	2dp
UserLin.3.X22	User linearization table 3 'X' value 22	float32	2aab	10923	2dp
UserLin.3.X23	User linearization table 3 'X' value 23	float32	2aad	10925	2dp
UserLin.3.X24	User linearization table 3 'X' value 24	float32	2aaf	10927	2dp
UserLin.3.X25	User linearization table 3 'X' value 25	float32	2ab1	10929	2dp
UserLin.3.X26	User linearization table 3 'X' value 26	float32	2ab3	10931	2dp
UserLin.3.X27	User linearization table 3 'X' value 27	float32	2ab5	10933	2dp

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Parameter path	Description	Type	Hex	Dec	Resolution
UserLin.3.X28	User linearization table 3 'X' value 28	float32	2ab7	10935	2dp
UserLin.3.X29	User linearization table 3 'X' value 29	float32	2ab9	10937	2dp
UserLin.3.X30	User linearization table 3 'X' value 30	float32	2abb	10939	2dp
UserLin.3.X31	User linearization table 3 'X' value 31	float32	2abd	10941	2dp
UserLin.3.X32	User linearization table 3 'X' value 32	float32	2abf	10943	2dp
UserLin.3.Y1	User linearization table 4 'Y' value 1	float32	2a82	10882	2dp
UserLin.3.Y2	User linearization table 4 'Y' value 2	float32	2a84	10884	2dp
UserLin.3.Y3	User linearization table 4 'Y' value 3	float32	2a86	10886	2dp
UserLin.3.Y4	User linearization table 4 'Y' value 4	float32	2a88	10888	2dp
UserLin.3.Y5	User linearization table 4 'Y' value 5	float32	2a8a	10890	2dp
UserLin.3.Y6	User linearization table 4 'Y' value 6	float32	2a8c	10892	2dp
UserLin.3.Y7	User linearization table 4 'Y' value 7	float32	2a8e	10894	2dp
UserLin.3.Y8	User linearization table 4 'Y' value 8	float32	2a90	10896	2dp
UserLin.3.Y9	User linearization table 4 'Y' value 9	float32	2a92	10898	2dp
UserLin.3.Y10	User linearization table 4 'Y' value 10	float32	2a94	10900	2dp
UserLin.3.Y11	User linearization table 4 'Y' value 11	float32	2a96	10902	2dp
UserLin.3.Y12	User linearization table 4 'Y' value 12	float32	2a98	10904	2dp
UserLin.3.Y13	User linearization table 4 'Y' value 13	float32	2a9a	10906	2dp
UserLin.3.Y14	User linearization table 4 'Y' value 14	float32	2a9c	10908	2dp
UserLin.3.Y15	User linearization table 4 'Y' value 15	float32	2a9e	10910	2dp
UserLin.3.Y16	User linearization table 4 'Y' value 16	float32	2aa0	10912	2dp
UserLin.3.Y17	User linearization table 4 'Y' value 17	float32	2aa2	10914	2dp
UserLin.3.Y18	User linearization table 4 'Y' value 18	float32	2aa4	10916	2dp
UserLin.3.Y19	User linearization table 4 'Y' value 19	float32	2aa6	10918	2dp
UserLin.3.Y20	User linearization table 4 'Y' value 20	float32	2aa8	10920	2dp
UserLin.3.Y21	User linearization table 4 'Y' value 21	float32	2aaa	10922	2dp
UserLin.3.Y22	User linearization table 4 'Y' value 22	float32	2aac	10924	2dp
UserLin.3.Y23	User linearization table 4 'Y' value 23	float32	2aae	10926	2dp
UserLin.3.Y24	User linearization table 4 'Y' value 24	float32	2ab0	10928	2dp
UserLin.3.Y25	User linearization table 4 'Y' value 25	float32	2ab2	10930	2dp
UserLin.3.Y26	User linearization table 4 'Y' value 26	float32	2ab4	10932	2dp
UserLin.3.Y27	User linearization table 4 'Y' value 27	float32	2ab6	10934	2dp
UserLin.3.Y28	User linearization table 4 'Y' value 28	float32	2ab8	10936	2dp
UserLin.3.Y29	User linearization table 4 'Y' value 29	float32	2aba	10938	2dp
UserLin.3.Y30	User linearization table 4 'Y' value 30	float32	2abc	10940	2dp
UserLin.3.Y31	User linearization table 4 'Y' value 31	float32	2abe	10942	2dp
UserLin.3.Y32	User linearization table 4 'Y' value 32	float32	2ac0	10944	2dp
UserLin.4.NumberOfBreakpoints	Number of points in user linearization table 4	uint8	2b40	11072	Not applicable
UserLin.4.X1	User linearization table 4 'X' value 1	float32	2b41	11073	2dp
UserLin.4.X2	User linearization table 4 'X' value 2	float32	2b43	11075	2dp
UserLin.4.X3	User linearization table 4 'X' value 3	float32	2b45	11077	2dp
UserLin.4.X4	User linearization table 4 'X' value 4	float32	2b47	11079	2dp
UserLin.4.X5	User linearization table 4 'X' value 5	float32	2b49	11081	2dp
UserLin.4.X6	User linearization table 4 'X' value 6	float32	2b4b	11083	2dp
UserLin.4.X7	User linearization table 4 'X' value 7	float32	2b4d	11085	2dp
UserLin.4.X8	User linearization table 4 'X' value 8	float32	2b4f	11087	2dp
UserLin.4.X9	User linearization table 4 'X' value 9	float32	2b51	11089	2dp
UserLin.4.X10	User linearization table 4 'X' value 10	float32	2b53	11091	2dp
UserLin.4.X11	User linearization table 4 'X' value 11	float32	2b55	11093	2dp
UserLin.4.X12	User linearization table 4 'X' value 12	float32	2b57	11095	2dp
UserLin.4.X13	User linearization table 4 'X' value 13	float32	2b59	11097	2dp
UserLin.4.X14	User linearization table 4 'X' value 14	float32	2b5b	11099	2dp
UserLin.4.X15	User linearization table 4 'X' value 15	float32	2b5d	11101	2dp
UserLin.4.X16	User linearization table 4 'X' value 16	float32	2b5f	11103	2dp
UserLin.4.X17	User linearization table 4 'X' value 17	float32	2b61	11105	2dp
UserLin.4.X18	User linearization table 4 'X' value 18	float32	2b63	11107	2dp
UserLin.4.X19	User linearization table 4 'X' value 19	float32	2b65	11109	2dp
UserLin.4.X20	User linearization table 4 'X' value 20	float32	2b67	11111	2dp
UserLin.4.X21	User linearization table 4 'X' value 21	float32	2b69	11113	2dp
UserLin.4.X22	User linearization table 4 'X' value 22	float32	2b6b	11115	2dp
UserLin.4.X23	User linearization table 4 'X' value 23	float32	2b6d	11117	2dp
UserLin.4.X24	User linearization table 4 'X' value 24	float32	2b6f	11119	2dp
UserLin.4.X25	User linearization table 4 'X' value 25	float32	2b71	11121	2dp
UserLin.4.X26	User linearization table 4 'X' value 26	float32	2b73	11123	2dp
UserLin.4.X27	User linearization table 4 'X' value 27	float32	2b75	11125	2dp
UserLin.4.X28	User linearization table 4 'X' value 28	float32	2b77	11127	2dp
UserLin.4.X29	User linearization table 4 'X' value 29	float32	2b79	11129	2dp
UserLin.4.X30	User linearization table 4 'X' value 30	float32	2b7b	11131	2dp
UserLin.4.X31	User linearization table 4 'X' value 31	float32	2b7d	11133	2dp
UserLin.4.X32	User linearization table 4 'X' value 32	float32	2b7f	11135	2dp
UserLin.4.Y1	User linearization table 4 'Y' value 1	float32	2b42	11074	2dp
UserLin.4.Y2	User linearization table 4 'Y' value 2	float32	2b44	11076	2dp
UserLin.4.Y3	User linearization table 4 'Y' value 3	float32	2b46	11078	2dp
UserLin.4.Y4	User linearization table 4 'Y' value 4	float32	2b48	11080	2dp
UserLin.4.Y5	User linearization table 4 'Y' value 5	float32	2b4a	11082	2dp
UserLin.4.Y6	User linearization table 4 'Y' value 6	float32	2b4c	11084	2dp
UserLin.4.Y7	User linearization table 4 'Y' value 7	float32	2b4e	11086	2dp
UserLin.4.Y8	User linearization table 4 'Y' value 8	float32	2b50	11088	2dp
UserLin.4.Y9	User linearization table 4 'Y' value 9	float32	2b52	11090	2dp
UserLin.4.Y10	User linearization table 4 'Y' value 10	float32	2b54	11092	2dp



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Parameter path	Description	Type	Hex	Dec	Resolution
UserLin.4.Y11	User linearization table 4 'Y' value 11	float32	2b56	11094	2dp
UserLin.4.Y12	User linearization table 4 'Y' value 12	float32	2b58	11096	2dp
UserLin.4.Y13	User linearization table 4 'Y' value 13	float32	2b5a	11098	2dp
UserLin.4.Y14	User linearization table 4 'Y' value 14	float32	2b5c	11100	2dp
UserLin.4.Y15	User linearization table 4 'Y' value 15	float32	2b5e	11102	2dp
UserLin.4.Y16	User linearization table 4 'Y' value 16	float32	2b60	11104	2dp
UserLin.4.Y17	User linearization table 4 'Y' value 17	float32	2b62	11106	2dp
UserLin.4.Y18	User linearization table 4 'Y' value 18	float32	2b64	11108	2dp
UserLin.4.Y19	User linearization table 4 'Y' value 19	float32	2b66	11110	2dp
UserLin.4.Y20	User linearization table 4 'Y' value 20	float32	2b68	11112	2dp
UserLin.4.Y21	User linearization table 4 'Y' value 21	float32	2b6a	11114	2dp
UserLin.4.Y22	User linearization table 4 'Y' value 22	float32	2b6c	11116	2dp
UserLin.4.Y23	User linearization table 4 'Y' value 23	float32	2b6e	11118	2dp
UserLin.4.Y24	User linearization table 4 'Y' value 24	float32	2b70	11120	2dp
UserLin.4.Y25	User linearization table 4 'Y' value 25	float32	2b72	11122	2dp
UserLin.4.Y26	User linearization table 4 'Y' value 26	float32	2b74	11124	2dp
UserLin.4.Y27	User linearization table 4 'Y' value 27	float32	2b76	11126	2dp
UserLin.4.Y28	User linearization table 4 'Y' value 28	float32	2b78	11128	2dp
UserLin.4.Y29	User linearization table 4 'Y' value 29	float32	2b7a	11130	2dp
UserLin.4.Y30	User linearization table 4 'Y' value 30	float32	2b7c	11132	2dp
UserLin.4.Y31	User linearization table 4 'Y' value 31	float32	2b7e	11134	2dp
UserLin.4.Y32	User linearization table 4 'Y' value 32	float32	2b80	11136	2dp
UsrVal.1.HighLimit	User Value High Limit	float32	2e8c	11916	Set by UsrVal.1.Resolution
UsrVal.1.LowLimit	User Value Low Limit	float32	2e8d	11917	Set by UsrVal.1.Resolution
UsrVal.1.Resolution	Result Resolution	uint8	2e90	11920	Not applicable
UsrVal.1.Status	User Value 1 Status (0 = Good (OK); 7 = Bad (Error))	bool	2e8f	11919	Not applicable
UsrVal.1.Units	Units of the value	string_t	68fc	26876	Not applicable
UsrVal.1.Val	The User Value	float32	2e8e	11918	Set by UsrVal.1.Resolution
UsrVal.2.HighLimit	User Value High Limit	float32	2e91	11921	Set by UsrVal.2.Resolution
UsrVal.2.LowLimit	User Value Low Limit	float32	2e92	11922	Set by UsrVal.2.Resolution
UsrVal.2.Resolution	Result Resolution	uint8	2e95	11925	Not applicable
UsrVal.2.Status	User Value 2 Status (0 = Good (OK); 7 = Bad (Error))	bool	2e94	11924	Not applicable
UsrVal.2.Units	Units of the value	string_t	6902	26882	Not applicable
UsrVal.2.Val	The User Value	float32	2e93	11923	Set by UsrVal.2.Resolution
UsrVal.3.HighLimit	User Value High Limit	float32	2e96	11926	Set by UsrVal.3.Resolution
UsrVal.3.LowLimit	User Value Low Limit	float32	2e97	11927	Set by UsrVal.3.Resolution
UsrVal.3.Resolution	Result Resolution	uint8	2e9a	11930	Not applicable
UsrVal.3.Status	User Value 3 Status (0 = Good (OK); 7 = Bad (Error))	bool	2e99	11929	Not applicable
UsrVal.3.Units	Units of the value	string_t	6908	26888	Not applicable
UsrVal.3.Val	The User Value	float32	2e98	11928	Set by UsrVal.3.Resolution
UsrVal.4.HighLimit	User Value High Limit	float32	2e9b	11931	Set by UsrVal.4.Resolution
UsrVal.4.LowLimit	User Value Low Limit	float32	2e9c	11932	Set by UsrVal.4.Resolution
UsrVal.4.Resolution	Result Resolution	uint8	2e9f	11935	Not applicable
UsrVal.4.Status	User Value 4 Status (0 = Good (OK); 7 = Bad (Error))	bool	2e9e	11934	Not applicable
UsrVal.4.Units	Units of the value	string_t	690e	26894	Not applicable
UsrVal.4.Val	The User Value	float32	2e9d	11933	Set by UsrVal.4.Resolution
UsrVal.5.HighLimit	User Value High Limit	float32	2ea0	11936	Set by UsrVal.5.Resolution
UsrVal.5.LowLimit	User Value Low Limit	float32	2ea1	11937	Set by UsrVal.5.Resolution
UsrVal.5.Resolution	Result Resolution	uint8	2ea4	11940	Not applicable
UsrVal.5.Status	User Value 5 Status (0 = Good (OK); 7 = Bad (Error))	bool	2ea3	11939	Not applicable
UsrVal.5.Units	Units of the value	string_t	6914	26900	Not applicable
UsrVal.5.Val	The User Value	float32	2ea2	11938	Set by UsrVal.5.Resolution
UsrVal.6.HighLimit	User Value High Limit	float32	2ea5	11941	Set by UsrVal.6.Resolution
UsrVal.6.LowLimit	User Value Low Limit	float32	2ea6	11942	Set by UsrVal.6.Resolution
UsrVal.6.Resolution	Result Resolution	uint8	2ea9	11945	Not applicable
UsrVal.6.Status	User Value 6 Status (0 = Good (OK); 7 = Bad (Error))	bool	2ea8	11944	Not applicable
UsrVal.6.Units	Units of the value	string_t	691a	26906	Not applicable
UsrVal.6.Val	The User Value	float32	2ea7	11943	Set by UsrVal.6.Resolution
UsrVal.7.HighLimit	User Value High Limit	float32	2eaa	11946	Set by UsrVal.7.Resolution
UsrVal.7.LowLimit	User Value Low Limit	float32	2eab	11947	Set by UsrVal.7.Resolution
UsrVal.7.Resolution	Result Resolution	uint8	2eae	11950	Not applicable
UsrVal.7.Status	User Value 7 Status (0 = Good (OK); 7 = Bad (Error))	bool	2ead	11949	Not applicable
UsrVal.7.Units	Units of the value	string_t	6920	26912	Not applicable
UsrVal.7.Val	The User Value	float32	2eac	11948	Set by UsrVal.7.Resolution
UsrVal.8.HighLimit	User Value High Limit	float32	2eaf	11951	Set by UsrVal.8.Resolution
UsrVal.8.LowLimit	User Value Low Limit	float32	2eb0	11952	Set by UsrVal.8.Resolution
UsrVal.8.Resolution	Result Resolution	uint8	2eb3	11955	Not applicable
UsrVal.8.Status	User Value 8 Status (0 = Good (OK); 7 = Bad (Error))	bool	2eb2	11954	Not applicable
UsrVal.8.Units	Units of the value	string_t	6926	26918	Not applicable
UsrVal.8.Val	The User Value	float32	2eb1	11953	Set by UsrVal.8.Resolution
UsrVal.9.HighLimit	User Value High Limit	float32	2eb4	11956	Set by UsrVal.9.Resolution
UsrVal.9.LowLimit	User Value Low Limit	float32	2eb5	11957	Set by UsrVal.9.Resolution

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Parameter path	Description	Type	Hex	Dec	Resolution
UsrVal.9.Resolution	Result Resolution	uint8	2eb8	11960	Not applicable
UsrVal.9.Status	User Value 9 Status (0 = Good (OK); 7 = Bad (Error))	bool	2eb7	11959	Not applicable
UsrVal.9.Units	Units of the value	string_t	692c	26924	Not applicable
UsrVal.9.Val	The User Value	float32	2eb6	11958	Set by UsrVal.9.Resolution
UsrVal.10.HighLimit	User Value High Limit	float32	2eb9	11961	Set by UsrVal.10.Resolution
UsrVal.10.LowLimit	User Value Low Limit	float32	2eba	11962	Set by UsrVal.10.Resolution
UsrVal.10.Resolution	Result Resolution	uint8	2ebd	11965	Not applicable
UsrVal.10.Status	User Value 10 Status (0 = Good (OK); 7 = Bad (Error))	bool	2ebc	11964	Not applicable
UsrVal.10.Units	Units of the value	string_t	6932	26930	Not applicable
UsrVal.10.Val	The User Value	float32	2ebb	11963	Set by UsrVal.10.Resolution
UsrVal.11.HighLimit	User Value High Limit	float32	2ebe	11966	Set by UsrVal.11.Resolution
UsrVal.11.LowLimit	User Value Low Limit	float32	2ebf	11967	Set by UsrVal.11.Resolution
UsrVal.11.Resolution	Result Resolution	uint8	2ec2	11970	Not applicable
UsrVal.11.Status	User Value 11 Status (0 = Good (OK); 7 = Bad (Error))	bool	2ec1	11969	Not applicable
UsrVal.11.Units	Units of the value	string_t	6938	26936	Not applicable
UsrVal.11.Val	The User Value	float32	2ec0	11968	Set by UsrVal.11.Resolution
UsrVal.12.HighLimit	User Value High Limit	float32	2ec3	11971	Set by UsrVal.12.Resolution
UsrVal.12.LowLimit	User Value Low Limit	float32	2ec4	11972	Set by UsrVal.12.Resolution
UsrVal.12.Resolution	Result Resolution	uint8	2ec7	11975	Not applicable
UsrVal.12.Status	User Value 12 Status (0 = Good (OK); 7 = Bad (Error))	bool	2ec6	11974	Not applicable
UsrVal.12.Units	Units of the value	string_t	693e	26942	Not applicable
UsrVal.12.Val	The User Value	float32	2ec5	11973	Set by UsrVal.12.Resolution
VirtualChannel.1.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01c0	448	Not applicable
VirtualChannel.1.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	1c50	7248	Not applicable
VirtualChannel.1.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	1c4b	7243	Not applicable
VirtualChannel.1.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	1c48	7240	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	1c4a	7242	Set by Network.Modbus.TimeFormat
VirtualChannel.1.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1c42	7234	Not applicable
VirtualChannel.1.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1c49	7241	Not applicable
VirtualChannel.1.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	1c47	7239	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Alarm1.Dwell	Alarm dwell time	time_t	1c45	7237	Set by Network.Modbus.TimeFormat
VirtualChannel.1.Alarm1.Hysteresis	Alarm hysteresis value	float32	1c44	7236	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1c4e	7246	Not applicable
VirtualChannel.1.Alarm1.Inhibit	1 = alarm inhibited	bool	1c51	7249	Not applicable
VirtualChannel.1.Alarm1.Latch	Alarm latch type (0 = None; 1 = Auto; 2 = Manual; 3 = Trigger)	uint8	1c41	7233	Not applicable
VirtualChannel.1.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	1c4f	7247	Not applicable
VirtualChannel.1.Alarm1.Reference	Deviation alarm 'Reference' value	float32	1c46	7238	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Alarm1.Status	Indication of the active and acknowledge status 0 = Unacknowledged    1 = None 2 = Active                3 = Inactive 4 = Acknowledged	uint8	0122	290	Not applicable
VirtualChannel.1.Alarm1.Threshold	Alarm trigger threshold	float32	1c43	7235	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Alarm1.Type	Alarm type 0 = None                1 = Abs High            2 = Abs Low 3 = Dev high            4 = Dev Low            5 = Dev band 6 = ROC rising        7 = ROC falling        10 = Dig Off 11 = Dig High        12 = Dig Low	uint8	1c40	7232	Not applicable
VirtualChannel.1.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01c1	449	Not applicable
VirtualChannel.1.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	1c70	7280	Not applicable
VirtualChannel.1.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	1c6b	7275	Not applicable
VirtualChannel.1.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	1c68	7272	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	1c6a	7274	Set by Network.Modbus.TimeFormat
VirtualChannel.1.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1c62	7266	Not applicable
VirtualChannel.1.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1c69	7273	Not applicable
VirtualChannel.1.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	1c67	7271	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Alarm2.Dwell	Alarm dwell time	time_t	1c65	7269	Set by Network.Modbus.TimeFormat
VirtualChannel.1.Alarm2.Hysteresis	Alarm hysteresis value	float32	1c64	7268	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1c6e	7278	Not applicable
VirtualChannel.1.Alarm2.Inhibit	1 = alarm inhibited	bool	1c71	7281	Not applicable
VirtualChannel.1.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1c61	7265	Not applicable
VirtualChannel.1.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	1c6f	7279	Not applicable
VirtualChannel.1.Alarm2.Reference	Deviation alarm 'Reference' value	float32	1c66	7270	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	0123	291	Not applicable
VirtualChannel.1.Alarm2.Threshold	Alarm trigger threshold	float32	1c63	7267	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	1c60	7264	Not applicable
VirtualChannel.1.Main.Descriptor	Virtual Channel descriptor	string_t	4b00	19200	Not applicable
VirtualChannel.1.Main.Disable	1 = Virtual channel disabled	bool	1c23	7203	Not applicable
VirtualChannel.1.Main.HighCutOff	High cut off value for totalisers and counters	float32	1c05	7173	Set by VirtualChannel.1.Main.Resolution
VirtualChannel.1.Main.Input1	Input 1 value	float32	1c07	7175	Set by VirtualChannel.1.Main.Resolution
VirtualChannel.1.Main.Input2	Input 2 value	float32	1c08	7176	Set by VirtualChannel.1.Main.Resolution
VirtualChannel.1.Main.LowCutOff	Low cutoff value for totalisers and counters	float32	1c04	7172	Set by VirtualChannel.1.Main.Resolution
VirtualChannel.1.Main.ModbusInput	Modbus input value	float32	1c06	7174	Set by VirtualChannel.1.Main.Resolution
VirtualChannel.1.Main.Operation	Specifies the operation of the virtual channel 0 = Off                2 = Add                3 = Subtract 4 = Multiply            5 = Divide            6 = Group avg 7 = Group min        8 = Group max        9 = Modbus i/p	uint8	1c01	7169	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
	11 = Copy      20 = Grp min latch      21 = Grp max latch 34 = Chan max    35 = Chan min      36 = Chan avg 43 = Config rev    64 = Off      65 = On 80 = Off      81 = On				
VirtualChannel.1.Main.Period	The time period over which the calculation is made	int32	1c0a	7178	Not applicable
VirtualChannel.1.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	1c0c	7180	Not applicable
VirtualChannel.1.Main.PresetValue	The preset value	float32	1c0d	7181	Set by VirtualChannel.1.Main.Resolution
VirtualChannel.1.Main.PV	The virtual channel output value	float32	0120	288	Set by VirtualChannel.1.Main.Resolution
VirtualChannel.1.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	1c0b	7179	Not applicable
VirtualChannel.1.Main.Resolution	Number of decimal places (0 to 6)	uint8	1c02	7170	Not applicable
VirtualChannel.1.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	1c11	7185	Not applicable
VirtualChannel.1.Main.RolloverValue	Rollover value	float32	1c12	7186	Set by VirtualChannel.1.Main.Resolution
VirtualChannel.1.Main.Status	Virtual Channel output status 0 = Good      1 = Off      2 = Over range 3 = Under range    4 = HW error    5 = Ranging 6 = Overflow    7 = bad      8 = HW exceeded 9 = No data    12 = Comms channel error	uint8	0121	289	Not applicable
VirtualChannel.1.Main.TimeRemaining	Time remaining before the calculation is made	time_t	1c09	7177	Set by Network.Modbus.TimeFormat
VirtualChannel.1.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	1c0e	7182	Not applicable
VirtualChannel.1.Main.Type	Specifies the type of virtual channel 1 = Maths; 2 = Totaliser; 3 = Counter	uint8	1c00	7168	Not applicable
VirtualChannel.1.Main.Units	Units descriptor	string_t	4b15	19221	Not applicable
VirtualChannel.1.Main.UnitsScaler	Units scaler for totalisers	float32	1c03	7171	1dp
VirtualChannel.1.Trend.Colour	Configures the trend colour for this virtual channel 0 = Red      1 = Blue      2 = Green 3 = Honey    4 = Violet    5 = Russet 6 = Dark blue    7 = Jade      8 = Magenta 9 = Dusky rose    10 = Yellow    11 = Powder blue 12 = Dark red    13 = Avocado    14 = Indigo 15 = Dark brown    16 = Aegean    17 = Cyan 18 = Aubergine    19 = Dark orange    20 = Pale yellow 21 = Hyacinth    22 = Dark green    23 = Sugar pink 24 = Bluebell    25 = Orange    26 = Pink 27 = Buttersilk    28 = Terracotta    29 = Blue babe 30 = Lime      31 = Blue jive    32 = Cucumber 33 = Eurogreen    34 = Wheatgerm    35 = Sea Blue 36 = Ginger      37 = Aqua pool    38 = Pale red 39 = Pale blue    40 = Lilac      41 = Sky blue 42 = Wild moss    43 = Turquoise    44 = Pale green 45 = Coffee      49 = Dark Gray    53 = Light gray	uint8	1c20	7200	Not applicable
VirtualChannel.1.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	1c22	7202	Same as VirtualChannel.1.Main.PV
VirtualChannel.1.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	1c21	7201	Same as VirtualChannel.1.Main.PV
VirtualChannel.2.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01c2	450	Not applicable
VirtualChannel.2.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	1cd0	7376	Not applicable
VirtualChannel.2.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	1ccb	7371	Not applicable
VirtualChannel.2.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	1cc8	7368	Same as VirtualChannel.2.Main.PV
VirtualChannel.2.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	1cca	7370	Set by Network.Modbus.TimeFormat
VirtualChannel.2.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1cc2	7362	Not applicable
VirtualChannel.2.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1cc9	7369	Not applicable
VirtualChannel.2.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	1cc7	7367	Same as VirtualChannel.2.Main.PV
VirtualChannel.2.Alarm1.Dwell	Alarm dwell time	time_t	1cc5	7365	Set by Network.Modbus.TimeFormat
VirtualChannel.2.Alarm1.Hysteresis	Alarm hysteresis value	float32	1cc4	7364	Same as VirtualChannel.2.Main.PV
VirtualChannel.2.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1cce	7374	Not applicable
VirtualChannel.2.Alarm1.Inhibit	1 = alarm inhibited	bool	1cd1	7377	Not applicable
VirtualChannel.2.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1cc1	7361	Not applicable
VirtualChannel.2.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	1ccf	7375	Not applicable
VirtualChannel.2.Alarm1.Reference	Deviation alarm 'Reference' value	float32	1cc6	7366	Same as VirtualChannel.2.Main.PV
VirtualChannel.2.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	0126	294	Not applicable
VirtualChannel.2.Alarm1.Threshold	Alarm trigger threshold	float32	1cc3	7363	Same as VirtualChannel.2.Main.PV
VirtualChannel.2.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	1cc0	7360	Not applicable
VirtualChannel.2.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01c3	451	Not applicable
VirtualChannel.2.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	1cf0	7408	Not applicable
VirtualChannel.2.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	1ceb	7403	Not applicable
VirtualChannel.2.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	1ce8	7400	Same as VirtualChannel.2.Main.PV
VirtualChannel.2.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	1cea	7402	Set by Network.Modbus.TimeFormat
VirtualChannel.2.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1ce2	7394	Not applicable
VirtualChannel.2.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1ce9	7401	Not applicable
VirtualChannel.2.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	1ce7	7399	Same as VirtualChannel.2.Main.PV
VirtualChannel.2.Alarm2.Dwell	Alarm dwell time	time_t	1ce5	7397	Set by Network.Modbus.TimeFormat
VirtualChannel.2.Alarm2.Hysteresis	Alarm hysteresis value	float32	1ce4	7396	Same as VirtualChannel.2.Main.PV
VirtualChannel.2.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1cee	7406	Not applicable
VirtualChannel.2.Alarm2.Inhibit	1 = alarm inhibited	bool	1cf1	7409	Not applicable
VirtualChannel.2.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1ce1	7393	Not applicable
VirtualChannel.2.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	1cef	7407	Not applicable
VirtualChannel.2.Alarm2.Reference	Deviation alarm 'Reference' value	float32	1ce6	7398	Same as VirtualChannel.2.Main.PV

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.2.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	0127	295	Not applicable
VirtualChannel.2.Alarm2.Threshold	Alarm trigger threshold	float32	1ce3	7395	Same as VirtualChannel.2.Main.PV
VirtualChannel.2.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	1ce0	7392	Not applicable
VirtualChannel.2.Main.Descriptor	Virtual Channel descriptor	string_t	4b1b	19227	Not applicable
VirtualChannel.2.Main.Disable	1 = Virtual channel disabled	bool	1ca3	7331	Not applicable
VirtualChannel.2.Main.HighCutOff	The highest input value that will be totalised/counted	float32	1c85	7301	Set by VirtualChannel.2.Main.Resolution
VirtualChannel.2.Main.Input1	Input 1 value	float32	1c87	7303	Set by VirtualChannel.2.Main.Resolution
VirtualChannel.2.Main.Input2	Input 2 value	float32	1c88	7304	Set by VirtualChannel.2.Main.Resolution
VirtualChannel.2.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	1c84	7300	Set by VirtualChannel.2.Main.Resolution
VirtualChannel.2.Main.ModbusInput	Modbus input value	float32	1c86	7302	Set by VirtualChannel.2.Main.Resolution
VirtualChannel.2.Main.Operation	As VirtualChannel1.Main.Operation	uint8	1c81	7297	Not applicable
VirtualChannel.2.Main.Period	The time period over which the calculation is made	int32	1c8a	7306	Not applicable
VirtualChannel.2.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	1c8c	7308	Not applicable
VirtualChannel.2.Main.PresetValue	The Preset value	float32	1c8d	7309	Set by VirtualChannel.2.Main.Resolution
VirtualChannel.2.Main.PV	The virtual channel output value	float32	0124	292	Set by VirtualChannel.2.Main.Resolution
VirtualChannel.2.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	1c8b	7307	Not applicable
VirtualChannel.2.Main.Resolution	Specifies the resolution/number of decimal places	uint8	1c82	7298	Not applicable
VirtualChannel.2.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	1c91	7313	Not applicable
VirtualChannel.2.Main.RolloverValue	Rollover value	float32	1c92	7314	Set by VirtualChannel.2.Main.Resolution
VirtualChannel.2.Main.Status	As VirtualChannel1.Main.Status	uint8	0125	293	Not applicable
VirtualChannel.2.Main.TimeRemaining	Time remaining before the calculation is made	time_t	1c89	7305	Set by Network.Modbus.TimeFormat
VirtualChannel.2.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	1c8e	7310	Not applicable
VirtualChannel.2.Main.Type	As VirtualChannel1.Main.Type	uint8	1c80	7296	Not applicable
VirtualChannel.2.Main.Units	Units descriptor	string_t	4b30	19248	Not applicable
VirtualChannel.2.Main.UnitsScaler	Units scaler for totalisers	float32	1c83	7299	1dp
VirtualChannel.2.Main.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	1ca0	7328	Not applicable
VirtualChannel.2.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	1ca2	7330	Same as VirtualChannel.2.Main.PV
VirtualChannel.2.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	1ca1	7329	Same as VirtualChannel.2.Main.PV
VirtualChannel.3.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01c4	452	Not applicable
VirtualChannel.3.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	1d50	7504	Not applicable
VirtualChannel.3.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	1d4b	7499	Not applicable
VirtualChannel.3.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	1d48	7496	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	1d4a	7498	Set by Network.Modbus.TimeFormat
VirtualChannel.3.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1d42	7490	Not applicable
VirtualChannel.3.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1d49	7497	Not applicable
VirtualChannel.3.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	1d47	7495	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Alarm1.Dwell	Alarm dwell time	time_t	1d45	7493	Set by Network.Modbus.TimeFormat
VirtualChannel.3.Alarm1.Hysteresis	Alarm hysteresis value	float32	1d44	7492	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1d4e	7502	Not applicable
VirtualChannel.3.Alarm1.Inhibit	1 = alarm inhibited	bool	1d51	7505	Not applicable
VirtualChannel.3.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1d41	7489	Not applicable
VirtualChannel.3.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	1d4f	7503	Not applicable
VirtualChannel.3.Alarm1.Reference	Deviation alarm 'Reference' value	float32	1d46	7494	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	012a	298	Not applicable
VirtualChannel.3.Alarm1.Threshold	Alarm trigger threshold	float32	1d43	7491	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	1d40	7488	Not applicable
VirtualChannel.3.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01c5	453	Not applicable
VirtualChannel.3.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	1d70	7536	Not applicable
VirtualChannel.3.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	1d6b	7531	Not applicable
VirtualChannel.3.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	1d68	7528	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	1d6a	7530	Set by Network.Modbus.TimeFormat
VirtualChannel.3.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1d62	7522	Not applicable
VirtualChannel.3.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1d69	7529	Not applicable
VirtualChannel.3.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	1d67	7527	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Alarm2.Dwell	Alarm dwell time	time_t	1d65	7525	Set by Network.Modbus.TimeFormat
VirtualChannel.3.Alarm2.Hysteresis	Alarm hysteresis value	float32	1d64	7524	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1d6e	7534	Not applicable
VirtualChannel.3.Alarm2.Inhibit	1 = alarm inhibited	bool	1d71	7537	Not applicable
VirtualChannel.3.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1d61	7521	Not applicable
VirtualChannel.3.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	1d6f	7535	Not applicable
VirtualChannel.3.Alarm2.Reference	Deviation alarm 'Reference' value	float32	1d66	7526	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	012b	299	Not applicable
VirtualChannel.3.Alarm2.Threshold	Alarm trigger threshold	float32	1d63	7523	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	1d60	7520	Not applicable
VirtualChannel.3.Main.Descriptor	Virtual Channel descriptor	string_t	4b36	19254	Not applicable
VirtualChannel.3.Main.Disable	1 = Virtual channel disabled	bool	1d23	7459	Not applicable
VirtualChannel.3.Main.HighCutOff	The highest input value that will be totalised/counted	float32	1d05	7429	Set by VirtualChannel.3.Main.Resolution
VirtualChannel.3.Main.Input1	Input 1	float32	1d07	7431	Set by VirtualChannel.3.Main.Resolution
VirtualChannel.3.Main.Input2	Input 2	float32	1d08	7432	Set by VirtualChannel.3.Main.Resolution
VirtualChannel.3.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	1d04	7428	Set by VirtualChannel.3.Main.Resolution
VirtualChannel.3.Main.ModbusInput	Modbus input value	float32	1d06	7430	Set by VirtualChannel.3.Main.Resolution
VirtualChannel.3.Main.Operation	As VirtualChannel1.Main.Operation	uint8	1d01	7425	Not applicable
VirtualChannel.3.Main.Period	The time period over which the calculation is made	int32	1d0a	7434	Not applicable
VirtualChannel.3.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	1d0c	7436	Not applicable
VirtualChannel.3.Main.PresetValue	The Preset value	float32	1d0d	7437	Set by VirtualChannel.3.Main.Resolution
VirtualChannel.3.Main.PV	The virtual channel output value	float32	0128	296	Set by VirtualChannel.3.Main.Resolution
VirtualChannel.3.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	1d0b	7435	Not applicable
VirtualChannel.3.Main.Resolution	Number of decimal places (0 to 6)	uint8	1d02	7426	Not applicable
VirtualChannel.3.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	1d11	7441	Not applicable
VirtualChannel.3.Main.RolloverValue	Rollover value	float32	1d12	7442	Set by VirtualChannel.3.Main.Resolution

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.3.Main.Status	As VirtualChannel1.Main.Status	uint8	0129	297	Not applicable
VirtualChannel.3.Main.TimeRemaining	Time remaining before the calculation is made	time_t	1d09	7433	Set by Network.Modbus.TimeFormat
VirtualChannel.3.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	1d0e	7438	Not applicable
VirtualChannel.3.Main.Type	As VirtualChannel1.Main.Type	uint8	1d00	7424	Not applicable
VirtualChannel.3.Main.Units	Units descriptor	string_t	4b4b	19275	Not applicable
VirtualChannel.3.Main.UnitsScaler	Units scaler for totalisers	float32	1d03	7427	1dp
VirtualChannel.3.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	1d20	7456	Not applicable
VirtualChannel.3.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	1d22	7458	Same as VirtualChannel.3.Main.PV
VirtualChannel.3.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	1d21	7457	Same as VirtualChannel.3.Main.PV
VirtualChannel.4.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01c6	454	Not applicable
VirtualChannel.4.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	1dd0	7632	Not applicable
VirtualChannel.4.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	1dcb	7627	Not applicable
VirtualChannel.4.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	1dc8	7624	Same as VirtualChannel.4.Main.PV
VirtualChannel.4.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	1dca	7626	Set by Network.Modbus.TimeFormat
VirtualChannel.4.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1dc2	7618	Not applicable
VirtualChannel.4.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1dc9	7625	Not applicable
VirtualChannel.4.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	1dc7	7623	Same as VirtualChannel.4.Main.PV
VirtualChannel.4.Alarm1.Dwell	Alarm dwell time	time_t	1dc5	7621	Set by Network.Modbus.TimeFormat
VirtualChannel.4.Alarm1.Hysteresis	Alarm hysteresis value	float32	1dc4	7620	Same as VirtualChannel.4.Main.PV
VirtualChannel.4.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1dce	7630	Not applicable
VirtualChannel.4.Alarm1.Inhibit	1 = alarm inhibited	bool	1dd1	7633	Not applicable
VirtualChannel.4.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1dc1	7617	Not applicable
VirtualChannel.4.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	1dcf	7631	Not applicable
VirtualChannel.4.Alarm1.Reference	Deviation alarm 'Reference' value	float32	1dc6	7622	Same as VirtualChannel.4.Main.PV
VirtualChannel.4.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	012e	302	Not applicable
VirtualChannel.4.Alarm1.Threshold	Alarm trigger threshold	float32	1dc3	7619	Same as VirtualChannel.4.Main.PV
VirtualChannel.4.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	1dc0	7616	Not applicable
VirtualChannel.4.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01c7	455	Not applicable
VirtualChannel.4.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	1df0	7664	Not applicable
VirtualChannel.4.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	1deb	7659	Not applicable
VirtualChannel.4.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	1de8	7656	Same as VirtualChannel.4.Main.PV
VirtualChannel.4.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	1dea	7658	Set by Network.Modbus.TimeFormat
VirtualChannel.4.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1de2	7650	Not applicable
VirtualChannel.4.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1de9	7657	Not applicable
VirtualChannel.4.Alarm2.Deviation	Deviation alarm 'Deviation Value'	time_t	1de5	7653	Set by Network.Modbus.TimeFormat
VirtualChannel.4.Alarm2.Hysteresis	Alarm hysteresis value	float32	1de4	7652	Same as VirtualChannel.4.Main.PV
VirtualChannel.4.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1dee	7662	Not applicable
VirtualChannel.4.Alarm2.Inhibit	1 = alarm inhibited	bool	1df1	7665	Not applicable
VirtualChannel.4.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1de1	7649	Not applicable
VirtualChannel.4.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	1def	7663	Not applicable
VirtualChannel.4.Alarm2.Reference	Deviation alarm 'Reference' value	float32	1de6	7654	Same as VirtualChannel.4.Main.PV
VirtualChannel.4.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	012f	303	Not applicable
VirtualChannel.4.Alarm2.Threshold	Alarm trigger threshold	float32	1de3	7651	Same as VirtualChannel.4.Main.PV
VirtualChannel.4.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	1de0	7648	Not applicable
VirtualChannel.4.Main.Descriptor	Virtual Channel descriptor	string_t	4b51	19281	Not applicable
VirtualChannel.4.Main.Disable	1 = Virtual channel disabled	bool	1da3	7587	Not applicable
VirtualChannel.4.Main.HighCutOff	The highest input value that will be totalised/counted	float32	1d85	7557	Set by VirtualChannel.4.Main.Resolution
VirtualChannel.4.Main.Input1	Input 1 value	float32	1d87	7559	Set by VirtualChannel.4.Main.Resolution
VirtualChannel.4.Main.Input2	Input 2 value	float32	1d88	7560	Set by VirtualChannel.4.Main.Resolution
VirtualChannel.4.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	1d84	7556	Set by VirtualChannel.4.Main.Resolution
VirtualChannel.4.Main.ModbusInput	Modbus input value	float32	1d86	7558	Set by VirtualChannel.4.Main.Resolution
VirtualChannel.4.Main.Operation	As VirtualChannel1.Main.Operation	uint8	1d81	7553	Not applicable
VirtualChannel.4.Main.Period	Averaging period	int32	1d8a	7562	Not applicable
VirtualChannel.4.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	1d8c	7564	Not applicable
VirtualChannel.4.Main.PresetValue	The Preset value	float32	1d8d	7565	Set by VirtualChannel.4.Main.Resolution
VirtualChannel.4.Main.PV	The virtual channel output value	float32	012c	300	Set by VirtualChannel.4.Main.Resolution
VirtualChannel.4.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	1d8b	7563	Not applicable
VirtualChannel.4.Main.Resolution	Number of decimal places (0 to 6)	uint8	1d82	7554	Not applicable
VirtualChannel.4.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	1d91	7569	Not applicable
VirtualChannel.4.Main.RolloverValue	Rollover value	float32	1d92	7570	Set by VirtualChannel.4.Main.Resolution
VirtualChannel.4.Main.Status	As VirtualChannel1.Main.Status	uint8	012d	301	Not applicable
VirtualChannel.4.Main.TimeRemaining	Time remaining before the calculation is made	time_t	1d89	7561	Set by Network.Modbus.TimeFormat
VirtualChannel.4.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	1d8e	7566	Not applicable
VirtualChannel.4.Main.Type	As VirtualChannel1.Main.Type	uint8	1d80	7552	Not applicable
VirtualChannel.4.Main.Units	Units descriptor	string_t	4b66	19302	Not applicable
VirtualChannel.4.Main.UnitsScaler	Units scaler for totalisers	float32	1d83	7555	1dp
VirtualChannel.4.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	1da0	7584	Not applicable
VirtualChannel.4.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	1da2	7586	Same as VirtualChannel.4.Main.PV
VirtualChannel.4.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	1da1	7585	Same as VirtualChannel.4.Main.PV
VirtualChannel.5.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01c8	456	Not applicable
VirtualChannel.5.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	1e50	7760	Not applicable
VirtualChannel.5.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	1e4b	7755	Not applicable
VirtualChannel.5.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	1e48	7752	Same as VirtualChannel.5.Main.PV
VirtualChannel.5.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	1e4a	7754	Set by Network.Modbus.TimeFormat
VirtualChannel.5.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1e42	7746	Not applicable
VirtualChannel.5.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1e49	7753	Not applicable
VirtualChannel.5.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	1e47	7751	Same as VirtualChannel.5.Main.PV
VirtualChannel.5.Alarm1.Dwell	Alarm dwell time	time_t	1e45	7749	Set by Network.Modbus.TimeFormat
VirtualChannel.5.Alarm1.Hysteresis	Alarm hysteresis value	float32	1e44	7748	Same as VirtualChannel.5.Main.PV

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.5.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1e4e	7758	Not applicable
VirtualChannel.5.Alarm1.Inhibit	1 = alarm inhibited	bool	1e51	7761	Not applicable
VirtualChannel.5.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1e41	7745	Not applicable
VirtualChannel.5.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	1e4f	7759	Not applicable
VirtualChannel.5.Alarm1.Reference	Deviation alarm 'Reference' value	float32	1e46	7750	Same as VirtualChannel.5.Main.PV
VirtualChannel.5.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	0132	306	Not applicable
VirtualChannel.5.Alarm1.Threshold	Alarm trigger threshold	float32	1e43	7747	Same as VirtualChannel.5.Main.PV
VirtualChannel.5.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	1e40	7744	Not applicable
VirtualChannel.5.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01c9	457	Not applicable
VirtualChannel.5.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	1e70	7792	Not applicable
VirtualChannel.5.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	1e6b	7787	Not applicable
VirtualChannel.5.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	1e68	7784	Same as VirtualChannel.5.Main.PV
VirtualChannel.5.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	1e6a	7786	Set by Network.Modbus.TimeFormat
VirtualChannel.5.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1e62	7778	Not applicable
VirtualChannel.5.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1e69	7785	Not applicable
VirtualChannel.5.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	1e67	7783	Same as VirtualChannel.5.Main.PV
VirtualChannel.5.Alarm2.Dwell	Alarm dwell time	time_t	1e65	7781	Set by Network.Modbus.TimeFormat
VirtualChannel.5.Alarm2.Hysteresis	Alarm hysteresis value	float32	1e64	7780	Same as VirtualChannel.5.Main.PV
VirtualChannel.5.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1e6e	7790	Not applicable
VirtualChannel.5.Alarm2.Inhibit	1 = alarm inhibited	bool	1e71	7793	Not applicable
VirtualChannel.5.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1e61	7777	Not applicable
VirtualChannel.5.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	1e6f	7791	Not applicable
VirtualChannel.5.Alarm2.Reference	Deviation alarm 'Reference' value	float32	1e66	7782	Same as VirtualChannel.5.Main.PV
VirtualChannel.5.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	0133	307	Not applicable
VirtualChannel.5.Alarm2.Threshold	Alarm trigger threshold	float32	1e63	7779	Same as VirtualChannel.5.Main.PV
VirtualChannel.5.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	1e60	7776	Not applicable
VirtualChannel.5.Main.Descriptor	Virtual Channel descriptor	string_t	4b6c	19308	Not applicable
VirtualChannel.5.Main.Disable	1 = Virtual channel disabled	bool	1e23	7715	Not applicable
VirtualChannel.5.Main.HighCutOff	The highest input value that will be totalised/counted	float32	1e05	7685	Set by VirtualChannel.5.Main.Resolution
VirtualChannel.5.Main.Input1	Input 1 value	float32	1e07	7687	Set by VirtualChannel.5.Main.Resolution
VirtualChannel.5.Main.Input2	Input 2 value	float32	1e08	7688	Set by VirtualChannel.5.Main.Resolution
VirtualChannel.5.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	1e04	7684	Set by VirtualChannel.5.Main.Resolution
VirtualChannel.5.Main.ModbusInput	Modbus input value	float32	1e06	7686	Set by VirtualChannel.5.Main.Resolution
VirtualChannel.5.Main.Operation	As VirtualChannel1.Main.Operation	uint8	1e01	7681	Not applicable
VirtualChannel.5.Main.Period	The time period over which the calculation is made	int32	1e0a	7690	Not applicable
VirtualChannel.5.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	1e0c	7692	Not applicable
VirtualChannel.5.Main.PresetValue	The Preset value	float32	1e0d	7693	Set by VirtualChannel.5.Main.Resolution
VirtualChannel.5.Main.PV	The virtual channel output value	float32	0130	304	Set by VirtualChannel.5.Main.Resolution
VirtualChannel.5.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	1e0b	7691	Not applicable
VirtualChannel.5.Main.Resolution	Number of decimal places (0 to 6)	uint8	1e02	7682	Not applicable
VirtualChannel.5.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	1e11	7697	Not applicable
VirtualChannel.5.Main.RolloverValue	Rollover value	float32	1e12	7698	Set by VirtualChannel.5.Main.Resolution
VirtualChannel.5.Main.Status	As VirtualChannel1.Main.Status	uint8	0131	305	Not applicable
VirtualChannel.5.Main.TimeRemaining	Time remaining before the calculation is made	time_t	1e09	7689	Set by Network.Modbus.TimeFormat
VirtualChannel.5.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	1e0e	7694	Not applicable
VirtualChannel.5.Main.Type	As VirtualChannel1.Main.Type	uint8	1e00	7680	Not applicable
VirtualChannel.5.Main.Units	Units descriptor	string_t	4b81	19329	Not applicable
VirtualChannel.5.Main.UnitsScaler	Units scaler for totalisers	float32	1e03	7683	1dp
VirtualChannel.5.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	1e20	7712	Not applicable
VirtualChannel.5.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	1e22	7714	Same as VirtualChannel.5.Main.PV
VirtualChannel.5.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	1e21	7713	Same as VirtualChannel.5.Main.PV
VirtualChannel.6.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01ca	458	Not applicable
VirtualChannel.6.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	1ed0	7888	Not applicable
VirtualChannel.6.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	1ecb	7883	Not applicable
VirtualChannel.6.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	1ec8	7880	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	1eca	7882	Set by Network.Modbus.TimeFormat
VirtualChannel.6.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1ec2	7874	Not applicable
VirtualChannel.6.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1ec9	7881	Not applicable
VirtualChannel.6.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	1ec7	7879	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Alarm1.Dwell	Alarm dwell time	time_t	1ec5	7877	Set by Network.Modbus.TimeFormat
VirtualChannel.6.Alarm1.Hysteresis	Alarm hysteresis value	float32	1ec4	7876	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1ece	7886	Not applicable
VirtualChannel.6.Alarm1.Inhibit	1 = alarm inhibited	bool	1ed1	7889	Not applicable
VirtualChannel.6.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1ec1	7873	Not applicable
VirtualChannel.6.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	1ecf	7887	Not applicable
VirtualChannel.6.Alarm1.Reference	Deviation alarm 'Reference' value	float32	1ec6	7878	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	0136	310	Not applicable
VirtualChannel.6.Alarm1.Threshold	Alarm trigger threshold	float32	1ec3	7875	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	1ec0	7872	Not applicable
VirtualChannel.6.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01cb	459	Not applicable
VirtualChannel.6.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	1ef0	7920	Not applicable
VirtualChannel.6.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	1eeb	7915	Not applicable
VirtualChannel.6.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	1ee8	7912	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	1eea	7914	Set by Network.Modbus.TimeFormat
VirtualChannel.6.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1ee2	7906	Not applicable
VirtualChannel.6.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1ee9	7913	Not applicable
VirtualChannel.6.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	1ee7	7911	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Alarm2.Dwell	Alarm dwell time	time_t	1ee5	7909	Set by Network.Modbus.TimeFormat
VirtualChannel.6.Alarm2.Hysteresis	Alarm hysteresis value	float32	1ee4	7908	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1eee	7918	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.6.Alarm2.Inhibit	1 = alarm inhibited	bool	1ef1	7921	Not applicable
VirtualChannel.6.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1ee1	7905	Not applicable
VirtualChannel.6.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	1eef	7919	Not applicable
VirtualChannel.6.Alarm2.Reference	Deviation alarm 'Reference' value	float32	1ee6	7910	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	0137	311	Not applicable
VirtualChannel.6.Alarm2.Threshold	Alarm trigger threshold	float32	1ee3	7907	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	1ee0	7904	Not applicable
VirtualChannel.6.Main.Descriptor	Virtual Channel descriptor	string_t	4b87	19335	Not applicable
VirtualChannel.6.Main.Disable	1 = Virtual channel disabled	bool	1ea3	7843	Not applicable
VirtualChannel.6.Main.HighCutOff	The highest input value that will be totalised/counted	float32	1e85	7813	Set by VirtualChannel.6.Main.Resolution
VirtualChannel.6.Main.Input1	Input 1 value	float32	1e87	7815	Set by VirtualChannel.6.Main.Resolution
VirtualChannel.6.Main.Input2	Input 2 value	float32	1e88	7816	Set by VirtualChannel.6.Main.Resolution
VirtualChannel.6.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	1e84	7812	Set by VirtualChannel.6.Main.Resolution
VirtualChannel.6.Main.ModbusInput	Modbus input value	float32	1e86	7814	Set by VirtualChannel.6.Main.Resolution
VirtualChannel.6.Main.Operation	As VirtualChannel1.Main.Operation	uint8	1e81	7809	Not applicable
VirtualChannel.6.Main.Period	The time period over which the calculation is made	int32	1e8a	7818	Not applicable
VirtualChannel.6.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	1e8c	7820	Not applicable
VirtualChannel.6.Main.PresetValue	The Preset value	float32	1e8d	7821	Set by VirtualChannel.6.Main.Resolution
VirtualChannel.6.Main.PV	The virtual channel output value	float32	0134	308	Set by VirtualChannel.6.Main.Resolution
VirtualChannel.6.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	1e8b	7819	Not applicable
VirtualChannel.6.Main.Resolution	Number of decimal places (0 to 6)	uint8	1e82	7810	Not applicable
VirtualChannel.6.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	1e91	7825	Not applicable
VirtualChannel.6.Main.RolloverValue	Rollover value	float32	1e92	7826	Set by VirtualChannel.6.Main.Resolution
VirtualChannel.6.Main.Status	As VirtualChannel1.Main.Status	uint8	0135	309	Not applicable
VirtualChannel.6.Main.TimeRemaining	Time remaining before the calculation is made	time_t	1e89	7817	Set by Network.Modbus.TimeFormat
VirtualChannel.6.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	1e8e	7822	Not applicable
VirtualChannel.6.Main.Type	As VirtualChannel1.Main.Type	uint8	1e80	7808	Not applicable
VirtualChannel.6.Main.Units	Units descriptor	string_t	4b9c	19356	Not applicable
VirtualChannel.6.Main.UnitsScaler	Units scaler for totalisers	float32	1e83	7811	1dp
VirtualChannel.6.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	1ea0	7840	Not applicable
VirtualChannel.6.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	1ea2	7842	Same as VirtualChannel.6.Main.PV
VirtualChannel.6.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	1ea1	7841	Same as VirtualChannel.6.Main.PV
VirtualChannel.7.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01cc	460	Not applicable
VirtualChannel.7.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	1f50	8016	Not applicable
VirtualChannel.7.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	1f4b	8011	Not applicable
VirtualChannel.7.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	1f48	8008	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	1f4a	8010	Set by Network.Modbus.TimeFormat
VirtualChannel.7.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1f42	8002	Not applicable
VirtualChannel.7.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1f49	8009	Not applicable
VirtualChannel.7.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	1f47	8007	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Alarm1.Dwell	Alarm dwell time	time_t	1f45	8005	Set by Network.Modbus.TimeFormat
VirtualChannel.7.Alarm1.Hysteresis	Alarm hysteresis value	float32	1f44	8004	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1f4e	8014	Not applicable
VirtualChannel.7.Alarm1.Inhibit	1 = alarm inhibited	bool	1f51	8017	Not applicable
VirtualChannel.7.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1f41	8001	Not applicable
VirtualChannel.7.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	1f4f	8015	Not applicable
VirtualChannel.7.Alarm1.Reference	Deviation alarm 'Reference' value	float32	1f46	8006	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	013a	314	Not applicable
VirtualChannel.7.Alarm1.Threshold	Alarm trigger threshold	float32	1f43	8003	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	1f40	8000	Not applicable
VirtualChannel.7.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01cd	461	Not applicable
VirtualChannel.7.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	1f70	8048	Not applicable
VirtualChannel.7.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	1f6b	8043	Not applicable
VirtualChannel.7.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	1f68	8040	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	1f6a	8042	Set by Network.Modbus.TimeFormat
VirtualChannel.7.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1f62	8034	Not applicable
VirtualChannel.7.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1f69	8041	Not applicable
VirtualChannel.7.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	1f67	8039	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Alarm2.Dwell	Alarm dwell time	time_t	1f65	8037	Set by Network.Modbus.TimeFormat
VirtualChannel.7.Alarm2.Hysteresis	Alarm hysteresis value	float32	1f64	8036	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1f6e	8046	Not applicable
VirtualChannel.7.Alarm2.Inhibit	1 = alarm inhibited	bool	1f71	8049	Not applicable
VirtualChannel.7.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1f61	8033	Not applicable
VirtualChannel.7.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	1f6f	8047	Not applicable
VirtualChannel.7.Alarm2.Reference	Deviation alarm 'Reference' value	float32	1f66	8038	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Alarm2.Status	As VirtualChannel1.Alarm1.Status	float32	1f63	8035	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	1f60	8032	Not applicable
VirtualChannel.7.Main.Descriptor	Virtual Channel descriptor	string_t	4ba2	19362	Not applicable
VirtualChannel.7.Main.Disable	1 = Virtual channel disabled	bool	1f23	7971	Not applicable
VirtualChannel.7.Main.HighCutOff	The highest input value that will be totalised/counted	float32	1f05	7941	Set by VirtualChannel.7.Main.Resolution
VirtualChannel.7.Main.Input1	Input 1 value	float32	1f07	7943	Set by VirtualChannel.7.Main.Resolution
VirtualChannel.7.Main.Input2	Input 2 value	float32	1f08	7944	Set by VirtualChannel.7.Main.Resolution
VirtualChannel.7.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	1f04	7940	Set by VirtualChannel.7.Main.Resolution
VirtualChannel.7.Main.ModbusInput	Modbus input value	float32	1f06	7942	Set by VirtualChannel.7.Main.Resolution
VirtualChannel.7.Main.Operation	As VirtualChannel1.Main.Operation	uint8	1f01	7937	Not applicable
VirtualChannel.7.Main.Period	Averaging period	int32	1f0a	7946	Not applicable
VirtualChannel.7.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	1f0c	7948	Not applicable
VirtualChannel.7.Main.PresetValue	The Preset value	float32	1f0d	7949	Set by VirtualChannel.7.Main.Resolution
VirtualChannel.7.Main.PV	The virtual channel output value	float32	0138	312	Set by VirtualChannel.7.Main.Resolution
VirtualChannel.7.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	1f0b	7947	Not applicable

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VirtualChannel.7.Main.Resolution	Number of decimal places (0 to 6)	uint8	1f02	7938	Not applicable
VirtualChannel.7.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	1f11	7953	Not applicable
VirtualChannel.7.Main.RolloverValue	Rollover value	float32	1f12	7954	Set by VirtualChannel.7.Main.Resolution
VirtualChannel.7.Main.Status	As VirtualChannel1.Main.Status	uint8	0139	313	Not applicable
VirtualChannel.7.Main.TimeRemaining	Time remaining before calculation is made	time_t	1f09	7945	Set by Network.Modbus.TimeFormat
VirtualChannel.7.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	1f0e	7950	Not applicable
VirtualChannel.7.Main.Type	As VirtualChannel1.Main.Type	uint8	1f00	7936	Not applicable
VirtualChannel.7.Main.Units	Units descriptor	string_t	4bb7	19383	Not applicable
VirtualChannel.7.Main.UnitsScaler	Units scaler for totalisers	float32	1f03	7939	1dp
VirtualChannel.7.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	1f20	7968	Not applicable
VirtualChannel.7.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	1f22	7970	Same as VirtualChannel.7.Main.PV
VirtualChannel.7.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	1f21	7969	Same as VirtualChannel.7.Main.PV
VirtualChannel.8.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01ce	462	Not applicable
VirtualChannel.8.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	1fd0	8144	Not applicable
VirtualChannel.8.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	1fcb	8139	Not applicable
VirtualChannel.8.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	1fc8	8136	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	1fca	8138	Set by Network.Modbus.TimeFormat
VirtualChannel.8.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1fc2	8130	Not applicable
VirtualChannel.8.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1fc9	8137	Not applicable
VirtualChannel.8.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	1fc7	8135	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Alarm1.Dwell	Alarm dwell time	time_t	1fc5	8133	Set by Network.Modbus.TimeFormat
VirtualChannel.8.Alarm1.Hysteresis	Alarm hysteresis value	float32	1fc4	8132	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1fce	8142	Not applicable
VirtualChannel.8.Alarm1.Inhibit	1 = alarm inhibited	bool	1fd1	8145	Not applicable
VirtualChannel.8.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1fc1	8129	Not applicable
VirtualChannel.8.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	1fcf	8143	Not applicable
VirtualChannel.8.Alarm1.Reference	Deviation alarm 'Reference' value	float32	1fc6	8134	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	013e	318	Not applicable
VirtualChannel.8.Alarm1.Threshold	Alarm trigger threshold	float32	1fc3	8131	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	1fc0	8128	Not applicable
VirtualChannel.8.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01cf	463	Not applicable
VirtualChannel.8.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	1ff0	8176	Not applicable
VirtualChannel.8.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	1feb	8171	Not applicable
VirtualChannel.8.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	1fe8	8168	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	1fea	8170	Set by Network.Modbus.TimeFormat
VirtualChannel.8.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	1fe2	8162	Not applicable
VirtualChannel.8.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	1fe9	8169	Not applicable
VirtualChannel.8.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	1fe7	8167	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Alarm2.Dwell	Alarm dwell time	time_t	1fe5	8165	Set by Network.Modbus.TimeFormat
VirtualChannel.8.Alarm2.Hysteresis	Alarm hysteresis value	float32	1fe4	8164	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	1fee	8174	Not applicable
VirtualChannel.8.Alarm2.Inhibit	1 = alarm inhibited	bool	1ff1	8177	Not applicable
VirtualChannel.8.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	1fe1	8161	Not applicable
VirtualChannel.8.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	1fef	8175	Not applicable
VirtualChannel.8.Alarm2.Reference	Deviation alarm 'Reference' value	float32	1fe6	8166	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	013f	319	Not applicable
VirtualChannel.8.Alarm2.Threshold	Alarm trigger threshold	float32	1fe3	8163	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	1fe0	8160	Not applicable
VirtualChannel.8.Main.Descriptor	Virtual Channel descriptor	string_t	4bbd	19389	Not applicable
VirtualChannel.8.Main.Disable	1 = Virtual channel disabled	bool	1fa3	8099	Not applicable
VirtualChannel.8.Main.HighCutOff	The highest input value that will be totalised/counted	float32	1f85	8069	Set by VirtualChannel.8.Main.Resolution
VirtualChannel.8.Main.Input1	Input 1 value	float32	1f87	8071	Set by VirtualChannel.8.Main.Resolution
VirtualChannel.8.Main.Input2	Input 2 value	float32	1f88	8072	Set by VirtualChannel.8.Main.Resolution
VirtualChannel.8.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	1f84	8068	Set by VirtualChannel.8.Main.Resolution
VirtualChannel.8.Main.ModbusInput	Modbus input value	float32	1f86	8070	Set by VirtualChannel.8.Main.Resolution
VirtualChannel.8.Main.Operation	As VirtualChannel1.Main.Operation	uint8	1f81	8065	Not applicable
VirtualChannel.8.Main.Period	The time period over which the calculation is made	int32	1f8a	8074	Not applicable
VirtualChannel.8.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	1f8c	8076	Not applicable
VirtualChannel.8.Main.PresetValue	The Preset value	float32	1f8d	8077	Set by VirtualChannel.8.Main.Resolution
VirtualChannel.8.Main.PV	The virtual channel output value	float32	013c	316	Set by VirtualChannel.8.Main.Resolution
VirtualChannel.8.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	1f8b	8075	Not applicable
VirtualChannel.8.Main.Resolution	Number of decimal places (0 to 6)	uint8	1f82	8066	Not applicable
VirtualChannel.8.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	1f91	8081	Not applicable
VirtualChannel.8.Main.RolloverValue	Rollover value	float32	1f92	8082	Set by VirtualChannel.8.Main.Resolution
VirtualChannel.8.Main.Status	As VirtualChannel1.Main.Status	uint8	013d	317	Not applicable
VirtualChannel.8.Main.TimeRemaining	Time remaining before the calculation is made	time_t	1f89	8073	Set by Network.Modbus.TimeFormat
VirtualChannel.8.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	1f8e	8078	Not applicable
VirtualChannel.8.Main.Type	As VirtualChannel1.Main.Type	uint8	1f80	8064	Not applicable
VirtualChannel.8.Main.Units	Units descriptor	string_t	4bd2	19410	Not applicable
VirtualChannel.8.Main.UnitsScaler	Units scaler for totalisers	float32	1f83	8067	1dp
VirtualChannel.8.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	1fa0	8096	Not applicable
VirtualChannel.8.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	1fa2	8098	Same as VirtualChannel.8.Main.PV
VirtualChannel.8.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	1fa1	8097	Same as VirtualChannel.8.Main.PV
VirtualChannel.9.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01d0	464	Not applicable
VirtualChannel.9.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	2050	8272	Not applicable
VirtualChannel.9.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	204b	8267	Not applicable
VirtualChannel.9.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	2048	8264	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	204a	8266	Set by Network.Modbus.TimeFormat
VirtualChannel.9.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	2042	8258	Not applicable



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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.9.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	2049	8265	Not applicable
VirtualChannel.9.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	2047	8263	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Alarm1.Dwell	Alarm dwell time	time_t	2045	8261	Set by Network.Modbus.TimeFormat
VirtualChannel.9.Alarm1.Hysteresis	Alarm hysteresis value	float32	2044	8260	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	204e	8270	Not applicable
VirtualChannel.9.Alarm1.Inhibit	1 = alarm inhibited	bool	2051	8273	Not applicable
VirtualChannel.9.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	2041	8257	Not applicable
VirtualChannel.9.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	204f	8271	Not applicable
VirtualChannel.9.Alarm1.Reference	Deviation alarm 'Reference' value	float32	2046	8262	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	0142	322	Not applicable
VirtualChannel.9.Alarm1.Threshold	Alarm trigger threshold	float32	2043	8259	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	2040	8256	Not applicable
VirtualChannel.9.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01d1	465	Not applicable
VirtualChannel.9.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	2070	8304	Not applicable
VirtualChannel.9.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	206b	8299	Not applicable
VirtualChannel.9.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	2068	8296	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	206a	8298	Set by Network.Modbus.TimeFormat
VirtualChannel.9.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	2062	8290	Not applicable
VirtualChannel.9.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	2069	8297	Not applicable
VirtualChannel.9.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	2067	8295	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Alarm2.Dwell	Alarm dwell time	time_t	2065	8293	Set by Network.Modbus.TimeFormat
VirtualChannel.9.Alarm2.Hysteresis	Alarm hysteresis value	float32	2064	8292	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	206e	8302	Not applicable
VirtualChannel.9.Alarm2.Inhibit	Inhibit	bool	2071	8305	Not applicable
VirtualChannel.9.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	2061	8289	Not applicable
VirtualChannel.9.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	206f	8303	Not applicable
VirtualChannel.9.Alarm2.Reference	Deviation alarm 'Reference' value	float32	2066	8294	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	0143	323	Not applicable
VirtualChannel.9.Alarm2.Threshold	Alarm trigger threshold	float32	2063	8291	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	2060	8288	Not applicable
VirtualChannel.9.Main.Descriptor	Virtual Channel descriptor	string_t	4bd8	19416	Not applicable
VirtualChannel.9.Main.Disable	1 = Virtual channel disabled	bool	2023	8227	Not applicable
VirtualChannel.9.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2005	8197	Set by VirtualChannel.9.Main.Resolution
VirtualChannel.9.Main.Input1	Input 1 value	float32	2007	8199	Set by VirtualChannel.9.Main.Resolution
VirtualChannel.9.Main.Input2	Input 2 value	float32	2008	8200	Set by VirtualChannel.9.Main.Resolution
VirtualChannel.9.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2004	8196	Set by VirtualChannel.9.Main.Resolution
VirtualChannel.9.Main.ModbusInput	Modbus input value	float32	2006	8198	Set by VirtualChannel.9.Main.Resolution
VirtualChannel.9.Main.Operation	As VirtualChannel1.Main.Operation	uint8	2001	8193	Not applicable
VirtualChannel.9.Main.Period	The time period over which the calculation is made	int32	200a	8202	Not applicable
VirtualChannel.9.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	200c	8204	Not applicable
VirtualChannel.9.Main.PresetValue	The Preset value	float32	200d	8205	Set by VirtualChannel.9.Main.Resolution
VirtualChannel.9.Main.PV	The virtual channel output value	float32	0140	320	Set by VirtualChannel.9.Main.Resolution
VirtualChannel.9.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	200b	8203	Not applicable
VirtualChannel.9.Main.Resolution	Number of decimal places (0 to 6)	uint8	2002	8194	Not applicable
VirtualChannel.9.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2011	8209	Not applicable
VirtualChannel.9.Main.RolloverValue	Rollover value	float32	2012	8210	Set by VirtualChannel.9.Main.Resolution
VirtualChannel.9.Main.Status	As VirtualChannel1.Main.Status	uint8	0141	321	Not applicable
VirtualChannel.9.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2009	8201	Set by Network.Modbus.TimeFormat
VirtualChannel.9.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	200e	8206	Not applicable
VirtualChannel.9.Main.Type	As VirtualChannel1.Main.Type	uint8	2000	8192	Not applicable
VirtualChannel.9.Main.Units	Units descriptor	string_t	4bed	19437	Not applicable
VirtualChannel.9.Main.UnitsScaler	Units scaler for totalisers	float32	2003	8195	1dp
VirtualChannel.9.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2020	8224	Not applicable
VirtualChannel.9.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2022	8226	Same as VirtualChannel.9.Main.PV
VirtualChannel.9.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2021	8225	Same as VirtualChannel.9.Main.PV
VirtualChannel.10.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01d2	466	Not applicable
VirtualChannel.10.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	20d0	8400	Not applicable
VirtualChannel.10.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	20cb	8395	Not applicable
VirtualChannel.10.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	20c8	8392	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	20ca	8394	Set by Network.Modbus.TimeFormat
VirtualChannel.10.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	20c2	8386	Not applicable
VirtualChannel.10.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	20c9	8393	Not applicable
VirtualChannel.10.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	20c7	8391	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Alarm1.Dwell	Alarm dwell time	time_t	20c5	8389	Set by Network.Modbus.TimeFormat
VirtualChannel.10.Alarm1.Hysteresis	Alarm hysteresis value	float32	20c4	8388	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	20ce	8398	Not applicable
VirtualChannel.10.Alarm1.Inhibit	1 = alarm inhibited	bool	20d1	8401	Not applicable
VirtualChannel.10.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	20c1	8385	Not applicable
VirtualChannel.10.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	20cf	8399	Not applicable
VirtualChannel.10.Alarm1.Reference	Deviation alarm 'Reference' value	float32	20c6	8390	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	0146	326	Not applicable
VirtualChannel.10.Alarm1.Threshold	Alarm trigger threshold	float32	20c3	8387	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	20c0	8384	Not applicable
VirtualChannel.10.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01d3	467	Not applicable
VirtualChannel.10.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	20f0	8432	Not applicable
VirtualChannel.10.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	20eb	8427	Not applicable
VirtualChannel.10.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	20e8	8424	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	20ea	8426	Set by Network.Modbus.TimeFormat
VirtualChannel.10.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	20e2	8418	Not applicable
VirtualChannel.10.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	20e9	8425	Not applicable

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VirtualChannel.10.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	20e7	8423	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Alarm2.Dwell	Alarm dwell time	time_t	20e5	8421	Set by Network.Modbus.TimeFormat
VirtualChannel.10.Alarm2.Hysteresis	Alarm hysteresis value	float32	20e4	8420	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	20ee	8430	Not applicable
VirtualChannel.10.Alarm2.Inhibit	1 = alarm inhibited	bool	20f1	8433	Not applicable
VirtualChannel.10.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	20e1	8417	Not applicable
VirtualChannel.10.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	20ef	8431	Not applicable
VirtualChannel.10.Alarm2.Reference	Deviation alarm 'Reference' value	float32	20e6	8422	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	0147	327	Not applicable
VirtualChannel.10.Alarm2.Threshold	Alarm trigger threshold	float32	20e3	8419	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	20e0	8416	Not applicable
VirtualChannel.10.Main.Descriptor	Virtual Channel descriptor	string_t	4bf3	19443	Not applicable
VirtualChannel.10.Main.Disable	1 = Virtual channel disabled	bool	20a3	8355	Not applicable
VirtualChannel.10.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2085	8325	Set by VirtualChannel.10.Main.Resolution
VirtualChannel.10.Main.Input1	Input 1 value	float32	2087	8327	Set by VirtualChannel.10.Main.Resolution
VirtualChannel.10.Main.Input2	Input 2 value	float32	2088	8328	Set by VirtualChannel.10.Main.Resolution
VirtualChannel.10.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2084	8324	Set by VirtualChannel.10.Main.Resolution
VirtualChannel.10.Main.ModbusInput	Modbus input value	float32	2086	8326	Set by VirtualChannel.10.Main.Resolution
VirtualChannel.10.Main.Operation	As VirtualChannel1.Main.Operation	uint8	2081	8321	Not applicable
VirtualChannel.10.Main.Period	Averaging period	int32	208a	8330	Not applicable
VirtualChannel.10.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	208c	8332	Not applicable
VirtualChannel.10.Main.PresetValue	The Preset value	float32	208d	8333	Set by VirtualChannel.10.Main.Resolution
VirtualChannel.10.Main.PV	The virtual channel output value	float32	0144	324	Set by VirtualChannel.10.Main.Resolution
VirtualChannel.10.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	208b	8331	Not applicable
VirtualChannel.10.Main.Resolution	Number of decimal places (0 to 6)	uint8	2082	8322	Not applicable
VirtualChannel.10.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2091	8337	Not applicable
VirtualChannel.10.Main.RolloverValue	Rollover value	float32	2092	8338	Set by VirtualChannel.10.Main.Resolution
VirtualChannel.10.Main.Status	As VirtualChannel1.Main.Status	uint8	0145	325	Not applicable
VirtualChannel.10.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2089	8329	Set by Network.Modbus.TimeFormat
VirtualChannel.10.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	208e	8334	Not applicable
VirtualChannel.10.Main.Type	As VirtualChannel1.Main.Type	uint8	2080	8320	Not applicable
VirtualChannel.10.Main.Units	Units descriptor	string_t	4c08	19464	Not applicable
VirtualChannel.10.Main.UnitsScaler	Units scaler for totalisers	float32	2083	8323	1dp
VirtualChannel.10.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	20a0	8352	Not applicable
VirtualChannel.10.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	20a2	8354	Same as VirtualChannel.10.Main.PV
VirtualChannel.10.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	20a1	8353	Same as VirtualChannel.10.Main.PV
VirtualChannel.11.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01d4	468	Not applicable
VirtualChannel.11.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	2150	8528	Not applicable
VirtualChannel.11.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	214b	8523	Not applicable
VirtualChannel.11.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	2148	8520	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	214a	8522	Set by Network.Modbus.TimeFormat
VirtualChannel.11.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	2142	8514	Not applicable
VirtualChannel.11.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	2149	8521	Not applicable
VirtualChannel.11.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	2147	8519	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Alarm1.Dwell	Alarm dwell time	time_t	2145	8517	Set by Network.Modbus.TimeFormat
VirtualChannel.11.Alarm1.Hysteresis	Alarm hysteresis value	float32	2144	8516	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	214e	8526	Not applicable
VirtualChannel.11.Alarm1.Inhibit	1 = alarm inhibited	bool	2151	8529	Not applicable
VirtualChannel.11.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	2141	8513	Not applicable
VirtualChannel.11.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	214f	8527	Not applicable
VirtualChannel.11.Alarm1.Reference	Deviation alarm 'Reference' value	float32	2146	8518	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	014a	330	Not applicable
VirtualChannel.11.Alarm1.Threshold	Alarm trigger threshold	float32	2143	8515	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	2140	8512	Not applicable
VirtualChannel.11.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01d5	469	Not applicable
VirtualChannel.11.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	2170	8560	Not applicable
VirtualChannel.11.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	216b	8555	Not applicable
VirtualChannel.11.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	2168	8552	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	216a	8554	Set by Network.Modbus.TimeFormat
VirtualChannel.11.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	2162	8546	Not applicable
VirtualChannel.11.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	2169	8553	Not applicable
VirtualChannel.11.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	2167	8551	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Alarm2.Dwell	Alarm dwell time	time_t	2165	8549	Set by Network.Modbus.TimeFormat
VirtualChannel.11.Alarm2.Hysteresis	Alarm hysteresis value	float32	2164	8548	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	216e	8558	Not applicable
VirtualChannel.11.Alarm2.Inhibit	1 = alarm inhibited	bool	2171	8561	Not applicable
VirtualChannel.11.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	2161	8545	Not applicable
VirtualChannel.11.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	216f	8559	Not applicable
VirtualChannel.11.Alarm2.Reference	Deviation alarm 'Reference' value	float32	2166	8550	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	014b	331	Not applicable
VirtualChannel.11.Alarm2.Threshold	Alarm trigger threshold	float32	2163	8547	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	2160	8544	Not applicable
VirtualChannel.11.Main.Descriptor	Virtual Channel descriptor	string_t	4c0e	19470	Not applicable
VirtualChannel.11.Main.Disable	1 = Virtual channel disabled	bool	2123	8483	Not applicable
VirtualChannel.11.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2105	8453	Set by VirtualChannel.11.Main.Resolution
VirtualChannel.11.Main.Input1	Input 1 value	float32	2107	8455	Set by VirtualChannel.11.Main.Resolution
VirtualChannel.11.Main.Input2	Input 2 value	float32	2108	8456	Set by VirtualChannel.11.Main.Resolution
VirtualChannel.11.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2104	8452	Set by VirtualChannel.11.Main.Resolution
VirtualChannel.11.Main.ModbusInput	Modbus input value	float32	2106	8454	Set by VirtualChannel.11.Main.Resolution
VirtualChannel.11.Main.Operation	As VirtualChannel1.Main.Operation	uint8	2101	8449	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.11.Main.Period	The time period over which the calculation is made	int32	210a	8458	Not applicable
VirtualChannel.11.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	210c	8460	Not applicable
VirtualChannel.11.Main.PresetValue	The Preset value	float32	210d	8461	Set by VirtualChannel.11.Main.Resolution
VirtualChannel.11.Main.PV	The virtual channel output value	float32	0148	328	Set by VirtualChannel.11.Main.Resolution
VirtualChannel.11.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	210b	8459	Not applicable
VirtualChannel.11.Main.Resolution	Number of decimal places (0 to 6)	uint8	2102	8450	Not applicable
VirtualChannel.11.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2111	8465	Not applicable
VirtualChannel.11.Main.RolloverValue	Rollover value	float32	2112	8466	Set by VirtualChannel.11.Main.Resolution
VirtualChannel.11.Main.Status	As VirtualChannel1.Main.Status	uint8	0149	329	Not applicable
VirtualChannel.11.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2109	8457	Set by Network.Modbus.TimeFormat
VirtualChannel.11.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	210e	8462	Not applicable
VirtualChannel.11.Main.Type	As VirtualChannel1.Main.Type	uint8	2100	8448	Not applicable
VirtualChannel.11.Main.Units	Units descriptor	string_t	4c23	19491	Not applicable
VirtualChannel.11.Main.UnitsScaler	Units scaler for totalisers	float32	2103	8451	1dp
VirtualChannel.11.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2120	8480	Not applicable
VirtualChannel.11.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2122	8482	Same as VirtualChannel.11.Main.PV
VirtualChannel.11.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2121	8481	Same as VirtualChannel.11.Main.PV
VirtualChannel.12.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01d6	470	Not applicable
VirtualChannel.12.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	21d0	8656	Not applicable
VirtualChannel.12.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	21cb	8651	Not applicable
VirtualChannel.12.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	21c8	8648	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	21ca	8650	Set by Network.Modbus.TimeFormat
VirtualChannel.12.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	21c2	8642	Not applicable
VirtualChannel.12.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	21c9	8649	Not applicable
VirtualChannel.12.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	21c7	8647	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Alarm1.Dwell	Alarm dwell time	time_t	21c5	8645	Set by Network.Modbus.TimeFormat
VirtualChannel.12.Alarm1.Hysteresis	Alarm hysteresis value	float32	21c4	8644	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	21ce	8654	Not applicable
VirtualChannel.12.Alarm1.Inhibit	1 = alarm inhibited	bool	21d1	8657	Not applicable
VirtualChannel.12.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	21c1	8641	Not applicable
VirtualChannel.12.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	21cf	8655	Not applicable
VirtualChannel.12.Alarm1.Reference	Deviation alarm 'Reference' value	float32	21c6	8646	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	014e	334	Not applicable
VirtualChannel.12.Alarm1.Threshold	Alarm trigger threshold	float32	21c3	8643	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	21c0	8640	Not applicable
VirtualChannel.12.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01d7	471	Not applicable
VirtualChannel.12.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	21f0	8688	Not applicable
VirtualChannel.12.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	21eb	8683	Not applicable
VirtualChannel.12.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	21e8	8680	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	21ea	8682	Set by Network.Modbus.TimeFormat
VirtualChannel.12.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	21e2	8674	Not applicable
VirtualChannel.12.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	21e9	8681	Not applicable
VirtualChannel.12.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	21e7	8679	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Alarm2.Dwell	Alarm dwell time	time_t	21e5	8677	Set by Network.Modbus.TimeFormat
VirtualChannel.12.Alarm2.Hysteresis	Alarm hysteresis value	float32	21e4	8676	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	21ee	8686	Not applicable
VirtualChannel.12.Alarm2.Inhibit	1 = alarm inhibited	bool	21f1	8689	Not applicable
VirtualChannel.12.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	21e1	8673	Not applicable
VirtualChannel.12.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	21ef	8687	Not applicable
VirtualChannel.12.Alarm2.Reference	Deviation alarm 'Reference' value	float32	21e6	8678	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	014f	335	Not applicable
VirtualChannel.12.Alarm2.Threshold	Alarm trigger threshold	float32	21e3	8675	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	21e0	8672	Not applicable
VirtualChannel.12.Main.Descriptor	Virtual Channel descriptor	string_t	4c29	19497	Not applicable
VirtualChannel.12.Main.Disable	1 = Virtual channel disabled	bool	21a3	8611	Not applicable
VirtualChannel.12.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2185	8581	Set by VirtualChannel.12.Main.Resolution
VirtualChannel.12.Main.Input1	Input 1 value	float32	2187	8583	Set by VirtualChannel.12.Main.Resolution
VirtualChannel.12.Main.Input2	Input 2 value	float32	2188	8584	Set by VirtualChannel.12.Main.Resolution
VirtualChannel.12.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2184	8580	Set by VirtualChannel.12.Main.Resolution
VirtualChannel.12.Main.ModbusInput	Modbus input value	float32	2186	8582	Set by VirtualChannel.12.Main.Resolution
VirtualChannel.12.Main.Operation	As VirtualChannel1.Main.Operation	uint8	2181	8577	Not applicable
VirtualChannel.12.Main.Period	The time period over which the calculation is made	int32	218a	8586	Not applicable
VirtualChannel.12.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	218c	8588	Not applicable
VirtualChannel.12.Main.PresetValue	The Preset value	float32	218d	8589	Set by VirtualChannel.12.Main.Resolution
VirtualChannel.12.Main.PV	The virtual channel output value	float32	014c	332	Set by VirtualChannel.12.Main.Resolution
VirtualChannel.12.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	218b	8587	Not applicable
VirtualChannel.12.Main.Resolution	Number of decimal places (0 to 6)	uint8	2182	8578	Not applicable
VirtualChannel.12.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2191	8593	Not applicable
VirtualChannel.12.Main.RolloverValue	Rollover value	float32	2192	8594	Set by VirtualChannel.12.Main.Resolution
VirtualChannel.12.Main.Status	As VirtualChannel1.Main.Status	uint8	014d	333	Not applicable
VirtualChannel.12.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2189	8585	Set by Network.Modbus.TimeFormat
VirtualChannel.12.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	218e	8590	Not applicable
VirtualChannel.12.Main.Type	As VirtualChannel1.Main.Type	uint8	2180	8576	Not applicable
VirtualChannel.12.Main.Units	Units descriptor	string_t	4c3e	19518	Not applicable
VirtualChannel.12.Main.UnitsScaler	Units scaler for totalisers	float32	2183	8579	1dp
VirtualChannel.12.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	21a0	8608	Not applicable
VirtualChannel.12.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	21a2	8610	Same as VirtualChannel.12.Main.PV
VirtualChannel.12.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	21a1	8609	Same as VirtualChannel.12.Main.PV
VirtualChannel.13.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01d8	472	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.13.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	2250	8784	Not applicable
VirtualChannel.13.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	224b	8779	Not applicable
VirtualChannel.13.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	2248	8776	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	224a	8778	Set by Network.Modbus.TimeFormat
VirtualChannel.13.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	2242	8770	Not applicable
VirtualChannel.13.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	2249	8777	Not applicable
VirtualChannel.13.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	2247	8775	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Alarm1.Dwell	Alarm dwell time	time_t	2245	8773	Set by Network.Modbus.TimeFormat
VirtualChannel.13.Alarm1.Hysteresis	Alarm hysteresis value	float32	2244	8772	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Alarm1.Inhibit	1 = alarm inhibited	bool	2251	8785	Not applicable
VirtualChannel.13.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	224e	8782	Not applicable
VirtualChannel.13.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	2241	8769	Not applicable
VirtualChannel.13.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	224f	8783	Not applicable
VirtualChannel.13.Alarm1.Reference	Deviation alarm 'Reference' value	float32	2246	8774	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	0152	338	Not applicable
VirtualChannel.13.Alarm1.Threshold	Alarm trigger threshold	float32	2243	8771	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	2240	8768	Not applicable
VirtualChannel.13.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01d9	473	Not applicable
VirtualChannel.13.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	2270	8816	Not applicable
VirtualChannel.13.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	226b	8811	Not applicable
VirtualChannel.13.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	2268	8808	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	226a	8810	Set by Network.Modbus.TimeFormat
VirtualChannel.13.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	2262	8802	Not applicable
VirtualChannel.13.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	2269	8809	Not applicable
VirtualChannel.13.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	2267	8807	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Alarm2.Dwell	Alarm dwell time	time_t	2265	8805	Set by Network.Modbus.TimeFormat
VirtualChannel.13.Alarm2.Hysteresis	Alarm hysteresis value	float32	2264	8804	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	226e	8814	Not applicable
VirtualChannel.13.Alarm2.Inhibit	1 = alarm inhibited	bool	2271	8817	Not applicable
VirtualChannel.13.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	2261	8801	Not applicable
VirtualChannel.13.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	226f	8815	Not applicable
VirtualChannel.13.Alarm2.Reference	Deviation alarm 'Reference' value	float32	2266	8806	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	0153	339	Not applicable
VirtualChannel.13.Alarm2.Threshold	Alarm trigger threshold	float32	2263	8803	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	2260	8800	Not applicable
VirtualChannel.13.Main.Descriptor	Virtual Channel descriptor	string_t	4c44	19524	Not applicable
VirtualChannel.13.Main.Disable	1 = Virtual channel disabled	bool	2223	8739	Not applicable
VirtualChannel.13.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2205	8709	Set by VirtualChannel.13.Main.Resolution
VirtualChannel.13.Main.Input1	Input 1 value	float32	2207	8711	Set by VirtualChannel.13.Main.Resolution
VirtualChannel.13.Main.Input2	Input 2 value	float32	2208	8712	Set by VirtualChannel.13.Main.Resolution
VirtualChannel.13.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2204	8708	Set by VirtualChannel.13.Main.Resolution
VirtualChannel.13.Main.ModbusInput	Modbus input value	float32	2206	8710	Set by VirtualChannel.13.Main.Resolution
VirtualChannel.13.Main.Operation	As VirtualChannel1.Main.Operation	uint8	2201	8705	Not applicable
VirtualChannel.13.Main.Period	The time period over which the calculation is made	int32	220a	8714	Not applicable
VirtualChannel.13.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	220c	8716	Not applicable
VirtualChannel.13.Main.PresetValue	The Preset value	float32	220d	8717	Set by VirtualChannel.13.Main.Resolution
VirtualChannel.13.Main.PV	The virtual channel output value	float32	0150	336	Set by VirtualChannel.13.Main.Resolution
VirtualChannel.13.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	220b	8715	Not applicable
VirtualChannel.13.Main.Resolution	Number of decimal places (0 to 6)	uint8	2202	8706	Not applicable
VirtualChannel.13.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2211	8721	Not applicable
VirtualChannel.13.Main.RolloverValue	Rollover value	float32	2212	8722	Set by VirtualChannel.13.Main.Resolution
VirtualChannel.13.Main.Status	As VirtualChannel1.Main.Status	uint8	0151	337	Not applicable
VirtualChannel.13.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2209	8713	Set by Network.Modbus.TimeFormat
VirtualChannel.13.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	220e	8718	Not applicable
VirtualChannel.13.Main.Type	As VirtualChannel1.Main.Type	uint8	2200	8704	Not applicable
VirtualChannel.13.Main.Units	Units descriptor	string_t	4c59	19545	Not applicable
VirtualChannel.13.Main.UnitsScaler	Units scaler for totalisers	float32	2203	8707	1dp
VirtualChannel.13.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2220	8736	Not applicable
VirtualChannel.13.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2222	8738	Same as VirtualChannel.13.Main.PV
VirtualChannel.13.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2221	8737	Same as VirtualChannel.13.Main.PV
VirtualChannel.14.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01da	474	Not applicable
VirtualChannel.14.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	22d0	8912	Not applicable
VirtualChannel.14.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	22cb	8907	Not applicable
VirtualChannel.14.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	22c8	8904	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	22ca	8906	Set by Network.Modbus.TimeFormat
VirtualChannel.14.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	22c2	8898	Not applicable
VirtualChannel.14.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	22c9	8905	Not applicable
VirtualChannel.14.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	22c7	8903	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Alarm1.Dwell	Alarm dwell time	time_t	22c5	8901	Set by Network.Modbus.TimeFormat
VirtualChannel.14.Alarm1.Hysteresis	Alarm hysteresis value	float32	22c4	8900	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	22ce	8910	Not applicable
VirtualChannel.14.Alarm1.Inhibit	1 = alarm inhibited	bool	22d1	8913	Not applicable
VirtualChannel.14.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	22c1	8897	Not applicable
VirtualChannel.14.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	22cf	8911	Not applicable
VirtualChannel.14.Alarm1.Reference	Deviation alarm 'Reference' value	float32	22c6	8902	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	0156	342	Not applicable
VirtualChannel.14.Alarm1.Threshold	Alarm trigger threshold	float32	22c3	8899	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	22c0	8896	Not applicable
VirtualChannel.14.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01db	475	Not applicable
VirtualChannel.14.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	22f0	8944	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.14.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	22eb	8939	Not applicable
VirtualChannel.14.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	22e8	8936	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	22ea	8938	Set by Network.Modbus.TimeFormat
VirtualChannel.14.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	22e2	8930	Not applicable
VirtualChannel.14.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	22e9	8937	Not applicable
VirtualChannel.14.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	22e7	8935	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Alarm2.Dwell	Alarm dwell time	time_t	22e5	8933	Set by Network.Modbus.TimeFormat
VirtualChannel.14.Alarm2.Hysteresis	Alarm hysteresis value	float32	22e4	8932	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	22ee	8942	Not applicable
VirtualChannel.14.Alarm2.Inhibit	1 = alarm inhibited	bool	22f1	8945	Not applicable
VirtualChannel.14.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	22e1	8929	Not applicable
VirtualChannel.14.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	22ef	8943	Not applicable
VirtualChannel.14.Alarm2.Reference	Deviation alarm 'Reference' value	float32	22e6	8934	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	0157	343	Not applicable
VirtualChannel.14.Alarm2.Threshold	Alarm trigger threshold	float32	22e3	8931	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	22e0	8928	Not applicable
VirtualChannel.14.Main.Descriptor	Virtual Channel descriptor	string_t	4c5f	19551	Not applicable
VirtualChannel.14.Main.Disable	1 = Virtual channel disabled	bool	22a3	8867	Not applicable
VirtualChannel.14.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2285	8837	Set by VirtualChannel.14.Main.Resolution
VirtualChannel.14.Main.Input1	Input 1 value	float32	2287	8839	Set by VirtualChannel.14.Main.Resolution
VirtualChannel.14.Main.Input2	Input 2 value	float32	2288	8840	Set by VirtualChannel.14.Main.Resolution
VirtualChannel.14.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2284	8836	Set by VirtualChannel.14.Main.Resolution
VirtualChannel.14.Main.ModbusInput	Modbus input value	float32	2286	8838	Set by VirtualChannel.14.Main.Resolution
VirtualChannel.14.Main.Operation	As VirtualChannel1.Main.Operation	uint8	2281	8833	Not applicable
VirtualChannel.14.Main.Period	The time period over which the calculation is made	int32	228a	8842	Not applicable
VirtualChannel.14.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	228c	8844	Not applicable
VirtualChannel.14.Main.PresetValue	The preset value	float32	228d	8845	Set by VirtualChannel.14.Main.Resolution
VirtualChannel.14.Main.PV	The virtual channel output value	float32	0154	340	Set by VirtualChannel.14.Main.Resolution
VirtualChannel.14.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	228b	8843	Not applicable
VirtualChannel.14.Main.Resolution	Number of decimal places (0 to 6)	uint8	2282	8834	Not applicable
VirtualChannel.14.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2291	8849	Not applicable
VirtualChannel.14.Main.RolloverValue	Rollover value	float32	2292	8850	Set by VirtualChannel.14.Main.Resolution
VirtualChannel.14.Main.Status	As VirtualChannel1.Main.Status	uint8	0155	341	Not applicable
VirtualChannel.14.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2289	8841	Set by Network.Modbus.TimeFormat
VirtualChannel.14.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	228e	8846	Not applicable
VirtualChannel.14.Main.Type	As VirtualChannel1.Main.Type	uint8	2280	8832	Not applicable
VirtualChannel.14.Main.Units	Units descriptor	string_t	4c75	19573	Not applicable
VirtualChannel.14.Main.UnitsScaler	Units scaler for totalisers	float32	2283	8835	1dp
VirtualChannel.14.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	22a0	8864	Not applicable
VirtualChannel.14.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	22a2	8866	Same as VirtualChannel.14.Main.PV
VirtualChannel.14.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	22a1	8865	Same as VirtualChannel.14.Main.PV
VirtualChannel.15.Alarm1.Acknowledge	1 = acknowledge alarm	bool	01de	478	Not applicable
VirtualChannel.15.Alarm1.Acknowledgement	1 = alarm acknowledged	bool	2350	9040	Not applicable
VirtualChannel.15.Alarm1.Active	1 = alarm source active, or safe but not ack'd	bool	234b	9035	Not applicable
VirtualChannel.15.Alarm1.Amount	Rate-of-change alarm 'Amount'	float32	2348	9032	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Alarm1.AverageTime	Rate-of-change alarm 'Average time'	time_t	234a	9034	Set by Network.Modbus.TimeFormat
VirtualChannel.15.Alarm1.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	2342	9026	Not applicable
VirtualChannel.15.Alarm1.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	2349	9033	Not applicable
VirtualChannel.15.Alarm1.Deviation	Deviation alarm 'Deviation Value'	float32	2347	9031	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Alarm1.Dwell	Alarm dwell time	time_t	2345	9029	Set by Network.Modbus.TimeFormat
VirtualChannel.15.Alarm1.Hysteresis	Alarm hysteresis value	float32	2344	9028	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Alarm1.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	234e	9038	Not applicable
VirtualChannel.15.Alarm1.Inhibit	1 = Alarm inhibited	bool	2351	9041	Not applicable
VirtualChannel.15.Alarm1.Latch	As VirtualChannel1.Alarm1.Latch	uint8	2341	9025	Not applicable
VirtualChannel.15.Alarm1.NotAcknowledged	1 = alarm has not been acknowledged	bool	234f	9039	Not applicable
VirtualChannel.15.Alarm1.Reference	Deviation alarm 'Reference' value	float32	2346	9030	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Alarm1.Status	As VirtualChannel1.Alarm1.Status	uint8	015a	346	Not applicable
VirtualChannel.15.Alarm1.Threshold	Alarm trigger threshold	float32	2343	9027	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Alarm1.Type	As VirtualChannel1.Alarm1.Type	uint8	2340	9024	Not applicable
VirtualChannel.15.Alarm2.Acknowledge	1 = acknowledge alarm	bool	01dd	477	Not applicable
VirtualChannel.15.Alarm2.Acknowledgement	1 = alarm acknowledged	bool	2370	9072	Not applicable
VirtualChannel.15.Alarm2.Active	1 = alarm source active, or safe but not ack'd	bool	236b	9067	Not applicable
VirtualChannel.15.Alarm2.Amount	Rate-of-change alarm 'Amount'	float32	2368	9064	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Alarm2.AverageTime	Rate-of-change alarm 'Average time'	time_t	236a	9066	Set by Network.Modbus.TimeFormat
VirtualChannel.15.Alarm2.Block	0 = Blocking alarms off; 1 = Blocking alarms on	uint8	2362	9058	Not applicable
VirtualChannel.15.Alarm2.ChangeTime	Rate-of-change alarm 'Change Time'	uint8	2369	9065	Not applicable
VirtualChannel.15.Alarm2.Deviation	Deviation alarm 'Deviation Value'	float32	2367	9063	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Alarm2.Dwell	Alarm dwell time	time_t	2365	9061	Set by Network.Modbus.TimeFormat
VirtualChannel.15.Alarm2.Hysteresis	Alarm hysteresis value	float32	2364	9060	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Alarm2.Inactive	1 = alarm source safe and ack'd (if necessary)	bool	236e	9070	Not applicable
VirtualChannel.15.Alarm2.Inhibit	1 = alarm inhibited	bool	2371	9073	Not applicable
VirtualChannel.15.Alarm2.Latch	As VirtualChannel1.Alarm1.Latch	uint8	2361	9057	Not applicable
VirtualChannel.15.Alarm2.NotAcknowledged	1 = alarm has not been acknowledged	bool	236f	9071	Not applicable
VirtualChannel.15.Alarm2.Reference	Deviation alarm 'Reference' value	float32	2366	9062	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Alarm2.Status	As VirtualChannel1.Alarm1.Status	uint8	015b	347	Not applicable
VirtualChannel.15.Alarm2.Threshold	Alarm trigger threshold	float32	2363	9059	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Alarm2.Type	As VirtualChannel1.Alarm1.Type	uint8	2360	9056	Not applicable
VirtualChannel.15.Main.Descriptor	Virtual Channel descriptor	string_t	4c7b	19579	Not applicable
VirtualChannel.15.Main.Disable	1 = Virtual channel disabled	bool	2323	8995	Not applicable
VirtualChannel.15.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2305	8965	Set by VirtualChannel.15.Main.Resolution

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.15.Main.Input1	Input 1 value	float32	2307	8967	Set by VirtualChannel.15.Main.Resolution
VirtualChannel.15.Main.Input2	Input 2 value	float32	2308	8968	Set by VirtualChannel.15.Main.Resolution
VirtualChannel.15.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2304	8964	Set by VirtualChannel.15.Main.Resolution
VirtualChannel.15.Main.ModbusInput	Modbus input value	float32	2306	8966	Set by VirtualChannel.15.Main.Resolution
VirtualChannel.15.Main.Operation	Specifies the operation of the virtual channel	uint8	2301	8961	Not applicable
VirtualChannel.15.Main.Period	The time period over which the calculation is made	int32	230a	8970	Not applicable
VirtualChannel.15.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	230c	8972	Not applicable
VirtualChannel.15.Main.PresetValue	Specifies the preset value	float32	230d	8973	Set by VirtualChannel.15.Main.Resolution
VirtualChannel.15.Main.PV	The virtual channel output value	float32	0158	344	Set by VirtualChannel.15.Main.Resolution
VirtualChannel.15.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	230b	8971	Not applicable
VirtualChannel.15.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2302	8962	Not applicable
VirtualChannel.15.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2311	8977	Not applicable
VirtualChannel.15.Main.RolloverValue	Rollover value	float32	2312	8978	Set by VirtualChannel.15.Main.Resolution
VirtualChannel.15.Main.Status	As VirtualChannel1.Main.Status	uint8	0159	345	Not applicable
VirtualChannel.15.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2309	8969	Set by Network.Modbus.TimeFormat
VirtualChannel.15.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	230e	8974	Not applicable
VirtualChannel.15.Main.Type	As VirtualChannel1.Main.Type	uint8	2300	8960	Not applicable
VirtualChannel.15.Main.Units	Units descriptor	string_t	4c90	19600	Not applicable
VirtualChannel.15.Main.UnitsScaler	Units scaler for totalisers	float32	2303	8963	1dp
VirtualChannel.15.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2320	8992	Not applicable
VirtualChannel.15.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2322	8994	Same as VirtualChannel.15.Main.PV
VirtualChannel.15.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2321	8993	Same as VirtualChannel.15.Main.PV
VirtualChannel.16.Main.Descriptor	Virtual Channel descriptor	string_t	4c96	19606	Not applicable
VirtualChannel.16.Main.Disable	1 = Virtual channel disabled	bool	23a3	9123	Not applicable
VirtualChannel.16.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2385	9093	Set by VirtualChannel.16.Main.Resolution
VirtualChannel.16.Main.Input1	Input 1 value	float32	2387	9095	Set by VirtualChannel.16.Main.Resolution
VirtualChannel.16.Main.Input2	Input 2 value	float32	2388	9096	Set by VirtualChannel.16.Main.Resolution
VirtualChannel.16.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2384	9092	Set by VirtualChannel.16.Main.Resolution
VirtualChannel.16.Main.ModbusInput	Modbus input value	float32	2386	9094	Set by VirtualChannel.16.Main.Resolution
VirtualChannel.16.Main.Operation	Specifies the operation of the virtual channel	uint8	2381	9089	Not applicable
VirtualChannel.16.Main.Period	The time period over which the calculation is made	int32	238a	9098	Not applicable
VirtualChannel.16.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	238c	9100	Not applicable
VirtualChannel.16.Main.PresetValue	Specifies the preset value	float32	238d	9101	Set by VirtualChannel.16.Main.Resolution
VirtualChannel.16.Main.PV	The virtual channel output value	float32	015c	348	Set by VirtualChannel.16.Main.Resolution
VirtualChannel.16.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	238b	9099	Not applicable
VirtualChannel.16.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2382	9090	Not applicable
VirtualChannel.16.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2391	9105	Not applicable
VirtualChannel.16.Main.RolloverValue	Rollover value	float32	2392	9106	Set by VirtualChannel.16.Main.Resolution
VirtualChannel.16.Main.Status	As VirtualChannel1.Main.Status	uint8	015d	349	Not applicable
VirtualChannel.16.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2389	9097	Set by Network.Modbus.TimeFormat
VirtualChannel.16.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	238e	9102	Not applicable
VirtualChannel.16.Main.Type	As VirtualChannel1.Main.Type	uint8	2380	9088	Not applicable
VirtualChannel.16.Main.Units	Units descriptor	string_t	4cab	19627	Not applicable
VirtualChannel.16.Main.UnitsScaler	Units scaler for totalisers	float32	2383	9091	1dp
VirtualChannel.16.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	23a0	9120	Not applicable
VirtualChannel.16.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	23a2	9122	Same as VirtualChannel.16.Main.PV
VirtualChannel.16.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	23a1	9121	Same as VirtualChannel.16.Main.PV
VirtualChannel.17.Main.Descriptor	Virtual Channel descriptor	string_t	4cb1	19633	Not applicable
VirtualChannel.17.Main.Disable	1 = Virtual channel disabled	bool	23e3	9187	Not applicable
VirtualChannel.17.Main.HighCutOff	The highest input value that will be totalised/counted	float32	23c5	9157	Set by VirtualChannel.17.Main.Resolution
VirtualChannel.17.Main.Input1	Input 1 value	float32	23c7	9159	Set by VirtualChannel.17.Main.Resolution
VirtualChannel.17.Main.Input2	Input 2 value	float32	23c8	9160	Set by VirtualChannel.17.Main.Resolution
VirtualChannel.17.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	23c4	9156	Set by VirtualChannel.17.Main.Resolution
VirtualChannel.17.Main.ModbusInput	Modbus input value	float32	23c6	9158	Set by VirtualChannel.17.Main.Resolution
VirtualChannel.17.Main.Operation	Specifies the operation of the virtual channel	uint8	23c1	9153	Not applicable
VirtualChannel.17.Main.Period	The time period over which the calculation is made	int32	23ca	9162	Not applicable
VirtualChannel.17.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	23cc	9164	Not applicable
VirtualChannel.17.Main.PresetValue	Specifies the preset value	float32	23cd	9165	Set by VirtualChannel.17.Main.Resolution
VirtualChannel.17.Main.PV	The virtual channel output value	float32	015e	350	Set by VirtualChannel.17.Main.Resolution
VirtualChannel.17.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	23cb	9163	Not applicable
VirtualChannel.17.Main.Resolution	Specifies the resolution/number of decimal places	uint8	23c2	9154	Not applicable
VirtualChannel.17.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	23d1	9169	Not applicable
VirtualChannel.17.Main.RolloverValue	Rollover value	float32	23d2	9170	Set by VirtualChannel.17.Main.Resolution
VirtualChannel.17.Main.Status	As VirtualChannel1.Main.Status	uint8	015f	351	Not applicable
VirtualChannel.17.Main.TimeRemaining	Time remaining before the calculation is made	time_t	23c9	9161	Set by Network.Modbus.TimeFormat
VirtualChannel.17.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	23ce	9166	Not applicable
VirtualChannel.17.Main.Type	As VirtualChannel1.Main.Type	uint8	23c0	9152	Not applicable
VirtualChannel.17.Main.Units	Units descriptor	string_t	4cc6	19654	Not applicable
VirtualChannel.17.Main.UnitsScaler	Units scaler for totalisers	float32	23c3	9155	1dp
VirtualChannel.17.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	23e0	9184	Not applicable
VirtualChannel.17.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	23e2	9186	Same as VirtualChannel.17.Main.PV
VirtualChannel.17.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	23e1	9185	Same as VirtualChannel.17.Main.PV
VirtualChannel.18.Main.Descriptor	Virtual Channel descriptor	string_t	4ccc	19660	Not applicable
VirtualChannel.18.Main.Disable	1 = Virtual channel disabled	bool	2523	9507	Not applicable
VirtualChannel.18.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2405	9221	Set by VirtualChannel.18.Main.Resolution
VirtualChannel.18.Main.Input1	Input 1 value	float32	2407	9223	Set by VirtualChannel.18.Main.Resolution
VirtualChannel.18.Main.Input2	Input 2 value	float32	2408	9224	Set by VirtualChannel.18.Main.Resolution
VirtualChannel.18.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2404	9220	Set by VirtualChannel.18.Main.Resolution

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.18.Main.ModbusInput	Modbus input value	float32	2406	9222	Set by VirtualChannel.18.Main.Resolution
VirtualChannel.18.Main.Operation	Specifies the operation of the virtual channel	uint8	2401	9217	Not applicable
VirtualChannel.18.Main.Period	The time period over which the calculation is made	int32	240a	9226	Not applicable
VirtualChannel.18.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	240c	9228	Not applicable
VirtualChannel.18.Main.PresetValue	Specifies the preset value	float32	240d	9229	Set by VirtualChannel.18.Main.Resolution
VirtualChannel.18.Main.PV	The virtual channel output value	float32	0160	352	Set by VirtualChannel.18.Main.Resolution
VirtualChannel.18.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	240b	9227	Not applicable
VirtualChannel.18.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2402	9218	Not applicable
VirtualChannel.18.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2411	9233	Not applicable
VirtualChannel.18.Main.RolloverValue	Rollover value	float32	2412	9234	Set by VirtualChannel.18.Main.Resolution
VirtualChannel.18.Main.Status	As VirtualChannel1.Main.Status	uint8	0161	353	Not applicable
VirtualChannel.18.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2409	9225	Set by Network.Modbus.TimeFormat
VirtualChannel.18.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	240e	9230	Not applicable
VirtualChannel.18.Main.Type	As VirtualChannel1.Main.Type	uint8	2400	9216	Not applicable
VirtualChannel.18.Main.Units	Units descriptor	string_t	4ce1	19681	Not applicable
VirtualChannel.18.Main.UnitsScaler	Units scaler for totalisers	float32	2403	9219	1dp
VirtualChannel.18.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2520	9504	Not applicable
VirtualChannel.18.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2522	9506	Same as VirtualChannel.18.Main.PV
VirtualChannel.18.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2521	9505	Same as VirtualChannel.18.Main.PV
VirtualChannel.19.Main.Descriptor	Virtual Channel descriptor	string_t	4ce7	19687	Not applicable
VirtualChannel.19.Main.Disable	1 = Virtual channel disabled	bool	2563	9571	Not applicable
VirtualChannel.19.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2445	9285	Set by VirtualChannel.19.Main.Resolution
VirtualChannel.19.Main.Input1	Input 1 value	float32	2447	9287	Set by VirtualChannel.19.Main.Resolution
VirtualChannel.19.Main.Input2	Input 2 value	float32	2448	9288	Set by VirtualChannel.19.Main.Resolution
VirtualChannel.19.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2444	9284	Set by VirtualChannel.19.Main.Resolution
VirtualChannel.19.Main.ModbusInput	Modbus input value	float32	2446	9286	Set by VirtualChannel.19.Main.Resolution
VirtualChannel.19.Main.Operation	Specifies the operation of the virtual channel	uint8	2441	9281	Not applicable
VirtualChannel.19.Main.Period	The time period over which the calculation is made	int32	244a	9290	Not applicable
VirtualChannel.19.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	244c	9292	Not applicable
VirtualChannel.19.Main.PresetValue	Specifies the preset value	float32	244d	9293	Set by VirtualChannel.19.Main.Resolution
VirtualChannel.19.Main.PV	The virtual channel output value	float32	0162	354	Set by VirtualChannel.19.Main.Resolution
VirtualChannel.19.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	244b	9291	Not applicable
VirtualChannel.19.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2442	9282	Not applicable
VirtualChannel.19.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2451	9297	Not applicable
VirtualChannel.19.Main.RolloverValue	Rollover value	float32	2452	9298	Set by VirtualChannel.19.Main.Resolution
VirtualChannel.19.Main.Status	TAs VirtualChannel1.Main.Statusv	uint8	0163	355	Not applicable
VirtualChannel.19.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2449	9289	Set by Network.Modbus.TimeFormat
VirtualChannel.19.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	244e	9294	Not applicable
VirtualChannel.19.Main.Type	As VirtualChannel1.Main.Type	uint8	2440	9280	Not applicable
VirtualChannel.19.Main.Units	Units descriptor	string_t	4cfc	19708	Not applicable
VirtualChannel.19.Main.UnitsScaler	Units scaler for totalisers	float32	2443	9283	1dp
VirtualChannel.19.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2560	9568	Not applicable
VirtualChannel.19.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2562	9570	Same as VirtualChannel.19.Main.PV
VirtualChannel.19.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2561	9569	Same as VirtualChannel.19.Main.PV
VirtualChannel.20.Main.Descriptor	Virtual Channel descriptor	string_t	4d02	19714	Not applicable
VirtualChannel.20.Main.Disable	1 = Virtual channel disabled	bool	25a3	9635	Not applicable
VirtualChannel.20.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2485	9349	Set by VirtualChannel.20.Main.Resolution
VirtualChannel.20.Main.Input1	Input 1 value	float32	2487	9351	Set by VirtualChannel.20.Main.Resolution
VirtualChannel.20.Main.Input2	Input 2 value	float32	2488	9352	Set by VirtualChannel.20.Main.Resolution
VirtualChannel.20.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2484	9348	Set by VirtualChannel.20.Main.Resolution
VirtualChannel.20.Main.ModbusInput	Modbus input value	float32	2486	9350	Set by VirtualChannel.20.Main.Resolution
VirtualChannel.20.Main.Operation	Specifies the operation of the virtual channel	uint8	2481	9345	Not applicable
VirtualChannel.20.Main.Period	The time period over which the calculation is made	int32	248a	9354	Not applicable
VirtualChannel.20.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	248c	9356	Not applicable
VirtualChannel.20.Main.PresetValue	Specifies the preset value	float32	248d	9357	Set by VirtualChannel.20.Main.Resolution
VirtualChannel.20.Main.PV	The virtual channel output value	float32	0164	356	Set by VirtualChannel.20.Main.Resolution
VirtualChannel.20.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	248b	9355	Not applicable
VirtualChannel.20.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2482	9346	Not applicable
VirtualChannel.20.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2491	9361	Not applicable
VirtualChannel.20.Main.RolloverValue	Rollover value	float32	2492	9362	Set by VirtualChannel.20.Main.Resolution
VirtualChannel.20.Main.Status	As VirtualChannel1.Main.Status	uint8	0165	357	Not applicable
VirtualChannel.20.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2489	9353	Set by Network.Modbus.TimeFormat
VirtualChannel.20.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	248e	9358	Not applicable
VirtualChannel.20.Main.Type	As VirtualChannel1.Main.Type	uint8	2480	9344	Not applicable
VirtualChannel.20.Main.Units	Units descriptor	string_t	4d17	19735	Not applicable
VirtualChannel.20.Main.UnitsScaler	Units scaler for totalisers	float32	2483	9347	1dp
VirtualChannel.20.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	25a0	9632	Not applicable
VirtualChannel.20.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	25a2	9634	Same as VirtualChannel.20.Main.PV
VirtualChannel.20.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	25a1	9633	Same as VirtualChannel.20.Main.PV
VirtualChannel.21.Main.Descriptor	Virtual Channel descriptor	string_t	4d1d	19741	Not applicable
VirtualChannel.21.Main.Disable	1 = Virtual channel disabled	bool	25e3	9699	Not applicable
VirtualChannel.21.Main.HighCutOff	The highest input value that will be totalised/counted	float32	24c5	9413	Set by VirtualChannel.21.Main.Resolution
VirtualChannel.21.Main.Input1	Input 1 value	float32	24c7	9415	Set by VirtualChannel.21.Main.Resolution
VirtualChannel.21.Main.Input2	Input 2 value	float32	24c8	9416	Set by VirtualChannel.21.Main.Resolution
VirtualChannel.21.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	24c4	9412	Set by VirtualChannel.21.Main.Resolution
VirtualChannel.21.Main.ModbusInput	Modbus input value	float32	24c6	9414	Set by VirtualChannel.21.Main.Resolution
VirtualChannel.21.Main.Operation	Specifies the operation of the virtual channel	uint8	24c1	9409	Not applicable
VirtualChannel.21.Main.Period	The time period over which the calculation is made	int32	24ca	9418	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.21.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	24cc	9420	Not applicable
VirtualChannel.21.Main.PresetValue	Specifies the preset value	float32	24cd	9421	Set by VirtualChannel.21.Main.Resolution
VirtualChannel.21.Main.PV	The virtual channel output value	float32	0166	358	Set by VirtualChannel.21.Main.Resolution
VirtualChannel.21.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	24cb	9419	Not applicable
VirtualChannel.21.Main.Resolution	Specifies the resolution/number of decimal places	uint8	24c2	9410	Not applicable
VirtualChannel.21.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	24d1	9425	Not applicable
VirtualChannel.21.Main.RolloverValue	Rollover value	float32	24d2	9426	Set by VirtualChannel.21.Main.Resolution
VirtualChannel.21.Main.Status	As VirtualChannel1.Main.Status	uint8	0167	359	Not applicable
VirtualChannel.21.Main.TimeRemaining	Time remaining before the calculation is made	time_t	24c9	9417	Set by Network.Modbus.TimeFormat
VirtualChannel.21.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	24ce	9422	Not applicable
VirtualChannel.21.Main.Type	As VirtualChannel1.Main.Type	uint8	24c0	9408	Not applicable
VirtualChannel.21.Main.Units	Units descriptor	string_t	4d32	19762	Not applicable
VirtualChannel.21.Main.UnitsScaler	Units scaler for totalisers	float32	24c3	9411	1dp
VirtualChannel.21.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	25e0	9696	Not applicable
VirtualChannel.21.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	25e2	9698	Same as VirtualChannel.21.Main.PV
VirtualChannel.21.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	25e1	9697	Same as VirtualChannel.21.Main.PV
VirtualChannel.22.Main.Descriptor	Virtual Channel descriptor	string_t	4d38	19768	Not applicable
VirtualChannel.22.Main.Disable	1 = Virtual channel disabled	bool	2623	9763	Not applicable
VirtualChannel.22.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2505	9477	Set by VirtualChannel.22.Main.Resolution
VirtualChannel.22.Main.Input1	Input 1 value	float32	2507	9479	Set by VirtualChannel.22.Main.Resolution
VirtualChannel.22.Main.Input2	Input 2 value	float32	2508	9480	Set by VirtualChannel.22.Main.Resolution
VirtualChannel.22.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2504	9476	Set by VirtualChannel.22.Main.Resolution
VirtualChannel.22.Main.ModbusInput	Modbus input value	float32	2506	9478	Set by VirtualChannel.22.Main.Resolution
VirtualChannel.22.Main.Operation	Specifies the operation of the virtual channel	uint8	2501	9473	Not applicable
VirtualChannel.22.Main.Period	The time period over which the calculation is made	int32	250a	9482	Not applicable
VirtualChannel.22.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	250c	9484	Not applicable
VirtualChannel.22.Main.PresetValue	Specifies the preset value	float32	250d	9485	Set by VirtualChannel.22.Main.Resolution
VirtualChannel.22.Main.PV	The virtual channel output value	float32	0168	360	Set by VirtualChannel.22.Main.Resolution
VirtualChannel.22.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	250b	9483	Not applicable
VirtualChannel.22.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2502	9474	Not applicable
VirtualChannel.22.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2511	9489	Not applicable
VirtualChannel.22.Main.RolloverValue	Rollover value	float32	2512	9490	Set by VirtualChannel.22.Main.Resolution
VirtualChannel.22.Main.Status	As VirtualChannel1.Main.Status	uint8	0169	361	Not applicable
VirtualChannel.22.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2509	9481	Set by Network.Modbus.TimeFormat
VirtualChannel.22.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	250e	9486	Not applicable
VirtualChannel.22.Main.Type	As VirtualChannel1.Main.Type	uint8	2500	9472	Not applicable
VirtualChannel.22.Main.Units	Units descriptor	string_t	4d4d	19789	Not applicable
VirtualChannel.22.Main.UnitsScaler	Units scaler for totalisers	float32	2503	9475	1dp
VirtualChannel.22.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2620	9760	Not applicable
VirtualChannel.22.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2622	9762	Same as VirtualChannel.22.Main.PV
VirtualChannel.22.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2621	9761	Same as VirtualChannel.22.Main.PV
VirtualChannel.23.Main.Descriptor	Virtual Channel descriptor	string_t	4d53	19795	Not applicable
VirtualChannel.23.Main.Disable	1 = Virtual channel disabled	bool	2663	9827	Not applicable
VirtualChannel.23.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2545	9541	Set by VirtualChannel.23.Main.Resolution
VirtualChannel.23.Main.Input1	Input 1 value	float32	2547	9543	Set by VirtualChannel.23.Main.Resolution
VirtualChannel.23.Main.Input2	Input 2 value	float32	2548	9544	Set by VirtualChannel.23.Main.Resolution
VirtualChannel.23.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2544	9540	Set by VirtualChannel.23.Main.Resolution
VirtualChannel.23.Main.ModbusInput	Modbus input value	float32	2546	9542	Set by VirtualChannel.23.Main.Resolution
VirtualChannel.23.Main.Operation	Specifies the operation of the virtual channel	uint8	2541	9537	Not applicable
VirtualChannel.23.Main.Period	The time period over which the calculation is made	int32	254a	9546	Not applicable
VirtualChannel.23.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	254c	9548	Not applicable
VirtualChannel.23.Main.PresetValue	Specifies the preset value	float32	254d	9549	Set by VirtualChannel.23.Main.Resolution
VirtualChannel.23.Main.PV	The virtual channel output value	float32	016a	362	Set by VirtualChannel.23.Main.Resolution
VirtualChannel.23.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	254b	9547	Not applicable
VirtualChannel.23.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2542	9538	Not applicable
VirtualChannel.23.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2551	9553	Not applicable
VirtualChannel.23.Main.RolloverValue	Rollover value	float32	2552	9554	Set by VirtualChannel.23.Main.Resolution
VirtualChannel.23.Main.Status	As VirtualChannel1.Main.Status	uint8	016b	363	Not applicable
VirtualChannel.23.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2549	9545	Set by Network.Modbus.TimeFormat
VirtualChannel.23.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	254e	9550	Not applicable
VirtualChannel.23.Main.Type	As VirtualChannel1.Main.Type	uint8	2540	9536	Not applicable
VirtualChannel.23.Main.Units	Units descriptor	string_t	4d68	19816	Not applicable
VirtualChannel.23.Main.UnitsScaler	Units scaler for totalisers	float32	2543	9539	1dp
VirtualChannel.23.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2660	9824	Not applicable
VirtualChannel.23.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2662	9826	Same as VirtualChannel.23.Main.PV
VirtualChannel.23.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2661	9825	Same as VirtualChannel.23.Main.PV
VirtualChannel.24.Main.Descriptor	Virtual Channel descriptor	string_t	4d6e	19822	Not applicable
VirtualChannel.24.Main.Disable	1 = Virtual channel disabled	bool	26a3	9891	Not applicable
VirtualChannel.24.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2585	9605	Set by VirtualChannel.24.Main.Resolution
VirtualChannel.24.Main.Input1	Input 1 value	float32	2587	9607	Set by VirtualChannel.24.Main.Resolution
VirtualChannel.24.Main.Input2	Input 2 value	float32	2588	9608	Set by VirtualChannel.24.Main.Resolution
VirtualChannel.24.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2584	9604	Set by VirtualChannel.24.Main.Resolution
VirtualChannel.24.Main.ModbusInput	Modbus input value	float32	2586	9606	Set by VirtualChannel.24.Main.Resolution
VirtualChannel.24.Main.Operation	Specifies the operation of the virtual channel	uint8	2581	9601	Not applicable
VirtualChannel.24.Main.Period	The time period over which the calculation is made	int32	258a	9610	Not applicable
VirtualChannel.24.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	258c	9612	Not applicable
VirtualChannel.24.Main.PresetValue	Specifies the preset value	float32	258d	9613	Set by VirtualChannel.24.Main.Resolution
VirtualChannel.24.Main.PV	The virtual channel output value	float32	016c	364	Set by VirtualChannel.24.Main.Resolution



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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.24.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	258b	9611	Not applicable
VirtualChannel.24.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2582	9602	Not applicable
VirtualChannel.24.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2591	9617	Not applicable
VirtualChannel.24.Main.RolloverValue	Rollover value	float32	2592	9618	Set by VirtualChannel.24.Main.Resolution
VirtualChannel.24.Main.Status	As VirtualChannel1.Main.Status	uint8	016d	365	Not applicable
VirtualChannel.24.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2589	9609	Set by Network.Modbus.TimeFormat
VirtualChannel.24.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	258e	9614	Not applicable
VirtualChannel.24.Main.Type	As VirtualChannel1.Main.Type	uint8	2580	9600	Not applicable
VirtualChannel.24.Main.Units	Units descriptor	string_t	4d83	19843	Not applicable
VirtualChannel.24.Main.UnitsScaler	Units scaler for totalisers	float32	2583	9603	1dp
VirtualChannel.24.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	26a0	9888	Not applicable
VirtualChannel.24.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	26a2	9890	Same as VirtualChannel.24.Main.PV
VirtualChannel.24.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	26a1	9889	Same as VirtualChannel.24.Main.PV
VirtualChannel.25.Main.Descriptor	Virtual Channel descriptor	string_t	4d89	19849	Not applicable
VirtualChannel.25.Main.Disable	1 = Virtual channel disabled	bool	26e3	9955	Not applicable
VirtualChannel.25.Main.HighCutOff	The highest input value that will be totalised/counted	float32	25c5	9669	Set by VirtualChannel.25.Main.Resolution
VirtualChannel.25.Main.Input1	Input 1 value	float32	25c7	9671	Set by VirtualChannel.25.Main.Resolution
VirtualChannel.25.Main.Input2	Input 2 value	float32	25c8	9672	Set by VirtualChannel.25.Main.Resolution
VirtualChannel.25.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	25c4	9668	Set by VirtualChannel.25.Main.Resolution
VirtualChannel.25.Main.ModbusInput	Modbus input value	float32	25c6	9670	Set by VirtualChannel.25.Main.Resolution
VirtualChannel.25.Main.Operation	Specifies the operation of the virtual channel	uint8	25c1	9665	Not applicable
VirtualChannel.25.Main.Period	The time period over which the calculation is made	int32	25ca	9674	Not applicable
VirtualChannel.25.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	25cc	9676	Not applicable
VirtualChannel.25.Main.PresetValue	Specifies the preset value	float32	25cd	9677	Set by VirtualChannel.25.Main.Resolution
VirtualChannel.25.Main.PV	The virtual channel output value	float32	016e	366	Set by VirtualChannel.25.Main.Resolution
VirtualChannel.25.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	25cb	9675	Not applicable
VirtualChannel.25.Main.Resolution	Specifies the resolution/number of decimal places	uint8	25c2	9666	Not applicable
VirtualChannel.25.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	25d1	9681	Not applicable
VirtualChannel.25.Main.RolloverValue	Rollover value	float32	25d2	9682	Set by VirtualChannel.25.Main.Resolution
VirtualChannel.25.Main.Status	As VirtualChannel1.Main.Status	uint8	016f	367	Not applicable
VirtualChannel.25.Main.TimeRemaining	Time remaining before the calculation is made	time_t	25c9	9673	Set by Network.Modbus.TimeFormat
VirtualChannel.25.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	25ce	9678	Not applicable
VirtualChannel.25.Main.Type	As VirtualChannel1.Main.Type	uint8	25c0	9664	Not applicable
VirtualChannel.25.Main.Units	Units descriptor	string_t	4d9e	19870	Not applicable
VirtualChannel.25.Main.UnitsScaler	Units scaler for totalisers	float32	25c3	9667	1dp
VirtualChannel.25.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	26e0	9952	Not applicable
VirtualChannel.25.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	26e2	9954	Same as VirtualChannel.25.Main.PV
VirtualChannel.25.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	26e1	9953	Same as VirtualChannel.25.Main.PV
VirtualChannel.26.Main.Descriptor	Virtual Channel descriptor	string_t	4da4	19876	Not applicable
VirtualChannel.26.Main.Disable	1 = Virtual channel disabled	bool	2723	10019	Not applicable
VirtualChannel.26.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2605	9733	Set by VirtualChannel.26.Main.Resolution
VirtualChannel.26.Main.Input1	Input 1 value	float32	2607	9735	Set by VirtualChannel.26.Main.Resolution
VirtualChannel.26.Main.Input2	Input 2 value	float32	2608	9736	Set by VirtualChannel.26.Main.Resolution
VirtualChannel.26.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2604	9732	Set by VirtualChannel.26.Main.Resolution
VirtualChannel.26.Main.ModbusInput	Modbus input value	float32	2606	9734	Set by VirtualChannel.26.Main.Resolution
VirtualChannel.26.Main.Operation	Specifies the operation of the virtual channel	uint8	2601	9729	Not applicable
VirtualChannel.26.Main.Period	The time period over which the calculation is made	int32	260a	9738	Not applicable
VirtualChannel.26.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	260c	9740	Not applicable
VirtualChannel.26.Main.PresetValue	Specifies the preset value	float32	260d	9741	Set by VirtualChannel.26.Main.Resolution
VirtualChannel.26.Main.PV	The virtual channel output value	float32	0170	368	Set by VirtualChannel.26.Main.Resolution
VirtualChannel.26.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	260b	9739	Not applicable
VirtualChannel.26.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2602	9730	Not applicable
VirtualChannel.26.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2611	9745	Not applicable
VirtualChannel.26.Main.RolloverValue	Rollover value	float32	2612	9746	Set by VirtualChannel.26.Main.Resolution
VirtualChannel.26.Main.Status	As VirtualChannel1.Main.Status	uint8	0171	369	Not applicable
VirtualChannel.26.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2609	9737	Set by Network.Modbus.TimeFormat
VirtualChannel.26.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	260e	9742	Not applicable
VirtualChannel.26.Main.Type	As VirtualChannel1.Main.Type	uint8	2600	9728	Not applicable
VirtualChannel.26.Main.Units	Units descriptor	string_t	4db9	19897	Not applicable
VirtualChannel.26.Main.UnitsScaler	Units scaler for totalisers	float32	2603	9731	1dp
VirtualChannel.26.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2720	10016	Not applicable
VirtualChannel.26.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2722	10018	Same as VirtualChannel.26.Main.PV
VirtualChannel.26.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2721	10017	Same as VirtualChannel.26.Main.PV
VirtualChannel.27.Main.Descriptor	Virtual Channel descriptor	string_t	4dbf	19903	Not applicable
VirtualChannel.27.Main.Disable	1 = Virtual channel disabled	bool	2763	10083	Not applicable
VirtualChannel.27.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2645	9797	Set by VirtualChannel.27.Main.Resolution
VirtualChannel.27.Main.Input1	Input 1 value	float32	2647	9799	Set by VirtualChannel.27.Main.Resolution
VirtualChannel.27.Main.Input2	Input 2 value	float32	2648	9800	Set by VirtualChannel.27.Main.Resolution
VirtualChannel.27.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2644	9796	Set by VirtualChannel.27.Main.Resolution
VirtualChannel.27.Main.ModbusInput	Modbus input value	float32	2646	9798	Set by VirtualChannel.27.Main.Resolution
VirtualChannel.27.Main.Operation	Specifies the operation of the virtual channel	uint8	2641	9793	Not applicable
VirtualChannel.27.Main.Period	The time period over which the calculation is made	int32	264a	9802	Not applicable
VirtualChannel.27.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	264c	9804	Not applicable
VirtualChannel.27.Main.PresetValue	Specifies the preset value	float32	264d	9805	Set by VirtualChannel.27.Main.Resolution
VirtualChannel.27.Main.PV	The virtual channel output value	float32	0172	370	Set by VirtualChannel.27.Main.Resolution
VirtualChannel.27.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	264b	9803	Not applicable
VirtualChannel.27.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2642	9794	Not applicable
VirtualChannel.27.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2651	9809	Not applicable

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.27.Main.RolloverValue	Rollover value	float32	2652	9810	Set by VirtualChannel.27.Main.Resolution
VirtualChannel.27.Main.Status	As VirtualChannel1.Main.Status	uint8	0173	371	Not applicable
VirtualChannel.27.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2649	9801	Set by Network.Modbus.TimeFormat
VirtualChannel.27.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	264e	9806	Not applicable
VirtualChannel.27.Main.Type	As VirtualChannel1.Main.Type	uint8	2640	9792	Not applicable
VirtualChannel.27.Main.Units	Units descriptor	string_t	4dd4	19924	Not applicable
VirtualChannel.27.Main.UnitsScaler	Units scaler for totalisers	float32	2643	9795	1dp
VirtualChannel.27.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2760	10080	Not applicable
VirtualChannel.27.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2762	10082	Same as VirtualChannel.27.Main.PV
VirtualChannel.27.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2761	10081	Same as VirtualChannel.27.Main.PV
VirtualChannel.28.Main.Descriptor	Virtual Channel descriptor	string_t	4dda	19930	Not applicable
VirtualChannel.28.Main.Disable	1 = Virtual channel disabled	bool	27a3	10147	Not applicable
VirtualChannel.28.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2685	9861	Set by VirtualChannel.28.Main.Resolution
VirtualChannel.28.Main.Input1	Input 1 value	float32	2687	9863	Set by VirtualChannel.28.Main.Resolution
VirtualChannel.28.Main.Input2	Input 2 value	float32	2688	9864	Set by VirtualChannel.28.Main.Resolution
VirtualChannel.28.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2684	9860	Set by VirtualChannel.28.Main.Resolution
VirtualChannel.28.Main.ModbusInput	Modbus input value	float32	2686	9862	Set by VirtualChannel.28.Main.Resolution
VirtualChannel.28.Main.Operation	Specifies the operation of the virtual channel	uint8	2681	9857	Not applicable
VirtualChannel.28.Main.Period	The time period over which the calculation is made	int32	268a	9866	Not applicable
VirtualChannel.28.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	268c	9868	Not applicable
VirtualChannel.28.Main.PresetValue	Specifies the preset value	float32	268d	9869	Set by VirtualChannel.28.Main.Resolution
VirtualChannel.28.Main.PV	The virtual channel output value	float32	0174	372	Set by VirtualChannel.28.Main.Resolution
VirtualChannel.28.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	268b	9867	Not applicable
VirtualChannel.28.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2682	9858	Not applicable
VirtualChannel.28.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2691	9873	Not applicable
VirtualChannel.28.Main.RolloverValue	Rollover value	float32	2692	9874	Set by VirtualChannel.28.Main.Resolution
VirtualChannel.28.Main.Status	As VirtualChannel1.Main.Status	uint8	0175	373	Not applicable
VirtualChannel.28.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2689	9865	Set by Network.Modbus.TimeFormat
VirtualChannel.28.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	268e	9870	Not applicable
VirtualChannel.28.Main.Type	As VirtualChannel1.Main.Type	uint8	2680	9856	Not applicable
VirtualChannel.28.Main.Units	Units descriptor	string_t	4def	19951	Not applicable
VirtualChannel.28.Main.UnitsScaler	Units scaler for totalisers	float32	2683	9859	1dp
VirtualChannel.28.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	27a0	10144	Not applicable
VirtualChannel.28.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	27a2	10146	Same as VirtualChannel.28.Main.PV
VirtualChannel.28.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	27a1	10145	Same as VirtualChannel.28.Main.PV
VirtualChannel.29.Main.Descriptor	Virtual Channel descriptor	string_t	4df5	19957	Not applicable
VirtualChannel.29.Main.Disable	1 = Virtual channel disabled	bool	27e3	10211	Not applicable
VirtualChannel.29.Main.HighCutOff	The highest input value that will be totalised/counted	float32	26c5	9925	Set by VirtualChannel.29.Main.Resolution
VirtualChannel.29.Main.Input1	Input 1 value	float32	26c7	9927	Set by VirtualChannel.29.Main.Resolution
VirtualChannel.29.Main.Input2	Input 2 value	float32	26c8	9928	Set by VirtualChannel.29.Main.Resolution
VirtualChannel.29.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	26c4	9924	Set by VirtualChannel.29.Main.Resolution
VirtualChannel.29.Main.ModbusInput	Modbus input value	float32	26c6	9926	Set by VirtualChannel.29.Main.Resolution
VirtualChannel.29.Main.Operation	Specifies the operation of the virtual channel	uint8	26c1	9921	Not applicable
VirtualChannel.29.Main.Period	The time period over which the calculation is made	int32	26ca	9930	Not applicable
VirtualChannel.29.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	26cc	9932	Not applicable
VirtualChannel.29.Main.PresetValue	Specifies the preset value	float32	26cd	9933	Set by VirtualChannel.29.Main.Resolution
VirtualChannel.29.Main.PV	The virtual channel output value	float32	0176	374	Set by VirtualChannel.29.Main.Resolution
VirtualChannel.29.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	26cb	9931	Not applicable
VirtualChannel.29.Main.Resolution	Specifies the resolution/number of decimal places	uint8	26c2	9922	Not applicable
VirtualChannel.29.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	26d1	9937	Not applicable
VirtualChannel.29.Main.RolloverValue	Rollover value	float32	26d2	9938	Set by VirtualChannel.29.Main.Resolution
VirtualChannel.29.Main.Status	As VirtualChannel1.Main.Status	uint8	0177	375	Not applicable
VirtualChannel.29.Main.TimeRemaining	Time remaining before the calculation is made	time_t	26c9	9929	Set by Network.Modbus.TimeFormat
VirtualChannel.29.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	26ce	9934	Not applicable
VirtualChannel.29.Main.Type	As VirtualChannel1.Main.Type	uint8	26c0	9920	Not applicable
VirtualChannel.29.Main.Units	Units descriptor	string_t	4e0a	19978	Not applicable
VirtualChannel.29.Main.UnitsScaler	Units scaler for totalisers	float32	26c3	9923	1dp
VirtualChannel.29.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	27e0	10208	Not applicable
VirtualChannel.29.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	27e2	10210	Same as VirtualChannel.29.Main.PV
VirtualChannel.29.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	27e1	10209	Same as VirtualChannel.29.Main.PV
VirtualChannel.30.Main.Descriptor	Virtual Channel descriptor	string_t	4e10	19984	Not applicable
VirtualChannel.30.Main.Disable	1 = Virtual channel disabled	bool	2823	10275	Not applicable
VirtualChannel.30.Main.HighCutOff	The highest input value that will be totalised/counted	float32	2705	9989	Set by VirtualChannel.30.Main.Resolution
VirtualChannel.30.Main.Input1	Input 1 value	float32	2707	9991	Set by VirtualChannel.30.Main.Resolution
VirtualChannel.30.Main.Input2	Input 2 value	float32	2708	9992	Set by VirtualChannel.30.Main.Resolution
VirtualChannel.30.Main.LowCutOff	The lowest input value that will be totalised/counted	float32	2704	9988	Set by VirtualChannel.30.Main.Resolution
VirtualChannel.30.Main.ModbusInput	Modbus input value	float32	2706	9990	Set by VirtualChannel.30.Main.Resolution
VirtualChannel.30.Main.Operation	Specifies the operation of the virtual channel	uint8	2701	9985	Not applicable
VirtualChannel.30.Main.Period	The time period over which the calculation is made	int32	270a	9994	Not applicable
VirtualChannel.30.Main.Preset	Initiate preset. 0 = No; 1 = Yes	bool	270c	9996	Not applicable
VirtualChannel.30.Main.PresetValue	Specifies the preset value	float32	270d	9997	Set by VirtualChannel.30.Main.Resolution
VirtualChannel.30.Main.PV	The virtual channel output value	float32	0178	376	Set by VirtualChannel.30.Main.Resolution
VirtualChannel.30.Main.Reset	Initiate reset. 0 = No; 1 = Yes	bool	270b	9995	Not applicable
VirtualChannel.30.Main.Resolution	Specifies the resolution/number of decimal places	uint8	2702	9986	Not applicable
VirtualChannel.30.Main.Rollover	A pulse signal to indicate PV (output) has just rolled over	bool	2711	10001	Not applicable
VirtualChannel.30.Main.RolloverValue	Rollover value	float32	2712	10002	Set by VirtualChannel.30.Main.Resolution
VirtualChannel.30.Main.Status	As VirtualChannel1.Main.Status	uint8	0179	377	Not applicable
VirtualChannel.30.Main.TimeRemaining	Time remaining before the calculation is made	time_t	2709	9993	Set by Network.Modbus.TimeFormat

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Parameter path	Description	Type	Hex	Dec	Resolution
VirtualChannel.30.Main.Trigger	Increment/decrement counter. 0 = No; 1 = Yes	bool	270e	9998	Not applicable
VirtualChannel.30.Main.Type	As VirtualChannel1.Main.Type	uint8	2700	9984	Not applicable
VirtualChannel.30.Main.Units	Units descriptor	string_t	4e25	20005	Not applicable
VirtualChannel.30.Main.UnitsScaler	Units scaler for totalisers	float32	2703	9987	1dp
VirtualChannel.30.Trend.Colour	As VirtualChannel1.Trend.Colour	uint8	2820	10272	Not applicable
VirtualChannel.30.Trend.SpanHigh	Specifies the highest PV (output value) to be displayed	float32	2822	10274	Same as VirtualChannel.30.Main.PV
VirtualChannel.30.Trend.SpanLow	Specifies the lowest PV (output value) to be displayed	float32	2821	10273	Same as VirtualChannel.30.Main.PV
WebServer.Status	Status	uint8	3044	12356	Not applicable
WebServer.Enabled	Enabled	uint8	3045	12357	Not applicable
WebServer.Port	Port	uint8	3046	12358	Not applicable
WebServer.Security	Security	uint8	3047	12359	Not applicable
WebServer.Username	Username	string_t	776f	30575	Not applicable
WebServer.Password	Password	string_t	77d4	30676	Not applicable

## 8 BACnet

### 8.1 BACnet Objects

In BACnet, objects are collections of properties, each representing some bit of information. In addition to standard defined properties, objects may include vendor-defined properties as long as they function in accordance with the standard. BACnet also defines the expected behavior from each property for that object. What makes the object-oriented approach work is that every object and every property as defined by the system is accessible in exactly the same manner.

### 8.2 BACnet Services

The process of reading or writing to a property is what BACnet calls a service. Services are the methods used by any BACnet device when it communicates with another BACnet device, including retrieving information, transmitting information or communicating an action. The standard defines a wide range of services for accessing objects and their properties. See Section 8.3.5 for further details.

### 8.3 BACnet Object Mapping

#### 8.3.1 Mapping to I/O and Loop Data Points

BACnet objects are mapped to FEC920 I/O and Loop data points as shown in Table 2.

Object types are denoted in the table as follows:

- AI – Analog Input
- AV – Analog Value
- BI – Binary Input
- BV – Binary Value
- CS – Character String
- MSI – Multi State Input

Input channels 5-8 are instantiated as BACnet objects if the 'Dual Input Channels' option is set to '05..08'.

**Table 2: BACnet Object Representation of I/O and Loops**

Object Name	Type	Data Parameter	Equivalent Modbus Path	R/W
Input Channel 1	AI	PV	Channel.1.Main.PV	R
		PV Status	Channel.1.Main.Status	
	AV	AL1 Threshold	Channel.1.Alarm1.Threshold	R/W
	MSI	AL1 Status	Channel.1.Alarm1.Status	R
	AV	AL2 Threshold	Channel.1.Alarm2.Threshold	R/W
MSI	AL2 Status	Channel.1.Alarm2.Status	R	
Input Channel 2	AI	PV	Channel.2.Main.PV	R
		PV Status	Channel.2.Main.Status	
	AV	AL1 Threshold	Channel.2.Alarm1.Threshold	R/W
	MSI	AL1 Status	Channel.2.Alarm1.Status	R
	AV	AL2 Threshold	Channel.2.Alarm2.Threshold	R/W
MSI	AL2 Status	Channel.2.Alarm2.Status	R	

Object Name		Type	Data Parameter	Equivalent Modbus Path	R/W
Input Channel 3	Channel.3.Main.PV	AI	PV	Channel.3.Main.PV	R
			PV Status	Channel.3.Main.Status	
	Channel.3.Alarm1.Threshold	AV	AL1 Threshold	Channel.3.Alarm1.Threshold	R/W
	Channel.3.Alarm1.Status	MSI	AL1 Status	Channel.3.Alarm1.Status	R
	Channel.3.Alarm2.Threshold	AV	AL2 Threshold	Channel.3.Alarm2.Threshold	R/W
Channel.3.Alarm2.Status	MSI	AL2 Status	Channel.3.Alarm2.Status	R	
Input Channel 4	Channel.4.Main.PV	AI	PV	Channel.4.Main.PV	R
			PV Status	Channel.4.Main.Status	
	Channel.4.Alarm1.Threshold	AV	AL1 Threshold	Channel.4.Alarm1.Threshold	R/W
	Channel.4.Alarm1.Status	MSI	AL1 Status	Channel.4.Alarm1.Status	R
	Channel.4.Alarm2.Threshold	AV	AL2 Threshold	Channel.4.Alarm2.Threshold	R/W
Channel.4.Alarm2.Status	MSI	AL2 Status	Channel.4.Alarm2.Status	R	
Input Channel 5-8	<i>Instantiated similar to above (if required)</i>				
Digital I/O	DigitalIO.DI_LALC.Output	BI	Dig In A	DigitalIO.DI_LALC.Output	R
	DigitalIO.DI_LBLC.Output	BI	Dig In B	DigitalIO.DI_LBLC.Output	R
	DigitalIO.1A1B.Output	BI	I/O 1 - Output	DigitalIO.1A1B.Output	R
	DigitalIO.1A1B.PV	AI	I/O 1 - Input	DigitalIO.1A1B.PV	R
	DigitalIO.2A2B.Output	BI	I/O 2 - Output	DigitalIO.2A2B.Output	R
	DigitalIO.2A2B.PV	AI	I/O 2 - Input	DigitalIO.2A2B.PV	R
	DigitalIO.3A3B.Output	BI	I/O 3 - Output	DigitalIO.3A3B.Output	R
	DigitalIO.3A3B.PV	AI	I/O 3 - Input	DigitalIO.3A3B.PV	R
	DigitalIO.RELAY_4AC.Output	BI	Relay Out 4	DigitalIO.RELAY_4AC.Output	R
	DigitalIO.RELAY_5AC.Output	BI	Relay Out 5	DigitalIO.RELAY_5AC.Output	R

### 8.3.2 Mapping to Virtual Channels

BACnet objects are mapped to FEC920 virtual channels as shown in Table 3.

A maximum of 30 virtual channel objects are supported.

**Table 3: BACnet Object Representation of Virtual Channels**

Object Name		Type	Data Parameter	Equivalent Modbus Path	R/W
Virtual Channel (n, m)	VirtualChannel.n.Main.PV	AI	PV	VirtualChannel.n.Main.PV	R
			PV Status	VirtualChannel.n.Main.Status	
	VirtualChannel.n.Alarm1.Threshold	AV	AL1 Threshold	VirtualChannel.n.Alarm1.Threshold	R/W
	VirtualChannel.n.Alarm1.Status	MSI	AL1 Status	VirtualChannel.n.Alarm1.Status	R
	VirtualChannel.n.Alarm2.Threshold	AV	AL2 Threshold	VirtualChannel.n.Alarm2.Threshold	R/W
VirtualChannel.n.Alarm2.Status	MSI	AL2 Status	VirtualChannel.n.Alarm2.Status	R	

### 8.3.3 Read/Write Access to Internal Modbus Registers

Read/write access to any internal Modbus register is provided using pairs of BACnet objects named 'User Parameters' as shown in Table 4.

30 User Parameter pairs (numbered 1 to 30) are supported.

Table 4: Modbus Register Access

Object Name	Type	Data Parameter	Internal Path	R/W
UserParameter.n.Address	AV	R/W User Parameter <i>n</i>	VirtualChannel.n.Alarm1.Threshold	R/W
UserParameter.n.Value	AV		VirtualChannel.n.Alarm1.Status	R/W

This functionality allows the BACnet user to access any internal parameter that is available in the standard Modbus address space. Pairs of values as shown in Table 4 are implemented as two BACnet Analog Value objects. The BACnet client (typically a BMS) will write the first value with the Modbus address for the data parameter required as shown in Figure 109. The user may obtain the Modbus address from Section 7.3 of this manual.



Figure 109 BMS Client writes address of required parameter

The BMS client may then read or write to the data referenced by this address, as shown in Figure 110.



Figure 110 BMS Client reads/writes to data parameter



**Note:** The data value will always be represented over BACnet as a floating point, even if the internal source data is of a different type (e.g. Bool). Strings will not be accessible using this mechanism.

**Note:** Values written to device parameters via BACnet may be overwritten (with different values) internally by the device firmware under certain device configurations. Due to this, when the values of the BACnet objects are read back, they may be different to the value requested via the preceding BACnet write command.

### 8.3.4 Optional parameters

The following optional parameters shall be implemented in addition to the standard required parameters for all relevant object types:

Table 5: Optional Parameters

Property	R/W	Description
Description	R	Alphanumeric description of channel function, eg "Furnace 1".
Device_Type	R	Alphanumeric description of Input type for the channel eg 'Off', 'Thermocouple', 'mV'

### 8.3.5 BACnet Services

Services required by the BACnet Application Specific Controller Profile (B-ASC) are supported, as detailed in the following table:

Table 6: Services Required by B-ASC Profile

Application Service	Description	Service Type
ReadProperty	Request the value of one property of a BACnet object	Object Access
WriteProperty	Modify value of a single property (if permitted)	Object Access
DeviceCommunicationControl	Allows an operator to take device communications on or off-line. With support for optional password.	Remote Device Management
Who-Is	Asks about the presence of specified BACnet devices	Remote Device Management
Who-Has	Asks about the presence of specified Objects either by type and instance or by name	Remote Device Management

### 8.3.6 Foreign Device Registration

A 'foreign device' has a different subnet address from the devices on the BACnet/IP network that it wishes to join. The device must register with a BBMD (BACnet Broadcast Management Device) which then forwards broadcast messages allowing full participation in the BACnet/IP network.

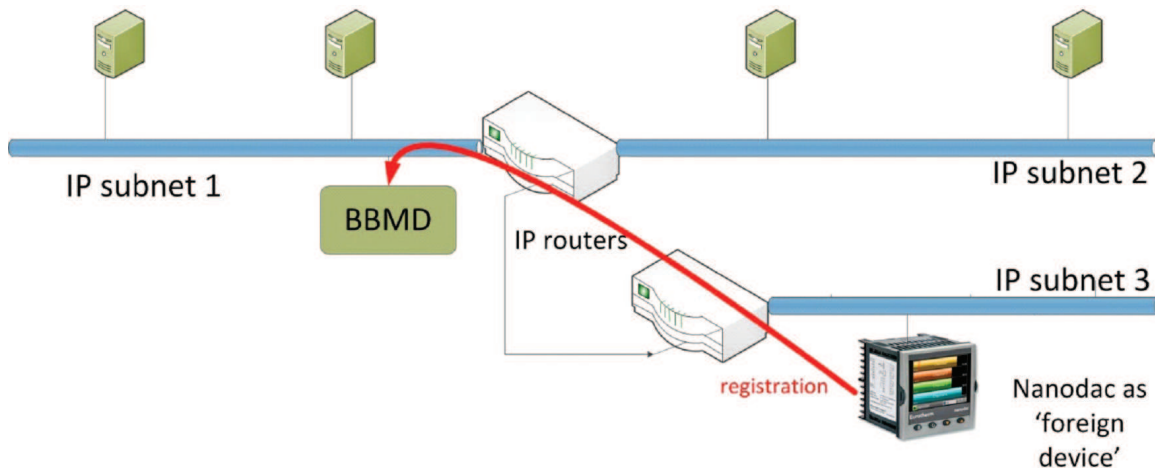


Figure 111 Foreign Device Registration

### 8.3.7 BACnet Configuration

Section 6.2.5 provides details for configuring BACnet on the instrument.

The BACnet parameters described in Section 8.3 can be configured using the iTools software.

## 9 iTOOLS

iTools software running on a PC allows quick and easy access to the configuration of the unit. The parameters used are generally the same as those described in Section 6, with the addition of various diagnostic parameters. iTools also gives the user the ability to create software wiring between function blocks, such wiring being carried out using the Graphical Wiring Editor feature.

In addition to the guidance given here, there are two on-line Help systems available within iTools: Parameter help and iTools help. Parameter help is accessed by clicking on 'Help' in the toolbar (opens the complete parameter help system), by right-clicking on a parameter and selecting 'Parameter Help' from the resulting context menu, or by clicking on the Help menu and selecting 'Device Help'. iTools help is accessed by clicking on the Help menu, and selecting 'Contents'. iTools help is also available in manual format under part number HA028838, either as a physical manual or as a PDF file.

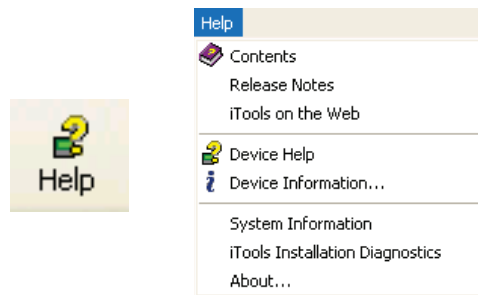


Figure 112 Help access

### 9.1 iTOOLS CONNECTION

The following descriptions assume that iTools software has been correctly installed on the PC.

#### 9.1.1 Ethernet (Modbus TCP) communications



**Note:** The following description is based on Windows 7.

It is first necessary to determine the IP address of the unit, as described under 'Network.Interface' in Section 6.2.1.

Once the Ethernet link has been correctly installed, carry out the following actions at the PC:

1. Click on 'Start'.
2. Click on 'Control Panel'.
3. Double-click on 'iTools (32-bit)'.
4. Click on the TCP/IP tab in the Registry settings configuration.
5. Click on 'Add...' The 'New TCP/IP Port' dialog box opens.
6. Type-in a name for the port, then click 'Add...' again.
7. Type the IP address of the unit in the 'Edit Host' box which appears. Click OK.
8. Check the details in the 'New TCP/IP Port' box, then click on 'OK'.
9. Click on 'OK' in the 'Registry settings' box to confirm the new port.



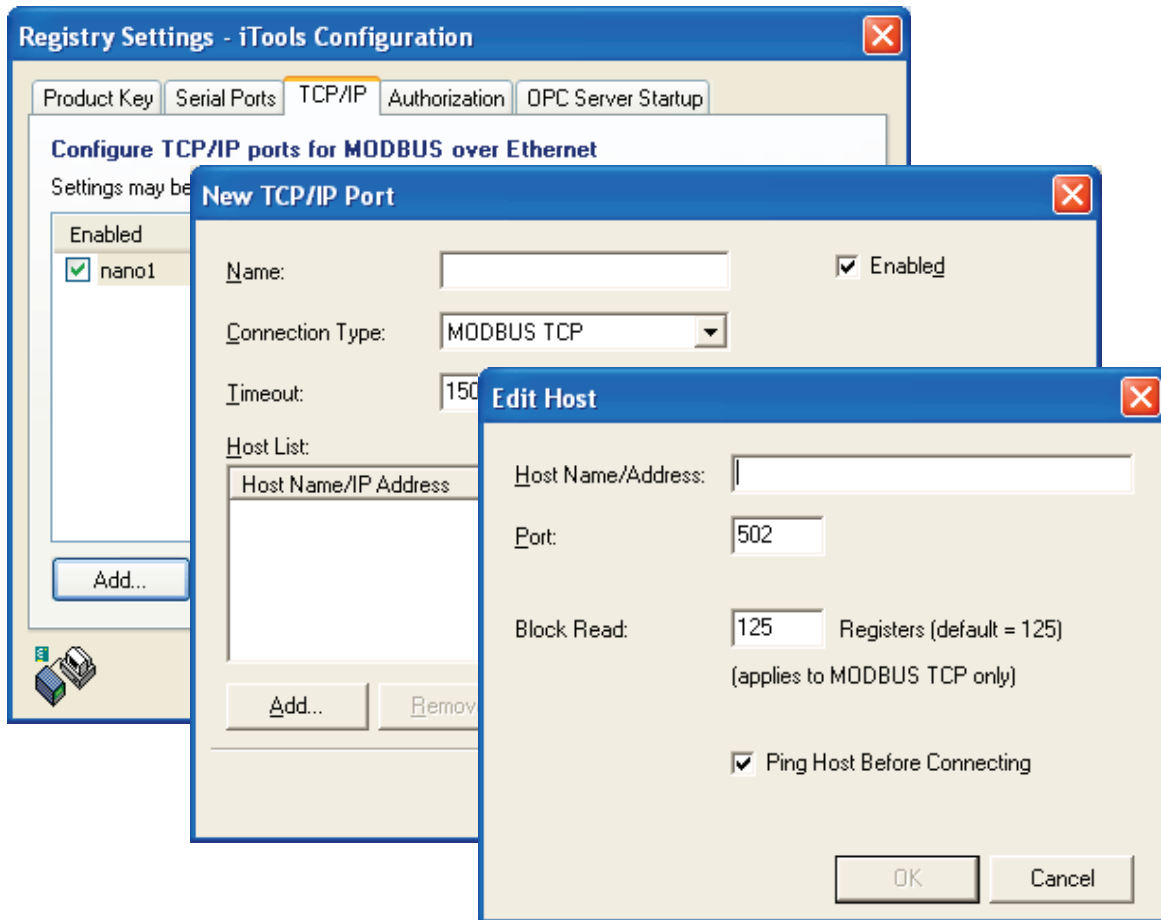


Figure 113 Adding a new Ethernet port

To check that the PC can now communicate with the instrument, Click 'Start'. 'All Programs', 'Accessories', 'Command Prompt'

when the Command Prompt box appears, type in: Ping<Space>IP1.IP2.IP3.IP4<Enter> (where IP1 to IP4 are the IP address of the instrument).

If the Ethernet link to the instrument is operating correctly, the 'successful' reply arrives. Otherwise, the 'failed' reply arrives, in which case, the Ethernet link, IP address, and PC port details should be verified.

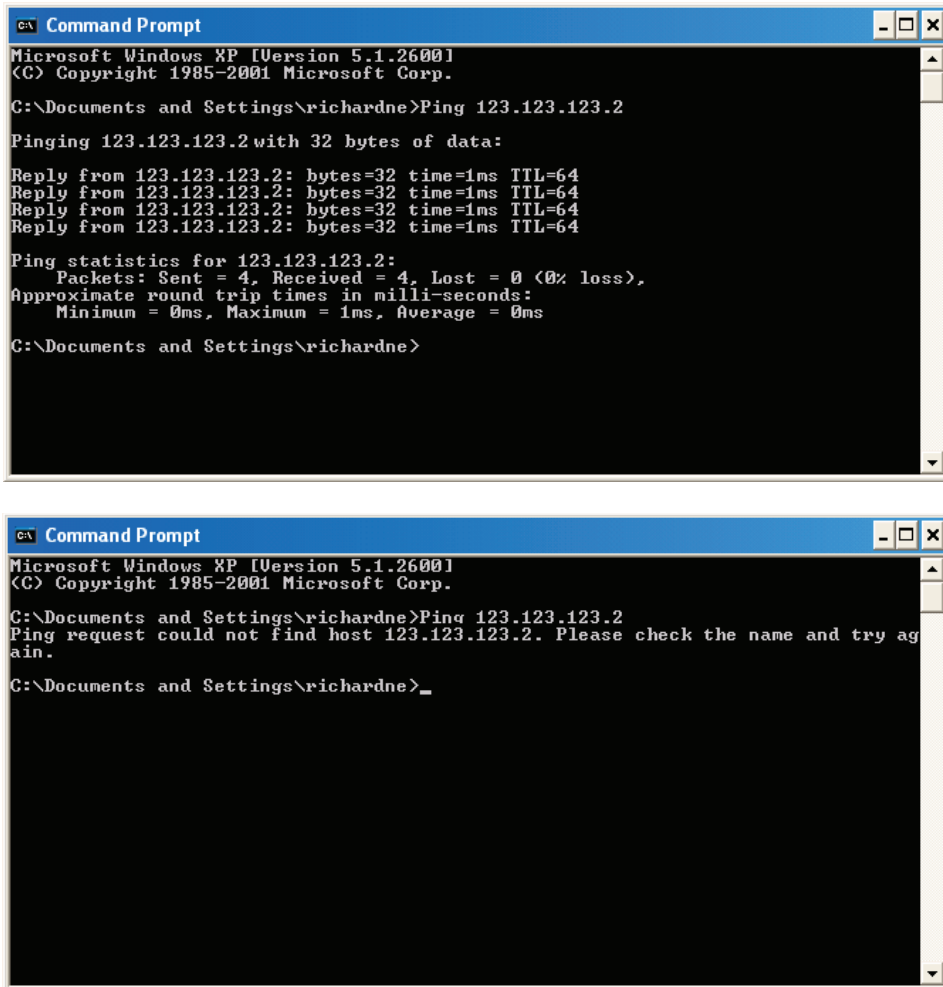


Figure 114 Command prompt 'Ping' screens (typical)

Once the Ethernet link to the instrument has been verified, iTools can be started (or shut down and restarted), and the Scan toolbar icon used, to 'find' the instrument. The scan can be stopped at any time by clicking on the Scan icon a second time.

See Section 9.2 for more details of the scan procedure.



### 9.1.2 Direct Connection

This section describes how to connect a PC directly to the instrument.

#### WIRING

Connection is made from the Ethernet connector at the rear of the Instrument to an Ethernet RJ45 connector, usually located at the rear of the PC. The cable can be either a 'cross-over' or 'straight through' type.



PC Ethernet connector.

Once wired correctly, and powered up, it is necessary to enter a suitable IP address and subnet mask into the Comms configuration of the Driver Module. This information can be found as follows:

1. At the PC, click 'Start'. 'All Programs', 'Accessories', 'Command Prompt'.
2. When the Command Prompt box appears, type IPConfig and press <Enter>.

The response is a display, such as that shown below, giving the IP address and Subnet mask of the PC. Choose an address in the range covered by these two values.

A subnet mask element of 255 means that the equivalent element of the IP address must be used unchanged. A subnet mask element of 0 means that the equivalent element of the IP address may take any value between 1 and 255 (0 is not allowed). In the example below, the range of IP addresses which may be chosen for the Driver Module is 123.123.123.2 to 123.123.123.255. (123.123.123.0 is not allowed and 123.123.123.1 is the same as the PC's address, and may therefore not be used.)

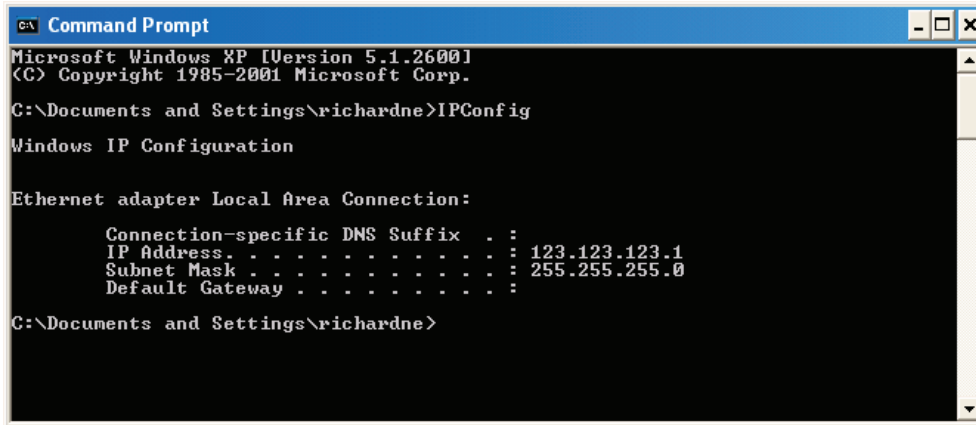


Figure 115 IP Config command

3. In Network.Interface configuration (Section 6.2.1) enter the selected IP address and the subnet mask (as it appears in the command prompt window) in the relevant parts of the menu.
4. Check communications by 'pinging' as described in Section 9.1.1.

Once the link to the instrument has been verified, iTools can be started (or shut down and re-started), and the Scan toolbar icon used, to 'find' the instrument. The scan can be stopped at any time by clicking on the Scan icon a second time.

See Section 9.2 for more details of the scan procedure.

**Subnet Masks and IP addresses.**

Subnet Masks are most readily understood when looked at in binary format. For example, a mask of 255.255.240.10 can be re-written as: 11111111.11111111.11110000.00001010. In such a case, IP addresses 11111111.11111111.1111xxxx.xxxx1x1x would be recognized (where x can be either a 0 or 1)


Subnet mask	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0	1	0
IP addresses (Binary)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	x	x	x	x	x	x	x	1	x	1	x
IP addresses (decimal)	255								255								240 to 255				10, 11, 14, 15, 26, 27, 30, 31, 42, 43, 46, 47 etc.									

## 9.2 SCANNING FOR INSTRUMENTS

Clicking on the 'Scan' toolbar icon causes a dialog box (Figure 116) to appear. This allows the user to define a search range of addresses.



- Note:** 1. The relevant instrument address is that entered in the Network.Modbus configuration item (Section 6.2.4, and it can take any value between 1 and 254 inclusive, as long as it is unique to the comms link.
- Note:** 2. The default selection (Scan all device addresses...) will detect any instrument on the serial link, which has a valid address.

As the search progresses, any instruments detected by the scan appear as thumbnails (faceplates) in the 'Panel Views' area, normally located at the bottom of the iTools screen. (options/Panel Views position allows this area to be moved to the top of the window, or the Close icon  can be used to close it. Once closed it can be re-opened by clicking on 'Panel Views' in the 'View' menu.)

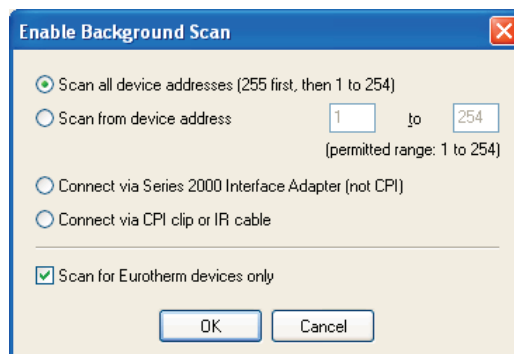


Figure 116 Scan range enable

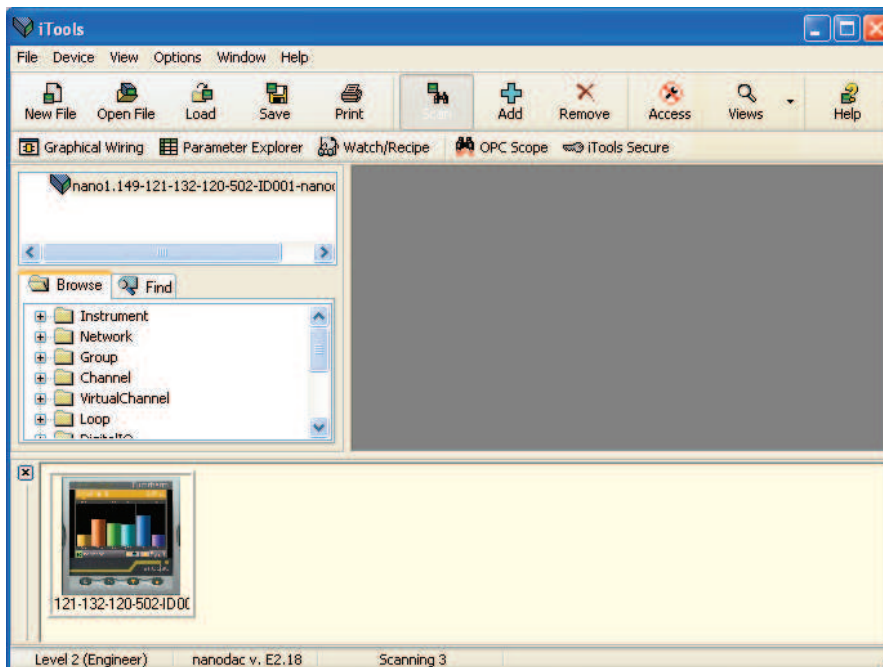


Figure 117 iTools initial window with one instrument detected

Once the instrument has been detected stop the scan. When the instrument has synchronized, click on the 'Access' button to enter configuration mode (a password might be required). Once the editing session is complete, click on the 'Access' button again to quit configuration mode.

### 9.3 GRAPHICAL WIRING EDITOR Graphical Wiring

Clicking on the Graphical Wiring Editor tool bar icon causes the Graphical wiring window for the current instrument configuration to open.

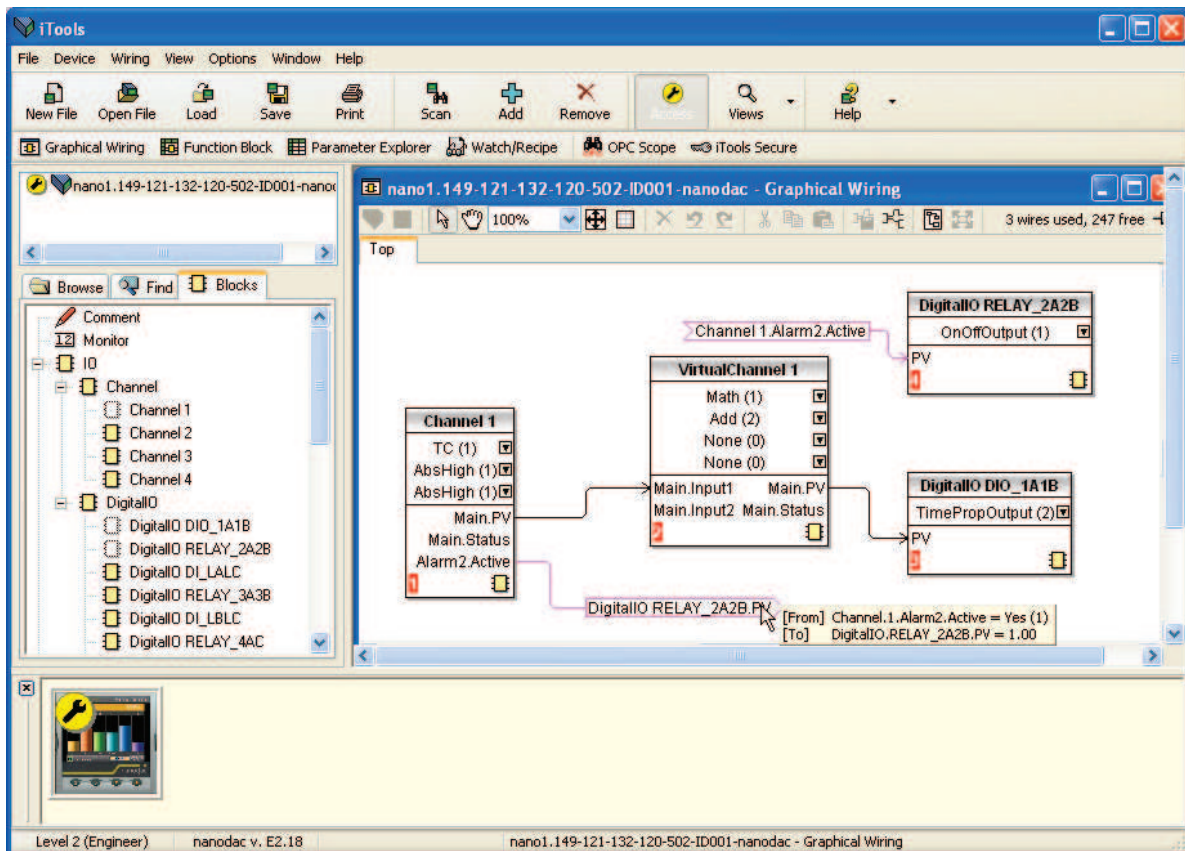












Figure 118 Graphical wiring Editor

The graphical wiring editor allows:

1. Function blocks, notes, comments etc. to be 'drag and dropped' into the wiring diagram from the tree list (left pane).
2. Parameters to be wired to one another by clicking on the output, then clicking on the required input.
3. Viewing and/or editing of parameter values by right-clicking on a function block and selecting 'Function Block View'.
4. The user to select parameter lists and to switch between parameter and wiring editors.
5. Completed wiring to be downloaded to the instrument (function blocks and wiring items with dashed outlines are new, or have been edited since the last download).

### 9.3.1 Tool bar



-  Download wiring to instrument.
-  Mouse select. Select normal mouse operation. Mutually exclusive with 'Mouse Pan' below.
-  Mouse Pan. When active, this causes the mouse cursor to change to a hand-shaped icon. Allows the graphical wiring diagram to be click-dragged within the GWE window aperture.
-  100% Zoom. Allows the magnification factor of the wiring diagram to be selected.
-  Pan tool. Whilst left clicked, the cursor appears as a rectangle showing which part of the wiring diagram is currently displayed. Click dragging allows the rectangle to be moved freely about the diagram. The size of the rectangle depends on the zoom setting.
-  Show/Hide grid. This toggles an alignment grid on and off.
-  Undo, redo. Allows the user to undo the last action, or, once an undo action has taken place, to undo the undo. Short cuts are <Ctrl>+<Z>. for undo; <Ctrl>+<V>, for redo.
-  Cut, Copy, Paste. Normal Cut (copy and delete), Copy (copy without delete) and Paste (insert into) functions. Shortcuts are: <Ctrl> + <X> for 'Cut'; <Ctrl> + <C> for copy and <Ctrl> + <V> for Paste.
-  Copy diagram fragment; Paste diagram fragment. Allows a part of the wiring diagram to be selected, named and be saved to file. The fragment may then be pasted into any wiring diagram, including the source diagram.
-  Create compound; Flatten compound. These two icons allow compounds to be created and 'un-created' (flattened).

### 9.3.2 Wiring Editor Operating Details

#### COMPONENT SELECTION

Single wires are shown with boxes at 'corners' when selected. When more than one wire is selected, as part of a group, the wire color changes to magenta. All other items have a dashed line drawn round them when selected.

Clicking on a single item selects it. An Item can be added to the selection by holding down the control key (Ctrl) whilst clicking on the item. (A selected item can be deselected in the same way.) If a block is selected, then all its associated wires are also selected.

Alternatively, the mouse can be click-dragged on the background to create a 'rubber band' round the relevant area; anything within this area being selected when the mouse is released.

<Ctrl>+<A> selects all items on the active diagram.

#### BLOCK EXECUTION ORDER

The order in which the blocks are executed by the instrument depends on the way in which they are wired. Each block displays its place in its sequence in a colored block in the bottom left-hand corner (Figure 119).

#### FUNCTION BLOCKS

A Function Block is an algorithm which may be wired to and from other function blocks to make a control strategy. Each function block has inputs and outputs. Any parameter may be wired from, but only parameters that are alterable in Operator Mode may be wired to. A function block includes any parameters that are needed to configure or operate the algorithm. The inputs and outputs which are considered to be of most use are always shown. In most cases all of these need to be wired before the block can perform a useful task.

If a function block is not faded in the tree (left hand pane) it can be dragged onto the diagram. The block can be dragged around the diagram using the mouse.

A Channel block is shown below as an example. When block type information is alterable (as in this case) click on the box with the down arrow in it to display a dialog box allowing the value to be edited.

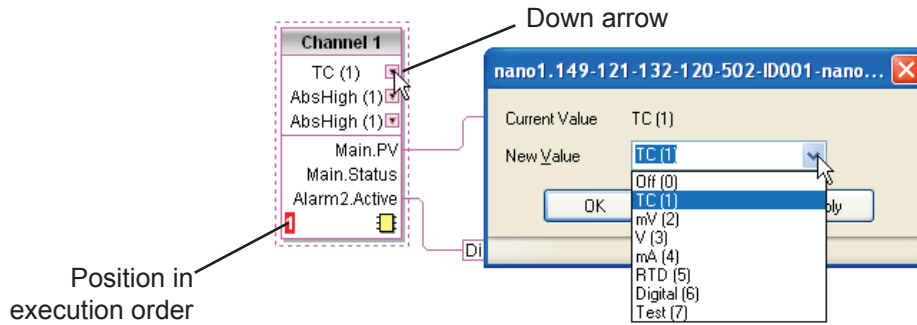


Figure 119 Function block example

If it is required to wire from a parameter, which is not shown as a recommended output, click on the 'Click to Select Output' icon in the bottom right hand corner to display a full list of parameters in the block (Figure 121, below). Click on one of these to start a wire.



FUNCTION BLOCK CONTEXT MENU

Right-click in the function block to display the context menu.

**Function block view** Displays a list of parameters associated with the function block. 'Hidden' parameters can be displayed by de-selecting 'Hide Parameters and Lists when not Relevant in the options menu 'Parameter availability setting...'

**Re-Route wires** Redraws all wiring associated with the function block.

**Re-route input wires** Redraws all input wiring associated with the function block.

**Re-route output wires** Redraws all output wiring associated with the function block.

**Show wiring using tags** Wires are not drawn, but their start and end destinations are indicated by tags instead. Reduces wire clutter in diagrams where source and destination are widely separated.

Hovering the cursor over the tag shows both its source and destination parameters and their values.

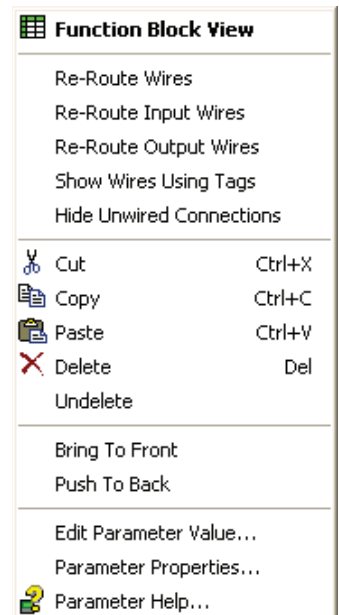
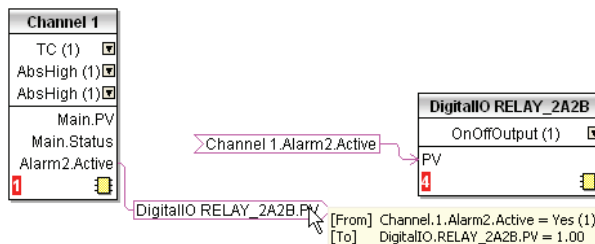


Figure 120 Function block context menu

**Hide unwanted connections**

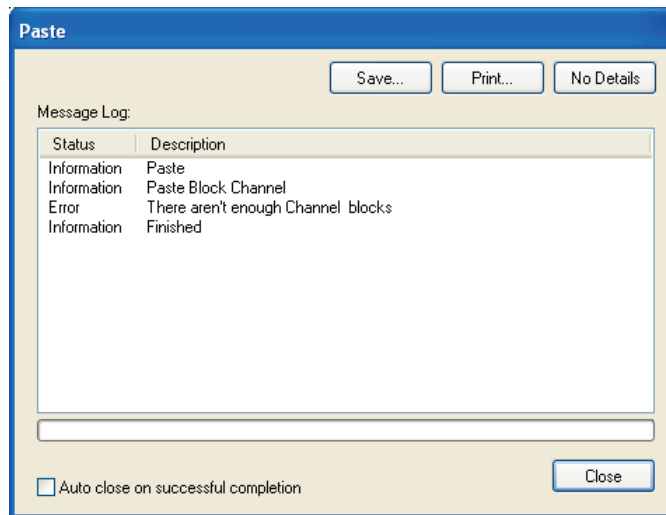
Causes the display to include only wired items.

**Cut**

Allows one or more selected items to be moved to the Clipboard ready for pasting into another diagram or compound, or for use in a Watch window, or OPC scope. The original items are grayed out, and function blocks and wires are shown dashed until next download, after which they are removed from the diagram. Short cut = <Ctrl>+<X>. Cut operations carried out since the last download can be 'undone' by using the 'Undo' tool bar icon, by selecting 'Undelete' or by using the short cut <Ctrl>+<Z>.

**Copy** Allows one or more selected items to be copied to the Clipboard ready for pasting into another diagram or compound, or for use in a Watch window, or OPC scope. The original items remain in the current wiring diagram. Short cut = <Ctrl>+<C>. If items are pasted to the same diagram from which they were copied, the items will be replicated with different block instances. Should this result in more instances of a block than are available, an error display appears showing details of which items couldn't be copied.

**Paste** Copies items from the Clipboard to the current wiring diagram. Short cut = <Ctrl>+<V>. If items are pasted to the same diagram from which they were copied, the items will be replicated with different block instances. Should this result in more instances of a block than are available, a Paste error display appears showing details of those items which could not be copied.



**Delete** Marks all selected items for deletion. Such items are shown dashed until next download, after which they are removed from the diagram. Short cut = <Del>.

**Undelete** Reverses 'Delete' and 'Cut' operations carried out on selected item(s) since the last download.

**Bring to Front** Brings selected items to the front of the diagram.

**Push to Back** Sends the selected items to the back of the diagram.

**Edit Parameter Value...** This menu item is active if the cursor is hovering over an editable parameter. Selecting this menu item causes a pop-up window to appear, which allows the user to edit the parameter value.

**Parameter Properties** This menu item is active if the cursor is hovering over an editable parameter. Selecting this menu item causes a pop-up window to appear, which allows the user to view the parameter properties, and also, to view the parameter Help (by clicking on the 'Help' tab).

**Parameter Help** Produces Parameter Properties and Help information for the selected function block or parameter, depending on the hover position of the cursor, when the right-click occurs.



## WIRES

To make a wire:

1. Drag two (or more) blocks onto the diagram from the function block tree.
2. Start a wire by either clicking on a recommended output or clicking on the 'Click to Select output' icon at the bottom right corner of the block to bring up the connection dialog, and clicking on the required parameter. Recommended connections are shown with a green plug symbol; other parameters which are available being shown in yellow. Clicking on the red button causes all parameters to be shown. To dismiss the connection dialog either press the escape key on the keyboard, or click the cross at the bottom left of the dialog box.
3. Once the wire has started a dashed wire is drawn from the output to the current mouse position. To complete the wire click on the required destination parameter.
4. Wires remain dashed until they are downloaded.

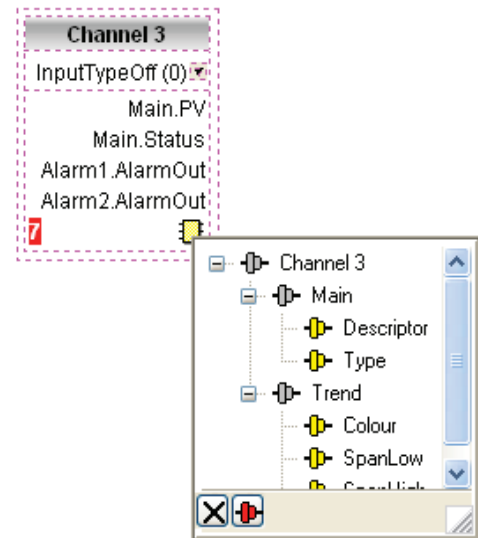


Figure 121 Output selection dialog box.

### Routing wires

When a wire is placed it is auto-routed. The auto routing algorithm searches for a clear path between the two blocks. A wire can be auto-routed again using the context menus or by double clicking the wire. A wire segment can be edited manually by click-dragging. If the block to which it is connected is moved, the end of the wire moves with it, retaining as much of the path as possible.

If a wire is selected by clicking on it, it is drawn with small boxes on its corners.

### Wire Context Menu

Right click on a wire to display the wire block context menu:

**Force Exec Break** When wires form a loop, a break point must be introduced, where the value written to the block comes from a source which was last executed during the previous cycle. A break is automatically placed by iTools, and appears in red . Force Exec Break allows the user to define where a break must be placed. Surplus breaks appear in black.

**Task Break** Not used in this product.

**Re-Route wire** Replaces the current wire route with a new route generated from scratch.

**Use Tags** Toggles between wire and tag mode between parameters. Tag mode is useful for sources and destinations which are widely separated.

**Find Start** Goes to the source of the wire.

**Find End** Goes to the destination of the wire.

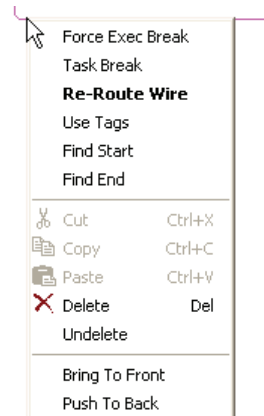
**Cut, Copy, Paste** Not used in this context.

**Delete** Marks the wire for deletion. The wire is redrawn as a dashed line (or dashed tags) until next download. Operation can be reversed until after next download.

**Undelete** Reverses the effect of the Delete operation up until the next download, after which, Undelete is disabled.

**Bring to Front** Brings the wire to the front of the diagram.

**Push to Back** Sends the wire to the back of the diagram.



### Wire Colors

Black	Normal functioning wire.
Red	The wire is connected to a non-changeable parameter. Values are rejected by the destination block.
Magenta	A normal functioning wire is being hovered-over by the mouse cursor.
Purple	A red wire is being hovered-over by the mouse cursor.
Green	New Wire (dashed green wire changes to solid black after being downloaded).

**COMMENTS**

Comments are added to a wiring diagram by click-dragging them from the Function Block tree onto the diagram. As soon as the mouse is released, a dialog box opens to allow the comment text to be entered.

Carriage returns are used to control the width of the comment. Once text entry is complete, 'OK' causes the comment to appear on the diagram. There are no restrictions on the size of a comment. Comments are saved to the instrument along with the diagram layout information.

Comments can be linked to function blocks and wires by clicking on the chain icon at the bottom right-hand corner of the comment box and then clicking again on the required block or wire. A dashed line is drawn to the top of the block or to the selected wire segment (Figure 123).

**Note:** Once the comment has been linked, the Chain icon disappears. It re-appears when the mouse cursor is hovered over the bottom right-hand corner of the comment box.

**Comment Context Menu**

Edit	Opens the Comment dialog box to allow the comment text to be edited.
Unlink	Deletes the current link from the comment.
Cut	Moves the comment to the Clipboard, ready to be pasted elsewhere. Short cut = <Ctrl>+<X>.
Copy	Copies the comment from the wiring diagram to the Clipboard, ready to be pasted elsewhere. Short cut = <Ctrl>+<C>.
Paste	Copies a comment from the Clipboard to the wiring diagram. Short cut = <Ctrl>+<V>.
Delete	Marks the comment for deletion at next download.
Undelete	Undoes the Delete command if download has not taken place since.

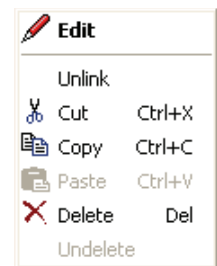


Figure 122 Comment context menu

**MONITORS**

Monitor points are added to a wiring diagram by click-dragging them from the Function Block tree onto the diagram. A monitor shows the current value (updated at the iTools parameter list update rate) of the parameter to which it is linked. By default the name of the parameter is shown. To hide the parameter name either double click on the monitor box or 'Show Names' in the context (right-click) menu can be used to toggle the parameter name on and off.

Monitors are linked to function blocks and wires by clicking on the chain icon at the bottom right-hand corner of the box and then clicking again on the required parameter. A dashed line is drawn to the top of the block or the selected wire segment.

**Note:** Once the monitor has been linked, the Chain icon disappears. It re-appears when the mouse cursor is hovered over the bottom right-hand corner of the monitor box.

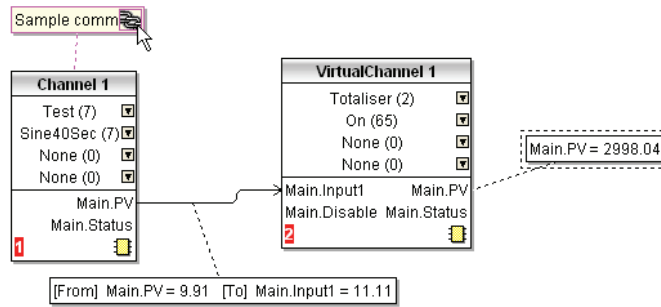


Figure 123 Comment and Monitor appearance

Monitor Context Menu

- Show names Toggles parameter names on and off in the monitor box.
- Unlink Deletes the current link from the monitor.
- Cut Moves the monitor to the Clipboard, ready to be pasted elsewhere. Short cut = <Ctrl>+<X>.
- Copy Copies the monitor from the wiring diagram to the Clipboard, ready to be pasted elsewhere. Short cut = <Ctrl>+<C>.
- Paste Copies a monitor from the Clipboard to the wiring diagram. Short cut = <Ctrl>+<V>.
- Delete Marks the monitor for deletion at next download.
- Undelete Undoes the Delete command if download has not taken place since.
- Bring to Front Moves the item to the 'top' layer of the diagram.
- Push to Back Moves the item to the 'bottom' layer of the diagram.
- Parameter Help Shows parameter help for the item.

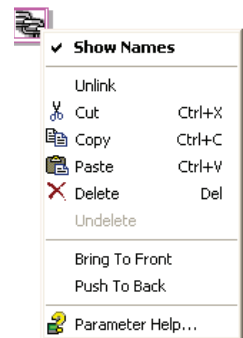


Figure 124 Monitor context menu

**DOWNLOADING**

When the wiring editor is opened the current wiring and diagram layout is read from the instrument. No changes are made to the instrument function block execution or wiring until the download button is pressed. Any changes made using the operator interface after the editor is opened are lost on download.

When a block is dropped onto the diagram, instrument parameters are changed to make the parameters for that block available. If changes are made and the editor is closed without saving them there is a delay while the editor clears these parameters.

During download, the wiring is written to the instrument which then calculates the block execution order and starts executing the blocks. The diagram layout including comments and monitors is then written into instrument flash memory along with the current editor settings. When the editor is reopened, the diagram is shown positioned as it was when it was last downloaded.

**COLORS**

Items on the diagram are colored as follows:

- Red Items which totally or partially obscure other items and items which are totally or partially obscured by other items. Wires that are connected to unalterable or non-available parameters. Execution breaks.
- Blue Non-available parameters in function blocks.
- Green Items added to the diagram since last download are shown as green dashed lines.
- Magenta All selected items, or any item over which the cursor is hovering.
- Purple Red wires when being hovered over by the mouse cursor.
- Black All items added to the diagram before the last download. Redundant execution breaks. Monitor and comment text.

**DIAGRAM CONTEXT MENU**

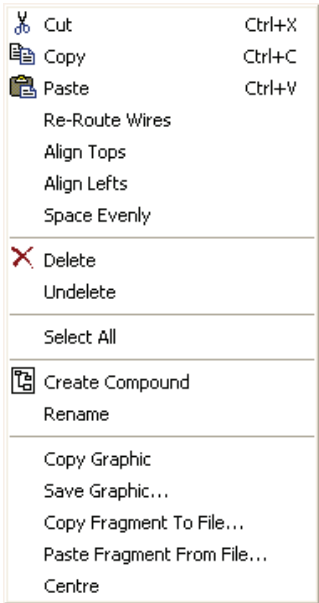
Cut	Active only when the right click occurs within the bounding rectangle which appears when more than one item is selected. Moves the selection off the diagram to the Clipboard. Short cut = <Ctrl>+<X>.	
Copy	As for 'Cut', but the selection is copied, leaving the original on the diagram. Short cut = <Ctrl>+<C>.	
Paste	Copies the contents of the Clipboard to the diagram. Short cut = <Ctrl>+<V>.	
Re-Route wires	Reroutes all selected wires. If no wires are selected, all wires are re-routed.	
Align Tops	Aligns the tops of all blocks in the selected area.	
Align Lefts	Aligns the left edges of all blocks in the selected area.	
Space Evenly	Spaces selected items such that their top left corners are spaced evenly across the width of the diagram. Click on the item which is to be the left-most item, then <Ctrl>+<left click> the remaining items in the order in which they are to appear.	
Delete	Marks the item for deletion at next download time. Can be 'Undeleted' up until download occurs.	
Undelete	Reverses the action of 'Delete' on the selected item.	
Select All	Selects all items on the current diagram.	
Create Compound	Active only when the right click occurs, in the top level diagram, within the bounding rectangle which appears when more than one item is selected. Creates a new wiring diagram as described in 'Compound', below.	
Rename	Allows a new name to entered for the current wiring diagram. This name appears in the relevant tab.	
Copy Graphic	Copies the selected items (or the whole diagram if no items are selected) to the clipboard as a Windows metafile, suitable for pasting into a documentation application. Wiring entering/leaving the selection (if any) are drawn in tag mode.	
Save Graphic...	As for 'Copy Graphic' above, but saves to a user-specified file location instead of the clipboard.	
Copy Fragment To File...	Copies selected items to a user-named file in folder 'My iTools Wiring Fragments' located in 'My Documents'.	
Paste Fragment From File	Allows the user to select a stored fragment for inclusion in the wiring diagram.	
Centre	Places the display window at the centre of the selected items. If 'Select All' has previously been clicked-on, then the display widow is placed over the centre of the diagram.	

Figure 125 Diagram context menu

**COMPOUNDS**

Compounds are used to simplify the top level wiring diagram, by allowing the placing of any number of function blocks within one 'box', the inputs and outputs of which operate in the same way as those of a normal function block.

Each time a compound is created, a new tab appears at the top of the wiring diagram. Initially compounds and their tabs are named 'Compound 1', 'Compound 2', etc. but they can be renamed by right clicking either on the compound in the top level diagram, or anywhere within an open Compound, selecting 'Rename' and typing in the required text string (16 characters max).

Compounds cannot contain other compounds (i.e. they can be created only in the top level diagram).

**Compound creation**

1. Empty compounds are created within the top level diagram by clicking on the 'Create Compound' tool bar icon.

- Compounds can also be created by highlighting one or more function blocks in the top level diagram and then clicking on the 'Create Compound' tool bar icon. The highlighted items are moved from the top level diagram into a new compound.
- Compounds are 'uncreated' (flattened), by highlighting the relevant item in the top level menu and then clicking on the 'Flatten Compound' tool bar icon. All the items previously contained within the compound appear on the top level diagram.
- Wiring between top level and compound parameters is carried out by clicking on the source parameter, then clicking on the compound (or the compound tab) and then clicking on the destination parameter. Wiring from a compound parameter to a top level parameter or from compound to compound is carried out in similar manner.
- Unused function blocks can be moved into compounds by dragging from the tree view. Existing blocks can be dragged from the top level diagram, or from another compound, onto the tab associated with the destination compound. Blocks are moved out of compounds to the top level diagram or to another compound in a similar way. Function blocks can also be 'cut and pasted'.
- Default compound names (e.g. 'Compound 2') are used only once, so that if, for example, Compounds 1 and 2 have been created, and Compound 2 is subsequently deleted, then the next compound to be created will be named 'Compound 3'.
- Top level elements can be click-dragged into compounds.



## TOOL TIPS

Hovering the cursor over the block displays 'tooltips' describing that part of the block beneath the cursor. For function block parameters the tooltip shows the parameter description, its OPC name, and, if downloaded, its value. Similar tooltips are shown when hovering over inputs, outputs and over many other items on the iTools screen.

A Function Block is enabled by dragging the block onto the diagram, wiring it, and finally downloading it to the instrument. Initially blocks and associated wires are drawn with dashed lines, and when in this state the parameter list for the block is enabled but the block is not executed by the instrument.

The block is added to the instrument function block execution list when the 'Download' icon is operated and the items are redrawn using solid lines.

If a block which has been downloaded is deleted, it is shown on the diagram in a ghosted form until the download button is pressed. (This is because it and any wires to/from it are still being executed in the instrument. On download it will be removed from the instrument execution list and the diagram.) A ghosted block can be 'undeleted' as described in 'Context menu', above.

When a dashed block is deleted it is removed immediately.

## 9.4 PARAMETER EXPLORER Parameter Explorer

This view can be displayed:

1. by clicking on the 'Parameter Explorer' toolbar icon,
2. by double clicking on the relevant block in the tree pane or in the graphical wiring editor,
3. by selecting 'Function Block View' from the Function block context menu in the Graphical wiring Editor,
4. by selecting 'parameter Explorer' from the 'View' menu,
5. by using the short cut <Alt>+<Enter>.

In each case the function block parameters appear in the iTools window in tabular form, such as the example in Figure 126, below.

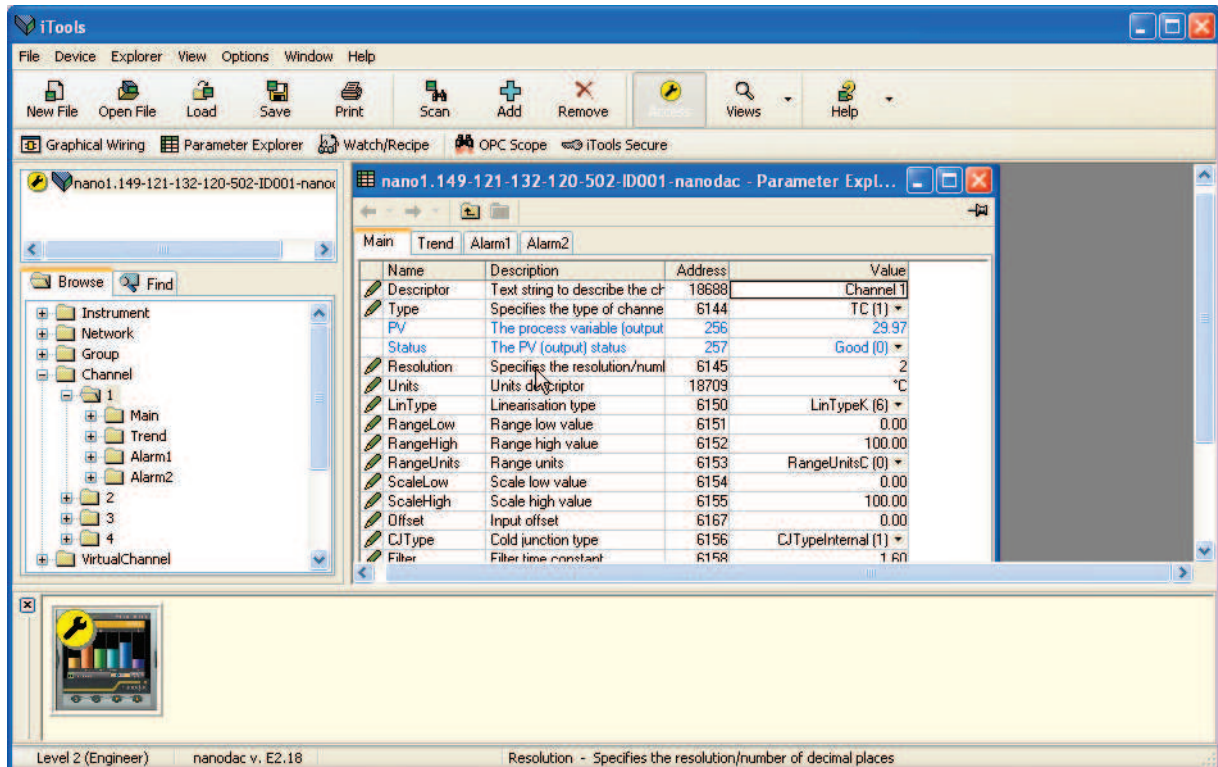


Figure 126 Parameter table example

The figure above shows the default table layout. Columns can be added/deleted from the view using the 'Columns' item of the Explorer or context menus (Figure 127).

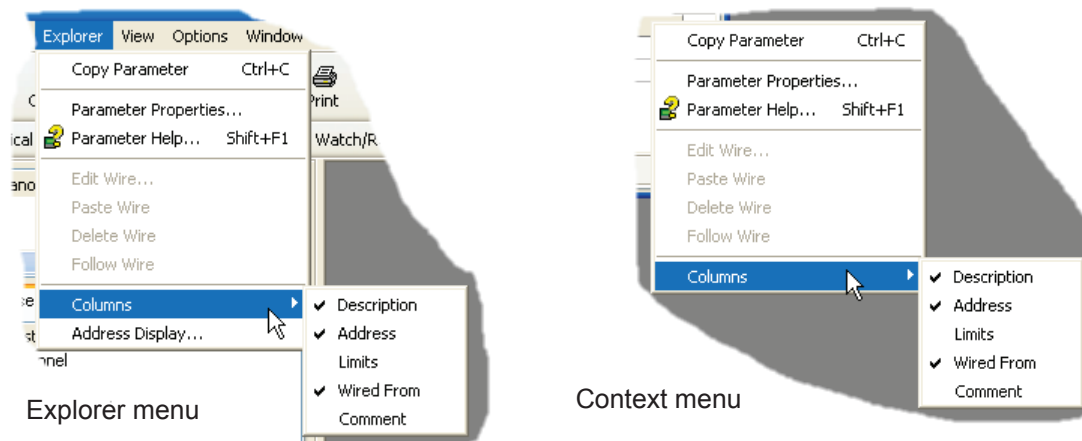


Figure 127 Column enable/disable

### 9.4.1 Parameter explorer detail

Figure 128 shows a typical parameter table. This particular parameter has a number of subfolders associated with it, and each of these is represented by a ‘tab’ across the top of the table.

Name	Description	Address	Value	Wired From
Descriptor	Text string to describe the channel	18688	Channel 1	
Type	Specifies the type of channel	6144	TC (1)	
PV	The process variable (output) of the channel	256	37.38	
Status	The PV (output) status	257	Good (0)	
IPAdjustState	Input Adjust state either Unadjusted or Adjusted	6166	Unadjusted (0)	
PV2	The secondary input process variable (output) of the channel	272	0.00	
Status2	The secondary input PV (output) status	273	Good (0)	
IPAdjustState2	Secondary Input Adjust state either Unadjusted or Adjusted	6172	Unadjusted (0)	
OpenString	Open String	18796	Open	
CloseString	Close String	18832	Closed	
Resolution	Specifies the resolution/number of decimal places	6145	1	
Units	Units descriptor	18709	°C	
TestSignal	Test signal	6146	Triangle5Hr (0)	
InputLow	Input range low value	6147	0.00	
InputHigh	Input range high value	6148	1.00	
Shunt	Shunt value	6149	2.49	
LinType	Linearisation type	6150	LinTypeK (6)	
RangeLow	Range low value	6151	0.00	
RangeHigh	Range high value	6152	50.00	
RangeUnits	Range units	6153	RangeUnitsC (0)	
ScaleLow	Scale low value	6154	0.00	
ScaleHigh	Scale high value	6155	50.00	
ScaleLow2	Scale low value for the secondary input	6170	0.00	
ScaleHigh2	Scale high value for the secondary input	6171	50.00	
Offset	Input offset	6167	0.00	
Offset2	Secondary input offset	6168	0.00	
CJType	Cold junction type	6156	CJTypeInternal (1)	
ExtCJTemp	External CJ temperature	6157	0.00	
Filter	Filter time constant	6158	1.60	

Figure 128 Typical parameter table



- Note:** 1. Parameters in blue are non-editable (Read only). In the example above all the parameters are read only. Read/write parameters are in black and have a ‘pencil’ symbol in the ‘read/Write access column at the left edge of the table. A number of such items are shown in Figure 128, above.
- Note:** 2. Columns. The default explorer window (Figure 126) contains the columns ‘Name’, ‘Description’, ‘Address’, ‘Value’, and ‘Wired From’. As can be seen from Figure 127, the columns to be displayed can be selected, to a certain extent, using either the ‘Explorer’ menu or the context menu.
- Note:** 3. Hidden Parameters. By default, iTools hides parameters which are considered irrelevant in the current context. Such hidden parameters can be shown in the table using the ‘Parameter availability’ settings item of the options menu (Figure 129). Such items are displayed with a shaded background.
- Note:** 4. The full pathname for the displayed parameter list is shown at the bottom left hand corner of the window.

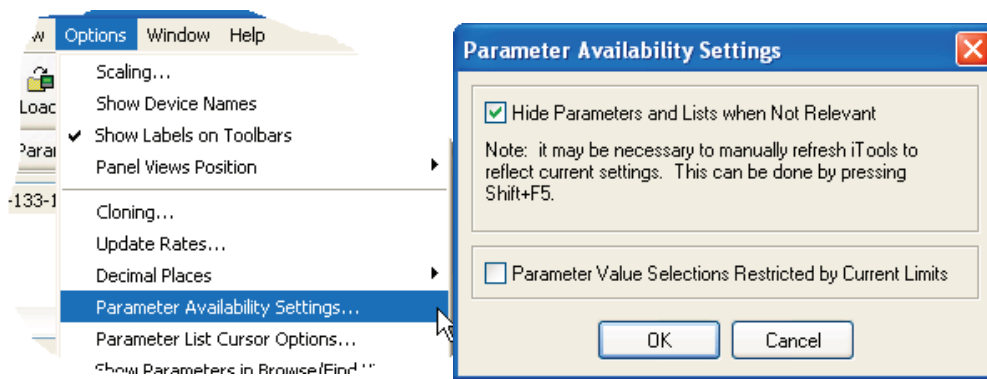


Figure 129 Show/Hide parameters

### 9.4.2 Explorer tools

A number of tool icons appear above the parameter list:



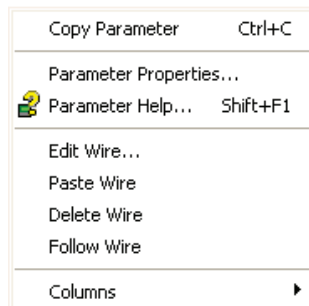
Back to: and Forward to: The parameter explorer contains a history buffer of up to 10 lists that have been browsed in the current instance of the window. The 'Back to: (list name)' and 'Forward to: (list name)' icons allow easy retracing or repeating of the parameter list view sequence.

If the mouse cursor is hovered over the tool icon, the name of the parameter list which will appear if the icon is clicked-on appears. Clicking on the arrow head displays a pick list of up to 10 previously visited lists which the user can select. Short cut = <Ctrl>+<B> for 'Back to' or <Ctrl>+<F> for 'Forward to'.

Go Up a Level, Go Down a Level. For nested parameters, these buttons allow the user to navigate 'vertically' between levels. Short cut = <Ctrl>+<U> for 'Go Up a Level' or <Ctrl>+<D> for 'Go Down a Level'.

Push pin to give the window global scope. Clicking on this icon causes the current parameter list to be permanently displayed, even if another instrument becomes the 'current device'.

### 9.4.3 Context Menu



Copy Parameter Copies the clicked-on parameter to the clipboard

Parameter properties Displays parameter properties for the clicked-on parameter

Parameter Help... Displays help information for the clicked-on parameter

Edit/Paste/Delete/Follow Wire Not used in this application

Columns Allows the user to enable/disable a number of parameter table columns (Figure 128).



## 10 USER WIRING

User wiring, created from the instrument front panel, allows parameters to be wired together so that, for example, a counter can be configured to be incremented when an alarm goes active. This can be used as an alternative to iTools.

This section is presented as two examples that show the general techniques used to create and delete wires from the instrument user interface.



Note: 1. These examples refer to Channel Configuration and to Virtual Channel configuration, descriptions of which are to be found in Section 6.4 and Section 6.5, respectively.

Note: 2. The destination parameter field has a small green triangle at the top left corner to indicate that it has a wire routed to it.

3A/3B (Relay)

### 10.1 DRIVE RELAY EXAMPLE

To drive the relay whose terminal contacts are 3A/3B, whilst the temperature being measured by Channel 2 exceeds 30°C. For this example Channel 2 alarm 1 and a hysteresis of 4°C will be used.

- In channel 2, Alarm 1 page (see note), set the following parameters:  
 Type: Abs. High  
 Threshold: 30  
 Hysteresis: 4  
 Latch: None  
 Block: Off  
 Dwell: 00:00:00  
 Acknowledge: No

Channel.2.Alarm1	
Type	Abs Hi
Status	Active Not ackd
Threshold	30.0
Hysteresis	4.0
Latch	None
Block	Off
Dwell	00:00:00
Acknowledge	No
Active	Yes
Inactive	No
N.acknowledged	Yes
Acknowledgement	No
Inhibit	x

Figure 130 Channel 2, Alarm 1 set up



**Note:** The channel alarm areas of configuration become accessible only once the channel with which they are associated has been configured with a suitable 'Type' (Section 6.4.1).

2. Highlight the 'Active' field, and press and hold the scroll button for a few seconds, until the top level User Wiring page appears. The name of the selected parameter appears at the top of the page. Any already existing wires from this parameter would appear below the 'Add new wire' area.
3. With 'Add new wire' highlighted operate the scroll button.
4. Use the down arrow to highlight 'Digital I/O' and press the scroll button.
5. Use the down arrow to highlight '3A3B (Relay)' and press the scroll button.
6. Use the down arrow to highlight 'PV' and press the scroll button. (If this parameter is already wired-to, the 'wired' symbol appears to the left of the parameter).
7. When the confirmation window appears, use the up or down arrow to highlight 'Ok', then operate the scroll button again.
8. The top level user wiring page reappears, showing the destination parameter.



### 10.1.1 Wire removal

At the top level user wiring page, use the up and down arrow buttons to highlight the wire to be deleted, and operate the scroll key. In the 'Delete Wire' confirmation window, highlight 'Ok' and operate the scroll key again. The wire is deleted without further confirmation.

## 10.2 COUNTER EXAMPLE

This example shows how to set up a counter to be incremented each time Channel 1 Alarm 1 becomes active, and reset each time channel 2, alarm 1 is acknowledged. For this example, Virtual Channel 3 will be configured as the counter, with a preset value of 0.

1. At Channel.1.Main, set:
  - Type = test
  - Test Signal = Sine 4 min.
  - Scale Low = 0
  - Scale High = 100
2. At Channel.1.Alarm1, set:
  - Type = Abs Hi
  - Threshold = 50
  - Latch = None
3. At Channel.2.Main, set:
  - Type = Test
  - Test Signal = Sine 40 min.
  - Scale Low = 0
  - Scale High = 100
4. At Channel.2.Alarm 1, set:
  - Type = Abs Hi
  - Threshold = 90
  - Latch = Manual
5. At Virtual Channel.3.Main, set:
  - Type = Counter
  - Operation = On
  - Input = 1

All the other parameters can be left at their defaults.

6. Still at Virtual Channel 3 (Main), use the up/down arrow buttons to highlight 'Trigger'. Press and hold the scroll key. The top level User Wiring page appears, this time with a 'From Source' tab as well as the 'To Destination' tab of example 1. This is because this parameter is read/write, whereas Alarm Active is read only (i.e. its value may be read but not changed).
7. Use the up (or down) arrow button to select the 'From Source' tab.

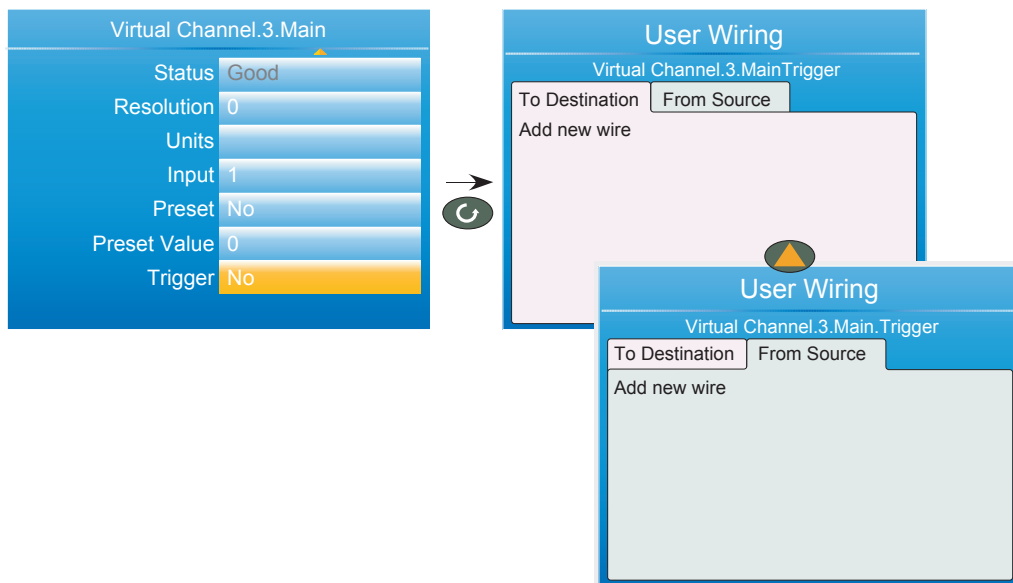


Figure 131 Wiring a counter: part 1

8. Operate the Scroll key to highlight 'Add new wire', then again to display the top level parameter list.
9. Use the down arrow button to highlight 'Channel' and operate the scroll button.
10. Operate the scroll button to select '1'.
11. Highlight 'Alarm 1' and operate the scroll button.
12. Use the down arrow button to highlight 'Active'. Operate the Scroll button again, and create the new wire.
13. Use the Page button twice to return to the Virtual Channel 3 menu.

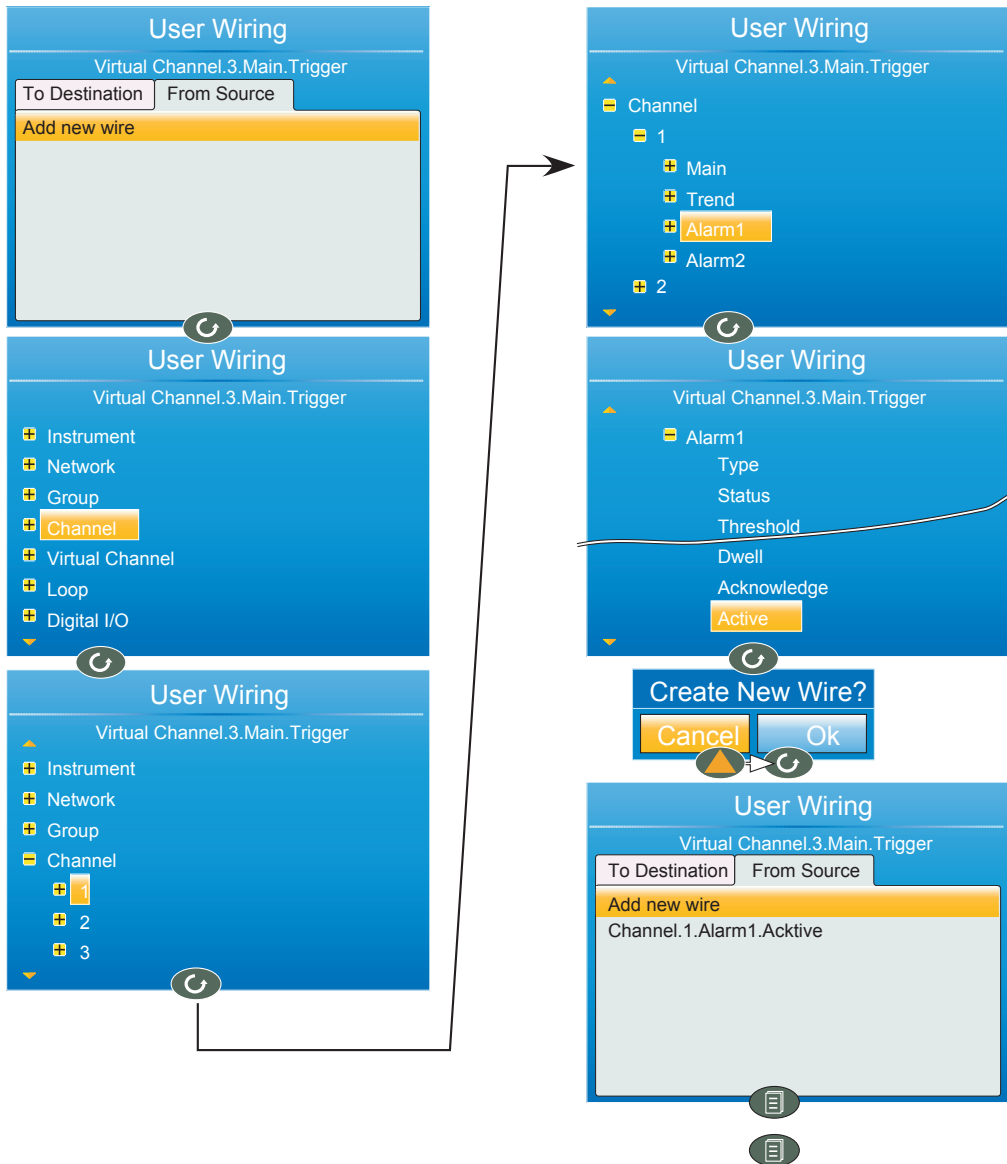


Figure 132 Wiring a counter: part 2

14. At Virtual Channel.3.Main, use the down arrow to select 'Preset'. Press and hold the scroll key. The top level User Wiring page appears.
15. Use the up (or down) arrow button to select the 'From Source' tab, if not already selected.
16. Operate the Scroll key to highlight 'Add new wire', then again to display the top level parameter list.
17. Use the down arrow button to highlight 'Channel' and operate the scroll button.
18. Use the down arrow button to highlight '2' and operate the scroll button.

19. Highlight 'Alarm 1' and operate the scroll button.
20. Use the down arrow button to highlight 'Acknowledgement' (not 'Acknowledge'). Operate the Scroll button again, and create the new wire.

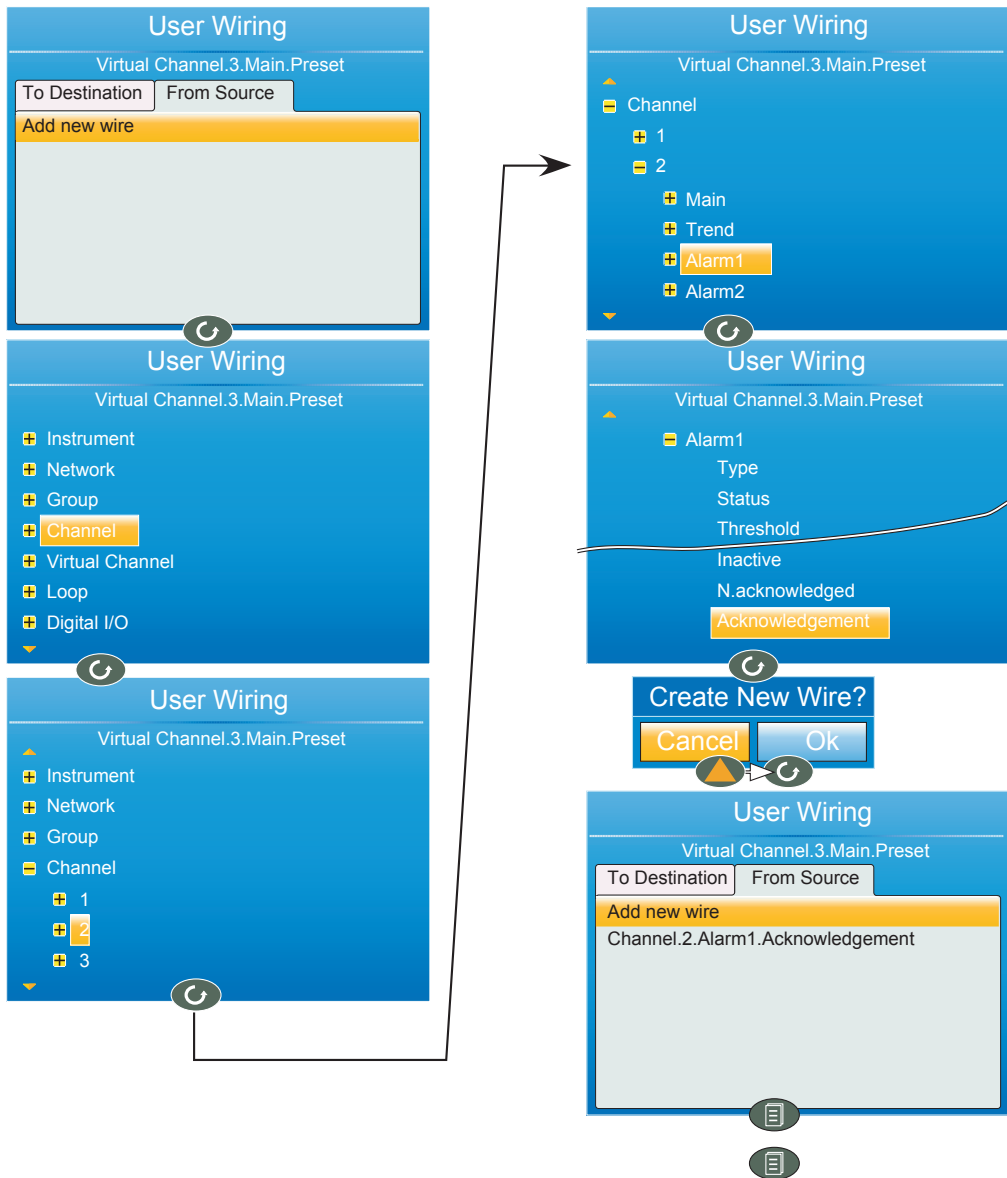


Figure 133 Wiring a counter: part 3

## 11 USB DEVICES

The devices listed below can be plugged into the USB connector at the back of the instrument, providing that the maximum current required is less than 100mA.

1. Memory Stick
2. Barcode reader
3. Keyboard



**Note:** 1. See 'USB DEVICE PRECAUTIONS' in the Safety Notes section of the manual.  
**Note:** 2. See Section A2 for the USB port specification.  
**Note:** 3. The use of USB hubs is not supported by this instrument.

### 11.1 MEMORY STICK

The use of the memory stick as an archiving device, or to facilitate software upgrades is well documented in the relevant sections of this manual.

### 11.2 BARCODE READER

If 'USB Auto Scan is set to 'Yes' in Display Configuration (Section 6.1.3) then, with the barcode reader plugged into the USB port, the scanned data input stream is packaged into a general message displayed on the vertical trend and message displays and included in the .uhh history file. The format of the message is: DD/MM/YY HH:MM:SS 123--13 (where 123--13 represents the ASCII data read from the barcode).



**Note:** The message and the vertical trend displays do not auto refresh so the display is not automatically updated when the barcode scanner is used. The message is, however, updated in the message list.

If 'USB auto Scan' is set to 'No, the ASCII data read from the barcode is displayed as a message ready for editing prior to being sent to the display etc. Figure 134 shows an example.



**Note:** The barcode reader must be configured to use a carriage return (decimal 13) terminating character.

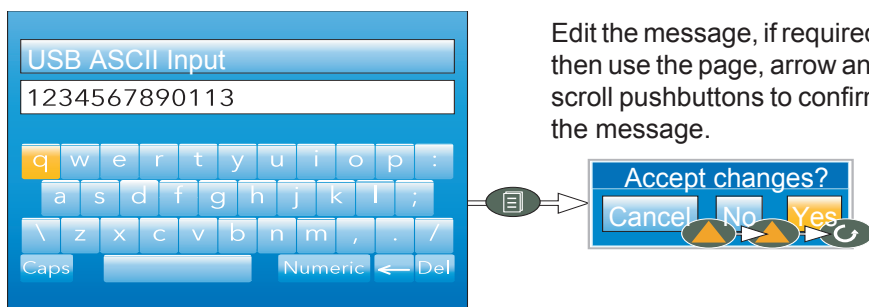


Figure 134 Barcode reader display

### 11.3 USB KEYBOARD

A QWERTY keyboard may be plugged into the rear USB port to act in parallel with the virtual keyboard (Section 5.6). The editing keys listed below are supported in addition to the standard alpha-numeric characters.

Left arrow	Moves the cursor leftwards through the text string (stops at the start of the string).
Right arrow	Moves the cursor rightwards through the text string (stops at the end of the string).
Backspace	Deletes the character immediately to the left of the cursor.
Delete	Removes the character immediately to the right of the cursor.
End	Moves the cursor to the end of the string.
Home	Moves the cursor to the start of the string.
Insert	Highlights the entire string, for overwriting.
Esc	Exit without saving changes.

## **Appendix A: TECHNICAL SPECIFICATION**

### **A1 INSTALLATION CATEGORY AND POLLUTION DEGREE**

This product has been designed to conform to BS EN61010 installation category II and pollution degree 2, defined as follows:

#### **INSTALLATION CATEGORY II**

The rated impulse voltage for equipment on nominal 230V mains is 2500V.

#### **POLLUTION DEGREE 2**

Normally, only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation shall be expected.



## A2 RECORDER SPECIFICATION

I/O types	Analog i/p	Four (eight if dual input option fitted)
	Digital i/p	Two
	Digital (logic) o/p	See Table A1 for options
	Relay o/p	See Table A1 for options
	DC output	See Table A1 for options
Features		CSV archive format EtherNet/IP (Option) File transfer protocol (FTP) Modbus Master (Option) Modbus TCP slave uhh (history file) archiving USB port at rear of instrument User linearization tables (four) 15 Virtual channels (each configurable as maths, totalizer or counter). 30 Virtual channels if Modbus Master or EtherNet/IP options fitted (no alarms on virtual channels 16 to 30)

IO1	OP2	OP3	OP4	OP5	
L	R	R	R	R	← Default
L	R	D	R	R	
L	L	R	R	R	← Options
R	D	D	R	R	
D	D	D	R	R	
L	L	D	R	R	

L = Logic output; R = Relay; D = DC output  
 OP4 and OP5 share Common terminals.

**Table A1 Output options**

### Environmental performance

Ambient temperature range	Operating:	0 to 55°C (32 to 131°F)
	Storage:	-20 to +70°C (-4 to 158°F)
Humidity range	Operating:	5% to 85% RH non condensing
	storage:	5% to 85% RH non condensing
Protection	Front panel (Standard):	IP65
	Front panel (Wash down):	IP66, NEMA12
	Behind panel:	IP10 (International)
Shock/Vibration		To BS EN61131-2 (5 to 150Hz. at 1g; 1 octave per min.)
Altitude		<2000 metres (6561.7ft)
Atmosphere		Not suitable for use in explosive or corrosive atmospheres.
Electrical safety		BS EN61010-1 (Installation category II; Pollution degree 2)
Electromagnetic compatibility		
	Emissions (standard units):	BS EN61326 Class B - Light industrial.
	Emissions (Low voltage option):	BS EN61326 Class A - Heavy industrial
	Immunity	BS EN61326 Industrial

### Other approvals and compliance details

	General:	CE and cUL, EN61010
	PV input	AMS2750E compliant
	RoHS	EU; China
Packaging		BS EN61131-2 section 2.1.3.3.

### Physical

Panel mounting	1/4 DIN
Weight	0.44kg (15.52 oz.)
Panel cutout dimension	92mm x 92mm (both -0.0 +0.8) or 3.62in x 3.62in (both -0.00 +0.03 in) (Figure 2)
Depth behind panel	90mm (3.54in) (Figure 2) excluding wiring.

### Operator interface

Display	3.5" TFT color display (320 pixels wide x 240 pixels high)
Controls	Four navigation pushbuttons below the display screen (Page, Scroll, Lower and Raise)

### Power requirements

Supply voltage	Standard:	100 to 230Vac ± 15% at 48 to 62Hz.
	Low voltage option:	24Vac (+10% - 15%), at 48 to 62Hz, or 24Vdc (+20% -15%)
Power dissipation		9W
Fuse type		None
Interrupt protection	Standard:	Holdup >20ms at 85V RMS supply voltage.
	Low voltage option:	Holdup >20ms at 20.4V RMS supply voltage.

### Battery backup

Stored data	Time, date.
Support time (for real-time clock)	Minimum of 1 year with unit unpowered.
Replacement period	Three years typical
Type	poly-carbonmonofluoride / lithium (BR2330) (PA260195)

### Ethernet communications

Type:	10/100Base-T Ethernet (IEEE802.3)
Protocols:	Modbus TCP/IP slave, FTP, DHCP
Cable type	Category 5
Maximum length	100metres (110 yards)
Termination	RJ45. Green LED illuminated = link connected; Amber LED flashing shows link activity.

### USB port

Number of ports	One at rear of instrument
-----------------	---------------------------

Standard	USB1.1
Transmission speeds	1.5Mbits/sec (low speed device)
Maximum current	<100mA
Peripherals supported	Memory stick (8GB max), Bar code reader, QWERTY keyboard

<b>Update/Archive rates</b>	
Sample rate (input/output)	8Hz (4Hz for digital inputs) (4Hz for dual input channels)
Trend update	8Hz max.
Archive sample value	Latest value at archive time
Display value	Latest value at display update time.

### A3 ANALOG INPUT SPECIFICATION

#### General

Number of analog inputs	Four
Input types	Standard: dc Volts, dc mV, dc mA (external shunt required), thermocouple, RTD (2-wire and 3-wire), digital (contact closure). Optional: dual mA, dual mV, dual thermocouple.
Input type mix	Freely configurable
Sample rate	8Hz (125ms)
Conversion method	16 bit delta sigma.
Input ranges	See below.
Mains rejection (48 to 62Hz)	Series mode: >95dB Common mode: >179dB
Common mode voltage	250Vac max.
Series mode voltage	280mV at lowest range; 5V peak-to-peak, at highest range.
Input impedance	See relevant Range specification, below.
Overvoltage protection	Continuous: ± 30V RMS Transient (<1ms): ±200V pk-pk between terminals.
Sensor break detection	Type: ac sensor break on each input giving quick response with no associated dc errors. Recognition time: <3 secs.
Minimum break resistance:	40mV, 80mV ranges: 5kΩ; other ranges: 12.5kΩ
Shunt (mA inputs only)	Values: 1Ω to 1kΩ, mounted externally. additional error due to shunt: 0.1% input
Isolation	Channel to channel: 300V RMS or dc (single insulation) Channel to common electronics: 300V RMS or dc (single insulation) Channel to ground: 300V RMS or dc (single insulation)
Dielectric strength	Test: BS EN61010, 1 minute type test Channel to channel: 2500Vac Channel to ground: 1500Vac

#### DC input ranges

Ranges	40mv, 80mV, 2V; 10V (-4.0 to +10V)
40mV Range	Range: -40mV to + 40mV Resolution: 1.9μV (unfiltered) Measurement noise: 1.0μV peak-to-peak with 1.6s input filter Linearity error: 0.003% (best fit straight line) Calibration error: ±4.6μV ±0.053% of measurement at 25°C ambient Temperature coefficient: ±0.2μV/°C ±13ppm/°C of measurement from 25°C ambient Input leakage current: ±14nA Input resistance: 100MΩ
80mV Range	Range: -80mV to + 80mV Resolution: 3.2μV (unfiltered) Measurement noise: 3.3μV peak-to-peak with 1.6s input filter Linearity error: 0.003% (best fit straight line) Calibration error: ±7.5μV ±0.052% of measurement at 25°C ambient Temperature coefficient: ±0.2μV/°C ± 13ppm/°C of measurement from 25°C ambient Input leakage current: ±14nA Input resistance: 100MΩ
2V Range	Range: ±2V Resolution: 82μV Measurement noise: 90μV peak-to-peak with 1.6s input filter Linearity error: 0.003% (best fit straight line) Calibration error: ±420μV ±0.044% of measurement at 25°C ambient Temperature coefficient: ±125μV/°C ±13ppm/°C of measurement from 25°C ambient Input leakage current: ±14nA Input resistance: 100MΩ

10V Range                      Range: -3V to +10V  
                                          Resolution: 500µV  
                                          Measurement noise: 550µV peak-to-peak with 1.6s input filter  
                                          Linearity error: 0.007% (best fit straight line) for zero source resistance. Add 0.003% for each 10Ω source and lead resistance  
                                          Calibration error: ±1.5mV ±0.063% measurement at 25°C ambient  
                                          Temperature coefficient: ±66µV/°C ± 45ppm/°C of measurement from 25°C ambient  
                                          Input resistance: 62.5kΩ for input voltages > 5.6V. 667kΩ for input ranges < 5.6V.

The 10V range is not available for dual input channels

Resistance input ranges

Temperature scale                      ITS90  
 RTD Types, ranges and accuracies      See table  
 Maximum source current                  200µA

Resistance input figures

                                         Range: 0 to 400Ω (-200 to +850°C)  
                                          Resolution: 0.05°C  
                                          Measurement noise: 0.05°C peak-peak with 1.6s input filter  
                                          Linearity error: 0.0033% (best fit straight line)  
                                          Calibration error: ±0.31°C ±0.023% of measurement in °C at 25°C ambient  
                                          Temperature coefficient: ±0.01°C/°C ±25ppm/°C measurement in °C from 25°C ambient  
                                          Lead resistance: 0 to 22Ω matched lead resistances  
                                          Bulb current: 200µA nominal

RTD type	Overall range °C	Standard	Max. linearization error
Cu10	-20 to +400	General Electric Co.	0.02°C
Cu53	-70 to +200	RC21-4-1966	<0.01°C
JPT100	-220 to +630	JIS C1604:1989	0.01°C
Ni100	-60 to +250	DIN43760:1987	0.01°C
Ni120	-50 to +170	DIN43760:1987	0.01°C
Pt100	-200 to +850	IEC751	0.01°C
Pt100A	-200 to +600	Eurotherm Recorders SA	0.09°C

Figure A.1 RTD type details

Thermocouple data

Temperature scale                      ITS90  
 CJC                                      Types: Off, internal, external, remote.  
                                          Remote CJC source: Any input channel  
                                          Internal CJC error: <1°C max, with instrument at 25°C  
                                          Internal CJC rejection ratio: 40:1 from 25°C  
 Upscale/downscale drive              High, low or none independently configurable for each channel's sensor break detection.  
 Types, ranges and accuracies              See Figure A.2

T/C type	Overall range (°C)	Standard	Max. linearization error
B	0 to +1820	IEC584.1	0 to 400°C = 1.7°C 400 to 1820°C = 0.03°C
C	0 to +2300	Hoskins	0.12°C
D	0 to +2495	Hoskins	0.08°C
E	-270 to +1000	IEC584.1	0.03°C
G2	0 to +2315	Hoskins	0.07°C
J	-210 to +1200	IEC584.1	0.02°C
K	-270 to +1372	IEC584.1	0.04°C
L	-200 to +900	DIN43710:1985 (to IPTS68)	0.02°C
N	-270 to +1300	IEC584.1	0.04°C
R	-50 to +1768	IEC584.1	0.04°C
S	-50 to +1768	IEC584.1	0.04°C
T	-270 to +400	IEC584.1	0.02°C
U	-200 to +600	DIN43710:1985	0.08°C
NiMo/NiCo	-50 to +1410	ASTM E1751-95	0.06°C
Platinel	0 to +1370	Engelhard	0.02°C
Mi/NiMo	0 to +1406	Ipsen	0.14°C
Pt20%Rh/Pt40%/Rh	0 to +1888	ASTM E1751-95	0.07°C

Figure A.2 Thermocouple types, ranges and accuracies

## A4 RELAY AND LOGIC I/O SPECIFICATION

OP1, OP2, OP3, OP4 and OP5 logic input, logic output and relay specification.

### Active (current on) current sourcing logic output

Voltage output across terminals	+11V min.; +13V max.
Short circuit output current	6mA min. (steady state); 44mA max. (switch current)

### Inactive (current off) current sourcing logic output (OP1 or OP2 only)

Voltage output across terminals	0V (min.); 300mV (max.)
Output source leakage current into short circuit	0µA (min.); 100µA max.

### Active (current on) contact closure sourcing logic input (OP1 and OP2 only)

Input current	Input at 12V: 0mA (min.); 44mA (max.)
	input at 0V: 6mA min. (steady state); 44mA max. (switch current)
Open circuit input voltage	11V (min.); 13V (max.)
Open circuit (inactive) resistance	500Ω (min.); ∞ (max.)
Closed circuit (active) resistance	0Ω (min.); 150Ω (max.)

### Relay contacts (OP1, OP2 and OP3) - AgCdO

Contact switching power (resistive)	Max: 2A at 230V RMS ±15%; Min: 100mA @ 12V.
Maximum current through terminals	2A
Estimated mechanical life:	>10,000,000 operations

### Relay contacts (OP4 and OP5) - AgNi

Contact switching power (resistive)	Max: 1A at 230V RMS ±15%; Min: 5mA @ 5V.
Maximum current through terminals	1A
Estimated mechanical life:	>10,000,000 operations

## A5 DIGITAL INPUTS

DigInA, DigInB, contact closure logic input

### Contact closure

Short circuit sensing current (source)	5.5mA (min.); 6.5mA (max.)
Open circuit (inactive) resistance	600 Ω (min.); ∞ (max.)
Closed circuit (active) resistance	0Ω (min.); 300Ω (max.)
Maximum frequency	8Hz
Minimum pulse width	62.5ms

## A6 DC OUTPUTS

OP1, OP2, OP3 DC analog outputs

### Current outputs (OP1, OP2 and OP3)

Output ranges	Configurable within 0 to 20mA
Load resistance	500Ω Max.
Calibration accuracy	<±100µA ±1% of reading

### Voltage outputs (OP3 only)

Output range	Configurable within 0 to 10V
Output impedance	500Ω Min.
Calibration accuracy	<±50mV ±1% of reading

### General

Isolation	300Vac double insulated from instrument and other I/O
Resolution	>11 bits
Thermal drift	<100ppm/°C

## A7 BLOCKS SUPPORTED

### A7.1 'Toolkit' Blocks

- Eight-input logic
- Eight input multiplexer
- Timers
- Two-input logic
- Two-input maths
- User values

## Appendix B: REFERENCE

### B1 BATTERY

This instrument is fitted with a battery which has a minimum life of 1 year unpowered and when stored in an ambient temperature of around 25°C (77°F). The battery life may be reduced if it is consistently operated in an elevated ambient temperature environment. The battery is designed to retain configuration and other settings in the event of a failure of the instrument power supply.

The battery is not user serviceable and any instrument displaying the symptoms of a battery fail should be returned to your supplier for battery replacement at the earliest opportunity.



**Warning:** It is strongly recommended that, with the instrument working normally, a clone file<sup>\*</sup> is made and stored in a known safe location so that the settings can be uploaded to a spare instrument or restored to the instrument following replacement of the battery. Alternatively maintain a record of the instrument configuration and other important settings.

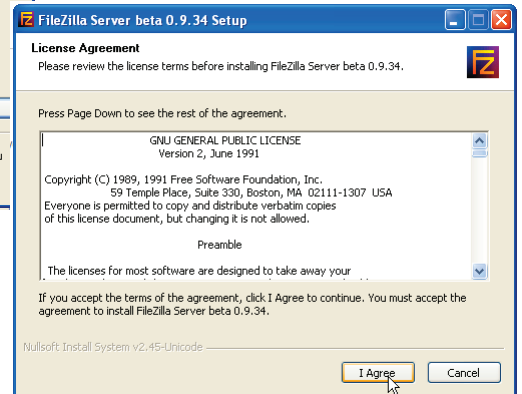
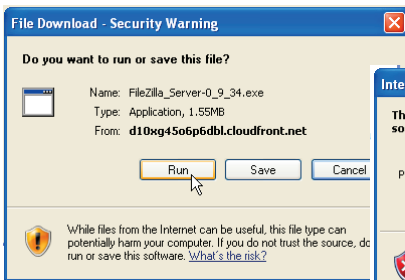
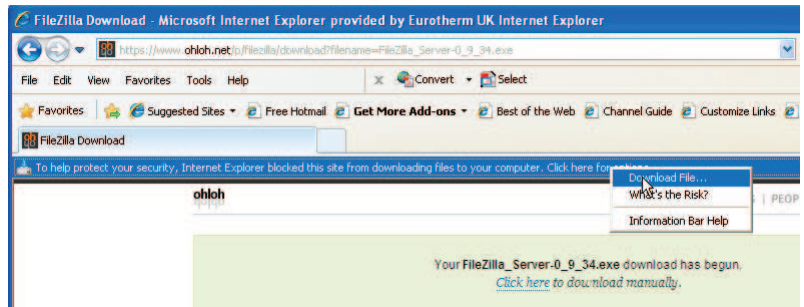
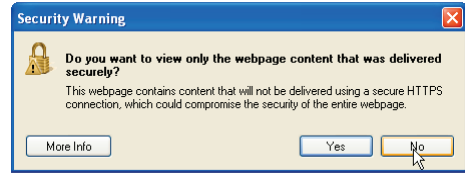
\* A clone file is made using iTunes, a proprietary package which may be downloaded from:  
[www.eurotherm.co.uk](http://www.eurotherm.co.uk).

## B2 SETTING UP AN FTP SERVER USING FILEZILLA

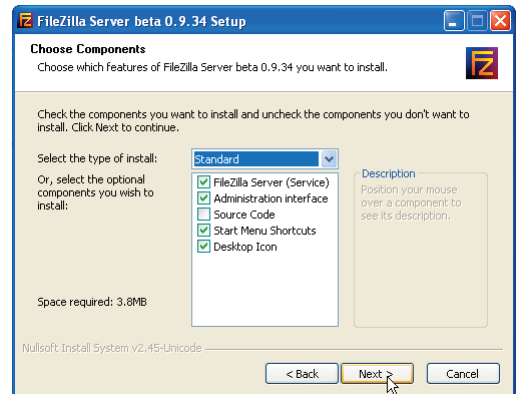
### B2.1 Downloading

'FileZilla' is a free download from the internet (search for 'FileZilla server download').

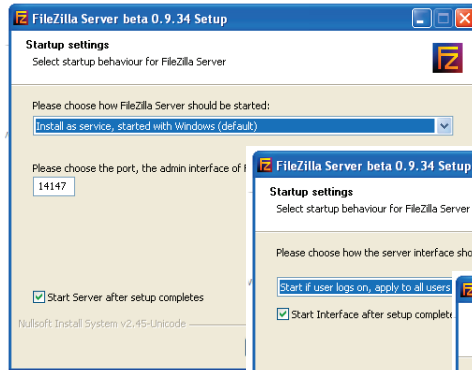
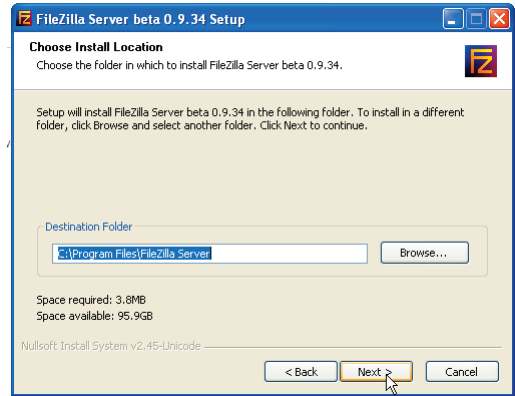
1. Download the latest version, following the instructions on the screen.
2. Answer 'No' to the question 'Do you want to view only the webpage content that was delivered securely?'
3. If necessary enable file download.
4. In the 'Do you want to run or save this file' Security Warning window, click on 'Run'.
5. In the 'The Publisher could not be verified...', Security Warning window, click on 'Run'.



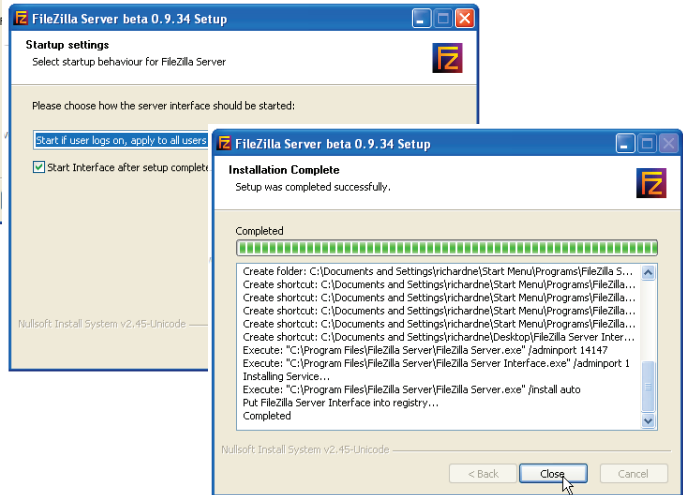
6. Agree or cancel the License agreement. If 'Agree', choose 'Standard' as the type of install.
7. Choose the destination for the file.



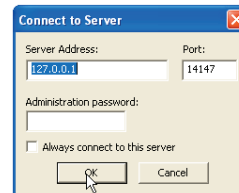
8. Select startup settings.



9. Click on Close when Installation is complete.

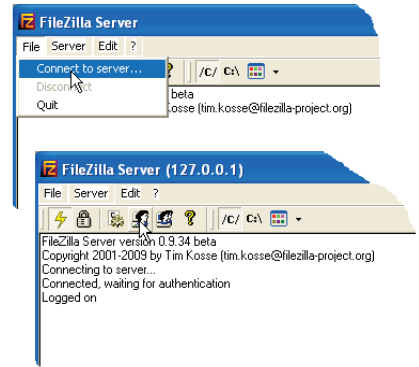


10. Click 'OK' in the 'Connect to Server' window.



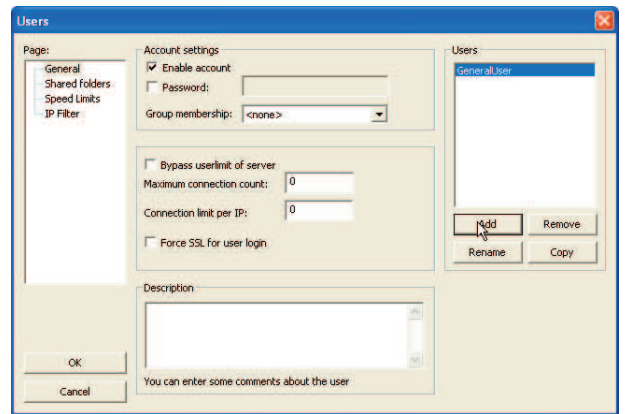
## B2.2 Server Setup

1. Create a new folder (directory) called, for this example, 'Archive' in a suitable location such as the C drive, or the desktop.
2. In the Filezilla server window, click on 'File' and select 'Connect to Server'.



The 'Logged on' message appears.

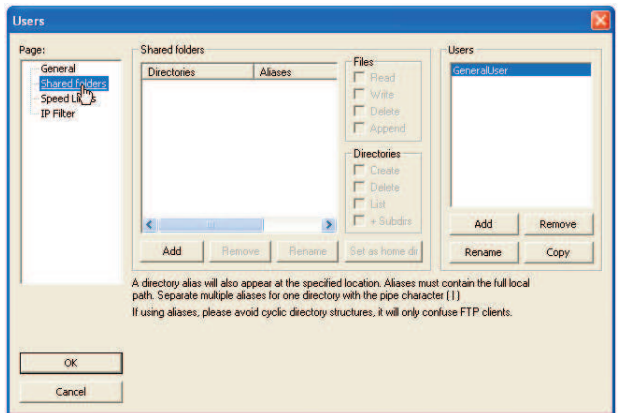
3. In the Edit menu, select 'Users' and in the 'General' page, click on 'Add' and enter a name for the user, then click 'OK'. For this example, 'GeneralUser' has been used, but it may be more advantageous to use 'Anonymous' because this is the default name in the recorder/controller. Click on 'OK'.



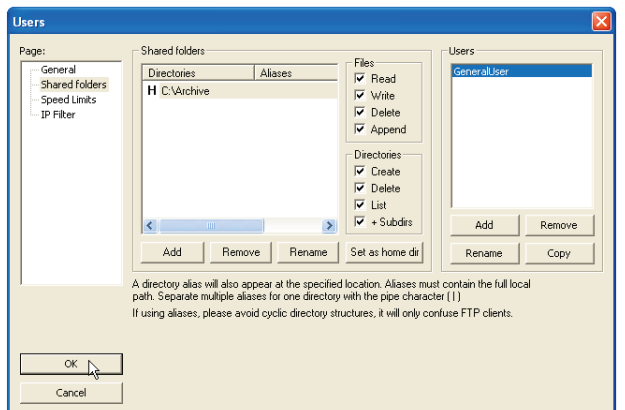
4. In the Edit menu, select 'Users' and in the 'Shared Folders' page, click on 'Add'.

A browse window opens allowing the user to select the new folder ('Archive') created in step 1, above.

When OK has been clicked to confirm the selection, the new folder appears in the centre window (with an 'h' next to it to indicate that this is the home folder for this ftp user setup).



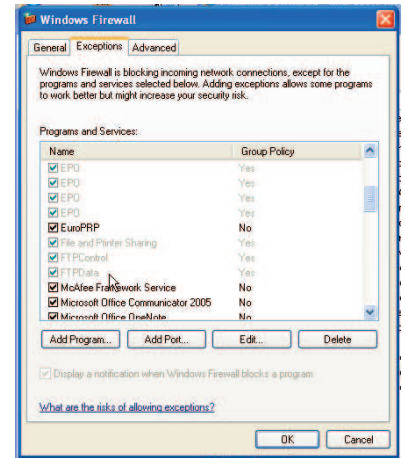
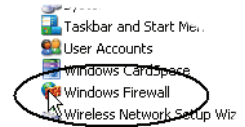
5. Click on the relevant folder to enable the tick boxes. Click on all the 'File' and 'Directory' enable tick boxes, then click OK.



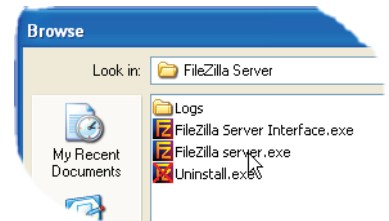


### B2.3 PC Setup

1. Operate the 'Start' button, and select 'Control Panel' from the window that appears. Double click on 'Windows Firewall'.
2. Click on the 'Exceptions' tab in the window that appears, and check that both 'FTPControl' and 'FTPData' are enabled (ticked). If not, the user's IT department should be contacted for advice.

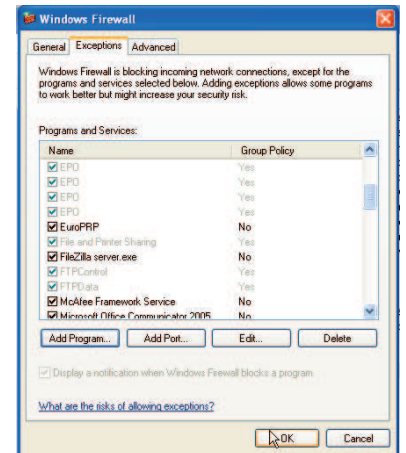


3. Click on 'Add Program...' and browse to the Filezilla destination defined in step 7 of the download section (Section B2.1). Select 'FileZilla server.exe' and click on 'Open'.



'FileZilla server.exe' appears in the Exceptions list.

4. Click on 'OK'.



## B2.4 Recorder/Controller Setup

In Network Archiving (Section 6.2.2):

1. Enter the IP address of the pc in which the FTP server has been enabled in the 'Primary Server' field.
2. Enter the Primary User name, as entered in step three of the Server setup procedure (Section B2.2) above (GeneralUser in this example).
3. Enter the IP address of another suitable pc which has been configured as an ftp server in the 'Sec. Server' field, and enter the relevant 'Sec. User' name.
4. Configure the other unattended archive parameters as required (Section 6.2.2).



**Note:** For the example above, 'Password' was not enabled in the User Accounts setup page (Section B2.2), so for this example any Primary (Sec.) password entry is ignored. If a password had been entered in the User Accounts setup, then the Primary (Sec.) Password field would have to contain this password.

## B2.5 Archive Activity

Once a demand or unattended archive is initiated, the FileZilla Server page shows the activity status as the archive progresses. Figure B.1 shows a typical page. The top of the page shows the transaction details between the server and any clients to which it is connected. The bottom portion shows details of the files currently being transferred. These files are archived to the 'Archive' folder.

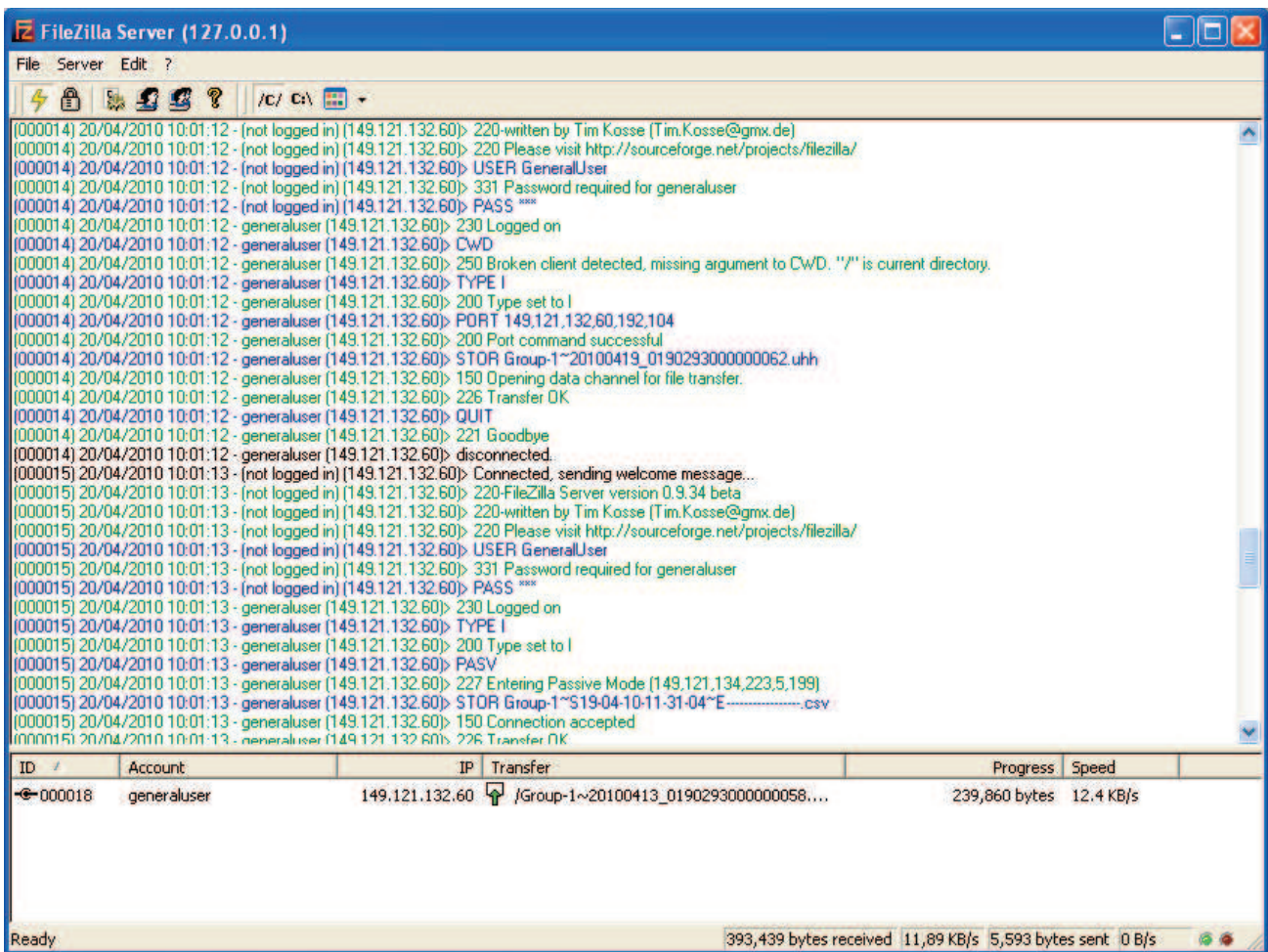


Figure B.1 FileZilla Server archive activity page

### B3 FUNCTION BLOCK DETAILS

#### B3.1 Eight Input OR Block

An eight input logical OR block whose output is high (1, On) if any one or more inputs is high (1, On). If more than eight inputs are required, a second block is automatically introduced, as shown in Figure B.2. The blocks in the figure are given the names 'A' and 'B', where 'A' and 'B' can be any of the 12 available instances.

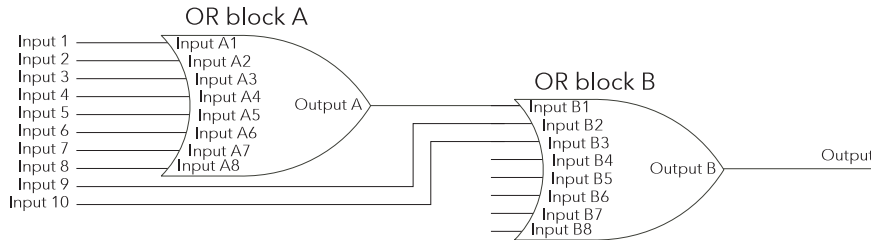


Figure B.2 Eight input OR block

OR blocks are used automatically by the 'user wiring' when more than one source is wired to the same destination parameter. For example, it may be required that Relay (Digital I/O 2A2B) is to operate if channel 1 alarm 1 and/or channel 2 alarm 1 channels goes active. In such a case, the 'Active' parameter for the two channel alarms would be wired to the same relay's 'PV' parameter.

OR blocks are invisible to the user interface, but the iTools graphical wiring page for this configuration (Figure B.3), shows that an OR block has been introduced to OR the two alarm outputs together.

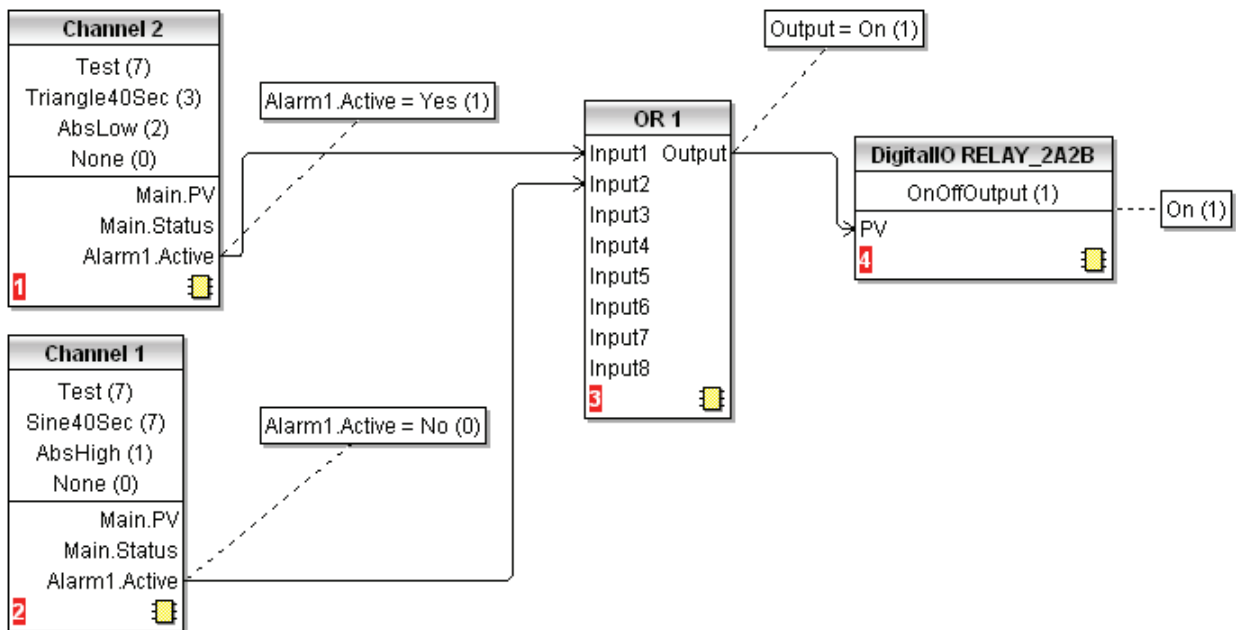


Figure B.3 iTools representation of OR block usage

### B4 TCP PORT NUMBERS

The following TCP ports are made use of by the instrument.

Port	Usage
20	File Transfer protocol (FTP) data
21	FTP control
502	Modbus TCP communications

### B5 ISOLATION DIAGRAM

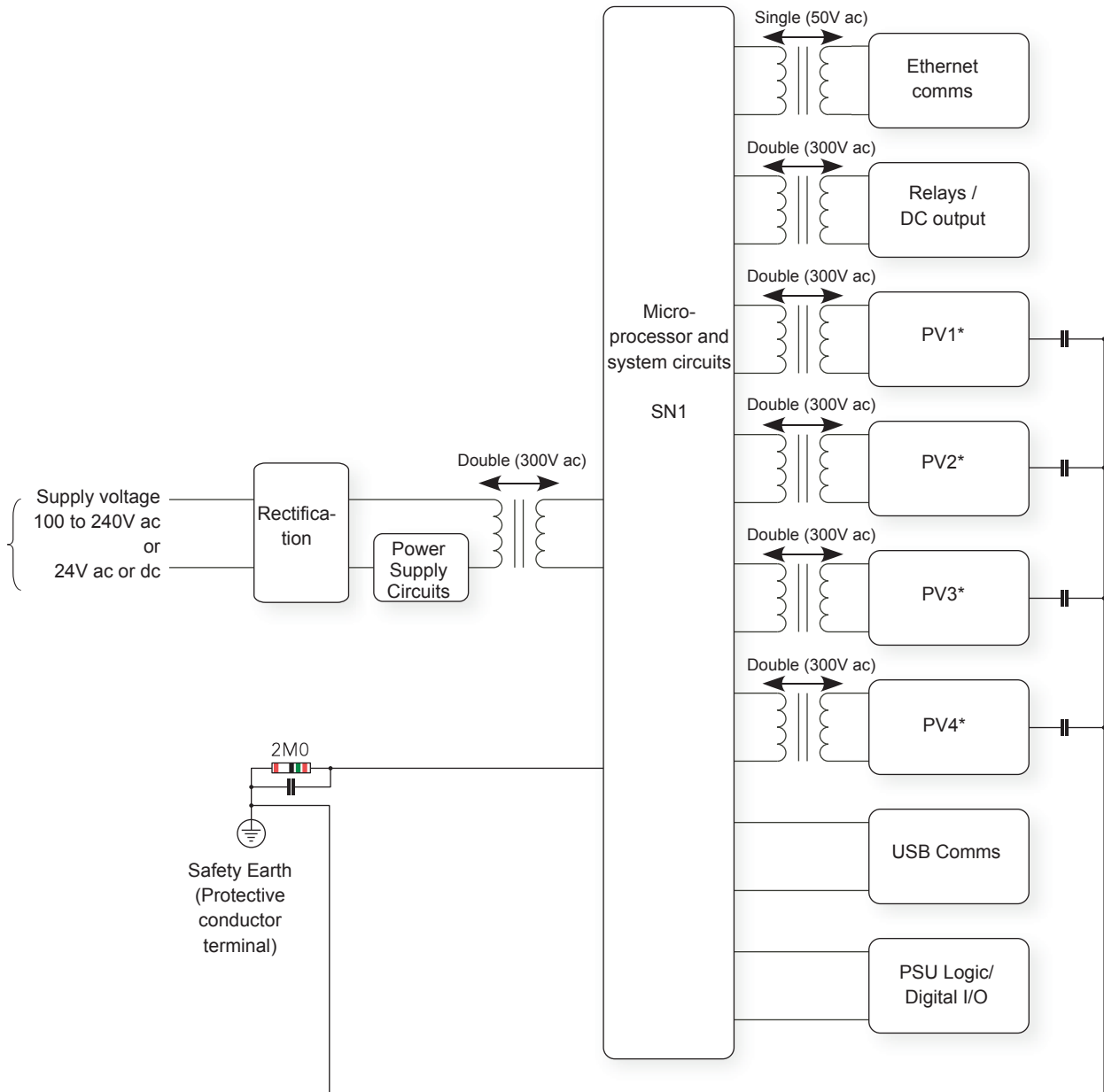


Figure B.4 Isolation diagram



**Note:** Each 'PV' is double isolated (300VRMS) from all other 'PV's.

## Appendix C: WEB SERVER

The Web Browser has been added from firmware release V5.00.

### C1 BROWSERS

The following browsers are supported in the above firmware release:

- Google Chrome V22.0 or greater
- Google Mobile Chrome (Android Mobile technology running 'Ice cream sandwich' or greater)
- Internet Explorer V9.0 or greater
- Mobile Safari (Apple Mobile technology running IOS 5.0 or greater)

All files are uploaded from the FEC920 device to the browser, where all JS and JQuery files are executed locally.

Browsers should be configured to allow cookies, and support for file caching should also be enabled.

If cookies are not enabled this will have the following detrimental effects:

- Any web page configuration changes 'saved' by the user in the client browser will not be retained when navigating between web pages
- For the most efficient browsing make sure that caching is enabled in the browser being used.
- Web server supports standard ASCII character set. Any non displayable characters will, therefore, be replaced by an asterisk '\*'.

#### C1.1 Connecting to the Internet

Open the desired web browser.

Enter the Ethernet address or other configured name of the instrument.



**Note:** The webserver requires up to 15 seconds before it becomes fully operational after it has been enabled.

#### C1.2 Denied Page

This page will be displayed when there are no more available connections to the server. It does not use the same FEC920 theme as all other pages, so that this page does not rely on any other files being transferred up to the client browser, since to do this would require access to the server, which has just been denied.

#### Invensys Eurotherm - Web Server Login Failed

Maximum amount of sessions reached, please try again later

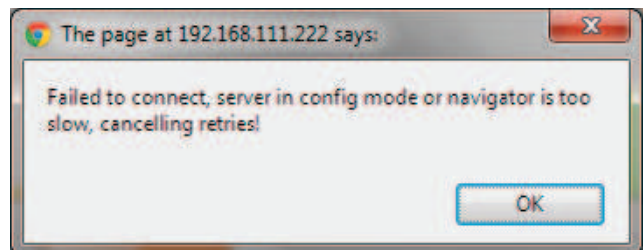
Try Again...

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#### C1.3 Error Message

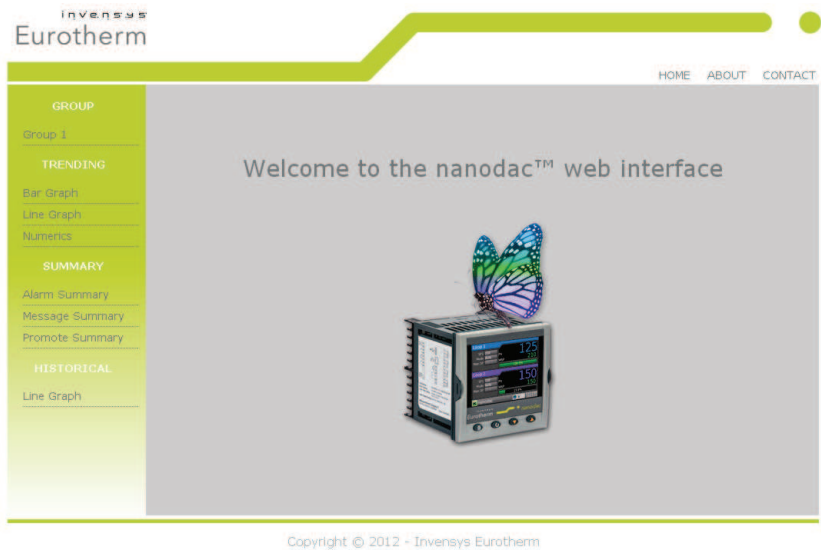
An error message can be displayed at any time if the following three conditions occur:

- A page fails to connect to the server. A retry will usually be sufficient to correct this condition.
- The server is in configuration mode. To correct this put the instrument into run mode.
- A page stops trying to connect. A refresh is usually sufficient to correct this condition.



### C1.4 Home Page

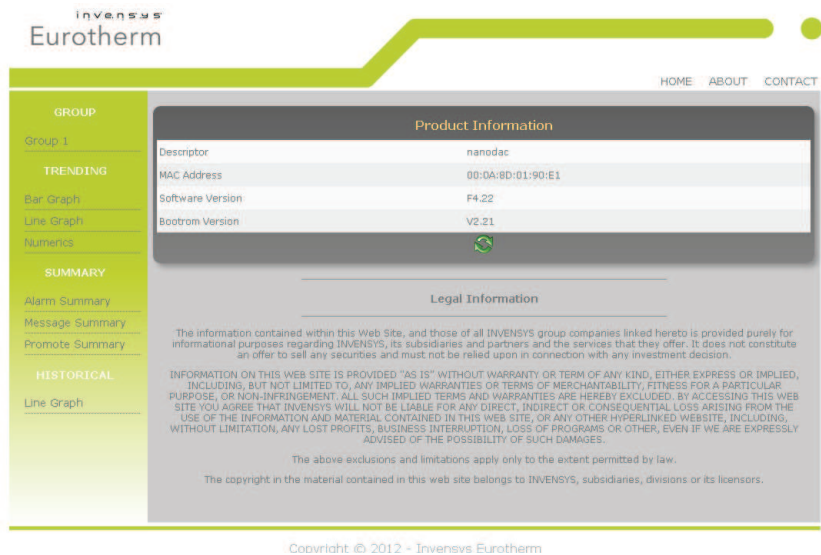
The Home Page is the first page the user is directed to on completion of a successful log in. If Security has been set to Yes in the instrument (page 99) it will be necessary to enter a User name and a Password. The defaults are:  
 Username: admin  
 Password: admin  
 These may be customized by the user up to 50 alpha/numeric characters.



### C1.5 About Page

This page contains the following target information:

- Instrument descriptor
- MAC address
- Application software version
- Bootrom software version
- Legal disclaimer



## C1.6 Contact Page

This page contains links to the following Eurotherm sites:

- Accredited Service
- Customer First & Technical Support
- Installation & Commissioning
- Repair & Support Services



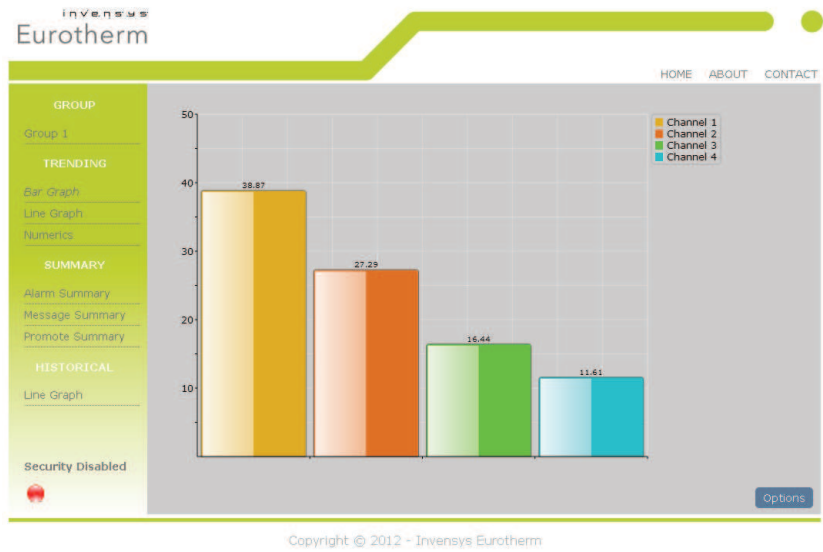
**Note:** Links are only active if the browser has Internet access.

### C1.7 Bar Graph Page

The channels that have been configured to be trended on the FEC920 instrument will automatically be displayed on this page. The current configuration data for those channels will be used to render the values on the graph.

The graph will always use the largest scale high and the lowest scale low of all the channels being rendered.

Click on a channel on the graph to display the current channel status. To remove this, click out of the graph again. The channel status will either be 'Ok' or 'Error' for all other error conditions.



All channels will be represented in their configured RGB colors. Color matching will very much depend on the display the browser is running on.

### Options

The Options button allows the user some control over how the Bar Graph page is displayed.

All data is stored as cookies.

- Graph Type            Gradient (as shown in the above display)
- Flat
- 3D
- Legend                Show or Hide the Channel numbering legend in the top right hand corner
- Background Type    Transparent or White
- Gridlines            Show or Hide
- Decimal Places     0 to 4
- Value Alignment    Horizontal or Vertical
- Plot Point            All (shows all available channels)
- Channel 1 only
- Channel 2 only
- Channel 3 only
- Channel 4 only

Graph Type	Gradient
Legend	Show
Background Type	Transparent
Gridlines	Show
Decimal Places	2
Value Alignment	Horizontal
Plot Point(s)	All



### C1.8 Line Graph Page

The channels that have been configured to be trended on the FEC920 will automatically be displayed on this page. The current configuration data for those channels will be used to render the values on the graph.

The graph will always use the largest scale high and the lowest scale low of all the channels being rendered.

This graph is currently fixed at 100 samples. The first time that this page is opened it may take a little more time as the page will need to interrogate the web server for UHH history and render 100 samples of backfill.

As each new sample arrives the oldest historical sample is removed.

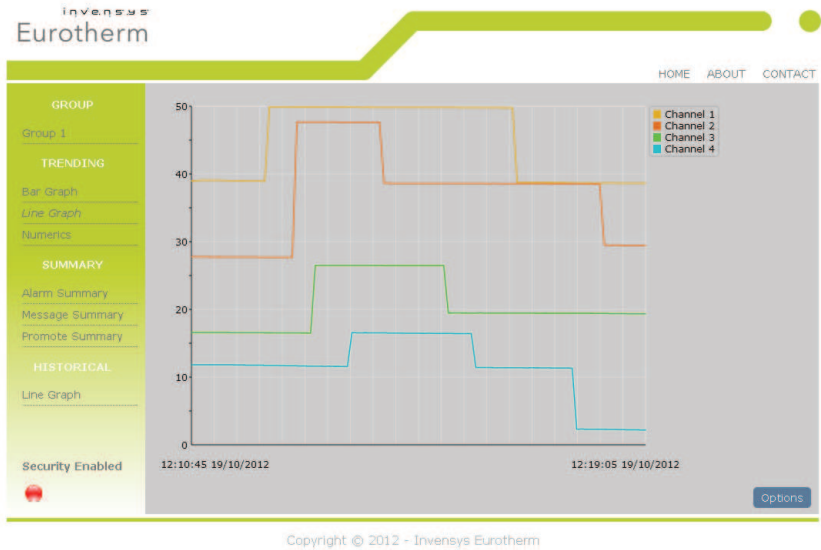
All channels will be represented in their configured RGB colors. Color matching will very much depend on the display the browser is running on.

#### Options

The Options button allows the user some control over how Line Graph page is displayed.

All data is stored as cookies.

- Plot Thickness      Narrow, Normal, Wide.
- Legend                Show, Hide.
- Background Type    Transparent, White.
- Gridlines            Show, Hide.
- Sample Period        1 second - 1 hour.
- Plot Point            All, (shows all available channels)  
                           Channel 1 only  
                           Channel 2 only  
                           Channel 3 only  
                           Channel 4 only



Plot Thickness	Normal	<input type="checkbox"/>
Legend	Show	<input checked="" type="checkbox"/>
Background Type	Transparent	<input checked="" type="checkbox"/>
Gridlines	Show	<input checked="" type="checkbox"/>
Sample Period	5 Secs	<input checked="" type="checkbox"/>
Plot Point(s)	All	<input checked="" type="checkbox"/>

### C1.9 Numeric Page

This page displays the process value and channel descriptor.

The process value (PV) will not be displayed if the channel is not in a good status. Instead the text for the channel status is displayed as one of the following

- OFF Channel is turned off
- >RANGE Over range
- <RANGE Under range
- HW\_ERROR Hardware error
- RANGING Automatic range configuration (may appear briefly)
- OVERFLOW Value out of limits e.g. a maths channel may have returned a bad value
- ERROR Error, e.g. a maths channel divided by zero
- NO\_DATA No data, e.g. nothing has been written to a Modbus input channel.

All channels will be represented in their configured RGB colors. Color matching will very much depend on the display the browser is running on.

#### Options

The Options button allows the user some control over how Numerics page is displayed.

All data is stored as cookies.

- Channel Font Size Small, Normal, Large
- PV Font Size Small, Normal, Large

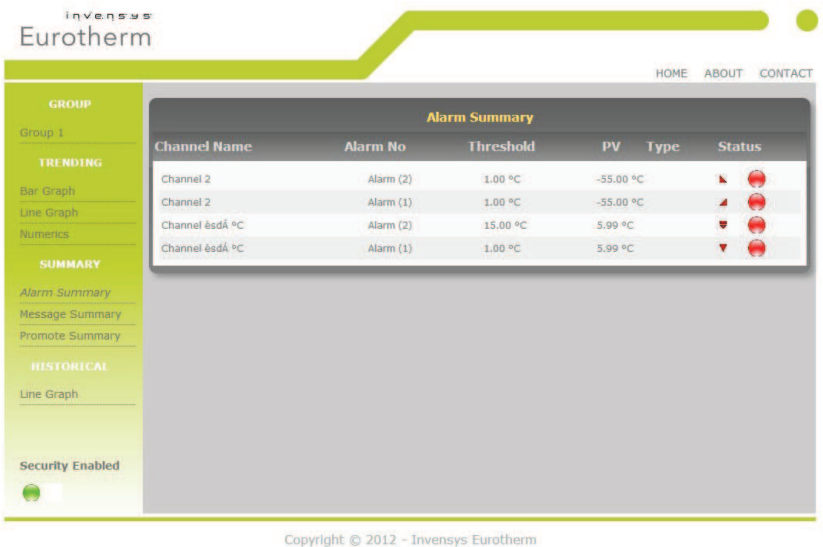


### C1.10 Alarm Summary Page

This page indicates if any process alarms are currently active

#### Status:


- Red = Unacknowledged alarm.
- Green = Acknowledged alarm.

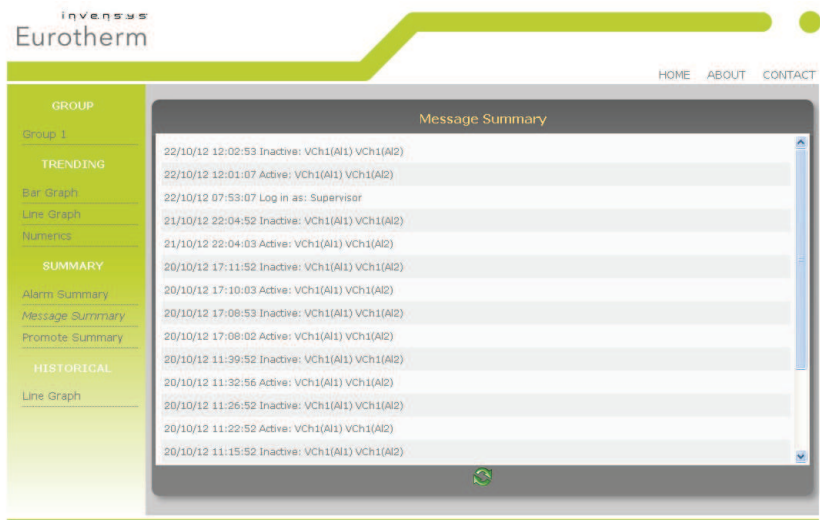


### C1.11 Message Summary Page

This page provides the last 30 messages in chronological order

This page does not auto-refresh.

To refresh this page press  or go to another page and re-open the Message Summary page.

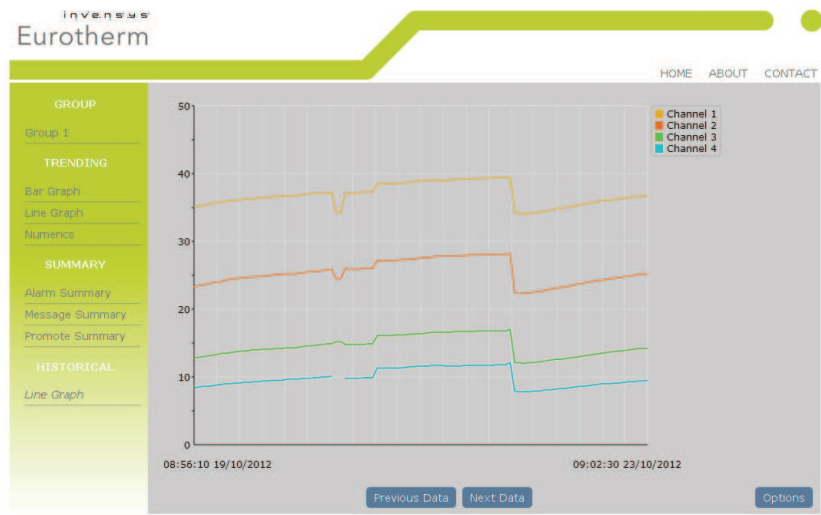


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### C1.12 Historical Line Page

The channels that have been configured to be trended in the FEC920 instrument will automatically be displayed on this page. The current configuration data for those channels will be used to render the values on the graph. The graph will always use the largest scale high and the lowest scale low of all the channels being rendered.

All channels will be represented in their configured RGB colors. Color matching will very much depend on the display the browser is running on.



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This graph is currently fixed at 100 samples, and the first time this page is accessed it may take a short time to load as the page will need to interrogate the web server for UHH history and render 100 samples of backfill.

Use the 'Previous Data' button to navigate back in time for up to a maximum of five time periods of history. If there is an end to the history event or a configuration change event, then the request to navigate back may result in only part of the trend being populated up to that event time.

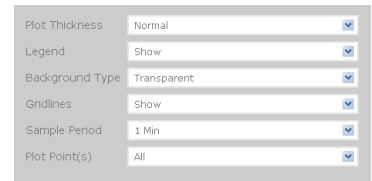
Use the 'Next Data' button to navigate back to the point in time when the web page was entered.

#### Options

The Options button allows the user some control over how the Historical Line page is displayed.

All data is stored as cookies.

Plot Thickness	Narrow, Normal, Wide.
Legend	Show, Hide.
Background Type	Transparent, White.
Gridlines	Show, Hide.
Sample Period	1 second - 1 hour.
Plot Point	All (shows all available channels) Channel 1 only Channel 2 only Channel 3 only Channel 4 only







### C1.13 Status Icons


The Status icons are shown in the lower left of those pages that are automatically updated (i.e. not the Message Summary page).

They indicate the following:

Security Enabled or Disabled in the FEC920 instrument.



-  Recording Status  
Green shows recording enabled e.g. when the instrument is not in configuration mode.  
Red shows recording disabled e.g. when the instrument is in configuration mode.
-  Any Channel Alarm Status. This flashes when any alarm is present, whether acknowledged or not.
-  Any new messages. Go to the Message Summary page to view any new messages. This icon is then removed from the other pages.
-  Any system alarm



**Note:** The update rate for the status icons is inherited from the current page.

### C1.14 DHCP Support

DHCP is managed in the web server in as much as the web server will not be allowed to come online until the FEC920 has received a valid IP address. The server will continually monitor the IP address and, if at any point an invalid address is found, the server will shut down and re-start.

### C1.15 Network Protocols

The web server is in no way mutually exclusive with all other network protocols on the FEC920, however, to achieve the best results from the web server it is recommended that no other communication protocols are active at the same time.

### C1.16 Languages

The web server will only support English for all static text. Any channel descriptors or units that have been configured at the target in another language will be displayed in that language on all web pages where they are visible.

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