SIEMENS

SINUMERIK 810D/840Di/840D

ePS Network Services

Function Manual

Preface

Overview of the functions 1

Machine information 2

Setting up functions 3

Organizational tasks 4

Statistics / export 5

Management 6

References 7

Appendix A

Valid for:

ePS Network Services Version 4.3

11/2006

--

Safety Guidelines

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

Danger

indicates that death or severe personal injury **will** result if proper precautions are not taken.

Warning

indicates that death or severe personal injury **may** result if proper precautions are not taken.

Caution

with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

Caution

without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

Notice

indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:

Warning

This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

Trademarks

All names identified by ® are registered trademarks of the Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Siemens AG
Automation and Drives
Postfach 48 48
90437 NÜRNBERG
GERMANY

Order No.: --
℗ 01/2007

Copyright © Siemens AG 2006.
Technical data subject to change

Preface

SINUMERIK documentation

The SINUMERIK documentation is organized in 3 parts:

- General documentation
- User documentation
- Manufacturer/Service documentation

An overview of publications, which is updated monthly and also provides information about the language versions available, can be found on the Internet at:

http://www.siemens.com/motioncontrol

Select the menu items "Support" → "Technical Documentation" → "Overview of Publications".

The Internet version of DOConCD (DOConWEB) is available at:

http://www.automation.siemens.com/doconweb

Information about training courses and FAQs (Frequently Asked Questions) can be found at the following website:

http://www.siemens.com/motioncontrol under menu item "Support".

Target group

This Function Manual is intended for project engineers, programmers, technologists (of machine manufacturers), and startup engineers (of systems/machines).

Benefits

The Function Manual describes the functions so that the target group knows them and can select them. It provides the target group with the information required to commission the functions.

Utilization phase: Planning and configuration phase, implementation phase, setup and commissioning phase.

Standard scope

This documentation only describes the functionality of the standard version. Additions or revisions made by the machine manufacturer are documented by the machine manufacturer.

Other functions not described in this documentation might be executable in the control. However, no claim can be made regarding the availability of these functions when the equipment is first supplied or in the event of servicing.

For the sake of simplicity, this documentation does not contain all detailed information about all types of the product and cannot cover every conceivable case of installation, operation, or maintenance.

Technical Support

If you have any technical questions, please contact our hotline:

	Europe / Africa	Asia / Australia	America
Phone	+49 180 5050 222	+86 1064 719 990	+1 423 262 2522
Fax	+49 180 5050 223	+86 1064 747 474	+1 423 262 2289
Internet	http://www.siemens.com/automation/support-request		
E-mail	adsupport@siemens.com		

Note

Country-specific telephone numbers for technical support are provided under the following Internet address: http://www.siemens.com/automation/service&support

Questions about the manual

If you have any queries (suggestions, corrections) in relation to this documentation, please fax or e-mail us:

Fax	+49 9131 98 63315
E-mail	docu.motioncontrol@siemens.com

A fax form is available at the end of this document.

SINUMERIK Internet address

http://www.siemens.com/sinumerik

EU Declaration of Conformity

The EC Declaration of Conformity for the EMC Directive can be viewed/downloaded from the Internet at:

http://www.ad.siemens.de/csinfo

under the Product Order No. 15257461or at the relevant branch office of the A&D MC group of Siemens AG.

Table of contents

Preface 3

1 Overview of the functions 9

1.1 General description 9

1.2 Basic principle of operation 11

2 Machine information 13

2.1 Machine events – List view 13

2.2 Machine events - detailed view 15
2.2.1 Evaluation of workflow actions 17
2.2.2 Evaluating diagnostics data 17

2.3 Current control software 25

2.4 Analysis at the PC 26
2.4.1 Analyzing measurements and series of measurements 26
2.4.2 Circularity test 28
2.4.3 Equability test 29
2.4.4 Universal axis test (UAT) 30

2.5 Execution at the machine 31
2.5.1 Executing series of measurements and test series 31
2.5.2 Prerequisites for performing the test 32
2.5.3 Prolog and epilog program for a measurement 33
2.5.4 Programming example 37
2.5.5 Release protocol 39
2.5.6 Contour test 40

2.6 NC monitors 41

2.7 PLC monitors 43

2.8 Maintenance jobs 45

2.9 Remote access 46
2.9.1 Remote access functions 46
2.9.2 Functions of a service session 47
2.9.3 Starting a service session 48
2.9.4 Example: Service session via remote access 50
2.9.5 Issuing permission to execute functions 52
2.9.6 Setting a service conference call 56
2.9.7 Remote operation using the keyboard 58

3 Setting up functions 59

3.1 Maintenance 59
3.1.1 Creating maintenance schedules 59
3.1.2 Configuring PLC monitors 63
3.1.3 Configuring NC monitors 65

3.2 Measurements and series of measurements ... 66
3.2.1 Circularity test ... 66
3.2.2 Equability test ... 68
3.2.3 Universal axis test ... 69
3.2.4 Configuring test series ... 71

3.3 Fault services ... 72
3.3.1 Creating a control monitor ... 72
3.3.2 Configuring control monitors ... 74
3.3.3 "Alarm group" trigger ... 75
3.3.4 "PLC trigger" trigger ... 76
3.3.5 "Combination trigger" trigger ... 79
3.3.6 "Request fault processing HMI / PC" trigger ... 80
3.3.7 "Time interval" trigger ... 81
3.3.8 "Server trigger" trigger for interval monitors ... 82
3.3.9 "Limit value for PLC monitor" trigger ... 84
3.3.10 "Limit value for measurement series" trigger ... 86
3.3.11 Workflow actions ... 87
3.3.12 Diagnostic actions ... 89

3.4 Global settings ... 94
3.4.1 Setting the notification limitation ... 94
3.4.2 PLC data blocks ... 95

3.5 Client-server communication ... 96
3.5.1 Synchronization times ... 96
3.5.2 Monitoring ePS services ... 97

4 Organizational tasks ... 99

4.1 Maintenance jobs ... 99
4.1.1 Selecting a maintenance job at the machine ... 100
4.1.2 Opening a maintenance job (PC) ... 102
4.1.3 Processing the maintenance job (HMI) ... 104

4.2 Service cases ... 106
4.2.1 Creating a service case ... 106
4.2.2 Service cases - list view ... 107
4.2.3 Creating a service case ... 108
4.2.4 Opening a service case ... 109
4.2.5 Requesting fault processing ... 111

5 Statistics / export ... 113

5.1 Statistics ... 113
5.1.1 Multiple-machine evaluation ... 113
5.1.2 Diagrams for measurement series ... 116

5.2 Import ... 118
5.2.1 Importing a file ... 120
5.2.2 Importing a directory ... 121
5.2.3 Active import operations ... 121

5.3 Export ... 122

5.4 Status overviews ... 123
5.4.1 Synchronizing the active machines ... 123
5.4.2 Monitoring ePS services ... 124

6 Management 127

6.1 Organization management 127
6.1.1 Organizational data 127
6.1.2 Addresses 129
6.1.3 Users 130
6.1.4 Machines 131
6.1.5 Download areas 135

6.2 Data protection guidelines and password 137

6.3 Administrating a machine 138
6.3.1 Administrating a machine at the HMI 138
6.3.2 Uploading the alarm model at the machine 138
6.3.3 Connecting a machine 140
6.3.4 Disconnecting a machine at the HMI 142
6.3.5 Disconnecting a machine at the PC 143
6.3.6 Synchronizing the control 145
6.3.7 Repeat strategy 146
6.3.8 Editing the prolog and epilog program 147

7 References 149

7.1 Cooperation areas 149
7.1.1 Releasing a machine to an organization 150
7.1.2 Machines in a cooperation area 152

7.2 Client diagnostics 154
7.2.1 Information of client diagnostics 154
7.2.2 Using the client diagnostics 156
7.2.3 Performing detailed diagnostics 157

7.3 Configuring 1:n connections 158

7.4 Useful functions of the various device classes 160

7.5 Functions of the various roles (matrix of authorizations) 163

7.6 References 166

A Appendix 167

A.1 Abbreviations 167

A.2 Correction sheet - fax template 168

Index 169

1 Overview of the functions

1.1 General description

What are ePS Network Services ?

The ePS Network Services support machine tool manufacturers and manufacturing companies with maintenance and services. This is done using software services that are available both on the CNC machine and on the PC.

This requires both Internet access and a control on the CNC machine that complies with the specifications.

The ePS Network Services include:

Remote access

Remote access to the control system via a secure Internet infrastructure allows the exchange of information and remote control of the CNC machine control.

- Desktop control
- File transfer
- Chat
- Video ...

Control monitor services

Recording of an event history with the documentation of the current state of the control device at this time. This allows the status of the device to be analyzed and compared with earlier states should a fault occur. The current status of the machine is documented using the following events and data:

- Alarms, PLC events, time intervals, combinations of machine signals
- Violation of limit value and predefined interval value from Condition Monitoring
- Series of measurements/tests and operating performance monitors
- Manual help request by the machine operator in the event of faults
- HMI action log, machine data, NC status data
- PLC trace, PLC data blocks
- Certain files (e.g. log files) of the control

Condition Monitoring Services

The current machine status is acquired and documented on the basis of predefined, standardized tests and continuous recording of status parameters (traverse path, traverse time and traverse operations for one axis). The test parameters can be defined centrally and configured with appropriate warning limits. Using series of measurements, it is also possible to identify trends and apply them as a basis for optimizing maintenance and service activities.

The machine operator can then carry out these predefined tests quickly and easily and without additional test equipment.

The following tests and monitors are available:

- Circularity test
- Equability test
- Universal axis test
- NC monitor
- PLC monitor

Data services

The current control archives (NCK and PLC archives) are saved on the ePS server. In the event of an error, the backup copy is loaded back to the control in a controlled process or used as a reference for comparisons of Control Monitors.

Workflow services

Messaging provided by internal and external media (SMS, e-mail, servicing) initiates servicing and maintenance procedures. Maintenance activities are planned, monitored and documented directly on the machine.

The advantages of maintenance schedules are:

- Load- and consumption-based predictive maintenance.
- Automatic triggering of work processes by detected faults
- Planning of the schedule and contents of condition monitors and monitoring of their execution.

The Workflow Services can respond to all event sources of the Control Monitor Services and Condition Monitor Services.

Administration Services

Functions for the administration of the system:

- Creation and administration of machines
- Creation and administration of users
- Assignment of access rights for external organizations
- Access to useful data / invoices

1.2 Basic principle of operation

Overview

The functions of the ePS Network Services are divided into five main categories which can be reached via tabs. The "Machine information" tab and "Set up functions" tab always apply to the selected machine.

Note

The availability of each function to the machine operator in each of the various roles is described in the Appendix.

Please see the descriptions in each Chapter for details of the functions.

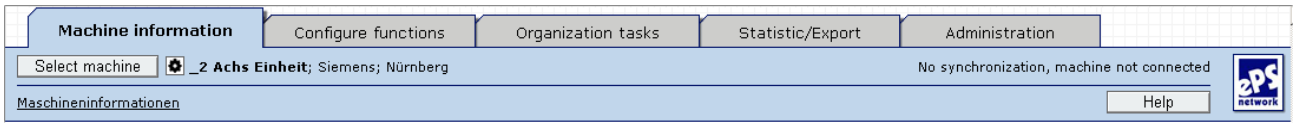


Figure 1-1 Basic principle of operation

Tab / Chapter	Description
Machine information	The Machine Information tab contains important information on a **particular selected machine**. It is divided into the following areas: • Machine overview • Maintenance • Fault services • Remote access
Setting up functions	The Configure Functions tab allows you to make all settings that apply to a **particular selected machine**. It is divided into the following areas: • Maintenance • Fault services • Global settings • Copying function settings • Client-server communication
Organizational tasks	The Organizational Tasks tab contains functions and services that apply to **all machines** of an organization. It is divided into the following areas: • Maintenance jobs • Service cases

Tab / Chapter	Description
Statistics / export	The Import / Export" tab contains functions and services that apply to **all machines** of an organization. It is divided into the following areas: • Statistics • Import • Export • Overviews
Management	The Administration tab contains functions and services that apply to the settings of **an organization**. • It is divided into the following areas: • Organization management • Personal settings

Machine information 2

2.1 Machine events – List view

Description of the function

Under Machine events in the machine information area you can view the following events for the selected machine as a list:

- Events from Control Monitor Services:
  - Alarm or PLC events
  - Fault processing request
  - Cyclic events (time trigger)
- Events from Condition Monitor Services:
  - Violated time delay limits from PLC or NC performance monitors
  - Limit value violation for series of measurements / test series
- System events:
  - NC/PLC archives created
  - Service sessions performed

You can view additional diagnostic information or triggered workflow services elements for each **event** and evaluate it and in some cases graphically evaluate it:

- Diagnostics data:
  - Files
  - HMI action log
  - Machine data or NC status data
  - PLC traces or PLC data blocks
- Workflow Services Elements:
  - Transmitted notifications (SMS / e-mail)
  - Generated maintenance jobs
  - Service cases

To ascertain differences between machine data, NC status data, and data of the HMI action log, you can compare this data with data of the same type for several events on the same machine.

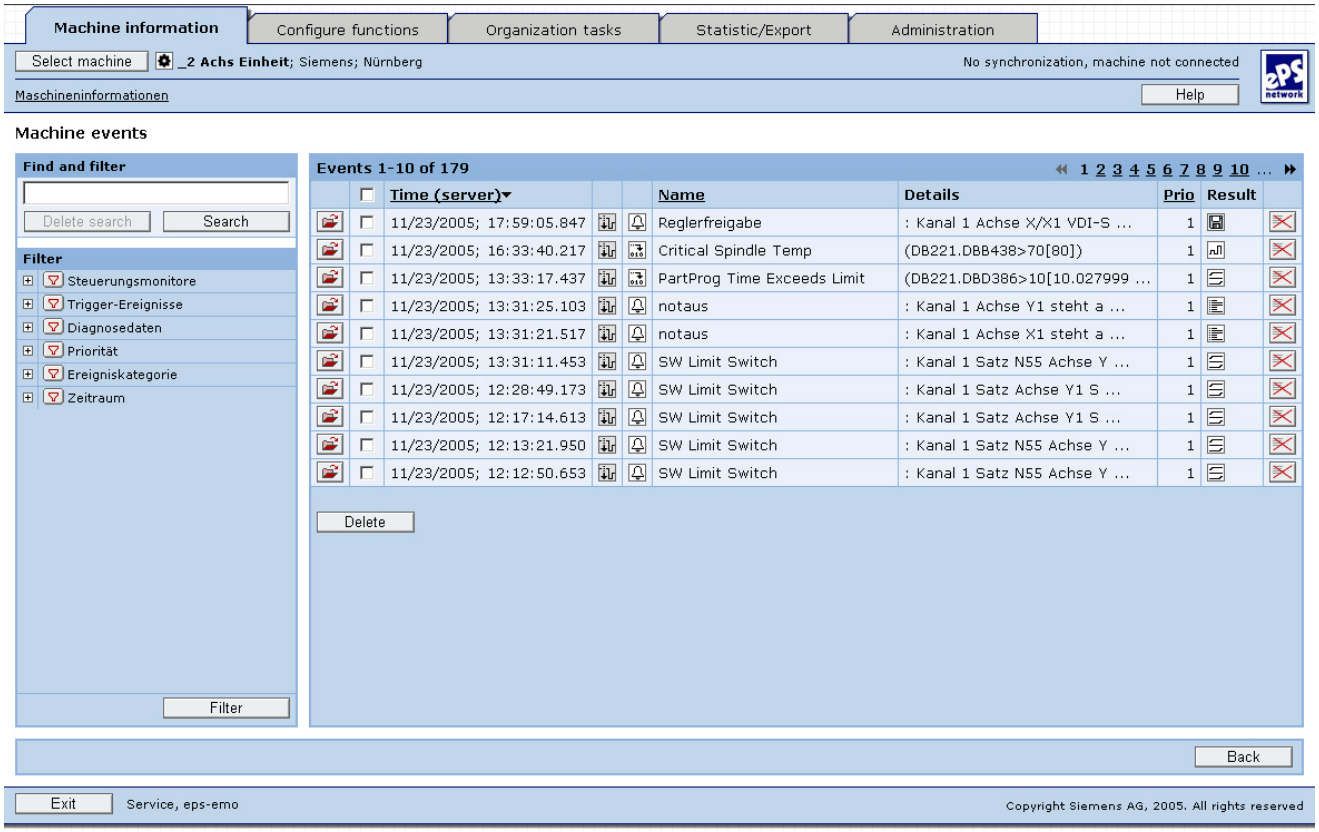


Figure 2-1 List view of machine events

Function	Description
View events (detailed view)	You can open the detail view of events, for example, to view and compare diagnostic events.
Sort events	You can sort events according to time stamp (date), designation or priority. **Note:** If the list of events has already been reduced by filtering and/or a search, the reduced list is sorted.
Filter events	You can filter events according to their properties. Various filter criteria are available: • Filter according to type of event (alarm, PLC, time trigger, trigger from performance monitors etc.) • Filter according to type of diagnostics data (e.g. files, PLC Traces) • Filter according to type of triggered Workflow Services Elements (e.g. maintenance jobs) • Filter according to event priority • Filter according to time periods (e.g. today, this week, from/to) **Note:** The filter can be hidden to make it easier to evaluate the event history on at lower screen resolutions. However, the filter settings still remain active.

Function	Description
Search for events	You can search through events using a free text search. The search is applied to the fields "Designation" and "Details".
	Note: Localized alarm texts of the machine loaded into the ePS server are also found, even if another language is currently set on your workstation (browser).
Delete events	You can delete individual events.
Delete several events	You can delete several events simultaneously: • Mark the control box in the title heading "Mark all" and then click the "Delete" button. • Mark individual entries via the control boxes for the line and then click the "Delete" button. **Note:** You can mark events in the Control Monitor Services as "not deletable" (e.g. for verification purpose). You cannot remove them from the list! **Notice:** Diagnostics data generated with an event are also deleted; however, triggered Workflow Services Elements (e.g. maintenance jobs) are not deleted!

2.2 Machine events - detailed view

Description of the function

In the detailed view of an event you can view detailed information about a trigger event and the diagnostics data and triggered Workflow Service Elements it generates.

The detailed view of an event is divided into three areas:

- Trigger
- Diagnostics data: Opening displayed actions

  (maintenance job, notification)
- Workflow actions: Opening displayed actions

The visualization is performed analogous to the configuration of a control monitor except for the restricted editing functions.

Note

The detailed information displayed for a particular event depends on the event type. The time stamp is displayed for all event types.

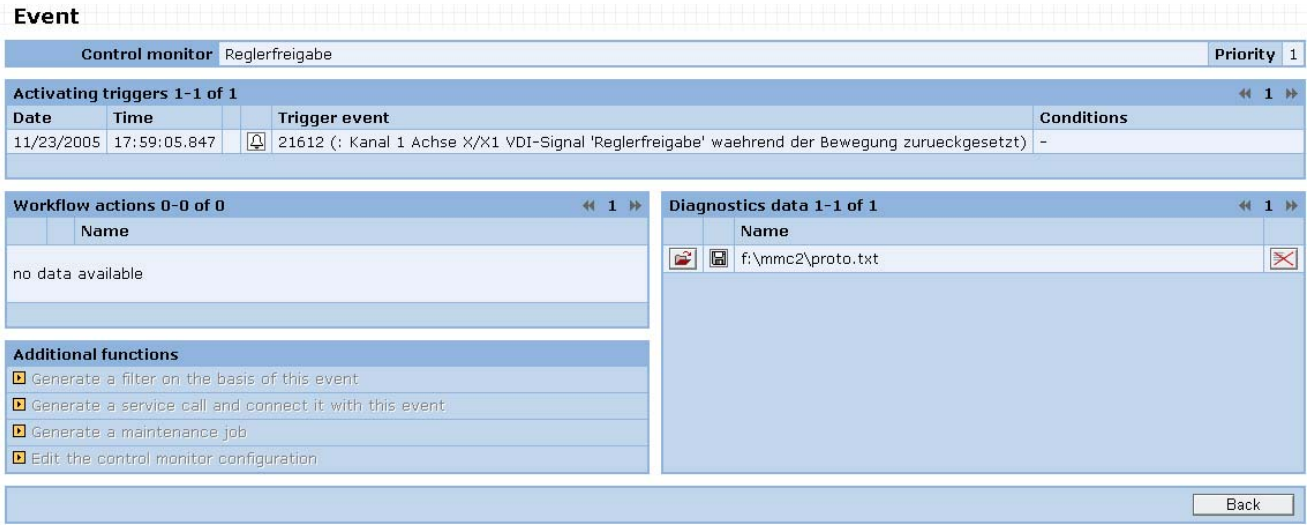


Figure 2-2 Example of a detailed view, machine event

Function	Description
View Workflow Element	You can view Workflow Elements in detail. The Workflow Element is opened and you can edit it (e.g. maintenance job). **Note:** Notifications cannot be edited.
Delete Workflow Element	You can delete Workflow Elements. **Note:** Notifications and service cases cannot be deleted.
View diagnostics data	You can view diagnostics data in detail and evaluate it.
Delete diagnostics data	You can delete diagnostics data. **Note:** You can mark events in the Control Monitor Services as "not deletable" (e.g. for verification purpose). Diagnostics data of these types of events cannot be deleted either.

2.2.1 Evaluation of workflow actions

Description of the function

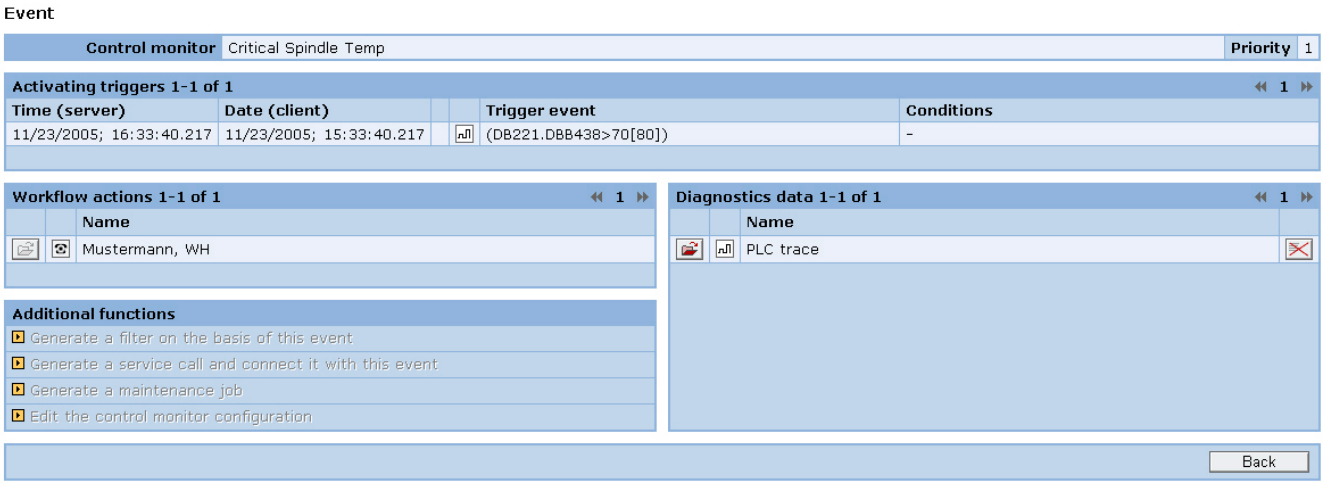


Figure 2-3 Display of completed Workflow Actions

Function	Description
View notifications	You can jump from the evaluation of one diagnostics data item directly to the next if it belongs to the same event.

2.2.2 Evaluating diagnostics data

Description of the function

ePS Network Services offers evaluation tools for acquired diagnostics data. These are either a text viewer (e.g. for machine data) or contain graphic views (e.g. PLC trace). A tool for comparing data is available for diagnostics data types machine data, NC status data, and HMI action log data. You can switch directly between different diagnostics data records of an event.

Function	Description
Change diagnostics data	You can jump from the evaluation of one diagnostics data item directly to the next if it belongs to the same event.

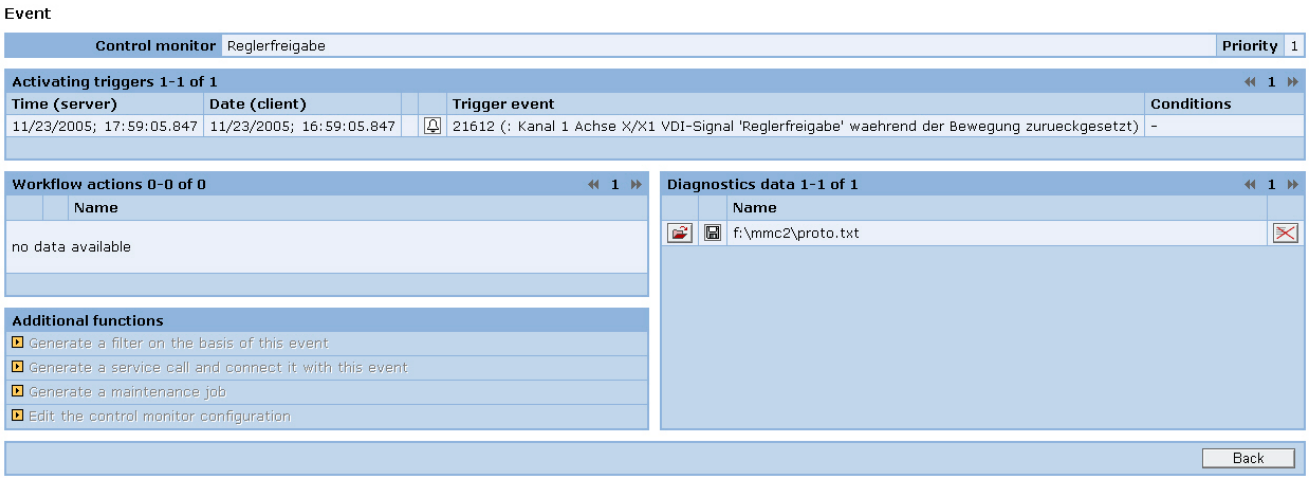


Figure 2-4 Display of recorded diagnostics data

Evaluating diagnostics data

The following **evaluation tools** are available for the various diagnostics data types:

- File list
- HMI action log
- Machine data
- NC status data
- PLC trace
- PLC data block / list

File list

The files uploaded from the control with a particular event can be displayed in the Browser or in another application, or stored on data media.

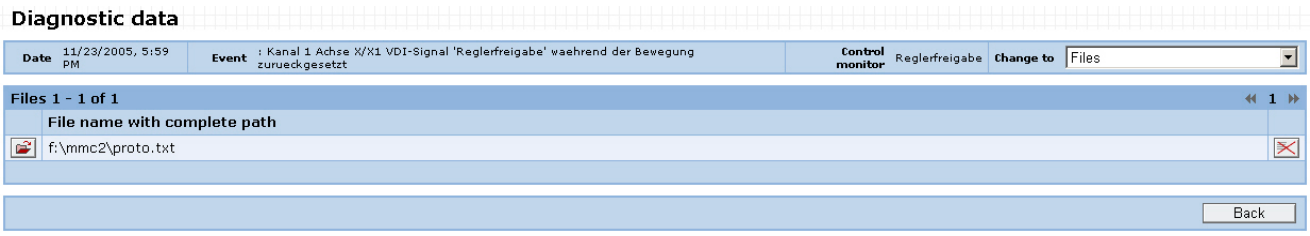


Figure 2-5 List of uploaded files

Function	Description
Display / save file	You can open a file in a separate browser window or in another application. Alternatively, you can save the file to data media. **Note:** The type of display depends on the data type and the applications installed on your system. Pure text or HTML documents are displayed in a separate browser window. Applications registered in the operating system are usually opened directly. You must save any files with unregistered data types and open them manually with your application.
Delete file	You can delete files. **Note:** That only deletes the file in the event that is currently selected. Deleting this file does not affect a file of the same name in another event.

HMI action log

An HMI action log uploaded with an event can be displayed in the browser and compared with other HMI action logs.

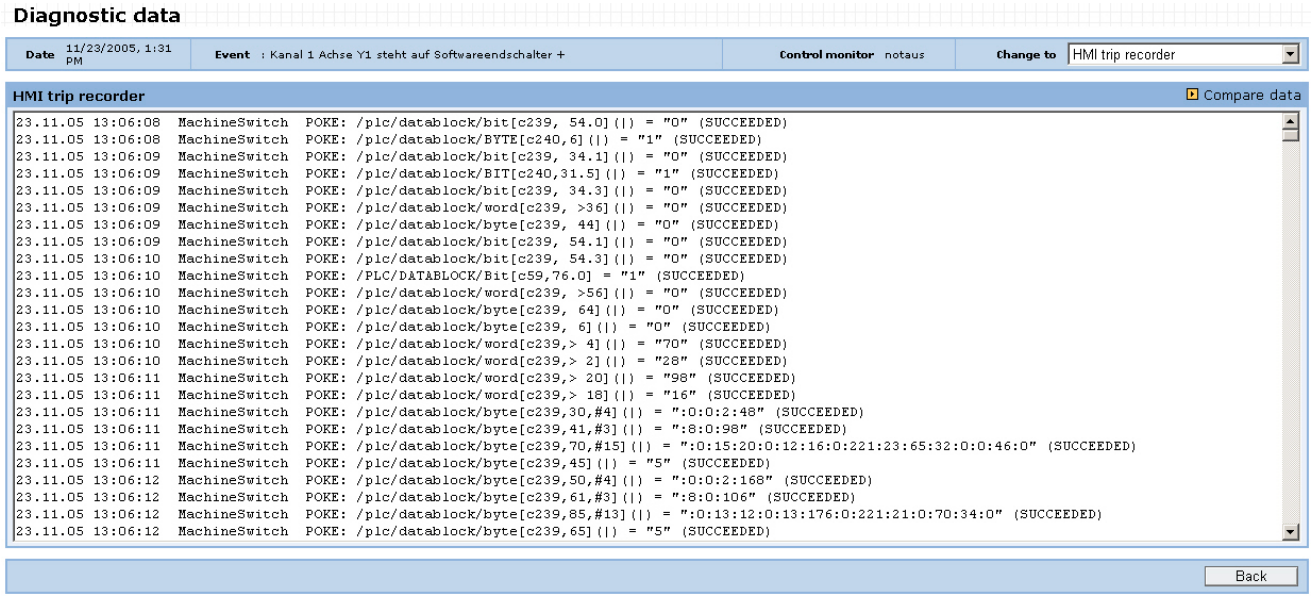


Figure 2-6 HMI action log display

Function	Description
Displaying the HMI action log	You can display and evaluate the content of an HMI action log in a text window and evaluate it. **Note:** The content of the HMI action log is defined via local settings on the control (see also Section 3.4 Setting up PLC for control monitors). The time stamp of the recorded information is generated from the PLC clock at the time of its occurrence.
Comparing HMI action logs	You can compare the HMI action log currently selected with another. The system offers you a list of all available HMI action logs of the currently selected machine. The HMI action logs are displayed in two horizontally adjacent windows and can be compared with each other. The event together with the event details and time stamp is displayed for each HMI action log.
Deleting the HMI action log	You can delete HMI action logs. **Note:** That only deletes the HMI action log in the event that is currently selected.

Machine data

Machine data uploaded with an event can be displayed in the Browser and compared with other machine data.

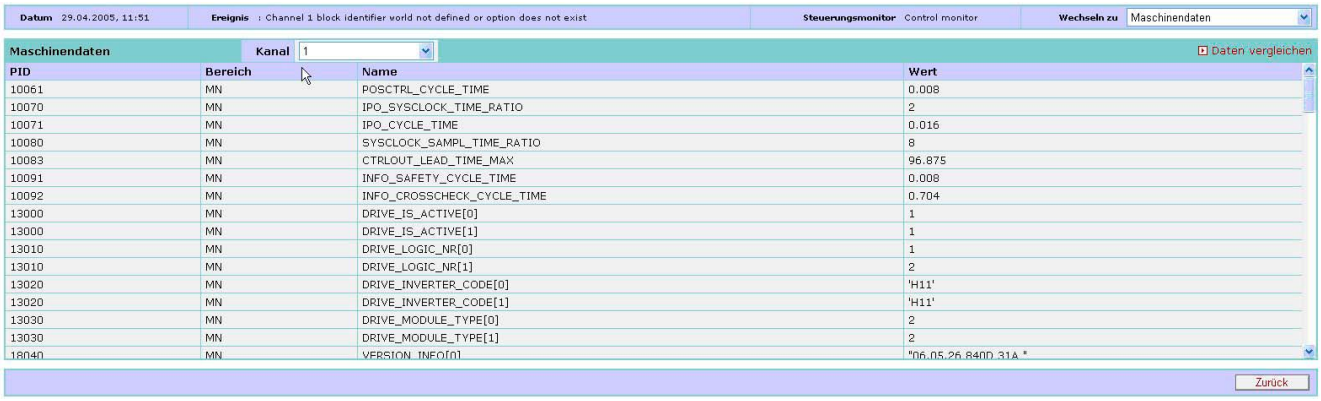


Figure 2-7 Displaying machine data

Function	Description
Displaying machine data	You can display and evaluate the content of the machine data in a table and evaluate it. You can select which channel you want to view machine data for. **Note:** Machine data without a channel reference are displayed in the first channel. The machine data generated with Control Monitor Services do not include any drive machine data.

Function	Description
Comparing machine data	You can compare the machine data record currently selected with another. The system offers you a list of all available machine data records of the currently selected machine. The machine data values are displayed side by side for each machine data item. A machine data item with different values in the original data record and the data record you are comparing with is highlighted. The event together with the event details and time stamp is displayed for each machine data record.
	You also have the possibility of just displaying the differences. The system then hides all machine data with identical values in the original data record and data record being compared. **Note:** Drive machine data are not compared.
Deleting machine data	You can delete a machine data record. **Note:** That only deletes the machine data record in the event that is currently selected.

NC status data

NC status data uploaded with an event can be displayed in the browser and compared with other NC status data.

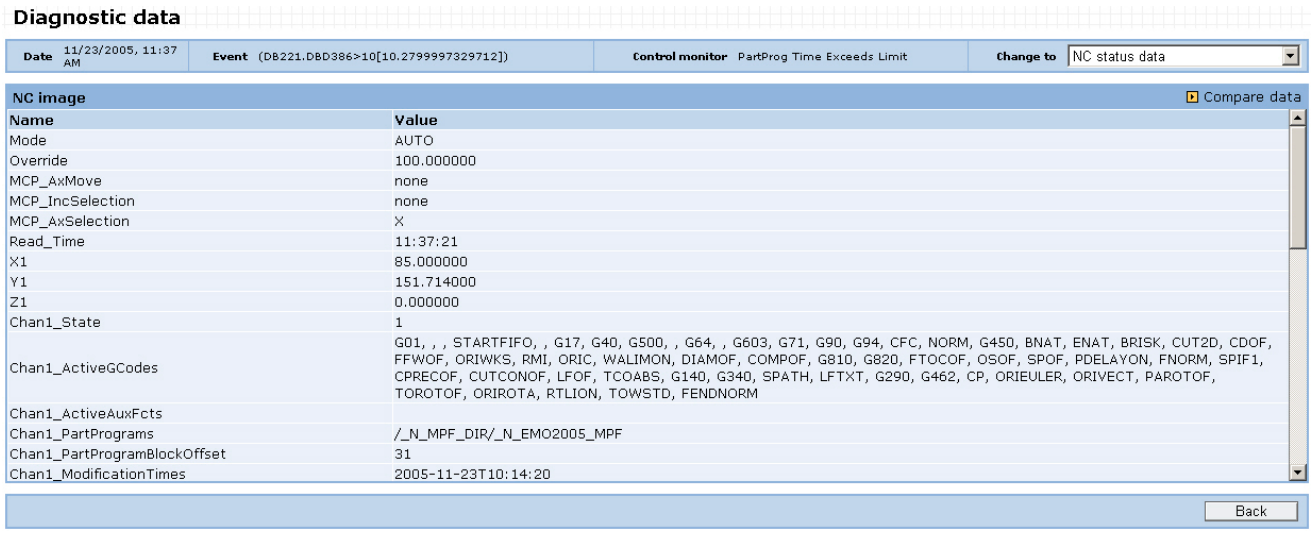


Figure 2-8 Displaying NC status data

Function	Description
Displaying NC status data	You can display and evaluate the content of the NC status data in a table and evaluate it. **Notice:** The NC status data reproduce the status of the relevant NC variables after occurrence of an event. For some events (e.g. RESET alarms) there is a danger of misinterpretation as the event itself influences the variable value (example: pointer to current block is reset by alarm).
Comparing NC status data	You can compare the NC status data set currently selected with another data set. The system offers you a list of all available NC status data records of the currently selected machine. The values of the NC status data sets are listed next to each other by variable for comparison purposes. A variable with different values in the original data set and the data set you are comparing with is highlighted. The event together with the event details and time stamp is displayed for each NC status data set. You also have the possibility of just displaying the differences. The system then hides all variables with identical values in the original data set and data set being compared.
Deleting NC status data	You can delete an NC status data set. **Note:** That only deletes the NC status data set in the event that is currently selected.

PLC trace

PLC traces uploaded with an event can be displayed in the browser and evaluated with graphical tools. Incorrect signal curves can easily be found by displaying variable values in the graphical display, setting markers, and zooming.

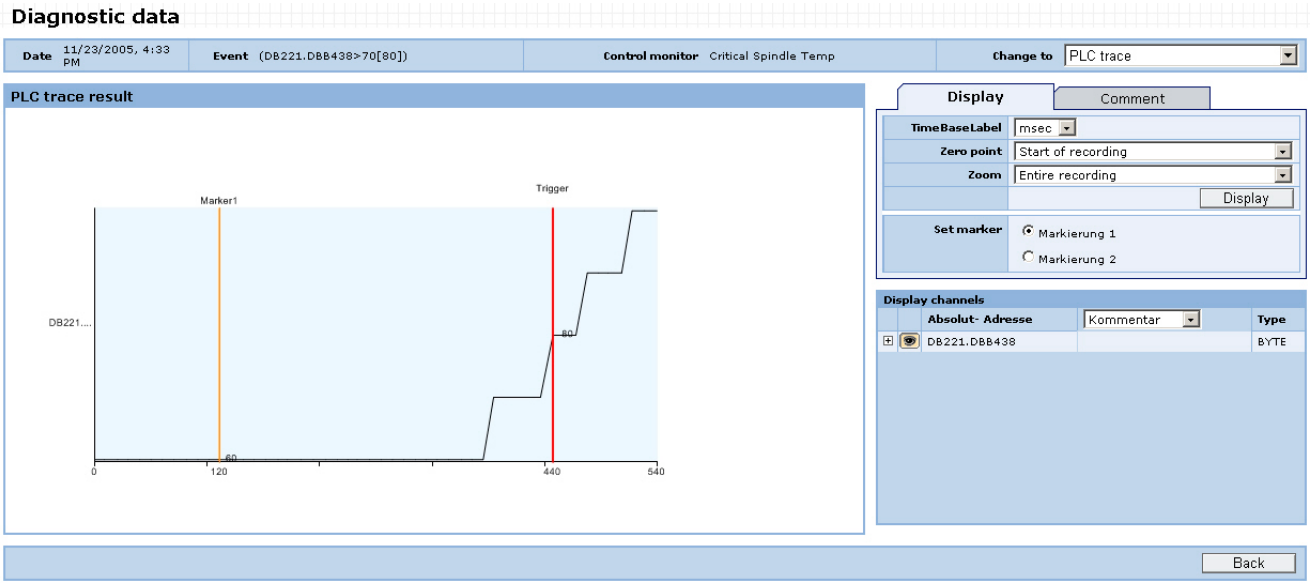


Figure 2-9 Displaying the PLC trace

Function	Description
Displaying the PLC trace	You can display the content of a PLC trace graphically. All the variables selected for the recording are displayed as standard. The current values are shown in the graphic at the trigger point for all values (exception: data type BOOL)
PLC trace / Comment	You can enter a comment for the PLC trace currently selected. This can be viewed by other operators once you have exited the display.
PLC trace / Changing-over the time base	You can change over the time base between milliseconds and PLC cycles. Milliseconds is the standard unit of time on the time axis. This corresponds to the real time stamps from the PLC.
PLC trace / Shifting the zero time point	You can use the trigger time or any measuring point you select with the marker as additional time zero points / reference points. The times are displayed relative to the beginning of recording as standard.
PLC trace / Set marker	You can set two markers and use this to measure signal curves. The actual values and time stamp of the selected measuring point is displayed in the graphic for each marker. If you set both markers the time difference is also displayed in the currently selected unit. **Note:** You set the selected marker by clicking into the graphics window.
PLC trace / Zoom	You can zoom the area between the two markers or display the whole trace.
PLC trace / Hide channel	If a PLC trace has recorded several channels, you can hide some channels in order to zoom other channels. **Note:** You can show/hide a channel by clicking on the (eye) icon.
PLC trace / Change channel details	You can change the display of the channels of a PLC trace, e.g. move or scale a channel. Once you have exited the display other operators can also view this trace with your settings. **Note:** You can show the channel detail by expanding a channel. This only changes the current PLC trace.
PLC trace / Change unit of display	You can display one unit per channel along the Y axis.
PLC trace / Change display scale	You can scale the measuring point values (Y values) with linear transformation (e.g. for linear measured value recorders). As standard the real variable values from the PLC are displayed in accordance with the data type set. **Note:** The two-point form of a straight line is used to enter the scale. You must always enter both points.
PLC trace / Move channel	You can move a channel up or down in the display.

Function	Description
Deleting the PLC Trace	You can delete a PLC trace. **Note:** That only deletes a PLC trace in the event that is currently selected.

PLC data blocks / list

PLC data blocks uploaded from the control on an event can be saved to a data medium.

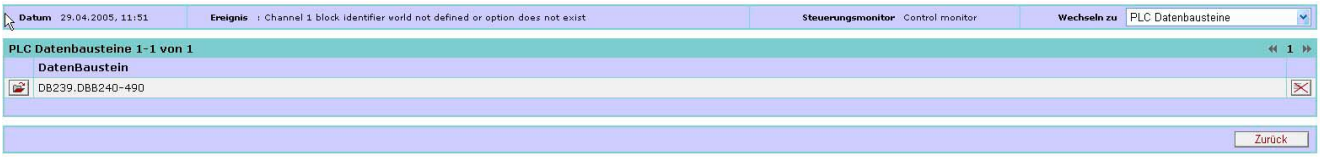


Figure 2-10 Displaying PLC data blocks

Function	Description
Saving a PLC data block	You can save a PLC data block to external data medium.
Deleting a PLC data block	You can delete PLC data blocks. **Note:** That only deletes a PLC data block in the event that is currently selected.

2.3 Current control software

Description of the function

In the Machine information area under **Current Control Software**, you can view all versions of the software packages currently installed on the control

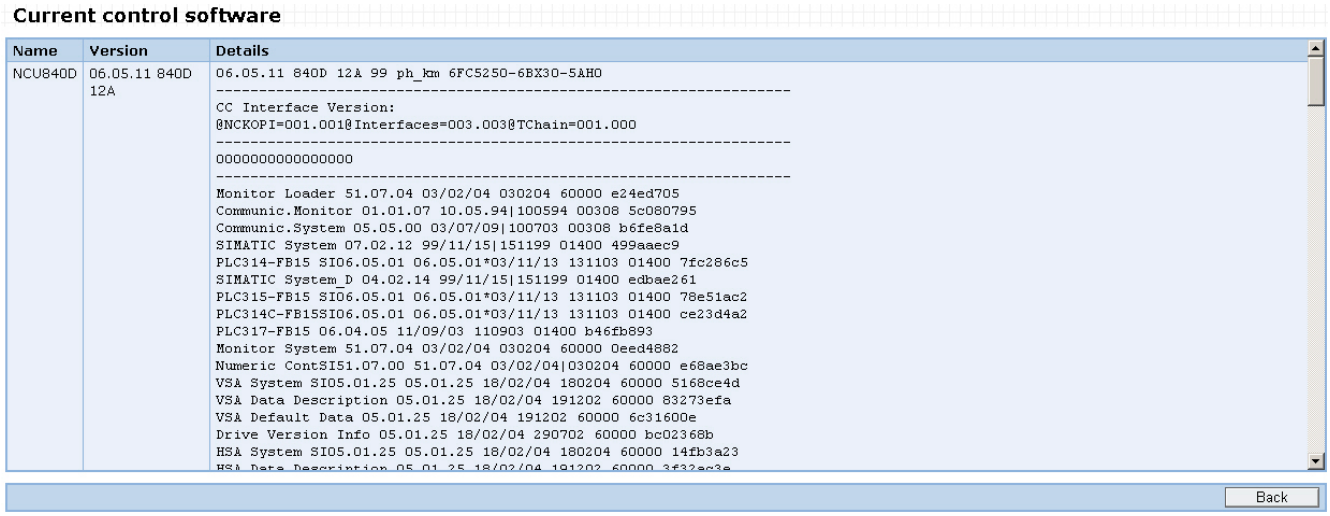


Figure 2-11 Control software

Function	Description
Current control software	Displaying the installed software versions. The display depends on the device class. For device class SINUMERIK these are the NCU and HMI versions.

2.4 Analysis at the PC

2.4.1 Analyzing measurements and series of measurements

Description of the function

The performance and status of a machine and its modules can be analyzed with measurements and series of measurements that have been performed on the machine. This includes measurement curves generated from the measurements and performance characteristics and additional information about the measurement result. Trend curves can be generated from characteristic quantities in the series of measurements. The operator can use the measurement results to make an analysis remote from the machine at a subsequent time. Status changes can be derived from the trend curves. Limit values will show in advance as to whether maintenance work is necessary.

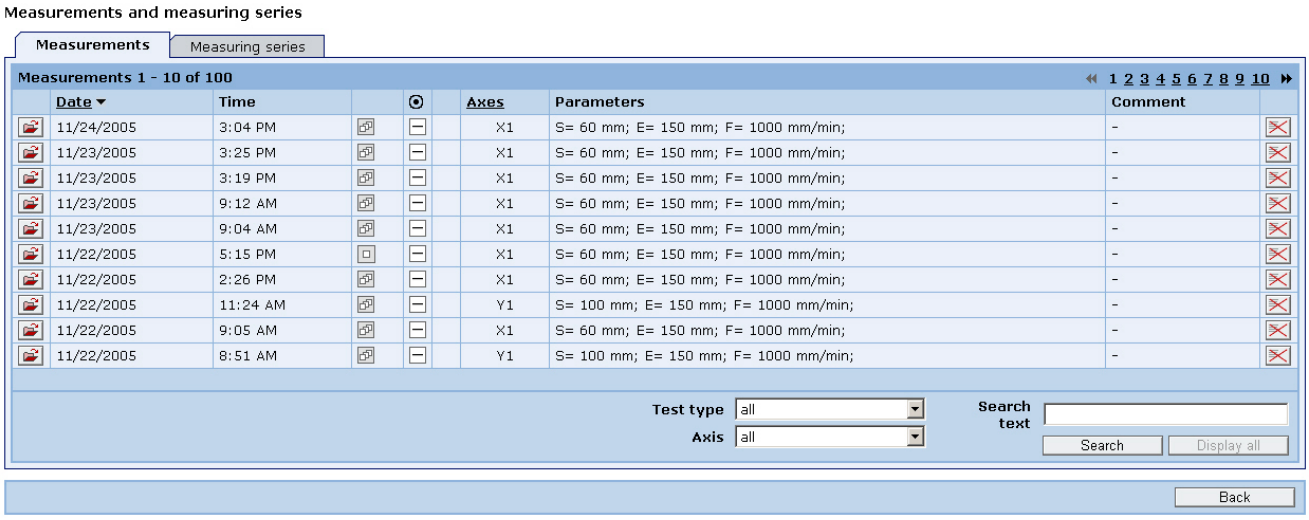


Figure 2-12 Overview of the stored measurement results

Displaying the measurement results

Measurement results from measurements can be viewed at the machine operator panel and also at the PC. Trend curves from a series of measurements can only be viewed on the PC.

When evaluated, the warning and critical limits of the characteristics can give the operator information about how far the quality state of the machine is from the limit criterion.

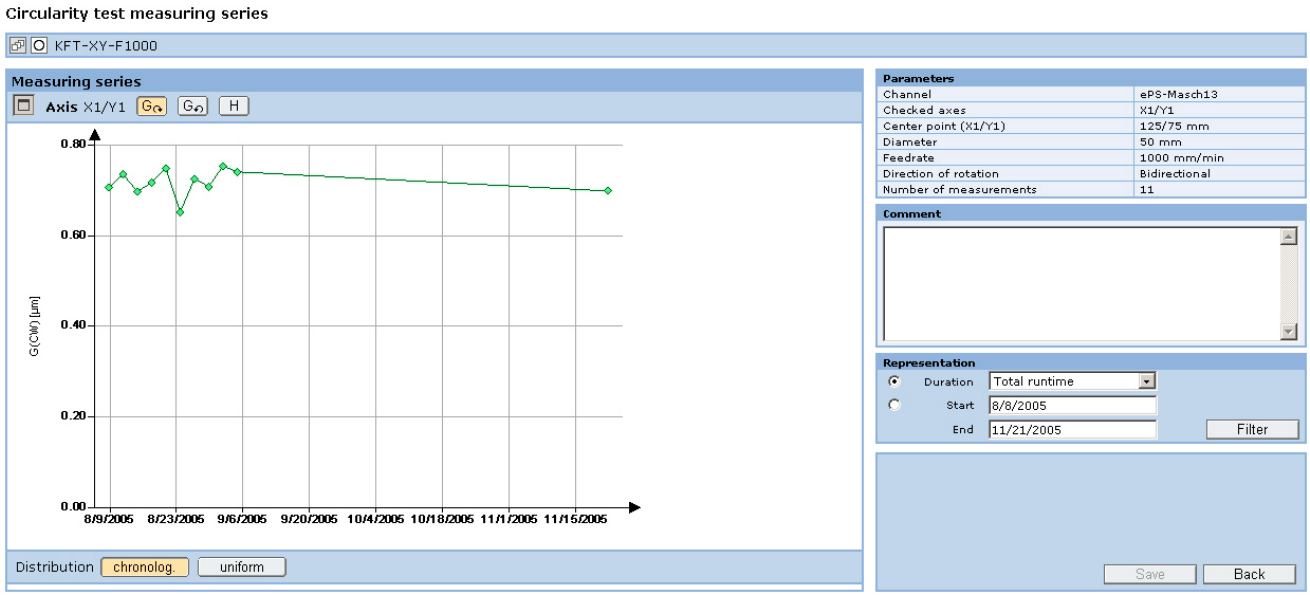


Figure 2-13 Time series of a characteristic quantities of a circularity test

Generating series of measurements

The trend curve can be generated from the measuring type-specific characteristic quantities (characteristic quantity over time) by cyclically repeating individual measurements. This is used in particular as a basis for condition-oriented maintenance. For this, measurement series can be generated based on existing individual measurements. This ensures that the series of measurements is based on the same measurement (the same measuring parameters).

Series of measurements are used as the basis for condition-oriented maintenance because the trend curve and the limit values provide a basis for planning maintenance activities.

The results of measurement can be viewed by the operator on the operator panel of the machine and on the PC. Trend curves derived from series of measurements can only be viewed by the operator on the PC.

See also

Executing series of measurements and test series (Page 31)

2.4.2 Circularity test

Description of the function

The circularity test produces a polar plot of the circular path and circularity-specific characteristic quantities:

- Circular deviation and
- Circular hysteresis

The measurement type-relevant parameters are also specified. The goal is to test the drive dynamics and accuracy of the two axes involved.

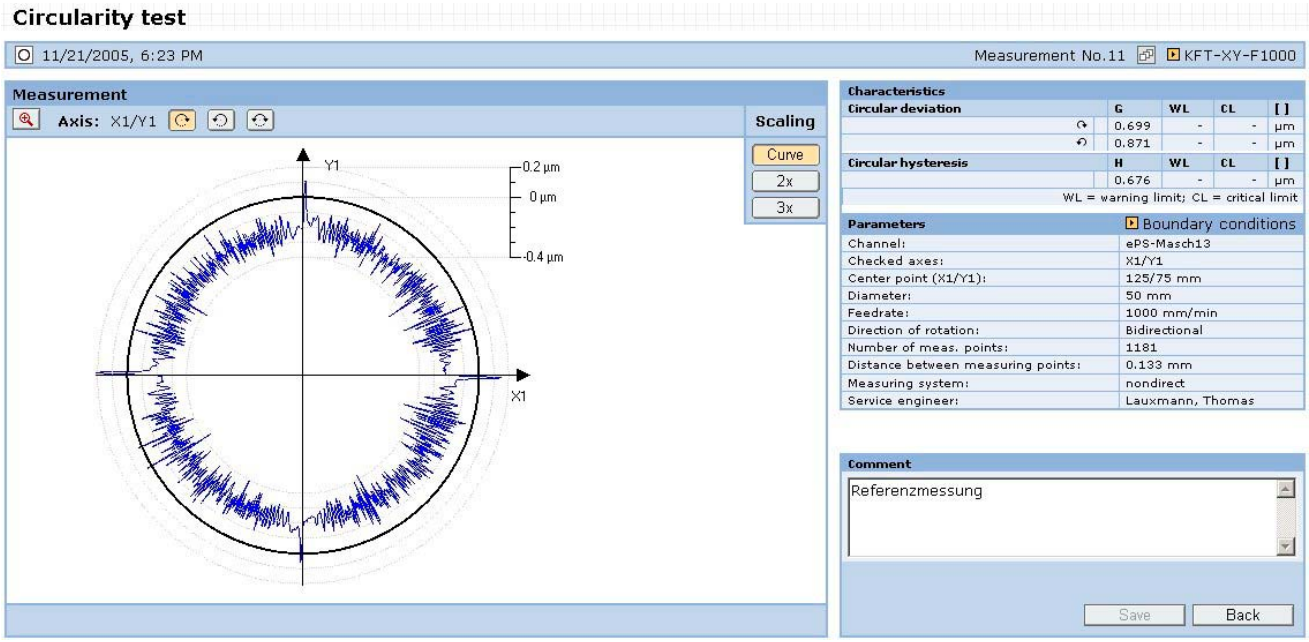


Figure 2-14 Measurement result of a circularity test

2.4.3 Equability test

Description of the function

The equability test result provides the torque/force measurement curve over the axis position and various torque values:

- Min./max. torque
- Average torque
- As well as the standard deviation.

Maximum torque when accelerating along the ramp

For axes that also have a direct measuring system the overall rigidity characteristic over the axis position is also displayed. The following rigidity characteristic quantities are also calculated:

- Min./max. rigidity
- Average rigidity
- Standard deviation of the rigidity

The analysis of the equability test indicates to the operator whether the feed axis elements have faults or there is a resistance to motion. The curve of the recorded quantities indicates at which axis position the disturbance is located. A trend analysis of the characteristic values will indicate any change in the status of the drive train.

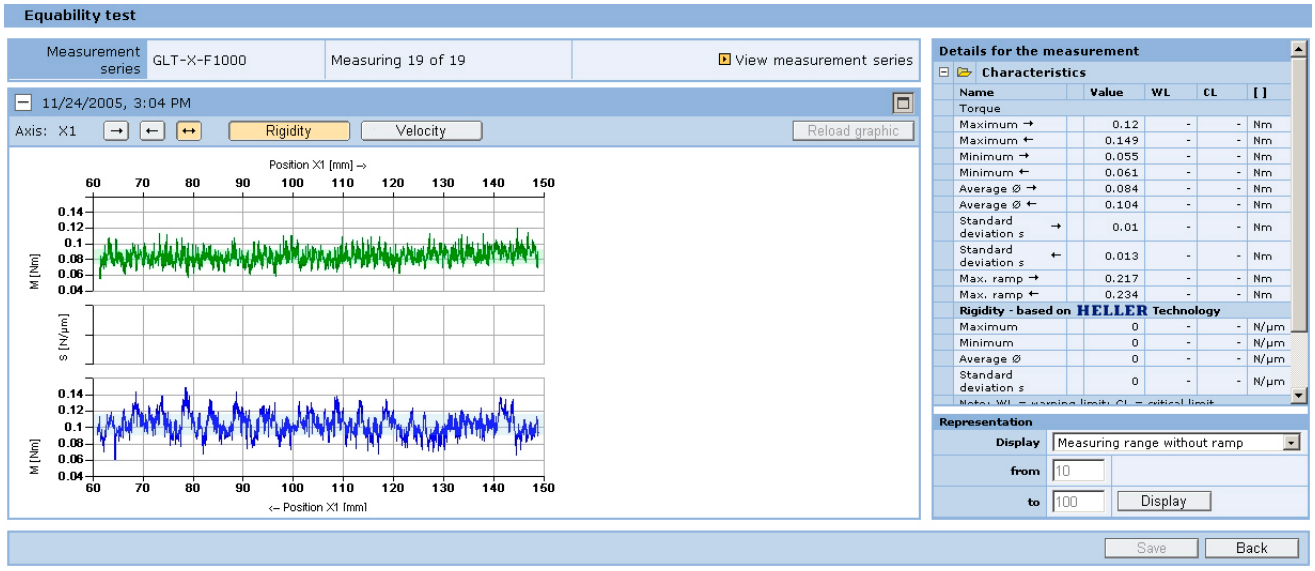


Figure 2-15 Measurement results of an equability test

2.4.4 Universal axis test (UAT)

Description of the function

With the universal axis test, characteristic quantities are determined to define the friction, the moment of inertia and a torque offset:

- Residual torque (Res)
- Coulomb friction (Coul)
- Mixed friction (Mix)
- Viscous friction (Visc)
- Moment of inertia (Inr)
- Torque offset (Const)
- Coherence (K)

The measurement type-relevant parameters are also specified.

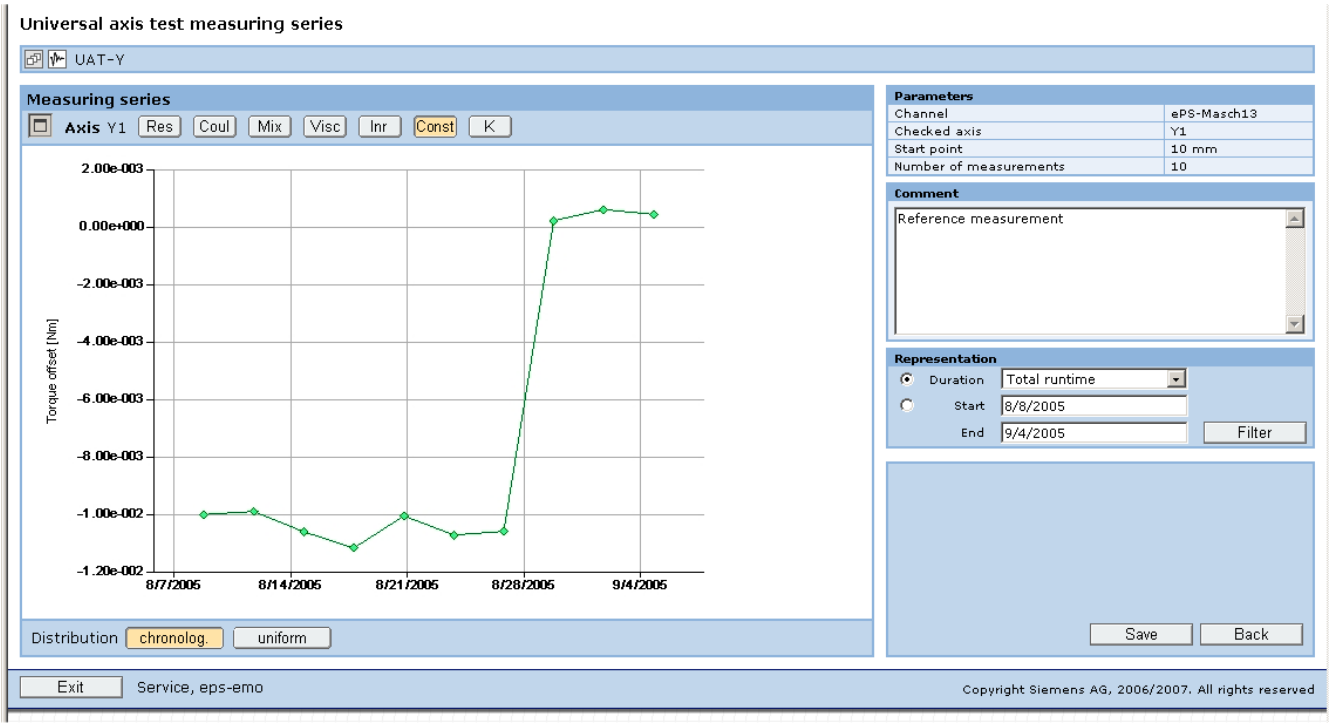


Figure 2-16 Measurement result of a universal axis test

2.5 Execution at the machine

2.5.1 Executing series of measurements and test series

Execute a measurement

The following alternatives are available for performing measurements on the machine:

- Performing a single measurement with manual entry of parameters before performing the actual test
- Performing a single measurement as a repeat of an existing measurement without changing the parameters
- Performing a further measurement as part of a series of measurements, based on the parameters predefined in the series of measurements
- Performing a measurement of a series of measurements prescribed by a maintenance job.
- Performing measurements configured in a test series.
- Performing measurements of a test series as part of a maintenance job

Availability and authorizations

Measurements, series of measurements, and test series can only be performed on the operator panel. Adequate user authorizations are required to execute measurements, series of measurements and test series (refer to the appendix).

Measurement sequence

The sequence is performed as follows independently of the different types of execution and type of test:

- The operator selects the measurement, series of measurements or test series
- Acknowledgement of the measurement parameters and display of the measurements in the test series
- A contour test to check the possibility of collision can be performed before the actual measurement
- Check whether enabled by the PLC
- The operator sets the AUTO mode and feedrate override to 100% on the control
- The operator presses NC-START on the control
- Performing machine-specific prolog of the measurement motion
- Performing the measurement motion with data recording
- Performing machine-specific epilog of the measurement movement
- Displaying the results
- Saving the results

Notice

Please observe the information on the operator panel!

2.5.2 Prerequisites for performing the test

Prerequisites of the control

When making measurements, the machine axes must be moved with precisely the motion profile that is defined in the NC program. In addition, it must also be guaranteed that the motion is also executed in the machine coordinates.

Functions in the NC program

The following functions in the NC program could be problematical when carrying out measurements (sample selection):

- Asynchronous subprograms
- Static synchronized actions
- Axis couplings
- Kinematic transformations
- Superimposed (overlaid) motion, such as DRF, external work offset
- Functions, that influence the velocity, such as G95
- Functions that change the position, such as DIAMON
- Axis replacement
- Axis is transferred over to the PLC (PLC axis)

The NC program for performing the measurement does not affect the functions listed above. Only the work offsets are disabled and the offset produced by DRF and external work offset is compensated statically, i.e., the value is corrected by the value that applies at the beginning of the measurement.

Orientation transformations are a special case. It is possible to execute measurements with the geometry axes when transformation is active. However, the offset of the geometry axis coordinates produced by the orientation axes is not compensated for. It is therefore advisable to deactivate transformation.

The ePS system assumes that it is possible to load, select, and start an NC program (with subroutines) downloaded from the ePS system on the machine in a particular channel.

For machines where the PLC prevents the operator from selecting or starting any NC program, the PLC can communicate with the ePS system via DB10.DBB90 or DBB91.

Machine data must be set in the control to acquire data for the condition monitoring measurements. Not only Trace Server machine data but also MD 36730: DRIVE_SIGNAL_TRACKING must be set.

Drives that are linked via Profibus must be handled differently. Here the Profibus configuration must be changed so that the torque values can be transmitted to the control cyclically.

Prerequisites of the machine

The measurements for condition monitoring assume that the machine axes can be traversed separately with precisely the motion profile that is defined by the NC program for performing the measurements.

Machine designs with parallel kinematics, for example, that do not allow this are not suitable for condition monitoring by ePS Network Services.

2.5.3 Prolog and epilog program for a measurement

Description of the function

To prepare the control making it suitable for the test, an NC program that has been specially adapted to the machine by the machine manufacturer or end user is executed at the beginning of the test. This means that machine settings can be specifically changed so that the test can be performed (example: Disabling transformations and couplings, resetting preset G codes).

The prolog and epilog program is reloaded into the control with name "N_EPS_PROLOGEPILOG_SPF" every time a test is performed. The NC program editor of the operator panel (=HMI-Advanced) can be used to modify this program.

After the test has been performed, the ePS system automatically checks whether the prolog/epilog program has been changed and stores it permanently, if the operator requires this.

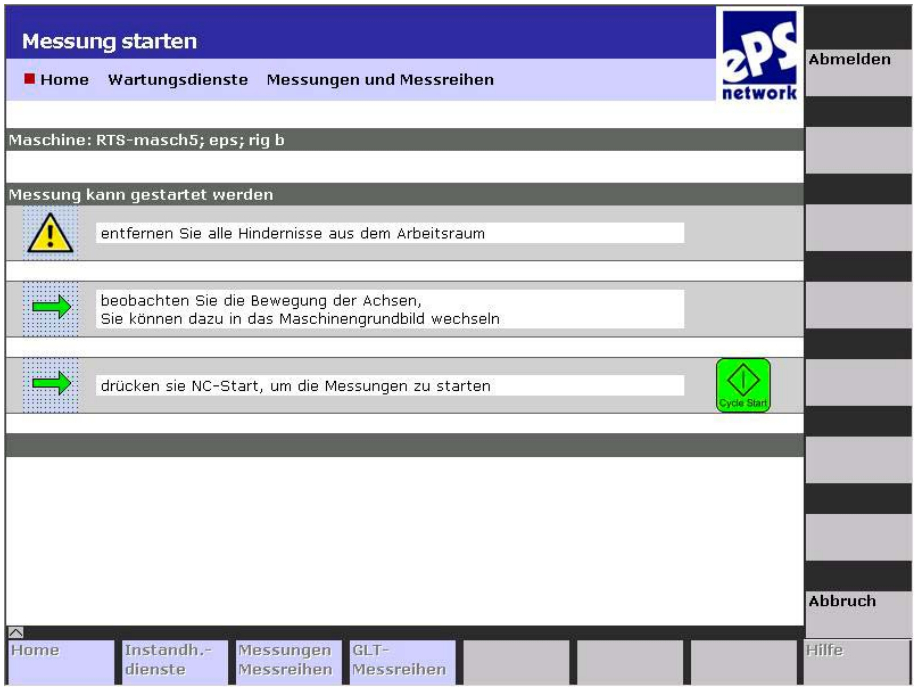


Figure 2-17 Request for an NC-START

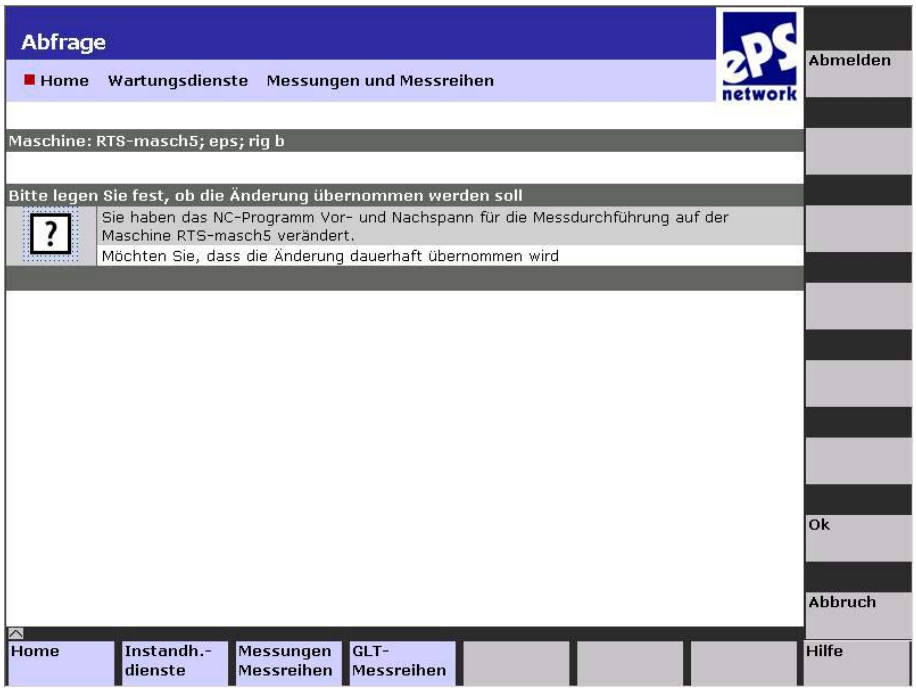


Figure 2-18 Permanently saving the prolog/epilog program

Call sequence of the NC programs

The prolog and epilog program is executed before and after each measurement movement. The program is also called at the start of a test series and at the end of a test series.

Example of a call sequence:

```
Prolog for a test series (testType == "FRAME")
Prolog for series of measurements1 (testType == "CIRCULARITY")
Measurement1
Epilog for series of measurements1 (testType == "CIRCULARITY")
Prolog for series of measurements2 (testType == "EQUABILITY")
Measurement2
Epilog for series of measurements2 (testType == "EQUABILITY")
Prolog for series of measurements3 (testType == "UNIVERSAL")
Measurement3
Epilog for series of measurements3 (testType == "UNIVERSAL")
Prolog for series of measurements4 (testType == "CIRCULARITY")
Measurement4
Epilog for series of measurements4 (testType == "CIRCULARITY")
...
Epilog for test series (testType == "FRAME")
```

testType == "FRAME" marks the call to start and end of the test series. For this call, the other parameters are of no significance. testType == "CIRCULARITY" identifies a circularity test measurement. "EQUABILITY" stands for the equability axis text and "UNIVERSAL" for the universal axis test.

In the calls made before and after a measurement, the further call parameters of the program contain the specific information about the measurement in accordance with the table.

Description of the call parameters

All position values refer to the machine coordinate system (MCS):

	Equability test	Circularity test	Universal axis test
doProlog	TRUE = call as prolog FALSE = call as epilog		
testType	FRAME = prolog/epilog of the test series (The following parameters are irrelevant.)		
testType	EQUABILITY	CIRCULARITY	UNIVERSAL
measSeriesName	Name of the series of measurements (in UPPERCASE LETTERS)		
intParam1	Channel axis number of the traversing axis	Plane selection (1 = G17, 2 = G18, 3 = G19)	Channel axis number of the traversing axis
intParam2	Channel axis number of the measurement axis	Reserve	Reserve
intParam3	Reserve	Reserve	Reserve
intParam4	Reserve	Reserve	Reserve
intParam5	Reserve	Reserve	Reserve
intParam6	Reserve	Reserve	Reserve
realParam1	Starting position	1. Center coordinate of the circle	Starting position
realParam2	End position	2. Center coordinate of the circle	Maximum position
realParam3	Reserve	Circle diameter	Reserve
realParam4	Feedrate	Feedrate	Reserve
realParam5	Reserve	Reserve	Reserve
realParam6	Reserve	Reserve	Reserve
axParam1	Channel axis (traversing axis)	Channel axis 1 (traversing axis)	Channel axis (traversing axis)
axParam2	Machine axis (measurement axis)	Channel axis 2 (traversing axis)	Reserve
axParam3	Machine axis (traversing axis)	Reserve	Reserve
axParam4	Reserve	Reserve	Reserve
axParam5	Reserve	Reserve	Reserve
axParam6	Reserve	Reserve	Reserve

2.5.4 Programming example

Description

Here is a commented program example to illustrate how the prolog and epilog program can be used to prepare the machine specifically for a certain test.

The structure of the program is as follows:

- **Prolog for the test series:**

  This section of the program is only executed once at the beginning of a test series and also on each single measurement outside a test series. This block contains everything that has to be executed irrespective of the type of test or the axis that is to be measured. For example, here G codes that are preset on the machine via machine data (G95, DIAMON, …) could be deactivated, the tool could be unloaded, the workpiece could be removed, and all axis could be moved to a safe initial position.

- **Prolog for each measurement:**

  This section of the program is executed before each measurement, irrespective of whether the measurement is part of a test series or is performed singly. This block can be used with call parameters to check which axis is to be tested, which test type is to be performed, and with which parameters the measurement will be performed. For example, when testing certain axes, it may be necessary to move other axes to another position than the basic position, or the starting point for the measurement cannot be approached directly (circularity test). Certain actions could also be performed depending on the position range in which the measurement is performed.

  When programming axis movements, it is important to ensure that the parameters of a measurement always refer to the machine coordinate system if they represent positions. The example program shows how the axis movement can be offset into the machine coordinate system using the command SUPA.

  It is possible to test the name of the series of measurements in the program and to execute special functions for a certain series of measurements. However, that should be limited to special cases because the parameters of a series of measurements can be changed at any time without its name having to be changed.

- **Epilog for the test series:**

  This section of the program is only executed once at the end of a test series and also after each single measurement made outside a test series. This block should contain actions that must be executed to minimize the work the machine operator must do to return to the productive process after performing measurements.

- **Epilog for individual measurements:**

  This section of the program is executed after each measurement, irrespective of whether the measurement is part of a test series or has been performed singly. It is useful for undoing actions performed before the measurement. It may be necessary to move all axes back to their safe initial position.

Program Code

```
                                        ; user DEF area
PROC EPS_PROLOGEPILOG(BOOL doProlog, STRING[32] testType, STRING[32] measSeriesName,
INT intParam1, INT intParam2, INT intParam3, INT intParam4, INT intParam5, INT
intParam6, REAL realParam1, REAL realParam2, REAL realParam3, REAL realParam4, REAL
realParam5, REAL realParam6, AXIS axParam1, AXIS axParam2, AXIS axParam3, AXIS
axParam4, AXIS axParam5, AXIS axParam6)
IF (doProlog == TRUE)
  MSG("Start of Prolog ... ")           ; start of Prolog - user section start
    IF ( testType == "FRAME")
    MSG("Frame Prolog ...")             ; Frame Prolog user section actions at start of a
                                        test series
    T0 M6                               ; Unload tool
    BASIC POSITION                      ; all axes to safe position
    TRAFOOF                             ; Deactivate transformation
    G94                                 ; for lathes, G95 is often placed in front
    DIAMOF
    G90
  ELSE
    MSG(testType << " Prolog ...")      ; prolog for a specific series of measurements
                                        ; handling irrespective of type of measurement
                                        ; handling for measurement of certain axes:
    IF (axParam1 == C) OR (axParam1 == A) ; if axis A or C is to be measured, Q must be 0
      IF ($AA_IW[Q]!=0)                 ; M code for rotation of Q
      ENDIF
    ENDIF
    IF (axParam1 == U) OR (axParam1 == W) ; if axis U or W is to be measured, Q must be 180
      IF ($AA_IW[Q]!=180)               ; M code for rotation of Q
      ENDIF
    ENDIF
    IF (testType == "CIRCULARITY")      ; specific handling for circularity test
                                        ; actions for all circularity tests: to avoid collision,
                                        the two axes are moved to the circle center one
                                        after the other. A particular sequence may be
                                        required.
      G1 F1000 SUPA                     ; SUPA, therefore target position in the machine
AX[axParam1]=realParam1                 coordinates
      G1 F1000 SUPA
AX[axParam2]=realParam2
      IF (measSeriesName == "KFT_FFWON")
        FFWON                           ; specifically this series of measurements should
                                        be performed using the pre-control FFWON
      ENDIF
    ENDIF
```

```
    IF (testType == "EQUABILITY")          ; actions for all equability axis tests, e.g.
                                             approaching the start position
      IF (measSeriesName == "")            ; specific actions for single series of
                                             measurements
      ENDIF
    ENDIF
    IF (testType == "UNIVERSAL")           ; actions for all universal axis tests, e.g.
                                             approaching the start position
      IF (measSeriesName == "")            ; specific actions for single series of
                                             measurements
      ENDIF
    ENDIF
    MSG(" ... finished Prolog.")           ; end of Prolog - user section end
    GOTOF PROG_END
ELSE
  MSG("Start of Epilog ... ")              ; start of Epilog - user section start
  IF ( testType == "FRAME")                ; Epilog of the test series
    MSG("Frame Epilog ...")                ; Frame Epilog user section
  ELSE
    MSG(testType << " Epilog ...")         ; Epilog specifically for the last meas. series
                                             conducted
    G90
    BASIC POSITION                         ; all axes back to safe position after measurement
    MSG(" ... finished Epilog.")           ; end of Epilog - user section end
  ENDIF
ENDIF

PROG_END:
G4 F1                                      ; is required for synchronization
M17
```

2.5.5 Release protocol

Description of the function

Communications are established between the ePS system and the PLC when a test is being performance The ePS system signals that a test will be executed with axis movements. The PLC can then put the machine in a suitable state and signals to the ePS system that the test can begin.

The protocol allows test series, that are to be carried-out with a maintenance schedule, to be fully automatically executed, monitored by the PLC.

References: More details are provided in /R1/.

2.5.6 Contour test

Description of the function

A dry run is possible to ensure measurements can safely be performed on the machine. The operator can execute an optional dry run with reduced velocity before the test is performed for the specific type. This allows the operator to check that all path motion is safe (contour monitoring) of the machine axes to avoid collisions, etc.

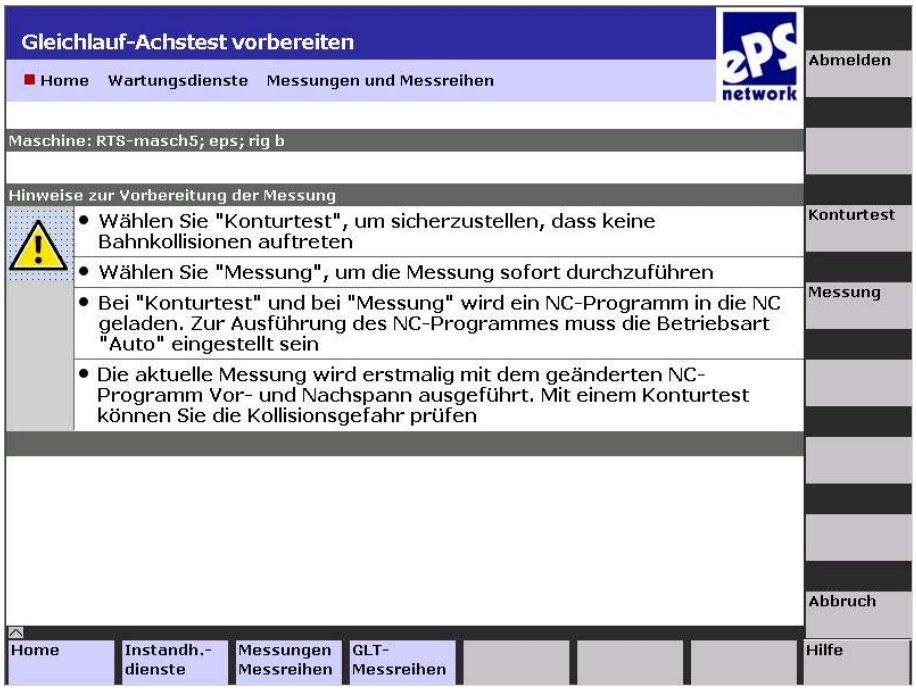


Figure 2-19 Selecting the contour test

Field	Description	Type
Contour test	A contour test can be run to check that the measurement part program is collision-free before the actual measurement in made.	ACTION
Measurement	Selecting the "Measurement type" tab. Measurement can be performed after observing the information provided.	ACTION

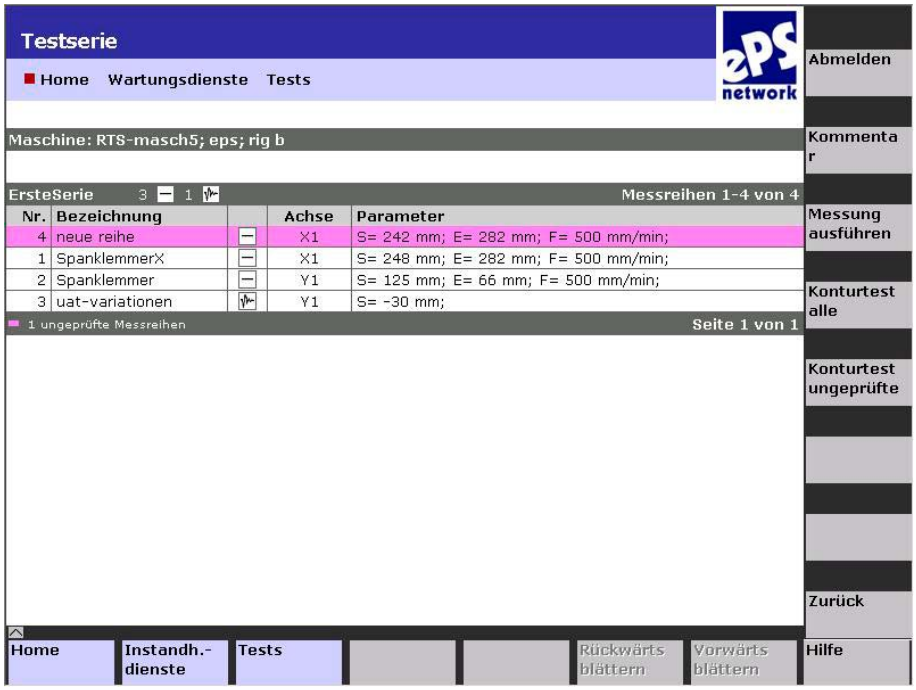


Figure 2-20 Series of measurements of a test series

2.6 NC monitors

Description of the function

The life-cycle loads of machine axes (linear, rotary, and main spindle) can be collected and analyzed using the monitors. NC variables (counters) relevant to maintenance, such as the traversing path, traversing time, or number of traverses are summated over the axis life or defined periods and can be viewed by the operator in the form of time charts. Specific maintenance can be performed based on this load data, especially with reference to defined alarm and critical limits.

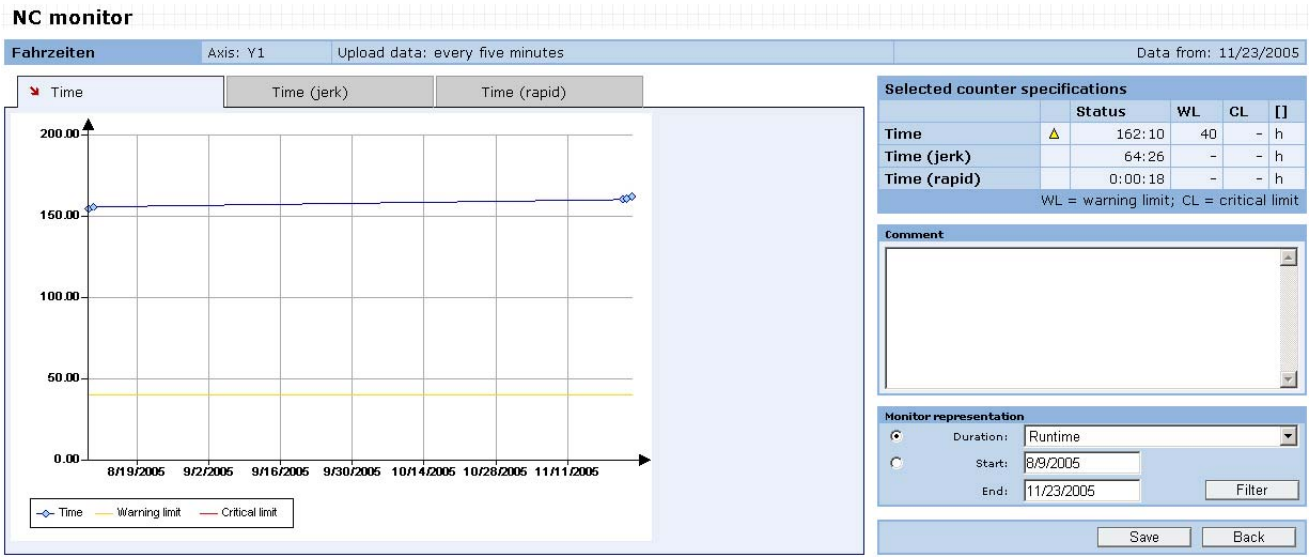


Figure 2-21 Time chart NC monitor

This information provides support with specifying new machine designs because the real load data is available for machine dimensioning.

Availability and authorizations

The time charts of the NC monitors can only be displayed on the PC. The actual counter states of an NC monitor can also be viewed on the operator panel.

The authorization required for using the NC monitors is described in detail in the Appendix.

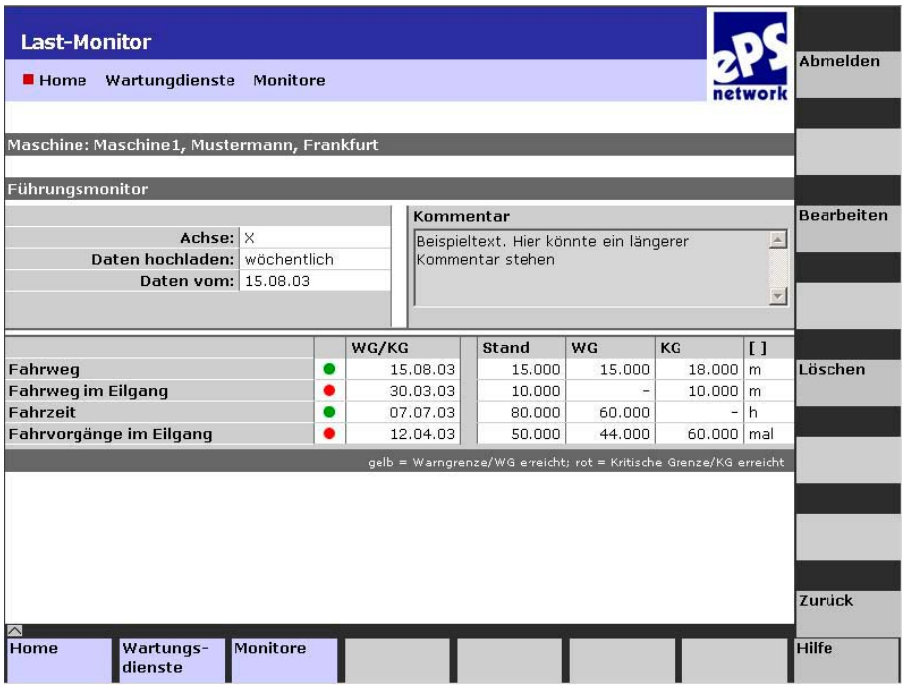


Figure 2-22 Counter states of an NC monitor on the operator panel

2.7 PLC monitors

Description of the function

PLC monitors allow the change of state of any data over time to be acquired in the PLC. PLC monitors are essentially used for long-term recording in slow data recording cycles (as opposed to the PLC trace). This means that all the machine peripherals that are controlled and monitored by the PLC can be included in condition monitoring.

Up to 32 variables from the PLC can be recorded together in a PLC monitor in the same cycle. The PLC variables recorded can include inputs, outputs, counters, flags, and any data addresses in PLC blocks.

The variables recorded can be scaled and assigned freely definable units. Individual variables of a PLC monitor can be identified as counting variables (e.g. workpiece counters). These variables can be used in the configuration of interval triggers to trigger recurring actions after a certain number of counting units have elapsed. Counting variables are counted up monotonically. Deleting variables in the PLC is compensated for by the system because counting is resumed on the basis of the last value before deletion.

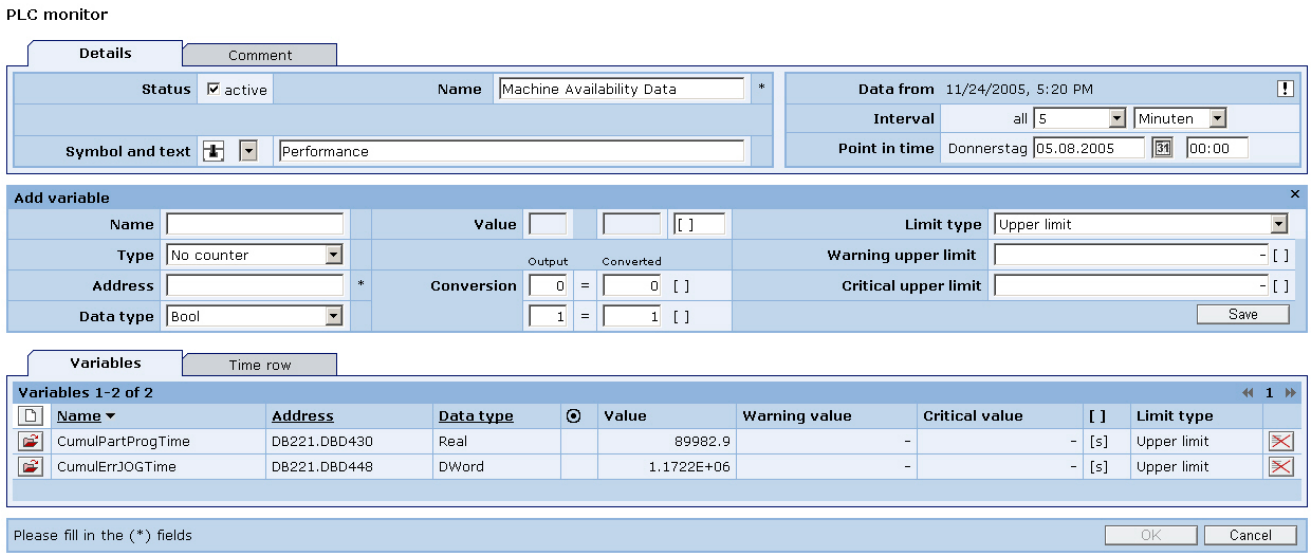


Figure 2-23 PLC monitor

Field	Contents	Type
Status	active	DISPLAY INPUT
Designation	Name	DISPLAY INPUT
Interval	All x selection	DISPLAY INPUT
Symbol / Text	Name	DISPLAY INPUT

Field	Contents	Type
Instant in time	Date, time	DISPLAY INPUT
Designation	Name	DISPLAY INPUT
Value	Actual value Converted value	DISPLAY
[ ]	Value dimension	DISPLAY INPUT
Limit type	Selection	DISPLAY INPUT
Type	Selection (important for limit value trigger: here always counter)	DISPLAY INPUT

Limit values can be configured for each variable for automatic monitoring of the state. Actions can be triggered when limit values are violated. This is the same as described for the control monitors.

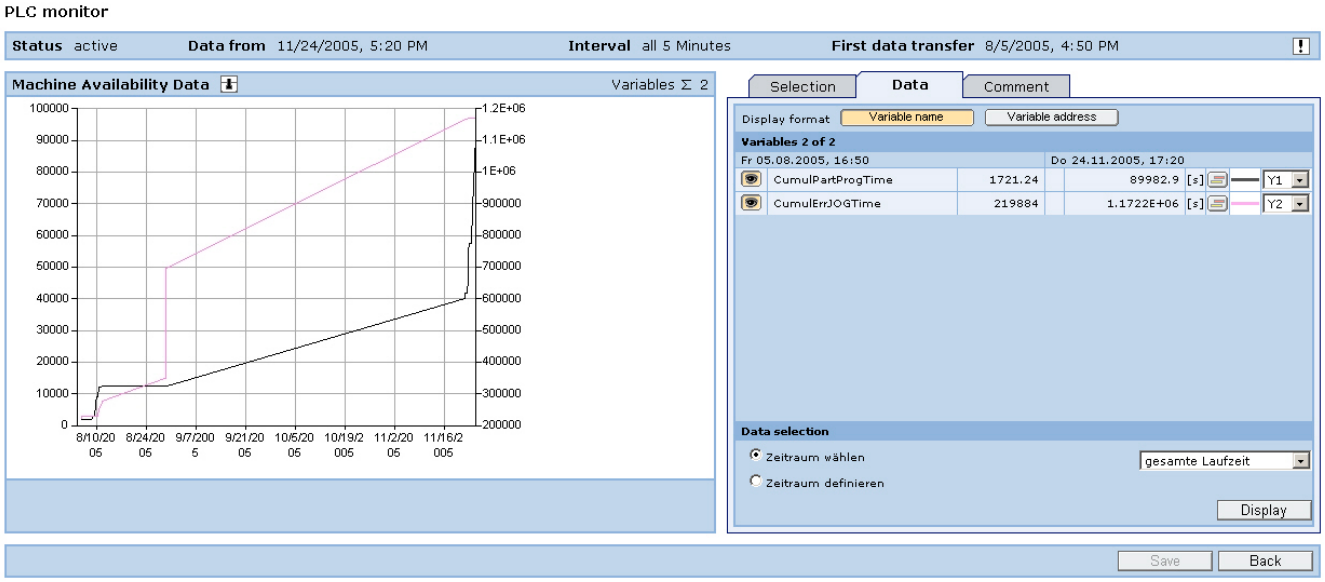


Figure 2-24 Progression over time of variables of a PLC monitor

2.8 Maintenance jobs

Description of the function

Calling via "Machine information" → "Maintenance jobs" provides an overview of the currently pending and already completed jobs **for the currently selected single machine**.

The operator can use the overview of the maintenance jobs on the PC for the following purposes:

- Obtaining an overview: Of the pending and already processed jobs; progress monitoring, planning service calls.
- Editing jobs: Individually adapting automatically generated jobs.
- Adapting work instructions: If other tasks not known at the time of planning must be completed together with the standard job.

  If you change the work instruction, please note that this is only valid for the selected maintenance job. If the underlying maintenance schedule is also to be modified, this must be done via the menu "Set up function" → "Maintenance schedules".
- Adapting the execution time: e.g. planning tasks on the same day that can or should be performed together.
- Editing results: Adding comments for the tasks performed, attaching detailed service reports to the job as a file.
- Processing jobs: Simple input for the tasks performed, e.g. for the same tasks on several machines.
- Deleting jobs

See also

Maintenance jobs (Page 99)

2.9 Remote access

2.9.1 Remote access functions

Overview

Remote access is an efficient and low-cost way of providing support for machine tools and production equipment via the Internet.

In the event of a fault, the service organization of the machine manufacturer has fast access to important control data and diagnostic functions. In that way, the machine manufacturer or maintenance department of the end user can immediately analyze the current condition of the machine in which a fault occurred.

Remote access avoids time-consuming on-site service assignments or at least helps prepare for them better. Machine manufacturers can therefore reduce their warranty costs while providing more efficient service support for their end users.

Overview of the most important functions

The following functions are available when a connection established to the machine control. These functions enable diagnostics to be carried-out and faults removed via the machine control. It is usually up to the service technician to execute the function. The technician can address all of the problems via remote access on a PC with a mouse and keyboard.

Function	Features
Chat	This permits the exchange of text messages with a participant in the service session.
Desktop sharing	Permits the display and remote operation of machine control. For safety reasons, however, it is not possible to initiate machine movements or to start NC programs. Within the function, areas of the screen can be marked with the "Annotate" function, which is similar to text marker.
Transfer file	Permits the transfer of single or multiple files or directories. Transfer can be from the service PC to the machine control or vice versa. This enables the import of patches to correct errors, for example. The machine control can also be updated quickly. Even complex NC programs can be transferred to the service employee for offline testing or to the service technician for modification via file transfer.
Video	This permits the transmission of video images from a webcam to the machine control.
Recording and playback	This enables storage of the entire service session or parts of the service session for training or archiving purposes.
Remote printing	This permits the printing on a local printer of the service PC of documents or graphics that are displayed on the control. This also installs the printer driver "Active Touch Document Loader" on the machine control.

2.9.2 Functions of a service session

Setting up a service session

Several service employees and specialists can work together in a service session to solve a problem. The service technician who establishes the service session first keeps control of all functions throughout the service session. All other service technicians can only observe what is going on.

If necessary, the first service technician can pass on and take back control to or from another service technician within a desktop control session. The entire session can also be passed on to a second service employee.

Function		Features
Chat	Dialog via a text window	You can exchange text messages online with the machine operator via a chat window. The "chat" function can be started without requiring an agreement from the machine operator.
Desktop view	Displaying on the HMI operator interface	The "desktop view" function is used to observe all operating steps at the operator interface of the HMI of the machine. That enables you to detect remotely on the service PC which functions are triggered on the control. Using an comments function, you can give instructions to the machine operator.
Desktop control	Remove control of all operator functions	Using the "desktop control" function you can execute all operating functions of the machine control via remote access. For safety reasons, however, it is not possible to initiate machine movements or to start NC programs.
Transfer file	Data transfer	You can use the "transfer file" function to transfer data between the machine control and your service PC. Data transfer is possible in both directions. Which functions and views of drives are used within data transfer depends on the type of session set.
Transfer session	Setting-up a conference call	You can use the "assist online support" function to involve other specialists to join the teleservice session. The person you invite into a running teleservice session has the option of providing active support or just participating in the teleservice as an observer.
Annotate	Remarks	The "Annotate" function provides a sort of marker pen. You can use this marker pen to give the machine operator instructions within the following functions: • Remote display – application view and desktop view • Remote control – application control and desktop control
Video session	Video transmission from the PC of the service engineer	Using the "show video" function, you can transfer a video image from your workstation to the machine operator. This can be used, for example, to show a drawing.

Function		Features
Remote Print	Remote printing	A special printer can be activated on the control. If data is output to this printer, it is redirected to your service PC during an online link. This enables a print-out of important information to be forwarded to you. The print-out is then output on the printer of the service PC.

2.9.3 Starting a service session

Starting a service session

To open a teleservice session, select the main menu item "Machine information" and then menu item "Run teleservice". Go to the "Remote access" section and click on the "Run teleservice" link.

The session ID shown is transferred to the machine operator:

Figure 2-25 Transfer session ID

Description of the function

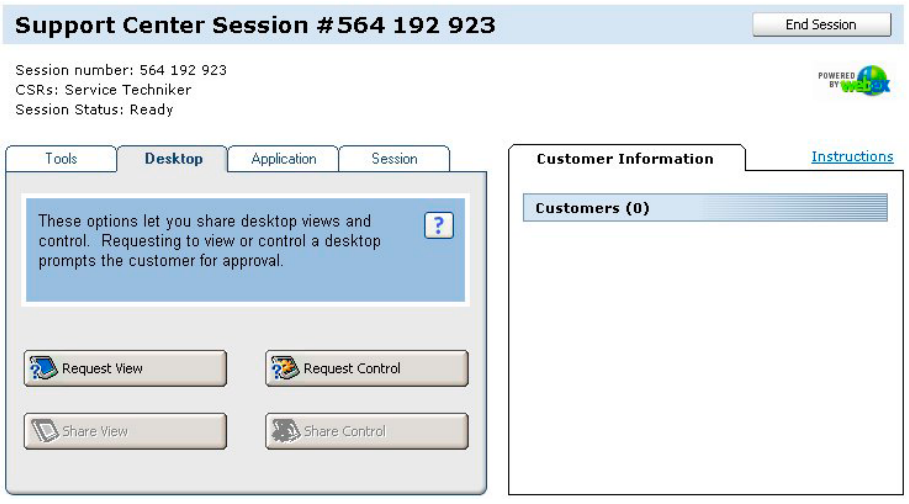


Figure 2-26 Main menu of a Support Center session

Tab	Contents	Type
Tools	Selecting functions: chat, video, or file transfer	SELECTION
Desktop	Selecting functions: desktop control or desktop view	SELECTION
Application	No longer used starting with ePS Network Services V4.0	SELECTION
Session	Selecting functions: transfer session, session options, or end session	SELECTION

Functions in "Tools"

Function	Description
Video	This permits the transmission of video images of a webcam from the service PC to the machine control
Transfer file	Permits the transfer of single or multiple files or directories. Transfer can be from the service PC to the machine control or vice versa. This enables the import of patches to correct errors, for example. The machine control can also be updated quickly. Even complex NC programs can be transferred to the service employee for offline testing or to the service technician for modification via file transfer. Which functions (Advance or Basic File Transfer) and views of drives are used within data transfer depend on the type of session set for an organization.
Chat	The chat function allows each participant to send text messages once it has been started. The participant can choose the participant to which he or she wants to send a message or broadcast the message to all service technicians who are logged on. The chat function can be started within the menu at any time. For communication with the machine operator, it is advisable to start the chat function before executing the desktop control function or a file transfer.

Note

You will not find it easy to operate the chat window without a mouse. You can place the chat window in the background or foreground via softkeys during a desktop control session. The chat window on the machine control is automatically placed in the foreground if a text message is received.

If the machine operator wants to send a text message on his or her own initiative and the chat window is minimized, the operator can place the chat window in the foreground via a softkey.

Functions under the "Desktop" tab

Function	Description
Request View	Permits display of a machine control. Within the function, areas of the screen can be marked with the "Annotate" function, which is similar to text marker. For safety reasons, however, it is not possible to initiate machine movements or to start NC programs.
Request Control	Permits control of a machine control: Within the function, areas of the screen can be marked with the "Annotate" function, which is similar to text marker. For safety reasons, however, it is not possible to initiate machine movements or to start NC programs.

Functions under the "Session" tab

Function	Description
Transfer Session	Transfer session control to another service technician
Session Options	Optimizing the display of complex graphics
End Session	Ending a service session

2.9.4 Example: Service session via remote access

Prerequisite

The service session has already been established. You want to open a chat session with the machine operator, then control the machine control via the desktop control, transfer data, and record the entire service session.

Starting a chat session

The chat function allows each participant to send text messages once it has been started. The participant can choose the participant to which he or she wants to send a message or broadcast the message to all service technicians who are logged onto the system.

The chat function can be started within the menu at any time. For communication with the machine operator, it is advisable to start the chat function before executing the desktop control function or a file transfer.

Proceed as follows

1. To start the chat session, click the "Chat" button.
2. Select the recipient. The default setting is "All Participants".
3. Clicking the "Send" button sends the text message to the participant. You can optionally use the enter key.

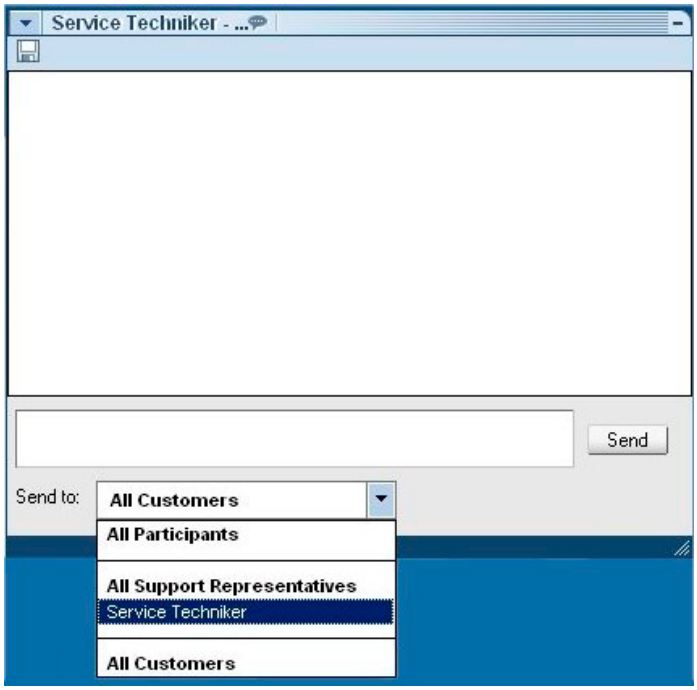


Figure 2-27 Selecting a recipient

4. Clicking the "−" button at the top right of the chat window closes the chat.

   If a participant closes the chat window, the initiator receives a message. The person who closed the Chat window cannot open it again. The initiator must end the chat and restart it to give all participants a chat window again.

Note

You will not find it easy to operate the chat window without a mouse. The service technician should therefore minimize the chat window during a desktop control session. The chat window on the machine control is automatically placed in the foreground if a text message is received.

If the machine operator wants to send a text message on his or her own initiative and the chat window is minimized, the operator can place the chat window in the foreground via a softkey.

2.9.5 Issuing permission to execute functions

Prerequisite

If you want to take control of the machine control, the machine operator has to grant you permission. The machine operator can grant you permission just for the requested "desktop control" function or generally for all functions that you may still want to use during the service session.

Desktop Control

Indicate to the machine operator that it is simpler for both to grant permission for the entire session.

1. Go to the "Desktop" tab and click "Request Desktop Control ..."

   You are shown the following display for your information. You can acknowledge it with "OK":

Figure 2-28 Requesting permission

2. As soon as permission has been granted at the machine end, the window is acknowledged automatically.

   In this dialog box, the machine operator allows you control of the machine control and via "Grant Permissions for all actions …", general execution of all functions without prior confirmation by the machine operator.

   The following dialog appears:

Figure 2-29 Granting permission

3. **Data transfer / "Advanced" transfer file:** Go to the "Tools" tab and click "Transfer Files" in the menu.

   The machine operator must agree to this file transfer. Unless the machine operator has granted general permission to execute all functions, he or she must agree to each individual transfer.

   This transfer may contain one or more files or a whole directory. Alternatively, you can select the file transfer within the desktop control by clicking on the "Sharing" button top right, upon which the following dialog box opens.

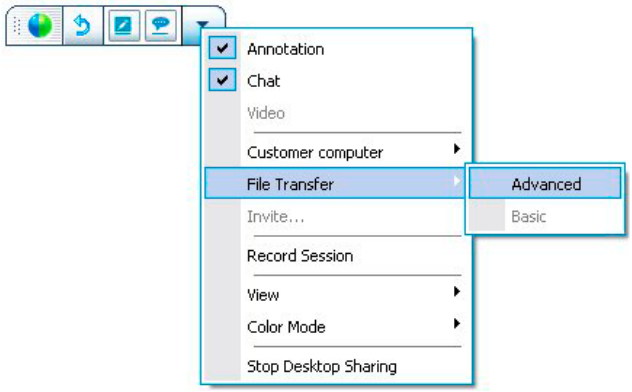


Figure 2-30 Starting file transfer

Note

It is advisable to perform the data transfer at the ePS display level because it does not contain HMI headers that reduce the screen content. In the case of file transfer within a desktop control session, both parties can view and operate the file transfer window. If this is not desired or is not permitted, the file transfer should only be started from the menu of the service technician. In this "stand-alone" file transfer, only the service technician has control of the files to be transferred.

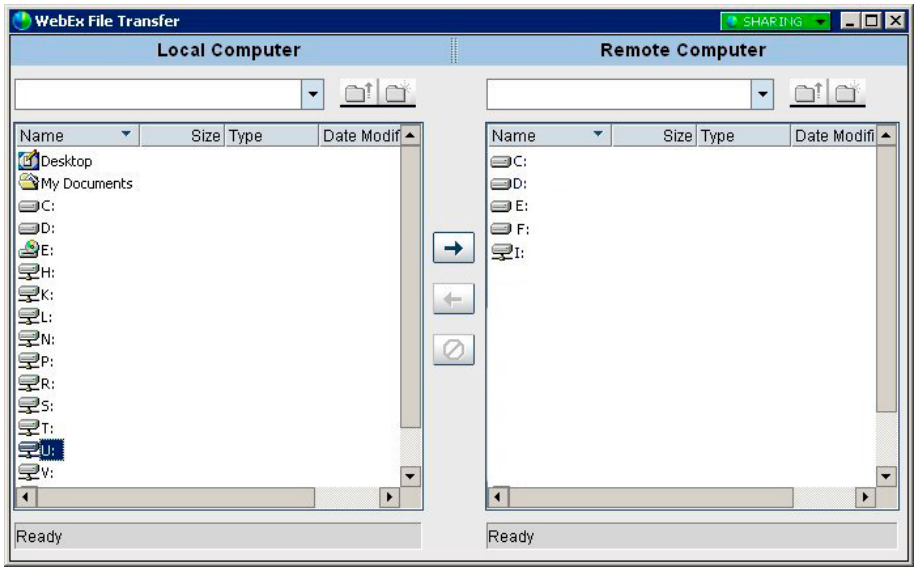


Figure 2-31 Directory structure

4. Open a directory with a double-click. Click the back arrow to go to the next level up.

   To select several files, hold the <CTRL> key down during selection.

5. Data transfer is started by clicking the arrow buttons.

   When data transfer has been started, the progress of transfer is indicated, allowing you to estimate the remaining transfer time.

6. You can end the file transfer with the "X" button.

Figure 2-32 End file transfer

7. **Recording a service session:** Select the "Record Session" button. The "Record Session" dialog box opens. Select the storage location and a file name for the Record File and confirm this name with "Save".

Figure 2-33 Recorder Panel

8. The recorder panel is used to select the various options and execute actions:

   Start recording by clicking the "Record" button.

   You can pause recording at any time and then resume it by clicking "Pause".

   To end recording, click the "Stop" button.

9. Ending desktop sharing: To cancel or end desktop sharing, click the "Sharing" button top right in the desktop sharing window and select "Stop desktop sharing".

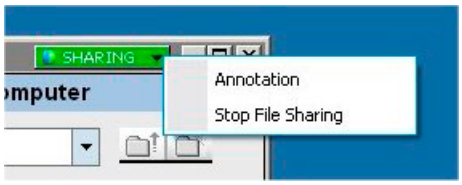


Figure 2-34 Ending desktop sharing

Marking screen contents during desktop control

To write annotations and markings on the desktop, click the Sharing button top right in the desktop sharing window and select "Annotation".

Figure 2-35 "Annotation" toolbar

On the "Annotation" toolbar, the cursor changes shape to a marker pen with which you can mark areas of the machine control.

1. To end the "Annotation" function, click on the "−" button at the top right of the toolbar.
2. You must then click on the desktop of the machine control with the mouse to get back mouse control.
3. **Ending a service session:** To end the service session, click the "End Session" button. Acknowledge the end of the session by clicking OK.

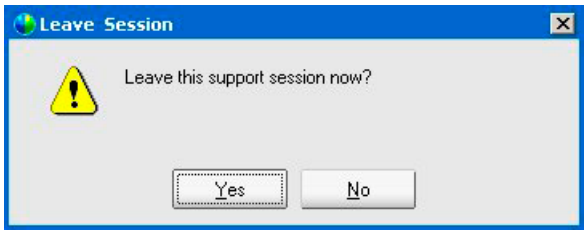


Figure 2-36 Ending the session

2.9.6 Setting a service conference call

Description of the function

Several service employees and specialists can work together in a service session to solve a problem. The service technician who establishes the service session first keeps control of all functions throughout the service session. All other service technicians can only observe what is going on. If necessary, the first service technician can pass on and take back control to or from another service technician within a desktop control session.

The entire session can also be passed on to a second service employee. After that, all functions must be confirmed again by the machine operator.

Example

Participants:

- "Service technician 1":

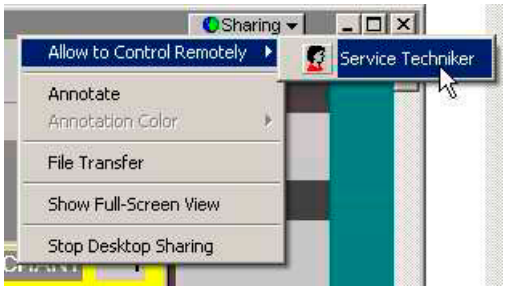
  "Service technician 1" opens a "desktop control session" and can execute all functions of the control.

- "Service technician 2":

  "Service technician 2" is logged-on under the name "Support Assist" and sees the same content, but cannot execute functions (exception: participating in the chat)

Transferring desktop control to "service technician 2" (Support Assist)

1. To transfer control, click the "Sharing" button top right in the desktop sharing window and choose "Allow to Control Remotely".
2. Click on the participant "Support Assist".



Control is transferred to "Service technician 2" for the current desktop control function. He or she can now take over control by clicking on the desktop of the machine control with the mouse.

"Service technician 2" can execute the following functions:

- Operating the machine control
- Ending desktop control
- Exiting a service session

Transferring desktop control back from "service technician 2" (Support Assist)

"Service technician 1" can fetch the control back again.

1. To transfer control, click the "Sharing" button top right in the desktop sharing window and choose "Allow to Control Remotely".
2. Click on the "Support Assist" participant and control is passed back to you.

Transferring of the entire service session

If "service technician 1" transfers the entire service session to "service technician 2", "service technician 1" can continue to observe the session or leave the session without closing the service session.

"Service technician 1" clicks the "Transfer Session" button.

A selection menu with the name of the other service technicians who are logged onto this session is displayed. "Service technician 1" selects "service technician 2" (example: Support Assist) and acknowledges with OK.

From this point on, "service technician 1" can only participate as an observer. All functions are deactivated in his menu.

"Service technician 2" has taken over the service session completely and can now let further "service technicians 3, 4, 5 ..." take part in the session. The service session can be transferred any number of times.

Note

Transferring the service session within the desktop view or desktop control terminates the desktop view or desktop control function.

2.9.7 Remote operation using the keyboard

Description of the function

In a service section, special function keys on the operator keyboard can also be operated using the keyboard of the service PC via remote access. The following table shows the keys on the PC to which the horizontal and vertical softkeys and the special keys of the SINUMERIK keyboard are mapped.

Voll-tastatur	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
mit SHIFT	vertik Soft. 1	vertik Soft. 2	vertik Soft. 3	vertik Soft. 4	vertik Soft. 5	vertik Soft. 6	vertik Soft. 7	vertik Soft. 8	>	M		
ohne SHIFT	horiz Soft. 1	horiz Soft. 2	horiz Soft. 3	horiz Soft. 4	horiz Soft. 5	horiz Soft. 6	horiz Soft. 7	horiz Soft. 8	^		W 1..n	Y
Voll-tastatur	5	Esc	Insert	Home	Page Up	Page Down	Enter	Tab				
ohne SHIFT								End				

Figure 2-37 Special keys

Key	Explanation
MENU SELECT	Area switchover key You can call the main menu from any operating area by pressing this key. Pressing the key twice in succession changes from the current operating area to the previous one and back again.
>	<ETC> key Expansion of the horizontal softkey bar in the same menu
^	<Recall> key The <Recall> key goes to the next highest menu. It also closes a window.
M MACHINE	Machine area key Direct jump to the "Machine" operating area

Setting up functions

3

3.1 Maintenance

3.1.1 Creating maintenance schedules

Description of the function

The maintenance schedules describe the maintenance and servicing tasks to be machine (maintenance, inspection, and servicing).

Purely manual tasks as well as tasks for the regular acquisition of measured quantities using the series of measurements condition monitor can be created:

- The maintenance jobs to be further processed by the target organization are automatically created from a schedule or control monitor that uses this schedule. A schedule always applies to just one machine.
- Maintenance jobs can be automatically generated from a maintenance schedule. An order is created in accordance with the time interval predefined in a maintenance schedule by the machine operator or based on a trigger detected in a control monitor, e.g. in case of faults or usage intervals. In this case, the maintenance schedule must not contain any scheduling information. The order is generated when the event occurs and is always due "immediately".
- Orders generated from a plan can be processed by the operator at the operator panel of the control ("Machine operator at the machine" application task) or reworked by the operator at the PC, e.g. the work description or the date can be changed ("Maintenance scheduler" application task).

Note

If a user is logged on to the control as machine operator, he or she can process the pending orders. For machines with version V3, he or she does not have to be a member of the target organization; for machines of version V4, he or she requires an MO authorization for this machine.

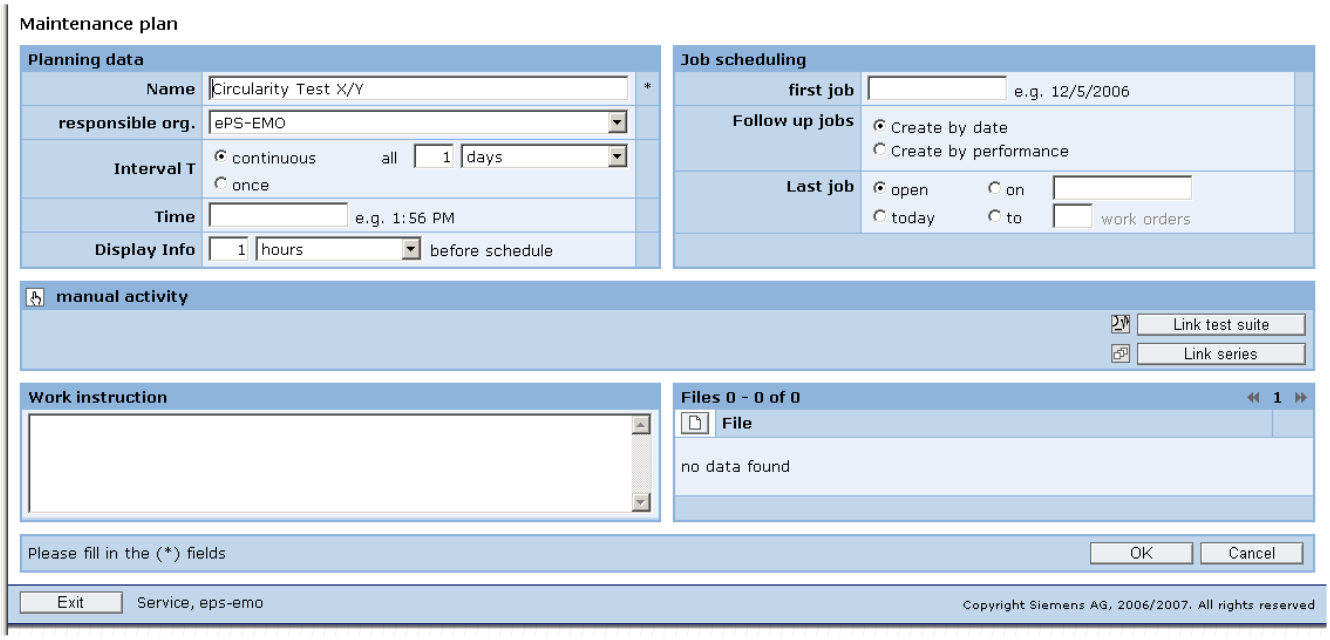


Figure 3-1 Editing a maintenance schedule

Field	Contents	Type
Designation	Title of the maintenance job generated from this schedule: The title is displayed to the operator on the machine.	INPUT
Interval	Both non-recurring and recurring tasks can be defined. The interval specifies how often the orders will be generated. **Note:** If an order has been generated automatically from a schedule, this order must be processed before the system will generate a new job. Any changes made to a schedule for which a pending job exists do not have any effect on this order, but will only be taken into consideration when the next order is created (by closing or deleting the job). Entries in this field are not considered when used in Control Monitor Services.	INPUT
Displaying information	Tasks are optically highlighted on the operator panel in hours/days/weeks before the scheduled date ("yellow dot"). **Note:** This identification can be used, for example, when a task needs certain preparation, a special tool is required, etc. Entries in this field are not considered when used in Control Monitor Services.	INPUT
Time of day	Time when the maintenance job is to be performed.	INPUT

Field	Contents	Type
Responsible org.	Describes which organization will further process the jobs from this schedule. **Note:** This information is added to the jobs from this schedule. However, any organization with access to this machine can change or delete the jobs for this schedule.	SELECTION
Working instructions	Explanatory description of the maintenance task.	INPUT
Linking-in test series	Selecting a test series to be carried out in the framework of the maintenance job.	SELECTION
Automatically executing a test series	The test series can be automatically executed, controlled by the PLC.	SELECTION
Linking-in series of measurements	Selecting the "series of measurements" condition monitor in which the result of the measurement is updated as part of a maintenance job. **Note:** Only one series of measurements can be selected from the series of measurements available on the machine.	SELECTION
First order (next order)	The first job will be automatically generated from the schedule on this date. **Note:** The earliest date you can enter is the current date. A maintenance schedule can also be stored without an entry in this field. However, in this case, no job will be created / the schedule is inactive. Within an active schedule (schedule generating orders), this field is flagged with "next job" and shows the next date on which the assigned pending job will be ready for processing. Entries in this field are not considered when used in Control Monitor Services.	INPUT
Last order	Describes when the automatic generation of orders should be ended. The "today" option can be used to end a schedule immediately. **Note:** A maintenance schedule for which no more pending jobs exist can be rescheduled, i.e. assigned a start date. Entries in this field are not considered when used in Control Monitor Services.	SELECTION INPUT
Generating the next job	The "After execution" option must be selected if the next order must be created on the actual processing time of the previous one. (Example: If the current open job is processed two days after its scheduled time, the next job is postponed by two days.) **Note:** Entries in this field are not considered when used in Control Monitor Services.	SELECTION

Field	Contents	Type
Add file	To provide more details about the order, documents with more information can be appended. **Note:** The operator at the operator panel can only view documents in PDF format.	ACTION

Safety note when displaying PDF documents

Caution

PDF documents to be displayed on the control operator panel must not contain any active contents (JavaScript, e-mail fields, etc.) nor have any HTML Links!!!

Otherwise, there is a danger that it may be possible to navigate from the ePS system to other websites.

ePS Network Services supports on the control operator panel only the display of PDF documents that are compatible with Acrobat 1.3 (Reader Version 4.x).

For optimum display, please create your PDF documents with the option "Initial View: Page Only / Magnification Fit Width".

3.1.2 Configuring PLC monitors

Configuration

The configuration of a PLC monitor includes the variables that for each record event are to be read-out of the PLC and saved. The event that is to be recorded is configured by configuring a control monitor with an appropriate trigger. In this control monitor, the PLC monitor involved is configured as diagnostics action.

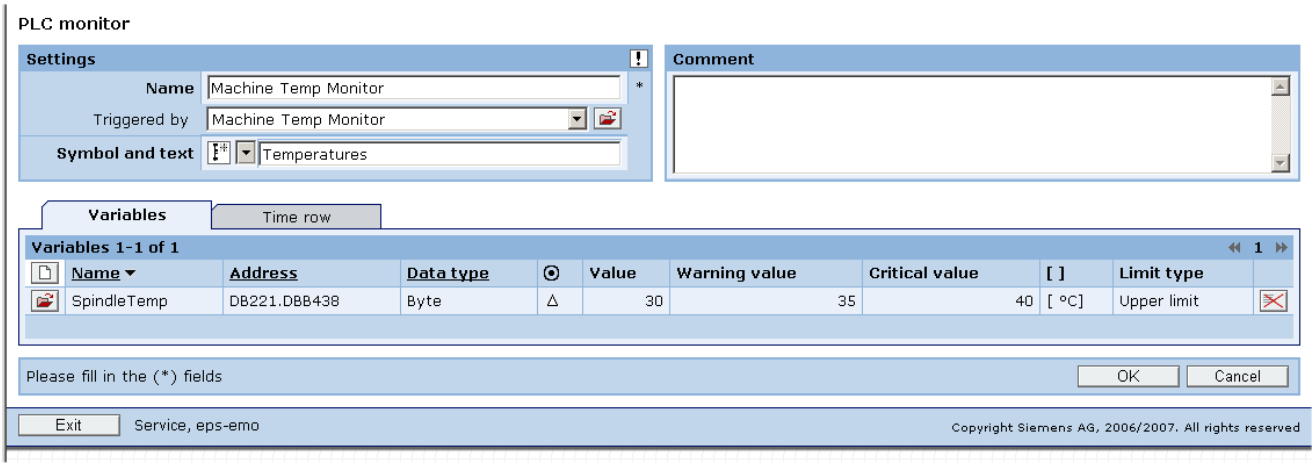


Figure 3-2 Configuring a PLC monitor on the PC

Make the following entries to configure a PLC monitor:

Field	Contents	Type
Designation	Name of the PLC monitor for easy identification	INPUT
Triggered by	Selecting the control monitor that is triggered by the data acquisition.	SELECTION
Opening/creating a control monitor	Opening or creating a control monitor that triggers the data acquisition of the PLC monitor.	ACTION
Text for symbol	Text with which the chosen symbol is to be associated. The text appears as the tooltip of the symbol in various views. The text entered applies to the entire machine and overwrites any existing text.	INPUT

Variable definition

The following entries must be made for each variable contained in the PLC monitor:

Field	Contents	Type
Designation	Designation to identify the variable	INPUT
Type	Identifies whether the variable is a counting variable	SELECTION
Address	Address expression in standard PLC syntax (e.g. DB221.DBB358)	INPUT

Field	Contents	Type
Data type	Selecting the data format supported by the PLC. The data format cannot be chosen independently of the address expression.	SELECTION
Unit	Free text input to designate the units of the quantity to be recorded. The units refer to the scaled quantity.	INPUT
Raw value 1	First raw value for defining scaling	INPUT
Scaled value 1	The scaled value assigned to the first raw value. This is based on a linear characteristic between the raw value and the measured quantity.	INPUT
Raw value 2	Second raw value for defining scaling	INPUT
Scaled value 2	The scaled value assigned to the second raw value.	INPUT
Limit value type	Selecting from the limit value types: Lower limit, upper limit, tunnel	SELECTION
Warning limit	Value (or value range) of the warning limit	INPUT
Critical limit	Value (or value range) of the critical limit	INPUT

Changes to the configuration are not effective until the machine is synchronized.

Availability and authorizations

The PLC monitors can only be configured on the PC. The authorization required for configuring the PLC monitors is described in detail in the Appendix.

See also

Diagnostic actions (Page 89)

3.1.3 Configuring NC monitors

Configuration

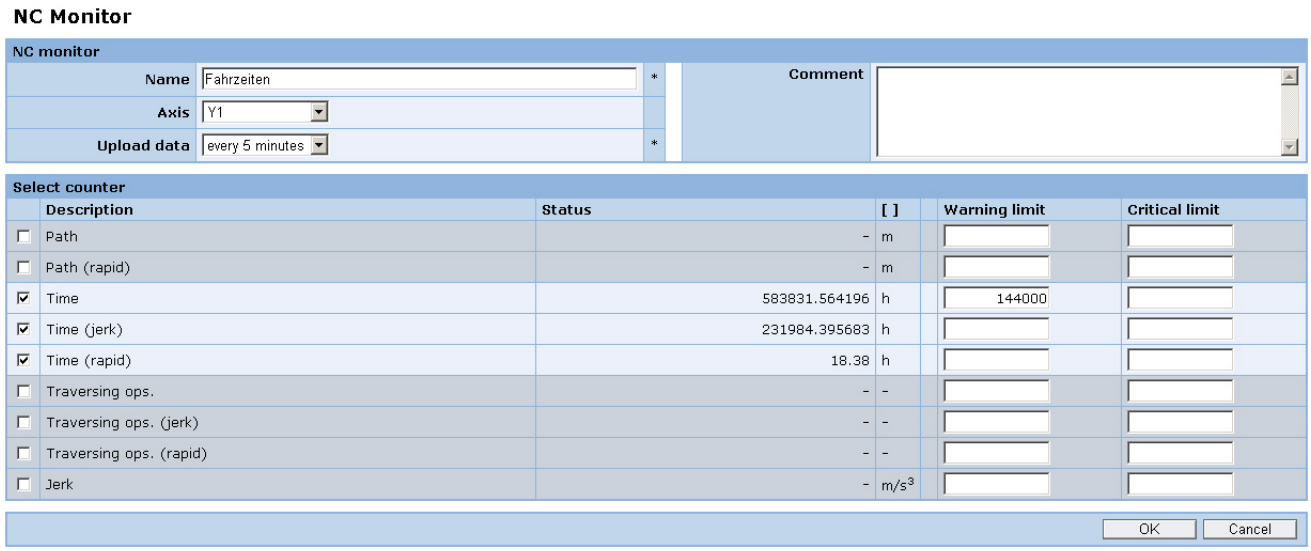


Figure 3-3 Configuring an NC monitor on the PC

Make the following entries to configure an NC monitor:

Field	Contents	Type
Designation	Monitor designation for easy identification	INPUT
Axis	Axis identifier, machine	SELECTION
Upload data	Cycles in which the data are acquired and stored	SELECTION
Comment	Detailed description of the monitor	INPUT
Select counter	The selected counter variables are acquired with the NC monitor.	ACTION
Warning limit	Entering the value for the warning limit	INPUT
Critical limit	Entering the value for the critical limit	INPUT

Availability and authorizations

The NC monitors can be configured on the PC and on the operator panel. The authorization required for configuring the NC monitors is described in detail in the Appendix.

3.2 Measurements and series of measurements

Description of the function

When configuring measurements or series of measurements, the parameters that are required to carry-out the measurement are defined. The configurations created are always stored with the measurements and can be used again to repeat the measurements. That especially applies to series of measurements. The configuration of a series of measurements ensures that measurements are made with the same settings every time. This permits evaluation of the progression of characteristic values over time.

In addition to parameters for performing a measurement, the limit values of the characteristics quantities are also configured. At the operator panel, this is done exclusively as part of the procedure for conducting a measurement. At the PC, this is done as part of configuring a series of measurements.

Availability and authorizations

At the operator panel, a measurement is configured or a measurement series configuration changed only during the measurement procedure. At the operator panel, in addition, it is only possible to create a series of measurements based on a measurement that has already been performed.

Series of measurements can be configured at the PC. The authorization required to configure measurements and series of measurements is described in detail in the Appendix.

3.2.1 Circularity test

Parameter description

Parameters for performing a circularity test:

Field	Contents	Type
Designation	Designation of the series of measurements (measurements do not have a designation)	INPUT
Channel	Selecting the required channel: The channel defines the possible axis pairs in the "Axes" selection list.	SELECTION
Axes	Selecting from the possible pairs of geometry axes	SELECTION
Center of the circle, 1st axis	Center point coordinates of the circle for the first axis	INPUT
Center of the circle, 2nd axis	Center point coordinates of the circle for the second axis	INPUT
Diameter	Diameter of the circle	INPUT
Feedrate	Path velocity of the circular motion	INPUT

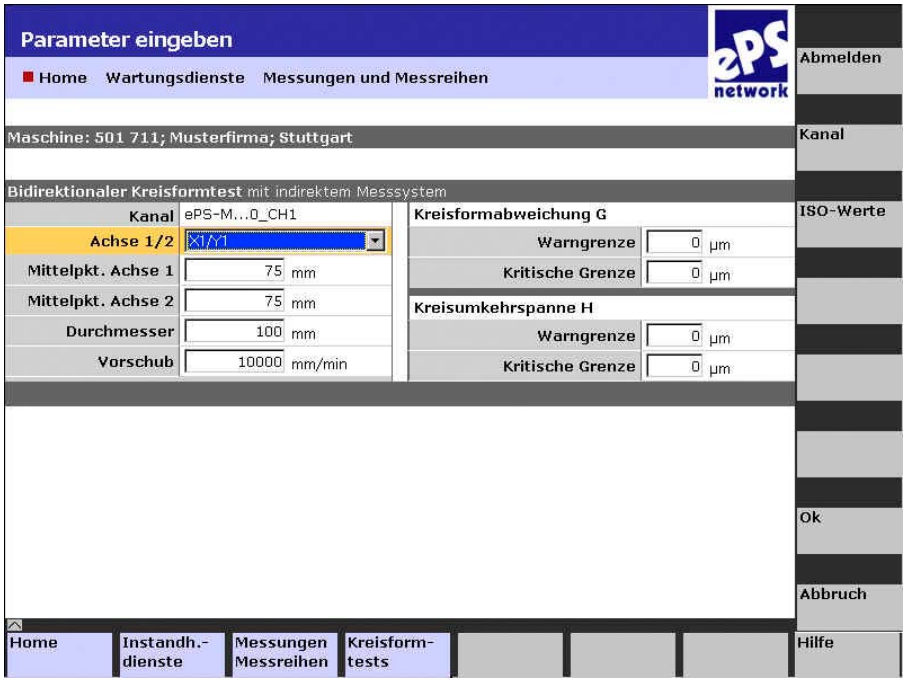


Figure 3-4 Circularity test at the operator panel

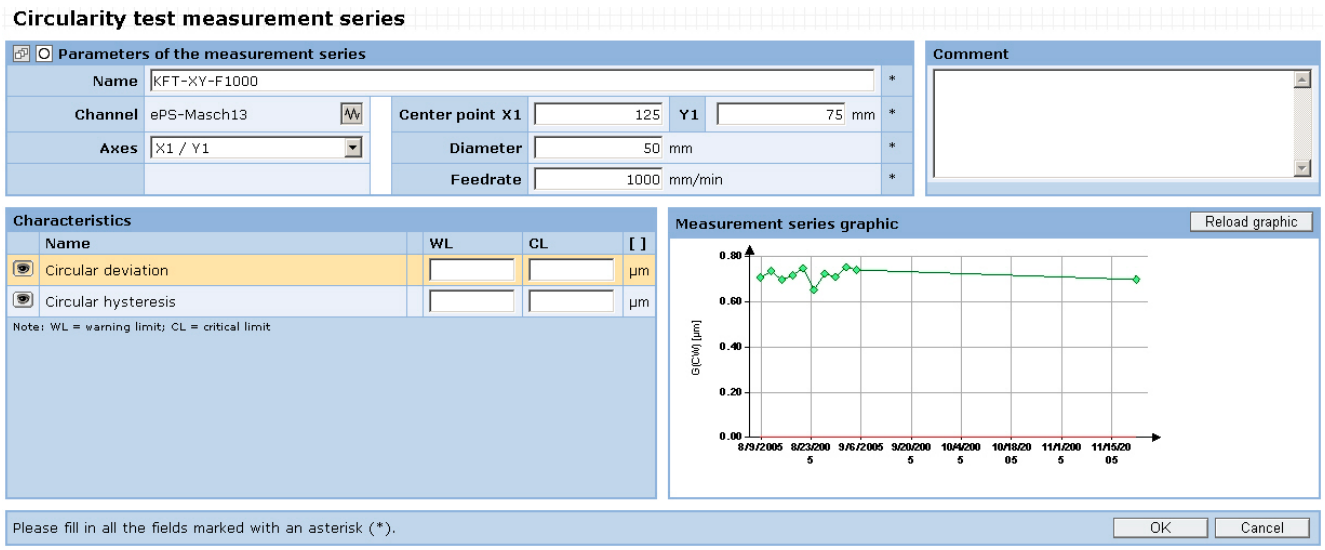


Figure 3-5 Series of measurements for a circularity test at the PC

3.2.2 Equability test

Parameter description

Parameters for conducting an equability test:

Field	Contents	Type
Designation	Designation of the series of measurements (measurements do not have a designation)	INPUT
Channel	Selecting the required channel. The channel specifies the possible machine axes in the "Axis" selection list.	SELECTION
Axis	Selection of the possible machine axes that can be programmed in the selected channel.	SELECTION
Starting point	The axis position at which the first partial movement of the measurement begins.	INPUT
End point	The axis position at which the first partial movement of the measurement ends.	INPUT
Feedrate	Velocity at which the axis is moved.	INPUT

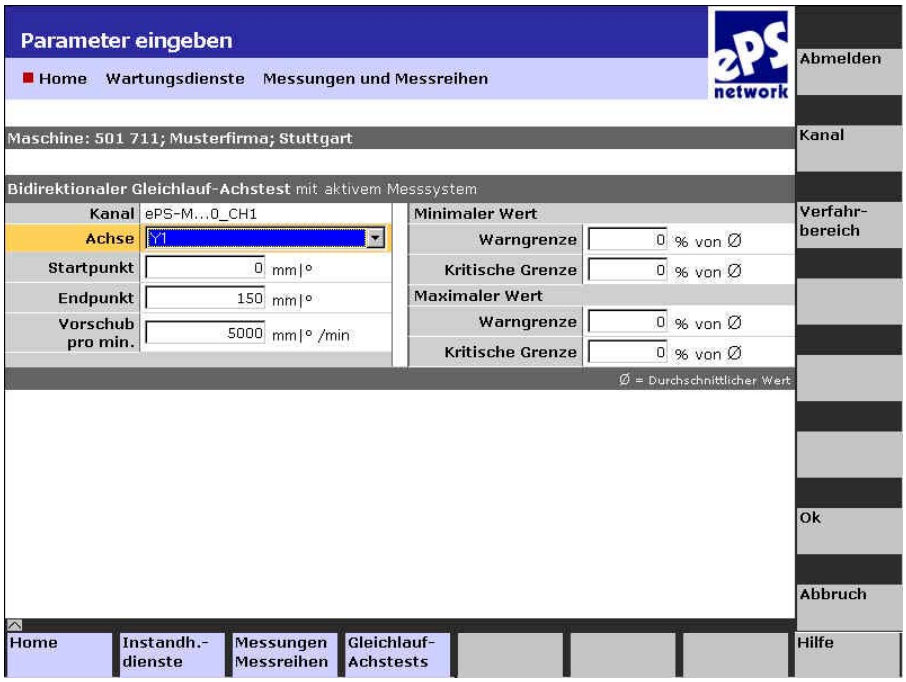


Figure 3-6 Equability test at the operator panel

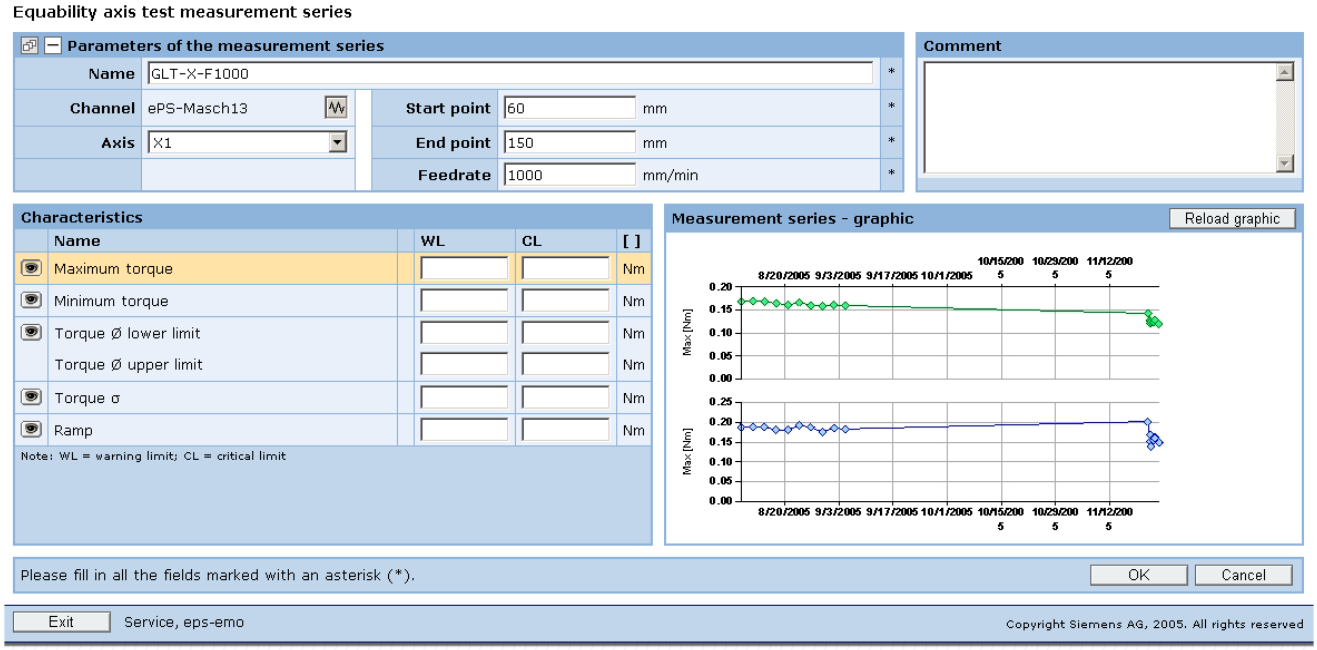


Figure 3-7 Series of measurements of an equability test at the PC

3.2.3 Universal axis test

Parameter description

Parameters for conducting a universal axis test:

Field	Contents	Type
Designation	Designation of the series of measurements (measurements do not have a designation)	INPUT
Channel	Selecting the required channel: The channel specifies the possible machine axes in the "Axis" selection list.	SELECTION
Axis	Selection of the possible machine axes that can be programmed in the selected channel.	SELECTION
Starting point	The axis position at which the various movements of the measurement begin. The position value is never lower than this value during measurement.	INPUT

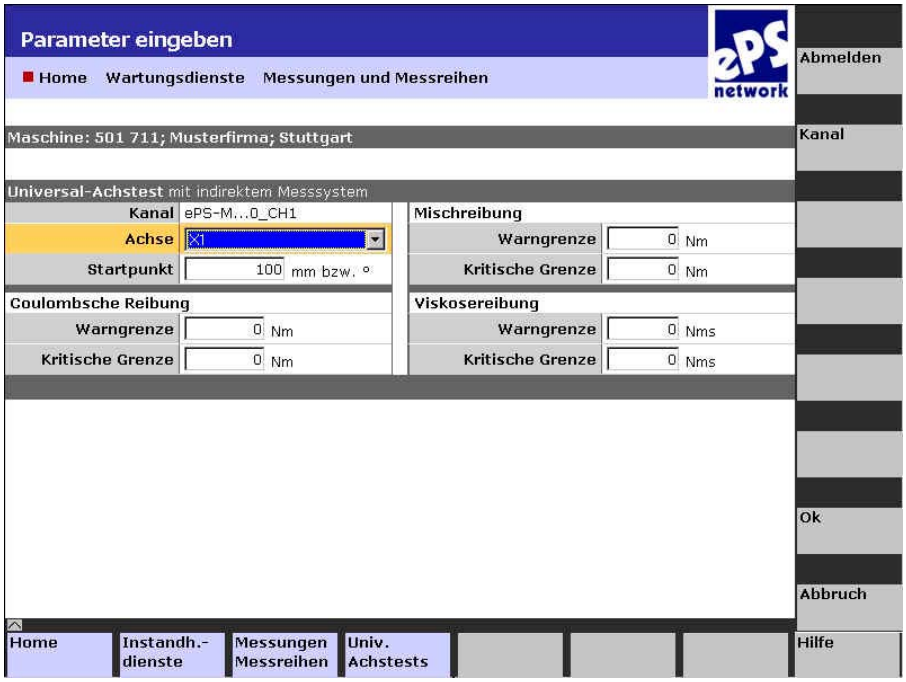


Figure 3-8 Universal axis test at the operator panel

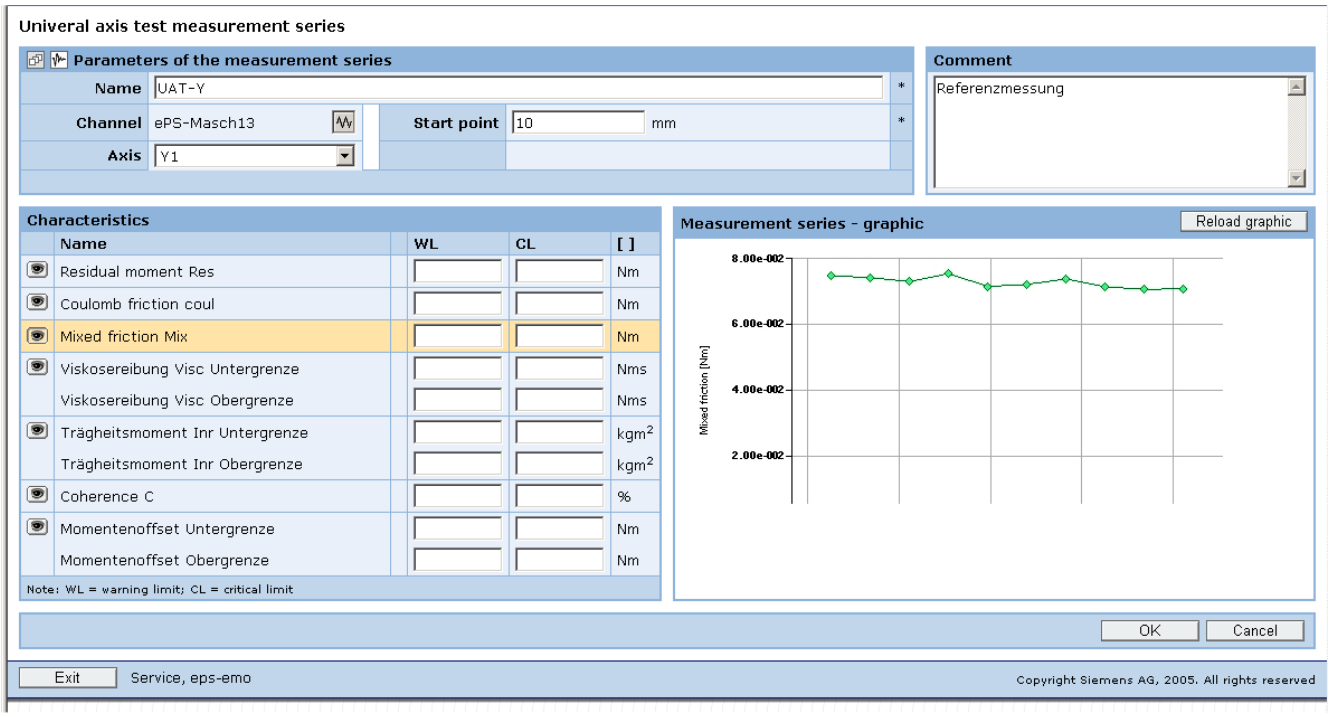


Figure 3-9 Series of measurements of a universal axis test at the PC

3.2.4 Configuring test series

Overview

Test series are used to significantly automate measurements for condition monitoring. A test series can contain any number of measurement series. These measurement series are performed one after the other in the defined order when a test series is run. An operator is only required at the machine to start the test series. The measurements are made and measurement results saved without any further operator actions.

Description of the function

To add, remove, or change the sequence of measurement series, these are selected in the overview displayed and moved by dragging and dropping or using the arrow buttons on the form.

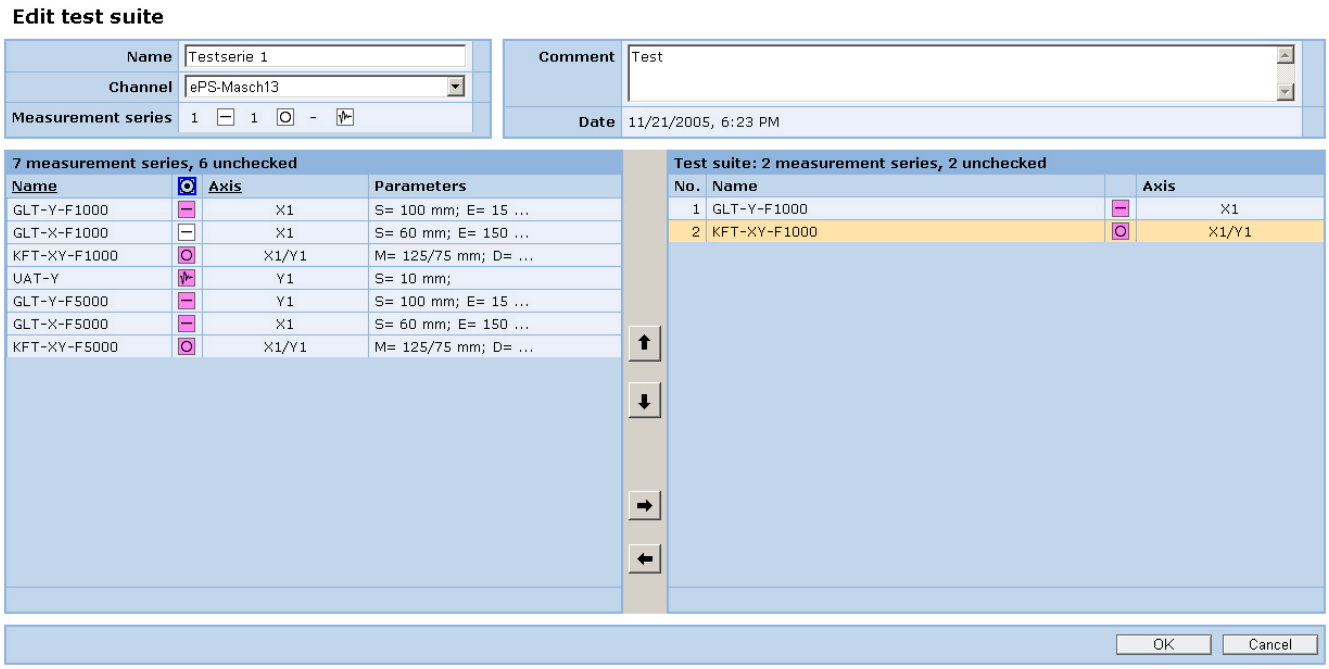


Figure 3-10 Changing the configuration of a test series

The following entries have to be made to configure a test series:

Field	Contents	Type
Designation	Designation of the test series. The system suggest an automatically generated name, which you can change. The designation of test series must be unique within the context of the machine. The system automatically supplements the designation if the name entered by the operator has already been assigned to another test series.	INPUT
Channel	Selecting the required channel.	SELECTION
Comment	Any text can be entered to provide a detailed description of the test series	INPUT

Note

A test series can only contain measurement series associated with one channel. It is not possible to change the channel of a test series.

Availability and authorizations

Test series can only be configured at the PC. The authorization required for configuring the test series is described in the Appendix.

See also

Functions of the various roles (matrix of authorizations) (Page 163)

3.3 Fault services

3.3.1 Creating a control monitor

Description of the function

Control monitors are used to detect events that provide information about faults (e.g. alarms), current machine states (e.g. precision determined by circularity tests), or use of resources (e.g. workpiece counter). The operator can define the signals he or she is interested in via a control monitor.

When the ePS system detects such an event, it can automatically trigger certain operations or provide diagnostic data for further analysis. Several trigger definitions, even of different types, and several parallel actions can be stored in each control monitor.

Note

The operator defines which data are generated and which actions triggered in response to which signal or combination of signals from the machine and which states on the ePS server by creating one or more control monitors.

PLC performance index

The PLC performance index allows you to define how much performance may be used for the ePS PLC trigger. Each ePS PLC trigger uses a certain number of performance points. In this way you can control to what extent the PLC may be occupied by the ePS PLC trigger. The PLC performance index has to be defined individually by the machine manufacturer.

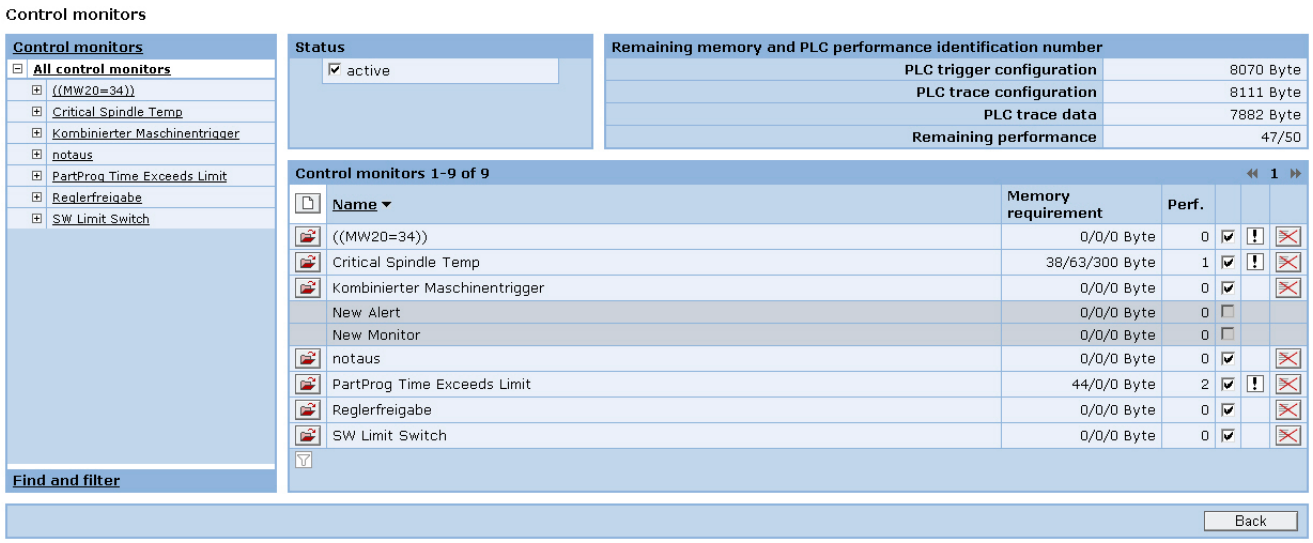


Figure 3-11 List view of control monitors

Field	Contents	Type
Control monitors	Tree for selecting the control monitor to be processed. It can be expanded to show the triggers defined in it, which can be jumped to directly.	TREE
(Overall)Status	Switches all of the control monitors that are currently active on or off at the next synchronization. **Note:** The activation state of each monitor is not changed.	SELECTION
Next synchronization in	Shows the time remaining until the next synchronization. If synchronization is overdue, negative values are displayed.	DISPLAY
Designation	Name of the control monitor	DISPLAY
Single monitor status (activation state)	Monitor runs on the machine or is inactive.	DISPLAY
Synchronization state of single monitor	An exclamation mark indicates that the configuration currently stored is not yet effective on the machine.	DISPLAY
Remaining memory and performance index PLC	Overview of the remaining memory of the individual PLC blocks and the currently used and maximum PLC performance index: • PLC trigger configuration • PLC trace configuration • PLC data	DISPLAY
Memory requirement (single monitor)	Used memory requirement of monitor for: • PLC trigger configuration • PLC trace configuration • PLC data	DISPLAY
Performance (single monitor)	Currently used PLC performance	DISPLAY

3.3.2 Configuring control monitors

Description of the function

After you have created a new control monitor or opened a control monitor for editing, you can perform the following actions:

- Selecting or changing the trigger signals that will cause the monitor to run.
- Defining or changing the actions to be executed when a trigger is detected.

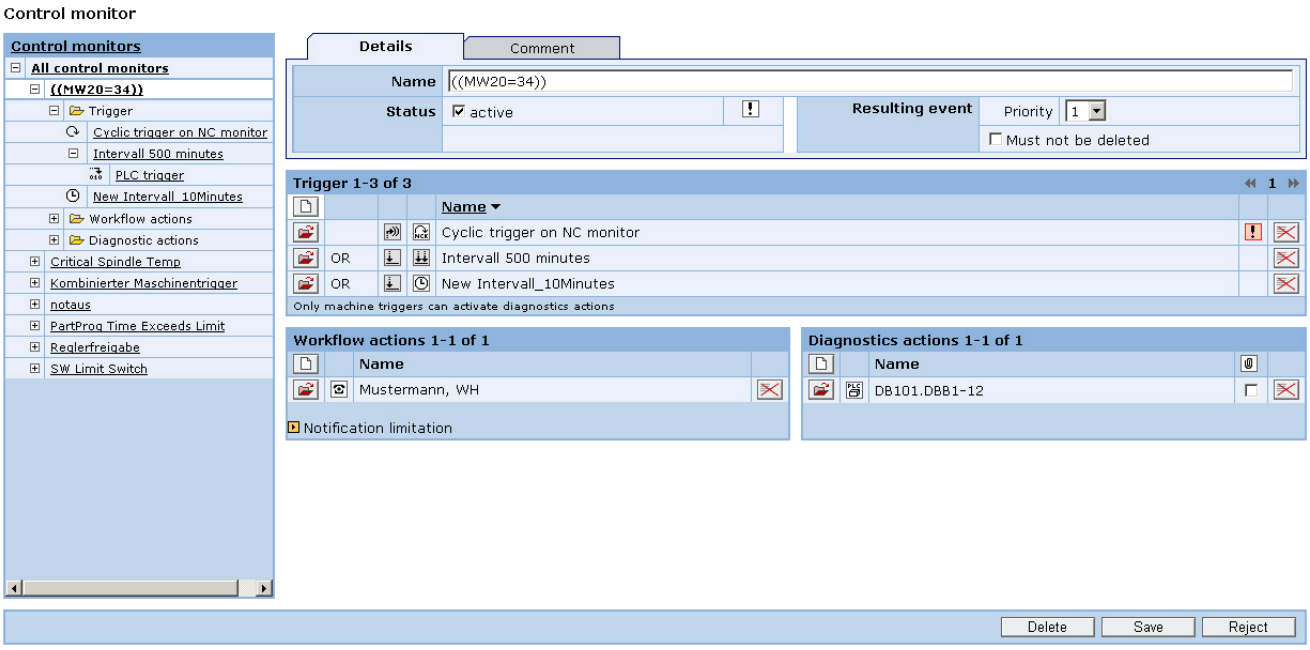


Figure 3-12 Detailed view control monitor

Field	Contents	Type
Details	Details of the control monitor configuration	TAB
Comment	Permits a comment to be entered for the currently selected control monitor.	TAB / INPUT
Designation	Name of the control monitor: Names of control monitors must be unique. If the machine operator does not enter a name, it is automatically generated by the system.	INPUT
Priority	Defining the priority of events; all events from this monitor are entered in the event history with the selected priority.	SELECTION
Must not be deleted (delete option for events)	If this option is selected, events from the monitor, and therefore also diagnostic data generated, cannot be deleted from the event history.	SELECTION
Creating a trigger	Opens the submenu for adding a trigger.	ACTION
Changing a trigger	Opens the submenu for changing a selected trigger	ACTION
Deleting a trigger	Deletes a trigger from the monitor configuration	ACTION

Field	Contents	Type
Creating workflow actions	Opens the submenu for triggering workflows	ACTION
Changing workflow actions	Opens the submenu for changing workflow actions	ACTION
Deleting workflow actions	Deletes workflow actions from the monitor configuration	ACTION
Creating diagnostic actions	Opens the submenu for adding a diagnostic action	ACTION
Changing diagnostic actions	Opens the submenu for changing a diagnostic action	ACTION
Deleting diagnostic actions	Deletes a diagnostic action from the monitor configuration	ACTION
Notification limitation	Opens the submenu for setting the notification limit for SMS/e-mail messages	ACTION
Saving	Saves the changes made on the monitor	ACTION
Rejecting	Undoes all changes made since last saving / opening of the monitor	ACTION
Sending data as attachment	Marks diagnostics data so they can be sent as attachment with an email	SELECTION
Deleting	Deletes the selected control monitor after confirmation	ACTION

3.3.3 "Alarm group" trigger

Description of the function

You can set up NC, PLC, and HMI alarms with or without additional PLC conditions as triggers for a control monitor.

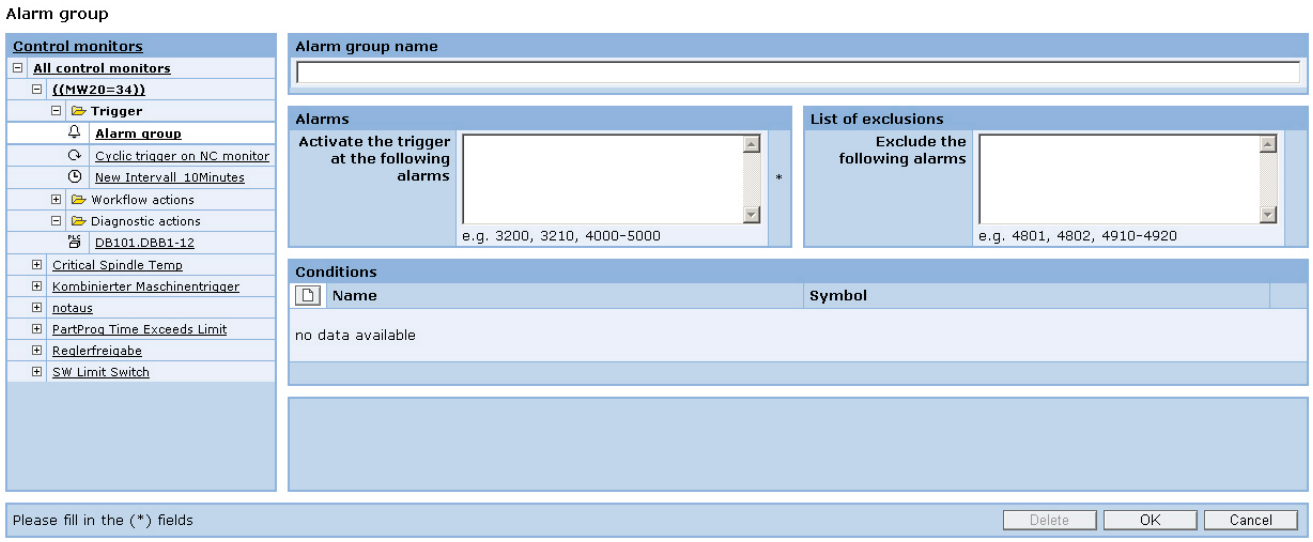


Figure 3-13 Editing an alarm group

Field	Contents	Type
Alarm group designation	Name of the trigger; can be entered by the user. If the field remains empty and is deleted, the system will generate a designation from the parameters of the trigger.	INPUT
Activating the trigger for the following alarms ("Alarms")	Entering the triggering alarms; list of single alarms separated by commas or ranges of alarm numbers separated by "–".	INPUT
Excluding alarms ("List of exclusions")	Entering alarms that will not cause triggering; list of single alarms separated by commas or ranges of alarm numbers separated by "–". **Note:** If the same alarm is contained in "Alarms" and "List of exclusions", the system will not trigger an event when the alarm occurs. This means provides an easy way of excluding parts of a range of alarm numbers, for example.	INPUT
Adding / editing conditions	Opens the submenu for entering a PLC condition. **Note:** If an alarm occurs, an event is only triggered if the PLC condition described here occurs at the same time.	ACTION

3.3.4 "PLC trigger" trigger

Description of the function

You can set up complex logic operations and value comparisons on PLC variables as triggers for a control monitor. PLC conditions for alarm triggers are configured in the same way as PLC triggers.

Note

In order to be able to use PLC trigger, PLC conditions (for conditional alarms) and PLC traces in monitors, the control must be set up accordingly (see /R1/). Without this set-up, you can set these functions in monitors but you cannot activate them on the control.

You must also enter the settings for the data blocks used for the machine.

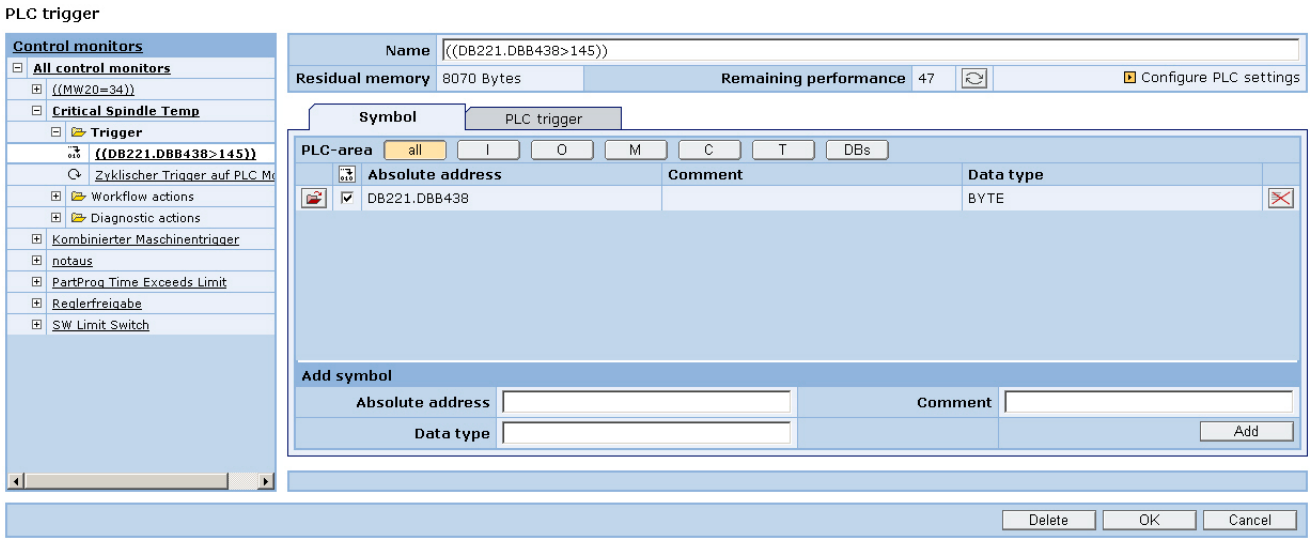


Figure 3-14 PLC trigger: Adding an address

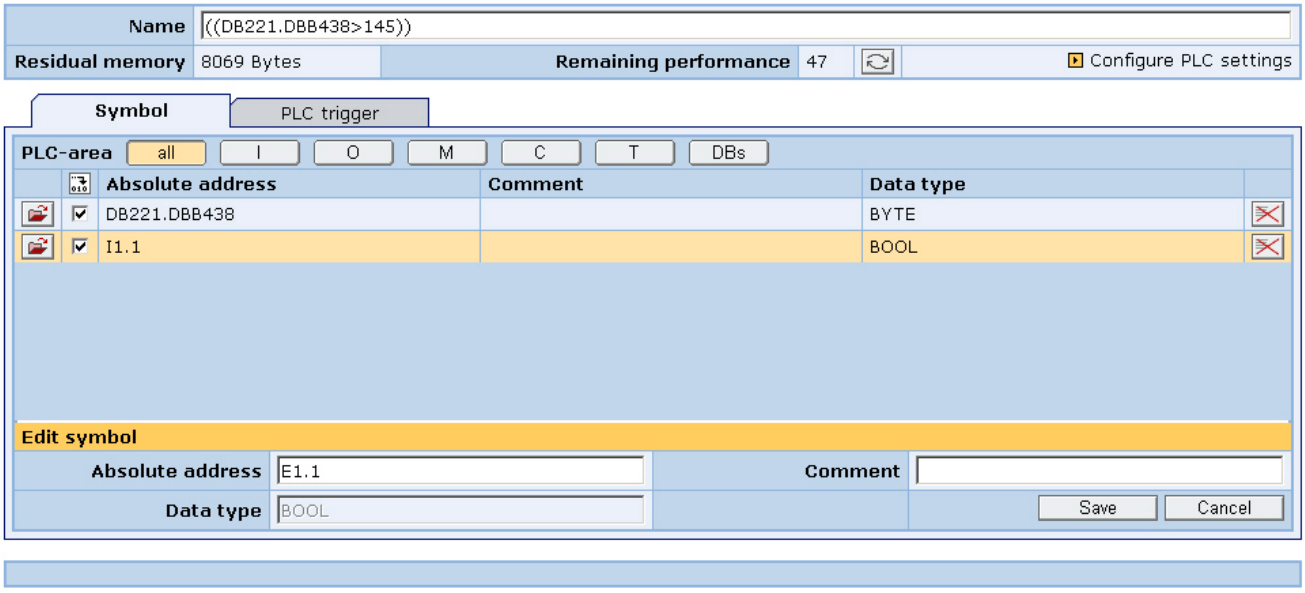


Figure 3-15 PLC trigger: Editing expressions

Field	Contents	Type
Designation	Name of the trigger: Can be entered by the user. If the field remains empty or is deleted, the system generates a designation from the parameters of the trigger.	INPUT
Residual memory trigger	Indicates how much memory is left in the PLC for PLC triggers and PLC conditions	DISPLAY
Icons (icon list)	Indicates the PLC variables that can be used in the current trigger or in the current PLC condition	TAB / DISPLAY

Field	Contents	Type
Editing a variable	Opens a PLC variable already contained in the list for editing	ACTION
Selecting a variable	Selects a variable contained in the list for use in terms for the PLC trigger / for the PLC condition.	SELECTION
Deleting a variable	Deletes a variable from the list: Terms defined for this variable are deleted from the PLC trigger.	ACTION
Absolute address	Entering the address of a PLC variable via STEP 7 syntax: All simple file types are supported. **Note:** The addresses can be entered in the German and English notation (example: E1.1 or I1.1).	INPUT
Comment	Entering a name for the PLC variable	INPUT
Adding	Adds an entered address of a PLC variable to the list	ACTION
PLC trigger	Defining the terms for the variables entered	TAB / DISPLAY
Trigger 1 … n	Displays the selected trigger (1…6) for editing **Note:** The columns within a PLC trigger are ORed.	SELECTION
Input term	Entering a comparison expression (comprising: Operator & comparison value) for a PLC variable as text; supported operators: <,>,=,<>	INPUT
+/–	Entering a tolerance value **Note:** The value entered is used as a tolerance band around the comparand with the operators (=,<>). For the operators (<,>) the value defines a hysteresis.	INPUT
Configuring a memory DB	Setting up a control for using PLC triggers / conditions / traces	ACTION
Remaining performance	Indicates how much performance is left in the PLC for PLC triggers and PLC conditions.	DISPLAY

See also

PLC data blocks (Page 95)

3.3.5 "Combination trigger" trigger

Description of the function

Trigger type: Triggers occurring simultaneously

You can only create an event if defined single events (alarms with and without PLC condition, PLC trigger) occur together within a defined time interval.

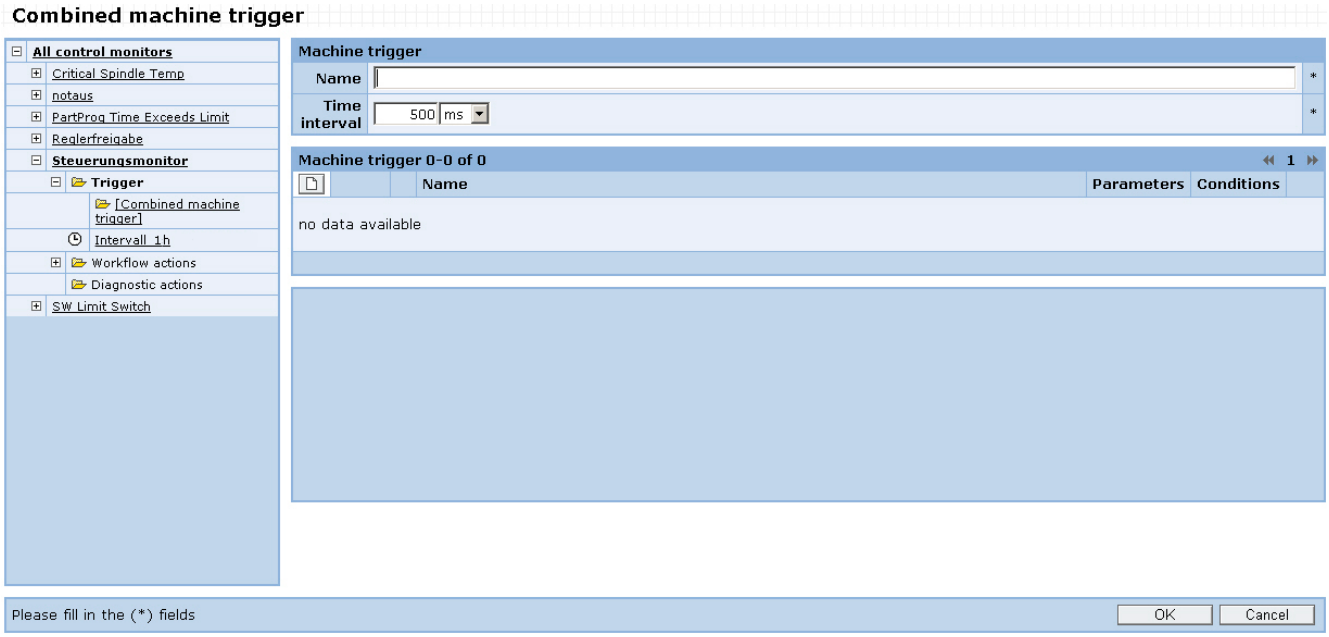


Figure 3-16 Processing combination triggers

Field	Contents	Type
Designation	Name of the combination trigger: Can be entered by the user. If the field remains empty or is deleted, the system generates a designation from the parameters of the trigger.	INPUT
Time interval	Entering a time interval: To trigger a combination trigger, the single events contained in the list must occur within this interval.	INPUT / SELECTION
Adding / changing a trigger	Adding or changing a single trigger	ACTION

3.3.6 "Request fault processing HMI / PC" trigger

Description of the function

Trigger type: Triggers occurring simultaneously

You can set up the request for fault processing on the HMI or on the PC as a trigger for a control monitor. This trigger type has no configurable parameters.

Note

The machine operator (MO) can also request a teleservice session when he or she requests fault processing. The session ID required to start teleservice is transferred directly by the PC of the remote service engineer and does not need to be entered manually at the machine. This function is especially useful if no phone connection is available to ask about the session ID or other circumstances prevent communication of the session ID.

The trigger "Fault on PC indicated" is a "Server trigger" and thus cannot trigger any diagnostic reactions on the machine.

3.3.7 "Time interval" trigger

Description of the function

You can set up events for a control monitor that recur at fixed intervals. An event ("time interval elapsed") is generated by the ePS system itself.

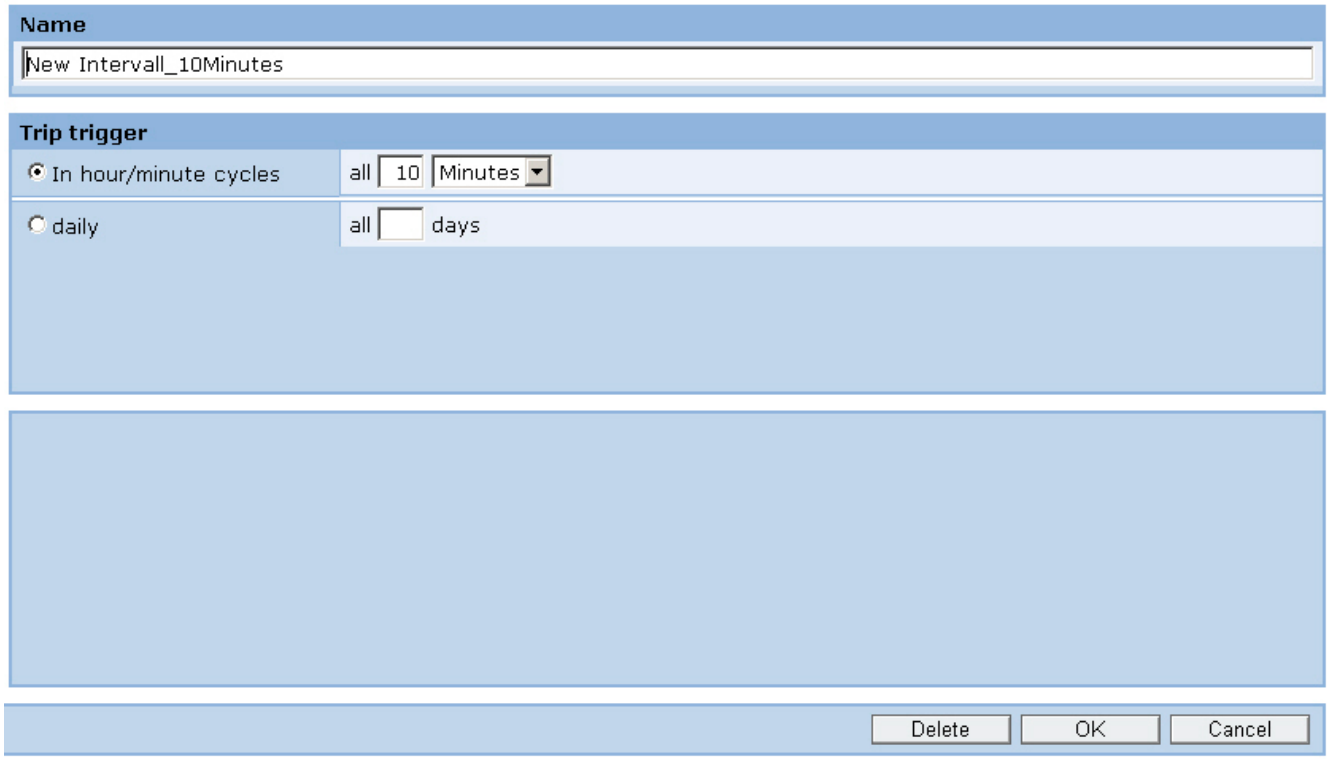


Figure 3-17 Processing time triggers

Field	Contents	Type
Designation	The name of the time trigger can be entered by the user. If the field remains empty or is deleted, the system generates a designation from the parameters of the trigger.	INPUT
by hour / minute	Entering a time interval in hours or minutes	INPUT / SELECTION
daily	Entering a time interval in days	INPUT

3.3.8 "Server trigger" trigger for interval monitors

Description of the function

The "Server Trigger" trigger type can be used to regularly trigger recurring actions based on the monotonic counting of events or summation of values (e.g. distance traveled, quantity consumed). The server trigger is based on one or more counters configured in a PLC monitor or in an NC monitor.

An interval value can be specified for each counter. As soon as the counter value has exceeded the trigger value, the trigger is triggered and a new count interval begins. The trigger value is incremented by the configured interval value. If two or more counters are combined in one trigger, the first counter to exceed the interval limit initiates the trigger. A new count interval then starts for all counters that are combined in the trigger. A server trigger for NC monitors and a server trigger for PLC monitors can be configured in a control monitor.

Server trigger for NC monitors

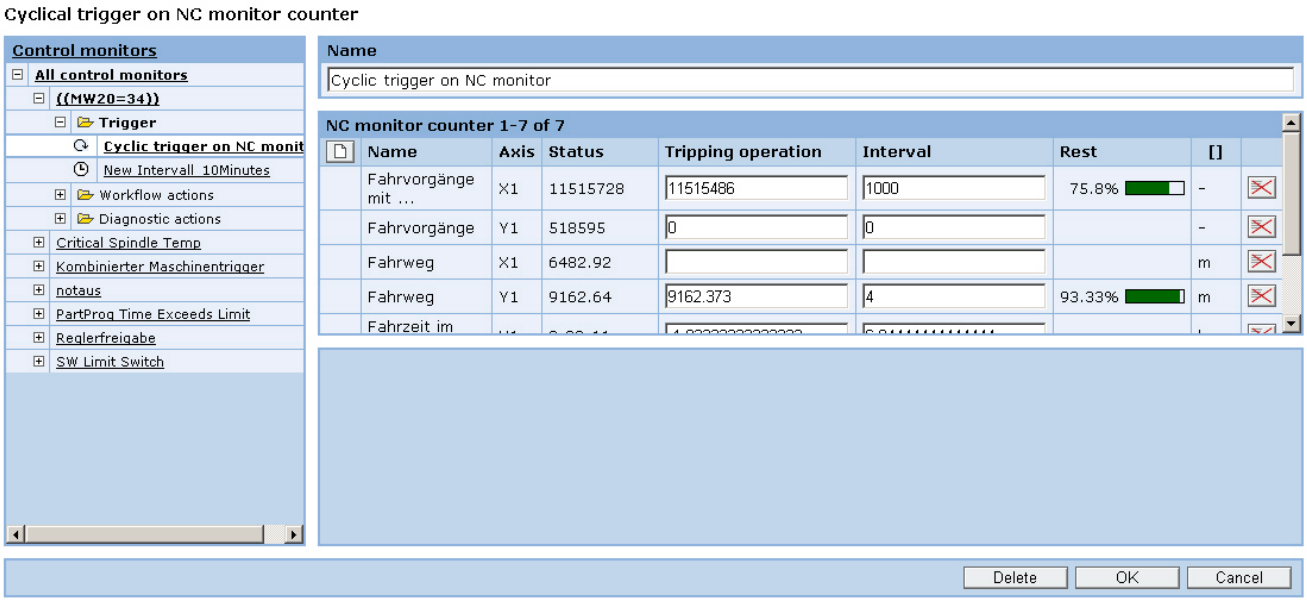


Figure 3-18 Configuring a server trigger for NC monitors

Field	Contents	Type
View	Displaying the counter states in a diagram	ACTION
Designation	Counter designation	DISPLAY
Axis	Axis identifier	DISPLAY
Status	Current counter state	DISPLAY
Trigger	Counter state when the next trigger will be initiated	DISPLAY INPUT
Interval	Interval value	INPUT
Remainder	Numeric and graphic display of the remaining count units until next triggering	DISPLAY

Field	Contents	Type
[ ]	Counter units	DISPLAY
Deleting	Deleting the counter from the server trigger	ACTION
Adding	Adds a further NC monitor counter to the server trigger	ACTION

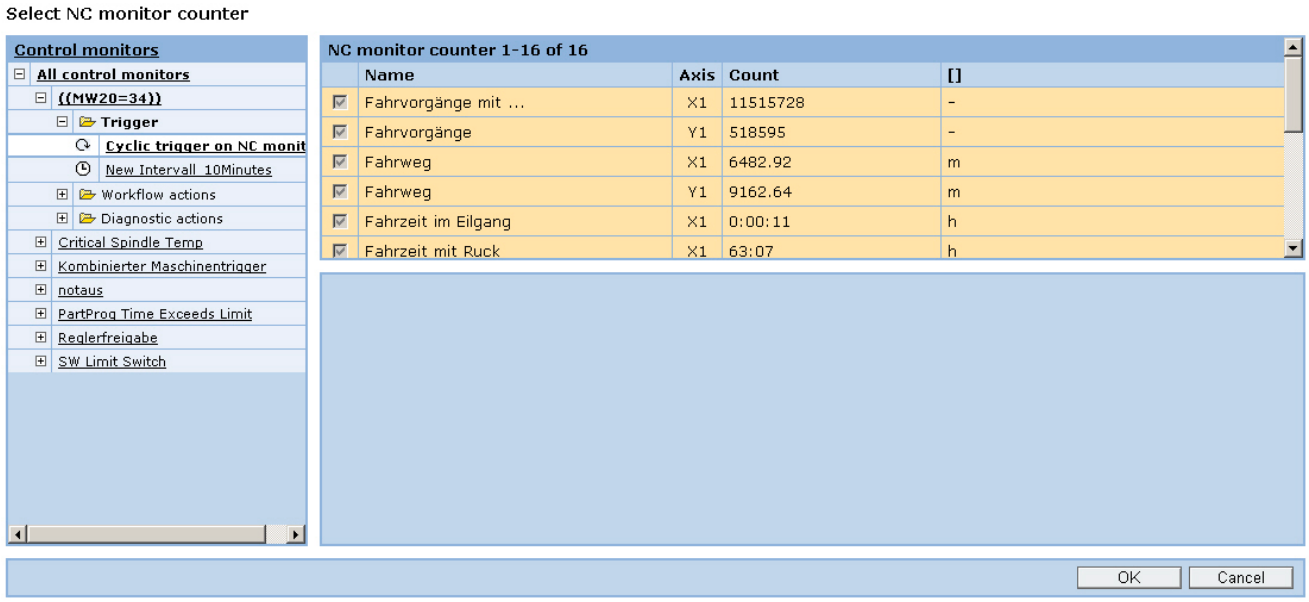


Figure 3-19 NC monitor counter for a server trigger

Server trigger for PLC monitors

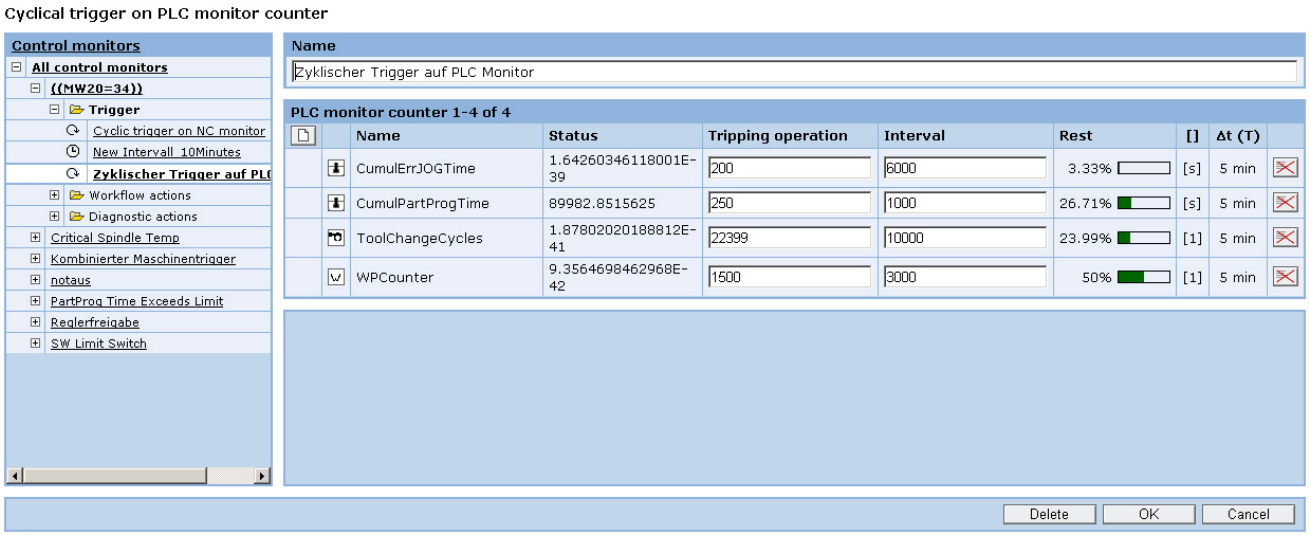


Figure 3-20 Server trigger for PLC monitors

Field	Contents	Type
View	Displaying the counter states in a diagram	ACTION
Designation	Designation of the PLC monitor counter	DISPLAY
Status	Current counter state	DISPLAY
Trigger	Counter state when the next trigger will be initiated	DISPLAY INPUT
Interval	Interval value	INPUT
Remainder	Numeric and graphic display of the remaining count units until next triggering	DISPLAY
[]	Counter units	DISPLAY
Deleting	Deleting the counter from the server trigger	ACTION
Adding	Adds a further PLC monitor counter to the server trigger	ACTION

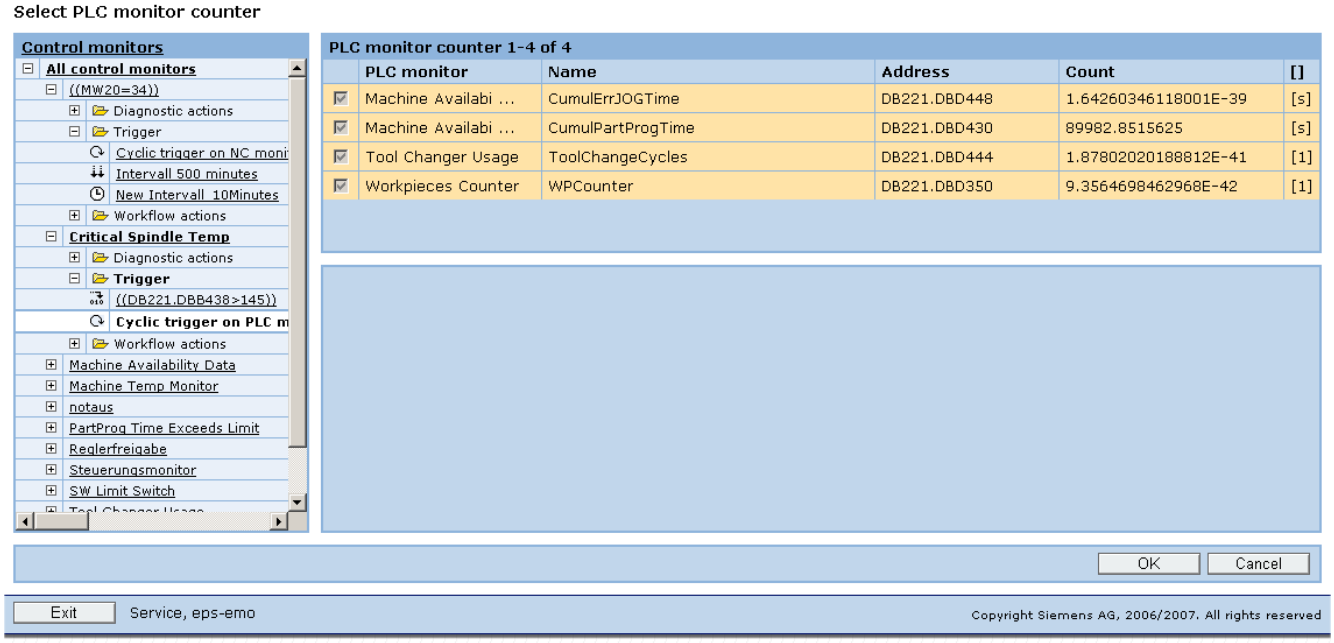


Figure 3-21 PLC monitor counter for a server trigger

3.3.9 "Limit value for PLC monitor" trigger

Description of the function

If limit values defined in the PLC are reached or exceeded, then they can be configured here as trigger in the control monitor. Since the PLC monitor cannot generate an entry in the event history, this is done via the control monitor to ensure that any limit value violations can be documented.

Additional functions of the control monitor, with workflow actions and diagnostics actions, are fully available, in order to be able to interactively initiate actions in response of limit value violations.

Since the processed data is not updated cyclically, the evaluation is performed when the limit is either reached or exceeded. In order not to initiate an action at every trigger, flank evaluation can be selected. An event will be generated only at the first trigger after the limit value violation.

Changed limit values will be taken into consideration with each trigger.

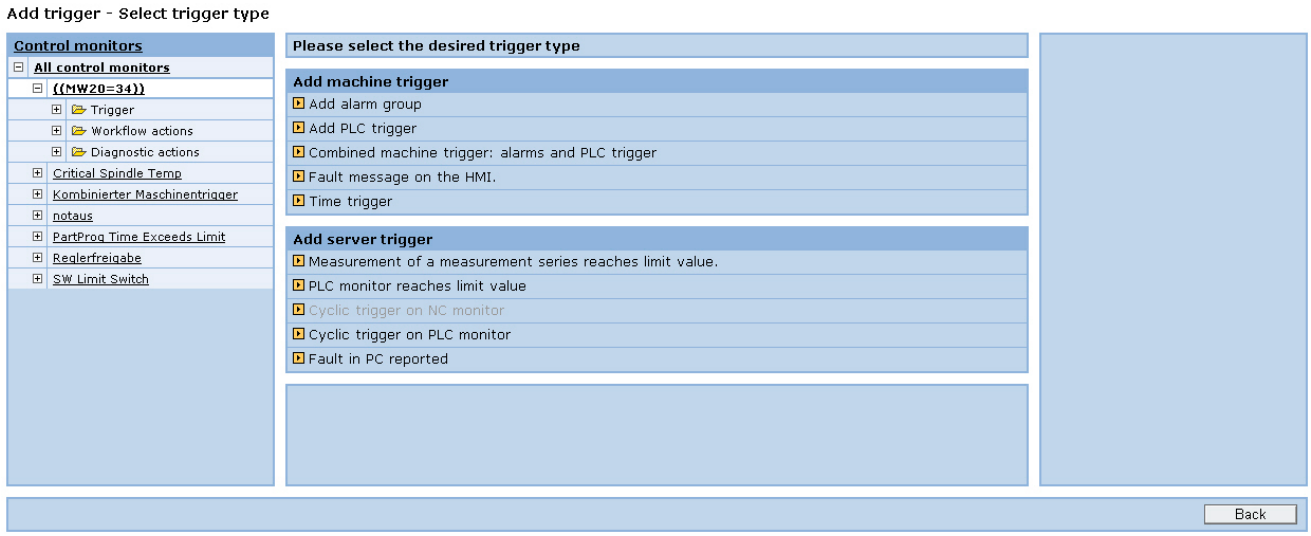


Figure 3-22 Calling the trigger in the control monitor

Field	Contents	Type
Adding a server trigger	PLC monitor reaches limit value.	ACTION

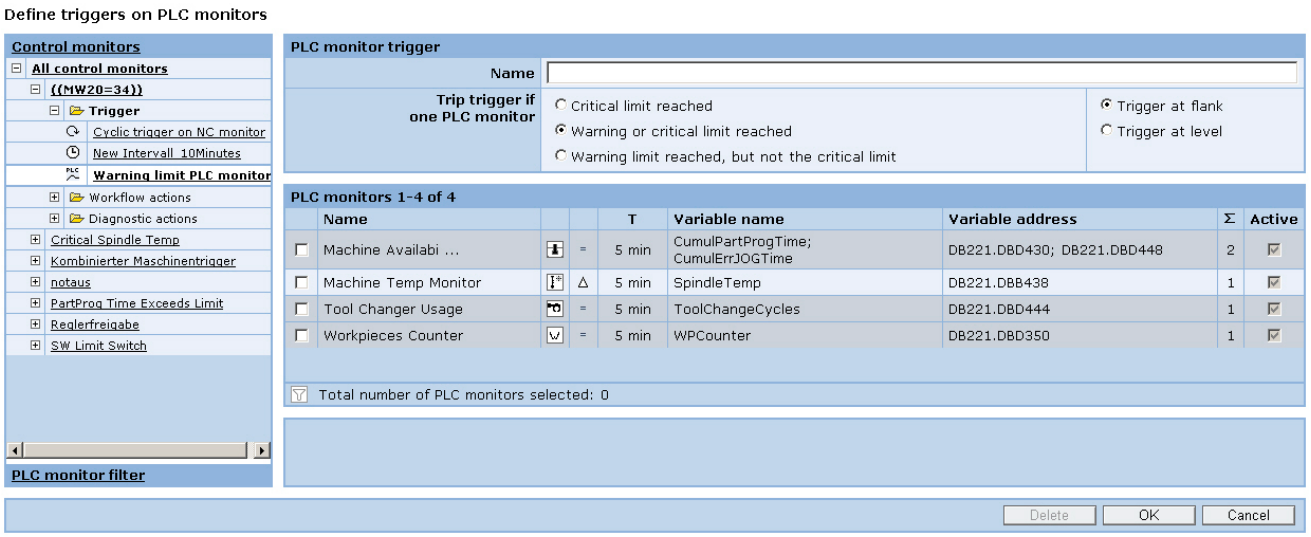


Figure 3-23 Configuring a PLC monitor trigger

Field	Contents	Type
Designation	Name	DISPLAY INPUT
Initiating a trigger if a PLC monitor	The following options are possible: • Critical limit reached • Warning limit or critical limit reached • Warning limit reached but not critical limit	DISPLAY INPUT
Edge / level	Evaluating a trigger	

3.3.10 "Limit value for measurement series" trigger

Description of the function

The "limit value violation" trigger for measurement series is used to trigger actions if a limit value is violated during a measurement in one of the measurement series configured in the trigger. If two or more measurement series are combined in the trigger, the trigger is initiated when a limit value is violated in at least one of the measurement series.

The trigger is only initiated if a limit value is violated during a measurement. Changing a limit value after measurement does not initiate the trigger.

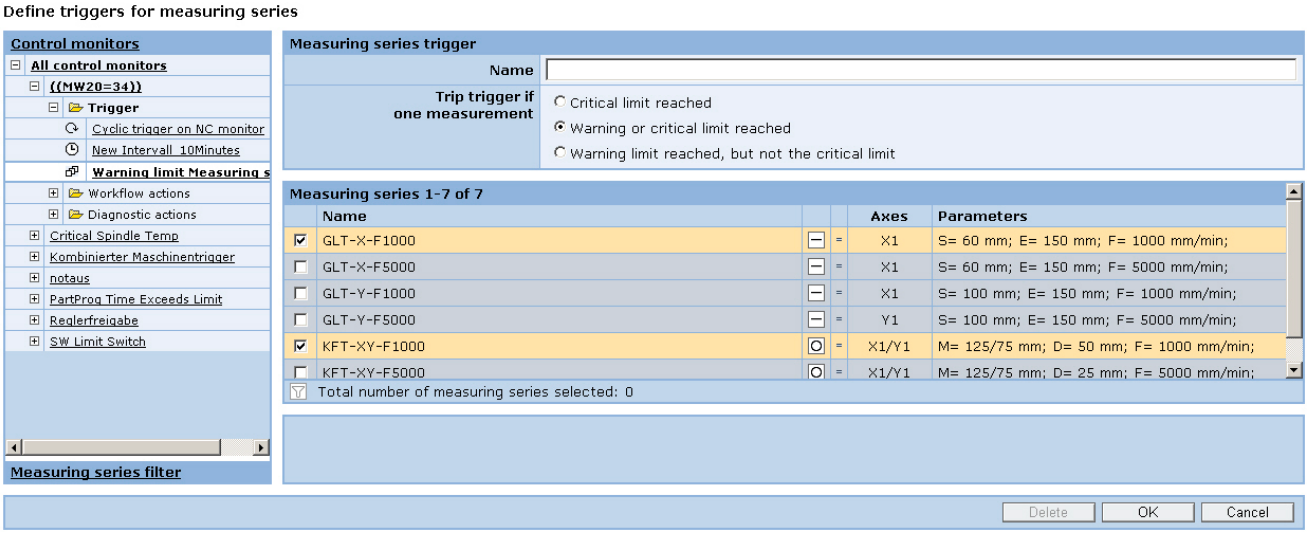


Figure 3-24 Limit value violation for measurement series

Field	Contents	Type
Designation	Name of limit value trigger; can be entered by the user. If the field remains empty and is deleted, the system will generate a designation from the parameters of the trigger.	INPUT
Initiating a trigger …	Selecting the type of limit value	SELECTION

Field	Contents	Type
Measurement series 1-n from n	Displaying and selecting the existing measurement series for the trigger	DISPLAY / SELECTION

3.3.11 Workflow actions

Description of the function "e-mail / SMS notification"

With the workflow action "e-mail/SMS notification", you can notify people of an event via SMS and/or e-mail. The receiving addresses can be stored in the address book.

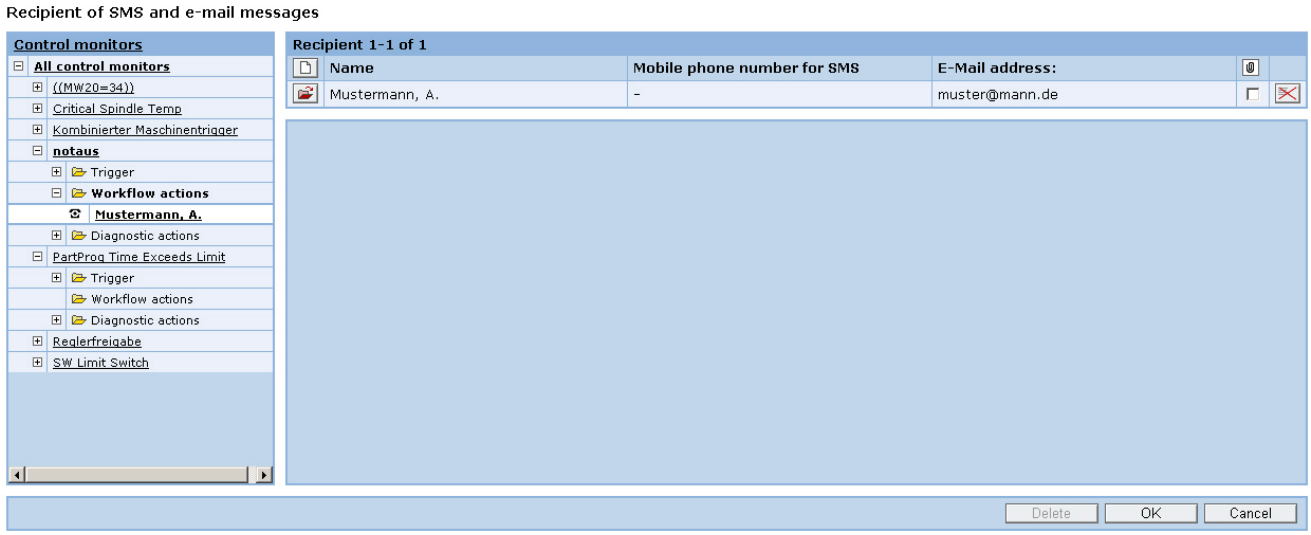


Figure 3-25 Recipient list for notification

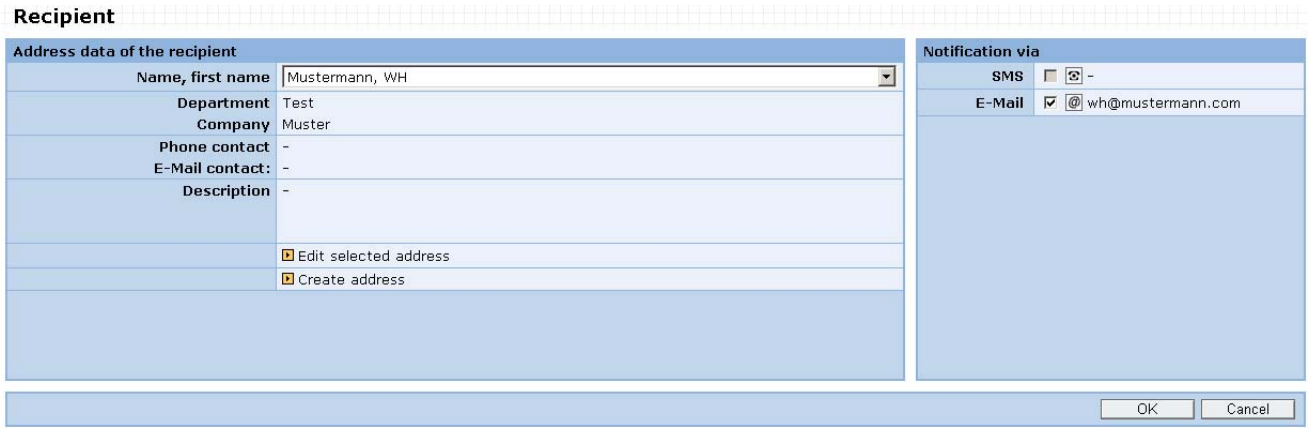


Figure 3-26 Editing recipients for notification

Field	Contents	Type
Adding a recipient	Inserting a new recipient into the recipient list of the control monitor	ACTION
Editing a recipient	Editing the notification type of the selected recipient (SMS/e-mail) or replacing the selected recipient by another	ACTION
Deleting a recipient	Deleting a recipient from the recipient list of the control monitor **Note:** This does not change or delete the address in the address book of the organization.	ACTION
Selecting a recipient	Selecting a recipient from the address book of the organization	SELECTION
Notification via	Processing the notification type of a recipient (SMS/e-mail)	SELECTION
Deleting	Deleting recipient	ACTION
Marking a recipient	Marking a recipient to receive the diagnostics data as attachment	SELECTION

"Create maintenance job" function description

With the workflow action "create maintenance job", you can create a maintenance job for an event. To create an order, a maintenance schedule is used as a template.

Note

If a maintenance job is created by a control monitor, it is always assigned the due date "immediately/today". The orders generated in this way to not affect any others that may have been generated from the same schedule.

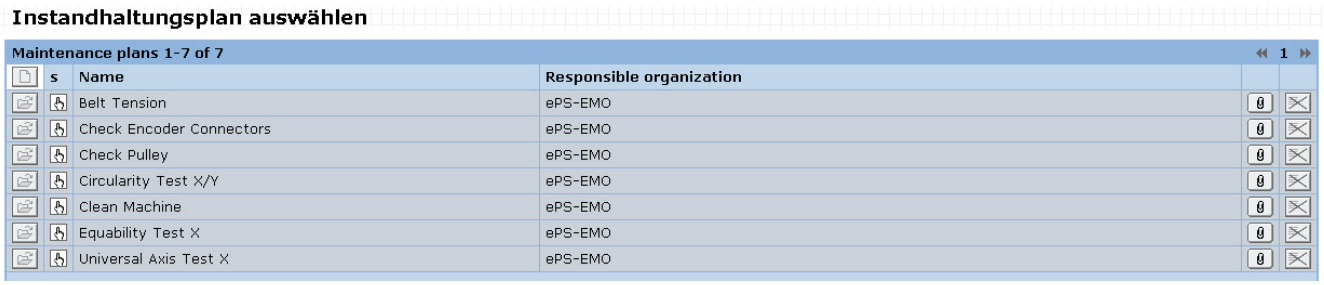


Figure 3-27 Creating a maintenance job from the control monitor

Field	Contents	Type
Creating a maintenance schedule	Creating a new maintenance schedule	ACTION

Field	Contents	Type
Opening a maintenance schedule	Opening and editing an existing maintenance schedule	ACTION
Linking-in a maintenance schedule	Using an existing maintenance schedule as a template for orders of the currently selected control monitor	ACTION
Deleting a maintenance schedule	Deleting a maintenance schedule **Note:** If the schedule is used for further monitors, the action stored there "create maintenance job" will also be deleted.	ACTION

"Create service case" function description

With the workflow action "create service case", you can create a service case for the currently selected machine for an event.

Note

The service cases created for a machine can be processed by all organizations that can currently view this machine. When a service case is created via a fault notification, the requesting operator is entered as the contact person.

See also

Addresses (Page 129)

Creating maintenance schedules (Page 59)

3.3.12 Diagnostic actions

Description of the "Upload files" function

The diagnostic action "Upload files" is used to upload any files from the file system of the SINUMERIK and the NCU onto the ePS server on an event.

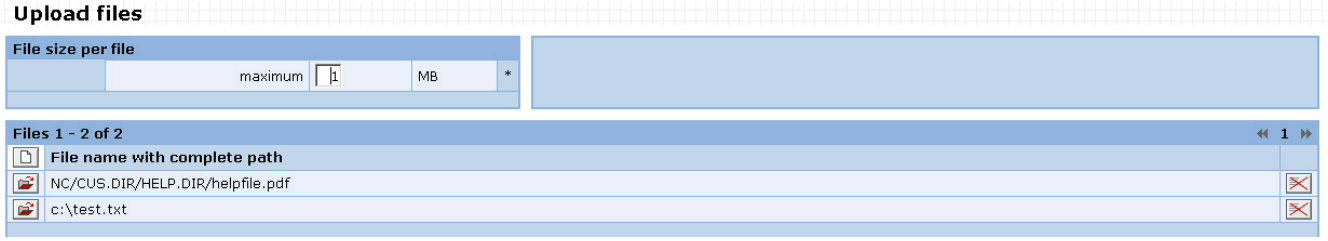


Figure 3-28 Uploading files with the control monitor

Field	Contents	Type
File size per file	Defines the maximum file size for each file to be loaded: If a file exceeds the maximum value, it is not loaded onto the ePS server.	INPUT
File names with complete path	Displays the list of files selected for uploading.	DISPLAY
Adding / changing	Selects a file for uploading or changes its current path. **Note:** For files, the complete path with reference to the file system of the control must be saved. The following notation is used for uploading files of the NC file system: `../NC/Directory.dir/Subdirectory.dir/<File.Extension>` This enables the system to determine the current storage location of the file automatically (hard disk / SRAM of the NCU) and the file is loaded from there.	ACTION / INPUT
Deleting	Deletes a file for uploading from the list	ACTION

Description of the "HMI action log" function

The diagnostic action "Upload HMI action log" allows you to upload the HMI action log to the ePS server when an event occurs.

This action type has no configurable parameters.

Description of the "Upload machine data" function

The diagnostic action "Upload machine data" enables you to upload the machine data to the ePS server when an event occurs.

This action type has no configurable parameters.

Note

The uploaded machine data do not contain any drive machine data.

Description of the "Upload NC state data" function

The diagnostic action "Upload NC state data" enables you to upload the NC state data to the ePS when an event occurs.

This action type has no configurable parameters.

Descriptions of the "Record and upload PLC trace" function

The diagnostic action "Record and upload PLC trace" enables recording of the progression over time of two or more PLC variables and uploading to the ePS server when an event occurs.

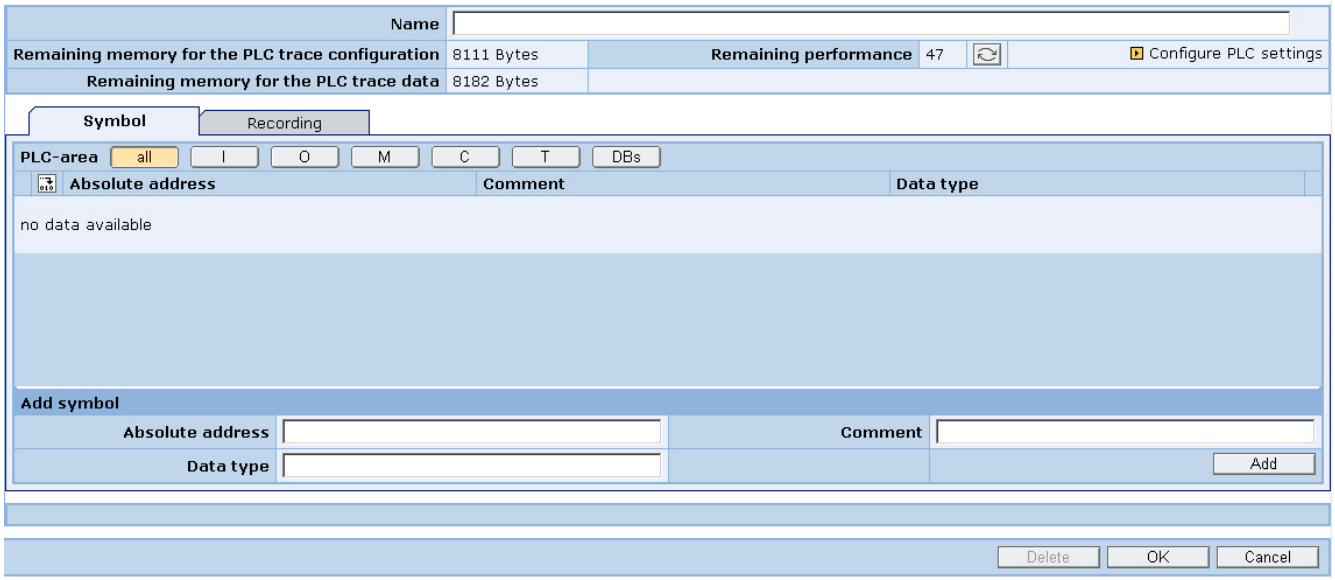


Figure 3-29 PLC trace: Adding variables

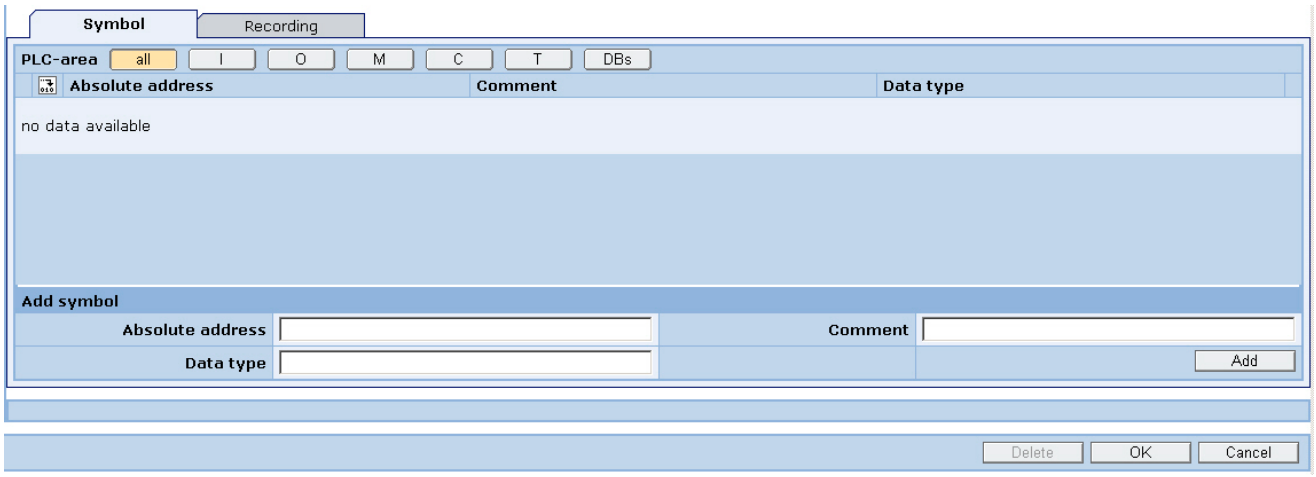


Figure 3-30 PLC trace: Defining recording parameters

Field	Contents	Type
Designation	Name of the PLC trace: Can be entered by the user. If the field remains empty or is deleted, the system will generate a name.	INPUT
Remaining memory for the PLC trace configuration	Indicates how much memory is left in the PLC for the definition of PLC traces.	DISPLAY

Field	Contents	Type
Remaining memory for the PLC trace data	Indicates how much memory is left in the PLC for the recording of PLC traces. **Note:** If the remaining memory is insufficient for the current definition of a trace, you can save the control monitor inactively in the system. In order to be able to activate it, you must first free memory by deactivating one or more other control monitors.	DISPLAY
Icons (icon list)	Displays the PLC variables that must be recorded in the trace **Note:** PLC variables to be recorded are selected in the same ways as for PLC triggers / conditions	TAB / DISPLAY
Recording	Entering PLC trace recording parameters	TAB / DISPLAY
Pretrigger / cycles	Entering the number of cycles for the pretrigger (recording of the signal curve until the trigger event / circulating buffer)	INPUT
Record / cycles	Entering the total number of PLC cycles to be recorded (including pretrigger cycles) for the current PLC trace.	INPUT
Remaining performance	Indicates how much performance is left in the PLC for PLC triggers and PLC conditions.	DISPLAY

Description of the "Upload PLC data blocks" function

The diagnostic action "Upload PLC data blocks" permits uploading of some or all of the PLC data blocks to the ePS server when an event occurs.

Notice

The PLC data blocks are available in binary form on the ePS server.

Precisely one contiguous range of the same data block can be selected for uploading for each control monitor.

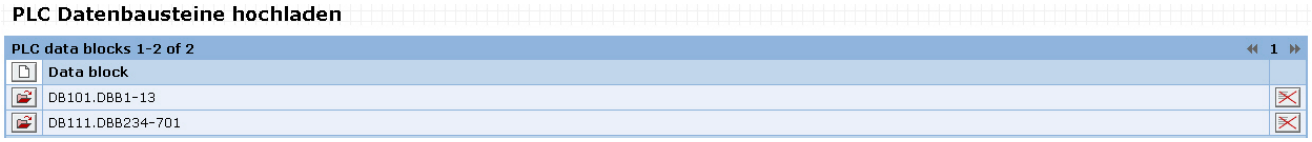


Figure 3-31 Adding PLC data blocks

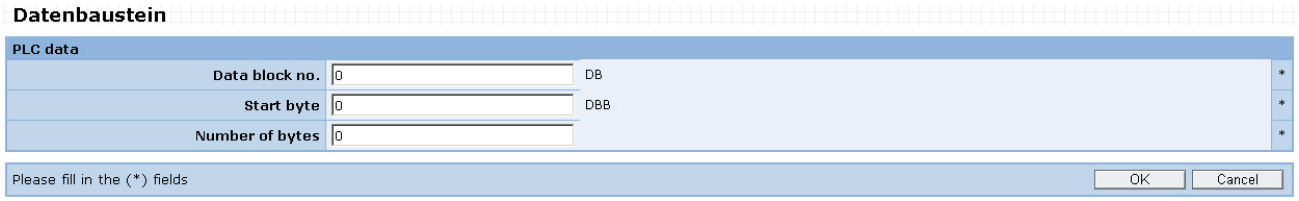


Figure 3-32 PLC data block (details)

Field	Contents	Type
Adding / changing	Adds a new PLC data block to the list and selects an existing PLC data block for changing	ACTION
Deleting	Deletes a PLC data block to be uploaded from the list	ACTION
Data block No.	Number of the data block to be loaded to the ePS server	INPUT
Start byte	Start byte from which the data of the data block will be loaded	INPUT
Number of bytes	Number of bytes starting from the starting address	INPUT

Description of the "Trigger PLC monitor(s)" function

Using the function "Trigger PLC monitor(s)", the variables configured in the selected PLC monitors are read-out of the PLC and uploaded.

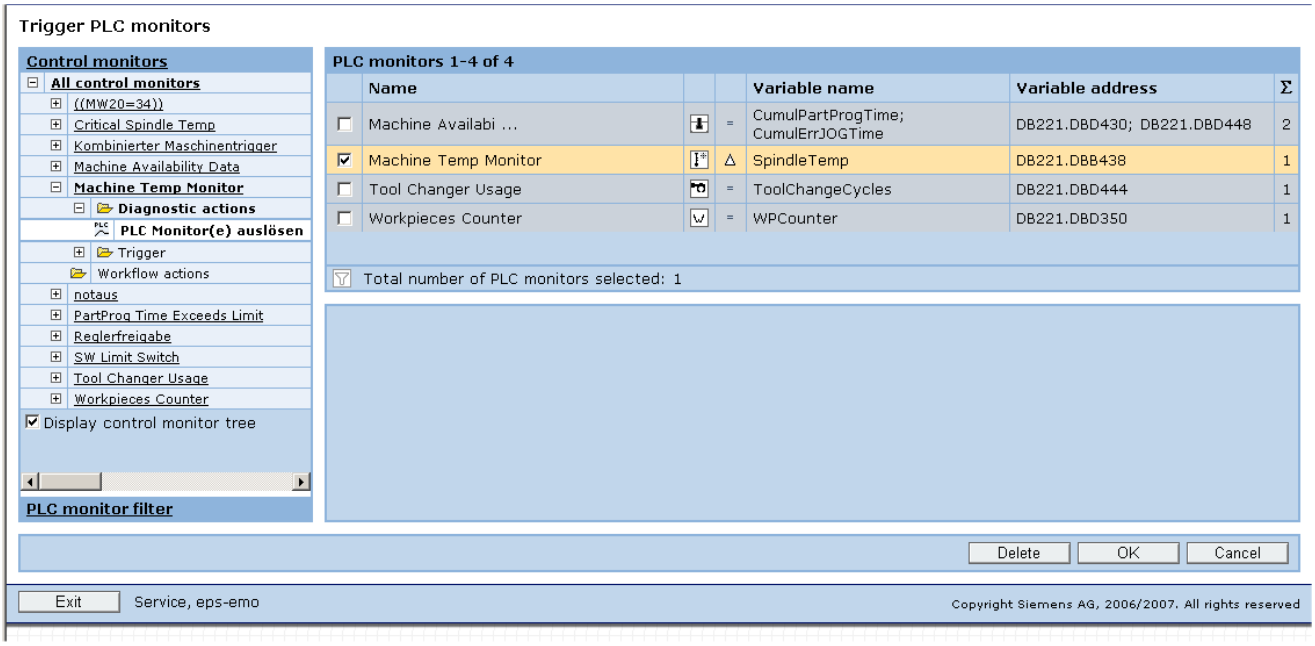


Figure 3-33 Triggering the PLC monitor

Field	Contents	Type
Triggering the PLC monitor	At the trigger event, the selected PLC monitor acquires the variables.	SELECTION

See also

"PLC trigger" trigger (Page 76)

3.4 Global settings

3.4.1 Setting the notification limitation

Description of the function

Using the notification limitation, you define the time interval within which the system must have sent a message (notification):

- to the same operator
- from the same machine

If more messages are generated by control monitors in the specified interval, they are blocked on the ePS server (e.g. on a burst of alarms due to faulty configuration).

Note

When the notification limit is active, all events are recorded in the event history. Only the action "Notification to recipient (SMS/e-mail)" is blocked to prevent the mailbox from filling up.

Figure 3-34 Setting the notification limitation

Field	Contents	Type
Status	Switching the notification limitation on/off for the machine **Note:** This setting is activated immediately after storage of a change.	SELECTION
Do not send any messages for …	Time interval for notification limitation	INPUT

3.4.2 PLC data blocks

Description of the function

To be able to use PLC triggers, PLC conditions, and PLC traces on a machine, the data blocks for the machine used in the control must be made known.

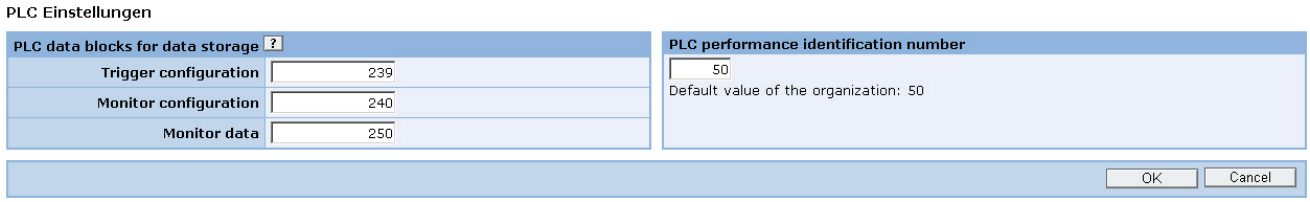


Figure 3-35 Setting-up the PLC for control monitors

Field	Contents	Type
PLC trigger configurations	Number of the data block for PLC trigger configurations	INPUT
PLC trace configurations	Number of the data block for PLC trace configurations	INPUT
PLC trace data	Number of the data block for PLC trace data	INPUT
PLC performance index	Entering the maximum available performance index of the PLC for PLC triggers and PLC conditions.	INPUT

Note

The PLC performance index allows you to define how much performance may be used for the ePS PLC trigger. Each ePS PLC trigger uses a certain number of performance points. In this way you can control to what extent the PLC may be occupied by the ePS PLC trigger. The PLC performance index has to be defined individually by the machine manufacturer.

3.5 Client-server communication

3.5.1 Synchronization times

Description of the function

When synchronizing, the defined configurations, e.g. from control monitors, from the ePS Network Server, are transferred to the control and become effective. You can configure an instant or interval when the machine will perform synchronization. You can also define the synchronization mode and time zone, in which the machine is located.

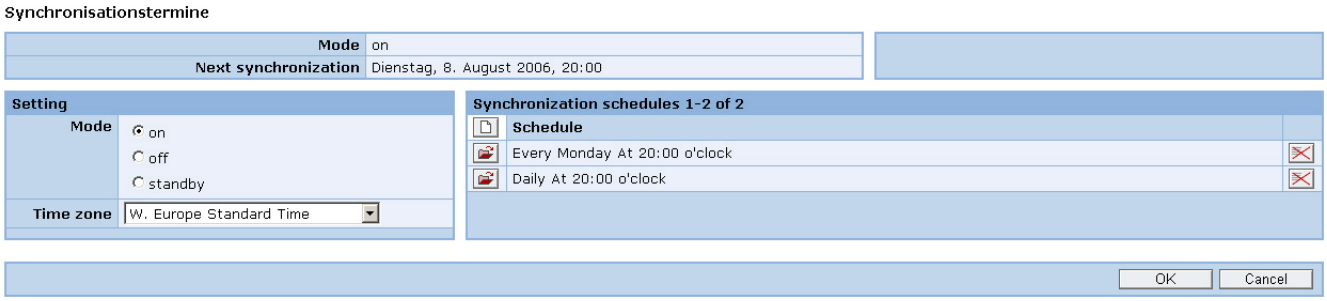


Figure 3-36 Overview, synchronization times

Field	Contents	Type
Next synchronization	Date of the next planned synchronization of the machine with the current configuration on the ePS network server.	DISPLAY
Mode	on: All data are updated. off: The machine does not automatically synchronize with the settings on the ePS network server standby: Only the synchronization data are updated.	SELECTION
Time zone		SELECTION
Data sets	Several synchronization times can be configured at the same time.	
Creating a data set	Creating a data set with new synchronization settings	ACTION
Opening a data set	Processing an already defined synchronization data set	ACTION

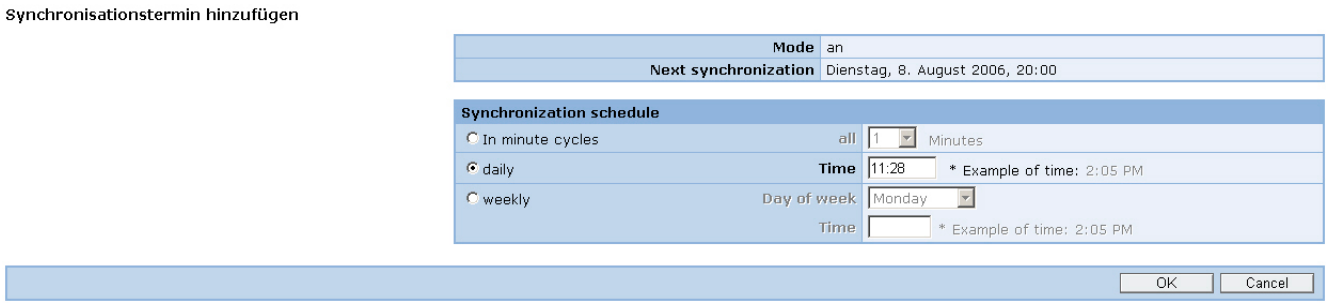


Figure 3-37 New synchronization time

3.5.2 Monitoring ePS services

Description of the function

With the monitoring function of the ePS services, you can configure the status monitoring of the ePS services on machines in your own organization.

You can activate or deactivate the status monitoring for a selected machine. The time interval for sign-of-life monitoring can be defined in the range 5 minutes to up to 24 hours.

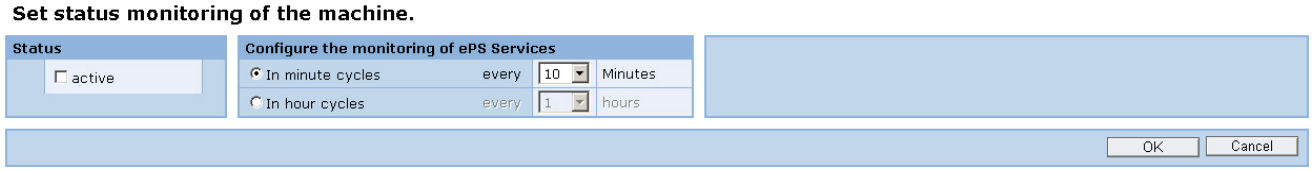


Figure 3-38 Setting the monitoring

Field	Contents	Type
Status	Activating or deactivating monitoring of ePS services	SELECTION
Setting-up the monitoring of ePS services	Defining the interval using predefined list values. In minute cycles: 5,10,15,20,30 In hour cycles: 1,2,3,4,6,8,12,24	SELECTION

Organizational tasks

4

4.1 Maintenance jobs

Applications

The maintenance jobs describe the maintenance and service tasks to be performed on the machine consisting of:

- Working instructions
- Time of execution

The maintenance jobs can be both tasks for the acquisition of measured quantities using the "series of measurements" condition monitor and also purely manual tasks.

- Orders are displayed to the user at the control operator panel where they can be processed ("machine operator at machine" application task), i.e. marking an order as being "completed" and specifying a result for it.
- The user can view and rework orders on the PC, e.g. the work description or the date can be specifically changed for each job ("maintenance scheduler" application task). This function is not available on the control operator panel!

Note

If a user is logged on at the control operator panel, the user can always process the pending orders there (change status and result).

Orders contain the "target organization" information that specifies which organization is to perform the order processing. Orders for a machine can be changed and deleted by any organization that has access to this machine.

Overview for organization or specific machine

The user can use the overview of the maintenance jobs on the PC for the following purposes:

- Obtaining an overview of jobs still pending and already processed; progress control, planning of service assignments
- Editing jobs → individually changing automatically created jobs
- Changing a work instruction → if other tasks not known at the time of planning must be completed together with the standard order

- Changing the execution time → for example, rescheduling tasks that can or should be completed together on the same day
- Editing a result → adding comments for the tasks performed, appending detailed service reports to the job as a file
- Processing jobs →Tasks to be performed, e.g. for the same tasks on several machines, can be entered in a user-friendly fashion
- Deleting jobs

The entry via Machine Information → Maintenance Jobs provides an overview of the orders for the currently selected single machine. This is also the view that the user sees on the control operator panel (Maintenance Services → Maintenance Jobs).

Note

The user only sees those new and open jobs of the machine where the user is currently located (logged on) on the control operator panel.

The entry via Organization Tasks → Maintenance Jobs provides an overview of the orders for all machines known in the organization. To be able quickly to find work that is still pending, jobs with the status "open" and "new" are highlighted in the list view.

A hierarchical tree structure can be used to restrict the view of the jobs to the machines of a customer, a location and a production unit down to the level of the individual machine in the "Own machines" and "Third-party machines" views.

When working with machines released in a cooperation area, these machines can be further restricted according to partner organization in the "Partner of third-party machines" and "Partner of own machines" views.

Note

In all views of the tree structure, the respective designations from the machine master data are used, as specified in the organization of the user.

4.1.1 Selecting a maintenance job at the machine

Description of the function

The selection of a row in the machine tree limits the viewed jobs to just the machines at this level.

The top level of the hierarchy represents the ownership/releases of the machines. The underlying hierarchy levels are Customer → Location → Production Unit → Single Machine.

Function	Description	
Filter (machine tree)	All:	All machines that the user can access.
	Own:	Only those machines logged-on in the user's organization.
	Released:	Own machines that have been released for other organizations.
	External:	External machines that have been released for your own organization.

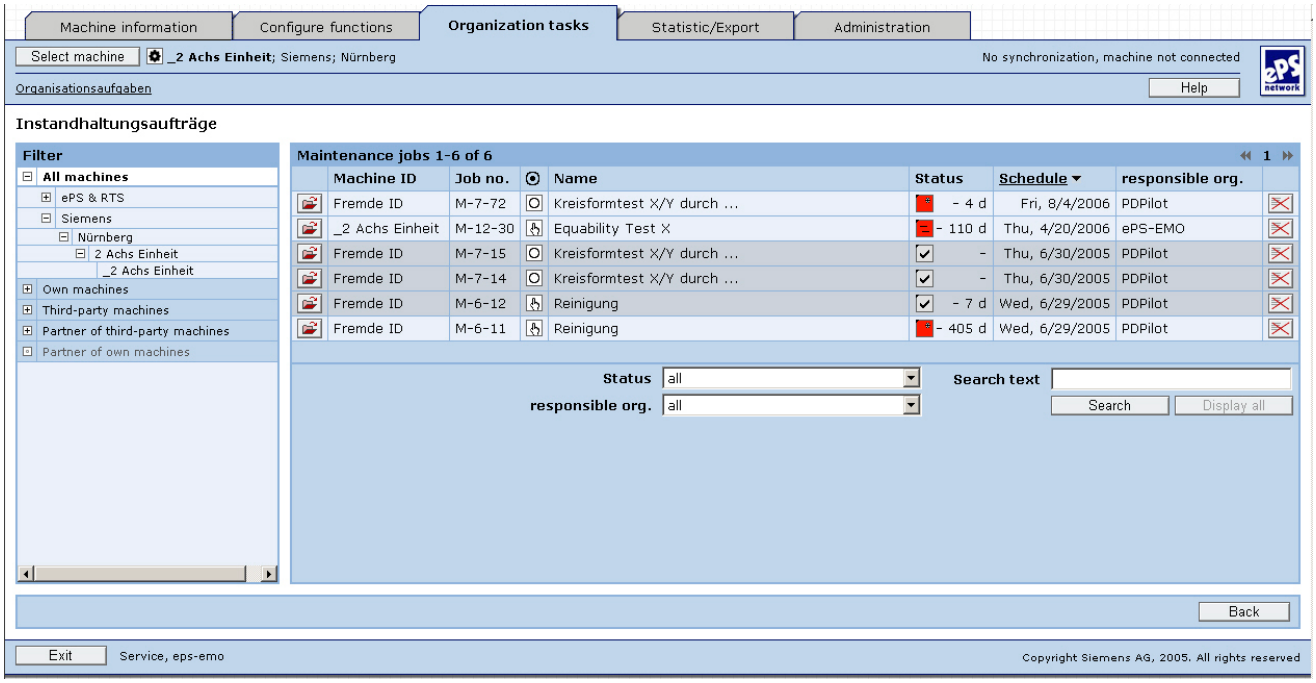


Figure 4-1 List of maintenance jobs

Field	Contents	Type
Machine ID	Displaying the machine ID	DISPLAY
Job number	Unique serial number of the maintenance job **Note:** The job ID can be used for communication between the persons involved in the service process to prevent misunderstanding.	DISPLAY
Type	It indicates whether it is a manual task or a measuring task (Condition Monitor): For measuring tasks, the type is more closely defined using a corresponding symbol.	DISPLAY
Designation	Short title of the maintenance job.	DISPLAY
Status	Indicates the status of the job: • Open folder icon = job open • Closed folder icon = job closed, without error • Closed folder icon with lightning flash = job closed, with error	DISPLAY

Field	Contents	Type
Info [t]	Indicates the number of days remaining until the time of execution. **Note:** The information display is generally omitted for "closed" jobs.	DISPLAY
Time	Planned execution time (set time).	DISPLAY
Responsible org.	Indicates the organization responsible for this job	DISPLAY
Information display	Indicates the urgency of the job: A pre-warning limit (yellow circle) is only displayed if this was entered when generating the schedule or post-processing (reworking) the job. Overdue jobs are indicated by a red circle. **Note:** The traffic light icon is generally omitted for "closed" jobs.	DISPLAY
Technician (only for the individual machine overview)	Last technician for this job	DISPLAY
(Filter) status	Filtering the jobs according to status: The filter is activated through searching.	SELECTION
(Filter) Associated organization	Filtering jobs according to the responsible organization: The filter is activated through searching.	SELECTION

4.1.2 Opening a maintenance job (PC)

Description of the function

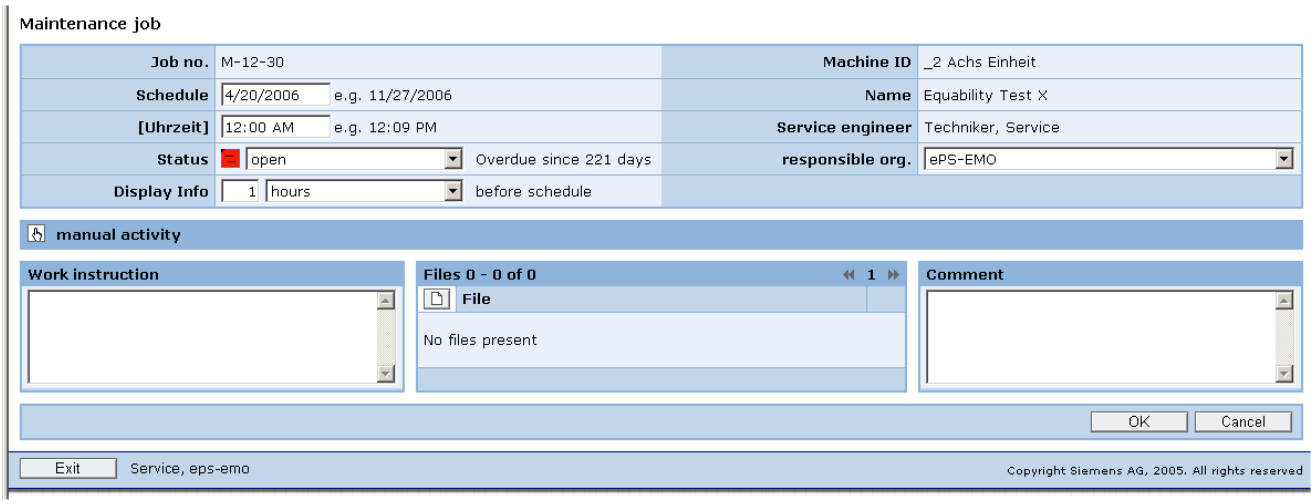


Figure 4-2 Processing a maintenance job (detailed view)

Field	Contents	Type
Time	Planned execution time (set time). **Note:** The earliest planned date/time you can enter is the current date.	INPUT
Time of day	Time of day when the maintenance job is due	INPUT
Status	Indicates the status of the job.	SELECTION
Displaying information	Indicates the urgency of the job: A pre-warning limit (yellow circle) is only displayed if this was entered when generating the schedule or post-processing (reworking) the job. Overdue jobs are indicated by a red circle.	INPUT
Technician	Last technician for this job	
Responsible org.	Indicates the organization responsible for this job.	INPUT
Working instructions	Description of the maintenance job.	INPUT
Files	To provide more details about the job, documents with more information can be appended using "Add file". **Note:** Only files in PDF format will be shown to the user on the control operator panel.	SELECTION
Comment	Comments of the job technician (generally: the machine operator) on the maintenance job	DISPLAY

Result:

Field	Contents	Type
Result → Measurement	A condition monitor measurement recorded together with a maintenance job: Displaying the measurement parameters and the series of measurements updated in the measurement.	DISPLAY
Opening measurement series	If a measurement result condition monitor was created with the job, the series of measurements associated with the job can be displayed directly at the PC.	ACTION
Opening the measurement results	If a measurement result condition monitor was created with the job, the single measurement associated with the job can be displayed directly at the PC.	ACTION

4.1.3 Processing the maintenance job (HMI)

Description of the function

The machine operator sees the jobs at the control operator panel (Maintenance Services → Maintenance Jobs) where they can be processed ("machine operator at the machine" application task).

Function	Description
Processing a maintenance job (processing)	The machine operator can process the pending maintenance jobs (open job). The associated due dates and the description of the work to be performed are displayed. After performing the work, the machine operator can enter a comment and set the order to "completed". If it was executed despite the occurrence of irregularities while processing the job, the job can be terminated with "completed/error".
Carry-out condition monitor measurement from maintenance job	The machine operator can perform condition monitor measurements that were defined in a maintenance job.
Viewing documentation	The machine operator can view detailed descriptions of the job (process instructions, machine documentation, etc.). These documents must have been made saved as PDF documents during the planning in the maintenance schedule or in the job.

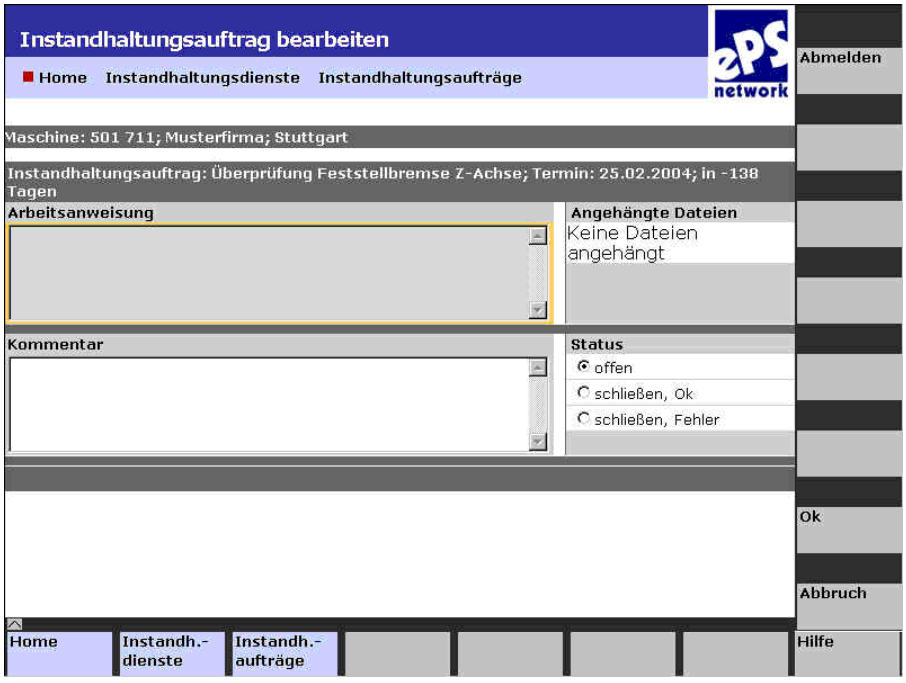


Figure 4-3 Processing a maintenance job at the HMI

Field	Contents	Type
Working instructions	Description of the maintenance job for the machine operator at the control operator panel.	DISPLAY
Attached files	To provide more details about the job, more advanced documents can be opened using "View file". **Note:** The first document of the list is preselected and can be directly opened with "View file". To view other documents of the list, they must have been selected previously with the cursor.	SELECTION
Comment	The machine operator can enter here a comment concerning execution of the maintenance job.	INPUT
Status	Processing status of the job for feedback to the maintenance scheduler. The machine operator can set the following statuses: • **Open** → must still be processed (initial status) • **Closed, OK** → job processed, no special incidents • **Closed, error** → job processed, an unexpected incident occurred (if necessary, specify more details in the comment)	SELECTION
Performing the measurement	Performing the measurement linked with this maintenance job. The measurement result is stored in a series of measurements (also see Performing CM Measurement).	ACTION
Measurement result	Displaying the measurement result created with this job. **Note:** The result can also originate from previous processing of the job, provided this was not completed with "closed" status.	ACTION

Safety note when displaying PDF documents

Notice

PDF documents to be displayed on the control operator panel must not contain any active contents (Java script, e-mail fields, etc.) nor have any HTML Links!!!

Otherwise, there is a danger that it may be possible to navigate from the ePS system to other websites.

ePS Network Services only supports the display of PDF documents that are compatible with Acrobat 1.3 (Reader version 4.x) on the control operator panel.

For optimum display, please create your PDF documents with the option "Initial View: Page Only/ Magnification Fit Width".

4.2 Service cases

4.2.1 Creating a service case

Description of the function

When a problem occurs on the machine, a control monitor can generate a service case. A typical application case is a control monitor with the event "Fault processing requested on the HMI", by which the user on the machine actively requests support from OEM service.

In the service case, itself, the technician can see the description of the problem and can document the error and its solution throughout the process, because access to the data/files backed up by the control monitor is possible at any time and further documents (e.g. service reports, manuals, drawings, and photos) can be added.

The overview of service cases is used to obtain a general view of all service cases assigned to an organization. That enables quick access to solutions have already been worked out and documented for use in new service cases.

Service cases can be assigned to people in your own organization by allocating employees. The current status of the work (processing status) can also be made transparent for all employees for the purpose of planning and progress control.

Notice

Service cases are always associated with the machine.

That applies both to generation by a control monitor and to manual creation on the PC.

Every user who is able to use the machine will also see its service cases. If the release for a machine is withdrawn from an organization, this organization will no longer be able to access the service cases of the machine

4.2.2 Service cases - list view

Description of the function

Function	Description
Opening a service case	Opens an existing service case so it can be processed
Creating a service case (manually)	Manually creating a service case. The service case is created for the currently selected machine.

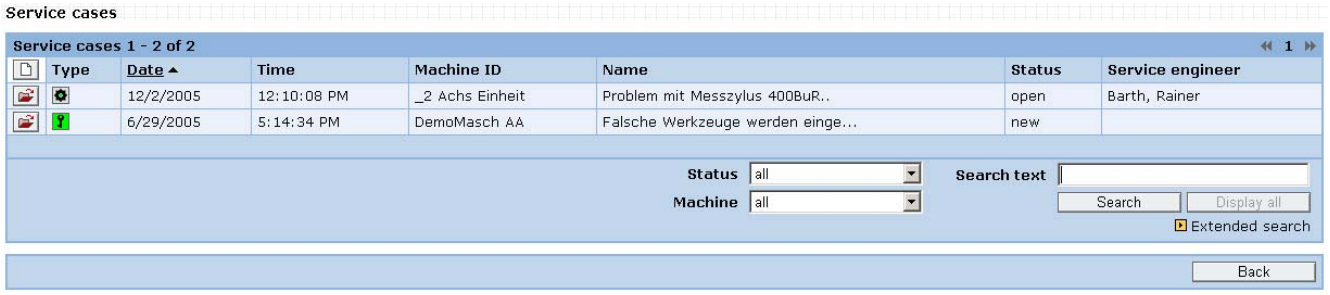


Figure 4-4 List view of service cases

Field	Contents	Type
Date / time	Date and time when the service case was created	DISPLAY
Machine ID	Designation of the machine from which the service case originates or for which it was created	DISPLAY
Designation	Description of the service case **Note:** If the service case was triggered by the event "Fault processing requested (HMI/PC)", the first 40 characters of the fault description entered there are used as the designation of the service case. Otherwise, a name for the service case is automatically generated from the triggering event.	DISPLAY
Status	Processing status of a service case	DISPLAY
Technician	Currently assigned technician for a service case	DISPLAY
Status of the service cases (filter)	Filtering of all service cases according to status: Filtering is performed by searching.	SELECTION
Machine (filter)	Filtering of all service cases according to the machine that is currently selected: Filtering is performed by searching.	SELECTION
Search text / free search text (filter)	Permits filtering of all service cases according to a free text: Filtering is activated by searching. **Note:** The filter text is applied to the machine ID and the service case designation. Technicians cannot be found in this way.	INPUT

Field	Contents	Type
Extended search	Extended search for service cases according to the search term, date, status, and the current technician and initiator of the service case.	ACTION

4.2.3 Creating a service case

Description of the function

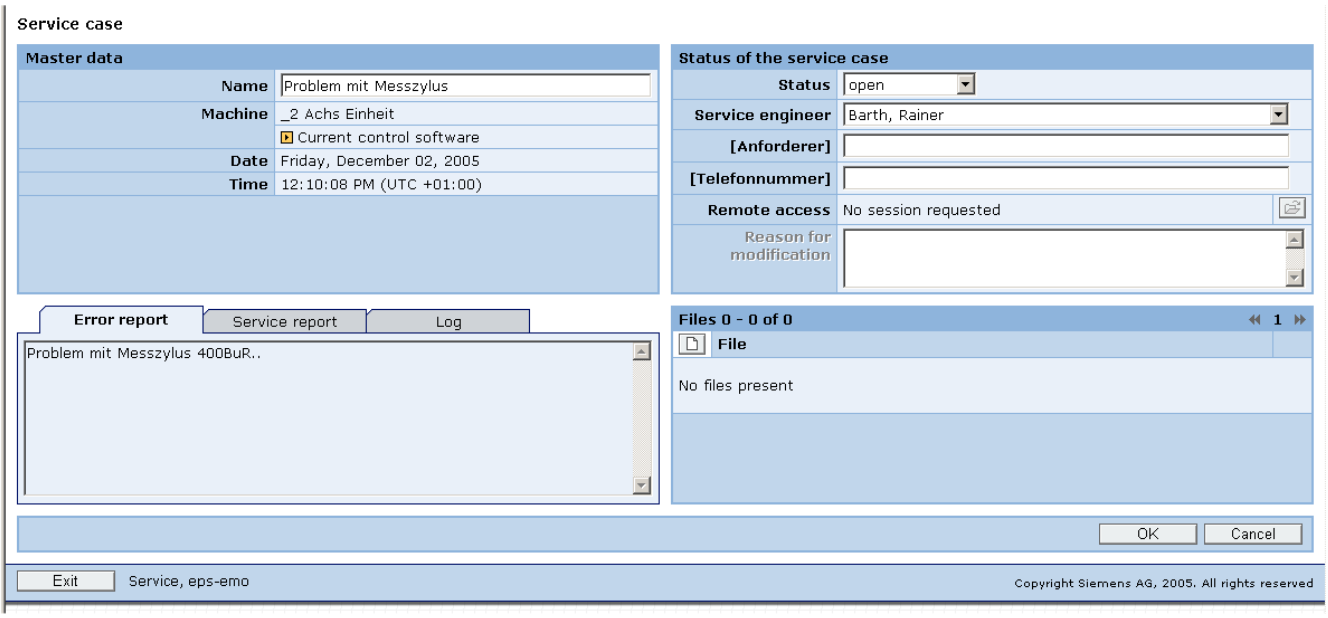


Figure 4-5 Manually creating a service case

Field	Contents	Type
Selecting the machine	Selecting another machine, if you want the service case to be created on a machine other than the currently selected machine.	ACTION
Fault report	Entering a fault description. Different than when requesting fault processing, here, in addition to the fault report, a technician and status can be immediately assigned.	INPUT
Status of the service case	Possible values: • New (opened) • Assigned (to a technician) • Open (viewed, no decision) • Closed (service completed successfully)	SELECTION
Technician	Addressee for providing support in the fault case	INPUT

Requested by	Name of the technician	INPUT / DISPLAY
Telephone number	For questions relating to clarifying the fault case, the person that made the original request can leave his telephone number as support in clarifying the case.	INPUT / DISPLAY

4.2.4 Opening a service case

Description of the function

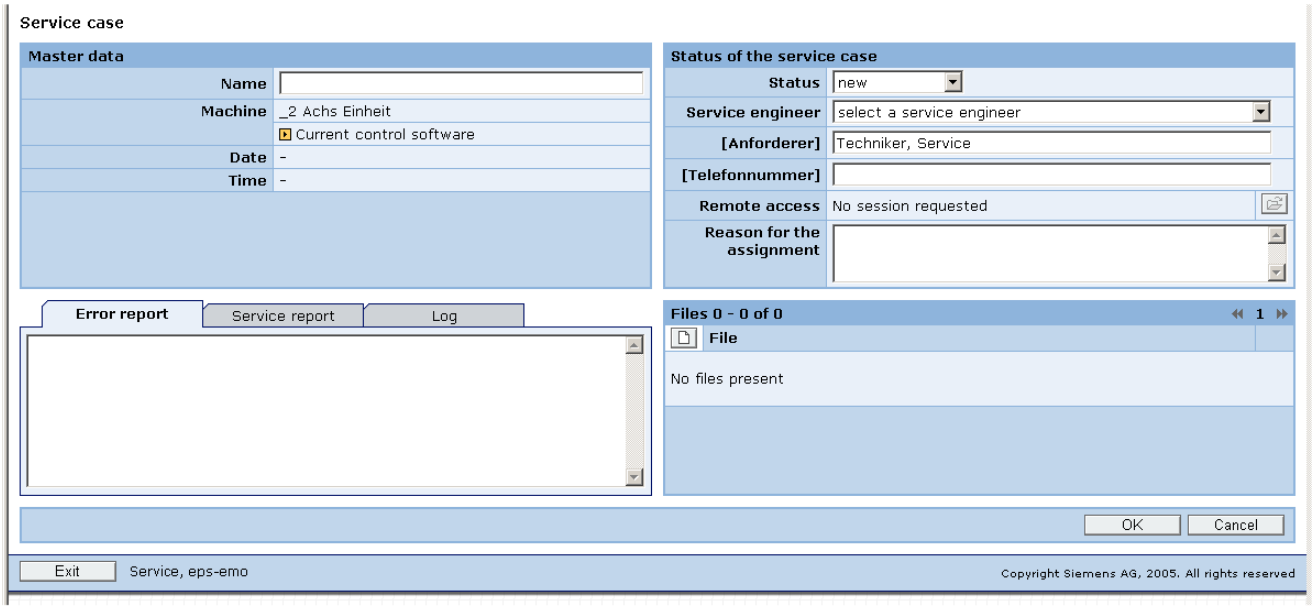


Figure 4-6 Opening and processing a service case

Field	Contents	Type
Fault report	Fault description that has been entered or initiating event	DISPLAY
Service report	Possibility of entering a service report: An existing report can be edited.	INPUT
Report		DISPLAY
Files	Display of the files associated with the service case for documentation purposes: Selecting a file (single click) opens it in the application associated with its file type. **Note:** Additional files from the local file system can be linked to the service case manually using "Add file" and saved on the ePS network server (e.g. repair reports, pictures of the damage).	DISPLAY SELECTION

Field	Contents	Type
Editing a designation	Assigning a meaningful name for the service case. **Note:** If the service case was triggered by the event "Fault processing requested (HMI/PC)", the first 40 characters of the fault description entered there are used as the designation of the service case. Otherwise, a name for the service case is automatically generated from the triggering event.	ACTION
Changing the status and technician	A user in your own organization can be assigned to the service case as a technician and the status of the service case can be changed. **Note:** Changes to technicians and status are stored jointly with the optional reason for the change in the change history of the service case.	ACTION
Technician	Addressee for providing support in the fault case	INPUT
Requested by	Name of the technician	INPUT / DISPLAY
Telephone number	For questions relating to clarifying the fault case, the person that made the original request can leave his telephone number as support in clarifying the case.	INPUT / DISPLAY
Performing a teleservice session	If the machine operator requested a teleservice session when initiating a service case, this session can then be opened. **Note:** The session ID is automatically transferred to the operator panel of the control from which the request for a teleservice session came. Manual entry at the panel is not necessary If the request form for the teleservice session on the operator panel of the control is no longer open (e.g. canceled by the machine operator), a teleservice session will have to be initiated.	ACTION

See also

Functions of a service session (Page 47)

4.2.5 Requesting fault processing

Description of the function

Function	Description
Requesting fault processing	The machine operator can enter and send a problem description on the operator panel to request help from the machine OEM or factory service unit.
Requesting a teleservice session	The machine operator can request a teleservice session on the operator panel of the control while requesting fault processing. Manual entry of the session ID on the operator panel of the control is then not necessary. The session ID can only be automatically transferred and teleservice session started by the service engineer, if the request form remains open until the teleservice session is up and running. If the request form for the teleservice session is closed on the operator panel beforehand (e.g. cancelled), the teleservice session will have to be set up manually. **Note:** This function is only available when fault processing is requested at the HMI.

Figure 4-7 Requesting fault processing at the HMI

Field	Contents	Type
Fault report	Entering a fault report: Pressing "OK" sends the fault report to the source organization of the machine.	INPUT
Requested by	Name of the technician	INPUT / DISPLAY
Telephone number	For questions relating to clarifying the fault case, the person that made the original request can leave his telephone number as support in clarifying the case.	INPUT / DISPLAY
Remote access	Requesting support via remote access	OPTION FIELD

See also

Functions of a service session (Page 47)

Statistics / export

5

Overview

The statistics and export function area provides ePS Network Services functions used to evaluate the information contained on the ePS Network Server or display task-specific summaries (e.g. for the system administration).

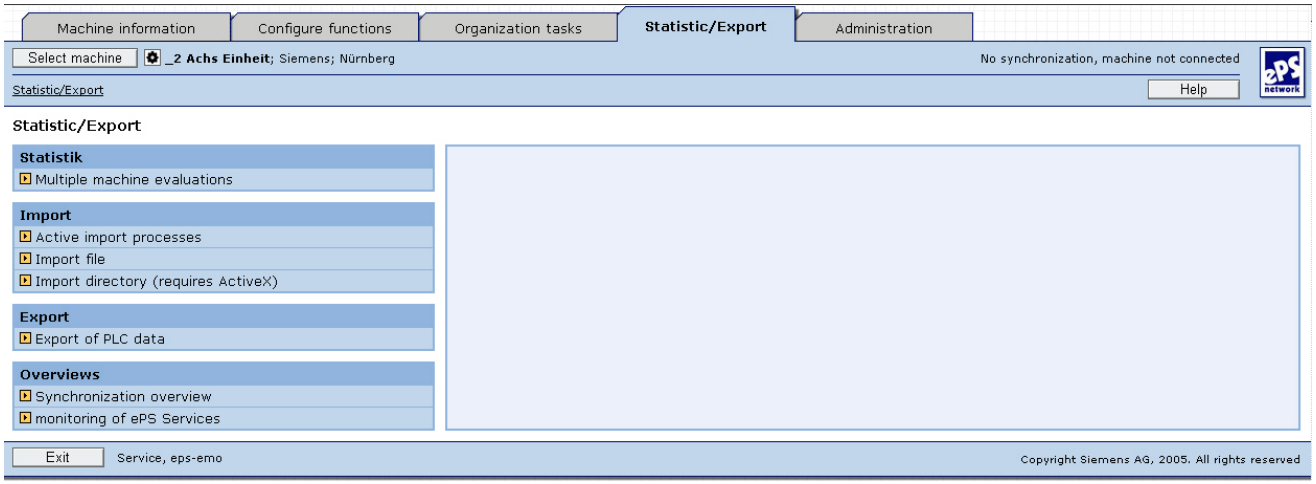


Figure 5-1 Overview of the functions

5.1 Statistics

5.1.1 Multiple-machine evaluation

Description of the function

On the basis of a measurement series of a machine to be examined, it is often not possible to decide whether the viewed machine is in good or bad condition. This applies in particular when only a few measurement data are available for the machine being investigated. By comparing the measurement data between machines of the same make, you might be able to assess even with few data sets whether a machine is in acceptable condition.

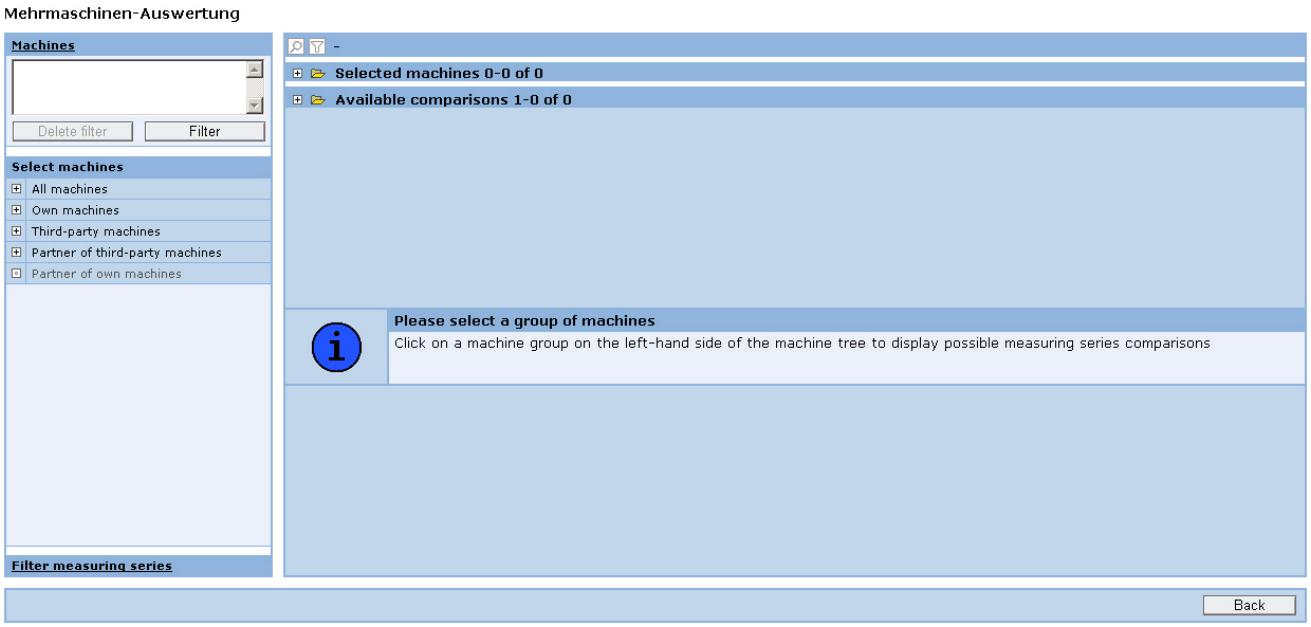


Figure 5-2 Initial status of the multiple machine evaluation

Selecting machines

The selection of the machines to be considered for the comparative inspection of measurement series is done via the machine tree. The technician selects a node in this tree, which will include all machines located below this node.

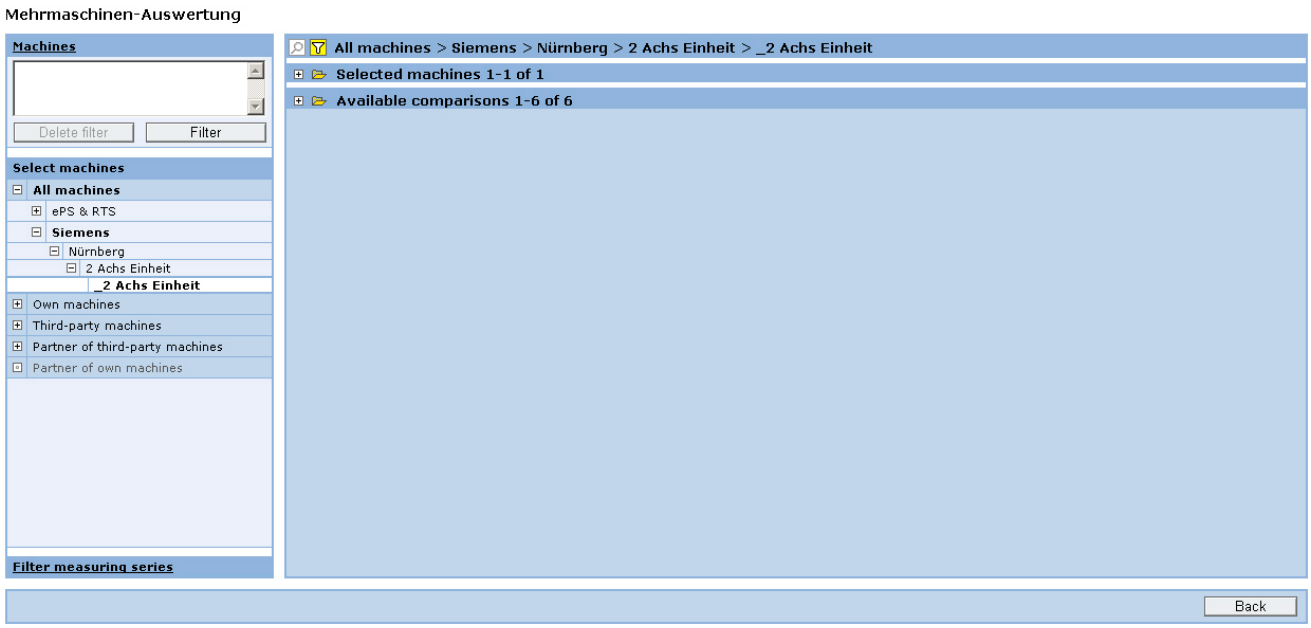


Figure 5-3 Selecting the machines via the machine tree

The number of machines selected via the machine tree can be limited through a filter. The filter entry box allows the entry of one or several texts. The filter has the effect that from all the machines selected via the machine tree, only those will be considered for the comparison, whose machine name contains one of the filter texts.

Selecting measurement series

After having selected the machines to be considered, the system will create an overview over the comparable measurement series.

This overview contains the following information:

- Type of measurement series
- Name of measured axis
- Values of the measurement series parameter relevant for the comparison
- Number of machines that have a comparable measurement series
- List of names of the measurement series (names of measurement series that have the same name for different machines will only be displayed once)

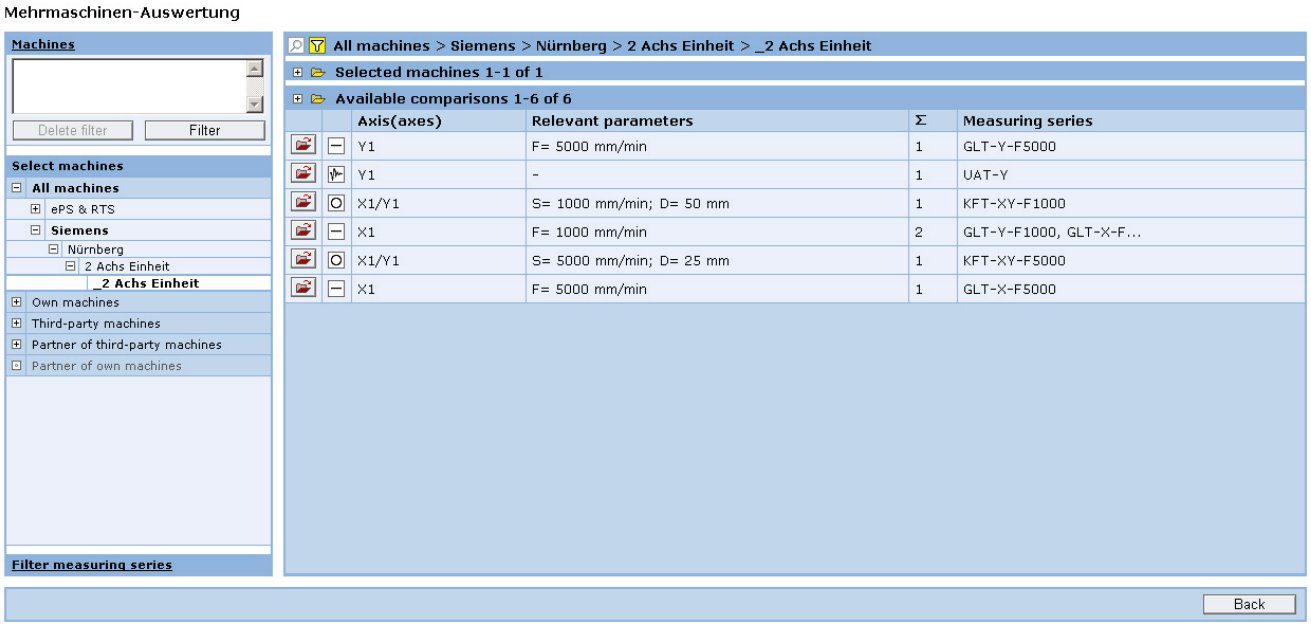


Figure 5-4 Overview of the measurement series groups

Interesting comparisons of measurement series are selected by clicking on the "Open" icon in the corresponding line.

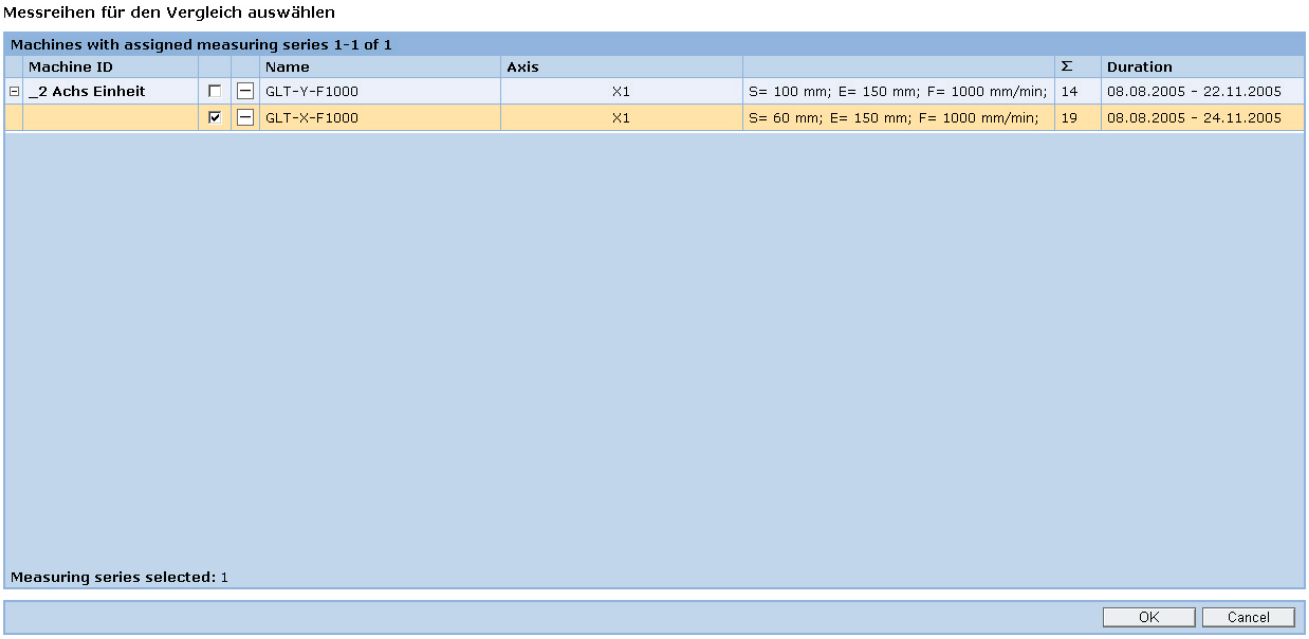


Figure 5-5 List of measurement series for the selected measurement series group

In an overview, the system shows all measurement series examined in one comparison grouped according to machines. In this overview, the selection of the measurement series to be examined in the comparison function can be changed. The system will make a preselection so that only one measurement series will be considered from each machine for displaying. The criteria for this preselection is the number of measurements contained in the measurement series. For each machine, the measurement series with the most measurements will be marked as selected. By selecting, this preselection can be overwritten at will.

5.1.2 Diagrams for measurement series

Description of the function

For displaying the measurement series in a diagram, the operator must select the required characteristic from the table. The system will then generate a diagram showing the progress in time of the selected characteristic value or each of the measurement series considered in the comparative display. There are various functions available for changing the diagram or displaying detailed information.

Function	Description
Machines	In the "Machines" table, all measurement series considered in the comparative function will be listed according to machines. Individual measurement series can be excluded from being displayed in the diagram or included again.
Characteristic quantities	The table shows the characteristic quantities that are calculated for the examined type of measurement series. For displaying in the diagram, a characteristic quantity must be selected.

Function	Description
Parameters	The pull-down "Parameter" table shows the parameters of the measurement being performed. Parameters that are not identical in all measurement series are marked. A detailed view of the parameters of each individual measurement series will be displayed by clicking on the "Open" icon in the table.
Constraints	The pull-down "Constraints" table shows the constraints of the measurement being performed. Constraints that are not identical in all measurement series are marked. A detailed view of the constraints of each individual measurement series are displayed by clicking on the "Open" icon in the table.
Time series	This function displays the progression over time of the selected characteristic quantities within the defined period.
Machine series	This function displays the selected characteristic quantity from the compared measurement series at a defined point in time. It is displayed as a bar chart. The ordinate at the left side indicates the relative deviation from the average value of the characteristics quantity values being investigated. The right ordinate indicates the absolute value.
Time period	The time period to be examined as a time series in the display can be set. You can select certain defined time periods or a time period limited by two markings in the displayed diagram.
Markings	In the display as time series, two markings can be set by double-clicking. These markings indicate the individual characteristic values at this point in time and serve to define a time period or a point in time.
Defining a point in time	In the display as machine series, the reference point can be defined. You can enter the point in time explicitly or use one of the two markings.

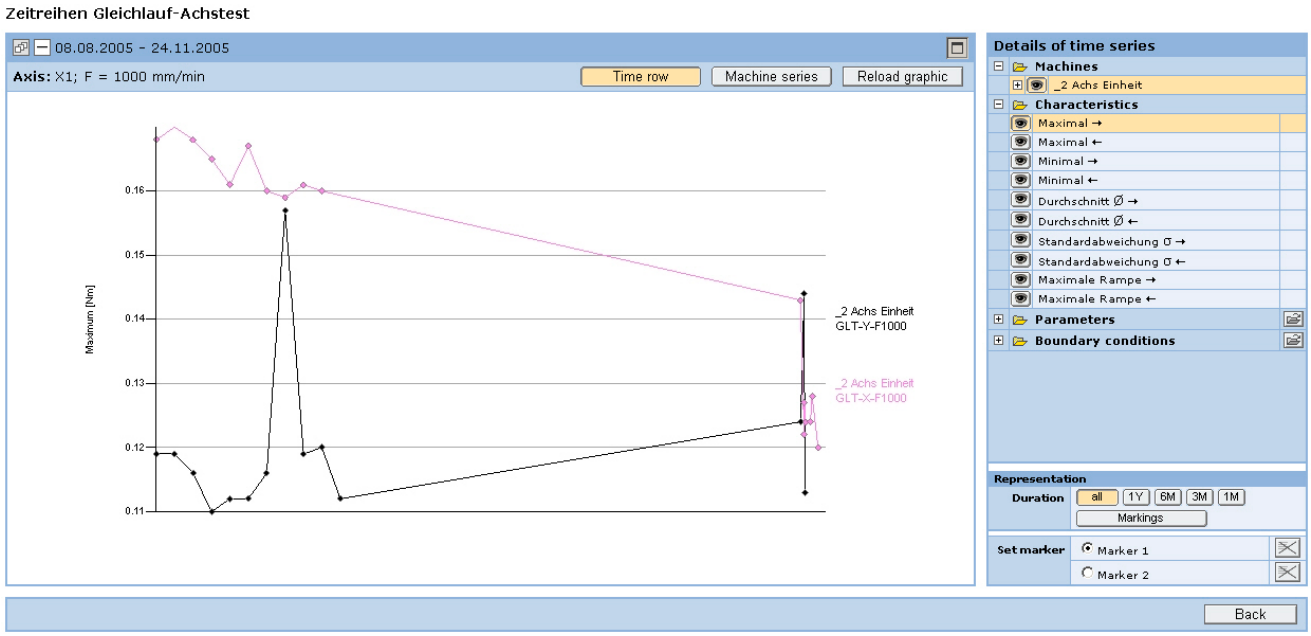


Figure 5-6 Displaying the measurement series as time series

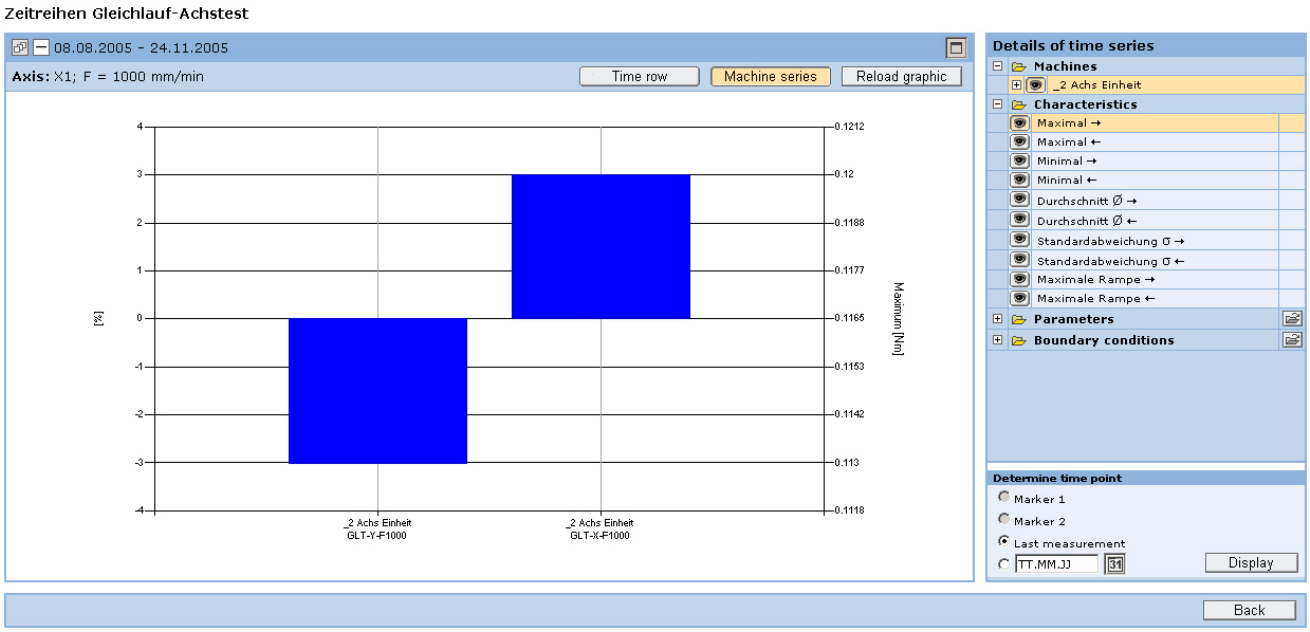


Figure 5-7 Displaying the measurement series as machine series

5.2 Import

Description of the function

In the Import area, data which results from the "Robust operation" can be transferred to ePS. "Robust operation" allows data that results from a trigger event to be temporarily saved on the local hard disk of the controller when the Internet connection is faulted or temporarily not available. Data is temporarily saved, for example, when there is no Internet connection to the ePS server due to network problems or when the Internet connection has been deliberately deactivated for a long period of time.

Locally acquired data can be transferred to the ePS server as follows:

When the Internet connection is active again, the data is automatically transferred to the ePS server.

The user can copy the data to a network drive via a local "Backup" function. The backup application is called using the "Backup" softkey.

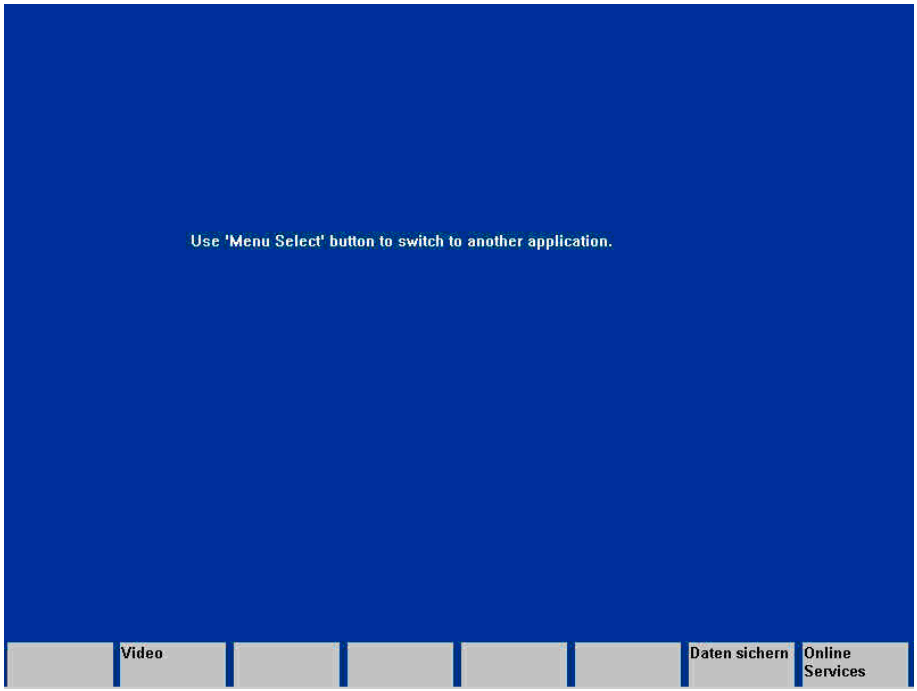


Figure 5-8 Local selection menu

Local backup application

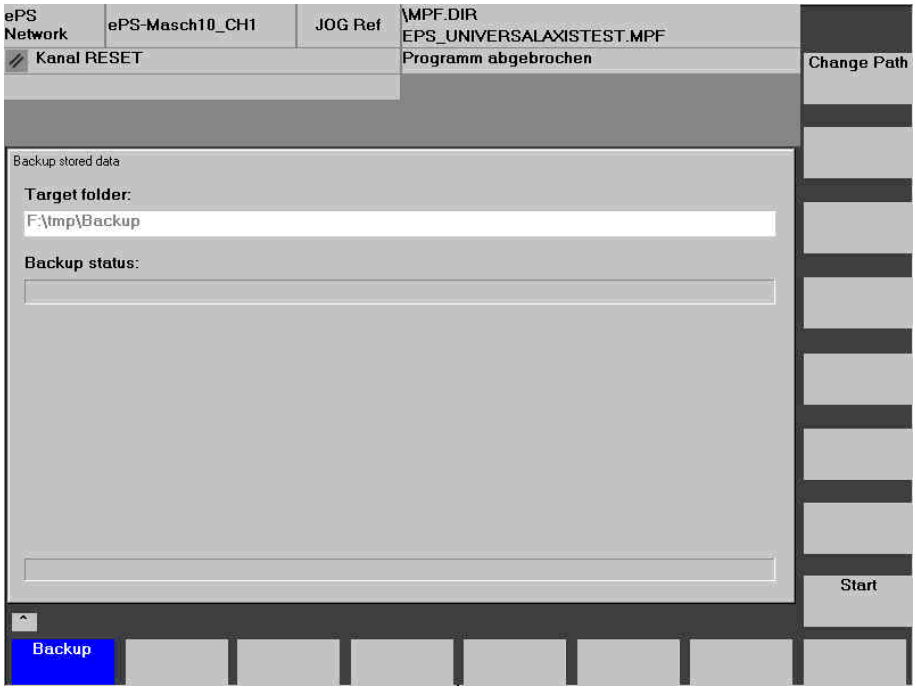


Figure 5-9 Backup application

Function	Description
Change path	The user can select the target directory.
Start	The user can start the backup operation.

5.2.1 Importing a file

Description of the function

The Import file function enables data files – resulting from "Robust operation" – to be individually transferred to the ePS server. This data must first have been transferred to an external data medium (PC, notebook, PG, etc.) using the "Data backup" function. You can also change the suggested e-mail address if you want to receive notification after import.

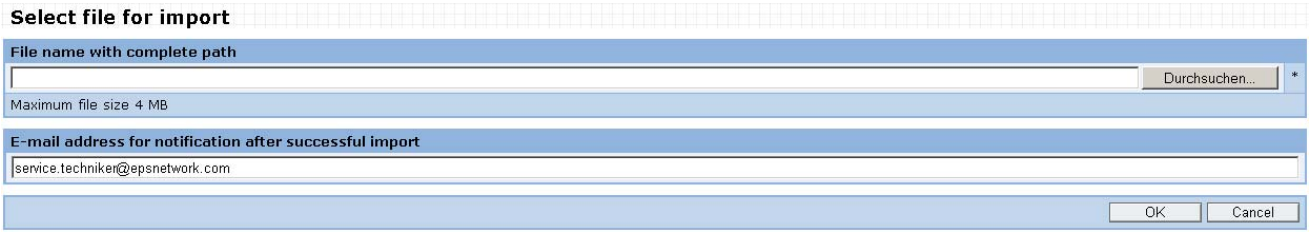


Figure 5-10 Importing a file

Note

Before importing data files from "Robust operation", you should activate the notification limit to avoid excessive generation of messages. This is only necessary if you have used notifications within the control monitor function.

See also

Setting the notification limitation (Page 94)

5.2.2 Importing a directory

Description of the function

The import directory function enables transfer of data resulting from robust operation to the ePS server, even from several different machines.

This data must first have been transferred to an external data medium (PC, notebook, PG, etc.) using the "Data backup" function available on the HMI.

All of the data must be saved in one directory. You can also change the suggested e-mail address if you want to receive notification after import.

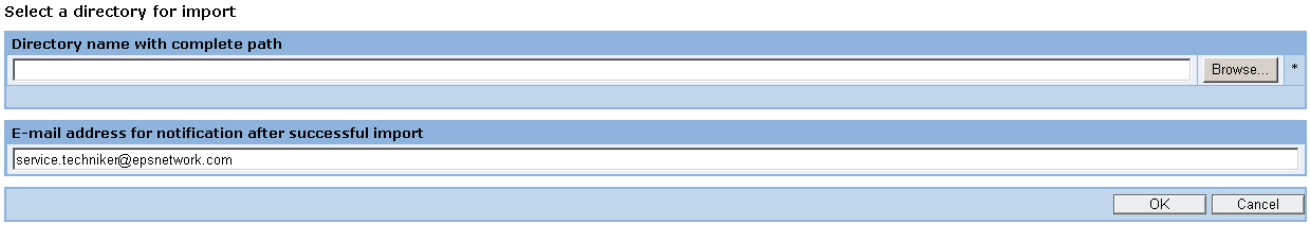


Figure 5-11 Importing a directory

5.2.3 Active import operations

Description of the function

Here you can view all file or directory import operations that have not been completed.

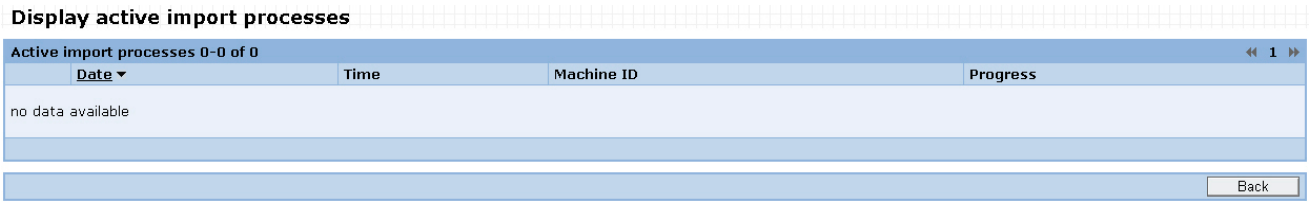


Figure 5-12 Active import operations

5.3 Export

Overview

In the export area, data that was downloaded from the machine to the ePS Network Server can be exported to external systems (e.g. local PC). This data is then available for further processing.

Description of the function

The export of PLC data blocks function can be used to export the uploaded contents of the PLC data blocks of a machine from the ePS Network Server to a file. The data that can be exported is available in binary format and can also be subsequently deleted from the ePS Network Server.

Figure 5-13 Exporting PLC data blocks

5.4 Status overviews

Overview

Overviews provide an overview of the status of all or some of the machines. This overview helps in making a decision, for example, on which machine should be synchronized although it did not have any scheduled contact with the ePS Network server.

5.4.1 Synchronizing the active machines

Description of the function

The synchronization overview function can be used to display a summary of the synchronization data for one's own and external machines. The synchronization overview can also be used to show the activated and deactivated machines in a single display.

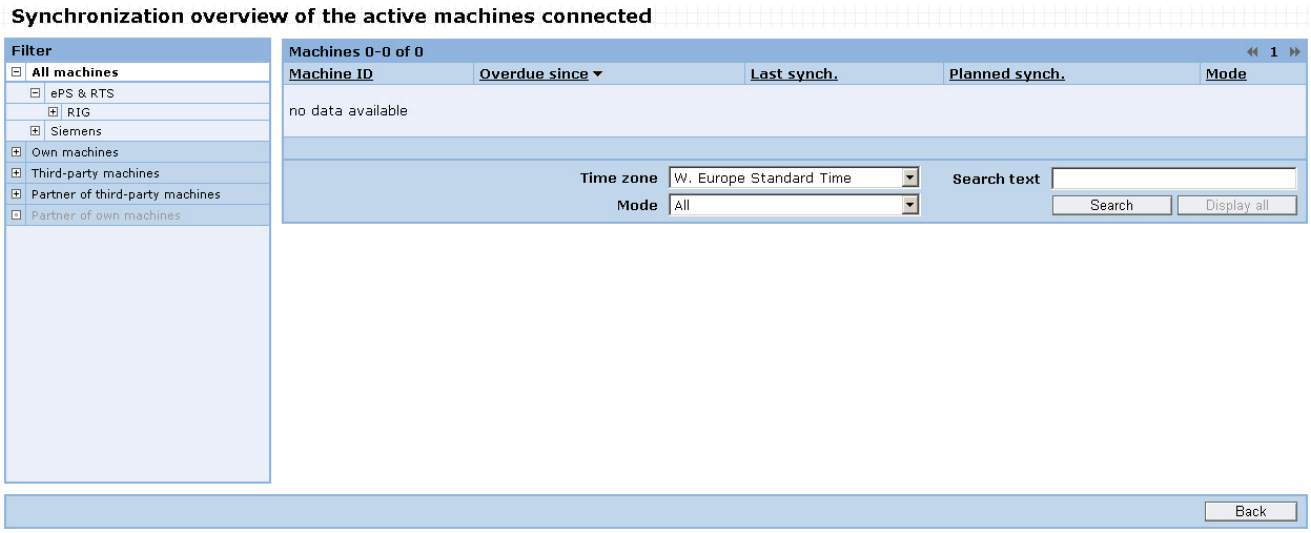


Figure 5-14 Synchronization overview

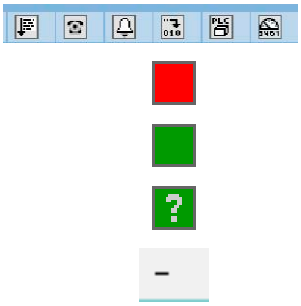
5.4.2 Monitoring ePS services

Description of the function

The monitoring function of the ePS services enables you to see how well the ePS services are functioning on the machine at a glance.

Malfunctions in the basic services or individual services such as alarm notification, alarm monitor, PLC monitor etc. are displayed and the appropriate countermeasures can be taken.

Meaning of the list output

Field		Contents	Type
	Machine ID	Machine	DISPLAY
	Condition monitoring	• **Red:** The machine did not register itself at the specified interval. • **Green:** The machine registered itself at the specified interval.	DISPLAY
	Interval	Value of the set machine time interval for condition monitoring	DISPLAY
	Last signal on	Date and time of the last signal of the condition monitoring	DISPLAY
		Details of ePS services: • ePS service not functioning at the time of reporting • ePS service functioning at the time of reporting • No information at the current time of reporting • This service is not available or no longer available, or not configured on this machine.	DISPLAY
	Basic service	Information on the "Basic services": Basic services are necessary ePS services without which other service such as alarm notification or monitors can function.	DISPLAY
	Alarm notification	Information on the "Alarm notification" service	DISPLAY
	Alarm monitor	Information on the "Alarm monitor" service	DISPLAY
	PLC monitor	Information on the "PLC monitor" service	DISPLAY
	Uploading a PLC data block	Information on the "Upload PLC data" service	DISPLAY
	Load monitor	Information on the "Load monitor" service	DISPLAY

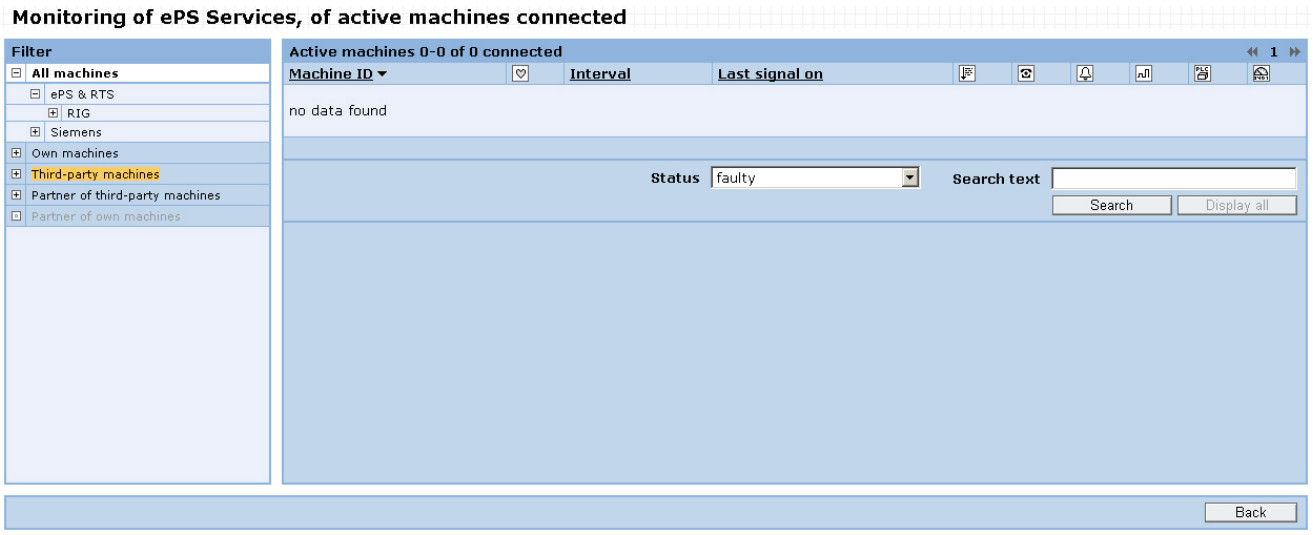


Figure 5-15 Monitoring ePS services

Field	Contents	Type
Status of the services	Selecting the desired status information: The default setting is "Any fault" Other selection fields are: • Condition monitoring fault • Functional fault • All states	SELECTION
Free search text	Search field for a more detailed specification of the "Status of the services" selection.	SELECTION

Management

6

6.1 Organization management

Description of the function

Before the ePS Network Services can be used by the machine operators, service engineers, and commissioning engineers, you as administrator must set-up

- Users
- Their roles
- Machines

If you want to work together with other organizations on machines, you must set up the machines for use in cooperation areas.

A machine can only by released by the administrator of the source organization. The target organization cannot make a further release. This means that the source organization always retains the control over which other organization can access its data and settings.

Users in the target organization have almost the same rights to access the released external machine as they would for a machine within their own organization.

6.1.1 Organizational data

Overview

As administrator you can view the saved organizational data.

Here you define the following:

- The release password, which another organization can use to release the machine to be accessed by you
- The teleservice session type, which defines the functions within a session

This is also where you select the server software version and modify it centrally for the entire organization.

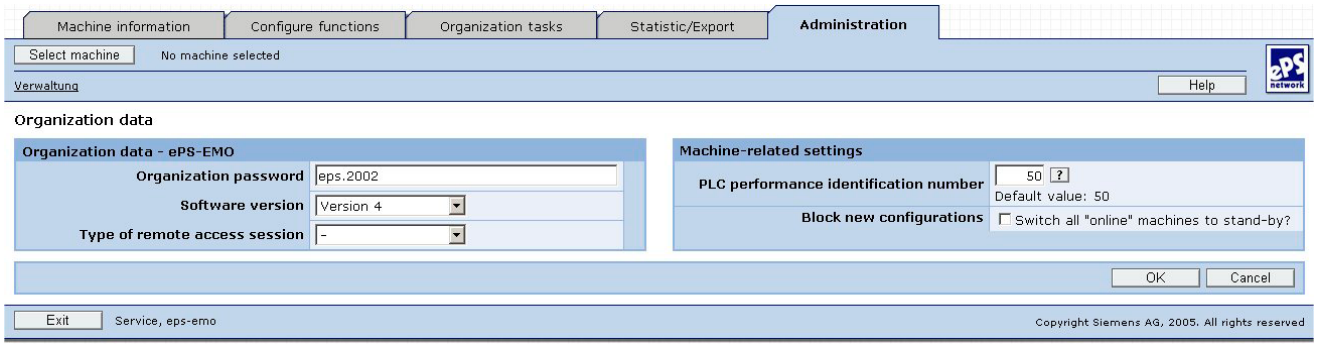


Figure 6-1 Editing organizational data

Teleservice session type

By selecting a session type, you as administrator can define the functions that can be used in teleservice session for the entire organization.

To find out which functions are permitted in each session type, see the description in /R3/.

PLC performance index

The PLC performance index allows you to define how much performance may be used for the ePS PLC trigger. Each ePS PLC trigger uses a certain number of performance points. In this way you can control to what extent the PLC may be occupied by the ePS PLC trigger. The PLC performance index has to be defined individually by the machine manufacturer.

Inhibiting the new configuration

This function serves to only release new ePS server versions for all machines after they have been tested on single machines. For this purpose, this function allows you to switch all machines with the synchronization mode "ONLINE" to "STANDBY" in order to temporarily prevent any changes to the ePS client scripts by new ePS server versions.

Notice

"STANDBY" has the effect that the machine will continue to regularly synchronize and check whether there is an online request. ePS client jobs will neither be started nor completed – and the job machine will also not be started as a result of modified scripts.

When the machine restarts, it will always retrieve the new boot script from the server independent of these settings. After this, the new scripts will also be started.

6.1.2 Addresses

Description of the function

The recipient addresses for SMS and e-mail notification are kept in the address book. This means that when you generate messages you can easily access already existing recipients or add new recipients. Changes to an address apply to all of the notifications defined for this recipient and are therefore always up to date.

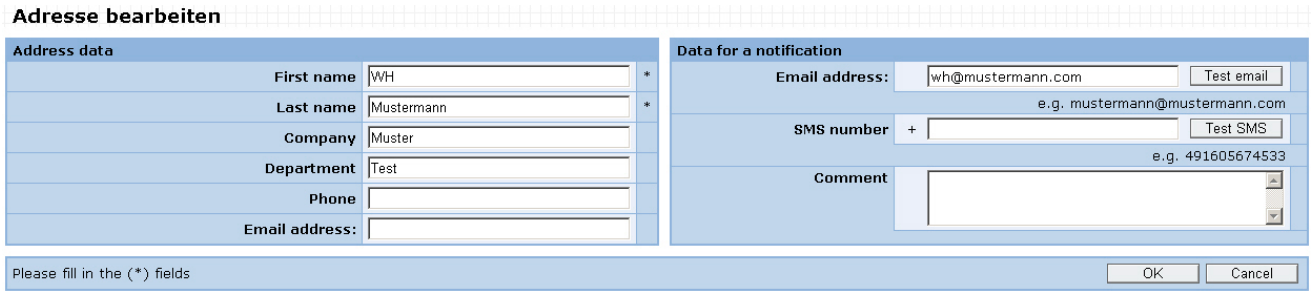


Figure 6-2 Adding an address to the address book

Field	Contents	Type
First name	First name of the notification recipient	INPUT
Last name	Last name of the notification recipient	INPUT
Company	Company of the notification recipient	INPUT
Department	Department of notification recipient	INPUT
Phone	Phone number of the notification recipient (for information only)	INPUT
E-mail address	E-mail address of the notification recipient (for information only)	INPUT
E-mail address	E-mail address of the notification recipient	INPUT
SMS number	SMS number of the notification recipient	INPUT
Comment	Comment on an address	INPUT
Test e-mail	The test e-mail function is used to check that the e-mail address is correct. Please check with the e-mail recipient that this test e-mail arrived at the correct recipient after it was sent.	ACTION
Test SMS	The test SMS function is to check that the SMS number is correct. Please check with the SMS recipient that this test SMS arrived at the correct recipient after it was sent.	ACTION

6.1.3 Users

Description of the function

The user manager offers the following possibilities:

- Creating users
- Changing the user name
- Assigning new passwords

You can also assign one of the following roles to a user:

- Administrator
- Commissioning engineer
- Service engineer
- Machine operator

This assignment only gives users the predefined program options for the specific user roles.

The user with the user name "Administrator" is not displayed in the user lists and so cannot be deleted. This ensures that the user "Administrator" of an organization is always able to perform machine and user administration, even when all other administrators of the organization have been inadvertently deleted.

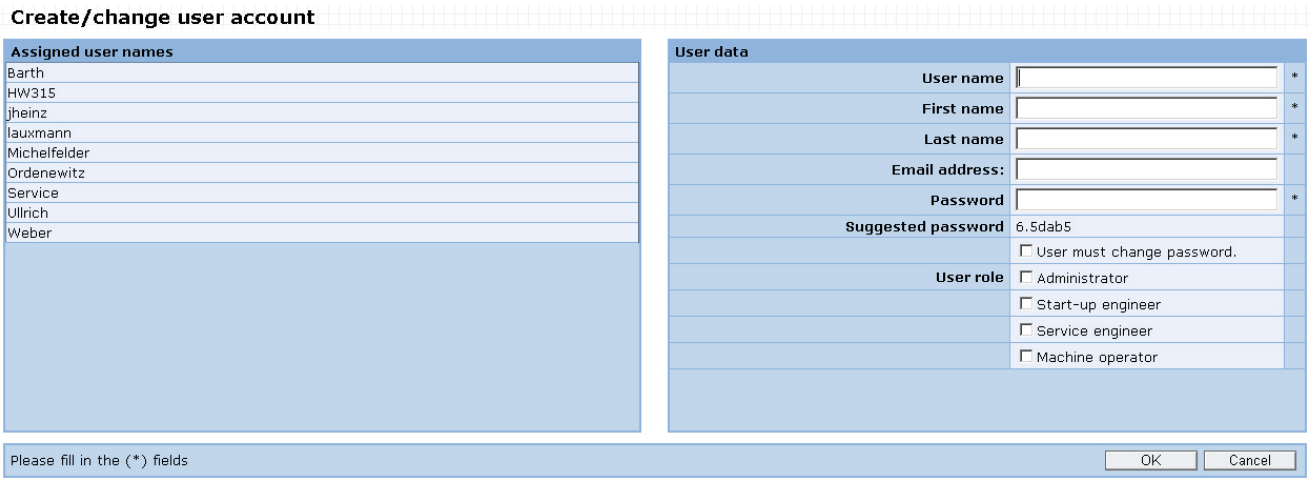


Figure 6-3 Creating/editing a user

Field	Contents	Type
User name	Login name for the ePS Network Services: The "user name" must be unique within the organization.	INPUT
E-mail	E-mail address of the user: It is used for information and can be used to transmit the user data.	INPUT
Password	The user's password: You can enter the suggested password or define your own password for the user. Please observe the criteria for a valid password.	INPUT

Field	Contents	Type
The user must change the password	You can specify whether the user must change the password when logging on for the first time.	SELECTION
User role	You can assign one or more roles to each user.	SELECTION

Notice

You can use the "Add user" function to specify a new password or use the suggested password. You can also force the user to change the assigned password after logging on. For security reasons, we recommend that you activate this option for assigning passwords.

For security reasons, the password to the ePS Network Services should be changed regularly. We recommend that you change the password in accordance with your company's guidelines. If this is not envisaged, we recommend that you change the password every four weeks at the latest.

See also

Functions of the various roles (matrix of authorizations) (Page 163)

6.1.4 Machines

Description of the function

Before the ePS Network Services can be used on a machine, the machine must be appropriately set-up.

Here, you have the following possibilities:

- Save and edit the machine name and other information about the machine
- Deactivate, activate or delete the machines.
- Release a machine for use by another organization (cooperation area), revoke a previously granted release, and reject an external machine released to your organization.
- Select the server software version of the machine.
- Define whether it is always necessary to have authorization to use particular functions on this machine during a teleservice session.
- Duplicate ("clone") a machine with your settings.

Function	Description
Creating your own machine	Creating a new machine in the user’s organization
Deleting a machine	Permanently deleting a machine. Machine data is no longer available.

Activating/deactivating a machine	Activating a machine to use ePS Network Services: Deactivated machines cannot use ePS Network Services.
Activating/deactivating a machine	Activating a machine to use ePS Network Services: Deactivated machines cannot use ePS Network Services.
Cloning a machine	Creating a new machine with same settings as an existing machine.

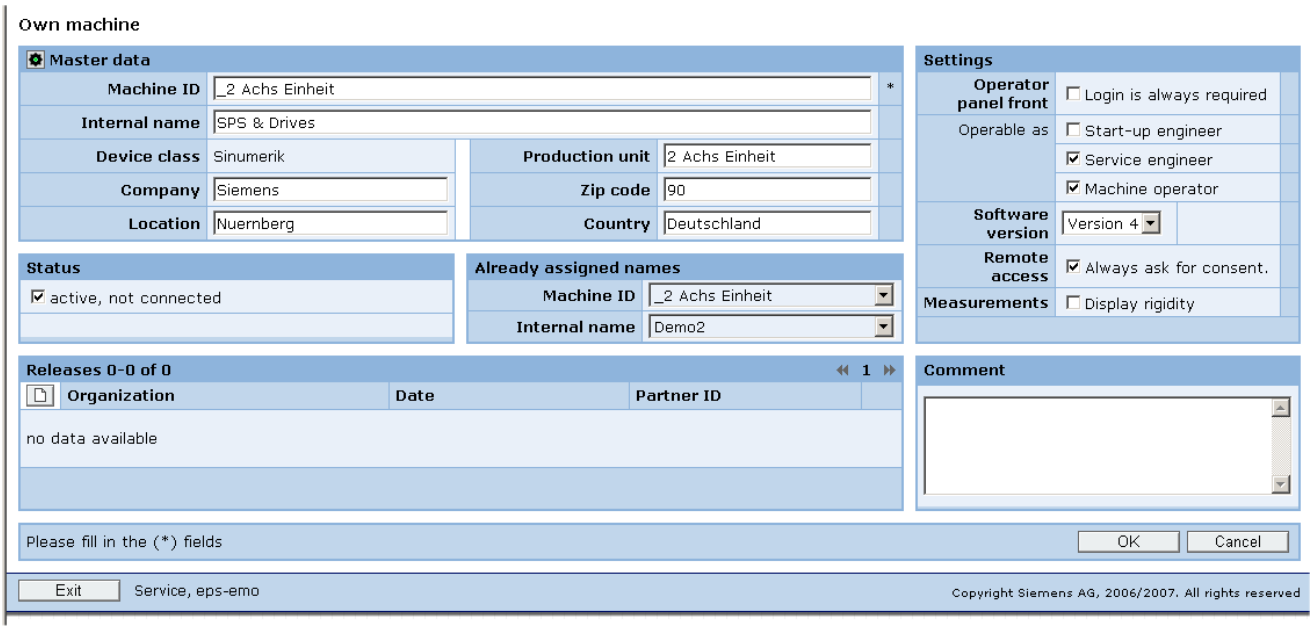


Figure 6-4 Editing the master data of the machine

Master data

Field	Contents	Type
Machine ID	Designation of the machine within the organization of the user: This machine name must be unique within an organization. Excluded are special characters such as § $; **Note:** If the machine is released to another organization, the partners will see this designation in the "Partner ID" field, if they selected the view "Partners of external machines" in the machine tree.	INPUT
Internal name	Freely selectable, additional designation of the machine can be the name at the final user (inventory number) or type designation.	INPUT
Device class	The device class defines which ePS Network Services can always be used on a particular machine. Various functions cannot be used depending on the device class **Notice:** Device classes can no longer be changed once the machine has been "connected".	SELECTION
Company	Name of the final user: Machines can be selected in the machine tree according to final users.	INPUT

Field	Contents	Type
Location	Location of the machine: Machines can be selected in the machine tree according to their location.	INPUT
Production unit	Specification of the production unit to which the machine belongs: Machines can be selected in the machine tree according to their production unit.	INPUT
Zip code	Entering the zip code of the location	INPUT
Country	Entering the country (location) of the machine	INPUT

Status

Field	Contents	Type
Status	Activating/deactivating the machine to use the ePS Network Services: Displaying the connection status of the machine.	SELECTION / DISPLAY

Already assigned designations

Field	Contents	Type
Already assigned designations	Displaying machine designations already available in the organization of the user.	DISPLAY

Releases

Field	Contents	Type
Deleting / modifying a release	Withdrawing the release of a machine to another organization or modifying the release rights.	ACTION
Adding a release	Releasing a machine for another organization when you want its users also to be able to access the machine. The release makes this machine visible in the target organization. Access to your other machines is not possible from the target organization.	ACTION
	Note: You can limit the maximum possible rights of the user of the target organization for this machine to the rights of commissioning engineers, service engineers, or machine operators.	

Settings

Field	Contents	Type
Operator panel front		
Login always required	Here you can specify whether a user always has to log in manually or whether the user can log into the machine automatically as one of the following roles (without having to enter user name, password and organization manually).	SELECTION
Can be operated as	Here you can specify with which role an "automatic" login should be made.	SELECTION
Software version	Adapting the server software version of the machine **Notice:** Only upgrades to a higher software version are possible. The upgrade is performed the next time the machine is booted after the change. After that it is no longer possible to undo the change!	SELECTION
Remote access		
Always request approval	Here you can define whether a user on the machine has to approve remote access by a service engineer.	SELECTION
Measurements		
Display rigidity	Here you can define whether the rigidity is also to be displayed for a measurement.	SELECTION

You can release a machine for several different organizations. The users of the target organization only see their own release but not that of other organizations. For the release, the master data of the external machine in the target organization is pre-assigned with the currently valid machine information (OEM machine name, location, etc.). This pre-assignment is not necessary if the machine has already been released to the same organization in the past.

If the organization to which you want to release a machine does not appear in the list of known organizations ("release to"), you must request the organization designation and the release password from your partner organization.

See also

Information of client diagnostics (Page 154)

Cooperation areas (Page 149)

6.1.5 Download areas

Description of the function

ePS Network Services allows you to access new download areas for the usage statistics and security patches for Microsoft Windows NT.

The download areas can only be accessed by the user named "Administrator" (use statistics) or users assigned the administrator role (security patches for Microsoft Windows NT) and can be reached via the "Management" tab under the " Download Areas" menu item of the "Management of Organization" menu group.

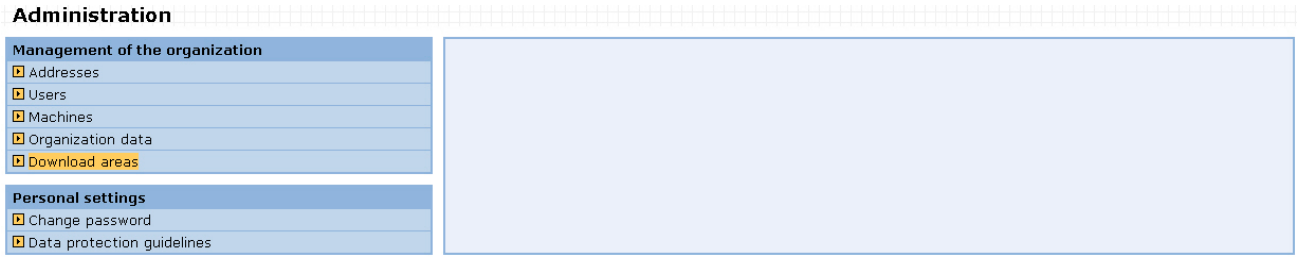


Figure 6-5 Download areas

Three tabs are available in the download area:

- Evaluations
- Security patches
- Services

You can return to ePS Network Services using the "Services" tab.

Download areas → Evaluations

Under the "Evaluations" tab, you can modify the display of the activated usage statistics according to criteria such as filtering the number of and time period for reports and the sequence in which reports are displayed.

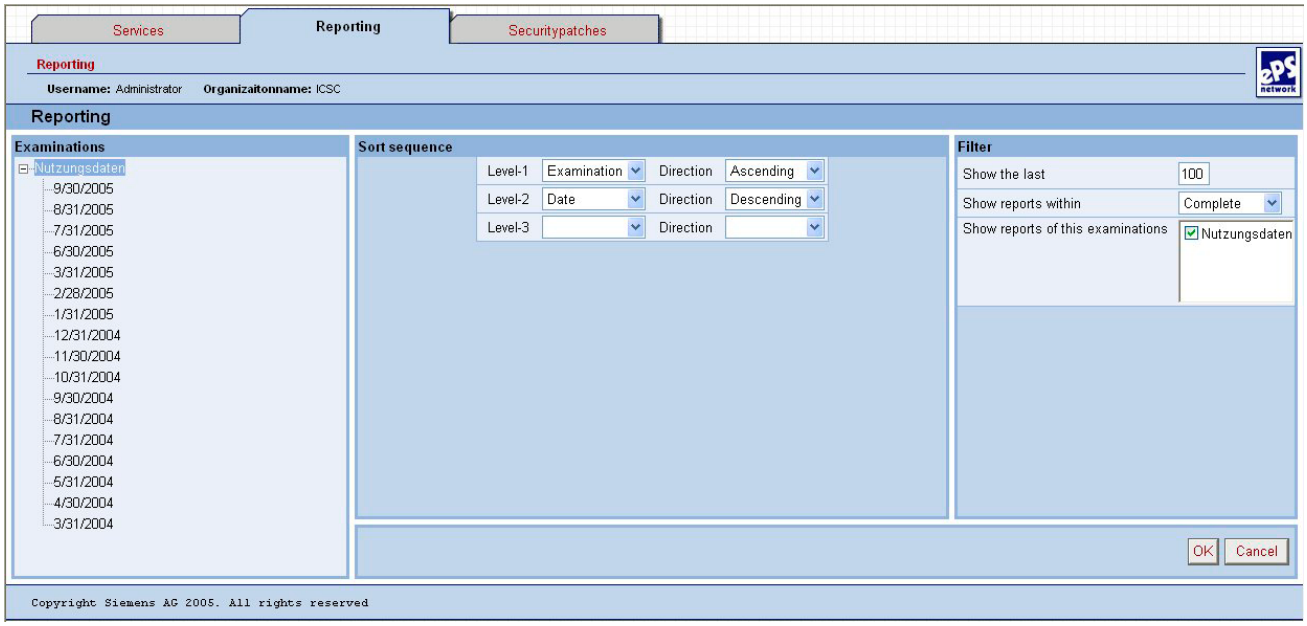


Figure 6-6 Evaluations

Download areas → Security patches

Under the "Security patches" tab, you can download the security patches provided for Microsoft Windows NT after agreeing to the terms of use.

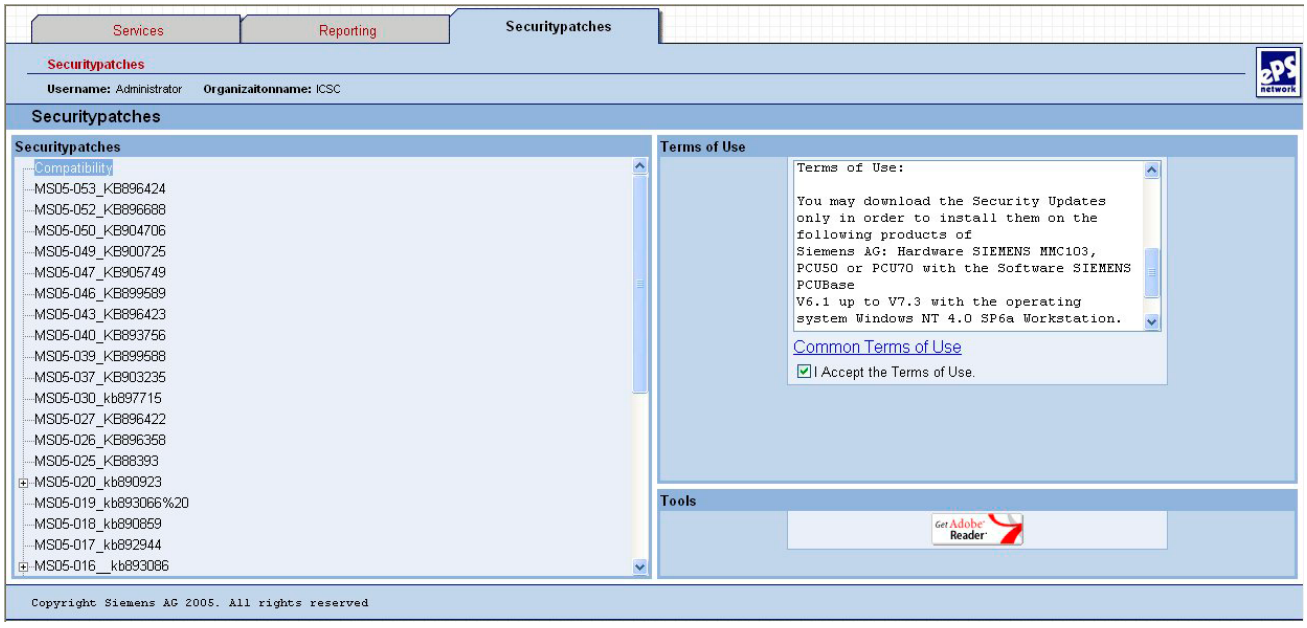


Figure 6-7 Security patches – Terms of use

6.2 Data protection guidelines and password

Changing the password

Every user can change his or her own password according to the specified guidelines using the "Change password" function.

Data protection guidelines

Each user must acknowledge the valid data protection guidelines using the "Data protection guidelines" function before using the system.

The user confirms that he or she will only enter personal data in the system after having first obtained the consent of the person concerned and will comply with the valid data protection guidelines. For more details, please read the document that the function itself provides.

Agreement to the data protection guidelines can be revoked at any time.

Note

A user cannot access the ePS Network Services without first agreeing to the current data protection guidelines.

6.3 Administrating a machine

6.3.1 Administrating a machine at the HMI

Description of the function

Before the ePS Network Services can be used on a control, a machine manufacturer administrator must first create the machine on the ePS Network Server.

It is then necessary to register the machine. The machine is then given an identifier by the ePS Network Server that identifies it uniquely. The alarm model can then be uploaded.

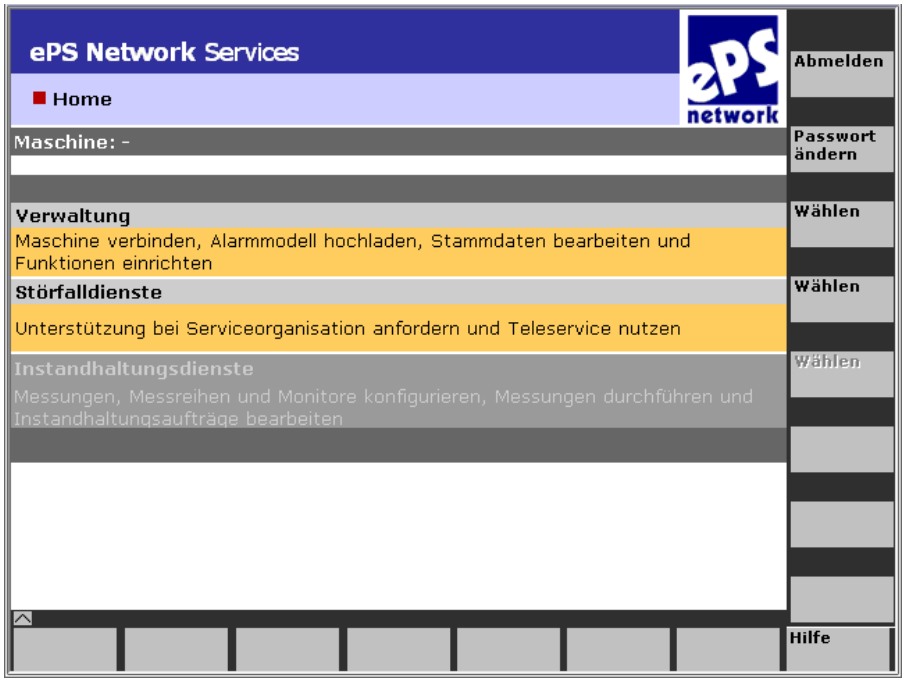


Figure 6-8 Administration at the HMI

6.3.2 Uploading the alarm model at the machine

Description of the function

Before a machine can use the ePS Network Services, this machine must be connected with the ePS Network Server. The machine is then given an identifier that identifies it uniquely.

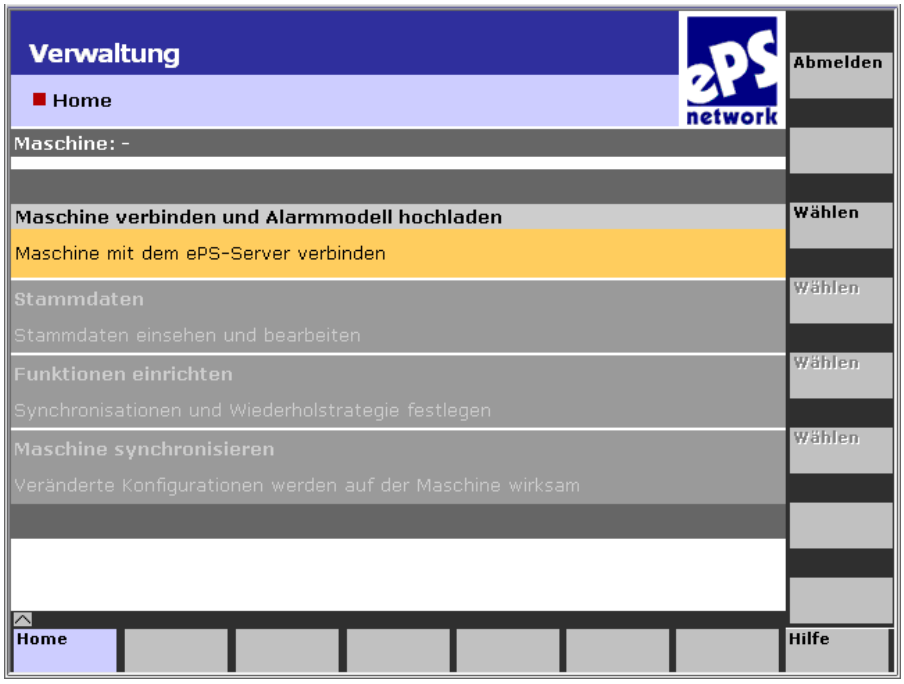


Figure 6-9 Connecting a machine to the HMI

Figure 6-10 Connecting a machine

Field	Contents	Type
Connecting	Registering a machine with the ePS Network Server that up until now was not connected. This machine is known only after it has been registered; it can then use the ePS Network Services.	ACTION
Uploading an alarm model	Making language-specific alarm text available on the ePS Server. This allows alarm messages to be displayed in the currently set browser language.	ACTION
Disconnecting	A "connected" machine is disconnected from the database machine and can then no longer be used for ePS services.	ACTION

6.3.3 Connecting a machine

Description of the function

Figure 6-11 Connecting a machine – selecting a machine

Field	Contents	Type
Selecting a machine using the machine ID	Selecting a machine for registration directly using its machine ID	ACTION
Selecting a machine from a list	Selecting a machine from a list of all non-connected machines of your own organization	ACTION
Selecting a machine according to customer	Selecting a machine according to the machines of a customer	ACTION

Displaying the selected machine for checking

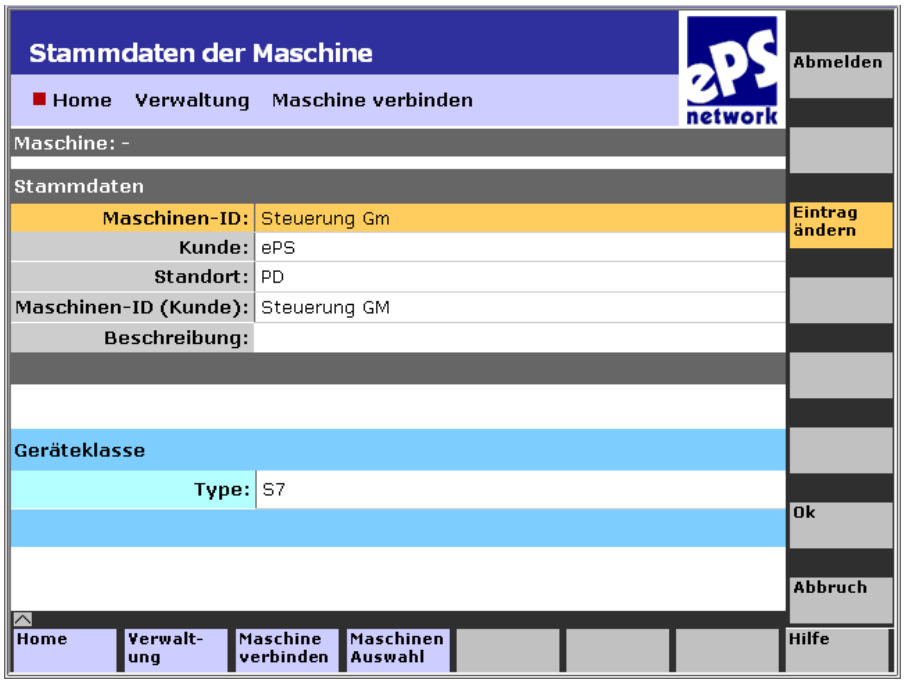


Figure 6-12 Displaying for checking

Field	Contents	Type
Changing an entry	Changing the master data of the selected machine	ACTION
OK	Registering a machine	ACTION

6.3.4 Disconnecting a machine at the HMI

Description of the function

Figure 6-13 Disconnecting a machine at the HMI

Field	Contents	Type
Disconnecting	A machine is disconnected from a database.	ACTION

Confirming disconnection

Figure 6-14 Confirming disconnection at the HMI

Procedure: Machine is being disconnected …

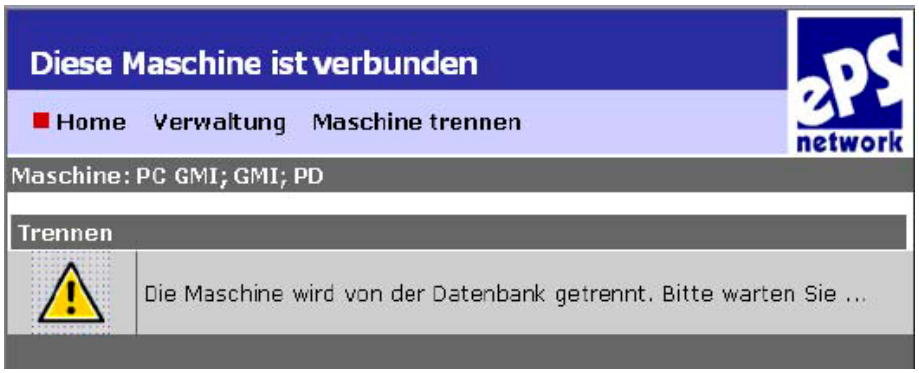


Figure 6-15 Note when disconnecting

After disconnection, all the information regarding the database have been removed from the local hard disk of the PCU.

6.3.5 Disconnecting a machine at the PC

Description of the function

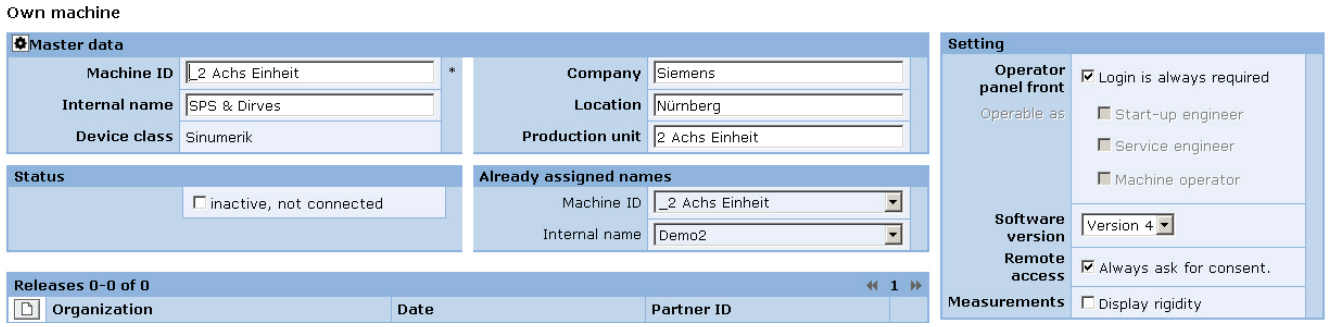


Figure 6-16 Disconnecting a machine at the PC

Field	Contents	Type
Disconnecting	A machine is disconnected from a database.	ACTION
Status		ACTION

Confirming disconnection

Figure 6-17 Confirming disconnection at the PC

Field	Contents	Type
Disconnecting machines	A machine is disconnected from a connected database machine	ACTION
Cancel	The disconnection operation is canceled	ACTION

Message on the HMI after disconnecting on the server side

As soon as a machine operator contacts ePS Network Services with a machine that has been disconnected from the database by the server, a message is displayed informing the user that this machine has been disconnected on the server side. All actions of the ePS client are canceled and disconnection is started by the client.

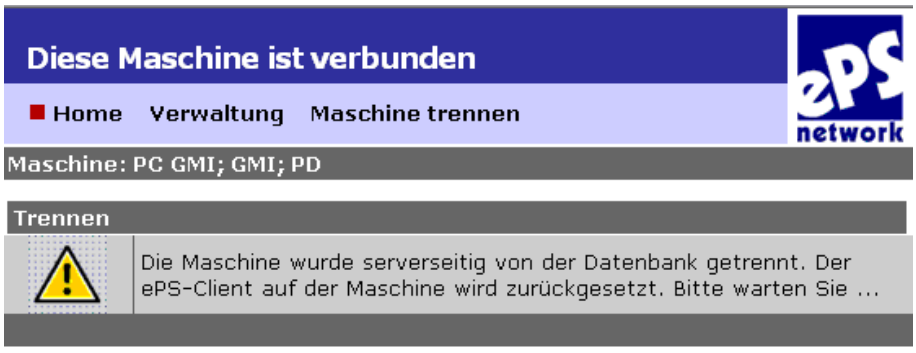


Figure 6-18 Message on the HMI

6.3.6 Synchronizing the control

Description of the function

Synchronization takes over and activates the defined configurations, such as alarm notifications and trigger events, from the ePS Network Server to the control.

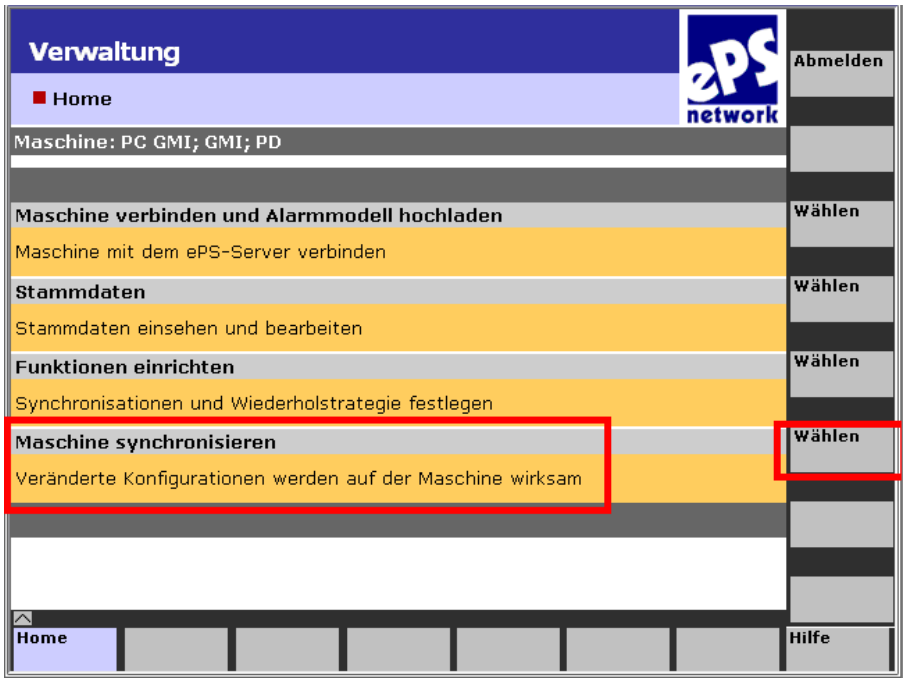


Figure 6-19 Synchronizing at the HMI

Field	Contents	Type
Synchronizing a machine	The machine is directly synchronized, irrespective of any scheduled synchronization	ACTION

Synchronization is in progress

Figure 6-20 Synchronizing is in progress at the HMI

Confirming synchronization

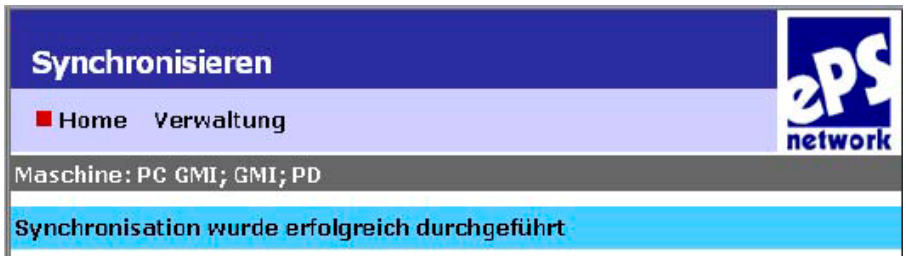


Figure 6-21 Synchronization has been successfully completed

6.3.7 Repeat strategy

Description of the function

The repeat strategy allows you to define how the ePS client will respond if communication via the Internet or the ePS Network Server fails. You can activate and deactivate the repeat strategy and define when the repeat strategy will be started.

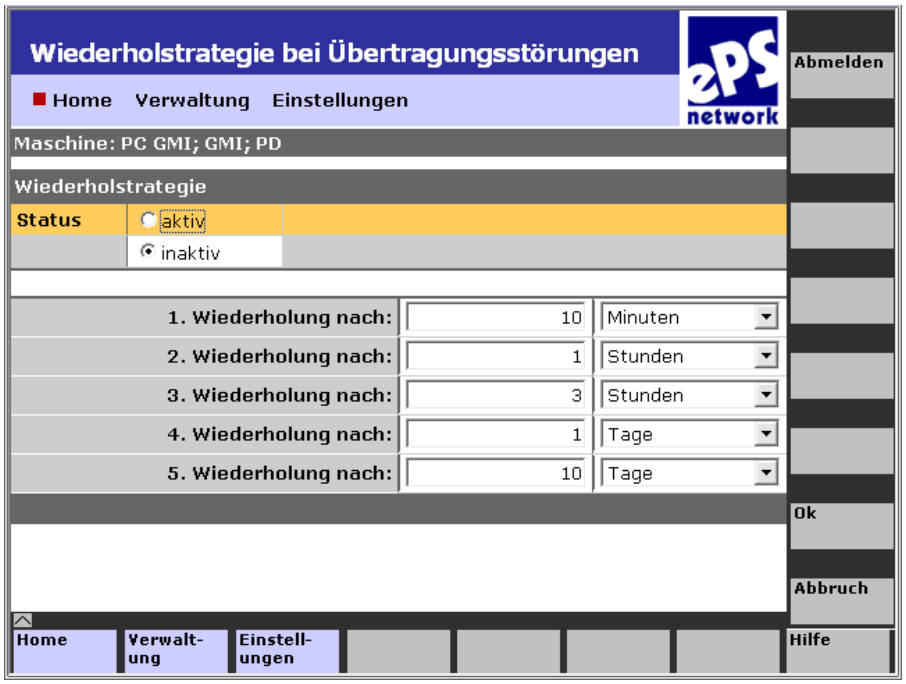


Figure 6-22 Configuring the repeat strategy at the HMI

Field	Contents	Type
• Active • Inactive	Changing the status of the repeat strategy	ACTION

Field	Contents	Type
Repeating 1. - 5.	Time until an attempt is again made to connected to the Internet.	INPUT

6.3.8 Editing the prolog and epilog program

Editing the prolog and epilog program

The prolog and epilog program is reloaded into the control with name "N_EPS_PROLOGEPILOG_SPF" every time a test is performed. The program editor at the operator panel can be used to adapt this program.

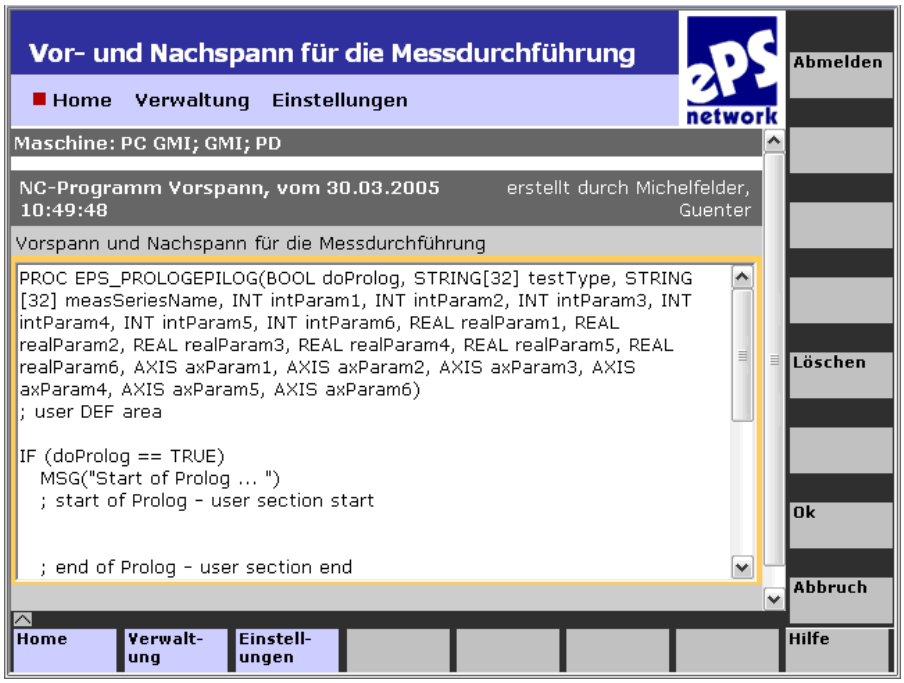


Figure 6-23 Example of a prolog and epilog program

Field	Contents	Type
DELETE		ACTION
OK		ACTION
CANCEL		ACTION

References

7

7.1 Cooperation areas

Description of the function

The owner organization can use the "cooperation area" function to make one of its machines in the ePS Network Services accessible to other organizations. This allows experts from different organizations to cooperate efficiently when performing troubleshooting on a machine.

Each person involved can access the released machine as if it were within their own organization. This applies with just a few exceptions: Also refer to the functions of the various roles.

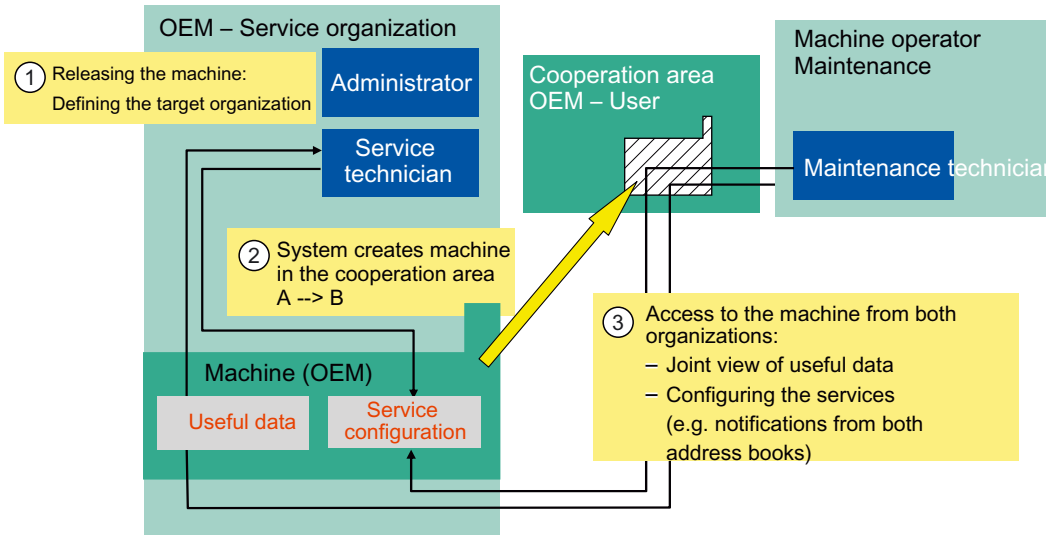


Figure 7-1 How the cooperation area functions

"Cooperation area between machine OEM and end user"; the machine tool is located on the end user's premises but is managed by the OEM (e.g. during the warranty period).

This function therefore permits cooperation between companies (machine manufacturers, machine users, external service providers) because release is not limited to one additional partner but any number of organizations can be connected to one machine.

The release mechanism is conveniently designed to permit short-term release for eliminating faults quickly as well as long-term release, e.g. for maintenance by an external service provider.

A requirement for using the cooperation area is that the organization to which a machine is to be released for use is also set up as an OEM service organization.

See also

Functions of the various roles (matrix of authorizations) (Page 163)

7.1.1 Releasing a machine to an organization

Overview

In ePS Network Services, a machine is always assigned to just one organization when it is set up. Depending on their assigned user roles, the users in an organization can access the functions of the machine. The administrator of the owner organization can use the "cooperation area" function to release a machine of that organization for use by another organization.

Note

In this documentation, source organization designates the organization that releases a machine. In this documentation, target organization designates the organization to which a machine is released.

Release rights specified by the administrator of the source organization define the type of access granted to the target organization. Machine function rights may be further limited in the target organization by the user roles that apply there.

A machine can **only be released by the administrator of the source organization**. A target organization cannot pass on a release to other organizations. This means that the source organization always maintains control over which other organization has access rights to its machine, data, and settings.

The administrator of the target organization must define a release password for receiving machines from other organizations. The target organization administrator discloses the release password together with the name of its organization to the administrator of the source organization.

This allows the source organization to release machines to its organization.

Caution

The release password and organization name must be communicated outside the ePS system, e.g. by phone, fax, or encrypted e-mail. On no account must the current password for the generic "administrator" account be used as the release password for the "cooperation area" function. If this is not the case, then unauthorized users can access your data.

As soon as the administrator of the source organization has received the enable password and the name of the target organization, he or she enters it in the ePS Network Services and can release machines of its organization to the target organization with immediate effect. A machine can be released to several target organizations simultaneously. Once the machine has been released to the target organization, the target organization administrator can enter his own name in the Machine ID field (Machine Alias) by which users in his or her organization will be able to find the machine.

Any changes to the settings made by any participants – either in the source organization or target organization – will be effective on the machine. The configurations (control monitors, PLC and NC performance monitors etc.) and user data (uploaded data, archives etc.) which result from the use of ePS Network Services are always assigned to the machine. By consulting the machine list, a user can easily find out at any particular time whether the machine on which he is currently working belongs to his own or an external organization (machine list divided up according to organizations).

The users of the source organization see the organizations for which the machine is released and the users of the target organization see the organization that is making a machine accessible. This applies to the user roles ‘administrator’, ‘commissioning engineer’, and ‘service engineer’ on a PC; users on the control are unable to see that it is an external machine.

To end cooperation, either the administrator of the source organization can remove the machine from the cooperation area (cancel access rights of other organization) or the administrator of the target organization can reject the machine from the cooperation area.

In both cases, the administrators can choose whether the recipients in the target organization will be removed from the notification configuration of the machine or whether they are kept. The other settings (configuration of monitors, service case notification configuration etc.) are kept on the machine.

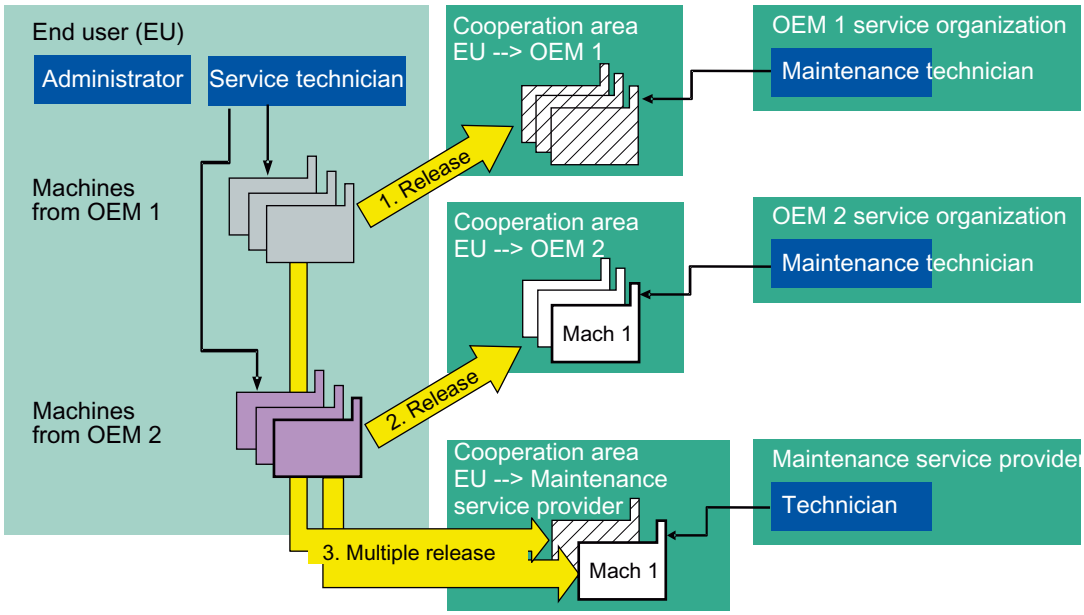


Figure 7-2 Multiple release of machines

Cooperation area between one end user with a large machine park and various OEMs or service providers. One machine can be released simultaneously to several organizations (machine "Mach 1" surrounded by thick border)

As soon as the machine has been removed from the cooperation area, the target organization and its users cannot access the data of the machine until it is released again.

If recipients in the target organization are still in the notification configuration of the machine they will continue to receive service case notifications etc. if an alarm occurs until they are deleted by the source organization.

7.1.2 Machines in a cooperation area

Overview

The limitations and special aspects of the functions of ePS Network Services when used with a machine via a cooperation are described below.

Machine tree

The machine ID used by the partner can be viewed in the machine tree views in the machine selection or machine management for machines in the cooperation area:

- "Partner of external machines" view (machines that the organization of the user can access when granted release)
- "Partner of own machines" view (machines released by the organization of the operator)

This ensures that the machine can always be clearly identified, e.g. during a hotline call. The partner's valid machine ID is displayed in the "Partner ID" field.

Managing / releasing machines

For security reasons, a machine can only be released by the administrator of the owner organization. The administrator always keeps control over which other organizations can work with his or her machines.

This is why the administrator of a target organization cannot release a machine released to his or her organization to other organizations via the cooperation area.

Deleting / deactivating machines

A machine can only be deleted from the ePS Network server by the administrator of the owner organization. Only the administrator can activate/deactivate the machines and change or re-release the machine master data.

The administrators of both the source organization and the target organization can change the master data of a machine released via a cooperation area. These changes do not affect the other organization, so both organizations keep separate versions of machine master data (for example, if they use different naming and numbering systems).

The users of a target organization can only access the configuration and user data of a machine while it is released to their organization. If a machine is removed from the

cooperation area by one of the administrators of the source or target organization, its users can no longer view or change that data.

Recipients' addresses for notifications

A user can only enter the addresses from the address book of his or her own organization in a list of notification recipients.

A user can remove all the existing addresses from a list of recipients, even if they originate from another organization.

A user has no access to the address books of other organizations and cannot change the content of external recipient addresses (address book entry).

Upgrading the server software version

The server software version of the machine can only be upgraded by the administrator of the owner organization.

Reading/processing service cases

Service cases (synonym: trouble tickets), generated, for example, by a request to process a fault, can be read or processed by any organization that has access to the machine.

Users of target organizations that access an external machine via a cooperation area can also set up service cases for this machine using the "Create Service Case" function.

Connecting a machine and uploading the alarm model

To link a control with the machine image on the ePS Network server, the user at the HMI of the control must be a member of the owner organization of the machine.

7.2 Client diagnostics

7.2.1 Information of client diagnostics

Description of the function

A local application has been developed for ePS client diagnostics, with which the user at the machine can analyze the ePS client software while the control is running.

As soon as the client diagnostics is started a screen displaying the main diagnostic information required for an initial problem analysis appears. The user can also start a comprehensive "diagnostics session" if problems occur and transmit detailed information to the ePS server (softkey "Start Session").

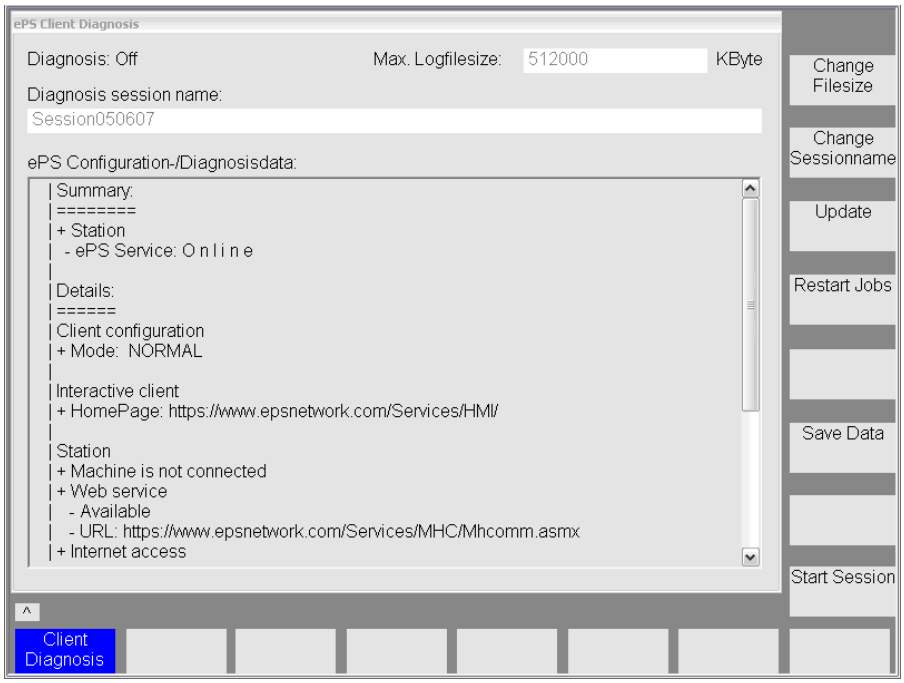


Figure 7-3 ePS client diagnostics (example)

Information of client diagnostics

The following information is output:

- Status information

Figure 7-4 Status information

- Diagnostics data

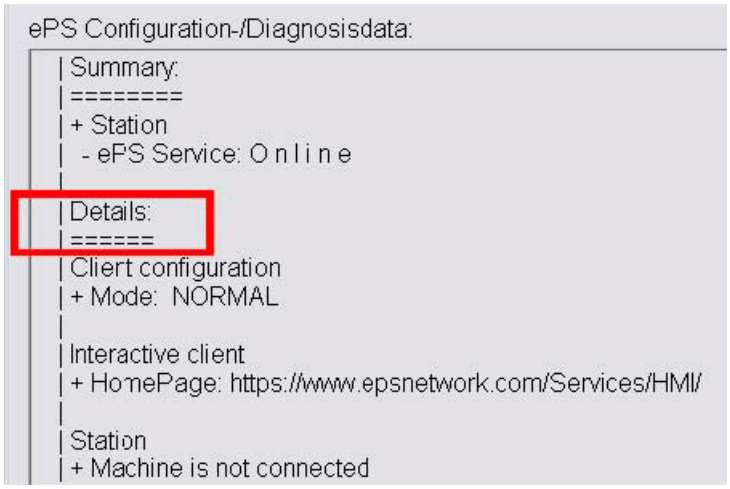


Figure 7-5 Diagnostics data (example)

Summary	When diagnostics is started, an overview is provided as to whether the ePS client is connected to the Internet.
Details	More precise information required for further diagnostics is shown under Details.
Client configuration	This display informs the user whether the installation is a normal 1:1 or a 1:n configuration.
Interactive client	The URL of the IAC is displayed for information purposes and to provide a comparison with the URL Web service.
Station	The user is informed whether the control is connected or not connected to a database machine.

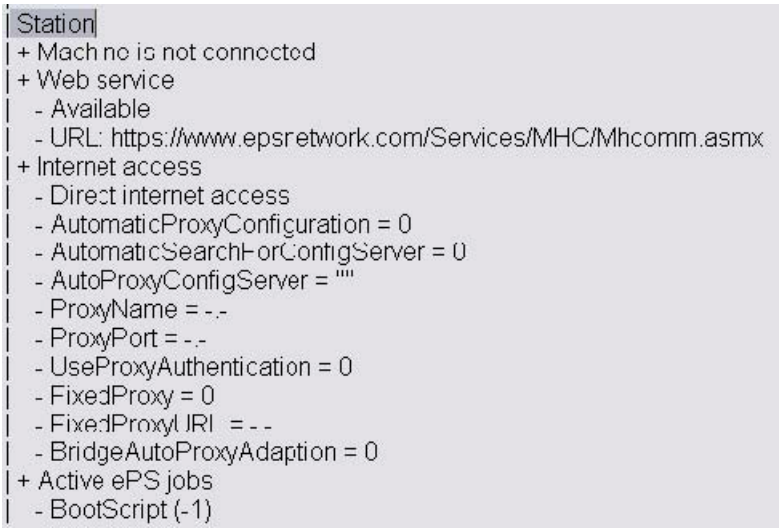


Figure 7-6 Diagnostics data: Station (example)

Station

The following details are displayed:

- Web services: URL of the machine handler (for comparison with the URL of the IAC)
- Internet access: Proxy configuration overview
- Active ePS jobs:
  - Status of active ePS jobs
  - Status of the repeat strategy

7.2.2 Using the client diagnostics

Operator functions

The following functions are available at the vertical softkey bar:

Softkey labels		Significance
"Change Filesize"	→	Changing the maximum size of log files
"Change Sessionname"	→	Changing the session name
"Update"	→	Updating diagnostics information
"Restart Jobs"	→	Restarting machine handler jobs

"Save Data"	→	Saving diagnostic data of a diagnostics session
---		
"Start Session"	→	Starting a diagnostics session

Restarting the ePS client job

It may be necessary to restart all ePS client jobs for diagnostic purposes. After a safety prompt the jobs are restarted.

Update

The "Update" softkey is used to update the screen content.

Starting ePS client software

"Diagnosis" softkey via HMI-Advanced

7.2.3 Performing detailed diagnostics

Starting a diagnostics session

When starting a diagnostics session using the softkey "Start Session", the following actions are executed:

- Existing log files are re-named
- New log files are created with the maximum LOG level

Diagnostics is carried-out

You should now execute the ePS functions that cause problems and need to be diagnosed.

Ending the diagnostics session

When the diagnostics session is ended using the softkey "Stop Session", the following actions are executed:

- Script files are buffered
- Log files that were generated during the session are buffered
- SETTINGS.INI is buffered
- A file with session information is buffered in the XML format
- LOG levels are reset to the default value

Saving LOG data

Generated data can be stored on any storage medium as long as it can be accessed online. Pressing the "Save Data" softkey starts an application that allows you to save any data you have generated as a ZIP file.

A data save path and an archive name can be entered. The size of the ZIP archive can be restricted to a certain size so that it is easier to send by e-mail.

Transferring diagnostics information to ePS Network Services

The saved ZIP archive should then be transferred to the OEM service or to the ePS hotline, for example.

7.3 Configuring 1:n connections

Overview

Every NCU of a 1:n group can be selected using a dialog box and then like a "standard machine" connected to an ePS database machine. The configuring program is called up automatically during the ePS client installation if a 1:n configuration is detected by ePS Network Services.

After installation, one instance of the Machine Handler service is started for each NCU selected.

Note

Every NCU selected must be connected to a separate database machine.

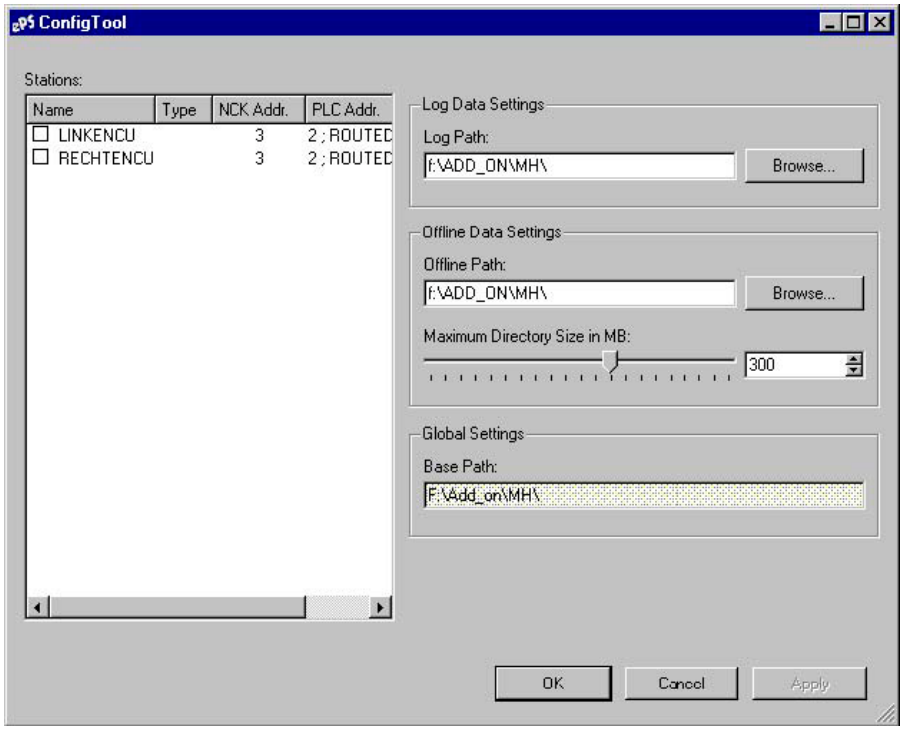


Figure 7-7 Configuration settings

Description of the function

The following settings for a configuration are made in this dialog box:

- "Stations:" Selecting an NCU

  ePS Network Services reads the information on the existing configuration from MMC.INI and NETNAMES.INI and displays the information it contains about the individual NCUs. Selecting an NCU makes it available to ePS Network Services for connection to a database machine.

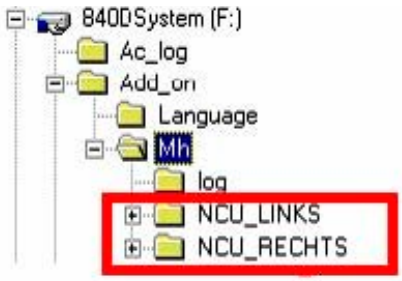
- "Log Path:"

  Directories for the log files of the individually selected NCUs are created below this path.

- "Offline Path:"

  Directories for the offline data of the individually selected NCUs are created below this path.

  Example: Directory path for offline data



Directory structure of the individual NCUs

- "Maximum Directory Size in MB:"

  Specifying the maximum directory size for the offline data.

Saving a configuration

The selected settings are saved and activated with "OK".

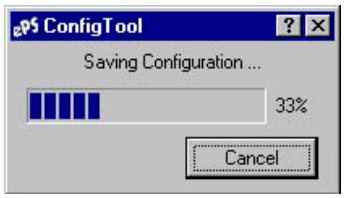


Figure 7-8 Saving a configuration

When the HMI systems boot, the associated "machine handlers" are automatically started one after the other.

7.4 Useful functions of the various device classes

Functions at the control

The device class defines which ePS Network Services functions can always be used on a particular machine.

Function	SINUMERIK	S7	IPC
Management	X	X	X
Connecting a machine	X	X	X
Uploading an alarm model	X	X	
Disconnecting a machine	X	X	X
Master data	X	X	X
Setting up functions	X	X	X
Synchronization	X	X	X
Repeat strategy	X	X	X
Prolog and epilog when carrying-out the measurements	X		
Synchronization	X	X	X
Fault services	X	X	X
Reporting a fault	X	X	X
Requesting remote access	X	X	X
Maintenance services	X	X	X
Data services	X		
Tests	X		
NC monitors	X		
Maintenance jobs	X	X	X

Functions at the PC

Function	SINUMERIK	S7	IPC
Machine information	**X**	**X**	**X**
Machine overview	X	X	X
Actual control software	X	X	
Machine events	X	X	X
NC monitors	X		
PLC monitors	X	X	
Measurements and series of measurements	X		
Maintenance	X	X	X
Maintenance jobs	X	X	X
Fault services	X	X	X
Reporting a fault	X	X	X
Remote access	X	X	X

Function	SINUMERIK	S7	IPC
Executing a remote access	X	X	X
Conference link	X	X	X
Using remote access	X	X	X
Setting up functions	**X**	**X**	**X**
Maintenance	X	X	X
Maintenance schedules	X	X	X
PLC monitors	X	X	
NC monitors	X		
Test series	X		
Series of measurements	X		
Prolog and epilog when carrying-out the measurements	X		
Fault services	X	X	X
Control monitors	X	X	X
Machine trigger	X	X	X
Alarms	X	X	
PLC	X	X	
Combined	X	X	
Fault message at the HMI	X	X	X
Time	X	X	X
Server trigger			
A measurement of a series of measurements reaches a limit value	X		
PLC monitor reaches a limit value	X	X	
Cyclic trigger at the NC monitor	X		
Cyclic trigger at the PLC monitor	X	X	
Reporting a fault at the PC	X	X	X
Actions	X	X	X
Uploading a file	X	X	X
HMI action log	X	X	
Machine data	X	X	
NC status data	X		
PLC trace	X	X	
PLC data block	X	X	
Triggering PLC monitor(s)	X	X	
Workflow	X	X	X
Notification	X	X	X
Maintenance job	X	X	X
Global settings	X	X	X
PLC settings	X	X	
Notification limitation	X	X	X
Copying function settings	X	X	X

Function	SINUMERIK	S7	IPC
Copying function settings to a new machine	X	X	X
Client/server communication	X	X	X
Synchronization times	X	X	X
Monitoring ePS services	X	X	X
Organizational tasks	**X**	**X**	**X**
Maintenance jobs	X	X	X
Service cases	X	X	X
Statistics/ export	**X**	**X**	**X**
Multi-machine view	X	X	X
Machine events	X	X	X
Series of measurements	X		
Importing	X	X	X
Importing a file	X	X	X
Importing a directory	X	X	X
Active import procedures	X	X	X
Exporting	X	X	X
Exporting PLC data	X	X	
Overviews	X	X	X
Synchronization overview	X	X	X
Monitoring ePS services	X	X	X
Management	**X**	**X**	**X**
Organization management	X	X	X
Addresses	X	X	X
Users	X	X	X
Machines	X	X	X
Organizational data	X	X	X
Download areas	X	X	X
Personal settings	X	X	X
Changing the password	X	X	X
Data protection guidelines	X	X	X
Resetting filter and search settings	X	X	X

7.5 Functions of the various roles (matrix of authorizations)

Administrator: Admin
Commissioning engineer: IB
Service engineer: SE (Service Engineer)
Machine operator: MO (Machine Operator)

	Own machines (PC)				Own machines (HMI)			
Assignment of authorizations to individual roles	**Admin**	**IB**	**SE**	**MO**	**Admin**	**IB**	**SE**	**MO**
Administration								
Machines								
Creating a new machine	X							
Deleting a machine	X							
Connecting a machine						X	X	X
Disconnecting a machine	X	X				X		
Changing machine master data	X	X				X		
Viewing machine master data	X	X				X		
Activating/deactivating a machine	X							
Releasing a machine / defining the authorizations for release	X	X						
Rejecting a release for an external machine	X	X						
Viewing authorizations assigned for an external machine	X	X						
Users								
Creating a new user	X							
Changing master data / password of any user	X							
Deleting a user	X							
Activating / deactivating a user	X							
Enabling a blocked user	X	X						
Changing a password for your own account	X	X	X	X		X	X	X
Viewing / accepting / rejecting data protection guidelines	X	X	X	X				
Address book								
Creating a new address	X	X						
Changing an address	X	X						
Copying an address	X	X						
Deleting an address	X	X						
Viewing an address	X	X						
Organizational data								
Viewing / changing organizational data	X							

	Own machines (PC)				Own machines (HMI)			
Assignment of authorizations to individual roles	**Admin**	**IB**	**SE**	**MO**	**Admin**	**IB**	**SE**	**MO**
Workflow services								
Maintenance schedules/jobs								
Creating a new maintenance schedule		X	X					
Viewing a maintenance schedule		X	X					
Editing/scheduling a maintenance schedule / Attaching documents / Deleting documents / Processing responsible organization		X	X					
Deleting a maintenance schedule		X	X					
Copying a maintenance schedule		X	X					
Editing maintenance job scheduling / Editing responsible organization / Editing info display		X	X					
Processing maintenance job / Changing status/result		X	X			X	X	X
Deleting a maintenance job		X	X					
Service cases								
Manually creating a new service case		X	X					
Editing a service case / Changing status / Assigning a technician / Linking other events		X	X					
Requesting fault processing						X	X	X
Condition Monitor Services								
Measurement: Execute a measurement						X		
Measurement: Viewing a measurement		X	X			X		
Measurement: Deleting a measurement		X				X		
Measurement: Editing a comment		X				X		
Measurement series: Creating						X		
Measurement series: Performing a measurement / Changing a comment on a measurement within a measurement series						X	X	X
Measurement series: Changing a parameter						X		
Measurement series: Viewing		X	X			X	X	X
Measurement series: Deleting		X				X		
Measurement series: Editing a comment		X				X		
Performance monitor: Configuring						X		
Performance monitor: Viewing		X	X			X	X	

	Own machines (PC)				Own machines (HMI)			
Assignment of authorizations to individual roles	**Admin**	**IB**	**SE**	**MO**	**Admin**	**IB**	**SE**	**MO**
Performance monitor: Deleting		X				X		
Performance monitor: Editing a comment		X				X		
PLC monitor: Configuring		X						
PLC monitor: Viewing		X	X					
PLC monitor: Deleting		X						
Editing/deleting OEM additions						X		
Viewing OEM additions		X	X			X	X	
Control Monitor Services								
Creating a new control monitor		X						
Viewing a control monitor (configuration)		X	X					
Editing a control / Changing a trigger / Changing actions		X						
Activating / deactivating individual control monitors		X	X					
Activating / deactivating all control monitors simultaneously		X	X					
Deleting a control monitor		X						
Control monitor: Viewing notification limitation		X	X					
Control monitor: Changing notification limitation		X						
Control monitor: Viewing configuration PLC trace/trigger blocks		X	X					
Control monitor: Changing the configuration of PLC trace/trigger blocks		X						
Remote access								
Performing teleservice / "Provide"		X	X					
Participating in conference link		X	X					
Requesting teleservice / within "Request fault processing"		X	X	X		X	X	X
Event history								
Viewing event history		X	X					
Viewing event details		X	X					
Deleting an event		X						
Viewing a control monitor configuration related to an event		X	X					
Internal services								
Manually synchronizing						X	X	X
Configuring synchronization		X				X		

	Own machines (PC)				Own machines (HMI)			
Assignment of authorizations to individual roles	**Admin**	**IB**	**SE**	**MO**	**Admin**	**IB**	**SE**	**MO**
Viewing configuration synchronization		X	X			X	X	
Configuring monitoring of ePS services		X						
Viewing configuration monitoring of ePS services		X	X					
Defining/editing repeat strategy						X		
Viewing repeat strategy						X	X	
Uploading an alarm model						X	X	X
Overview of machines								
Viewing synchronization overview		X	X					
Viewing monitoring of ePS services		X	X					
Data services								
Creating an archive						X	X	
Reading-in an archive						X	X	
Clearing an archive						X		
Platform services								
Importing offline data								
Importing a file		X	X					
Importing a directory		X	X					
Viewing active import procedures		X	X					
Miscellaneous								
Viewing invoice data	X							
Viewing configuration at the HMI overview page						X	X	X

7.6 References

Additional references:

/R1/ ePS Network Services Installation Guide

/R2/ HMI-Advanced Commissioning Manual

/R3/ Description of Teleservice - Session Types

Appendix

A

A.1 Abbreviations

Admin	Administrator (user role)
CNC	Computerized Numerical Control Computerized numerical control
DB	Data Block in the PLC
DBB	Data Block Byte in the PLC
DBW	Data Block Word in the PLC
DBX	Data block bit in the PLC
DW	Data word
GLT	Equability axis test
KFT	Circularity test
UAT	Universal axis test
HD	Hard Disk Hard disk
HMI	Human Machine Interface: Controller user interface
IB	Commissioning engineer (user role)
IBN	Commissioning
IHA	Maintenance job
MB	Megabyte
MD	Machine data
MCS	Machine coordinate system
MO	Machine Operator: Machine operator (user role)
NC	Numerical Control: Numerical control
NCK	Numerical Control Kernel: NC kernel with block preparation, traversing range, etc.
NCU	Numerical Control Unit: NCK hardware unit
OEM	Original Equipment Manufacturer
PCU	Programmable Control Unit
PG	Programming device
PLC	Programmable Logic Control:
SD	Setting Data
SDB	System Data Block
SE	Service engineer: Service engineer (user role)
SK	Softkey
SW	Software
WCS	Workpiece coordinate system

A.2 Correction sheet - fax template

Should you come across any printing errors when reading this publication, please notify us on this sheet. Suggestions for improvement are also welcome.

To SIEMENS AG A&D MC MS1 Postfach 3180 D-91050 Erlangen Fax: +49 (0) 9131 / 98 - 63315 (Documentation) mailto: docu.motioncontrol@siemens.com www.siemens.com/automation/service&support	From Name: Company/Dept. Street: Zip code: Town: Phone: / Fax: /

Suggestions and / or corrections

Index

A

Action log, 20
Administration Services, 10

B

Basic principle of operation, 11

C

Changing the password, 137
Circularity test, 28
Client diagnostics, 154
  Details, 155
  Status information, 155
Client-server communication, 96
Condition Monitoring Services, 10
Connections 1:n, 158
Contour test, 40
Control monitor, 72, 74
Control monitor services, 9
Control software, 25
Cooperation area, 149

D

Data protection guidelines, 137
Data services, 10
Device classes, 160
Diagnostic actions, 89
Diagnostics data, 13
  Evaluation, 17
Diagram, 116
Download areas, 135
  Evaluations, 135
  Security patches, 136

E

ePS services, 97
Equability test, 29
Evaluation
  Diagnostics data, 17
  Workflow, 17
Exporting PLC data, 122

F

Fault services, 72
File Transfer, 53

I

Import, 118
  Active operations, 121
  Directory, 121
  File, 120

M

Machine
  Connecting, 140
  Creating, 138
  Disconnecting (HMI), 142
  Disconnecting (PC), 143
  selecting, 114
  Selecting, 140
Machine events
  Detailed view, 15
  List view, 13
Machine information, 13
Maintenance job, 45, 99
  Opening (PC), 102
  Processing (HMI), 104
Maintenance schedule, 59
Measurement, 66
Measurement results, 26
Monitor
  NC, 41, 82
  PLC, 43, 82
Multiple-machine evaluation, 113

N

NC monitor, 41, 65, 82
NC status data, 21
Notification limitation, 94

O

Operator panel, 26, 62

P

PDF documents, 62
Performance index, 72
Permission of the machine operator, 52
PLC data block, 24
PLC data blocks, 95
PLC monitor, 43, 63, 82
PLC trace, 22
Prolog/epilog program, 33, 147

R

Release protocol, 39
Remote access, 9, 46
  Example of a service session, 50
  Keyboard, 58
Remote Access --> Remote access, 46
Repeat strategy, 146
Requesting fault processing, 111

S

Series of measurements, 26, 31, 66
Service case, 106
  Creating, 89, 108
  Opening, 109
Service conference call, 56
Service session, 47, 56
Service technician, 56
Session ID, 48
Starting a service session, 48
Statistics, 113
Status overviews, 123
Support Center, 48
Synchronization, 145
  Times, 96

T

Test series, 31, 71
Time zone, 96
Transfer File, 53
Trigger type, 72
  Alarm group, 75
  Combination triggers, 79
  Limit value violation, 86
  PLC trigger, 76
  Processing a fault, 80
  Server trigger, 82
  Time interval, 81

U

Universal axis test, 30
Uploading an alarm model, 140

W

Workflow actions, 87
Workflow evaluation, 17
Workflow services, 10
Workflow Services, 13