

Support when migrating from MICROMASTER 4 and SINAMICS G120 (< V4.4) to SINAMICS G120 (V4.4)

MICROMASTER 4 and SINAMICS G120

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Question

What do I have to observe when migrating from a SINAMICS CU2xx (less than V4.4) or a MICROMASTER 4 to a SINAMICS CU2xx-2 (V4.4)?

Answer

The instructions and notes listed in this document provide a detailed answer to this question.

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1 Migrating from MICROMASTER 4 and SINAMICS G120 (V3.x) to SINAMICS G120 (V4.4)

1.1 Summary

Today's SINAMICS Control Units CU240E and CU240S with firmware V3.x as well as MICROMASTER 4 can, in most cases, be replaced by SINAMICS Control Units CU240B-2 and CU240E-2 (V4.4). SINAMICS CU2xx-2 with firmware from V4.4 onwards are compatible from a functional perspective; however they are not compatible from a spare part perspective – i.e. the parameterization must be appropriately adapted.

The relevant data at the parameter level for migrating from MICROMASTER 4 and SINAMICS CU2xx with FW V3.x to SINAMICS CU2xx-2 with FW V4.4 are handled in this document. The parameters are only briefly mentioned here. When migrating, it is absolutely essential that "old" and "new" parameter lists for each relevant parameter are precisely considered. The same is also valid for control via a terminal strip.

CU2xx FW V3.x

CU2xx FW V4.4



2 Operator control and displaying

2.1 Changes and expanded functionality in STARTER

For the free function blocks, parameterizing screen forms are no longer available in Starter V4.2 and 4.3; instead, the Expert list is used for parameterization.

2.2 Changes and expanded functionality for operation with AOP, IOP, BOP-2

The operator control and diagnostic functions of these devices, for instance switching over parameter sets or processing status signals, are different. From FW V4.3.2 and higher, several parameters, such as p0004 (parameter filter), r0019 (display selection DDS), p0800 / p0801 (load parameters set 0/1), are therefore no longer available.

2.3 Different module factory settings

The factory settings of the input and output terminals for modules with and without bus connection are in some cases different, e.g. MM44040/CU240x and CU240x DP. More detailed information is provided in the particular List Manual.

2.4 Changes and expanded functionality to changeover from Hz to speed

Setpoints are no longer parameterized and interpreted in Hz, but in rpm. This refers to standard and safety functions.

2.5 r0002 to p0014, operator control and displaying

Table 2-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0000	Drive display	x	x	-	-	Displays the output selected by the user on the OP. This value is defined in P0005. From FW V4.3.2 and higher Parameter is eliminated. The display value of parameter r0002 has been extended.
r0002	Drive operating display Drive status (up to FW V3.2)	x	x	x	x	Display values are different in the individual FW versions.
p0003	Access level	x	x	x	x	From FW V4.3.2 and higher The following setting options have been eliminated: [0] User-defined parameter list (P0013) [1] Standard [2] Extended Only the following are still saved: [3] Expert [4] Service
p0004	Parameter filter (BOP/AOP)	x	x	-	-	Eliminated from FW V4.3.2 and higher
p0005	Display selection, drive data set (BOP/AOP)	[3]	[3]	-	-	Eliminated from FW V4.3.2 and higher
p0006	Display mode (BOP/AOP)	x	x	-	-	Eliminated from FW V4.3.2 and higher
p0007	Background lighting delay (BOP/AOP)	x	x	-	-	Eliminated from FW V4.3.2 and higher

2 Operator control and displaying

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0010	Drive commissioning parameter filter	x	x	x	x	From FW V4.3.2 and higher The commissioning offline is inhibited. The selection options have been extended from 5 up to 15. The selection values should be noted: [3] Motor commissioning [15] Data sets (creating additional DDS and CDS - and for commissioning later).
p0011	Parameter lock for P0013	x	x	-	-	Eliminated from FW V4.3.2 and higher
p0012	Parameter key for P0013	x	x	-	-	Eliminated from FW V4.3.2 and higher
p0013	User-defined parameters	[20]	[20]	-	-	Eliminated from FW V4.3.2 and higher
p0014	Memory mode/intermediate memory mode (inhibited offline)	[3]	[3]	x	x	FW V3.2 The values 0 volatile or 1 permanent can be set for interfaces COM [0], BOP [1], PROFIBUS [2] using indexed parameters. From FW V4.3.2 and higher Values, volatile/non-volatile/delete can be selected online.

2.6 p0015, macro function for commissioning

Table 2-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0015	Macro drive device	-	-	-	x	Only available ONLINE

From FW V4.4 and higher, while commissioning, it is possible to select the required "drive macro" for typical applications.

- The macro is defined using parameter p0015.
- The parameter influences both the I/O configuration as well as the command source selection (p0700) and the speed setpoint selection (p1000).
- The corresponding settings are made when a macro is executed (run).
- In FW V4.4, it is only possible to change parameter p15 "ONLINE".

When commissioning a drive, the drive macro should first be selected, which is the closest to the required parameterization. After the basic commissioning has been completed, the additionally required BICO interconnections can be adapted in the inputs/outputs screen form.

The factory setting of parameter p0015 with a macro depends on the particular CU:

Macro 7 Switchover, automatic/local (switchover, fieldbus/jogging)
CU230P-2 DP; CU240B-2 DP; CU240E-2 DP; CU240E-2 DP-F;

Macro 12 Two-wire control ON/OFF1, reversing and analog setpoint
CU230P-2 HVAC; CU230P-2 CAN; CU240B-2; CU240E-2; and CU240E-2 F

The available macros are described in the technical documentation of the particular product and in the Getting Started document for CU230, CU240 (A5E02792536C) article ID:[44388139](#).

The relevant parameters include:

- p0700 (select command source),
- p1000 (select speed setpoint),
- p1500 (select torque setpoint),
- r8570 (macro drive object)

Note

With Starter V4.2, p0015 can only be accessed online; with STARTER V4.3, offline access is also possible.

2.7 r0018 to r0047, monitoring functions, setpoints and actual values

Table 2-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0018	CU firmware version	x	x	x	x	From FW V4.3.2 and higher Changing the data type from FloatingPoint32 to Unsigned32
r0019	BOP control word	.14	.14	-	-	Eliminated from FW V4.3.2 and higher, as a consequence it is no longer possible to evaluate the signals from the BOP keys. MOP function cannot be implemented.
r0020	Speed setpoint, smoothed	x	x	x	x	Display values have been changed from Hz to rpm
r0021	CO: Speed actual value, smoothed	x	x	x	x	Display values have been changed from Hz to rpm
r0022	Speed actual value rpm, smoothed	x	x	x	x	Display values have been changed from Hz to rpm
r0024	Output frequency, smoothed	x	x	x	x	Display of the smoothed converter frequency.
r0025	CO: Output voltage, smoothed	x	x	x	x	Display of the smoothed output voltage

2 Operator control and displaying

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0026	CO: DC link voltage, smoothed	x	[2]	x	x	Designation/value changed FW V3.2 [0] Main DC link voltage [1] Decoupled DC link voltage for internal supply
r0027	CO: Absolute current actual value, smoothed	x	x	x	x	Displays the rms motor current.
r0028	Modulation depth, smoothed	-	-	x	x	Display of the smoothed actual value of the modulation depth. From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0029	CO: Current actual value Field-generating, smoothed	x	x	x	x	Display of the smoothed, field-generating current actual value. From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0030	CO: Current actual value Torque-generating, smoothed	x	x	x	x	Display of the smoothed, torque-generating current actual value. From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0031	CO: Torque actual value, smoothed	x	x	x	x	Display of the smoothed torque actual value.
r0032	CO: Active power actual value, smoothed	x	x	x	x	Display of the smoothed actual value of the active power.

2 Operator control and displaying

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0033	Torque utilization, smoothed	-	-	x	x	Display of the smoothed torque utilization in %.
r0034	CO: Motor utilization [%]	-	-	x	x	Is only applicable for permanent-magnet synchronous motors and when the I2t motor model temperature p0612 is activated From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0035	CO: Motor temperature	[3]	[3]	x	x	Up to FW V3.2, display of the motor temperatures for each DDS in indexed parameters [0] to [2]. From FW V4.3.2 and higher Only the actual motor temperature is displayed.
r0036	CO: Power unit overload I2t	x	x	x	x	Up to FW V3.2 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0037	CO: Converter temperature [°C], measured heat sink temperature, barrier/depletion layer temperature	[5]	[5]	[20]	[20]	From FW V4.3.2 and higher Changed designations/values: [0] Heatsink temperature becomes the inverter temperature, [1] Chip temperature becomes the barrier/depletion layer temperature [0] and [1] remain reference values for p0290 (overload response) and p0292 (temperature alarm threshold) [2] Input rectifier temperature and [3] Air intake temperature are no longer available. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

2 Operator control and displaying

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0038	CO: Active power factor	x	x	x	x	From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0039	Energy consumption	x	x	x	x	Display of the electrical energy used.
p0040	Reset energy consumption display	x	x	x	x	Reset energy consumption display (r0039).
r0041	Energy consumption saved	-	-	-	x	Displays the saved energy referred to 100 operating hours when compared to a fixed-speed drive or to direct line operation.
p0045	Display values smoothing time constant	-	-	x	x	Sets the smoothing time constant for the following display values: r0063[1] speed, r0068[1] current, r0080[1] torque, r0082[1] active power.
r0046	CO/BO: Missing enable signals	-	-	.31	.31	Displays missing enable signals, which prevent the drive closed-loop control from being commissioned.
r0047	Motor data identification and speed control optimization	-	-	x	x	Displays the actual status of the motor data identification (stationary measurement) and speed controller optimization (rotating measurement).

2.8 r0050 to r0096, monitoring functions, setpoints and actual values

Table 2-4

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0050	CO/BO: Command data set CDS effective	x	x	.1	.1	Modified representation of the CDS
r0051	CO/BO: Drive data set DDS effective	[2]	[2]	.1	.1	Modified representation of the DDS
r0052	CO/BO: Status word 1	.15	.15	.15	.15	Partially revised significance, e.g. bit 12 "Holding brake active" or "Holding brake open"
r0053	CO/BO: Status word 2	.15	.15	.11	.11	Partially revised significance, e.g. change from frequency to speed
r0054	CO/BO: Control word 1	.15	.15	.15	.15	No change
r0055	CO/BO: Supplementary control word	.15	.15	.15	.15	From FW V4.3.2 and higher Changed designation from frequency to speed for fixed setpoint bits 0 to 3
r0056	CO/BO: Status word closed-loop control	.15	.15	(.15)	(.15)	From FW V4.3.2 for PM250 and PM260, bit field has changed
r0060	CO: Speed setpoint before the setpoint filter	-	-	x	x	Displays the actual speed setpoint at the input of the speed controller and/or the V/f characteristic (after the interpolator).
r0061	CO: Encoder actual frequency (encoder feedback)	x	x	-	-	FW V3.2 Displays the speed currently sensed by the encoder. MM440 Displays the frequency currently sensed by the encoder
r0062	CO: Frequency setpoint or CO: speed setpoint after the filter	x	x	x	x	Displays the actual speed setpoint after the setpoint filters. Speed setpoint, frequency setpoint for MM440

2 Operator control and displaying

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0063	Speed actual value (actual frequency, unsmoothed)	x	x	[3]	[3]	Up to FW V3.2 Actual frequency value V/f unsmoothed. The possible source V/f, SLVC or encoder is defined by p1300 control mode/type. From FW V4.3.2 and higher [0] unsmoothed; [1] smoothed with p0045; [2] calculated from f_set - f_slip
r0064	CO: Speed controller system deviation	x	x	x	x	rpm or Hz
r0065	Slip frequency	x	x	x	x	Up to FW V3.2 as a % From FW V4.3.2 in Hz
r0066	CO: Output frequency [Hz]	x	x	x	x	Displays the power unit output frequency, smoothed.
r0067	CO: Output current, maximum (limit value)	x	x	x	x	Displays the maximum power unit output current.
r0068	Absolute current actual value, unsmoothed/smoothed	x	x	[2]	[2]	Up to, FW V3.2 only unsmoothed value.
r0069	CO: Phase current actual value	[6]	[6]	[7]	[7]	From FW V4.3.2, additional sum U V W
r0070	CO: Actual DC link voltage value, unsmoothed	x	x	x	x	The measurement of a DC link voltage < 200 V for the Power Module (e.g. PM240) does not provide a valid measured value.
r0071	Maximum output voltage	x	x	x	x	Displays the maximum output voltage.
r0072	CO: Output voltage, unsmoothed	x	x	x	x	Displays the actual power unit output voltage, unsmoothed.
r0073	Maximum modulation depth	-	-	x	x	Displays the maximum modulation depth as a %.
r0074	CO: Actual modulation CO: Modulation depth	x	x	x	x	Displays the actual modulation depth, unsmoothed.

2 Operator control and displaying

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0075	CO: Field-generating current setpoint, unsmoothed	x	x	x	x	Displays the field-generating current setpoint (Id_set). For V/f control, this value has no significance.
r0076	CO: Field-generating actual current value	x	x	x	x	Displays the field-generating actual current value, unsmoothed. Also see r0029. For V/f control, this value has no significance.
r0077	CO: Torque-generating current setpoint	x	x	x	x	Displays the torque/force-generating current setpoint. For V/f control, this value has no significance.
r0078	CO: Torque-generating current actual value	x	x	x	x	Displays the torque-generating actual current value. Also see r0030. For V/f control, this value has no significance.
r0079	CO: Total torque setpoint	x	x	x	x	Displays the torque setpoint at the speed controller output.
r0080	CO: Torque actual value	x	x	[2]	[2]	Up to FW V3.2 Unsmoothed torque setpoint, smoothed see r0031 From FW V4.3.2 and higher [0] unsmoothed, [1] smoothed with p45, smoothed in r0031 with 100ms. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0081	CO: Torque utilization					Displays the torque utilization as a percentage, unsmoothed. This parameter is only available for vector control. Also see r0033.
r0082	CO: Active power actual value	-	-	[3]	[3]	From FW V4.3.2 and higher [0] unsmoothed; [1] smoothed with p45; [2] electrical power, smoothed in r0032 with 100 ms. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

2 Operator control and displaying

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0083	CO: Flux setpoint in [%]	-	-	x	x	Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0084	CO: Flux actual value	x	x	[2]	[2]	Up to FW V3.2 Unsmoothed flux actual value. From FW V4.3.2 and higher [0] unsmoothed, [1] smoothed Parameter is not displayed in the expert list, however it can be called via the "user-defined parameter list".
r0085	CO: Actual reactive current value	-	x	-	-	Displays the reactive power component of the motor current, only for V/f control.
r0086	CO: Actual active current value	x	x	-	-	Actual active current value is only valid if the V/f control is selected in P1300 (control mode). Eliminated from FW V4.3.2 and higher
r0087	CO: Power factor actual value	-	x	x	x	From FW V3.2 and higher Displays the actual active power factor
r0089	Actual phase voltage value	-	-	[3]	[3]	From FW4.3.2 and higher [0] = phase U [1] = phase V [2] = phase W Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0090	CO: Actual pole wheel angle	x	x	-	-	Displays the actual position sensed by the encoder (rotor position). Eliminated from FW 4.3.2 and higher

2 Operator control and displaying

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0094	CO: Transformation angle	-	x	x	x	The transformation angle corresponds to the electrical commutation angle.
p0095	CI: Displays PZD signals	[10]	[10]	-	-	Selects the source to display PZD signals. Eliminated from FW 4.3.2 and higher
r0096	PZD signals in [%]	[10]	[10]	-	-	Eliminated from FW 4.3.2 and higher

3 Commissioning

3.1 p0100 to p0199, hardware data, data set changeover

3.1.1 Changes and expansions to p0170 and p0180 command/drive data sets

p0170 command data set (CDS)

Up to FW V3.2, 3 command data sets are available.

From FW V4.3.2, up to 4 command data sets are available,

p0180 drive data set (DDS)

Up to FW V3.2, 3 drive data sets are available.

From FW V4.3.2, up to 4 drive data sets are available,

Data set changeover (CDS and DDS)

The number of CDS are enabled using p0170.

The number of DDS are enabled using p0180.

p0010 must be set here to selection value 15.

Table 3-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0100	Motor standard, IEC/NEMA	x	x	x	x	Europe/North America
p0170	Command data sets (CDS) number	-	-	x	x	Sets the number of command data sets, max 4 data sets, condition p0010 [15]
p0180	Drive data sets (DDS) number	-	-	x	x	Sets the number of drive data sets, max 4 data sets, condition p0010 [15]

3 Commissioning

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0191	Control Unit configuration	-	[3]	-	-	Displays the vector configuration of the Control Unit.
r0197	Boot loader version	-	-	x	x	From FW V4.3.2 and higher, displays the boot loader version.
r0198	BIOS/EEPROM data version	-	-	[2]	[2]	Displays the version for BIOS and EEPROM data. [0] BIOS version; [1] EEPROM data version [2] BIOS/EEPROM data version
p0199	Device number Drive object name	x	x	[25]	[25]	Up to FW V3.2: Device system number; parameter has no effect (only for factory-related purposes) From FW V4.3.2 and higher Name for a drive object that can be freely assigned. In the commissioning software, this name cannot be entered via the expert list; instead it is specified in the configuration wizards. The object name can be subsequently changed using standard Windows mechanisms in the project navigator. The parameter is not influenced by the factory setting.

4 Power unit

4.1 p0200 to p0297, hardware data

4.1.1 Changes and expansions to p0291, converter protection

Up to FW V3.2, the phase failure monitoring was able to be deactivated with p0291 = 2. The deactivation was required, if devices with 2-phase phase angle control were connected to the same line supply, which cause a phase shift, for example SIRIUS soft starters. From FW V4.3.2 and higher, this is no longer possible!

Table 4-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0200	Actual power unit code number	x	-	[n]	[n]	Displays the unique power unit code number. [n] indexed for power units connected in parallel.
p0201	Reference power unit code number	x	[3]	[n]	[n]	FW V3.2: Designated hardware version. [0] Powerstack code, [1] Functionality version, last position of the MLFB, [2] Last used PS-Id The parameter is used to identify when the drive was first commissioned. Sets the actual code number from r0200 to confirm the power unit used. [n] indexed for power units connected in parallel.
r00203	Power unit, actual type	x	x	[n]	[n]	[n] indexed for power units connected in parallel.
r0204	Power unit hardware properties	x	x	[n]	[n]	[n] indexed for power units connected in parallel.

4 Power unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0205	Power unit use	x	x	x	x	MM440 [0] Constant torque [1] Variable torque FW V4.4 for vector drives [0] Load duty cycle with high overload [1] Load duty cycle with low overload
r0206	Power unit rated power	x	x	[5]	[5]	MM440 Rated power FW V4.4 [0] Rated value [1] Load duty cycle with low overload [2] Load duty cycle with high overload [3], [4] reserved
r0207	Power unit rated current	[3]	[3]	[5]	[5]	MM440 [0] Converter rated current [1] VT input current [2] CT input current FW V4.4 [0] Rated value [1] Load duty cycle with low overload [2] Load duty cycle with high overload [3], [4] reserved
r0208	Power unit, rated line voltage	x	x	x	x	Different parameter values for voltage ranges

4 Power unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0209	Maximum power unit current	x	x	[5]	[5]	MM440 Maximum converter current FW V4.4 [0] Catalog [1] Load duty cycle with low overload [2] Load duty cycle with high overload [3] [4] reserved
p0210	Unit/device supply voltage	x	x	x	-	From FW V4.3.2 and higher Additionally, set P1254 = 0 ("Auto detection Vdc switch-on levels"). The intervention thresholds of the Vdc controller and for compound braking are then determined directly using P0210 (line voltage). Factory setting MM440 230V, From FW V3.2 and higher 400V.
p0215	Power module data	-	-	[4]	-	Parameter is not described in more detail in the List Manual.
p0230	Drive filter type motor side	-	x	x	x	From FW V4.3.2 and higher [2] du/dt filter (additional)
r0231	Maximum power cable length, (un) shielded	[2]	[2]	[2]	[2]	Inductance of a filter connected at the power unit output. For third-party filters p0230 = 4, the value must first be set after quick commissioning p3900 = 1.
p0233	Power unit motor reactor, filter inductance	-	x	x	x	Enter the inductance of a filter connected at the power unit output.

4 Power unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0234	Power unit sine-wave filter capacitance	-	x	x	x	Capacitance of a filter connected at the power unit output. For third-party filters p0230 = 4, the value must first be set after quick commissioning p3900 = 1.
r0238	Power unit internal resistance	-	-	x	x	Displays the internal resistance of the power unit (IGBT and line resistance).
p0278	DC link voltage undervoltage threshold reduction	-	-	x	x	Threshold value to initiate the undervoltage fault (F30003). For chassis power units, this parameter has no significance. The resulting shutdown threshold can be read in r0296.
p0287	Ground fault monitoring, thresholds	-	-	[2]	[2]	Sets the shutdown thresholds for the ground fault monitoring as a percentage of the maximum power unit current (r0209). [0] Threshold while the DC link is being precharged [1] Threshold after precharging has been completed.
r0289	CO: Maximum power unit output current	-	-	x	x	Displays the actual maximum power unit output current taking into account derating factors.
p0290	Power unit overload response	x	x	x	x	Response to a thermal overload of the power unit from the heat sink temperature (r0037.0), chip temperature (r0037.1) and power unit overload I2t (r0036). From FW V4.3.2 and higher Four selection values 0 to 3 with slightly changed meaning

4 Power unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0291	Converter protection, phase failure detection	[3]	[3]	-	-	Eliminated from FW V4.3.2 and higher Deactivation phase failure detection and pulse frequency reduction <2Hz. Deactivation is required when using a SIRIUS soft starter with 2-phase, phase angle control connected to the same line supply.
p0292	Power unit temperature alarm threshold, heatsink temperature	x	x	[2]	[2]	Temperature difference (in °C) between the overtemperature shutdown threshold (F0004) and the overtemperature alarm threshold (A0504). An overload alarm is issued when the threshold value is exceeded. Up to FW V3.2 The factory setting cannot be changed. Temperature actual values, see r0037, Overload response, see p0290. From FW V4.3.2 and higher Separate threshold values for the heat sink chip [0] = temperature threshold value, heat sink [1] = temperature threshold value, chip Factory setting 5°C or 15°C
p0294	Power unit alarm for I2t overload	x	x	x	x	Sets the alarm threshold for I2t power unit overload.
p0295	Fan run on time	x	x	x	x	FW V4.3.2 The maximum fan run on time has been changed from 3600s to 600s; Changed data type, from U16 to FloatingPoint32. For PM230 power unit, sizes D – F, the parameter is not effective.

4 Power unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0296	DC link voltage, undervoltage threshold	-	-	x	x	If the DC link voltage falls below this threshold, then the power unit is shut down due to a DC link undervoltage condition (F30003). Also see p0278.
r0297	DC link voltage, overvoltage threshold	-	-	x	x	If the DC link voltage exceeds the threshold specified here, then the system is shut down due to a DC link overvoltage condition (F30002).

5 Motor

5.1 p0300 to p0396 hardware data

Note

valid for all p03xx[n]:
 Up to FW V3.2: [0] ..[2] = max.3 data sets (DDS0/1/2),
 from FW V4.3.2 max. 4 data sets [0] ..[3]

Table 5-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0300	Motor type selection	[3]	[3]	[4]	[4]	MM440 and V3.2 [1] Induction motor, rotary [2] Synchronous motor, rotary FW V4.3.2 and FW V4.4 [0] No motor [1] Induction motor (rotary) [2] Synchronous motor (rotary, permanent-magnet) [17] 1LA7 standard induction motor [204] 1LE4 synchronous motor
p0301	Motor code number selection	-	-	[4]	[4]	From FW V4.3.2: The parameter is used to select a motor from the motor parameter list.

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0304	Rated motor voltage	[3]	[3]	[4]	[4]	MM440: The default value depends on the converter type and its rated values, table, refer to the List Manual. From FW V4.3.2: After the Control Unit powers up for the first time, or the factory setting is set, the parameters are pre-assigned to match the power unit.
p0305	Rated motor current	[3]	[3]	[4]	[4]	Sets the rated motor current (rating plate).
p0307	Rated motor power	[3]	[3]	[4]	[4]	Sets the rated motor power (rating plate).
p0308	Rated motor power factor	[3]	[3]	[4]	[4]	Sets the rated motor power factor (cos phi, rating plate).
p0309	Rated motor efficiency, drive data set 0 (DDS0)	[3]	[3]	[4]	[4]	FW V4.3.2 Parameter cannot be changed (access level, "factory"). From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list". FW V4.4: The parameter is not used for synchronous motors.
p0310	Rated motor frequency	[3]	[3]	[4]	[4]	Sets the rated motor frequency (rating plate).
p0311	Rated motor speed	[3]	[3]	[4]	[4]	Sets the rated motor speed (rating plate).
r0313	Actual motor pole pair number (or calculated)	[3]	[3]	[4]	[4]	Displays the number of motor pole pairs.

5 Motor

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0314	Motor pole pair number	[3]	[3]	[4]	[4]	Sets the motor pole pair number.
p0316	Motor torque constant	-	-	[4]	[4]	From FW V4.3.1 and higher Sets the torque constant of the synchronous motor. [0] The torque constant is calculated from the motor data. > [0] The set value is used as torque constant. Also see r0334 "Motor torque constant actual". When selecting a list/catalog motor (p0301) this parameter is automatically pre-assigned and is write protected. For induction motors (p0300 = 1xx) the parameter is not used.
p0318	Motor stall (standstill) current	-	-	[4]	[4]	From FW V4.3.1 and higher Sets the stall current for synchronous motors (p0300 = 2xx). The parameter is used for the I2t monitoring of the motor (see p0611). The parameter is not used for induction motors.
p0320	Rated motor magnetizing current/short-circuit current	[3]	[3]	[4]	[4]	Induction motors: Sets the rated motor magnetizing current. Synchronous motors: Sets the rated motor short-circuit current. Up to FW V3.2: in [%] From FW V4.3.1 and higher in [Arms]
p0322	Motor maximum speed	-	-	[4]	[4]	If p0322 is changed as part of the quick commissioning (p0010 [1]), then the maximum speed p1082, which also belongs to the quick commissioning routine, is appropriately pre-assigned.

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0323	Motor maximum current	-	-	[4]	[4]	Sets the maximum permissible motor current, e.g. the demagnetizing current for a synchronous motor. If p0323 is changed as part of the quick commissioning (p0010 [1]), then the maximum current p0640 is appropriately pre-assigned. The parameter has no effect for induction motors.
p0325	Motor rotor position identification current 1st phase	-	-	[4]	[4]	Current value for the 1st phase of the two-stage technique to identify the rotor position The value is automatically pre-assigned for the following events: <ul style="list-style-type: none"> For p0325 = 0, and automatic calculation of the control parameters (p0340 = 1, 2, 3). For the quick commissioning (p3900 = 1, 2, 3). The current in the 2nd phase is set in p0329.
p0326	Motor stall torque correction factor	-	-	[4]	[4]	Sets the correction factor for the stall torque for a DC link voltage of 600 V. When exiting quick commissioning, the parameter is reset with p3900 > 0, if a list motor (see p0300) has not been set.
p0327	Motor load angle, optimum	-	-	[4]	[4]	Sets the optimum load angle for synchronous motors with reluctance torque. For synchronous motors without reluctance torque, an angle of 90 degrees must be set. When exiting quick commissioning, the parameter is reset with p3900 > 0, if a list motor (see p0300) has not been set. The parameter has no significance for induction motors.

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0328	Motor reluctance torque constant	-	-	[4]	[4]	Sets the reluctance torque constant for synchronous motors with reluctance torque (e.g. 1FE ...motors). For synchronous motors without reluctance torque, a value of 0 must be set. The parameter has no significance for induction motors.
p0329	Motor rotor position identification, current	-	-	[4]	[4]	Sets the current for the rotor position identification For a two-stage technique, the current for the 2nd phase is set here. Dependency: p0325, p1980, r1984, r1985, r1987.
r0330	Motor rated slip	[3]	[3]	[4]	[4]	Displays the motor rated slip. Up to FW V3.2 as a % From FW V4.3.2 in Hz.
r0331	Actual motor magnetizing current/short-circuit current	[3]	[3]	[4]	[4]	Displays the rated power factor for induction motors. For synchronous motors (p0300 = 2xx) the parameter is not used.
r0332	Rated motor power factor	[3]	[3]	[4]	[4]	Displays the rated power factor for induction motors.
r0333	Motor rated torque	[3]	[3]	[4]	[4]	Displays the motor rated torque.
r0334	Actual motor torque constant	-	-	[4]	[4]	Displays the torque constant of the synchronous motor used. For synchronous motors, parameter r0334 is calculated from p0305, p0307 and p0311. For induction motors (p0300 = 1xx) the parameter is not used. From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0335	Motor cooling type	[3]	[3]	[4]	[4]	Up to FW V3.2 [0] Self-ventilated: Fan mounted on the motor shaft [1] Force ventilated: The fan is separately driven [2] Self-ventilated and internal fan [3] Force ventilated and internal fan From FW V4.3.2 and higher [0] Natural cooling [1] Force-ventilated [2] Liquid cooling [128] No fan
p0337	Motor rated EMF	-	-	[4]	[4]	Displays the rated motor EMF From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0340	Automatic calculation of the motor/control parameters	[3]	[3]	[4]	[4]	Up to FW V3.2 [0] No calculation [1] Complete parameterization [2] Calculate equivalent circuit diagram data [3] Calculate V/f and vector control [4] Calculate controller setting From FW V4.3.2 and higher [0] No calculation [1] Complete calculation [2] Calculate equivalent circuit diagram parameters [3] Calculate closed-loop control parameters [4] Calculate closed-loop control parameters [5] Calculate technological limits and threshold values

5 Motor

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0341	Motor moment of inertia	[3]	[3]	[4]	[4]	Sets the moment motor of inertia (without load).
p0342	Moment of inertia, ratio of total moment of inertia to the motor	[3]	[3]	[4]	[4]	Sets the ratio between the total moment of inertia (load + motor) and just the motor moment of inertia (without load).
p0343	Rated motor current identified	-	-	[4]	[4]	Displays the identified rated motor current. From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0344	Motor mass (for the thermal motor model)	[3]	[3]	[4]	[4]	From FW4.3.2 and higher When selecting a list/catalog motor (p0301) this parameter is automatically pre-assigned and is write protected. For synchronous motors (p0300 = 2xx) the parameter is not used.
r0345	Motor rated starting time	[3]	[3]	[4]	[4]	Displays the motor rated starting time. This time corresponds to the time from standstill up to reaching the rated motor speed and acceleration with the rated motor torque (r0333).
p0346	Motor excitation time / magnetizing time	[3]	[3]	[4]	[4]	Sets the motor excitation time. Different factory settings of the firmware versions.
p0347	Motor de-excitation time/demagnetization time	[3]	[3]	[4]	[4]	The default value depends on the converter type and its rated values.

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0350	Motor stator resistance, cold	[3]	[3]	[4]	[4]	<p>Up to FW V3.2: The stator resistance value also includes the cable resistance.</p> <p>From FW V4.3.2 and higher The motor identification determines the stator resistance from the total stator resistance minus the cable resistance (p0352). When selecting a list/catalog motor (p0301) this parameter is automatically pre-assigned and is write protected.</p>
p0352	Cable resistance	[3]	[3]	[4]	[4]	<p>The cable resistance should be entered before the motor data identification. See p0350.</p>
p0354	Motor rotor resistance, cold	[3]	[3]	[4]	[4]	<p>MM440 Parameter is not displayed in the expert list, however it can be called via the "user-defined parameter list".</p> <p>From FW V4.3.2 and higher When selecting a list/catalog motor (p0301) this parameter is automatically pre-assigned and is write protected. For synchronous motors (p0300 = 2xx) the parameter is not used.</p>

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0356	Motor stator leakage inductance	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the expert list. The parameter can be called via the "user-defined parameter list". From FW4.3.2 When selecting a list motor (p0301), this parameter is automatically pre-assigned, and is write protected.
p0357	Motor stator inductance (d-axis)	-	-	[4]	[4]	Induction motor: Sets the stator leakage inductance of the motor Synchronous motor: sets the stator quadrature inductance of the motor Sets the stator direct-axis inductance of the synchronous motor. The parameter value is automatically calculated using the motor model (p0340 = [1], [2]) or determined via the motor identification (p1910). Also see r0378
p0358	Motor rotor leakage inductance	[3]	[3]	[4]	[4]	The value is automatically calculated or determined using the motor data identification (p1910). MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0360	Motor magnetizing inductance	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0362	Motor saturation characteristic, flux 1	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0363	Motor saturation characteristic, flux 2	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0364	Motor saturation characteristic, flux 3	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0365	Motor saturation characteristic, flux 4	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0366	Motor saturation characteristic, I_mag 1	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0367	Motor saturation characteristic, I_mag 2	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0368	Motor saturation characteristic, I_mag 3	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0369	Motor saturation characteristic, I_mag 4	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0370	Motor stator resistance, cold	[3]	[3]	[4]	[4]	<p>MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p> <p>Up to FW V3.2 Display value in [%] for the ambient temperature.</p> <p>From FWV4.3.2 and higher Display value in [Ohm], for ambient temperature.</p>
r0372	Cable resistance	[3]	[3]	[4]	[4]	<p>MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p> <p>Up to FW V3.2 Display value in [%].</p> <p>From FWV4.3.2 and higher Display value in [Ohm].</p>
r0373	Motor rated stator resistance	[3]	[3]	[4]	[4]	<p>MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p> <p>Up to FW V3.2 Display value in [%] for the ambient temperature / overtemperature.</p> <p>From FWV4.3.2 and higher Display value in [Ohm], for overtemperature.</p>

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0374	Motor rotor resistance, cold	[3]	[3]	[4]	[4]	<p>MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p> <p>Up to FW V3.2 Display value in [%] for the ambient temperature.</p> <p>From FWV4.3.2 and higher Display value in [Ohm], for ambient temperature.</p>
r0376	Motor rated rotor resistance	[3]	[3]	[4]	[4]	<p>MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p> <p>Up to FW V3.2 Display value in [%] for the ambient temperature / overtemperature.</p> <p>From FWV4.3.2 and higher Display value in [Ohm], for ambient temperature.</p>
r0377	Motor leakage inductance, total	[3]	[3]	[4]	[4]	<p>MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p> <p>Up to FW V3.2. Display value in [%]</p> <p>From FW4.3.2. display value in [mH]</p>

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0378	Motor stator inductance (d-axis)	-	-	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list". Up to FW V3.2. Display value in [%] From FW4.3.2 and higher. Display value in [mH] Also see p0357, stator direct axis inductance.
r0382	Motor magnetizing inductance, transformed	[3]	[3]	[4]	[4]	MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list". Up to FW V3.2. Display value in [%] From FW4.3.2 and higher. Display value in [mH]
r0384	Motor rotor time constant / damping time constant, d axis	[3]	[3]	[4]	[4]	Rotor time constant, the parameter is not used for synchronous motors.
r0386	Motor stator leakage time constant / total leakage time constant	[3]	[3]	[4]	[4]	Motor stator leakage time constant / total leakage time constant Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0394	CO: Stator resistance IGBT [%]	x	x	-	-	CO: Stator resistance IGBT [%] From FW4.3.2 and higher, eliminated. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0395	Stator resistance, actual	x	x	[4]	[4]	Up to FW V3.2. Display value in [%], temperature-dependent From FW V4.3.2 and higher Display value in [Ohm], temperature-dependent
r0396	Rotor resistance, actual	x	x	[4]	[4]	Up to FW V3.2. Display value in [%] From FW V4.3.2 and higher Display value in [Ohm].

6 Interfaces, speed encoders

6.1 p0400 to p0494 speed encoders

6.1.1 Important functional restrictions for converters with speed encoders

The CU250S-2 module is being prepared to migrate converters from the MICROMASTER 440 and SINAMICS G120 family with FW V3.x and speed encoder. Until this module is available, it is recommended that the migration is made to SINAMICS S110 with CU305 and FW V4.4. Also see article ID:57106848

One option of directly monitoring the speed of the motor or the velocity of the driven machine is the "Measuring probe" function available from FW4.3.2.

Table 6-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0400	Selecting the encoder type	[3]	[3]	-	-	Selects the encoder type (single-track/2-track encoder).
r0403	CO/BO: Encoder status word	x	x	-	-	Displays the encoder status word (in the bit format).
p0405	Enables the pulse types to be selected	-	[3]	-	-	Enables the different pulse types to be selected.
p0408	Number of encoder pulses per revolution	[3]	[3]	-	-	Specifies the number of encoder pulses per revolution.
p0410	Reverses the internal direction of rotation	-	[3]	-	-	Inverts the internal direction of rotation of the encoder signal.
r0485	CO: Encoder counter state	-	x	-	-	Represents the internal counter state of the encoder pulses.
p0491	Speed loss response	[3]	[3]	-	-	Defines the speed loss response.
p0492	Permissible speed difference	[3]	[3]	-	-	Is used for loss of encoder detection at low and high speeds.
p0494	Delay time for loss of speed response	[3]	[3]	-	-	Is used for loss of encoder detection at low and high speeds.

7 Technology and units

7.1 Changes and expansions to the measuring probe for monitoring functions

p0580 measuring probe input terminal

p3230 load monitoring speed actual value

p3232 load monitoring failure detection

The measuring probe function is available from FW V4.3.2.

This can be used to directly monitor the speed of the motor or the velocity of the driven machine. A signal transmitter, e.g. a proximity switch is required for this monitoring function. The converter evaluates the signal via a digital input.

Using the signal transmitter, monitoring load failure or monitoring speed deviation functions can be parameterized using p3230 and p3232.

The parameterization is described in the Operating Instructions SINAMICS G120 Frequency Converters with the Control Units CU240B-2 and CU240E-2 Article ID:[50815575](#).

[Monitoring the load torque](#)

[Monitoring the speed using a digital input](#)

7.2 p0490 to p0596 measuring probe, technology and units

Table 7-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0490	Invert measuring probe	-	-	x	x	Setting to invert the digital input signals of the measuring probe.
p0500	Technological application	x	x	x	x	<p>Dependencies, see p0205</p> <p>MM440 [0] Const. Torque [1] Pumps and fans [3] Basic positioning</p> <p>FW V3.2 [0] High overload [1] Pumps and fans</p> <p>FW V4.3.2 [0] Standard drive [1] Pumps and fans [2] Encoderless control down to f = 0 [3] Pumps and fans, efficiency optimization</p> <p>FW V4.4 [0] Standard drive [1] Pumps and fans [2] Encoderless control down to f = 0 [3] Pumps and fans, efficiency optimization</p>

7 Technology and units

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0505	Selection of system of units	-	-	-	x	From FW V4.4 and higher For parameters with units that can be switched over, for "Unit group" and "Unit selection" it is specified as to which group this parameter belongs, and with which parameter the unit can be switched over.
p0573	Inhibit automatic reference value calculation	-	-	x	x	From FW4.3.2 and higher Inhibit to calculate the reference parameters (e.g. p2000) fully automatic calculation of motor and control parameters (p0340, p3900).
p0580	Measuring probe, input terminal	-	-	x	x	Sets the input terminal for the measuring probe for speed actual value measurement.
p0581	Measuring probe, signal edge	-	-	x	x	Sets the signal edge to evaluate the measuring probe signal for speed actual value measurement.
p0582	Measuring probe, pulses per revolution	-	-	x	x	Sets the number of pulses per revolution (e.g. for indexing disks)
p0583	Measuring probe, maximum measuring time	-	-	x	x	Sets the maximum measuring time for the measuring probe.
p0585	Measuring probe, gearbox ratio	-	-	x	x	Sets the BERO gearbox ratio.
r0586	CO: Measuring probe, speed actual value	-	-	x	x	Displays the measured speed actual value.
r0587	CO: Measuring probe, measuring time measured	-	-	x	x	Displays the time between the last two BERO pulses.
r0588	CO: Measuring probe, pulse counter	-	-	-	x	Displays the number of measuring pulses that have occurred.
r0589	Measuring probe, wait time	-	-	-	x	Displays the time since the last measuring pulse was to detected.

7 Technology and units

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0595	Selects the technological unit	-	-	-	x	From FW V4.4 and higher For parameters with units that can be switched over, for "Unit group" and "Unit selection" it is specified as to which group this parameter belongs, and with which parameter the unit can be switched over.
p0596	Reference quantity, technological unit	-	-	-	x	From FW V4.4 and higher For parameters with units that can be switched over, for "Unit group" and "Unit selection" it is specified as to which group this parameter belongs, and with which parameter the unit can be switched over.

8 Thermal motor monitoring

8.1 p0600 to p0651 thermal motor monitoring, motor model, maximum current

8.1.1 Changes and expansions to p0650, actual operating hours counter

From FW V4.4 and higher, using p0650, the actual operating hours can be detected and read out.

After a maintenance interval, which can be set, alarm A1590 is output.

The maintenance interval is parameterized using p0651.

Table 8-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0601	Motor temperature sensor, sensor type	[3]	[3]	[4]	[4]	Possible settings: MM440 [0] No sensor [1] PTC thermistor (PTC) [2] KTY84 FW V3.2 [0] No sensor [1] PTC thermistor [2] KTY84 [4] ThermoClick sensor FW V4.3.2 [0] No sensor [1] PTC alarm & timer [2] KTY84 [4] Bimetallic NC contact alarm & timer

8 Thermal motor monitoring

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
						FW V4.4 [0] No sensor [1] PTC alarm & timer [2] KTY84 [4] Bimetallic NC contact alarm & timer
p0604	Motor temperature alarm threshold	[3]	[3]	[4]	[4]	Sets the alarm threshold for the motor temperature monitoring.
p0605	Motor temperature, fault threshold	-	-	[4]	[4]	Up to FW V3.2 The fault threshold is permanently set to 10% above the alarm threshold in p0604 From FW V4.3.2 and higher Variable setting of the fault threshold, motor temperature monitoring. Factory setting is 130.0 [°C]
p0606	Motor temperature timer	-	-	[4]	[4]	From FW V4.3.2 and higher Sets the timer for the alarm threshold, motor temperature monitoring. This timer is started when the temperature alarm threshold (p0604) is exceeded. If the timer has expired, and the temperature has not fallen below the temperature alarm threshold, then fault F07011 is output. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

8 Thermal motor monitoring

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0607	Temperature sensor fault, timer	-	-	[4]	[4]	<p>From FW V4.3.2 and higher</p> <p>Sets the timer between the output of alarm and fault for a temperature sensor fault.</p> <p>This timer is started if a sensor fault is present.</p> <p>If the timer has expired, and the sensor fault is still present, then an appropriate fault is signaled.</p> <p>Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p>
p0610	Motor overtemperature response	[3]	[3]	[4]	[4]	<p>Sets the response when the motor temperature alarm threshold is reached.</p>
p0611	I2t motor model, thermal time constant	-	-	[4]	[4]	<p>From FW V4.3.2 and higher</p> <p>Sets the winding time constant.</p> <p>The time constant specifies the time that it takes for the cold stator winding to reach 63 % of the continuous permissible winding temperature with the motor standstill current.</p> <p>The parameter is only used for synchronous motors (p0300 = 2xx).</p> <p>Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p>

8 Thermal motor monitoring

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0612	Thermal motor model configuration	-	-	[4]	[4]	<p>From FW V4.3.2 and higher</p> <p>Activating and deactivating the thermal motor model:</p> <ul style="list-style-type: none"> - activate the I2t motor model, yes/no - activate the motor temperature model, yes/no <p>For permanent magnet synchronous motors, activate the I2t motor model.</p> <p>For induction motors, activate the thermal motor temperature model.</p> <p>Dependency: r0034, p0611, p0615.</p>
p0615	I2t motor model, fault threshold	-	-	[4]	[4]	<p>From FW V4.3.2 and higher</p> <p>Sets the fault threshold for monitoring using the thermal I2t motor model.</p> <p>The parameter is only used for permanent magnet synchronous motors (p0300 = 2xx).</p>
p0620	Thermal adaptation, stator and rotor resistance.	-	-	[4]	[4]	<p>Sets the thermal adaptation of the stator/primary section resistance and rotor/secondary section resistance according to r0395 or r0396.</p> <p>Selects the adaptation of the resistances:</p> <ul style="list-style-type: none"> - none - at the thermal model - at the measured stator winding temperature. <p>Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p>

8 Thermal motor monitoring

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0621	Stator resistance identification after switching on again	-	[3]	[4]	[4]	Identification of the stator resistance each time the drive is switched on (pulse enable). Selects the identification: None // After switch on // Each time the drive is switched on. Identification only if the vector control is active (see p1300) and if a temperature sensor (KTY) is not connected.
p0622	Motor excitation/magnetizing time for Rs_ident after it has been switched on again	-	[3]	[4]	[4]	Sets the excitation time of the motor for the stator resistance identification after it has been switched on again. Dependency: p0621, r0623.
r623	Stator resistance of the Rs identification after having been switched on again	-	[3]	[4]	[4]	Displays the identified stator resistance according to the Rs identification after having been switched on again. Dependency: p0621, p0622. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0625	Motor ambient temperature	[3]	[3]	[4]	[4]	Defines the motor ambient temperature to calculate the motor temperature model.
p0626	Motor overtemperature, stator iron	[3]	[3]	[4]	[4]	Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0627	Motor overtemperature, stator winding	[3]	[3]	[4]	[4]	Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0628	Motor overtemperature, rotor winding	[3]	[3]	[4]	[4]	Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r630	Motor temperature model, ambient temperature	[3]	[3]	[4]	[4]	Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

8 Thermal motor monitoring

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r631	Motor temperature model, stator iron temperature	[3]	[3]	[4]	[4]	Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r632	Motor temperature model, stator winding temperature	[3]	[3]	[4]	[4]	Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r633	Motor temperature model, rotor temperature	[3]	[3]	[4]	[4]	Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0634	Q flux, flux constant unsaturated	-	-	[4]	[4]	The non-linear cross-coupled quadrature flux function is defined using 4 coefficients. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0635	Q flux, quadrature current constant unsaturated	-	-	[4]	[4]	The non-linear cross-coupled quadrature flux function is defined using 4 coefficients. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0636	Q flux, direct axis current constant unsaturated	-	-	[4]	[4]	The non-linear cross-coupled quadrature flux function is defined using 4 coefficients. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0637	Q flux, flux gradient saturated	-	-	[4]	[4]	The non-linear cross-coupled quadrature flux function is defined using 4 coefficients. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p0640	Current limit [A] / motor overload factor [%]	[3]	[3]	[4]	[4]	Up to FW V3.2 Motor overload factor [%]. From FW V4.3.2 and higher Current limit [A].

8 Thermal motor monitoring

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0641	CI: Variable current limit	-	-	[4]	[4]	Signal source for the variable current limit. The value is referred to p0640.
p0650	Actual motor operating hours	-	-	[4]	[4]	Operating hours display of the corresponding motor. [0] Operating hours counter deactivated.
p0651	Motor operating hours, maintenance interval	-	-	[4]	[4]	Sets the maintenance interval in hours for the corresponding motor. Dependency: p0650

9 Command sources and terminals of the Control Unit

9.1 p0700 to p0748 digital inputs and outputs

9.1.1 Changes to p0701 to p0713, digital inputs

The function assignment of digital inputs p0701 up to p0713 and enabling using the value 99 for the BICO interconnection is, from FW V4.4 and higher, no longer available. The enabling type was already changed in FW V4.3.2

Interconnection from FW V4.4 and higher is made in the basic commissioning using p0015. After the commissioning has been completed, the additionally required BICO interconnections can be adapted in the inputs/outputs screen form.

9.1.2 Changes and expanded functionality for r0720 and r0730, digital outputs

The parameter numbers to set the function of the digital outputs DO 0 to DO 2 has been shifted by one position.

FW V3.x r0720 = number of digital inputs
 r0730 = number of digital outputs
 p0731 to p0733 = function of the digital outputs DO 0 to DO 2

FW V4.x r0720 = number of inputs and outputs (indexed)
 r0730 = becomes p0730
 p0730 to p0732 = function of the digital outputs DO 0 to DO 2

MM440 Terminal designation is DO 1 to DO 3 (from FW V3.x: DO 0 to DO 2)

Table 9-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0700	Command source selection, command data set [0..n]	[3]	x	[4]	[4]	Different selection options for the command sources in the firmware versions. FW V4.4: By running the drive macro, selected using p0015, p700 is set.

9 Command sources and terminals of the Control Unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0701	Function of digital input 0, command data set [0..n]	[3]	[3]	[4]	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.
p0702	Function of digital input 1, command data set [0..n]	[3]	[3]	[4]	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.
p0703	Function of digital input 2, command data set [0..n]	[3]	[3]	[4]	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.
p0704	Function of digital input 3, command data set [0..n]	[3]	[3]	[4]	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.
p0705	Function of digital input 4, command data set [0..n]	[3]	[3]	[4]	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.
p0706	Function of digital input 5, command data set [0..n]	[3]	[3]	[4]	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.
p0707	Function of digital input 6, command data set [0..n]	[3]	[3]	-	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.

9 Command sources and terminals of the Control Unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0708	Function of digital input 7, command data set [0..n]	[3]	[3]	-	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.
p0709	Function of digital input 8, command data set [0..n]	-	[3]	-	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.
p0712	Analog / digital input 0, (AI0 / DI11) Command data set [0..n]	-	[3]	[4]	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.
p0713	Analog / digital input 1, (AI1 / DI12) Command data set [0..n]	-	[3]	[4]	-	FW V4.4: The function assignment of the digital inputs is no longer available, on this topic refer to 9.1.1 Changes to p0701 to p0713, digital inputs.
p0719	Selects command/setpoint source, command data set [0..n]	[3]	[3]	-	-	Using parameter P0719 it is possible to select the command or setpoint sources, without changing the BICO connections (contrary to P0700 / P1000). Eliminated from FW V4.3.2 and higher
r0720	Number of CU inputs and outputs	x	x	[5]	[5]	Up to FW V3.2 only number of digital inputs; number of digital outputs is in r0730 From FW V4.3.2 and higher indexed value for inputs and outputs.

9 Command sources and terminals of the Control Unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0721	CU digital inputs, terminal actual value	-	-	x	x	Display of the actual value at the digital inputs. This means that before switching over from the simulation mode (p0795.x [1]) to the terminal mode (p0795.x [0]), the actual input signal at terminal DI x can be checked.
r0722	CO/BO: CU digital inputs, status	.7	.12.	.11	.12	The length and significance of the bit fields of the parameter depends on the particular CU.
r0723	CO/BO: CU digital inputs, inverted status	-	-	.11	.12	Bit field, inverted Status display same as r0722
p0724	CU digital inputs, debounce time	x	x	x	x	Up to FW V3.2 four values can be selected for the debounce time, From FW V4.3.2 and higher Time in [ms]
p0725	Switchover PNP / NPN digital inputs	x	x	-	-	Switchover of the digital inputs between P-reading (PNP high-active) and N-reading (NPN low-active). Eliminated from FW V4.3.2 and higher the inverted input signals are available with r0723. The PNP / NPN connection of the digital inputs is defined using the wiring of the inputs
p0727	Selects the 2/3-wire method		[3]	-	-	From FW V4.4 and higher macros are available to set two or three-wire control p0015.
r0730	Number of digital outputs	x	x	-	-	From FW V4.3.2 and higher Displays the number of outputs in the indexed r0720.
p0730	BI: CU signal source for DO 0			x	x	Sets the signal source for terminal DO 0
p0731	BI: CU signal source for DO 0	[3]	[3]			Sets the signal source for terminal DO 0 (DO 1 for MM440)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0731	BI: CU signal source for DO 1			x	x	Sets the signal source for terminal DO 1
p0732	BI: CU signal source for DO 1	[3]	[3]			Sets the signal source for terminal DO 1 (DO 2 for MM440)
p0732	BI: CU signal source for DO 2			x	x	Sets the signal source for terminal DO 2
p0733	BI: CU signal source for DO 2	[3]	[3]	-	-	Sets the signal source for terminal DO 2 (DO 3 for MM440)
r0747	CU digital outputs, status	.2	.2	.2	.2	For CU240B-2 only DO 0, otherwise DO 0 up to 2.
p0748	Invert CU digital outputs	.2	.2	.2	.2	For CU240B-2 only DO 0, otherwise DO 0 up to 2.

9.2 p0750 to p0798, analog inputs and outputs

9.2.1 Changes and expansions to p0761, wire breakage and dead zone for analog inputs

Up to FW V3.2, using p0761 analog values around 0V were suppressed.

From FW4.3.2 and higher, p0761 is used to set the response threshold for the wire breakage monitoring of the analog inputs, and is only valid for analog inputs +2 V ... +10 V and +4 mA ... +20 mA.

The function to suppress analog values can be implemented using free function blocks (FFB).

The scope and functions of FFB have been significantly expanded (Chapter 2.21).

Also refer to article ID:[57021336](#).

FW V3.x p0761 = width of the AI dead zone.

FW V4.x p0761 = analog inputs wire breakage monitoring, response threshold.

9.2.2 Changes and expansions to p0795 up to p0798, simulation of the digital and analog inputs

FW V3.x p0795 up to p0798 are not available.

FW V4.x The analog and digital input signals can be simulated using parameters p0795 to p0798.

Table 9-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0750	Number of AD converters	x	x	-	-	Number of available analog inputs from FW V4.3.2 and higher in the indexed r0720.
r0751	BO: CU analog inputs status word	.15	.9	.9	.9	all versions Wire breakage display using bit 0 and 1 the same MM440 Display "no wire breakage" as bits 8 and 9 are not available Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r0752	CU analog inputs, actual input voltage/current	[2]	[2]	[2]	[2]	Analog value designation MM440 ADC1 and ADC2, in subsequent versions AI0 and AI1.
p0753	CU analog inputs smoothing time constant	[2]	[2]	[2]	[2]	Factory settings and data types are different.
r0754	AI value after scaling [%]	[2]	[2]	-	-	Up to FW V3.2: Smoothed value of the analog input in [%] after scaling.

9 Command sources and terminals of the Control Unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0755	CU analog inputs, actual value in [%]	[2]	[2]	[2]	[2]	Value is used as input for the analog BICO connectors. Up to FW V3.2: Different scalings of r0754 and r0755.
p0756	CU analog inputs, type	[2]	[2]	[2]	[2]	From FW V4.3.2: Additional selection value "8" for "no encoder connected". Factory setting changed from 0..10V to -10..+10V. Both analog inputs can be set to -10..+10V.
p0757	CU analog inputs Characteristic, value x1	[2]	[2]	[2]	[2]	Sets the normalization characteristic for the analog inputs.
p0758	CU analog inputs Characteristic, value y1	[2]	[2]	[2]	[2]	Sets the normalization characteristic for the analog inputs.
p0759	CU analog inputs Characteristic, value x2	[2]	[2]	[2]	[2]	Sets the normalization characteristic for the analog inputs.
p0760	CU analog inputs Characteristic, value y2,	[2]	[2]	[2]	[2]	Sets the normalization characteristic for the analog inputs.
p0761	Width of the AI dead zone. or CU analog inputs wire breakage monitoring, response threshold.	[2]	[2]	[2]	[2]	From FW V4.3.2 and higher modified function of the parameter, parameterization of the wire breakage monitoring, see 9.2.1
p0762	CU analog inputs wire breakage monitoring, delay time	[2]	[2]	[2]	[2]	Factory settings are different 10ms / 100ms

9 Command sources and terminals of the Control Unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0770	Number of AO	x	x	-	-	Number of available analog outputs From FW V4.3.2 and higher in the indexed r0720.
p0771	CI: CU analog output signal source	[2]	[2]	[2]	[2]	Selects the signal source Factory setting for the 2nd analog value changed.
r0772	CU analog outputs, actual output value in [%]	-	-	[2]	[2]	Displays the actual referred output value of the analog outputs.
p0773	CU analog outputs, smoothing time constant	[2]	[2]	[2]	[2]	Factory settings and data types are different.
r0774	CU analog outputs, actual output voltage/current	[2]	[2]	[2]	[2]	MM44040 Analog output value in [mA] from FW V3.2 and higher in [V] or [mA] depending on the default setting using p0776.
p0775	CU analog outputs, activate absolute value generation	[2]	[2]	[2]	[2]	Selects whether the absolute value of the analog output is used.
p0776	CU analog outputs, type	[2]	[2]	[2]	[2]	From FW V4.3.2 and higher Additional setting value [2] for the current output +4 mA ... +20 mA
p0777	CU analog outputs Characteristic, value x1	[2]	[2]	[2]	[2]	Sets the normalization characteristic for the analog outputs.
p0778	CU analog outputs Characteristic, value y1	[2]	[2]	[2]	[2]	Sets the normalization characteristic for the analog outputs.
p0779	CU analog outputs Characteristic, value x2	[2]	[2]	[2]	[2]	Sets the normalization characteristic for the analog outputs.
p0780	CU analog outputs Characteristic, value y2	[2]	[2]	[2]	[2]	Sets the normalization characteristic for the analog outputs.

9 Command sources and terminals of the Control Unit

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0781	Width of the AO dead zone	[2]	[2]	-	-	From FW V4.3.2 and higher Set using p0776 [2].
p0782	BI: CU analog outputs, invert signal source	-	-	[2]	[2]	Sets the signal source to invert the analog output signals.
r0785	BO: CU analog outputs status word	.1	.1	.1	.1	Displays the status of the analog outputs, value is either positive or negative.
p0795	CU digital inputs, simulation mode	-	-	.12	.12	Selects the simulation mode and sets the setpoint for the digital input signals in the simulation mode.
p0796	CU digital inputs, simulation mode setpoint	-	-	.12	.12	Selects the simulation mode and sets the setpoint for the digital input signals in the simulation mode.
p0797	CU analog inputs simulation mode	-	-	[2]	[2]	Selects the simulation mode and sets the setpoint for the analog input signals in the simulation mode.
p0798	CU analog inputs simulation mode setpoint	-	-	[2]	[2]	Selects the simulation mode and sets the setpoint for the analog input signals in the simulation mode.

10 Sequence control, command and drive data sets

10.1 p0800 to p0837 CDS, DDS data sets (e.g. switching over, copying)

Table 10-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0800	Bl: Load parameter set 0	[3]	[3]	-	-	Determines the command source for the start of the load operation of parameter set 0 from the connected AOP.
p0801	Bl: Load parameter set 1	[3]	[3]	-	-	Determines the command source for the start of the load operation of parameter set 1 from the connected AOP.
p0802	Data transfer, memory card as source/target	-	x	x	x	Data transfer of a parameter backup from/to the device memory. Different setting values for the firmware versions.
p0803	Data transfer, device memory as source/target	-	x	x	x	Data transfer of a parameter backup from/to the device memory. Different setting values for the firmware versions.
p0804	Start of data transfer	-	x	x	x	Data transfer of a parameter backup from/to the device memory. Different setting values for the firmware versions.
p0806	Bl: Inhibit master control	-	x	x	x	Sets the signal source to inhibit the master control.
r0807	BO: Master control active	-	.0	.0	.0	Displays which device has the master control. Master control for PC/OP or BICO interconnection active
p0809	Copy command data set CDS, source/target/start	[3]	[3]	[3]	[3]	Copy one command data set into another.
p0810	Bl: Command data set selection CDS bit 0	x	x	x	x	Sets the signal source to select the command data set, bit 0
p0811	Bl: Command data set selection CDS bit 1	x	x	x	x	Sets the signal source to select the command data set, bit 1
p0819	Copy drive data set DDS,	[3]	[3]	[3]	[3]	Copy one drive data set into another.

10 Sequence control, command and drive data sets

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
	source/target/start					
p0820	BI: Drive data set selection DDS bit 0	x	x	[4]	[4]	Sets the signal source to select the drive data set, bit 0 From FW V4.3.2, indexed for DDS 0...3.
p0821	BI: Drive data set selection DDS bit 1	x	x	[4]	[4]	Sets the signal source to select the drive data set, bit 1 From FW V4.3.2, indexed for DDS 0...3.
p0826	Motor changeover, motor number	-	-	[4]	[4]	Sets a freely selectable motor number for the drive data set changeover. If the motor is changed over at the same time as the drive data set, then different motor numbers must be used.
r0835	CO/BO: Data set changeover status word	-	-	.8	.8	Displays the status word for the drive data set changeover.
r0836	CO/BO: Command data set CDS selected	-	-	.1	.1	Displays the command data set selected via binector input.
r0837	CO/BO: Drive data set DDS selected	-	-	.1	.1	Displays the drive data set selected via binector input.

10.2 p0840 to 0858 sequence control (e.g. source for ON/OFF1)

10.2.1 Changes and expansions to p0842, sequence control ON/OFF1 with reversing

FW V3.x p0842 = ON reverse/OFF1

For a positive frequency setpoint, the drive is started counterclockwise.

FW V4.3.2 p0842 is no longer available

Table 10-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0840	BI: ON/OFF (OFF1)	[3]	[3]	[4]	[4]	Sets the signal source for the command "ON/OFF1".
p0842	BI: ON reverse/OFF1	[3]	[3]	-	-	For a positive frequency setpoint, the drive is started counterclockwise. Eliminated from FW V4.3.2 and higher
p0844	BI: No coast down/coast down (OFF2) signal source 1	[3]	[3]	[4]	[4]	The factory settings differ, also between CU_types within a FW version.
p0845	BI: No coast down/coast down (OFF2) signal source 2	[3]	[3]	[4]	[4]	The factory settings differ, also between CU_types within a FW version.
p0848	BI: No fast stop/fast stop (OFF3) signal source 1	[3]	[3]	[4]	[4]	The factory settings differ, also between CU_types within a FW version.
p0849	BI: No fast stop/fast stop (OFF3) signal source 2	[3]	[3]	[4]	[4]	The factory settings differ, also between CU_types within a FW version.
p0852	BI: Enable operation/inhibit operation/pulse enable	[4]	[4]	[4]	[4]	The factory settings differ, also between CU_types within a FW version.
p0854	BI: Control by the PLC/no control by the PLC	-	-	[4]	[4]	Sets the signal source for the command "Control by PLC", corresponds to control word 1, bit 10.
p0855	BI: Unconditionally open holding brake	-	-	[4]	[4]	Sets the signal source for the command "Unconditionally open holding brake". Also see p0858.

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0856	BI: Enable speed controller	-	-	[4]	[4]	Sets the signal source for the command "Enable speed controller" (r0898.12).
p0857	Power unit monitoring time	-	-	x	x	Sets the monitoring time for the power unit. Also see Fault F07802.
p0858	BI: Unconditionally close holding brake	-	-	[4]	[4]	Sets the signal source for the command "Unconditionally close holding brake". Also see p0855.

10.3 p0880 to p0899 control and status words

Table 10-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0897	BI: Parking axis selection	-	-	x	x	Sets the signal source to select the "parking axis" function.
p0898	CO/BO: Control word, sequence control	-	-	.14	.14	Displays the control word of the sequence control.
p0899	CO/BO: Status word sequence control	-	-	.13	.13	Displays the status word of the sequence control. These signals are used for status word 1 for PROFIdrive.

11 PROFIBUS / PROFIdrive

11.1 p0900 to p0999 PROFIBUS / PROFIdrive

Table 11-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p0918	PROFIBUS address	x	x	x	x	Displays the setting of the PROFIBUS address for the PROFIBUS interface on the Control Unit. Permissible PROFIBUS addresses: 1 ... 125, From FW4.3.2 and higher additionally, 126 as address for commissioning.
p0922	PROFIdrive telegram selection	-	x	x	x	Using this parameter, the type of standard telegram is selected, and the associated BICO links are frozen during the standard telegram.
p0927	Parameter can be changed via interface	.3	.3			Parameter can be changed via: Profibus/CB BOP USS connected to BOP USS connected to COM-Link
r0944	CO: Fault buffer changes counter	-	x	x	x	Displays the fault buffer changes. This counter is incremented each time the fault buffer changes.
r0945	Fault code	-	-	[64]	[64]	Identical with r0947.
r0946	Fault code list	-	-	[n]	[n]	List of the fault codes available in the drive unit. The indices can only be accessed using a valid fault code. Index [0...65534].

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0947	Fault number/last fault message	[8]	[64]	[64]	[64]	Message memory indicates the fault history (fault numbers). See also r0945.
r0948	Fault time coming/fault time	[12]	[64]	[64]	[64]	Time stamp when the fault occurred. Dimensioning Up to FW V3.2 Time differs depending on the source of the time stamp (r2114 or p2115). Data types are U16 or U32. From FW V4.3.2 and higher Displays the system runtime in milliseconds when the fault actually occurred. With r2109, the value "fault time resolved" is also available.
r0949	Fault value	[8]	[64]	[64]	[64]	Supplementary information, fault value: The data type is U16, from FW V3.2 and higher U32. Values are not documented, for service purposes.
p0952	Fault cases, counter	x	x	x	x	Number of faults that have occurred since the last reset.
r0963	PROFIBUS baud rate	-	-	x	x	Displays the baud rate for PROFIBUS.
r0964	Device identification/firmware version data	[5]	[7]	[7]	[7]	Displays the device identification: Device type, firmware version, firmware date, number of drive objects ...
r0965	PROFIdrive profile number	x	x	x	x	Displays the PROFIdrive profile number and profile version.
r0967	Control word 1	x	x	-	-	Also see r0054

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0968	Status word 1	x	x	-	-	Also see r0052
p0969	Relative system runtime	-	x	x	x	Displays the system runtime in milliseconds since the last POWER ON, this can be reset.
p0970	Reset drive parameters/factory setting	x	x	x	x	Different selection values to reset are available in the firmware versions.
p0971	Save parameters/load values from RAM into EEPROM	x	x	x	x	Setting to save the parameters in the non-volatile memory.
p0972	Drive device reset	-	-	x	x	Setting to execute a hardware reset for the drive unit.
r0975	DO identification	-	[11]	-	-	Identification of the drive object. Only for CU240S PN(-F).
r0980	List of the available parameter numbers/parameter 1	-	[100]	[300]	[300]	Displays the parameters available for this drive. FW V3.2: Contains 100 parameter numbers with indices 0-99.
r0981	List of the available parameter numbers/parameter 2	-	[100]	[300]	[300]	Displays the parameters available for this drive. FW V3.2: Contains 100 parameter numbers with indices 100-199.
r0982	List of the available parameter numbers	-	[100]	-	-	Contains 100 parameter numbers with indices 200-299.
r0983	List of the available parameter numbers	-	[100]	-	-	Contains 100 parameter numbers with indices 300-399.
r0984	List of the available parameter numbers	-	[100]	-	-	Contains 100 parameter numbers with indices 400-499.
r0985	List of the available parameter numbers	-	[100]	-	-	Contains 100 parameter numbers with indices 500-599.
r0986	List of the available parameter numbers	-	[100]	-	-	Contains 100 parameter numbers with indices 600-699.
r0987	List of the available parameter numbers	-	[100]	-	-	Contains 100 parameter numbers with indices 700-799.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r0988	List of the available parameter numbers	-	[100]	-	-	Contains 100 parameter numbers with indices 800-899.
r0989	List of the available parameter numbers/parameter 10	-	[100]	[300]	[300]	Displays the parameters available for this drive. FW V3.2: Contains 100 parameter numbers with indices 900-999.
r0990	List of modified parameters 1	-	-	[100]	[100]	Displays the parameters which have been changed with respect to the factory setting for this drive.
r0991	List of modified parameters 2	-	-	[100]	[100]	Displays the parameters which have been changed with respect to the factory setting for this drive.
r0999	List of modified parameters 10	-	-	[100]	[100]	Displays the parameters which have been changed with respect to the factory setting for this drive.

12 Setpoint channel

12.1 p1000 to p1028 macro, setpoint selection, fixed speed

Note

Setpoints are no longer parameterized and interpreted in Hz, but in rpm. This refers to standard and safety functions

Table 12-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1000	Speed setpoint selection / frequency setpoint source	[3]	[3]	[4]	[4]	Sets the source for the speed setpoint. Different setting options for various CU. From FW4.3.2 and higher: Parameter indexed for 4 command data sets CDS. Frequency or speed setpoints. Drive macro p0015 influences the selection.
p1001	CO: Fixed speed setpoint 1 / fixed frequency 1	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 1.
p1002	CO: Fixed speed setpoint 2 / fixed frequency 2	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 2
p1003	CO: Fixed speed setpoint 3 / fixed frequency 3	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 3
p1004	CO: Fixed speed setpoint 4 / fixed frequency 4	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 4
p1005	CO: Fixed speed setpoint 5 / fixed frequency 5	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 5
p1006	CO: Fixed speed setpoint 6 / fixed frequency 6	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 6

12 Setpoint channel

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1007	CO: Fixed speed setpoint 7 / fixed frequency 7	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 7
p1008	CO: Fixed speed setpoint 8 / fixed frequency 8	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 8
p1009	CO: Fixed speed setpoint 9 / fixed frequency 9	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 9
p1010	CO: Fixed speed setpoint 10 / fixed frequency 10	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 10
p1011	CO: Fixed speed setpoint 11 / fixed frequency 11	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 11
p1012	CO: Fixed speed setpoint 12 / fixed frequency 12	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 12
p1013	CO: Fixed speed setpoint 13 / fixed frequency 13	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 13
p1014	CO: Fixed speed setpoint 14 / fixed frequency 14	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 14
p1015	CO: Fixed speed setpoint 15 / fixed frequency 15	[3]	[3]	[4]	[4]	Sets the value for fixed frequency/speed setpoint 15
p1016	Fixed speed setpoint mode/fixed frequency mode - bit 0	[3]	[3]	[4]	[4]	Modified selection of the setpoint sources. For the differences, see the List Manuals
p1017	Fixed frequency mode - bit 1	[3]	-	-	-	Modified selection of the setpoint sources. For the differences, see the List Manuals
p1018	Fixed frequency mode - bit 2	[3]	-	-	-	Modified selection of the setpoint sources. For the differences, see the List Manuals
p1019	Fixed frequency mode - bit 3	[3]	-	-	-	Modified selection of the setpoint sources. For the differences, see the List Manuals
p1020	BI: Fixed speed setpoint/fixed frequency selection bit 0	[3]	[3]	[4]	[4]	Modified selection of the setpoint sources. For the differences, see the List Manuals

12 Setpoint channel

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1021	BI: Fixed speed setpoint/fixed frequency selection bit 1	[3]	[3]	[4]	[4]	Modified selection of the setpoint sources. For the differences, see the List Manuals
p1022	BI: Fixed speed setpoint/fixed frequency selection bit 2	[3]	[3]	[4]	[4]	Modified selection of the setpoint sources. For the differences, see the List Manuals
p1023	BI: Fixed speed setpoint/fixed frequency selection bit 3	[3]	[3]	[4]	[4]	Modified selection of the setpoint sources. For the differences, see the List Manuals
r1024	CO: Active fixed speed setpoint/actual fixed frequency	x	x	x	x	Displays the selected and active setpoint.
p1025	Fixed frequency mode - bit 4	[3]	-	-	-	Direct selection or direct selection + ON for bit 4
r1025	BO: Fixed speed setpoint, status BO: Fixed frequency status	-	.0	.0	.0	Displays the status, fixed setpoint selected yes/no.
p1026	BI: Fixed frequency selection, bit 4	[3]	-	-	-	Defines the source with which the fixed frequency is selected.
p1027	Fixed frequency mode - bit 5	[3]	-	-	-	Direct selection or direct selection + ON for bit 5
p1028	BI: Fixed frequency selection, bit 5	[3]	-	-	-	Defines the source with which the fixed frequency is selected.

12.2 p1030 to p1050 motorized potentiometer (MOP)

Table 12-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1030	Motorized potentiometer configuration	-	-	[4]	[4]	Setting the configuration: - Memory mode for MOP setpoint p1040 - Activating the ramp-function generator - Initial rounding.
p1031	MOP mode	[3]	[3]	-	-	Different selectable memory modes for the last MOP setpoint p1040.
p1032	Inhibiting the MOP for direction of rotation reversal	x	x	-	-	Inhibiting the selection of the direction of rotation setpoint for the MOP.
p1035	BI: Motorized potentiometer setpoint, raise	[3]	[3]	[4]	[4]	Sets the signal source to increase/decrease the setpoint for the motorized potentiometer. Different factory settings, also for CU types of a firmware release.
p1036	BI: Motorized potentiometer setpoint, lower	[3]	[3]	[4]	[4]	Sets the signal source to increase/decrease the setpoint for the motorized potentiometer. Different factory settings, also for CU types of a firmware release.
p1037	Motorized potentiometer, maximum speed	-	-	[4]	[4]	The setpoint output from the motorized potentiometer is limited to this value.
p1038	Motorized potentiometer, minimum speed	-	-	[4]	[4]	The setpoint output from the motorized potentiometer is limited to this value.
p1039	BI: Motorized potentiometer, inversion	-	-	[4]	[4]	Sets the signal source to input the minimum speed or the maximum speed for the motorized potentiometer.
p1040	Setpoint / starting value for the MOP	[3]	[3]	[4]	[4]	Different factory settings. Speed/frequency.

12 Setpoint channel

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1041	BI: Motorized potentiometer, manual/automatic	-	[3]	[4]	[4]	In the automatic mode, the setpoint must be interconnected via a connector input.
p1042	CI: Motorized potentiometer, automatic setpoint	-	[3]	[4]	[4]	Sets the signal source for switching over from the manual to automatic mode for the motorized potentiometer.
p1043	BI: Motorized potentiometer, accept setting value	-	[3]	[4]	[4]	Sets the signal source to accept the setpoint for the motorized potentiometer.
p1044	CI: Motorized potentiometer, setting value	-	[4]	[4]	[4]	Sets the signal source for the setting value for the motorized potentiometer.
r1045	CO: Motorized potentiometer, speed setpoint in front of the ramp-function generator	-	x	x	x	Displays the effective setpoint in front of the internal ramp-function generator of the motorized potentiometer. Speed/frequency.
p1047	Motorized potentiometer, ramp-up time	-	[3]	[4]	[4]	Within this time, the setpoint should change from zero up to the limit value defined in P1082.
p1048	Motorized potentiometer, ramp-down time	-	[3]	[4]	[4]	Within this time, the setpoint should change from the limit value defined in P1082 down to zero.
r1050	CO: Motorized potentiometer setpoint after the ramp-function generator	x	x	x	x	Actual output frequency/speed of the motorized potentiometer setpoint.

12.3 p1051 to p1114 setpoint selection, skip speed

Table 12-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1051	Cl: Speed limit, ramp function generator, positive direction of rotation			[4]	[4]	Sets the signal source for the speed limit of the positive direction at the ramp-function generator input.
p1052	Cl: Speed limit, ramp function generator, negative direction of rotation			[4]	[4]	Sets the signal source for the speed limit of the negative direction at the ramp-function generator input.
p1055	Bl: Jogging bit 0 / Bl: Selects JOG right	[3]	[3]	[4]	[4]	Enable jogging. ON/OFF1 via p0840 or via p1055 / p1056. MM440 Only active, if P0719 < 10. FW V3.2 Only active, if P0719 = 0.
p1056	Bl: Jogging bit 1 / Bl: Selects JOG left	[3]	[3]	[4]	[4]	Enable jogging. ON/OFF1 via p0840 or via p1055 / p1056. MM440 Only active, if P0719 < 10. FW V3.2 Only active, if P0719 = 0.
p1057	Enable JOG	-	p1057	-	-	As long as enable JOG is set to [0], the jog mode (p1056 and p1055) is inhibited.
p1058	Jogging 1 speed setpoint / JOG frequency right	[3]	[3]	[4]	[4]	Speed or frequency setpoint.

12 Setpoint channel

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1059	Jogging 2 speed setpoint / JOG frequency left	[3]	[3]	[4]	[4]	Speed or frequency setpoint.
p1060	JOG ramp-up time	[3]	[3]	-	-	This time is used in the jog mode.
p1061	JOG ramp-down time	[3]	[3]	-	-	This time is used in the jog mode.
p1063	Speed limit, setpoint channel	-	-	[0]	[0]	Sets the speed limit active in the setpoint channel.
p1070	CI: Select main setpoint	[3]	[3]	[4]	[4]	Setting the signal source for the main setpoint.
p1071	CI: Select main setpoint scaling	[3]	[3]	[4]	[4]	Setting the signal source to scale the main setpoint.
r1073	CO: Main setpoint active	-	-	x	x	Displaying the active main setpoint.
p1074	BI: Supplementary setpoint inhibit	[3]	[3]	-	-	Deactivates the supplementary setpoint (ZUSW).
p1075	CI: Select supplementary setpoint	[3]	[3]	[3]	[3]	Setting the signal source for the supplementary setpoint.
p1076	CI: Select supplementary setpoint scaling	[3]	[3]	[3]	[3]	Setting the signal source to scale the supplementary setpoint.
r1077	CO: Supplementary setpoint active	-	-	x	x	Displaying the active supplementary setpoint.
r1078	CO: Total setpoint active	r1078	r1078	r1078	r1078	Displaying the active total setpoint. Speed/frequency.
r1079	CO: Setpoint selection	r1079	r1079	-	-	The following frequency setpoints are displayed: r1078 total frequency setpoint P1058 JOG frequency right P1059 JOG frequency left Display depends on P1055/P1056 enable JOG right/left
p1080	Minimum frequency/minimum speed	[3]	[3]	[4]	[4]	Setting the lowest possible motor speed.
p1082	Maximum frequency/maximum speed	[3]	[3]	[4]	[4]	Sets the highest possible speed.

12 Setpoint channel

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1083	CO: Speed limit, positive direction of rotation			[4]	[4]	Setting the maximum speed for the positive direction.
r1084	CO: Speed limit positive active/resulting maximum frequency	x	x	x	x	Up to FW V3.2 Indicates the resulting maximum frequency. From FW V4.3.2 and higher Displays the active positive speed limit.
p1085	CI: Speed limit, positive direction of rotation	-	-	[4]	[4]	Sets the signal source for the speed limit of the positive direction.
p1086	CO: Speed limit, negative direction of rotation	-	-	[0]	[0]	Sets the speed limit for the negative direction.
r1087	CO: Speed limit, negative active	-	-	x	x	Displays the active negative speed limit.
p1088	CI: Speed limit, negative direction of rotation	-	-	[4]	[4]	Sets the signal source for the speed limit of the negative direction.
p1091	Skip speed 1/skip frequency 1	[3]	[3]	[4]	[4]	Sets the skip speeds or skip frequencies 1 to 4.
p1092	Skip speed 2/skip frequency 2	[3]	[3]	[4]	[4]	Sets the skip speeds or skip frequencies 1 to 4.
p1093	Skip speed 3/skip frequency 3	[3]	[3]	[4]	[4]	Sets the skip speeds or skip frequencies 1 to 4.
p1094	Skip speed 4/skip frequency 4	[3]	[3]	[4]	[4]	Sets the skip speeds or skip frequencies 1 to 4.
p1101	Skip speed bandwidth/bandwidth skip frequency	[3]	[3]	[4]	[4]	The setpoints are suppressed (skipped) in the range of the skip values +/-p1101. Dimensions, speed / frequency

12 Setpoint channel

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1108	BI: Total setpoint selection	-	-	[4]	[4]	Sets the signal source to select the total setpoint. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1109	CI: Total setpoint	-	-	[4]	[4]	Sets the signal source for the total setpoint. For p1108 [1], the total setpoint is read-in via p1109. For p2200 > [0] and p2251 [0] (technology control selected), the signal source of the total setpoint is automatically interconnected to the output of the technology controller (r2294). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1110	BI: Inhibit negative direction	[3]	[3]	[4]	[4]	Sets the signal source to inhibit the negative direction.
p1111	BI: Inhibit positive direction	-	-	[4]	[4]	Sets the signal source to inhibit the positive direction. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1112	CO: Speed setpoint after minimum limiting	-	-	x	x	Displays the speed setpoint after the minimum limiting. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1113	BI: Setpoint inversion	[3]	[3]	[4]	[4]	Sets the signal source to invert the setpoint.
r1114	CO: Setpoint after direction limiting [rpm] or [Hz]	x	x	x	x	Displays the setpoint after switchover and limiting the direction.

12.4 p1115 to p1199 ramp-function generator

Table 12-4

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1115	Ramp-function generator selection	-	-	x	x	Sets the ramp-function generator type: Basic ramp-function generator Extended ramp-function generator.
r1119	CO: Ramp-function generator setpoint at the input [rpm] or [Hz]	x	x	x	x	Displays the setpoint at the input of the ramp-function generator.
p1120	Ramp-function generator, ramp-up time	[3]	[3]	[4]	[4]	In this time, the ramp-function generator ramps-up the setpoint from standstill up to the maximum speed (p1082).
p1121	Ramp-function generator, ramp-down time	[3]	[3]	[4]	[4]	The factory settings differ: old 10s new 30s.
p1122	BI: Bypass ramp-function generator	-	-	[4]	[4]	Sets the signal source to bypass the ramp-function generator (ramp-up time and ramp-down time = 0). Note: If the technology controller is operated in the mode p2251 = 0 (technology controller as main speed setpoint), then it is not permissible to cancel the interconnection to its status word (r2349). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1123	Ramp-function generator, minimum ramp-up time	-	-	[4]	[4]	Sets the minimum ramp-up time. The ramp-up time (p1120) is internally set to this minimum time. When changing the maximum speed p1082, p1123 is recalculated. Parameter is not displayed in the Expert list. Parameter

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
						can be called via the "user-defined parameter list".
p1124	Enable JOG ramp times	[3]	[3]	-	-	Defined source for switchover between: JOG ramp times (P1060, P1061) Normal ramp times (P1120, P1121).
p1130	Ramp-function generator initial rounding time / ... Ramp-up	[3]	[3]	[4]	[4]	Time for the initial rounding. From FW V3.2 and higher Separate values apply for ramp-up and ramp-down.
p1131	Ramp-function generator, end rounding time / ... Ramp-up	[3]	[3]	[4]	[4]	Time for the initial rounding. From FW V3.2 and higher Separate values apply for ramp-up and ramp-down.
p1132	Initial rounding time, down ramp	[3]	[3]	-	-	From FW V4.3.2 and higher p1130 and p1131 apply for the ramp up and ramp down.
p1133	End rounding time, down ramp	[3]	[3]	-	-	From FW V4.3.2 and higher p1130 and p1131 apply for the ramp up and ramp down.
p1134	Ramp-function generator, rounding type	[3]	[3]	[4]	[4]	Sets the smoothing response to the OFF 1 command: Continuous/discontinuous smoothing.
p1135	OFF3 ramp-down time	[3]	[3]	[4]	[4]	The factory settings differ: 0 ... 30s.
p1136	OFF3 initial rounding time	-	-	[4]	[4]	Sets the initial rounding time for OFF3 for the extended ramp-function generator.
p1137	OFF3 end rounding time	-	-	[4]	[4]	Sets the end rounding time for OFF3 for the extended ramp-function generator.
p1140	BI: Enable ramp-function generator/inhibit ramp-function generator	[3]	[3]	[4]	[4]	Sets the signal source for the command "Enable ramp-function generator/inhibit ramp-function generator".

12 Setpoint channel

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1141	BI: Continue ramp-function generator/freeze ramp-function generator	[3]	[3]	[4]	[4]	Sets the signal source for the command "Continue ramp-function generator/freeze ramp-function generator".
p1142	BI: Enable setpoint/inhibit setpoint	[3]	[3]	[4]	[4]	Sets the signal source for the command "Enable setpoint/inhibit setpoint".
p1143	BI: Ramp-function generator accept setting value	-	-	[4]	[4]	Sets the signal source for accept the setting value for the ramp-function generator. The signal source for the setting value of the ramp-function generator is set via parameter. Also refer to: p1144.
p1144	CI: Ramp-function generator, setting value	-	-	[4]	[4]	Sets the signal source for the setting value for the ramp-function generator. The signal source for accepting the setting value is set via parameter. Also refer to: p1143
p1145	Ramp-function generator tracking intensity	-	-	[4]	[4]	Sets the ramp-function generator tracking. The ramp-function generator output value is tracked corresponding to the maximum possible drive acceleration.
p1148	Ramp-function generator tolerance for ramp-up and ramp-down active	-	-	[4]	[4]	Sets the tolerance value for the ramp-function generator status (ramp-up active, ramp-down active). If the ramp-function generator input does not change more than the entered tolerance time when compared to the output, then the state bits "ramp-up active" or "ramp-down active" are not influenced. Also refer to: r1199
r1149	CO: Ramp-function generator acceleration	-	-	x	x	Displays the ramp-function generator acceleration [1/s ²].

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1150	CO: Ramp-function generator speed setpoint at the output	-	-	x	x	Displays the setpoint at the output of the ramp-function generator. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1155	CI: Speed controller speed setpoint 1	-	-	[4]	[4]	Sets the signal source for speed setpoint 1 of the speed controller. The effectiveness of the setpoint depends on, e.g. STW1.4 and STW1.6. If the technology controller is activated, then it is not permissible that the parameter interconnection is disconnected. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1160	CI: Speed controller speed setpoint 2	-	-	[4]	[4]	Sets the signal source for speed setpoint 2 of the speed controller. Also refer to: p1155, r1170. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1169	CO: Speed controller speed setpoint 1 and 2	-	-	x	x	Displays the speed setpoint after adding speed setpoint 1 (p1155) and speed setpoint 2 (p1160). Also refer to: p1155, p1160. The value is only correctly displayed for r0899.2 = 1 (operation enabled). Also see r1170. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1170	CO: Speed controller, setpoint sum / CO: Setpoint after RFG	x	x	x	x	Displays the speed setpoint p1155 + p1160 or the total frequency setpoint after the ramp-function generator (RFG).

12 Setpoint channel

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1197	Fixed speed setpoint number, actual	-	-	x	x	Displays the number of the selected fixed speed-velocity setpoint. Also refer to: p1020, p1021, p1022, p1023. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1198	CO/BO: Control word setpoint channel	-	-	.15	.15	Displays the control word for the setpoint channel.
r1199	CO/BO: Ramp-function status word	-	-	.6	.6	Displays the status word for the ramp-function generator (RFG). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

13 Functions

13.1 p1200 to p1205 flying restart

Table 13-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1200	Flying restart mode	x	x	[4]	[4]	Up to FW V3.2 6 modes can be selected, one setting for all DDS. From FW V4.3.2 and higher 3 modes can be selected for each DDS.
p1201	BI: Flying restart enable signal source	-	-	[4]	[4]	Sets the signal source to enable the "flying restart" function.
p1202	Flying restart search current	[3]	[3]	[4]	[4]	Sets the search current for the "flying restart" function. From FW V4.3.2 and higher Extended setting range up to 400 % referred to the motor magnetizing current.
p1203	Flying restart, search speed factor	[3]	[3]	[4]	[4]	Sets the factor with which the output frequency changes during the flying restart operation. From FW V4.3.2 and higher Extended setting range up to 4000 %. Modified factory setting for PM230.
r1204	CO/BO: Flying restart V/f control status	.7	.7	.13	.13	Displays the status to check and monitor the states for flying restart with V/f control. Bit fields with different significance. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1205	CO/BO: Flying restart vector control status	.15	.15	.15	.15	Displays the status to check and monitor the states for flying restart with vector control. Bit fields with different significance. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

13.2 p1206 to p1213 automatic restart

Table 13-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1206	Fault number without automatic restart	-	-	[10]	[10]	Selects the faults, for which the automatic restart should not be effective. The setting is only effective for certain settings of p1210
p1210	Automatic restart mode	x	x	x	x	Sets the automatic restart mode (ARM). From FW V4.3.2 and higher The adjustable values (modes) have a modified significance.
p1211	Automatic restart, start attempts	x	x	x	x	Sets the start attempts of the automatic restart
p1212	Automatic restart, wait time start attempt	-	-	x	x	Sets the wait time up to restart. The setting is only effective for certain settings of p1210

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1213	Automatic restart, monitoring time for restart	-	-	[2]	[2]	Sets the monitoring time of the automatic restart mode (ARM). [0] for restart, [1] to reset the fault counter.
r1214	CO/BO: Automatic restart, status	-	-	.15	.15	Displays the status for the automatic restart (ARM). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

13.3 p1215 to p1228 motor holding brake

13.3.1 Changes and expansions to p1215 up to p1228 configuration, motor holding brake

The parameterization of the motor holding brake has been expanded.

Various modes are now available, where the brake, as before, can be opened or closed from the process, but now also permanently or as a function of an external signal.

Table 13-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1215	Motor holding brake configuration/enable motor holding brake	x	x	x	x	Up to FW V3.2 Activating/deactivating the holding brake function From FW V4.3.2 and higher Setting/configuration of the motor holding brake Various functions can be configured for the Power Module PM230 up to PM250.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1216	Motor holding brake, opening time	x	x	x	x	Modified factory settings. Dimension [s] / [ms]
p1217	Motor holding brake, closing time	x	x	x	x	Modified factory settings. Dimension [s] / [ms]
p1218	MHB override	-	[3]	-	-	Enable to override the motor holding brake output, allows the brake to be opened using a separate control.
p1226	Standstill detection, speed threshold	-	-	[4]	[4]	Sets the speed threshold for standstill detection. For braking with OFF1 or OFF3, when this threshold is fallen below, standstill is detected. Also see p1227.
p1227	Standstill detection, monitoring time	-	[3]	x	x	Sets the monitoring time for standstill detection. When braking with OFF1 or OFF3, after this time expires, standstill is detected, after the setpoint speed has fallen below a value of FW V 3.2, p2167 or From FW V4.3.2, p1226 The brake signal is then started.
p1228	Pulse cancellation delay time	-	-	x	x	When the motor holding brake is activated, the pulses are only canceled when this delay time (p1228) has expired, and when the closing time of the brake (p1217) has also expired. Standstill is detected, if, during the complete delay time (p1228) the speed actual value falls below the speed threshold (p1226)

13.4 p1230 to p1239 DC braking, resistor braking

13.4.1 Changes and expansions to p1236 and p3856 compound braking current

The value of DC braking current (defined as a [%] of rated motor current) for compound braking, has been shifted from parameter p1236 to p3856.

FW V3.x p1236 = compound braking current
p3856 = is no longer available

FW V4.x p3856 = compound braking current
p1236 = is no longer available

13.4.2 Important function restrictions of p1237, resistor braking

FW V3.x is only applicable for converters with integrated braking chopper

FW V4.3.2 is no longer available.

Table 13-4

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1230	BI: DC braking, activation/enable	[3]	[3]	[4]	[4]	Sets the signal source to activate DC braking.
p1231	DC braking, configuration	-	-	[4]	[4]	Setting to activate DC braking. The function is activated as soon as the activation criterion is fulfilled. FW V4.3.2 Selection, no brake/brake FW V4.4 Two additional selection values.
p1232	DC braking, braking current	[3]	[3]	[4]	[4]	Sets the braking current for DC braking.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
						Up to FW V3.2 Values in [%] From FW V4.3.2 and higher Values in [A].
p1233	DC braking, duration	[3]	[3]	[4]	[4]	Sets the DC braking duration (as fault response). Different factory settings.
p1234	DC braking, starting speed/starting frequency	[3]	[3]	[4]	[4]	Sets the starting speed for DC braking. Different factory settings.
p1236	Higher-level DC braking/compound brake	[3]	[3]	-	-	A compound brake is a superimposition of the DC brake with a regenerative brake (utilizing the braking effect along the ramp). From FW V4.3.2 and higher p3856.
p3856	Higher-level DC braking/compound brake	-	-	[4]	[4]	A compound brake is a superimposition of the DC brake with a regenerative brake (utilizing the braking effect along the ramp).
p1237	Brake resistors	x	x	-	-	The resistor braking function eliminated from FW V4.3.2 and higher
r1239	CO/BO: DC braking status word	-	-	.11	.13	From FW V4.3.2 and higher DC braking status word

13.5 p1240 to p1257 Vdc controller

Table 13-5

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1240	Vdc controller or Vdc monitoring configuration (vector control)	[3]	[3]	[4]	[4]	Sets the configuration of the controller for the DC link voltage (vector control). For V/f control: see p1280. Four selection values. For PM230, only three.
r1242	Vdc_max controller, switch-on level	r1242	r1242	r1242	r1242	Displays the switch-on level (activation level) for the Vdc_max controller.
p1243	Vdc_max controller dynamic factor in [%]	[3]	[3]	[4]	[4]	Sets the dynamic factor for the DC link voltage controller, Vdc_max controller. From FW V4.3.2 and higher Extended setting range Modified factory setting Modified data type.
p1245	Vdc_min controller, switch-on level (kinetic buffering)	[3]	[3]	[4]	[4]	Sets the switch-on level for the Vdc_min controller (kinetic buffering).
r1246	Vdc_min controller, switch-on level (kinetic buffering)	x	x	x	x	Displays the switch-on level for the Vdc_min controller (kinetic buffering). From FW V4.3.2 and higher Extended setting range Modified factory setting Modified data type.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1247	Vdc_min controller, dynamic factor (kinetic buffering)	[3]	[3]	[4]	[4]	Sets the dynamic factor for the Vdc_min controller (kinetic buffering).
p1249	Vdc_max controller, speed threshold	-	-	[4]	[4]	Sets the lower speed threshold for the Vdc_max controller. When the threshold is fallen below, the Vdc_max control is deactivated and the speed is controlled via the ramp-function generator.
p1250	Vdc controller proportional gain	[3]	[3]	[4]	[4]	Sets the proportional gain for the DC link voltage controller (Vdc_min controller, Vdc_max controller). FW V4.3.2 Extended setting range. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1251	Vdc controller integral time/integration time	[3]	[3]	[4]	[4]	Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1252	Vdc controller rate time / differentiating time	[3]	[3]	[4]	[4]	Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1253	Vdc controller output limiting	[3]	[3]			Limits the output of the Vdc-max controller.
p1254	Vdc_max controller, automatic sensing of the on level	x	x	x	x	Activates/deactivates the automatic sensing of the switch-on level for the Vdc_max controller.
p1255	Vdc_min controller, time threshold (kinetic buffering)	-	-	[4]	[4]	Sets the time threshold for the Vdc_min controller (kinetic buffering).
p1256	Vdc_min controller response (kinetic buffering)	[3]	[3]	[4]	[4]	Defines the response for the kinetic buffering controller (KIB) (Vdc-min controller). From FW4.3.2 and higher, the setting value for the 2 down ramp is eliminated

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1257	Vdc_min controller, speed threshold / frequency threshold	[3]	[3]	[4]	[4]	Sets the speed threshold or the frequency threshold for the Vdc_min controller.

13.6 p1258 to p1298 Vdc controller (V/f)

Table 13-6

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1258	CO: Vdc controller output	-	-	x	x	Displays the actual Vdc controller output
p1280	Vdc controller or Vdc monitoring configuration (V/f)	-	-	[4]	[4]	Sets the inhibit/enable the DC link voltage controller (Vdc controller) in the V/f mode. For PM230, two selection values, For PM240, four selection values.
r1282	Vdc_max controller, switch-on level (V/f)	-	-	x	x	Displays the switch-on level (activation level) for the Vdc_max controller.
p1283	Vdc_max controller, dynamic factor (V/f)	-	-	[4]	[4]	Sets the dynamic factor for the DC link voltage controller (Vdc_max controller).
p1285	Vdc_min controller, switch-on level (kinetic buffering) (V/f)	-	-	[4]	[4]	Sets the switch-on level for the Vdc_min controller (kinetic buffering).
r1286	Vdc_min controller, switch-on level (kinetic buffering) (V/f)	-	-	x	x	Displays the switch-on level for the Vdc_min controller (kinetic buffering).
p1287	Vdc_min controller, dynamic factor (kinetic buffering) (V/f)	-	-	[4]	[4]	Sets the dynamic factor for the Vdc_min controller (kinetic buffering).
p1288	Vdc_max controller, feedback	-	-	[4]	[4]	Sets the feedback factor for the ramp-function

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
	factor, ramp-function generator (V/f)					generator. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1290	Vdc controller proportional gain (V/f)	-	-	[4]	[4]	Sets the proportional gain for the Vdc controller.
p1291	Vdc controller integral time (V/f)	-	-	[4]	[4]	Sets the integral time for the Vdc controller.
p1292	Vdc controller rate time (V/f)	-	-	[4]	[4]	Sets the rate time constant for the Vdc controller.
p1293	Vdc_min controller output limiting (V/f)	-	-	x	x	Sets the output limiting for the Vdc_min controller. For PM240.
p1294	Vdc_max controller, automatic sensing of the on level (V/f)	-	-	x	x	Activates/deactivates the automatic sensing of the switch-on level for the Vdc_max controller.
p1295	Vdc_min controller, time threshold (V/f)	-	-	[4]	[4]	Sets the time threshold for the Vdc_min controller (kinetic buffering).
p1296	Vdc_min controller, response (kinetic buffering) (V/f)	-	-	[4]	[4]	Sets the response for the Vdc_min controller (kinetic buffering).
p1297	Vdc_min controller, speed threshold (V/f)	-	-	[4]	[4]	Sets the speed threshold for the Vdc_min controller (kinetic buffering).
r1298	CO: Vdc controller output (V/f)	-	-	x	x	Displays the actual Vdc controller output

14 V/f control

14.1 p1300 to p1338 control type, slip compensation

14.1.1 p1326 and p1327 programmable V/f characteristic

From FW V4.3.2, the programmable V/f characteristic was expanded by an additional, fourth voltage/frequency interpolation point; this allows the characteristic to be more finely parameterized. If the additional interpolation point is not required, then interpolation points 3 and 4 are set to the same value.

Table 14-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1300	Open-loop/closed-loop control mode	[3]	[3]	[4]	[4]	Sets the open-loop or closed-loop control mode. The selectable closed-loop control modes differ From FW V4.3.2 and higher closed-loop controls with sensor are eliminated.
p1310	Permanent voltage boost	[3]	[3]	[4]	[4]	Defines the voltage boost as a [%] referred to the rated motor current (p0305).
p1311	Voltage boost when accelerating	[3]	[3]	[4]	[4]	Up to FW V3.2 Parameter results in a voltage boost when ramping up/ramping down and generates an additional torque for accelerating/braking. From FW V4.3.2 and higher Parameter only results in a voltage boost when ramping up and generates an additional torque for accelerating.
p1312	Voltage boost when starting	[3]	[3]	[4]	[4]	Up to FW V3.2 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1315	Voltage boost, total	x	x	x	x	Displays the total, resulting voltage boost in volt. $r1315 = p1310 + p1311 + p1312$
p1316	Boost final frequency	[3]	[3]			Specifies the point, where the programmed boost is 50% of its parameterized voltage value. The standard value depends on the converter type and its rated values; can only be modified/changed by experienced users.
p1320	V/f open-loop control programmable characteristic, frequency 1	[3]	[3]	[4]	[4]	Programmable characteristic, frequency/voltage. From FW V4.3.2 and higher Maximum value extended up to 3000[Hz] / 10.000[V].
p1321	V/f open-loop control programmable characteristic, voltage 1	[3]	[3]	[4]	[4]	Programmable characteristic, frequency/voltage. From FW V4.3.2 and higher Maximum value extended up to 3000[Hz] / 10.000[V].
p1322	V/f open-loop control programmable characteristic, frequency 2	[3]	[3]	[4]	[4]	Programmable characteristic, frequency/voltage. From FW V4.3.2 and higher Maximum value extended up to 3000[Hz] / 10.000[V].
p1323	V/f open-loop control programmable characteristic, voltage 2	[3]	[3]	[4]	[4]	Programmable characteristic, frequency/voltage. From FW V4.3.2 and higher Maximum value extended up to 3000[Hz] / 10.000[V].
p1324	V/f open-loop control programmable characteristic, frequency 3	[3]	[3]	[4]	[4]	Programmable characteristic, frequency/voltage. From FW V4.3.2 and higher Maximum value extended up to 3000[Hz] / 10.000[V].
p1325	V/f open-loop control programmable characteristic, voltage 3	[3]	[3]	[4]	[4]	Programmable characteristic, frequency/voltage. From FW V4.3.2 and higher Maximum value extended up to 3000[Hz] / 10.000[V].

14 V/f control

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1326	V/f open-loop control programmable characteristic, frequency 4	-	-	[4]	[4]	Up to FW V3.2 this point corresponds to the value, rated frequency/rated voltage p0310 / p0304. From FW4.3.2 and higher: Additional programmable interpolation point of the characteristic.
p1327	V/f open-loop control programmable characteristic, voltage 4	-	-	[4]	[4]	Up to FW V3.2 this point corresponds to the value, rated frequency/rated voltage p0310 / p0304. From FW4.3.2 and higher: Additional programmable interpolation point of the characteristic.
p1330	CI: V/f control, independent voltage setpoint	[3]	[3]	[4]	[4]	Sets the signal source for the voltage setpoint for V/f control with independent voltage setpoint (p1300 = 19).
p1333	V/f control FCC starting frequency	[3]	[3]	[4]	[4]	Up to FW V3.2 as a [%] referred to the rated motor frequency. From FW V4.3.2 and higher Value in [Hz]
p1334	V/f control, slip compensation starting frequency	-	[3]	[4]	[4]	Up to FW V3.2 as a [%] referred to the rated motor frequency. From FW V4.3.2 and higher Value in [Hz]

14 V/f control

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1335	Slip compensation, scaling	[3]	[3]	[4]	[4]	From FW V4.3.2 and higher p1300 = [4] or [7] For the V/f control modes with Eco optimization, the slip compensation must be activated in order to guarantee correct operation.
p1336	Slip compensation, limit value	[3]	[3]	[4]	[4]	Sets the limit value of the slip compensation as a [%] referred to r0330 (rated motor slip).
r1337	CO: slip compensation actual value	x	x	x	x	Displays the actual, compensated slip as a [%] referred to r0330 (rated motor slip).
p1338	V/f operation, resonance damping, gain	[3]	[3]	[4]	[4]	Sets the gain for resonance damping for V/f control. Up to FW V3.2 Value range 0 ... 10 From FW V4.3.2 and higher Value range 0 ... 100
p1339	V/f operation, resonance damping, filter time constant	-	-	[4]	[4]	Sets the filter time constant for resonance damping for V/f control.

14.2 p1340 to p1352 I_max controller, soft starting

Table 14-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1340	I_max frequency controller, proportional gain	[3]	[3]	[4]	[4]	Sets the proportional gain of the I_max controller.
p1341	I_max frequency controller, integral time	[3]	[3]	[4]	[4]	Sets the integral time for the I_max frequency controller.
r1343	CO: I_max controller frequency output	x	x	x	x	Displays the effective frequency limiting. Up to FW V3.2 Value in [Hz] From FW V4.3.2 and higher Values in [rpm].
r1344	I_max controller voltage output	x	x	x	x	Displays the absolute voltage value, by which the converter output voltage is reduced.
p1345	I_max voltage controller, proportional gain	[3]	[3]	[4]	[4]	Sets the proportional gain for the I_max voltage controller. Up to FW V3.2 Maximum value 5.499 From FW V4.3.2 and higher Maximum value 10000.0
p1346	I_max voltage controller, integral time	[3]	[3]	[4]	[4]	Sets the integral time for the I_max voltage controller. Up to FW V3.2 Factory setting 0.3[s] From FW V4.3.2 and higher Factory setting 0.03[s]

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1348	CO: V/f control Eco factor actual value	-	-	x	x	Displays the determined economic factor for usage optimization of the motor. Also refer to: p1335 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1349	V/f operation, resonance damping, maximum frequency	-	-	[4]	[4]	Maximum output frequency for resonance damping for V/f operation. The resonance damping is not active above this output frequency. Also refer to: p1338, p1339. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1350	Soft starting	[3]	[3]	[4]	[4]	Sets whether, during the parameterization phase, the voltage is continuously increased, or whether it immediately jumps to the voltage boost level.
p1351	CO: Motor holding brake, starting frequency	-	-	[4]	[4]	Frequency setting value at the output of the slip compensation when starting with motor holding brake. When parameter p1351 > [0] is set, the slip compensation is automatically activated (p1335) and pre-assigned with 100%.
p1352	CI: Motor holding brake, starting frequency signal source	-	-	[4]	[4]	Signal source for the frequency setting value at the output of the slip compensation when starting with motor holding brake. Also refer to: p1216.

15 Field-orientated vector control

15.1 p1400 up to p1482 speed controller

15.1.1 p1455 up to p1466 speed-dependent controller adaptation

From FW V4.3.2, with p1455 up to p1466, there is an option of adapting controller parameters Tn and Kp of the speed controller as a function of the speed.

Table 15-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1400	Speed control configuration	[3]	[3]	[4]	[4]	Configuration for the speed control From FW V4.3.2 and higher extended bit pattern.
p1401	Flux control configuration	-	-	[4]	[4]	Sets the configuration of the flux setpoint control. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1402	Current control and motor model configuration	-	-	[4]	[4]	Sets the configuration for the current control and the motor model. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1406	CO/BO: Control word speed controller	-	-	.15	.15	Displays the control word of the speed controller.
r1407	CO/BO: Status word speed controller	.15	.15	.15	.15	Displays the status word of the speed controller. From FW V4.3.2 and higher extended bit pattern.
r1408	CO/BO: Status word current controller	-	-	.14	.14	Displays the status word of the speed controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

15 Field-orientated vector control

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1416	Speed setpoint filter 1 time constant	-	-	[4]	[4]	Time constant of the speed setpoint filter 1 (PT1). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1438	CO: Speed controller speed setpoint / frequency setpoint	x	x	x	x	Speed or frequency setpoint. For V/f operation, the displayed value offers no information.
r1439	Speed setpoint, I component	-	-	x	x	Display for the I component of the speed controller speed setpoint. In the standard case (the reference model is inactive), r1438 = r1439. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1442	Filter time for the speed actual value	[3]	[3]	-	-	Time constant of the PT1 filter to smooth the speed controller system deviation.
r1444	Speed controller speed setpoint steady state (static)	-	-	x	x	Displays the sum of all of the speed setpoints available. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1445	CO: Speed actual value smoothed / smoothed actual frequency 2	x	x	x	x	Displays the actual smoothed speed actual value (Hz / rpm) at the speed controller input. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1452	Speed controller speed actual value smoothing time (SLVC)	[3]	[3]	[4]	[4]	Sets the smoothing time for the speed actual value of the speed controller for encoderless (sensorless) closed-loop speed control. The factory settings differ. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

15 Field-orientated vector control

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1454	CO: Speed controller, system deviation I component	-	-	x	x	Displays the system deviation of the I component of the speed controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1455	CI: Speed controller, P gain adaptation signal	-	-	[4]	[4]	Sets the source for the adaptation signal to additionally adapt the P gain of the speed controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1456	Speed controller P gain, adaptation, start of adaptation lower	-	-	[4]	[4]	Sets the lower start of the adaptation range for the additional adaptation of the P gain of the speed controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1457	Speed controller P gain, adaptation, start of adaptation upper	-	-	[4]	[4]	Sets the upper start of the adaptation range for the additional adaptation of the P gain of the speed controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1458	Adaptation factor, lower	-	-	[4]	[4]	Sets the adaptation factor before the adaptation range (0 % ... p1456) to additionally adapt the P gain of the speed/velocity controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

15 Field-orientated vector control

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1459	Adaptation factor, upper	-	-	[4]	[4]	Sets the adaptation factor after the adaptation range (> p1457) to additionally adapt the P gain of the speed/velocity controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1460	Speed controller gain	[3]	[3]	-	-	Specifies the speed control gain.
p1461	Speed controller Kp adaptation speed, upper scaling	-	-	[4]	[4]	Sets the P gain of the speed controller for the upper adaptation speed range (> p1465).
p1462	Integration time, speed controller	[3]	[3]	-	-	Specifies the integration time of the speed controller.
p1463	Speed controller Tn adaptation speed, upper scaling	-	-	[4]	[4]	Sets the integral time of the speed controller after the adaptation speed range (> p1465). The input is realized referred to the integral time for the lower adaptation speed range of the speed controller (% referred to p1472).
p1464	Speed controller adaptation speed, lower	-	-	[4]	[4]	Sets the lower adaptation speed of the speed controller. No adaptation is effective below this speed.
p1465	Speed controller adaptation speed, upper	-	-	[4]	[4]	Sets the upper adaptation speed of the speed controller. No adaptation is effective above this speed.
p1466	CI: Speed controller, P gain scaling	-	-	[4]	[4]	Sets the signal source for the scaling of the P gain of the speed controller As a consequence, the effective P gain, including the adaptations, is additionally scalable. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

15 Field-orientated vector control

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1468	CO: Speed controller, P gain effective	-	-	[4]	[4]	Displays the effective P gain of the speed controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1469	Speed controller integral time effective	-	-	[4]	[4]	Displays the effective integral time of the speed controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1470	Speed controller encoderless operation P gain	[3]	[3]	[4]	[4]	Sets the P gain, SLVC ¹ . Different factory settings and maximum values.
p1472	Speed controller, encoderless operation, integral time	[3]	[3]	[4]	[4]	Sets the integral time for SLVC. Different factory settings and maximum values.
p1475	CI: Speed controller torque setting value for motor holding brake	-	-	[4]	[4]	Sets the signal source for the torque setting value when starting with motor holding brake.
p1476	BI: Hold the speed controller integrator	-	-	[4]	[4]	Sets the signal source to stop the integrator for the speed controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1477	BI: Speed controller set integrator value	[3]	[3]	[4]	[4]	Sets the signal source to set the integrator setting value
p1478	CI: Speed controller, integrator setting value	[3]	[3]	[4]	[4]	Select the source for the integral component of the speed controller.

¹ SLVC = Sensorless Vector Control = vector control without encoder

Support when migrating from MICROMASTER 4 and SINAMICS G120 (< V4.4) to SINAMICS G120 (V4.4)
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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1479	CI: Speed controller, integrator setting value, scaling	-	-	[4]	[4]	Sets the signal source for the scaling of the integrator setting value (p1478) of the speed controller. Also refer to: p1477, p1478. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1482	CO: Integral component, n-controller CO: Speed controller I-torque output	x	x	x	x	Up to FW v3.2 Displays the integral component of the speed control output. From FW V4.3.2 and higher Displays the torque setpoint at the output of the I speed controller.

15.2 p1486 up to p1499 droop, speed controller precontrol

Table 15-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1486	CI: Droop, compensation torque	-	-	[4]	[4]	Sets the signal source for the compensation torque within the droop calculation. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1487	Droop, compensation torque scaling	-	-	[4]	[4]	Sets the scaling for the compensation torque within the droop calculation. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

15 Field-orientated vector control

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1488	Droop input, source	[3]	[3]	[4]	[4]	Sets the source for the droop feedback.
p1489	Droop feedback, scaling	[3]	[3]	[4]	[4]	Sets the source of the scaling for the droop feedback.
r1490	CO: Droop feedback speed reduction/frequency	x	x	x	x	Displays the output signal of the droop calculation. Displayed value in Hz or in rpm
p1492	BI: Droop feedback, enable	[3]	[3]	[4]	[4]	Enables the droop input to the speed/velocity setpoint. MM440 Selection value 0/1 From FW V3.2 and higher Adjustable binector input.
r1493	CO: Total moment of inertia	-	-	x	x	Displays the parameterized total moment of inertia ((p0341 * p0342) * p1496).
p1496	Acceleration precontrol, scaling	[3]	[3]	[4]	[4]	Scaling of the acceleration precontrol. Different maximum values.
p1499	Acceleration for torque control, scaling	[3]	[3]	[4]	[4]	Sets the scaling for the acceleration integrator for low speeds (only for encoderless torque control).

16 Closed-loop torque control, flux control, current controller

16.1 p1500 up to p1554 closed-loop torque control

Table 16-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1500	Torque setpoint selection	[3]	[3]	[4]	[4]	Source of the torque setpoint. Also within a firmware release, the selection values differ/are dependent on the Control Unit.
p1501	BI: Switchover, closed-loop speed/torque control	[3]	[3]	[4]	[4]	Sets the signal source for the switchover between closed-loop speed and torque control.
p1503	CI: Torque setpoint	[3]	[3]	[4]	[4]	Sets the signal source for the torque setpoint of the closed-loop torque control.
r1508	CO: Torque setpoint before supplementary torque	x	x	x	x	Displays the torque setpoint before the input of the supplementary torque.
p1511	CI: Supplementary torque 1	[3]	[3]	[4]	[4]	Sets the signal source for the supplementary torque 1.
p1512	CI: Supplementary torque 1 scaling	-	-	[4]	[4]	Sets the signal source for scaling supplementary torque 1.
p1513	CI: Supplementary torque 2	-	-	[4]	[4]	Sets the signal source for the supplementary torque 2.
p1514	Supplementary torque 2 scaling	-	-	[4]	[4]	Sets the scaling for supplementary torque 2.
r1515	Supplementary torque, total	x	x	x	x	Displays the total supplementary torque.
r1516	CO: Supplementary torque and acceleration torque	-	-	x	x	Displays the total supplementary torque and the acceleration torque ($r1516 = r1518[1] + r1515$).

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1518	Acceleration torque, unsmoothed	x	x	[2]	[2]	Displays the acceleration torque to precontrol the speed controller. From FW V4.3.2 and higher [0] unsmoothed [1] smoothed
p1520	CO: Torque limit, upper	[3]	[3]	[4]	[4]	Sets the fixed, upper torque limit. Factory settings differ.
p1521	CO: Torque limit, lower	[3]	[3]	[4]	[4]	Sets the fixed, lower torque limit. Factory settings differ.
p1522	CI: Torque limit, upper	[3]	[3]	[4]	[4]	Sets the signal source for the upper torque limit.
p1523	CI: Torque limit, lower	[3]	[3]	[4]	[4]	Sets the signal source for the lower torque limit.
p1524	CO: Torque limit upper/motoring, scaling	-	-	[4]	[4]	Sets the signal source for the upper or the motoring torque limit.
p1525	CO: Torque limit, lower scaling	[3]	[3]	[4]	[4]	Sets the scaling for the lower torque limit. Min/max values differ.
r1526	CO: Torque limit upper, without offset	x	x	x	x	Displays the upper torque limit of all torque limits without offset.
r1527	CO: Torque limit lower, without offset	x	x	x	x	Displays the lower torque limit of all torque limits without offset.
p1528	CI: Torque limit, upper scaling	-	-	[4]	[4]	Sets the signal source for the scaling of the upper torque limit in p1522.
p1529	CI: Torque limit, lower scaling	-	-	[4]	[4]	Sets the signal source for the scaling of the lower torque limit in p1523.

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1530	Power limit, motoring	[3]	[3]	[4]	[4]	Sets the power limit when motoring. Different factory settings and min/max values.
p1531	Power limit when generating	[3]	[3]	[4]	[4]	Sets the power limit when generating. Different factory settings and min/max values.
r1533	Total current limit, torque-generating	-	-	x	x	Displays the maximum torque/force-generating current as a result of all current limits.
r1536	Maximum current limit, torque-generating current	x	x	x	x	Displays the maximum limit for the torque-generating current component. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1537	CO: Maximum torque-generating current, generating	x	x			Up to FW V3.2: Displays the maximum torque-generating current component for generator operation.
r1537	Minimum current limit, torque-generating current			x	x	From FW V4.3.2 and higher Displays the minimum limit for the torque-generating current component. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1538	CO: Torque limit, upper effective	x	x	x	x	Displays the currently effective upper torque limit.
r1539	CO: Torque limit, lower effective	x	x	x	x	Displays the currently effective lower torque limit.
r1547	Torque limit for the speed control output	-	-	[2]	[2]	Displays the torque limit for the speed controller output limiting. [0] Upper limit [1] Lower limit.

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1548	CO: Stall current limit torque-generating maximum	-	-	[2]	[2]	Displays the limit for the torque-generating current component. [0] Upper limit [1] Lower limit. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1552	CI: Torque limit upper scaling without offset	-	-	[4]	[4]	Sets the signal source for scaling the upper torque limit to limit the speed controller output without taking into account current and power limits.
p1554	CI: Lower torque limit scaling without offset	-	-	[4]	[4]	Sets the signal source for scaling the lower torque limit to limit the speed controller output without taking into account current and power limits.

16.2 p1570 to p1611 open-loop flux control

Table 16-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1570	CO: Flux setpoint	[3]	[3]	[4]	[4]	Sets the flux setpoint referred to the rated motor flux. Different factory settings.
p1571	CI: Supplementary flux setpoint	-	-	[4]	[4]	Sets the signal source for the supplementary flux setpoint.
p1573	Flux threshold value magnetizing	-	-	[4]	[4]	Sets the flux threshold value to enable the speed setpoint and the end of magnetizing (r0056.4).
p1574	Voltage reserve dynamic	[3]	[3]	[4]	[4]	Sets a dynamic voltage reserve. Different factory settings (PM230).
p1580	Efficiency optimization	[3]	[3]	[4]	[4]	Sets the efficiency optimization. Different factory settings (PM230).
p1582	Flux setpoint smoothing time	[3]	[3]	[4]	[4]	Sets the smoothing time for the flux setpoint. From FW V4.3.2 and higher Higher maximum values.
r1583	Flux setpoint smoothed	x	x	x	x	Display of the smoothed flux setpoint. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1584	Field weakening operation flux setpoint smoothing time	-	-	[4]	[4]	Sets the smoothing time for the flux setpoint in the field weakening range. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1589	Field weakening current precontrol value	-	-	x	x	Displays the precontrol value for the field weakening current. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1593	CO: Field weakening controller/flux controller output	-	-	[2]	[2]	Displays the field weakening controller output (synchronous motor). [0] PI output [1] = I output Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1594	Field weakening controller P gain	-	-	[4]	[4]	Sets the P gain of the field weakening controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1596	Field weakening controller integral time	[3]	[3]	[4]	[4]	Sets the integral time of the field weakening controller Different factory settings and min/max values.
r1597	CO: Field weakening controller output	-	-	x	x	Displays the field weakening controller output. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1598	CO: Total flux setpoint	x	x	x	x	Displays the effective flux setpoint.
p1610	Torque setpoint static (SLVC)	[3]	[4]	[4]	[4]	Sets the static torque setpoint for the lower speed range for sensorless vector control (SLVC).
p1611	Supplementary acceleration torque (SLVC)	[3]	[3]	[4]	[4]	Torque boost in the lower speed range. Factory settings differ.

16.3 p1616 to p1740 current controller

Table 16-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1616	Current setpoint smoothing time	-	-	[4]	[4]	Sets the smoothing time for the current setpoint. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1623	Field-generating current setpoint (steady state)	-	-	[2]	[2]	Displays the steady-state field-generating current setpoint (Id_set). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1624	Field-generating current setpoint total	-	-	x	x	Displays the limited field-generating current setpoint (Id_set). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1650	Current setpoint torque-generating before the filter	-	-	x	x	Displays the torque-generating current setpoint Iqset after the torque limits and after the clock cycle interpolation, which is performed before the current setpoint filters.
p1654	Current setpoint torque-generating smoothing time field weakening range	[3]	[3]	[4]	[4]	Sets the smoothing time constant for the setpoint of the torque-generating current component. The smoothing time only becomes effective when reaching the field weakening range. Different factory settings and min/max values. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1702	Isd current controller precontrol scaling	-	-	[4]	[4]	<p>Sets the scaling of the dynamic current controller precontrol for the flux-generating current component Isd.</p> <p>The parameter is active for permanent-magnet synchronous motors.</p> <p>Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p>
p1703	Isq current controller precontrol scaling	-	-	[4]	[4]	<p>Sets the scaling of the dynamic current controller precontrol for the torque-generating/force-generating current component Isq.</p> <p>Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p>
p1715	Current controller P gain	[3]	[3]	[4]	[4]	<p>Sets the proportional gain of the current controller. After commissioning has been completed, this value is automatically preset via p3900 or via p0340.</p> <p>Different factory settings and min/max values.</p> <p>Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p>
p1717	Current controller integral time	[3]	[3]	[4]	[4]	<p>Sets the integral time of the current controller. Also refer to: p1715.</p> <p>Different factory settings and min/max values.</p> <p>Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p>

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1718	CO: Isq controller output	x	x	x	x	Displays the actual output of the Isq current controller (torque-, force-generating current, PI controller). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1719	Isq controller integral component	x	x	x	x	Displays the integral component of the Isq current controller (torque-, force-generating current, PI controller). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1723	CO: Isd controller output	x	x	x	x	Displays the actual output of the Isd current controller (flux-generating current, PI controller). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1724	Isd controller integral component	x	x	x	x	Displays the integral component of the Isd current controller (flux-generating current, PI controller). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1725	Isd controller integral component limiting	x	x	x	x	Displays the limit value for the integral component of the Isd current controller. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1726	Quadrature arm decoupling scaling	-	-	[4]	[4]	Sets the scaling of the quadrature arm decoupling. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1727	Quadrature arm decoupling at the voltage limit scaling	-	-	[4]	[4]	Sets the scaling of the quadrature arm decoupling when reaching the voltage limiting. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1728	Decoupling voltage in-line axis	x	x	x	x	Displays the actual output of the quadrature channel decoupling for the d axis. Up to FW V3.2 Displays the total value. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1729	Decoupling voltage quadrature axis	-	-	x	x	Displays the actual output of the quadrature channel decoupling for the q axis. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1732	CO: In-line voltage setpoint	-	-	[2]	[2]	Displays the in-line voltage setpoint Ud. [0] unsmoothed [1] smoothed with p0045.
r1733	CO: Quadrature voltage setpoint	-	-	[2]	[2]	Displays the quadrature voltage setpoint Uq. [0] unsmoothed [1] = smoothed with p0045.
p1740	Gain resonance damping for sensorless closed-loop control	x	x	[4]	[4]	Defines the controller gain for resonance damping for operation with sensorless vector control in the impressed current range. Different factory settings.

16.4 p1745 to p1797 motor model

Table 16-4

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1745	Motor model fault threshold value stall detection	[3]	[3]	[4]	[4]	Sets the fault threshold value to detect a stalled motor. Sets the limit of the flux deviation to identify that a motor is in the stalled state.
r1746	Motor model fault signal stall detection	x	x	x	x	Signal to initiate stall detection. Indicates the actual flux deviation as a percentage, see P1745.
p1750	Motor model configuration	[3]	[3]	[4]	[4]	Motor model configuration. From FW V4.3.2 and higher The control word bit field was expanded.
r1751	Motor model status	x	x	x	x	Motor model status. From FW V4.3.2 and higher The status word bit field was expanded.
p1752	Start frequency speed adaptation (VC with pulse encoder)	-	[3]	-	-	Enters the start frequency of the n adaptation in vector control operation with pulse encoder (VC, hysteresis as in P1755). The speed adaptation function is an essential function for correcting the torque (i.e. the slip) in the VC mode. However, the activated n adaptation can cause problems at low frequencies. This is the reason that this function is deactivated below the limit value of P1752 * P1756 / 100 %.
p1755	Motor model switchover speed, sensorless operation/start frequency	[3]	[3]	[4]	[4]	Start frequency motor model. Values in [Hz] or [rpm].

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1756	Motor model switchover speed hysteresis sensorless operation	[3]	[3]	x	x	Sets the hysteresis for the switchover speed. From FW V4.3.2 and higher Common value for all DDS Max. value of 95% increased up to 100%.
p1758	Motor model switchover time closed-loop controlled open-loop controlled	[3]	[3]	[4]	[4]	Sets the minimum time for falling below the switchover threshold. From FW V3.2 and higher Modified factory setting and maximum value.
p1759	Motor model switchover time open-loop controlled closed-loop controlled	[3]	[3]	[4]	[4]	Sets the minimum time for exceeding the switchover threshold. From FW V3.2 and higher Modified factory setting and minimum value.
r1762	Motor model deviation component 1	-	-	[2]	[2]	Induction motor: Displays the referred imaginary system deviation for the adaptation circuits of the motor model. Permanent-magnet synchronous motor: Displays the system deviation for the speed adaptation. [0] deviation model1 [1] deviation model2 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1763	Motor model deviation component 2	-	-	x	x	Not used. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1764	Motor model without encoder speed adaptation Kp	[3]	[3]	[4]	[4]	Sets the proportional gain of the controller for speed adaptation without speed encoder. From FW V4.3.2 and higher Modified factory setting and max. value. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1765	Motor model speed adaptation Kp effective	-	-	x	x	Displays the effective proportional gain of the controller for speed adaptation. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1767	Motor model without encoder speed adaptation Tn	[3]	[3]	[4]	[4]	Sets the integral time of the controller for speed adaptation without speed encoder. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1768	Motor model speed adaptation Vi effective	-	-	x	x	Displays the effective gain of the controller integral component for speed adaptation. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1770	CO: Motor model speed adaptation proportional component/frequency	x	x	x	x	Displays the P component of the controller for speed adaptation. Values in [Hz] or [rpm]. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1771	CO: Motor model speed adaptation I component/frequency	x	x	x	x	Displays the I component of the controller for speed adaptation. Values in [Hz] or [rpm]. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1773	Motor model slip speed	-	-	[2]	[2]	Motor model actual values electric induction motor: Stator voltage, ..., access level "factory". Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1772	Motor model actual values electric induction motor	-	-	[8]	[8]	Display estimated (speed) signals of the motor model: [0] estimated slip speed [1] estimated speed Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1774	Motor model compensation offset voltage alpha	-	-	[4]	[4]	Sets the offset voltage in the alpha direction. The value is preset during the rotating measurement. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1775	Motor model compensation offset voltage beta	-	-	[4]	[4]	Sets the offset voltage in the beta direction. The value is preset during the rotating measurement. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1776	Motor model status signals	-	-	[7]	[7]	Displays the internal status signals of the motor model. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1778	Motor model flux angle difference	x	x	x	x	Displays the difference motor model flux angle to transformation angle. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1780	Motor model adaptation configuration/control word of the Rs/Rr adaptation	[3]	[3]	[4]	[4]	Sets the configuration of the adaptation circuits of the motor model. Different significance of the bit fields in the firmware releases. From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1781	Motor model Rs adaptation integral time	[3]	[3]	[4]	-	Specifies the integration time constant of the adaptation controller for the stator resistance (induction motor). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1782	Motor model Rs adaptation correction value	x	x	x	-	Displays the correction value of the Rs adaptation of the motor model for an induction motor. FW V4.3.2 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1783	Motor model Rs adaptation Kp	-	-	[4]	-	Displays the proportional gain of the Rs adaptation of the motor model for an induction motor. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1784	Motor model feedback scaling	-	-	-	[4]	Sets the scaling for the model error feedback. The model feedback is only effective for sensorless operation of the induction motor.
p1785	Motor model Lh adaptation Kp / MotMod Lh Kp	-	-	[4]	[4]	Sets the proportional gain of the Lh adaptation of the motor model for an induction motor. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list". Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1786	Motor model Lh adaptation integral time	[3]	[3]	[4]	[4]	Sets the integral time of the Lh adaptation of the motor model for an induction motor. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1787	Motor model Lh adaptation correction value	x	x	[4]	[4]	Displays the correction value of the Lh adaptation of the motor model for an induction motor. From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1789	Motor model Rs adaptation switch-on frequency	-	-	x	-	Displays the switch-on stator frequency of the Rs adaptation for an induction motor. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1790	Motor model Rs adaptation switch-on slip	-	-	x	-	Displays the switch-on slip frequency of the Rs adaptation for an induction motor. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1791	Motor model Lh adaptation switch-on frequency	-	-	x	x	Displays the power-on stator frequency/primary section frequency of the Lh adaptation for the induction motor. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1792	Motor model Lh adaptation switch-on slip	-	-	x	x	Displays the switch-on slip frequency of the Lh adaptation for an induction motor. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

16 Closed-loop torque control, flux control, current controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1795	Motor model kT adaptation integral time	-	-	[4]	[4]	Sets the integral time of the kT adaptation of the motor model for a permanent-magnet synchronous motor (PEM). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1797	Motor model kT adaptation correction value	-	-	[4]	[4]	Sets the correction value of the kT adaptation of the motor model for a permanent-magnet synchronous motor (PEM). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

17 Converter parameters

17.1 p1800 to p1864 converter parameters

Table 17-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1800	Pulse frequency setpoint	x	[3]	[4]	[4]	Sets the converter switching frequency. From FW V3.2 and higher Parameter is indexed for DDS.
r1801	Pulse frequency, actual	x	[2]	[2]	[2]	Displays the actual converter switching frequency. From FW V3.2 and higher Parameter is indexed [0] actual [1] minimum modulator value.
p1802	Modulator mode	x	x	[4]	[4]	Sets the modulator mode. Various setting options for space vector modulation (SVM). From FW V4.3.2 and higher Parameter is indexed for DDS. Different factory settings and values.
p1803	Modulation depth maximum/modulation maximum	[3]	[3]	[4]	[4]	Maximum modulation/modulation depth maximum. Different factory settings and maximum values. MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

17 Converter parameters

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1806	Filter time constant Vdc correction	-	-	[4]	[4]	Sets the filter time constant of the DC link voltage, which is used to calculate the modulation depth. MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1808	DC link voltage actual value for U_max calculation		-	x	x	DC link voltage, which is used to determine the maximum possible output voltage. MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1809	CO: Actual modulator mode	-	-	x	x	Displays the active modulator mode. [1] Flat top modulation (FLB) [2] space vector modulation (SVM). MM440 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1810	Modulator configuration / control word Vdc controller	-	.1	.1	.1	Sets the modulator configuration.
p1820	Reverse output phase sequence	[3]	[3]	[4]	[4]	Setting to reverse the phase sequence for the motor without setpoint change.
p1825	Converter valve threshold voltage / IGBT on-state voltage	x	x	x	x	Sets the threshold voltage drop of the valves to be compensated. Different factory settings and min/max values. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

17 Converter parameters

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1828	Compensation valve lockout time phase U / deadtime of the gating unit	x	x	x	x	Sets the valve lockout time for phase U to be compensated. Up to FW V3.2 One value for the complete gating unit. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1829	Compensation valve lockout time phase V	-	-	x	x	Sets the valve lockout time for phase V to be compensated. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1830	Compensation valve lockout time phase W	-	-	x	x	Sets the valve lockout time for phase W to be compensated. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1832	Dead time compensation current level	-	-	x	x	Dead time compensation current level. The factory setting is automatically set to 0.02 * rated converter current (r0207). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1860	Filter control word	-	.2	-	-	Filter control word for the closed-loop control of the voltage, current correction. The voltage/current correction can be independently enabled/inhibited (output filter).
r1861	Filter correction voltage (alpha component)	-	x	-	-	Alpha component of the voltage correction value (output filter installed and vector control active).
r1862	Filter correction voltage (beta component)	-	x	-	-	Beta component of the voltage correction value (output filter installed and vector control active).

17 Converter parameters

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1863	Filter correction current (alpha component)	-	x	-	-	Alpha component of the current correction value (output filter installed and vector control active).
r1864	Filter correction current (beta component)	-	x	-	-	Beta component of the current correction value (output filter installed and vector control active).

18 Motor identification and speed optimization

18.1 p1900 to p1999 motor identification and speed optimization

Table 18-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1900	Selects motor data identification and rotating measurement	-	x	x	x	Sets the motor data identification. From FW V4.3.2 and higher Additional selection values for the rotating measurement. Also see p1910.
p1901	Test pulse evaluation configuration	-	-	x	x	Sets the test pulse evaluation configuration. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r1902	Test pulse evaluation status	-	-	x	x	Displays the status of the test pulse evaluation. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1909	Motor data identification control word	[3]	[3]	[4]	[4]	Sets the configuration of the motor data identification. The bit patterns of the control word have different meanings in the various firmware releases. Up to FW V3.2 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p1910	Motor data identification selection	x	x	x	x	Sets the motor data identification. The adjustable values are different in the firmware releases.

18 Motor identification and speed optimization

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1911	Number of phases to be identified	x	x	x	x	Sets the number of phases to be identified.
r1912	Identified stator resistance [phase U/V/W]	[3]	[3]	[3]	[3]	Displays the identified stator resistance.
r1913	Identified rotor time constant [phase U/V/W]	[3]	[3]	[3]	[3]	Displays the identified rotor time constant.
r1914	Identified total leakage inductance [phase U/V/W]	[3]	[3]	[3]	[3]	Displays the identified total leakage inductance.
r1915	Identified stator nominal reactance [phase U/V/W] (nominal stator inductance)	[3]	[3]	[3]	[3]	Displays the identified nominal stator inductance.
r1916	Identified stator inductance 1 [phase U/V/W]	[3]	[3]	[3]	[3]	Displays the identified stator inductance of the 1st point of the saturation characteristic.
r1917	Identified stator inductance 2, [phase U/V/W]	[3]	[3]	[3]	[3]	Displays the identified stator inductance of the 2nd point of the saturation characteristic.
r1918	Identified stator inductance 3 [phase U/V/W]	[3]	[3]	[3]	[3]	Displays the identified stator inductance of the 3rd point of the saturation characteristic.
r1919	Identified stator inductance 4 [phase U/V/W]	[3]	[3]	[3]	[3]	Displays the identified stator inductance of the 4th point of the saturation characteristic.
r1920	Identified dynamic leakage reactance [phase U/V/W]	[3]	[3]	-	-	Indicates the identified dynamic leakage inductance].
r1925	Identified on-state voltage [phase U/V/W]	x	[3]	[3]	[3]	Indicates the identified on-state voltage of the IGBTs. (V)
r1926	Identification, gating unit dead time (effective valve lockout time)	x	x	[3]	[3]	Displays the identified effective valve lockout time. From FW V4.3.2, indexed for phase U/V/W
r1927	Identified rotor resistance [phase U/V/W]	-	-	[3]	[3]	Displays the identified rotor resistance.
p1930	Voltage setpoint for calibration	x	x	-	-	Specifies the setpoint of a test voltage vector.

18 Motor identification and speed optimization

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p1931	Phase of the test voltage	x	x	-	-	Defines the phase in which the test voltage is generated:
p1959	Rotating measurement configuration	-	-	[4]	[4]	Sets the configuration of the rotating measurement.
p1960	Rotating measurement selection/speed optimization	x	x	x	x	Sets the rotating measurement. Up to FW V3.2 Enable/inhibit From FW V4.3.2 and higher Inhibit/rotating measurement/speed controller optimization
p1961	Saturation characteristic speed for determination	-	-	x	x	Sets the speed to determine the saturation characteristic.
p1965	Speed_ctrl_opt speed	-	-	x	x	Sets the speed to identify the moment of inertia and the vibration/oscillation test.
p1967	Speed_ctrl_opt dynamic factor	-	-	x	x	Sets the dynamic factor for the speed control optimization.
r1968	Speed_ctrl_opt dynamic factor actual	-	-	x	x	Displays the actually achieved dynamic factor for the oscillation test.
r1969	Speed_ctrl_opt moment of inertia determined	-	-	x	x	Displays the moment of inertia of the drive that has been determined.
r1970	Speed_ctrl_opt vibration test vibration frequency determined	-	-	[2]	[2]	Displays the vibration frequencies determined for the vibration test. [0] low frequency [1] high frequency.
p1980	Pole position identification technique	-	-	[4]	[4]	Sets the pole position identification technique.

18 Motor identification and speed optimization

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r1984	Pole position identification angular difference	-	-	x	x	Displays the angular difference between the actual electrical commutation angle and that determined using the pole position identification.
r1985	Pole position identification (PolID) saturation curve	-	-	x	x	Displays the saturation curve of the pole position identification (saturation technique). Displays the current curve of the pole position identification (elasticity technique).
r1987	Pole position identification trigger curve	-	-	x	x	Displays the trigger curve of the pole position identification.
p1999	Angular commutation offset calibration and pole positionID - scaling	-	-	[4]	[4]	Sets the scaling for the runtime of the current-impressing technique for the pole position identification.

18.2 Communication (PROFIBUS)

18.3 p2000 to p2006 reference parameters

18.3.1 Changes and expansions to p2000 up to p2007 reference quantities

From FW V4.4 and higher, the reference quantities in p2000 up to p2006 apply as standard for all drive data sets. Expanded to include the reference angle p2005, the reference temperature p2006 and the reference acceleration p2007.

With FW V 3.x

- p2000 = reference frequency
- p2001 = reference voltage
- p2002 = reference current
- p2003 = reference torque
- p2004 = reference power (from FW V4.3.2 r2004 and higher)

From FW V4.3.2 and higher, additionally

- p2005 = reference angle
- p2007 = reference acceleration

From FW V4.4 and higher, additionally

- p2006 reference temperature

Table 18-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2000	Reference speed reference frequency	[3]	[3]	x	x	<p>Sets the reference quantity for speed or frequency. Reference frequency (in Hz) = reference speed (in ((rpm) / 60) x pole pair number).</p> <p>Up to FW V3.2 indexed for three DDS,</p> <p>From FW V4.3.2 and higher Common reference value for all DDS/MDS.</p>

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2001	Reference voltage	[3]	[3]	x	x	Sets the reference quantity for voltages. Up to FW V3.2 indexed for three DDS.
p2002	Reference current	[3]	[3]	x	x	Sets the reference quantity for currents. Up to FW V3.2 indexed for three DDS. From FW V4.3.2 and higher Modified factory setting.
p2003	Reference torque	[3]	[3]	x	x	Sets the reference quantity for torques. Up to FW V3.2 indexed for three DDS From FW V4.3.2 and higher Modified factory setting and limit values.
p2004	Reference power	[3]	[3]			Final value of the reference power Up to FW V3.2 indexed for three DDS.
r02004				x	x	Displays the reference quantity for powers. This value is calculated as follows: Closed-loop control Calculated from torque times speed. Infeed/supply Calculated from voltage times current.
p2005	Reference angle	-	-	x	x	Sets the reference quantity for angle.
p2006	Reference temperature	-	-	-	x	Sets the reference quantity for temperature.
p2007	Reference acceleration	-	-	x	x	Sets the reference quantity for acceleration levels.

18.4 p2009 to p2037 USS communication parameters

18.4.1 Changes and expansions to communication interfaces PROFIBUS from p2009

In some instances, the interface parameters have a different meaning. An overview of the changes is provided in the subsequent table; details are described in the List Manuals.

Table 18-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2009	USS De-normalization, serial interface COM link	[2]	-	-	-	The normalization was only used in order to guarantee upwards compatibility to MM3.
p2010	Commissioning interface baud rate / USS baud rate	[2]	[2]	x	x	<p>Sets the baud rate for USS data transfer.</p> <p>Up to FW V3.2 [0] USS on RS485 [1] USS on RS232</p> <p>From FW V4.3.2 and higher Sets the baud rate for the commissioning interface (USS, RS232), see also p2020 (RS485).</p>
p2011	Commissioning interface address/ USS interface	[2]	[2]	x	x	<p>Sets the USS address of the converter.</p> <p>Up to FW V3.2 [0] USS on RS485 [1] USS on RS232</p> <p>From FW V4.3.2 and higher Common value commissioning interface Commissioning interface.</p>

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2012	USS PZD length	[2]	[2]	-	-	Defines the number of 16-bit words in the PZD part of the USS telegram. Up to FW V3.2 [0] USS on RS485 [1] USS on RS232
p2013	USS PKW length	[2]	[2]	-	-	Defines the number of 16-bit words in the PKW part of the USS telegram. Up to FW V3.2 [0] USS on RS485 [1] USS on RS232
p2014	USS telegram off time	[2]	[2]	-	-	Parameter defines a time, which after it expires, a fault is output (F0072/F0071) if a telegram has not been received via the USS channel RS485/RS232. Up to FW V3.2 [0] USS on RS485 [1] USS on RS232
r2015	CO: PZD from USS at RS232	[8]	[8]	-	-	Indicates process data, which were received via USS at RS232.
p2016	CI: Commissioning interface USS PZD send word / CI: PZD on USS at RS232	[8]	[8]	[4]	[4]	Up to FW V3.2: Selects the signals, which are transferred via USS at RS232, at the serial interface. Eight words. From FW V4.3.2: Selects the PZD (actual values) to be sent to the Intelligent Operator Panel (IOP) via the USS commissioning interface. Four words.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2018	CO: PZD from USS at RS485	[8]	[8]	-	-	Displays the process data received via USS at RS485.
p2019	Commissioning interface error statistics / CI: PZD at COM link (USS)	[8]	[8]	[8]	[8]	Up to FW V3.2 Displays the process data received via USS at RS485. From FW V4.3.2 and higher Displays receive errors at the commissioning interface (USS, RS232). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p2020	Fieldbus interface baud rate	-	-	-	x	Sets the baud rate for the fieldbus interface (RS485),
p2021	Fieldbus interface address	-	-	-	x	Sets the address for the fieldbus interface (RS485). Or displays the setting via the address switch on the Control Unit.
p2022	Fieldbus interface USS PZD number	-	-	-	x	Sets the number of 16-bit words in the PZD part of the USS telegram for the fieldbus interface. Also refer to: p2030.
p2023	Fieldbus interface USS PKW number	-	-	-	x	Sets the number of 16-bit words in the PKW part of the USS telegram for the fieldbus interface. Values: PKW words 0/3/4/variable.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2024	Fieldbus interface times / USS error-free telegrams	[2]	[2]	[3]	[3]	<p>Up to FW V3.2 Displays the number of USS telegrams that have been received without error. [0] USS on RS485 [1] USS on RS232</p> <p>From FW V4.3.2 and higher Sets the time values for the fieldbus interface (fieldbus interface), [0] maximum processing time [1] character delay time [2] inter-frame dead time.</p> <p>For MODBUS, refer to the parameter list.</p> <p>Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p>
r2025	Rejected USS telegrams	[2]	[2]	-	-	Displays the number of USS telegrams that have been rejected.
r2026	USS frame error, serial interface. COM link	[2]	[2]	-	-	Displays the number of USS frame errors.
r2027	USS overflow errors, serial interface. COM link	[2]	[2]	-	-	Displays the number of USS telegrams with overrun error.
r2028	USS parity error, serial interface. COM link	[2]	[2]	-	-	Displays the number of USS telegrams with parity error.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2029	Fieldbus interface error statistics / start of USS not detected	[2]	[2]	[8]	[8]	<p>Up to FW V3.2 Displays the number of USS telegrams where the start was not detected.</p> <p>From FW V4.3.2 and higher Displays receive errors at the fieldbus interface (RS485). Indexed values for eight error types. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".</p>
r2030	Fieldbus interface protocol selection / USS BCC errors	[2]	[2]	x	x	<p>Up to FW V3.2 Displays the number of USS telegrams with BCC error.</p> <p>From FW V4.3.2 and higher Sets the communication protocol for the fieldbus interface: No protocol / USS / MODBUS</p>
r2031	USS length error	[2]	[2]	-	-	<p>Up to FW V3.2 Displays the number of USS telegrams with incorrect length.</p>
r2032	Master control, control word active / BO: Control word 1 from USS at RS232	.15	.15	.10	.10	<p>Up to FW V3.2 Displays control word 1 of the USS at the RS232 interface (word 1 in USS).</p> <p>From FW V4.3.2 and higher Displays the active control word 1 (STW1) of the drive for master control. Bit patterns with different significance.</p>

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2033	BO: Control word2 from the BOP link (USS)	.15	.15	-	-	Up to FW V3.2 Displays control word 2 of the USS at RS232 (word 4 in USS).
r2036	BO: Control word1 from the COM link (USS)	.15	.15	-	-	Up to FW V3.2 Displays control word 1 of the USS at RS485 (word 1 in USS=PZD1).
r2037	BO: Control word 2 from USS at RS485 (USS)	.15	.15			Displays control word 2 of the USS at the RS485 interface (word 4 in USS=PZD4). From FW V4.3.2 p2037

18.5 p2037 to p2099 communication parameters PROFdrive

Table 18-4

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2037	PROFdrive STW1.10 = 0 mode			x	x	Sets the processing mode for PROFdrive STW1.10 "Control by PLC". Up to FW V3.2 r2037
p2038	PROFdrive STW/ZSW Interface Mode	-	x	x	x	Sets the Interface Mode of the PROFdrive control words and status words: SINAMICS / VIK-NAMUR. Only for CU with DP interface.
p2039	Debug monitor interface selection	-	-	x	x	Select: The serial interface for the debug monitor is COM1 (commissioning interface, RS232) or COM2 (fieldbus interface, RS485). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p2040	Fieldbus interface monitoring time / fieldbus telegram (frame) off time	x	x	x	x	Defines the time, which after it has expired, an error is initiated if a telegram (frame) has not been received via the connection. Parameter not available for CU240x-2 DP. Factory settings are different.
p2041	CB parameter, FB parameter	[5]	[5]	-	-	The parameter configures the communication module.
p2042	PROFIBUS identification number	-	x	x	x	Sets the PROFIBUS identification number (PNO-ID): SINAMICS / VIK-NAMUR.
r2043	BO: PROFdrive PZD state	-	-	.2	.2	Displays the PROFdrive PZD state: Failed / running.

18 Motor identification and speed optimization

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2044	PROFIdrive fault delay	-	-	x	x	Sets the delay time to initiate fault F01910 after setpoint failure.
p2047	PROFIBUS additional monitoring time	-	-	x	x	Sets the additional monitoring time for monitoring process data received via PROFIBUS.
r2050	PROFIdrive PZD received word, PZD 1 to 8 (0 to 7)	[8]	[8]	[8]	[8]	Different designation: PZD 1 to 8 or PZD 0 to 7.
p2051	PROFIdrive PZD send word, PZD 1 to 8 (0 to 7)	[8]	[8]	[8]	[8]	Different designation: PZD 1 to 8 or PZD 0 to 7. Selects the PZD (actual values) in the word format to be sent to the fieldbus master.
r2053	PROFIdrive diagnostics PZD send word / FB identification	[5]	[8]	[8]	[8]	Up to FW V3.2 Displays the communication identification data. From FW V4.3.2 and higher Displays the PZD (actual values) in the word format sent to the fieldbus master.
r2054	PROFIBUS state / FB diagnostics	[7]	[16]	x	x	Status display for the PROFIBUS interface. From FW V4.3.2 and higher Parameter not indexed, four states.
r2055	PROFIBUS diagnostics standard	-	-	[3]	[3]	Diagnostics display for the PROFIBUS interface.
r2058	FB rev. Config.	-	[16]	-	-	Displays the direction of rotation configuration data of the display communication, only for CU240S DP.
r2059	CO: Indicates the status of the SOL for the SOL master.	-	[5]	-	-	Only for CU240S DP, CU240S DP-F, CU240S PN, CU240S PN-F
r2074	PROFIdrive diagnostics bus address PZD receive, PZD 1 to 8	-	-	[8]	[8]	Displays the PROFIBUS address of the sender, from which the process data (PZD) is received.

18 Motor identification and speed optimization

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2075	PROFIdrive diagnostics telegram offset PZD receive	-	-	[8]	[8]	Displays the byte offset of the PZD in the PROFIdrive receive telegram (Controller Output).
r2076	PROFIdrive diagnostics telegram offset PZD send	-	-	[8]	[8]	Displays the byte offset of the PZD in the PROFIdrive send telegram (Controller Input).
r2077	PROFIBUS diagnostics slave-to-slave communication addresses	-	-	[16]	[16]	Displays the addresses of the slaves, with which a connection is configured via PROFIBUS slave-to-slave communication.
p2079	PROFIdrive PZD telegram selection extended	-	-	x	x	Sets the send and receive telegram. Contrary to p0922, using p2079, a telegram can be set and subsequently extended.
p2080	Binector-connector converter status word 1	-	-	[16]	[16]	Selects the bits, status word 1, to be sent to the PROFIdrive controller
p2081	Binector-connector converter status word 2	-	-	[16]	[16]	Selects the bits, status word 2, to be sent to the PROFIdrive controller
p2082	Binector-connector converter status word 3	-	-	[16]	[16]	Selects the bits, status word 3, to be sent to the PROFIdrive controller
p2083	Binector-connector converter status word 4	-	-	[16]	[16]	Selects the bits, status word 4, to be sent to the PROFIdrive controller
p2084	Binector-connector converter status word 5	-	-	[16]	[16]	Selects the bits, status word 5, to be sent to the PROFIdrive controller
p2088	Binector-connector converter invert status word	-	-	[5]	[5]	Setting to invert the individual binector inputs of the binector-connector converter.
r2089	Binector-connector converter send status word	-	-	[5]	[5]	Connector output to interconnect the status words to a PZD send word.
r2090	BO: PROFIdrive PZD1 receive bit by bit / BO: Control word 1 from the fieldbus	.15	.15	.15	.15	Up to FW V3.2 Displays control word 1 received from the fieldbus. From FW V4.3.2 and higher Binector output to interconnect - bit by bit - the PZD1 (normally control word 1) received from the PROFIBUS master.

18 Motor identification and speed optimization

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2091	BO: PROFIdrive PZD2 receive bit by bit / BO: Control word 2 from the fieldbus	.15	.15	.15	.15	Up to FW V3.2 Displays control word 2 received from the fieldbus. From FW V4.3.2 and higher Binector output to interconnect - bit by bit - the PZD2 (normally control word 2 , see r2093) received from the PROFIBUS master.
r2092	BO: PROFIdrive PZD3 receive bit by bit	-	-	.15	.15	Binector output to interconnect - bit by bit - the PZD3 received from the PROFIBUS master.
r2093	BO: PROFIdrive PZD4 receive bit by bit	-	-	.15	.15	Binector output to interconnect - bit by bit - the PZD4 (normally control word 2) received from the PROFIBUS master.
r2094	BO: Connector-binector converter binector output	-	-	.15	.15	Binector output to further interconnect - bit by bit - a PZD word received from the fieldbus master. The PZD is selected using p2099[0].
r2095	BO: Connector-binector converter binector output	-	-	.15	.15	Binector output to further interconnect - bit by bit - a PZD word received from the fieldbus master. The PZD is selected using p2099[1].
p2098	Connector-binector converter invert binector output	-	-	[2]	[2]	Setting to invert the individual binector outputs of the binector-connector converter. Using p2098, the signals from CI: p2099 are influenced.
p2099	CI: Connector-binector converter signal source	-	-	[2]	[2]	Sets the signal source for the connector-binector converter. A PZD receive word can be selected as signal source. Also refer to: r2094, r2095.

19 Faults and alarms, monitoring functions

19.1 p2100 to p2139 faults and alarms

19.1.1 Changes and expansions p2100 to p2139 faults and alarms

Messages for diagnostic purposes and the corresponding parameters have been expanded. An overview of the changes is provided in the subsequent table; details are described in the List Manuals.

19.1.2 Important function restrictions of p2115 real-time clock

FW V3.x p2115 = real-time clock,
set using USS telegram; possible source for the timestamp of the error time r0948.

FW V4.3.2 p2115 is no longer available.
System runtime r2114 is used for the timestamp of the error time.

Note

For the CU230P-2, the real time is available in parameter p8400/p8401, and is used as timestamp for the error time.

Table 19-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2100	Sets the fault number for the fault response	[3]	[3]	[20]	[20]	Selects the faults, for which the fault response should be changed. From FW V4.3.2 and higher Index has been expanded to include other fault numbers.

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2101	Sets the fault response	[3]	[3]	[20]	[20]	Sets the fault response for the selected fault. From FW V4.3.2 and higher [4] no response - "only alarm" has been eliminated Additional selection values - „STOP2“ and "IASC / DC BRAKE".
p2103	BI: 1. Acknowledge faults / BI: 1. Fault acknowledgment	[3]	[4]	[4]	[4]	Sets the first signal source to acknowledge faults. Factory settings are different, depending on the module.
p2104	BI: 2. Acknowledge faults / BI: 2. Fault acknowledgment	[3]	[3]	[4]	[4]	Sets the second signal source to acknowledge faults. Factory settings are different, Module-dependent.
p2105	BI: 3. Acknowledge faults	-	-	[4]	[4]	Sets the third signal source to acknowledge faults.
p2106	BI: External fault 1	[3]	[3]	[4]	[4]	Sets the signal source for external fault 1
p2107	BI: External fault 2	-	-	[4]	[4]	Sets the signal source for external fault 2
p2108	BI: External fault 3	-	-	[4]	[4]	Sets the signal source for external fault 3
r2109	Fault time resolved in milliseconds	-	-	[64]	[64]	Displays the system runtime in milliseconds when the fault was resolved.

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2110	Alarm number	[4]	[4]	[64]	[64]	<p>Displays the number of alarms that have occurred.</p> <p>Up to FW V3.2 Maximum of 2 active alarms (indices 0 and 1) and 2 alarms from the past (indices 2 and 3) can be displayed.</p> <p>From FW V4.3.2 and higher This parameter is identical with r2122.</p>
p2111	Alarms counter	x	x	x	x	<p>Number of faults that have occurred since the last reset.</p> <p>Up to FW V3.2 Maximum 4.</p> <p>From FW V4.3.2 and higher 65535.</p>
p2112	BI: External alarm 1	-	-	[4]	[4]	<p>Sets the signal source for external alarm 1. Also see: A07850.</p>
r2114	Total system runtime	[2]	[2]	[2]	[2]	<p>Displays the total system runtime of the drive device.</p> <p>Up to FW V3.2 [0] seconds, upper word [1] = seconds, lower word.</p> <p>From FW V4.3.2 and higher [0] = milliseconds [1] days, (data type U32).</p>

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2115	Real-time clock	[3]	[3]	-	-	Real time clock, set by the USS telegram. FW V3.2 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p2116	BI: External alarm 2	-	-	[4]	[4]	Sets the signal source for external alarm 2. Also refer to: A07851.
p2117	BI: External alarm 3	-	-	[4]	[4]	Sets the signal source for external alarm 3. Also refer to: A07852.
p2118	Sets the message number for the message type	-	-	[20]	[20]	Selects the faults or alarms, for which the message type should be changed. Also refer to: p2119
p2119	Sets the message type	-	-	[20]	[20]	The fault or alarm is selected and the required type of message is set under the same index. Also refer to: p2118
r2120	CO: Sum of the fault and alarm buffer changes	x	x	x	x	Displays the sum of all of the fault and alarm buffer changes in the drive device. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r2121	CO: Alarm buffer changes counter	-	-	x	x	This counter is incremented each time the alarm buffer changes.
r2122	Alarm code	-	-	[64]	[64]	Displays the number of alarms that have occurred.
r2123	Alarm time received in milliseconds	-	-	[64]	[64]	Displays the system runtime in milliseconds when the alarm actually occurred.
r2124	Alarm value	-	-	[64]	[64]	Displays the supplementary information regarding the alarm that has occurred (as integer number).

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2125	Alarm time resolved in milliseconds	-	-	[64]	[64]	Displays the system runtime in milliseconds when the alarm was resolved.
p2126	Sets the fault number for the acknowledgment mode	-	-	[20]	[20]	Selects the faults, for which the acknowledgment type should be changed. The selection of the fault and setting of the required acknowledgment type are realized under the same index, see p2127
p2127	Sets the acknowledgment mode	-	-	[20]	[20]	Sets the acknowledgment type for the selected fault p2126: Only using POWER ON / IMMEDIATE acknowledgment after the fault has been resolved/removed.
p2128	Selects the fault/alarm code for the trigger	-	-	[16]	[16]	Selects the faults or alarms, which can be used as a trigger basis. Also refer to: r2129.
r2129	CO/BO: Trigger word for faults and alarms	-	-	.15	.15	Trigger signal for the selected faults and alarms. Also refer to: r2128.
r2130	Fault time received in days	-	-	[64]	[64]	Displays the system runtime in days when the fault actually occurred.
r2131	CO: Actual fault code	-	x	x	x	Displays the code of the oldest fault that is still active.
r2132	CO: Actual alarm code / CO: First alarm numbers-code	-	x	x	x	Up to FW V3.2 CO: First alarm numbers-code From FW V4.3.2 and higher Displays the code of the alarm that last occurred.
r2133	Fault value for float values	-	-	[64]	[64]	Displays the supplementary information regarding the fault that has occurred for float values.
r2134	Alarm value for float values	-	-	[64]	[64]	Displays the supplementary information regarding the alarm that has occurred for float values.
r2135	CO/BO: Status word faults/alarms 2	-	-	.15	.15	Displays the second status word of faults and alarms.

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2136	Fault time resolved in days	-	-	[64]	[64]	Displays the system runtime in days when the fault was resolved.
r2138	CO/BO: Control word faults/alarms	-	-	.15	.15	Displays the control word of faults and alarms.
r2139	CO/BO: Status word faults/alarms 1	-	-	.12	.12	Displays the first status word of faults and alarms.

19.2 p2140 to p2173 monitoring functions for speed, current, voltage

19.2.1 p2140 to p2164 threshold value designations for monitoring functions

The designations of threshold values has been changed:

Table 19-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2140	Hysteresis speed 2	-	-	[4]	[4]	Sets the hysteresis speed (bandwidth) for the following messages/signals: " n_act <= speed threshold value 2" (BO: r2197.1) " n_act > speed threshold value 2" (BO: r2197.2)
p2141	Speed threshold value 1	-	-	[4]	[4]	Sets the speed threshold value for the message "f or n comparison value reached or exceeded" (BO: r2199.1). Also refer to: p2142, r2199.
p2142	Hysteresis speed 1	-	-	[4]	[4]	Sets the hysteresis speed (bandwidth) for the message "f or n comparison value reached or exceeded" (BO: r2199.1). Also refer to: p2141, r2199

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2144	BI: Motor stalled/blocked monitoring enable (negated)	-	-	[4]	[4]	Sets the signal source for the negated enable ([0] enable) of the motor stalled/blocked monitoring function. Also refer to: p2163, p2164, p2166, r2197, r2198 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r2145	Alarm time received in days	-	-	[64]	[64]	Displays the system runtime in days when the alarm actually occurred. The time comprises r2145 (days) and r2123 (milliseconds).
r2146	Alarm time resolved in days	-	-	[64]	[64]	Displays the system runtime in days when the alarm actually occurred. The time comprises r2145 (days) and r2123 (milliseconds).
p2148	BI: Ramp-function generator active	-	-	[4]	[4]	Sets the signal source for the "Ramp-function generator active" signal for the messages: r2199.4 BO: r2199.5.
p2149	Monitoring function configuration	-	-	[4]	[4]	Configuration word for messages and monitoring functions.
p2150	Hysteresis speed 3 / hysteresis frequency f_hys	[3]	[3]	[4]	[4]	Defines the hysteresis frequency for the different message functions. From FW V4.3.2 and higher Sets the hysteresis speed (bandwidth) for the following messages/signals: "n_act < speed threshold value 3" (BO: r2199.0) "n_set >= 0" (BO: r2198.5) "n_act >= 0" (BO: r2197.3).
p2151	CI: Speed setpoint for messages	-	[3]	[4]	[4]	Sets the signal source for the speed setpoint for messages.
p2152	Delay for comparison n > n_max	-	[3]	[4]	[4]	Delay time for comparing the speed with the maximum speed.

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2153	Speed actual value filter time constant	[3]	[3]	[4]	[4]	Sets the time constant of the PT1 element to smooth the speed/velocity actual value. Modified factory setting 5ms/0ms.
p2155	Speed threshold value 2 / frequency threshold value f_1	[3]	[3]	[4]	[4]	Speed threshold value 2 / frequency threshold value f_1 Sets a threshold value for the messages r2197.1, r2197.2 and r0053.
p2156	Switch-on delay comparison value reached/delay time of the frequency threshold value f_1	[3]	[3]	[4]	[4]	Sets the switch-on delay time for the message "Comparison value reached" (BO: r2199.1).
p2157	Speed threshold value 5 / frequency threshold value f_2	[3]	[3]	[4]	[4]	Speed threshold value 5 / frequency threshold value f_2 Sets a threshold value for the messages r2198.0, r2198.1.
p2158	Delay for n_act comparison with the speed threshold value 5 / delay time of the frequency threshold value f_2	[3]	[3]	[4]	[4]	Delay time for comparing the speed with the speed threshold value 5 (P2157).
p2159	Speed threshold value 6 / frequency threshold value f_3	[3]	[3]	[4]	[4]	Speed threshold value 6 / frequency threshold value f_3 Sets a threshold value for the messages r2198.2, r2198.3
p2160	Delay for n_act comparison with the speed threshold value 6 / delay time of the frequency threshold value f_3	[3]	[3]	[4]	[4]	Sets the delay time for comparing the speed with the speed threshold value 6 (p2159).
p2161	Speed threshold value 3 / minimum threshold for the frequency setpoint	[3]	[3]	[4]	[4]	Speed threshold value 3 / minimum threshold for the frequency setpoint Up to FW V3.2 Sets a threshold value for the message r2198.4 From FW V4.3.2 and higher Additionally sets a threshold value for the message r2199.0

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2162	Hysteresis speed $n_{act} > n_{max}$ / hysteresis frequency for overspeed	[3]	[3]	[4]	[4]	Hysteresis speed $n_{act} > n_{max}$ / hysteresis frequency for overspeed Sets a threshold value for the messages r2197.6
p2163	Speed threshold value 4 / frequency for the start of the permitted deviation	[3]	[3]	[4]	[4]	Speed threshold value 4 / frequency for the start of the permitted deviation Sets a threshold value for the message r2197.7. Parameter designation: r2197.7: Up to FW V3.2 „f_act == setpoint (f_set)“. From FW V4.3.2 and higher "Speed setpoint-actual value deviation within tolerance t_off“.
p2164	Hysteresis speed 4 / hysteresis frequency deviation	[3]	[3]	[4]	[4]	Hysteresis speed 4 / Hysteresis frequency deviation Belongs to p2163, sets r2197.7
p2165	Delay time for the permitted deviation	[3]	[3]	-	-	Delay time for the permitted deviation Belongs to p2163, sets r2197.7
p2166	Switch-off delay $n_{act} = n_{set}$ / Delay for ramp-up/acceleration completed	[3]	[3]	[4]	[4]	Switch-off delay $n_{act} = n_{set}$ / Delay for ramp-up/acceleration completed Up to FW V3.2 Belongs to p2174 (torque threshold value & setpoint reached) From FW V4.3.2 and higher Belongs to p2163, sets r2197.7

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2167	Switch-on delay $n_{act} = n_{set} /$ shutdown frequency f_{off}	[3]	[3]	[4]	[4]	Switch-on delay $n_{act} = n_{set} /$ shutdown frequency f_{off} Up to FW V3.2 Influences status word 2 (r0053.1) From FW V4.3.2 and higher Influences the message "Speed setpoint-actual value deviation ... " (r2199.4).
p2168	Delay time T_{off}	[3]	[3]	-	-	Delay time T_{off} for shutdown below the shutdown frequency p2167.
r2169	CO: Speed actual value smoothed messages / CO: Smoothed frequency actual value 3	x	x	x	x	Displays the smoothed actual speed / actual frequency for messages.
p2170	Current threshold value	[3]	[3]	[4]	[4]	Sets the current threshold value for the messages r2197.8 and r2198.8. Up to FW V3.2 Value in [%] Factory setting 100%. From FW V4.3.2 and higher Value in [A] Factory setting 0A
p2171	Current threshold value reached delay time	[3]	[3]	[4]	[4]	Sets the delay time for the comparison of the current actual value (r0068) with the current threshold value (p2170).
p2172	DC link voltage threshold value	[3]	[3]	[4]	[4]	Sets the DC link voltage threshold value for the following messages: "Vdc_act <= Vdc_threshold value p2172" (BO: r2197.9) "Vdc_act > Vdc_threshold value p2172" (BO: r2197.10)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2173	DC link voltage comparison delay time	[3]	[3]	[4]	[4]	Sets the delay time for comparing the DC link voltage r0070 with the threshold value p2172.

19.3 p2174 to p2199 torque monitoring, status words

Table 19-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2174	Torque threshold value 1 / upper torque threshold value 1	[3]	[3]	[4]	[4]	Torque threshold value 1 / upper torque threshold value 1 Sets the torque threshold value for the messages: r2198.9, r2198.10, From FW V4.3.2 and higher additionally, r2198.13.
p2175	Motor stalled (locked rotor) speed threshold	-	-	[4]	[4]	Sets the speed threshold for the message "Motor stalled/blocked" r2198.6.
p2176	Torque threshold value comparison delay time	[3]	[3]	[4]	[4]	Delay time for the comparison with threshold value p2174. Up to FW V3.2 Factory setting 10ms, From FW V4.3.2 and higher Factory setting 200ms.

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2177	Motor stalled (locked rotor) delay time	[3]	[3]	[4]	[4]	Delay time to identify that the motor has stalled (motor blocked). Belongs to p2175, sets r2198.6. Up to FW V3.2 Factory setting 10ms, From FW V4.3.2 and higher Factory setting 3s Changed unit [ms] / [s].
p2178	Motor stalled delay time	[3]	[3]	[4]	[4]	Sets the delay time for the message "Motor stalled" r2198.7. Unit up to FW V3.2 [ms], from FW V4.3.2 [s].
p2179	Output load detection current limit / current limit for no-load detection	x	x	[4]	[4]	Sets the current limit for the output load detection r2197.11. Unit up to FW V3.2 [%], from FW V4.3.2 3 [A], factory settings 3[%] / 0[A].
p2180	Missing output load delay time / delay time no-load detection	x	x	[4]	[4]	Delay time for p2179 Indexed from FW V4.3.2 and higher,
p2181	Load monitoring response	[3]	[3]	[4]	[4]	Sets the response when evaluating the load monitoring.
p2182	Load monitoring speed threshold 1 / load torque monitoring frequency threshold 1	[3]	[3]	[4]	[4]	Sets the speed/torque envelope curve for the load monitoring. Up to FW V3.2 Frequency/torque

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2183	Load monitoring speed threshold 2 / load torque monitoring frequency threshold 2	[3]	[3]	[4]	[4]	Sets the speed/torque envelope curve for the load monitoring. Up to FW V3.2 Frequency/torque
p2184	Load monitoring speed threshold 3 / load torque monitoring frequency threshold 3	[3]	[3]	[4]	[4]	Sets the speed/torque envelope curve for the load monitoring. Up to FW V3.2 Frequency/torque
p2185	Load monitoring torque threshold 1 upper / upper load torque threshold M_o1	[3]	[3]	[4]	[4]	Sets the speed/torque envelope curve for the load monitoring. From FW V4.3.2 and higher Extended setting range.
p2186	Load monitoring torque threshold 1 lower / lower load torque threshold M_u1	[3]	[3]	[4]	[4]	Sets the speed/torque envelope curve for the load monitoring. From FW V4.3.2 and higher Extended setting range.
p2187	Load monitoring torque threshold 2 upper / upper load torque threshold M_o2	[3]	[3]	[4]	[4]	Sets the speed/torque envelope curve for the load monitoring. From FW V4.3.2 and higher Extended setting range.
p2188	Load monitoring torque threshold 2 lower / lower load torque threshold M_u2	[3]	[3]	[4]	[4]	Sets the speed/torque envelope curve for the load monitoring. From FW V4.3.2 and higher Extended setting range.

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2189	Load monitoring torque threshold 3 upper / upper load torque threshold M_o3	[3]	[3]	[4]	[4]	Sets the speed/torque envelope curve for the load monitoring. From FW V4.3.2 and higher Extended setting range.
p2190	Load monitoring torque threshold 3 lower / lower load torque threshold M_u3	[3]	[3]	[4]	[4]	Sets the speed/torque envelope curve for the load monitoring. From FW V4.3.2 and higher Extended setting range.
p2192	Load monitoring delay time / delay time load torque monitoring	[3]	[3]	[4]	[4]	Sets the delay time when evaluating the load monitoring.
p2193	Load monitoring configuration	-	-	[4]	[4]	Setting to configure the load monitoring. Four setting values to monitor torque, speed and load failure.
p2194	Torque threshold value 2	-	-	[4]	[4]	Sets the torque/force threshold value for the message "Torque utilization < torque threshold value 2" r2199.11.
p2195	Torque utilization switch-off delay	-	-	[4]	[4]	Sets the switch-off delay time for the negated signal "Ramp-up/acceleration completed" The evaluation of the message "Torque setpoint < p2174" (r2198.10) and "Torque utilization < p2194" (r2199.11) is only realized after ramp-up/acceleration has been completed and the delay time has expired.
p2196	Torque utilization scaling	-	-	[4]	[4]	Sets the scaling factor for the torque utilization (r0033).

19 Faults and alarms, monitoring functions

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2197	CO/BO: Status word monitoring functions 1 / CO/BO: Messages 1	.11	.12	.12	.13	<p>Status word monitoring functions 1 Bit 5 Up to FW V3.2 " f_act <= P2167 (f_off)",</p> <p>From FW V4.3.2 and higher " n_act <= n_standstill p1226"</p> <p>Additionally from FW V3.2 and higher Bit 12 " f_act > P1082 with delay"</p> <p>From FW V4.4 and higher Bit 13 " n_act > n_max error"</p>
r2198	CO/BO: Status word monitoring functions 2 / CO/BO: Messages 2	.12	.12	.13	.13	<p>Status word monitoring functions 2</p> <p>From FW V4.3.2 and higher Bit 13 " M_act > torque threshold value 1"</p>
r2199	CO/BO: Status word monitoring functions 3	-	-	.11	.11	<p>Status word monitoring functions 3 Displays additional monitoring of speed threshold values, torque threshold values, torque utilization.</p>

20 Technology controller

20.1 p2200 to p2229 technology controller - fixed values

Table 20-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2200	BI: Technology controller enable	[3]	[3]	[4]	[4]	Sets the signal source to activate/deactivate the technology controller.
p2201	CO: Technology controller fixed value 1	[3]	[3]	[4]	[4]	Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency. From FW V4.3.2 and higher Modified factory settings.
p2202	CO: Technology controller fixed value 2	[3]	[3]	[4]	[4]	Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency. From FW V4.3.2 and higher Modified factory settings.
p2203	CO: Technology controller fixed value 3	[3]	[3]	[4]	[4]	Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency. From FW V4.3.2 and higher Modified factory settings.
p2204	CO: Technology controller fixed value 4	[3]	[3]	[4]	[4]	Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency. From FW V4.3.2 and higher Modified factory settings.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2205	CO: Technology controller fixed value 5	[3]	[3]	[4]	[4]	<p>Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency.</p> <p>From FW V4.3.2 and higher Modified factory settings.</p>
p2206	CO: Technology controller fixed value 6	[3]	[3]	[4]	[4]	<p>Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency.</p> <p>From FW V4.3.2 and higher Modified factory settings.</p>
p2207	CO: Technology controller fixed value 7	[3]	[3]	[4]	[4]	<p>Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency.</p> <p>From FW V4.3.2 and higher Modified factory settings.</p>
p2208	CO: Technology controller fixed value 8	[3]	[3]	[4]	[4]	<p>Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency.</p> <p>From FW V4.3.2 and higher Modified factory settings.</p>
p2209	CO: Technology controller fixed value 9	[3]	[3]	[4]	[4]	<p>Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency.</p> <p>From FW V4.3.2 and higher Modified factory settings.</p>

20 Technology controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2210	CO: Technology controller fixed value 10	[3]	[3]	[4]	[4]	<p>Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency.</p> <p>From FW V4.3.2 and higher Modified factory settings.</p>
p2211	CO: Technology controller fixed value 11	[3]	[3]	[4]	[4]	<p>Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency.</p> <p>From FW V4.3.2 and higher Modified factory settings.</p>
p2212	CO: Technology controller fixed value 12	[3]	[3]	[4]	[4]	<p>Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency.</p> <p>From FW V4.3.2 and higher Modified factory settings.</p>
p2213	CO: Technology controller fixed value 13	[3]	[3]	[4]	[4]	<p>Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency.</p> <p>From FW V4.3.2 and higher Modified factory settings.</p>
p2214	CO: Technology controller fixed value 14	[3]	[3]	[4]	[4]	<p>Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency.</p> <p>From FW V4.3.2 and higher Modified factory settings.</p>

20 Technology controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2215	CO: Technology controller fixed value 15	[3]	[3]	[4]	[4]	Sets the fixed values of the technology controller. Values as a [%] referred to the speed or frequency. From FW V4.3.2 and higher Modified factory settings.
p2216	Technology controller fixed value selection method / PID fixed setpoint mode - bit 0	[3]	[3]	[4]	[4]	Selects the methods, with which the fixed setpoint can be selected. selection direct/binary From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
p2217	PID fixed setpoint mode - bit 1	[3]	-	-	-	From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
p2218	PID fixed setpoint mode - bit 2	[3]	-	-	-	From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
p2219	PID fixed setpoint mode - bit 3	[3]	-	-	-	From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
p2220	BI: Technology controller fixed value selection bit 0	[3]	[3]	[4]	[4]	From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
p2221	BI: Technology controller fixed value selection bit 1	[3]	[3]	[4]	[4]	From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals

20 Technology controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2222	BI: Technology controller fixed value selection bit 2	[3]	[3]	[4]	[4]	From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
p2223	BI: Technology controller fixed value selection bit 3	[3]	[3]	[4]	[4]	From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
r2224	CO: Technology controller fixed value active	x	x	x	x	Displays the selected and active fixed value of the technology controller.
r2225	PID fixed setpoint mode - bit 4	[3]				From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
r2225	PID fixed value selection status word		.0	.0	.0	Displays technology controller fixed value selected yes/no
p2226	BI: PID fixed setpoint selection bit 4	[3]	-	-	-	From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
p2227	PID fixed setpoint mode - bit 5	[3]	-	-	-	From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
p2228	BI: PID fixed setpoint selection bit 5	[3]	-	-	-	From FW V3.2 and higher Modified selection of the setpoint sources. For the differences, see the List Manuals
r2229	Technology controller number actual	-	-	x	x	Displays the number of the selected fixed setpoint of the technology controller.

20.2 p2230 to p2263 motorized potentiometer configuration

Table 20-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2230	Technology controller motorized potentiometer configuration	-	-	[4]	[4]	Sets the configuration for the motorized potentiometer of the technology controller: Bit 00 save active yes/no Bit 02 initial rounding active yes/no Bit 03 non-volatile data save active for p2230.0 = [1]
p2231	Technology controller motorized potentiometer setpoint memory/setpoint memory PID MOP	[3]	[3]	-	-	Specification of the PID-MOP mode: MM440 PID-MOP setpoint is (not) saved FW V3.2 Bit 00 setpoint save active yes/no Bit 01 No ON state for MOP required yes/no
r2231	Technology controller motorized potentiometer setpoint memory/setpoint memory PID MOP	-	-	x	x	Displays the setpoint memory for the motorized potentiometer of the technology controller.
p2232	Negative PID-MOP setpoint inhibit	x	x	-	-	Inhibits negative setpoints at the PID-MOP output r2250.
p2235	BI: Technology controller motorized potentiometer setpoint, raise	[3]	[3]	[4]	[4]	Sets the signal source of the command "Motor potentiometer raise/lower". From FW V4.3.2 and higher Modified factory settings.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2236	BI: Technology controller motorized potentiometer setpoint, lower	[3]	[3]	[4]	[4]	Sets the signal source of the command "Motor potentiometer raise/lower". From FW V4.3.2 and higher Modified factory settings.
p2237	Technology controller motorized potentiometer maximum value	-	-	[4]	[4]	Sets the maximum/minimum value for the motorized potentiometer of the technology controller: Factory setting +100%/-100%.
p2238	Technology controller motorized potentiometer minimum value	-	-	[4]	[4]	Sets the maximum/minimum value for the motorized potentiometer of the technology controller: Factory setting +100%/-100%.
p2240	Technology controller motorized potentiometer initial value	[3]	[3]	[4]	[4]	Sets the initial value for the motorized potentiometer of the technology controller. Up to FW V3.2 Factory setting 10% From FW V4.3.2 and higher 0%.
p2241	PID-MOP select setpoint auto/man	-	[3]	-	-	Configures a signal change from the manual mode (P2235 and P2236) into the automatic mode (P2242).
p2242	PID-MOP: auto. Setpoint	-	[3]	-	-	Sets the signal source for the setpoint of the motorized potentiometer if the automatic mode P2241 is selected.
p2243	PID-MOP: Accept ramp generator setpoint	-	[3]	-	-	Sets the signal source so that the setting command accepts the setting value for the motor potentiometer
p2244	PID-MOP: Ramp generator setpoint	-	[3]	-	-	Sets the signal source for the setpoint of the MOP.

20 Technology controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2245	CO: Technology controller motorized potentiometer setpoint before RFG	-	x	x	x	Displays the motor potentiometer setpoint before it passes the PID-MOP RFG.
p2247	Technology controller motorized potentiometer ramp-up time	-	[3]	[4]	[4]	Sets the ramp-up time/ramp-down time for the internal ramp-function generator for the motorized potentiometer of the technology controller.
p2248	Technology controller motorized potentiometer ramp-down time	-	[3]	[4]	[4]	Sets the ramp-up time/ramp-down time for the internal ramp-function generator for the motorized potentiometer of the technology controller.
r2250	CO: Technology controller motorized potentiometer setpoint after RFG	x	x	x	x	Displays the effective setpoint after the internal ramp-function generator for the motorized potentiometer of the technology controller.
p2251	Technology controller mode	x	x	x	x	Sets the mode to use the technology controller output as main speed setpoint or as supplementary speed setpoint.
p2253	CI: Technology controller setpoint 1	[3]	[3]	[4]	[4]	Sets the signal source for setpoint 1 of the technology controller.
p2254	CI: Technology controller setpoint 2	[3]	[3]	[4]	[4]	Sets the signal source for setpoint 2 of the technology controller.
p2255	Technology controller setpoint 1 scaling	x	x	x	x	Sets the scaling for setpoint 1 of the technology controller.
p2256	Technology controller setpoint 2 scaling	x	x	x	x	Sets the scaling for setpoint 2 of the technology controller.
p2257	Technology controller ramp-up time	x	x	x	x	Sets the ramp-up time of the technology controller.
p2258	Technology controller ramp-down time	x	x	x	x	Sets the ramp-down time of the technology controller.

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2260	CO: Technology controller setpoint after the ramp-function generator	x	x	x	x	Displays the active total PID setpoint as a % after the PID ramp-function generator. From FW V4.3.2 and higher Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p2261	Technology controller setpoint filter time constant	x	x	x	x	Sets the time constant for the setpoint filter (PT1) of the technology controller.
r2262	CO: Filtered PID setpoint after the RFG	x	x	x	x	Displays the smoothed setpoint after the setpoint filter (PT1) of the technology controller.
p2263	Technology controller type	x	x	x	x	Sets the technology controller type. D component in the actual value signal / in the fault signal

20.3 p2264 to p2355 technology controller - actual values

Table 20-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2264	CI: Technology controller actual value	[3]	[3]	[4]	[4]	Selects the source of the PID actual value signal. From FW V4.3.2 and higher Modified factory settings.
p2265	Technology controller actual value filter time constant	x	x	x	x	Sets the time constant for the actual value filter (PT1) of the technology controller.
r2266	CO: Technology controller actual value after filter	x	x	x	x	Displays the smoothed actual value after the filter (PT1) of the technology controller.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2267	Technology controller upper limit actual value	x	x	x	x	Sets the upper limit for the actual value signal of the technology controller.
p2268	Technology controller lower limit actual value	x	x	x	x	Sets the lower limit for the actual value signal of the technology controller. Factory setting Up to FW V3.2 0%, From FW V4.3.2 and higher 100%.
p2269	Technology controller gain actual value	x	x	x	x	Scaling factor for the technology controller actual value
p2270	Technology controller actual value function	x	x	x	x	Setting to use an arithmetic function for the actual value signal of the technology controller.
p2271	Technology controller actual value inversion (sensor type)	x	x	x	x	Setting to invert the technology controller actual value signal.
r2272	CO: Technology controller actual value scaled	x	x	x	x	Displays the scaled actual value signal of the technology controller.
r2273	CO: Technology controller error	x	x	x	x	Displays the error (system deviation) between the setpoint and actual value of the technology controller.
p2274	Technology controller differentiation time constant	x	x	x	x	Sets the time constant for the differentiation (D component) of the technology controller.
p2280	Technology controller proportional gain	x	x	x	x	Sets the proportional gain (P component) of the technology controller. Factory setting, Up to FW V3.2 Kp 3 From FW V4.3.2 and higher Kp 1

20 Technology controller

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2285	Technology controller integral time	x	x	x	x	Sets the integration time constant) of the technology controller. Factory setting, Up to FW V3.2 Tn 0s From FW V4.3.2 and higher Tn 30s.
p2286	BI: Technology controller hold integrator	-	-	[4]	[4]	Sets the signal source to hold the integrator for the technology controller.
p2289	CI: Technology controller precontrol signal	-	-	[4]	[4]	Sets the signal source for the precontrol signal of the technology controller.
p2291	CO: Technology controller maximum limiting	x	x	x	x	Sets the maximum limiting of the technology controller.
p2292	CO: Technology controller minimum limiting	x	x	x	x	Sets the minimum limiting of the technology controller.
p2293	Technology controller ramp-up/ramp-down time	x	x	x	x	Sets the ramp-up and ramp-down time for the output signal of the technology controller.
r2294	CO: Technology controller output signal	x	x	x	x	Displays the output signal of the technology controller.
p2295	CO: Technology controller output scaling	x	x	x	x	Sets the scaling for the output signal of the technology controller.
p2296	CI: Technology controller output scaling	-	-	[4]	[4]	Sets the signal source for the scaling value of the technology controller.
p2297	CI: Technology controller maximum limiting signal source	-	-	[4]	[4]	Sets the signal source for the maximum limiting of the technology controller.
p2298	CI: Technology controller minimum limiting signal source	-	-	[4]	[4]	Sets the signal source for the minimum limiting of the technology controller.
p2299	CI: Technology controller limiting offset	-	-	[4]	[4]	Sets the signal source for the output limiting offset of the technology controller.

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Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2302	Technology controller output signal initial value	-	-	x	x	Initial value of the technology controller output.
p2306	Technology controller error signal inversion	-	-	-	x	Setting to invert the technology controller error signal.
r2344	CO: Technology controller last speed setpoint (smoothed)	-	-	x	x	Displays the smoothed speed setpoint of the technology controller before switching over to operation with fault response - see p2345.
p2345	Technology controller fault response	-	-	x	x	Sets the technology control output response when fault F07426 occurs (limited technology controller actual value).
r2349	CO/BO: Technology controller status word	-	-	.12	.12	Displays the status word of the technology controller.
p2350	Enable PID automatic tuning	x	x	-	-	Activates the function to automatically tune the PID controller.
p2354	PID autotuning monitoring time	x	x	-	-	Sets the monitoring time after the automatic tuning has been canceled.
p2355	PID autotuning offset	x	x	-	-	Sets the offset for the automatic PID calibration.

20.4 p2470 to p2489 positioning down ramp

20.4.1 Important function restrictions for p2480 to p2488 positioning down ramp

From FW V4.x and higher, the positioning down ramp will no longer be supported

Table 20-4

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2470	Scaling factor encoder speed	-	[3]	-	-	Scaling factor to be applied to the measured encoder speed.
r2477	CO: Actual scaled encoder speed	-	x	-	-	Scaled output value of the encoder speed.
r2478	CO: Actual scaled encoder frequency	-	x	-	-	Scaled output value of the encoder frequency (Hz).
p2480	Enable positioning down ramp/positioning operating mode	[3]	[3]	-	-	Selects the signal source to enable/inhibit positioning.
p2481	Input gearbox ratio	[3]	[3]	-	-	P2481 and P2482 define the gearbox ratio for the positioning down ramp functionality.
p2482	Output gearbox ratio	[3]	[3]	-	-	P2481 and P2482 define the gearbox ratio for the positioning down ramp functionality.
p2484	Number of shaft revolutions = 1 unit	[3]	[3]	-	-	Defines the number of revolutions, which are required to represent a user-defined unit.
p2487	Calibration value positioning error	[3]	[3]	-	-	This parameter can be used to optimize positioning for a down the ramp.
p2488	Distance/number of revolutions	[3]	[3]	-	-	Defines the distance or the number of revolutions See P2484.

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2489	Tracking parameter / actual number of shaft revolutions	x	[3]	-	-	MM440 Displays the actual number of shaft revolutions since activating the positioning function. FW V3.2 This parameter displays three tracking values of the positioning for the down ramp function

20.5 p2800 to p2888 free function blocks up to FW V3.2

See Section 27.2 p2800 to p2888 free function blocks to FW V3.2.

20.6 p2889 to p2955 fixed values, wobble function

20.6.1 p2900 to p2930 fixed setpoints that can be freely used

From FW V4.3.2 and higher, with p2900 up to p2930 fixed setpoints are available that can be freely used.

p2900/p2901 Setting, fixed percentage values

r2902 Preselected fixed setpoints

p2930 Setting a fixed value for torque

20.6.2 Important function restrictions of p2940 to p2955 wobble generator

From FW V4.x and higher, the wobble generator will no longer be supported

Table 20-5

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2889	CO: Fixed setpoint 1 in [%]	x	x	-	-	Fixed percentage setting 1.
p2890	CO: Fixed setpoint 2 in [%]	x	x	-	-	Fixed percentage setting 2.
p2900	CO: Fixed value 1 [%]	-	-	[4]	[4]	Setting a fixed percentage value. The value can be used to interconnect a scaling (e.g. to scale the main setpoint).
p2901	CO: Fixed value 2 [%]	-	-	[4]	[4]	Setting a fixed percentage value.
r2902	CO: Fixed values [%]	-	-	[15]	[15]	Signal sources for frequently used percentage values. Fixed values from -200% up to +200%. These signal sources can be used, for example to interconnect scalings.
p2930	CO: Fixed value M [Nm]	-	-	[4]	[4]	Sets a fixed value for torque
p2940	BI: Enable wobble function	-	x	-	-	Defines the source to enable the wobble function.
p2945	Wobble signal frequency	-	x	-	-	Defines the wobble signal frequency.
p2946	Wobble signal amplitude	-	x	-	-	Defines the amplitude value for the wobble signal proportional to the available RFG output
p2947	Decrementing step wobble signal	-	x	-	-	Defines the value of the decrementing step at the end of the positive signal period.
p2948	Incrementing step wobble signal	-	x	-	-	Defines the value of the incrementing step at the end of the negative signal period.
p2949	Pulse width wobble signal	-	x	-	-	Defines the relative width of the rising and falling pulses.
r2955	CO: Wobble signal output	-	x	-	-	Displays the wobble function output.

21 Messages, commissioning, data management

21.1 p3110 to p3132 messages

Table 21-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p3110	External fault 3 switch on delay	-	-	x	x	Sets the delay time for external fault 3
p3111	BI: External fault 3 enable	-	-	[4]	[4]	Sets the signal source for the enable signal of external fault 3.
p3112	BI: External fault 3 enable negated	-	-	[4]	[4]	Sets the signal source for the negated enable signal of external fault 3.
r3113	CO/BO: NAMUR message bit bar / CO/BO: Fault bit field	-	.15	.15	.15	FW V3.2 The fault bit field displays information about the actual fault From FW 4.3.2 Displays the status of the NAMUR message bit bar. Bit assignment has in some cases been changed.
r3131	CO: Actual fault value	-	-	x	x	Displays the code value of the oldest fault that is still active.
r3132	CO: Actual component number	-	-	-	x	Displays the component number of the oldest fault that is still active.

21.2 p3230 to p3233 load monitoring

Table 21-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p3230	Cl: Load monitoring speed actual value	-	-	[4]	[4]	Sets the signal source for the speed actual value of the load monitoring.
p3231	Load monitoring speed deviation	-	-	[4]	[4]	Sets the permissible speed deviation for the load monitoring (for p2193 = 2).
p3232	Bl: Load monitoring failure detection	-	-	[4]	[4]	Sets the signal source for detecting a failure.
p3233	Torque actual value filter time constant	-	-	[4]	[4]	Sets the time constant of the PT1 element to smooth the torque actual value.
p3235	Phase failure message motor monitoring time	-	-	[4]	[4]	Sets the monitoring time for the phase failure detection of the motor. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

21.3 p3320 to p3329 fluid flow machine

Table 21-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p3320	Fluid flow machine $P = f(n)$, Y coordinate: P flow1 %	-	-	-	[4]	Power (P) for point 1 on the Y coordinate of the flow characteristic [%].
p3321	Fluid flow machine $P = f(n)$, X coordinate: n flow1 %	-	-	-	[4]	Speed (n) for point 1 on the X coordinate of the flow characteristic [%].
p3322	Fluid flow machine $P = f(n)$, Y coordinate: P flow2 %	-	-	-	[4]	Power (P) for point 2 on the Y coordinate of the flow characteristic [%].
p3323	Fluid flow machine $P = f(n)$, X coordinate: n flow2 %	-	-	-	[4]	Speed (n) for point 2 on the X coordinate of the flow characteristic [%].
p3324	Fluid flow machine $P = f(n)$, Y coordinate: P flow3 %	-	-	-	[4]	Power (P) for point 3 on the Y coordinate of the flow characteristic [%].
p3325	Fluid flow machine $P = f(n)$, X coordinate: n flow3 %	-	-	-	[4]	Speed (n) for point 3 on the X coordinate of the flow characteristic [%].
p3326	Fluid flow machine $P = f(n)$, Y coordinate: P flow4 %	-	-	-	[4]	Power (P) for point 4 on the Y coordinate of the flow characteristic [%].
p3327	Fluid flow machine $P = f(n)$, X coordinate: n flow4 %	-	-	-	[4]	Speed (n) for point 4 on the X coordinate of the flow characteristic [%].
p3328	Fluid flow machine $P = f(n)$, Y coordinate: P flow5 %	-	-	-	[4]	Power (P) for point 5 on the Y coordinate of the flow characteristic [%].
p3329	Fluid flow machine $P = f(n)$, X coordinate: n flow5 %	-	-	-	[4]	Speed (n) for point 5 on the X coordinate of the flow characteristic [%].

21.4 p3330 to p3334 interfaces 2/3 wire control

Table 21-4

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p3330	BI: 2/3 wire control command 1	-	-	-	[4]	Sets the signal source for command 1 for the 2-wire control/3-wire control. The function of this binector input depends on the type of wire control set in p0015.
p3331	BI: 2/3 wire control command 2	-	-	-	[4]	Sets the signal source for command 2 for the 2-wire control/3-wire control. The function of this binector input depends on the type of wire control set in p0015.
p3332	BI: 2/3 wire control command 3	-	-	-	[4]	Sets the signal source for command 3 for the 2-wire control/3-wire control. The function of this binector input depends on the type of wire control set in p0015.
r3333	CO/BO: 2/3 wire control, control word	-	-	-	.3	Displays the control word for the 2-wire control/3-wire control. The control signal depends on the type of wire control set in p0015, and the signal states at the digital inputs.
p3334	2/3 wire control selection	-	-	-	x	Sets the 2-wire control/3-wire control. The value depends on the type of wire control set in p0015. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

21.5 p3856 to p3859 compound braking

Table 21-5

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p3856	Compound braking current	-	-	[4]	[4]	With the compound braking current, the magnitude of the DC current is defined, which, when stopping the motor for operation with V/f control, is generated to additionally increase the braking effect. Up to FW V3.2 The parameter number is p1236.
r3859	CO/BO: Compound braking status word	-	-	.0	.0	Status display of the compound braking active/inactive

21.6 p3900 to p3996 commissioning, data management

Table 21-6

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p3900	Completion of basic commissioning	x	x	x	x	Exits basic commissioning (p0010 = 1) with automatic calculation of all parameters of all existing drive data sets, which depends on the entries made in the basic commissioning. Four selection values with different significance in the various firmware versions.
r3925	Identification completion display	-	-	[4]	[4]	Lists the commissioning steps executed.
r3926	Alternating voltage generation basis voltage amplitude	-	-	[4]	[4]	Displays the basis voltage of the alternating voltage for the last motor data identification. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r3927	Motor data identification control word	-	-	[4]	[4]	Successfully completed element of the last motor data identification executed
r3928	Rotating measurement configuration	-	-	[4]	[4]	Successfully completed element of the last rotating measurement executed.
r3929	Motor data identification modulated voltage generation	-	-	[4]	[4]	Configuration of the voltage generation for the various MotID sections for the last successful MotID. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r3930	Power unit EEPROM characteristic data	-	[5]	[5]	[5]	Displays the characteristic data of the power unit. (A5E number and versions)

21 Messages, commissioning, data management

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p3950	Service parameters	x	x	x	x	Accesses special development (only for experts) and factory functionality (calibration parameters). Up to FW V3.2 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p3954	CM version and GUI ID	[13]	[13]	-	-	Is used to classify the firmware (only for internal SIEMENS purposes). Up to FW V3.2 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r3960	Control Unit temperature measured/time slice overflow counter	-	[9]	[2]	[2]	Displays the measured temperature on the Control Unit. An appropriate message is output when 87 °C is exceeded. [0] actual temperature, [1] maximum temperature FW V3.2 Time slice overflow counter, internal use. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r3974	Drive unit status word	-	-	.2	.2	Displays the status word for the drive unit.
r3978	BICO counter for the unit	-	-	x	x	Displays the counter state for changed BICO interconnections of this unit. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

21 Messages, commissioning, data management

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p3980	Commissioning command selection	x	-	-	-	Switches over command and setpoint sources between freely programmable BICO parameters and fixed command/setpoint profiles for commissioning. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p3981	Acknowledge faults drive object	x	x	x	x	Resets active faults, if the value is changed from 0 to 1. Up to FW V3.2 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p3984	Client telegram off time	-	x	-	-	Defines the time, which after it has expired, an error is initiated (7220), if a telegram (frame) has not been received from the client.
p3985	Master control mode selection	-	-	x	x	Sets the mode to change the master control/LOCAL mode. [0] master control change for STW1.0 = 0 [1] master control change in operation.
r3986	Parameter number	[2]	[2]	x	x	Number of parameters for the drive Up to FW V3.2 [0] only reading [1] reading & writing Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r3988	Boot state	-	-	[2]	[2]	Displays the boot state. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

21 Messages, commissioning, data management

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r3996	Parameter write inhibit status	-	-	x	x	Displays whether writing to parameters is inhibited. The value indicates the progress of the calculations. See also r7760.

22 Memory, data and macro management

22.1 Changes and expansions to r7843, p8991 and p9400 memory card

From FW V4.3.2 and higher, MMC and SD cards can be used. Writing data to an MMC / SD card has been significantly simplified for the CU240E-2. Parameter changes are automatically saved to the memory card.

New parameter for handling memory cards:

FW V3.x p0802 transfer data from EEPROM (value 2: Start MMC transfer)

FW V4.3.2 r7843 = memory card serial number
p9400 safely remove the memory card

FW V4.4 r7843 = memory card serial number
p8991 USB memory access
p9400 safely remove the memory card

22.2 p7760 to p8458 EEPROM read-write parameters

Table 22-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r7760	Write protection status	-	-	-	x	Displays the status for write protection of the adjustable parameters. Write protection can be activated/deactivated via p7760 on the Control Unit. Also see r3996.
p7761	Write protection	-	-	-	x	Setting to activate/deactivate write protection for the adjustable parameters. The following parameters are excluded from write protection: p0003 = BOP access level p0971 = save drive object parameters, p0977 = save all parameters, p3950 = service parameters, p3981 = acknowledge fault, drive object p7760 =adjustable parameters write protection.
p7841	Power Module serial number hot / swap check	-	[6]	[16]	[16]	Displays the actual Power Module serial number. FW V3.2 When booting/powering up, using this serial number, a check is made as to whether the CU or the PM was hot swapped. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p7843	Memory card serial number	-	-	[21]	[21]	Displays the actual memory card serial number. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

22 Memory, data and macro management

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p7844	Acceptance test acknowledgment	-	x	-	-	FW V3.2 After a CU/PM replacement, this parameter is automatically set to 1 (acceptance test/acknowledgment pending).
r7844	Acceptance test acknowledgment	-	-	[2]	[2]	From FW V4.3.2 and higher Memory card firmware version (access level "Factory" via a user-defined parameter list).
r7901	Sampling times	-	-	[44]	[44]	Displays the sampling times available on the drive unit. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r7903	Hardware sampling times still not assigned	-	-	x	x	Displays the number of hardware sampling times that have still not been assigned. These free sampling times can be used by OA applications, such as DCC (Drive Control Chart) or FBLOCKS (free function blocks)
p8458	Clone control	-	x	-	-	While booting/powering up, this parameter defines whether cloning should be executed. The clone00.bin file is used. Normal powering up/booting applies if a MMC is not inserted.

22.3 p8500 to p8799 data and macro management

Table 22-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r8570	Macro drive object	-	-	-	[40]	Displays the macro files saved on the memory card/device memory in the corresponding directory. Also see p0015. Factory internal parameters.
r8571	Macro binector inputs (BI)	-	-	-	[40]	Displays the ACX files saved in the non-volatile memory in the corresponding directory. Also see p0700. Factory internal parameters.
r8572	Macro connector inputs (CI) for speed setpoints	-	-	[40]	[40]	Displays the ACX files saved in the non-volatile memory in the corresponding directory. Also see p1000. Factory internal parameters.
r8573	Macro connector inputs (CI) for torque setpoints	-	-	[40]	[40]	Displays the ACX files saved in the non-volatile memory in the corresponding directory. Also see p1500. Factory internal parameters.
r8585	Actual macro execution	-	-	x	x	Displays the macro presently being executed on the drive object. Factory internal parameters.

23 PROFIdrive, PROFINET, USB

23.1 p8800 to p8899 PROFIdrive

Table 23-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p8840	Fieldbus OFF time	-	x	-	-	Fieldbus OFF time
p8841	Fieldbus configuration data	-	[16]	-	-	Fieldbus configuration data.
r8849	Fieldbus inverse configuration data	-	[16]	-	-	Fieldbus inverse configuration data display.
r8850	PZD from the fieldbus	-	[8]	-	-	PZD from the fieldbus.
p8851	PZD from the fieldbus	-	[8]	-	-	PZD from the fieldbus
r8858	Fieldbus diagnostics data display	-	[16]	-	-	Fieldbus diagnostics data display.
r8859	Fieldbus identification data display	-	[8]	-	-	Fieldbus identification data display.
r8890	BO: Control word 1 from the fieldbus	-	.15	-	-	Displays control word 1 received from the fieldbus.
r8891	BO: Control word 2 from the fieldbus	-	.15	-	-	Displays control word 2 received from the fieldbus.

23.2 p8900 to p8999 PROFINet, USB

Table 23-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p8991	USB memory access	-	-	-	x	Selects the storage medium for access via USB mass storage (1 memory card, 2 flash r/w internal).
p8999	USB functionality	-	-	-	x	Selects the USB functionality (1 USS commissioning via virtual COM port, 2 memory access only, 3 USB commissioning and memory access). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

23.3 p61000 to p61004 PROFINet

Table 23-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r61000	PROFINet station name	-	x	-	-	Profinet station name. Displays each character in a separate index.
r61001	PROFINet station IP	-	[4]	-	-	Profinet IP address.
r61002	PROFINet station MAC	-	[6]	-	-	Profinet MAC address.
r61003	PROFINet standard gateway of the station	-	[4]	-	-	PROFINET standard gateway.
r61004	PROFINet subnet mask of the station	-	[4]	-	-	PROFINET subnet mask

24 Parameter consistency and saving

24.1 p9400 to p9486 parameter consistency and saving

Table 24-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p9400	Safely remove the memory card	-	-	x	x	Setting and display for "safely remove" the memory card.
r9401	Safely remove the memory card status	-	-	.15	.15	Displays the status of the memory card.
r9406	PS file parameter number parameter not accepted	-	-	[20]	[20]	Displays the parameters, which were not able to be accepted when reading the parameter backup files (PS files) from the non-volatile memory (e.g. memory card). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r9407	PS file parameter index parameter not accepted	-	-	[20]	[20]	Displays the first index of the parameters, which were not able to be accepted when reading the parameter backup files (PS files) from the non-volatile memory (e.g. memory card). Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

24 Parameter consistency and saving

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r9408]	PS file error code parameter not accepted	-	-	[20]	[20]	Only for Siemens internal service. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r9409	Number of parameters to be backed up	-	-	x	x	Displays the number of changed parameters, which have also still not been backed-up for this drive object. Also see p0971 Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r9451]	Unit changeover adapted parameters	-	-	[30]	[30]	Displays the parameter, whose parameter value had to be adapted during a unit changeover. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r9463	Valid macro that has been set	-	-	-	x	Displays the valid macro. A value of 0 is displayed, if a parameter set from a macro is changed.
p9484	BICO interconnections search for signal source			x	x	Sets the signal source (BO/CO parameters, BICO-coded) to search in the signal sinks.
r9485	BICO interconnections search for signal source number			x	x	Displays the number of BICO interconnections for the signal source being searched for.
r9486	BICO interconnections search for signal source first index			x	x	Displays the first index of the signal source being searched for. The signal source being searched for is set in p9484 (BICO-coded) and the search result specified using the number (r9485) and the first index (r9486).

25 Topology, internal diagnostics

25.1 p9925 to p9967 topology, internal diagnostics

Table 25-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r9925	Firmware file error	-	-	[100]	[100]	Displays the directory and name of the file, which was identified as being illegal when making a check with respect to the state when shipped.
r9926	Firmware check status	-	-	x	x	Displays the status when checking the firmware after switching on.
p9930	System logbook activation	-	-	[9]	[9]	Only for service. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p9931	System logbook module selection p9931[100]	-	-	[0]	[0]	Only for service. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
p9932	System logbook save in EEPROM	-	-	x	x	Only for service. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r9935	BO: POWER ON delay signal	-	-	.0	.0	Binector output r9935.0 is set after switching on, starting with the first sampling time, and is reset again after approximately 100 ms. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

25 Topology, internal diagnostics

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r9975	System utilization measured	-	-	[8]	[8]	Displays the measured system utilization. The higher the displayed value, the higher the system utilization. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".
r9976	System utilization	-	-	[8]	[8]	Displays the system utilization. Fault F01054 is output for a utilization greater than 100 %.
r9999	Internal software error supplementary diagnostics	-	-	[100]	100]	Diagnostics parameter to display supplementary information for internal software error. Only for Siemens internal fault diagnostics. Parameter is not displayed in the Expert list. Parameter can be called via the "user-defined parameter list".

26 Safety Integrated

26.1 Changes and expansions to safety functions p9300 / p9500 / p10000

The parameter structure and parameterizing screen forms have changed as a result of new and expanded safety functions:

- Extension SS1
- Extension to SLS
- New safety function SDI (Safe Direction)
- New safety function SSM (Safe Speed Monitor)
- New function acceptance report
- Changes to the fail-safe inputs (F-DI)
- SBC is no longer supported
- STO safety function group converters
- Changes in the PROFIsafe telegrams

26.2 p9301 to p9399 Safety Integrated

Table 26-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p9301	SI motion enable safe functions (processor 2)	-	-	x	x	
p9306	SI motion function specification (processor 2)	-	-	-	x	
p9307	SI motion function configuration (processor 2)	-	-	-	x	
p9309	SI motion behavior during pulse cancellation (processor 2)	-	-	-	x	
p9321	SI motion gearbox motor/load denominator (processor 2), gearbox 1	-	-	[8]	[8]	
p9322	SI motion gearbox motor/load numerator (processor 2), gearbox 1	-	-	[8]	[8]	
p9331	SI motion SLS limit values (processor 2), limit value SLS1	-	-	[4]	[4]	
p9342	SI motion actual value comparison tolerance (crosswise) (processor 2)	-	-	x	x	
p9345	SI motion SSM filter time (processor 2)	-	-	-	x	
p9346	SI motion SSM velocity limit (processor 2)	-	-	-	x	
p9347	SI motion SSM velocity hysteresis (processor 2)	-	-	-	x	
p9348	SI motion SAM actual velocity tolerance (Motor Module)	-	-	-	x	

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p9351	SI motion SLS changeover delay time (processor 2)	-	-	-	x	
p9356	SI motion pulse cancellation delay time (processor 2)	-	-	-	x	
p9358	SI motion acceptance test mode time limit (processor 2)	-	-	x	x	
p9360	SI motion pulse cancellation shutdown speed (processor 2)	-	-	x	x	
p9363	SI motion SLS stop response (processor 2), limit value SLS1	-	-	[4]	[4]	
p9364	SI motion SDI tolerance (processor 2)	-	-	x	x	
p9365	SI motion SDI delay time (processor 2)	-	-	x	x	
p9366	SI motion SDI stop response (processor 2)	-	-	x	x	
p9368	SI motion SAM velocity limit (processor 2)	-	-	x	x	
p9370	SI motion acceptance test mode (processor 2)	-	-	x	x	
r9371	SI motion acceptance test status (processor 2)	-	-	x	x	
p9381	SI motion braking ramp reference value (processor 2)	-	-	x	x	
p9382	SI motion braking ramp delay time (processor 2)	-	-	x	x	
p9383	SI motion braking ramp monitoring time (processor 2)	-	-	x	x	

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p9386	SI motion evaluation delay time sensorless (processor 2)	-	-	-	x	
p9387	SI motion sensorless actual value sensing filter time (processor 2)	-	-	x	x	
p9388	SI motion actual value sensing minimum current (processor 2)	-	-	x	x	
p9389	SI motion voltage tolerance acceleration (processor 2)	-	-	x	x	
r9398	SI motion actual checksum SI parameter (processor 2), checksum across SI parameters for motion monitoring	-	-	[2]	[2]	
p9399	SI motion reference checksum SI parameter (processor 2), checksum across SI parameters for motion monitoring	-	-	[2]	[2]	

26.3 p9500 to p9590 Safety Integrated

Table 26-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p9501	SI motion enable safe functions (processor 1)	-	-	x	x	
p9506	SI motion function specification (processor 1)	-	-	-	x	
p9507	SI motion function configuration (processor 1)	-	-	-	x	
p9509	SI motion behavior during pulse cancellation (processor 1)	-	-	-	x	
p9521	SI motion gearbox motor/load denominator (processor 1), gearbox 1	-	-	[8]	[8]	
p9522	SI motion gearbox motor/load numerator (processor 1), gearbox 1	-	-	[8]	[8]	
p9531	SI motion SLS limit values (processor 1), limit value SLS1	-	-	[4]	[4]	
p9533	SI motion SLS setpoint velocity limiting (processor 1)	-	-	x	x	
p9542	SI motion actual value comparison tolerance (crosswise) (processor 1)	-	-	x	x	
p9545	SI motion SSM filter time (processor 1)	-	-	-	x	
p9546	SI motion SSM velocity limit (processor 1)	-	-	-	x	

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p9547	SI motion SSM velocity hysteresis (processor 1)	-	-	-	x	
p9548	SI motion SAM actual velocity tolerance (Control Unit)	-	-	-	x	
p9551	SI motion SLS changeover delay time (processor 1)	-	-	-	x	
p9556	SI motion pulse cancellation delay time (processor 1)	-	-	-	x	
p9558	SI motion acceptance test mode time limit (processor 1)	-	-	x	x	
p9559	SI motion forced checking procedure timer (processor 1)	-	-	x	x	
p9560	SI motion pulse cancellation shutdown speed (processor 1)	-	-	x	x	
p9563	SI motion SLS-specific stop response (processor 1), limit value SLS1	-	-	[4]	[4]	
p9564	SI motion SDI tolerance (processor 1)	-	-	-	x	
p9565	SI motion SDI delay time (processor 1)	-	-	-	x	
p9566	SI motion SDI stop response (processor 1)	-	-	-	x	
p9568	SI motion SAM velocity limit (processor 1)	-	-	-	x	
p9570	SI motion acceptance test mode (processor 1)	-	-	x	x	

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r9571	SI motion acceptance test status (processor 1)			x	x	
p9581	SI motion braking ramp reference value (processor 1)	-	-	x	x	
p9582	SI motion braking ramp delay time (processor 1)	-	-	x	x	
p9583	SI motion braking ramp monitoring time (processor 1)	-	-	x	x	
p9586	SI motion evaluation delay time sensorless (CU)	-	-	-	x	
p9587	SI motion sensorless actual value sensing filter time (processor 1)	-	-	x	x	
p9588	SI motion actual value sensing sensorless minimum current (processor 1)	-	-	x	x	
p9589	SI motion voltage tolerance acceleration (processor 1)	-	-	x	x	
r9590	SI motion version safe motion monitoring (processor 1), Safety version (major release)	-	-	[4]	[4]	

26.4 p9600 to p9692 Safety Integrated

Table 26-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p9601	SI enable functions integrated in the drive (processor 1)/ ALT: SI parameter enable	-	x	x	x	
p9602	SI enable safe brake monitoring	-	x	-	-	
p9603	SI selection of the safety source	-	x	-	-	
p9610	SI PROFIsafe address (processor 1)	-	-	x	x	
r9620	CO/BO: SI status word	-	x	-	-	
p9650	SI F-DI changeover tolerance time (processor 1)	-	x	x	x	
p9651	SI STO debounce time (processor 1)	-	x	x	x	
p9659	SI forced checking procedure timer	-	x	x	x	
r9660	SI forced checking procedure remaining time	-	x	x	x	
p9680	SI brake ramp delay	-	x	-	-	
p9681	SI brake ramp down time	-	x	-	-	
p9682	SI minimum frequency for standstill detection	-	x	-	-	
p9690	SI setpoint for SLS	-	x	-	-	
p9690	SI setpoint for SLS	-	x	-	-	
p9691	SI tolerance for SLS	-	x	-	-	
p9692	SI response to selecting SLS	-	x	-	-	

26.5 p9700 to p9799 Safety Integrated

Table 26-4

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p9700	SI copy function	-	-	x	x	
p9701	SI data change acknowledge					
p9705	BI: SI motion test stop signal source	-	-	x	x	
r9710	SI motion diagnostics result list 1	-	-	[2]	[2]	
r9712	SI motion diagnostics position actual value motor side (processor 1)	-	-	x	x	
r9713	SI motion diagnostics position actual value load side, load-side actual value on processor 1 (P1)	-	-	[4]	[4]	
r9714	SI motion diagnostics velocity (processor 1), Load-side velocity actual value on processor 1	-	-	[2]	[2]	
r9720	CO/BO: SI motion control signals integrated in the drive	-	-	x	x	
r9722	CO/BO: SI motion status signals integrated in the drive	-	-	x	x	
r9723	CO/BO: SI motion diagnostic signals integrated in the drive	-	-	x	x	
r9724	SI motion crosswise comparison clock cycle	-	-	x	x	
r9725	SI motion diagnostics STOP F, message value for KDV (crosswise data comparison/data cross-check)	-	-	[3]	[3]	

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r9728	SI motion reference checksum SI parameters (processor 1)			[3]	[3]	
p9729	SI motion reference checksum SI parameter (processor 1), checksum across SI parameters for motion monitoring	-	-	[3]	[3]	
r9732	SI motion velocity resolution	-	-	-	x	
r9734	CO/BO: SI motion safety information channel status word	-	-	-	x	
r9742	CO/BO: SI motion status signals integrated in the drive (processor 2)			x	x	
r9760	SI internal password	-	x	-	-	
p9761	SI password input	-	x	x	x	
p9762	SI password new	-	x	x	x	
p9763	SI password acknowledgment	-	x	x	x	
r9765	SI motion forced checking procedure remaining time (processor 1)			x	x	
r9770	SI version safety functions integrated in the drive (processor 1), Safety version (major release)	-	[6]	[4]	[4]	
r9771	SI common functions (processor 1)	-	x	x	x	
r9772	CO/BO: SI status (processor 1)	-	x	x	x	
r9773	CO/BO: SI status (processor 1 + processor 2)	-	-	x	x	
r9776	SI diagnostics			x	x	

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r9780	SI monitoring cycle (processor 1)	-	-	x	x	
r9781	SI change monitoring checksum (processor 1)	-	-	[2]	[2]	
r9782	SI change monitoring time stamp (processor 1)	-	-	[2]	[2]	
r9794	SI crosswise comparison list (processor 1)	-	-	[20]	[20]	
r9795	SI diagnostics STOP F (processor 1)	-	-	x	x	
r9798	SI actual checksum SI parameters (processor 1)	-	x	x	x	
p9799	SI reference checksum SI parameters (processor 1)	-	x	x	x	

26.6 p9800 to p9899 Safety Integrated

Table 26-5

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p9801	SI enable functions integrated in the drive (processor 2)	-	x	x	x	
p9802	SI enable safe brake monitoring	-	x	-	-	
p9803	SI selection of the safety source	-	x	-	-	
p9810	SI PROFIsafe address (processor 2)	-	x	x	x	
r9820	CO/BO: SI status word	-	x	-	-	
p9850	SI F-DI changeover tolerance time (processor 2)	-	x	x	x	
p9851	SI STO debounce time (processor 2)	-	x	x	x	
r9870	SI version safety functions integrated in the drive (Motor Module), Safety version (major release)	-	-	[4]	-	
r9871	SI common functions (processor 2)	-	-	x	x	
r9872	CO/BO: SI status (processor 2)	-	-	x	x	
p9880	SI brake ramp delay	-	x	-	-	
p9881	SI brake ramp down time	-	x	-	-	
p9882	SI minimum frequency for standstill detection	-	x	-	-	
p9890	SI setpoint for SLS	-	x	-	-	
p9891	SI tolerance for SLS	-	x	-	-	
p9892	SI response to selecting SLS	-	x	-	-	

Support when migrating from MICROMASTER 4 and SINAMICS G120 (< V4.4) to SINAMICS G120 (V4.4)
Version 1, Item ID: 64913783

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r9898	SI actual checksum SI parameters (processor 2)	-	x	x	x	
p9899	SI reference checksum SI parameters (processor 2)	-	x	x	x	

26.7 p10000 to p10152 Safety Integrated

Table 26-6:

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p10002	SI discrepancy monitoring time (processor 1)	-	-	x	x	
p10006	SI acknowledgment internal event F-DI (processor 1)	-	-	x	x	
p10017	SI digital inputs debounce time (processor 1)	-	-	x	x	
p10022	SI STO input terminal (processor 1)	-	-	x	x	
p10023	SI SS1 input terminal (processor 1)	-	-	x	x	
p10026	SI SLS input terminal (processor 1)	-	-	x	x	
p10030	SI SDI positive input terminal (processor 1)	-	-	-	x	
p10031	SI SDI negative input terminal (processor 1)	-	-	-	x	
r10049	SI F-DI monitoring status (processor 1)	-	-	x	x	
p10050	SI PROFIsafe F-DI transfer (processor 1)	-	-	x	x	
r10051	SI digital input status (processor 1)	-	-	x	x	
r10052	SI digital outputs, status	-	-	x	-	
p10102	SI discrepancy monitoring time (processor 2)	-	-	x	x	

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p10106	SI acknowledgment internal event F-DI (processor 2)	-	-	x	x	
p10117	SI digital inputs debounce time (processor 2)	-	-	x	x	
p10122	SI STO input terminal (processor 2)	-	-	x	x	
p10123	SI SS1 input terminal (processor 2)	-	-	x	x	
p10126	SI SLS input terminal (processor 2)	-	-	x	x	
p10130	SI SDI positive input terminal (processor 2)	-	-	-	x	
p10131	SI SDI negative input terminal (processor 2)	-	-	-	x	
r10149	SI F-DI monitoring status (processor 2)	-	-	x	x	
p10150	SI PROFIsafe F-DI transfer (processor 2)	-	-	x	x	
r10151	SI digital input status (processor 2)	-	-	x	x	
r10152	SI digital output status (2nd channel)	-	-	x	-	

27 p20000 freely assignable function blocks (FFB)

27.1 Changes and expansions to the FFB p2800 and p20000

The scope and functionality of the FFB have been significantly expanded.

New blocks have been added. In some cases, the functionality of comparable blocks has been modified. For instance, the AND block now has 4 instead of 2 inputs. The RS flip-flop is now reset dominant. As a consequence, when transferring circuits into the new firmware, the function must be carefully checked.

Parameters p2800 to p2888 have been shifted to p20000 to p20383.

FW V3.x FFB p2800 to p2888

FW V4.x FFB p20000 to p20383

27.2 p2800 to p2888 free function blocks to FW V3.2

Table 27-1

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2800	Enable FFBs	x	x	-	-	
p2801	Activate FFBs, enable AND 1	[0]	[0]	-	-	
p2802	Activate FFBs, enable timer1	[0]	[0]	-	-	
p2803	Activate Fast FFBs command data set 0 (CDS0)	-	[0]	-	-	
p2810	AND 1, binector input 0 (BI 0)	[0]	[0]	-	-	
r2811	BO: AND 1	x	x	-	-	
p2812	AND 2, binector input 0 (BI 0)	[0]	[0]	-	-	
r2813	BO: AND 2	x	x	-	-	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p2814	AND 3, binector input 0 (BI 0)	[0]	[0]	-	-	
r2815	BO: AND 3	x	x	-	-	
p2816	OR 1, binector input 0 (BI 0)	[0]	[0]	-	-	
r2817	BO: OR 1	x	x	-	-	
p2818	OR 2, binector input 0 (BI 0)	[0]	[0]	-	-	
r2819	BO: OR 2	x	x	-	-	
p2820	OR 3, binector input 0 (BI 0)	[0]	[0]	-	-	
r2821	BO: OR 3	x	x	-	-	
p2822	XOR 1, binector input 0 (BI 0)	[0]	[0]	-	-	
r2823	BO: XOR 1	x	x	-	-	
p2824	XOR 2, binector input 0 (BI 0)	[0]	[0]	-	-	
r2825	BO: XOR 2	x	x	-	-	
p2826	XOR 3, binector input 0 (BI 0)	[0]	[0]	-	-	
r2827	BO: XOR 3	x	x	-	-	
p2828	BI: NOT 1	x	x	-	-	
r2829	BO: NOT 1	x	x	-	-	
p2830	BI: NOT 2	x	x	-	-	
r2831	BO: NOT 2	x	x	-	-	
p2832	BI: NOT 3	x	x	-	-	
r2833	BO: NOT 3	x	x	-	-	
p2834	D-FF 1, binector input: set	[0]	[0]	-	-	
r2835	BO: Q D-FF 1	x	x	-	-	
r2836	BO: NOT-Q D-FF 1	x	x	-	-	
p2837	D-FF 2, binector input: set	[0]	[0]	-	-	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2838	BO: Q D-FF 2	x	x	-	-	
r2839	BO: NOT-Q D-FF 2	x	x	-	-	
p2840	RS-FF 1, binector input: set	[0]	[0]	-	-	
r2841	BO: Q RS-FF 1	x	x	-	-	
r2842	BO: NOT-Q RS-FF 1	x	x	-	-	
p2843	RS-FF 2, binector input: set	[0]	[0]	-	-	
r2844	BO: Q RS-FF 2	x	x	-	-	
r2845	BO: NOT-Q RS-FF 2	x	x	-	-	
p2846	RS-FF 3, binector input: set	[0]	[0]	-	-	
r2847	BO: Q RS-FF 3	x	x	-	-	
r2848	BO: NOT-Q RS-FF 3	x	x	-	-	
p2849	BI: Timer 1	x	x	-	-	
p2850	Delay timer 1	x	x	-	-	
p2851	Op. mode timer 1	x	x	-	-	
r2852	BO: Timer 1	x	x	-	-	
r2853	BO: NOT out timer 1	x	x	-	-	
p2854	BI: Timer 2	x	x	-	-	
p2855	Delay timer 2	x	x	-	-	
p2856	Op. mode timer 2	x	x	-	-	
r2857	BO: Timer 2	x	x	-	-	
r2858	BO: NOT out timer 2	x	x	-	-	
p2859	BI: Timer 3	x	x	-	-	
p2860	Delay timer 3	x	x	-	-	
p2861	Op. mode timer 3	x	x	-	-	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2862	BO: Timer 3	x	x	-	-	
r2863	BO: NOT out timer 3	x	x	-	-	
p2864	BI: Timer 4	x	x	-	-	
p2865	Delay timer 4	x	x	-	-	
p2866	Op. mode timer 4	x	x	-	-	
r2867	BO: Timer 4	x	x	-	-	
r2868	BO: NOT out timer 4	x	x	-	-	
p2869	ADD 1, connector input 0 (CI 0)	[0]	[0]	-	-	
r2870	CO: ADD 1	x	x	-	-	
p2871	ADD 2, connector input 0 (CI 0)	[0]	[0]	-	-	
r2872	CO: ADD 2	x	x	-	-	
p2873	SUB 1, connector input 0 (CI 0)	[0]	[0]	-	-	
r2874	CO: SUB 1	x	x	-	-	
p2875	SUB 2, connector input 0 (CI 0)	[0]	[0]	-	-	
r2876	CO: SUB 2	x	x	-	-	
p2877	MUL 1, connector input 0 (CI 0)	[0]	[0]	-	-	
r2878	CO: MUL 1	x	x	-	-	
p2879	MUL 2, connector input 0 (CI 0)	[0]	[0]	-	-	
r2880	CO: MUL 2	x	x	-	-	
p2881	DIV 1, connector input 0 (CI 0)	[0]	[0]	-	-	
r2882	CO: DIV 1	x	x	-	-	
p2883	DIV 2, connector input 0 (CI 0)	[0]	[0]	-	-	
r2884	CO: DIV 2	x	x	-	-	
p2885	CMP 1, connector input 0 (CI 0)	[0]	[0]	-	-	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r2886	BO: CMP 1	x	x	-	-	
p2887	CMP 2, connector input 0 (CI 0)	[0]	[0]	-	-	
r2888	BO: CMP 2	x	x	-	-	

27.3 p20001 to p20061 FFB: AND 0 to AND 3, OR 0 to OR 3

Table 27-2

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r20001	Runtime group sampling time, runtime group 0	-	-	[0]	[0]	
p20030	AND 0 inputs, input I0	-	-	[0]	[0]	
r20031	BO: AND 0 output Q	-	-	x	x	
p20032	AND 0 runtime group	-	-	x	x	
p20033	AND 0 run sequence	-	-	x	x	
p20034	AND 1 inputs, input I0	-	-	[0]	[0]	
r20035	BO: AND 1 output Q	-	-	x	x	
p20036	AND 1 runtime group	-	-	x	x	
p20037	AND 1 run sequence	-	-	x	x	
p20038	AND 2 inputs, input I0	-	-	[0]	[0]	
r20039	BO: AND 2 output Q	-	-	x	x	
p20040	AND 2 runtime group	-	-	x	x	
p20041	AND 2 run sequence	-	-	x	x	
p20042	AND 3 inputs, input I0	-	-	[0]	[0]	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r20043	BO: AND 3 output Q	-	-	x	x	
p20044	AND 3 runtime group	-	-	x	x	
p20045	AND 3 run sequence	-	-	x	x	
p20046	OR 0 inputs, input I0	-	-	[0]	[0]	
r20047	BO: OR 0 output Q	-	-	x	x	
p20048	OR 0 runtime group	-	-	x	x	
p20049	OR 0 run sequence	-	-	x	x	
p20050	OR 1 inputs, input I0	-	-	[0]	[0]	
r20051	BO: OR 1 output Q	-	-	x	x	
p20052	OR 1 runtime group	-	-	x	x	
p20053	OR 1 run sequence	-	-	x	x	
p20054	OR 2 inputs, input I0	-	-	[0]	[0]	
r20055	BO: OR 2 output Q	-	-	x	x	
p20056	OR 2 runtime group	-	-	x	x	
p20057	OR 2 run sequence	-	-	x	x	
p20058	OR 3 inputs, input I0	-	-	[0]	[0]	
r20059	BO: OR 3 output Q	-	-	x	x	
p20060	OR 3 runtime group	-	-	x	x	
p20061	OR 3 run sequence	-	-	x	x	

27.4 p20062 to p20093 FFB: XOR 0 to XOR 3, NOT 0 to NOT 3

Table 27-3

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20062	XOR 0 inputs, input I0	-	-	[0]	[0]	
r20063	BO: XOR 0 output Q	-	-	x	x	
p20064	XOR 0 runtime group	-	-	x	x	
p20065	XOR 0 run sequence	-	-	x	x	
p20066	XOR 1 inputs, input I0	-	-	[0]	[0]	
r20067	BO: XOR 1 output Q	-	-	x	x	
p20068	XOR 1 runtime group	-	-	x	x	
p20069	XOR 1 run sequence	-	-	x	x	
p20070	XOR 2 inputs, input I0	-	-	[0]	[0]	
r20071	BO: XOR 2 output Q	-	-	x	x	
p20072	XOR 2 runtime group	-	-	x	x	
p20073	XOR 2 run sequence	-	-	x	x	
p20074	XOR 3 inputs, input I0	-	-	[0]	[0]	
r20075	BO: XOR 3 output Q	-	-	x	x	
p20076	XOR 3 runtime group	-	-	x	x	
p20077	XOR 3 run sequence	-	-	x	x	
p20078	BI: NOT 0 input I	-	-	x	x	
r20079	BO: NOT 0 inverted output	-	-	x	x	
p20080	NOT 0 runtime group	-	-	x	x	
p20081	NOT 0 run sequence	-	-	x	x	
p20082	BI: NOT 1 input I	-	-	x	x	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r20083	BO: NOT 1 inverted output	-	-	x	x	
p20084	NOT 1 runtime group	-	-	x	x	
p20085	NOT 1 run sequence	-	-	x	x	
p20086	BI: NOT 2 input I	-	-	x	x	
r20087	BO: NOT 2 inverted output	-	-	x	x	
p20088	NOT 2 runtime group	-	-	x	x	
p20089	NOT 2 run sequence	-	-	x	x	
p20090	BI: NOT 3 input I	-	-	x	x	
r20091	BO: NOT 3 inverted output	-	-	x	x	
p20092	NOT 3 runtime group	-	-	x	x	
p20093	NOT 3 run sequence	-	-	x	x	

27.5 p20094 to p20127 FFB: ADD 0, ADD 1, SUB 0, SUB 1, MUL 0, MUL 1, DIV 0, DIV 1

Table 27-4

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20094	ADD 0 inputs, input X0	-	-	[0]	[0]	
r20095	CO: ADD 0 output Y	-	-	x	x	
p20096	ADD 0 runtime group	-	-	x	x	
p20097	ADD 0 run sequence	-	-	x	x	
p20098	ADD 1 inputs, input X0	-	-	[0]	[0]	
r20099	CO: ADD 1 output Y	-	-	x	x	
p20100	ADD 1 runtime group	-	-	x	x	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20101	ADD 1 run sequence	-	-	x	x	
p20102	SUB 0 inputs, minuend X1	-	-	[0]	[0]	
r20103	CO: SUB 0 difference Y	-	-	x	x	
p20104	SUB 0 runtime group	-	-	x	x	
p20105	SUB 0 run sequence	-	-	x	x	
p20106	SUB 1 inputs, minuend X1	-	-	[0]	[0]	
r20107	CO: SUB 1 difference Y	-	-	x	x	
p20108	SUB 1 runtime group	-	-	x	x	
p20109	SUB 1 run sequence	-	-	x	x	
p20110	MUL 0 inputs, factor X0	-	-	[0]	[0]	
r20111	CO: MUL 0 product Y	-	-	x	x	
p20112	MUL 0 runtime group	-	-	x	x	
p20113	MUL 0 run sequence	-	-	x	x	
p20114	MUL 1 inputs, factor X0	-	-	[0]	[0]	
r20115	CO: MUL 1 product Y	-	-	x	x	
p20116	MUL 1 runtime group	-	-	x	x	
p20117	MUL 1 run sequence	-	-	x	x	
p20118	DIV 0 inputs, dividend X0	-	-	[0]	[0]	
r20119	DIV 0 quotient, quotient Y	-	-	[0]	[0]	
r20120	BO: DIV 0 divisor is zero QF	-	-	x	x	
p20121	DIV 0 runtime group	-	-	x	x	
p20122	DIV 0 run sequence	-	-	x	x	
p20123	DIV 1 inputs, dividend X0	-	-	[0]	[0]	
r20124	DIV 1 quotient, quotient Y	-	-	[0]	[0]	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r20125	BO: DIV 1 divisor is zero QF	-	-	x	x	
p20126	DIV 1 runtime group	-	-	x	x	
p20127	DIV 1 run sequence	-	-	x	x	

27.6 p20128 to p20157 FFB: AVA 0, AVA 1, MFP 0, MFP 1, PCL 0, PCL 1

Table 27-5

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20128	CI: AVA 0 input X	-	-	x	x	
r20129	CO: AVA 0 output Y	-	-	x	x	
r20130	BO: AVA 0 input negative SN	-	-	x	x	
p20131	AVA 0 runtime group	-	-	x	x	
p20132	AVA 0 run sequence	-	-	x	x	
p20133	CI: AVA 1 input X	-	-	x	x	
r20134	CO: AVA 1 output Y	-	-	x	x	
r20135	BO: AVA 1 input negative SN	-	-	x	x	
p20136	AVA 1 runtime group	-	-	x	x	
p20137	AVA 1 run sequence	-	-	x	x	
p20138	BI: MFP 0 input pulse I	-	-	x	x	
p20139	MFP 0 pulse duration in ms	-	-	x	x	
r20140	BO: MFP 0 output Q	-	-	x	x	
p20141	MFP 0 runtime group	-	-	x	x	
p20142	MFP 0 run sequence	-	-	x	x	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20143	BI: MFP 1 input pulse I	-	-	x	x	
p20144	MFP 1 pulse duration in ms	-	-	x	x	
r20145	BO: MFP 1 output Q	-	-	x	x	
p20146	MFP 1 runtime group	-	-	x	x	
p20147	MFP 1 run sequence	-	-	x	x	
p20148	BI: PCL 0 input pulse I	-	-	x	x	
p20149	PCL 0 pulse duration in ms	-	-	x	x	
r20150	BO: PCL 0 output Q	-	-	x	x	
p20151	PCL 0 runtime group	-	-	x	x	
p20152	PCL 0 run sequence	-	-	x	x	
p20153	BI: PCL 1 input pulse I	-	-	x	x	
p20154	PCL 1 pulse duration in ms	-	-	x	x	
r20155	BO: PCL 1 output Q	-	-	x	x	
p20156	PCL 1 runtime group	-	-	x	x	
p20157	PCL 1 run sequence	-	-	x	x	

27.7 p20158 to p20187 FFB: PDE 0, PDE 1, PDF 0, PDF 1, PST 0, PST 1

Table 27-6

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20158	BI: PDE 0 input pulse I	-	-	x	x	
p20159	PDE 0 pulse delay time in ms	-	-	x	x	
r20160	BO: PDE 0 output Q	-	-	x	x	
p20161	PDE 0 runtime group	-	-	x	x	
p20162	PDE 0 run sequence	-	-	x	x	
p20163	BI: PDE 1 input pulse I	-	-	x	x	
p20164	PDE 1 pulse delay time in ms	-	-	x	x	
r20165	BO: PDE 1 output Q	-	-	x	x	
p20166	PDE 1 runtime group	-	-	x	x	
p20167	PDE 1 run sequence	-	-	x	x	
p20168	BI: PDF 0 input pulse I	-	-	x	x	
p20169	PDF 0 pulse extension time in ms	-	-	x	x	
r20170	BO: PDF 0 output Q	-	-	x	x	
p20171	PDF 0 runtime group	-	-	x	x	
p20172	PDF 0 run sequence	-	-	x	x	
p20173	BI: PDF 1 input pulse I	-	-	x	x	
p20174	PDF 1 pulse extension time in ms	-	-	x	x	
r20175	BO: PDF 1 output Q	-	-	x	x	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20176	PDF 1 runtime group	-	-	x	x	
p20177	PDF 1 run sequence	-	-	x	x	
p20178	PST 0 inputs, input pulse I	-	-	[0]	[0]	
p20179	PST 0 pulse duration in ms	-	-	x	x	
r20180	BO: PST 0 output Q	-	-	x	x	
p20181	PST 0 runtime group	-	-	x	x	
p20182	PST 0 run sequence	-	-	x	x	
p20183	PST 1 inputs, input pulse I	-	-	[0]	[0]	
p20184	PST 1 pulse duration in ms	-	-	x	x	
r20185	BO: PST 1 output Q	-	-	x	x	
p20186	PST 1 runtime group	-	-	x	x	
p20187	PST 1 run sequence	-	-	x	x	

27.8 p20188 to p20207 FFB: RSR 0, RSR 1, DFR 0, DFR 1,

Table 27-7

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20188	RSR 0 inputs, set S	-	-	[0]	[0]	
r20189	BO: RSR 0 output Q	-	-	x	x	
r20190	BO: RSR 0 inverted output ON	-	-	x	x	
p20191	RSR 0 runtime group	-	-	x	x	
p20192	RSR 0 run sequence	-	-	x	x	
p20193	RSR 1 inputs, set S	-	-	[0]	[0]	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r20194	BO: RSR 1 output Q	-	-	x	x	
r20195	BO: RSR 1 inverted output ON	-	-	x	x	
p20196	RSR 1 runtime group	-	-	x	x	
p20197	RSR 1 run sequence	-	-	x	x	
p20198	DFR 0 inputs, trigger input I	-	-	[0]	[0]	
r20199	BO: DFR 0 output Q	-	-	x	x	
r20200	BO: DFR 0 inverted output QN	-	-	x	x	
p20201	DFR 0 runtime group	-	-	x	x	
p20202	DFR 0 run sequence	-	-	x	x	
p20203	DFR 1 inputs, trigger input I	-	-	[0]	[0]	
r20204	BO: DFR 1 output Q	-	-	x	x	
r20205	BO: DFR 1 inverted output QN	-	-	x	x	
p20206	DFR 1 runtime group	-	-	x	x	
p20207	DFR 1 run sequence	-	-	x	x	

27.9 p20208 to p20227 FFB: BSW 0, BSW 1, NSW 0, NSW 1

Table 27-8

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20208	BSW 0 inputs, input I0	-	-	[0]	[0]	
p20209	BI: BSW 0 switch position I	-	-	x	x	
r20210	BO: BSW 0 output Q	-	-	x	x	
p20211	BSW 0 runtime group	-	-	x	x	
p20212	BSW 0 run sequence	-	-	x	x	
p20213	BSW 1 inputs, input I0	-	-	[0]	[0]	
p20214	BI: BSW 1 switch position I	-	-	x	x	
r20215	BO: BSW 1 output Q	-	-	x	x	
p20216	BSW 1 runtime group	-	-	x	x	
p20217	BSW 1 run sequence	-	-	x	x	
p20218	NSW 0 inputs, input X0	-	-	[0]	[0]	
p20219	BI: NSW 0 switch position I	-	-	x	x	
r20220	CO: NSW 0 output Y	-	-	x	x	
p20221	NSW 0 runtime group	-	-	x	x	
p20222	NSW 0 run sequence	-	-	x	x	
p20223	NSW 1 inputs, input X0	-	-	[0]	[0]	
p20224	BI: NSW 1 switch position I	-	-	x	x	
r20225	CO: NSW 1 output Y	-	-	x	x	
p20226	NSW 1 runtime group	-	-	x	x	
p20227	NSW 1 run sequence	-	-	x	x	

27.10 p20228 to p20255 FFB: LIM 0, LIM 1, PT1 0, PT1 1

Table 27-9

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20228	CI: LIM 0 input X	-	-	x	x	
p20229	LIM 0 upper limit value LU	-	-	x	x	
p20230	LIM 0 lower limit value LL	-	-	x	x	
r20231	CO: LIM 0 output Y	-	-	x	x	
r20232	BO: LIM 0 input quantity at the upper limit QU	-	-	x	x	
r20233	BO: LIM 0 input quantity at the lower limit QL	-	-	x	x	
p20234	LIM 0 runtime group	-	-	x	x	
p20235	LIM 0 run sequence	-	-	x	x	
p20236	CI: LIM 1 input X	-	-	x	x	
p20237	LIM 1 upper limit value LU	-	-	x	x	
p20238	LIM 1 lower limit value LL	-	-	x	x	
r20239	CO: LIM 1 output Y	-	-	x	x	
r20240	BO: LIM 1 input quantity at the upper limit QU	-	-	x	x	
r20241	BO: LIM 1 input quantity at the lower limit QL	-	-	x	x	
p20242	LIM 1 runtime group	-	-	x	x	
p20243	LIM 1 run sequence	-	-	x	x	
p20244	PT1 0 inputs, input X	-	-	[0]	[0]	
p20245	BI: PT1 0 accept setting value S	-	-	x	x	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20246	PT1 0 smoothing time constant in ms	-	-	x	x	
r20247	CO: PT1 0 output Y	-	-	x	x	
p20248	PT1 0 runtime group	-	-	x	x	
p20249	PT1 0 run sequence	-	-	x	x	
p20250	PT1 1 inputs, input X	-	-	[0]	[0]	
p20251	BI: PT1 1 accept setting value S	-	-	x	x	
p20252	PT1 1 smoothing time constant in ms	-	-	x	x	
r20253	CO: PT1 1 output Y	-	-	x	x	
p20254	PT1 1 runtime group	-	-	x	x	
p20255	PT1 1 run sequence	-	-	x	x	

27.11 p20256 to p20288 FFB: INT 0, LVM 0, LVM 1, DIF 0

Table 27-10

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20256	INT 0 inputs, input X	-	-	[0]	[0]	
p20257	INT 0 upper limit value LU	-	-	x	x	
p20258	INT 0 lower limit value LL	-	-	x	x	
p20259	INT 0 integrating time constant in ms	-	-	x	x	
p20260	BI: INT 0 accept setting value S	-	-	x	x	
r20261	CO: INT 0 output Y	-	-	x	x	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r20262	BO: INT 0 integrator at the upper limit QU	-	-	x	x	
r20263	BO: INT 0 integrator at the lower limit QL	-	-	x	x	
p20264	INT 0 runtime group	-	-	x	x	
p20265	INT 0 run sequence	-	-	x	x	
p20266	CI: LVM 0 input X	-	-	x	x	
p20267	LVM 0 interval average value M	-	-	x	x	
p20268	LVM 0 interval limit L	-	-	x	x	
p20269	LVM 0 hysteresis HY	-	-	x	x	
r20270	BO: LVM 0 input quantity above interval QU	-	-	x	x	
r20271	BO: LVM 0 input quantity within interval QM	-	-	x	x	
r20272	BO: LVM 0 input quantity below interval QL	-	-	x	x	
p20273	LVM 0 runtime group	-	-	x	x	
p20274	LVM 0 run sequence	-	-	x	x	
p20275	CI: LVM 1 input X	-	-	x	x	
p20276	LVM 1 interval average value M	-	-	x	x	
p20277	LVM 1 interval limit L	-	-	x	x	
p20278	LVM 1 hysteresis HY	-	-	x	x	
r20279	BO: LVM 1 input quantity above interval QU	-	-	x	x	
r20280	BO: LVM 1 input quantity within interval QM	-	-	x	x	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r20281	BO: LVM 1 input quantity below interval QL	-	-	x	x	
p20282	LVM 1 runtime group	-	-	x	x	
p20283	LVM 1 run sequence	-	-	x	x	
p20284	CI: DIF 0 input X	-	-	x	x	
p20285	DIF 0 differentiating time constant in ms	-	-	x	x	
r20286	CO: DIF 0 output Y	-	-	x	x	
p20287	DIF 0 runtime group	-	-	x	x	
p20288	DIF 0 run sequence	-	-	x	x	

27.12 p20300 to p20328 FFB: NOT 4, NOT 5, ADD 2, NCM 0, NCM 1, RSR 2

Table 27-11

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20300	BI: NOT 4 input I	-	-	x	x	
r20301	BO: NOT 4 inverted output	-	-	x	x	
p20302	NOT 4 runtime group	-	-	x	x	
p20303	NOT 4 run sequence	-	-	x	x	
p20304	BI: NOT 5 input I	-	-	x	x	
r20305	BO: NOT 5 inverted output	-	-	x	x	
p20306	NOT 5 runtime group	-	-	x	x	
p20307	NOT 5 run sequence	-	-	x	x	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20308	ADD 2 inputs, input X0	-	-	[0]	[0]	
r20309	CO: ADD 2 output Y	-	-	x	x	
p20310	ADD 2 runtime group	-	-	x	x	
p20311	ADD 2 run sequence	-	-	x	x	
p20312	NCM 0 inputs, input X0	-	-	[0]	[0]	
r20313	BO: NCM 0 output QU	-	-	x	x	
r20314	BO: NCM 0 output QE	-	-	x	x	
r20315	BO: NCM 0 output QL	-	-	x	x	
p20316	NCM 0 runtime group	-	-	x	x	
p20317	NCM 0 run sequence	-	-	x	x	
p20318	NCM 1 inputs, input X0	-	-	[0]	[0]	
r20319	BO: NCM 1 output QU	-	-	x	x	
r20320	BO: NCM 1 output QE	-	-	x	x	
r20321	BO: NCM 1 output QL	-	-	x	x	
p20322	NCM 1 runtime group	-	-	x	x	
p20323	NCM 1 run sequence	-	-	x	x	
p20324	RSR 2 inputs, set S	-	-	[0]	[0]	
r20325	BO: RSR 2 output Q	-	-	x	x	
r20326	BO: RSR 2 inverted output ON	-	-	x	x	
p20327	RSR 2 runtime group	-	-	x	x	
p20328	RSR 2 run sequence	-	-	x	x	

27.13 p20329 to p20353 FFB: DFR 2, PDE 2, PDE 3, PDF 2, PDF 3

Table 27-12

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20329	DFR 2 inputs, trigger input I	-	-	[0]	[0]	
r20330	BO: DFR 2 output Q	-	-	x	x	
r20331	BO: DFR 2 inverted output QN	-	-	x	x	
p20332	DFR 2 runtime group	-	-	x	x	
p20333	DFR 2 run sequence	-	-	x	x	
p20334	BI: PDE 2 input pulse I	-	-	x	x	
p20335	PDE 2 pulse delay time in ms	-	-	x	x	
r20336	BO: PDE 2 output Q	-	-	x	x	
p20337	PDE 2 runtime group	-	-	x	x	
p20338	PDE 2 run sequence	-	-	x	x	
p20339	BI: PDE 3 input pulse I	-	-	x	x	
p20340	PDE 3 pulse delay time in ms	-	-	x	x	
r20341	BO: PDE 3 output Q	-	-	x	x	
p20342	PDE 3 runtime group	-	-	x	x	
p20343	PDE 3 run sequence	-	-	x	x	
p20344	BI: PDF 2 input pulse I	-	-	x	x	
p20345	PDF 2 pulse extension time in ms	-	-	x	x	
r20346	BO: PDF 2 output Q	-	-	x	x	
p20347	PDF 2 runtime group	-	-	x	x	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20348	PDF 2 run sequence	-	-	x	x	
p20349	BI: PDF 3 input pulse I	-	-	x	x	
p20350	PDF 3 pulse extension time in ms	-	-	x	x	
r20351	BO: PDF 3 output Q	-	-	x	x	
p20352	PDF 3 runtime group	-	-	x	x	
p20353	PDF 3 run sequence	-	-	x	x	

27.14 p20354 to p20383 FFB: MFP 2, MFP 3, PLI 0, PLI 1

Table 27-13

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
p20354	BI: MFP 2 input pulse I	-	-	x	x	
p20355	MFP 2 pulse duration in ms	-	-	x	x	
r20356	BO: MFP 2 output Q	-	-	x	x	
p20357	MFP 2 runtime group	-	-	x	x	
p20358	MFP 2 run sequence	-	-	x	x	
p20359	BI: MFP 3 input pulse I	-	-	x	x	
p20360	MFP 3 pulse duration in ms	-	-	x	x	
r20361	BO: MFP 3 output Q	-	-	x	x	
p20362	MFP 3 runtime group	-	-	x	x	
p20363	MFP 3 run sequence	-	-	x	x	
p20372	CI: PLI 0 input X	-	-	x	x	

27 p20000 freely assignable function blocks (FFB)

Parameter number	Parameter text	MM440	FW V3.2	FW V4.3.2	FW V4.4	Note
r20373	CO: PLI 0 output Y	-	-	x	x	
p20374	PLI 0 X coordinate A transition point, transition point 0	-	-	[0]	[0]	
p20375	PLI 0 Y coordinate B transition point, transition point 0	-	-	[0]	[0]	
p20376	PLI 0 runtime group	-	-	x	x	
p20377	PLI 0 run sequence	-	-	x	x	
p20378	CI: PLI 1 input X	-	-	x	x	
r20379	CO: PLI 1 output Y	-	-	x	x	
p20380	PLI 1 X coordinate A transition point, transition point 0	-	-	x	x	
p20381	PLI 1 Y coordinate B transition point, transition point 0	-	-	[0]	[0]	
p20382	PLI 1 runtime group	-	-	x	x	
p20383	PLI 1 run sequence	-	-	x	x	

28 Attachment

28.1 Notes and an explanation of the terminology regarding this document

Notation for indexed parameters

Table 28-1

Abbreviation	Significance
p0013[0...19]	Adjustable parameters 13 with 20 indices, index [0] to [19]
p0013[20]	Abbreviated notation: Adjustable parameter 13 with 20 indices
[20]	Parameter with 20 indices
p20062[0]	Adjustable parameter, refer to the manual for the number of indices
[n]	The number of indices depends on the configuration, for example if power units are connected in parallel.

Notation for bit fields

Table 28-2

Abbreviation	Significance
r0722.0...11	Read parameter 722 with bits 0 to 11
r0722.11	Abbreviated notation: Read parameter 722 with bits 0 to 11
.11	Abbreviated notation: Parameter with bit field bits 0 to 11
r0722.3	Significance is also dependent on the context: Bit number 3 of parameter r0722, this is: "CU digital inputs status - DI 3 (terminal 8)"

Additional notations

Table 28-3

Abbreviation	Significance
x	Parameter available
-	Parameter not available
FW	Firmware
V	Version

Notation example

Table 28-4

Parameter number	Parameter text	MM44 0	FW V3.2	FW V4.3.2	FW V4.4	Note
p0305	Rated motor current	[3]	[3]	[4]	[4]	Adjustable parameter with 3 or 4 indices (in this case, for 3 or 4 DDS)
r0722	CO/BO: CU digital inputs, status	.7	.12	.11	.12	Read parameter with bit fields of different lengths; for the significance refer to the List Manuals
p20062	XOR 0 inputs, input I0	-	-	[0]	[0]	Adjustable parameter, refer to the manual for the number of indices. The number is not specifically specified here; this is because there is no direct comparison with the predecessor firmware.

28.2 Abbreviations

Abbreviation	Significance
AC	AC current
A/D	Analog-digital converter
ADR	Address
AFM	Additional frequency modulation
AG	Automation device, e.g. PLC
AI	Analog Input
AK	Requirement identification
AO	Analog Output
AOP	Advanced Operator Panel
ASIC	Application Specific Integrated Circuit
ASP	Analog setpoint
ASVM	Asymmetric space vector modulation
BCC	Block check character
BCD	Binary coded decimal number
BI	Binector input
BIA	Regulatory Body for Safety at Work
BICO	Binector-connector technology
BO	Binector output
BOP	Basic Operator Panel
CB	Communication module
CCW	Counterclockwise
CDS	Command Data Set
CI	Connector Input
CM	Configuration management
CMD	Command
CO	Connector Output
CO/BO	Connector-output/binector-output
COM	Center contact of a changeover contact (terminal is connected and NO or NC)
CU	Control Unit
CW	Clockwise

Abbreviation	Significance
D/A	Digital-analog converter
DC	DC current
DDS	Drive Data Set
DI	Digital Input
DIP	DIP switch
DO	Digital Output
DP	Distributed I/O, remote I/O
DS	Drive state
EEC	European Economic Community
EEPROM	Erasable Programmable Read-Only Memory
ELCB	Ground fault circuit breaker
EMC	Electromagnetic compatibility (EMC)
EMF	Electromagnetic force
ES	Engineering System
ESB	Equivalent circuit diagram
FAQ	Frequently asked question
FB:	Function block
FCC	Field current control
FCL	Fast current limiting
FF	Fixed frequency
FFB	Free function block
FLB	Flat Top Modulation
FOC	Field oriented control
FP	Function chart
FREQ	Frequency
FSA	FS = frame size
FSB	Frame size B
FSC	Frame size C
FSD	Frame size D
FSE	Frame size E
FSF	Frame size F
GSD	Generic station description
GSG	Getting Started Guide
GUI	ID unique global identification

Abbreviation	Significance
HIW	Main actual value
HMI	Human Machine Interface
HO	High Overload (constant torque)
HSW	Main setpoint
HTL	High-voltage transistor logic
IASC	Internal Armature Short-Circuit
IBN	Commissioning
IGBT	Insulated Gate Bipolar Transistor
I/O	Input/output
IOP	Intelligent Operator Panel
JOG	Jogging
KDV	Crosswise data comparison (cross data check)
KIB	Kinetic buffering
LCD	Liquid crystal display
LEDs	Light emitting diode
LGE	Length
LO	Low Overload (varying torque)
LSTO	Safe Torque Off with latching
FoC	Fiber-optic cable
MHB	Motor holding brake
MLP	Multi-language package
MOP	Motor potentiometer
NC	Normally closed contact
NEMA	National Electrical Manufacturers Association
NO	Normally open contact
OLM	Optical coupling module
OLP	Connector for an optical connection
OP	Operator Panel
OPI	Operating Instructions

Abbreviation	Significance
P1	Processor 1
P2	Processor 2
PID	Proportional Integral Differential
PKE	Parameter identification
PKW	Parameter identification value
PLC	Programmable Logic Controller
PM	Power Module
PM-IF	Power Module interface
PPO	Parameter process data object
PTC	Positive Temperature Coefficient thermistor
PWE	Parameter value
PWM	Pulse width modulation
PZD	Process data
QC	Quick commissioning
RAM	Random Access Memory
RCCB	Residual Current Circuit Breaker
RCD	Residual Current Device
RFG	Ramp function generator
RFI	Radio frequency interference
ROM	Read only memory
RPM	Revolutions per minute
rxxxx	Read parameter
SVM	Space vector modulation
SBC	Safe brake control
SLS	Safely limited speed
SLVC	Sensorless Vector Control
SOL	Serial Option Link
SS1	Safe standstill 1
STO	Safe torque off
STW	Control word
STX	Start of text
SVM	Space vector modulation
TTL	Transistor-transistor logic
V/f	Voltage/frequency
USS	Universal serial interface

Abbreviation	Significance
VC	Vector Control
VT	Variable torque
WEA	Automatic restart
ZSW	Status word
ZUSW	Supplementary setpoint

28.3 Internet links - data

This list is in no way complete and only reflects a selection of suitable literature.

Table 28-5

Title	Article ID:
SINAMICS G120: Parameter p610 motor overtemperature response	49455179
Replacement of Control Units CU230P-2, CU240B-2, CU240E-2 with firmware V4.3 by the new Control Units with firmware V4.4	51889804
What do I have to observe, if I want to replace a CU240E of the SINAMICS G120 with a CU240E-2 (firmware V4.4)?	54997738
What do I have to observe if I wish to replace a member of the CU240S family (CU240S, CU240S DP, CU240S DP--F, CU240S PN or CU240S PN -F) of SINAMICS G120 by a CU240E- 2 (Firmware V4.4)?	55644272
For the CU2xy-2 of the SINAMICS G120 with firmware version V4.4, how can the analog inputs be parameterized for 4...20mA with monitoring?	57021336
What do I have to take into account if I wish to replace a member of the CU240S family of SINAMICS G120 by a SINAMICS S110 with CU305 (firmware V4.4)?	57106848
What must I observe if I wish to replace a SIMATIC ET200S FC converter by a converter from the SINAMICS family?	58349882
What do I have to take into account if I wish to replace a member of the CU240S family of SINAMICS G120 by a SINAMICS S120 with CU310-2?	58856350
What do I have to observe, if I want to replace a CU240D of the SINAMICS G120D with a CU2..D-2? What advantages do I have by making this changeover?	60162672

28.4 History

Table history

Version	Date	Change
V1.0	xx.xx.20xx	First Edition