

11 Parameter list

Overview

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U005 - U007	Password protection, key/lock mechanism
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U710 - n739	Configuration of supplementary boards in board locations 2 and 3
U740 - U753	Configuration of the SIMOLINK board
U755 - n770	Configuration of the EB1 expansion board
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U790 - n795	Configuration of the SBP pulse encoder board
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U820 - U833	Definition of the external power section
U840	Simulation operation
n845 - n949	Parameters for SIMOVIS
n957 - n959	Parameters for SIMOVIS
n980 - n999	List of existing and modified U and n parameters

Parameters for technology software in the basic converter, S00 option ("freely assignable function blocks")

Range of parameter numbers	Function
n010 - n023	Displays
U099	Settable fixed values [SW 1.8 and later]
U100 - U107	Triggering of faults and alarms
U110 - U115	Connector/binector converters, binector/connector converters
U120 - U171	Mathematical functions
U172 - U173	Processing of connectors (averager) [SW 1.8 and later]
U175 - U218	Limiter, limit-value monitors
U220 - U259	Processing of connectors
U260 - U299	Integrators, DT1 elements, characteristics, dead zones, setpoint branching
U300 - U303	Simple ramp-function generator
U310 - U313	Multiplexer [SW 1.8 and later]
U318 - U411	Logic functions
U415 - U474	Storage elements, timers and binary signal selector switches
U480 - U512	Technology controller
U515 - U523	Velocity/speed calculators
U525 - U529	Variable moment of inertia [SW 1.8 and later]
U530 - U545	PI controller [SW 1.8 and later]
U550 - U554	Closed-loop control elements [SW 1.8 and later]
U950 - U952	Sampling times
U960 - U969	Altering the processing sequence of function blocks
U977 - n978	Enabling of technology software in basic unit, S00 option ("freely assignable function blocks")

Overview of abbreviations

Example:

PNU *	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
FDS				
P520 * 1) FDS 2) 8) 9)	Friction at 0% speed Setting as % of converter rated DC current or converter rated torque	0.0 to 100.0 [%] 0.1% 4)	Ind: 4 FS=0.0 5) Type: O2 3)	P052 = 3 P051 ≥ 20 Online 6)

1) An * under the parameter number means that the parameter requires confirmation, i.e. the altered value does not take effect until the P key is pressed.

2) Abbreviation indicating that the parameter belongs to a data set (refers only to indexed parameters) (see Section 9.11 "Switch over parameter sets")

FDS Parameter belongs to the function data set (see Section 9.1, subsection "Data sets")
BDS Parameter belongs to the BICO data set (see Section 9.1, subsection "Data sets")

3) Specification of parameter type

O2 Unsigned 16-bit value
I2 Signed 16-bit value
O4 Unsigned 32-bit value
I4 Signed 32-bit value
V2 Bit-coded quantity
L2 Nibble-coded quantity

4) Setting steps for access via PKW mechanism

5) Factory setting

6) Minimum setting required (P052) to allow display of the relevant parameter
Minimum access level required (P051) to allow modification of the relevant parameter
Online: The parameter can be changed in all converter operating states
Offline: The parameter can only be changed in converter operating states of ≥ o1.0

8)

S00 Parameter belongs to the technology software in the basic converter, S00 option

9) The "OP parameter number" (i.e. the number to be entered via the OP1S operator panel) is specified in brackets in the "PNU" column for all parameters which are not "P parameters" or "r parameters": e.g. (2010) under n010 or (2100) under U100.

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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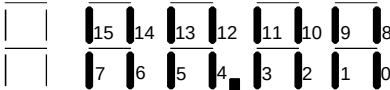
11.1 Operating status display

r000	Operating status display Status display, fault and alarm messages Torque direction M0, MI or MII (=RUN) -- No torque direction active I Torque direction I active (MI) II Torque direction II active (MII) o1 Waiting for operating enable (=READY) o1.0 Brake release delay time running. o1.1 Waiting for operating enable at terminal 38. o1.2 Waiting for operating enable via binector (acc. to selection in P661) or control word, bit 3 (acc. to selection in P648) o1.3 Inching command cancellation delay time running. o1.4 Waiting for field to be reversed. Waiting for cancellation of command "Brake by field reversal" o1.5 Waiting for operating enable from optimization run (the optimization run does not output the operating enable signal at the end until $n < n_{min}$ has been reached and SHUTDOWN input). o1.6 Waiting for cancellation of immediate pulse disable via binector (acc. to selection with P175) [SW 1.8 and later] o2 Reserved o2.0 Reserved o3 Test phase o3.0 Waiting for completion of thyristor check (selectable function). o3.1 Waiting for completion of line symmetry check. o3.2 Waiting for a DC contactor to pick up o3.3 Waiting for operating enable via checkback signal "Line contactor closed". [SW 1.8 and later] o4 Waiting for voltage (armature) o4.0 Waiting for voltage at power terminals 1U1, 1V1, 1W1 (the threshold set in parameters P351 and P353 must be exceeded, see also P078.001) o4.1 Waiting for fuse monitoring to signal OK o5 Waiting for field current o5.0 Waiting until actual field current (K0266) equals >50% of field current setpoint (K0275) and for "$I_{field\ ext} > I_{f\ min}$". o5.1 Waiting for voltage at power terminals 3U1, 3W1 (the threshold set in parameters P351 and P353 must be exceeded, see also P078.002) NOTE The converter dwells in states o4 and o5 for a maximum total delay time that is set in parameter P089. The appropriate fault message is output if the corresponding conditions are still not fulfilled at the end of this period. o6 Wait status before the line contactor is closed o6.0 Waiting for auxiliaries to be switched on (delay in P093) o6.1 Waiting for a setpoint $\leq$ P091 to be applied to the ramp-function generator input (K0193) o7 Waiting for switch-on command (=READY TO SWITCH ON) o7.0 Waiting for switch-on command via terminal 37. o7.1 Waiting for switch-on command via binector (acc. to selection in P654) or control word, bit 0 (acc. to selection in P648). o7.2 Waiting for cancellation of internal shutdown through input of an internal shutdown command or waiting for cancellation of command "Braking with field reversal"		Ind: None Type: O2	P052 = 3
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
	o7.3 Waiting for completion of "Restore factory settings" operation. o7.4 Waiting for switch-on command before execution of an optimization run o7.5 Wait for completion of "Read in parameter set" operation. o7.6 Wait for completion of "Load MLFB" operation (performed at factory) o8 Waiting for acknowledgement of starting lockout o8.0 Waiting for acknowledgement of starting lockout through input of SHUTDOWN command (OFF1). o8.1 Simulation operation active (see under U840) o9 Fast stop (OFF3) o9.0 Fast stop has been input via binector (acc. to selection in P658) or control word, bit 1 (acc. to selection in P648). o9.1 Fast stop has been input via binector (acc. to selection in P659). o9.2 Fast stop has been input via binector (acc. to selection in P660). o9.3 Fast stop is stored internally (memory can be reset by cancelling FAST STOP command and entering SHUTDOWN). o10 Voltage disconnection (OFF2) o10.0 Voltage disconnection has been input via binector (acc. to selection in P655) or control word, bit 1 (acc. to selection in P648). o10.1 Voltage disconnection has been input via binector (acc. to selection in P656). o10.2 Voltage disconnection has been input via binector (acc. to selection in P657). o10.3 E-Stop (safety shutdown) has been input via terminal 105 or 107 o10.4 Wait for receipt of a valid telegram on G-SST1 (only if telegram failure time monitoring is set with P787 ≠ 0) o10.5 Waiting for receipt of a valid telegram on G-SST2 (only if telegram failure time monitoring is set with P797 ≠ 0) o10.6 Waiting for receipt of a valid telegram on G-SST3 (only if telegram failure time monitoring is set with P807 ≠ 0) o11 Fault o11.0 = Fxxx Fault message is displayed, red LED lights up. o12 Electronics initialization in progress o12.1 Basic converter electronics initialization in progress o12.2 Initialization of supplementary board in location 2 in progress o12.3 Initialization of supplementary board in location 3 in progress o12.9 Restructuring of parameters in non-volatile storage after software update (takes approx. 15s) o13 Software update in progress o13.0 Waiting for arrival of start command from HEXLOAD PC routine (press the DOWN key to abort this status and start a RESET) o13.1 Deletion of Flash EPROM in progress xxxxx Display of address currently being programmed o13.2 The Flash EPROM has been successfully programmed (a RESET is performed automatically after approx. 1 second) o13.3 Programming of the Flash EPROM has <u>failed</u> (press UP key to return to operating state o13.0) o14 Loading of boot sector in progress (this operation is performed only in factory) o15 Electronics not connected to voltage Dark display: Waiting for voltage at terminals 5U1, 5W1 (electronics supply voltage).			

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.2 General visualization parameters

r001	Display of terminals 4 and 5 (main setpoint)	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r002	Analog input, terminals 103 and 104 (main actual value)	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r003	Analog input, terminals 6 and 7 (selectable input 1)	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r004	Analog input, terminals 8 and 9 (selectable input 2)	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r005	Analog input, terminals 10 and 11 (selectable input 3)	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r006	Analog output, terminals 14 and 15 Display of output value <u>before</u> normalization and offset	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r007	Analog output, terminals 16 and 17 Display of output value <u>before</u> normalization and offset	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r008	Analog output, terminals 18 and 19 Display of output value <u>before</u> normalization and offset	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r009	Analog output, terminals 20 and 21 Display of output value <u>before</u> normalization and offset	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r010	Display of status of binary inputs Representation on operator panel (PMU):  Segment alight: Corresponding terminal is activated (HIGH level is applied) Segment dark: Corresponding terminal is not activated (LOW level is applied) Segment or bit 0 Terminal 36 1 Terminal 37 (switch-on) 2 Terminal 38 (operating enable) 3 Terminal 39 4 Terminal 40 5 Terminal 41 6 Terminal 42 7 Terminal 43 8 Terminal 211 9 Terminal 212 10 Terminal 213 11 Terminal 214 12 Safety shutdown (E-Stop is applied) 1) 13 (not used) 14 (not used) 15 (not used) 1) The safety shutdown command is applied (segment dark) if - terminal XS-105 is open (switch operation, see also Section 9) or - terminal XS-107 (Stop pushbutton) is opened briefly and terminal XS-108 (Reset pushbutton) is not yet activated (pushbutton operation, see also Section 9)		Ind: None Type: V2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
r011	Display of status of binary outputs Representation on operator panel (PMU): 15141312111098 76543210 Segment alight: Corresponding terminal is activated (HIGH level is applied) or overloaded or short-circuited Segment dark: Corresponding terminal is not activated (LOW level is applied) or not overloaded or not short-circuited Display of status of binary output terminals: Segment or bit 0 Terminal 46 1 Terminal 48 2 Terminal 50 3 Terminal 52 7 Terminal 109/110 (relay contact for line contactor) Display of overloading of binary outputs: Segment or bit 8 Terminal 46 9 Terminal 48 10 Terminal 50 11 Terminal 52 12 Terminal 26 (15V output) 13 Terminal 34, 44 and/or 210 (24V output)		Ind: None Type: V2	P052 = 3
r012	Motor temperature Display of motor temperature when a KTY 84 temperature sensor is connected (P490.x=1). A value of "0" is always output in r012 when a PTC thermistor or no temperature sensor is installed. i001: Motor temperature 1 (sensor at terminals 22 / 23) i002: Motor temperature 2 (sensor at terminals 204 / 205)	-58 to +200 [°C] 1°C	Ind: 2 Type: I2	P052 = 3
r013	Heatsink temperature Display of heatsink temperature (temperature sensor according to U830 to terminal X6, X7 of the power interface)	-47 to +200 [°C] 1°C	Ind: None Type: I2	P052 = 3
r014	Temperature rise i001: Calculated motor temperature rise (see P114) i002: no meaning	0.0 to 200.0 [%] 0.1%	Ind: 2 Type: O2	P052 = 3
r015	Display of line voltage (armature) (generated as arithmetic rectification average, RMS value display applies to sinusoidal voltage, average over 3 line-to-line voltages)	0.0 to 1500.0 [V] 0.1V	Ind: None Type: O2	P052 = 3
r016	Display of line voltage (field) (generated as arithmetic rectification average, RMS value display applies to sinusoidal voltage)	0.0 to 800.0 [V] 0.1V	Ind: None Type: O2	P052 = 3
r017	Display of line frequency	0.00 to 100.00 [Hz] 0.01Hz	Ind: None Type: O2	P052 = 3
r018	Display of firing angle (armature)	0.00 to 180.00 [degrees] 0.01degrees	Ind: None Type: O2	P052 = 3
r019	Display of actual armature current The internal actual armature current value is displayed (arithmetic average between two gating pulses)	-400.0 to 400.0 [% of P100] 0.1% of P100	Ind: None Type: I2	P052 = 3
r020	Display of armature current setpoint	-300.0 to 300.0 [% of P100] 0.1% of P100	Ind: None Type: I2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
r021	Display of torque setpoint after torque limitation Steps: $1 \triangleq 0.1\%$ of rated motor torque (=rated motor armature current (P100) * magnetic flux at rated motor field current (P102))	-400.0 to 400.0 [%] 0.1% (see column on left)	Ind: None Type: I2	P052 = 3
r022	Display of torque setpoint before torque limitation Steps: $1 \triangleq 0.1\%$ of rated motor torque (=rated motor armature current (P100) * magnetic flux at rated motor field current (P102))	-400.0 to 400.0 [%] 0.1% (see column on left)	Ind: None Type: I2	P052 = 3
r023	Display of speed controller setpoint/actual value deviation	-200.00 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r024	Display of actual speed value from pulse encoder	-200.00 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r025	Display of actual speed controller value	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r026	Display of speed controller setpoint	-200.0 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r027	Display of ramp-function generator output	-200.00 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r028	Display of ramp-function generator input	-200.00 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r029	Display of main setpoint before limitation	-200.00 to 199.99 [%] 0.01%	Ind: None Type: I2	P052 = 3
r034	Display of firing angle (field)	0.00 to 180.00 [degrees] 0.01degrees	Ind: None Type: O2	P052 = 3
r035	Display of field current controller actual value	0.0 to 199.9 [% of P102] 0.1% of P102	Ind: None Type: O2	P052 = 3
r036	Display of field current controller setpoint	0.0 to 199.9 [% of P102] 0.1% of P102	Ind: None Type: O2	P052 = 3
r037	Display of actual EMF value	-1500.0 to 1500.0 [V] 0.1V	Ind: None Type: I2	P052 = 3
r038	Display of actual armature voltage value	-1500.0 to 1500.0 [V] 0.1V	Ind: None Type: I2	P052 = 3
r039	Display of EMF setpoint This parameter displays the EMF setpoint which is applied as the control quantity in the field-weakening range. This value is calculated from: $U_{motor_{rated}} - I_{motor_{rated}} * RA (= P101 - P100 * P110)$	0.0 to 1500.0 [V] 0.1V	Ind: None Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
r040	Display of limitations: Representation on operator panel (PMU): Segment alight: Corresponding limitation is reached Segment dark: Corresponding limitation is not reached Segment or bit 0 α_W limit (field) reached (P251) 1 Negative current limit (field) reached (K0274) 2 α_W limit (armature) reached (α_W acc. to P151 for continuous current, 165° for discontinuous current) 3 Negative current limit (armature) reached (K0132) 4 Negative maximum speed reached (P513) Speed limiting controller responds (B0201) 5 Negative torque limit reached (B0203) 6 Neg. limitation at ramp generator output reached (K0182) 7 Neg. limitation at ramp generator input reached (K0197) 8 α_G limit (field) reached (P250) 9 Positive current limit (field) reached (K0273) 10 α_G limit (armature) reached (P150) 11 Positive current limit (armature) reached (K0131) 12 Positive maximum speed reached (P512) Speed limiting controller responds (B0201) 13 Positive torque limit reached (B0202) 14 Pos. limitation at ramp generator output reached (K0181) 15 Pos. limitation at ramp generator input reached (K0196)		Ind: None Type: V2	P052 = 3

Connector and binector displays				
r041	High-resolution connector display: i001: Display of connector selected in P042.01 i002: Display of connector selected in P042.02 The display value is filtered with a time constant of 300ms (see Section 8, Sheet G120)	-200.00 to 199.99 [%] 0.01%	Ind: 2 Type: I2	P052 = 3
P042 *	High-resolution connector display: i001: Selection of connector to be displayed in r041.01 i002: Selection of connector to be displayed in r041.02 The display value is filtered with a time constant of 300ms (see Section 8, Sheet G120)	All connector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Online
r043	Connector display: i001: Display of connector selected in P044.01 i002: Display of connector selected in P044.02 i003: Display of connector selected in P044.03 i004: Display of connector selected in P044.04 i005: Display of connector selected in P044.05 i006: Display of connector selected in P044.06 i007: Display of connector selected in P044.07	-200.0 to 199.9 [%] 0.1%	Ind: 7 Type: I2	P052 = 3
P044 *	Connector display: i001: Selection of connector displayed in r043.01 i002: Selection of connector displayed in r043.02 i003: Selection of connector displayed in r043.03 i004: Selection of connector displayed in r043.04 i005: Selection of connector displayed in r043.05 i006: Selection of connector displayed in r043.06 i007: Selection of connector displayed in r043.07	All connector numbers 1	Ind: 7 FS=0 Type: L2	P052 = 3 P051 = 40 Online
r045	Binector display: i001: Display of binector selected in P046.01 i002: Display of binector selected in P046.02 i003: Display of binector selected in P046.03 i004: Display of binector selected in P046.04	0 to 1	Ind: 4 Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P046 *	Binector display: i001: Selection of binector displayed in r045.01 i002: Selection of binector displayed in r045.02 i003: Selection of binector displayed in r045.03 i004: Selection of binector displayed in r045.04	All binector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 Online
r047	Display of fault diagnostic memory Provides more detailed information about the cause of a fault after activation of a fault message (see Section 10). i001 Word 1 (fault value) i002 Word 2 ... i016 Word 16 (fault number)	0 to 65535 1	Ind: 16 Type: O2	P052 = 3
r048	Hours run Display of time (hours) in which drive has been operating in states I, II or - -. All times of $\geq$ approx. 0.1 s are included in the count.	0 to 65535 [hours] 1 hour	Ind: None Type: O2	P052 = 3
r049	Fault time Display of time at which the current fault, and the last 7 acknowledged faults, were activated. i001: Current fault hours i002: 1 st acknowledged fault hours i003: 2 nd acknowledged fault hours i004: 3 rd acknowledged fault hours i005: 4 th acknowledged fault hours i006: 5 th acknowledged fault hours i007: 6 th acknowledged fault hours i008: 7 th acknowledged fault hours	0 to 65535 [hours] 1 hour	Ind: 8 Type: O2	P052 = 3
P050 *	Language Language of plaintext display on optional OP1S operator panel and in SIMOVIS PC service routine 0: German 1: English 2: Spanish 3: French 4: Italian	0 to 4 1	Ind: None FS=0 Type: O2	P052 = 3 P051 $\geq$ 0 Online

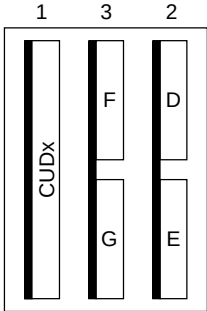
11.3 Access authorization levels

P051 *	Key parameters 0 No access authorization 6 Do not set (for use by SIMOVIS) 7 Do not set (for use by SIMOVIS) 21 Restore factory settings All parameters are reset to their defaults (factory settings). Parameter P051 is then automatically reset to factory setting "40". 22 Execute internal offset compensation (see Section 7.4) 24 Forcing (see parameters P480 to P485) 25 Optimization run for precontrol and current controller (armature and field) (see Section 7.5) 26 Optimization run for speed controller (see Section 7.5) 27 Optimization run for field weakening (see Section 7.5) 28 Optimization run for compensation of friction and moment of inertia (see Section 7.5) 40 Access authorization to parameter values for authorized service personnel	see column on left	Ind: None FS=40 Type: O2	P052 = 3 P051 $\geq$ 0 Online
P052 *	Selection of display parameters 0 Display only parameters that are not set to original factory settings 3 Display all parameters used	0, 3	Ind: None FS=3 Type: O2	P052 = 3 P051 $\geq$ 0 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P053 *	Control word for the permanent memory Disabling or enabling write accesses to the permanent memory i001: Disabling or enabling write accesses to the <u>parameter memory</u> 0 Only save parameter P053 in the permanent memory; parameter changes are active immediately but the changed values are only stored temporarily and are lost when the electronics supply voltage is switched off 1 Save all parameter values in the permanent memory i002: Disabling or enabling write accesses to the memory of the <u>nonvolatile process data</u> 0 Do not save nonvolatile process data in the permanent memory 1 Save all nonvolatile process data in the permanent memory If the nonvolatile process data are not stored (P053.002=0), data are lost when the electronics supply of the SIMOREG CM is switched off, i.e. they have the value 0 after the electronics supply is switched on again: K0240: Setpoint of the motor potentiometer K0309: Motor heating K0310: Thyristor heating K9195: Output of the 1st tracking/storage element K9196: Output of the 2nd tracking/storage element	0 to 1 1	Ind: 2 FS=1 Type: O2	P052 = 3 P051 = 0 on-line
P054	OP1S – Background lighting 0 ON continuously 1 ON when panel is in use	0, 1	Ind: None FS=0 Type: O2	P052 = 3 P051 ≥ 0 Online
P055 *	Copy function data set This parameter allows parameter set 1, 2, 3 or 4 to be <u>copied</u> to parameter set 1, 2, 3 or 4. This function is applicable only to parameters with 4 indices in the function data set (see also Section 9.1, Data sets and Section 9.11, and Section 8, Sheet G175). 0xy <u>Do nothing</u> , automatic resetting value at the end of a copy operation. 1xy The contents of parameter set x (source data set, x=1, 2, 3 or 4) are <u>copied</u> to parameter set y (target data set, y=1, 2, 3 or 4) (parameter set x remains unchanged, the original contents of parameter set y are overwritten). x and y are the respective parameter set numbers (1, 2, 3 or 4) of the source and target parameter sets. Each copy operation is started by switching P055 over into parameter mode when P055=1xy. During the copy operation, the numbers of the parameters being copied are displayed on the operator panel (PMU). At the end of the copy operation, P055 is reset to P055=0xy.	011 to 143 1	Ind: None FS=012 Type: L2	P052 = 3 P051 = 40 Offline
r056	Display of active function data set	1 to 4 1	Ind: None Type: O2	P052 = 3
P057 *	Copy Bico data set This parameter allows parameter set 1 or 2 to be <u>copied</u> to parameter set 1 or 2. This function is applicable only to parameters with 2 indices in the Bico data set (see also Section 9.1, Data sets and Section 9.11, and Section 8, Sheet G175). 0xy <u>Do nothing</u> , automatic resetting value at the end of a copy operation. 1xy The contents of parameter set x (source data set, x=1 or 2) are <u>copied</u> to parameter set y (target data set, y=1 or 2) (parameter set x remains unchanged, the original contents of parameter set y are overwritten). x and y are the respective parameter set numbers (1 or 2) of the source and target parameter sets. Each copy operation is started by switching P057 over into parameter mode when P057=1xy. During the copy operation, the numbers of the parameters being copied are displayed on the operator panel (PMU). At the end of the copy operation, P057 is reset to P057=0xy.	011 to 121 1	Ind: None FS=012 Type: L2	P052 = 3 P051 = 40 Offline
r058	Display of active Bico data set	1 to 2 1	Ind: None Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
r059	Display of operating state Meaning as for r000	0.0 to 14.5 0.1	Ind: None Type: O2	P052 = 3

11.4 Definition of SIMOREG CM converter

r060	Software version Converter software release i001: CUD i002: Slot D (board location 2) i003: Slot E (board location 2) i004: Slot F (board location 3) i005: Slot G (board location 3)	0.0 to 9.9 0.1	Ind: 5 Type: O2	P052 = 3
r061	Creation date of software i001: Year i002: Month i003: Day i004: Hour i005: Minute		Ind: 5 Type: O2	P052 = 3
r062	Checksum i001: Converter firmware checksum i002: Boot sector checksum		Ind: 2 Type: L2	P052 = 3
r063	Board code Identification code of boards mounted in locations 1 to 3 of electronics box.  Arrangement of board locations 1 to 3 and slots D to G in electronics box i001: Board in location 1 71: CUD1 72: CUD1 + CUD2 i002: Board in slot D (upper slot of location 2) 111: Pulse encoder board (SBP) [SW 1.8 and later] 131 to 139: Technology board 141 to 149: Communications board 151, 152, 161: Special board (EB1, EB2, SLB) i003: Board in slot E (lower slot of location 2) 111: Pulse encoder board (SBP) [SW 1.8 and later] 131 to 139: Technology board 141 to 149: Communications board 151, 152, 161: Special board (EB1, EB2, SLB) i004: Board in slot F (upper slot of location 3) 111: Pulse encoder board (SBP) [SW 1.8 and later] 141 to 149: Communications board 151, 152, 161: Special board (EB1, EB2, SLB) i005: Board in slot G (lower slot of location 3) 111: Pulse encoder board (SBP) [SW 1.8 and later] 141 to 149: Communications board 151, 152, 161: Special board (EB1, EB2, SLB)		Ind: 5 Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)																
r064	Board compatibility Compatibility identifier of boards in locations 1 to 3 of electronics box. The compatibility identifier is bit-coded. To ensure the compatibility of a board, it must have a "1" setting at the same bit location of the parameter value as the CUD (in location 1 / index i001). Indices: i001: Compatibility identifier of board in location 1 i002: Compatibility identifier of board in slot D i003: Compatibility identifier of board in slot E i004: Compatibility identifier of board in slot F i005: Compatibility identifier of board in slot G Example: <table><tr><td>Index</td><td>Value</td><td>Bit representation</td><td>Compatible with CUD</td></tr><tr><td>i001</td><td>253</td><td>0000 0000 1111 1101</td><td></td></tr><tr><td>i002</td><td>002</td><td>0000 0000 0000 0010</td><td>no</td></tr><tr><td>i003</td><td>001</td><td>0000 0000 0000 0001</td><td>yes</td></tr></table>	Index	Value	Bit representation	Compatible with CUD	i001	253	0000 0000 1111 1101		i002	002	0000 0000 0000 0010	no	i003	001	0000 0000 0000 0001	yes		Ind: 5 Type: O2	P052 = 3
Index	Value	Bit representation	Compatible with CUD																	
i001	253	0000 0000 1111 1101																		
i002	002	0000 0000 0000 0010	no																	
i003	001	0000 0000 0000 0001	yes																	
r065	Software identifiers Extended software version identifiers in locations 1, 2, and 3 of the electronics box Indices: i001: Software identifier of the board in location 1 i002: Software identifier of the board in slot D i003: Software identifier of the board in slot E i004: Software identifier of the board in slot F i005: Software identifier of the board in slot G		Ind: 5 Type: O2	P052 = 3																

11.5 Definition of SIMOREG CM power section

P067 *	No meaning [SW 1.8 and higher]	1 to 5 1	Ind: None FS=1 Type: O2	P052 = 3 P051 = 40 off-line
r068	Options according to rating plate 0 No option 2 Option K01 (terminal expansion)		Ind: None Type: O2	P052 = 3
r069	Serial number of SIMOREG CM i001: 1 st and 2 nd places of serial number i002: 3 rd and 4 th places of serial number i003: 5 th and 6 th places of serial number i004: 7 th and 8 th places of serial number i005: 9 th and 10 th places of serial number i006: 11 th and 12 th places of serial number i007: 13 th and 14 th places of serial number i008 to i015: 0 i016: Checksum for serial number The serial number ASCII code is displayed in this parameter. The number is output in plaintext on the OP1S panel.		Ind: 16 Type: L2	P052 = 3
r070	MLFB (order number) of SIMOREG CM converter The MLFB (60) is displayed in encoded form in this parameter. The MLFB is displayed in plaintext on the OP1S panel.		Ind: None Type: O2	P052 = 3
r071	Rated converter connection voltage (armature) Rated converter connection voltage (armature) acc. to parameter U820	10 to 830 [V] 1V	Ind: None Type: O2	P052 = 3
r072	Rated converter direct current (armature) i001: Rated device direct current (armature) acc. to parameter U822 (output direct current at the power terminals 1C1 and 1D1) i002: Real rated converter direct current (armature) acc. to setting in parameter P076.001	1.0 to 6553.5 [A] 0.1A	Ind: 2 Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
r073	Converter rated DC current (field) i001: Converter rated DC current (field) as specified on rating plate (output DC current at power terminals 3C and 3D) i002: Actual converter rated DC current (field) as set in parameter P076.002	1.00 to 100.00 [A] 0.01A	Ind: 2 Type: O2	P052 = 3
r074	Converter rated supply voltage (field) Converter rated supply voltage (field) as specified on rating plate	10 to 460 [V] 1V	Ind: None Type: O2	P052 = 3
P075	No function			
P076 *	Reduction of converter rated DC current i001: Reduction of converter rated DC current (armature) i002: Reduction of converter rated DC current (field) For the purpose of achieving a close match between the converter and motor, the converter rated DC current is reduced to the value entered here. The current value of the device rated DC is indicated in parameter r072.002. The following values can be set: 10.0%, 20.0%, 33.3%, 40.0%, 50.0%, 60.0%, 66.6% 70.0%, 80.0%, 90.0% and 100.0%	see column on left	Ind: 2 FS=100.0 Type: O2	P052 = 3 P051 = 40 Offline
P077	No function			
P078	Reduction of converter rated supply voltage i001: Rated input voltage armature i002: Rated input voltage field The rated voltage value of the power system actually used to supply the power section must be set in this parameter. This setting acts as the reference for the undervoltage, overvoltage and phase failure monitoring functions (see also P351, P352 and P353) as well as for connectors K0285 to K0289, K0291, K0292, K0301 K0302, K0303 and K0305	10 to r071 [V] 1V	Ind: 2 FS=r071 Type: O2	P052 = 3 P051 = 40 Offline
P079 *	Short pulses / long pulses, armature gating unit 0 <u>Short pulses</u> (0.89 ms=approx. 16 degrees at 50 Hz) are output on the armature gating unit. 1 <u>Long pulses</u> (pulse duration up to approx. 0.1 ms before next pulse) are output on the armature gating unit (e.g. required in cases where field is supplied via armature terminals).	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

11.6 Setting values for converter control

P080 *	Control word for brake control 1 The brake is a <u>holding brake</u> (When the "Operating enable" command is cancelled or when the "Voltage disconnection" or "E-Stop" command is input, the "Close brake" command is not input until $n < n_{\min}$ (P370, P371) is reached.) 2 The brake is an <u>operating brake</u> (When the "Operating enable" command is cancelled or when the "Voltage disconnection" or "E-Stop" command is input, the "Close brake" command is input immediately, i.e. while the motor is still rotating.)	1 to 2	Ind: None FS=1 Type: O2	P052 = 3 P051 = 40 Offline
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P081 *	EMF-dependent field weakening 0 <u>No field-weakening operation as a function of speed or EMF</u> (100% of rated motor field current is applied constantly as the internal field current setpoint). 1 <u>Field-weakening operation by internal closed-loop EMF control</u> to ensure that in field-weakening operation, i.e. at speeds above the motor rated speed (=“field-weakening activation limit speed”), the motor EMF is maintained constantly at the setpoint $EMF_{set} (K0289) = P101 - P100 * P110$ (field current setpoint is the product of the EMF controller output and the precontrol component determined by the actual speed according to the field characteristic). NOTE When P081=1, a valid field characteristic must be available (P117=1), otherwise the optimization run for field weakening (P051=27) must be executed.	0 to 1 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P082 *	Operating mode for field 0 Internal field is <u>not used</u> (e.g. for permanent-field motors), field gating pulses are disabled. Unlike all other cases, the motor flux (K0290) is <u>not</u> calculated according to the field characteristic (P120 to P139) as a function of the actual field current (K0265), but set to the value for 100% rated flux. 1 The field is <u>switched with the line contactor</u> - this setting must be selected if the mains supplies for the field and armature power sections are connected or disconnected simultaneously (field gating pulses are enabled/disabled at the same time as the line contactor is closed/opened, the field current decays with the field time constant). 2 Automatic injection of <u>standstill field</u> set in P257 after expiry of a time period set in P258, after converter has reached operating state o7 or higher. 3 Field <u>ACTIVE continuously</u> . <u>Note:</u> Even though changes to the parameter value from > 0 to = 0 are accepted in operating states of $\geq o1.0$, they do not take effect until the converter reaches an operating state of $\geq o7.0$.	0 to 3 1	Ind: None FS=2 Type: O2	P052 = 3 P051 = 40 Offline
P083 * FDS	Selection of actual speed value 0 Actual speed value is not yet selected (fixed value 0%) 1 Actual speed value supplied by "Main actual value" channel (K0013) (terminals XT.103, XT.104) 2 Actual speed value supplied by "Actual speed from pulse encoder" channel (K0040) 3 Actual speed value supplied by "Actual EMF" channel (K0287), but weighted with P115 (operation without tachometer) 4 Actual speed value is wired up freely (selected in P609)	0 to 4 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P084 *	Selection of closed-loop speed / current or torque control 1 Operation under closed-loop speed control 2 Operation under closed-loop current / torque control (the setpoint supplied by the ramp-function generator output is input as a current or torque setpoint (speed controller is bypassed))	1 to 2 1	Ind: None FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P085	Wait period after cancellation of inching command After an inching command has been cancelled, the drive dwells in operating state o1.3 for the time period set in this parameter with the controllers disabled, but the line contactor closed. This wait period does not commence until $n < n_{min}$ (P370, P371) is reached. If a new inching command is input within this period, then the drive switches to the next operating state (o1.2 or lower). However, if the time runs out without a new inching command being entered, then the line contactor drops out and the drive switches to operating state o7 (see also Section 9).	0.0 to 60.0 [s] 0.1s	Ind: None FS=10.0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P086	Voltage failure period for automatic restart If the voltage fails (F001, F004) at one of the terminals 1U1, 1V1, 1W1, 3U1, 3W1, 5U1 or 5W1, or if it drops below a certain threshold (F006 undervoltage) or exceeds a certain threshold (F007 overvoltage), or its frequency is too low (F008 frequency <45Hz) or too high (F009 frequency >65Hz), or if the actual field current drops to below 50% of the field current setpoint for more than 0.5s (F005), then the corresponding fault message is activated only if the fault condition has not been eliminated within the "Automatic restart" period set in this parameter. The gating pulses and controllers are disabled while the fault conditions are present. The converter dwells in operating state o4 (in the case of armature line voltage fault) or o5 (in the case of field line voltage or field current fault) or in o13. Setting this parameter to 0.0s deactivates the "Automatic restart" function.	0.0 to 2.0 [s] 0.1s	Ind: None FS=0.4 Type: O2	P052 = 3 P051 = 40 Online
P087	Brake release time -10.00 to -0.01 s The "Release brake" command is delayed in relation to enabling of the gating pulses for thyristors and controllers (i.e. operating state I, II or --) by the delay time set in this parameter. During this period, the motor rotates against the closed brake. This setting is useful, for example, for vertical loads. 0.00 to +10.00 s When a "Switch-on" or "Inching" or "Crawling" command is input with "Operating enable", the drive dwells in operating state o1.0 for the delay period set in this parameter; the internal controller enabling signal, and thus enabling of the thyristor gating pulses, do not take effect until the delay period has elapsed so as to give the holding brake time to open.	-10.00 to 10.00 [s] 0.01s	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P088	Brake closing time When the "Switch-on" or "Inching" or "Crawling" command is cancelled, or when the "Switch-on" command is not applied, or when the "Fast stop" command is input, the internal controller disabling signal, and thus the thyristor gating pulse disabling signal, is not actually activated after $n < n_{min}$ has been reached until the time delay set in this parameter has elapsed. During this period, the drive continues to produce a torque (operating state I, II or --), so as to give the holding brake enough time to close.	0.00 to 10.00 [s] 0.01s	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
P089	Maximum wait time for voltage to appear at power section When the line contactor has dropped out and the "Switch-on" or "Inching" or "Crawling" command is applied, the converter waits in operating states o4 and o5 for voltage to appear at the power section, for the actual field current value (K0265) to reach > 50% of the field current setpoint (K0268). The corresponding fault message is activated if no power section voltage and no field current is detected. This parameter specifies the maximum total delay period in which the drive may dwell in operating states o4 and o5 (response threshold for function which checks for voltage at power section, see parameter P353).	0.0 to 60.0 [s] 0.1s	Ind: None FS=2.0 Type: O2	P052 = 3 P051 = 40 Online
P090	Stabilization time for line voltage When the line contactor has dropped out and the "Switch-on" or "Inching" or "Crawling" command is applied, or after a phase failure has been detected in the armature or field mains supply with active "Automatic restart" function (P086>0), the converter dwells in operating state o4 and o5 until voltage appears at the power section. Line voltage is not assumed to be applied to the power terminals until the amplitude, frequency and phase symmetry have remained within the permissible tolerance for a period exceeding the setting in this parameter. The parameter applies to both the armature and field power connections. Caution: The setting in P090 must be lower than the settings in P086 (except when P086=0.0) and P089!	0.01 to 1.00 [s] 0.01s	Ind: None FS=0.02 Type: O2	P052 = 3 P051 = 40 Online
P091	Setpoint threshold The converter can be switched on only if a setpoint $ K0193 \leq P091$ is applied to the ramp-function generator input. If the applied setpoint is higher, the converter dwells in state o6 after "switch-on" until the absolute setpoint value is $\leq P091$.	0.00 to 199.99 [%] 0.01%	Ind: None FS=199.99 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P092	Delay times for field reversal These times are used to control a reversing contactor for reversing the field polarity on a 1-quadrant converter with field reversal. i001: <u>Delay time for the field reduction before opening of the current field contactor</u> When field polarity reversal is initiated, the delay time set in P092.i001 elapsed after reaching I_{field} (K0265) < $I_{\text{field min}}$ (P394) before the current field contactor is opened. i002: <u>Delay time before actuation of the new field contactor</u> After opening the current field contactor the delay time set in P092.i002 elapsed before the field contactor for the "new" field direction is actuated (drop-out delay time of the contactor use is usually longer then the pick-up delay time). i003: <u>Delay time for enabling the field firing pulses</u> After actuation of the field contactor for the "new" field direction, the delay time acc. to P092.i003 elapses before the field firing pulses are enabled. This time must be longer than the pick-up delay time of the contactor used. i004: <u>Delay time after the field build-up before armature enable</u> After - directly following the field firing pulse enable - the actual field current value I_{field} in the "new" field direction den value I_{field} (K0265) > $I_{\text{field set}}$ (K0268)*P398/100% reached hat, the delay time acc. to P092.i004 elapses, before the internal (armature) "Operating enable of field reversal" is issued, i.e. before the Stopping of the drive in operating state $\geq o1.4$ is canceled. This delay time permits waiting of the end of overshooting of the actual field current value and therefore overshooting of the EMF of the DC machine straight after the field current has been built up again, before the armature operating enable is issued. This is intended to prevent armature overcurrents due to excessive EMF during overshooting.	0.0 to 10.0 [s] 0.1s	Ind: 4 FS= i001: 3.0 i002: 0.2 i003: 0.1 i004: 3.0 Type: O2	P052 = 3 P051 = 40 on-line
P093	Pick-up delay for line contactor Pick-up of the line contactor is delayed in relation to "Switch on auxiliaries" by the time delay set in this parameter.	0.0 to 120.0 [s] 0.1s	Ind: None FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P094	Switch-off delay for auxiliaries Switch-off of the auxiliaries is delayed in relation to dropout of the line contactor by the time delay set in this parameter.	0.0 to 120.0 [s] 0.1s	Ind: None FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P095	Pick-up time for a contactor in the DC circuit If the DC output (terminals 1C1 and 1D1) is switched through to the motor via a contactor, and if this contactor is controlled by the "Relay for line contactor" (terminals 109 and 110), then the gating pulses may not be enabled until the contactor has safely picked up. For this purpose, it may be necessary to parameterize an additional delay time for the pick-up operation. The timer set in P095 commences during a pick-up operation when the converter reaches operating state o5. If the timer has still not run down by the time the converter exits state o4, then the converter dwells in state o3.2 until the timer has finished.	0.00 to 1.00 [s] 0.01s	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
P096	After-running time for the device fan After the drive has been shut down (operating state ≥ 7.0 reached) the device fan continues to run until the power section has cooled down. With this parameter you can set the minimum duration for the after-running time.	0.0 to 60.0 [min] 0.1min	Ind: None FS=4,0 Type: O2	P052 = 3 P051 = 40 on-line

11.7 Definition of motor

P100 *	Rated motor armature current (acc. to motor rating plate)	0.0 to 6553.0 [A] 0.1A	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Offline
FDS	0.0 Parameter not yet set			
P101 *	Rated motor armature voltage (acc. to motor rating plate)	10 to 1400 [V] 1V	Ind: 4 FS=400 Type: O2	P052 = 3 P051 = 40 Offline
FDS	Notes: One of the functions of this parameter is to determine the point at which field-weakening operation commences. If possible, the rated motor armature voltage + the voltage drop in the motor feeder cable (for a current setting acc. to P100) should be set in P101.			

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P102 * FDS	Rated motor field current (acc. to motor rating plate) 0.00 Parameter not yet set	0.00 to 100.00 [A] 0.01A	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
P103 * FDS	Minimum motor field current Note: P103 must be set to <50% of P102 to execute the optimization run for field weakening (P051=27).	0.00 to 100.00 [A] 0.01A	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline
P104 * FDS	Speed n1 (acc. to motor rating plate) 1 st point (speed value) in speed-dependent current limitation. This parameter is used together with P105, P106, P107 and P108 to define the characteristic of the current limiting value as a function of actual speed.	1 to 10000 [rev/min] 1rev/min	Ind: 4 FS=5000 Type: O2	P052 = 3 P051 = 40 Offline
P105 * FDS	Armature current I1 (acc. to motor rating plate) 1 st point (current value) in speed-dependent current limitation. This parameter is used together with P104, P106, P107 and P108 to define the characteristic of the current limiting value as a function of actual speed.	0.1 to 6553.0 [A] 0.1A	Ind: 4 FS=0.1 Type: O2	P052 = 3 P051 = 40 Offline
P106 * FDS	Speed n2 (acc. to motor rating plate) 2 nd point (speed value) in speed-dependent current limitation. This parameter is used together with P104, P105, P107 and P108 to define the characteristic of the current limiting value as a function of actual speed.	1 to 10000 [rev/min] 1rev/min	Ind: 4 FS=5000 Type: O2	P052 = 3 P051 = 40 Offline
P107 * FDS	Armature current I2 (acc. to motor rating plate) 2 nd point (current value) in speed-dependent current limitation. This parameter is used together with P104, P105, P106 and P108 to define the characteristic of the current limiting value as a function of actual speed.	0.1 to 6553.0 [A] 0.1A	Ind: 4 FS=0.1 Type: O2	P052 = 3 P051 = 40 Offline
P108 * FDS	Maximum operating speed n3 When the speed-dependent current limitation is in use, the maximum speed which is defined by the selection of the actual speed source as set in P083, <u>must</u> be entered in this parameter: When P083=1 (analog tacho): Speed at which a tacho voltage as set in P741 is reached When P083=2 (pulse encoder): Same value as maximum speed set in P143 When P083=3 (operation without tacho): Speed at which EMF as set in P115 is reached	1.0 to 10000 [rev/min] 1rev/min	Ind: 4 FS=5000 Type: O2	P052 = 3 P051 = 40 Offline
P109 * FDS	Control word for speed-dependent current limitation 0 Speed-dependent current limitation is deactivated 1 Speed-dependent current limitation is activated	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P110 FDS	Armature circuit resistance This parameter is set automatically during the optimization run for precontrol and current controller (armature and field) (P051=25).	0.000 to 32.767 [Ω] 0.001Ω	Ind: 4 FS=0.000 Type: O2	P052 = 3 P051 = 40 Online
P111 FDS	Armature circuit inductance This parameter is set automatically during the optimization run for precontrol and current controller (armature and field) (P051=25).	0.000 to 327.67 [mH] 0.01mH	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
P112 FDS	Field circuit resistance This parameter is set automatically during the optimization run for precontrol and current controller (armature and field) (P051=25).	0.0 to 3276.7 [Ω] 0.1Ω	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P114 FDS	Thermal time constant of motor (see Section 9.14) 0.0 I ² t monitoring deactivated	0.0 to 80.0 [min] 0.1min	Ind: 4 FS=10.0 Type: O2	P052 = 3 P051 = 40 Online
P115 FDS	EMF at maximum speed in operation without tachometer This parameter is used to adjust the speed in cases where the internal actual EMF value is applied as the actual speed value. P115 defines the EMF which corresponds to maximum speed as a percentage of P078.001.	1.00 to 140.00 [% of P078.001] 0.01%	Ind: 4 FS=100.00 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P117 *	Control word for field characteristic	0 to 1	Ind: 4	P052 = 3
FDS	0 No valid field characteristic has yet been recorded 1 Valid field characteristic (P118 to P139 valid) The parameter is set automatically during the field-weakening optimization run (P051=27).	1	FS=0 Type: O2	P051 = 40 Offline
P118	Rated EMF value	0 to 1400	Ind: 4	P052 = 3
FDS	(see also Section 8, Sheet G165) EMF that is reached with a full field (according to parameter P102) and a speed as set in parameter P119. The parameter is set automatically during the field-weakening optimization run (P051=27) and specifies in this case the <u>setpoint EMF</u> in the field-weakening range. Note: As regards the closed-loop field-weakening control, only the ratio between P118 and P119 is relevant. The EMF setpoint in the field-weakening range is determined by $(P101 - P100 * P110)$. When the setting in P100, P101 or P110 is changed subsequently, the field-weakening optimization run <u>need not be repeated</u> . However, P118 then no longer defines the setpoint EMF in the field-weakening range. When the setting in parameter P102 is changed subsequently, the field-weakening optimization run <u>must be repeated</u> , the same applies if the maximum speed setting is subsequently re-adjusted.	[V] 1V	FS=340 Type: O2	P051 = 40 Offline
P119	Rated speed	0.0 to 199.9	Ind: 4	P052 = 3
FDS	Speed at which an actual EMF value as set in parameter P118 is reached at full field (according to parameter P102). This parameter is set automatically during the optimization run for field weakening (P051=27) and specifies in this case the <u>field-weakening activation limit speed</u> . Note: As regards the closed-loop field-weakening control, only the ratio between P118 and P119 is relevant. When the setting in P100, P101 or P110 is changed subsequently, the field-weakening optimization run <u>need not be repeated</u> . However, P119 then no longer defines the field-weakening activation limit speed. When the setting in parameter P102 is changed subsequently, the field-weakening optimization run <u>must be repeated</u> , the same applies if the maximum speed setting is subsequently re-adjusted.	[%] 0.1%	FS=100.0 Type: O2	P051 = 40 Offline

Magnetization characteristic (field characteristic)

Parameters P120 to P139 determine the curve shape of the magnetization characteristic (field characteristic) in normalized representation (see example field characteristic below for further details).

Note:

When the setting in parameter P102 is changed subsequently, the field-weakening optimization run must be repeated, because this alters the degree of saturation and thus the shape of the magnetization characteristic. (When parameter P100, P101 or P110, or the maximum speed adjustment, is subsequently altered, the settings in P120 to P139 remain the same, but the values in P118 and/or P119 are changed).

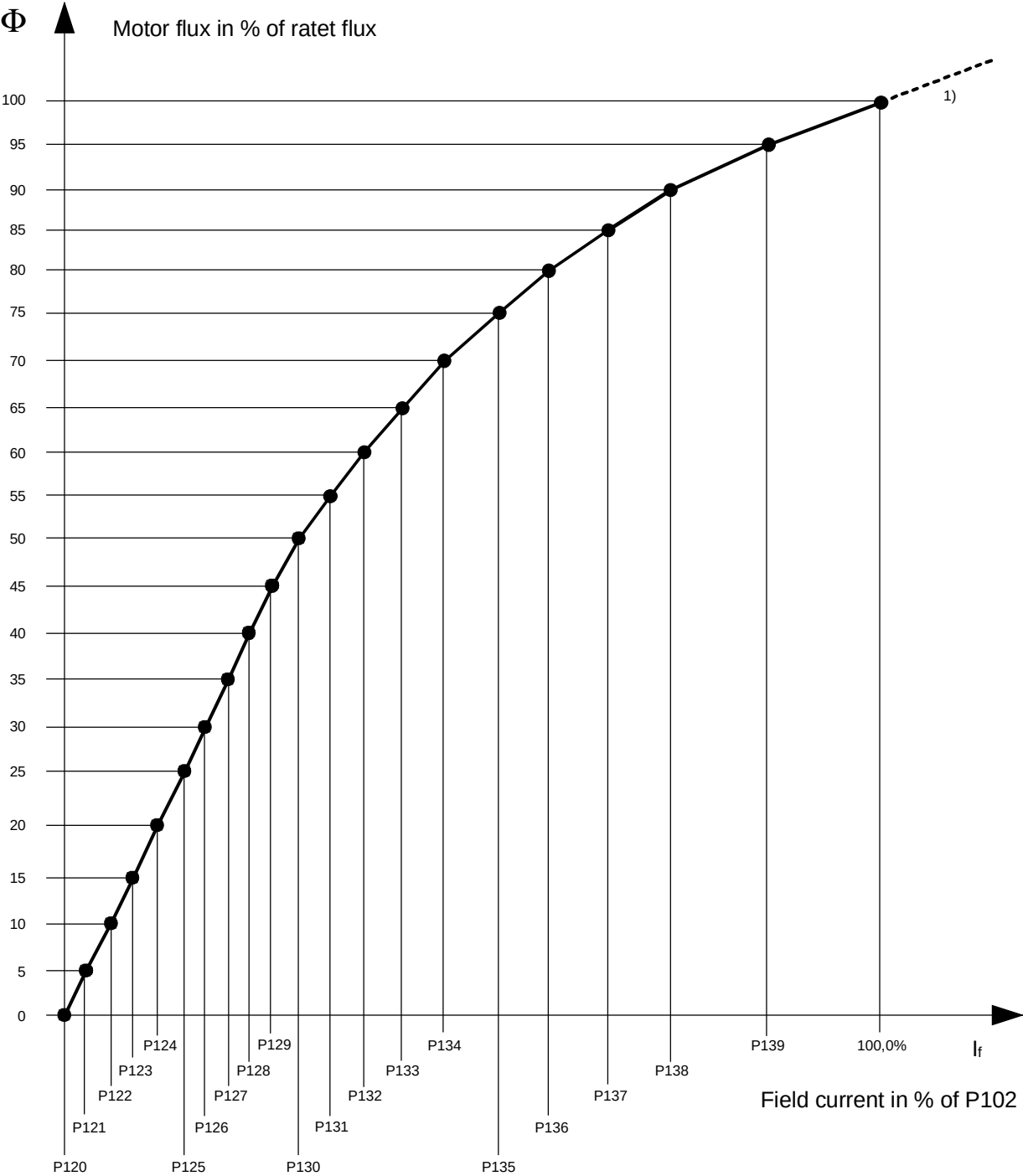
r120	Field current for 0% motor flux (field characteristic, point no. 0)	0.0	Ind: 4	P052 = 3
FDS		[% of P102] 0.1% of P102	Type: O2	
P121	Field current for 5% motor flux (field characteristic, point no. 1)	0.0 to 100.0	Ind: 4	P052 = 3
FDS		[%] 0.1% of P102	FS=3.7 Type: O2	P051 = 40 Offline
P122	Field current for 10% motor flux (field characteristic, point no. 2)	0.0 to 100.0	Ind: 4	P052 = 3
FDS		[% of P102] 0.1% of P102	FS=7.3 Type: O2	P051 = 40 Offline
P123	Field current for 15% motor flux (field characteristic, point no. 3)	0.0 to 100.0	Ind: 4	P052 = 3
FDS		[% of P102] 0.1% of P102	FS=11.0 Type: O2	P051 = 40 Offline
P124	Field current for 20% motor flux (field characteristic, point no. 4)	0.0 to 100.0	Ind: 4	P052 = 3
FDS		[% of P102] 0.1% of P102	FS=14.7 Type: O2	P051 = 40 Offline
P125	Field current for 25% motor flux (field characteristic, point no. 5)	0.0 to 100.0	Ind: 4	P052 = 3
FDS		[% of P102] 0.1% of P102	FS=18.4 Type: O2	P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P126 FDS	Field current for 30% motor flux (field characteristic, point no. 6)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=22.0 Type: O2	P052 = 3 P051 = 40 Offline
P127 FDS	Field current for 35% motor flux (field characteristic, point no. 7)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=25.7 Type: O2	P052 = 3 P051 = 40 Offline
P128 FDS	Field current for 40% motor flux (field characteristic, point no. 8)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=29.4 Type: O2	P052 = 3 P051 = 40 Offline
P129 FDS	Field current for 45% motor flux (field characteristic, point no. 9)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=33.1 Type: O2	P052 = 3 P051 = 40 Offline
P130 FDS	Field current for 50% motor flux (field characteristic, point no. 10)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=36.8 Type: O2	P052 = 3 P051 = 40 Offline
P131 FDS	Field current for 55% motor flux (field characteristic, point no. 11)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=40.6 Type: O2	P052 = 3 P051 = 40 Offline
P132 FDS	Field current for 60% motor flux (field characteristic, point no. 12)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=44.6 Type: O2	P052 = 3 P051 = 40 Offline
P133 FDS	Field current for 65% motor flux (field characteristic, point no. 13)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=48.9 Type: O2	P052 = 3 P051 = 40 Offline
P134 FDS	Field current for 70% motor flux (field characteristic, point no. 14)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=53.6 Type: O2	P052 = 3 P051 = 40 Offline
P135 FDS	Field current for 75% motor flux (field characteristic, point no. 15)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=58.9 Type: O2	P052 = 3 P051 = 40 Offline
P136 FDS	Field current for 80% motor flux (field characteristic, point no. 16)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=64.9 Type: O2	P052 = 3 P051 = 40 Offline
P137 FDS	Field current for 85% motor flux (field characteristic, point no. 17)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=71.8 Type: O2	P052 = 3 P051 = 40 Offline
P138 FDS	Field current for 90% motor flux (field characteristic, point no. 18)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=79.8 Type: O2	P052 = 3 P051 = 40 Offline
P139 FDS	Field current for 95% motor flux (field characteristic, point no. 19)	0.0 to 100.0 [% of P102] 0.1% of P102	Ind: 4 FS=89.1 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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Example of a field characteristic

The example characteristic exhibits a sharper curvature (i.e. a lower degree of saturation) than the field characteristic produced by the factory setting.



1) For actual field currents I_f of > 100% of P102, the characteristic is extended linearly for internal calculation of the motor flux.

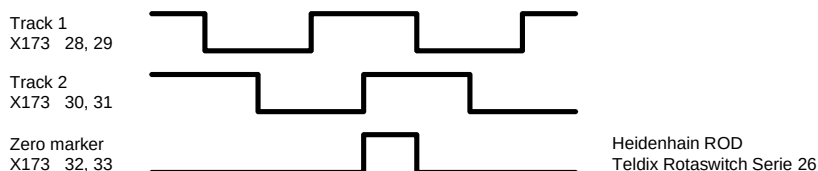
PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.8 Definition of pulse encoder, speed sensing using pulse encoder

The following types of pulse encoder can be used (type selection in P140):

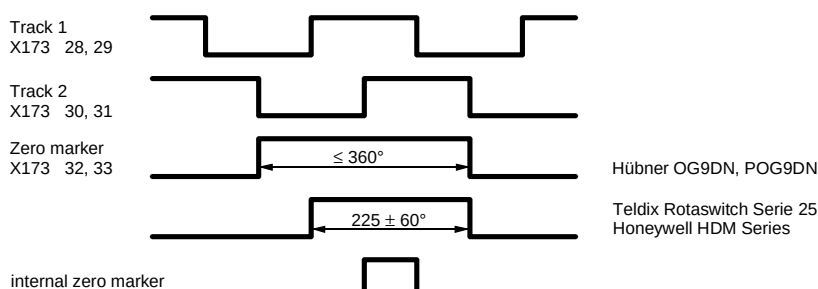
1. Pulse encoder type 1

Encoder with two pulse tracks mutually displaced by 90° (with/without zero marker)



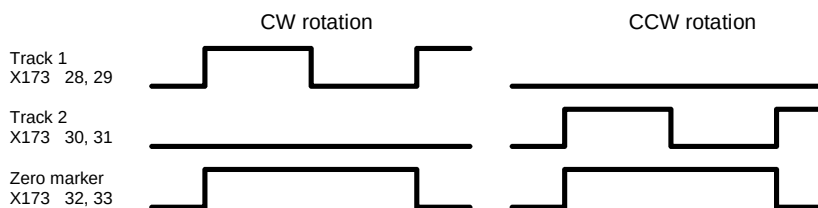
2. Pulse encoder type 1a

Encoder with two pulse tracks mutually displaced by 90° (with/without zero marker). The zero marker is converted internally to a signal in the same way as on encoder type 1.



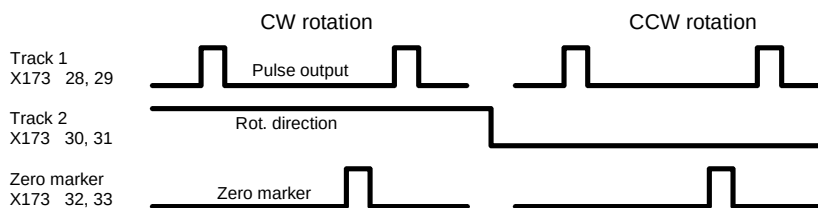
3. Pulse encoder type 2

Encoder with one pulse track per direction of rotation (with/without zero marker).



4. Pulse encoder type 3

Encoder with one pulse track and one output for direction of rotation (with/without zero marker).



PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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Notes on selecting a pulse encoder (number of pulses):

The lowest speed which can be measured by a pulse encoder is calculated with the following equation:

$$n_{min}[\text{rev} / \text{min}] = 21973 \cdot \frac{1}{X \cdot P141}$$

Formula applies with a nominal measuring time of 1 ms when P146=0 and P147=0

The following applies:

- X = 1 for 1x evaluation of pulse encoder signals (P144=0)
 2 for 2x evaluation of pulse encoder signals (P144=1)
 4 for 4x evaluation of pulse encoder signals (P144=2)
 see also "Single/multiple evaluation of encoder pulses"

Lower speeds are interpreted as n=0.

The frequency of the pulse encoder signals at terminals 28 and 29 or 30 and 31 must not be higher than 300 kHz.

The highest speed which can be measured by a pulse encoder is calculated with the following equation:

$$n_{max}[\text{rev} / \text{min}] = \frac{18000000}{P141}$$

When selecting a pulse encoder, therefore, it is important to ensure that the lowest possible speed $\neq 0$ is significantly higher than n_{min} and the highest possible speed does not exceed n_{max} .

$$IM > \frac{21973}{X \cdot n_{min}[\text{rev} / \text{min}]}$$

Equations for selection of pulses per revolution IM of pulse encoder

$$IM \leq \frac{18000000}{n_{max}[\text{rev} / \text{min}]}$$

Single/multiple evaluation of encoder pulses:

The setting for single/multiple evaluation of encoder pulses is applicable for both the speed and position sensing functions.

- 1x evaluation: Only the rising edges of one pulse track are evaluated (applies to all encoder types).
 2x evaluation: The rising and falling edges of one pulse track are evaluated (can be set for encoder types 1, 1a and 2).
 4x evaluation: The rising and falling edges of both pulse tracks are evaluated (can be set for encoder types 1 and 1a)

See parameters P450 and P451 for position sensing function

P140	Selection of pulse encoder type See beginning of this Section (11.8) for pulse encoder types 0 No encoder/"Speed sensing with pulse encoder" function not selected 1 Pulse encoder type 1 2 Pulse encoder type 1a 3 Pulse encoder type 2 4 Pulse encoder type 3	0 to 4 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P141	Number of pulses of pulse encoder	1 to 32767 [pulses/rev] 1 pulse/rev	Ind: None FS=500 Type: O2	P052 = 3 P051 = 40 Offline
P142	Matching to pulse encoder signal voltage 0 Pulse encoder outputs 5 V signals 1 Pulse encoder outputs 15V signals Matching of internal operating points to signal voltage of incoming pulse encoder signals. CAUTION Resetting parameter P142 to the alternative setting <u>does not</u> switch over the supply voltage for the pulse encoder (terminals X173.26 and 27). Terminal X173.26 always supplies +15V. An external voltage supply is must be provided for pulse encoders requiring a 5V supply.	0 to 1 1	Ind: None FS=1 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P143 FDS	Setting the maximum speed for pulse encoder operation The speed set in this parameter corresponds to an actual speed (K0040) of 100%.	1 to 6500.0 [rev/min] 0.1rev/min	Ind: 4 FS=500.0 Type: O4	P052 = 3 P051 = 40 Online

Control parameters for speed sensing with pulse encoder P144 to P147:

P144 and P147 determine the basic setting for actual speed sensing by means of pulse encoder (single or multiple evaluation of pulse encoder signals and nominal measuring time) and thus also define the lowest possible measurable speed (minimum speed).

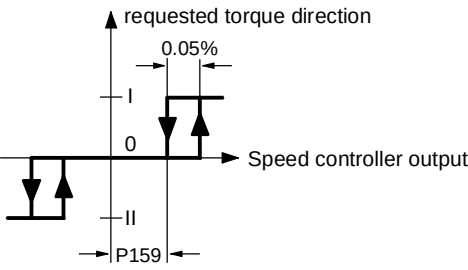
P145 and P146 can be used in special cases to extend the measurable speed range down to even lower speeds, on the basis of the minimum speed defined by the settings in P144 and P147.

P144 * FDS	Multiple evaluation of encoder signals 0 <u>1x</u> evaluation of pulse encoder signals 1 <u>2x</u> evaluation of pulse encoder signals (for encoder types 1, 1a, 2) 2 <u>4x</u> evaluation of pulse encoder signals (for encoder types 1, 1a) <u>Note:</u> In contrast to the 1x evaluation method, 2x or 4x evaluation reduces the minimum measurable speed by a factor of 2 or 4 respectively, but may produce an "unsteady" actual speed value on encoders with unequal pulse/pause ratio or without an exact 90° displacement between encoder signals.	0 to 2 1	Ind: 4 FS=2 Type: O2	P052 = 3 P051 = 40 Offline
P145 * FDS	Automatic measuring range switchover for measurement of low speeds - switchover of multiple evaluation 0 <u>Automatic switchover of multiple evaluation</u> of pulse encoder signals OFF (i.e. P144 is always active) 1 <u>Automatic switchover of multiple evaluation</u> of pulse encoder signals ON (i.e. when P144 = 0, 2x evaluation is selected for low speeds and 4x evaluation for very low speeds. When P144 = 1, 4x evaluation is selected for low speeds) As opposed to P145 = 0, this setting reduces the minimum measurable speed by up to a factor of 4. <u>Caution:</u> Switching over the multiple evaluation method for encoder pulses also affects the <u>position sensing function</u> in the measuring channel. For this reason, this setting may not be used in conjunction with positioning operations. Connectors K0042 to K0044 are inoperative when P145 = 1.	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P146 * FDS	Automatic measuring range switchover for measurement of low speeds - switchover of measuring time 0 Automatic switchover of measuring time OFF (i.e. P147 is always active) 1 Automatic switchover of measuring time ON This setting extends the measuring time for low speeds (based on the measuring time set in P147, i.e. when P147 = 0, the nominal measuring time is switched over to 2 ms for low speeds and to 4 ms for very low speeds. When P147 = 1, the nominal measuring time is switched over to 4 ms for low speeds) <u>Caution:</u> When P146=1, the minimum measurable speed can be reduced by up to a factor of 4 as opposed to a 0 setting. However, this setting results in a longer <u>actual speed sensing delay</u> in the extended minimum speed range.	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P147 * FDS	Nominal measuring time of pulse encoder signal evaluation 0 Nominal measuring time = 1 ms 1 Nominal measuring time = 2 ms (produces "steadier" actual speed value than with 0) 2 Nominal measuring time = 4 ms (for drives with high moment of inertia, produces "steadier" actual speed value than with 0) <u>Caution:</u> When P147 = 1 or 2, the minimum measurable speed can be reduced by a factor of 2 or 4 respectively as opposed to 0. However, these settings increase the <u>actual speed sensing delay</u> . For this reason, P200 should be parameterized to at least 5ms <u>before</u> the optimization run for the speed controller is executed.	0 to 2 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P148 *	Pulse encoder monitoring function	0 to 1	Ind: 4 FS=1	P052 = 3 P051 = 40
FDS	0 Pulse encoder monitoring OFF (activation of F048 in response to a defective pulse encoder is disabled) 1 Pulse encoder monitoring ON (hardware monitoring of pulse encoder signals for implausible behaviour (i.e. frequent speed changes, distance between edges too short, encoder cable defect or short between two encoder cables) may cause activation of F048)	1	Type: O2	Offline

11.9 Closed-loop armature current control, auto-reversing stage, armature gating unit

P150 *	Alpha G limit (armature)	0 to 165 [degrees]	Ind: 4 FS=5 / 30 (for 1Q / 4Q converters)	P052 = 3 P051 = 40
FDS	Rectifier stability limit for firing angle of armature converter.	1 degrees	Type: O2	Online
P151 *	Alpha W limit (armature)	120 to 165 [degrees]	Ind: 4 FS=150	P052 = 3 P051 = 40
FDS	Inverter stability limit for firing angle of armature converter. This firing angle limitation is active only when the armature current is continuous. In the case of a discontinuous armature current, the firing angle is limited to 165 degrees.	1 degrees	Type: O2	Online
P152 *	Line frequency correction (armature)	1 to 20	Ind: 4 FS=20	P052 = 3 P051 = 40
FDS	The internal line synchronization for the armature gating pulses derived from the power terminals (armature mains infeed) is averaged over the number of line periods set in this parameter. In operation on "weak" power supplies with unstable frequencies, for example, on a diesel-driven generator (isolated operation), this parameter must be set lower than for operation on "constant V/Hz" systems in order to achieve a higher frequency correction speed.		Type: O2	Online
P153 *	Control word for the armature precontrol	0 to 3	Ind: 4 FS=1	P052 = 3 P051 = 40
FDS	0 Armature precontrol disabled, output of the precontrol=165° 1 Armature precontrol active 2 Armature precontrol active but EMF influence only active on change in torque direction 3 Armature precontrol active but without EMF influence., i.e. for precontrol, the EMF is assumed to be 0. (recommended setting for supplying large inductance from armature terminals, e.g. solenoids, field supply)	1	Type: O2	off-line
P154 *	Set armature current controller I component to zero	0 to 1	Ind: 4 FS=1	P052 = 3 P051 = 40
FDS	0 Set controller I component to zero (i.e. to obtain pure P controller) 1 Controller I component is active	1	Type: O2	Offline
P155 *	Armature current controller P gain	0.01 to 200.00 0.01	Ind: 4 FS=0.10	P052 = 3 P051 = 40
FDS	Proportional gain of armature current controller This parameter is automatically set during the optimization run for precontrol and current controller (armature and field) (P051=25). See also parameters P175		Type: O2	Online
P156 *	Armature current controller reset time	0.001 to 10.000 [s]	Ind: 4 FS=0.200	P052 = 3 P051 = 40
FDS	This parameter is automatically set during the optimization run for precontrol and current controller (armature and field) (P051=25). See also parameters P176	0.001s	Type: O2	Online
P157 *	Control word for current setpoint integrator	0 to 1	Ind: 4 FS=0	P052 = 3 P051 = 40
FDS	0 Reduced gearbox stressing The integrator is active only after a change in torque direction (acts as ramp-function generator for armature current setpoint only until the output reaches the setpoint at the integrator input for the 1 st time after a change in torque direction). 1 Current setpoint integrator The integrator is always active (acts as ramp-function generator for the armature current setpoint)	1	Type: O2	Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P158 FDS	Ramp-up time for current setpoint integrator (reduced gearbox stressing) Period of an acceleration ramp with a setpoint step change from 0% to 100% at r072.002. P157=1, P158=0.040 must be set for older machines.	0.000 to 1.000 [s] 0.001s	Ind: 4 FS=0.000 Type: O2	P052 = 3 P051 = 40 Online
P159 FDS	Switchover threshold for auto-reversing stage (armature) 	0.00 to 100.00 [%] 0.01% of n controller output	Ind: 4 FS=0.01 Type: O2	P052 = 3 P051 = 40 Online
P160 FDS	Additional torque-free interval Additional torque-free interval for torque direction change in 4Q operation. It is particularly important to set this parameter to values of > 0 for converter armatures which supply large inductances (e.g. lifting solenoids).	0.000 to 2.000 [s] 0.001s	Ind: 4 FS=0.000 Type: O2	P052 = 3 P051 = 40 Online
P161 FDS	Additional Alpha W pulses Number of additional alpha-W pulses after detection of the I=0 indication before a change of torque direction. It is particularly important to set this parameter to values of > 0 for converter armatures which supply large inductances (e.g. lifting solenoids).	0 to 100 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P162 * FDS	EMF calculation method for armature precontrol 0 The EMF derived from the <u>measured</u> armature voltage is applied 1 The EMF derived from the <u>calculated</u> armature voltage is applied (the purpose of this setting is to prevent the occurrence of any low-frequency (< 15 Hz) armature current fluctuations)	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P163 * FDS	EMF filtering method for armature precontrol 0 No filtering 1 Filtering element, filter time constant = approx. 10 ms (for use by works engineers only) 2 Averaging over the last 2 EMF values (for use by works engineers only) 3 Averaging over the last 3 EMF values	0 to 3 1	Ind: 4 FS=3 Type: O2	P052 = 3 P051 = 40 Offline
P164 * FDS	Set armature current controller P component to zero 0 Set controller P component to zero (i.e. to obtain pure I controller) 1 Controller P component is active	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P165 * BDS	Select the binector to control the "Enable a torque direction for torque direction change" function 0 = Binector B0000 1 = Binector B0001 etc. Binector status = 0 ... Enable for M0 or MII 1 ... Enable for M0 or MI	All binector numbers 1	Ind: 2 FS=220 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.10 Current limitation, torque limitation

P169 *	Select closed-loop torque / current control See parameter P170	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P170 *	Select closed-loop torque / current control P169 P170 0 0 0 1 1 0 1 1	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P171 FDS	System current limit in torque direction I	0.0 to 300.0 [% of P100] 0.1% of P100	Ind: 4 FS=100.0 Type: O2	P052 = 3 P051 = 40 Online
P172 FDS	System current limit in torque direction II	-300.0 to 0.0 [% of P100] 0.1% of P100	Ind: 4 FS=-100.0 Type: I2	P052 = 3 P051 = 40 Online
P175 *	Source for variable P gain [SW 1.8 and later] The content of the selected connector acts as the P gain for the armature current controller after multiplication with P155.	All connector numbers 1	Ind: 4 FS=1 Type: L2	P052 = 3 P051 = 40 off-line
P176 *	Source for variable Integration time [SW 1.8 and later] The content of the selected connector acts as the integration time for the armature current controller after multiplication with P156.	All connector numbers 1	Ind: 4 FS=1 Type: L2	P052 = 3 P051 = 40 off-line
P177 *	Source for the command "no immediate pulse disable" [SW 1.8 and later] A low signal causes the armature firing pulses to be disabled immediately without waiting for the I=0 signal or without outputting alpha-W pulses for current reduction. The additional alpha-W pulses (acc. to parameter P161) are not output either. As long as this command is pending, it is not possible to fall below operating state o1.6. This command can be used, for example, if it is not a motor that is supplied by the SIMOREG CM but a field and the current is to be reduced via an external parallel-connected de-excitation resistance.	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 off-line
P178 *	Source for the command "fire all thyristors simultaneously" [SW 1.8 and later] Setting this command (high signal) causes all six thyristors of the thyristor bridge I to be fired continuously and simultaneously. Switchover to long pulses is automatic. This command is only active if no line voltage is applied to the armature power section.	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 off-line
P180 FDS	Positive torque limit 1	-300.00 to 300.00 [%] 0.01% of rated motor torque	Ind: 4 FS=300.00 Type: I2	P052 = 3 P051 = 40 Online
P181 FDS	Negative torque limit 1	-300.00 to 300.00 [%] 0.01% of rated motor torque	Ind: 4 FS=-300.00 Type: I2	P052 = 3 P051 = 40 Online
P182 FDS	Positive torque limit 2 If "Torque limit switchover" is selected (state of binector selected in P694 =1) and the speed is higher than the threshold speed set in parameter P184, then torque limit 2 is activated in place of torque limit 1.	-300.00 to 300.00 [%] 0.01% of rated motor torque	Ind: 4 FS=300.00 Type: I2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P183 FDS	Negative torque limit 2 If "Torque limit switchover" is selected (state of binector selected in P694 =1) and the speed is higher than the threshold speed set in parameter P184, then torque limit 2 is activated in place of torque limit 1.	-300.00 to 300.00 [%] 0.01% of rated motor torque	Ind: 4 FS=-300.00 Type: I2	P052 = 3 P051 = 40 Online
P184 FDS	Threshold speed for torque limits If "Torque limit switchover" is selected (state of binector selected in P694 =1) and the speed (K0166) is higher than the threshold speed set in parameter P184, then torque limit 2 (P182, P183) is activated in place of torque limit 1 (P180, P181).	0.00 to 120.00 [%] 0.01% of maximum speed	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online

11.11 Speed controller

(further parameters for the speed controller P550 - P563)

Setting values for speed controller - actual value/setpoint processing				
P200 FDS	Filter time for actual speed controller value Filtering of the actual speed value by means of a PT1 element. This filter setting is taken into account by the speed controller optimization run (P051=26).	0 to 10000 [ms] 1ms	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P201 FDS	Band-stop 1: Resonant frequency	1 to 140 [Hz] 1Hz	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Online
P202 FDS	Band-stop 1: Quality 0 Quality = 0.5 1 Quality = 1 2 Quality = 2 3 Quality = 3	0 to 3 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P203 FDS	Band-stop 2: Resonant frequency	1 to 140 [Hz] 1Hz	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Online
P204 FDS	Band-stop 2: Quality 0 Quality = 0.5 1 Quality = 1 2 Quality = 2 3 Quality = 3	0 to 3 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P205 FDS	D element: Derivative-action time	0 to 1000 [ms] 1ms	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P206 FDS	D element: Filter time	0 to 100 [ms] 1ms	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online

r217	Indication of the active droop of the speed controller	0.0 to 10.0 [%] 0.1%	Ind: None Type: O2	P052 = 3
r218	Indication of the active integration time of the speed controller	0.010 to 10.000 [s] 0.001s	Ind: None Type: O2	P052 = 3
r219	Display of effective P gain of speed controller	0.01 to 200.00 0.01	Ind: None Type: O2	P052 = 3

P222 FDS	Speed controller: PI / P controller switchover threshold 0.00 Automatic switchover from PI to P controller deactivated. > 0.00 Depending on the actual speed (K0166), the PI controller switches over to a P controller if the speed drops below the threshold set in parameter P222. The integrator is not switched in again (with value of 0) until the actual speed is > P222 + 2% n_{max} . This function allows the drive to be stopped without overshoot using a zero setpoint with the controllers enabled. This function is active only if the binector selected in P698 is in the log. "1" state.	0.00 to 10.00 [%] 0.01% of maximum speed	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Setting values for speed controller				
P223 *	Control word for speed controller precontrol	0 to 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
FDS	0 Speed controller precontrol disabled 1 Speed controller precontrol acts as torque setpoint (is added to n controller output)	1		
P224 *	Control word for speed controller I component	0 to 3	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
FDS	0 Set controller I component to 0 (i.e. to achieve a pure P controller) 1 Controller I component is active The I component is stopped when a torque or current limit is reached 2 Controller I component is active The I component is stopped when a torque limit is reached 3 Controller I component is active The I component is stopped only when $\pm 199.99\%$ is reached	1		
P225	Speed controller P gain	0.10 to 200.00	Ind: 4 FS=3.00 Type: O2	P052 = 3 P051 = 40 Online
FDS	See also setting values for "Speed controller adaptation" function (P550 to P559). This parameter is set automatically during the speed controller optimization run (P051=26).	0.01		
P226	Speed controller reset time	0.010 to 10.000	Ind: 4 FS=0,650 Type: O2	P052 = 3 P051 = 40 Online
FDS	This parameter is set automatically during the speed controller optimization run (P051=26).	[s] 0.001s		

Speed controller droop

Function: A parameterizable feedback loop can be connected in parallel to the I and P components of the speed controller (acts on summation point of setpoint and actual value).

P227	Speed controller droop	0.0 to 10.0	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
FDS	A 10% speed droop setting causes a 10% deviation in the speed from the setpoint at a 100% controller output (100% torque or armature current setpoint) ("softening" of closed-loop control). See also P562, P563, P630 and P684	[%] 0.1%		

P228	Filter time for speed setpoint	0 to 10000	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
FDS	Filtering of setpoint by means of a PT1 element. This parameter is automatically set to the same value as the speed controller reset time during the speed controller optimization run (P051=26). It may be useful to parameterize lower values when the ramp-function generator is in use.	[ms] 1ms		
P229 *	Control of I component tracking for slave drive	0 to 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
FDS	0 On a slave drive, the I component of the speed controller is made to follow such that $M(\text{set}, n\text{contr.}) = M(\text{set}, \text{limit})$, the speed setpoint is set to the actual speed value 1 Tracking deactivated	1		
P234 *	Set speed controller P component to zero	0 to 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
FDS	0 Set controller P component to zero (i.e. to obtain a pure I controller) 1 Controller P component is active	1		

11.12 Closed-loop field current control, field gating unit

P250	Alpha G limit (field)	0 to 180	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
FDS	Rectifier stability limit for firing angle of field converter	[degrees] 1 degree		
P251	Alpha W limit (field)	0 to 180	Ind: 4 FS=180 Type: O2	P052 = 3 P051 = 40 Online
FDS	Inverter stability limit for firing angle of field converter	[degrees] 1 degree		

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P252 * FDS	Filtering of line frequency correction (field) The internal line synchronization for the field gating pulses derived from the field mains infeed terminals is filtered with this time constant. In operation on "weak" power supplies with unstable frequencies, for example, on a diesel-driven generator (isolated operation), the filter time constant must be set lower than for operation on "constant V/Hz" systems in order to achieve a higher frequency correction speed. Using the units position, the line synchronization function can be altered <u>additionally</u> as follows: When the parameter is set to an <u>uneven</u> number, the measured line zero crossings for line synchronization are subjected to an extra "filter", may improve performance in the case of difficulties with brief mains interruptions (e.g. power supply via sliding current collectors), but may only be set for constant V/Hz power supplies (not for weak isolated supply systems).	0 to 200 [ms] 1ms	Ind: 4 FS=200 Type: O2	P052 = 3 P051 = 40 Offline
P253 * FDS	Control word for field precontrol 0 Field precontrol disabled, precontrol output = 180° 1 Field precontrol active, output is dependent on field current setpoint, field line voltage, P112	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P254 * FDS	Set field current controller I component to zero 0 Set controller I component to zero (i.e. to obtain pure P controller) 1 Controller I component is active	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P255 FDS	Field current controller P gain This parameter is set automatically during the optimization run for precontrol and current controller (armature and field) (P051=25).	0.01 to 100.00 0.01	Ind: 4 FS=5.00 Type: O2	P052 = 3 P051 = 40 Online
P256 FDS	Field current controller reset time This parameter is set automatically during the optimization run for precontrol and current controller (armature and field) (P051=25).	0.001 to 10.000 [s] 0.001s	Ind: 4 FS=0,200 Type: O2	P052 = 3 P051 = 40 Online
P257 FDS	Standstill field Value to which the field current is reduced when "Automatic field current reduction" function is parameterized (by means of P082=xx2) or with signal-driven selection of "Standstill excitation" function (selected in P692).	0.0 to 100.0 [%] 0.1% of P102	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P258 FDS	Delay time with automatic field current reduction Delay after which the field current is reduced to the value set in parameter P257 with automatic or signal-driven "Field current reduction" function when the drive is stopped after operating state o7.0 or higher is reached.	0.0 to 60.0 [s] 0.1s	Ind: 4 FS=10.0 Type: O2	P052 = 3 P051 = 40 Online
P263 * FDS	Input quantity for motor flux calculation 0 The input quantity for the motor flux calculation is the <u>field current controller actual value according to P612</u> (K0265), to be used in connection with a fully compensated DC machine 1 The input quantity for the motor flux calculation is the <u>precontrol output for the EMF controller</u> (K0293) (exception: Field current controller setpoint (K0268) with active standstill field or with disabled field pulses), to be used in connection with an non-compensated DC machine. The EMF controller <u>must</u> be active when this setting is selected (EMF controller compensates the armature reaction). 2 The input quantity for the motor flux calculation is the field current controller setpoint (K0268). Advantage: Quantities derived from the setpoint are generally "steadier" than those derived from actual values.	0 to 2 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P264 * FDS	Set field current controller P component to zero 0 Set controller P component to zero (i.e. to obtain pure I controller) 1 Controller P component is active	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.13 Closed-loop EMF control

P272 *	Operating mode of closed-loop EMF control 0 <u>Fault message F043 ("EMF too high for braking operation")</u> is active: If the EMF is too high when a <u>torque direction change is requested</u> (i.e. if the calculated firing angle (K0101) for the armature current in the new torque direction is > 165 degrees), both torque directions are disabled. If, at the same time, the absolute value of the armature current required in the new torque direction is > 0.5% of rated converter DC current (P072), fault message F043 is activated (see Section 10 for possible fault causes). 1 <u>Alarm A043 and automatic field reduction if EMF is too high in braking operation.</u> If the EMF is too high <u>in braking operation</u> (i.e. if the following applies to the armature firing angle α before limitation (K0101): $\alpha > (\alpha_W - 5 \text{ degrees})$), alarm A043 is activated (α_W is the inverter stability limit according to P151 or 165 degrees with a discontinuous armature current). The field is reduced with activation of A043. This field reduction is achieved by regulating the armature firing angle to $(\alpha_W - 5 \text{ degrees})$ by means of a P controller, whose output reduces the EMF controller setpoint. "Field weakening operation by internal closed-loop EMF control" (P081=1) must therefore be parameterized so that the field reduction can take effect. When a <u>torque direction change is requested</u> , both torque directions remain disabled until the field, and thus the EMF, have been reduced accordingly (i.e. until the calculated firing angle (K0101) for the armature current required in the new torque direction is <165 degrees).	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P273 * FDS	Control word for EMF controller precontrol 0 EMF controller precontrol disabled, precontrol output = rated motor field current (P102) 1 EMF controller precontrol is active	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P274 * FDS	Set EMF controller I component to zero 0 Set controller I component to zero (i.e. to obtain pure P controller) 1 Controller I component is active	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P275 FDS	EMF controller P gain This parameter is automatically set during the field weakening optimization run (P051=27).	0.10 to 100.00 0.01	Ind: 4 FS=0.60 Type: O2	P052 = 3 P051 = 40 Online
P276 FDS	EMF controller reset time This parameter is automatically set during the field weakening optimization run (P051=27).	0.010 to 10.000 [s] 0.001s	Ind: 4 FS=0.200 Type: O2	P052 = 3 P051 = 40 Online
P277 FDS	EMF controller droop	0.0 to 10.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P284 * FDS	Set EMF controller P component to zero 0 Set controller P component to zero (i.e. to obtain pure I controller) 1 Controller P component is active	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.14 Ramp-function generator

(see also Section 8, Sheet G136 and Section 9)

See P639 and P640 for ramp-function generator setting parameters

Limitation at ramp-function generator output (setpoint limiting)

The effective limitations are:

Upper limit: Minimum value of P300 and the four connectors selected with P632

Lower limit: Maximum value of P301 and the four connectors selected with P633

Note: The limiting values for both the positive and negative setpoint limits can have a positive or negative sign. The negative setpoint limit, for example, can therefore be parameterized to a positive value and the positive setpoint limit to a negative value.

P300	Positive limitation at ramp-function generator output	-200.00 to 199.99 [%] 0.01%	Ind: 4 FS=100.00 Type: I2	P052 = 3 P051 = 40 Online
P301	Negative limitation at ramp-function generator output	-200.00 to 199.99 [%] 0.01%	Ind: 4 FS=-100.00 Type: I2	P052 = 3 P051 = 40 Online
P302 *	Select ramp-function generator / ramp-up integrator mode	0 to 3 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
FDS	0 Normal <u>ramp-function generator</u> operation Ramp-function generator setting 1 (P303 to P306) is applied. When a binary selectable input parameterized as "Ramp-function generator setting 2" (P307 to P310)" (selected in P637) or "Ramp-function generator setting 3" (P311 to P314)" (selected in P638), generator setting 2 or 3 is applied as appropriate.			
	1 <u>Ramp-up integrator</u> operation: When the setpoint is reached for the first time, ramp-function generator setting 1 is switched over to a ramp-up/down times = 0			
	2 <u>Ramp-up integrator</u> operation: When the setpoint is reached for the first time, ramp-function generator setting 1 is switched over to generator setting 2 (P307 to P310)			
	3 <u>Ramp-up integrator</u> operation: When the setpoint is reached for the first time, ramp-function generator setting 1 is switched over to generator setting 3 (P311 to P314)			

Ramp-function generator parameter set 1

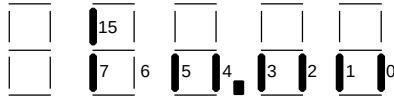
P303	Ramp-up time 1	0.00 to 650.00 [s] 0.01s	Ind: 4 FS=10.00 Type: O2	P052 = 3 P051 = 40 Online
FDS				
P304	Ramp-down time 1	0.00 to 650.00 [s] 0.01s	Ind: 4 FS=10.00 Type: O2	P052 = 3 P051 = 40 Online
FDS				
P305	Lower transition rounding 1	0.00 to 100.00 [s] 0.01s	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
FDS				
P306	Upper transition rounding 1	0.00 to 100.00 [s] 0.01s	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
FDS				

Ramp-function generator parameter set 2

Ramp-function generator parameter set 2 is selected via the binector parameterized in P637.

P307	Ramp-up time 2	0.00 to 650.00 [s] 0.01s	Ind: 4 FS=10.00 Type: O2	P052 = 3 P051 = 40 Online
FDS				
P308	Ramp-down time 2	0.00 to 650.00 [s] 0.01s	Ind: 4 FS=10.00 Type: O2	P052 = 3 P051 = 40 Online
FDS				
P309	Lower transition rounding 2	0.00 to 100.00 [s] 0.01s	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
FDS				
P310	Upper transition rounding 2	0.00 to 100.00 [s] 0.01s	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
FDS				

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Ramp-function generator parameter set 3				
Ramp-function generator parameter set 3 is selected via the binector parameterized in P638.				
P311 FDS	Ramp-up time 3	0.00 to 650.00 [s] 0.01s	Ind: 4 FS=10.00 Type: O2	P052 = 3 P051 = 40 Online
P312 FDS	Ramp-down time 3	0.00 to 650.00 [s] 0.01s	Ind: 4 FS=10.00 Type: O2	P052 = 3 P051 = 40 Online
P313 FDS	Lower transition rounding 3	0.00 to 100.00 [s] 0.01s	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
P314 FDS	Upper transition rounding 3	0.00 to 100.00 [s] 0.01s	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online

Displays				
r315	Display of effective times i001: Display of effective ramp-up time i002: Display of effective ramp-down time i003: Display of effective lower transition rounding i004: Display of effective upper transition rounding	0.00 to 650.00 / 10.00 [s] 0.01s	Ind: 4 Type: O2	P052 = 3
r316	Display of ramp-function generator status Mode of representation on operator panel (PMU):  Segment: 0 RFG enable 1 RFG start 2 Setpoint enable & /OFF1 3 Set RFG 4 RFG tracking 5 Bypass RFG 7 Ramp-down 15 Ramp-up		Ind: None Type: V2	P052 = 3

P317 *	Ramp-function generator tracking 0 Ramp-function generator tracking is not active 1 Ramp-function generator tracking is active	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P318 *	Set ramp-function generator output This parameter determines how the ramp-function generator output is set at the commencement of a "Shutdown" process: 0 The ramp-function generator output is <u>not set</u> at the commencement of a "Shutdown" process" 1 At the commencement of "Shutdown", the output is set to the <u>actual speed value K0167</u> (actual speed value K0167 is "unfiltered") 2 At the commencement of "Shutdown", the output is set to the <u>actual speed value K0179</u> (value is filtered by PT1 in P200, other filters may also be active) (setting may not be used in conjunction with P205 > 0) During a "Shutdown" process, the limitation at the ramp-function generator output is not effective. P318 must be set to 1 or 2 to prevent any (temporary) excess speed during "Shutdown" when the generator output is limited.	0 to 2 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P319 FDS	Delay time for enabling ramp-function generator	0,00 to 10,00 [s] 0,01s	Ind: 4 FS=0,05 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.15 Setpoint processing

P320 FDS	Multiplier for main setpoint	-300.00 to 300.00 [%] 0.01%	Ind: 4 FS=100.00 Type: I2	P052 = 3 P051 = 40 Online
P321 FDS	Multiplier for additional setpoint	-300.00 to 300.00 [%] 0.01%	Ind: 4 FS=100.00 Type: I2	P052 = 3 P051 = 40 Online
P322 * FDS	Source for multiplier for main setpoint 0 = Connector K0000 1 = Connector K0001 etc.	All connector numbers 1	Ind: 4 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P323 * FDS	Source for multiplier for additional setpoint 0 = Connector K0000 1 = Connector K0001 etc.	All connector numbers 1	Ind: 4 FS=1 Type: L2	P052 = 3 P051 = 40 Offline

11.16 Setting values for monitoring functions and limits

Setting values for monitoring functions				
P351 FDS	Threshold for undervoltage trip If the line voltage drops below a specific value (P078) and does not return to the permissible tolerance range within the "Restart time" set in P086, fault message F006 is activated. The drive dwells in operating state o4 or o5 while the line undervoltage persists.	-90 to 0 [%] Armature: 1% of P078.001 Field: 1% of P078.002	Ind: 4 FS=-20 Type: I2	P052 = 3 P051 = 40 Online
P352 FDS	Source for overvoltage trip If the line voltage exceeds a specific value (P078) and does not return to the permissible tolerance range within the "Restart time" set in P086, fault message F007 is activated.	0 to 99 [%] Armature: 1% of P078.001 Field: 1% of P078.002	Ind: 4 FS=20 Type: O2	P052 = 3 P051 = 40 Online
P353 FDS	Response threshold for phase failure monitoring If the line voltage drops below the permissible value in operating states of $\leq o4$ and does not return to an "acceptable" value within the "Restart time" set in P086, fault message F004 or F005 is activated. The drive dwells in operating state o4 or o5 for the period that the line voltage remains below the threshold and during the subsequent voltage stabilization period set in P090. <u>When a switch-on command is entered</u> , the converter dwells in operating states o4 and o5 for a maximum total delay period for both states set in P089 until the voltages in all phases exceed the threshold set in this parameter before fault message F004 or F005 is activated.	10 to 100 [%] Armature: 1% of P078.001 Field: 1% of P078.002	Ind: 4 FS=40 Type: O2	P052 = 3 P051 = 40 Online
P355 FDS	Stall protection time F035 is activated if the conditions for the "Stall protection" fault message are fulfilled for longer than the period set in P355. When P355=0.0, the "Drive blocked" monitoring function (F035) is deactivated and alarm A035 is likewise suppressed.	0.0 to 600.0 [s] 0.1s	Ind: 4 FS=0,5 Type: O2	P052 = 3 P051 = 40 Online
P357 FDS	Threshold for tachometer interruption monitoring F042 is suppressed if the actual EMF value is lower than the value set in P357. The setting is entered as a % of the ideal mean DC voltage value at $\alpha=0$, i.e. as a % of P078.001 * 1.35	10 to 70 [%] 1%	Ind: 4 FS=10 Type: O2	P052 = 3 P051 = 40 Online
P360	Response delay for external faults and alarms The fault message or alarm is not activated on the converter until the appropriate input or corresponding control word bit (as selected in P675, P686, P688 or P689) has been in the LOW state for at least the time period set in this parameter (see also Section 8, Sheets G180 and G181). i001: Delay for external fault 1 i002: Delay for external fault 2 i003: Delay for external alarm 1 i004: Delay for external alarm 2	0 to 10000 [ms] 1ms	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P361 FDS	Delay time for the undervoltage monitoring Activation of the fault message F006 (line undervoltage) is delayed by the time that can be set in this parameter. During this delay time firing pulses are output! Another time which is parameterized for automatic restarting (P086) only begins after the time set here has elapsed.	0 to 60000 [ms] 1ms	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 on-line
P362 FDS	Delay time for the overvoltage monitoring Activation of the fault message F007 (line overvoltage) is delayed by the time that can be set in this parameter. During this delay time firing pulses are output! Another time which is parameterized for automatic restarting (P086) only begins after the time set here has elapsed.	0 to 60000 [ms] 1ms	Ind: 4 FS=10000 Type: O2	P052 = 3 P051 = 40 on-line
P363 FDS	Threshold for the minimum line frequency [SW 1.8 and later] If the line frequency falls below the value set here and does not rise above it again within the "restart" time set in P086, the fault message F008 is activated. As long as the line frequency is below the value set here, the drive is kept in operating state o4 or o5.	45.0 to 60.0 [Hz] 0.1 Hz	Ind: 4 FS=45.0 Type: O2	P052 = 3 P051 = 40 on-line
P364 FDS	Threshold for the maximum line frequency [SW 1.8 and later] If the line frequency rises above the value set here and does not fall below it again within the "restart" time set in P086, the fault message F009 is activated. As long as the line frequency is above the value set here, the drive is kept in operating state o4 or o5.	50.0 to 110.0 [Hz] 0.1 Hz	Ind: 4 FS=65.0 Type: O2	P052 = 3 P051 = 40 on-line

11.17 Setting values for limit-value monitors

(see also Section 8, Sheet G187 und G188)

n < n_{min} signal				
P370 FDS	Speed threshold n_{min} Speed threshold for n < n _{min} limit-value monitor. Note: This threshold also affects the sequence of control operations for "Shutdown", "Fast stop", cancellation of the "Inching" or "Crawling" command, the "Braking with field reversal" function and the brake control operation (see Section 9).	0.00 to 199.99 [%] 0.01% of maximum speed	Ind: 4 FS=0,50 Type: O2	P052 = 3 P051 = 40 Online
P371 FDS	Hysteresis for n < n_{min} signal This value is added to the response threshold if n < n _{min} is active.	0.00 to 199.99 [%] 0.01% of maximum speed	Ind: 4 FS=0,50 Type: O2	P052 = 3 P051 = 40 Online

n < n_{comp.} signal				
P373 FDS	Speed threshold n_{comp.} Speed threshold for n < n _{comp.} signal	0.00 to 199.99 [%] 0.01% of maximum speed	Ind: 4 FS=100.00 Type: O2	P052 = 3 P051 = 40 Online
P374 FDS	Hysteresis for < n_{comp.} signal (n < n_{comp.} signal) This value is added to the response threshold if n < n _{comp.} is active.	0.00 to 199.99 [%] 0.01% of maximum speed	Ind: 4 FS=3.00 Type: O2	P052 = 3 P051 = 40 Online
P375 FDS	OFF delay for n < n_{comp.} signal	0.0 to 100.0 [s] 0.1s	Ind: 4 FS=3.0 Type: O2	P052 = 3 P051 = 40 Online

Overspeed				
P380 FDS	Maximum speed in positive direction of rotation	0.0 to 199.9 [%] 0.1% of rated speed	Ind: 4 FS=120.0 Type: O2	P052 = 3 P051 = 40 Online
P381 FDS	Maximum speed in negative direction of rotation	-199.9 to 0.0 [%] 0.1% of rated speed	Ind: 4 FS=-120.0 Type: I2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Setpoint/actual value deviation				
P388 FDS	Permissible deviation between setpoint and actual value	0.00 to 199.99 [%] 0.01% of maximum speed	Ind: 4 FS=3.00 Type: O2	P052 = 3 P051 = 40 Online
P389 FDS	Hysteresis for setpoint/actual value deviation signal This value is added to the response threshold if a setpoint/actual value deviation signal is active	0.00 to 199.99 [%] 0.01% of maximum speed	Ind: 4 FS=1.00 Type: O2	P052 = 3 P051 = 40 Online
P390 FDS	Response delay for setpoint/actual value deviation signal	0.0 to 100.0 [s] 0.1s	Ind: 4 FS=3.0 Type: O2	P052 = 3 P051 = 40 Online

$I_f < I_{f \min}$ signal				
P394 FDS	Field current threshold $I_{f \min}$ Field current threshold for $I_f < I_{f \min}$ limit-value monitor. Note: This threshold affects the sequence of control operations for the "Direction of rotation reversal using field reversal" and "Braking with field reversal" functions (see Section 9). The $I_f < I_{f \min}$ signal is connected to binector B0215, the actual value at field current controller input K0265 is applied as I_f . B0215 = 0 when K0265 > threshold set in P394 B0215 = 1 when K0265 < threshold set in P394 + hysteresis set in P395 0 → 1 transition takes place when K0265 < P394 1 → 0 transition takes place when K0265 > P394 + P395	0.00 to 199.99 [%] 0.01% of converter rated field DC current (r073.i02)	Ind: 4 FS=3.00 Type: O2	P052 = 3 P051 = 40 Online
P395 FDS	Hysteresis for $I_f < I_{f \min}$ signal This value is added to the response threshold if $I_f < I_{f \min}$ is active. (see also P394)	0.00 to 100.00 [%] 0.01% of converter rated field DC current (r073.i02)	Ind: 4 FS=1.00 Type: O2	P052 = 3 P051 = 40 Online

$I_f < I_{f x}$ signal				
P398 FDS	Field current threshold $I_{f x}$ Setpoint-oriented field current threshold for $I_f < I_{f x}$ limit-value monitor. Note: This threshold affects the sequence of control operations for the "Direction of rotation reversal using field reversal" and "Braking with field reversal" functions (see Section 9). The $I_f < I_{f x}$ signal is connected to binector B0216, the actual value at field current controller input K0265 is applied as I_f . B0216 = 0 when K0265 > threshold set in P398 B0216 = 1 when K0265 < threshold set in P398 + hysteresis set in P399 0 → 1 transition takes place when K0265 < P398 1 → 0 transition takes place when K0265 > P398 + P399	0.00 to 199.99 [%] 0.01% of setpoint at field current controller input (K0268)	Ind: 4 FS=80.00 Type: O2	P052 = 3 P051 = 40 Online
P399 FDS	Hysteresis for $I_f < I_{f x}$ signal This value is added to the response threshold if $I_f < I_{f x}$ is active. (see also P398)	0.00 to 100.00 [%] 0.01% of converter rated field DC current (r073.i02)	Ind: 4 FS=1.00 Type: O2	P052 = 3 P051 = 40 Online

11.18 Settable fixed values

Function: The value set in the parameter is applied to the specified connector				
P401 FDS	K401 fixed value is applied to connector K0401	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P402 FDS	K402 fixed value is applied to connector K0402	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P403 FDS	K403 fixed value is applied to connector K0403	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P404 FDS	K404 fixed value is applied to connector K0404	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P405 FDS	K405 fixed value is applied to connector K0405	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P406 FDS	K406 fixed value is applied to connector K0406	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P407 FDS	K407 fixed value is applied to connector K0407	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P408 FDS	K408 fixed value is applied to connector K0408	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P409 FDS	K409 fixed value is applied to connector K0409	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P410 FDS	K410 fixed value is applied to connector K0410	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P411 FDS	K411 fixed value is applied to connector K0411	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P412 FDS	K412 fixed value is applied to connector K0412	-32768 to 32767 1	Ind: 4 FS=0 Type: I2	P052 = 3 P051 = 40 Online
P413 FDS	K413 fixed value is applied to connector K0413	-32768 to 32767 1	Ind: 4 FS=0 Type: I2	P052 = 3 P051 = 40 Online
P414 FDS	K414 fixed value is applied to connector K0414	-32768 to 32767 1	Ind: 4 FS=0 Type: I2	P052 = 3 P051 = 40 Online
P415 FDS	K415 fixed value is applied to connector K0415	-32768 to 32767 1	Ind: 4 FS=0 Type: I2	P052 = 3 P051 = 40 Online
P416 FDS	K416 fixed value is applied to connector K0416	-32768 to 32767 1	Ind: 4 FS=0 Type: I2	P052 = 3 P051 = 40 Online

11.19 Fixed control bits

Function: The value set in the parameter is applied to the specified binector				
P421 FDS	B421 fixed bit is applied to binector B0421	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P422 FDS	B422 fixed bit is applied to binector B0422	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P423 FDS	B423 fixed bit is applied to binector B0423	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P424 FDS	B424 fixed bit is applied to binector B0424	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P425 FDS	B425 fixed bit is applied to binector B0425	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P426 FDS	B426 fixed bit is applied to binector B0426	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P427 FDS	B427 fixed bit is applied to binector B0427	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P428 FDS	B428 fixed bit is applied to binector B0428	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.20 Digital setpoint input (fixed setpoint, inching and crawling setpoints)

(see also Section 8, Sheets G127, G129 and G130)

Fixed setpoint

Function: Up to 8 connectors can be selected in P431 indices .01 to .08. These can be applied as an additional fixed setpoint (K0204, K0209) via the binectors selected in P430, indices .01 to .08 (setpoint is applied when binector switches to log. "1" state). P432 indices .01 to .08 can be set to define for each setpoint individually whether the ramp-function generator must be bypassed on setpoint injection.

If fixed setpoint injection is not selected, the connector set in P433 is applied to K0209.

P430 *	Source for fixed-setpoint injection Selection of binector to control injection of the fixed setpoint ("1" state = fixed setpoint injected). 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P431 *	Source for fixed setpoint Selection of connector to be injected as the fixed setpoint 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P432 *	Source for selection of ramp-function generator bypass Selection as to whether or not ramp-function generator must be bypassed when the fixed setpoint is injected. The ramp-function generator is bypassed if the AND operation between the binector selected via an index of P430 and the setting in the same index of P432 produces a log. "1"	0 to 1 1	Ind: 8 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P433 * FDS	Source for standard setpoint Selection of the connector to be applied if fixed-setpoint injection is not selected 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=11 Type: L2	P052 = 3 P051 = 40 Offline

Inching setpoint

Function: Up to 8 connectors can be selected in P436 indices .01 to .08. These can be applied as an inching setpoint (K0202, K0207) via the binectors selected in P435, indices .01 to .08 (setpoint is applied when binector switches to log. "1" state). P437 indices .01 to .08 can be set to define for each setpoint individually whether the ramp-function generator must be bypassed on setpoint injection. If more than one inching setpoint is injected, an output value corresponding to inching setpoint = 0% is applied.

If inching setpoint injection is not selected, the connector set in P438 is applied to K0207.

P435 *	Source for injection of inching setpoint Selection of binector to control injection of the inching setpoint ("1" state = inching setpoint injected). 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P436 *	Source for inching setpoint Selection of connector to be injected as the inching setpoint 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P437 *	Source for selection of ramp-function generator bypass Selection as to whether or not ramp-function generator must be bypassed when the inching setpoint is injected. The ramp-function generator is bypassed if the AND operation between the binector selected via an index of P435 and the setting in the same index of P437 produces a log. "1".	0 to 1 1	Ind: 8 FS=0 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P438 * FDS	Source for standard setpoint Selection of the connector to be applied if inching-setpoint injection is not selected 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=208 Type: L2	P052 = 3 P051 = 40 Offline

Crawling setpoint Function: Up to 8 connectors can be selected in P441 indices .01 to .08. These can be applied as an additional crawling setpoint (K0201, K0206) via the binectors selected in P440, indices .01 to .08. P445 can be set to define whether the setpoint must be applied when the selected binectors have reached the log. "1" state (when P445=0) or in response to a 0 → 1 transition (when P445=1). When setpoint injection in response to a 0 → 1 transition is selected, the setpoint injection function is reset when the binector selected in P444 switches to the log. "0" state. P442 indices .01 to .08 can be set to define for each setpoint individually whether the ramp-function generator must be bypassed on setpoint injection. If crawling setpoint injection is not selected, the connector set in P443 is applied to K0206.				
P440 *	Source for injection of crawling setpoint Selection of binector to control injection of the crawling setpoint. 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P441 *	Source for crawling setpoint Selection of connector to be injected as the crawling setpoint 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P442 *	Source for selection of ramp-function generator bypass Selection as to whether or not ramp-function generator must be bypassed when the crawling setpoint is injected. The ramp-function generator is bypassed if the AND operation between the binector selected via an index of P440 and the setting in the same index of P442 produces a log. "1".	0 to 1 1	Ind: 8 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P443 * FDS	Source for standard setpoint Selection of the connector to be applied if crawling-setpoint injection is not selected 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=207 Type: L2	P052 = 3 P051 = 40 Offline
P444 * BDS	Source for standstill command Selection of the binector to control the standstill operation (OFF1) or resetting of crawling setpoint injection when P445=1 (log. "0" state = reset). 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P445 *	Selection of level/edge for switch-on/crawling Selection to define whether ON command must be input via terminal 37 and the crawling setpoint injected in response to a log. "1" level or to a 0 → 1 transition 0 ON with log. "1" state at terminal 37 and injection of crawling setpoint with binectors selected in P440 in log. "1" state 1 ON in response to 0 → 1 transition at terminal 37 and injection of crawling setpoint in response to 0 → 1 transition of binectors selected in P440 With this setting, the ON command or injection command for the crawling setpoint is stored. The memory is reset when the binector selected in P444 switches to the log. "0" state.	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.21 Position sensing with pulse encoder

See parameters P140 to P148 for pulse encoder definition and monitoring

P450 *	Resetting of position counter 0 Reset position counter OFF 1 Reset position counter with zero marker 2 Reset position counter with zero marker when LOW signal is applied to terminal 39 3 Reset position counter when LOW signal is applied to terminal 39 Note: Counter resetting with P450 = 2 and 3 is executed in the hardware and is not affected by how the binectors controlled by terminal 39 are interconnected	0 to 3 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P451 *	Position counter hysteresis 0 Hysteresis for rotational direction reversal OFF 1 Hysteresis for rotational direction reversal ON (the first pulse encoder input pulse after a change in rotational direction is not counted)	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline

11.22 Motorized potentiometer

(see also Section 8, Sheet G126)

P460 *	Control word for motorized potentiometer ramp-function generator 0 The motorized potentiometer ramp generator is bypassed in Automatic mode (same effect as for P462 and P463 = 0.01, i.e. the generator output is made to follow the automatic setpoint without delay) 1 Motorized potentiometer ramp generator is active in Manual and Automatic modes	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P461 *	Source for setpoint in Automatic mode Selection of the connector to be applied as the Automatic setpoint to the ramp-function generator in the motorized potentiometer 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P462	Ramp-up time for motorized potentiometer	0.01 to 300.00 [s] 0.01s	Ind: 4 FS=10.00 Type: O2	P052 = 3 P051 = 40 Online
P463	Ramp-down time for motorized potentiometer	0.01 to 300.00 [s] 0.01s	Ind: 4 FS=10.00 Type: O2	P052 = 3 P051 = 40 Online
P464	Time difference for dy/dt Setting of <u>dt</u> for the output of dy/dt at a connector, i.e. on K0241 the change in the output quantity (K0240) is output within the time set in P464, multiplied by the factor set in P465 (unit of time setting is [s] if P465=0 or [min] if P465=1) Example: The ramp-function generator is currently ramping up with a ramp-up time of P462=5s, i.e. a ramp-up operation from y=0% to y=100% takes 5s. - A time difference dt of P464=2s is set. - ⇒ A dy/dt of 40% appears at connector K0241 since the dy within the set dt of 2 s equals (2s/5s)*100%.	0.01 to 300.00 [s] 0.01s	Ind: 4 FS=10.00 Type: O2	P052 = 3 P051 = 40 Online
P465 *	Factor of expansion for motorized potentiometer The effective ramp-up time, ramp-down time or time difference for dy/dt is the product of the time setting in parameter P462, P463 and P464 respectively, multiplied by the factor set in this parameter. 0 Parameters P462, P463 and P464 are multiplied by a <u>factor of 1</u> 1 Parameters P462, P463 and P464 are multiplied by a <u>factor of 60</u>	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P466 * FDS	Source for motorized potentiometer setting value Selection of the connector to be injected as the motorized potentiometer setting value 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P467 FDS	Motorized potentiometer starting value Starting value of motorized potentiometer after ON when P473 = 0	-199.9 to 199.9 [%] 0.1%	Ind: 4 FS=0.0 Type: I2	P052 = 3 P051 = 40 Online
P468 FDS	Setpoint for "Raise motorized potentiometer" Motorized potentiometer manual operation: Setpoint for "Raise motorized potentiometer"	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=100.00 Type: I2	P052 = 3 P051 = 40 Online
P469 FDS	Setpoint for "Lower motorized potentiometer " Motorized potentiometer manual operation: Setpoint for "Lower motorized potentiometer"	-199.99 to 199.99 [%] 0.01%	Ind: 4 FS=-100.00 Type: I2	P052 = 3 P051 = 40 Online
P470 * BDS	Source for clockwise/counter-clockwise switchover Selection of binector to control " Clockwise/counter-clockwise switchover " ("0" state = clockwise). 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P471 * BDS	Source for manual/automatic switchover Selection of binector to control " Manual/automatic switchover " ("0" state = manual). 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P472 * BDS	Source for set motorized potentiometer Selection of binector to control " Set motorized potentiometer " ("0" to "1" transition = set motorized potentiometer). 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P473 * FDS	Storage of output value 0 <u>No storage of output value:</u> The output is set to 0 in all operating states of >0.5. The starting point after ON is determined by P467 (MOP starting value). 1 <u>Non-volatile storage of output value:</u> The output value remains stored in all operating states and after voltage disconnection or failure. The last value stored is output again after voltage recovery/reconnection.	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.23 Forcing, oscillation

Function:

Parameters P480 to P483 define the waveshape of a rectangular signal (oscillation setpoint K0203). The value set in P480 determines the signal level for the time period set in P481 and the value set in P482 the signal level for the time period set in P483.

Oscillation: Selected in P485. The free-running rectangular signal is switched through to the output K0208.

Forcing: Selected by setting P051=24 and pressing the P key (switchover to parameter mode). The output of the square-wave generator (K0203) is set to zero.

Briefly pressing the UP key (forcing activated) starts the square-wave generator in a defined manner (value as set in P480 for period set in P481, then value set in P482 for time set in P483, etc.) and applies it to output (K0208).

Briefly pressing the DOWN key (forcing deactivated) resets the output of the square-wave generator (K0203) to zero and injects the standard setpoint as set in P484 at the output (K0208) again.

Pressing the P key (return to value mode) also deactivates "Forcing". The square-wave generator (K0203) is decoupled again and is available for the "Oscillation" function.

P480 FDS	Oscillation setpoint 1	-199.9 to 199.9 [%] 0.1% of maximum speed	Ind: 4 FS=0,5 Type: I2	P052 = 3 P051 = 40 Online
P481 FDS	Oscillation time 1	0.1 to 300.0 [s] 0.1s	Ind: 4 FS=0.1 Type: O2	P052 = 3 P051 = 40 Online
P482 FDS	Oscillation setpoint 2	-199.9 to 199.9 [%] 0.1% of maximum speed	Ind: 4 FS=-0,4 Type: I2	P052 = 3 P051 = 40 Online
P483 FDS	Oscillation time 2	0.1 to 300.0 [s] 0.1s	Ind: 4 FS=0.1 Type: O2	P052 = 3 P051 = 40 Online
P484 * FDS	Source for standard setpoint Selection of connector to be injected as the output value when the "Oscillation" or "Forcing" function is not selected 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=209 Type: L2	P052 = 3 P051 = 40 Offline
P485 * BDS	Source for oscillation selection Selection of binector to control activation of the "Oscillation" function (log. "1" state = oscillation active) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.24 Definition of "Motor interface"

(see also Section 8, Sheets G185 und G186)

CAUTION! The encoders for measurement and monitoring of the brush length, bearing condition, air flow and motor temperature must be safely isolated from the power circuit.				
P490 *	Selection of temperature sensor for analog monitoring of motor temperature i001: Temperature sensor at terminals 22 / 23: i002: Temperature sensor at terminals 204 / 205: Settings: 0 No temperature sensor 1 KTY84 2 PTC thermistor with R=600Ω 1) 3 PTC thermistor with R=1200Ω 1) 4 PTC thermistor with R=1330Ω 1) 5 PTC thermistor with R=2660Ω 1) 1) PTC thermistor according to DIN 44081 / 44082 with specified R at rated response temperature, 1330Ω on Siemens motors (setting 4 must be selected). When a PTC thermistor is selected as the temperature sensor, it is not necessary to set parameters P491 and P492 (alarm and trip temperatures). These two temperatures are predetermined by the type of PTC thermistor installed. Whether an alarm or fault is output when the operating point of the PTC thermistor is reached depends on how the relevant input is parameterized (P493.F or P494.F).	0 to 5 1	Ind: 2 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P491 FDS	Analog monitoring of motor temperature: Alarm temperature Operative only when P490.x=1.	0 to 200 [°C] 1°C	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P492 FDS	Analog monitoring of motor temperature: Trip temperature Operative only when P490.x=1.	0 to 200 [°C] 1°C	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P493 * FDS	Motor temperature analog 1 (temperature sensor at terminals 22 / 23): Tripping of alarm or fault message Motor temperature grasped with KTY84 0 Monitoring deactivated 1 Alarm (A029) at temperature > P491 2 Fault message (F029) at temperature > P492 3 Alarm (A029) at temperature > P491 and fault message (F029) at temperature > P492 Motor temperature grasped with PTC thermistor 0 Monitoring deactivated 1 Alarm message (A029) when operating point of PTC thermistor is reached 2 Fault message (F029) when operating point of PTC thermistor is reached 3 Illegal setting	0 to 3 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P494 * FDS	Motor temperature analog 2 (temperature sensor at terminals 204 / 205): Tripping of alarm or fault message Motor temperature grasped with KTY84 0 Monitoring deactivated 1 Alarm (A029) at temperature > P491 2 Fault message (F029) at temperature > P492 3 Alarm (A029) at temperature > P491 and fault message (F029) at temperature > P492 Motor temperature grasped with PTC thermistor 0 Monitoring deactivated 1 Alarm message (A029) when operating point of PTC thermistor is reached 2 Fault message (F029) when operating point of PTC thermistor is reached 3 Illegal setting	0 to 3 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P495 * FDS	Brush length sensing: Tripping of alarm or fault message 0 No brush length sensing (terminal 211 is not scanned) 1 Binary brush length sensing (terminal 211 is scanned) Alarm (A025) in response to 0 signal 2 Binary brush length sensing (terminal 211 is scanned) Fault message (F025) in response to 0 signal	0 to 2 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P496 * FDS	Bearing condition: Tripping of alarm or fault message 0 No bearing condition sensing (terminal 212 is not scanned) 1 Bearing condition sensing (terminal 212 is scanned) Alarm (A026) in response to 1 signal 2 Bearing condition sensing (terminal 212 is scanned) Fault message (F026) in response to 1 signal	0 to 2 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P497 * FDS	Air flow: Tripping of alarm or fault message 0 No air flow monitoring (terminal 213 is not scanned) 1 Air flow monitoring (terminal 213 is scanned) Alarm (A027) in response to 0 signal 2 Air flow monitoring (terminal 213 is scanned) Fault message (F027) in response to 0 signal	0 to 2 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P498 * FDS	Temperature switch: Tripping of alarm or fault message 0 No temperature switch connected (terminal 214 is not scanned) 1 Temperature switch connected (terminal 214 is scanned) Alarm (A028) in response to 0 signal 2 Temperature switch connected (terminal 214 is scanned) Fault message (F028) in response to 0 signal	0 to 2 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline

11.25 Configuring of torque shell input

P500 * BDS	Source for torque setpoint for slave drive Selection of the connector to be injected as the torque setpoint for a slave drive 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 2 FS=170 Type: L2	P052 = 3 P051 = 40 Offline
P501 * BDS	Source for additional torque setpoint Selection of connector to be injected as the additional torque setpoint 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P502 *	Source for value to be added to speed controller output Selection of connector to be injected as the value to be added to the speed controller output (in addition to friction and moment of inertia compensation) 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

11.26 Speed limiting controller

(see also Section 8, Sheet G160)

The output of the speed limiting controller comprises a positive (K0136) and a negative (K0137) torque limit. These limits are applied to the torque limitation.				
P509 *	Source for input quantity (n-act) of speed limiting controller 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=167 Type: L2	P052 = 3 P051 = 40 Offline
P510 *	Source for pos. torque limit of speed limiting controller Selection of the connector to be injected as the limit value for torque limitation 1 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=2 Type: L2	P052 = 3 P051 = 40 Offline
P511 *	Source for neg. torque limit of speed limiting controller Selection of the connector to be injected as the limit value for torque limitation 2 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=4 Type: L2	P052 = 3 P051 = 40 Offline
P512 FDS	Maximum speed in positive direction of rotation	0.0 to 199.9 [%] 0.1% of rated speed	Ind: 4 FS=105.0 Type: O2	P052 = 3 P051 = 40 Online
P513 FDS	Maximum speed in negative direction of rotation	-199.9 to 0.0 [%] 0.1% of rated speed	Ind: 4 FS=-105.0 Type: I2	P052 = 3 P051 = 40 Online
P515 FDS	P gain of speed limiting controller	0.10 to 200.00 0.01	Ind: 4 FS=3.00 Type: O2	P052 = 3 P051 = 40 Online

11.27 Friction compensation

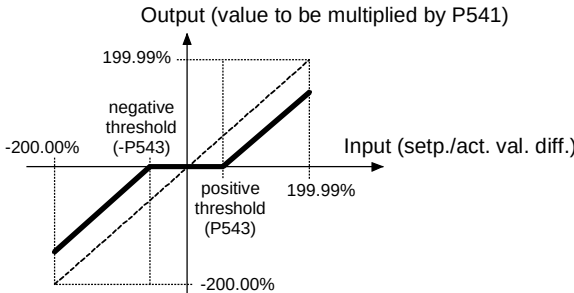
(see also Section 8, Sheet G153)

Parameters P520 to P530 are the armature current and torque setpoints required to obtain a steady-state speed of 0%, 10% to 100% of maximum speed (in steps of 10%). These parameters represent interpolation points in the friction characteristic. They are either an armature current or torque setpoint depending on the setting in P170 (0 or 1) and set automatically during the optimization run for friction or moment of inertia compensation (P051=28). P520 is set to 0.0% during this run. Depending on the actual speed controller value (K0179), the values between the interpolation points are calculated by linear interpolation, the output of the friction compensation assuming the sign of the actual speed controller value. P530 is specified by the friction compensation function when the actual speed control value equals >100% of maximum speed. For operation in both directions of rotation, it is advisable to leave P520 set at 0.0% in order to avoid armature current oscillations at 0% speed.				
P520 FDS	Friction at 0% speed Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P521 FDS	Friction at 10% speed Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P522 FDS	Friction at 20% speed Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P523 FDS	Friction at 30% speed Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P524 FDS	Friction at 40% speed Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P525 FDS	Friction at 50% speed Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P526 FDS	Friction at 60% speed Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P527 FDS	Friction at 70% speed Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P528 FDS	Friction at 80% speed Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P529 FDS	Friction at 90% speed Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
P530 FDS	Friction at 100% speed and higher Setting as % of converter rated DC current or rated torque	0.0 to 100.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online

11.28 Compensation of moment of inertia (dv/dt injection)

(see also Section 8, Sheet G153)

P540 FDS	Acceleration time The acceleration time is the time that would be needed to accelerate the drive from 0% to 100% of maximum speed (with no friction) at 100% converter rated DC current (armature) and 100% rated motor field current (i.e. 100% flux). It is a measure of the moment of inertia on the motor shaft. This parameter is set automatically during the optimization run for friction and moment of inertia compensation (P051=28).	0.00 to 650.00 [s] 0.01s	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
P541 FDS	P gain of acceleration Proportional gain for "SAD-dependent acceleration" function (see also parameter P543)	0.00 to 650.00 0.01	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
P542 FDS	Time difference for dy/dt of ramp-function generator Ramp-function generator: Setting of $\frac{dy}{dt}$ for the output of $\frac{dy}{dt}$ at a connector, i.e. at K0191, the change in the output quantity of the ramp-function generator (K0190) is output within the period set in P542 Example: The ramp-function generator is currently ramping up with a ramp-up time of P311=5s, i.e. a ramp-up operation from y=0% to y=100% takes 5s. - A time difference dt of P542=2s is set. - $\Rightarrow$ A $\frac{dy}{dt}$ of 40% appears at connector K0191 since the dy within the set dt of 2 s equals $(2s/5s) \cdot 100\%$.	0.01 to 300.00 [s] 0.01s	Ind: 4 FS=0.01 Type: O2	P052 = 3 P051 = 40 Online
P543 FDS	Threshold for SAD-dependent acceleration With respect to the SAD-dependent acceleration function, only the component of the speed controller setpoint/actual value difference which has an absolute value in excess of the threshold set in this parameter is switched through (see also parameter P541). 	0.00 to 100.00 [%] 0.01% of maximum speed	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P546 FDS	Filter time for compensation of moment of inertia	0 to 10000 [ms] 1ms	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online

11.29 Speed controller

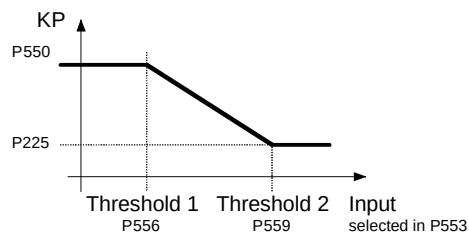
(see also Section 8, Sheet G151)

further parameters for the speed controller P200 - P234

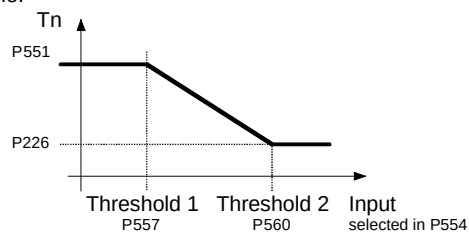
Speed controller adaptation

The parameters of the speed controller (Kp, Tn, droop) can be altered as a function of any connector to adapt the speed controller optimally to a changing controlled system.
The diagrams below show the active P gain, the active Integration time and the active droop depending on the value of the set connector.

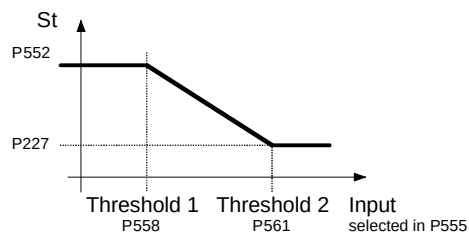
Adaptation of the P gain:



Adaptation of the integration time:



Adaptation of the droop:



For parameter pairs P225/P550, P226/P551 and P227/P552 all values can be set completely mutually independently, e.g., P550 does not have to be greater than P225. The above diagrams show only the effect of the individual parameters.
Threshold 1 must always be set smaller than threshold 2, otherwise the fault message F058 is activated.

P550 FDS	P gain in the adaptation range Value of Kp, if Influencing quantity $\leq$ Threshold 1	0.10 to 200.00 0.01	Ind: 4 FS=3,00 Type: O2	P052 = 3 P051 = 40 on-line
P551 FDS	Integration time in the adaptation range Value of Tn, if Influencing quantity $\leq$ Threshold 1	0.010 to 10.000 [s] 0.001s	Ind: 4 FS=0.650 Type: O2	P052 = 3 P051 = 40 on-line
P552 FDS	Droop in the adaptation range Value of droop, if Influencing quantity $\leq$ Threshold 1	0.0 to 10.0 [%] 0.1%	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 on-line
P553 * FDS	Source for the Influencing quantity of the Kp adaptation Selection of which connector is connected at the influencing quantity for adaptation of the n controllers P gain 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P554 *	Source for the Influencing quantity of the Tn-adaptation Selection of which connector is connected at the influencing quantity for adaptation of the n controllers integration time 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 off-line
P555 *	Source for the Influencing quantity of the droop adaptation Selection of which connector is connected at the influencing quantity for adaptation of the n controllers droop 0 = Connector K0000 1 = Connector K0001 etc.	All connector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 off-line
P556 FDS	Adaptation n controller P gain: Threshold 1	0.00 to 100.00 [%] 0.01%	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 on-line
P557 FDS	Adaptation n controller integration time: Threshold 1	0.00 to 100.00 [%] 0.01%	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 on-line
P558 FDS	Adaptation n controller droop: Threshold 1	0.00 to 100.00 [%] 0.01%	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 on-line
P559 FDS	Adaptation n controller P gain: Threshold 2	0.00 to 100.00 [%] 0.01%	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 on-line
P560 FDS	Adaptation n controller integration time: Threshold 2	0.00 to 100.00 [%] 0.01%	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 on-line
P561 FDS	Adaptation n controller droop: Threshold 2	0.00 to 100.00 [%] 0.01%	Ind: 4 FS=0.00 Type: O2	P052 = 3 P051 = 40 on-line

Speed controller - speed droop limitation

P562 FDS	Positive speed droop limitation	0.00 to 199.99 [%] 0.01%	Ind: 4 FS=100.00 Type: O2	P052 = 3 P051 = 40 Online
P563 FDS	Negative speed droop limitation	-199.99 to 0.00 [%] 0.01%	Ind: 4 FS=-100.00 Type: I2	P052 = 3 P051 = 40 Online

11.30 Field reversal

(see also Section 9)

P580 *	Source for selection of "Direction of rotation reversal using field reversal" Selection of binector to control the "Direction of rotation reversal using field reversal" function 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P581 *	Source for selection of "Braking with field reversal" Selection of binector to control the "Braking with field reversal" function 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.31 Input quantities for signals

(see also Section 8, Sheet G187 and G188)

P590 *	Source for setpoint of "nset = nact signal" Setpoint/actual value deviation signal: Selection of connector to be injected as input quantity "nset" for the setpoint/actual value deviation signal. 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=174 Type: L2	P052 = 3 P051 = 40 Offline
P591 *	Source for actual value of "n-set = n-act signal" Setpoint/actual value deviation signal: Selection of connector to be injected as input quantity "nact" for the setpoint/actual value deviation signal. 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=167 Type: L2	P052 = 3 P051 = 40 Offline
P592 *	Source for actual value of "n < ncomp. signal" n < ncomp. signal: Selection of connector to be injected as input quantity (n) for the n < ncomp. signal. 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=167 Type: L2	P052 = 3 P051 = 40 Offline
P593 *	Source for actual value of "n < nmin signal" n < nmin signal: Selection of connector to be injected as input quantity (n) for the n < nmin signal. 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=167 Type: L2	P052 = 3 P051 = 40 Offline
P594 *	Source for input quantity of "Polarity signal" Polarity signal of speed setpoint: Selection of connector to be injected as input quantity "nset" for the polarity signal of the speed setpoint. 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=170 Type: L2	P052 = 3 P051 = 40 Offline
P595 *	Source for actual value of "Overspeed signal" Overspeed signal: Selection of connector to be injected as input quantity "nact" for the overspeed signal. 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=167 Type: L2	P052 = 3 P051 = 40 Offline

11.32 Configuring of closed-loop control

Setting values for configuring of torque shell				
P600 *	Source for gating unit input (armature) Selection of connector to be injected as the gating unit input (armature) 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=102 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P601 *	Source for armature current controller setpoint i001,i002 Speed limiting controller: Selection of connectors to be injected as input quantities for the speed limiting controller . Both values are added. i003,i004 Current limitation: Selection of connectors to be injected as armature current controller setpoint (before current limitation). Both values are added. i005,i006 Current control: [SW 1.8 and later] Selection of which connectors are connected as the armature current controller setpoint (before current controller). The two values are added. The magnitude is formed from the value selected with index 6. Settings: 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 6 FS= i001: 141 i002: 0 i003: 134 i004: 0 i005: 125 i006: 0 Type: L2	P052 = 3 P051 = 40 Offline
P602 *	Source for armature current controller actual value Selection of connector to be injected as armature current controller actual value 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=117 Type: L2	P052 = 3 P051 = 40 Offline
P603 *	Source for variable current limit in torque direction I i001..i004 Selection of connector to be injected as <u>variable</u> current limit in torque direction I i005 Selection of connector to be injected as current limit in torque direction I with <u>Fast Stop or Shutdown</u> Settings: 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 5 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P604 *	Source for variable current limit in torque direction II i001..i004 Selection of connector to be injected as <u>variable</u> current limit in torque direction II i005 Selection of connector to be injected as current limit in torque direction II with <u>Fast Stop or Shutdown</u> Settings: 0 = connector K0000 ... 8 = connector K0008 9 = value as set in parameter P603.ixx * (-1) 10 = connector K0010 etc.	All connector numbers 1	Ind: 5 FS=9 Type: L2	P052 = 3 P051 = 40 Offline
P605 *	Source for variable positive torque limit Torque limitation: Selection of connectors to be injected as the variable positive torque limit (100% of connector value corresponds to positive system torque limit obtained with settings $I_a=P171$ and $I_f = P102$) 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=2 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P606 *	Source for variable negative torque limit Torque limitation: Selection of connectors to be injected as the variable negative torque limit (100% of connector value corresponds to negative system torque limit obtained with settings I_a =P172 and I_f = P102) 0 = connector K0000 ... 8 = connector K0008 9 = value as set in parameter P605 * (-1) 10 = connector K0010 etc.	All connector numbers 1	Ind: 4 FS=9 Type: L2	P052 = 3 P051 = 40 Offline
P607 * BDS	Source for torque setpoint for master drive Torque limitation: Selection of connector to be injected as the torque setpoint for a master drive 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 2 FS=148 Type: L2	P052 = 3 P051 = 40 Offline

Speed controller

P609 *	Source for actual speed controller value Selection of connector to be injected as the actual speed controller value when P083=4 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
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Setting values for configuring of closed-loop field and EMF control

P610 *	Source for gating unit input (field) Selection of connector to be applied to the gating unit input (field) 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=252 Type: L2	P052 = 3 P051 = 40 Offline
P611 *	Source for field current controller setpoint Limitation at EMF controller output: Selection of connectors to be injected as the field current controller setpoint . The connectors selected in the four indices are added. 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS= i001: 277 i002: 0 i003: 0 i004: 0 Type: L2	P052 = 3 P051 = 40 Offline
P612 *	Source for actual field current controller value Selection of connector to be injected as the actual field current controller value 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=266 Type: L2	P052 = 3 P051 = 40 Offline
P613 *	Source for variable field current setpoint upper limit Limitation at EMF controller output Selection of connector to be injected as the variable field current setpoint upper limit 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=1 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P614 *	Source for variable field current setpoint lower limit Limitation at EMF controller output Selection of connector to be injected as the variable field current setpoint lower limit 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P615 *	Source for EMF controller setpoint Selection of connectors to be injected as the EMF controller setpoint . The connectors selected in the four indices are added. 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS= i001: 289 i002: 0 i003: 0 i004: 0 Type: L2	P052 = 3 P051 = 40 Offline
P616 *	Source for actual EMF controller value Selection of connector to be injected as the actual EMF controller value 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=286 Type: L2	P052 = 3 P051 = 40 Offline

Configuring of injection of acceleration value

P619 *	Source for acceleration injection value Selection of connector to be applied as the acceleration injection value 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=191 Type: L2	P052 = 3 P051 = 40 Offline
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Speed controller

Speed controller, setpoint/actual value deviation

Function: The connectors selected in parameters P621 and P622 are added and those selected in P623 and 624 subtracted

P620 *	Source for speed controller setpoint/actual value deviation Selection of connector to be injected as the control deviation 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=165 Type: L2	P052 = 3 P051 = 40 Offline
P621 *	Source for speed controller setpoint 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=176 Type: L2	P052 = 3 P051 = 40 Offline
P622 *	Source for speed controller setpoint 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=174 Type: L2	P052 = 3 P051 = 40 Offline
P623 *	Source for actual speed controller value 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=179 Type: L2	P052 = 3 P051 = 40 Offline
P624 *	Source for actual speed controller value 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Speed controller: Filtering of setpoint and actual value, band-stop filters				
P625 *	Source for speed controller setpoint Selection of connector to be injected as the input signal for speed setpoint filtering 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=170 Type: L2	P052 = 3 P051 = 40 Offline
P626 *	Source for actual speed controller value Selection of connector to be injected as the input signal for actual speed value filtering 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=167 Type: L2	P052 = 3 P051 = 40 Offline
P627 *	Source for input of D element Selection of connector to be injected as the input signal for the D element 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=178 Type: L2	P052 = 3 P051 = 40 Offline
P628 *	Source for input of band-stop filter 1 Selection of connector to be injected as the input signal for band-stop filter 1 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=179 Type: L2	P052 = 3 P051 = 40 Offline
P629 *	Source for band-stop filter 2 Selection of connector to be injected as the input signal for band-stop filter 2 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=177 Type: L2	P052 = 3 P051 = 40 Offline
Speed controller droop				
P630 *	Source for influencing quantity for speed droop Selection of connector to be injected as the influencing quantity 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=162 Type: L2	P052 = 3 P051 = 40 Offline
Setting the speed controller I component Function: When the binector selected in P695 switches state from log. "0" to log. "1", the I component of the speed controller is set to the value of the connector selected in P631. With this function it is possible, for example, to use the same signal (binector) to control controller enabling commands and setting of the I component.				
P631 *	Source for setting value for speed controller integrator Selection of connector to be injected as the setting value for the I component 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Setting values for configuring the setpoint processing function and ramp-function generator				
Limitation at ramp-function generator output (setpoint limitation) (see also Section 8, Sheet G136) The effective limitations are: Upper limit: Minimum value of P300 and the four connectors selected with P632 Lower limit: Maximum value of P301 and the four connectors selected with P633 Note: The limiting values for both the positive and negative setpoint limits can have a positive or negative sign. The negative setpoint limit, for example, can therefore be parameterized to a positive value and the positive setpoint limit to a negative value.				
P632 *	Source for variable positive limitation at ramp-function generator output Selection of connectors to be injected at the variable positive limitation at the ramp-function generator output (setpoint limitation). 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P633 *	Source for variable negative limitation at ramp-function generator output Selection of connectors to be injected at the variable negative limitation at the ramp-function generator output (setpoint limitation). 0 = connector K0000 ... 8 = connector K0008 9 = value as set in parameter P632 * (-1) 10 = connector K0010 etc.	All connector numbers 1	Ind: 4 FS=9 Type: L2	P052 = 3 P051 = 40 Offline
P634 *	Source for limitation input at ramp-function generator output Selection of connectors which must be added up to provide the limitation input at the ramp-function generator output (setpoint limitation). 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 2 FS= i001: 190 i002: 0 Type: L2	P052 = 3 P051 = 40 Offline
P635 * FDS	Source for ramp-function generator setpoint Selection of connector to be injected as the ramp-function generator setpoint 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=194 Type: L2	P052 = 3 P051 = 40 Offline
P636 *	Source for reduction signal for ramp-function generator times Selection of connector to be injected as the reduction signal for the ramp-function generator times i001 acts on ramp-up and ramp-down time (P303, P304) i002 acts on lower and upper transition roundings (P305, P306) 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 2 FS=2 Type: L2	P052 = 3 P051 = 40 Offline
P637 * BDS	Source for selection of "Ramp-function generator setting 2" Selection of binector to control switchover to "Ramp-function generator setting 2" . With a log. "1" signal at the binector, ramp-function generator parameter set 2 (P307 - P310) is selected. This function has a higher priority than the ramp-up integrator function. 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P638 * BDS	Source for selection of "Ramp-function generator setting 3" Selection of binector to control switchover to " Ramp-function generator setting 3 ". With a log. "1" signal at the binector, ramp-function generator parameter set 3 (P311 - P314) is selected. This function has a higher priority than the ramp-up integrator function. 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P639 *	Source for the ramp-function generator setting values Selection of the connectors that are connected as the ramp-function generator setting values . i001 Setting value for the ramp-function generator output in state log. "1" of the binector selected via P640 i002 Setting value for the ramp-function generator output if the drive is not in state "Operating" (B0104=0) <u>and</u> the binector selected via P640 is in state log. "0" 0 = Connector K0000 1 = Connector K0001 etc.	All connector numbers 1	Ind: 2 FS=167 Type: L2	P052 = 3 P051 = 40 ≥off-line
P640 * BDS	Source for selection of "Set ramp-function generator" Selection of binector to control the " Set ramp-function generator " function 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P641 * BDS	Source for selection of "Bypass ramp-function generator" Selection of binector to control the " Bypass ramp-function generator " function 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P642 *	Source for variable positive limitation of main setpoint Selection of connectors to be injected at the variable positive limitation of the main setpoint . The lowest value in each case of the connectors selected via the 4 indices is applied as the limit. Note: Negative values at the selected connectors result in a negative maximum value at the output of the limitation. 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=2 Type: L2	P052 = 3 P051 = 40 Offline
P643 *	Source for variable negative limitation of main setpoint Selection of connectors to be injected at the variable negative limitation of the main setpoint . The lowest value in each case of the connectors selected via the 4 indices is applied as the limit. Note: Positive values at the selected connectors result in a positive minimum value at the output of the limitation. 0 = connector K0000 ... 8 = connector K0008 9 = value as set in parameter P642 * (-1) 10 = connector K0010 etc.	All connector numbers 1	Ind: 4 FS=9 Type: L2	P052 = 3 P051 = 40 Offline

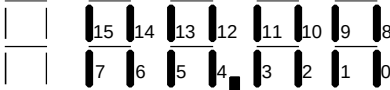
PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P644 * FDS	Source for main setpoint Selection of connector to be injected as the main setpoint 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=206 Type: L2	P052 = 3 P051 = 40 Offline
P645 * FDS	Source for additional setpoint Selection of connector to be injected as an additional setpoint 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P646 * BDS	Source for enable signal for ramp-up integrator switchover Selection of binector to control enabling of the ramp-function integrator switchover function . 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline

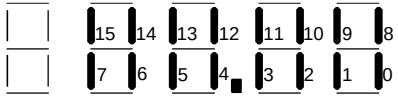
11.33 Control word, status word

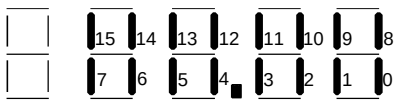
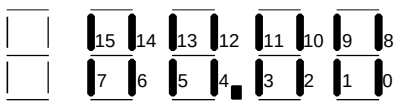
Selection of sources of control words 1 and 2

P648 * BDS	Source for control word 1 Selection of connector to act as the source for control word 1. 0 = connector K0000 ... 8 = connector K0008 9 = parameters P654 to P675 are effective (every individual bit of control word 1 is input by a binector) 10 = connector K0010 etc.	All connector numbers 1	Ind: 2 FS=9 Type: L2	P052 = 3 P051 = 40 Offline
P649 * BDS	Source for control word 2 Selection of connector to act as the source for control word 2. 0 = connector K0000 ... 8 = connector K0008 9 = parameters P676 to P691 are effective (every individual bit of control word 2 is input by a binector) 10 = connector K0010 etc.	All connector numbers 1	Ind: 2 FS=9 Type: L2	P052 = 3 P051 = 40 Offline

Display of control words 1 and 2

r650	Display of control word 1 Mode of representation on operator panel (PMU):  Segments 0 to 15 correspond to bits 0 to 15 of the control word Segment alight: Corresponding bit is in log. "1" state Segment dark: Corresponding bit is in log. "0" state		Ind: None Type: V2	P052 = 3
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
r651	Display of control word 2 Mode of representation on operator panel (PMU):  Segments 0 to 15 correspond to bits 16 to 31 of the control word Segment alight: Corresponding bit is in log. "1" state Segment dark: Corresponding bit is in log. "0" state		Ind: None Type: V2	P052 = 3

Display of status words 1 and 2				
r652	Display of status word 1 Mode of representation on operator panel (PMU):  Segments 0 to 15 correspond to bits 0 to 15 of the status word Segment alight: Corresponding bit is in log. "1" state Segment dark: Corresponding bit is in log. "0" state		Ind: None Type: V2	P052 = 3
r653	Display of status word 2 Mode of representation on operator panel (PMU):  Segments 0 to 15 correspond to bits 16 to 31 of the status word Segment alight: Corresponding bit is in log. "1" state Segment dark: Corresponding bit is in log. "0" state		Ind: None Type: V2	P052 = 3

The following parameters are used to select the binectors (some of which are gated with one another or with other signals) to be applied to the individual bits of the control word.

The settings of all these parameters are as follows:

- 0 = binector B0000
- 1 = binector B0001
- etc.

The functions and logic operations are also shown on Sheets G180 and G181 in Section 8.

Control word 1				
P654 *	Source for control word 1, bit0	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
BDS	(0=OFF1, 1=ON; ANDed with terminal 37)			
P655 *	1st source for control word 1, bit1	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
BDS	(0=OFF2; ANDed with 2 nd and 3 rd sources for bit1)			
P656 *	2nd source for control word 1, bit1	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
BDS	(0=OFF2; ANDed with 1 st and 3 rd sources for bit1)			
P657 *	3rd source for control word 1, bit1	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
BDS	(0=OFF2; ANDed with 1 st and 2 nd sources for bit1)			
P658 *	1st source for control word 1, bit2	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
BDS	(0=OFF3=Fast stop; ANDed with 2 nd and 3 rd sources for bit2)			
P659 *	2nd source for control word 1, bit2	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
BDS	(0=OFF3=Fast stop; ANDed with 1 st and 3 rd sources for bit2)			

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P660 * BDS	3rd source for control word 1, bit2 (0=OFF3=Fast stop; ANDed with 1 st and 2 nd sources for bit2)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P661 * BDS	Source for control word 1, bit3 (0=pulse disable, 1=enable; ANDed with terminal 38)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P662 * BDS	Source for control word 1, bit4 (0=set ramp-function generator to zero, 1=enable ramp-function generator)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P663 * BDS	Source for control word 1, bit5 (0=ramp-function generator stop, 1=ramp-function generator start)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P664 * BDS	Source for control word 1, bit6 (0=enable setpoint, 1=disable setpoint)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P665 * BDS	1st source for control word 1, bit7 (0→1 transition=acknowledge; ORed with 2 nd and 3 rd sources for bit7)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P666 * BDS	2nd source for control word 1, bit7 (0→1 transition=acknowledge; ORed with 1 st and 3 rd sources for bit7)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P667 * BDS	3rd source for control word 1, bit7 (0→1 transition=acknowledge; ORed with 1 st and 2 nd sources for bit7)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P668 * BDS	Source for control word 1, bit8 (1=inching bit0)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P669 * BDS	Source for control word 1, bit9 (1=inching bit1)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P671 * BDS	Source for control word 1, bit11 (0=pos. direction of rotation disabled, 1=pos. direction of rotation enabled)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P672 * BDS	Source for control word 1, bit12 (0= neg. direction of rotation disabled, 1= neg. direction of rotation enabled)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P673 * BDS	Source for control word 1, bit13 (1=raise motorized potentiometer)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P674 * BDS	Source for control word 1, bit14 (1=lower motorized potentiometer)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P675 * BDS	Source for control word 1, bit15 (0=external fault, 1=no external fault)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline

Control word 2				
P676 * BDS	Source for control word 2, bit16 (select function data set bit 0)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P677 * BDS	Source for control word 2, bit17 (select function data set bit 1)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P680 * BDS	Source for control word 2, bit20 (select fixed setpoint 0)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P681 * BDS	Source for control word 2, bit21 (select fixed setpoint 1)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P684 * BDS	Source for control word 2, bit24 (0=n controller speed droop disabled, 1=enabled)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P685 * BDS	Source for control word 2, bit25 (0=n controller disabled, 1=n controller enabled)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P686 * BDS	Source for control word 2, bit26 (0=external fault 2, 1=no external fault 2)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P687 * BDS	Source for control word 2, bit27 (0=master drive, speed control, 1=slave drive, torque control)	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P688 * BDS	Source for control word 2, bit28 (0=external alarm 1, 1=no external alarm 1)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P689 * BDS	Source for control word 2, bit29 (0=external alarm 2, 1=no external alarm 2)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P690 * BDS	Source for control word 2, bit30 (0=select Bico data set 1, 1=select Bico data set 2)	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P691 * BDS	Source for control word 2, bit31 (main contactor checkback signal)	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline

11.34 Further configuring measures

P692 * BDS	Source for selection of injection of standstill field Selection of binector to control injection of the standstill field ("0" state = inject standstill field) Note: The delay time set in P258 is not effective when this function is active. 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P693 * BDS	Source for selection of enabling command for EMF controller Selection of binector which is to control enabling of the EMF controller 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P694 * BDS	Source for selection of enabling command for "Torque limit switchover" Selection of binector which is to control enabling of the "Torque limit switchover" function (1=enable, see also Sheet G160 in Section 8 and P180 to P183) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P695 * BDS	Source for selection of "Set speed controller I component" function Selection of binector to control the "Set I component" function 0 = binector B0000 1 = binector B0001 etc. When the binector selected in P695 switches from log. "0" to log. "1", the I component of the speed controller is set to the value of the connector selected in P631. With this function it is possible, for example, to use the same signal (binector) to control controller enabling commands and setting of the I component.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P696 * BDS	Source for selection of "Stop speed controller I component" function Selection of binector to control the "Stop I component" function 0 = binector B0000 1 = binector B0001 etc. When the binector selected in P696 changes to the log. "1" state, the I component of the speed controller is stopped.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P697 * BDS	Source for selection of enabling of dv/dt injection Selection of binector to control enabling of dv/dt injection (state "1" = enable) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P698 * BDS	Source for selection of enabling command for speed controller PI / P function switchover Selection of binector to control enabling of the PI / P controller switchover function (see also P222) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

11.35 Analog inputs (main actual value, main setpoint, selectable inputs)

(see also Section 8, Sheets G113 and G114)

Analog input terminals 4 / 5 (main setpoint)				
P700 *	Signal type of "Main setpoint" analog input 0 = Voltage input 0 to ±10 V 1 = Current input 0 to 20 mA 2 = Current input 4 to 20 mA	0 to 2 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P701 FDS	Normalization of "Main setpoint" analog input This parameter specifies the percentage value which is generated for an input voltage of 10V (or an input current of 20mA) at the analog input. The following generally applies: For voltage input: $P701 [\%] = 10 V * \frac{Y}{X}$ X .. Input voltage in volts Y .. % value which is generated for input voltage X With current input: $P701 [\%] = 20 mA * \frac{Y}{X}$ X .. Input current in mA Y .. % value which is generated for input current X	-1000.0 to 1000.0 [%] 0.1%	Ind: 4 FS=100.0 Type: I2	P052 = 3 P051 = 40 Online
P702	Offset for "Main setpoint" analog input	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P703 *	Mode of signal injection at "Main setpoint" analog input 0 = Injection of signal with sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P704 *	Source for selection of sign reversal at "Main setpoint" analog input Selection of binector to control sign reversal at the analog input ("1" state = reverse sign) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P705	Filtering time for "Main setpoint" analog input Note: Hardware filtering of approximately 1 ms is applied as standard.	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)																				
P706 *	Source for enabling of "Main setpoint" analog input Selection of binector to control enabling of the analog input ("1" state = enabled) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline																				
P707 *	Resolution of "Main setpoint" analog input The voltage applied to the analog input is converted to a digital value (A/D conversion) for further processing. The method used calculates an average value of the input voltage over a specific measuring time. The A/D conversion process produces a scale for the voltage range of 0 to ± 10V, the number of steps (divisions) along this scale can be set in P707 (i.e. the smallest possible differentiable change in the input voltage (quantization) can be set in this parameter). The number of scale steps or intervals is referred to as "Resolution". The resolution is normally specified in bits: ± 11 bits means 2 * 2048 scale divisions ± 12 bits means 2 * 4096 scale divisions ± 13 bits means 2 * 8192 scale divisions ± 14 bits means 2 * 16384 scale divisions The following applies: The higher the resolution, the longer the averaging time and thus also the delay period between the application of an analog step change and the earliest possible moment of availability of the digital value for further processing. For this reason, it is important to find a compromise between the resolution and delay period. <table><tr><td>Param. value</td><td>Resolution better than</td><td>Quantization</td><td>Delay period</td></tr><tr><td>11</td><td>± 11 bits</td><td>4.4 mV</td><td>0.53 ms</td></tr><tr><td>12</td><td>± 12 bits</td><td>2.2 mV</td><td>0.95 ms</td></tr><tr><td>13</td><td>± 13 bits</td><td>1.1 mV</td><td>1.81 ms</td></tr><tr><td>14</td><td>± 14 bits</td><td>0.56 mV</td><td>3.51 ms</td></tr></table> If the analog input is operating as a current input (0 to 20 mA or 4 to 20 mA), the above applies analogously.	Param. value	Resolution better than	Quantization	Delay period	11	± 11 bits	4.4 mV	0.53 ms	12	± 12 bits	2.2 mV	0.95 ms	13	± 13 bits	1.1 mV	1.81 ms	14	± 14 bits	0.56 mV	3.51 ms	11 to 14 [Bit] 1 bit	Ind: None FS=12 Type: O2	P052 = 3 P051 = 40 Offline
Param. value	Resolution better than	Quantization	Delay period																					
11	± 11 bits	4.4 mV	0.53 ms																					
12	± 12 bits	2.2 mV	0.95 ms																					
13	± 13 bits	1.1 mV	1.81 ms																					
14	± 14 bits	0.56 mV	3.51 ms																					

Analog input terminals 6 / 7 (analog selectable input 1)				
P710 *	Signal type of "Analog selectable input 1" 0 = Voltage input 0 to $\pm 10 V$ 1 = Current input 0 to 20 mA 2 = Current input 4 to 20 mA	0 to 2 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P711 FDS	Normalization of "Analog selectable input 1" This parameter specifies the percentage value which is generated for an input voltage of 10V (or an input current of 20mA) at the analog input. The following generally applies: For voltage input: $P711 [\%] = 10 V * \frac{Y}{X}$ X .. Input voltage in volts Y .. % value which is generated for input voltage X With current input: $P711 [\%] = 20 mA * \frac{Y}{X}$ X .. Input current in mA Y .. % value which is generated for input current X	-1000.0 to 1000.0 [%] 0.1%	Ind: 4 FS=100.0 Type: I2	P052 = 3 P051 = 40 Online
P712	Offset for "Analog selectable input 1"	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P713 *	Mode of signal injection at "Analog selectable input 1" 0 = Injection of signal with sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P714 *	Source for selection of sign reversal at "Analog selectable input 1" Selection of binector to control sign reversal at the analog input ("1" state = reverse sign) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P715	Filtering time for "Analog selectable input 1" Note: Hardware filtering of approximately 1 ms is applied as standard.	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P716 *	Source for enabling of "Analog selectable input 1" Selection of binector to control enabling of the analog input ("1" state = enabled) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P717 *	Resolution of "Analog selectable input 1" See P707	10 to 14 [Bit] 1 bit	Ind: None FS=12 Type: O2	P052 = 3 P051 = 40 Offline

Analog input terminals 8 / 9 (analog selectable input 2)

P721 FDS	Normalization of "Analog selectable input 2" This parameter specifies the percentage value which is generated for an input voltage of 10V (or an input current of 20mA) at the analog input. The following generally applies: For voltage input: $P721 [\%] = 10 V * \frac{Y}{X}$ X .. Input voltage in volts Y .. % value which is generated for input voltage X With current input: $P721 [\%] = 20 mA * \frac{Y}{X}$ X .. Input current in mA Y .. % value which is generated for input current X	-1000.0 to 1000.0 [%] 0.1%	Ind: 4 FS=100.0 Type: I2	P052 = 3 P051 = 40 Online
P722	Offset for "Analog selectable input 2"	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P723 *	Mode of signal injection at "Analog selectable input 2" 0 = Injection of signal with sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P724 *	Source for selection of sign reversal at "Analog selectable input 2" Selection of binector to control sign reversal at the analog input ("1" state = reverse sign) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P725	Filtering time for "Analog selectable input 2" Note: Hardware filtering of approximately 1 ms is applied as standard.	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P726 *	Source for enabling of "Analog selectable input 2" Selection of binector to control enabling of the analog input ("1" state = enabled) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Analog input terminals 10 / 11 (analog selectable input 3)				
P731 FDS	Normalization of "Analog selectable input 3" This parameter specifies the percentage value which is generated for an input voltage of 10V (or an input current of 20mA) at the analog input. The following generally applies: For voltage input: $P731 [\%] = 10V * \frac{Y}{X}$ X .. Input voltage in volts Y .. % value which is generated for input voltage X With current input: $P731 [\%] = 20mA * \frac{Y}{X}$ X .. Input current in mA Y .. % value which is generated for input current X	-1000.0 to 1000.0 [%] 0.1%	Ind: 4 FS=100.0 Type: I2	P052 = 3 P051 = 40 Online
P732	Offset for "Analog selectable input 3"	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P733 *	Mode of signal injection at "Analog selectable input 3" 0 = Injection of signal with sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P734 *	Source for selection of sign reversal at "Analog selectable input 3" Selection of binector to control sign reversal at the analog input ("1" state = reverse sign) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P735	Filtering time for "Analog selectable input 3" Note: Hardware filtering of approximately 1 ms is applied as standard.	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P736 *	Source for enabling of "Analog selectable input 3" Selection of binector to control enabling of the analog input ("1" state = enabled) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline

Analog input terminals 103 / 104 (main actual value)				
P741 FDS	Normalization for "Main actual value" Rated value of input voltage at n_{max} (=tachometer voltage at maximum speed) This parameter defines the maximum speed when P083=1.	-270.00 to 270.00 [V] 0.01V	Ind: 4 FS=60.00 Type: I2	P052 = 3 P051 = 40 Online
P742	Offset for "Main actual value" analog input	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
P743 *	Mode of signal injection at "Main actual value" analog input 0 = Injection of signal with sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P744 *	Source for selection of sign reversal at "Main actual value" analog input Selection of binector to control sign reversal at the analog input ("1" state = reverse sign) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
P745	Filtering time for "Main actual value" analog input Note: Hardware filtering of approximately 1 ms is applied as standard.	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P746 *	Source for enabling of "Main actual value" analog input Selection of binector to control enabling of the analog input ("1" state = enabled) 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline

11.36 Analog outputs

(see also Section 8, Sheets G115 and G116)

Analog output terminals 12 / 13 (actual current display)				
P749 *	Control word for terminal 12 (actual current display) 0 Output with correct sign (positive voltage: Current in torque direction MI) (negative voltage: Current in torque direction MII) 1 Output of absolute value (positive voltage only) 2 Output with sign, inverted (positive voltage: Current in torque direction MII) (negative voltage: Current in torque direction MI) 3 Output of absolute value, inverted (negative voltage only)	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online

Analog output terminals 14 / 15				
P750 *	Source for output value at analog output 1 Selection of connector whose value is to be applied to the analog output 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Online
P751 *	Mode of signal injection at analog output 1 0 = Injection of signal with correct sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P752	Filtering time for analog output 1	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P753	Normalization of analog output 1 $y[V] = x * \frac{P753}{100\%}$ x = Normalization input (corresponds to filtering output) y = Normalization output (corresponds to output voltage at analog output with offset = 0)	-200.00 to 199.99 [V] 0.01V	Ind: None FS=10.00 Type: I2	P052 = 3 P051 = 40 Online
P754	Offset for analog output 1	-10.00 to 10.00 [V] 0.01V	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Online

Analog output terminals 16 / 17				
P755 *	Source for output value at analog output 2 Selection of connector whose value is to be applied to the analog output 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Online
P756 *	Mode of signal injection at analog output 2 0 = Injection of signal with correct sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P757	Filtering time for analog output 2	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P758	Normalization of analog output 2 $y[V] = x * \frac{P758}{100 \%}$ x = Normalization input (corresponds to filtering output) y = Normalization output (corresponds to output voltage at analog output with offset = 0)	-200.00 to 199.99 [V] 0.01V	Ind: None FS=10.00 Type: I2	P052 = 3 P051 = 40 Online
P759	Offset for analog output 2	-10.00 to 10.00 [V] 0.01V	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Online

Analog output terminals 18 / 19

P760 *	Source for output value at analog output 3 Selection of connector whose value is to applied to the analog output 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Online
P761 *	Mode of signal injection at analog output 3 0 = Injection of signal with correct sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P762	Filtering time for analog output 3	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P763	Normalization of analog output 3 $y[V] = x * \frac{P763}{100 \%}$ x = Normalization input (corresponds to filtering output) y = Normalization output (corresponds to output voltage at analog output with offset = 0)	-200.00 to 199.99 [V] 0.01V	Ind: None FS=10.00 Type: I2	P052 = 3 P051 = 40 Online
P764	Offset for analog output 3	-10.00 to 10.00 [V] 0.01V	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Online

Analog output terminals 20 / 21

P765 *	Source for output value at analog output 4 Selection of connector whose value is to applied to the analog output 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Online
P766 *	Mode of signal injection at analog output 4 0 = Injection of signal with correct sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P767	Filtering time for analog output 4	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P768	Normalization of analog output 4 $y[V] = x * \frac{P768}{100 \%}$ x = Normalization input (corresponds to filtering output) y = Normalization output (corresponds to output voltage at analog output with offset = 0)	-200.00 to 199.99 [V] 0.01V	Ind: None FS=10.00 Type: I2	P052 = 3 P051 = 40 Online
P769	Offset for analog output 4	-10.00 to 10.00 [V] 0.01V	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.37 Binary outputs

(see also Section 8, Sheet G112)

P770 *	Control word for binary selectable outputs i001: 0 Binary selectable output at terminal 46 is not inverted 1 Binary selectable output at terminal 46 is inverted i002: 0 Binary selectable output at terminal 48 is not inverted 1 Binary selectable output at terminal 48 is inverted i003: 0 Binary selectable output at terminal 50 is not inverted 1 Binary selectable output at terminal 50 is inverted i004: 0 Binary selectable output at terminal 52 is not inverted 1 Binary selectable output at terminal 52 is inverted	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
P771 *	Source for output value at binary output 1 Selection of binector to be injected at binary selectable output, terminal 46 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Online
P772 *	Source for output value at binary output 2 Selection of binector to be injected at binary selectable output, terminal 48 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Online
P773 *	Source for output value at binary output 3 Selection of binector to be injected at binary selectable output, terminal 50 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Online
P774 *	Source for output value at binary output 4 Selection of binector to be injected at binary selectable output, terminal 52 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Online
P775	Delay for output value at binary output 1 The logic level at the binary selectable output changes only if the internal signal level remains constant for the set delay period (internal signal level changes which do not last as long as this delay period are not switched through to the output)	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P776	Delay for output value at binary output 2 The logic level at the binary selectable output changes only if the internal signal level remains constant for the set delay period (internal signal level changes which do not last as long as this delay period are not switched through to the output)	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P777	Delay for output value at binary output 3 The logic level at the binary selectable output changes only if the internal signal level remains constant for the set delay period (internal signal level changes which do not last as long as this delay period are not switched through to the output)	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
P778	Delay for output value at binary output 4 The logic level at the binary selectable output changes only if the internal signal level remains constant for the set delay period (internal signal level changes which do not last as long as this delay period are not switched through to the output)	0 to 10000 [ms] 1ms	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.38 Configuration of serial interfaces on basic converter

G-SST 1 (RS485 / RS232 on X300) (see also Section 8, Sheet G170 and Section 9)				
P780 *	Selection of protocol for G-SST1 basic converter interface 0 Setting has no function 2 USS protocol 9 For internal factory test purposes	0, 2, 9 1	Ind: None FS=2 Type: O2	P052 = 3 P051 = 40 Offline
P781 *	Number of process data for G-SST1 <u>When P780 = 0 or 9 is selected:</u> Parameter is irrelevant <u>When USS protocol (P780=2) is selected:</u> Number of PZD elements 0 No process data are expected or sent in the USS protocol 1...16 Number of process data words in USS protocol (same number applies to transmission and receipt) The received PZD elements (1 to max. 16) are available at connectors (K2001 to K2016) and, in some cases, bit-serially at binectors for "internal wiring" purposes. The PZD elements to be transmitted (1 to max. 16) are selected in parameters P784.01 to P784.16.	0 to 16 1	Ind: None FS=2 Type: O2	P052 = 3 P051 = 40 Offline
P782 *	Length of parameter jobs for G-SST1 This parameter is effective only when P780=2 (USS protocol). 0 <u>No PKW data</u> are expected or sent in the USS protocol. 3, 4 <u>3 or 4 PKW data words</u> are expected in the USS protocol and 3 or 4 PKW data words are also sent (for transmission of parameter values). 127 Number of PKWs is determined by the telegram length	0, 3, 4, 127 1	Ind: None FS=127 Type: O2	P052 = 3 P051 = 40 Offline
P783 *	Baud rate for G-SST1 1 300 baud 2 600 baud 3 1200 baud 4 2400 baud 5 4800 baud 6 9600 baud 7 19200 baud 8 38400 baud 9 56700 baud 11 93750 baud 13 187500 baud	1 to 13 1	Ind: None FS=6 Type: O2	P052 = 3 P051 = 40 Offline
P784 *	Source for transmit data for G-SST1 Selection of connectors to be transferred as transmit data to the USS master via USS interface 1. i001: Selection for word 1 i002: Selection for word 2 ... i016: Selection for word 16 Applicable settings: 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 16 FS= i001: 32 i002: 167 i003: 0 i004: 33 i005-i016: 0 Type: L2	P052 = 3 P051 = 40 Offline
P785	Bus terminator for G-SST1 0 = Bus terminator OFF 1 = Bus terminator ON	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P786 *	USS bus address for G-SST1 This parameter is functional only when P780=2 (USS protocol). Address via which the unit can be addressed in USS bus operation.	0 to 30 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P787	Telegram failure time for G-SST1 The failure time set in this parameter is valid when setting P780=2 (USS protocol) is selected. 0.000 No time monitoring 0.001...65.000 Time which may elapse between the receipt of two telegrams addressed to the unit before a fault message is activated. Fault message F011 is activated if no valid telegram is received within this time period. Note: The telegram monitoring function is active - from the receipt of the first error-free telegram after connection of the electronics power supply - from the receipt of the first error-free telegram after the telegram monitor has responded (i.e. monitoring timeout).	0.000 to 65.000 [s] 0.001s	Ind: None FS=0.000 Type: O2	P052 = 3 P051 = 40 Offline
P788 *	Source for activation of F011 Selection of binector which will activate fault message F011 when it switches to log. "1" 2030 = binector B2030 2031 = binector B2031	2030, 2031	Ind: None FS=2030 Type: L2	P052 = 3 P051 = 40 Offline
r789	Diagnostic information for G-SST1 Free-running counter, overflow at 65535 i001: Number of <u>error-free</u> telegrams i002: Number of <u>errored</u> telegrams: Byte frame, parity, overrun or BCC error i003: Number of byte frame errors i004: Number of overrun errors i005: Parity error i006: STX error: Start interval before STX not observed, telegram residual transfer time not observed, delay time of LGE character too long, erroneous STX, i.e. ≠ 02 i007: Violation of telegram residual transfer time i008: Block check error i009: Incorrect telegram length: With P782=3 or 4 only: The length of the received telegram is ≠ P781 + P782 (Note: If the received values are correct, they will be processed even when this error has been detected) i010: Timeout error: No valid telegram has been received for a period exceeding the setting in P787. After the occurrence of a timeout error, this counter is not activated again until the next valid telegram is received.		Ind: 10 Type: O2	P052 = 3

G-SST 2 (RS485 on X172) (see also Section 8, Sheets G171 and G173 and Section 9)

P790 *	Selection of protocol for G-SST2 basic converter interface 0 Setting has no function 2 USS protocol 5 "Peer-to-peer" communication 9 For internal factory test purposes	0, 2, 5, 9 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P791 *	Number of process data for G-SST2 <u>When P790 = 0 or 9 is selected:</u> Parameter is irrelevant <u>When USS protocol (P790=2) is selected:</u> Number of PZD elements 0 No process data are expected or sent in the USS protocol 1...16 Number of process data words in USS protocol (same number applies to transmission and receipt) The received PZD elements (1 to max. 16) are available at connectors (K6001 to K6016) and, in some cases, bit-serially at binectors for "internal wiring" purposes. The PZD elements to be transmitted (1 to max. 16) are selected in parameters P794.01 to P794.16. <u>When peer-to-peer (P790= 5) is selected:</u> Number of transferred words 0 Illegal setting 1...5 Number of transferred words 6...16 Illegal setting	0 to 16 1	Ind: None FS=2 Type: O2	P052 = 3 P051 = 40 Offline
P792 *	Length of parameter jobs for G-SST2 This parameter is effective only when P790=2 (USS protocol). 0 <u>No PKW data</u> are expected or sent in the USS protocol. 3, 4 <u>3 or 4 PKW data words</u> are expected in the USS protocol and 3 or 4 PKW data words are also sent (for transmission of parameter values). 127 Number of PKWs is determined by the telegram length	0, 3, 4, 127 1	Ind: None FS=127 Type: O2	P052 = 3 P051 = 40 Offline
P793 *	Baud rate for G-SST2 1 300 baud 2 600 baud 3 1200 baud 4 2400 baud 5 4800 baud 6 9600 baud 7 19200 baud 8 38400 baud 9 56700 baud 11 93750 baud 13 187500 baud	1 to 13 1	Ind: None FS=6 Type: O2	P052 = 3 P051 = 40 Offline
P794 *	Source for transmit data for G-SST2 Selection of connectors to be transferred as <u>transmit data</u> via basic converter interface 2 <u>When USS protocol (P790=2) is selected:</u> i001: Selection for word 1 i002: Selection for word 2 ... i016: Selection for word 16 <u>When peer-to-peer (P790=5) is selected:</u> i001: Selection for word 1 i002: Selection for word 2 ... i005: Selection for word 5 i006: Not used ... i016: Not used Applicable settings: 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 16 FS= i001: 32 i002: 167 i003: 0 i004: 33 i005-i016: 0 Type: L2	P052 = 3 P051 = 40 Offline
P795	Bus terminator for G-SST2 0 = Bus terminator OFF 1 = Bus terminator ON	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P796 *	USS bus address for G-SST2 This parameter is functional only when P790=2 (USS protocol). Address via which the unit can be addressed in USS bus operation.	0 to 30 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P797	Telegram failure time for G-SST2 The failure time set in this parameter is valid when setting P790=2 (USS protocol) or P790=5 (peer-to-peer) is selected. 0.000 No time monitoring 0.001...65.000 Time which may elapse between the receipt of two telegrams addressed to the unit before a fault message is activated. Fault message F012 is activated if no valid telegram is received within this time period. Note: The telegram monitoring function is active - from the receipt of the first error-free telegram after connection of the electronics power supply - from the receipt of the first error-free telegram after the telegram monitor has responded (i.e. monitoring timeout). Since the telegram transfer time is dependent on the set baud rate, the following minimum setting values for P797 are recommended: Baud rate as set in P793: Recommended minimum value for P797: 300 baud 0.520s 600 baud 0.260s 1200 baud 0.140s 2400 baud 0.080s ≥ 4800 baud 0.040s Note: If the "Automatic restart" function is selected (P086>0) on the peer-to-peer communication partner, then only a parameter setting of P797>P086 (on the communication partner) is meaningful.	0.000 to 65.000 [s] 0.001s	Ind: None FS=0.000 Type: O2	P052 = 3 P051 = 40 Offline
P798 *	Source for activation of F012 Selection of binector which will activate fault message F012 when it switches to log. "1" 6030 = binector B6030 6031 = binector B6031	6030, 6031	Ind: None FS=6030 Type: L2	P052 = 3 P051 = 40 Offline
r799	Diagnostic information for G-SST2 Free-running counter, overflow at 65535 i001: Number of <u>error-free</u> telegrams i002: Number of <u>errored</u> telegrams: Byte frame, parity, overrun or BCC error i003: Number of byte frame errors i004: Number of overrun errors i005: Parity error i006: STX error: Start interval before STX not observed, telegram residual transfer time not observed, delay time of LGE character too long, erroneous STX, i.e. ≠ 02 i007: Violation of telegram residual transfer time (USS prot. only) i008: Block check error i009: Incorrect telegram length: With P792=3 or 4 only: The length of the received telegram is ≠ P791 + P792 (Note: If the received values are correct, they will be processed even when this error has been detected) i010: Timeout error: No valid telegram has been received for a period exceeding the setting in P797. After the occurrence of a timeout error, this counter is not activated again until the next valid telegram is received.		Ind: 10 Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
G-SST 3 (RS485 on X162) (see also Section 8, Sheets G172 and G174 and Section 9)				
P800 *	Selection of protocol for G-SST3 basic converter interface 0 Setting has no function 2 USS protocol 5 "Peer-to-peer" communication 9 For internal factory test purposes	0, 2, 5, 9 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P801 *	Number of process data for G-SST3 <u>When P800 = 0 or 9 is selected:</u> Parameter is irrelevant <u>When USS protocol (P800=2) is selected:</u> Number of PZD elements 0 No process data are expected or sent in the USS protocol 1...16 Number of process data words in USS protocol (same number applies to transmission and receipt) The received PZD elements (1 to max. 16) are available at connectors (K6001 to K6016) and, in some cases, bit-serially at binectors for "internal wiring" purposes. The PZD elements to be transmitted (1 to max. 16) are selected in parameters P804.01 to P804.16. <u>When peer-to-peer (P800= 5) is selected:</u> Number of transferred words 0 Illegal setting 1...5 Number of transferred words 6...16 Illegal setting	0 to 16 1	Ind: None FS=2 Type: O2	P052 = 3 P051 = 40 Offline
P802 *	Length of parameter jobs for G-SST3 This parameter is effective only when P800=2 (USS protocol). 0 <u>No PKW data</u> are expected or sent in the USS protocol. 3, 4 <u>3 or 4 PKW data words</u> are expected in the USS protocol and 3 or 4 PKW data words are also sent (for transmission of parameter values). 127 Number of PKWs is determined by the telegram length	0, 3, 4, 127 1	Ind: None FS=127 Type: O2	P052 = 3 P051 = 40 Offline
P803 *	Baud rate for G-SST3 1 300 baud 2 600 baud 3 1200 baud 4 2400 baud 5 4800 baud 6 9600 baud 7 19200 baud 8 38400 baud 9 56700 baud 11 93750 baud 13 187500 baud	1 to 13 1	Ind: None FS=6 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P804 *	Source for transmit data for G-SST3 Selection of connectors to be transferred as <u>transmit data</u> via basic converter interface 3 <u>When USS protocol (P800=2) is selected:</u> i001: Selection for word 1 i002: Selection for word 2 ... i016: Selection for word 16 <u>When peer-to-peer (P800=5) is selected:</u> i001: Selection for word 1 i002: Selection for word 2 ... i005: Selection for word 5 i006: Not used ... i016: Not used Applicable settings: 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 16 FS= i001: 32 i002: 167 i003: 0 i004: 33 i005-i016: 0 Type: L2	P052 = 3 P051 = 40 Offline
P805	Bus terminator for G-SST3 0 = Bus terminator OFF 1 = Bus terminator ON	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P806 *	USS bus address for G-SST3 This parameter is functional only when P800=2 (USS protocol). Address via which the unit can be addressed in USS bus operation.	0 to 30 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
P807	Telegram failure time for G-SST3 The failure time set in this parameter is valid when setting P800=2 (USS protocol) or P800=5 (peer-to-peer) is selected. 0.000 No time monitoring 0.001...65.000 Time which may elapse between the receipt of two telegrams addressed to the unit before a fault message is activated. Fault message F013 is activated if no valid telegram is received within this time period. Note: The telegram monitoring function is active - from the receipt of the first error-free telegram after connection of the electronics power supply - from the receipt of the first error-free telegram after the telegram monitor has responded (i.e. monitoring timeout). Since the telegram transfer time is dependent on the set baud rate, the following minimum setting values for P807 are recommended: Baud rate as set in P803: Recommended minimum value for P807: 300 baud 0.520s 600 baud 0.260s 1200 baud 0.140s 2400 baud 0.080s ≥ 4800 baud 0.040s Note: If the "Automatic restart" function is selected (P086>0) on the peer-to-peer communication partner, then only a parameter setting of P807>P086 (on the communication partner) is meaningful.	0.000 to 65.000 [s] 0.001s	Ind: None FS=0.000 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P808 *	Source for activation of F013 Selection of binector which will activate fault message F013 when it switches to log. "1" 9030 = binector B9030 9031 = binector B9031	9030, 9031	Ind: None FS=9030 Type: L2	P052 = 3 P051 = 40 Offline
r809	Diagnostic information for G-SST3 Free-running counter, overflow at 65535 i001: Number of <u>error-free</u> telegrams i002: Number of <u>errored</u> telegrams: Byte frame, parity, overrun or BCC error i003: Number of byte frame errors i004: Number of overrun errors i005: Parity error i006: STX error: Start interval before STX not observed, telegram residual transfer time not observed, delay time of LGE character too long, erroneous STX, i.e. ≠ 02 i007: Violation of telegram residual transfer time (USS prot. only) i008: Block check error i009: Incorrect telegram length: With PP802=3 or 4 only: The length of the received telegram is ≠ P801 + P802 (Note: If the received values are correct, they will be processed even when this error has been detected) i010: Timeout error: No valid telegram has been received for a period exceeding the setting in P807. After the occurrence of a timeout error, this counter is not activated again until the next valid telegram is received.		Ind: 10 Type: O2	P052 = 3
r810	Receive data on G-SST1 Display of data received via USS interface 1 i001: Display process data word 1 ... i016: Display process data word 16 i017: Display parameter data word 1 ... i020: Display parameter data word 4	0000 to FFFF H 1	Ind: 20 Type: L2	P052 = 3
r811	Transmit data on G-SST1 Display of data transmitted via USS interface 1 i001: Display process data word 1 ... i016: Display process data word 16 i017: Display parameter data word 1 ... i020: Display parameter data word 4	0000 to FFFF H 1	Ind: 20 Type: L2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
r812	Receive data on G-SST2 <u>When USS protocol (P790=2) is selected:</u> Display of data received via USS interface 2 i001: Display process data word 1 ... i016: Display process data word 16 i017: Display parameter data word 1 ... i020: Display parameter data word 4 <u>When peer-to-peer (P790=5) is selected:</u> Display of data received via peer-to-peer interface 2 i001: Receive data word 1 ... i005: Receive data word 5 i006: Not used ... i020: Not used	0000 to FFFF H 1	Ind: 20 Type: L2	P052 = 3
r813	Transmit data on G-SST2 <u>When USS protocol (P790=2) is selected:</u> Display of data transmitted via USS interface 2 i001: Display process data word 1 ... i016: Display process data word 16 i017: Display parameter data word 1 ... i020: Display parameter data word 4 <u>When peer-to-peer (P790=5) is selected:</u> Display of data transmitted via peer-to-peer interface 2 i001: Transmit data word 1 ... i005: Transmit data word 5 i006: Not used ... i020: Not used	0000 to FFFF H 1	Ind: 20 Type: L2	P052 = 3
r814	Receive data on G-SST3 <u>When USS protocol (P800=2) is selected:</u> Display of data received via USS interface 3 i001: Display process data word 1 ... i016: Display process data word 16 i017: Display parameter data word 1 ... i020: Display parameter data word 4 <u>When peer-to-peer (P800=5) is selected:</u> Display of data received via peer-to-peer interface 3 i001: Receive data word 1 ... i005: Receive data word 5 i006: Not used ... i020: Not used	0000 to FFFF H 1	Ind: 20 Type: L2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
r815	Transmit data on G-SST3 <u>When USS protocol (P800=2) is selected:</u> Display of data transmitted via USS interface 3 i001: Display process data word 1 ... i016: Display process data word 16 i017: Display parameter data word 1 ... i020: Display parameter data word 4 <u>When peer-to-peer (P800=5) is selected:</u> Display of data transmitted via peer-to-peer interface 3 i001: Transmit data word 1 ... i005: Transmit data word 5 i006: Not used ... i020: Not used	0000 to FFFF H 1	Ind: 20 Type: L2	P052 = 3

Peer-to-peer interfaces: Enable transmission and receipt of telegrams:

If transmission on a peer-to-peer interface is disabled, the associated output drivers are connected to high impedance. If reception is disabled on a peer-to-peer interface, then the telegram failure monitoring function is deactivated.

P816	Peer-to-peer 2: Source for data reception enabling command 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P817	Peer-to-peer 2: Source for data transmission enabling command 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P818	Peer-to-peer 3: Source for data reception enabling command 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline
P819	Peer-to-peer 3: Source for data transmission enabling command 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline

11.39 Deactivation of monitoring functions



WARNING

If monitoring functions are deactivated, there may be a risk to the safety of operating personnel or of substantial property damage if a fault or error actually occurs!

P820 *	Deactivation of fault messages The numbers of all fault messages to be deactivated must be entered in this parameter. Fault numbers can be entered in any order. 0 must be entered for any unused indices of the parameter. Factory setting: i001 = 7 (overvoltage) i002 = 18 (short circuit at binary outputs) i003 = 31 (monitoring of speed controller) i004 = 35 (drive blocked) i005 = 36 (armature current cannot flow) i006 = 37 (I ² t motor monitoring function has responded) i007 to i099 = 0	0 to 147 1	Ind: 99 FS= see column on left Type: O2	P052 = 3 P051 = 40 Online
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P821 *	Deactivation of alarms The numbers of all alarm messages to be deactivated must be entered in this parameter. Alarm numbers can be entered in any order. 0 must be entered for any unused indices of the parameter.	0 to 147 1	Ind: 99 FS= 0 Type: O2	P052 = 3 P051 = 40 Online

11.40 Compensation values

r824	A7006 compensation values These data contain compensation values for the analog section of electronics board A7006	0 to 65535 1	Ind: 10 Type: O2	P052 = 3
P825	Offset compensation for actual field current channel These data contain compensation values for the actual field current sensing function. They are automatically set during "Restore factory settings" (P051=21) and during the automatic offset compensation run (P051=22).	13000 to 25000 1	Ind: 3 FS=19139 Type: O2	P052 = 3 P051 = 40 Online
P826	Correction of natural commutation timing If there is a variation in the armature current peak value (in spite of a constant firing angle), it can be corrected by offsetting the firing angle reference time of the appropriate line phase in parameter P826. One line phase (UV, UW, VW, VU, WU, WV) is assigned to each parameter index (i001 to i006). Increasing the parameter setting by a value of 1 corresponds to an increase of 1.333 µs in the firing angle (0.024 degrees at 50Hz line frequency), consequently reducing the armature current peak in the appropriate line phase. P826 is automatically set during the optimization run for precontrol and current controller (armature and field) (P051=25) (only when U800=0; when U800=1 or 2, parameters P826.001 to 006 are set to 0). Caution: Even an asymmetrical system causes variations in the magnitude of armature current peaks. However, the system asymmetry may also change.	-100 to 100 * 1.333 [µs] 1.333µs	Ind: 6 FS=0 Type: I2	P052 = 3 P051 = 40 Online
r827	Internal diagnosis i001: Number of write access operations to EEPROM i002: Number of Page-Write access operations to EEPROM i003: Counter for DUAL-PORT RAM timeouts	0 to 65535 1	Ind: 3 Type: O2	P052 = 3
r828	MLFB data These data contain details about the power section design (model)	0 to 65535 1	Ind: 16 Type: O2	P052 = 3
r829	A7001 compensation values These data contain compensation values for the analog section of electronics board A7001	0 to 65535 1	Ind: 68 Type: O2	P052 = 3

11.41 Thyristor diagnosis

P830 *	Control word for thyristor diagnosis 0 Thyristor check function deactivated 1 Thyristors are checked on initial SWITCH-ON or INCHING command after connection of the electronics supply voltage. 2 Thyristors are checked on every SWITCH-ON or INCHING command. 3 Thyristors will be checked on the next SWITCH-ON or INCHING command. Parameter P830 is set to 0 if no fault is detected. Note: The thyristor check function may not be activated (setting P830=0 must be selected) – when the "Enable a torque direction for torque direction change by parallel drive" function is in use (see also parameter P165) or – when the converter is used to supply large inductances (e.g. field supply from armature terminals, supply of lifting solenoids, etc.).	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.42 Parameters for SIMOVIS and OP1S

P831 to r849	Parameters for the Trace function of SIMOVIS These parameters are settings for the data exchange between SIMOVIS and the SIMOREG converter. They must <u>not</u> be changed!			P052 = 3
r850 to P899	Parameters for the OP1S These parameters are settings for the data exchange between OP1S and the SIMOREG converter. They must <u>not</u> be changed!			P052 = 3

11.43 Profile parameters

P918	CB bus address Protocol-dependent bus address for communication boards Note: The validity of the bus address is monitored by the communication board. (Bus addresses 0 to 2 are reserved for Master stations on PROFIBUS boards and must not therefore be set for other purposes). If the value is not accepted by the COM BOARD, fault F080 is displayed with fault value 5	0 to 200 1	Ind: 2 FS=3 Type: O2	P052 = 3 P051 = 40 Offline
P927 *	Parameterization enable Enabling of interfaces for parameterization. A parameter value can only be altered via an enabled interface. 0: None 1: Communications board (CB) 2: Parameterizing unit (PMU) 4: G-SST1 serial interface and OP1S 8: Reserved 16: Technology board (TB) 32: G-SST2 serial interface 64: G-SST3 serial interface Setting information: Every interface has a numeric code. The number for one specific interface, or the sum of various numbers assigned to several interfaces, must be entered in this parameter in order to enable the relevant interface(s) for use as a parameterization interface. Example: Factory setting value 6 (=4+2) means that the PMU and G-SST1 interfaces are enabled for parameterization purposes.	0 to 127 1	Ind: None FS=6 Type: V2	P052 = 3 P051 = 40 Offline

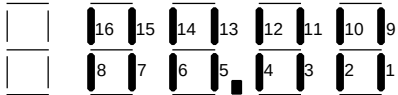
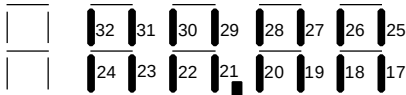
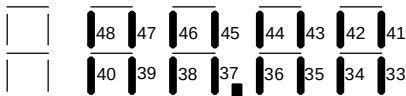
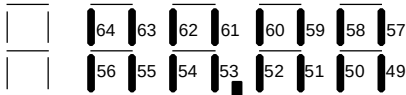
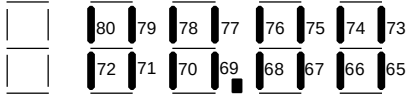
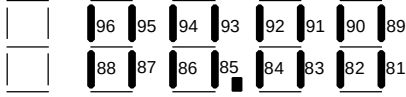
PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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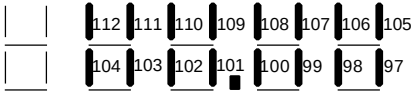
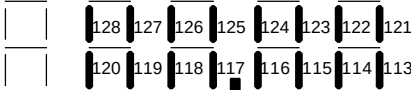
11.44 Fault memory, alarm parameters

r947	Fault memory Display of fault messages generated in response to recent faults. A <u>fault value</u> and <u>fault time</u> is assigned to each <u>fault number</u> (see Section 10 for details of fault numbers and fault values). The interrelationship between the associated parameters is shown in the diagram below. The <u>fault numbers</u> of the last (maximum 8) fault events are stored under the indices of parameter P947. r947.001 displays the fault number of the current (still not acknowledged) fault, index 9 displays the number of the most recent acknowledged fault, index 17 the fault number of the second most recent acknowledged fault, etc. An entry of "0" means that no "earlier" fault has occurred. Since only one fault message can be stored with respect to any fault event on the SIMOREG CM, only indices 1, 9, 17, 25, 33, 41, 49 and 57 are relevant. A <u>fault value</u> is assigned to each fault number in the corresponding index of parameter r949. This provides further information about the nature of the fault. In addition, the <u>fault time</u> (the current reading of the hours run counter as the fault occurred (r048)), is stored for each fault in r049. The data for the current (not yet acknowledged) fault are stored as the "Hours run counter reading" in index 1. The data for earlier, already acknowledged faults are stored under the following indices. Plaintext information about the fault numbers is available under the corresponding index of parameter r951. When the electronics power supply fails, only fault numbers and fault values are stored, but fault times are lost (all indices are set to "0" on recovery of the power supply).		Ind: 64 Type: O2	P052 = 3
r949	Fault value Fault value of faults, allows more detailed diagnosis for a variety of parameters. The fault values are stored in the same indices as the associated fault numbers (r947) - see parameter r947.		Ind: 64 Type: O2	P052 = 3
r951	Fault text	0 to 65535 1	Ind: 101 Type: O2	P052 = 3
r952	Number of faults	0 to 65535 1	Ind: None Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.45 Visualization parameters: Alarms, control and status word

r953	Alarm parameter 1 Display of active alarms in bit-coded form (A001 to A016). If one of the alarms between 1 and 16 is generated, the corresponding segment in the display lights up.  See Section 10.2 for meaning of individual alarms.		Ind: None Type: V2	P052 = 3
r954	Alarm parameter 2 Display of active alarms in bit-coded form (A017 to A032). If one of the alarms between 17 and 32 is generated, the corresponding segment in the display lights up.  See Section 10.2 for meaning of individual alarms		Ind: None Type: V2	P052 = 3
r955	Alarm parameter 3 Parameter alarms 3 If one of the alarms between 33 and 48 is generated, the corresponding segment in the display lights up. 		Ind: None Type: V2	P052 = 3
r956	Alarm parameter 4 Parameter alarms 4 If one of the alarms between 49 and 64 is generated, the corresponding segment in the display lights up. 		Ind: None Type: V2	P052 = 3
r957	Alarm parameter 5 Parameter alarms 5 If one of the alarms between 65 and 80 is generated, the corresponding segment in the display lights up.. 		Ind: None Type: V2	P052 = 3
r958	Alarm parameter 6 Parameter alarms 6 (CB alarms) If one of the alarms between 81 and 96 is generated, the corresponding segment in the display lights up. 		Ind: None Type: V2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
r959	Alarm parameter 7 Parameter alarms 7 (TB alarms 1) If one of the alarms between 97 and 112 is generated, the corresponding segment in the display lights up. 		Ind: None Type: V2	P052 = 3
r960	Alarm parameter 8 Parameter alarms 8 (TB alarms 2) If one of the alarms between 113 and 128 is generated, the corresponding segment in the display lights up. 		Ind: None Type: V2	P052 = 3
r967	Display of control word 1 Visualization parameter for control word 1 (bits 0-15) Identical to r650 (control word 1)		Ind: None Type: V2	P052 = 3
r968	Display of status word 1 Visualization parameter for status word 1 (bits 0 - 15) Identical to r652 (status word 1)		Ind: None Type: V2	P052 = 3

11.46 Resetting and storing parameters, list of existing and modified P and r parameters

P970 *	Restore factory setting Reset parameters to factory setting (default) 0: Parameter reset: All parameters are reset to their original values (factory setting). This parameter is then automatically reset to 1. 1: No parameter reset Note: Function can also be selected by setting P051=21.	0 to 1 1	Ind: None FS=1 Type: O2	P052 = 3 P051 = 40 Offline
P971 *	EEPROM transfer Transfer of parameter values from RAM to EEPROM on switchover from 0 to 1. It takes approximately 15s to process all values. The PMU remains in value mode for this period.	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
r980	List of existing parameter numbers, start Visualization parameter for displaying the first 100 parameter numbers in the P or r parameter range (0 to 999). The parameter numbers are listed in ascending sequence. Repetition of a number over several indices means that there are no further parameter numbers in the 0 to 999 range. The list is continued at the parameter whose number is displayed under index 101. See also r989		Ind: 101 Type: O2	P052 = 3
r981	List of existing parameter numbers, continuation See r980.		Ind: 101 Type: O2	P052 = 3
r982	List of existing parameter numbers, continuation See r980.		Ind: 101 Type: O2	P052 = 3
r983	List of existing parameter numbers, continuation See r980.		Ind: 101 Type: O2	P052 = 3
r984	List of existing parameter numbers, continuation See r980.		Ind: 101 Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
r985	List of existing parameter numbers, continuation See r980.		Ind: 101 Type: O2	P052 = 3
r986	List of existing parameter numbers, continuation See r980.		Ind: 101 Type: O2	P052 = 3
r987	List of existing parameter numbers, continuation See r980.		Ind: 101 Type: O2	P052 = 3
r988	List of existing parameter numbers, continuation See r980.		Ind: 101 Type: O2	P052 = 3
r989	List of existing parameter numbers, continuation Continuation of the list can be found under index 101. Please note: 860 = r860 (TECH BOARD installed) 2980 = n980 See also r980.		Ind: 101 Type: O2	P052 = 3
r990	List of modified parameter numbers, start Visualization parameter for displaying the first 100 modified parameters in the P or r parameter range (0 to 999). The parameter numbers are listed in ascending sequence. Repetition of a number over several indices means that there are no further modified parameters in the 0 to 999 range. The list is continued at the parameter whose number is displayed under index 101. See also r999.		Ind: 101 Type: O2	P052 = 3
r991	List of modified parameter numbers, continuation See r990.		Ind: 101 Type: O2	P052 = 3
r992	List of modified parameter numbers, continuation See r990.		Ind: 101 Type: O2	P052 = 3
r993	List of modified parameter numbers, continuation See r990.		Ind: 101 Type: O2	P052 = 3
r994	List of modified parameter numbers, continuation See r990.		Ind: 101 Type: O2	P052 = 3
r995	List of modified parameter numbers, continuation See r990.		Ind: 101 Type: O2	P052 = 3
r996	List of modified parameter numbers, continuation See r990.		Ind: 101 Type: O2	P052 = 3
r997	List of modified parameter numbers, continuation See r990.		Ind: 101 Type: O2	P052 = 3
r998	List of modified parameter numbers, continuation See r990.		Ind: 101 Type: O2	P052 = 3
r999	List of modified parameter numbers, continuation Continuation of the list can be found under index 101. Please note: 2990 = n990 See also r990.		Ind: 101 Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.47 Password protection, key/lock mechanism

Key/lock mechanism

To prevent unintended parameterization of the devices and to protect the know-how stored in the parameterization, you can restrict access to the (basic converter) parameters and define your own passwords (=pairs of numbers that you can choose). This done in parameters:

- **U005** key and
- **U006** lock.

If U005 and U006 are parameterized differently, it is only possible to access the following parameters:

- All visualization parameters (rxxx, nxxx)
- All parameters that can be changed with P051 = 0 (See parameter list)
- All "user parameters" (see Parameter U007)
- All parameter of technology boards (T100, T300, T400)

All other parameters neither be read nor altered.

Only when U005 and U006 are parameterized to the same values, are these restrictions removed again.

When using the key-lock-mechanism you should follow this procedure:

1. Program the den lock parameter U006 in both parameter indices with your specific password.
2. Set Parameter P051 to the value 0. This activates the password you have just set (in U006).

After that, P051 can be set to 40 again and the password protection remains active.

Examples:

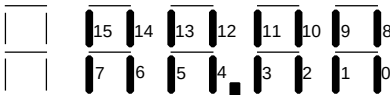
Lock	Key	Result
U006.1 = 0 (factory setting) U006.2 = 0	U005.1 = 0 (factory setting) U005.2 = 0	The key and lock are parameterized identically, all parameters are accessible
U006.1 = 12345 U006.2 = 54321	U005.1 = 0 U005.2 = 0	The key and lock are parameterized <u>differently</u> , only the visualization parameters, the parameters that can be altered with P051=0, and the "user parameters" are accessible
U006.1 = 12345 U006.2 = 54321	U005.1 = 12345 U005.2 = 54321	The key and lock are parameterized identically, all parameters are accessible

NOTE: If you forget or lose your password, you can only regain access to all parameters by restoring the factory setting (P051=21).

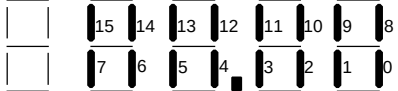
U005 (2005) *	Key Parameter for entering the keys for the key/lock mechanism	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 P051 = 0 on-line
U006 (2006) *	Lock Parameter for entering the password for the key/lock mechanism	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 P051 = 40 on-line
U007 (2007) *	Numbers of the user parameters Parameters for entering the numbers of those parameters that are to be accessible if the key and lock are set differently. NOTE: Parameters U000 to U999 must be entered as 2000 to 2999	0 to 999 2000 to 2005 2008 to 2999 1	Ind: 100 FS=0 Type: O2	P052 = 3 P051 = 40 on-line

11.48 Display parameters for technology functions with S00

Parameters apply only if optional S00 technology software is installed

Connector/binector converters				
n010 (2010) S00	Connector/binector converter 1 (bit field 1) Displays the status of the bits in the bit field on the bars of the 7-segment display  Segment alight: Bit (binector) = log. "1" state Segment dark: Bit (binector) = log. "0" state	FB 10	Ind: None Type: V2	P052 = 3
n011 (2011) S00	Connector/binector converter 2 (bit field 2) As for n010	FB 11	Ind: None Type: V2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
n012 (2012) S00	Connector/binector converter 3 (bit field 3) As for n010	FB 12	Ind: None Type: V2	P052 = 3

Binector/connector converters				
n013 (2013) S00	Binector/connector converter 1 (bit field 4) Displays the status of the bits in the bit field on the bars of the 7-segment display  Segment alight: Bit = log. "1" state Segment dark: Bit = log. "0" state	FB 13	Ind: None Type: V2	P052 = 3
n014 (2014) S00	Binector/connector converter 2 (bit field 5) As for n013	FB 14	Ind: None Type: V2	P052 = 3
n015 (2015) S00	Binector/connector converter 3 (bit field 6) As for n013	FB 15	Ind: None Type: V2	P052 = 3

Technology controller				
n016 (2016) S00	Actual value display	FB 260	-200.0 to 199.9 [%] 0.1	Ind: None Type: I2 P052 = 3
n017 (2017) S00	Setpoint display	FB 260	-200.0 to 199.9 [%] 0.1	Ind: None Type: I2 P052 = 3
n018 (2018) S00	Display of effective Kp factor	FB 260	0.00 to 30.00 0.01	Ind: None Type: O2 P052 = 3
n019 (2019) S00	Display of technology controller output	FB 260	-200.0 to 199.9 [%] 0.1	Ind: None Type: I2 P052 = 3

Velocity/speed calculator				
n020 (2020) S00	Display of actual speed	FB 261	-200.0 to 199.9 [%] 0.1	Ind: None Type: I2 P052 = 3
n021 (2021) S00	Display of actual velocity	FB 261	-32.768 to 32767 [m/s] 0.001	Ind: None Type: I2 P052 = 3
n022 (2022) S00	Display of setpoint velocity	FB 261	-32.768 to 32767 [m/s] 0.001	Ind: None Type: I2 P052 = 3
n023 (2023) S00	Display of setpoint speed	FB 261	-200.0 to 199.9 [%] 0.1	Ind: None Type: I2 P052 = 3

11.49 Settable fixed values

[SW 1.8 and later]

Only active with optional technology software S00

U099 (2099) S00	Fixed value The values set in Index .001 to .100 are connected to connectors K9501 to K9600	[SW 1.8 and later] -199.99 to 199.99 [%] 0.01%	Ind: 100 FS=0.00 Type: I2	P052 = 3 P051 = 40 on-line
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.50 Activation of fault messages and alarm messages

Only active with optional technology software S00

U100 (2100) * S00	Source for the activation of F023 and F019 FB 2, FB 286 Selection of the binectors that activate fault messages F023 or F019 on log. "1" 0 = Binector B0000 1 = Binector B0001 etc. Up to SW 1.7: F023 (without fault value) if binector = 1 (FB 2) SW 1.8 and later: i001: F023 with fault value 1 (FB 2) i002: F023 with fault value 2 i003: F023 with fault value 3 i004: F023 with fault value 4 i005: F019 with fault value 1 (FB 286) i006: F019 with fault value 2 i007: F019 with fault value 3 i008: F019 with fault value 4	All binector numbers 1	Ind: None [up to SW1.7] 8 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U101 (2101) * S00	Source for the activation of F024 and F020 FB 3, FB 287 Selection of the binectors that activate fault messages F024 or F020 on log. "1" 0 = Binector B0000 1 = Binector B0001 etc. Up to SW 1.7: F024 (without fault value) if binector = 1 (FB 3) SW 1.8 and later: i001: F024 with fault value 1 (FB 3) i002: F024 with fault value 2 i003: F024 with fault value 3 i004: F024 with fault value 4 i005: F020 with fault value 1 (FB 287) i006: F020 with fault value 2 i007: F020 with fault value 3 i008: F020 with fault value 4	All binector numbers 1	Ind: None [up to SW1.7] 8 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U102 (2102) * S00	Source for the activation of F033 and F053 FB 4, FB 288 Selection of the binectors that activate fault messages F033 or F053 on log. "1" 0 = Binector B0000 1 = Binector B0001 etc. Up to SW 1.7: F033 (without fault value) if binector = 1 (FB 4) SW 1.8 and later: i001: F033 with fault value 1 (FB 4) i002: F033 with fault value 2 i003: F033 with fault value 3 i004: F033 with fault value 4 i005: F053 with fault value 1 (FB 288) i006: F053 with fault value 2 i007: F053 with fault value 3 i008: F053 with fault value 4	All binector numbers 1	Ind: None [up to SW1.7] 8 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U103 (2103) * S00	Source for the activation of F034 and F054 FB 5, FB 289 Selection of the binectors that activate fault messages F034 or F054 on log. "1" 0 = Binector B0000 1 = Binector B0001 etc. Up to SW 1.7: F034 (without Fault value) if binector = 1 (FB 5) SW 1.8 and later: i001: F034 with fault value 1 (FB 5) i002: F034 with fault value 2 i003: F034 with fault value 3 i004: F034 with fault value 4 i005: F054 with fault value 1 (FB 289) i006: F054 with fault value 2 i007: F054 with fault value 3 i008: F054 with fault value 4	All binector numbers 1	Ind: None [up to SW1.7] 8 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U104 (2104) * S00	Source for the activation of A023 and A019 FB 6, FB 256 Selection of the binectors that activate alarm A023 or A019 on log. "1" 0 = Binector B0000 1 = Binector B0001 etc. Up to SW 1.7: A023 (FB 6) SW 1.8 and later: i001: A023 (FB 6) i002: A019 (FB 256)	All binector numbers 1	Ind: None [up to SW1.7] 2 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U105 (2105) * S00	Source for the activation of A024 and A020 FB 7, FB 257 Selection of the binectors that activate alarm A024 or A020 on log. "1" 0 = Binector B0000 1 = Binector B0001 etc. Up to SW 1.7: A024 (FB 7) SW 1.8 and later: i001: A024 (FB 7) i002: A020 (FB 257)	All binector numbers 1	Ind: None [up to SW1.7] 2 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U106 (2106) * S00	Source for the activation of A033 and A053 FB 8, FB 258 Selection of the binectors that activate alarm A033 or A053 on log. "1" 0 = Binector B0000 1 = Binector B0001 etc. Up to SW 1.7: A033 (FB 8) SW 1.8 and later: i001: A033 (FB 8) i002: A053 (FB 258)	All binector numbers 1	Ind: None [up to SW1.7] 2 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U107 (2107) * S00	Source for the activation of A034 and A054 FB 9, FB 259 Selection of the binectors that activate alarm A034 or A054 on log. "1" 0 = Binector B0000 1 = Binector B0001 etc. Up to SW 1.7: A034 (FB 9) SW 1.8 and later: i001: A034 (FB 9) i002: A054 (FB 259)	All binector numbers 1	Ind: None [up to SW1.7] 2 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.51 Connector/binector converters, binector/connector converters

Parameters apply only if optional S00 technology software is installed

U110 (2110) * S00	Source for connector/binector converter 1 FB 10 Connector which must be converted to binectors B9052 (bit 0) to B9067 (bit 15) 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U111 (2111) * S00	Source for connector/binector converter 2 FB 11 Connector which must be converted to binectors B9068 (bit 0) to B9083 (bit 15) 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U112 (2112) * S00	Source for connector/binector converter 3 FB 12 Connector which must be converted to binectors B9084 (bit 0) to B9099 (bit 15) 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U113 (2113) * S00	Source for binector/connector converter 1 FB 13 Binectors which must be converted to connector K9113 i001: 1 st binector (bit 0) i002: 2 nd binector (bit 1) ... i016: 16 th binector (bit 15) Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 16 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U114 (2114) * S00	Source for binector/connector converter 2 FB 14 Binectors which must be converted to connector K9114 i001: 1 st binector (bit 0) i002: 2 nd binector (bit 1) ... i016: 16 th binector (bit 15) Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 16 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U115 (2115) * S00	Source for binector/connector converter 3 FB 15 Binectors which must be converted to connector K9115 i001: 1 st binector (bit 0) i002: 2 nd binector (bit 1) ... i016: 16 th binector (bit 15) Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 16 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.52 Binector/connector converter for serial interfaces

U116 (2116) *	Source for binector/connector converter for GSST1 Binectors which must be converted to connector K2020 i001: 1 st binector (bit 0) i002: 2 nd binector (bit 1) ... i016: 16 th binector (bit 15) Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 16 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U117 (2117) *	Source for binector/connector converter for GSST2 Binectors which must be converted to connector K6020 i001: 1 st binector (bit 0) i002: 2 nd binector (bit 1) ... i016: 16 th binector (bit 15) Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 16 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U118 (2115) *	Source for binector/connector converter for GSST3 Binectors which must be converted to connector K9020 i001: 1 st binector (bit 0) i002: 2 nd binector (bit 1) ... i016: 16 th binector (bit 15) Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 16 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U119 (2119) *	Parameters for the Trace function of SIMOVIS This parameter is a setting for the exchange of process data between SIMOVIS and the SIMOREG converter. It must <u>not</u> be changed!			

11.53 Mathematical functions

Parameters apply only if optional S00 technology software is installed

Adder / subtractor The 3 operands of a function block are selected by 3 indices each of a parameter. U120 to U131: The connectors selected via indices i001 and i002 are added, the connector selected via index i003 is subtracted. U120 to U122 [SW 1.8 and later]: The connectors selected via indices i004 and i005 are added, the connector selected via index i006 is subtracted. The result is limited to -200.00 to +199.99% and applied to the connector stated.				
U120 (2120) * S00	Operands for 1st adder / subtractor (result = K9120) FB 20 Operands for 13th adder / subtractor (result = K9132) FB 32 (SW 1.8 and later) 0 = Connector K0000 1 = Connector K0001 etc.	All connector numbers 1	Ind: 3 [up to SW1.7] 6 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line

PNU	Description		Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U121 (2121) * S00	Operands for 2nd adder / subtractor (result = K9121) Operands for 14th adder / subtractor (result = K9133) [SW 1.8 and later] 0 = Connector K0000 1 = Connector K0001 etc.	FB 21 FB 33	All connector numbers 1	Ind: 3 3 [up to SW1.7] 6 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U122 (2122) * S00	Operands for 3rd adder / subtractor (result = K9122) Operands for 14th adder / subtractor (result = K9134) [SW 1.8 and later] 0 = Connector K0000 1 = Connector K0001 etc.	FB 22 FB 34	All connector numbers 1	Ind: 3 3 [up to SW1.7] 6 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U123 (2123) * S00	Operands for 4th adder / subtractor (result = K9123) 0 = connector K0000 1 = connector K0001 etc.	FB 23	All connector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U124 (2124) * S00	Operands for 5th adder / subtractor (result = K9124) 0 = connector K0000 1 = connector K0001 etc.	FB 24	All connector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U125 (2125) * S00	Operands for 6th adder / subtractor (result = K9125) 0 = connector K0000 1 = connector K0001 etc.	FB 25	All connector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U126 (2126) * S00	Operands for 7th adder / subtractor (result = K9126) 0 = connector K0000 1 = connector K0001 etc.	FB 26	All connector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U127 (2127) * S00	Operands for 8th adder / subtractor (result = K9127) 0 = connector K0000 1 = connector K0001 etc.	FB 27	All connector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U128 (2128) * S00	Operands for 9th adder / subtractor (result = K9128) 0 = connector K0000 1 = connector K0001 etc.	FB 28	All connector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U129 (2129) * S00	Operands for 10th adder / subtractor (result = K9129) 0 = connector K0000 1 = connector K0001 etc.	FB 29	All connector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U130 (2130) * S00	Operands for 11th adder / subtractor (result = K9130) 0 = connector K0000 1 = connector K0001 etc.	FB 30	All connector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U131 (2131) * S00	Operands for 12th adder / subtractor (result = K9131) 0 = connector K0000 1 = connector K0001 etc.	FB 31	All connector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Sign inverters

The contents of the connector selected in the parameter are negated (two's complement). The result is applied to the specified connector.

U135 (2135) * S00	Source for 1st sign inverter (result = K9135) 0 = connector K0000 1 = connector K0001 etc.	FB 35	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
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PNU	Description		Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U136 (2136) * S00	Source for 2nd sign inverter (result = K9136) 0 = connector K0000 1 = connector K0001 etc.	FB 36	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U137 (2137) * S00	Source for 3rd sign inverter (result = K9137) 0 = connector K0000 1 = connector K0001 etc.	FB 37	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U138 (2138) * S00	Source for 4th sign inverter (result = K9138) 0 = connector K0000 1 = connector K0001 etc.	FB 38	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Switchable sign inverters

The contents of the connector entered in the parameter for selection of a source is switched through, depending on the state of the binector entered in the parameter for control bit selection, as an unchanged value (when control bit = 0) or as a negated value (two's complement, when control bit = 1). The result is applied to the specified connector.

U140 (2140) * S00	Source for 1st switchable sign inverter Result = K9140 0 = connector K0000 1 = connector K0001 etc.	FB 40	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U141 (2141) * S00	Control bit for 1st switchable sign inverter 0 = binector B0000 1 = binector B0001 etc.	FB 40	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U142 (2142) * S00	Source for 2nd switchable sign inverter Result = K9141 0 = connector K0000 1 = connector K0001 etc.	FB 41	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U143 (2143) * S00	Control bit for 2nd switchable sign inverter 0 = binector B0000 1 = binector B0001 etc.	FB 41	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Divider

The two operands (x1, x2) for each divider are selected via 2 indices each of the parameter:

Index i001 = x1, index i002 = x2

Index i003 = x1, index i004 = x2 [SW 1.8 and later]

$$\text{Formula: } y = \frac{x1 * 100\%}{x2}$$

For division by 0 (x2=0) the following applies:

for x1 > 0: y = +199.99%

for x1 = 0: y = 0.00%

for x1 < 0: y = -200.00%

y is limited to -200.00 to +199.99% and applied to the connector stated.

U145 (2145) * S00	Operands for 1st divider (result = K9145) Operands for 4th divider (result = K9142) 0 = Connector K0000 1 = Connector K0001 etc.	FB 45 FB 42	All connector numbers 1	Ind: 2 [up to SW1.7] 4 [SW 1.8 and later] FS=1 Type: L2	P052 = 3 P051 = 40 off-line
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U146 (2146) * S00	Operands for 2nd divider (result = K9146) Operands for 5th divider (result = K9143) 0 = Connector K0000 1 = Connector K0001 etc.	FB 46 FB 43	All connector numbers 1 Ind: 2 [up to SW1.7] 4 [SW 1.8 and later] FS=1 Type: L2	P052 = 3 P051 = 40 off-line
U147 (2147) * S00	Operands for 3rd divider (result = K9147) Operands for 6th divider (result = K9144) 0 = Connector K0000 1 = Connector K0001 etc.	FB 47 FB 44	All connector numbers 1 Ind: 2 [up to SW1.7] 4 [SW 1.8 and later] FS=1 Type: L2	P052 = 3 P051 = 40 off-line

Multiplier

The two operands (x1, x2) for each multiplier are selected via 2 indices of the parameter each:

Index i001 = x1, Index i002 = x2

Index i003 = x1, Index i004 = x2 [SW 1.8 and later]

Index i005 = x1, Index i006 = x2 [SW 1.8 and later]

$$\text{Formula: } y = \frac{x1 * x2}{100\%}$$

y is limited to -200.00 to +199.99% and applied to the connector stated.

U150 (2150) * S00	Operands for 1st multiplier (result = K9150) Operands for 5th multiplier (result = K9430) Operands for 9th multiplier (result = K9431) 0 = Connector K0000 1 = Connector K0001 etc.	FB 50 FB 290 FB 291	All connector numbers 1 Ind: 2 [up to SW1.7] 6 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U151 (2151) * S00	Operands for 2nd multiplier (result = K9151) Operands for 6th multiplier (result = K9432) Operands for 10th multiplier (result = K9433) 0 = Connector K0000 1 = Connector K0001 etc.	FB 51 FB 292 FB 293	All connector numbers 1 Ind: 2 [up to SW1.7] 6 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U152 (2152) * S00	Operands for 3rd multiplier (result = K9152) Operands for 7th multiplier (result = K9434) Operands for 11th multiplier (result = K9435) 0 = Connector K0000 1 = Connector K0001 etc.	FB 52 FB 294 FB 295	All connector numbers 1 Ind: 2 [up to SW1.7] 6 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U153 (2153) * S00	Operands for 4th multiplier (result = K9153) Operands for 8th multiplier (result = K9436) Operands for 12th multiplier (result = K9437) 0 = Connector K0000 1 = Connector K0001 etc.	FB 53 FB 296 FB 297	All connector numbers 1 Ind: 2 [up to SW1.7] 6 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
High-resolution multipliers/dividers The three operands are selected via the three indices of the parameter, i.e. index i001 = x1, index i002 = x2, index i003 = x3 $\text{Equations: } x4(32\text{bit}) = x1 * x2, \quad y = \frac{x4}{x3} = \frac{x1 * x2}{x3}$ <u>Applicable for division by 0 (x2=0):</u> When x1 > 0: y = +199.99% When x1 = 0: y = 0.00% When x1 < 0: y = -200.00% y is limited to -200.00 to +199.99% and applied to the specified connector.				
U155 (2155) * S00	Operands for 1st multiplier/divider (result = K9155) FB 55 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U156 (2156) * S00	Operands for 2nd multiplier/divider (result = K9156) FB 56 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U157 (2157) * S00	Operands for 3rd multiplier/divider (result = K9157) FB 57 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
Absolute-value generators with filtering				
U160 (2160) * S00	Source for input quantity for 1st abs.-value generator with filter FB 60 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U161 (2161) * S00	Signal injection mode for 1st abs.-value generator with filter FB 60 0 Injection of signal with correct sign 1 Injection of absolute value of signal 2 Injection of signal with sign, inverted 3 Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U162 (2162) S00	Filter time for 1st abs.-value generator with filter FB 60	0 to 10000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U163 (2163) * S00	Source for input quantity for 2nd abs.-value generator with filter FB 61 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U164 (2164) * S00	Signal injection mode for 2nd abs.-value generator with filter FB 61 0 Injection of signal with correct sign 1 Injection of absolute value of signal 2 Injection of signal with sign, inverted 3 Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U165 (2165) S00	Filter time for 2nd abs.-value generator with filter FB 61	0 to 10000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U166 (2166) * S00	Source for input quantity for 3rd abs.-value generator with filter FB 62 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U167 (2167) * S00	Signal injection mode for 3rd abs.-value generator with filter FB 62 0 Injection of signal with correct sign 1 Injection of absolute value of signal 2 Injection of signal with sign, inverted 3 Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U168 (2168) S00	Filter time for 3rd abs.-value generator with filter FB 62	0 to 10000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U169 (2169) * S00	Source for input quantity for 4th abs.-value generator with filter FB 63 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U170 (2170) * S00	Signal injection mode for 4th abs.-value generator with filter FB 63 0 Injection of signal with correct sign 1 Injection of absolute value of signal 2 Injection of signal with sign, inverted 3 Injection of absolute value of signal, inverted	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U171 (2171) S00	Filter time for 4th abs.-value generator with filter FB 63	0 to 10000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

11.54 Processing of connectors

Only active with optional technology software S00

Averager [SW 1.8 and later]		FB 16, FB 17, FB 18, FB 19		
U172 (2172) * S00	Source for input signal i001: 1st averager (FB 16) i002: 2nd averager (FB 17) i003: 3rd averager (FB 18) i004: 4. averager (FB 19) Settings: 0 = Connector K0000 1 = Connector K0001 etc.	All connector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U173 (2173) S00	Number of sampling cycles i001: 1st averager (FB 16) i002: 2nd averager (FB 17) i003: 3rd averager (FB 18) i004: 4. averager (FB 19)	1 to 100 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 on-line

11.55 Limiters, limit-value monitors

Parameters apply only if optional S00 technology software is installed

Limiters				
The input quantity selected via index i001 of the 1 st parameter is limited to the limit values selected via indices i002 and i003 and applied to the specified connector. Violation of the limit values is signalled by means of two binectors.				
U175 (2175) * S00	Source for input signal and limits for limiter 1 FB 65 Output = connector K9167 i001: Input signal i002: Positive limiting value (L+) i003: Negative limiting value (L-) Settings: 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 3 FS= i001: 0 i002: 9165 i003: 9166 Type: L2	P052 = 3 P051 = 40 Offline
U176 (2176) S00	Limit value for limiter FB 65 Applied to connector K9165	-199.99 to 199.99 [%] 0.01%	Ind: None FS=100.00 Type: I2	P052 = 3 P051 = 40 Offline

PNU	Description		Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U177 (2177) * S00	Source for input signal and limits for limiter 2 Output = connector K9170 i001: Input signal i002: Positive limiting value (L+) i003: Negative limiting value (L-) Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 66	All connector numbers 1	Ind: 3 FS= i001: 0 i002: 9168 i003: 9169 Type: L2	P052 = 3 P051 = 40 Offline
U178 (2178) S00	Limit value for limiter Applied to connector K9168	FB 66	-199.99 to 199.99 [%] 0.01%	Ind: None FS=100.00 Type: I2	P052 = 3 P051 = 40 Offline

U179 (2179) * S00	Source for input signal and limits for limiter 3 Output = connector K9173 i001: Input signal i002: Positive limiting value (L+) i003: Negative limiting value (L-) Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 67	All connector numbers 1	Ind: 3 FS= i001: 0 i002: 9171 i003: 9172 Type: L2	P052 = 3 P051 = 40 Offline
U180 (2180) S00	Limit value for limiter Applied to connector K9171	FB 67	-199.99 to 199.99 [%] 0.01%	Ind: None FS=100.00 Type: I2	P052 = 3 P051 = 40 Offline

Limit-value monitors with filtering					
U185 (2185) * S00	Source for input signal (A) and operating point (B) for 1st limit-value monitor with filtering i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 70	All connector numbers 1	Ind: 2 FS= i001: 0 i002: 9181 Type: L2	P052 = 3 P051 = 40 Offline
U186 (2186) S00	Settable operating point for limit-value monitor Applied to connector K9181	FB 70	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Offline
U187 (2187) S00	Filter time for 1st limit-value monitor with filtering	FB 70	0 to 10000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U188 (2188) S00	Hysteresis for 1st limit-value monitor with filtering	FB 70	0.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline

U189 (2189) * S00	Source for input signal (A) and operating point (B) for 2nd limit-value monitor with filtering i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 71	All connector numbers 1	Ind: 2 FS= i001: 0 i002: 9183 Type: L2	P052 = 3 P051 = 40 Offline
U190 (2190) S00	Settable operating point for limit-value monitor Applied to connector K9183	FB 71	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Offline
U191 (2191) S00	Filter time for 2nd limit-value monitor with filtering	FB 71	0 to 10000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description		Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U192 (2192) S00	Hysteresis for 2nd limit-value monitor with filtering i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 71	0.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline
U193 (2193) * S00	Source for input signal (A) and operating point (B) for 3rd limit-value monitor with filtering i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 72	All connector numbers 1	Ind: 2 FS= i001: 0 i002: 9185 Type: L2	P052 = 3 P051 = 40 Offline
U194 (2194) S00	Settable operating point for limit-value monitor Applied to connector K9185	FB 72	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Offline
U195 (2195) S00	Filter time for 3rd limit-value monitor with filtering	FB 72	0 to 10000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U196 (2196) S00	Hysteresis for 3rd limit-value monitor with filtering	FB 72	0.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline

Limit-value monitors without filtering

U197 (2197) * S00	Source for input signal (A) and operating point (B) for 1st limit-value monitor without filtering i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 73	All connector numbers 1	Ind: 2 FS= i001: 0 i002: 9186 Type: L2	P052 = 3 P051 = 40 Offline
U198 (2198) S00	Settable operating point for limit-value monitor Applied to connector K9186	FB 73	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Offline
U199 (2199) S00	Hysteresis for 1st limit-value monitor without filtering	FB 73	0.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline
U200 (2200) * S00	Source for input signal (A) and operating point (B) for 2nd limit-value monitor without filtering i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 74	All connector numbers 1	Ind: 2 FS= i001: 0 i002: 9187 Type: L2	P052 = 3 P051 = 40 Offline
U201 (2201) S00	Settable operating point for limit-value monitor Applied to connector K9187	FB 74	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Offline
U202 (2202) S00	Hysteresis for 2nd limit-value monitor without filtering	FB 74	0.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description		Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U203 (2203) * S00	Source for input signal (A) and operating point (B) for 3rd limit-value monitor without filtering i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 75	All connector numbers 1	Ind: 2 FS= i001: 0 i002: 9188 Type: L2	P052 = 3 P051 = 40 Offline
U204 (2204) S00	Settable operating point for limit-value monitor Applied to connector K9188	FB 75	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Offline
U205 (2205) S00	Hysteresis for 3rd limit-value monitor without filtering	FB 75	0.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline
U206 (2206) * S00	Source for input signal (A) and operating point (B) for 4th limit-value monitor without filtering i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 76	All connector numbers 1	Ind: 2 FS= i001: 0 i002: 9189 Type: L2	P052 = 3 P051 = 40 Offline
U207 (2207) S00	Settable operating point for limit-value monitor Applied to connector K9189	FB 76	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Offline
U208 (2208) S00	Hysteresis for 4th limit-value monitor without filtering	FB 76	0.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline
U210 (2210) * S00	Source for input signal (A) and operating point (B) for 5th limit-value monitor without filtering i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 77	All connector numbers 1	Ind: 2 FS= i001: 0 i002: 9190 Type: L2	P052 = 3 P051 = 40 Offline
U211 (2211) S00	Settable operating point for limit-value monitor Applied to connector K9190	FB 77	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Offline
U212 (2212) S00	Hysteresis for 5th limit-value monitor without filtering	FB 77	0.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline
U213 (2213) * S00	Source for input signal (A) and operating point (B) for 6th limit-value monitor without filtering i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	FB 78	All connector numbers 1	Ind: 2 FS= i001: 0 i002: 9191 Type: L2	P052 = 3 P051 = 40 Offline
U214 (2214) S00	Settable operating point for limit-value monitor Applied to connector K9191	FB 78	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Offline
U215 (2215) S00	Hysteresis for 6th limit-value monitor without filtering	FB 78	0.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U216 (2216) * S00	Source for input signal (A) and operating point (B) for 7th limit-value monitor without filtering FB 79 i001: Input signal i002: Operating point Settings: 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: 2 FS= i001: 0 i002: 9192 Type: L2	P052 = 3 P051 = 40 Offline
U217 (2217) S00	Settable operating point for limit-value monitor FB 79 Applied to connector K9192	-200.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: I2	P052 = 3 P051 = 40 Offline
U218 (2218) S00	Hysteresis for 7th limit-value monitor without filtering FB 79	0.00 to 199.99 [%] 0.01%	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline

11.56 Processing of connectors

Parameters apply only if optional S00 technology software is installed

Maximum selection		FB 80, FB 174, FB 175, FB 176		
The largest of the input values selected by 3 indices each of the parameter (x1, x2, x3) is applied to the output.				
U220 (2220) * S00	Source for maximum selection	All connector numbers 1	Ind: 3 [up to SW 1.7] 12 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
	0 = Connector K0000 1 = Connector K0001 etc. i001: x1 Maximum selection 1 (FB 80, Output = K9193) i002: x2 Maximum selection 1 i003: x3 Maximum selection 1 SW 1.8 and later: i004: x1 Maximum selection 2 (FB 174, Output = K9460) i005: x2 Maximum selection 2 i006: x3 Maximum selection 2 i007: x1 Maximum selection 3 (FB 175, Output = K9461) i008: x2 Maximum selection 3 i009: x3 Maximum selection 3 i010: x1 Maximum selection 4 (FB 176, Output = K9462) i011: x2 Maximum selection 4 i012: x3 Maximum selection 4			

Minimum selection		FB 81, FB 177, FB 178, FB 179		
The smallest of the input values selected by 3 indices each of the parameter (x1, x2, x3) is applied to the output.				
U221 (2221) * S00	Source for minimum selection	All connector numbers 1	Ind: 3 [up to SW 1.7] 12 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
	0 = Connector K0000 1 = Connector K0001 etc.			
	i001: x1 Minimum selection 1 (FB 81, Output = K9194) i002: x2 Minimum selection 1 i003: x3 Minimum selection 1			
	SW 1.8 and later:			
	i004: x1 Minimum selection 2 (FB 177, Output = K9463) i005: x2 Minimum selection 2 i006: x3 Minimum selection 2			
	i007: x1 Minimum selection 3 (FB 178, Output = K9464) i008: x2 Minimum selection 3 i009: x3 Minimum selection 3			
	i010: x1 Minimum selection 4 (FB 179, Output = K9465) i011: x2 Minimum selection 4 i012: x3 Minimum selection 4			

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Tracking/storage elements The tracking/storage elements are storage elements for the parameterized input quantity. The outputs are linked to connectors. Transfer of the input quantity is controlled via the RESET, TRACK and STORE functions: RESET: When the controlling binector reaches log. "1", the output is set to 0.00% (y=0) TRACK: When the controlling binector reaches log. "1", the output is set to the input value and then tracks it continuously (y=x). If the TRACK signal switches from "1" to "0", the last value applied to the y output is "frozen" STORE: With a "0" to "1" transition of the controlling binector signal, the output is permanently set to the current input value (y=x). This value then remains stored Priority 1. RESET, 2. TRACK, 3. STORE				
Tracking/storage element 1				
U222 (2222) * S00	Source for input quantity (x) 0 = connector K0000 1 = connector K0001 etc.	FB 82	All connector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U223 (2223) * S00	Source for control signals RESET, TRACK and STORE i001: TRACK i002: STORE i003: RESET Settings: 0 = binector B0000 1 = binector B0001 etc.	FB 82	All binector numbers 1	Ind: 3 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U224 (2224) * S00	Control word for Power On Mode 0 Volatile storage: Zero appears at output when voltage recovers 1 Non-volatile storage: When the voltage is disconnected or fails, the current output value is stored and then output when the voltage recovers/is reconnected	FB 82	0 to 1 1	Ind: None FS=0 Type: O2 P052 = 3 P051 = 40 Offline
Tracking/storage element 2				
U225 (2225) * S00	Source for input quantity (x) 0 = connector K0000 1 = connector K0001 etc.	FB 83	All connector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U226 (2226) * S00	Source for control signals RESET, TRACK and STORE i001: TRACK i002: STORE i003: RESET Settings: 0 = binector B0000 1 = binector B0001 etc.	FB 83	All binector numbers 1	Ind: 3 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U227 (2227) * S00	Control word for Power On Mode 0 Volatile storage: Zero appears at output when voltage recovers 1 Non-volatile storage: When the voltage is disconnected or fails, the current output value is stored and then output when the voltage recovers/is reconnected	FB 83	0 to 1 1	Ind: None FS=0 Type: O2 P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Connector memories				
The connector memories are memory elements for the input quantities selected via the parameters. The outputs are linked to connectors. While the SET input is in the log. "1" state, output quantity y tracks input quantity x continuously. If the SET input changes state from log. "1" to log. "0", the current value of x is stored and output continuously at y. Output (y) = 0 is set on POWER ON.				
Connector memory 1				
U228 (2228) * S00	Source for input quantity (x) 0 = connector K0000 1 = connector K0001 etc.	FB 84	All connector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U229 (2229) * S00	Source for control signal SET 0 = binector B0000 1 = binector B0001 etc.	FB 84	All binector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline

Connector memory 2				
U230 (2230) * S00	Source for input quantity (x) 0 = connector K0000 1 = connector K0001 etc.	FB 85	All connector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U231 (2231) * S00	Source for control signal SET 0 = binector B0000 1 = binector B0001 etc.	FB 85	All binector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline

Connector changeover switches				
Depending on the state of the control signal, one of the two input quantities is applied to the output (connector): Control signal = 0: The input quantity selected in index i001 is applied to the output Control signal = 1: The input quantity selected in index i002 is applied to the output				
Connector changeover switch 1 (output = K9210)				
U240 (2240) * S00	Source for input quantities 0 = connector K0000 1 = connector K0001 etc.	FB 90	All connector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U241 (2241) * S00	Source for control signal 0 = binector B0000 1 = binector B0001 etc.	FB 90	All binector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline

Connector changeover switch 2 (output = K9211)				
U242 (2242) * S00	Source for input quantities 0 = connector K0000 1 = connector K0001 etc.	FB 91	All connector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U243 (2243) * S00	Source for control signal 0 = binector B0000 1 = binector B0001 etc.	FB 91	All binector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline

Connector changeover switch 3 (output = K9212)				
U244 (2244) * S00	Source for input quantities 0 = connector K0000 1 = connector K0001 etc.	FB 92	All connector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U245 (2245) * S00	Source for control signal 0 = binector B0000 1 = binector B0001 etc.	FB 92 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Connector changeover switch 4 (output = K9213)				
U246 (2246) * S00	Source for input quantities 0 = connector K0000 1 = connector K0001 etc.	FB 93 All connector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U247 (2247) * S00	Source for control signal 0 = binector B0000 1 = binector B0001 etc.	FB 93 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Connector changeover switch 5 (output = K9214)				
U248 (2248) * S00	Source for input quantities 0 = connector K0000 1 = connector K0001 etc.	FB 94 All connector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U249 (2249) * S00	Source for control signal 0 = binector B0000 1 = binector B0001 etc.	FB 94 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Connector changeover switch 6 (output = K9215)				
U250 (2250) * S00	Source for input quantities 0 = connector K0000 1 = connector K0001 etc.	FB 95 All connector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U251 (2251) * S00	Source for control signal 0 = binector B0000 1 = binector B0001 etc.	FB 95 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Connector changeover switch 7 (output = K9216)				
U252 (2252) * S00	Source for input quantities 0 = connector K0000 1 = connector K0001 etc.	FB 96 All connector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U253 (2253) * S00	Source for control signal 0 = binector B0000 1 = binector B0001 etc.	FB 96 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Connector changeover switch 8 (output = K9217)				
U254 (2254) * S00	Source for input quantities 0 = connector K0000 1 = connector K0001 etc.	FB 97 All connector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U255 (2255) * S00	Source for control signal 0 = binector B0000 1 = binector B0001 etc.	FB 97 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description		Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Connector changeover switch 9 (output = K9218)					
U256 (2256) * S00	Source for input quantities 0 = connector K0000 1 = connector K0001 etc.	FB 98	All connector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U257 (2257) * S00	Source for control signal 0 = binector B0000 1 = binector B0001 etc.	FB 98	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Connector changeover switch 10 (output = K9219)					
U258 (2258) * S00	Source for input quantities 0 = connector K0000 1 = connector K0001 etc.	FB 99	All connector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U259 (2259) * S00	Source for control signal 0 = binector B0000 1 = binector B0001 etc.	FB 99	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

11.57 Integrators, DT1 elements, characteristics, dead zones, setpoint branching

Parameters apply only if optional S00 technology software is installed

Integrator 1 (output = K9220)					
U260 (2260) * S00	Source for input quantity 0 = connector K0000 1 = connector K0001 etc.	FB 100	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U261 (2261) S00	Integral-action time	FB 100	10 to 65000 [ms] 1	Ind: None FS=10 Type: O2	P052 = 3 P051 = 40 Online
U262 (2262) * S00	Source for control signals i001 Source for "Stop integrator" signal (integrator is stopped when binector reaches log. "1" state) i002 Source for "Set integrator" signal (when binector reaches log. "1" state, the integrator is set to the value entered in parameter U263) Settings: 0 = binector B0000 1 = binector B0001 etc.	FB 100	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U263 (2263) * S00	Source for setting value 0 = connector K0000 1 = connector K0001 etc.	FB 100	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Integrator 2 (output = K9221)					
U264 (2264) * S00	Source for input quantity 0 = connector K0000 1 = connector K0001 etc.	FB 101	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U265 (2265) S00	Integral-action time	FB 101	10 to 65000 [ms] 1	Ind: None FS=10 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U266 (2266) * S00	Source for control signals FB 101 i001 Source for "Stop integrator" signal (integrator is stopped when binector reaches log. "1" state) i002 Source for "Set integrator" signal (when binector reaches log. "1" state, the integrator is set to the value entered in parameter U267) Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U267 (2267) * S00	Source for setting value FB 101 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Integrator 3 (output = K9222)				
U268 (2268) * S00	Source for input quantity FB 102 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U269 (2269) S00	Integral-action time FB 102	10 to 65000 [ms] 1	Ind: None FS=10 Type: O2	P052 = 3 P051 = 40 Online
U270 (2270) * S00	Source for control signals FB 102 i001 Source for "Stop integrator" signal (integrator is stopped when binector reaches log. "1" state) i002 Source for "Set integrator" signal (when binector reaches log. "1" state, the integrator is set to the value entered in parameter U271) Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U271 (2271) * S00	Source for setting value FB 102 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

DT1 element 1 (output = K9223, inverted: K9224)				
U272 (2272) * S00	Source for input quantity FB 103 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U273 (2273) S00	Derivative-action time FB 103	0 to 1000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
U274 (2274) S00	Filter time FB 103	0 to 1000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online

DT1 element 2 (output = K9225, inverted: K9226)				
U275 (2275) * S00	Source for input quantity FB 104 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U276 (2276) S00	Derivative-action time FB 104	0 to 1000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U277 (2277) S00	Filter time FB 104	0 to 1000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online

DT1 element 3 (output = K9227, inverted: K9228)

U278 (2278) * S00	Source for input quantity FB 105 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U279 (2279) S00	Derivative-action time FB 105	0 to 1000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
U280 (2280) S00	Filter time FB 105	0 to 1000 [ms] 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online

Characteristic blocks

The curve of the characteristics can be defined by 10 points each:

Index i001 to i010 of the parameters for the x values (U282, U285, U288): x values for FB 106, FB 107, FB 108

Index i001 to i010 of the parameters for the y values (U283, U286, U289): associated y values

SW1.8 and later:

Index i011 to i020 of the parameters for the x values (U282, U285, U288): x values for FB 280, FB 282, FB 284

Index i011 to i020 of the parameters for the y values (U283, U286, U289): associated y values

Index i021 to i030 of the parameters for the x values (U282, U285, U288): x values for FB 281, FB 283, FB 285

Index i021 to i030 of the parameters for the y values (U283, U286, U289): associated y values

for x = -200.00% up to x value acc. to index i001 (or i011 or i021) of the parameter for the x values gilt:
y = value acc. to index i001 (or i011 or i021) of the parameter for the y values

for x = x value acc. to index i010 (or i020 or i030) of the parameter for the x values to x = 200.00% gilt:
y = value acc. to index i010 (or i020 or i030) of the parameter for the y values

The distance between two adjacent x or y values must not be more than 199.99% otherwise deviations from the required shape of the characteristic can arise.

Characteristic block 1 (output = K9229)

Characteristic block 4 (output = K9410) [SW1.8 and later]

Characteristic block 5 (output = K9411) [SW1.8 and later]

FB 106**FB 280****FB 281**

U281 (2281) * S00	Source for input quantity 0 = Connector K0000 1 = Connector K0001 etc. Up to SW 1.7: Selected connector = input quantity for FB106 SW 1.8 and later: i001 Input quantity for FB106 i002 Input quantity for FB280 i003 Input quantity for FB281	All connector numbers 1	Ind: None [up to SW 1.7] 3 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U282 (2282) S00	x values i001 1st characteristic point for FB106 i002 2nd characteristic point for FB106 ... i010 10th characteristic point for FB106 SW 1.8 and later: i011 1st characteristic point for FB280 i012 2nd characteristic point for FB280 ... i020 10th characteristic point for FB280 i021 1st characteristic point for FB281 i022 2nd characteristic point for FB281 ... i030 10th characteristic point for FB281	-200.00 to 199.99 [%] 0.01	Ind: 10 [up to SW 1.7] 30 [SW 1.8 and later] FS=0.00 Type: I2	P052 = 3 P051 = 40 on-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U283 (2283) S00	y values i001 1st characteristic point for FB106 i002 2nd characteristic point for FB106 ... i010 10th characteristic point for FB106 SW 1.8 and later: i011 1st characteristic point for FB280 i012 2nd characteristic point for FB280 ... i020 10th characteristic point for FB280 i021 1st characteristic point for FB281 i022 2nd characteristic point for FB281 ... i030 10th characteristic point for FB281	-200.00 to 199.99 [%] 0.01	Ind: 10 [up to SW 1.7] 30 [SW 1.8 and later] FS=0.00 Type: I2	P052 = 3 P051 = 40 on-line

Characteristic block 2 (output = K9230) Characteristic block 6 (output = K9412) [SW1.8 and later] Characteristic block 7 (output = K9413) [SW1.8 and later]				FB 107 FB 282 FB 283
U284 (2284) * S00	Source for input quantity 0 = Connector K0000 1 = Connector K0001 etc. up to SW 1.7: Selected connector = input quantity for FB107 SW 1.8 and later: i001 input quantity for FB107 i002 input quantity for FB282 i003 input quantity for FB283	All connector numbers 1	Ind: None [up to SW 1.7] 3 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U285 (2285) S00	x values i001 1st characteristic point for FB107 i002 2nd characteristic point for FB107 ... i010 10th characteristic point for FB107 SW 1.8 and later: i011 1st characteristic point for FB282 i012 2nd characteristic point for FB282 ... i020 10th characteristic point for FB282 i021 1st characteristic point for FB283 i022 2nd characteristic point for FB283 ... i030 10th characteristic point for FB283	-200.00 to 199.99 [%] 0.01	Ind: 10 [up to SW 1.7] 30 [SW 1.8 and later] FS=0.00 Type: I2	P052 = 3 P051 = 40 on-line
U286 (2286) S00	y values i001 1st characteristic point for FB107 i002 2nd characteristic point for FB107 ... i010 10th characteristic point for FB107 SW 1.8 and later: i011 1st characteristic point for FB282 i012 2nd characteristic point for FB282 ... i020 10th characteristic point for FB282 i021 1st characteristic point for FB283 i022 2nd characteristic point for FB283 ... i030 10th characteristic point for FB283	-200.00 to 199.99 [%] 0.01	Ind: 10 [up to SW 1.7] 30 [SW 1.8 and later] FS=0.00 Type: I2	P052 = 3 P051 = 40 on-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Characteristic block 3 (Output = K9231) Characteristic block 8 (Output = K9414) [SW1.8 and later] Characteristic block 9 (Output = K9415) [SW1.8 and later]				FB 108 FB 284 FB 285
U287 (2287) * S00	Source for input quantity 0 = Connector K0000 1 = Connector K0001 etc. up to SW 1.7: Selected connector = input quantity for FB108 SW 1.8 and later: i001 Input quantity for FB108 i002 Input quantity for FB284 i003 Input quantity for FB285	All connector numbers 1	Ind: None [up to SW 1.7] 3 [SW 1.8 and later] FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U288 (2288) S00	x values i001 1st characteristic point for FB108 i002 2nd characteristic point for FB108 ... i010 10th characteristic point for FB108 SW 1.8 and later: i011 1st characteristic point for FB284 i012 2nd characteristic point for FB284 ... i020 10th characteristic point for FB284 i021 1st characteristic point for FB285 i022 2nd characteristic point for FB285 ... i030 10th characteristic point for FB285	-200.00 to 199.99 [%] 0.01	Ind: 10 [up to SW 1.7] 30 [SW 1.8 and later] FS=0.00 Type: I2	P052 = 3 P051 = 40 on-line
U289 (2289) S00	y values i001 1st characteristic point for FB108 i002 2nd characteristic point for FB108 ... i010 10th characteristic point for FB108 SW 1.8 and later: i011 1st characteristic point for FB284 i012 2nd characteristic point for FB284 ... i020 10th characteristic point for FB284 i021 1st characteristic point for FB285 i022 2nd characteristic point for FB285 ... i030 10th characteristic point for FB285	-200.00 to 199.99 [%] 0.01	Ind: 10 [up to SW 1.7] 30 [SW 1.8 and later] FS=0.00 Type: I2	P052 = 3 P051 = 40 on-line

Dead zones

The component of the input quantity (x) whose absolute value exceeds the threshold for the dead zone is applied to the output (y).

Dead zone 1 (output = K9232)

U290 (2290) * S00	Source for input quantity 0 = connector K0000 1 = connector K0001 etc.	FB 109 All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U291 (2291) S00	Dead zone	FB 109 0.00 to 100.00 [%] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Online

Dead zone 2 (output = K9233)

U292 (2292) * S00	Source for input quantity 0 = connector K0000 1 = connector K0001 etc.	FB 110 All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U293 (2293) S00	Dead zone FB 110	0.00 to 100.00 [%] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Online

Dead zone 3 (output = K9234)

U294 (2294) * S00	Source for input quantity FB 111 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U295 (2295) S00	Dead zone FB 111	0.00 to 100.00 [%] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Online

Setpoint branching (output = K9234)

The input quantity is weighted with 2 parameters:

Parameter U297 determines the output value with an input = 0%

Parameter U298 determines the output value with an input = +100%

-U297 and -U298 apply in the case of negative input values.

The hysteresis set in parameter U299 is applied for transitions from negative to positive input values and vice versa

U296 (2296) * S00	Source for input quantity FB 112 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U297 (2297) S00	Minimum speed FB 112	0.00 to 200.00 [%] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
U298 (2298) S00	Maximum speed FB 112	0.00 to 200.00 [%] 0.01	Ind: None FS=100.00 Type: O2	P052 = 3 P051 = 40 Online
U299 (2299) S00	Hysteresis FB 112	0.00 to 100.00 [%] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Online

11.58 Simple ramp-function generator

Parameters apply only if optional S00 technology software is installed

Please note: The output (y) = 0 is set in response to "Set simple ramp-function generator to zero" and POWER ON
The output (y) is frozen at the current value in response to "Stop simple ramp-function generator"
The ramp-up and ramp-down times are set to zero in response to "Bypass simple ramp-function generator"

Ramp-up integrator:

The simple ramp-function generator contains a flip-flop whose output is set to log. "0" (ramp generator initial run) after POWER ON or when the ramp-function generator has been enabled. When the ramp-function generator output reaches a value corresponding to the input quantity (y=x) for the first time, the flip-flop output switches to log. "1" and remains in this state until the next enabling command. This output is linked to binector B9191. By parameterizing U301, index i001=919, it is possible to apply this binector to the "Bypass simple ramp-function generator" function and thus to implement a ramp-up integrator function.

U300 (2300) * S00	Source for input quantity FB 113 0 = connector K0000 1 = connector K0001 etc.	All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U301 (2301) * S00	Source for control signals FB 113 i001 Source for "Bypass simple ramp-function generator" signal i002 Source for "Stop simple ramp-function generator" signal i003 Source for "Reset / enable simple ramp-function generator" signal (0 = reset to zero, 1 = enable) Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 3 FS= i001: 0 i002: 0 i003: 1 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U302 (2302) S00	Ramp-up time FB 113	0.00 to 300.00 [s] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Online
U303 (2303) S00	Ramp-down time FB 113	0.00 to 300.00 [s] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Online

11.59 Multiplexer

[SW 1.8 and later]

Only active with optional technology software S00

FB86 = 1st multiplexer (output = K9450)
 FB87 = 2nd multiplexer (output = K9451)
 FB88 = 3rd multiplexer (output = K9452)

Function:

An input quantity is connected through to the output depending on the control bits:

B3	B2	B1	Output y
0	0	0	X0
0	0	1	X1
0	1	0	X2
0	1	1	X3
1	0	0	X4
1	0	1	X5
1	1	0	X6
1	1	1	X7

U310 (2310) * S00	Source for control bits for the multiplexer [SW 1.8 and later] 0 = Binector B0000 1 = Binector B0001 etc. i001: Control bit B1 for 1st multiplexer i002: Control bit B2 i003: Control bit B3 i004: Control bit B1 for 2nd multiplexer i005: Control bit B2 i006: Control bit B3 i007: Control bit B1 for 3rd multiplexer i008: Control bit B2 i009: Control bit B3	All binector numbers 1	Ind: 9 FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U311 (2311) * S00	Source for input quantities for 1st multiplexer [SW 1.8 and later] 0 = Connector K0000 1 = Connector K0001 etc. i001 Input quantity X0 i002 Input quantity X1 i003 Input quantity X2 i004 Input quantity X3 i005 Input quantity X4 i006 Input quantity X5 i007 Input quantity X6 i008 Input quantity X7	All connector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U312 (2312) * S00	Source for input quantities for 2nd multiplexer [SW 1.8 and later] 0 = Connector K0000 1 = Connector K0001 etc. i001 Input quantity X0 i002 Input quantity X1 i003 Input quantity X2 i004 Input quantity X3 i005 Input quantity X4 i006 Input quantity X5 i007 Input quantity X6 i008 Input quantity X7	All connector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U313 (2313) * S00	Source for input quantities for 3rd multiplexer [SW 1.8 and later] 0 = Connector K0000 1 = Connector K0001 etc. i001 Input quantity X0 i002 Input quantity X1 i003 Input quantity X2 i004 Input quantity X3 i005 Input quantity X4 i006 Input quantity X5 i007 Input quantity X6 i008 Input quantity X7	All connector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 off-line

11.60 Logic functions

Parameters apply only if optional S00 technology software is installed

Decoders/demultiplexers, binary to 1 of 8						
U318 (2318) * S00	Source for input signals for decoder/demultiplexer 1		FB 118	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
	i001	Source for input signal, bit 0				
	i002	Source for input signal, bit 1				
	i003	Source for input signal, bit 2				
Settings:						
0 = binector B0000						
1 = binector B0001						
etc.						
U319 (2319) * S00	Source for input signals for decoder/demultiplexer 2		FB 119	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
	i001	Source for input signal, bit 0				
	i002	Source for input signal, bit 1				
	i003	Source for input signal, bit 2				
Settings:						
0 = binector B0000						
1 = binector B0001						
etc.						

AND elements with 3 inputs each					
The input signals selected via the 3 indices of the parameter are ANDed and the result of the logic operation applied to the specified binector.					
U320 (2320) * S00	Source for input signals, AND element 1 (output = B9350) i001 Source for input 1 i002 Source for input 2 i003 Source for input 3 Settings: 0 = binector B0000 1 = binector B0001 etc.	FB 120	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U321 (2321) * S00	Source for input signals, AND element 2 (output = B9351) As for U320	FB 121	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U322 (2322) * S00	Source for input signals, AND element 3 (output = B9352) As for U320	FB 122	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U323 (2323) * S00	Source for input signals, AND element 4 (output = B9353) As for U320	FB 123	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U324 (2324) * S00	Source for input signals, AND element 5 (output = B9354) As for U320	FB 124	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description		Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U325 (2325) * S00	Source for input signals, AND element 6 (output = B9355) As for U320	FB 125	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U326 (2326) * S00	Source for input signals, AND element 7 (output = B9356) As for U320	FB 126	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U327 (2327) * S00	Source for input signals, AND element 8 (output = B9357) As for U320	FB 127	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U328 (2328) * S00	Source for input signals, AND element 9 (output = B9358) As for U320	FB 128	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U329 (2329) * S00	Source for input signals, AND element 10 (output = B9359) As for U320	FB 129	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U330 (2330) * S00	Source for input signals, AND element 11 (output = B9360) As for U320	FB 130	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U331 (2331) * S00	Source for input signals, AND element 12 (output = B9361) As for U320	FB 131	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U332 (2332) * S00	Source for input signals, AND element 13 (output = B9362) As for U320	FB 132	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U333 (2333) * S00	Source for input signals, AND element 14 (output = B9363) As for U320	FB 133	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U334 (2334) * S00	Source for input signals, AND element 15 (output = B9364) As for U320	FB 134	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U335 (2335) * S00	Source for input signals, AND element 16 (output = B9365) As for U320	FB 135	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U336 (2336) * S00	Source for input signals, AND element 17 (output = B9366) As for U320	FB 136	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U337 (2337) * S00	Source for input signals, AND element 18 (output = B9367) As for U320	FB 137	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U338 (2338) * S00	Source for input signals, AND element 19 (output = B9368) As for U320	FB 138	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U339 (2339) * S00	Source for input signals, AND element 20 (output = B9369) As for U320	FB 139	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U340 (2340) * S00	Source for input signals, AND element 21 (output = B9370) As for U320	FB 140	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U341 (2341) * S00	Source for input signals, AND element 22 (output = B9371) As for U320	FB 141	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U342 (2342) * S00	Source for input signals, AND element 23 (output = B9372) As for U320	FB 142	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U343 (2343) * S00	Source for input signals, AND element 24 (output = B9373) FB 143 As for U320	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U344 (2344) * S00	Source for input signals, AND element 25 (output = B9374) FB 144 As for U320	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U345 (2345) * S00	Source for input signals, AND element 26 (output = B9375) FB 145 As for U320	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U346 (2346) * S00	Source for input signals, AND element 27 (output = B9376) FB 146 As for U320	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U347 (2347) * S00	Source for input signals, AND element 28 (output = B9377) FB 147 As for U320	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline

OR elements with 3 inputs each

The input signals selected via the 3 indices of the parameter are ORed and the result of the logic operation applied to the specified binector.

U350 (2350) * S00	Source for input signals, OR element 1 (output = B9380) FB 150 i001 Source for input 1 i002 Source for input 2 i003 Source for input 3 Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U351 (2351) * S00	Source for input signals, OR element 2 (output = B9381) FB 151 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U352 (2352) * S00	Source for input signals, OR element 3 (output = B9382) FB 152 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U353 (2353) * S00	Source for input signals, OR element 4 (output = B9383) FB 153 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U354 (2354) * S00	Source for input signals, OR element 5 (output = B9384) FB 154 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U355 (2355) * S00	Source for input signals, OR element 6 (output = B9385) FB 155 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U356 (2356) * S00	Source for input signals, OR element 7 (output = B9386) FB 156 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U357 (2357) * S00	Source for input signals, OR element 8 (output = B9387) FB 157 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U358 (2358) * S00	Source for input signals, OR element 9 (output = B9388) FB 158 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U359 (2359) * S00	Source for input signals, OR element 10 (output = B9389) FB 159 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U360 (2360) * S00	Source for input signals, OR element 11 (output = B9390) FB 160 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U361 (2361) * S00	Source for input signals, OR element 12 (output = B9391) FB 161 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U362 (2362) * S00	Source for input signals, OR element 13 (output = B9392) FB 162 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U363 (2363) * S00	Source for input signals, OR element 14 (output = B9393) FB 163 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U364 (2364) * S00	Source for input signals, OR element 15 (output = B9394) FB 164 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U365 (2365) * S00	Source for input signals, OR element 16 (output = B9395) FB 165 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U366 (2366) * S00	Source for input signals, OR element 17 (output = B9396) FB 166 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U367 (2367) * S00	Source for input signals, OR element 18 (output = B9397) FB 167 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U368 (2368) * S00	Source for input signals, OR element 19 (output = B9398) FB 168 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U369 (2369) * S00	Source for input signals, OR element 20 (output = B9399) FB 169 As for U350	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

EXCLUSIVE OR elements with 2 inputs each

The input signals selected via the 2 indices of the parameter are combined in an EXCLUSIVE OR (XOR) operation and the result applied to the specified binector.

U370 (2370) * S00	Source for input signals, XOR element 1 (output = B9195) FB 170 i001 Source for input 1 i002 Source for input 2 Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U371 (2371) * S00	Source for input signals, XOR element 2 (output = B9196) FB 171 As for U370	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U372 (2372) * S00	Source for input signals, XOR element 3 (output = B9197) FB 172 As for U370	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U373 (2373) * S00	Source for input signals, XOR element 4 (output = B9198) FB 173 As for U370	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Inverters				
The input signal is inverted and the result applied to the specified binector.				
U380 (2380) * S00	Source for input signal, inverter 1 (output = B9450) 0 = binector B0000 1 = binector B0001 etc.	FB 180 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U381 (2381) * S00	Source for input signal, inverter 2 (output = B9451) As for U380	FB 181 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U382 (2382) * S00	Source for input signal, inverter 3 (output = B9452) As for U380	FB 182 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U383 (2383) * S00	Source for input signal, inverter 4 (output = B9453) As for U380	FB 183 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U384 (2384) * S00	Source for input signal, inverter 5 (output = B9454) As for U380	FB 184 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U385 (2385) * S00	Source for input signal, inverter 6 (output = B9455) As for U380	FB 185 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U386 (2386) * S00	Source for input signal, inverter 7 (output = B9456) As for U380	FB 186 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U387 (2387) * S00	Source for input signal, inverter 8 (output = B9457) As for U380	FB 187 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U388 (2388) * S00	Source for input signal, inverter 9 (output = B9458) As for U380	FB 188 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U389 (2389) * S00	Source for input signal, inverter 10 (output = B9459) As for U380	FB 189 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U390 (2390) * S00	Source for input signal, inverter 11 (output = B9460) As for U380	FB 190 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U391 (2391) * S00	Source for input signal, inverter 12 (output = B9461) As for U380	FB 191 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U392 (2392) * S00	Source for input signal, inverter 13 (output = B9462) As for U380	FB 192 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U393 (2393) * S00	Source for input signal, inverter 14 (output = B9463) As for U380	FB 193 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U394 (2394) * S00	Source for input signal, inverter 15 (output = B9464) As for U380	FB 194 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U395 (2395) * S00	Source for input signal, inverter 16 (output = B9465) As for U380	FB 195 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
NAND elements with 3 inputs each				
The input signals selected via the 3 indices of the parameter are combined in an NAND operation and the result applied to the specified binector.				
U400 (2400) * S00	Source for input signals, NAND element 1 (output = B9470) FB 200 i001 Source for input 1 i002 Source for input 2 i003 Source for input 3 Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U401 (2401) * S00	Source for input signals, NAND element 2 (output = B9471) FB 201 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U402 (2402) * S00	Source for input signals, NAND element 3 (output = B9472) FB 202 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U403 (2403) * S00	Source for input signals, NAND element 4 (output = B9473) FB 203 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U404 (2404) * S00	Source for input signals, NAND element 5 (output = B9474) FB 204 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U405 (2405) * S00	Source for input signals, NAND element 6 (output = B9475) FB 205 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U406 (2406) * S00	Source for input signals, NAND element 7 (output = B9476) FB 206 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U407 (2407) * S00	Source for input signals, NAND element 8 (output = B9477) FB 207 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U408 (2408) * S00	Source for input signals, NAND element 9 (output = B9478) FB 208 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U409 (2409) * S00	Source for input signals, NAND element 10 (output = B9479) FB 209 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U410 (2410) * S00	Source for input signals, NAND element 11 (output = B9480) FB 210 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U411 (2411) * S00	Source for input signals, NAND element 12 (output = B9481) FB 211 As for U400	All binector numbers 1	Ind: 3 FS=1 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.61 Storage elements, timers and binary signal selector switches

Parameters apply only if optional S00 technology software is installed

RS flipflops				
RS flipflops with SET (Q=1) and RESET (Q=0) (priority: 1 st RESET, 2 nd SET). RESET setting is enabled on POWER ON.				
U415 (2415) * S00	Source for SET and RESET for RS flipflop 1 (Outputs: Q = B9550, /Q = B9551) i001 Source for SET i002 Source for RESET Settings: 0 = binector B0000 1 = binector B0001 etc.	FB 215	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U416 (2416) * S00	Source for SET and RESET for RS flipflop 2 (outputs: Q = B9552, /Q = B9553) As for U415	FB 216	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U417 (2417) * S00	Source for SET and RESET for RS flipflop 3 (outputs: Q = B9554, /Q = B9555) As for U415	FB 217	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U418 (2418) * S00	Source for SET and RESET for RS flipflop 4 (outputs: Q = B9556, /Q = B9557) As for U415	FB 218	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U419 (2419) * S00	Source for SET and RESET for RS flipflop 5 (outputs: Q = B9558, /Q = B9559) As for U415	FB 219	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U420 (2420) * S00	Source for SET and RESET for RS flipflop 6 (outputs: Q = B9560, /Q = B9561) As for U415	FB 220	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U421 (2421) * S00	Source for SET and RESET for RS flipflop 7 (outputs: Q = B9562, /Q = B9563) As for U415	FB 221	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U422 (2422) * S00	Source for SET and RESET for RS flipflop 8 (outputs: Q = B9564, /Q = B9565) As for U415	FB 222	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U423 (2423) * S00	Source for SET and RESET for RS flipflop 9 (outputs: Q = B9566, /Q = B9567) As for U415	FB 223	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U424 (2424) * S00	Source for SET and RESET for RS flipflop 10 (outputs: Q = B9568, /Q = B9569) As for U415	FB 224	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U425 (2425) * S00	Source for SET and RESET for RS flipflop 11 (outputs: Q = B9570, /Q = B9571) As for U415	FB 225	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U426 (2426) * S00	Source for SET and RESET for RS flipflop 12 (outputs: Q = B9572, /Q = B9573) As for U415	FB 226	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U427 (2427) * S00	Source for SET and RESET for RS flipflop 13 (outputs: Q = B9574, /Q = B9575) As for U415	FB 227	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U428 (2428) * S00	Source for SET and RESET for RS flipflop 14 (outputs: Q = B9576, /Q = B9577) As for U415	FB 228	All binector numbers 1	Ind: 2 FS=0 Type: L2 P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
D flipflops				
D flipflops with RESET (Q=0), SET (Q=1) and STORE (Q=D on transition from 0 to 1) (priority: 1 st RESET, 2 nd SET, 3 rd STORE). RESET setting is enabled on POWER ON.				
U430 (2430) * S00	Source for SET, D, STORE and RESET for D flipflop 1 FB 230 (outputs: Q = B9490, /Q = B9491) i001 Source for SET i002 Source for D i003 Source for STORE i004 Source for RESET Settings: 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U431 (2431) * S00	Source for SET, D, STORE and RESET for D flipflop 2 FB 231 (outputs: Q = B9492, /Q = B9493) As for U430	All binector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U432 (2432) * S00	Source for SET, D, STORE and RESET for D flipflop 3 FB 232 (outputs: Q = B9494, /Q = B9495) As for U430	All binector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U433 (2433) * S00	Source for SET, D, STORE and RESET for D flipflop 4 FB 233 (outputs: Q = B9496, /Q = B9497) As for U430	All binector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Timer 1 (0.000 to 60.000s) (output = B9580, inverted: B9581)				
U440 (2440) * S00	Source for input signal and reset signal for timer element 1 FB 240 i001 Source for input signal i002 Source for reset signal for the pulse generator (if U442=3) (in state "1", the pulse generator is set to "0") Settings: 0 = Binector B0000 1 = Binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U441 (2441) S00	Time for timer 1 FB 240	0.000 to 60.000 [s] 0.001	Ind: None FS=0.000 Type: O2	P052 = 3 P051 = 40 Offline
U442 (2442) * S00	Mode for timer 1 FB 240 0 ON delay 1 OFF delay 2 ON / OFF delay 3 Pulse generator with positive edge triggering	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Timer 2 (0.000 to 60.000s) (output = B9582, inverted: B9583)				
U443 (2443) * S00	Source for input signal and reset signal for timer element 2 FB 241 As for U440	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U444 (2444) S00	Time for timer 2 FB 241	0.000 to 60.000 [s] 0.001	Ind: None FS=0.000 Type: O2	P052 = 3 P051 = 40 Offline
U445 (2445) * S00	Mode for timer 2 FB 241 As for U442	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Timer 3 (0.000 to 60.000s) (output = B9584, inverted: B9585)				
U446 (2446) * S00	Source for input signal and reset signal for timer element 3 FB 242 As for U440	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U447 (2447) S00	Time for timer 3 FB 242	0.000 to 60.000 [s] 0.001	Ind: None FS=0.000 Type: O2	P052 = 3 P051 = 40 Offline
U448 (2448) * S00	Mode for timer 3 As for U442 FB 242	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Timer 4 (0.000 to 60.000s) (output = B9586, inverted: B9587)				
U449 (2449) * S00	Source for input signal and reset signal for timer element 4 As for U440 FB 243	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U450 (2450) S00	Time for timer 4 FB 243	0.000 to 60.000 [s] 0.001	Ind: None FS=0.000 Type: O2	P052 = 3 P051 = 40 Offline
U451 (2451) * S00	Mode for timer 4 As for U442 FB 243	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Timer 5 (0.000 to 60.000s) (output = B9588, inverted: B9589)				
U452 (2452) * S00	Source for input signal and reset signal for timer element 5 As for U440 FB 244	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U453 (2453) S00	Time for timer 5 FB 244	0.000 to 60.000 [s] 0.001	Ind: None FS=0.000 Type: O2	P052 = 3 P051 = 40 Offline
U454 (2454) * S00	Mode for timer 5 As for U442 FB 244	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Timer 6 (0.000 to 60.000s) (output = B9590, inverted: B9591)				
U455 (2455) * S00	Source for input signal and reset signal for timer element 6 As for U440 FB 245	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U456 (2456) S00	Time for timer 6 FB 245	0.000 to 60.000 [s] 0.001	Ind: None FS=0.000 Type: O2	P052 = 3 P051 = 40 Offline
U457 (2457) * S00	Mode for timer 6 As for U442 FB 245	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Timer 7 (0.00 to 600.00s) (output = B9592, inverted: B9593)				
U458 (2458) * S00	Source for input signal and reset signal for timer element 7 As for U440 FB 246	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U459 (2459) S00	Time for timer 7 FB 246	0.00 to 600.00 [s] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline
U460 (2460) * S00	Mode for timer 7 As for U442 FB 246	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Timer 8 (0.00 to 600.00s) (output = B9594, inverted: B9595)				
U461 (2461) * S00	Source for input signal and reset signal for timer element 8 As for U440 FB 247	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U462 (2462) S00	Time for timer 8 FB 247	0.00 to 600.00 [s] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline
U463 (2463) * S00	Mode for timer 8 As for U442 FB 247	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Timer 9 (0.00 to 600.00s) (output = B9596, inverted: B9597)

U464 (2464) * S00	Source for input signal and reset signal for timer element 9 As for U440 FB 248	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U465 (2465) S00	Time for timer 9 FB 248	0.00 to 600.00 [s] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline
U466 (2466) * S00	Mode for timer 9 As for U442 FB 248	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Timer 10 (0.00 to 600.00s) (output = B9598, inverted: B9599)

U467 (2467) * S00	Source for input signal and reset signal for timer element 10 As for U440 FB 249	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U468 (2468) S00	Time for timer 10 FB 249	0.00 to 600.00 [s] 0.01	Ind: None FS=0.00 Type: O2	P052 = 3 P051 = 40 Offline
U469 (2469) * S00	Mode for timer 10 As for U442 FB 249	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Binary signal selector switches

The control signal (binector) is selected via index i001 of the parameter.
Control signal = 0: Binector as set in index i002 is applied to the output
Control signal = 1: Binector as set in index i003 is applied to the output

U470 (2470) * S00	Source for input signals for binary signal selector switch 1 (output = B9482) i001 Source for control signal i002 Source for output signal when control signal = 0 i003 Source for output signal when control signal = 1 Settings: 0 = binector B0000 1 = binector B0001 etc. FB 250	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U471 (2471) * S00	Source for input signals for binary signal selector switch 2 (output = B9483) As for U470 FB 251	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U472 (2472) * S00	Source for input signals for binary signal selector switch 3 (output = B9484) As for U470 FB 252	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U473 (2473) * S00	Source for input signals for binary signal selector switch 4 (output = B9485) As for U470 FB 253	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U474 (2474) * S00	Source for input signals for binary signal selector switch 5 (output = B9486) As for U470 FB 254	All binector numbers 1	Ind: 3 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.62 Technology controller

Parameters apply only if optional S00 technology software is installed

Technology controller: Actual value				
U480 (2480) * S00	Source for actual value Selection of connectors to be added as the actual value 0 = connector K0000 1 = connector K0001 etc.	FB 114	All connector numbers 1	Ind: 4 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U481 (2481) S00 FDS	Filter time for actual value	FB 114	0.00 to 600.00 [s] 0.01	Ind: 4 FS=0.00 Type: O2 P052 = 3 P051 = 40 Online
U482 (2482) S00 FDS	Derivative-action time for actual value (D component) 0.000 = D component deactivated See also U483	FB 114	0.000 to 30.000 [s] 0.001	Ind: 4 FS=0.000 Type: O2 P052 = 3 P051 = 40 Online
U483 (2483) * S00 FDS	Factor for derivative-action time 0 Derivative-action time = U482 * 1 1 Derivative-action time = U482 * 1000	FB 114	0 to 1 1	Ind: 4 FS=0 Type: O2 P052 = 3 P051 = 40 Offline

Technology controller: Setpoint				
U484 (2484) * S00	Source for setpoint Selection of connectors to be added as the setpoint 0 = connector K0000 1 = connector K0001 etc.	FB 114	All connector numbers 1	Ind: 4 FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U485 (2485) S00 FDS	Injectable additional setpoint This parameter setting is added to the setpoint when the binector selected in U486 changes to the log. "1" state	FB 114	-200.00 to 199.99 [%] 0.01	Ind: 4 FS=0.00 Type: I2 P052 = 3 P051 = 40 Online
U486 (2486) * S00	Source for control bit for injection of additional setpoint 0 = binector B0000 1 = binector B0001 etc.	FB 114	All binector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U487 (2487) S00 FDS	Filter time for setpoint	FB 114	0.00 to 600.00 [s] 0.01	Ind: 4 FS=0.00 Type: O2 P052 = 3 P051 = 40 Online

Technology controller: Controller parameters				
U488 (2488) S00 FDS	P gain	FB 114	0.10 to 200.00 0.01	Ind: 4 FS=3.00 Type: O2 P052 = 3 P051 = 40 Online
U489 (2489) * S00	Source for input quantity (x) for Kp adaptation 0 = connector K0000 1 = connector K0001 etc.	FB 114	All connector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline
U490 (2490) S00 FDS	Characteristic for Kp adaptation: Threshold 1 (x1)	FB 114	0.00 to 200.00 [%] 0.01	Ind: 4 FS=0.00 Type: O2 P052 = 3 P051 = 40 Online
U491 (2491) S00 FDS	Characteristic for Kp adaptation: Threshold 2 (x2)	FB 114	0.00 to 200.00 [%] 0.01	Ind: 4 FS=100.00 Type: O2 P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U492 (2492) S00 FDS	Characteristic for Kp adaptation: Minimum value (y1) FB 114 Minimum value of Kp factor (y) when $x \leq x1$	0.10 to 30.00 0.01	Ind: 4 FS=1.00 Type: O2	P052 = 3 P051 = 40 Online
U493 (2493) S00 FDS	Characteristic for Kp adaptation: Maximum value (y2) FB 114 Maximum value of Kp factor (y) when $x \geq x2$	0.10 to 30.00 0.01	Ind: 4 FS=1.00 Type: O2	P052 = 3 P051 = 40 Online
U494 (2494) S00 FDS	Reset time FB 114 See also U495	0.000 to 60.000 [s] 0.001	Ind: 4 FS=3.000 Type: O2	P052 = 3 P051 = 40 Online
U495 (2495) * S00 FDS	Factor for reset time FB 114 0 Reset time = U494 * 1 1 Reset time = U494 * 1000	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline

Technology controller: Speed droop

A parameterizable feedback loop can be connected in parallel to the I and P components of the technology controller (acts on summation point of setpoint and actual value). This loop can be activated and deactivated by settings in parameter U496 (loop can also be deactivated by setting U497 = 0).

U496 (2496) * S00	Source for control bit for speed droop injection FB 114 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U497 (2497) S00 FDS	Speed droop FB 114 Example: A 10% speed droop setting causes a 10% reduction in the setpoint at a 100% controller output ("softening" of closed-loop control).	0.0 to 60.0 [%] 0.1	Ind: 4 FS=0.0 Type: O2	P052 = 3 P051 = 40 Online
U498 (2498) S00 FDS	Positive limit for speed droop FB 114	0.00 to 199.99 [%] 0.01	Ind: 4 FS=100.00 Type: O2	P052 = 3 P051 = 40 Online
U499 (2499) S00 FDS	Negative limit for speed droop FB 114	-200.00 to 0.00 [%] 0.01	Ind: 4 FS=-100.00 Type: I2	P052 = 3 P051 = 40 Online

Technology controller: Control bits

U500 (2500) * S00	Source for technology controller enabling command FB 114 0 = binector B0000 1 = binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U502 (2502) * S00 FDS	PI/PID controller switchover FB 114 0 PI controller (D component is applied only in actual-value channel) 1 PID controller (D component is applied for control deviation)	0 to 1 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U503 (2503) * S00 FDS	Set P component to zero FB 114 0 Set controller P component to zero (i.e. to obtain pure I controller) 1 Controller P component is active	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
U504 (2504) * S00 FDS	Set I component to zero FB 114 0 Set controller I component to zero (i.e. to obtain pure P controller) 1 Controller I component is active	0 to 1 1	Ind: 4 FS=1 Type: O2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Technology controller: Set I component When the state of the binector selected in U506 switches from log. "0" to "1", the I component of the technology controller is set to the value parameterized in U505. With this function it is possible, for example, to use the same signal (binector) to control controller enabling commands and setting of the I component.				
U505 (2505) * S00	Source for setting value for I component 0 = connector K0000 1 = connector K0001 etc.	FB 114 All connector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U506 (2506) * S00	Source for control bit "Set I component" 0 = binector B0000 1 = binector B0001 etc.	FB 114 All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 Offline

Technology controller: Output, limitation				
U507 (2507) * S00	Source for variable positive limit After multiplication with U508, the contents of the selected connector act as a positive limit for the technology controller output. 0 = connector K0000 1 = connector K0001 etc. Note: If the selected connector contains a negative value, a negative maximum value is applied to the output of this limiter stage.	FB 114 All connector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U508 (2508) S00 FDS	Positive limit for output of technology controller See also U507	FB 114 0.0 to 199.9 [%] 0.1	Ind: 4 FS=100.0 Type: O2	P052 = 3 P051 = 40 Online
U509 (2509) * S00	Source for variable negative limit After multiplication with U510, the contents of the selected connector act as a negative limit for the technology controller output. 0 = connector K0000 1 = connector K0001 etc. Note: If the selected connector contains a positive value, a positive minimum value is applied to the output of this limiter stage. <u>Note:</u> Connector K9252 contains the positive limiting value with inverted sign generated by U507 and U508. By setting U509=9252 and U510=100.00, therefore, it is possible to set the negative and positive limits symmetrically.	FB 114 All connector numbers 1	Ind: None FS=9252 Type: L2	P052 = 3 P051 = 40 Offline
U510 (2510) S00 FDS	Negative limit for output of technology controller See also U509	FB 114 0.0 to 199.9 [%] 0.1	Ind: 4 FS=100.0 Type: O2	P052 = 3 P051 = 40 Online
U511 (2511) * S00	Source for variable weighting factor for output After multiplication with U512, the contents of the selected connector act as a weighting factor for the technology controller output. 0 = connector K0000 1 = connector K0001 etc.	FB 114 All connector numbers 1	Ind: None FS=1 Type: L2	P052 = 3 P051 = 40 Offline
U512 (2512) S00 FDS	Weighting factor for output See also U511	FB 114 -100.0 to 100.0 [%] 0.1	Ind: 4 FS=100.0 Type: I2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.63 Velocity/speed calculators

Parameters apply only if optional S00 technology software is installed

Speed/velocity calculator Function: $v_{act} = \frac{D * \pi * n_{rated}}{i} * \frac{n_{act}}{100\%}$ v_act Actual velocity (n021, U521, K9256) D Diameter (U517, U518) n Rated Rated speed (U520) i Gear ratio (U519) n_act Actual speed (U515)				
U515 (2515) * S00	Source for actual speed 0 = connector K0000 1 = connector K0001 etc.	FB 115	All connector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 Offline
Velocity/speed calculator Function: $n_{set} = \frac{v_{set} * i}{D * \pi * n_{rated}} * 100\%$ n_set Setpoint speed (n023, K9257) D Diameter (U517, U518, U523) n Rated Rated speed (U520) i Gear ratio (U519) v_set Setpoint velocity (U516)				
U516 (2516) * S00	Source for set velocity A value of 16384 in the selected connector is equivalent to the set velocity set in U522 0 = Connector K0000 1 = Connector K0001 etc.	FB 115	All connector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 off-line
U517 (2517) * S00	Source for diameter A value of 16384 in the selected connector is equivalent to the diameter set in U523 0 = Connector K0000 1 = Connector K0001 etc.	FB 115	All connector numbers 1	Ind: None FS=0 Type: L2 P052 = 3 P051 = 40 off-line
U518 (2518) S00 FDS	Minimum diameter Lower limit for diameter set in U517	FB 115	10.0 to 6553,5 [mm] 0.1	Ind: 4 FS=6500.0 Type: O2 P052 = 3 P051 = 40 Online
U519 (2519) S00 FDS	Gear ratio (i)	FB 115	1.00 to 300.00 0.01	Ind: 4 FS=1.00 Type: O2 P052 = 3 P051 = 40 Online
U520 (2520) S00 FDS	Rated speed (n Rated)	FB 115	600 to 4000 [rev/m] 1	Ind: 4 FS=1450 Type: O2 P052 = 3 P051 = 40 Online
U521 (2521) S00	Normalization for actual velocity [SW 1.8 and later] 16384 in K9256 correspond to the actual velocity set here		0.01 to 327,67 [m/s] 0.01	Ind: None FS=16,38 Type: O2 P052 = 3 P051 = 40 on-line
U522 (2522) S00	Normalization for set velocity [SW 1.8 and later] See parameter U516		0.01 to 327,67 [m/s] 0.01	Ind: None FS=16,38 Type: O2 P052 = 3 P051 = 40 on-line
U523 (2523) S00	Normalization for diameter [SW 1.8 and later] See parameter U517		10 to 60000 [mm] 1	Ind: None FS=1638 Type: O2 P052 = 3 P051 = 40 on-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.64 Variable moment of inertia

[SW 1.8 and later]

Only active with optional technology software S00

Calculation of the variable moment of inertia		FB 115		
Function: $J_V = \frac{D^4 - D_{H\ddot{u}lse}^4}{D_{max}^4} * K$				
J _V	Variable moment of inertia			
D	Diameter			
D _{H_ülse}	Diameter of the sleeve			
D _{max}	Maximum diameter			
K	Constant			
U525 (2525) * S00	Source for input quantities 0 = Connector K0000 1 = Connector K0001 etc. i001 Diameter (16384 are equivalent to set diameter U526) i002 Diameter of the sleeve (16384 are equivalent to set diameter U527) i003 Maximum diameter (16384 are equivalent to set diameter U528) i004 Constant (16384 are equivalent to set factor U529)	[SW 1.8 and later] <		

11.65 PI controller

[SW 1.8 and later]

Only active with optional technology software S00

PI controller 1 = FB260 PI controller 2 = FB261 PI controller 3 = FB262 PI controller 4 = FB263 PI controller 5 = FB264 PI controller 6 = FB265 PI controller 7 = FB266 PI controller 8 = FB267 PI controller 9 = FB268 PI controller 10 = FB269				
U530 (2530) * S00	Source for input quantity [SW 1.8 and later] 0 = Connector K0000 1 = Connector K0001 etc. i001: input quantity PI controller 1 i002: input quantity PI controller 2 ... i010: input quantity PI controller 10	All connector numbers 1	Ind: 10 FS=0 Type: L2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Enable and setting of the PI controllers				
U531 (2531) * S00	Source for control signals (enable PI controller) [SW 1.8 and later] 0 = Binector B0000 1 = Binector B0001 etc. i001: 0 = Disable controller PI controller 1 i002: 0 = Disable controller PI controller 2 ... i010: 0 = Disable controller PI controller 10 i011: 1 = Freeze I component PI controller 1 i012: 1 = Freeze I component PI controller 2 ... i020: 1 = Freeze I component PI controller 10 i021: 1 = Freeze output PI controller 1 i022: 1 = Freeze output PI controller 2 ... i030: 1 = Freeze output PI controller 10 i031: 1 = Freeze I component in pos.direction PI controller 1 i032: 1 = Freeze I component in pos.direction PI controller 2 ... i040: 1 = Freeze I component in pos.direction PI controller 10 i041: 1 = Freeze I component in neg.direction PI controller 1 i042: 1 = Freeze I component in neg.direction PI controller 2 ... i050: 1 = Stop I component in neg.direction PI controller 10	All binector numbers 1	Ind: 50 FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U532 (2532) * S00	Source for control signals (set PI controller) [SW 1.8 and later] 0 = Binector B0000 1 = Binector B0001 etc. i001: 0 = Set I component PI controller 1 i002: 0 = Set I component PI controller 2 ... i010: 0 = Set I component PI controller 10 i011: 0 = Set output PI controller 1 i012: 0 = Set output PI controller 2 ... i020: 0 = Set output PI controller 10	All binector numbers 1	Ind: 20 FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U533 (2533) * S00	Source for Setting values [SW 1.8 and later] 0 = Connector K0000 1 = Connector K0001 etc. i001: Setting value for I component PI controller 1 i002: Setting value for I component PI controller 2 ... i010: Setting value for I component PI controller 10 i011: Setting value for Output PI controller 1 i012: Setting value for Output PI controller 2 ... i020: Setting value for Output PI controller 10	All connector numbers 1	Ind: 20 FS=0 Type: L2	P052 = 3 P051 = 40 off-line
Filtering of the input signals				
U534 (2534) * S00	Source for variable filtering time for the input signal [SW 1.8 and later] The content of the selected connector acts as filtering time for the PI controller after multiplication with U535. 0 = Connector K0000 1 = Connector K0001 etc. i001: variable filtering time PI controller 1 i002: variable filtering time PI controller 2 ... i010: variable filtering time PI controller 10	All connector numbers 1	Ind: 10 FS=1 Type: L2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U535 (2535) S00	Filtering time for the input signal [SW 1.8 and later] i001: filtering time PI controller 1 i002: filtering time PI controller 2 ... i010: filtering time PI controller 10	0 to 10000 [ms] 1	Ind: 10 FS=0 Type: O2	P052 = 3 P051 = 40 on-line

Controller parameters				
U536 (2536) * S00	Source for variable P gain [SW 1.8 and later] The content of the selected connector acts as the P gain for the PI controller after multiplication with U537. 0 = Connector K0000 1 = Connector K0001 etc. i001: variable P gain PI controller 1 i002: variable P gain PI controller 2 ... i010: variable P gain PI controller 10	All connector numbers 1	Ind: 10 FS=1 Type: L2	P052 = 3 P051 = 40 off-line
U537 (2537) S00	PI controller P gain [SW 1.8 and later] i001: P gain PI controller 1 i002: P gain PI controller 2 ... i010: P gain PI controller 10	0.10 to 200.00 0.01	Ind: 10 FS=3,00 Type: O2	P052 = 3 P051 = 40 on-line
U538 (2538) * S00	Source for variable Integration time [SW 1.8 and later] The content of the selected connector acts as the integration time for the PI controller after multiplication with U539. 0 = Connector K0000 1 = Connector K0001 etc. i001: variable Integration time PI controller 1 i002: variable Integration time PI controller 2 ... i010: variable Integration time PI controller 10	All connector numbers 1	Ind: 10 FS=1 Type: L2	P052 = 3 P051 = 40 off-line
U539 (2539) S00	PI controller integration time [SW 1.8 and later] i001: Integration time PI controller 1 i002: Integration time PI controller 2 ... i010: Integration time PI controller 10	0.010 to 10.000 [s] 0.001	Ind: 10 FS=3,000 Type: O2	P052 = 3 P051 = 40 on-line

Control bits				
U540 (2540) * S00	Freeze P component [SW 1.8 and later] 0 Controller P component frozen (i.e. pure I controller) 1 Controller P component active i001: PI controller 1 i002: PI controller 2 ... i010: PI controller 10	0 to 1 1	Ind: 10 FS=1 Type: O2	P052 = 3 P051 = 40 off-line
U541 (2541) * S00	Freeze I component [SW 1.8 and later] 0 Controller I component frozen (i.e. pure P controller) 1 Controller I component active i001: PI controller 1 i002: PI controller 2 ... i010: PI controller 10	0 to 1 1	Ind: 10 FS=1 Type: O2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Output, Limitation				
U542 (2542) * S00	Source for variable positive limit [SW 1.8 and later] The content of the selected connector acts as the positive limit for the output of the PI controller after multiplication with U543. 0 = Connector K0000 1 = Connector K0001 etc. i001: PI controller 1 i002: PI controller 2 ... i010: PI controller 10 Note: If the content of the selected connector has a negative value, this causes a negative maximum value at the output of this limiter stage.	All connector numbers 1	Ind: 10 FS=1 Type: L2	P052 = 3 P051 = 40 off-line
U543 (2543) S00	Positive limit for the output of the PI controller [SW 1.8 and later] See also U542	0.0 to 199.9 [%] 0.1	Ind: 10 FS=100.0 Type: O2	P052 = 3 P051 = 40 on-line
U544 (2544) * S00	Source for variable negative Limit [SW 1.8 and later] The content of the selected connector acts as the negative limit for the output of the technology controller after multiplication with U510. 0 = Connector K0000 1 = Connector K0001 etc. i001: PI controller 1 i002: PI controller 2 ... i010: PI controller 10 Note: If the content of the selected connector has a positive value, this causes a positive minimum value at the output of this limiter stage. Note: Connectors K9306 to K9396 contain for PI controllers 1 to 10 the positive limitation values formed by U542 and U543 with an inverted sign. In this way it is possible to set the negative limitation symmetrically to the positive limitation by setting U544= 9306 to 9396 and U545=100.0.	All connector numbers 1	Ind: 10 FS= i001: 9306 i002: 9316 i003: 9326 i004: 9336 i005: 9346 i006: 9356 i007: 9366 i008: 9376 i009: 9386 i010: 9396 Type: L2	P052 = 3 P051 = 40 off-line
U545 (2545) S00	Negative limit for the output of the PI controller [SW 1.8 and later] See also U544	0.0 to 199.9 [%] 0.1	Ind: 4 FS=100.0 Type: O2	P052 = 3 P051 = 40 on-line

11.66 Closed-loop control elements

Only active with optional technology software S00

Derivative / delay elements SW 1.8 and later		FB 270 to FB 279		
U550 (2550) * S00	Source for input quantity [SW 1.8 and later] 0 = Connector K0000 1 = Connector K0001 etc. i001: Input quantity derivative/delay element 1 (FB 270) i002: Input quantity derivative/delay element 2 (FB 271) i003: Input quantity derivative/delay element 3 (FB 272) i004: Input quantity derivative/delay element 4 (FB 273) i005: Input quantity derivative/delay element 5 (FB 274) i006: Input quantity derivative/delay element 6 (FB 275) i007: Input quantity derivative/delay element 7 (FB 276) i008: Input quantity derivative/delay element 8 (FB 277) i009: Input quantity derivative/delay element 9 (FB 278) i010: Input quantity derivative/delay element 10 (FB 279)	All connector numbers 1	Ind: 10 FS=0 Type: L2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U551 (2551) * S00	Source for multiplier for derivative-action time [SW 1.8 and later] 0 = Connector K0000 1 = Connector K0001 etc. i001: Multiplier derivative/delay element 1 (FB 270) i002: Multiplier derivative/delay element 2 (FB 271) i003: Multiplier derivative/delay element 3 (FB 272) i004: Multiplier derivative/delay element 4 (FB 273) i005: Multiplier derivative/delay element 5 (FB 274) i006: Multiplier derivative/delay element 6 (FB 275) i007: Multiplier derivative/delay element 7 (FB 276) i008: Multiplier derivative/delay element 8 (FB 277) i009: Multiplier derivative/delay element 9 (FB 278) i010: Multiplier derivative/delay element 10 (FB 279)	All connector numbers 1	Ind: 10 FS=1 Type: L2	P052 = 3 P051 = 40 off-line
U552 (2552) S00	Derivative-action time [SW 1.8 and later] i001: Der.-act.time deriv./delay element 1 (FB 270) i002: Der.-act.time deriv./delay element 2 (FB 271) i003: Der.-act.time deriv./delay element 3 (FB 272) i004: Der.-act.time deriv./delay element 4 (FB 273) i005: Der.-act.time deriv./delay element 5 (FB 274) i006: Der.-act.time deriv./delay element 7 (FB 276) i008: Der.-act.time deriv./delay element 8 (FB 277) i009: Der.-act.time deriv./delay element 9 (FB 278) i010: Der.-act.time deriv./delay element 10 (FB 279)	0 to 10000 [ms] 1	Ind: 10 FS=100 Type: O2	P052 = 3 P051 = 40 on-line
U553 (2553) * S00	Source for multiplier for filtering time [SW 1.8 and later] 0 = Connector K0000 1 = Connector K0001 etc. i001: Multiplier derivative/delay element 1 (FB 270) i002: Multiplier derivative/delay element 2 (FB 271) i003: Multiplier derivative/delay element 3 (FB 272) i004: Multiplier derivative/delay element 4 (FB 273) i005: Multiplier derivative/delay element 5 (FB 274) i006: Multiplier derivative/delay element 6 (FB 275) i007: Multiplier derivative/delay element 7 (FB 276) i008: Multiplier derivative/delay element 8 (FB 277) i009: Multiplier derivative/delay element 9 (FB 278) i010: Multiplier derivative/delay element 10 (FB 279)	All connector numbers 1	Ind: 10 FS=1 Type: L2	P052 = 3 P051 = 40 off-line
U554 (2554) S00	Filtering time [SW 1.8 and later] i001: Filtering time derivative/delay element 1 (FB 270) i002: Filtering time derivative/delay element 2 (FB 271) i003: Filtering time derivative/delay element 3 (FB 272) i004: Filtering time derivative/delay element 4 (FB 273) i005: Filtering time derivative/delay element 5 (FB 274) i006: Filtering time derivative/delay element 6 (FB 275) i007: Filtering time derivative/delay element 7 (FB 276) i008: Filtering time derivative/delay element 8 (FB 277) i009: Filtering time derivative/delay element 9 (FB 278) i010: Filtering time derivative/delay element 10 (FB 279)	0 to 10000 [ms] 1	Ind: 10 FS=100 Type: O2	P052 = 3 P051 = 40 on-line

11.67 Setpoint reduction

U607 (2607) * BDS	Source for activation of the setpoint reduction 0 = Binector B0000 1 = Binector B0001 etc. 0 Setpoint reduction active The Setpoint (before the ramp-function generator) is multiplied by the factor set in parameter U608 1 No setpoint reduction	All binector numbers 1	Ind: 2 FS=9382 Type: L2	P052 = 3 P051 = 40 off-line
U608 (2608) FDS	Multiplier for speed setpoint on activation of the setpoint reduction	0.00 to 100.00 [%] 0.01%	Ind: 4 FS=15,00 Type: O2	P052 = 3 P051 = 40 on-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.68 Definition of the function of the relay output at terminals 109 / 110#

(See also Chapter 8 Function Diagram Sheet G112)

U619 (2619) * BDS	Source for the relay output "line contactor ON" (terminals 109 / 110) 0 = Binector B0000 1 = Binector B0001 etc. 124 = Main contactor EIN	All binector numbers 1	Ind: 2 FS=124 Type: L2	P052 = 3 P051 = 40 off-line
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11.69 Starting pulse – Speed controller

(See also Chapter 8 Function Diagram Sheet G150)

U651 (2651) FDS	Starting pulse (integrator setting value for the speed controller)	-100.00 to 100.00 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 on-line
U652 (2652) FDS	Multiplier for starting pulse with neg. setpoint if the starting pulse acc. to U651 is also used for pos. setpoint	0.00 to 100.00 [%] 0.01%	Ind: 4 FS=50.00 Type: O2	P052 = 3 P051 = 40 on-line
U653 (2653) FDS	Starting pulse with neg. setpoint	-100.00 to 100.00 [%] 0.01%	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 on-line
U655 (2655) *	Source for Starting pulse 0 = Connector K0000 1 = Connector K0001 etc.	All connector numbers 1	Ind: None FS=451 Type: L2	P052 = 3 P051 = 40 off-line
U656 (2656) *	Source for starting pulse with neg. setpoint 0 = Connector K0000 1 = Connector K0001 etc.	All connector numbers 1	Ind: None FS=452 Type: L2	P052 = 3 P051 = 40 off-line
U657 (2657) * BDS	Source for switchover starting pulse for pos./neg. setp. 0 = Binector B0000 1 = Binector B0001 etc.	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 off-line

11.70 Evaluation of a 4-step master switch for cranes

(See also Chapter 8 Function Diagram Sheet G125)

U660 (2660) *	Source for travel command 1 0 = Binector B0000 1 = Binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U661 (2661) *	Source for travel command 2 0 = Binector B0000 1 = Binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U662 (2662) *	Source for switchover to setpoint step S2 0 = Binector B0000 1 = Binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U663 (2663) *	Source for switchover to setpoint step S3 0 = Binector B0000 1 = Binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U664 (2664) *	Source for switchover to setpoint step S4 0 = Binector B0000 1 = Binector B0001 etc.	All binector numbers 1	Ind: None FS=0 Type: L2	P052 = 3 P051 = 40 off-line
U665 (2665)	Setpoint for setpoint step S1	0.00 to 110.00 [%] 0.01%	Ind: None FS=10.00 Type: O2	P052 = 3 P051 = 40 on-line
U666 (2666)	Setpoint for setpoint step S2	0.00 to 110.00 [%] 0.01%	Ind: None FS=25.00 Type: O2	P052 = 3 P051 = 40 on-line
U667 (2667)	Setpoint for setpoint step S3	0.00 to 110.00 [%] 0.01%	Ind: None FS=40.00 Type: O2	P052 = 3 P051 = 40 on-line
U668 (2668)	Setpoint for setpoint step S4	0.00 to 110.00 [%] 0.01%	Ind: None FS=100.00 Type: O2	P052 = 3 P051 = 40 on-line

11.71 Configuration of supplementary boards in board locations 2 and 3

U710 (2710) *	Initialize link to supplementary boards i001 Initialization of 1 st communications board (in slot with lower ID letter) i002 Initialization of 2 nd communications board (in slot with higher ID letter) Settings: 0 The link to supplementary boards is re-initialized. After the configuration parameters for supplementary boards have been changed, U710 must be set to 0 so that the new settings can take effect. The parameter is then set automatically to 1. Note: Data transmission is interrupted while initialization is in progress. 1 Deactivated	0 to 1 1	Ind: 2 FS=1 Type: O2	P052 = 3 P051 = 40 Offline
U711 (2711) *	Communications board parameter 1 (CB parameter 1) See documentation for installed COM BOARD. This parameter is relevant only if a communications board is installed. The validity of the setting is monitored by the CB. If the CB rejects the setting, fault message F080 is displayed with fault value 5 Index 1 is used to parameterize the 1 st CB (including CB behind TB) and index 2 to parameterize the 2 nd CB.	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 Online
U712 (2712) *	Communications board parameter 2 (CB parameter 2) See U711	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 Online
U713 (2713) *	Communications board parameter 3 (CB parameter 3) See U711	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 Online
U714 (2714) *	Communications board parameter 4 (CB parameter 4) See U711	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 Online
U715 (2715) *	Communications board parameter 5 (CB parameter 5) See U711	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 Online
U716 (2716) *	Communications board parameter 6 (CB parameter 6) See U711	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 Online
U717 (2717) *	Communications board parameter 7 (CB parameter 7) See U711	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 Online
U718 (2718) *	Communication Board Parameter 8 (CB-Parameter 8) See U711	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U719 (2719) *	Communications board parameter 9 (CB parameter 9) See U711	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 Online
U720 (2720) *	Communications board parameter 10 (CB parameter 10) See U711	0 to 65535 1	Ind: 2 FS=0 Type: O2	P052 = 3 Online
U721 (2721) *	Communications board parameter 11 (CB parameter 11) See U711	0 to 65535 1	Ind: 10 FS=0 Type: O2	P052 = 3 Online
U722 (2722) *	Telegram failure time for CB and TB i001: Telegram failure time for board location 2 i002: Telegram failure time for board location 3 Settings: 0 No time monitoring, must be parameterized for sporadic (acyclic) telegrams 1...65000 Permissible time interval between two process data exchange operations before a fault message is output. Fault message F082 is displayed if no process data are exchanged with the supplementary board within this delay period. The monitoring function is implemented within a 20 ms cycle. For this reason, only setting values which constitute a multiple of 20 ms are meaningful. Note: The telegram monitoring function is active - from the receipt of the first error-free telegram after connection of the electronics power supply - from the receipt of the first error-free telegram after the telegram monitor has responded (i.e. monitoring timeout).	0 to 65000 [ms] 1ms	Ind: 2 FS=0 Type: O2	P052 = 3 Online
n732 (2732)	CB/TB diagnostics Diagnostic information about an installed communications board (CB) or technology board (TB). i001 - i032: 1. CB/TB (lower slot ID letter) i033 - i064: 2. CB (higher slot ID letter) i065, i066: 1. CB/TB (internal diagnostic data) i067, i068: 2. CB (internal diagnostic data) For detailed information, please refer to operating instructions of relevant CB or TB.		Ind: 68 Type: O2	P052 = 3
n733 (2733)	CB/TB receive data Display of control words and setpoints (process data) that are transferred to the basic converter from a communications board (CB) or technology board (TB). i001: 1 st process data word from 1 st CB/TB ... i016: 16 th process data word from 1 st CB/TB i017: 1 st process data word from 2 nd CB ... i032: 16 th process data word from 2 nd CB	0000 to FFFF H 1	Ind: 32 Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U734 (2734) *	Transmit data for first CB/TB (lower slot ID letter) Selection of connectors whose contents must be injected as transmit data to the first communications board (CB) or technology board (TB). 0 = connector K0000 1 = connector K0001 etc. This parameter not only defines the transmit data, but also their position in the transmit telegram. i001: Word 1 in PZD section of telegram i002: Word 2 in PZD section of telegram ... i016: Word 16 in PZD section of telegram Status word 1 (K0032) should be linked to word 1.	All connector numbers 1	Ind: 16 FS=0 Type: L2	P052 = 3 Online
n735 (2735)	Display of transmit data to CB/TB i001: 1 st process data word to 1 st CB or TB ... i016: 16 th process data word to 1 st CB or TB i017: 1 st process data word to 2 nd CB ... i032: 16 th process data word to 2 nd CB	0000 to FFFF H 1	Ind: 32 Type: O2	P052 = 3
U736 (2736) *	Transmit data for second CB (higher slot letter) Selection of connectors whose contents must be injected as transmit data to a communications board (CB) with a higher slot ID letter. 0 = connector K0000 1 = connector K0001 etc. This parameter not only defines the transmit data, but also their position in the transmit telegram. i001: Word 1 in PZD section of telegram i002: Word 2 in PZD section of telegram ... i016: Word 16 in PZD section of telegram Status word 1 (K0032) should be linked to word 1.	All connector numbers 1	Ind: 16 FS=0 Type: L2	P052 = 3 Online
n738 (2738)	Display of PKW job from supplementary boards in locations 2 and 3 i001: 1 st word of PKW job from 1 st CB ... i004: 4 th word of PKW job from 1 st CB i005: 1 st word of PKW job from location 2 nd CB ... i008: 4 th word of PKW job from 2 nd CB i009: 1 st word of PKW job from TB ... i012: 4 th word of PKW job from TB Details refer to "Function diagrams", Section 8 Sheets Z110 and Z111	0000 to FFFF H 1	Ind: 12 Type: O2	P052 = 3
n739 (2739)	Display of PKW response to supplementary boards in locations 2 and 3 i001: 1 st word of PKW job from 1 st CB ... i004: 4 th word of PKW job from 1 st CB i005: 1 st word of PKW job from location 2 nd CB ... i008: 4 th word of PKW job from 2 nd CB i009: 1 st word of PKW job from TB ... i012: 4 th word of PKW job from TB Details refer to "Function diagrams", Section 8 Sheets Z110 and Z111	0000 to FFFF H 1	Ind: 12 Type: O2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.72 Configuring the SIMOLINK board

U740 (2740) *	SLB Node address Node address of the SIMOLINK board (SLB) on the bus. The node address defines the telegrams to which the relevant board has write access. The node address also defines whether a node is to perform the additional function of dispatcher. 0 = Dispatcher (generates telegram circulation) Not 0 = Transceiver Only one node in a SIMOLINK ring may perform the function of dispatcher. Node address 0 may not be assigned to any node if a higher-level PLC is performing the dispatcher function as the SIMOLINK master. When an SLB is selected to operate as dispatcher, all nodes must be assigned consecutive addresses, starting with address 0 for the dispatcher. i001: For first SLB in unit i002: Reserved	0 to 200 1	Ind: 2 FS=0 Type: O2	P052 = 3 P051 =40 Offline
U741 (2741) *	SLB Telegram failure time The telegram failure time defines the period within which a valid synchronizing telegram (SYNC telegram) must be received. Failure of any SYNC telegram to arrive within the set period indicates a communications error. The unit activates fault message F015 (see also U753) as a function of U741. 0 = No telegram failure monitoring i001: For first SLB in unit i002: Reserved	0 to 6500 [ms] 1	Ind: 2 FS=0 Type: O2	P052 = 3 P051 =40 Online
U742 (2742) *	SLB Transmitter power Setting of power of fiber optic transmitter 1 = 0m to 15m (length of plastic fiber optic cable) 2 = 15m to 25m (length of plastic fiber optic cable) 3 = 25m to 40m (length of plastic fiber optic cable) Operation at a lower transmitter power increases the service life of the transmitter and receiver modules. Reducing the transmitter power also allows hidden fault sources on the transmission path (e.g. poor contacts on fiber optics) to be detected. i001: For first SLB in unit i002: Reserved	1 to 3 1	Ind: 2 FS=3 Type: O2	P052 = 3 P051 =40 Online
U744 (2744) *	SLB Selection of active SLB board Selection of the active SIMOLINK board (SLB) when two SLBs are installed in one unit. 0 = Binector B0000 1 = Binector B0001 etc. A binector value of 0 means "SLB in low slot is active". A binector value of 1 is reserved for "SLB in high slot is active".	All binector numbers	Ind: None FS=0 Type: L2	P052 = 3 P051 =40 Online
U745 (2745) *	SLB No. of channels Number of channels which dispatcher provides for each transceiver. Together with U746, the number of channels determines the number of addressable nodes. This parameter is relevant only for the dispatcher. i001: For first SLB in unit i002: Reserved	1 to 8 1	Ind: 2 FS=3 Type: O2	P052 = 3 P051 =40 Offline

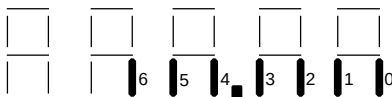
PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U746 (2746) *	SLB Cycle time The cycle time is the period required for all telegrams to be passed around the SIMOLINK ring. Together with U745, the cycle time determines the number of addressable nodes. This parameter is relevant only for the dispatcher. i001: For first SLB in unit i002: Reserved	1.00 to 6.50 [ms] 0.01	Ind:2 FS=1.20 Type: O2	P052 = 3 P051 =40 Offline
n748 (2748)	SLB Diagnosis Visualization parameter which displays diagnostic information for an installed SIMOLINK board (SLB) i001: Number of error-free synchronizing telegrams i002: Number of CRC errors i003: Number of timeout errors i004: Last accessible bus address i005: Address of node sending the special telegram "Timeout" i006: Implemented bus cycle time i007: Number of new configurations i008: Reserved ... i016: Reserved		Ind: 16 Type: O2	P052 = 3
U749 (2749) *	SLB Read address Definition of node addresses and channels from which the SLB must read data (a total of 8 channels can be read according to the index entries). The digits before the decimal point in the input value define the node address and those after the point the channel number (See also Chapter 7 "Startup of SIMOLINK modules" and function diagrams, Chapter 8, Sheet Z122). Example: 2.0 = address 2 channel 1 Changes to the receive data parameters have no effect until the electronics supply voltage of the drive is switched on again.	0.0 to 200.7 0.1	Ind: 8 FS=0.0 Type: O2	P052 = 3 P051 =40 Offline
n750 (2750)	SLB Receive data Visualization parameter for data received via the SIMOLINK board (See also Chapter 7 "Startup of SIMOLINK modules" and function diagrams, Chapter 8, Sheet Z122) i001: Word 1 in PZD section of telegram ... i016: Word 16 in PZD section of telegram	0000 to FFFF H 1	Ind: 16 Type: L2	P052 = 3
U751 (2751) *	SLB Transmit data selection Selection of connectors whose contents must be transferred as transmit data by the SLB (See also Chapter 7 "Startup of SIMOLINK modules" and function diagrams, Chapter 8, Sheet Z122). 0 = connector K0000 1 = connector K0001 etc. In addition to the transmit data itself, its place in the transmit telegram is also defined. i001: Channel0, low word i002: Channel0, high word ... i015: Channel7, low word i016: Channel7, high word	All connector numbers	Ind: 16 FS=0 Type: L2	P052 = 3 P051 =40 Offline
n752 (2752)	SLB Display of transmit data Process data transmitted by SLB via SIMOLINK in hexadecimal notation (See also Chapter 7 "Startup of SIMOLINK modules" and function diagrams, Chapter 8, Sheet Z122).		Ind: 16 Type: L2	P052 = 3
U753 (2753) *	SLB Fault delay Delay in activation of fault message F015 (see also U741) 0 = fault message is activated immediately the telegram failure monitor responds	0.0 to 100.0 [s] 0.1	Ind: None FS=0.0 Type: O2	P052 = 3 P051 =40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.73 Configuring the EB1 expansion board

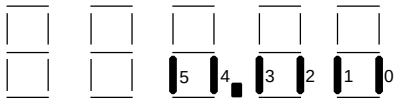
U755 (2755) *	Signal type of analog inputs on EB1 0 = Voltage input 0 to ± 10 V 1 = Current input 0 to ± 20 mA i001: AI1 of the first EB1 i002: AI1 of the second EB1	0 to 1 1	Ind: 2 FS=0 Type: O2	P052 = 3 P051 = 40 Online
U756 (2756)	Normalization of analog inputs on EB1 This parameter specifies the percentage value which is generated for an input voltage of 10V (or an input current of 20mA) at the analog input. The following general rule applies: With a voltage input: $U756[\%] = 10\text{ V} * \frac{Y}{X}$ X .. input voltage in volts Y .. % value which is generated for input voltage X With a current input: $U756[\%] = 20\text{ mA} * \frac{Y}{X}$ X .. input current in mA Y .. % value which is generated for input current X i001: AI1 of the first EB1 i002: AI2 of the first EB1 i003: AI3 of the first EB1 i004: AI1 of the second EB1 i005: AI2 of the second EB1 i006: AI3 of the second EB1	-1000.0 to 1000.0 [%] 0.1%	Ind: 6 FS=100.0 Type: I2	P052 = 3 P051 = 40 Online
U757 (2757)	Offset for analog inputs on EB1 i001: AI1 of the first EB1 i002: AI2 of the first EB1 i003: AI3 of the first EB1 i004: AI1 of the second EB1 i005: AI2 of the second EB1 i006: AI3 of the second EB1	-100.00 to 100.00 [%] 0.01%	Ind: 6 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
U758 (2758) *	Mode of signal injection at analog inputs on EB1 0 = Injection of signal with sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted i001: AI1 of the first EB1 i002: AI2 of the first EB1 i003: AI3 of the first EB1 i004: AI1 of the second EB1 i005: AI2 of the second EB1 i006: AI3 of the second EB1	0 to 3 1	Ind: 6 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U759 (2759) *	Source for selection of sign reversal at analog inputs on EB1 Selection of binector to control sign reversal at the analog input ("1" state = reverse sign) 0 = binector B0000 1 = binector B0001 etc. i001: AI1 of the first EB1 i002: AI2 of the first EB1 i003: AI3 of the first EB1 i004: AI1 of the second EB1 i005: AI2 of the second EB1 i006: AI3 of the second EB1	All binector numbers 1	Ind: 6 FS=0 Type: L2	P052 = 3 P051 = 40 Offline

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U760 (2760) *	Filtering time for analog inputs on EB1 Note: Hardware filtering of approximately 0.2 ms is applied as standard i001: AI1 of the first EB1 i002: AI2 of the first EB1 i003: AI3 of the first EB1 i004: AI1 of the second EB1 i005: AI2 of the second EB1 i006: AI3 of the second EB1	0 to 10000 [ms] 1ms	Ind: 6 FS=0 Type: O2	P052 = 3 P051 = 40 Online
U761 (2761) *	Source for enabling of analog inputs on EB1 Selection of binector to control enabling of the analog input ("1" state = enabled) 0 = binector B0000 1 = binector B0001 etc. i001: AI1 of the first EB1 i002: AI2 of the first EB1 i003: AI3 of the first EB1 i004: AI1 of the second EB1 i005: AI2 of the second EB1 i006: AI3 of the second EB1	All binector numbers 1	Ind: 6 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
n762 (2762)	Display of analog inputs on EB1 i001: AI1 of the first EB1 i002: AI2 of the first EB1 i003: AI3 of the first EB1 i004: AI1 of the second EB1 i005: AI2 of the second EB1 i006: AI3 of the second EB1	-200.0 to 199.99 [%] 0.01%	Ind: 6 Type: I2	P052 = 3
U763 (2763) *	Source for output value at analog outputs on EB1 Selection of connector whose value must be output at the analog output 0 = connector K0000 1 = connector K0001 etc. i001: AO1 of the first EB1 i002: AO2 of the first EB1 i003: AO1 of the second EB1 i004: AO2 of the second EB1	All connector numbers 1	Ind: 4 FS=0 Type: L2	P052 = 3 P051 = 40 Online
U764 (2764) *	Mode of signal injection at analog outputs on EB1 0 = Injection of signal with sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted i001: AO1 of the first EB1 i002: AO2 of the first EB1 i003: AO1 of the second EB1 i004: AO2 of the second EB1	0 to 3 1	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online
U765 (2765) *	Filtering time for analog outputs on EB1 i001: AO1 of the first EB1 i002: AO2 of the first EB1 i003: AO1 of the second EB1 i004: AO2 of the second EB1	0 to 10000 [ms] 1ms	Ind: 4 FS=0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U766 (2766)	Normalization of analog outputs on EB1 $y[V] = x * \frac{U766}{100\%}$ x = normalization input (corresponds to filtering output) y = normalization output (corresponds to output voltage at analog output with an offset of 0) i001: AO1 of the first EB1 i002: AO2 of the first EB1 i003: AO1 of the second EB1 i004: AO2 of the second EB1	-200.00 to 199.99 [V] 0.01V	Ind: 4 FS=10.00 Type: I2	P052 = 3 P051 = 40 Online
U767 (2767)	Offset for analog outputs on EB1 i001: AO1 of the first EB1 i002: AO2 of the first EB1 i003: AO1 of the second EB1 i004: AO2 of the second EB1	-10.00 to 10.00 [V] 0.01V	Ind: 4 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
n768 (2768)	Display of analog outputs on EB1 i001: AO1 of the first EB1 i002: AO2 of the first EB1 i003: AO1 of the second EB1 i004: AO2 of the second EB1	-200.0 to 199.99 [%] 0.01%	Ind: 4 Type: I2	P052 = 3
U769 (2769) *	Source for output values at binary outputs on EB1 Selection of binectors to be applied to binary outputs at terminals 43 - 46. 0 = Binector B0000 1 = Binector B0001 etc. i001: BO1 of the first EB1 i002: BO2 of the first EB1 i003: BO3 of the first EB1 i004: BO4 of the first EB1 i005: BO1 of the second EB1 i006: BO2 of the second EB1 i007: BO3 of the second EB1 i008: BO4 of the second EB1	All binector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
n770 (2770)	Display of status of binary inputs and outputs on EB1 Representation on operator panel (PMU):  Segment alight: Corresponding terminal is activated (HIGH level is applied) Segment dark: Corresponding terminal is not activated (LOW level is applied) Segment or bit 0 Terminal 40 1 Terminal 41 2 Terminal 42 3 Terminal 43 4 Terminal 44 5 Terminal 45 6 Terminal 46 i001: Terminal states of first EB1 i002: Terminal states of second EB1		Ind: 2 Type: V2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.74 Configuring the EB2 expansion board

n773 (2773)	Display of status of binary inputs and outputs on EB2 Representation on operator panel (PMU):  Segment alight: Corresponding terminal is activated (HIGH level is applied) Segment dark: Corresponding terminal is not activated (LOW level is applied) Segment or bit 0 Terminal 53 1 Terminal 54 2 Terminal 39 3 Terminal 41 4 Terminal 43 5 Terminal 45 i001: Terminal states of first EB2 i002: Terminal states of second EB2		Ind: 2 Type: V2	P052 = 3
U774 (2774) *	Source for output values at binary outputs on EB2 Selection of binectors to be applied to binary outputs at terminals 39 - 46. 0 = binector B0000 1 = binector B0001 etc. i001: BO1 of the first EB2 i002: BO2 of the first EB2 i003: BO3 of the first EB2 i004: BO4 of the first EB2 i005: BO1 of the second EB2 i006: BO2 of the second EB2 i007: BO3 of the second EB2 i008: BO4 of the second EB2	All binector numbers 1	Ind: 8 FS=0 Type: L2	P052 = 3 P051 = 40 Online
U775 (2775) *	Signal type of analog input on EB2 0 = voltage input 0 to ± 10 V 1 = current input 0 to ± 20 mA i001: AI1 of the first EB2 i002: AI1 of the second EB2	0 to 1 1	Ind: 2 FS=0 Type: O2	P052 = 3 P051 = 40 Online
U776 (2776)	Normalization of analog input on EB2 This parameter specifies the percentage value which is generated for an input voltage of 10V (or an input current of 20mA) at the analog input. The following general rule applies: With a voltage input: $U776 [\%] = 10 \text{ V} * \frac{Y}{X}$ X .. input voltage in volts Y .. % value which is generated for input voltage X With a current input: $U776 [\%] = 20 \text{ mA} * \frac{Y}{X}$ X .. input current in mA Y .. % value which is generated for input current X i001: AI of the first EB2 i002: AI of the second EB2	-1000.0 to 1000.0 [%] 0.1%	Ind: 2 FS=100.0 Type: I2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U777 (2777)	Offset for analog input on EB2 i001: AI of the first EB2 i002: AI of the second EB2	-100.00 to 100.00 [%] 0.01%	Ind: 2 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
U778 (2778) *	Mode of signal injection at analog input on EB2 0 = Injection of signal with sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted i001: AI of the first EB2 i002: AI of the second EB2	0 to 3 1	Ind: 2 FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U779 (2779) *	Source for selection of sign reversal at analog input on EB2 Selection of binector to control sign reversal at the analog input ("1" state = reverse sign) 0 = binector B0000 1 = binector B0001 etc. i001: AI of the first EB2 i002: AI of the second EB2	All binector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Offline
U780 (2780)	Filtering time for analog input on EB2 Note: Hardware filtering of approximately 0.2 ms is applied as standard i001: AI of the first EB2 i002: AI of the second EB2	0 to 10000 [ms] 1ms	Ind: 2 FS=0 Type: O2	P052 = 3 P051 = 40 Online
U781 (2781) *	Source for enabling of analog inputs on EB2 Selection of binector to control enabling of the analog input ("1" state = enabled) 0 = binector B0000 1 = binector B0001 etc. i001: AI of the first EB2 i002: AI of the second EB2	All binector numbers 1	Ind: 2 FS=1 Type: L2	P052 = 3 P051 = 40 Offline
n782 (2782)	Display of analog input on EB2 i001: AI of the first EB2 i002: AI of the second EB2	-200.0 to 199.99 [%] 0.01%	Ind: 2 Type: I2	P052 = 3
U783 (2783) *	Source for output value at analog output on EB2 Selection of connector whose value must be output at the analog output 0 = connector K0000 1 = connector K0001 etc. i001: AO of the first EB2 i002: AO of the second EB2	All connector numbers 1	Ind: 2 FS=0 Type: L2	P052 = 3 P051 = 40 Online
U784 (2784) *	Mode of signal injection at analog output on EB2 0 = Injection of signal with sign 1 = Injection of absolute value of signal 2 = Injection of signal with sign, inverted 3 = Injection of absolute value of signal, inverted i001: AO of the first EB2 i002: AO of the second EB2	0 to 3 1	Ind: 2 FS=0 Type: O2	P052 = 3 P051 = 40 Online
U785 (2785)	Filtering time for analog outputs on EB1 i001: AO of the first EB2 i002: AO of the second EB2	0 to 10000 [ms] 1ms	Ind: 2 FS=0 Type: O2	P052 = 3 P051 = 40 Online

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U786 (2786)	Normalization of analog outputs on EB2 $y[V] = x * \frac{U_{786}}{100\%}$ x = normalization input (corresponds to filtering output) y = normalization output (corresponds to output voltage at analog output with an offset of 0) i001: AO of the first EB2 i002: AO of the second EB2	-200.00 to 199.99 [V] 0.01V	Ind: 2 FS=10.00 Type: I2	P052 = 3 P051 = 40 Online
U787 (2787)	Offset for analog output on EB2 i001: AO of the first EB2 i002: AO of the second EB2	-10.00 to 10.00 [V] 0.01V	Ind: 2 FS=0.00 Type: I2	P052 = 3 P051 = 40 Online
n788 (2788)	Display of analog outputs on EB2 i001: AO of the first EB2 i002: AO of the second EB2	-200.0 to 199.99 [%] 0.01%	Ind: 2 Type: I2	P052 = 3

11.75 Configuring the SBP pulse encoder board

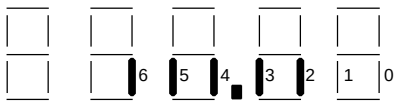
U790 (2790) *	Configuration of input level of A/B and CRTL tracks 0: HTL unipolar 1: TTL unipolar 2: HTL differential input 3: TTL/RS422 differential input	0 to 3 1	Ind: None FS=1 Type: O2	P052 = 3 P051 = 40 Offline
U791 (2791) *	Configuration of encoder supply voltage The supply is subject to a current limit of 250mA Caution: Setting the parameter incorrectly can damage the encoder (i.e. 15 V voltage for an encoder which requires a 5 V supply). 0: 5V voltage supply 1: 15V voltage supply	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U792 (2792) *	Number of pulses per revolution Number of lines on one track around circumference of disk	100 to 20000 1	Ind: None FS=1024 Type: O2	P052 = 3 P051 = 40 Offline
U793 (2793) *	Encoder type 0: Encoder with A/B track (two tracks displaced by 90 degrees) 1: Encoder with separate forward and reverse tracks	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
U794 (2794)	Reference speed When actual speed = reference speed a value of 100% is output in the appropriate diagnostic parameter (n795) and connector	50.0 to 6500.0 [rev/min] 1.0	Ind: None FS=500.0 Type: O2	P052 = 3 P051 = 40 Online
n795 (2795)	Display of actual speed in % of reference speed	-200.00 to 199.99 [%]	Ind: None Type: I2	P052 = 3

11.76 Configuration of paralleling interface

Notes about parameterization of the paralleling interface see Chapter 6.9.2

U800 (2800) *	Control word for parallel connection of SIMOREG converters 0: SIMOREG converters are not connected in parallel 1: SIMOREG converters are connected in parallel The gating pulses are generated by each individual converter 2: SIMOREG converters are connected in parallel The gating pulses are generated by the master for all slaves	0 to 2 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U803 (2803) *	Operating mode for the parallel connection 0 Standard mode All parallel-connected SIMOREG devices must be in continuous operation. Failure (fault message, fuse blown) <u>of one</u> of the parallel-connected SIMOREG devices causes immediate pulse disabling for <u>all</u> SIMOREG devices. 1 "N+1 mode" (redundancy mode) On failure (fault message, fuse blown) of one of the parallel-connected SIMOREG devices, operation is maintained with the remaining SIMOREG devices.	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 off-line
U804 (2804) *	Transmit data on paralleling interface Selection of connectors whose contents must be injected as transmit data (master to slaves or slave to master) for the paralleling interface. 0 = connector K0000 1 = connector K0001 etc. This parameter not only defines the transmit data, but also their position in the transmit telegram. i001: Word 1 of telegram ... i005: Word 5 of telegram i006: word 1 of the telegram, if "standby master" ... i010: word 5 of the telegram, if "standby master"	All connector numbers 1	Ind: 10 FS=0 Type: L2	P052 = 3 P051 = 40 Online
U805 (2805)	Control word for bus terminator of paralleling interface 0: No bus terminator 1: Bus terminator active	0 to 1 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Online
U806 (2806) *	Address for the parallel connection of SIMOREG devices i001: Address of the masters or of the slaves i002: Address of the "standby master" or slaves 2: Slave device with address 2 3: Slave device with address 3 4: Slave device with address 4 5: Slave device with address 5 6: Slave device with address 6 12: Master device for 1 slave device with address 2 13: Master device for 2 slave devices with addresses 2 and 3 14: Master device for 3 slave devices with addresses 2, 3 and 4 15: Master device for 4 slave devices with addresses 2, 3, 4 and 5 16: Master device for 5 slave devices with addresses 2, 3, 4, 5 and 6 In "Standard" mode (U803 = 0), i001 and i002 must be set to the same value. In "N+1 mode" (U803 = 1), a SIMOREG device has the "master" function, a SIMOREG device has the "standby Master" function and all other devices are slaves. In the slaves, i001 and i002 must be set to the same value. On the master, a value of 12 to 16 must be set in i001, in i002 a value of 2 to 6. In the "standby master", a value of 2 to 6 must be set in i001, in i002 a value of 12 to 16.	see column on left	Ind: 2 FS=2 Type: O2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U807 (2807)	Telegram failure time on paralleling interface 0 No time monitoring 0.001...65.000 Permissible time interval between two data exchange operations before a fault message is output. Fault message F014 is displayed if no data are exchanged with the parallel-connected converter within this delay period. The monitoring function is implemented within a 20 ms cycle. For this reason, only setting values which constitute a multiple of 20 ms are meaningful. Note: The telegram monitoring function is active - from the receipt of the first error-free telegram after connection of the electronics power supply - from the receipt of the first error-free telegram after the telegram monitor has responded (i.e. monitoring timeout).	0.000 to 65.000 [s] 0.001s	Ind: None FS=0.100 Type: O2	P052 = 3 P051 = 40 Online
U808 (2808) *	Source for triggering of message F014 Selection of binector which must trigger message F014 when it switches to log. "1" 6040 = binector B6040 6041 = binector B6041	6040, 6041	Ind: None FS=6040 Type: L2	P052 = 3 P051 = 40 Offline
n809 (2809)	Diagnostic information for paralleling interface i001 to i008=Free-running counter, overflow at 65535 i001: Error-free Telegram Counter i002: Errored Telegram Counter i003: Transmit Error Counter i004: Receive Error Counter i005: Phase Error Counter i006: Baud rate Error Counter i007: Bad BCC Counter i008: Timeout Counter i009: Bit 2: Valid telegram received from (if master) / for (if slave) address 2 ... Bit6: Valid telegram received from (if master) / for (if slave) address 6	0 to 65535	Ind: 9 Type: O2	P052 ≥ 0
n810 (2810)	Display of active slaves <u>For master:</u> Display of responding slaves <u>For slave:</u> Display of slave addresses to which master is sending valid telegrams 		Ind: None Type: V2	P052 = 3

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
n812 (2812)	Receive data on paralleling interface <u>When U806=1 (master) is selected</u> i001 Receive data from slave with address 2, word 1 ... i005 Receive data from slave with address 2, word 5 i006 Receive data from slave with address 3, word 1 ... i010 Receive data from slave with address 3, word 5 i011 Receive data from slave with address 4, word 1 ... i015 Receive data from slave with address 4, word 5 i016 Receive data from slave with address 5, word 1 ... i020 Receive data from slave with address 5, word 5 i021 Receive data from slave with address 6, word 1 ... i025 Receive data from slave with address 6, word 5 <u>When U806=2 to 6 (slave) is selected:</u> i001 Receive data from master, word 1 ... i005 Receive data from master, word 5 i006 Not in use ... i025 Not in use	0000 to FFFFH 1	Ind: 25 Type: L2	P052 ≥ 0
n813 (2813)	Transmit data on paralleling interface <u>When U806=1 (master) is selected</u> i001 Transmit data to slaves, word 1 ... i005 Transmit data to slaves, word 5 <u>When U806=2 to 6 (slave) is selected:</u> i001 Transmit data to master, word 1 ... i005 Transmit data to master, word 5	0 to FFFFH	Ind: 5 Type: L2	P052 ≥ 0

11.77 Definition of the external power section

Connection voltage (line voltage) and direct voltage armature																			
U820 (2820) *	Rated connection voltage armature Here you can set the rated connection voltage (rms value), for which the power section is suited (dielectric strength of the thyristors). The value is indicated in parameter r071. Parameter P078.001 (nominal input voltage armature) is limited to this value.	85 to 1000 [V] 1V	Ind: None WE=1000 Type: O2	P052 = 3 P051 = 40 off-line															
U821 (2821) *	Connection of the measuring leads Here you can set the terminals on module A7044 to which the leads for measuring the line voltage and the armature voltage are connected. The parameter value indicates the nominal rms value of the maximum line voltage that can be measured. <table><tr><td>U821</td><td>Line voltage</td><td>Armature voltage</td></tr><tr><td>85</td><td>Connection to XU4 / XV4 / XW4</td><td>Connection to XC4 / XD4</td></tr><tr><td>250</td><td>Connection to XU3 / XV3 / XW3</td><td>Connection to XC3 / XD3</td></tr><tr><td>575</td><td>Connection to XU2 / XV2 / XW2</td><td>Connection to XC2 / XD2</td></tr><tr><td>1000</td><td>Connection to XU1 / XV1 / XW1</td><td>Connection to XC1 / XD1</td></tr></table>	U821	Line voltage	Armature voltage	85	Connection to XU4 / XV4 / XW4	Connection to XC4 / XD4	250	Connection to XU3 / XV3 / XW3	Connection to XC3 / XD3	575	Connection to XU2 / XV2 / XW2	Connection to XC2 / XD2	1000	Connection to XU1 / XV1 / XW1	Connection to XC1 / XD1	85, 250, 575, 1000 [V] 1V	Ind: None WE=1000 Type: O2	P052 = 3 P051 = 40 off-line
U821	Line voltage	Armature voltage																	
85	Connection to XU4 / XV4 / XW4	Connection to XC4 / XD4																	
250	Connection to XU3 / XV3 / XW3	Connection to XC3 / XD3																	
575	Connection to XU2 / XV2 / XW2	Connection to XC2 / XD2																	
1000	Connection to XU1 / XV1 / XW1	Connection to XC1 / XD1																	

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
Armature current The armature <u>direct</u> current is measured by evaluation of the signals of two <u>line</u> -side AC transformers. The two current transformers must be connected to terminals X3-1 / X3-2 and X3-4 / X3-3 on module A7042. Two load resistors of 10 Ω each are mounted on module A7042. It is also possible to connect the two CTs externally in a V-connection through a diode rectifier. The output of the V-connection must then be routed to terminals X3-4 / X3-3 (signal / ground) on module A7042.				
U822 (2822) *	Rated direct current armature Here it is necessary to set the output direct current to which the power section is suited in continuous operation.	0.0 to 6500.0 [A] 0.1A	Ind: None WE=0.0 Type: O2	P052 = 3 P051 = 40 off-line
U823 (2823) *	Load voltage at rated current armature Here it is necessary to set the load voltage that is generated at terminals X3-1 / X3-2 and X3-4 / X3-3 if the rated <u>direct</u> current set in parameter U822 is flowing in the armature circuit of the motor. <u>Calculation formula:</u> $u_B = R_B \cdot \ddot{u} \cdot I_d$ where: u_B = The load voltage searched for to be set in parameter U823 R_B = Load resistance (default: 10 Ω) $\ddot{u}$ = Transformation ratio of the current transformer (I_2 / I_1) I_d = Output direct current acc. to parameter U822 <u>Note:</u> When using the differential amplifier to reduce the input voltage on the power interface (C98043-A7042) as described in Chapter 6.5, 1/10 of the load voltage must be set at rated direct current.	200.0 to 1200.0 [mV] 0.1mV	Ind: None WE=1000.0 Type: O2	P052 = 3 P051 = 40 off-line
U824 (2824) *	Configuration of the current transformers 1 Current transformer in phases U and V 2 Current transformer in phases U and W 3 Current transformer in phases V and W 4 Current transformer connected externally in V-connection	1 to 4 1	Ind: None WE=2 Type: O2	P052 = 3 P051 = 40 off-line
U825 (2825) *	Type of power section: 1Q / 4Q 1 1-quadrant power section 4 4-quadrant power section	1 and 4 1	Ind: None WE=1 Type: O2	P052 = 3 P051 = 40 off-line
Field				
U828 (2828) *	Rated connection voltage field The power section for the field is suitable for a connection voltage of 460 Vrms (dielectric strength of the thyristors). The acquisition of the line voltage for the field is also dimensioned for this voltage. If the field is operated with a rated line voltage of less than 130 Vrms, it is advisable to convert the hardware for line voltage measurement for the field on module A7044 to extra-low voltage. Once this conversion has been performed, set parameter U828 to value 130 Vrms. The value of U828 is indicated in parameter r074. Parameter P078.002 (nominal input voltage field) is limited to this value. 130 Module A7044 converted to extra-low voltage 460 Module A7044 in the original state	130 and 460 [V] 1V	Ind: None WE=460 Type: O2	P052 = 3 P051 = 40 off-line
Measurement of the heat sink temperature The heat sink temperature can be measured with an NTC. The NTC must be connected to terminals X6 / X7 on module A7042.				
U830 (2830) *	Sensors for measuring heat sink temperature 0 No sensor present 1 NTC with 6.8 kΩ 2 NTC with 10 kΩ	0 to 3 1	Ind: None WE=1 Type: O2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)										
Fuse monitoring Fuse monitoring can be used universally. For example, it can be used to monitor fuses in the armature circuit, the field circuit, the fan circuit, or the primary side of a heavy-current transformer. The terminals used (Faston tabs) on the fuse monitoring module (C98043-A7044) for the measuring leads depend on the voltage applied to a tripped fuse. <table><tr><td>Voltage</td><td>Measuring leads connected to</td></tr><tr><td>20 ... 85V</td><td>XS1_4 to XS12_4</td></tr><tr><td>>85 ... 250V</td><td>XS1_3 to XS12_3</td></tr><tr><td>>250 ... 600V</td><td>XS1_2 to XS12_2</td></tr><tr><td>>600 ... 1000V</td><td>XS1_1 to XS12_1</td></tr></table>					Voltage	Measuring leads connected to	20 ... 85V	XS1_4 to XS12_4	>85 ... 250V	XS1_3 to XS12_3	>250 ... 600V	XS1_2 to XS12_2	>600 ... 1000V	XS1_1 to XS12_1
Voltage	Measuring leads connected to													
20 ... 85V	XS1_4 to XS12_4													
>85 ... 250V	XS1_3 to XS12_3													
>250 ... 600V	XS1_2 to XS12_2													
>600 ... 1000V	XS1_1 to XS12_1													
U831 (2831) *	Fuse monitoring OFF / ON 0 Monitoring OFF 1 Monitoring ON Response of the fuse monitoring causes a fault message F004 with the fault value 3	0 to 1 1	Ind: None WE=1 Type: O2	P052 = 3 P051 = 40 off-line										

Monitoring of the device fan A "fan OK" signal from the device fan must be connected to terminals 122 and 123.				
U832 (2832) *	Monitoring of the converter fan OFF / ON 0 Monitoring OFF 1 Monitoring ON A LOW signal at terminals 122 / 123 causes fault message F067 with the fault value 3	0 to 1 1	Ind: None WE=1 Type: O2	P052 = 3 P051 = 40 off-line

External monitoring The signaling contact for external monitoring must be connected to terminals 124 / 125.				
U833 (2833) *	External monitoring OFF / ON 0 Monitoring AUS 1 Monitoring EIN A LOW signal at terminals 124 / 125 causes fault message F003 with the fault value 1	0 to 1 1	Ind: None WE=1 Type: O2	P052 = 3 P051 = 40 off-line

11.78 Simulation operation

Simulation operation Simulation operation is used to test the power section (measurement of the firing pulses with a current probe). Firing pulses are output to a single thyristor (pulse distance = 20 ms, pulse duration = approx. 1 ms, firing pulse chopping as in normal operation). The thyristor is selected with parameter U840. The line voltage does not have to be applied during simulation operation. Simulation operation is activated by setting a value > 0 in Parameter U840. Simulation operation is then actually started when the SIMOREG CM is in an operating state ≥ o7. As soon as the SIMOREG CM is in simulation operation, it goes into operating state o8.1 (simulation operation). Simulation operation is exited by resetting parameter U840 to zero.				
U840 (2840) *	Control parameters for simulation operation 0 No simulation operation 11 Firing cable 11 ... 16 Firing cable 16 21 Firing cable 21 ... 26 Firing cable 26	0, 11 to 16, 21 to 26 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 off-line

11.79 Parameter for SIMOVIS

n845 to n949 (2940 to 2949)	These parameters are used by SIMOVIS			
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.80 Technology software in the basic converter, Option S00: Sampling times

Only active with optional technology software S00

Sampling times

For each function block of the technology software S00, it is necessary to define in which "time slice" (i.e. with which sampling time) it is processed.

5 time slices are available:

Time slice	Sampling time	
1	1 * T0 (firing-pulse-synchronous time slice)	T0 = Mean distance between 2 firing pulses
2	2 * T0 (firing-pulse-synchronous time slice)	T0 = 3.33 ms at 50 Hz line frequency
4	4 * T0 (firing-pulse-synchronous time slice)	T0 = 2.78 ms at 60 Hz line frequency
10	20 ms (<u>not</u> firing-pulse-synchronous)	
20	Block is not calculated	

U950 (2950) * S00	Selection of time slices for function blocks FB1 to FB100						1, 2, 4, 10, 20	Ind: 100 FS= see column on left Type: O2	P052 = 3 P051 = 40 off-line
	Index	Function block	Time slice (FS)	Index	Function block	Time slice (FS)			
	i001	FB1	20	i051	FB51	1			
	i002	FB2	20	i052	FB52	1			
	i003	FB3	1	i053	FB53	1			
	i004	FB4	1	i054	FB54	20			
	i005	FB5	1	i055	FB55	1			
	i006	FB6	1	i056	FB56	1			
	i007	FB7	1	i057	FB57	1			
	i008	FB8	1	i058	FB58	20			
	i009	FB9	1	i059	FB59	20			
	i010	FB10	1	i060	FB60	1			
	i011	FB11	1	i061	FB61	1			
	i012	FB12	1	i062	FB62	1			
	i013	FB13	1	i063	FB63	1			
	i014	FB14	1	i064	FB64	20			
	i015	FB15	1	i065	FB65	1			
	i016	FB16	10	i066	FB66	1			
	i017	FB17	10	i067	FB67	1			
	i018	FB18	10	i068	FB68	20			
	i019	FB19	10	i069	FB69	20			
	i020	FB20	1	i070	FB70	1			
	i021	FB21	1	i071	FB71	1			
	i022	FB22	1	i072	FB72	1			
	i023	FB23	1	i073	FB73	1			
	i024	FB24	1	i074	FB74	1			
	i025	FB25	1	i075	FB75	1			
	i026	FB26	1	i076	FB76	1			
	i027	FB27	1	i077	FB77	1			
	i028	FB28	1	i078	FB78	1			
	i029	FB29	1	i079	FB79	1			
	i030	FB30	1	i080	FB80	1			
	i031	FB31	1	i081	FB81	1			
	i032	FB32	2	i082	FB82	1			
	i033	FB33	2	i083	FB83	1			
	i034	FB34	2	i084	FB84	1			
	i035	FB35	1	i085	FB85	1			
	i036	FB36	1	i086	FB86	1			
	i037	FB37	1	i087	FB87	1			
	i038	FB38	1	i088	FB88	1			
	i039	FB39	20	i089	FB89	20			
	i040	FB40	1	i090	FB90	1			
	i041	FB41	1	i091	FB91	1			
	i042	FB42	2	i092	FB92	1			
	i043	FB43	2	i093	FB93	1			
	i044	FB44	2	i094	FB94	1			
	i045	FB45	1	i095	FB95	1			
	i046	FB46	1	i096	FB96	1			
	i047	FB47	1	i097	FB97	1			
	i048	FB48	20	i098	FB98	1			
	i049	FB49	20	i099	FB99	1			
	i050	FB50	1	i100	FB100	1			

PNU	Description						Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U951 (2951) * S00	Selection of time slices for function blocks FB101 to FB200						1, 2, 4, 10, 20	Ind: 100 FS= see column on left Type: O2	P052 = 3 P051 = 40 off-line
	Index	Function block	Time slice (FS)	Index	Function block	Time slice (FS)			
	i001	FB101	1	i051	FB151	1			
	i002	FB102	1	i052	FB152	1			
	i003	FB103	1	i053	FB153	1			
	i004	FB104	1	i054	FB154	1			
	i005	FB105	1	i055	FB155	1			
	i006	FB106	1	i056	FB156	1			
	i007	FB107	1	i057	FB157	1			
	i008	FB108	1	i058	FB158	1			
	i009	FB109	1	i059	FB159	1			
	i010	FB110	1	i060	FB160	1			
	i011	FB111	1	i061	FB161	1			
	i012	FB112	1	i062	FB162	1			
	i013	FB113	1	i063	FB163	1			
	i014	FB114	1	i064	FB164	1			
	i015	FB115	1	i065	FB165	1			
	i016	FB116	2	i066	FB166	1			
	i017	FB117	20	i067	FB167	1			
	i018	FB118	1	i068	FB168	1			
	i019	FB119	1	i069	FB169	1			
	i020	FB120	1	i070	FB170	1			
	i021	FB121	1	i071	FB171	1			
	i022	FB122	1	i072	FB172	1			
	i023	FB123	1	i073	FB173	1			
	i024	FB124	1	i074	FB174	1			
	i025	FB125	1	i075	FB175	1			
	i026	FB126	1	i076	FB176	1			
	i027	FB127	1	i077	FB177	1			
	i028	FB128	1	i078	FB178	1			
	i029	FB129	1	i079	FB179	1			
	i030	FB130	1	i080	FB180	1			
	i031	FB131	1	i081	FB181	1			
	i032	FB132	1	i082	FB182	1			
	i033	FB133	1	i083	FB183	1			
	i034	FB134	1	i084	FB184	1			
	i035	FB135	1	i085	FB185	1			
	i036	FB136	1	i086	FB186	1			
	i037	FB137	1	i087	FB187	1			
	i038	FB138	1	i088	FB188	1			
	i039	FB139	1	i089	FB189	1			
	i040	FB140	1	i090	FB190	1			
	i041	FB141	1	i091	FB191	1			
	i042	FB142	1	i092	FB192	1			
	i043	FB143	1	i093	FB193	1			
	i044	FB144	1	i094	FB194	1			
	i045	FB145	1	i095	FB195	1			
	i046	FB146	1	i096	FB196	20			
	i047	FB147	1	i097	FB197	20			
	i048	FB148	20	i098	FB198	20			
	i049	FB149	20	i099	FB199	20			
	i050	FB150	1	i100	FB200	1			

PNU	Description						Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U952 (2952) * S00	Selection of time slices for function blocks FB201 to FB300						1, 2, 4, 10, 20	Ind: 100 FS= see column on left Type: O2	P052 = 3 P051 = 40 off-line
	Index	Function block	Time slice (FS)	Index	Function block	Time slice (FS)			
	i001	FB201	1	i051	FB251	1			
	i002	FB202	1	i052	FB252	1			
	i003	FB203	1	i053	FB253	1			
	i004	FB204	1	i054	FB254	1			
	i005	FB205	1	i055	FB255	20			
	i006	FB206	1	i056	FB256	1			
	i007	FB207	1	i057	FB257	1			
	i008	FB208	1	i058	FB258	1			
	i009	FB209	1	i059	FB259	1			
	i010	FB210	1	i060	FB260	10			
	i011	FB211	1	i061	FB261	10			
	i012	FB212	20	i062	FB262	10			
	i013	FB213	20	i063	FB263	10			
	i014	FB214	20	i064	FB264	10			
	i015	FB215	1	i065	FB265	10			
	i016	FB216	1	i066	FB266	10			
	i017	FB217	1	i067	FB267	10			
	i018	FB218	1	i068	FB268	10			
	i019	FB219	1	i069	FB269	10			
	i020	FB220	1	i070	FB270	10			
	i021	FB221	1	i071	FB271	10			
	i022	FB222	1	i072	FB272	10			
	i023	FB223	1	i073	FB273	10			
	i024	FB224	1	i074	FB274	10			
	i025	FB225	1	i075	FB275	10			
	i026	FB226	1	i076	FB276	10			
	i027	FB227	1	i077	FB277	10			
	i028	FB228	1	i078	FB278	10			
	i029	FB229	20	i079	FB279	10			
	i030	FB230	1	i080	FB280	10			
	i031	FB231	1	i081	FB281	10			
	i032	FB232	1	i082	FB282	10			
	i033	FB233	1	i083	FB283	10			
	i034	FB234	20	i084	FB284	10			
	i035	FB235	20	i085	FB285	10			
	i036	FB236	20	i086	FB286	10			
	i037	FB237	20	i087	FB287	10			
	i038	FB238	20	i088	FB288	10			
	i039	FB239	20	i089	FB289	10			
	i040	FB240	1	i090	FB290	10			
	i041	FB241	1	i091	FB291	10			
	i042	FB242	1	i092	FB292	10			
	i043	FB243	1	i093	FB293	10			
	i044	FB244	1	i094	FB294	10			
	i045	FB245	1	i095	FB295	10			
	i046	FB246	10	i096	FB296	10			
	i047	FB247	10	i097	FB297	10			
	i048	FB248	10	i098	FB298	10			
	i049	FB249	10	i099	FB299	20			
	i050	FB250	1	i100	FB300	20			

11.81 Parameter for SIMOVIS

n957 to n959 (2957 to 2959)	These parameters are used by SIMOVIS			
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.82 Technology software in basic unit, S00 option: Altering the processing sequence of function blocks

Parameters apply only if optional S00 technology software is installed

The function blocks of the S00 technology software are processed within the computational cycle in the sequence defined in parameters U960 to U962:

1. Function block with number set in U960 index.001
- ...
100. Function block with number set in U960 index.100
101. Function block with number set in U961 index.001
- ...
200. Function block with number set in U961 index.100
201. Function block with number set in U962 index.001
- etc.

The numbers are parameterized in ascending sequence (1, 2, 3, ...) in the factory setting (standard sequence).

Altering the processing sequence:

If a new function block number is entered (i.e. moved from another location) in a certain index of parameter U960, U961 or U962, then the new processing sequence is defined such that the function block previously entered in this index will be processed after the newly entered block. The gap which may be left at the old location of the moved (newly entered) function block is closed by shifting the function block numbers behind the space forward by one position.

Example 1:

Starting with the standard sequence setting, the processing sequence must be altered such that function block 90 (analog signal selector switch) will be processed immediately after function block 83 (tracking/storage element):

Function block no. 90 must be entered in the index in which the number of the function block previously processed after block 83 (84 in U960.9065) is currently stored. Function block numbers (84 and 85) in the following indices of U960 will be shifted up to the next index automatically.

Function block	Processing sequence		Function block	Processing sequence
91	U960.Index 068		91	U960.Index 068
<u>90</u>	<u>U960.Index 067</u>	→	85	U960.Index 067
85	U960.Index 066		84	U960.Index 066
84	U960.Index 065		<u>90</u>	<u>U960.Index 065</u>
83	U960.Index 064		83	U960.Index 064
82	U960.Index 063		82	U960.Index 063
81	U960.Index 062		81	U960.Index 062

Example 2:

Starting with the standard sequence setting, the processing sequence must be altered such that function block 38 (sign inverter) will be processed immediately after function block 45 (divider):

Function block number 38 must be entered in the index in which the number of the function block previously processed after function block 45 (46 in U960.i035) is currently stored. The function block numbers stored in the indices immediately above this position shift up by one index, then all numbers immediately above the gap left shift down automatically by one index.

Function block	Processing sequence		Function block	Processing sequence		Function block	Processing sequence
47	U960.Index 036		47	U960.Index 036		47	U960.Index 036
46	U960.Index 035		46	U960.Index 035		46	U960.Index 035
45	U960.Index 034		<u>38</u>	<u>U960.Index 035</u>	→	<u>38</u>	<u>U960.Index 034</u>
41	U960.Index 033		41	U960.Index 033		45	U960.Index 033
40	U960.Index 032		40	U960.Index 032		41	U960.Index 032
<u>38</u>	<u>U960.Index 031</u>	→		U960.Index 031		40	U960.Index 031
37	U960.Index 030		37	U960.Index 030		37	U960.Index 030

U960 (2960) *	Processing sequence of function blocks of S00 technology software (1)	Numbers of all function blocks	Ind: 100 FS= Standard sequence Type: O2	P052 = 3 P051 = 40 Offline
S00	i001: Number of function block for 1 st place in processing sequence i002: Number of function block for 2 nd place in processing sequence etc.			

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
U961 (2961) * S00	Processing sequence of function blocks of S00 technology software (2) i001: Number of function block for 101 st place in processing sequence i002: Number of function block for 102 nd place in processing sequence etc.	Numbers of all function blocks	Ind: 100 FS= Standard sequence Type: O2	P052 = 3 P051 = 40 Offline
U962 (2962) * S00	Processing sequence of function blocks of S00 technology software (3) i001: Number of function block for 201 st place in processing sequence i002: Number of function block for 202 nd place in processing sequence etc.	Numbers of all function blocks	Ind: 100 FS= Standard sequence Type: O2	P052 = 3 P051 = 40 Offline
U969 (2969) * S00	Automatic setting and activation of the execution sequence 0 Return 1 Set standard sequence: The numbers of the function blocks are entered in ascending order in Parameters U960, U961 and U962. The parameter is then automatically set to value 0. 2 Set optimum sequence: U960, U961, and U962 are set in such a way that as few deadtimes as possible occur. After that, the parameter is automatically set to value 0 again. 3 Set standard setting of the sampling times. U950, U951, and U952 are set to the factory setting. 4 Automatic activation / deactivation: U950, U951 and U952 are set in such a way that the unwired function blocks are deselected and the wired function blocks are selected (activated), if they are not yet selected. The time slice 10 (sampling time 20 ms) is set for all function blocks not previously activated, the time slice is left unchanged for all previously activated function blocks.	0 to 4 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 off-line

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
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11.83 Enabling of technology software in basic unit, S00 option ("freely assignable function blocks")

The S00 technology option can only be utilized on SIMOREG CM converters on which this option has been enabled by a proper PIN number. The software remains enabled after software updates, i.e. it need not be enabled again after new software has been installed.

Permanent enabling of S00 technology option (subject to charge):

Please proceed as follows if you wish to enable the S00 technology option:

- Find out the serial number of your SIMOREG CM unit (e.g. "Q6K31253320005"):
 - The serial number is specified on the delivery note
 - The serial number is printed on the rating plate of the SIMOREG CM
 - The serial number can be displayed in parameter r069 on the OP1S
- Find out the PIN number (a number between 2001 and 65535) which matches the converter serial number:
 - If you have ordered the SIMOREG CM with S00 option, you will find the PIN number printed on a sticker on the unit and specified on the delivery note.
 - If not, please contact your local Siemens sales office to obtain the correct PIN number.
- Enter the PIN number in parameter U977. After you have entered the number, this parameter will automatically be reset to 0. Please take particular care when entering the PIN number - only 5 attempts are allowed!
- The S00 technology option will then be enabled, check this by the setting in n978.

Temporary enabling of S00 technology option (free of charge):

The S00 technology option can be enabled **once**, free of charge, on all converters for 500 hours of use by means of a special PIN number. This 500-hour period can be used for test purposes or for the operation of replacement units which have been ordered without the S00 option (i.e. to cover the period until a PIN number for permanent enabling is obtained).

The 500 hours are counted by the hours run counter (r049), i.e. only the time that the drive is actually switched on is counted. When the 500-hour period has expired, the S00 option is disabled automatically if the PIN number for permanent enabling has not been entered in the meantime.

The special PIN number is: U977 = **1500** (identical number for all units)

Temporary enabling of the option can be interrupted with PIN U977 = **500**. The remaining time credit remains valid for the next period of use with the temporarily enabling PIN number.

Alarm **A059** is output if the time credit is less than 50 hours and the S00 technology option is temporarily enabled.

Fault message **F059** is displayed if the time credit of 500 hours has run out and the S00 option is still temporarily enabled.

System response when S00 technology option is not enabled:

The connectors and binectors associated with freely assignable function blocks are not updated (they are set to 0 when the electronics voltage is connected; when the time credit for temporary enabling has run out, they remain frozen at the last recorded values until the electronics voltage is disconnected again).

U977 (2977) * S00	PIN number for S00 option This parameter is automatically reset to "0" after entry of the PIN number. Take care to enter the PIN number correctly. You are only allowed up to 5 attempts!	0 to 65535 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
n978 (2978) S00	"S00 enabled" display 0 The optional S00 technology software is disabled The time credit for temporary enabling has run out xxx The optional S00 technology software is not enabled. xxx = number of credit hours which are still available for use under temporary enabling PIN number 1xxx The optional S00 technology software is temporarily enabled. xxx = number of credit hours still available 2000 The optional S00 technology software is permanently enabled.	see column on left	Ind: None Type: O2	P052 = 3

11.84 List of existing and modified U and n parameters

n980 (2980)	List of existing parameter numbers, continuation Viewing parameter for displaying the first 100 parameter numbers in the U or n parameter range (numbers 2000 to 2999). The parameters are arranged in ascending sequence. The list is continued in the parameter whose number is displayed in index 101. This means, for example, 2981 = n981 The first 0 to be displayed signals that no further parameter numbers are stored.		Ind: 101 Type: O2	P052 = 3
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PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
n981 (2981)	List of existing parameter numbers, continuation See n980.		Ind: 101 Type: O2	P052 = 3
n982 (2982)	List of existing parameter numbers, continuation See n980.		Ind: 101 Type: O2	P052 = 3
n983 (2983)	List of existing parameter numbers, continuation See n980.		Ind: 101 Type: O2	P052 = 3
n984 (2984)	List of existing parameter numbers, continuation See n980.		Ind: 101 Type: O2	P052 = 3
n985 (2985)	List of existing parameter numbers, continuation See n980.		Ind: 101 Type: O2	P052 = 3
n986 (2986)	List of existing parameter numbers, continuation See n980.		Ind: 101 Type: O2	P052 = 3
n987 (2987)	List of existing parameter numbers, continuation See n980.		Ind: 101 Type: O2	P052 = 3
n988 (2988)	List of existing parameter numbers, continuation See n980.		Ind: 101 Type: O2	P052 = 3
n989 (2989)	List of existing parameter numbers, continuation See n980.		Ind: 101 Type: O2	P052 = 3
n990 (2990)	List of modified parameters, continuation Viewing parameter for displaying the first 100 modified parameters in the U or n parameter range (numbers 2000 to 2999). The parameters are arranged in ascending sequence. The list is continued in the parameter whose number is displayed in index 101. This means, for example, 2991 = n991 The first 0 to be displayed signals that there are no further modified parameters.		Ind: 101 Type: O2	P052 = 3
n991 (2991)	List of modified parameters, continuation See n990.		Ind: 101 Type: O2	P052 = 3
n992 (2992)	List of modified parameters, continuation See n990.		Ind: 101 Type: O2	P052 = 3
n993 (2993)	List of modified parameters, continuation See n990.		Ind: 101 Type: O2	P052 = 3
n994 (2994)	List of modified parameters, continuation See n990.		Ind: 101 Type: O2	P052 = 3
n995 (2995)	List of modified parameters, continuation See n990.		Ind: 101 Type: O2	P052 = 3
n996 (2996)	List of modified parameters, continuation See n990.		Ind: 101 Type: O2	P052 = 3
n997 (2997)	List of modified parameters, continuation See n990.		Ind: 101 Type: O2	P052 = 3
n998 (2998)	List of modified parameters, continuation See n990.		Ind: 101 Type: O2	P052 = 3
n999 (2999)	List of modified parameters, continuation See n990.		Ind: 101 Type: O2	P052 = 3

