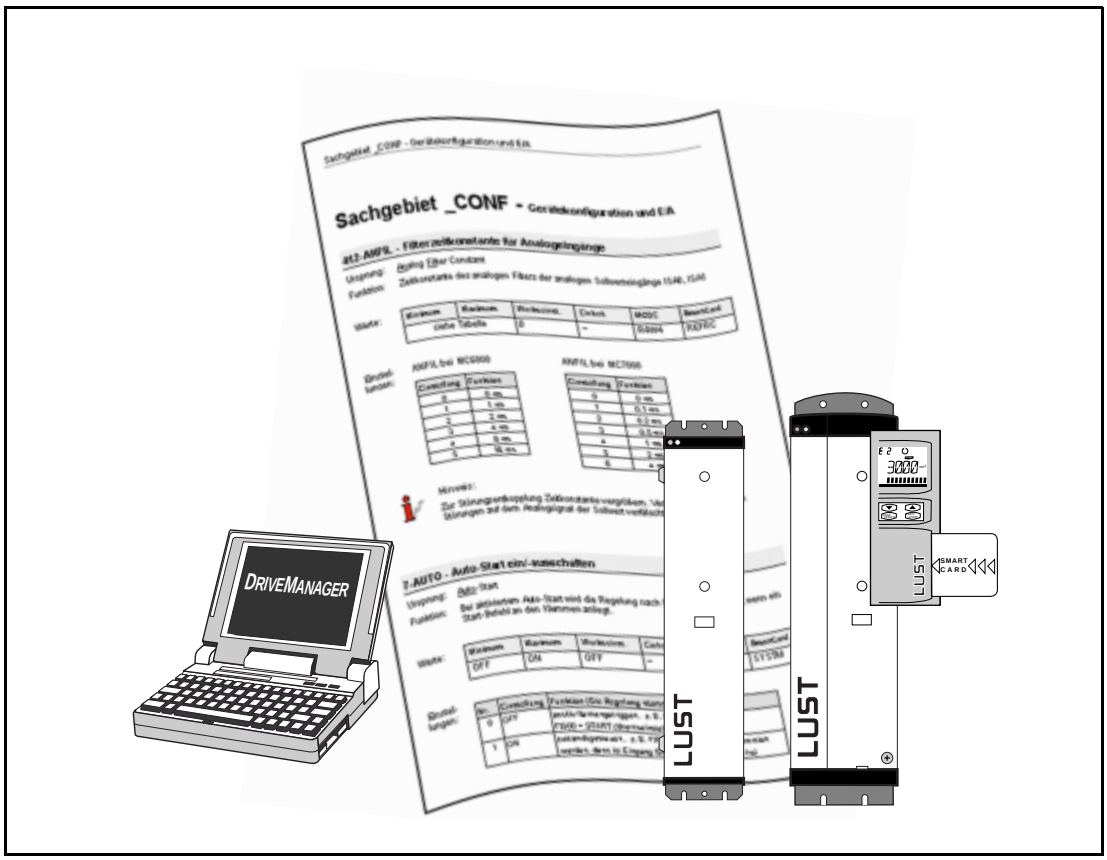
LUST
ANTRIEBSTECHNIK

MASTERCONTROL MC6000/MC7000

EN

Servocontrollers from 2 to 64 A



Parameter Description

Parameter description
for servocontrollers of series

MASTERCONTROL MC6000
MASTERCONTROL MC7000

Valid as from software version: V2.60 (MC6000)
V3.55 (MC7000)

ID no.: 0792.26B.0-00
Date: March 1999

We reserve the right to make technical changes.

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Introduction

Key to symbols

Note:
Useful information, tip.

Attention!
Pay attention to the notice/follow the instructions given.

CAUTION - Do not change parameter!
Parameter only for development and service purposes
This parameter is intended only for service and development purposes, and should be modified only by LUST staff.
Changing the setting may cause the drive to stop running altogether, or to perform much less efficiently. Make a note of the previous setting if you do change it - otherwise the factory setting will usually have to be restored with the SMARTCARD.

Key to terms in the parameter table

Example:

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	255	0	s	R4W5	DRIVE	USIGN8

Minimum Lowest possible setting

Maximum Highest possible setting

Factory set. Factory setting

Unit Physical unit of the parameter, e.g. seconds

MODE User level, e.g.
R4 = Display level 4 (Read)
W5 = Write level 5 (Write)

User levels in the DriveManager:
1 = Layman
2 = Beginner
3 = Advanced
4 = Expert
5 = LUST Service
6-15 = Non-editable

MODE indicates the user level as from which a parameter can be displayed and possibly changed.

SMARTCARD SMARTCARD area in which the parameter is stored. All the parameters can be stored on the SmartCard and just one area, e.g. the DRIVE drive parameters, loaded into the servocontroller.

Type Parameter data type; required for interface operation, e.g. over CAN bus. For further information see data transfer protocol.

_CONF – Device configuration and I/O

412-ANFIL – Filter time constant for analog inputs

Source: Analog Filter Constant
Function: Time constant of the analog filter of the analog reference inputs ISA0, ISA1

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		0	–	R4W4	REFRC	USIGN8

Settings:

ANFIL on MC6000

Setting	Function
0	0 ms
1	1 ms
2	2 ms
3	4 ms
4	8 ms
5	16 ms

ANFIL on MC7000

Setting	Function
0	0 ms
1	0.1 ms
2	0.2 ms
3	0.5 ms
4	1 ms
5	2 ms
6	4 ms

Note:
For fault isolation increase time constant. Use if reference value is corrupted by disturbances on the analog signal.

7-AUTO – Activate/deactivate Auto-Start

Source: Auto-Start TEST
Function: When Auto-Start is active control is immediately active after power-up, provided a Start command is received at the terminals.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	ON	OFF	–	R1W2	SYSTM	USIGN8

Settings:

No.	Setting	Function (Control starts ...)
0	OFF	positive edge triggered, e.g. input IS00 FIS00 = START (factory setting)
1	ON	status-controlled, e.g. FIF0 = START can be programmed, then input IS00 is free for other function

Note:
No other input is required if one of the fixed inputs FIF0 or FIF1 = START is programmed.

465-BRAKE - Actuation mode for motor brake

Source: Brake mode

Function: **Parameter only on MC7000.**
Operation mode of holding brake, activation with function selector FOS03

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
SPD_0	HOLD2	HOLD2	–	R1W2	APPLI	USIGN8

Settings:

No.	Setting	Holding brake engages when ...
0	SPD_0	motor is stopped 1) and control is disabled.
1	ERR_1	an error occurs and the motor is stopped 1).
2	ERR_2	an error occurs and the motor is stopped 1) or no later than 400 ms after occurrence of the error.
3	ERR_3	an error occurs (immediate).
4	HOLD	the start signal is removed
5	HOLD1	the motor is stopped 1) or when an error occurs (immediate). When the holding time 467-THTDC expires the control is shut off.
6	HOLD2	the motor is stopped 1) or when an error occurs and the motor is stopped or after no more than 400 ms. When the holding time 467-THTDC expires the control is shut off.

1) Depending on the window for motor standstill, parameter SPD_0 (_CONF)

Note:
On restart the holding brake is only released when the motor ready to start, i.e. when the flux build-up phase in asynchronous machines is complete.

Attention!
With settings ERR_3 and /START the holding brake is always activated immediately, regardless of the current motor speed. Braking at high speeds impairs the durability of the brake, however. Depending on the external moment of inertia, this may result in the brake sticking and so damage the motor ("breakdown braking"). This is accepted as a reasonable risk in many safety devices.

The durability of the holding brake types in the form of the maximum permissible braking energy (lifetime switching) is given in the MASTERDRIVE data specification booklet and must always be taken into account in parameter setting **(commissioning)** !

488-BUSYE - Activate/deactivate synchronization

Source:

Function: **Parameter for future application, currently without function.**
With this parameter synchronization of the drive is activated.
0 = no synchronization)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	ON	OFF	–	R3W3	SYSTM	USIGN8

486-BUTCD - Max. permissible cycle deviation relative to master

Source: Bus Time Cycle

Function: **Parameter only for CAN bus.**
Maximum permissible deviation of the internal cycle relative to the cycle of drive 1.
Scaling: 1 bit = 0.1 µs.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	ON	OFF	–	R3W3	SYSTM	USIGN16

487-BUTCS - Sampling time of status message relative to "BUTCY"

Source: Bus Time Cycle to Status

Function: **Parameter only for CAN bus.**
Sampling time of status message relative to bus cycle time BUTCY
The status message is delivered: 1 = every cycle; 2 = every 2nd cycle; etc.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	255	10	–	R3W3	SYSTM	USIGN8

411-BUTCY - Bus sampling time in microseconds

Source: Bus Time Cycle

Function: **Parameter only for CAN bus.**
Sampling time of the CAN bus in microseconds.
Scaling: 1 bit = 1 µs.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
100	32000	1000	–	R3W3	SYSTM	USIGN16

Note:
This parameter only need be set if time-equidistant adoption of the reference value is required.

➔ 487-BUTCS - Sampling time of status message relative to "BUTCY", Page 13

409-BUTWD - Bus watchdog time in ms

Source: Bus Time Watchdog

Function: **Parameter only for CAN bus.**

To monitor the bus activity (CAN bus or InterBus-S) a watchdog is provided.

With the parameter BUTWD the monitoring time in ms can be set. The value 0 deactivates the watchdog.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	255	0	–	R3W3	SYSTM	USIGN8

304-CFCMX - Effective value of maximum current

Source: Configuration Current Maximum

Function: Maximum permissible effective value of the current (double overload for 10s). The value is dependent on the device type, and is calculated automatically from the power stage identifier.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
Dependent on device type, see table			A	R4W7	ALL	FLOAT32

Settings:

CFCMX on MC6000

Setting	Device type
8A	MC6404
16 A	MC6408
24 A	MC6412
32 A	MC6416
64A	MC6432
96A	MC6464

CFCMX on MC7000

Setting	Device type
4 A	MC7402
8 A	MC7404
16 A	MC7408
24 A	MC7412
32 A	MC7416
64A	MC7432
96A	MC7464

303-CFCNM - Scaling current

Source: Configuration Current Nominal

Function: Device current dependent configuration parameter required for internal calculations and derived automatically from the power stage identifier

.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
Dependent on device type			A	R5W7	ALL	FLOAT32

Example: In MC6408 CFCNM = 25.76 A

300-CFCON - Current control mode of servo

Source: Configuration Control

Function: Choice of control mode (e.g. speed control)

For each control mode appropriate reference values are stored in the servocontroller (separate structures for each control mode). As a result, when the control mode is switched the reference values are also switched.

In the MC7000 as from software V3.0 the control modes are subdivided into **operation modes** (parameter RNMOD)

.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		SCON	–	R4W4	SYSTM	FLOAT32

Settings

No.	Setting	Designation	Operation mode
1	TCON	Torque Control	Closed-loop torque control
2	SCON	Speed Control	Closed-loop speed control
3	PCON	Position Control	Closed-loop position control

Note:

If in **torque control** mode the torque (reference) is greater than the load torque, the drive accelerates up to the speed/voltage limit. The speed limit can be set by way of parameter SCSMX(_SCON).

Note:

In position control the position is given in revolution. A reference value of 1.00 corresponds to the position rotated clockwise through 360°.

Accelerations and decelerations are always executed torque-controlled at the maximum value TCMMX.

309-CFENC - Encoder type

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Configuration Encoder

Function: Configuration of the encoder.

1) The motor data sets supplied on floppy disk or SMARTCARD contain the correct setting of CFENC for the encoder built into the motor.

2) With this parameter the encoder can also be set manually (MODE = 5).

3) In the normal setting "OFF" the resolvers Rx and G1 and G2 are automatically detected. The parameters of G3, G4 and G5 must be set in CFENC.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		OFF	–	R5W5	DRIVE	USIGN8

Settings

No.	Setting	Function	Type (or similar)	SSI
0	OFF	Automatic detection active		
1	R	Resolvers (all types)		
2	G1	Incremental encoder (sin/cos)	ERN1381	
3	G2	Single-turn absolute encoder (sin/cos)	ECN1313	25 bits
4	G3	Multi-turn absolute encoder (sin/cos)	EQN1325	25 bits
5	G4	Single-turn absolute encoder (sin/cos), attachment encoder with 1024 pulses	ROC411	11 bits
6	G5	Single-turn absolute encoder (sin/cos), successor type for G2	ECN1313-2	13 bits

Note: **Manual setting of encoder type:**

- for resolvers: Number of pole pairs ECNPP
- for optical encoders: Parameter CFENC (LUST internal parameter).

305-CFHSW - Hardware status word of system

Source: Configuration Hardware State Word

Function: Hardware status word (set after power-up or on manual change)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		0000H	–	R4W15	ALL	USIGN16

CFHSW on MC6000

Bit position	Value of position	Meaning of bit
0	0000 H	No encoder parameterized
1	0001 H	Resolver parameterized (R1, R2, R8)
2	0002 H	Encoder with sinusoidal output parameterized (G1) or no encoder detected
3	0004 H	Encoder with square output parameterized
4	0008 H	Single-turn absolute value generator with SSI interface (G2)
5	0010 H	Multi-turn absolute value generator with SSI interface (G3)
6	0020 H	Slot 1 (X6) occupied
7	0040 H	Slot 2 (X7) occupied
8	0080 H	Asynchronous motor parameterized
9	0100 H	Synchronous motor parameterized
10	0200 H	Reluctance motor parameterized

Example: 0C81 H = asynchronous machine with resolver connected, I/O expansion with 8 inputs and 4 outputs

Bit position	Value of position	Meaning of bit
0	0001 H	Resolver parameterized (R1, R2, R8)
1	0002 H	Encoder with sinusoidal output parameterized (G1)
2	0004 H	Encoder with square output parameterized
3	0008 H	Single-turn absolute value generator with SSI interface (G2, G5)
4	0010 H	Multi-turn absolute value generator with SSI interface (G3)
5	0020 H	Option slot 1 occupied (e.g. AH7)
6	0040 H	Position communication slot occupied (e.g. Motion)
7	0080 H	Asynchronous motor parameterized
8	0100 H	Synchronous motor parameterized
9	0200 H	Special motor parameterized
10	0400 H	Module slot 1 occupied with 8 inputs (AH6)
11	0800 H	Module slot 2 occupied with 4 outputs (AH6)
12	1000 H	CAN bus interface (C11) occupied
13	2000 H	Memory upgrade occupied (suitable for SW 3.0 and higher)
14	4000 H	Motor PTC evaluation occupied
15	8000 H	Driver for holding brake occupied (HB1)

Example: 2C81 H = asynchronous machine with resolver connected, I/O expansion AH6, memory upgrade for software version 3.0 and higher

301-CFMOT - Motor type

Source: Configuration Motor

Function: The parameter defines the motor type (synchronous/asynchronous).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		MC6000: AS MC7000 PS	–	R4W5	DRIVE	USIGN8

Settings

No.	Setting	Motor type
0	AS	Asynchronous servomotor
1	PS	Synchronous servomotor

302-CFPNM - Performance class of power stage

Source: Configuration Power Class Nominal
Function: Identifier of performance class of power stage (effective rated output current in Amperes)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
Dependent on device type			–	R4W7	ALL	USIGN8

Settings

Setting	Device type
4 A	MC6404
8 A	MC6408
12 A	MC6412
16 A	MC6416
32 A	MC6432
64 A	MC6464

Setting	Device type
2 A	MC7402
4 A	MC7404
8 A_N	MC7408 (standard)
8 A	MC7408R (reduced)
12 A	MC7412
16 A	MC7416
32 A	MC7432
64 A	MC7464

306-CFSSW - Control structure status word of system

Source: Configuration Software State Word
Function: Software status word, indicates e.g. which control mode is selected.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	A	R4W15	ALL	USIGN16

Settings:

Bit position	Value of position	Meaning of bit
0	0001 H	Torque control
1	0002 H	Speed control
2	0004 H	Position control
4	0010 H	Electronic gearing (master)
5	0020 H	Electronic gearing (slave)

402-CLSEL - Control location selector

Source: Control Location Selector

Function: Control location selector (terminals, KeyPad, ...)

CLSEL designates the source for the control commands START and INV; reference values may also originate from other control locations according to reference input.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		TERM	–	R4W4	REFRC	USIGN8

CLSEL on MC6000

No.	Setting	Designation	Function
1	TERM	Terminal	Control drive via terminal strip (input configured as “Start“)
2	KPAD	KeyPad	Control drive via KeyPad
3	SIO	Serial Input/Output	Control drive via serial interface (LustBus control word)
4	OPTN1	Option 1	Control drive via module in slot 1 (e.g. InterBus-S / CAN bus interface)
5	OPTN2	Option 2	Control drive via module in slot 2 (e.g. I/O module 1, PosMod1)

CLSEL on MC7000

No.	Setting	Designation	Function
1	TERM	Terminal	Control drive via terminal strip (input configured as “Start“)
2	KPAD	KeyPad	Control drive via KeyPad
3	SIO	Serial Input/Output	Control drive via serial interface (LustBus control word)
4	OPTN1	Option 1	Control drive via module in slot 1
5	CAN	CAN bus	Control drive via CAN bus
6	POMOD	PosMod1	Control drive via position control

129-FIEC2 - Function selector for 2nd position measurement system

Source: Function Selector Encoder Input 2

Function: Selection of function which uses the 2nd position measurement system (e.g. speed synchronism, electronic gearing).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		0	–	R4W4	REF	USIGN8

Settings:

No.	Setting	Function
0	OFF	2nd position measurement system is not evaluated.
1	SNOM	Speed synchronism active
2	PNOM	Electronic gearing active
3	PACT	Currently not supported.

Note:
The selected function requires correct setting of the control mode!
SNOM => CFCON = SCON
PNOM => CFCON = PCON

➔ 300-CFCON - Current control mode of servo, Page 15

443-FIF0, 444-FIF1 - Function selector, fixed input 0, 1

Source: Function Selector Input Fixed 0, 1
Function: Function selector for fixed input 0 or 1. This input is simulated by software and is permanently assigned the value = 1.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		0	–	R4W4	REF	USIGN8

Examples:
- START - Start drive without additional input (Auto-Start\)
- INV - Always invert reference
- GEAR - Always engage electronic gearing

➔ Functions for inputs on MC6000, Page 21
➔ Functions for inputs on MC7000, Page 22
➔ Structure of reference input, Page 24
➔ Notes on function selectors for inputs, Page 23

439-FIS00, 440-FIS01 - Function selector, input IS00, IS01

Source: Function Selector Input Standard 00, 01
Function: Function selector for input IS00 or IS01. Defines which function the input executes. Only digital functions possible.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	EGEAR	START	–	R1W2	REFRC	USIGN8

Examples:
- START – Start drive with preset reference value
- /STOP – Quick-stop drive (brakes to speed = 0 and stop)

Functions for inputs on MC6000

Inputs:	IS00:	Standard input, digital
	IS01:	Standard input, digital
	ISA0:	Analog input +/- 10 V, also usable digitally
	ISA1:	Analog input +/- 10 V, also usable digitally
	IF0:	Fixed input, always =1
	IF1:	Fixed input, always =1
	IExx:	External inputs (I/O module)

⊙ Factory setting

● Input can execute this function

No.	Setting	Function	IS00	IS01	ISA0	ISA1	IF0	IF1	IExx
0	OFF	None	●	●	⊙	⊙	⊙	⊙	⊙
1	START	Start with preset reference value	⊙	●	●	●	●	●	●
2	INV	Reference of reference channels 3 and 4 is inverted (see section 7.4 Reference input")		⊙	●	●	●	●	●
3	/STOP	Activate quick-stop with stop ramp STOPR (Low-active)	●	●	●	●	●	●	●
4	AD1-0	Offset for RSSL1 (SADD1 bit 0), switchover: +1	●	●	●	●	●	●	●
5	AD1-1	Offset for RSSL1 (SADD1 bit 1), switchover: +2	●	●	●	●	●	●	●
6	AD1-2	Offset for RSSL1 (SADD1 bit 2), switchover: +4	●	●	●	●	●	●	●
7	AD1-3	Offset for RSSL1 (SADD1 bit 3), switchover: +8	●	●	●	●	●	●	●
8	AD2-0	Offset for RSSL2 (SADD2 bit 0), switchover: +1	●	●	●	●	●	●	●
9	AD2-1	Offset for RSSL2 (SADD2 bit 1), switchover: +2	●	●	●	●	●	●	●
10	AD2-2	Offset for RSSL2 (SADD2 bit 2), switchover: +4	●	●	●	●	●	●	●
11	AD2-3	Offset for RSSL2 (SADD2 bit 3), switchover: +8	●	●	●	●	●	●	●
12	AD3-0	Offset for RSSL3 (SADD3 bit 0), switchover: +1	●	●	●	●	●	●	●
13	AD3-1	Offset for RSSL3 (SADD3 bit 1), switchover: +2	●	●	●	●	●	●	●
14	AD3-2	Offset for RSSL3 (SADD3 bit 2), switchover: +4	●	●	●	●	●	●	●
15	AD3-3	Offset for RSSL3 (SADD3 bit 3), switchover: +8	●	●	●	●	●	●	●
16	AD4-0	Offset for RSSL4 (SADD4 bit 0), switchover: +1	●	●	●	●	●	●	●
17	AD4-1	Offset for RSSL4 (SADD4 bit 1), switchover: +2	●	●	●	●	●	●	●
18	AD4-2	Offset for RSSL4 (SADD4 bit 2), switchover: +4	●	●	●	●	●	●	●
19	AD4-3	Offset for RSSL4 (SADD4 bit 3), switchover: +8	●	●	●	●	●	●	●
20	/ENDL	Limit switch left (low-active) 1)	●	●	●	●			●
21	/ENDR	Limit switch right (low-active) 1)	●	●	●	●			●
22	E-EXT	External error	●	●	●	●			●
23	MP-UP	MOP “UP“ (increase reference)	●	●	●	●			●
24	MP-DN	MOP “DOWN“ (decrease reference)	●	●	●	●			●
25	OPTN1	Module in slot 1 (X6) available 2)	●	●	●	●			●
26	OPTN2	Module in slot 2 (X7) available 2)	●	●	●	●			●
27	USER0	Input can be used by modified software	●	●	●	●			●
28	USER1	(see relevant documentation),	●	●	●	●			●
29	USER2	with standard software no function	●	●	●	●			●
30	USER3		●	●	●	●			●
31	ANALG	Analog reference input			●	●			
32	SCALE	Scaling of torque limitation TCMMX (_TCON) from 0 ... 100 % (only for FISA1)				●			
33	SPEED	Direct input for speed references +/- 10V (only for FISA0), use in conjunction with a higher-level position control. 3)			●				

1) Quick-stop with stop ramp is triggered; to release open and close START (also for Auto-Start).
2) No function if functional module not present.
3) Deactivate reference selectors (RSSLx = RCON), otherwise error message E-PAR. If the SPEED function is selected, control via the CTRL menu is not possible.

➔ Structure of reference input, Page 24

➔ Notes on function selectors for inputs, Page 23

Functions for inputs on MC7000

Inputs: IS00:Standard input, digital
IS01:Standard input, digital
ISA0:Analog input +/- 10 V, also usable digitally
ISA1:Analog input +/- 10 V, also usable digitally
IF0:Fixed input, always =1
IF1:Fixed input, always =1
IExx:External inputs (I/O module)

⊙ Factory setting
● Input can execute this function

No.	Setting	Function:	IS00	IS01	ISA0	ISA1	IF0	IF1	IExx
0	OFF	None	●	●	●	⊙	⊙	⊙	⊙
1	START	Start with preset reference value	⊙	●	●	●	●	●	●
2	INV	Reference value of reference channels 3 and 4 is inverted (see section 7.4, "Reference input")		⊙	●	●	●	●	●
3	/STOP	Activate quick-stop with stop ramp STOPR (Low-active)	●	●	●	●	●	●	●
4	AD1-0	Offset for RSSL1 (SADD1 bit 0), switchover: +1	●	●	●	●	●	●	●
5	AD1-1	Offset for RSSL1 (SADD1 bit 1), switchover: +2	●	●	●	●	●	●	●
6	AD1-2	Offset for RSSL1 (SADD1 bit 2), switchover: +4	●	●	●	●	●	●	●
7	AD1-3	Offset for RSSL1 (SADD1 bit 3), switchover: +8	●	●	●	●	●	●	●
8	AD2-0	Offset for RSSL2 (SADD2 bit 0), switchover: +1	●	●	●	●	●	●	●
9	AD2-1	Offset for RSSL2 (SADD2 bit 1), switchover: +2	●	●	●	●	●	●	●
10	AD2-2	Offset for RSSL2 (SADD2 bit 2), switchover: +4	●	●	●	●	●	●	●
11	AD2-3	Offset for RSSL2 (SADD2 bit 3), switchover: +8	●	●	●	●	●	●	●
12	AD3-0	Offset for RSSL3 (SADD3 bit 0), switchover: +1	●	●	●	●	●	●	●
13	AD3-1	Offset for RSSL3 (SADD3 bit 1), switchover: +2	●	●	●	●	●	●	●
14	AD3-2	Offset for RSSL3 (SADD3 bit 2), switchover: +4	●	●	●	●	●	●	●
15	AD3-3	Offset for RSSL3 (SADD3 bit 3), switchover: +8	●	●	●	●	●	●	●
16	AD4-0	Offset for RSSL4 (SADD4 bit 0), switchover: +1	●	●	●	●	●	●	●
17	AD4-1	Offset for RSSL4 (SADD4 bit 1), switchover: +2	●	●	●	●	●	●	●
18	AD4-2	Offset for RSSL4 (SADD4 bit 2), switchover: +4	●	●	●	●	●	●	●
19	AD4-3	Offset for RSSL4 (SADD4 bit 3), switchover: +8	●	●	●	●	●	●	●
20	/ENDL	Limit switch left (low-active) 1)	●	●	●	●			●
21	/ENDR	Limit switch right (low-active) 1)	●	●	●	●			●
22	E-EXT	External error	●	●	●	●			●
23	MP-UP	MOP “UP“ (increase reference)	●	●	●	●			●
24	MP-DN	MOP “DOWN“ (decrease reference)	●	●	●	●			●
25	OPTN1	Module in slot 1 (X6) available 2)	●	●	●	●			●
26	OPTN2	Module in slot 2 (X7) available 2)	●	●	●	●			●
27	USER0	Input can be used by modified software (see relevant documentation), with standard software no function	●	●	●	●			●
28	USER1		●	●	●	●			●
29	USER2		●	●	●	●			●
30	USER3		●	●	●	●			●
31	ANALG	Analog reference input			⊙	●			
32	SCALE	Scaling of torque limitation TCMMX (_TCON) from 0 ... 100 % (only for FISA1)				●			
33	SPEED	Direct input for speed references +/- 10V (only for FISA0), use in conjunction with a higher-level position control. 3)			●				
34	POMOD	Input available to PosMod 2)	●	●	●	●			●

No.	Setting	Function: (continued)	IS00	IS01	ISA0	ISA1	IF0	IF1	IExx
35	REF	Start/stop reference run 2)	●	●	●	●			●
36	RSERR	Reset error	●	●	●	●			●
37	RECAM	Input for reference cam 2) + only IE00!							+
38	EGEAR	Activate electronic gearing 2)	●	●	●	●			●
39	ENCAM	reserved							

1) Quick-stop with stop ramp is triggered; to release open and close START (also for Auto-Start).

2) No function if functional module not present.

3) Deactivate reference selectors (RSSLx = RCON), otherwise error message E-PAR. If the SPEED function is selected, control via the CTRL menu is not possible.

➔ Structure of reference input, Page 24
➔ Notes on function selectors for inputs, Page 23

Notes on function selectors for inputs

Attention!
A changed function becomes active immediately (applies to all input function selectors). This means the drive starts immediately when an input is assigned the START function!

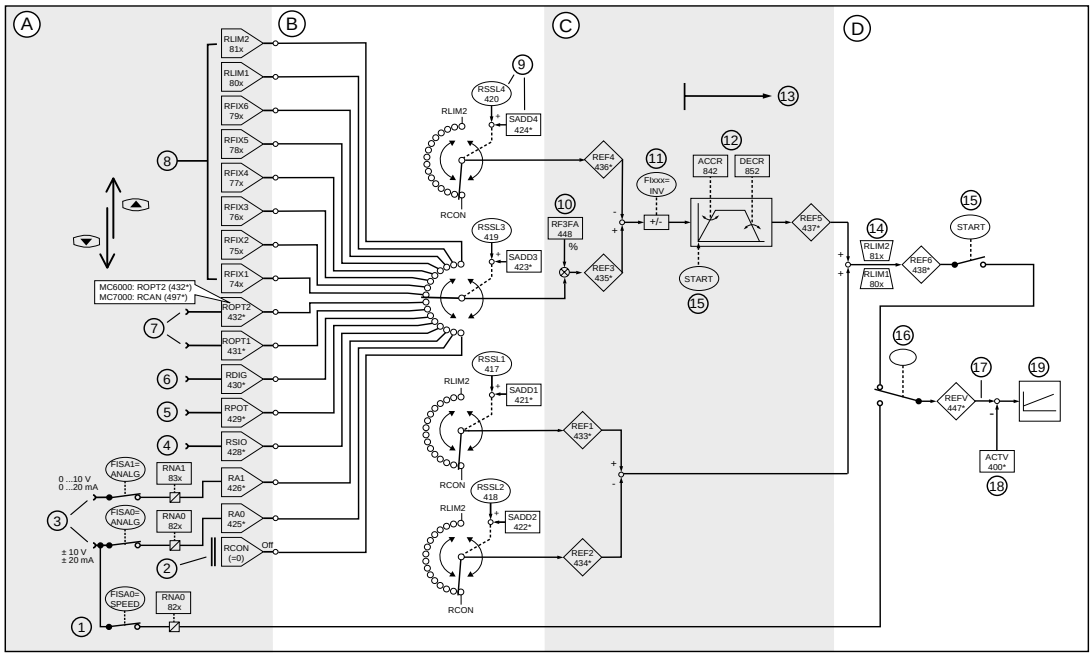
Note:
Inputs with identical function act as logical OR gates (applies to to all input function selectors)

Structure of reference input

Note before reference input

Before reference input is parameterized, in subject area _CONF parameterize:

- *Control mode CFCON*
- *Control location CLSEL*
- *Function selectors Fixxx, Foxxx*



Key:

No.	Function:	No.	Function
A	Reference sources		The diagram shows the reference selectors in the factory setting.
B	Reference selectors of the 4 reference channels		
C	Reference channels and interim references		
D	Calculation of total reference value	11	Reversal of preceding sign possible
1	Fast reference channel for ±10V	12	Ramp generator 2)
2	Constant to deactivate channel	13	Effect only after START
3	Analog reference inputs ISA0, ISA1	14	Limitation of reference value
4	Reference input serial interface	15	Start command closes switch and starts acceleration ramp. 3)
5	MOP function (via dig. inputs)		
6	Input of digital references 1)	16	Auto. switchover where FISA0=SPEED
7	References from module in slot 1 or 2	17	Total reference value
8	Fixed references (parameterizable)	18	Actual value of control
9	Reference selector with offset possibility	19	To control structure
10	Percentage reference adjustment		

1) Not available with standard software.

2) Acceleration and braking ramps only available in speed control mode.

3) The drive runs uncontrolled when START is removed. If this is not wanted, use stop ramp STOPR or run drive to new reference (e.g. speed 0 rpm). If a holding brake is fitted, check the setting of the BRAKE parameter.

Direct input for higher-level position control (SPEED function)

If the servocontroller is operated with speed references from an external position control, the setting FISA0 = SPEED (_CONF) should be selected for ±10V speed references.

This ensures a time-optimized sampling synchronized with the speed control loop and processing of the speed references (250 µs clock).

Scaling is via the parameter RNA0 (_REF) as described for the analog input. The reference selectors should be deactivated RSSLx = RCON (_REF), otherwise error message E-PAR (error in parameter list) will be displayed.

Note:
When the SPEED function is selected, control via the CTRL menu is not possible.

441-FISA0 - Function selector, analog input ISA0

Source: Function Selector Input Standard Analog 0

Function: Function selector for input ISA0 (differential input); defines which function the input executes. Analog or digital functions possible.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	EGEAR	ANALG	–	R1W2	REFRC	USIGN8

Examples:
- ANALG - Input for analog references -10V ... +10V
- START - Start drive with specified reference value
- /STOP - = Quick-stop drive (brake to speed = 0 and hold)

➔ Functions for inputs on MC6000, Page 21
➔ Functions for inputs on MC7000, Page 22
➔ Structure of reference input, Page 24
➔ Notes on function selectors for inputs, Page 23

442-FISA1 - Function selector, analog input ISA1

Source: Function Selector Input Standard Analog 1

Function: Function selector for input ISA1 (differential input); defines which function the input executes. Analog or digital functions possible.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	EGEAR	OFF	–	R1W2	REFRC	USIGN8

Examples:
- ANALG - Input for analog references 0 ... +10 V
- START - Start drive with specified reference value
- /STOP - = Quick-stop drive (brake to speed = 0 and hold)

➔ Functions for inputs on MC6000, Page 21
➔ Functions for inputs on MC7000, Page 22
➔ Structure of reference input, Page 24
➔ Notes on function selectors for inputs, Page 23

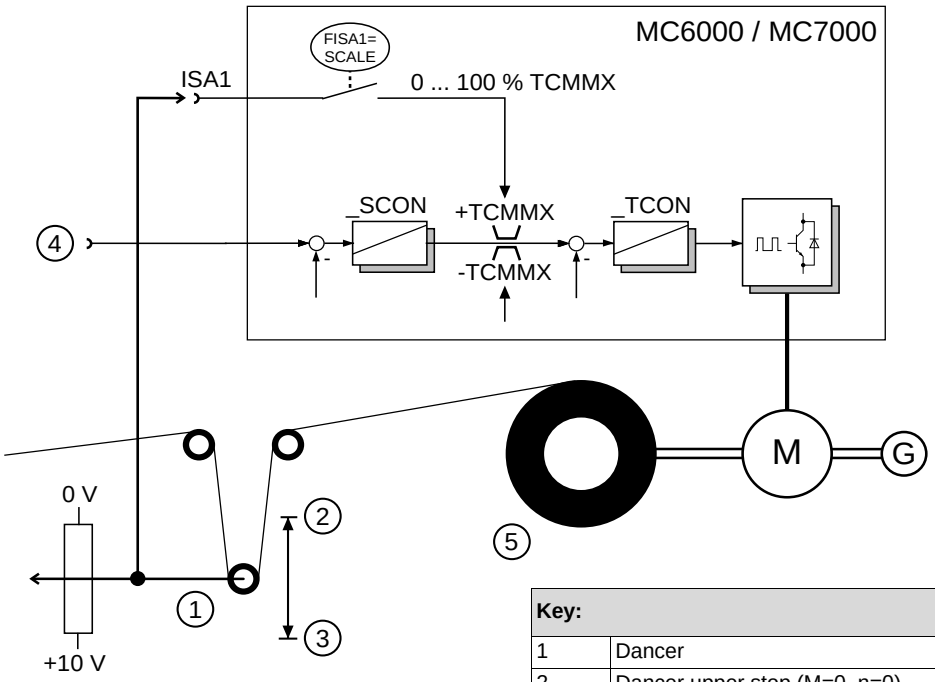
Torque limitation (SCALE function)

Some applications require that the torque limitation be continuously adjusted. The SCALE function can be used to adjust the torque limitation by way of the analog input ISA1. When the SCALE function is active it also takes effect in the event of a quick-stop!

0 ... +10 V
0 ... 20 mA ➔ 0 .. 100 % TCMMX

Note:
The SCALE function limits the reference value of the torque,i. e. the torque generated by the servocontroller (see diagram below). Dynamic forces may additionally act on the motor shaft arising from the moment of inertia of the load.

Example: Winding drive
To ensure that the wound material does not tear, a specific torque must not be exceeded. The tractive force is recorded via the dancer and the torque is corrected accordingly.



Key:	
1	Dancer
2	Dancer upper stop (M=0, n=0)
3	Dancer upper stop (M=max., n=max.)
4	Speed reference
5	Roller with wound material

132-FLABU - FLASH parameter group (FLAGP) in Flash-EPROM

Source: Flashbackup

Function: **Parameter only on MC7000.**

Start data backup of the FLASH parameter group (value of parameter FLAGP) in the FLASH EPROM.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		READY	–	R5W5	Non	USIGN8

Settings:

No.	Setting	Function
0	READY	Backup is complete and can be restarted (value to BUSY)
1	BUSY	Backup started

Note:

The backup operation may take a few seconds. Only parameters of data type “FLASHEPROM” whose group number matches the current value of parameter FLAGP are backed-up.

During data backup (BUSY) the parameter is not writable.

When data backup is complete the parameter automatically switches its value from BUSY to READY and is again accessible for write operations.

Attention!

Not the complete FLASH EPROM is saved, only a group. The user must therefore known the group number of the parameters.

Example: Parameter data of group 1 are to be backed-up in the FLASH.

Set 1st parameter FLAGP to 1.

Set 2nd parameter FLABU to 1, i.e. BUSY.

131-FLAGP - Number of FLASH parameter group to be stored

Source: Flash-Group

Function: **Parameter only on MC7000.**

Determines the number of the FLASH parameter group which is to be backed-up.

➔ 132-FLABU - FLASH parameter group (FLAGP) in Flash-EPROM, Page 27

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	7	0	–	R5W5	Non	USIGN8

Settings:

No.	Setting	Function
0	Sector 0	Back up parameters of group 0 (PosMod) to Flash EPROM
1 ... 7	Sector 1 ... 7	reserved

Attention!
Not the complete FLASH EPROM is saved, only a group. The user must therefore known the group number of the parameters.

Example: Parameter data of group 1 are to be backed-up in the FLASH.
Set 1st parameter FLAGP to 1.
Set 2nd parameter FLABU to 1, i.e. BUSY.

133-FLALL - Store all FLASH parameters

Source: Flashbackup all groups
Function: **Parameter only on MC7000.**
All parameters of type “FLASHEPROM” are backed-up to the Flash EPROM.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		READY	–	R5W5	Non	USIGN8

Settings:

No.	Setting	Function
0	READY	Backup is complete and can be restarted (value to BUSY)
1	BUSY	Backup started

Note:
The data backup may take a few seconds, as all the groups have to be backed-up in succession.

Attention!
During data backup the device must not be switched off!

449-FOA0 - Function selector for analog function of output OS00

Source: Function Selector Output Analog 0
Function: Function selector determining which variable is delivered at output OS00 pulse width modulated or analog.
The output then delivers a quasi-analog output signal suitable for time-lag display instruments but not for processing in controllers!
The output signal is scaled by OA0MN and OA0MX (_CONF).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
TORQE	IA1	SPEED	–	R1W2	REFRC	USIGN8

➔ Example of use of output OS00:, Page 34

Setting	Output variable
TORQE	Current torque
SPEED	Current speed
POS	Current position
CURNT	Current effective output current
IA0	Input difference at input ISA0
IA1	Input value at input ISA1

445-FOS00 - Function selector, output OS00

Source: Function Selector Output Standard 00
Function: Function selector for output OS00; determines which variable is delivered at the output.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	TCAVM	/ERRW	–	R1W2	REFRC	USIGN8

Examples:
- REF - Reference (e.g. speed) reached
- ERR - Error message

➔ Functions for outputs on MC6000, Page 30
➔ Functions for outputs on MC7000, Page 32

Note:
Output OS00 can also be used as a **PWM output** (quasi-analog);
see parameter FOA0.

446-FOS01- Function selector, output OS01

Source: Function Selector Output Standard 01
Function: Function selector for output OS01; determines which variable is delivered at the output.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	TCAVM	ACTIV	–	R1W2	REFRC	USIGN8

Examples:
- REF - Reference (e.g. speed) reached
- ERR - Error message

➔ Functions for outputs on MC6000, Page 30
➔ Functions for outputs on MC7000, Page 32

463-FOS02- Function selector, relay output OS02

Source: Function Selector Output Standard 02

Function: **Parameter only on MC7000.**

Function selector for output OS02; determines which variable is delivered at the output.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	TCAVM	OFF	–	R1W2	REFRC	USIGN8

Examples:
- REF - Reference (e.g. speed) reached
- ERR - Error message

➔ Functions for outputs on MC6000, Page 30
➔ Functions for outputs on MC7000, Page 32

464-FOS03- Function selector, brake output OS03

Source: Function Selector Output Standard 03

Function: **Parameter only on MC7000.**

Function selector for output OS03; determines which variable is delivered at the output.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	TCAVM	OFF	–	R1W2	REFRC	USIGN8

Examples:
- BRAKE - Activation of motor holding brake, further setting with parameter BRAKE
- REF - Reference (e.g. speed) reached
- ERR - Error message

➔ Functions for outputs on MC6000
➔ Functions for outputs on MC7000

Functions for outputs on MC6000

Outputs:
OS00: Standard output, digital or PWM (analog)
OS01: Standard output, digital
OExx: External outputs (I/O module)

⊙ Factory setting
● Output can execute this function

No.	Setting	Function:	OS00	OS01	OExx
0	OFF	None	●	●	⊙
1	ERR	Error	●	●	●
2	WARN	Warning	●	●	●
3	/ERR	No error	●	●	●
4	/WARN	No warning	●	●	●
5	ACTIV	Control in operation (green LED flashing)	●	⊙	●
6	ROT_R	Rotate Right 1)	●	●	●
7	ROT_L	Rotate Left 1)	●	●	●
8	ROT_0	No Rotation (energized) 1)	●	●	●
9	LIMIT	Limit value reached, dependent on parameter RLIM1, RLIM2 (_REF)	●	●	●
10	REF	Reference reached, dependent on parameter REF_R (_CONF)	●	●	●
11	ASM	Asynchronous machine parameterized	⊙	●	●
12	SIO	Output is assigned to serial interface and can be set via SCTL1 (_SIO)	●	●	●
13	OPTN1	Output is assigned to module in slot 1 and assigned function 2)	●	●	●
14	OPTN2	Output is assigned to module in slot 2 and assigned function 2)	●	●	●
15	ERRW	Warning or error	●	●	●
16	/ERRW	No warning and no error	●	●	●
17	USER0	Output can be used by modified software (see relevant documentation), with standard software no function	●	●	●
18	USER1		●	●	●
19	USER2		●	●	●
20	USER3		●	●	●
21	ANALG	Output delivers analog (PWM) output signal, 3) function is assigned by FOA0 (only FOS00)	●	●	●

1) Dependent on parameter SPD_0 (_CONF).
2) No function if module not fitted.
3) PWM signal 24 V, 200 Hz, e.g. for time-lag pointer instruments; smooth with RC element as necessary.

Note:
The output delivers High level if the condition is met.

Functions for outputs on MC7000

Outputs:
- OS00: Standard output, digital or PWM (analog)
- OS01: Standard output, digital
- OS02: Relay output (only MC7000)
- OS03: Brake actuation output (only MC7000)
- OExx: External outputs (I/O module)

⊙ Factory setting
● Output can execute this function

No.	Setting	Function:	OS00	OS01	OS02	OS03	OExx
0	OFF	None	●	●	⊙	⊙	⊙
1	ERR	Error	●	●	●	●	●
2	WARN	Warning	●	●	●	●	●
3	/ERR	No error	●	●	●	●	●
4	/WARN	No warning	●	●	●	●	●
5	ACTIV	Control in operation (green LED flashing)	●	⊙	●	●	●
6	ROT_R	Rotate Right 1)	●	●	●	●	●
7	ROT_L	Rotate Left 1)	●	●	●	●	●
8	ROT_0	No Rotation (energized) 1)	●	●	●	●	●
9	LIMIT	Limit value reached, dependent on parameter RLIM1, RLIM2 (_REF)	●	●	●	●	●
10	REF	Reference reached, dependent on parameter REF_R (_CONF)	●	●	●	●	●
11	ASM	Asynchronous machine parameterized	●	●	●	●	●
12	SIO	Output is assigned to serial interface and can be set via SCTL1 (_SIO)	●	●	●	●	●
13	OPTN1	Output is assigned to module in slot 1 and assigned function 2)	●	●	●	●	●
14	CAN	Reserved for CAN bus	●	●	●	●	●
15	ERRW	Warning or error	●	●	●	●	●
16	/ERRW	No warning and no error	⊙	●	●	●	●
17	USER0	Output can be used by modified software (see relevant documentation), with standard software no function	●	●	●	●	●
18	USER1		●	●	●	●	●
19	USER2		●	●	●	●	●
20	USER3		●	●	●	●	●
21	ANALG	Output delivers analog (PWM) output signal, 3) function is assigned by FOA0 (only FOS00)	●	●	●	●	●
22	POMOD	Output is activated by PosMod1 2)	●	●	●	●	●
23	REFOK	Referencing successful 2)	●	●	●	●	●
24	RFERR	Reference point not found within max. positioning range 2)	●	●	●	●	●
25	/EFLW	No tracking error 2)	●	●	●	●	●
26	BRAKE	Actuation of holding brake, mode determined by parameter BRAKE (_CONF) 2)	●	●	●	●	●

No.	Setting	Function: (continued)	OS00	OS01	OS02	OS03	OExx
27	S_RDY	Servocontroller ready (Servo_Ready): Power stage enable ENPO not yet set. The signal remains set after the control has started.	●	●	●	●	●
28	C_RDY	Ready (Control_Ready): ENPO is set, control ready to start. The signal remains set after the control has started.	●	●	●	●	●
29	REERR	Referencing error	●	●	●	●	●
30	SCAVM	Speed threshold SCAVM exceeded	●	●	●	●	●
31	TCAVM	Torque threshold TCAVM exceeded	●	●	●	●	●

1) Dependent on parameter SPD_0 (_CONF).
2) No function if module not fitted.
3) PWM signal 24 V, 200 Hz, e.g. for time-lag pointer instruments; smooth with RC element as necessary.

Note:
The output delivers High level if the condition is met.

Assigning a function to an input/output

1) First select the input, e.g. IS01.

2a) On servocontrollers MC7000 Basic or Motion:
From the **Active device - Change settings** menu select the "Inputs" tab and assign the input the desired function.

2b) On other servocontrollers:
Activate the Parameter Editor from the **Active device - Change settings** menu. Locate the function selector belonging to the input or output - in the example FIS01 - and change the setting of that parameter to the desired function.

415-MPCN0F - Configuration for MOP

Source: Motor Potentiometer Configuration
Function: Configuration of the motor operated potentiometer (MOP) (operation mode status- or edge-controlled)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	3	0	–	R4W4	REFRC	USIGN8

The reference value can be increase d or decreased by way of 2 inputs to which the functions MP-UP and MP-DN are assigned. Four operation modes can be selected by way of parameter MPCNF:

Setting	Function
0	Status-controlled, without reset
1	Status-controlled, with reset
2	Edge-controlled, without reset
3	Edge-controlled, with reset

Operation with reset means the reference value of the MOP is set = 0.

➔ MOP function, Page 99
➔ Parameter setting for the MOP function, Page 99
➔ Operation modes of the MOP function, Page 100

481-OA0MN - Lower window limit for analog output OS00

Source: Output Analog 0 Minimum Value;

Function: For the PWM function of output OS00:
OA0MN= minimum output value (value of output variable at 0V)
The parameters are also used on MC6000 servocontrollers with D/A output module, version AH4.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	–	R4W4	REFRC	INT32Q16

482-OA0MX - Upper window limit for analog output OS00

Source: Output Analog 0 Maximum Value

Function: For the PWM function of output OS00:
OA0MX= Maximum output value (value of output variable at 24V)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	3000	–	R4W4	REFRC	INT32Q16

Example of use of output OS00:

With factory setting:

- Function selector FOA0\ (= SPEED)
- Lower limit OA0MN (= 0)
- Upper limit OA0MX (= 3000)

and selection of the PWM function by FOS00=ANALG (_CONF) the current speed is delivered via OS00.

The parameters OA0MN and OA0MX determine the speed window: 0 ... 3000 rpm then correspond to 0 ... +24 V.

296-OPTN1 - Assignment of slot 1

Source: Option1
Function: Identifier of module in option slot 1

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		NONE	–	R5W15	ALL	USIGN8

OPTN1 on MC6000

Settings:

Bit position	Value of position	Meaning of bit
0	0001 H	CAN bus
16	01FF H	InterBus-S

OPTN1 on MC7000

Settings:

Bit position	Value of position	Meaning of bit
0	0001 H	Analog output 4-channel
1	0002 H	Analog output 2-channel
2	0004 H	Analog output 1-channel
3	0008 H	CANopen

293-OPTN2 - Assignment of slot 2

Source: Option 2
Function: Identifier of module in option slot 2

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		NONE	–	R5W15	ALL	USIGN8

OPTN2 on MC6000

Settings:

Bit position	Value of position	Meaning of bit
0	0001 H	I/O expansion
1	0002 H	Analog output 4-channel
2	0004 H	Analog output 1-channel
16	01FF H	POSMOD

OPTN2 on MC7000

Settings:

Bit position	Value of position	Meaning of bit
0	0001 H	SSI interface Absolute position simulation
1	0002 H	LK1 Encoder simulation & input
2	0004 H	LK2 Second analog encoder input (only SSI)

341-PMFS - Switching frequency of power stage

Source: Pulse Modulation Frequency (Switching)
Function: Switching frequency of power stage (PWM frequency): 4, 8 or 16 kHz

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
4KHZ	16KHZ	8KHZ	–	R1W3	SYSTM	USIGN8

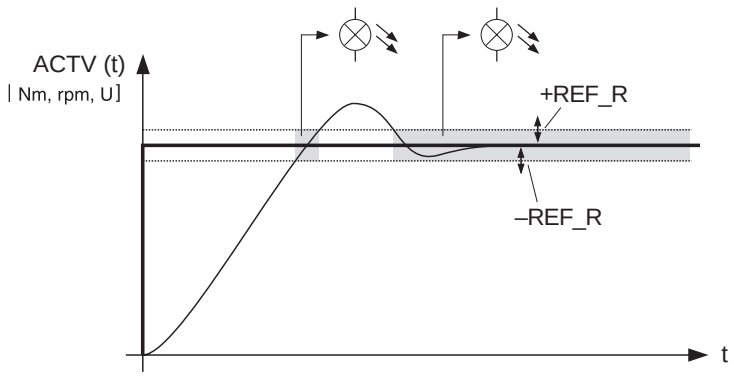
860-REF_R - Reference-reached window

Source: Reference Reached
Function: Window for ”Reference reached” message.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	100	30	Hz	R1W2	REFRC	INT32Q16

To indicate that the actual value is within the range from -REF_R to +REF_R, an output can be assigned the "REF" function with the function selector\.



Reference: Thick line

Actual: Thin line

451-SETUP - Setup mode for speed controller on/off (only MC6000)

Source: Setup Mode

Function: Setup mode to activate/deactivate speed controller setup.
With the setup mode the speed controller can be optimized if the moment of inertia of the system is not known (see also SCGFA\).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	ON	OFF	–	R4W4	ALL	USIGN8

Note:
Parameter only for MC6000.

Other setup mode parameters (_SCON).

➔ 452-10PC - Setup mode: Number of overshoots with amplitude >10% in first overshoot range (only MC6000), Page 60

➔ 454-1OVER - Setup mode: First overshoot range (only MC6000), Page 60

➔ 453-STIME - Setup mode: Rise time (only MC6000), Page 64

134-RNERR - Error status of current operation mode

Source: Run mode error

Function: Parameter (only for MC7000) indicates whether the setting of the current operation mode is valid, or whether the installation of an operation mode is complete.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		ok	–	R1W5	SYS	USIGN8

Settings:

No.	Setting	Function
0	OK	Operation mode is valid
ERROR	BUSY	Data of the operation mode are not valid

Note:
The DRIVEMANAGER sets this parameter when the setting of an operation mode is faulty, currently invalid or not yet completed.

Attention!
If the parameter is set to ERROR when the device is switched off, the next time it is switched on the servo signals the error E-PAR-58.

This error can only be eliminated by reinstalling the operation mode by way of the DRIVEMANAGER or by resetting the parameters to their factory defaults.

Example: The parameter is set by the DRIVEMANAGER to ERROR as long as you are in the DRIVE MANAGER Control dialog. It indicates that in this state the setting of the operation mode is not valid.

When you quit the Control dialog the mode setting is restored and parameter RNERR is reset to OK.

135-RNMOD - Number of current operation mode

Source: Run mode

Function: Number of the current operation mode.

The parameter (only for MC7000) RNTAB\ indicates which operation modes can be activated in the servocontroller.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	96	0	–	R1W5	SYS	USIGN16

Settings:

No.	Function
0	Free operation mode
1	Speed control with external position control
2	Speed control with reference via ±10V
3	Speed control with reference via fixed speeds
4	Speed control with reference via pulse input
5	Torque control
10	Stepper motor mode
11	Electronic gearing
30	Positioning and sequence control
31	Point-to-point positioning
32	Positioning by serial interface
90 - 95	User-defined operation modes 0 - 5

Note:

The parameter cannot be written on the KP100, because the servo has not stored the settings of all operation modes.

The DRIVEMANAGER operator control program sets this parameter when the relevant operation mode has been properly installed on the servo.

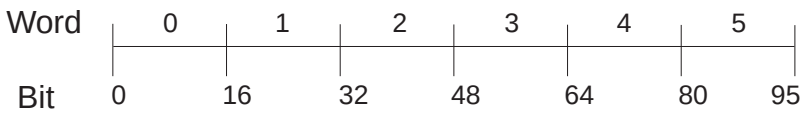
Example: When the DRIVEMANAGER has installed “Speed control with reference via pulse input” mode on the servo, it sets parameter RNMOD to 4 and parameter RNERR to OK.

136-RNTAB - Bit field of valid operation modes

Source: Run mode table

Function: Parameter RNTAB is a 6-word field. Within a word each bit (6 * 16 = 96 bits) represents one operation mode. The position of a set bit within the field corresponds to the number of an operation mode which can be activated on the device in question.

Its structure is as follows:



Bit = operation mode, see parameter RNMOD\

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	FFFFh	?	–	R5W15	Non	USIGN16

Note:
The parameter is not writable. It is initialized at the factory according to the device design. It cannot be read on the KP100 (display ”xxxx”).

401-SPD_0 - Standstill window (limit value for speed = 0)

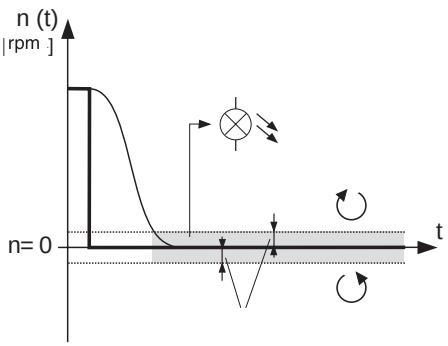
Source: Speed = 0

Function: Window for ”Motor is stopped” message.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.019989	20	10	rpm	R1W2	REFRC	INT32Q16

If the motor speed is higher than this window, the direction of rotation is indicated by symbols on the KeyPad.



Reference: Thick line

Actual: Thin line

Display via outputs: This parameter also determines the speed as from which outputs are set to which the functions "ROT_R", "ROT_L" or "ROT_0"\ (clockwise, counter-clockwise or standstill) are assigned.

Note:
For resolvers the lowest logical setting for the reference window is a value of 0.2 rpm; for high-resolution optical encoders the value can be reduced to 0.02 rpm.

467-THTDC - Holding time (time between brake-on and control-off)

Source: Time Hold to disable Control

Function: This is the time, starting from the "standstill" message, until the control is shut off. In this time the control is active and the brake closed.

Only with setting BRAKE = HOLD1 or HOLD2.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
100	2000	100	ms	R1W2	APPLI	USIGN16

Note:
In HOLD1 and HOLD2 modes the holding brake engages when the motor speed reaches the standstill window SPD_0\. At the end of the holding time THTDC the control is shut off. Setting the controller enable (Start) releases the holding brake.

➔ Operation modes of the holding brake

_ENCD – Encoder

331-ECLNC - Lines per revolution of encoder

Source: Encoder Line Count

Function: Lines per revolution of the encoder (only for optical encoders Gx). Encoders with 512 to 4096 in increments of 2 can be used.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
512	4096	2048	–	R4W4	DRIVE	USIGN16

334-ECNPP - Number of pole pairs of encoder

Source: Encoder Number of Pole Pairs

Function: Number of pole pairs of the encoder (only for resolvers Rx)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	4	3	–	R4W4	DRIVE	USIGN8

Setting	Number of pole pairs	Resolver type	Motor type
1	1	R1	AS, PS
2	2	R2	AS
3	3	R8	PS
4	4	–	(only MC7000)

AS = Asynchronous machine

PS = Permanent magnet excited synchronous machine

Note:

With higher-pole resolvers (e.g. R8) a higher resolution is obtained and so smoother operation, but also several zero pulses per revolution.

Note:

The number of pole pairs of resolver ECNPP must be equal to that of the motor (MONPP) or equal to one or a whole-number multiple of the number of pole pairs of the motor.

333-ECOFF - Encoder offset

Source: Encoder Offset

Function: Offset of the encoder (correction value for the mechanical mounting orientation)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R4W5	DRIVE	USIGN16

Encoder type	Value range	Corresponding to
R1 (single pole pair), all optical encoders Gx	0000 H ... FFFF H	360°
R2 (two pole pair)	0000 H ... FFFF H	180°
R8 (three pole pair)	0000 H ... FFFF H	120°

17-ECSG - Controller gain for encoder simulation

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: **Parameter only for MC7000 with setting ECSIM = 1-X.**

The positional accuracy of the encoder simulation is safeguarded by way of a control loop. This is a P-controller. The input of the controller comprises the difference between the actual position of the rotor and the position simulated to the outside world (by way of the encoder simulation). From this control deviation the manipulated variable is formed.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.0128	16	1	–	R5W6	OPTN2	FLOAT32

Note:
If more dynamism of the encoder simulation output is desired, increase ECSG. This does, however, mean more noise on the encoder simulation frequency.

29-ECSIM - Mode of encoder simulation

Source: Encoder Simulation

Function: **Parameter only for MC7000.**
Mode of encoder simulation

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1-1	1-X		–	R4W4	OPTN2	USIGN8

No.	Setting	Function
0	1 - 1	**Factory setting for optical encoders:** Hardware encoder simulation, lines per revolution = lines per revolution of connected encoder. 1)
1	1 - X	**Factory setting for resolvers:** Normal encoder simulation, lines per revolution determined by parameter ECSLN. 1) + 2)

1) The position of the zero pulse relative to the rotor position is reproducible.
2) **Only for G1 encoders:** The position of the zero pulse relative to the rotor position is no longer reproducible after a restart (referencing required). The setting 1-X is therefore usable only to a limited extent for G1 encoders.

Note:
The encoder simulation delivers valid signals right from power-up (as from software version V1.45). When the "S_RDY: Servocontroller ready" state is reached, the encoder simulation signals follow the actual position of the axle. The "S_RDY" state can be delivered via an output (see Functions for outputs on MC7000).

Note:
In the case of optical encoders and ECSIM = 1 - X no additional encoder can be evaluated.

13-ECSLN - Lines per revolution in encoder simulation

Source: Encoder Simulation Line Count
Function: **Parameter only for MC7000 with setting ECSIM = 1-X.**
Lines per revolution in encoder simulation

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
128	4096	1024	–	R4W4	OPTN2	USIGN8

Encoder type	Lines per revolution with ECSIM = 1-X
R1	128, 256, 512, **1024**, 2048, 4096
R2	256, 512, 1024, **2048**, 4096, 8192
R8	384, 768, 1536, **3072**, 6144, 12288
G1, G3, G5	256, 512, 1024, **2048**, 4096, 8192

Note:
In the case of resolvers the delivered lines per revolution results from multiplication of parameter ECSLN with the number of pole pairs p.

336-ECTF - Jitter filter time constant

Source: Encoder Time Filter
Function: Actual speed filter

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	0.032	0.0006	s	R1W3	DRIVE	FLOAT32

Note:
The setting is described in detail in the MC7000 Basic/Motion Operation Manual.

ECTF on MC6000:

Depending on the sampling rate of the encoder ECTS, the following filter time constants are produced:

Timeconstant[ms] (ECTS = 2 kHz)	Timeconstant[ms] (ECTS = 4 kHz)
0.00 ms	0.00 ms
0.72 ms	0.36 ms
1.74 ms	0.87 ms
3.74 ms	1.87 ms
7.73 ms	3.87 ms
15.72 ms	7.86 ms
31.70 ms	15.85 ms
–	31.82 ms

Entered values are approximated to discrete values where necessary.

Note:
The parameter value balanced to the motor is transferred to the SMARTCARD. In the case of high moments of inertia it may be necessary to increase the filter time constant. However, ECTF should only ever be changed by one stage, as an incorrect setting may make the control unstable! This may be noticeable at a standstill by humming of the drive. Any greater need for adjustment should be agreed with LUST.

ECTF on MC7000

Actual speed filter (dependent on sampling rate of encoder ECTS)

Note:
The parameter value balanced to the motor is transferred to the SMARTCARD. In the case of high moments of inertia it may be necessary to increase the filter time constant. However, ECTF should only ever be changed slightly (in 0.1 ms increments), as an incorrect setting may make the control unstable! This may be noticeable at a standstill by humming of the drive. Any greater need for adjustment should be agreed with LUST.

330-ECTS - Sampling time of speed recording

Source: Encoder Time Sampling

Function: Sampling rate of the encoder; adjusted with the relevant SMARTCARD to the built-in encoder.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
4KHZ	4_KHZ	8KHZ	–	R1W3	DRIVE	USIGN8

_OPT1 – Slot 1

452-DA0MN, 454-DA1MN - Lower limit value of value range for channel 0 or 1 of analog output (AH7)

Source: Digital/Analog Minimum Value for Channel 0, 1

Function: **Parameter for MC7000 with 2-channel analog output (AH7).**
Minimum output value for channel 0 or 1 (value of output variable at - 10 V).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	-3000	–	R3W3	OPTN1	INT32Q16

➔ Application example for analog output AH7, page 47

453-DA0MX, 466-DA1MX - Upper limit value of value range for channel 0 or 1 of analog output (AH7)

Source: Digital/Analog Maximum Value for Channel 0, 1

Function: **Parameter for MC7000 with 2-channel analog output (AH7)**
Maximum output value for channel 0 or 1 (value of output variable at + 10 V).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	3000	–	R3W3	OPTN1	INT32Q16

➔ Application example for analog output AH7, page 47

450-FODA0, 451-FODA1 - Function selector for DA module for channel 0 or 1

Source: Function Selector Output Digital/Analog Channel 0, 1

Function: **Parameter for MC7000 with 2-channel analog output (AH7).**
Function selector determining which variable is delivered in analog form on channel 0 or 1.

Values:

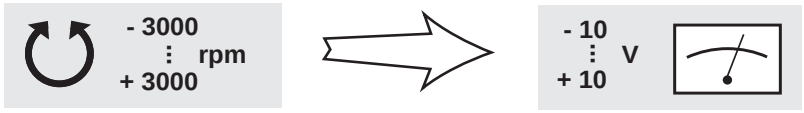
Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
TORQE	REFV	SPEED	–	R3W3	OPTN1	USIGN8

No.	Setting	Function
0	TORQE	Actual torque
1	SPEED	Actual speed
2	POS	Actual position
3	CURNT	Effective phase current
4	IA0	Input difference at input ISA0
5	IA1	Input value at input ISA1
6	ASPED	Amount of actual speed
7	REFV	Reference

Application example for analog output AH7

Parameter FODA0 = SPEED, DA0MN = - 3000 and DA0MX = + 3000: Then - 10 V correspond to a speed of - 3000 rpm and + 10 V a speed of + 3000 rpm.

Speed: Output voltage:



Note:
The window limits do not need to be selected symmetrical to zero, nor do they need to cover the entire possible input range (zoom). However, it should be taken into account that with asymmetrical window limits an output voltage of 0 V does not correspond to an input value of zero and values outside the window limits are limited to - 10 V and + 10 V respectively.

Recommendations for setting of the AH7 parameters

FODAx =	DAxMN =	DAxMX =	Explanation
IA0	-2048	2047	
IA1	0	2047	
ASPED	e.g. - 3000	e.g. + 3000	Symmetrical to zero, otherwise see example

Example: DA0MN = - 1000, DA0MX = + 3000.
Then both at 3000 rpm and at -1000 rpm an output voltage of + 10 V would be produced! This does not make sense.

406-IBCNF - Configuration of reference transfer via InterBus-S

Source: InterBus-S Configuration

Function: **Parameter only on MC6000.**
The first word in the process data channel contains the control or status word according to DRIVECOM profile 20. The remaining words in the process data channel are reserved for reference transfer and actual value checkback. The interpretation of the reference and actual value words can be set with parameter IBCNF.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	5	2	–	R3W3	OPTN1	USIGN8

IBCNF	Reference	Actual	Permitted "SUPI" settings
0	No reference adopted	All words = 0	1 ... 12
1	16 bits, torque, speed or position, depending on control mode	16 bits, torque, speed or position, depending on control mode	7 ... 12
2	32 bits, torque, speed or position, depending on control mode	32 bits, torque, speed or position, depending on control mode	10 ... 12
3	32 bits, speed	16 bits speed (1st word), 16 bits torque (2nd word)	10 ... 12
4	Modified software L.	Modified software L.	9

407-IBCTR - InterBus-S control word

Source: InterBus-S Control Word

Function: **Parameter only on MC6000.**
Control word for status of DRIVECOM state machine.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R3W15	–	USIGN16

Settings:

Bit	Name
0	Switch-on
1	Disable power
2	Emergency stop
3	Enable operation
4	No function
5	No function
6	No function
7	Reset fault
8	reserved
9	reserved
10	reserved
11	vacant
12	vacant
13	vacant
14	Reference state output OS00
15	Reference state output OS01

408-IBSTA - InterBus-S status word

Source: InterBus-S Status Word

Function: **Parameter only on MC6000.**
Status word for status of DRIVECOM state machine.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R3W15	–	USIGN16

Settings:

Bit	Name
0	Ready for start
1	On
2	Enable operation
3	Error
4	Power disabled
5	Emergency stop
6	Switch-on inhibit
7	Warning
8	Not implemented
9	Remote
10	Reference reached
11	Limit value
12	reserved
13	reserved
14	Actual state input IS00
15	Actual state input IS01

405-SUPI - Configuration of word length in SUPI chip (only InterBus-S)

Source: Configuration of word length in the SUPI chip (only for InterBus-S)

Function: **Parameter only on MC6000.**

In the MC6000 the PCP version 2.0 is implemented. This version permits various word lengths of the parameter channel. The split of the max. four words on the bus between parameter and process data channel is set with parameter SUPI. The parameter is only evaluated when the device is switched on.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	12	11	–	R3W3	OPTN1	USIGN8

The following settings are possible:

Settings:

SUPI	Number of words process data	Number of words PCP	ID code local bus (Hex)	ID code remote bus (Hex)
0	*)	*)	13B	17B
1	0	1	1E7	1DB
2	0	2	2E4	2D8
3	0	4	4E5	4D9
4	1	0	13B	17B
5	1	1	2E7	2DB
6	1	2	3E4	3D8
7	2	0	23B	27B
8	2	1	3E7	3DB
9	2	2	4E4	4D8
10	3	0	33B	37B
11	3	1	4E7	4DB
12	4	0	43B	47B

*) With the setting 'SUPI = 0' the servocontroller requires no Interbus operation. The Interbus CPU initializes the SUPI with configuration 4 and comes to a steady state in an endless loop with no data exchange with the servo.

_MOT – Motor parameters

Notes:

- Changes to parameters in this subject area only take effect after a rest (e.g. start command canceled and re-entered, ➔ 15 -PLRDY)!
- Read in motor data from SMARTCARD (Drive area), in the factory setting the servocontroller is set to motor type PSM04-R83 (MC7000) or ASM22 (MC6000).

317-MOCNM - Motor rated current

Source: Motor Current Nominal
Function: Motor rated current

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.1	64	3.2	A	R1W5	DRIVE	FLOAT32

310-MOFNM - Nominal pole flux

Source: Motor Flux Nominal
Function: Nominal flux of motor

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.032	3.999	0.207139	Vs	R4W5	DRIVE	FLOAT32

326-MOI2T - i^2 x t limit of motor

Source: Motor I^2 x t
Function: **Parameter only on MC7000.**
Limit value of I^2xt monitoring
If the upward-integrated current time value exceeds this motor-dependent limit value, the servocontroller shuts down to protect against motor overload with error E-OLM, error location 1.
To shut off the I^2xt monitoring parameter MOI2T must be programmed = 0.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	59315.5	0	–	R4W4	DRIVE	FLOAT32

319-MOJNM - Moment of inertia of motor

Source: Motor Inertia Nominal
Function: Moment of inertia of the motor (nominal value)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1e-06	0.12	0.00074	kgmm	R4W5	DRIVE	FLOAT32

312-MOL_M - Magnetizing inductance

Source: Motor Inductivity [L] Mutual
Function: Magnetizing inductance of the motor

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.001	0.9999	0.0058	H	R4W5	DRIVE	FLOAT32

311-MOL_S - Stator inductance

Source: Motor Inductivity [L] Stator
Function: Stator inductance of the motor

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.001	0.9999	0.0058	H	R4W5	DRIVE	FLOAT32

321-MOMC0 - Value 0 of continuous magnetizing characteristic

CAUTION - Do not change parameter!
Parameter only for development and service purposes.

Source:
Function: Motor constant for the field weakening range
The field weakening can be shut off by setting MOMC0 = 0.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-128	128	0	–	R5W5	DRIVE	FLOAT32

322-MOMC1 - Value 1 of continuous magnetizing characteristic

CAUTION - Do not change parameter!
Parameter only for development and service purposes.

Source:

Function: Motor constant for the field weakening range
The field weakening can be shut off by setting MOMC0 = 0.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-128	128	0.2868	–	R5W5	DRIVE	FLOAT32

323-MOMC2 - Value 2 of continuous magnetizing characteristic

CAUTION - Do not change parameter!
Parameter only for development and service purposes.

Source:

Function: Motor constant for the field weakening range
The field weakening can be shut off by setting MOMC0 = 0.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-128	128	-1.9	–	R5W5	DRIVE	FLOAT32

324-MOMC3 - Value 3 of continuous magnetizing characteristic

CAUTION - Do not change parameter!
Parameter only for development and service purposes.

Source:

Function: Motor constant for the field weakening range
The field weakening can be shut off by setting MOMC0 = 0.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-128	128	3.966	–	R5W5	DRIVE	FLOAT32

325-MOMC4 - Value 4 of continuous magnetizing characteristic

CAUTION - Do not change parameter!
Parameter only for development and service purposes.

Source:

Function: Motor constant for the field weakening range
The field weakening can be shut off by setting MOMC0 = 0.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-128	128	-4.016	–	R5W5	DRIVE	FLOAT32

327-MOMMX - Motor maximum torque

Source: Motor Torque [M] Maximum

Function: Maximum motor torque

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	600	8.2	Nm	R5W5	DRIVE	FLOAT32

Note:

- To limit the maximum torque in an application, use parameter TCMMX\ (TCMMX must be less than or equal to MOMMX).
- On the SMARTCARD the maximum motor torque MOMMX is preset to twice the nominal torque of the motor. For pulse mode (to 0.2 s) a maximum of five times the nominal torque is permitted.

318-MOMNM - Motor nominal torque

Source: Motor Torque [M] Nominal

Function: Nominal torque of the motor

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.01	256	4.1	Nm	R1W5	DRIVE	FLOAT32

320-MONPP - Number of pole pairs of motor

Source: Motor Number of Pole Pairs
Function: Number of pole pairs of motor

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	4	3	–	R4W5	DRIVE	USIGN8

Note:
For resolvers, the number of pole pairs of the resolver (ECNPP) must be equal to that of the motor or equal to one or a whole-number multiple of the number of pole pairs of the motor.

314-MOR_R - Rotor resistance

Source: Motor Resistance Rotor
Function: Rotor resistance of the motor

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.001	25	1.47	Ohm	R4W5	DRIVE	FLOAT32

313-MOR_S - Stator resistance

Source: Motor Resistance Stator
Function: Stator resistance of the motor

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.001	100	1.875	Ohm	R4W5	DRIVE	FLOAT32

316-MOSMX - Maximum speed

Source: Motor Speed Maximum
Function: Maximum motor speed (only for asynchronous machines in the field weakening range)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
50	12000	3000	rpm	R1W5	DRIVE	USIGN16

Note:
- On synchronous machines the nominal speed of the motor (MOSNM) corresponds to the maximum motor speed.
- To limit the maximum speed in an application, use parameter SCSMX. SCSMX must then be less than or equal to MOSMX.

315-MOSNM - Nominal speed

Source: Motor Speed Nominal

Function: Nominal speed of the motor

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
50	6000	3000	rpm	R1W5	DRIVE	USIGN16

328-MOTYP - Motor type

Source: Motor type

Function: **Parameter only for MC7000.**

The parameter is a string and contains the symbolic name of the motor to which the servo-controller is set (max. 20 characters).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
–	–	–	–	R1W5	DRIVE	TERM

Note:

When installing a motor via the DRIVEMANAGER**,** the file name of the relevant motor data is stored in this string.

Attention!

There is no control on whether the servo really does contain precisely the parameters originally entered in the file with the name corresponding to this parameter.

Example: By way of the DRIVEMANAGER the motor data set PSF11R83.00D is transferred onto the device. Parameter MOTYP then contains the string “PSF11R83”.

_TCON – Torque control

365-TCAVM - Threshold value for actual torque monitoring

Source: Torque Control Actual Value Maximum

Function: Maximum value (threshold value) of actual torque monitoring.

When the threshold value is exceeded an output OSxx is set, provided the output has been assigned the TCAVM function with the function selector FOSxx.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	32764	4.099991	Nm	R4W4	DRIVE	INT32Q16

➔ Notes on function selectors for inputs, page 23

351-TCG - Torque controller gain

Source: Torque Controller Gain

Function: Gain of the torque controller (P-component)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	426	32.445202	–	R4W5	DRIVE	FLOAT32

353-TCMMX - Torque limit of torque controller

Source: Torque Controller Torque [M] Maximum

Function: Torque limit of the torque controller

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	= 327-MOMMX or device limit		Nm	R1W3	DRIVE	FLOAT32

Note:

The torque limit is active in all control modes. Generally the torque limit should be set by the servocontroller, since the maximum torque of the motor MOMMX may be around five times the nominal torque. The servocontroller is limited to twice its rated current, however.

The parameter must be set specific to application!

Note:

The quadratic mean (RMS) of the torque should be less than or equal to the nominal torque of the motor MOMNM within a clock cycle!

Note:

Continuous scaling of the torque limitation from 0 to 100 % is possible with the SCALE function\ by way of an analog input.

352-TCTLG - Lag time of torque controller

Source: Torque Controller Time Lag

Function: Lag time of the torque controller (I-component)
The lag time must be longer than the sampling time of the torque controller (124.8 ms for MC6000, 62.4 µs for MC7000). It should not be set too high, in order to maintain accuracy.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.000125	0.05	0.003093	s	R4W5	DRIVE	FLOAT32

350-TCTS - Sampling time of torque controller

Source: Torque Controller Time Sampling

Function: Sampling time of torque controller. 62.5 µs for MC7000 (16 kHz), 125 µs for MC6000 (8 kHz)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
6.25e-05	0.000125	6.25e.05	s	R4W15	ALL	FLOAT32

60x-TCI1, TCI2 - Input pointer for torque controller (only MC6000)

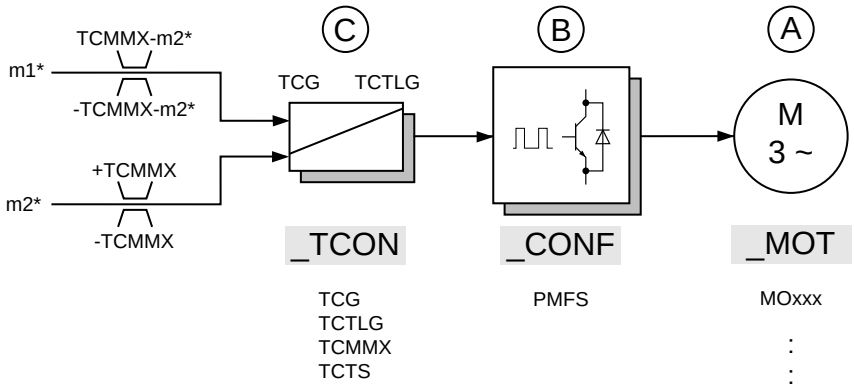
CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: Reference pointer for the inputs of the torque controller.
The two inputs are internally added together. The second input is required for input of pre-control values in position control and also in torque control.
Each input of the torque controller is assigned limits. The limits of input m1* are dynamic and dependent on the input value m2*.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	38	3	–	R5W6	APPLI	USIGN8



The input pointers TCI1 and TCI2 determine which variable is switched to inputs m1* and m2* of the torque controller. The limitation of the torque is pointered by way of TCIMX. The diagram shows the default setting.

➔ List of pointers (only MC6000), page 58

62x-TCIMX - Pointers for torque limit (only MC6000)

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:
Function: Pointers for torque limitation TCMMX

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	53	15	–	R5W5	APPLI	USIGN8

➔ 60x-TCI1, TCI2 - Input pointer for torque controller (only MC6000), page 57
➔ List of pointers (only MC6000), page 58

List of pointers (only MC6000)

Some control variables are integrated into the control structure by way of so-called pointers, to enable customer-specific adaptations without having to make software changes.

Pointers point to specific tables. There are two tables, containing addresses of variables. One contains 16-bit variables, the other 32-bit variables. The variable whose address is in the table to which the pointer is pointing is applied as the variable for the control.

In control the input variables and the limit values for the control loops are pointered. The pointer parameters are identified by an ”I” (= ”Input pointer”) at the third position of the parameter name.

TCI1, SCI2, SCI1, SCI2, PCI1, PCI2	Pointers for the inputs of the control loops
TCIMX, SCIMX, PCIMX, PCIMN	Pointers for the limits of the control loops
SFI	Pointer for the reference filter (only _SCON)

Example: The pointer TCIMX in the factory setting points to TCMMX.

Note:
Pointers are only checked against the limits of the respective address table, since their physical significance is generally unknown.
Pointer 16-bit
Pointer 32-bit

_SCON – Speed control

452-10PC - Setup mode: Number of overshoots with amplitude >10% in first overshoot range (only MC6000)

Source: 10 Percent

Function: For speed controller setup mode (SETUP function\): Number of overshoots with an amplitude greater than 10 percent of the first overshoot.

Parameter only on MC6000.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	255	0	–	R3W15	ALL	USIGN8

454-1OVER - Setup mode: First overshoot range (only MC6000)

Source: First Overshoot

Function: For speed controller setup mode (SETUP function\): First overshoot

Parameter only on MC6000.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	rpm	R4W15	ALL	INT32Q16

366-FCG - Flux control gain

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: Flux control gain (P-component of PI controller).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	8191	514.200012	–	R5W5	DRIVE	FLOAT32

367-FCQA - Factor A for calculation of reduced q-current in FSB

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: The constants QA and QB of the flux control determine the torque reduction in the field weakening range.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	31	2.432	A	R5W5	DRIVE	FLOAT32

368-FCQB - Factor B for calculation of reduced q-current in FSB

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: The constants QA and QB of the flux control determine the torque reduction in the field weakening range.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1.53552e+06	45640	A	R5W5	DRIVE	FLOAT32

364-FCTLG - Lag time of flux control

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: Lag time of flux control (I-component of PI controller).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1	0.06397	s	R5W5	DRIVE	FLOAT32

128-FCTS - Sampling time of voltage and flux control circuit

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: Sampling time of flux control

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.00025	0.0005	0.00025	s	R5W15	ALL	FLOAT32

369-SCAVM - Threshold value for actual speed monitoring

Source: Speed Control Actual Value Maximum

Function: Maximum value (threshold value) which the actual speed may reach.

If the threshold value is exceeded an output OSxx is set, provided the output is assigned the SCAVM function with the function selector FOSxx.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	32764	3000	rpm	R4W4	DRIVE	INT32Q16

➔ Functions for inputs on MC6000, page 21

362-SCG - Speed controller gain

Source: Speed Controller Gain

Function: Gain of speed controller (P-component)

SCG may only be changed in exceptional cases where the normal adjustment of the gain by way of parameter SCGFA is no longer sufficient. An incorrect setting may cause the drive to hum, buck, vibrate, or fail to run at all, etc.!

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1e+09	0.035	–	R4W4	DRIVE	FLOAT32

Opti-mization: SCG is optimized by reading-in the matching SMARTCARD to the motor. In the process the reduced external moment of inertia = 0 acting on the motor shaft is assumed. For percentage adjustment of the gain (optimization of the drive response), parameter SCGFA\ (= 0 ... 1000 %) is available.

375-SCGFA - Scaling of speed controller gain (0 to 1000 %)

Source: Speed Controller Gain Factor

Function: Online adaptation factor for SCG (= speed controller gain (P-component))

With this parameter the gain of the speed controller (P-component, parameter SCG) can be adjusted online from 0 to 1000 %.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.00	999.95	100.00	%	R1W3	DRIVE	FIXPOINT16

An optimization may be useful if the moment of inertia of the system SCJ is not known and/ or the drive is not running satisfactorily. This optimization is possible with:

- the SETUP function (not very convenient, MC6000 only) or
- the Scope tool for the DRIVEMANAGER.

363-SCJ - Moment of inertia of system

Source: Speed Controller Inertia
Function: Moment of inertia of the system, reduced onto the motor shaft

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1000	0	kgmm	R1W3	APPLI	FLOAT32

384-SCSMX - Speed limitation of speed controller

Source: Speed Controller Speed Maximum
Function: With this parameter the rotation speed of the motor can be limited where necessary specific to application (also with torque control).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	(12000) 1)	3000	rpm	R1W3	APPLI	FLOAT32

1) ≤ MOSMX with asynchronous motors; ≤ MOSNM with synchronous motors

Note:
The highest possible speed is dependent on the motor used (MOSMX for asynchronous machines, MOSNM for synchronous machines).

Notes on use of the PosMod positioning and sequence control:

- Asynchronous machines can only be run up to the motor nominal speed MOSNM!
- To limit the positioning speed use machine parameter K14 (not SCSMX).

376-SCTF - Time constant of speed reference filter

Source: Speed Controller Time Filter
Function: The speed reference filter damps the control in case of speed reference step-changes.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1	0	s	R5W5	DRIVE	FLOAT32

Note:
SCTF is correctly preset for all operation modes. In "electronic gearing" mode SCTF is shut off, for example, because the dead times would have a disturbing effect as a result of the filter.

360-SCTLG - Lag time of speed controller

Source: Speed Controller Time Lag
Function: Lag time of speed controller (I-component)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.001	2	0.0126	s	R1W3	DRIVE	FLOAT32

361-SCTS - Sampling time of speed controller

Source: Speed Controller Time Sampling
Function: Sampling time of speed controller (125 or 250 µs)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.000125	0.0005	0.00025	s	R4W15	ALL	FLOAT32

453-STIME - Setup mode: Rise time (only MC6000)

Source: Setup Time
Function: For speed controller setup mode (SETUP function\): **Rise time**
Parameter only on MC6000.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-25	25	0	s	R4W7	ALL	FLOAT32

64x-SCI1, 65x-SCI2 - Input pointer for speed controller (only MC6000)

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:
Function: Pointer for the inputs of the speed controller
Parameter only on MC6000.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	38		–	R5W5	DRIVE	USIGN8

66x-SCIMX - Pointers for speed limit (only MC6000)

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:
Function: Pointer for speed limitation
Parameter only on MC6000.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	53	46	–		APPLI	USIGN8

373-VCTF - Time constant of actual voltage filter

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:
Function: Parameter only on MC6000
Filter time constant of quadratic voltage reference

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1	1	s	R5W5	DRIVE	FLOAT32

370-VCTLG - Lag time of voltage regulator

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:
Function: Lag time of voltage regulator

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.0081	20	0.203	s	R5W5	DRIVE	FLOAT32

371-VCTS - Sampling time of voltage regulator (only MC6000)

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:
Function: Sampling time of voltage regulator (display only)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.0004992	0.0004992	0.0004992	s	R5W7	DRIVE	FLOAT32

372-VCVLM - Limitation of control deviation of voltage regulator

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:
Function: Limitation of control deviation of voltage regulator

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	25	1	V	R5W5	DRIVE	FLOAT32

374-VCVRF - Voltage reserve in voltage control loop

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:
Function: MC7000 Voltage reserve in voltage control loop
MC6000: Voltage reference of voltage control loop

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1000	0	V	R5W5	DRIVE	FLOAT32

_PCON – Position control

307-ENEG - Activation of electronic gearing

Source:

Function: **This parameter is inactive and currently has no significance!**

120-PCALR- Active level of reference cam

Source: Position Control Active Level of Reference Cam

Function: With this parameter the active level of the reference cam is set.
For **stepper motor interface** and **electronic gearing** modes.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		24 V	–	R2W2	DRIVE	USIGN8

Settings:

No.	Setting	Function
0	0 V	Active level is 0 V
1	24 V	Active level is 24 V

➔ 522-PORTY - Reference run type (K70), page 129

119-PCAZ - Activation of automatic machine zeroing

Source: Position Control Automatic Zero

Function: Activate or deactivate automatic zero search after reference cam has been reached in a reference run.
For **stepper motor interface** and **electronic gearing** modes.

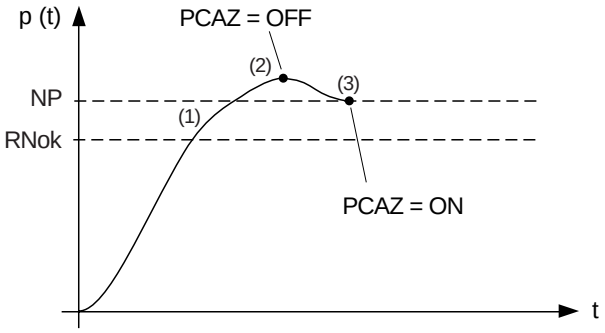
Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
See table		0	–	R2W2	DRIVE	USIGN8

Settings:

No.	Setting	Function
0	OFF	Zero search off
1	ON	Zero search on

Note:
The diagram shows the end positions after the reference run with the zero search on and off.



The servocontroller searches for the next zero after the reference cam (Rnok). When the reference cam is reached the speed is braked with the braking ramp (1).
In the setting PCAZ = OFF the drive stops on completion of the braking ramp in position (2), regardless of the zero point of the encoder (NP).
With PCAZ = ON the drive runs back to the encoder zero (3).

381-PCG - Position controller gain

Source: Position Controller Gain
Function: Gain of the position controller (P-component)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	16387	4000	–	R1W3	DRIVE	FLOAT32

Note:
On the MC6000 parameter PCGFA can be used to precision-set a percentage gain online.

382-PCAMX - Acceleration limit value of position controller (only MC6000)

Source: Position Controller Acceleration Maximum
Function: Acceleration limit value of the position controller (ramp)
Parameter only on MC6000.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.1	1e+06	1800	–	R2W3	APPLI	FLOAT32

Note:
Overshoot occurs if PCAMX is selected too high. When using PosMod1, use the appropriate machine parameters K17 to K24.

386-PCGFA - Adaptation factor for position controller gain (only MC6000)

Source: Position Controller Gain Factor

Function: Adaptation factor for the position controller gain (P-component)

Parameter only on MC6000.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.05	409.55	100.00	%	R2W3	APPLI	FIXPOINT16

Note:

For the safe functioning of the position control it is essential that the parameter SCJ corresponds approximately to the actual moment of inertia of the system. Otherwise the result of the position control may be unsatisfactory. The response may be too dynamic or too slow.

In these cases it may be necessary to adjust the preset gain (PCG). With parameter PCGFA a percentage gain can be precision-set online.

703-PCI1, PCI2 - Pointers for inputs of position controller (only MC6000)

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: Pointer for the inputs of the position controller

Parameter only on MC6000.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	38	7	–	R5W5	APPLI	USIGN8

118-PCRA - Acceleration for referencing

Source: Position Control Reference Acceleration

Function: Startup and braking acceleration of the axle for the reference run.

For **stepper motor interface** and **electronic gearing** modes.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
100	32000	100	rpm/s	R2W2	DRIVE	USIGN16

113-PCRMD - Max. number of revolutions in referencing

Source: Position Control Referencedrive Maximum Distance

Function: Indication of the maximum number of revolutions for a reference run without the reference cam having been activated. When this threshold value is exceeded output OSxx “Referencing error“ is set, if the output has been assigned the REERR or REFOK (= Reference run successful) function with the function selector FOSxx.

For **stepper motor interface** and **electronic gearing** modes.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
100	32000	32000	rev	R2W2	APPLI	USIGN16

112-PCRV - Referencing speed

Source: Position Control Reference Velocity

Function: Maximum positioning speed during referencing. The positioning speed must be in the range - SCSMX ... + SCSMX (parameter no. 384).

For **stepper motor interface** and **electronic gearing** modes.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-3000	3000	100	rpm	R2W2	APPLI	INT16

380-PCTS - Sampling time of position controller

Source: Position Controller Time Sampling

Function: Sampling time of the position controller (250 µs or 500 µs on MC7000 with 4 kHz switching frequency PMFS).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.00025	0.0005	0.00025	s	R4W15	DRIVE	FLOAT32

117-PCZS - Offset machine zero relative to reference point

Source: Position Control Zeropoint Offset

Function: Distance between reference point and machine zero.

The machine zero is shifted by this value (zero correction).

For **stepper motor interface** and **electronic gearing** modes.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32000	32000	0	Increments	R2W2	APPLI	INT32Q16

Note:
The parameter only takes effect when automatic zeroing is activated. (PCAZ = ON).

308-PDMX - Max. position deviation (limit for tracking error)

Source: Position Difference Maximum

Function: Input of the (absolute) maximum deviation between actual and reference position. If the deviation is greater than the specified value, the error E-FLW is delivered and the output with the function /EFLW is set.

For **stepper motor interface, electronic gearing** and **PosMod** modes.

Values:	Minimum	Maximum	Factory set.	Unit	MODE	SmartCard	Type
In the Parameter Editor:	0	32764	5	Revolu-tions	R3W3	APPLI	INT32Q16
In the Mode window:	0	2.147.483.647 (31 bits)	327.680	Incre-ments			

121-RCDE - Increment size of register control

Source: Register Control Delta Epsilon

Function: Distance in revolutions by which the synchronous position of the axle is shifted online (maximum: RCEM\).

For **stepper motor interface** and **electronic gearing** modes.

Values:	Minimum	Maximum	Factory set.	Unit	MODE	SmartCard	Type
In the Parameter Editor:	0	1	0	Revolu-tions	R2W2	APPLI	INT32Q16
In the Mode window:	0	65535	0	Incre-ments			

122-RCEM - Max. adjustment distance for register control

Source: Register Control Epsilon Maximum

Function: Max. amount of adjustment distance by which the synchronous position can be shifted.

For **stepper motor interface** and **electronic gearing** modes.

Values:	Minimum	Maximum	Factory set.	Unit	MODE	SmartCard	Type
In the Parameter Editor:	0	1	1	Revolu-tions	R2W2	APPLI	INT32Q16
In the Mode window:	0	65535	65535	Incre-ments			

124-RCO - Offset between position of ref.cam and activation position

Source: Register Control Offset

Function: Distance between the reference cam and the position at which the shift of the synchronous position is executed.
With RCO an offset can be specified between the position of the reference cam and the position at which the register control becomes active.
For **stepper motor interface** and **electronic gearing** modes.

Values:

	Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
In the Parameter Editor:	0	32764	0	Revolu-tions	R2W2	APPLI	INT32Q16
In the Mode window:	0	2.147.483.647 (31 bits)	0	Incre-ments			

123-RCR - Ramp for register control

Source: Register Control Ramp

Function: Ramp run in the register offset. **This parameter is not active!**

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0		R2W2	APPLI	USIGN16

388-VRDEN - Denominator of speed ratio for the electronic gearing

Source: Velocity Ratio Denominator

Function: Denominator for the transmission ratio.
For **stepper motor interface** and **electronic gearing** modes.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	65535	1	–	R4W4	APPLI	USIGN16

➔ 387-VRNOM - Numerator of speed ratio for the electronic gearing, page 72

387-VRNOM - Numerator of speed ratio for the electronic gearing

Source: Velocity Ratio Nominator

Function: Numerator of the transmission ratio.
For **stepper motor interface** and **electronic gearing** modes.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	65535	1	–	R4W4	APPLI	USIGN16

➔ 388-VRDEN - Denominator of speed ratio for the electronic gearing, page 72

_VFCON – (V/F mode)

34-VFVHZ - Voltage frequency control setting

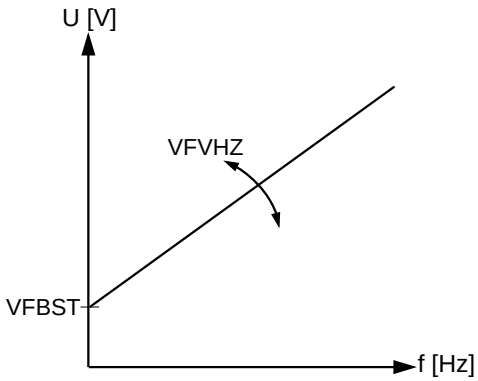
CAUTION - Do not change parameter!
Parameter only for development and service purposes

Function: The parameter determines the rise in the linear voltage/frequency characteristic in the unit Volts per Hz.

Values:

	Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
MC7000	0	20	7.6	V	R5W5	DRIVE	FLOAT32

Note:
For commissioning and test purposes the servocontroller also has a simple voltage/ frequency characteristic voltage frequency control. It is activated with CFCON = VFCON (_CONF).



➔ 35-VFBST – Boost setting of voltage frequency control

35-VFBST - Voltage frequency control boost setting

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Function: The parameter determines the voltage boost at a frequency of 0Hz.

Values:

	Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
MC7000	0	50	2	V	R5W5	DRIVE	FLOAT32

➔ 34-VFVHZ – Voltage frequency control setting

_SIO – Serial interface RS485

82-SADDR - LustBus device address

Source: Serial Address
Function: Serial address of the device

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	30	1	–	R4W4	ALL	USIGN8

Special Addresses:

- The address 0 addresses every servocontroller in non-network operation.
- The address 31 addresses all networked devices ("Broadcast"); without checkback.

81-SBAUD - LustBus transfer rate

Source: Serial Baud Rate
Function: Baud rate of the serial interface (data transfer rate)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
9600	57600	19200	1/s	R4W4	SYSTM	USIGN8

No.	Function
0	9600 Bit/s
1	4800 Bit/s
2	2400 Bit/s
3	1200 Bit/s
4	19200 Bit/s
5	28800 Bit/s
6	57600 Bit/s

Note:
A changed baud rate is not activated immediately. Only when the device is switched back on is the serial interface set to the changed transfer rate.
A change in baud rate in operation can be made by means of parameter PROG = 111 in subject area _KPAD.

416-SCTL1 - Control word of serial interface

Source: Serial Control Word 1
Function: Control word 1 of the serial interface

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0	–	R4W4	ALL	USIGN16

Bit position	Value of position	Designation	Meaning of bit
0	0001 H	START	Start control (1 = Start, 0 = Stop)
1	0002 H	INV	Invert reference
2	0004 H	STOP	Quick-stop / stop ramp
3	0008 H		reserved
4	0010 H		reserved
5	0020 H		reserved
6	0040 H		reserved
7	0080 H		Reset error (with rising edge)
8	0100 H		Set/reset output OS00 1)
9	0200 H		Set/reset output OS01 1)
10...15			reserved

1) Assign output with function selector of serial interface: FOS00 or FOS01 = SIO

83-SDMMY - LustBus dummy parameter

Source: Serial Dummy
Function: Dummy parameter of the serial interface

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	255	0	–	R4W4	ALL	USIGN8

Explanatory note: This is a dummy parameter which can be used to maintain the SIO access times when the watchdog is active. Write access to this parameter has no effect in the device. The value of the parameters is not lost, however; it is stored in the RAM area of the MC7000.

85-SERR - LustBus error status word

Source: Serial Error State
Function: Error status of the serial interface

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
00H	FFH	00H	–	R4W5	ALL	USIGN8

Bit position	Hex value	Designation	Meaning
0	01 H	Power on	Bit is set after every power-up
1	02 H	Watchdog	Watchdog has detected timeout
2	04 H	EEPROM busy	The EEPROM of the servocontroller is currently busy with an active write operation
3	08 H	Checksum error	Error in data transfer, checksum is incorrect
5	20 H	No parameter	There is no parameter with the transmitted number in the device
6	40 H	No change	Change of parameters not permitted
7	80 H	Invalid value	The transmitted parameter value is impermissible

84-SWDGT - LustBus watchdog time setting

Source: Serial Watchdog Time

Function: Watchdog sampling time of the serial interface

Time in which the Busmaster must have sent at least 1 telegram to the servocontroller. If the servocontroller does not receive a telegram, error E-WDG (Watchdog) is signaled with error location 11.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.00	20.00	0.00	s	R4W4	SYSTM	FIXPOINT16

Note:
With the setting SWDGT = 0.00 the watchdog is deactivated.

80-SLOAD - LustBus handshake parameter for record transfer

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: For handshake see LustBus data transfer protocol.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-2	999	0		R6W6	ALL	INT16

110-TRACK - Handshake parameter for download of transient memory

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: TransientAcknowledge

Function: Handshake parameter for download of the transient memory

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	255	0	–	R5W5	ALL	USIGN8

107-UNIT - Available parameter units

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: Calls off the units of the parameters (by way of value substitution texts) over the bus system.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
	kgmm		–	R5W5	ALL	USIGN8

108-STEXT - Handshake parameter for transfer of value substitution texts

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: STEXT gives the setting no. of a parameter. The corresponding value substitution text is returned. (The parameter number is defined in the protocol.)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	999	0	–	R5W5	ALL	USIGN16

_KPAD – KeyPad KP100

3-BARG - Parameter for bar graph display of KP100

Source: Bargraph (Displayed Parameter)

Function: Continuous actual value of bar graph display of KeyPad (defines which parameter is on permanent display on the bar graph display)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	999	77	–	R4W4	SYSTM	USIGN16

No.	Setting	Function
9	TAX	Current controller workload
12	MIDTX	Mean controller workload
10	MAXTX	Maximum controller workload
427	TEMP	Device temperature
77	SPEED	Speed
76	TORQUE	Torque
75	CURNT	Effective output current
347	DCV	DC-link voltage
495	IOSTA	Status of inputs and outputs 1)

1) For description see parameter IOSTA in subject area _VAL.

11-CASEL - Functional areas of SMARTCARD

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: Divides into SMARTCARD AREA. Not a user parameter, used only for SMARTCARD OPERATIONS.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
ALL	POMOD	ALL	–	R6W&	ALL	USIGN8

5-CTLFA - Multiplier for incremental value in CTRL menu of KP100

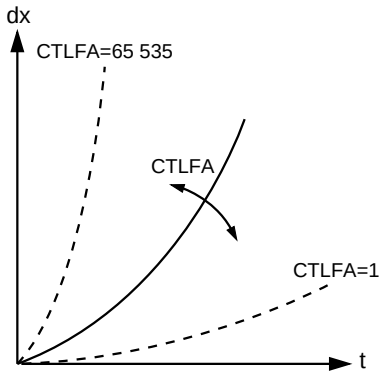
Source: CTRL-Menu Factor

Function: Factor to scale the MOP function\ of the CTRL menu on the KeyPad.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	65535	10000	–	R4W4	SYSTM	USIGN16

Explanatory note: The value of this parameter determines the sensitivity of the MOP function when key ▲ or ▼ is pressed. The graphic outlines the function of the parameter.



On the y-axis the duration of the keypress is plotted. If a cursor key is held down, the MOP reference value changes more quickly.

2-DISP - Parameter for continuous actual value display of KP100

Source: Displayed Parameter
Function: Continuous actual value of the display (determines the parameter shown on the KeyPad display permanently after startup or which appears first on entry into the VAL menu).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	999	447	–	R1W2	SYSTM	USIGN16

Note:
The value can be changed in the VAL menu by pressing the Start/Enter key for the desired parameter for 3 seconds.

1-MODE - User level of KP100

Source: Mode
Function: User level

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	6	1	–	R1W1	ALL	USIGN8

The password parameters (PSWx) prevent unauthorized access to safety-related parameters.
The user level should always be selected dependent on the knowledge of the user. A higher user level permits more detailed access to the parameters. However, the larger number of parameters then makes operation somewhat more complex.

Setting	Use for	Comments
1	Users without access permission	No parameter editable, key parameters displayable
2	User with basic knowledge	Key parameters editable, many displayable
3	Users with advanced knowledge and for control via SIO, Interbus-S	All parameters necessary for standard applications editable, many displayable
4	Users with control skills and for control via SIO	All control parameters editable and displayable

The user levels can be password-protected (parameter PSWx) against unauthorized access.

15-PLRDY - Activate control initialization

Source: Parameter List Ready

Function: Initiate manual update of the parameter list (reset)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1	0	–	R4W4	ALL	USIGN8

Explanatory note: With this parameter the control can be initialized. The parameter list is checked for validity and the dependent parameters are calculated.

The manual update of the parameter list is started by setting parameter **PLRDY = 1**. The parameter is subsequently reset automatically = 0. When the start command is canceled (controller enable) the control reset is started immediately. In the subsequent controller enable the new parameter values are then active with no delay.

Reset

Changes to parameter values usually take effect immediately, i.e. they become active while the current control is running. However, some parameters first require a **reset**, because changing them has far-reaching consequences.

A reset can be initiated by:

		Specially suitable for
1.	**quitting the PARA menu after parameter setting**	Parameter setting on KEYPAD
2.	**resetting and re-entering the start command**	Universal (control via terminals, serial interface or bus system)
3.	setting parameter PLRDY (_KPAD)	Universal, but complicated when parameter setting on KEYPAD

In a reset the parameter list is checked for validity and the dependent parameters are calculated. This update of the parameter list takes a short time.

To avoid the delay in starting the drive, the reset can be triggered manually beforehand (above option 1 or 3).

6-PNUM - Activate/deactivate parameter number display of KP100

Source: Parameter Number
Function: Activate/deactivate display of parameter number

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	ON	OFF	–	R4W4	SYSTM	USIGN8

Note:
When the parameter number display is deactivated the KeyPad display indicates whether a parameter can only be displayed, or also edited (-S- or -E-).

4-PROG - Special functions

Source: Program Functions
Function: Selection of special program functions

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	2	–	R4W4	SYSTM	USIGN16

Setting	Function
1	Reset all parameters to factory defaults
2	Normal setting, no function.
111	Reset serial interface with current value of parameter SBAUD

Note:
Other values are intended for special functions. Caution!

100-PSW2 - Password for user level 2 of KP100

Source:

Function: Password Mode 2
Password for user level 2 can be activated with these parameters.
(scan --PWx-- on change of user level MODE)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0	–	R2W2	SYSTM	USIGN16

101-PSW3 - Password for user level 3 of KP100

Source:

Function: Password Mode 3
Password for user level 3 can be activated with these parameters.
(scan --PWx-- on change of user level MODE)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0	–	R3W3	SYSTM	USIGN16

102-PSW4 - Password for user level 4 of KP100

Source:

Function: Password Mode 4
Password for user level 4 can be activated with these parameters.
(scan --PWx-- on change of user level MODE)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	546		R4W4	SYSTM	USIGN16

103-PSW5 - Password for user level 5 of KP100

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: Password Mode 5
Password for user levels 5
(scan --PWx-- on change of user level MODE)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	657	–	R5W5	APP	USIGN16

104-PSW6 - Password for user level 6 of KP100

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: Password Mode 6
Password for user level 6
(scan --PWx-- on change of user level MODE)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	768	–	R6W6	SYSTM	USIGN16

105-PSWCT - Password for Control menu of KP100.

Source: Password CTRL-Menu

Function: Password for CTRL menu (scan PASSW)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0	–	R3W3	SYSTM	USIGN16

_SCTY – Device response in case of error

Parameters to program the error response

With these parameters (subject area _SCTY) the defined response of the servocontrollers to an error can be programmed.

Error response table for MC6000

In the error response table possible error responses are defined. With the parameters described in the following they can be assigned to the individual errors.

Some parameters require a minimum error response, and so the selectable responses from the table for those errors are restricted.

Name	No.	Meaning (error on ...)	Response	Sig.
R-CPU	41	... Error in processor unit	5	5
R-EEP	48	... Error in EEPROM	5	5
R-ENC	55	... Encoder error (incorrect type or missing)	5	5
R-EXT	54	... Error message from external controller (via control input)	0 ... 5	0
R-FLT	52	... Error in floating point calculation	5	5
R-FLW	59	... Tracking error	0 ... 5	3
R-OC	43	... Current overload error	1, 3, 5	1
R-OFF	42	... Undervoltage or power cut	1, 3, 5	1
R-OLI	45	... Servocontroller Ixt shut-off	1 ... 5	1
R-OLM	49	... Motor I t shut-off (motor protection device) (currently without function)	1 ... 5	1
R-OP1	56	... Error on option module 1	0 ... 5	0
R-OP2	57	... Error on option module 2 (only MC6000)	0 ... 5	0
R-OTI	47	... Overheating in servocontroller	1 ... 5	1
R-OTM	46	... Motor overheating	1 ... 5	1
R-OV	44	... Voltage overload	1, 3, 5	3
R-PAR	51	... Invalid data in parameter list	5	5
R-PLS	50	... Error in plausibility check	5	5
R-PWR	53	... Error - power stage not detected	5	5
R-TIM	58	... Runtime error	5	5
R-WDG	40	... Error - watchdog triggered	0 ... 5	0

Error response table for MC7000

In the error response table possible error responses are defined. With the parameters described in the following they can be assigned to the individual errors.

Some parameters require a minimum error response, and so the selectable responses from the table for those errors are restricted.

Name	No.	Meaning (error on ...)	Response	Sig.
R-BRK	99	... Error in holding brake (cable break, short-circuit or overheating)	1 ... 5	1
R-CAN	39	... CAN module initialization error	0 ... 5	0
R-CPU	41	... Error in processor unit	5	5
R-EEP	48	... Error in EEPROM	5	5

Name	No.	Meaning (error on ...) (continued)	Response	Sig.
R-ENC	55	... Encoder error (incorrect type or missing)	5	5
R-END	140	... Limit switch activated (23=left, 24=right)		5
R-EEX	141	... Limit switches swapped		5
R-EXT	54	... Error message from external controller (via control input)	0 ... 5	0
R-FLH	114	... Error in Flash memory	5	5
R-FLT	52	... Error in floating point calculation	5	5
R-FLW	59	... Tracking error	0 ... 5	3
R-IO1	88	... Initialization error module ext. inputs	5	5
R-IO2	89	... Initialization error module ext. outputs	5	5
R-OC	43	... Current overload error	1, 3, 5	1
R-OFF	42	... Undervoltage or power cut	1, 3, 5	1
R-OLI	45	... Servocontroller Ixt shut-off	1 ... 5	1
R-OLM	49	... Motor I^2t shut-off (motor protection device) (currently without function)	1 ... 5	1
R-OP1	56	... Error on option module 1	0 ... 5	0
R-OP2	57	... Error on option module 2	0 ... 5	0
R-OTI	47	... Overheating in servocontroller	1 ... 5	1
R-OTM	46	... Motor overheating	1 ... 5	1
R-OV	44	... Voltage overload	1, 3, 5	3
R-PAR	51	... Invalid data in parameter list	5	5
R-PLS	50	... Error in plausibility check	5	5
R-POS	109	... Error message, positioning unit	0 ...5	0
R-PWR	53	... Error - power stage not detected	5	5
R-TIM	58	... Runtime error	5	5
R-VEC	37	... Error in VeCon initialization	5	5
R-WDG	40	... Error - watchdog triggered	0 ... 5	0

Possible error responses

Errors with a higher response number have a higher priority. Errors with higher priority are also triggered when an error with lower priority has already occurred. Errors with equal or lower priority are ignored.

Response no.	Designation	Function
0	No Reaction	Only signal error (warning)
1	Servo Halt	Signal error and disable power stage
2	Servo Stop	Signal error, quick-stop and wait for start command to be canceled
3	Servo Halt and Lock	Signal error, disable power stage and secure against automatic restart
4	Servo Stop and Lock	Signal error, quick-stop, wait for start command to be canceled and secure against automatic restart
5	Wait on Error-Reset and Reset	Signal error, disable power stage and wait for error reset; then software reset

Acknowledging errors

The following possibilities for acknowledgment are provided:

- Rising edge at input ENPO of control terminal strip
- Press **stop/return key** on **KeyPad** for approx. 3 seconds
- Set RESET bit in SIO control word SCTL1 (control via serial interface)
  (only with control via **serial interface;** CLSEL = SIO)
- Set bit 'Reset fault' in CAN bus control word (control via CAN bus)
  (only with control via **CAN bus;** CLSEL = OPTN1)

Attention!
The motor is isolated from the servocontroller during this process. The motor runs out, and can rotate freely!

74-ERES - Reset MC errors

Source: Error Reset
Function: Permits acknowledgment of an error message regardless of the current control location.
If the parameter is set to 1, a current error message is acknowledged.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1	0	–	R5W5	–	USIGN8

Note:
When the error message has been acknowledged the parameter value is automatically reset to 0. If the cause of the error was not rectified before the error was acknowledged, the error is immediately signaled again.

18-LOCKS - Disable drive

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:
Function: Secure drive against restarting with LOCKS = 1; = 0 is the normal state

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	ON	OFF	–	R5W5	ALL	USIGN8

16-MKERR - Error simulation parameter to test error responses

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: The parameter can trigger a specific error for test purposes. The parameter contains the error number and error location in hexadecimal form.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R6W6	ALL	USIGN16

Example: 0301 h = Error no. 1 with location 1

_SYS – Diagnosis and digital scope

Digital scope

The software of the MASTERCONTROL includes a Trace tool (digital scope) with which the contents of specific digital variables can be documented over a limited period of time.
The digital scope is conveniently operated with the **DRIVEMANAGER**.

The scope has 4 channels (0 .. 3) which share a fixed data area for recording of their values; that is to say, the recording capacity per channel falls with the number of active channels.
Since the data recording function operates at a max. frequency of 8 kHz (MC6000) or 16kHz (MC7000), the control software timeout may be exceeded by activating several channels and with a correspondingly short sampling time. In this case the display of the KeyPad shows E-TIM to signal processor overload.

Starting and monitoring the digital scope

First set all channels, the Scope function and the trigger mode by way of parameters DSMx, DSVx,DSTM, DSTCH, DSVTC, DSTLV, DSPRT, DSTIM according to the parameter description.

- With parameter DSRUN = 1 start the scope.
- Wait until bit 1 of DSRUN equal to 1, i.e. until the scope has obtained a trigger signal.
  Now the recording runs until the servo signals the end of data recording with DSRUN = 0.
- The scope can be stopped manually by zeroing DSRUN.
- In automatic mode the scope stops automatically when the transient memory has been filled.

Downloading the transient memory see development documentation “Download and interpretation of transient data” TSF_7000.DOC.

20-DSM0, 22-DSM1, 24-DSM2, 26-DSM3 - Operation mode channel 0...3 of digital scope

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Mode

Function: Operation mode of relevant channel
The parameters DSM0 to DSM3 set the operation mode of channels 0 - 3. They are bit-coded. The following table shows the significance of the individual bit positions.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
00H	FFH		–	R5W5	ALL	USIGN8

Bit position	Hex value	Meaning
0.. 4	0..1Fh	Left-shift value for the recorded variable. For 32-bit variables the value should be less than 32, and for 16-bit variables less than 16. This functionality only makes sense for DA output. For the digital scope this value is always 0.
5	20h	Channel on/off
6	40h	0 -> Value from 16-bit table, 1 -> Value from 32-bit table
7	80h	Not used

➔ Digital scope, page 88

62-DSMSZ - Size of transient memory in bytes

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Memory Size
Function: Size of transient memory
Maximum value on MC6000: Factory setting, on MC7000 dependent on memory capacity and operation mode (not available for PosMod, for example).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	6144	6144	–	R5W5	ALL	USIGN16

➔ Digital scope, page 88

67-DSPRT - Pretrigger of digital oscilloscope

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Pretrigger
Function: Pretrigger of digital oscilloscope
The parameter is scaled to 0.05. The setting range is real 0-100 % in stepwidths of 0.05%.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.00	100.00	10.00	%	R5W5	ALL	FIXPOINT16

➔ Digital scope, page 88

68-DSRUN - Start enable of digital oscilloscope

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Run
Function: Start enable of digital oscilloscope
In the write operation to this parameter only bit 0 is influenced. In read operations bit 0 and bit 1 are read.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	7	0	–	R5W5	ALL	USIGN8

Value	Meaning
0	Digital scope is off, data recording finished
2	Digital scope has triggered, data recording is active
5	Digital scope is active and waiting for trigger signal

➔ Digital scope, page 88

66-DSTCH - Trigger channel of digital oscilloscope

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Trigger-Channel
Function: Trigger channel of digital oscilloscope

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	5	0	–	R5W5	ALL	USIGN8

Value	Meaning
0	Trigger channel 0
1	Trigger channel 1
2	Trigger channel 2
3	Trigger channel 3

➔ Digital scope, page 88

60-DSTIM - Time division of digital oscilloscope

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Time

Function: Time division of the digital oscilloscope in multiples of 62.4 µs (MC7000) or 124.8 µs (MC6000) respectively

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	1	–	R5W5	ALL	USIGN16

65535 = 2097.1 s

➔ Digital scope, page 88

29-DSTF - Filter time constant of digital scope (only MC6000)

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Time Filter

Function: Filter time constant of the digital scope (only MC6000)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	15	0	–	R5W5	ALL	USIGN8

➔ Digital scope, page 88

64-DSTLV - Trigger threshold of digital oscilloscope

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Trigger-Level

Function: Trigger threshold of digital oscilloscope
The parameter receives the scaled value of the trigger level. For 32-bit variables this value corresponds to the upper 16 bits; the lower bits are always set to 0 in the MASTERCONTROL.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32768	32767	30	–	R5W5	ALL	INT16

➔ Digital scope, page 88

65-DSTM - Trigger mode, digital oscilloscope

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Trigger Mode
Function: Trigger mode of digital oscilloscope

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-1	9	2	–	R5W5	ALL	INT16

The parameter sets the trigger mode. The following table shows the available trigger modes and the necessary settings in each case:

Value	Trigger mode
-1	Scope off
0	DA output (only in conjunction with "DA board" option)
1	Automatic
2	Rising edge
3	Falling edge
4	Both edges
5	Trigger on bit (rising edge)
6	Trigger on bit (falling edge)
7	Trigger on bit (both edges)
8	Trigger on warning (error no. / error location)
9	Trigger on error (error no. / error location)

On the MC7000 in conjunction with the DRIVEMANAGER only settings 1 to 4 possible.

➔ Digital scope, page 88

21-DSV0, 23-DSV1, 25-DSV2, 27-DSV3 - Index of channel 0...3 for values table of digital scope

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Value
Function: Index for the values table
The number of this parameter is the index for the table of recordable values. There are two such tables in total, one for 16-bit values and one for 32-bit values. Which of those two tables is accessed depends on bit 6 in parameter DSMx (x = channel number).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	127		–	R5W5	ALL	USIGN8

➔ Digital scope, page 88

36-DSVTC - Index of trigger channel for values table of Trace tool

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Digital Scope Value Trigger Channel
Function: Variable for the trigger channel

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R5W5	ALL	USIGN16

The exact use of this parameter is dependent on the values of parameters DSTM and DSTCH:

DSTM	DSTCH	=> DSVTC
1...4	0...3	Not used
1...4	4	Indicates the index of the 16-bit trigger variable
1...4	5	Indicates the index of the 32-bit trigger variable
5...7	x	Contains the address of a bit from the"bitFeld[ ]" field such that the High byte designates the field index and the Low byte the index of the bit in this word. The definition is "flagword bitFeld[SIZE_OF_BITFELD]";
		The precise significance of the bits must be obtained from a table which still remains to be created.
8...9	x	In the High byte contains the error number and in the Low byte the error location of the warning or error in response to which the trigger is to occur.

➔ Digital scope, page 88

19-EEPCC - Number of repairs to EEPROM

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:
Function: The number of repairs should actually be = 0. If the number is >100, error E-EEP is triggered with error location 12.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0	–	R5W6	ALL	USIGN16

31-PTR_H, 30-PTR_L - Data pointer to any memory locations

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source: Pointer High Word, Pointer Low Word

Function: High word, Low word of the data pointer which addresses a memory location. With P-VAL this memory location can be read and written.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH		–	R6W6	ALL	USIGN16

32-P-VAL - Editable memory location of data pointer

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Source:

Function: The parameter reads from and writes to the memory location addressed with PTR_H, PTR_L.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000	FFFFH	0000H	–	R6W6	ALL	USIGN16

111-VPROG - Capacity utilization of VECON program memory

Source:

Function: Only for display of the percentage capacity utilization of the VeCon program memory. At >100% E-VEC is signaled.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	%	R6W6	ALL	USIGN16

_REF – Reference structure

842-ACCR - Acceleration ramp for speed control

Source: Acceleration Ramp
Function: Acceleration ramp (only with speed control)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0	rpm/s	R1W2	REFRC	USIGN16

Note:
The acceleration ramp can be deactivated by setting ACCR very high (> 30.000 rpm per s). Then the drive accelerates to the reference speed at maximum torque.
The complete ramp generator can be shut off by means of ACCR = 0 or DECR = 0 (acceleration and braking ramp inactive!).

➔ Structure of reference input, page 24

852-DECR - Deceleration ramp for speed control

Source: Deceleration Ramp
Function: Braking ramp (only with speed control)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0	rpm/s	R1W2	REFRC	USIGN16

Note:
The speed changes with parameter DECR if the reference is set lower. The braking ramp can be shut off by setting DECR very high (> 30,000 rpm per s). Then the drive brakes at maximum torque.
The complete ramp generator can be shut off by means of ACCR = 0 or DECR = 0 (acceleration and braking ramp inactive!).
When the START signal is canceled the drive runs uncontrolled! If this is not wanted, use quick-stop with stop ramp STOPR. If a holding brake is fitted, check the setting of the BRAKE parameter.

➔ Structure of reference input, page 24

335-EC2LN - Lines per revolution of optical encoder, encoder input 2

Source: Encoder 2 Line Count

Function: Lines per revolution of the encoder at encoder interface 2 (input for electronic gearing). Values from 512 to 32000 can be set, in increments of 2.

Parameter only for MC7000.

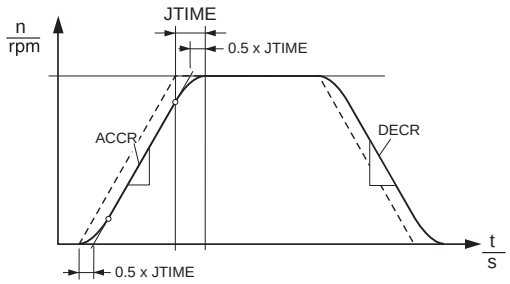
Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
512	32000	2048	–	R4W4	REFRC	USIGN16

856-JTIME - Smoothing time of sinusoidal ramp in ms

Source: Jolt Time

Function: The parameter determines how steep the sinusoidal acceleration ramps are shaped to limit the bucking. The smoothing time indicates directly the time by which the attainment of the final speed is delayed.



Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	2000	0	ms	R1W2	REFRC	USIGN16

Note:

Reaching of the final speed is delayed by precisely the smoothing time.

In positioning operations reaching of the destination position is delayed by precisely the smoothing time.

425-RA0, 426-RA1 - Analog reference channel 0 or 1

Source: Reference from Analog Input 0, 1

Function: Reference values from analog inputs

These parameters display the digitized value of analog input 0 (ISA0) or 1 (ISA1).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	–	R4W15	ALL	INT32Q16

➔ Structure of reference input, page 24

497-RCAN - Reference from CAN bus

Source: Reference from CAN-Bus

Function: Reference values via CAN bus

This parameter only displays the reference value from the CAN bus.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	–	R4W15	ALL	INT32Q16

➔ Structure of reference input, page 24

390-RDDEN - Transmission ratio of rotation speed (denominator)

Source: Reference Drive Denominator

Function: Denominator of the transmission ratio for speed synchronism (operation mode speed control via pulse input).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	65535	1	–	R1W2	APP	USIGN16

389-RDNOM - Transmission ratio of rotation speed (numerator)

Source: Reference Drive Nominator

Function: Numerator of transmission ratio for speed synchronism (operation mode speed control via pulse input).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	65535	1	–	R1W2	APP	USIGN16

➔ 126-RSDIR - Level of directional signal for stepper motor mode, page 102

430-RDIG - Digital reference input

Source: Reference from Digital Input

Function: Digital reference input

This parameter displays the reference value from the digital reference input
(e.g. speed reference in reference input via pulse input = speed synchronism).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	–	R4W15	ALL	INT32Q16

➔ Structure of reference input, page 24

434-REF1 ... 438-REF6 - Interim values of reference input

Source: Reference Value 1 - 6

Function: Interim values of reference input

These parameters display the reference value (interim stages) on the reference channels. They are useful for troubleshooting in reference input.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	–	R4W15	ALL	INT32Q16

➔ Structure of reference input, page 24

448-RF3FA - Factor for reference channel 3

Source: Reference Channel 3 Factor

Function: Factor for percentage scaling of the reference value on channel 3

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	100	100	%	R4W4	REFRC	USIGN16

➔ Structure of reference input, page 24

74x-RFIX1 ... 79x-RFIX6 - Fixed references 1 to 6

Source: Reference Fixed Value 1 - 6

Function: Fixed references 1 to 6; the programmed values can be selected and switched with a reference selector RSSLx.

Examples of parameter numbers:
740-RFIX1 – Fixed frequency 1
741-RFIX1 – Fixed torque 1
742-RFIX1 – Fixed speed 1
743-RFIX1 – Fixed position 1

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	Hz, Nm, rpm	R1W2	REFRC	INT32Q16

➔ Structure of reference input, page 24

87x-RINC - Reference increments in MOP function

Source: Reference Increment

Function: Stepwidth for MOP function\ via digital inputs. This parameter displays the reference value of the motor operated potentiometer.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	1(0.5) Nm	Hz, Nm, rpm	R4W4	REFRC	INT32Q16

Note:
Where the MOP function is used by way of the **CTRL menu** of the KeyPad, the parameter CTLFA determines the stepwidth.

➔ Structure of reference input, page 24

MOP function

The motor operated potentiometer (MOP) function means that the reference is increased or decreased as appropriate by a specific amount by way of two digital inputs or using **keys** ▼ and ▲ on the KeyPad.

Parameter setting for the MOP function

1. Parameter RSSLx= RPOT (_REF)	Set MOP as reference source
2. Parameter MPCNF (_CONF):	Select operation mode (MOP configuration)
3. Parameter RINC (_REF):	Determines increase/decrease amount (dig. inputs)
Parameter CTLFA (_KPAD):	Determines increase/decrease amount (KeyPad)
4. Input with MP-UP function:	Increases reference
5. Input with MP-DN function:	Decreases reference

Operation modes of the MOP function

Four operation modes can be selected by way of parameter MPCNF (_CONF):

MPCNF	Operation mode	Input MP-UP	Input MP-DN	Function
0	Status controlled Without reset	0 1 0 1	0 0 1 1	– Increase MP reference Decrease MP reference –
1	Status controlled With reset	0 1 0 1	0 0 1 1	– Increase MP reference Decrease MP reference Set MP reference = 0
2	Edge-controlled Without reset	0 0 > 1 0 1	0 0 0 > 1 1	– Increase MP reference Decrease MP reference –
3	Edge-controlled With reset	0 0 > 1 0 1	0 0 0 > 1 1	– Increase MP reference Decrease MP reference Set MP reference = 0

80x-RLIM1 - Lower reference limit

Source: Reference Limitation 1
Function: RLIM1 = Lower limit of reference value (also selectable directly as reference source)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	-3000 -3000 -12000 -3000	Hz Nm rpm –	R4W4	REFRC	INT32Q16

Note:
If RLIM1 > RLIM2 is set, error E-PAR is signaled (parameter list invalid).

➔ Structure of reference input, page 24

81x-RLIM2 - Upper reference limit

Source: Reference Limitation 2
Function: RLIM2 = Upper limit of reference value (also selectable directly as reference source)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	3000 3000 12000 3000	Hz Nm rpm –	R4W4	REFRC	INT32Q16

Note:
If RLIM1 > RLIM2 is set, error E-PAR is signaled (parameter list invalid).

➔ Structure of reference input, page 24

82x-RNA0, 83xRNA1 - Scaling for analog reference input 0 or 1

Source: Reference Norm Analog Input 0, 1
Function: Scaling for analog reference input 0 or 1

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	50 10 3000 100	Hz Nm rpm –	R1W2	REFRC	INT32Q16

Example, speed control: RNA0 = 3000 means that a reference value of +10 V corresponds to a reference speed of 3000 rpm.

➔ Structure of reference input, page 24

431-ROPT1, 432-ROPT2 - Reference value of option slot 1 or 2

Source: Reference from Option 1, 2
Function: Module in slot 1, 2
These parameters display the reference value of modules in slot 1 or 2 (option slot 2 is only on the MC6000).
The modules can be selected as reference sources.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	–	R4W15	ALL	INT32Q16

➔ Structure of reference input, page 24

429-RPOT - Reference value of MOP

Source: Reference Potentiometer
Function: MOP function via digital inputs
This parameter only displays the MOP reference value.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	–	R4W15	ALL	INT32Q16

➔ Structure of reference input, page 24

126-RSDIR - Level of directional signal for stepper motor mode

Source: Reference Step Direction

Function: Input of the level of the directional signal for the positive direction of rotation in evaluation of stepper motor signals (pulse direction signals) with speed synchronism.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1	0	–	R4W4	APP	USIGN8

Settings:

No.	Setting	Function
0	NORM	Low level corresponds to positive direction, i.e. clockwise viewed onto the motor shaft (A-side bearing plate)
1	INVRT	High level corresponds to negative direction

428-RSIO - Reference value from LustBus

Source: Reference from Serial Input/Output

Function: Serial interface, selectable as reference source by way of reference selector
This parameter displays the reference value via the serial interface RS485.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	–	R4W4	ALL	INT32Q16

➔ Structure of reference input, page 24

417-RSSL1 ... 420-RSSL4 - Reference selector 1 ... 4

Source: Reference Source Selector 1 - 4

Function: Reference selectors for channels 1 to 4, for selection of a reference source

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
RCON	RLIM2	RCON, RA0	–	R3W3	REFRC	USIGN8

➔ Structure of reference input, page 24

RSSLx on MC6000

No.	Setting	Reference source is:
0	RCON	None (reference channel deactivated [constant =0])
1	RA0	Analog input ISA0
2	RA1	Analog input ISA1
3	RSIO	Serial interface
4	RPOT	Motor operated potentiometer at digital inputs
5	RDIG	Digital reference input (PWM)
6	ROPT1	Module in slot 1 (X6)
7	ROPT2	Module in slot 2 (X7)
8	RFIX1	Fixed reference 1
9	RFIX2	Fixed reference 2
10	RFIX3	Fixed reference 3
11	RFIX4	Fixed reference 4
12	RFIX5	Fixed reference 5
13	RFIX6	Fixed reference 6
14	RLIM1	Lower limit of reference value
15	RLIM2	Upper limit of reference value

RSSLx on MC7000

No.	Setting	Reference source is:
0	RCON	None (reference channel deactivated [constant =0])
1	RA0	Analog input ISA0
2	RA1	Analog input ISA1
3	RSIO	Serial interface
4	RPOT	Motor operated potentiometer at digital inputs
5	RDIG	Digital reference input (PWM)
6	ROPT1	Module in slot 1
7	RCAN	CAN bus
8	RFIX1	Fixed reference 1
9	RFIX2	Fixed reference 2
10	RFIX3	Fixed reference 3
11	RFIX4	Fixed reference 4
12	RFIX5	Fixed reference 5
13	RFIX6	Fixed reference 6
14	RLIM1	Lower limit of reference value
15	RLIM2	Upper limit of reference value

125-RSTEP - Evaluation of stepper motor signals (2nd encoder input)

Source: Reference Step Motor Interface

Function: Activate stepper motor interface, i.e. instead of incremental encoder signals (A-B signals) pulse direction signals are evaluated.
Parameter is not editable; set automatically in stepper motor mode.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1	0	–	R4W6	APPLI	USIGN8

Settings:

No.	Setting	Function
0	OFF	Stepper motor interface is shut off (A-B signals)
1	ON	Stepper motor interface is on (pulse direction signals)

➔ 126-RSDIR - Level of directional signal for stepper motor mode, page 102
➔ 390-RDDEN - Transmission ratio of rotation speed (denominator), page 97
➔ 389-RDNOM - Transmission ratio of rotation speed (numerator), page 97

421-SADD1 ... 424-SADD4 - Offset for reference selector 1 ...4

Source: Selector Addition Value for RSSL1 - 4

Function: Offset for reference selectors 1 to 4 (RSSL1 - RSSL4), to switch reference sources during operation.

The offset is set via digital inputs. The parameters SADDx only display the current offset value (switchover distance).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	15	0	–	R4W15	ALL	USIGN8

➔ Structure of reference input, page 24

496-STOPR - Stop ramp

Source: Stop Ramp

Function: Stop ramp (for quick-stop\ )

The parameter determines the ramp, in the unit rpm per s, with which the motor is braked to speed = 0. In the setting STOPR = 0 (factory setting) the motor is braked as quickly as possible at the preset torque limit TCMMX\ (quick-stop without ramp).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0	rpm/s	R1W2	REFRC	USIGN16

Quick-stop (/STOP)

The quick-stop function can be used as a safety function. The quick-stop can be triggered from various control locations:

By way of the stop ramp parameter STOPR (_CONF) the ramp with which the motor is braked down to speed = 0 can be specified, in the unit rpm per s. In the setting STOPR = 0 (factory setting) the motor is braked as quickly as possible at the preset torque limit (TCMMX in subject area _TCON) (quick-stop without ramp).

The drive control remains active, and the motor is held in this position under speed control. The quick-stop can be activated in any control mode.

Note:
If the torque limitation (SCALE function) is active, it also takes effect in case of a quick-stop!

Resetting the quick-stop state:
The quick-stop state is retained until the /STOP signal **and** the start signal have been reset.

Attention!
The ENPO signal must not be canceled during the quick-stop state, as otherwise the motor would be cut off from the control. The servocontroller would then no longer have any control over the motor, and the motor would be able to rotate freely (or, motor runs down uncontrolled).
To restart the axle, the /STOP input must be High and an edge change with START must occur to deliver an acknowledgment.

_IO1 – Inputs

455-FIE00 ... 462-FIE07 - Function selector, external inputs IE00 ... IE07

Source: Function Selector Input External 0 - 7
Function: Function selectors for external inputs 0 to 7 (I/O module)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	EGEAR	OFF	–	R4W4	REFRC	USIGN8

Examples:

- AD3-0 – To switch between various references, for example, various preprogrammed reference values can be selected (AD3-0 switches to the next Reference source of the 3rd reference channel)
- AD3-1 – To switch between various references, for example, various preprogrammed reference values can be selected (AD3-1 switches by two Reference source of the 3rd reference channel)

➔ Functions for inputs on MC6000, page 21
➔ Functions for inputs on MC7000, page 22
➔ Structure of reference input, page 24
➔ Notes on function selectors for inputs, page 23

479-SIEXT - Status word of external inputs IE00...IE07

Source: Status Word Input Extern
Function: Status word of the external inputs (I/O module) to scan the inputs via serial interface

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R4W15	ALL	USIGN16

Bit	Hex value	Function
0	0001 H	Scan input IE00
1	0002 H	Scan input IE01
2	0004 H	Scan input IE02
3	0008 H	Scan input IE03
4	0010 H	Scan input IE04
5	0020 H	Scan input IE05
6	0040 H	Scan input IE06
7	0080 H	Scan input IE07

_IO2 – Outputs

471-FOE00 ... 474-FOE03 - Function selector, external outputs OE00 ...OE03

Source: Function Selector Output External 0 - 3
Function: Function selectors for external outputs 0 to 3 (I/O module)
The output delivers High level if the condition is met.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	TCAVM	OFF	–	R4W4	REFRC	USIGN8

➔ Functions for outputs on MC6000, page 30
➔ Functions for outputs on MC7000, page 32

494-SCTL2 - Control word to set ext. outputs via SIO

Source: Status Control 2
Function: Control word 2 to set the external outputs (I/O module) via serial interface

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0		R4W4	ALL	USIGN16

Bit	Hex value	Function
0	0001 H	Set/reset output OE00
1	0002 H	Set/reset output OE01
2	0004 H	Set/reset output OE02
3	0008 H	Set/reset output OE03

Note:
Output must be assigned with function selector of serial interface:
FOExx = SIO.

480-SOEXT - Status word of external outputs OE00...OE03

Source: Status Word Output Extern

Function: Status word of the external outputs (I/O module) to scan the outputs via serial interface

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R4W15	ALL	USIGN16

Bit	Hex value	Function
0	0001 H	Scan output OE00
1	0002 H	Scan output OE01
2	0004 H	Scan output OE02
3	0008 H	Scan output OE03

_CAN – CAN bus

493-CAADR - CAN bus device address

Source: CAN-Bus address

Function: Address on CAN – BUS.

This parameter has priority over hardware settings.

To assign the address by hardware means (DIP switch or DSUB connector) the parameter must be set to 0. 0 is the default value of the parameter. Changes only take effect after a restart.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	29	0	–	R3W3	CAN	USIGN8

489-CABDR - CAN bus baud rate

Source: CAN-Bus Baud Rate

Function: By way of this parameter the baud rate of the CAN controller is set. Changes only take effect after a restart.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1000	25	500	–	R3W3		USIGN8

CABDR	Transfer rate
0	1 MBaud
1	800 KBaud
2	500 KBaud
3	250 KBaud
4	125 KBaud
5	75 KBaud
6	50 KBaud
7	25 KBaud

Note:
The maximum permissible baud rate depends on the transmission distances (e.g. 1 MBAUD to 40 m total line length).

492-CACNF - CAN bus configuration

Source: CAN-Bus Configuration

Function: Configuration of the CAN bus. Changes only take effect after a restart.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	4	2	–	R3W3	CAN	USIGN8

CACNF	Reference	Actual
0	No reference adopted	No actual transferred
1	16 bits, torque, speed or position	16 bits, torque, speed or position
2	32 bits, torque, speed or position	32 bits, torque, speed or position
3	32 bits speed	16 bits speed (1st word) 16 bits torque (2nd word)
4	Format VF1000L (Sa) 32 bits frequency + 16 bits Inbits	Format VF1000L (Sa) 32 bits frequency + 16 bits Outbits

Scaling of 32-bit values:

Torque: Nm • 2^{-16}
Speed: rpm • 2^{-16}
Position: Revolutions 2^{-16}

Scaling of 16-bit values

Torque: Nm
Speed: rpm
Position: Revolutions

491-CACTR - CAN bus control word

Source: CAN-Bus Control Word
Function: Current control word.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H		R3W8	ALL	USIGN16

The 16 bits of the control word result from the logical linking of control commands which act on the state machine. The following bits of the DRIVECOM control word are supported:

DriveCOM status word (not where CACNF = 4):

Bit	Name
0	Switch-on
1	Disable power
2	Emergency stop
3	Operation enabled
4 - 6	Mode-dependent, more detailed definition: DRIVECOM profile no. 22 of January 1994
7	Reset fault
8	reserved
9	reserved
10	reserved

Bit	Name (continued)
11	vacant
12	vacant
13	vacant
14	Reference state output OS00 1), S1OUT 2)
15	Reference state output OS01 1), S2OUT 2)

1) MCxxxx, 2) VF1xxx

490-CASTA – CAN bus status word

Source: CAN-Bus Status Word
Function: Current status word

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R3W15	ALL	USIGN16

In the status word the current state of the device and additional messages are displayed. The following bits of the DRIVECOM STATUS WORD are supported:

DriveCOM status word (not where CACNF = 4):

Bit	Name
0	Ready for start
1	On
2	Operation enabled
3	Error
4	Power disabled
5	Emergency stop
6	Switch-on inhibit
7	Warning
8	No function
9	Remote
10	Reference reached
11	Limit value
12, 13	Mode-dependent, more detailed definition: DRIVECOM profile no. 22 of January 1994
14	Actual state input IS00 1), S1IND 2)
15	Actual state input IS01 1), S2IND 2)

1) MCxxxx, 2) VF1xxx

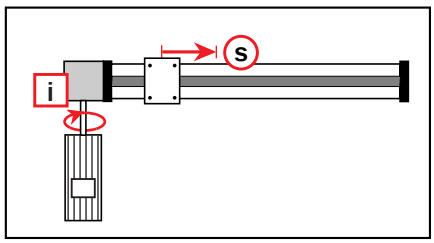
_PMOD – Open-loop position control (option)

Calculation aids

Example for determining the scaling factors for travel, velocity and acceleration

In order to make the position entries in a unit of length in a linear application, for example, the position controller must be informed of the context. This is done on the **Units** tab.

Example: Linear axle with toothed belt drive



Motor:	1 motor rev ⇔ 65536 increments (regardless of motor and encoder type)
Gearing:	i = 4
Linear transmission:	1 axle rev ⇔ 192 mm

In one revolution of the carriage covers $s = \frac{\text{Pinion circumfence}}{\text{Transmission ratio}} = \frac{192mm}{(i = 4)} = 48mm$.

The following translations are required:

	Desired programming unit	Internal unit
Travel:	mm	Incr.
Velocity:	m/min	Incr./ 5 ms
Acceleration:	m/s	Incr./ (5 ms)

Travel resolution

General rule:
Here: $1U = 48mm = 65536\text{Incr.}$

$$\text{Programming unit} = \frac{K10}{K11} \cdot \text{Incr.}$$

Example - requirement is default in programming unit mm:
The internal unit is isolated, the factor represents the scaling factor K10/K11.

$$1mm = \underbrace{\frac{65536}{48}}_{\frac{K10}{K11}} \text{Incr.}$$

The ratio K10/K11 should be chosen as small as possible. Reduction produces the following:

$$\frac{K10}{K11} = \frac{65536/16}{48/16} = \frac{4096}{3}$$

Result:

$$K10 = \underline{4096}\,, \quad K11 = \underline{3}$$

That is to say: The positions can now be specified in mm.

Velocity resolution

General rule:

$$\text{Programming unit} = \text{K12} \cdot \frac{\text{Incr.}}{5ms}$$

where: $1mm = \frac{65536\text{Incr.}}{48}$ (see above)

Example - requirement is default in programming unit 0.01 m/s:

$$\frac{10mm}{s} = \frac{10 \cdot \frac{65536\text{Incr.}}{48}}{s}$$

Translate time units into 5 ms (1 s = 200 · 5 ms):

$$\frac{10mm}{s} = \frac{10 \cdot 65536\text{Incr.}}{48 \cdot (200 \cdot 5ms)}$$

The internal unit is isolated, the factor represents the scaling factor K12.

$$\frac{10mm}{s} = \underbrace{\frac{10 \cdot 65536}{48 \cdot 200}} \cdot \frac{\text{Incr.}}{5ms}$$

Result:

$$\text{K12} = \underline{68}$$

(rounding error: $\frac{68 - (68,267)}{68,267} = -0,4\%$)

➔ This means that all positioning speeds will be 0.4 % too slow.

Acceleration resolution

General rule:

$$\text{Programming unit} = \text{K13} \cdot \frac{\text{Incr.}}{(5ms)^2}$$

Example - requirement is default in unit 0.1 m/s:

$$\frac{100mm}{s^2} = \frac{100 \cdot 65536\text{Incr.}}{48 \cdot (200 \cdot 5ms)(200 \cdot 5ms)}$$

Translate time units into (5 ms) (1 s = 200 · 5 ms · 200 · 5 ms):

The internal unit is isolated, the factor represents the scaling factor K12.

$$\frac{100mm}{s^2} = \underbrace{\frac{100 \cdot 65536}{48 \cdot 200 \cdot 200}} \cdot \frac{\text{Incr.}}{(5ms)^2}$$

Result:

$$\text{K13} = \underline{3}$$

(rounding error: $\frac{3 - 3,413}{3,413} = -12,1\%$)

➔ This means that all accelerations will be 12 % too slow.

Remedy based on different unit of acceleration resolution

Default in unit 1000 rpm/s (on the motor shaft):

$$\frac{1000U}{min \cdot s} = \frac{1000 \cdot 65536\text{Incr.}}{(60 \cdot 200 \cdot 5ms)(200 \cdot 5ms)}$$

Translate time units into (5 ms) (1 min = 60 • 200 · 5 ms):

The internal unit is isolated, the factor represents the scaling factor K13.

$$\frac{1000U}{min \cdot s} = \underbrace{\frac{1000 \cdot 65536}{60 \cdot 200 \cdot 200}} \cdot \frac{\text{Incr.}}{(5ms)^2}$$

Result:

$$\text{K13} = \underline{27}$$

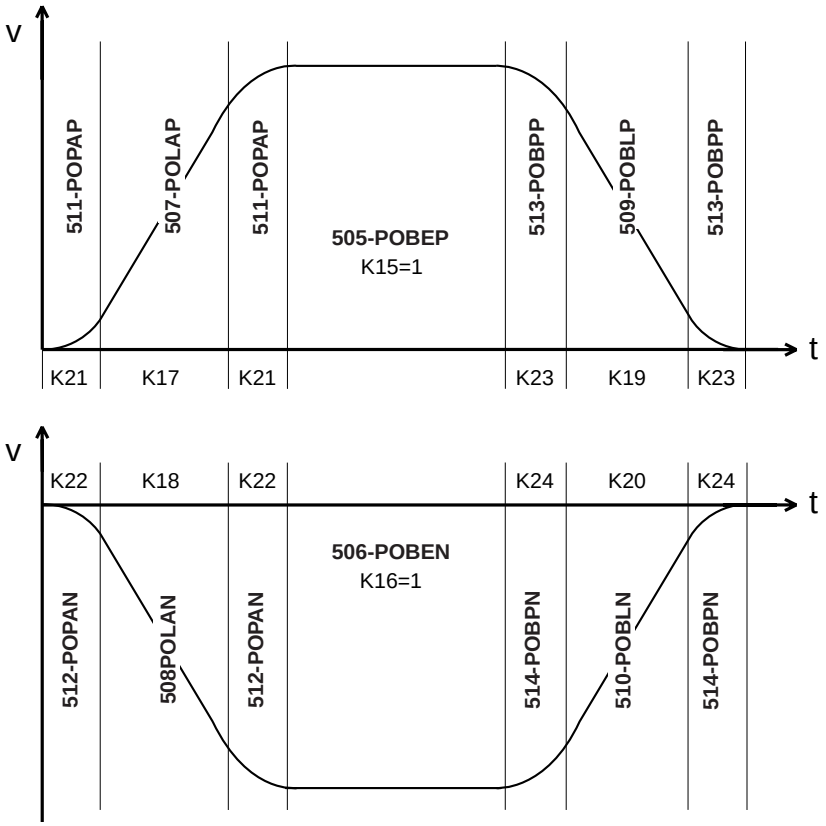
(rounding error: $\frac{27 - 27,307}{27,307} = -1,1\%$)

Distance unit

On the **Units** tab you define the unit with which destination positions and positioning travels are entered in the sequence program or in manual mode.

- In the setting "Calculation from resolutions", the "travel resolution" corresponds to the distance unit.
- In the "Direct input" setting the distance unit can be freely defined by a fraction (➔ parameter POWGZ / POWGN). As a result of the representation in the form of a fraction the travel resolution can be entered absolutely precisely (with no rounding error).

Acceleration ramps



The graphic at the top shows the parameters for accelerations in positive direction of rotation; the bottom graphic shows the parameters for accelerations in negative direction.

For example, the parameter POLAP (K17) determines the max. permissible startup acceleration rate in positive direction of rotation.

➔ Positive direction of rotation, page 115

Note:
With the aid of the K-factors the ramps can be adjusted in percent in the sequence program. Example: SET K17 = 50 causes the position controller to work with 50 % of the ramp set in parameter POLAP.

➔ 505-POBEP - Acceleration mode in positive direction (K15), page 117

Positive direction of rotation

Note:
Positive direction of rotation means clockwise as viewed onto the motor shaft (A-side bearing plate), unless the "direction of rotation preceding sign" is specified as "Negative" on the **Tolerances** tab (or in parameter POSIG).

503-POABE - Resolution of acceleration (K13)

Function: **Parameter only on MC7000.**
This parameter defines the unit with which accelerations can be programmed in the sequence program.
Use of this parameter is necessary:

- if the parameter is to be entered via serial interface (without DRIVEMANAGER), or
- if rounding errors result from the automatic conversion in the **Active device - Change settings – Units** dialog, or
- if you want to use your own custom units, e.g. change the acceleration into mm per second per second.

➔ Calculation aids, page 112

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	1	–	R4W4	POMOD	TERM

556-POADP - Current tracking error in distance units

Function: **Parameter only on MC7000.**
The tracking error is the deviation of the actual position relative to the reference position.
➔ Distance unit, page 114

Values:

Minimum	Maximum	Factory set.	Unit	«F»MODE	«F»SMARTCARD	Type
-32764	32764	0	–	R1W7	–	INT32Q16

554-POAIP - Current actual position in distance units

Function: **Parameter only on MC7000.**
Indicates the current actual position in distance units.
➔ Distance unit, page 114

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	–	R1W7	–	INT32Q16

545-POAPO - Current program set number of active positioning program

Function: **Parameter only on MC7000.**

The parameter indicates the number of the program set of the current positioning program which is to be executed when the still running positioning set is finished.

➔ 544-POAPR - Number of active positioning program, page 116

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0	–	R1W3	–	USIGN16

544-POAPR - Number of active positioning program

Function: **Parameter only on MC7000.**

The parameter indicates the number of the positioning program currently being worked through in the position controller, e.g. in program P01 ➔ display: "1".

This information is displayed in the **Active device – Monitor – Positioning module MC7000** menu.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	99	0	–	R1W3	–	USIGN8

Note:

The program to start is defined on the **Inputs** tab (program selection).

555-POASP - Current reference position in distance units

Function: **Parameter only on MC7000.**

Indicates the current reference position of the position control in distance units.

➔ 554-POAIP - Current actual position in distance units, page 115
➔ Distance unit, page 114

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32764	32764	0	–	R1W7	–	INT32Q16

502-POAVE - Velocity resolution (K12)

Function: **Parameter only on MC7000.**
With this parameter the unit of the velocities in the position control is defined.

Use of this parameter is necessary:

- if the parameter is to be entered via serial interface (without DRIVEMANAGER), or
- if the automatic conversion in the **Active device – Change settings... – Units** dialog results in rounding errors, or
- if you want to use your own custom units e.g. belt speed in bottles per second.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	1	–	R4W4	POMOD	TERM

506-POBEN - Acceleration mode in negative direction (K16)

Function: **Parameter only on MC7000.**
With this parameter a choice can be made between linear and sinusoidal acceleration. With parameter setting via interface: linear = 0, sinusoidal = 1.

➔ 505-POBEP - Acceleration mode in positive direction (K15), page 117

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
LIN	SIN	LIN	–	R4W4	POMOD	USIGN8

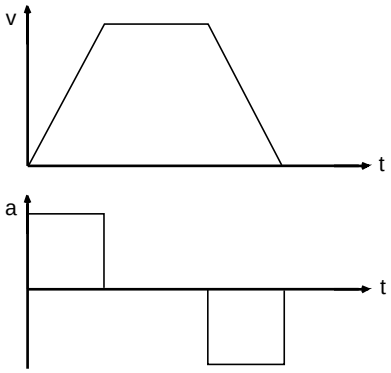
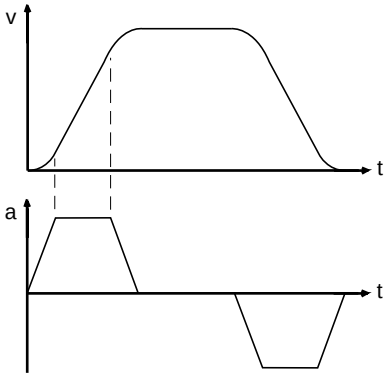
505-POBEP - Acceleration mode in positive direction (K15)

Function: **Parameter only on MC7000.**
With this parameter a choice can be made between linear and sinusoidal acceleration. With parameter setting via interface: linear = 0, sinusoidal = 1.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
LIN	SIN	LIN	–	R4W4	POMOD	USIGN8

Advantage:

Linear:	Sinusoidal:
Greatest possible dynamics	Smooth but rapid acceleration, so smooth positioning.
	

➔ Acceleration ramps, page 114

510-POBLN - Maximum linear braking acceleration in negative direction (K20)

Function: **Parameter only on MC7000.**

The parameter determines the maximum permissible linear braking acceleration for movements in negative direction (K20).

➔ Acceleration ramps

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	100	–	R4W4	POMOD	TERM

509-POBLP - Maximum linear braking acceleration in positive direction (K19)

Function: **Parameter only on MC7000.**

The parameter determines the maximum permissible braking acceleration for movements in positive direction (K19).

➔ Acceleration ramps, page 114

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	100	–	R4W4	POMOD	TERM

514-POBPN - Maximum sinusoidal braking acceleration in negative direction (K24)

Function: **Parameter only on MC7000.**

The parameter determines the initial steepness of the sinusoidal braking acceleration in negative direction (K24).

➔ Acceleration ramps, page 114

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	1	–	R4W4	POMOD	TERM

Note:

The parameter is only required for parameter setting via interface. In DRIVEMANAGER operation the value is calculated by way of the settings.

513-POBPP - Maximum sinusoidal braking acceleration in positive direction (K23)

Function: **Parameter only on MC7000.**

The parameter determines the initial steepness of the sinusoidal braking acceleration in positive direction (K23).

➔ Acceleration ramps, page 114

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	1	–	R4W4	POMOD	TERM

Note:

The parameter is only required for parameter setting via interface. In DRIVEMANAGER operation the value is calculated by way of the settings.

551-POCMD - Direct command input in manual mode

Function: **Parameter only on MC7000.**

POCMD is used for communication between the user and POSMOD and has two functionalities:

Command mode: Send POSMOD commands for program and data administration (e.g. load a program into the servo (%Pxx), read programs from the servo (%DIR), save programs to the Flash EPROM (%SAV), see programming manual)

Remote mode: Positioning commands are executed immediately, e.g. GO A200 V50. This is used by the **Active device - Control - Manual mode POSMOD** menu.

Remote mode is selected by the command %+R and deselected by %-R. This mode is not possible in automatic operation.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
–	–	–	–	R1W3	ALL	String

Settings:

No.	Function
|N	No Data
|E	End of Communication
' | ' =	ESC sequence 1B

515-POECO - External CAN outputs of PosMod

Function: **Parameter only on MC7000.**
Preparation for I/O expansion via CAN, currently without function.

515-POEGW - Quick jog rate (K25)

Function: **Parameter only on MC7000.**
Positioning speed for jog mode.
Jog mode is activated via inputs (**Active device – Change settings – Inputs**) or in manual mode (**Active device – Control – Manual mode POSMOD)**.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	100	–	R4W4	POMOD	TERM

546-POENA - Enable positioning software

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
OFF	STDBY	OFF	–	R4W4	POMOD	USIGN8

POENA on MC6000

Source: PosMod1 Enable
Function: Parameter to shut down **POSMOD**1

To commission a servodrive into operation it is necessary to adapt the speed controller to the application conditions (especially moment of inertia of the system SCJ). For this, the **POSMOD**1 must be shut down with parameter POENA.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type

Settings

No.	POENA =	Function
0	OFF	POSMOD1 deactivated, MC6000 in "speed control" mode for setting of the speed controller, control via CTRL menu on KEYPAD possible
1	ON	Default after power-up: POSMOD1 active, CTRL menu of KEYPAD inactive
2	STDBY	POSMOD1 deactivated, MC6000 in "position control" mode, KEYPAD active

Note:
The switch of POENA can only be made if the **PosMod**1 is not being operated in automatic mode (input Manual/Automatic) and not in the “Manual“ control mode by way of the LuPos user interface.

Attention!
Accessing the **PosMod**1 or parameters of the servocontroller **via the serial interface** is not permitted with a setting POENA = OFF OR STDBY, as otherwise the **PosMod**1 can no longer be activated!
Remedy: Reset device to factory defaults.

POENA on MC7000

Source: PosMod1 Enable
Function: Parameter to shut down the position control
To commission the servodrive into operation, it may be necessary temporarily to shut down the position control and work under speed control.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SmartCard	Type

Settings:

No.	POENA =	Function
0	OFF	Position control is deactivated, i.e. the drive can rotate freely. Reference selectors remain set to position control
1	ON	Position control active (default)
2	STDBY	No function

Attention!
Shutting down the position control is also possible in automatic mode (input Manual/Automatic). **Make sure that shutting down the position control, and any freely rotating drive shaft movement, does not cause damage!**

552-POFNC - Position control function diagram

CAUTION - Do not change parameter!
Parameter only for development and service purposes

Function: **Parameter only on MC7000.**
Additional information for the DRIVEMANAGER (Control and Monitor dialog)

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
FAIL	FAIL	FAIL	–	R6W7	ALL	

540-POKAS - Configuration, update/sequence program stop (K07)

Function: **Parameter only on MC7000.**
This parameter determines which input influences the update of the position control.
The allocation is bit-wise, i.e. bit 0 of the parameter is linked to input 0. With parameter POPRT the input port is defined (➔ 543-POPRT - Port configuration for input assignment, page 128).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
00H	FFH	00H	–	R1W4	POMOD	USIGN8

Example:

POPRT = 0	Input port is IExx
POKAS = 08	Bit 3 is set, IE03 is logically linked to the update.
POKAS = 00H	No input allocated, update is basically enabled

Note:
The function selector of the input must be assigned to the position control (FIExx = POMOD, subject area _IO1).
The parameter is only required for parameter setting via interface. In DRIVEMANAGER operation the value is calculated by way of the settings.

542-POKHE - Configuration, hardware limit switches (assignment of inputs, K02)

Function: **Parameter only on MC7000.**
This parameter determines which input is linked to which hardware limit switch (HWE).
The least-significant byte configures the positive hardware limit switch; the most significant the negative. The allocation is bit-wise, i.e. bit 0 of the parameter is linked to input 0.
With parameter POPRT the input port is defined (➔ 543-POPRT - Port configuration for input assignment, page 128).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R1W4	POMOD	USIGN16

Example: POPRT = 0 Input port is IExx
POKHE = 1008H IE03 -> positive HWE
IE04 -> negative HWE

Note:
The function selector of the input must be assigned to the position control (FIExx = POMOD, subject area _IO1).
The parameter is only required for parameter setting via interface. In DRIVEMANAGER operation the value is calculated by way of the settings.

538-POKLA - Configuration of local outputs (K05)

Function: **Parameter only on MC7000.**
This parameter determines the function of outputs OE00 to OE03. If the output is not assigned a **POSMOD** function, it can be used in the sequence program.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
00H	10H	00H	–	R1W4	POMOD	USIGN8

Output	PosMod function	Bit
OE00	End of program run	0
OE01	Axle in position	1
OE02	Reference point defined	2
OE03	Error message	3

Example: POKLA = 0FH All outputs assigned **PosMod** function
POKLA = 0AH OE01 and OE03 assigned **PosMod** function

Note:
The function of the standard outputs OSxx is defined by way of the respective function selector FOSxx (subject area _CONF).
The parameter is only required for parameter setting via interface. In **DriveManager** operation the value is calculated by way of the settings.

536-POKPN - Configuration of program number (assignment of inputs, K02)

Function: **Parameter only on MC7000.**
This parameter is required to be able to select various programs via inputs on program start.
POKPN defines which input bit is assigned to which bit of the program number. As a basic rule, the least significant input bit influences bit 0 of the program number, the next significant bit influences bit 1, etc.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
00H	FFH	00H	–	R1W4	POMOD	USIGN8

Example: POPRT = 0 Input port is IExx
POKPN = 72H IE01 = program bit 0
IE04 = program bit 1
IE05 = program bit 2
IE06 = program bit 3

Note:
With parameter 535-POPKD the type of coding is defined.
The parameter is only required for parameter setting via interface. In DRIVEMANAGER operation the value is calculated by way of the settings.

537-POKTI - Configuration of table index (assignment of inputs, K03)

Function: **Parameter only on MC7000.**
POKTI defines which input bit is assigned to which bit of the table index. As a basic rule, the least significant input bit influences bit 0 of the table index, the next significant bit influences bit 1, etc.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
00H	F0H	00H	–	R1W4	POMOD	USIGN8

Example: POPRT = 0 Input port is IExx
POKTI = 34H IE02 = index bit 0
IE04 = index bit 1
IE05 = index bit 2

541-POKTP - Configuration of jog mode (assignment of inputs, K08)

Function: **Parameter only on MC7000.**
This parameter determines the assignment of jog mode inputs.
The least-significant byte configures the positive jog input (positioning in positive direction) and the most significant byte influences the negative jog input. The allocation is bit-wise, i.e. bit 0 of the parameter is linked to input 0.
With parameter POPRT the input port is defined (➔ 543-POPRT - Port configuration for input assignment, page 128).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	2040H	–	R1W4	POMOD	USIGN16

Example: POPRT = 0 Input port is IExx
POKHE = 1004H IE02 -> positive jog input
IE04 -> negative jog input

Note:
The parameter is only required for parameter setting via interface. In DRIVEMANAGER operation the value is calculated by way of the settings.

539-POKVF - Configuration of feed hold (K06)

Function: **Parameter only on MC7000.**

The feed hold is the prerequisite for all axle movements; that is to say, the axle can only be positioned when a High level is applied to this input.

The allocation is bit-wise, i.e. bit 0 of the parameter is linked to input bit 0.

If the value is zero, no input is assigned and the feed hold is basically enabled.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
00H	FFH	00H	–	R1W4	POMOD	USIGN8

Example: POPRT = 0 Input port is IExx
POKVF = 08H Bit 3 is set, IE03 is logically linked to the update.

Note:

The parameter is only required for parameter setting via interface. In DRIVEMANAGER operation the value is calculated by way of the settings.

508-POLAN - Maximum linear startup acceleration rate in negative direction (K18)

Function: **Parameter only on MC7000.**

The parameter determines the initial steepness of the sinusoidal startup acceleration rate in negative direction (K18).

➔ Acceleration ramps, page 114

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	100	–	R4W4	POMOD	TERM

507-POLAP - Maximum linear startup acceleration rate in positive direction (K17)

Function: **Parameter only on MC7000.**

The parameter determines the initial steepness of the sinusoidal startup acceleration rate in positive direction (K17).

➔ Acceleration ramps, page 114

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	100	–	R4W4	POMOD	TERM

529-POMER - Flags

Function: **Parameter only on MC7000.**

The flags of the position control can be read and altered by way of POMER. This is a field parameter whose index matches that of the position control; that is, flag M00 is identical to POMER[0].

100 flags are available (index 0 to 99).

Field parameters: ➔ 527-POTAB - Table values, page 133

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	1	0	–	R4W4	–	USIGN8

517-PONKR - Zero correction (K27)

Function: **Parameter only on MC7000.**

This parameter shifts the machine zero in relation to the reference point. When the reference run is complete the current position is set equal to the value of the zero correction.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
– 2.15E+09	2147483647	0	–	R4W4	POMOD	TERM

533-POOPT - Optional parameter for POSMOD

Function: **Parameter only on MC7000.**

Reserved. Currently not used.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R4W4	POMOD	USIGN16

553-POOVR - Override

Function: **Parameter only on MC7000.**

This parameter is read-only!

With the aid of the override function the positioning speed can be adjusted via the analog input ISA1 (FISA1=POMOD) in the range from 0 to 150 %. The parameter POOVR contains the current override value.

Note:

The override function only influences the positioning speed when it has been enabled in the position control by the command **SET OV=1**.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	255	0	–	R6W7	ALL	USIGN8

512-POPAN - Maximum sinusoidal startup acceleration rate in negative direction (K22)

Function: **Parameter only on MC7000.**

The parameter determines the initial steepness of the sinusoidal startup acceleration rate in negative direction (K22).

➔ Acceleration ramps, page 114

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	1	–	R4W4	POMOD	TERM

511-POPAP - Maximum parabolic startup acceleration rate in positive direction (K21)

Function: **Parameter only on MC7000.**

The parameter determines the initial steepness of the sinusoidal startup acceleration rate in positive direction (K21).

➔ Acceleration ramps, page 114

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	1	–	R4W4	POMOD	TERM

535-POPKD - Coding of program number (K01, K02)

Function: **Parameter only on MC7000.**

This parameter determines

- whether the program number is fixed by parameter 534-POQPN or entered via inputs (➔ 536-POKPN - Configuration of program number (assignment of inputs, K02), page 123) and
- how the program number is coded.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
FIX	BCD	FIX	–	R4W4	POMOD	USIGN8

Setting:

Parameter value	Meaning	Explanation
0	FIX	534-POQPN contains the program number
1	NOCOD	Program number is entered via the inputs. The bit significance determines the program number: Bit 0 Program 0 Bit 1 Program 1 Bit 2 Program 2 etc. A maximum of 8 programs can be selected.
2	BIN	The program number is entered via the inputs. The value is binary coded.
3	BCD	The program number is entered via the inputs. The value is BCD coded.

Note:
The parameter is only required for parameter setting via interface. In DRIVEMANAGER operation the value is calculated by way of the settings.

532-POPLI - Program line counter

Function: **Parameter only on MC7000.**
The parameter contains the total number of program lines of all programs stored in the position controller.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	255	0	–	R4W4	–	USIGN8

543-POPRT - Port configuration for input assignment

Function: **Parameter only on MC7000.**
The input functions (e.g. hardware limit switches, jog mode, program number) can be assigned to different ports.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R1W4	POMOD	USIGN16

Port number	Port inputs	
0	IE00 - IE07 (expanded inputs of the MC7000)	
1	IC00 - IC07 (IO module 0)	In preparation
2	IC10 - IC17 (IO module 1)	
3	IC20 - IC27 (IO module 2)	

In the 16-bit value two bits in each case determine the assignment of a function to an input port.

13	12	11	10	9	8	7	6	5	4	3	2	1	0	Bit
												Table index POKTI		
										Program number POKPN				
								Feed hold POKVF						
						Update POKAS								
				Hardware limit switches POKHE										
		Jog positive POKTP												
Jog negative POKTP														

534-POQPN - Source of program number (K00)

Function: **Parameter only on MC7000.**
The program number entered here is adopted by the position control on program start, if parameter 535-POPKD contains the value 0 (FIX).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	99	0	–	R1W4	POMOD	USIGN8

523-PORPO - Reference cam polarity (K71)

Function: **Parameter only on MC7000.**
The parameter indicates which is the active edge of the zero initiator (0 = negative = falling edge; 1 = positive = rising edge).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
NEG	POS	POS	–	R4W4	POMOD	USIGN8

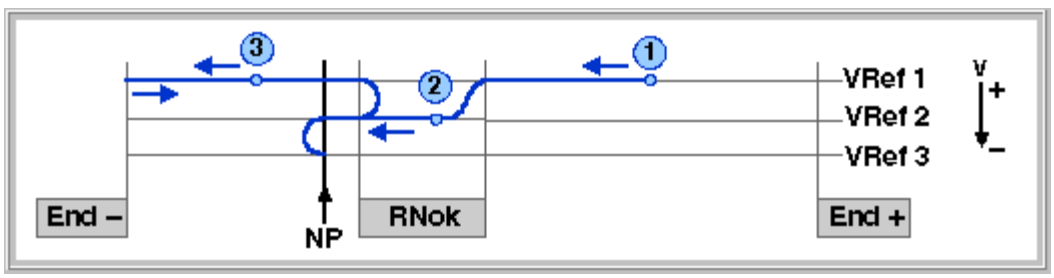
522-PORTY - Reference run type (K70)

Function: **Parameter only on MC7000.**
With this parameter the reference run is adapted to the specific features of the machine (position of reference cam and of zero pulse).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	8	1	–	R4W4	POMOD	USIGN8

Example: Type 1



Key to “Reference run type“ diagram

Possible starting positions:			Abbreviations used:	
(1)	Between reference cam and positive limit switch		End -	Negative hardware limit switch
(2)	On reference cam		End +	Positive hardware limit switch
(3)	Between reference cam and negative limit switch		RNok	Reference cam
			NP	Zero pulse of encoder
			VRef 1	First (highest) ref.velocity
			VRef 2	Second (middle) ref.velocity
			VRef 3	Third (lowest) ref.velocity

Reference run type (K70)

Select the reference run type matching your layout:

Setting	Function	
Type 0:	No reference run is carried out. Instead, the current position is read-in and set equal to the zero correction (also via command SET 0).	
Type 1:	Reference cam: Zero pulse:	Between the two limit switches First zero after leaving the cam in negative direction
Type 2:	Reference cam: Zero pulse:	Between the two limit switches First zero after leaving the cam in positive direction
Type 3:	Reference cam: Zero pulse:	Between the two limit switches, first zero after reaching the cam in positive direction
Type 4:	Reference cam: Zero pulse:	Between the two limit switches First NP after reaching the cam in negative direction
Type 5:	Reference cam: Zero pulse:	Flush with the negative limit switch First zero after reaching the cam in negative direction
Type 6:	Reference cam: Zero pulse:	Flush with the positive limit switch First zero after reaching the cam in positive direction
Type 7:	Reference cam: Zero pulse:	Flush with the negative limit switch First zero after leaving the cam in positive direction
Type 8:	Reference cam: Zero pulse:	Flush with the positive limit switch First zero after leaving the cam in negative direction

524-PORV1 - First referencing speed (K72)

Function: **Parameter only on MC7000.**
Speed at which referencing is begun.
➔ 522-PORTY - Reference run type (K70), page 129

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	2147483647	500	–	R4W4	POMOD	TERM

525-PORV2 - Second referencing speed (K73)

Function: **Parameter only on MC7000.**

When the reference cam is reached the speed changes to this.

➔ 522-PORTY - Reference run type (K70), page 129

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SmartCard	Type
0	2147483647	100	–	R4W4	POMOD	TERM

526-PORV3 - Third referencing speed (K74)

Function: **Parameter only on MC7000.**

Lowest speed at which the zero position is precisely approached.

➔ 522-PORTY - Reference run type (K70), page 129

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SmartCard	Type
0	2147483647	20	–	R4W4	POMOD	TERM

516-POSGW - Slow jog speed (K26)

Function: **Parameter only on MC7000.**

Slow positioning speed for jog mode.

Jog mode is activated via inputs **(Active device – Change settings – Inputs)** or in manual mode **(Active device – Change settings – Inputs).**

➔ 515-POEGW - Quick jog rate (K25), page 120

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SmartCard	Type
1	2147483647	50	–	R4W4	POMOD	TERM

521-POSIG - Preceding sign direction (K32)

Function: **Parameter only on MC7000.**

Referred to the motor, positive direction of rotation means clockwise as viewed onto the motor shaft. The "Negative" setting allows you to change the direction where beneficial for programming of the application. For example, for gearing with negative transmission ratio.

The directional display and the actual value of the motor speed are not affected.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SmartCard	Type
NEG	POS	POS	–	R4W4	POMOD	USIGN8

531-POSTA - Positioning status

Function: **Parameter only on MC7000.**
This parameter is read-only!
POSTA contains status information on the position control which is only of relevance to the DRIVEMANAGER.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R4W4	–	USIGN16

557-POSTI - Status information of positioning and sequence control

Function: **Parameter only on MC7000.**
This parameter is read-only!
POSTA contains status information on the position control which is only of relevance to the DRIVEMANAGER.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
-32768	32767	0	–	R1W7	–	INT16

519-POSWN - Negative software limit switch (K29)

Function: **Parameter only on MC7000.**
With this parameter the travel range can be limited (referred to the machine zero, on the Referencing tab). POSWN must be parameterized so that it is before the negative hardware limit switch, as viewed from the travel range.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
– 2.15E+09	2147483647	0	–	R4W4	POMOD	TERM

Note:
If both software limit switches (518-POSWP and 519-POSWN) are set to "0", monitoring is shut off.

518-POSWP - Positive software limit switch (K28)

Function: **Parameter only on MC7000.**

With this parameter the travel range can be limited (referred to the machine zero, on the Referencing tab). POSWP must be parameterized so that it is before the negative hardware limit switch, as viewed from the travel range.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
– 2.15E+09	2147483647	0	–	R4W4	POMOD	TERM

Note:

If both software limit switches (518-POSWP and 519-POSWN) are set to "0", monitoring is shut off.

527-POTAB - Table values

Function: **Parameter only on MC7000.**

POTAB is a field parameter and contains the 16 table positions which can be used in a sequence program, e. g.by way of the GOT command.

The indices in the sequence program match the indices of the field parameter POTAB (0 - 15).

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
– 2.15E+09	2147483647	0	–	R4W4	–	TERM

Field parameters:

A field parameter administers a one-dimensional field of memory locations which can be individually addressed. The properties (min. and max. value, etc.) apply to every field.

Field parameters are supported by the DRIVEMANAGER (identified in the Parameter Editor by a folder icon), but not by the KEYPAD KP100 control unit. Handling of the parameters in bus operation is described in the bus documentation.

528-POVAR - Variables

Function: **Parameter only on MC7000.**

POVAR contains the 100 variables of the position control. The index of a variable in the sequence program matches the index of the field parameter POVAR.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
– 2.15E+09	2147483647	0	–	R4W4	–	TERM

504-POVMX - Maximum velocity in velocity unit (K14)

Function: **Parameter only on MC7000.**
All programmed velocities are limited to the value set here.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	16384	–	R4W4	POMOD	TERM

501-POWGN - Travel resolution factor, denominator (K11)

Function: **Parameter only on MC7000.**
The fraction from parameters **POWGZ / POWGN** defines the unit with which positions and positioning travels can be programmed in the sequence program.
As a result of the representation in the form of a fraction the travel resolution can be entered absolutely precisely (with no rounding error).

➔ Calculation aids, page 112

Unit: Increments

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	1	–	R4W4	POMOD	TERM

500-POWGZ - Travel resolution factor, numerator (K10)

Function: **Parameter only on MC7000.**
The fraction from parameters **POWGZ / POWGN** defines the unit with which positions and positioning travels can be programmed in the sequence program.
As a result of the representation in the form of a fraction the travel resolution can be entered absolutely precisely (with no rounding error).

➔ Calculation aids, page 112

Unit: Increments

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	2147483647	1	–	R4W4	POMOD	TERM

520-POWIN - Position window (K31)

Function: **Parameter only on MC7000.**

The parameter determines the tolerance limit for reaching of the reference position (in increments). When the actual position has reached the position window, the "Axle in position" output is set.

Window larger, i.e. output is set earlier

Window too small, i.e. output may switch when axle is still at standstill (output "chatter")

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
1	65535	100	–	R4W4	POMOD	USIGN16

530-POZAH - Counters

Function: **Parameter only on MC7000.**

POVAR is a field parameter containing the 100 counters of the position control. The index of a counter in the sequence program matches the index of the field parameter POZAH.

Field parameters: ➔ 527-POTAB - Table values, page 133

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	65535	0	–	R4W4	–	USIGN16

_VAL – Actual value parameter

The _VAL menu contains actual values and fixed values of the servocontroller.

_VAL menu on MC6000

This listing shows all actual values and fixed values which can be scanned in the VAL menu.

Each parameter is assigned a parameter number. The parameter number is required primarily in open-loop control via the serial interface or over the CAN bus. The ”MODE” column indicates the user level as from which the parameter can be displayed.

No.	Name	Designation	Description	MODE	Unit
75	CURNT	Current	Effective output current (phase)	1	A
76	TORQE	Torque	Actual torque	1	Nm
77	SPEED	Speed	Actual speed	1	rpm
78	POS	Position	Actual position	1	rev
86	TSYS	System Time	System time (time since power-up)	1	min
87	TOP	Time of Operation	Operating hours meter	1	h
90	SREV	Standard Revision	For modified software, gives reference to standard software	1	
91	TYPE	Type	Device type	1	
92	REV	Revision	Software version	1	
94	TERR	Time Error	Time between power-up and the last occurring error	1	min
95	ERR1	Error 1	Last error 1)	1	
339	OP1RV	Option 1 Revision	Software version of module in slot X6 (if fitted)	1	
340	OP2RV	Option 2 Revision	Software version of module in slot X7 (if fitted)	1	
347	DCV	DC-(Link-)Voltage	DC-link voltage	1	V
400	ACTV	Actual Value	Actual value of control variable	1	Nm, rpm, rev
427	TEMP	Temperature	Temperature of MC6000	1	°C
447	REFV	Reference Value	Control variable reference value	1	Nm, rpm, rev
495	IOSTA	I/O-Status	Status of inputs and outputs 2)	1	
9	TAX	Controller Tax	Current controller workload	3	%
10	MAXTX	Maximum Tax	Maximum controller workload	3	%
12	MIDTX	Mid Tax	Mean controller workload	3	%
96	ERR2	Error 2	Second-last error 1)	3	
97	ERR3	Error 3	Third-last error 1)	3	
98	ERR4	Error 4	Fourth-last error 1)	3	

1) The error E-OFF is only stored in case of short-term mains power cuts (< 1 min.). In parameters ERR2, ERR3 and ERR4 the system time at which the error occurred is additionally displayed. The system time always relates to the respective mains power-up, not to the operating hours meter.

2) Precise description of parameter

_VAL menu on MC7000

This table shows all actual values and fixed values which can be scanned in the VAL menu (**up to user level Mode = 4**). Parameters of the higher user levels follow on.

Each parameter is assigned a parameter number. The parameter number is required primarily in open-loop control via the serial interface or over the CAN bus. The ”MODE” column indicates the user level as from which the parameter can be displayed.

No.	Name	Designation	Description	MODE	Unit
75	CURNT	Current	Effective output current (phase)	1	A
76	TORQE	Torque	Actual torque	1	Nm
77	SPEED	Speed	Actual speed	1	rpm
78	POS	Position	Actual position	1	rev
86	TSYS	System Time	System time (time since power-up)	1	min
87	TOP	Time of Operation	Operating hours meter	1	h
90	SREV	Standard Revision	For modified software, gives reference to standard software	1	
91	TYPE	Type	Device type	1	
92	REV	Revision	Software version	1	
94	TERR	Time Error	Time between power-up and the last occurring error	1	min
95	ERR1	Error 1	Last error 1)	1	
127	S_NR	Serial number	Serial number	1	
130	NAME	Device Name	Symbolic name of the device in the Drive-Manager	1	
339	OP1RV	Option 1 Revision	Software version of module in slot X6 (if fitted)	1	
347	DCV	DC-(Link-)Voltage	DC-link voltage	1	V
400	ACTV	Actual Value	Actual value of control variable	1	Nm, rpm, rev
427	TEMP	Temperature	Temperature of MC6000	1	°C
447	REFV	Reference Value	Control variable reference value	1	Nm, rpm, rev
96	ERR2	Error 2	Second-last error 1)	3	
97	ERR3	Error 3	Third-last error 1)	3	
98	ERR4	Error 4	Fourth-last error 1)	3	
483	ISA0	Voltage on ISA0	Voltage at analog input	3	V
484	ISA1	Voltage on ISA1	Voltage at analog input	3	V
115	CSXOR	Checksum XOR	Software checksum (XOR)	3	Hex
116	CSADD	Checksum ADD	Software checksum (UND)	3	Hex

1) The error E-OFF is only stored in case of short-term mains power cuts (< 1 min.). In parameters ERR2, ERR3 and ERR4 the system time at which the error occurred is additionally displayed. The system time always relates to the respective mains power-up, not to the operating hours meter.

404-CNTL - Control word of system

Function: Internal and external signals are entered in the control word CNTL. The Event Generator then creates an event from the control word. Bit 0 has the highest priority and bit 15 the lowest priority in event generation.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R5Ww15	–	USIGN16

The control word is composed of 16 bits:

Bit	Name
0	Error
1	Emergency stop
2	Enable control
3	Function
4	Warning
5	Control modules initialized
6	Flux built up
7	Power stage disabled

Bit	Name (continued)
8	Parameter list invalid
9	Editing of param.list finished
10	Start reference run
11	vacant
12	vacant
13	vacant
14	External error
15	Invert reference (channel 3, 4)

106-CRIDX - Revision index as suffix to version number

Function: Internal suffix to version number indicating the correction status of the software.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	99	0	–	R5W7	–	USIGN8

In a newly released version CRIDX is = 00 (e.g. 3.35-00) and in the event of changes is counted down from 99 until a new version is completed and released.

79-DPOS - Tracking error of position controller

Source: Delta Position

Function: Current tracking error in revolutions

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
–32764	32764	0	incr.	R6W7	ALL	INTEGER32

70-DSCH0 ... 73-DSCH3 - Value of channel 0 ... 3 of digital oscilloscope

Source: Digital Scope Channel

Function: Value of channel 0, 1, 2 or 3 of the digital oscilloscope. Value is displayed unscaled in HEX format.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R5W7	–	USIGN16

495-IOSTA - Status of inputs and outputs

Source: Input/Output Status

Function: Status of the inputs and outputs (hexadecimal); can also be displayed by the KeyPad bar graph display.

Values:

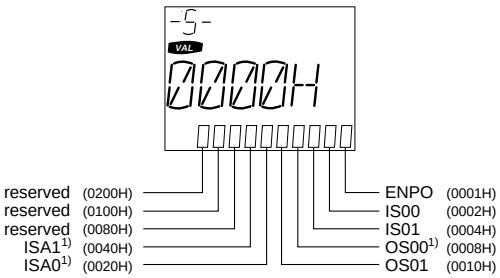
Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R5W15	–	USIGN16

IOSTA on MC6000

The parameter displays the IO status in **hexadecimal** format:

Bit position	Value of position	Input/output
0	0001 H	ENPO
1	0002 H	IS00
2	0004 H	IS01
3	0008 H	OS00 (only digital)
4	0010 H	OS01
5	0020 H	ISA0 (only digital)
6	0040 H	ISA1 (only digital)
7...15		reserved

For representation on the KeyPad **bar graph display** parameter BARG = IOSTA must be set.



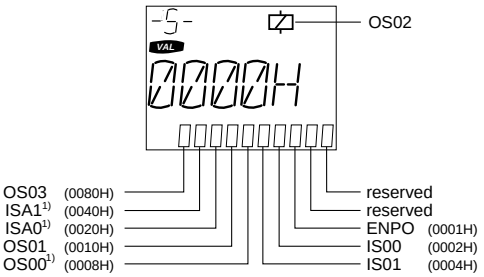
1) Only with digital function of input/output

IOSTA on MC7000

The parameter displays the IO status in **hexadecimal** format:

Bit position	Value of position	Input/output
0	0001 H	ENPO
1	0002 H	IS00
2	0004 H	IS01
3	0008 H	OS00 (only digital)
4	0010 H	OS01
5	0020 H	ISA0 (only digital)
6	0040 H	ISA1 (only digital)
7	0080 H	OS03
8...15		reserved

For representation on the KeyPad **bar graph display** parameter BARG = IOSTA must be set.



1) Only with digital function of input/output

93-KOMP - Compatibility class of SmartCard

Function: The parameter permits the compatibility of the SMARTCARD to be restricted, e.g. for modified software. The value of KOMP in the servocontroller must match the value of KOMP in the SMARTCARD header.

In standard software the value is = 1.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0	255	1	–	R5W7	SYSTM	USIGN8

403-STAT - Status word of system

Function: The status word STAT displays information on the status of the device, as well as messages. The individual bits are updated by the system status monitor ("SZUE") and the control.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R5W15	–	USIGN16

The status word is composed of 16 bits:

Bit	Name
0	Error
1	Warning
2	Reference reached
3	Limit for reference reached
4	Motor output active
5	Motor standstill
6	Clockwise
7	Counter-clockwise
8	Tracking error
9	Drive successfully referenced
10	vacant
11	Emergency stop active
12	Bits 12 ... 15:
13	Number of current
14	system state (0...B)
15	

9-TAX - Current processor workload

Function: Current controller workload

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.00	999.95	0.00	–	R5W15	–	FIXPOINT16

10-MAXTX - Maximum processor workload since power-up

Function: Maximum controller workload

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.00	999.95	0.00	–	R5W15	–	FIXPOINT16

12-MIDTX - Average processor workload

Function: Mean controller workload

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0.00	999.95	0.00	–	R5W15	–	FIXPOINT16

33-V-VAL - Display of data pointer memory location

Function: The parameter reads the memory location addressed with PTR_H, PTR_L.

Values:

Minimum	Maximum	Factory set.	Unit	MODE	SMARTCARD	Type
0000H	FFFFH	0000H	–	R6W15	ALL	USIGN16

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We reserve the right to make technical changes. ID no. 0792.26B.0-00 **EN** 03/99

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