

8. Parameters

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8.1 General

The **System 900** puts 10000 to 50000 parameters at the users disposal, depending on the system size.

It is distinguished between two kinds of parameters:

System - Parameter q

Channel - Parameter P

System - Parameter q

This is a linear array, which is generally accessible, from q0 .. q (max. parameter).

The area of q is subdivided in function blocks:

0 .. 99	General system-configuration
100 .. 999	Definition channel-descriptor
1000 .. 1999	System-setups, system overlapping data
2000 .. 9999	Axis data
10000 ..	Channel - Parameter

Notes:

Input 0 or — means 0 or reset

Counting method byte 1... 4

Counting method bit 0... 7

8.1 General (continued)

Channel - Parameter P

When programming a channel - parameter, a system parameter is always accessed in dependence on the channel - descriptor.

That means channel - parameters are actually system - parameters, whereby the channel - descriptor defines, which channel - parameter accesses on which system - parameter.

The assignment between channel - parameter and system - parameter is not linear. This assignment is defined in the channel - descriptor.

Channel - Parameter are virtual parameters, which show on a system - parameter. Therefore, the channel-parameter-number can be bigger than the maximum number of the parameters.

The area of P is subdivided into function - blocks:

0 ... 6999	User block 1 free user - parameter, real number definable in q103 Standard setup: 5000 parameters, subdivided in
0 ... 499	Reserved for BWO standard - cycles
0 ... 299	Cycles - transmission - area for (cycles - interface)
300 ... 399	Area reserved for cycles Area for filing statical, modal data
400 ... 499	Area reserved for cycles Temporary data area Calculation fields, Scratch etc.
500 ... 6999	Free area for the user
7000 ... 9999	Fixed defined channel - parameter
11000 ... 11999	System - setup, system overlapping data, common area of all channels
12000 ... 18399	Axis data
20000 ... 29999	User block 2
30000 ... 39999	User block 3

8.1 General (continued)

Each physical axis occupies a parameter block of 200 parameters.

In the system has physical axis	the area	in the channel has logical axis	the area
1.	q2000 ... q2199,	1.	P12000 ... P12199,
2.	q2200 ... q2399,	2.	P12200 ... P12399,
3.	q2400 ... q2599,	3.	P12400 ... P12599,
4.	q2600 ... q2799,	4.	P12600 ... P12799,
5.	q2800 ... q2999,	5.	P12800 ... P12999,
6.	q3000 ... q3199,	6.	P13000 ... P13199,
7.	q3200 ... q3399,	7.	P13200 ... P13399,
8.	q3400 ... q3599,	8.	P13400 ... P13599,
9.	q3600 ... q3799,	9.	P13600 ... P13799,
10.	q3800 ... q3999,	10.	P13800 ... P13999,
11.	q4000 ... q4199,	11.	P14000 ... P14199,
12.	q4200 ... q4399,	12.	P14200 ... P14399,
13.	q4400 ... q4599,	13.	P14400 ... P14599,
14.	q4600 ... q4799,	14.	P14600 ... P14799,
15.	q4800 ... q4999,	15.	P14800 ... P14999,
16.	q5000 ... q5199,	16.	P15000 ... P15199,
17.	q5200 ... q5399,	17.	P15200 ... P15399,
18.	q5400 ... q5599,	18.	P15400 ... P15599,
19.	q5600 ... q5799,	19.	P15600 ... P15799,
20.	q5800 ... q5999,	20.	P15800 ... P15999,
21.	q6000 ... q6199,	21.	P16000 ... P16199,
22.	q6200 ... q6399,	22.	P16200 ... P16399,
23.	q6400 ... q6599,	23.	P16400 ... P16599,
24.	q6600 ... q6799,	24.	P16600 ... P16799,
25.	q6800 ... q6999,	25.	P16800 ... P16999,
26.	q7000 ... q7199,	26.	P17000 ... P17199,
27.	q7200 ... q7399,	27.	P17200 ... P17399,
28.	q7400 ... q7599,	28.	P17400 ... P17599,
29.	q7600 ... q7799,	29.	P17600 ... P17799,
30.	q7800 ... q7999,	30.	P17800 ... P17999,
31.	q8000 ... q8199,	31.	P18000 ... P18199,
32.	q8200 ... q8399	32.	P18200 ... P18399

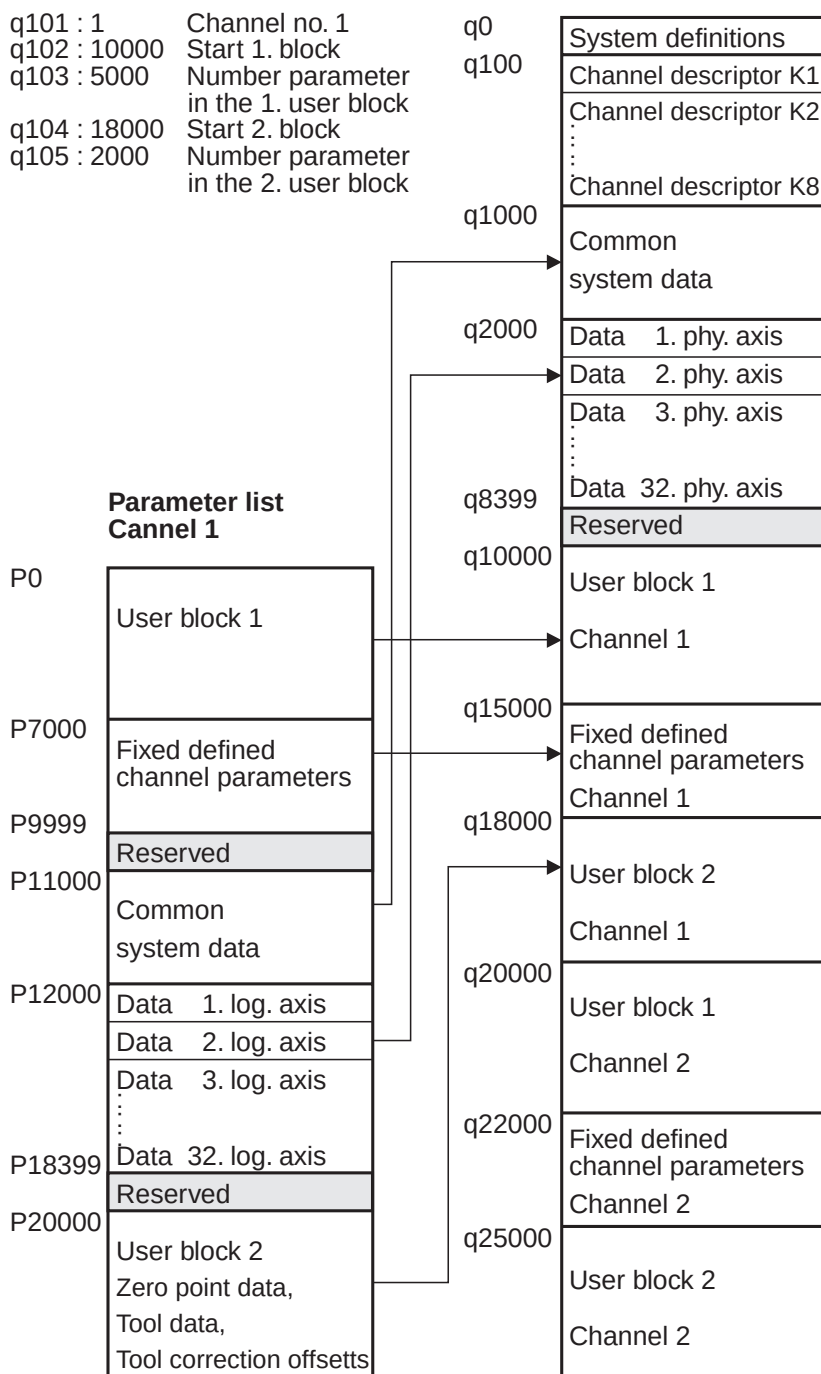
In the channel descriptor physical axes are assigned to the channel axes (q110 ... q141, Byte 3).

8.1 General (continued)

Configuration example for system with one channel (q2:1)

Definition Channel 1

q101 : 1 Channel no. 1
 q102 : 10000 Start 1. block
 q103 : 5000 Number parameter
 in the 1. user block
 q104 : 18000 Start 2. block
 q105 : 2000 Number parameter
 in the 2. user block

System parameter list

8.1 General (continued)

Configuration example for system with two channels (q2:2)

Definition Channel 1

q101 : 1 Channel no. 1
 q102 : 10000 Start 1. block
 q103 : 5000 Number parameter
 in the 1. user block
 q104 : 18000 Start 2. block
 q105 : 2000 Number parameter
 in the 2. user block

System parameter list

q0	System definitions
q100	Channel descriptor K1
	Channel descriptor K2
	...
	Channel descriptor K8
q1000	Common system data
q2000	Data 1. phy. axis
	Data 2. phy. axis
	Data 3. phy. axis
	...
q8399	Data 32. phy. axis
q10000	Reserved
	User block 1
	Channel 1
q15000	Fixed defined channel parameters Channel 1
q18000	User block 2
	Channel 1
q20000	User block 1
	Channel 2
q22000	Fixed defined channel parameters Channel 2
q25000	User block 2
	Channel 2

Definition Channel 2

q201 : 2 Channel no. 2
 q202 : 20000 Start 1. block
 q203 : 2000 Number parameter
 in the 1. user block
 q204 : 25000 Start 2. block
 q205 : 2000 Number parameter
 in the 2. user block

Parameter list Channel 1

P0	User block 1
P7000	Fixed defined channel parameters
P9999	Reserved
P11000	Common system data
P12000	Data 1. log. axis
	Data 2. log. axis
	Data 3. log. axis
	...
P18399	Data 32. log. axis
	Reserved
P20000	User block 2
	Zero point data, Tool data, Tool correction offsets

Parameter list Channel 2

P0	User block 1
P7000	Fixed defined channel parameters
P9999	Reserved
P11000	Common system data
P12000	Data 1. log. axis
	Data 2. log. axis
	Data 3. log. axis
	...
P18399	Data 32. log. axis
	Reserved
P20000	User block 2
	Zero point data, Tool data, Tool correction offsets

8.1 General (continued)

General to the Decimal / Hexadecimal and Binary format

display and input in the controller		allocation of the Byte's and Bit's	
Representation in Decimal / Hexa format		Representation in Binary format (half byte format)	
0	\$ 0	0 0 0 0	0 0 0 0
1	\$ 1	0 0 0 1	0 0 0 1
2	\$ 2	0 0 1 0	0 0 1 0
3	\$ 3	0 0 1 1	0 0 1 1
4	\$ 4	0 1 0 0	0 1 0 0
5	\$ 5	0 1 0 1	0 1 0 1
6	\$ 6	0 1 1 0	0 1 1 0
7	\$ 7	0 1 1 1	0 1 1 1
8	\$ 8	1 0 0 0	1 0 0 0
9	\$ 9	1 0 0 1	1 0 0 1
10	\$ A	1 0 1 0	1 0 1 0
11	\$ B	1 0 1 1	1 0 1 1
12	\$ C	1 1 0 0	1 1 0 0
13	\$ D	1 1 0 1	1 1 0 1
14	\$ E	1 1 1 0	1 1 1 0
15	\$ F	1 1 1 1	1 1 1 1

input in the **Hexa** format

with key ± clocks to \$ in display appears.

Now the digits know
A, B, C, D, E, F
over the following keys
to be input :

- A key ' modifying '
- B key ' pos 1 '
- C key ' picture up '
- D key ' resetting '
- E key ' end '
- F key ' picture down '

With the operate of the input
key ↵ those become
original functions
modifying, pos 1 etc. again
adjusted.

Bytes		Byte 4		Byte 3		Byte 2		Byte 1	
Bit number in the Byte		7 6 5 4 3 2 1 0		7 6 5 4 3 2 1 0		7 6 5 4 3 2 1 0		7 6 5 4 3 2 1 0	
Bit number in 4 Byte		31 30 29 28 27 26 25 24		23 22 21 20 19 18 17 16		15 14 13 12 11 10 9 8		7 6 5 4 3 2 1 0	

To meaning see display and input with parameter status, M functions etc.

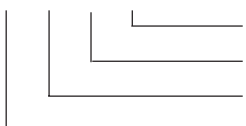
8.1 General (continued)

Parameter status

Each parameter possesses 4 status bytes, in which additional information is contained. The parameter status is displayed in the menu parameter editor.

Example:

Parameter NR. Status indication Meaning

P1000	\$ 30 02 04 01	
		byte 1 parameter loaded byte 2 parameter is transferred to the operating panel byte 3 parameter closed, if barrier 2 is settinged byte 4 hexadecimal format / parameter in the EEPROM store

Status byte 1	bit 0	0	Parameter is reset.
		1	Parameter is loaded.
	bit 1	-	
	bit 2	1	Parameter is loaded to the real time. This identifier works only in the AUTOMATIK operation when processing a NC program. Real time parameters do not become with an interpreting of the NC block (advance) described, but only if this NC block is actually processed. Real time parameters become from the Interpoator before the pre path M functional module described.
	bit 3	1	Parameter with synchronisation. This identifier works only in the AUTOMATIK operation when processing a NC program. Becomes from a NC program if parameters with this identifier described, becomes at the NC end of record synchronizes. (the advance of the theorem interpreter disassembled).
	bit 4		Inch bit.
		0	Parameter is not influenced by input system.
		1	After switching the system of units of inch - > metric or metric - > inch becomes this parameter in each case into that different one system of units converted (see also P11308).
	bit 5 - 6	-	
	bit 7	1	FAST parameter. Parameter is transferred over fast SMMS channel. (system internal information).

8.1 General (continued)

Parameter status

Status byte 2	bit 0	1	Parameter is transferred when describing to the Interpolator.
	bit 1	1	Parameter is transferred when describing to the PLC. All parameters with settinged PLC bit become of the CNC transfer automatically after each switching on routine to the PLC.
	bit 2	1	Parameter is transferred when describing to the operating panel. With each run of the switching on routine this bit becomes with all parameters reset.
	bit 3	1	Identifier procedure parameter. (SMMS chain is passed through when describing).
	bit 4 - 5	-	
	bit 6	1	Parameter is transferred when each describing to the operating panel. (speed Par function)
	bit 7	0	Parameter sample identifier not settinged
		1	Parameter sample identifier settinged, i.e. if P11271..=4 becomes, describing this parameter in the sample buffer logs.

8.1 General (continued)

Parameter status

Status byte 3	With activated parameter barrier		
	- is the parameter status nevertheless to be described		
	- can the PLC nevertheless the parameter value change		
Bit 0	1	Parameters closed, if parameter barrier 1 is settinged	
Bit 1	1	Parameters closed, if parameter barrier 2 is settinged	
Bit 2	1	Parameters closed, if parameter barrier 3 is settinged	
Bit 3	1	Parameters closed, if parameter barrier 4 is settinged	
Bit 4 - 7	-		
Status byte 4	Bit 0 - 3	Format for display: Number of post-decimal positions	
	Bit 4	0	Decimal notation
		1	Hex notation
	Bit 5	0	Parameters do not store
		1	Parameters in the EEPROM store
	Bit 6 - 7	-	

8.2 System Initializing

If a parameter in the area of q0 . . . q9 is changed, the control must be reset with 'Clear parameter'.

q1	Number of axes Is written at the end of the starting routine by the system. The number of axes is calculated according to the definitions in the channel descriptors (q110..). q1 is transmitted to the PLC.
q2	Number of valid channel - descriptors. Corresponds to the number of channels started when initializing.
q3	Number of q-parameters, minimum 30000. Attention: When making a change, the NC - memory is formatted.
q4	-
q5	Pointer on system data enlargement
q6	-
q7	-
q8	CPU clock One describes by the system
q9	Version of the operating system of the operating panel Parameter is written from the operating panel after the starting routine. Enable new operating panel commands 0 1 new actual position display

8.2 System - Initializing (continued)

q10 FLASH Functions / special functions

So long a FLASH function actively is, should not the system not switched off become! For processing a q10-Funktion itself the machine must in operating mode HAND to find.

99 Activate channel descriptors (function 99 is effective only with EA import)

Application:

With this function defined channel descriptors (q100.., q200.., q300..) become in accordance with q2 (number of valid channel descriptors) activates.

Channels are however not started!

This function is helpful while the loading of the machine data, even if here channel parameters must be described by channels, which not yet actively are.

Example:

```
q    2 : x
q  100 : ...
:
q  200 : ...
:
q  300 : ...
:
:
q 1000 : ...
:
q 2000 : ...
:
q   10 : 99      Activate channel descriptors
:
K1:P8250 : ...
:
K2:P8250 : ...
:
K3:P8250 : ...
:
```

8.2 System - Initializing (continued)

q10 Functions:

120 Reset all parameters in the FLASH

125 Reset all NC programs in the FLASH

170 Store all marked parameters in the FLASH memory
(max. 14000 parameters).

Being supposed the parameter areas of several channels to be stored,
the following is to be observed:

Channel descriptors that channels which can be stored must available / defined
to be, i.e., q2 (number of channels) was changed, to start then the CNC is before
memory again. Only with the passing through of the switching on routine
become in the CNC, in accordance with q2, channels started.

In the machine data file with q10:99 if the channel descriptors was activated, so
the parameters can to be stored immediately.

175 Store all visible NC programs / cycles from that NC memory in the FLASH
(max. 262kBytes).

In the starting routine after the ' NC memory ' all will reset in the FLASH
stored programs into the NC memory written back.

176 Store all cycles of the NC memory in the FLASH
In the starting routine after the ' NC memory ' all will reset in the FLASH
stored programs into the NC memory written back.

190 Restore q0..q999 from the FLASH memory.

200 Restore all parameters (apart from q0..q999) from the FLASH memory.

205 Restore all NC programs / cycles from the FLASH.

8.2 System - Initializing (continued)

500 With the I/O picture in the CNC direktory of the NC memory one displays.

501 With the I/O picture in the CNC Direktory FLASH Contents are displayed.

510 The CNC DLL Left is removed

Caution: With the next start of the system, those is to CNC DLL not more for the order.

Function is executed only if in q11:510 one enters before.

520 The switch ' NO_DMA ' is removed

Function is executed only if in q11:520 one enters before.

521 The switch ' NO_DMA ' is settinged

Function is executed only if in q11:521 one enters before.

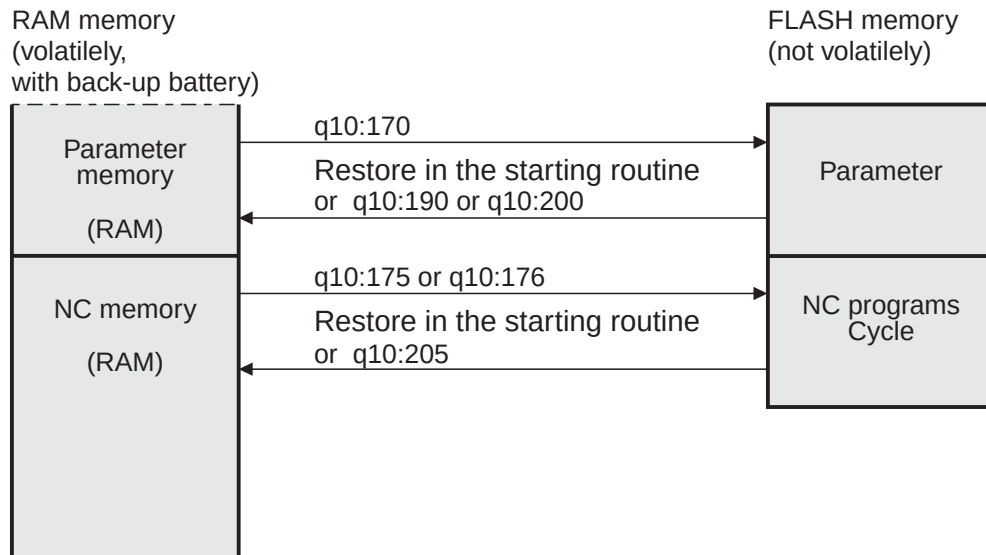
530 The switch ' PLC_BIG ' is removed

Function is executed only if in q11:530 one enters before.

531 The switch ' PLC_BIG ' is settinged

Function is executed only if in q11:531 one enters before.

8.2 System - Initializing (continued)



8.2 System - Initializing (continued)

q12	Operating system - version
q13	Operating system - check sum
q14	Operating system - time stamp day
q15	Operating system - time stamp month
q16	Operating system - time stamp year
q17	Operating system - time stamp hour
q18	Operating system - time stamp minute
q19	Operating system - time stamp second

q22	DLL version
q23	DLL check sum
q24	DLL time stamp day
q25	DLL time stamp month
q26	DLL time stamp year
q27	DLL time stamp hour
q28	DLL time stamp minute
q29	DLL time stamp second

q32	PLC version	(planned)
q33	PLC check sum	(planned)
q34	PLC time stamp day	(planned)
q35	PLC time stamp month	(planned)
q36	PLC time stamp year	(planned)
q37	PLC time stamp hour	(planned)
q38	PLC time stamp minute	(planned)
q39	PLC time stamp second	(planned)

q42	OP version	(planned)
q43	OP check sum	(planned)
q44	OP time stamp day	(planned)
q45	OP time stamp month	(planned)
q46	OP time stamp year	(planned)
q47	OP time stamp hour	(planned)
q48	OP time stamp minute	(planned)
q49	OP time stamp second	(planned)

8.2 System - Initializing (continued)

ESR (starting routine) information

q50	Info	1	Parameters are deleted in ESR.
		0	Parameters are not deleted in ESR. Parameter shows information of the latest ESR.
q51	Info	1	Parameters are deleted in ESR. Parameter is waiting and has to be deleted by the user.
q52	Info	1	NC program memory is deleted in ESR.
		0	NC program memory is not deleted in ESR. Parameter shows information of the latest ESR.
q53	Info	1	NC program memory is deleted in ESR. Parameter is waiting and has to be deleted by the user.
q60	Password 1 (planned)		
:			
q68	Password 9 (planned)		
q70	Priority PLC (planned)		
q71	Priority channel 1 (planned)		
:			
q78	Priority channel 8 (planned)		

8.2 System - Initializing (continued)

Internal system parameter to the PLC

q97	Fatal error	
	0 or —	No error
	< > 0	Error number a cause for fatal error (M1800)
q98	Error message information for the display	
	q98 and q99 are set again at each channel changeover	
	Byte 1	Channel 1
		Bit 0: System message
		Bit 1: High priority message
		Bit 2: Low priority message
		Bit 3: Display message
		Bit 4: PLC high priority message
		Bit 5: PLC low priority message
		Bit 6: free
		Bit 7: free
	Byte 2	Channel 2
	Byte 3	Channel 3
	Byte 4	Channel 4
q99	Error message informations	
	Byte 1	Channel 5

8.3 Channel - descriptor

The channel - descriptors are in the area of q100 ... 899, that means:

Channel 1 q100 ... q199
Channel 2 q200 ... q299
Channel 3 q300 ... q399
Channel 4 q400 ... q499
Channel 5 q500 ... q599
Channel 6 q600 ... q699
Channel 7 q700 ... q799
Channel 8 q800 ... q899

If a parameter in the area of q100 ... q899 is changed, the control must be restarted.

8.3 Channel - descriptor (continued)

Parameters for channel - descriptor 1

- q101 Channel - No. 1 channel 1 fix defined
- q102 Parameter - relocator
Here is defined, from which q on the channel starts, e.g. q102: 10000,
i.e. P0 shows on q10000
- q103 Amount of channel - parameters in the 1st user block P0 ... P6999
Here is defined, how many parameters actually should be reserved.
Input: 1 ... 7000
The fixed defined channel-parameters succeed to the 1st user block
(3000 parameters).
- q104 Parameter - relocator for 2nd user block P20000 ...
Here is defined, from which q on this block starts, e.g. q104: 15000,
i.e. P20000 shows on q15000
The area for the fixed defined channel-parametes is between the 1st. and 2nd user
block (3000 parameter).
- q105 Amount of the channel - parameters in the 2nd. user block P20000 ... P29999
Here is defined, how many parameters actually should be reserved.
Input: 1 ... 10000
- q106 Parameter - relocator for 3rd user block P30000 ...
Here is defined, from which q on this block starts, e.g. q106: 10000
i.e. P30000 shows on q10000
- q107 Amount of channel - parameters in the 3rd. user block P20000 ... P39999
Here is defined how many parameters actually should be reserved.
Input: 1 ... 10000

8.3 Channel - descriptor (continued)

Parameters for channel - descriptor 1

q110

Axis name and axis assignment

Here is defined, with which name the axis is programmed and which physical axis is addressed.

The Control determines with the system initialising the number of the axes available in the channel using this data.

1st. log. axis assignment -> to physical axis!
 byte 1 Axis name (ASCII)

ASCII	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Hex	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	50	51	52	53	54	55	56	57	58	59	5A
ASCII	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
Hex	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F	70	71	72	73	74	75	76	77	78	79	7A

Not certified axis identifiers are deposited with raster.

byte 2 Axis identifier extended 1... 8
 e.g.: X1, X2 etc.
 note: If byte 1 and byte 2 = 0,
 there is no actual position display at the operating panel.
 If byte 2 = 0, consists the axis identifier only of one
 character (byte 1).

byte 3 Physical axis number 1... 32
 Defines, which physical axis is to be addressed.
 To observe: Input in the hexadecimal system
 e.g.: axis number 32 —> input: \$20

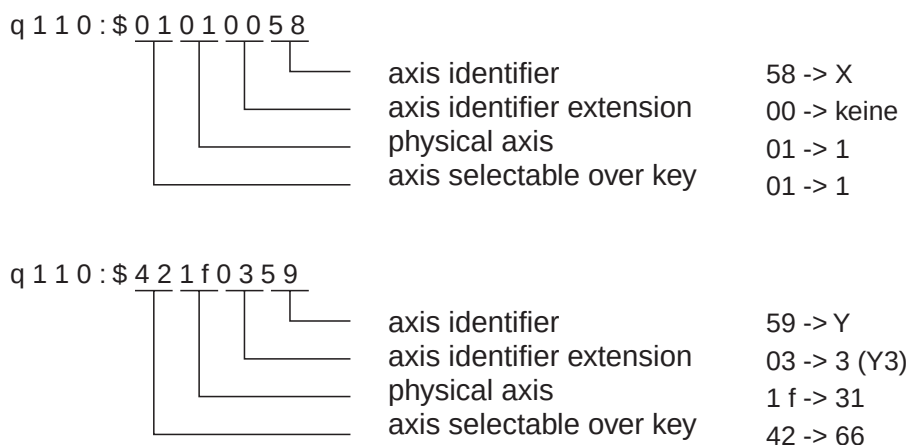
byte 4 Key allocation
 Defines, with which key in the operating panel axis block this axis
 one selects.
 0 Axis is not selectable
 1... 79 Key number
 To observe: Input in the hexadecimal system
 e.g.: key number 66 —> input: \$42

8.3 Channel - descriptor (continued)

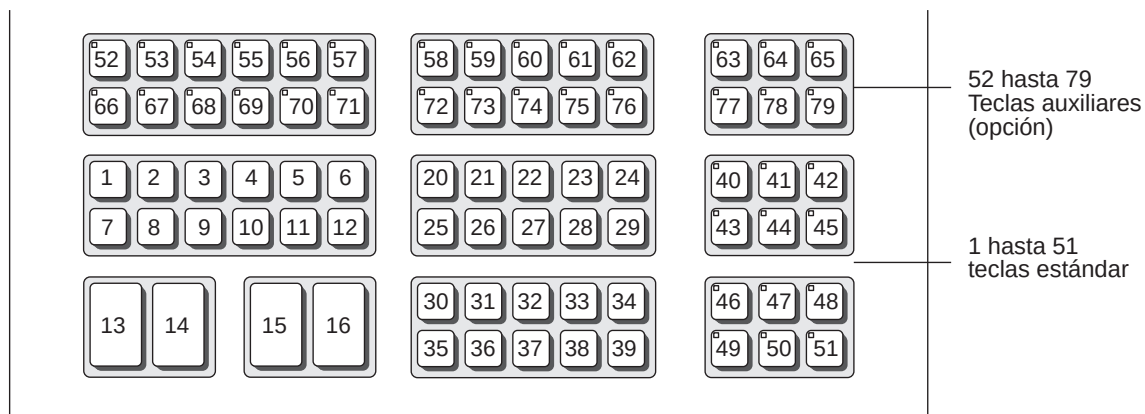
Parameters for channel descriptor 1

q110 Axis identifier and axis allocation (continuation)

Examples:



Key numbers



q111 2nd. log. Axis
q112 3rd. log. Axis
:
q141 32nd.log. Axis

8.3 Channel - descriptor (continued)

Parameters for channel - descriptor 1

q142	Spindel assignments	
:	Assignment of the in the NC - program programmed spindle data to	
q149	the corresponding spindle blocks. Example: q143 : 4	
	When programming S2 in the NC - program, the number of revolutions in the 4th.	
	spindle block is changed. Input: 1...8	
q142	Spindle block reference for S	
q143	Spindle block reference for S2	
q144	Spindle block reference for S3	
q145	Spindle block reference for S4	
q146	Spindle block reference for S5	
q147	Spindle block reference for S6	
q148	Spindle block reference for S7	
q149	Spindle block reference for S8	
q150	Polar co-ordinate system : Name for radius (e.g. 'x')	Input the ASCII - code
q151	Polar co-ordinate system : Name for angles (e.g. 'c')	Input the ASCII - code

8.3 Channel - descriptor (continued)

Parameters for channel - descriptor 1

q152 Definition of the coordinate system for G17
byte 1 1. logical axis number abscissa (horizontal axis)
 01 centre point identifier I
byte 2 2. logical axis number ordinate (vertically axis)
 02 centre point identifier J
byte 3 3. logical axis number
 03 vertically axis on the interpolation plane.
default \$030201

q153 Definition coordinate system for G18
byte 1 1. logical axis number abscissa (horizontal axis)
 03 centre point identifier K
byte 2 2. logical axis number ordinate (vertically axis)
 01 centre point identifier I
byte 3 3. logical axis number
 02 vertically axis on the interpolation plane.
default \$020103

q154 Definition coordinate system for G19
byte 1 1. logical axis number abscissa (horizontal axis)
 02 centre point identifier J
byte 2 2. logical axis number ordinate (vertically axis)
 03 centre point identifier K
byte 3 3. logical axis number
 01 vertically axis on the interpolation plane.
default \$010302

8.3 Channel - descriptor (continued)

Parameters for channel - descriptor 1

q157	CNC error message Acknowledgement	
0 or —	The acknowledgement of pending CNC Error messages takes place with mode change after HAND (—> when describing P8683). Additional is possible it to acknowledge over P8508 CNC Error messages.	
1	The acknowledgement of pending CNC Error messages takes place only with describing P8508. With the mode change after HAND NO CNC becomes error messages acknowledges.	
q158	M function definition block from system or channel	
0 or —	M0..M199 are defined in the system block	(i.e. P11050..P11099)
	M200..M999 are defined in the channel block	(i.e. P8300..P8499)
1	M0..M999 are defined in the channel block	(i.e. P8250..P8499)
q159	Default of the number of post-decimal positions of the position parameters	
	After ' parameter = resetting ' (switching on routine) the following parameters become (in accordance with contents of q159 adjusted in the FLASH Memory) to post-decimal positions:	
	- axis displays P12150... 12169....	
	- null point record	
	- tool data theorem (starting from P10)	
0 or —	3 post-decimal positions (standard adjustment)	
q166	Definition of the Robot record (1... 2)	
	Robot record 1	(P11800..P11809)
	Robot record 2	(P11810..P11819)
0 or —	off	
1	on	
q167	Deinition of the polar record (1... 2)	
	Polar record 1	(P11820..P11824)
	Polar record 2	(P11825..P11829)
0 or —	off	
1	on	

8.3 Channel - descriptor (continued)**Parameters for channel - descriptor 1**

q171	Number zero point blocks Standard adjustment 1	work areas (see P8555)
q172	Number of additional groups per zero point blocks Defined, from many individual shifts itself the total shift together settings. Standard adjustment 0	
q173	Number of items (axes) per group Number of entries per zero point. The zero point array always becomes for 7 points of zero created. Number of used parameters:	
	Number zero point blocks	(q171 of work areas)
	* (number of groups +1)	(q172 + 1)
	* number of items per group	(q173 axes)
	* 7	(number of points of zero with q174 = 0, -)
	Number of used parameters for zero point array	
q174	Number of usable, programmable points of zero 0 or — (preset) 7 available points of zero G53.. G59 (G153 always programmable)	
	1	G154.. G159 additionally programmable altogether 13 points of zero available G53.. G59, G154.. G159
	2	G254.. G259 additionally programmable altogether 19 points of zero available G53.. G59, G154.. G159, G254.. G259
	:	
	9	G954.. G959 additionally programmable altogether 61 points of zero available G53.. G59, G154.. G159.... G954.. G959
	The zero point array is increased at additional points of zero: Number of used parameters:	
	Number zero point-corrodes	(q171 of work areas)
	* (number of groups + 1)	(q172+1)
	* number of items per group	(q173 axes)
	* number of points of zero	(q174*6 + 7)
	Number of used parameters for null point array	

8.3 Channel - descriptor (continued)

Zero point records q170... q174

Example: Zero point box with 2 work areas

q170	20000	at the beginning of the zero point record
q171	2	number of zero point blocks (work areas)
q172	2	number of additional groups per zero point block (shift)
q173	3	number of items (axes) per group
q174	-	number of usable, programmable zero points: G53... G59 = 7

Work area			sum shift	shift 1	shift 2
Work area 1	G53	1. Achse	P20000	P20021	P20042
		2. Achse	P20001	P20022	P20043
		3. Achse	P20002	P20023	P20044
	G54	1. Achse	P20003	P20024	P20045
		2. Achse	P20004	P20025	P20046
		3. Achse	P20005	P20026	P20047
	G55	1. Achse	P20006	P20027	P20048
		2. Achse	P20007	P20028	P20049
		3. Achse	P20008	P20029	P20050
	G56	1. Achse	P20009	P20030	P20051
		2. Achse	P20010	P20031	P20052
		3. Achse	P20011	P20032	P20053
	G57	1. Achse	P20012	P20033	P20054
		2. Achse	P20013	P20034	P20055
		3. Achse	P20014	P20035	P20056
	G58	1. Achse	P20015	P20036	P20057
		2. Achse	P20016	P20037	P20058
		3. Achse	P20017	P20038	P20059
	G59	1. Achse	P20018	P20039	P20060
		2. Achse	P20019	P20040	P20061
		3. Achse	P20020	P20041	P20062
Work area 2	G53	1. Achse	P20063	P20084	P20105
		2. Achse	P20064	P20085	P20106
		3. Achse	P20065	P20086	P20107
	G54	1. Achse	P20066	P20087	P20108
		2. Achse	P20067	P20088	P20109
		3. Achse	P20068	P20089	P20110
	G55	1. Achse	P20069	P20090	P20111
		2. Achse	P20070	P20091	P20112
		3. Achse	P20071	P20092	P20113
	G56	1. Achse	P20072	P20093	P20114
		2. Achse	P20073	P20094	P20115
		3. Achse	P20074	P20095	P20116
	G57	1. Achse	P20075	P20096	P20117
		2. Achse	P20076	P20097	P20118
		3. Achse	P20077	P20098	P20119
	G58	1. Achse	P20078	P20099	P20120
		2. Achse	P20079	P20100	P20121
		3. Achse	P20080	P20101	P20122
	G59	1. Achse	P20081	P20102	P20123
		2. Achse	P20082	P20103	P20124
		3. Achse	P20083	P20104	P20125

8.3 Channel - descriptor (continued)

Zero point records q170... q174

Example: Zero point box with extended zero points

q170	20000	at the beginning of the zero point record
q171	1	number of zero point blocks (work areas)
q172	3	number of additional groups per zero point block (shift)
q173	4	number of items (axes) per group
q174	1	number of usable, programmable zero points: G53 ... G59 and G154 ... G159 = 13

Work area 1			sum shift	shift 1	shift 2	shift 3
G53	1. Achse	P20000	P20052	P20104	P20156	
	2. Achse	P20001	P20053	P20105	P20157	
	3. Achse	P20002	P20054	P20106	P20158	
	4. Achse	P20003	P20055	P20107	P20159	
G54	1. Achse	P20004	P20056	P20108	P20160	
	2. Achse	P20005	P20057	P20109	P20161	
	3. Achse	P20006	P20058	P20110	P20162	
	4. Achse	P20007	P20059	P20111	P20163	
G55	1. Achse	P20008	P20060	P20112	P20164	
	2. Achse	P20009	P20061	P20113	P20165	
	3. Achse	P20010	P20062	P20114	P20166	
	4. Achse	P20011	P20063	P20115	P20167	
G56	1. Achse	P20012	P20064	P20116	P20168	
	2. Achse	P20013	P20065	P20117	P20169	
	3. Achse	P20014	P20066	P20118	P20170	
	4. Achse	P20015	P20067	P20119	P20171	
G57	1. Achse	P20016	P20068	P20120	P20172	
	2. Achse	P20017	P20069	P20121	P20173	
	3. Achse	P20018	P20070	P20122	P20174	
	4. Achse	P20019	P20071	P20123	P20175	
G58	1. Achse	P20020	P20072	P20124	P20176	
	2. Achse	P20021	P20073	P20125	P20177	
	3. Achse	P20022	P20074	P20126	P20178	
	4. Achse	P20023	P20075	P20127	P20179	
G59	1. Achse	P20024	P20076	P20128	P20180	
	2. Achse	P20025	P20077	P20129	P20181	
	3. Achse	P20026	P20078	P20130	P20182	
	4. Achse	P20027	P20079	P20131	P20183	
G154	1. Achse	P20028	P20080	P20132	P20184	
	2. Achse	P20029	P20081	P20133	P20185	
	3. Achse	P20030	P20082	P20134	P20186	
	4. Achse	P20031	P20083	P20135	P20187	
G155	1. Achse	P20032	P20084	P20136	P20188	
	2. Achse	P20033	P20085	P20137	P20189	
	3. Achse	P20034	P20086	P20138	P20190	
	4. Achse	P20035	P20087	P20139	P20191	
G156	1. Achse	P20036	P20088	P20140	P20192	
	2. Achse	P20037	P20089	P20141	P20193	
	3. Achse	P20038	P20090	P20142	P20194	
	4. Achse	P20039	P20091	P20143	P20195	
G157	1. Achse	P20040	P20092	P20144	P20196	
	2. Achse	P20041	P20093	P20145	P20197	
	3. Achse	P20042	P20094	P20146	P20198	
	4. Achse	P20043	P20095	P20147	P20199	
G158	1. Achse	P20044	P20096	P20148	P20200	
	2. Achse	P20045	P20097	P20149	P20201	
	3. Achse	P20046	P20098	P20150	P20202	
	4. Achse	P20047	P20099	P20151	P20203	
G159	1. Achse	P20048	P20100	P20152	P20204	
	2. Achse	P20049	P20101	P20153	P20205	
	3. Achse	P20050	P20102	P20154	P20206	
	4. Achse	P20051	P20103	P20155	P20207	

8.3 Channel - descriptor (continued)**Parameters for channel - descriptor 1**

q175	Beginning of the tool data blocks 1. parameter Defines, from which parameter on the tool data array starts.
q176	Number of tool data blocks Number of elements of the tool data arrays.
q177	Number of sub data blocks
q178	Number of parameters of a tool block Total length of an element in the tool data array.
q179	Number of tool places available in the tool magazine

8.3 Channel - descriptor (continued)

Configuration - Example

Example: Amount of channels : 1
Amount of axes : 3

q2	1	channels	
q101	1	channel number	
q102	10000	parameter - relocator user block 1	(q number)
q103	5000	number of channel parameters in the 1st. block	
q104	18000	parameter - relocator user block 2	(q number)
q105	2000	number of channel parameters in the 2. block	
q110	\$010058	1st. logical axis = 1. physical axis, axis name 'X', key 1	
q111	\$020059	2nd. logical axis = 2. physical axis, axis name 'Y', key 18	
q112	\$03005A	3rd. logical axis = 3. physical axis, axis name 'Z', key 3	
q170	20000	beginning of the zero point data block	
q171	1	number of zero point blocks	
q172	0	number of groups per zero point block	
q173	32	number of elements per group	
q175	21000	beginning of the tool data block	
q176	50	number of tool data blocks	
q177	1	number of sub data blocks	
q178	20	number of elements per data block	

Parameters for this example are lying for this example as follows:

	q0 ... q99	general system configuration
	q100 ... q999	definition channel descriptors
P11000 ... P11999	q1000 ... q1999	system overlapping data
P12000 ... P13599	q2000 ... q3599	axis data
P0 ... P4999	q10000 ... q14999	customer parameter block 1
P7000 ... P9999	q15000 ... q17999	fix defined channel parameters
P20000 ... P21999	q18000 ... q19999	for zero pointes, tool data

8.4 Modes of operation - groups

Operating mode network 1

The following parameters contain bit information for suitable channel selection.

q903 Operating mode switching in the network

Bit information: bit 0 channel 1

bit 1 channel 2

:

e.g.: \$00000003: Channel 1 & channel 2

(P8683 in the defined channels is simultaneous setting)

With the describing of q903 operating mode switching in the network becomes changes immediately.

q904 Stop in the network (see q903)

Stop in the network works only for STOP key

i.e. if a channel over STOP key is stopped, become the remaining channels in network also stopped.

Stop in the network does not work with stop by messages, measuring stops, Program end etc.

With the describing of q904 stop in the network is changed immediately.

q905 Abort in the network (see q903)

With the describing of q905 abort in the network is changed immediately.

q908 Message display in the network
(messages of the CNC)

Byte 1 Messages system and channel-specific messages of the PLC

Byte 2 Messages High Prio.

Byte 3 Messages Low Prio.

Byte 4 Messages display and channel-specific messages of the PLC

All bytes contain the following

Bit information bit 0 channel 1

bit 1 channel 2

:

bit 7 channel 8

Example q908 \$00030303

i.e.. Messages that priority system / High Prio. / Low Prio.

in both channels (K1 + K2) are displayed.

The display messages are displayed only in the selected channel (byte 4 = 0).

8.4 Modes of operation - groups (continued)

Operating mode network 1

q909 PLC message display in the network
 (messages of the PLC)
 Byte 1 PLC Messages High Prio.
 Byte 2 PLC Messages Low Prio.

see further q908

q910 Operating mode network 2
:
q919

q920 Operating mode network 3
:
q929

q930 Operating mode network 4
:
q939

8.5 Standard channel parameters**Milling cycles**

(only if the milling cycles G71 / G72 / G73 / G74 / G75 are used, otherwise freely available)

P11	Pocket dimension in x-direction
P12	Pocket dimension in y-direction
P13	Pocket depth in z-direction
P14	Corner radius
P15	Allowance on outline in x and y-direction
P16	Setting measure in x or y-direction (sign + / -)
P17	Setting measure in z-direction
P18	Allowance on pocket depth in z-direction
P19	Safety margin in z-direction
P21	Feed in z-direction (when immersing into the material)

8.5 Standard channel parameters (continued)**Drill cycles**

(only if the drill cycles G81 / G83 / G84 / G85 are used, otherwise freely available)

P30	Free cutting time		
P31	Balance fodder	G84	
		P31: 3	= thread cutting without balance fodder on the right
		P31: 4	= thread cutting without balance fodder links
		P31: 0 or --	= G84 standard cycle (with balance fodder)
P32	Drill feed		
P32	Thread pitch	G84	
P33	Drilling depth		
P33	Hread depth	G84	
P34	Anticipation plane		Safety margin of the processing upper edge
P35	Retreat plane		To running around obstacles in the setting axis
P36	Stroke rate		G83, constant setting depth = $(P33 - P34) / P36$
P36	Setting depth		G83, degressive setting depth
P37	1. Stroke		G83, degressive setting depth
P38	Safety margin		G83, default = 1mm
P39	Gradual decrease		G83, degressive setting depth
		P39: 1	= on
		P39: 0 or --	= off

8.5 Standard channel parameters (continued)

Cycle patterns

(only if the cycle patterns G86 / G87 / G88 / G89 are used, otherwise freely available)

G86 vector type processing

P100	Coordinate of the 1. Axis (x)
P101	Coordinate of the 2. Axis (y)
P103	Vector bracket related to the 1.Achse (x)
P104	Vector length
P105	Vector splitting
P106	Number of points of positioning

G87 scope handling of a parallelogram

Vector 1	Vector 2	
P100	P110	Coordinate of the 1. Axis (x)
P101	P111	Coordinate of the 2. Axis (y)
P103	P113	Vector bracket related to the 1.Achse (x)
P104	P114	Vector length
P105	P115	Vector splitting
P106	P116	Number of points of positioning

G88 grid handling

Vector 1	Vector 2	
P100	P110	Coordinate of the 1. Axis (x)
P101	P111	Coordinate of the 2. Axis (y)
P103	P113	Vector bracket related to the 1.Achse (x)
P104	P114	Vector length
P105	P115	Vector splitting
P106	P116	Number of points of positioning

G89 circle handling

P120	Coordinate of the 1. Axis (x) of the pitch diameter centre point
P121	Coordinate of the 2. Axis (y) of the pitch diameter centre point
P122	Circle diameter
P123	Start bracket
P124	Travel bracket
P125	Vector part
P126	Number of points of positioning

8.5 Standard channel parameters (continued)**Measuring cycle**

(only if the measuring cycle G69 are used, otherwise freely available)

P140	Cycle selection	
P141	Safety margin	[mm]
P143	Measuring rate	[mm/min]
P144	Number of measurements at the same point (> 0)	[n]
P147	Pointer on the measuring tolerance data	
(P147)+4	Confidence interval	[mm]
P148	Measuring axis in plane system (1... 3)	
P149	Pointer on the data of point of trigger	
(P149)+0	XN, point of trigger in negative direction 1. Axis	[mm]
(P149)+1	XP, point of trigger in positive direction 1. Axis	[mm]
(P149)+2	YN, point of trigger in negative direction 2. Axis	[mm]
(P149)+3	YP, point of trigger in positive direction 2. Axis	[mm]
(P149)+4	ZN, point of trigger in negative direction 3. Axis	[mm]
(P149)+5	ZP, point of trigger in positive direction 3. Axis	[mm]
P150	Pointer on the calibrating drilling data	
(P150)+0	Position of the calibrating drilling centre point 1. Axis (i)	[mm]
(P150)+1	Position of the calibrating drilling centre point 2. Axis (j)	[mm]
(P150)+2	Position of the calibrating drilling centre point 3. Axis (k)	[mm]
(P150)+3	Calibrating drilling diameter	[mm]
P152	Expected drilling diameter	[mm]
P154	Pointer on the measuring data	
(P154)+0	Measuring position 1. Axis	[mm]
(P154)+1	Measuring position 2. Axis	[mm]
(P154)+2	Measuring position 3. Axis	[mm]

8.5 Standard channel parameters (continued)

Channel parameters

P70	Graphical programming environment with phase Input leg length	(G12)	[mm]
P71	Graphical programming environment with radius Input radius	(G12)	[mm]
P160	U_0 Origin axis 1 of the system UV (Rotating 45) Parameter is activated in the block with G45.		[mm]
P161	V_0 Origin axis 1 of the system UV (Rotating 45) Parameter is activated in the block with G45.		[mm]
P163	E Rotating angle Content is activated in the block with G45. Conversion of the coordinates of the UV-system into coordinates of the XY-system $X_b = (U \cdot \cos E - V \cdot \sin E) + U_0$ $Y_b = (U \cdot \sin E + V \cdot \cos E) + V_0$ see also G45/G56		[degree]
P165	U additive shift axis 1 (rotation G45 planned)		[mm]
P166	V additive shift axis 2 (rotation G45 planned)		[mm]
P168	E incrementing of the rotating angle (planned)		[degree]

8.5 Standard channel parameters (continued)

P7000 Parameter area is used by the system

.

.

P7999

	Offset
- Measuring position	0 ... 31
- Display positions	32 ... 63
- Program positions	64 ... 95
- Delta positions	96 ... 127
- Display shifts	128 ... 159

8.5 Standard channel parameters (continued)

ZSM control parameter

P7950	ZSM command
0	in the case of current measurement, the measurement is aborted.
1	start ZSM measurement
	- > P7960 to 1 is settinged
	- > if P7960 = 10 measurement terminates error free.

Internal operational sequence with the measuring start:

With the ZSM command ' start ZSM measurement ' becomes with the suitable Measuring axis (P7951) the ZSM Messaufzeichnung activates.

In accordance with the defined measuring logic of this measuring axis (P12045, byte 4), becomes with the switch edge defined there the ZSM recording started. The first edge defines a gap/tooth change.

Example: P12045: \$0 xx xx xx switch edge positively effectively
i.e.. The measured value recording starts with a positive switch edge at the sensor input (0/24V-Sprung).

A positive edge is detected as gap/tooth change —> beginning of the tooth.

A negative edge is detected as tooth/gap change —> beginning of the gap.

P7951	Axis number
Contents	log. Axis number (1... 32)
P7952	Number of teeth which can be measured (max. 250)
P7954	Correction window
	[%]
	0... 100
	Here the ZSM Korrekturalgorithmus can be influenced,
	100 ZSM Korrekturalgorithmus ineffectivly.
	0 ZSM Korrekturalgorithmus fully effectively
	if 0 or -- 80

8.5 Standard channel parameters (continued)

ZSM Statusparameter

P7960	ZSM status Parameter may not be described. 1 measured value recording runs 5 measuring analysis runs 10 measurement terminates, measured value error free valid (P7950 reaches 0) > 10 measurement incorrectly or aborted 20 measurement aborted 21 no edges were detected 22 division ?? 0 determines 24 measuring recording not correctly, missing measured values in the data array 25 measuring recording not correctly, measured values not continuously up/down-rising 30 incorrect input, P7951 / P7952 check	
P7961	Measured value 1 Tooth center Area 0... measured division	[°]
P7962	Measured value 2 Gap center Area: P7962 > P7961	[°]

8.5 Standard channel parameters (continued)

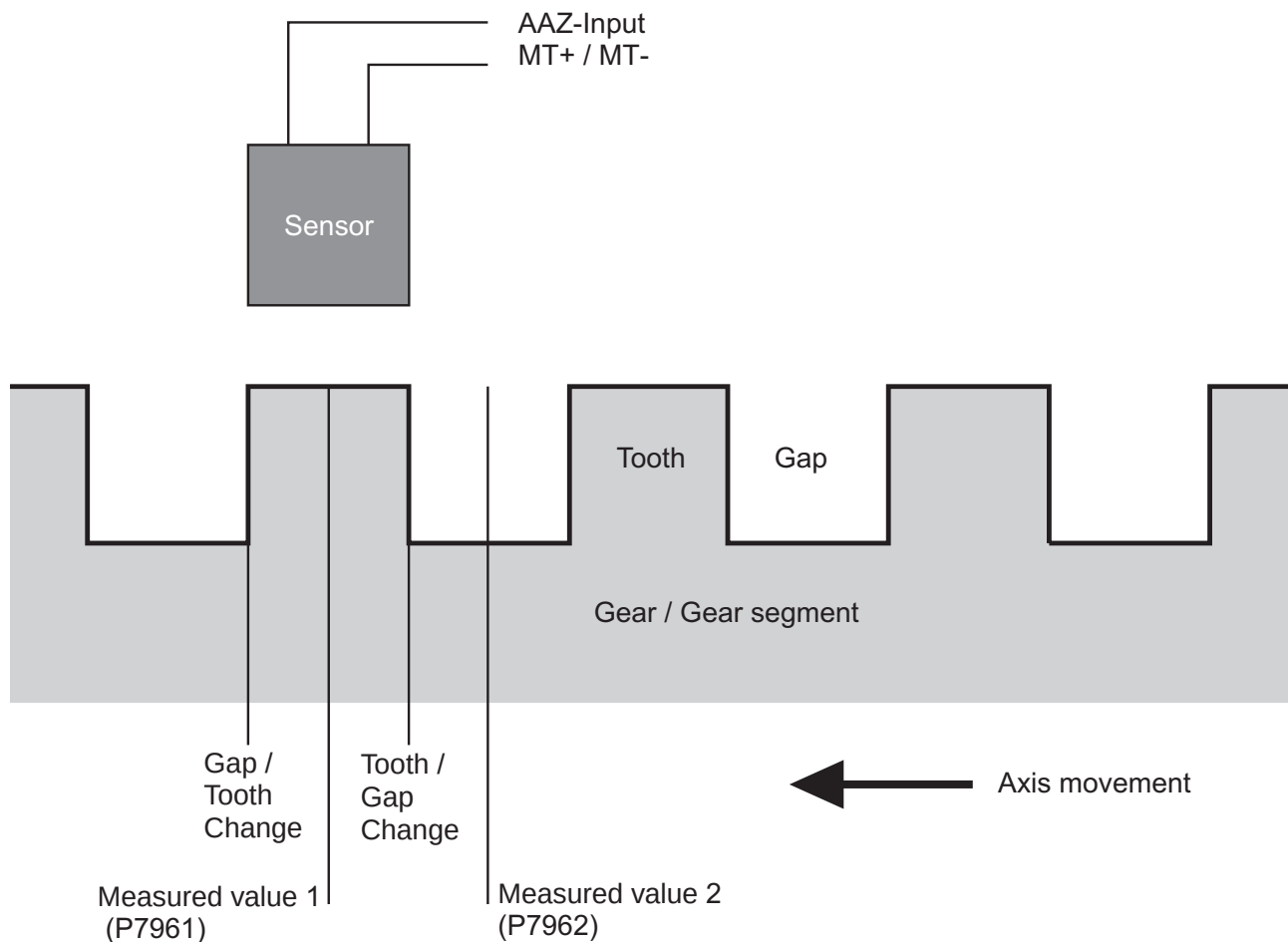
ZSM Statusparameter

Example of a measuring flow in the NC program

```

N100 P7950:1           { start measurement }
N110 M1                { loop re-entry point }
N120 P7960<10.110      { control room, to measurement terminates or aborted }
N130 P7960=10.200      { branch, if measurement of OK ONE }
N140...                { error handling, measurement aborted or errors }
:
N200...:P7961          { measured value process }
:

```



8.5 Standard channel parameters (continued)**Channel parameters**

P8000 Axis shifts
:
P8031

P8000 Shift axis 1
P8001 Shift axis 2
P8002 Shift axis 3
P8003 Shift axis 4
:
P8031 Shift axis 32

8.5 Standard channel parameters (continued)

Tool - Data - Interface

P8040 T read in locking
0 or -- T read in locking is open
1 T read in locking is set
When a locking is set, it is prevented that the realtime data block (P8200...) is written by the system.

If the read in locking is set and 'T' is programmed in the NC block, the NC program run is stoped as long as the T read in locking is set.

T read in locking is reset:

- at a NC program start
- when copying the real time data block into the spindle data block (P8046 : 2).

P8043 Tool exchange in the manual mode
Loading the tool data block into the PLC tool data block (P8050 ... P8099) and into the real time data block (P8200...).

Example: P8043:1
The tool group number 1 is searched in the tool data array. If the search is successful, the corresponding data block is copied to P8050... and P8200.

At P 8043=0 the tool data are set to zero.

If the data block can not be found, a message appears.

Subsequently, it is switched to AUTO and Z6 is called up.

At the end of Z6, it is changed back to MANUAL.

If Z6 does not exist, M6 is sent to the PLC.

At DLL active tool change command 1 is sent to the DLL before Z6 is called up.

8.5 Standard channel parameters (continued)

Tool - Data - Interface

P8045 Tool datas input

Byte 1 CMD
Byte 2 CMD Extention

CMD 1

Thus the PLC becomes tool record (P8050..) into the spindle tool record (P8100..) and the offsettings record (P8150..) copies.

CMD 2

Thus the real time record becomes (P8200...) into the spindle tool record (P8100...) copies. Additionally T read in barrier reset (P8040:0). In the operating mode HAND becomes additional the spindle tools record (P8100...) in the offsettings record (P8150...) copies.

With CMD Extention: Channel number real time of the record.

0 or -- copy over within the channel
1...8 copy over channel-spreading
spindle tool record 1..8. channel becomes in the spindle tool record (P8100...) copies.

In the tool record array becomes with the suitable tools that Tool workstation zeroed.

P8046 Tool datas copy over

- 1 Thereby the spindle tools record (P8100..) becomes in offsetting record (P8150) copies.
- 2 Thereby the PLC becomes tool record (P8050...) into that offsetting record (P8150) copies.

8.5 Standard channel parameters (continued)

Tool - Data - Interface

- P8047 Tool datas placings
1 Thereby the spindle tool data block (P8100..) becomes in the suitable tool data block array back-stored and afterwards the actual spindle tool data block reset.
- If P8100 = 0 or -- (no tools in the spindle) this procedure becomes leave immediately.
 With active tool change DLL only command 2 is transmitted to the DLL.
- P8048 Tool group number (t-paragraph from NC program)
 (parameter to the real time is described)
 The parameter is described only if ' T ' is programmed in the NC block
- P8049 Info NC block contains tool-controlling m-function
 0 no tool-controlling m-function
 6 M06 in the block
 16 M16 in the block
 P8049 is described in the advance, if T is programmed in the NC block
 P8049 is updated, before the parameter block P8050... is described.

8.5 Standard channel parameters (continued)

Tool - Data - Interface

Actual PLC tool data block

P8050 Actual PLC tool data (interface to the PLC).
: Here are the tool data, which were transmitted to the PLC.
P8099 Is loaded during block analysis with the tool data according to the T
programmed in the NC - program (see also P8049).

Special case:

If the tool group number (T number) is the same like the tool group number of a spindle data block, the PLC tool data are not loaded from the tool data array, but the spindle data block is copied into the PLC tool data block.

P8050 Tool group number (T - number)
P8051 Tool number (e.g. continuous numbering)
P8052 Tool place in the magazine
P8053 Tool sub data block (selected)

P8058 Tool life status
0 or -- tool life o.k.
1 tool life run down

P8060 Tool radius
P8061 Tool length
P8062 Radius correction offset
P8063 Length correction offset
P8064 Tool type (active quadrant 0...9)
P8065 Customer data <— Here the customer specific area begins
:
P8099

8.5 Standard channel parameters (continued)

Tool - Data - Interface

Actual spindle tool data block

P8100 Actual spindle tool data block.
: The data block refers to the actual tool in the spindle.
P8149 This data block is loaded from the tool data array and when laying back the tool
 stored again into the array.

P8100	Tool group number	(T - number)
P8101	Tool number	(e.g. continuous numbering)
P8102	Tool place in the magazine	
P8103	Tool sub data block	(selected)

P8108	Tool life status	
	0 or --	tool life o.k.
	1	tool life run down

P8110	Tool radius
P8111	Tool length
P8112	Radius correction offset
P8113	Length correction offset
P8114	Tool type (active quadrant 0...9)
P8115	Customer data <— Here the customer specific area begins
:	
P8149	

8.5 Standard channel parameters (continued)

Tool - Data - Interface

Actual data block

P8150 Actual data block.
: This is the data block, which is calculated into the NC program.
P8199 From this data block, it can not be stored back to the data array.

P8150 Tool group number (T - number)
P8151 Tool number (e.g. continuous numbering)
P8152 Tool place in the magazine
P8153 Tool sub data block (selected)

P8158 Tool life status
 0 or -- tool life o.k.
 1 tool life run down

P8160 Tool radius
P8161 Tool length
P8162 Radius correction offset
P8163 Length correction offset
P8164 Tool type (active quadrant 0...9)
P8165 Customer data <— Here the customer specific area begins
:
P8199

8.5 Standard channel parameters (continued)

Tool - Data - Interface

Real time data block

This is the data block that is loaded from the system to the real time:

- T programmed in the NC block
- T M6 programmed in the NC block (is not written at T M16)

Special case:

If the tool group number (T number) is the same like the tool group number of a spindle data block, the PLC tool data are not loaded from the tool data array, but the spindle data block is copied into the PLC tool data block.

See also T read in locking P8040

With external tool administration, the real time data block is loaded with calling up command 3.

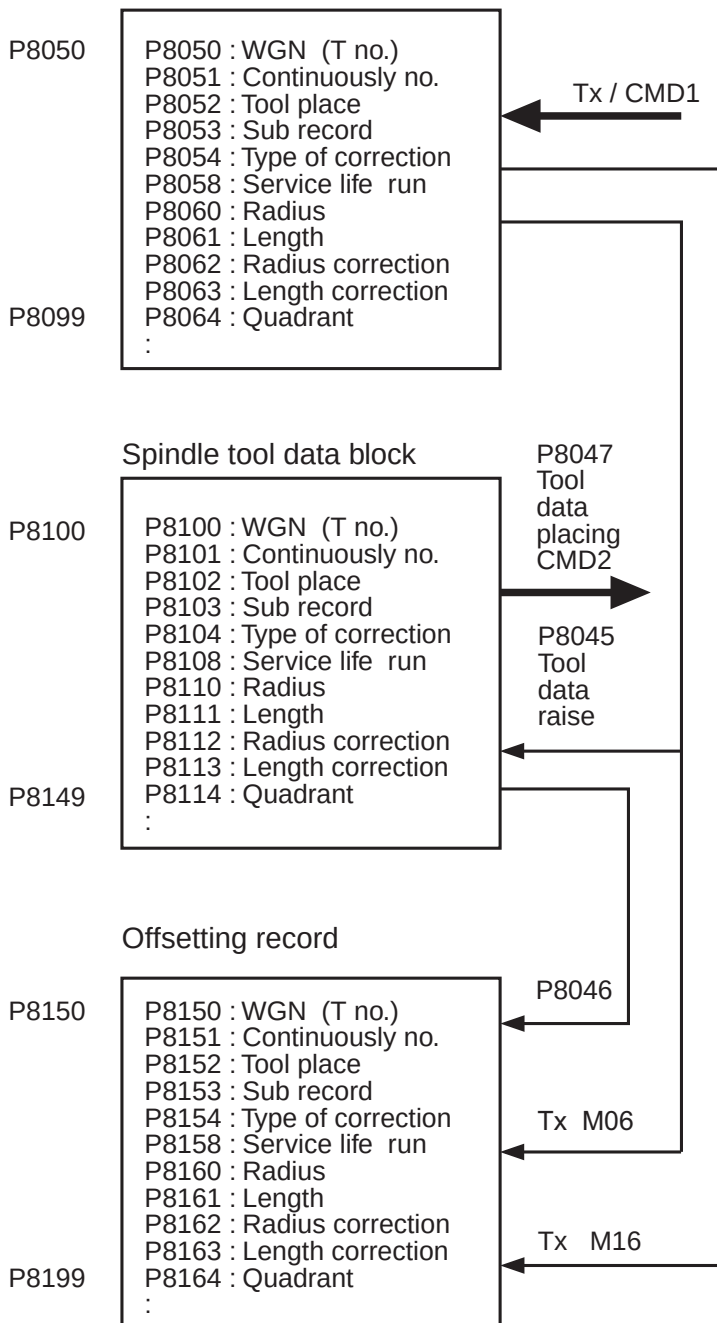
P8200	Tool group number	(T number)
P8201	Tool number	(e.g. continuous numbering)
P8202	Tool place in the magazine	
P8203	Tool sub data block	(selected)
P8208	Tool life status	(-, 0 tool life o.k., 1 tool life over)
P8210	Tool radius	
P8211	Length of the tool	
P8212	Radius correction	
P8213	Length correction	
P8214	Tool type	(active quadrant 0..9)
P8215	Customer specific area	
.		
.		
P8249		

8.5 Standard channel parameters (continued)

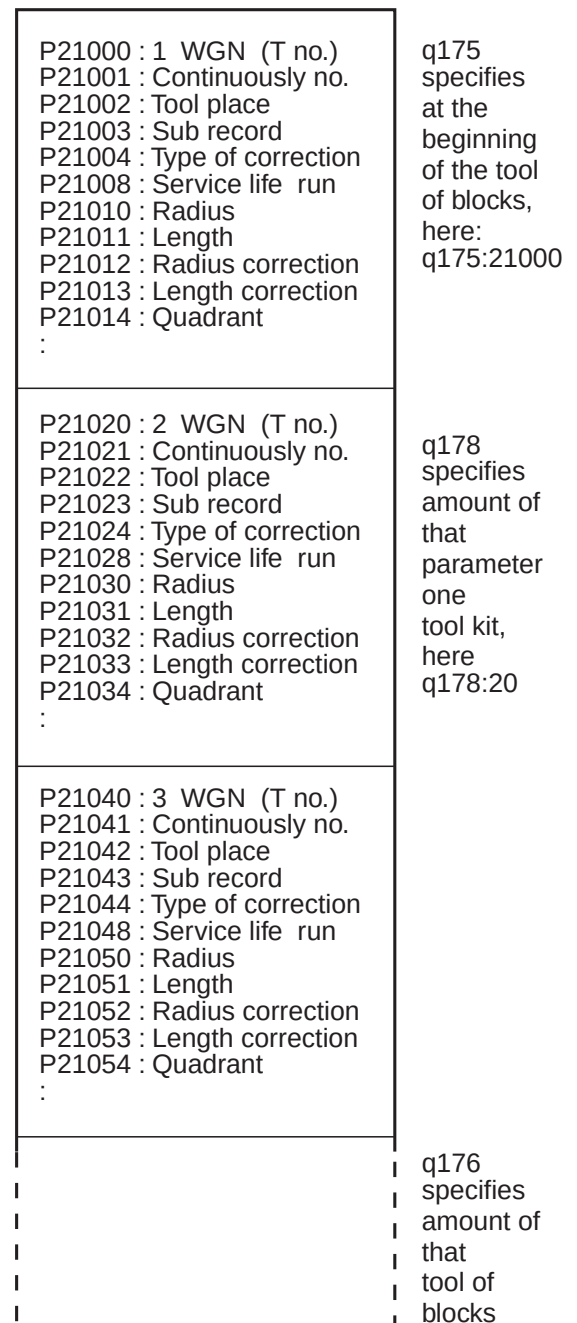
Tool data blocks in the overview

Tool data interface
specifies firmly

PLC interface



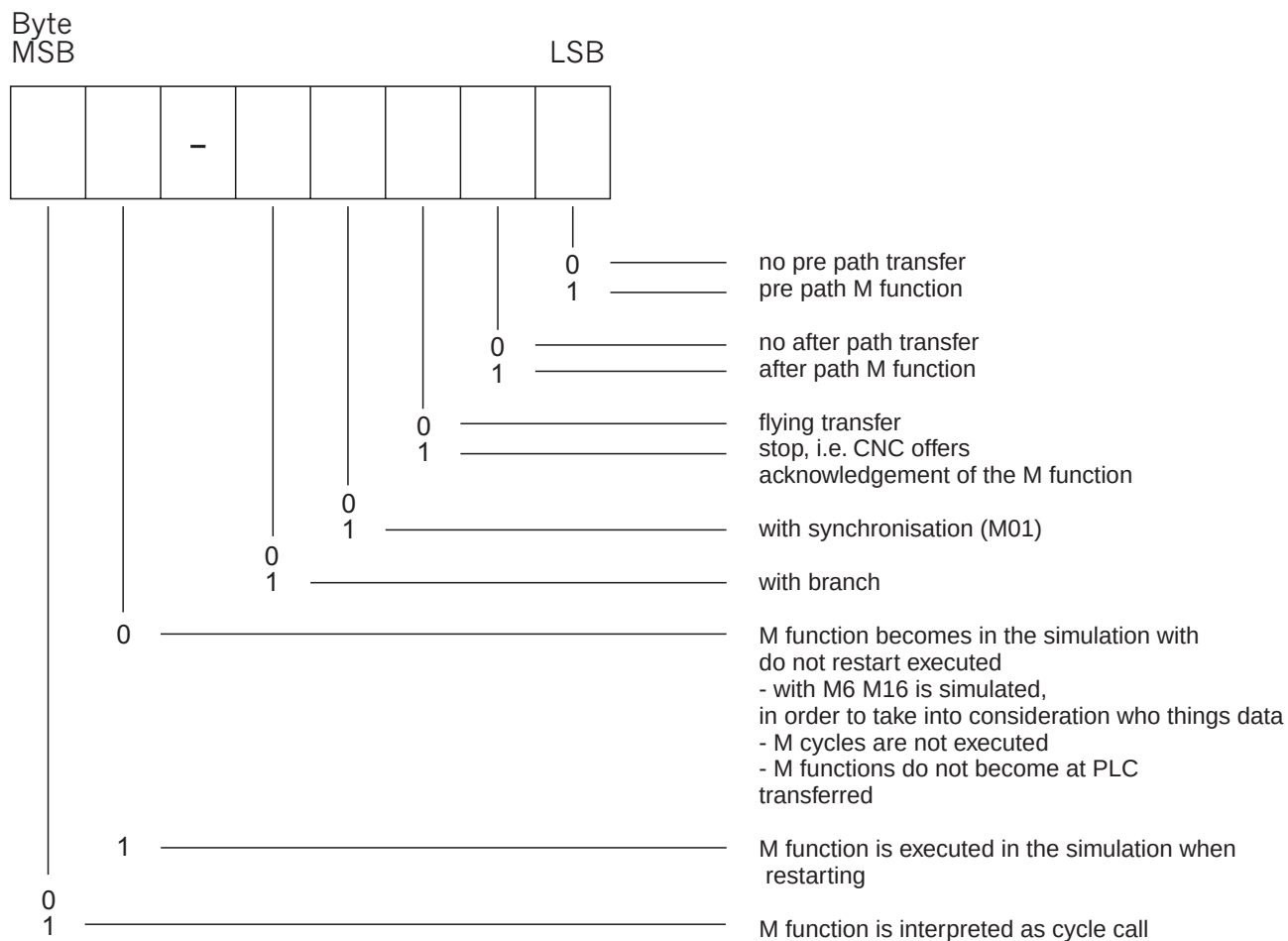
Tool data array
freely definably



8.5 Standard channel parameters (continued)

Channel specific definition of the M functions

Information for a M - function



P8250 Channel-specific definition of the M functions
see table starting from P11050, see also q158
Here 1000 channel-specific M functions can be specified.
Note: A modification in P8250.. becomes with a operating modes changes
by HAND after AUTO effectively.

8.5 Standard channel parameters (continued)

Definition of the M functions

P8250 M	03	02	01	00	P8300 M	203	202	201	200
P8251 M	07	06	05	04	P8301 M	207	206	205	204
P8252 M	11	10	09	08	P8302 M	211	210	209	208
P8253 M	15	14	13	12	P8303 M	215	214	213	212
P8254 M	19	18	17	16	P8304 M	219	218	217	216
					P8305 M	223	222	221	220
P8255 M	23	22	21	20	P8306 M	227	226	225	224
P8256 M	27	26	25	24	P8307 M	231	230	229	228
P8257 M	31	30	29	28	P8308 M	235	234	233	232
P8258 M	35	34	33	32	P8309 M	239	238	237	236
P8259 M	39	38	37	36					
					P8310 M	243	242	241	240
P8260 M	43	42	41	40	P8311 M	247	246	245	244
P8261 M	47	46	45	44	P8312 M	251	250	249	248
P8262 M	51	50	49	48	P8313 M	255	254	253	252
P8263 M	55	54	53	52	P8314 M	259	258	257	256
P8264 M	59	58	57	56					
					P8315 M	263	262	261	260
P8265 M	63	62	61	60	P8316 M	267	266	265	264
P8266 M	67	66	65	64	P8317 M	271	270	269	268
P8267 M	71	70	69	68	P8318 M	275	274	273	272
P8268 M	75	74	73	72	P8319 M	279	278	277	276
P8269 M	79	78	77	76					
					P8320 M	283	282	281	280
P8270 M	83	82	81	80	P8321 M	287	286	285	284
P8271 M	87	86	85	84	P8322 M	291	290	289	288
P8272 M	91	90	89	88	P8323 M	295	294	293	292
P8273 M	95	94	93	92	P8324 M	299	298	297	296
P8274 M	99	98	97	96					
					P8325 M	303	302	301	300
P8275 M	103	102	101	100	P8326 M	307	306	305	304
P8276 M	107	106	105	104	P8327 M	311	310	309	308
P8277 M	111	110	109	108	P8328 M	315	314	313	312
P8278 M	115	114	113	112	P8329 M	319	318	317	316
P8279 M	119	118	117	116					
					P8330 M	323	322	321	320
P8280 M	123	122	121	120	P8331 M	327	326	325	324
P8281 M	127	126	125	124	P8332 M	331	330	329	328
P8282 M	131	130	129	128	P8333 M	335	334	333	332
P8283 M	135	134	133	132	P8334 M	339	338	337	336
P8284 M	139	138	137	136					
					P8335 M	343	342	341	340
P8285 M	143	142	141	140	P8336 M	347	346	345	344
P8286 M	147	146	145	144	P8337 M	351	350	349	348
P8287 M	151	150	149	148	P8338 M	355	354	353	352
P8288 M	155	154	153	152	P8339 M	359	358	357	356
P8289 M	159	158	157	156					
					P8340 M	363	362	361	360
P8290 M	163	162	161	160	P8341 M	367	366	365	364
P8291 M	167	166	165	164	P8342 M	371	370	369	368
P8292 M	171	170	169	168	P8343 M	375	374	373	372
P8293 M	175	174	173	172	P8344 M	379	378	377	376
P8294 M	179	178	177	176					
					P8345 M	383	382	381	380
P8295 M	183	182	181	180	P8346 M	387	386	385	384
P8296 M	187	186	185	184	P8347 M	391	390	389	388
P8297 M	191	190	189	188	P8348 M	395	394	393	392
P8298 M	195	194	193	192	P8349 M	399	398	397	396
P8299 M	199	198	197	196					

8.5 Standard channel parameters (continued)

Definition of the M functions

P8350 M	403	402	401	400	P8400 M	603	602	601	600
P8351 M	407	406	405	404	P8401 M	607	606	605	604
P8352 M	411	410	409	408	P8402 M	611	610	609	608
P8353 M	415	414	413	412	P8403 M	615	614	613	612
P8354 M	419	418	417	416	P8404 M	619	618	617	616
					P8405 M	623	622	621	620
P8355 M	423	422	421	420	P8406 M	627	626	625	624
P8356 M	427	426	425	424	P8407 M	631	630	629	628
P8357 M	431	430	429	428	P8408 M	635	634	633	632
P8358 M	435	434	433	432	P8409 M	639	638	637	636
P8359 M	439	438	437	436					
					P8410 M	643	642	641	640
P8360 M	443	442	441	440	P8411 M	647	646	645	644
P8361 M	447	446	445	444	P8412 M	651	650	649	648
P8362 M	451	450	449	448	P8413 M	655	654	653	652
P8363 M	455	454	453	452	P8414 M	659	658	657	656
P8364 M	459	458	457	456					
					P8415 M	663	662	661	660
P8365 M	463	462	461	460	P8416 M	667	666	665	664
P8366 M	467	466	465	464	P8417 M	671	670	669	668
P8367 M	471	470	469	468	P8418 M	675	674	673	672
P8368 M	475	474	473	472	P8419 M	679	678	677	676
P8369 M	479	478	477	476					
					P8420 M	683	682	681	680
P8370 M	483	482	481	480	P8421 M	687	686	685	684
P8371 M	487	486	485	484	P8422 M	691	690	689	688
P8372 M	491	490	489	488	P8423 M	695	694	693	692
P8373 M	495	494	493	492	P8424 M	699	698	697	696
P8374 M	499	498	497	496					
					P8425 M	703	702	701	700
P8375 M	503	502	501	500	P8426 M	707	706	705	704
P8376 M	507	506	505	504	P8427 M	711	710	709	708
P8377 M	511	510	509	508	P8428 M	715	714	713	712
P8378 M	515	514	513	512	P8429 M	719	718	717	716
P8379 M	519	518	517	516					
					P8430 M	723	722	721	720
P8380 M	523	522	521	520	P8431 M	727	726	725	724
P8381 M	527	526	525	524	P8432 M	731	730	729	728
P8382 M	531	530	529	528	P8433 M	735	734	733	732
P8383 M	535	534	533	532	P8434 M	739	738	737	736
P8384 M	539	538	537	536					
					P8435 M	743	742	741	740
P8385 M	543	542	541	540	P8436 M	747	746	745	744
P8386 M	547	546	545	544	P8437 M	751	750	749	748
P8387 M	551	550	549	548	P8438 M	755	754	753	752
P8388 M	555	554	553	552	P8439 M	759	758	757	756
P8389 M	559	558	557	556					
					P8440 M	763	762	761	760
P8390 M	563	562	561	560	P8441 M	767	766	765	764
P8391 M	567	566	565	564	P8442 M	771	770	769	768
P8392 M	571	570	569	568	P8443 M	775	774	773	772
P8393 M	575	574	573	572	P8444 M	779	778	777	776
P8394 M	579	578	577	576					
					P8445 M	783	782	781	780
P8395 M	583	582	581	580	P8446 M	787	786	785	784
P8396 M	587	586	585	584	P8447 M	791	790	789	788
P8397 M	591	590	589	588	P8448 M	795	794	793	792
P8398 M	595	594	593	592	P8449 M	799	798	797	796
P8399 M	599	598	597	596					

8.5 Standard channel parameters (continued)

Definition of the M functions

P8450 M	803	802	801	800
P8451 M	807	806	805	804
P8452 M	811	810	809	808
P8453 M	815	814	813	812
P8454 M	819	818	817	816
P8455 M	823	822	821	820
P8456 M	827	826	825	824
P8457 M	831	830	829	828
P8458 M	835	834	833	832
P8459 M	839	838	837	836
P8460 M	843	842	841	840
P8461 M	847	846	845	844
P8462 M	851	850	849	848
P8463 M	855	854	853	852
P8464 M	859	858	857	856
P8465 M	863	862	861	860
P8466 M	867	866	865	864
P8467 M	871	870	869	868
P8468 M	875	874	873	872
P8469 M	879	878	877	876
P8470 M	883	882	881	880
P8471 M	887	886	885	884
P8472 M	891	890	889	888
P8473 M	895	894	893	892
P8474 M	899	898	897	896
P8475 M	903	902	901	900
P8476 M	907	906	905	904
P8477 M	911	910	909	908
P8478 M	915	914	913	912
P8479 M	919	918	917	916
P8480 M	923	922	921	920
P8481 M	927	926	925	924
P8482 M	931	930	929	928
P8483 M	935	934	933	932
P8484 M	939	938	937	936
P8485 M	943	942	941	940
P8486 M	947	946	945	944
P8487 M	951	950	949	948
P8488 M	955	954	953	952
P8489 M	959	958	957	956
P8490 M	963	962	961	960
P8491 M	967	966	965	964
P8492 M	971	970	969	968
P8493 M	975	974	973	972
P8494 M	979	978	977	976
P8495 M	983	982	981	980
P8496 M	987	986	985	984
P8497 M	991	990	989	988
P8498 M	995	994	993	992
P8499 M	999	998	997	996

8.5 Standard channel parameters (continued)

Messages

P8500	Message	system	causes	abort of all channels
P8501	Message	high - priority	causes	abort of the channel
P8502	Message	low - priority	causes	stop of the channel
P8503	Message	only display		
P8504	Additional information	of axis		
P8505	Additional information 1	for message	Info1	in the picture with key '?'
P8506	Additional information 2	for message	Info2	in the picture with key '?'
P8507	Additional information 3		Info3	in the picture with key '?'
P8508	Acknowledgement of pending CNC messages (see also q157)			
P8509	Actually displayed message (parameter of the PLC one describes)			
	Byte 1	Message paragraph		
	Byte 2	Message paragraph		
	Byte 3	Channel number (1... 8)		
	Byte 4	Axis paragraph (1... 32)		

(see also parameter status byte 3)

Channel locking

P8510 Automatic transmission locking

The lockings that are defined here are activated in the AUTOMATIC mode.

Activating can be done with the mode of operation changeover (see also P11010 ...)

Byte 0

Bit 0	Parameter locking 1	(see also parameter status byte 3)
Bit 1	Parameter locking 2	(see also parameter status byte 3)
Bit 2	Parameter locking 3	(see also parameter status byte 3)
Bit 3	Parameter locking 4	(see also parameter status byte 3)

Byte 2

Bit 0	NC-memory locking
Bit 1	Cycle-memory locking

8.5 Standard channel parameters (continued)

Channel informations

P8540	M function - interface diagnosis Diagnostic parameter only described with active PLC< >CNC
P8549	interface diagnosis. (P11280 = 1) Byte 1 M function paragraph Byte 2 M function paragraph Byte 3 M function definition
P8550	Channel number, is pre-allocated.
P8551	Number of axes of this channel, is obtained when the switching on routine.
P8552	Final axis in the channel (logical axis paragraph) After the switching on routine one obtains.
P8553	Mapping test parameter Mode of operation: P8553 is described with a p-paragraph, sees P8554.
P8554	Those obtains the Procedure called when describing the parameter P8553 q paragraph this parameter and this writes after P8554.
P8555	Actual work area, switches zero point blocks over 0 or -- Invalid work area 1 1. Record of the zero points actively 2 2. Record of the zero points actively :
P8559	Control rooms on end of block acknowledgement with M function with stop 0 or -- ok 1 Wait for acknowledgement (block release) (CNC waits for the PLC Acknowledgement of a m-function with stop)

8.5 Standard channel parameters (continued)

Channel informations

P8570 ... Actual reference point display

P8570	1st display field	Content:	1..32 logical axis number
:			0 no display
P8577	8th display field		

P8578 Number of max. reference point displays in the status line,
if P8578 < axis number of the last channel axis, the reference point displays
are showing the subsequent reference points.

P8679	All reference points taken
0 or --	Not all reference points taken
1	All reference points in the channel taken

8.5 Standard channel parameters (continued)

Channel informations

P8580	Actual organization of the actual position display
:	This parameter area is set by the operating system.
P8587	(may not be written).
P8580	Number of the display field
Content:	1..32 logical axis number
	0 no axis display
Byte 1	display field 1
Byte 2	display field 2
Byte 3	display field 3
Byte 4	display field 4
P8581	Number of the display field
Byte 1	display field 5
Byte 2	display field 6
Byte 3	display field 7
Byte 4	display field 8
:	
P8587	Number of the display field 29..32
P8588	Maximum number of actual display fields

8.5 Standard channel parameters (continued)

Channel informations

P8590 Standard (customer specific) organization of the actual position display
: At each operating mode change, the here defined actual position display is activated.
P8597

P8590 Number of the display field
Content: 1..32 logical axis number
0 no axis display
Byte 1 display field 1
Byte 2 display field 2
Byte 3 display field 3
Byte 4 display field 4

Comment:

With the describing of P8590 the Istpositionsanzeige is again structured.
(trigger parameters)

P8591 Paragraph of the indication area
Byte 1 display field 5
Byte 2 display field 6
Byte 3 display field 7
Byte 4 display field 8

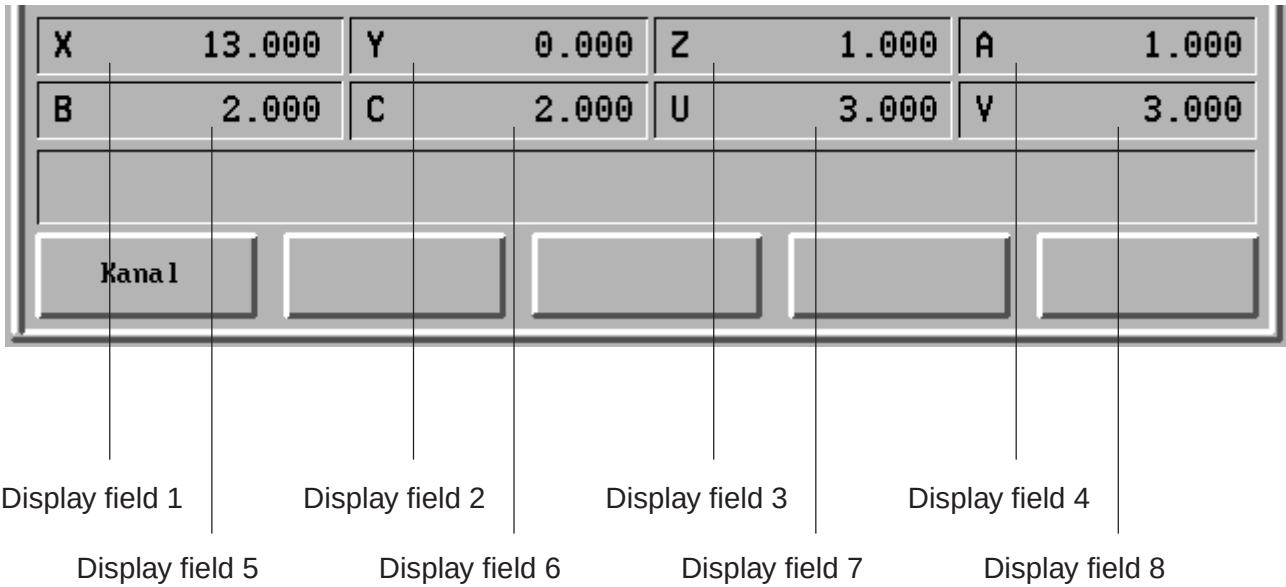
P8597 Paragraph of the indication area 29.. 32
Parameter with trigger function.
With each describing P8597 becomes into that
parameters P8590... activates p8597 specified Istpos display.

P8598 Display mode of the actual position display
0 or -- If the actual position display knows not all available axes at the same time
to raise, if this becomes on the final indication area with the axis selection
of an axis, which not at the moment to display comes, another axis
to displace.
1 Actual position display does not change.

8.5 Standard channel parameters (continued)

Channel informations

Example actual position display



8.5 Standard channel parameters (continued)

Presettings MANUAL (planned)

P8600 Presetting axis position display
:
P8639

8.5 Standard channel parameters (continued)

Presetting AUTO (planned)

P8640 Presetting axis position display
:
P8679

8.5 Standard channel parameters (continued)

Channel - Commands to PLC

P8681	Key Manual 0 Key released 1 Key pressed P8681 is written by the operating panel.	(to PLC)	is written by the operating panel (PLC:THANDK1)
P8682	Key Start / Stop 0 Keys released 1 Key Stop pressed 2 Key start pressed When writing P8682, P8684 is written with AUTO Start /-Stop and answered to the PLC.	(to PLC)	is written by the operating panel (PLC:TSTOPK1) (PLC:TSTARK1)
P8683	Mode of operation change 1 Manual Pending CNC messages become with mode change after hand reset. 2 Automatic sequential block 3 Automatic single block 8 Automatic positioning block	(to PLC)	 (PLC:BAWHAK1) (PLC:BAWAUK1) (PLC:BAWAUK1) (PLC:BAWAUK1)

8.5 Standard channel parameters (continued)

Channel - Commands to PLC

P8684 Automatic transmission Start/Stop (to PLC)

0 Stop

(PLC:TASTOK1)

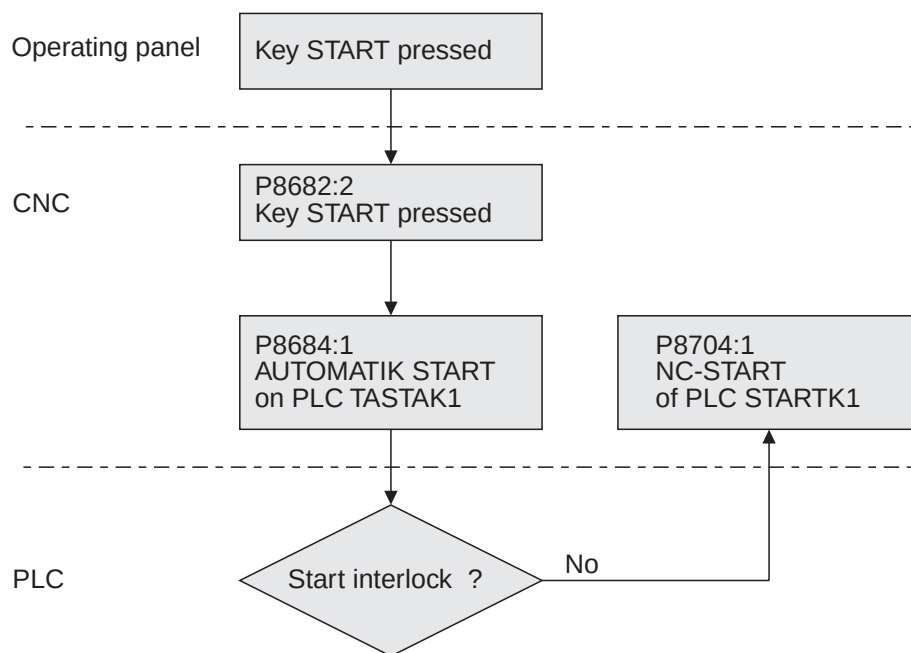
1 Start

(PLC:TASTAK1)

Example: NC Program start

When writing P8682, P8684 is written with AUTO- Start/Stop and answered to the PLC.
If there are no start interlocking in the PLC, the Start/Stop command is answered to P8704. With P8704 the NC program (P8800) is started.

Example: Flow of a NC program start



P8685 Automatic program active (to PLC)

The CNC indicates here the actual condition.

The parameters may not be written.

0 Program not yet active or finished.

(PLC:ANAK_K1)

1 Program active Stop

(PLC:AASP_K1)

2 Program active Start

(PLC:AAST_K1)

8.5 Standard channel parameters (continued)

Channel - Commands to PLC

- P8686 Restarting info. at PLC
0 No restarting, normal railway company.
1 Restarting without axis movement, NC program is in the browsing.
2 Restarting at outline (axis movement), starting block was found.
Outline on direct path started with rapid traverse feed (P8816).
With achieving the outline P8686:0
- P8689 Actual type of coordinate (see also P8759)
0 or -- Transformation out
15, 16 Polar transformation
47, 48, 49 Robot transformation
- P8690 M function code at PLC
Transmit a m-code at PLC in the manual operation.
- P8695 Acknowledgement for remainder path resetting
0 or -- With NC block with M26 a NC nC-Verfahrweg becomes over
- hardware sensor input
- P8715
aborted,
P8695 with the actual NC record number is described.
- P8696 Acknowledgement for measuring position accommodation
0 or -- With start of a measuring travel P8717 measuring position raised over
- hardware sensor input
- P8716
aborted,
P8696 with the actual NC record number is described.

8.5 Standard channel parameters (continued)

Channel commands of the PLC

P8700	Enable regulator for channel 0 no regulator enabling, i.e. command = actual of the axis 1 enable regulator	(PLC:REOK_K1)
P8701	Enable move of all axes in the channel 0 no channel enabling, i.e. stopping the axes without dynamics 1 channel enabling	(PLC:KAFR_K1)
P8702	Security stop of all axes in the channel 1 Stop, i.e. stopping the axes with dynamics	(PLC:SICHAK1)
P8703	Mode of operation 1 MANUAL 2 AUTO sequential block 4 AUTO single block 8 AUTOp positioning block	(PLC:BA_K1) (PLC:HAND_K1) (PLC:AUTF_K1) (PLC:AUTE_K1) (PLC:AUTP_K1)
P8704	AUTO Start / Stop Herewith a NC program is started (number is in P8800). 0 Stop 1 Start	(PLC:STARTK1)
P8705	NC program abort 1 Abort	(PLC:ABBRUK1)
P8706	Enable block Sentence by sentence control of a NC program 0 No block change 1 Block change	(PLC:SAFREK1)
P8709	Reference points taken 0 Reference points not yet taken 1 All reference points taken	(PLC:REFALK1)

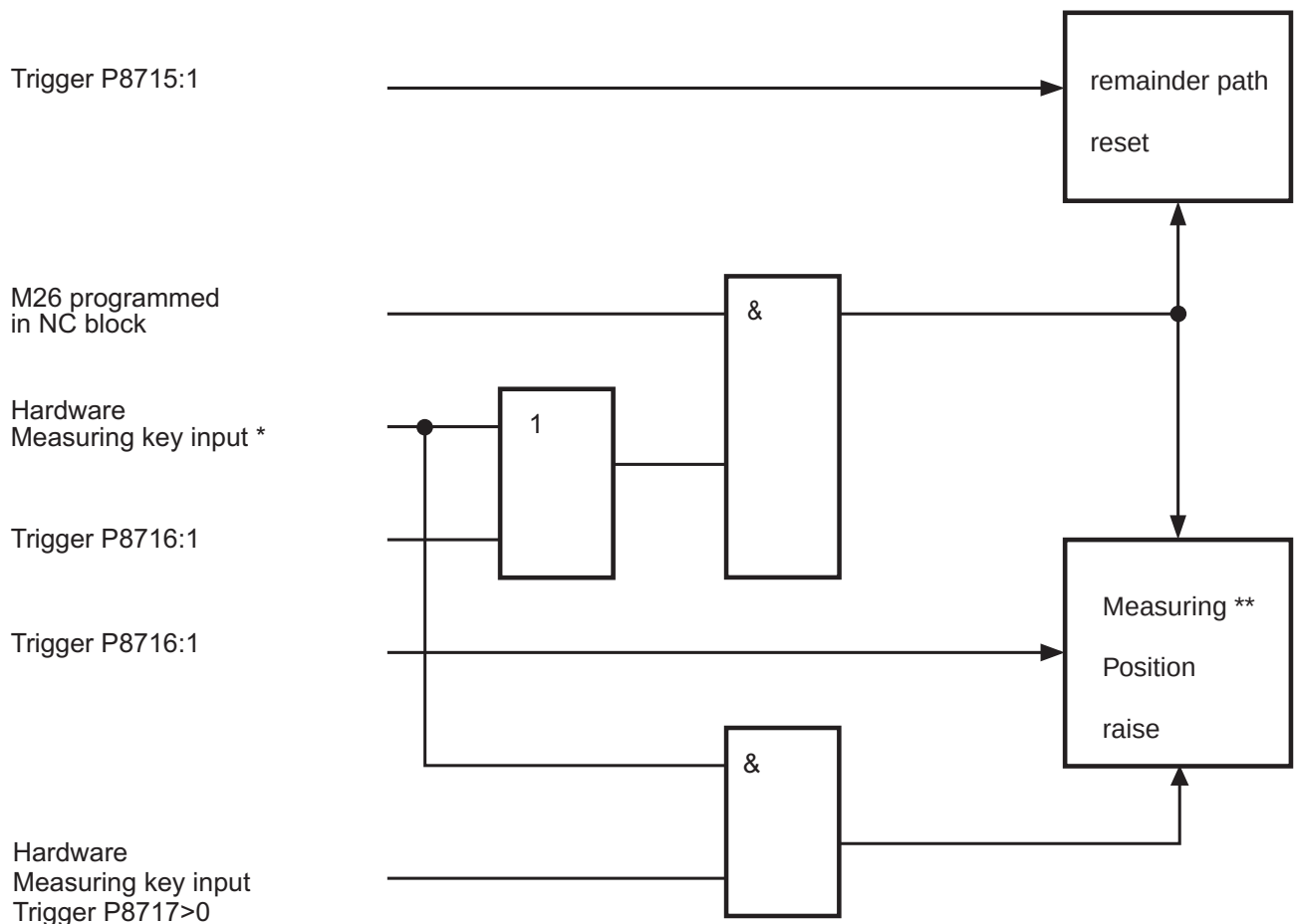
8.5 Standard channel parameters (continued)

Channel command of PLC

P8710	Emergency programm call 1 0 No call 1 Program call Program - and block number according to P8820, P8821 Function: When calling up an emergency program a running NC program is interrupted. When activating a emergency program in manual mode, the operating mode AUTO sequential block is changed. If operating mode change is locked, the message 1320 appears. At the end of the emergency program the mode of operation AUTO sequential block remains. When starting the emergency program P8710 is loaded with 0.	(PLC:NPA1K1)
P8711	Emergency program call 2 0 No call 1 Program call Program- and block number according to P8822, P8823 Function see P8710	(PLC:NPA2K1)
P8714	Conditional block skip 0 no skip 1 skip after block number	(M22) (PLC:BSP22K1)
P8715	Trigger for clearing movement in progress 1 trigger	(M26) (PLC:TRWLOK1)
P8716	Trigger for software-measuring key 1 trigger	(PLC:TSWMTK1)
P8717	Measuring position release 1 Measuring position release over sensor input unique release for measuring position accommodation 2 Measuring position release over sensor input constant release for measuring position accommodation (see P8696)	

8.5 Standard channel parameters (continued)

Clearing residual traverse (movement in progress) Measuring position logics



note:

* see also P12045 measuring logic

** see also P12153 measuring position
 P12181 measuring position achieves
 P8855 measuring position type of display
 P8655 acknowledgement measuring position accommodation

8.5 Standard channel parameter (continued)

Teach-in

- P8747 Axis selection at Teach-In
0 or -- All existing axis positions are overtaken in the NC block at key target=actual
<>0 Only axis positions according to selection are overtaken in the NC block
Example:
P8747: 0FH At axis 1 to 4, the position is overtaken in the NC block.
- P8748 Radius of the tool used in Teach-In.
- P8749 Mode of coordinate for Teach - In
Input 0 off
48 tool coordinate mode
49 work piece coordinate mode

8.5 Standard channel parameters (continued)

Manual operation

P8750	Traverse mode selection	
1	Continuously (relative)	(PLC:KONT_K1)
2	Step (relative)	(PLC:STEP_K1)
3	Hand-wheel	(PLC:HARA_K1)
4	Divide (absolute/relative)	(PLC:TEIL_K1)
5	Home (absolute/relative)	(PLC:HOME_K1)

P8751	Axis selection	(PLC:RAGAWK1)
	Logical axis number 1...32	

P8752	Manual move + / -	
0	stop	
1	+	(PLC:HAND+K1)
2	-	(PLC:HAND-K1)

With the describing of this parameter the technique becomes the axis (P8751) started in the suitable procedure mode (P8750). Parameter becomes of the system with depressing the key hand + / - described.

P8753	Relative-travel in manual mode (internally used parameter)	
P8754	max. programmable manual feed	[mm/min, degree/min]
P8755	Programmed manual feed rate	[mm/min, degree/min]
P8756	Actual manual feed rate	[mm/min, degree/min]

8.5 Standard channel parameters (continued)

Manual operation

- P8757 Coordinate system in HAND
Input -- , 0 , 17 G17
18, 19, 117, 118, 119 Gxxx
The tool length always affects the vertically axis of the interpolation plane.
Parameter wid after each passing through of the switching on routine reset.
- P8758 Zero pointes in Manual
- display of the actual zero point in manual operation.
- When writing the corresponding zero point is activated.
Input 53 . . 59
Parameter wid after each passing through of the switching on routine reset.
- P8759 Coordinate mode in Manual
0 transformation off
Polar transformation
Input 15 off
16 on
Robot transformation
Input 47 off
48 Tool - coordinates
49 Workpiece - coordinates
4849 Automatic switch between 48 and 49
Parameter wid after each passing through of the switching on routine reset.

8.5 Standard channel parameters (continued)

Step operation

P8760	Actual step width		[mm]
P8761	step width 1 h on step width		
P8762	Pointer on selected step		
P8763 : P8769	Step width table		
P8763	Step width 1 default	10	
P8764	Step width 2 default	1	
P8765	Step width 3 default	0,1	
P8766	Step width 4 default	0,01	
P8767	Step width 5 default	0,001	
P8768	Step width 6 default	0	
P8769	Step width 7 default	0	

8.5 Standard channel parameters (continued)

Indexing (planned)

P8780

:

P8789

8.5 Standard channel parameters (continued)

Home (planned)

P8790

:

P8799

8.5 Standard channel parameters (continued)

Start data

P8800 Program number of the program to be started (see P8704)

P8801 Block number
Start from this block.

P8802 Program number in the case of the NC program abort
Parameter is described by the system
see function: Restart at outline

P8803 Record number in the case of the NC program abort
Parameter is described by the system
see function: Restart at outline

P8804 Restarting at outline
0 or -- Restarting function not actively
1 Restarting function actively

Mode of operation restarting at outline:

In the case of the abort of a current NC program (HAND abort, message) becomes of system the actual NC program position in the parameters P8802, P8803 and P8807 stored. A properly terminated NC program resets these information.

After an NC abort if the restarting mode is switched on and the NC program started, then if the NC program up to the restarting point is simulated, i.e.. no axis movements egeben themselves.

In the restarting block the simulation is switched off. The restarting position on direct path one starts. With achieving the restarting position becomes P8804=0 settinged.

One restarts on the initial position of the aborted block.

If the NC program in a process cycle is aborted, then becomes to cycle start started.

When restarting become accordingly m-functions, M6 and m-cycles
M function definition (P11050..., P8250...) treats.

During the restarting simulation P8050 (advance t NR.) becomes to the PLC do not transfer.

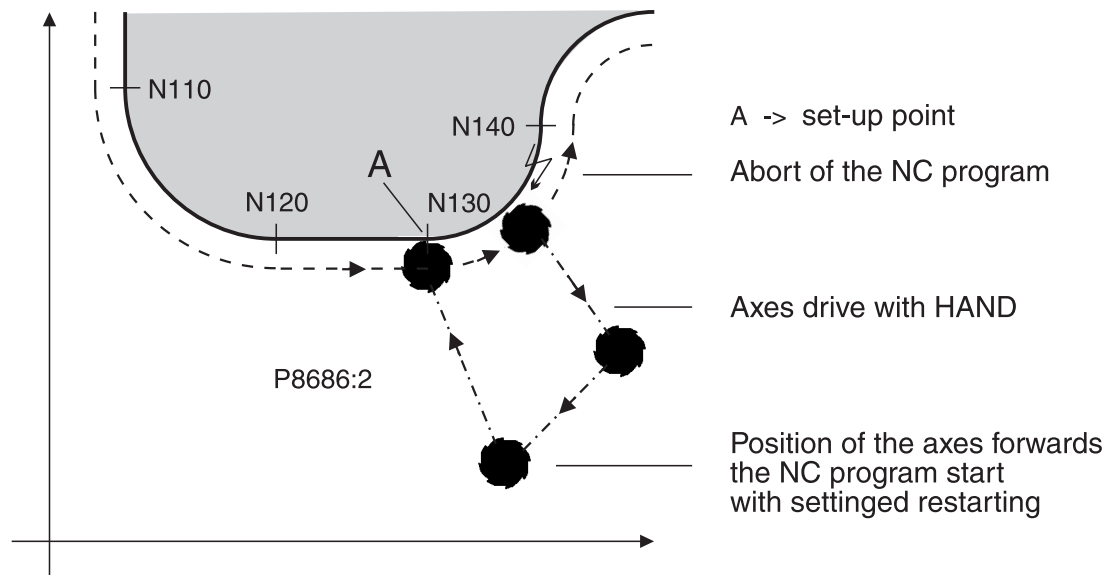
see also P8686

8.5 Standard channel parameters (continued)

Start data

P8805 Restarting adjustments

Example:



8.5 Standard channel parameters (continued)

Start data

P8806	Start data flag		
	Byte 1 bit 0	0	No block display during cycle handling
		1	Block display runs during cycle handling
	Byte 2 bits 0	0	Increasing automatic file barrier actively, i.e. of the NC interpreter processed NC programs and cycles remain up to the program end (abort or M30) with the editing barrier provide (max. 250 entries).
		1	Increasing automatic file barrier not actively, now the editing barrier is only so long active, as the NC interpreter the NC program opened (interpreter operates in the advance).
	Byte 3 bit 0	0	Drill cycles do not pend to modal, G80 does not have effect.
		1	Drill cycle modality switched on, i.e. with the unique programming of a Bohrzyklus (G81, G83, G84, G85) becomes in the following NC blocks 'also path' implicitly the drill cycle programmed first called. This Modalitaet is switched off with G80.
P8807	Internal restarting information		
P8809	Graphics on/off		
	0	Graphics off	
	1	Graphics on	
P8810	Block skip		
	0	Block skip not switched on	
	1	Block skip switched on	
P8811	Dripfeed operation		
	0	No Dripfeed operation	
	1	With Dripfeed operation	
P8812	Without axis movement		
	1	NC program sequence without axis movement	

8.5 Standard channel parameters (continued)

Start data

P8813	Without M - function 1 NC program sequence without M-function - M-functions at PLC are not transmitted - program-controlling M-functions work unchanged - branch M-functions do not branch	
P8814	Single block mode with / without stop in intermediate blocks 0 or -- each main block is stopped in the single block mode 1 after each block end is stopped in the single block mode (at cycle blocks, insert block etc.)	
P8815	Test feed rate 0 or -- switched off <>0 at G01, G02 and G03 this programmed feed is used.	[mm/min]
P8816	Rapid traverse G00 0 or -- Manual feed rate active max. Axis speed (P12004) the axes available in the channel positions. < > 0 with prog. Rapid traverse is positioned with this speed.	[mm/min]
P8817	Asynchronous feed rate The programmed feed rate of the active NC block is replaced until the block end by the feed rate of P8817	[mm/min]
P8818	Percentage feed rate change The programmed feed rates in the NC program are changed with this percentage value.	[%]

8.5 Standard channel parameters (continued)**Start data**

P8820	Program number	Emergency program 1
P8821	Block number	
	Emergency program call up see P8710	
P8822	Program number	Emergency program 2
P8823	Block number	
	Emergency program call up see P8711	
P8824	Program number	
P8825	Block number	
	Emergency program call up see P8712	
P8826	Program number	
P8827	Block number	
	Emergency program call up see P8713	
P8830	Zero point in AUTO	
	0 or --	NC program starts with G53
	53..59,153..	NC program starts with the programmed zero point

8.5 Standard channel parameters (continued)

Program controlling parameters

P8840 Definition of the coordinate system for G117
(see also q152...)

Byte 1	1. logical axis paragraph abscissa (horizontal axis) centre point identifier I
Byte 2	2. logical axis paragraph ordinate (vertically axis) abscissa and ordinate specify the level, in which the circular interpolation takes place. centre point identifier J
Byte 3	3. logical axis paragraph definition of the vertically axis on the interpolation level

The definition of the sense of circle turning a right-angled coordinate system always becomes assumed.

The direction of rotation in the various levels is as follows determined:

One looks against the direction of the axis, which is vertically on the level.
(axis No. in byte 3).

With G02 now in the clockwise direction one interpolates.

With G03 against the clockwise direction one interpolates.

Programming example:

```
N100 G117 P8840:$00010302
      byte:  4 3 2 1
```

P8841 Definition of the coordinate system for G118 (see also q153..)
Default, if

0 or --	\$020103
Byte 1	03 (centre point identifier K)
Byte 2	01 (centre point identifier I)
Byte 3	02

P8842 Definition of the coordinate system for G119 (see also q154..)
Default, if

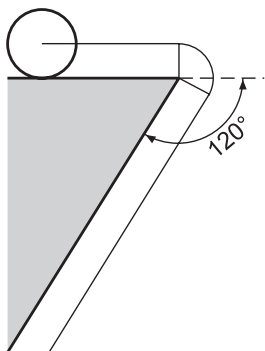
0 or --	\$010302
Byte 1	02 (centre point identifier J)
Byte 2	03 (centre point identifier K)
Byte 3	01

8.5 Standard channel parameters (continued)

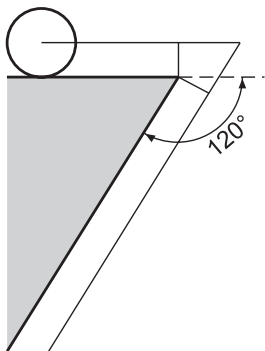
Program controlling parameters

- P8843 Max. one permitted radius error during centre point programming [mm]
 0 or -- Default radius error 0.003mm
 otherwise error message M1238
 < > 0 Permitted error of the radius during centre point programming, starting from that the error message M1238 is output.
- P8844 Radius correction messages suppress
 Byte 1
 bit 0 0 M1154 release
 1 M1154 is suppresses
 bit 1 0 M1155 release
 1 M1155 is suppresses
- P8845 Inserting sets / intersections with werkzeugradius-Korrektur.
 -- at outside edges sets are always inserted.
 0 in the case of direction deviation over 120 degrees sets are inserted under 120 degrees intersections are calculated.
 0... 180 [degrees] in the case of direction deviations, which are larger than the input degree number, sets are inserted and in the case of direction deviations, which are smaller than the input degree number, intersections are calculated.
 Example:
 Direction deviation 120° and degree number of 110: Circle is inserted.
 Direction deviation 120° and degree number of 130: Intersection is calculated.

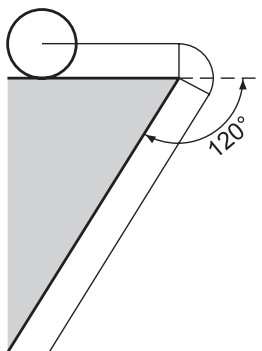
P8845 : --



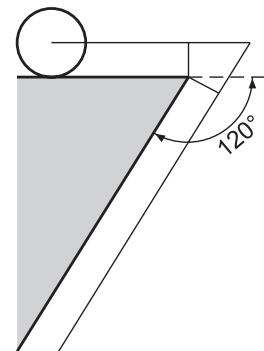
P8845 : 0



P8845 : 110°



P8845 : 130°



8.5 Standard channel parameters (continued)

Program controlling parameters

P8846 Spline modification
0 or -- 3D-spline (standard)
< > 0 5D-spline switched on
 byte 1 logical axis paragraph of the 4. spline axis
 byte 2 logical axis paragraph of the 5. spline axis

1., 2., 3. Spline axis are specified over G17, G18, G19.

Example: P8846:\$0604 means

4. Spline axis is 4th logical axis

5. Spline axis is 6th logical axis

P8847 Spline modification
0, -- or 0,5 Standard spline
0,5... 2 Spline modifies
 i.e. decaying the Splines is influenced.
0,5 Flat spline
0,85 Spline decays more

Effectiveness becomes clear with large bracket steps.

8.5 Standards channel parameters (continued)

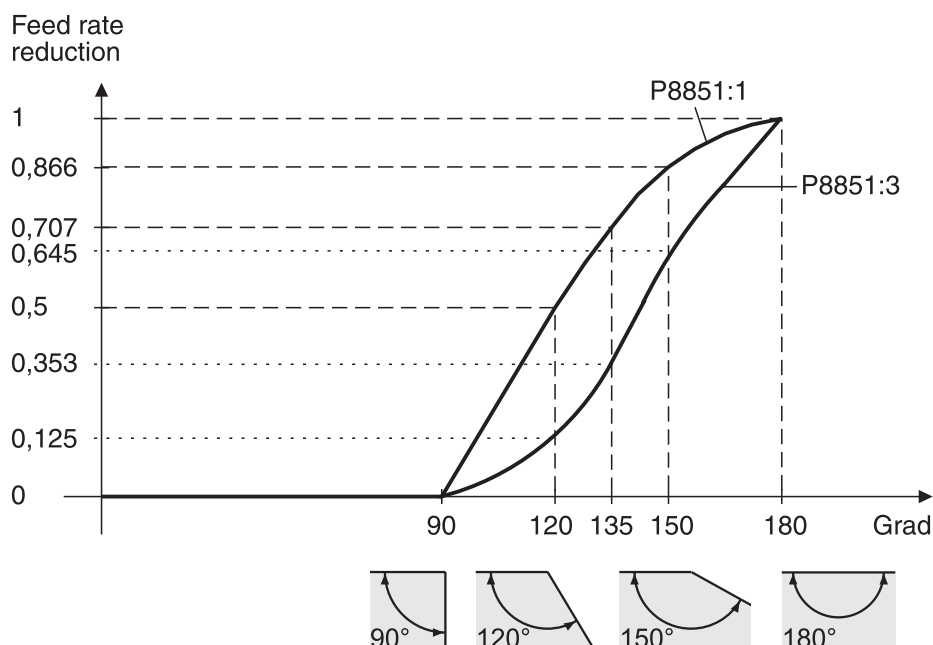
Program controlling parameters

P8851 Corner dynamics [Input: 0... 10]
 0 or -- Standard corner dynamics actively
 < > 0 Corner dynamics
 -1 Switch off

Function of the standard corner dynamics

When approaching a corner, the contour feedrate is reduced in dependancy of the corner angle, that means slow down before corners. Because of the corner angle, a reducing factor is effective (cos), which results in the contour feedrate before the corner when multiplying with the programmed feed rate.

Example: Corner angle	Corner feed reduction	
	at P8851:1	at P8851:3
≤90 degree	0	0
120 degree	0,5	0,125
135 degree	0,707	0,353
150 degree	0,866	0,649
180 degree	1	1



Function corner dynamics

At P8851>0, the standard reducing factor is raised to a power with the content of P8851. The larger P8851 is, the more it is slowed down before corners.

8.5 Standards channel parameters (continued)

Program controlling parameters

P8852	Circle dynamics	[mm]
0 or --	Circle dynamics switched off	
<>0	Circle dynamics active	
	input value permissible path deviation	[mm]
	function reduction of the feedrate at circular interpolation	

At circular interpolations (G02/G03), an internal circle feed rate is calculated with the help of the permissible path deviation which is limiting the feed rate that is programmed in the NC program.

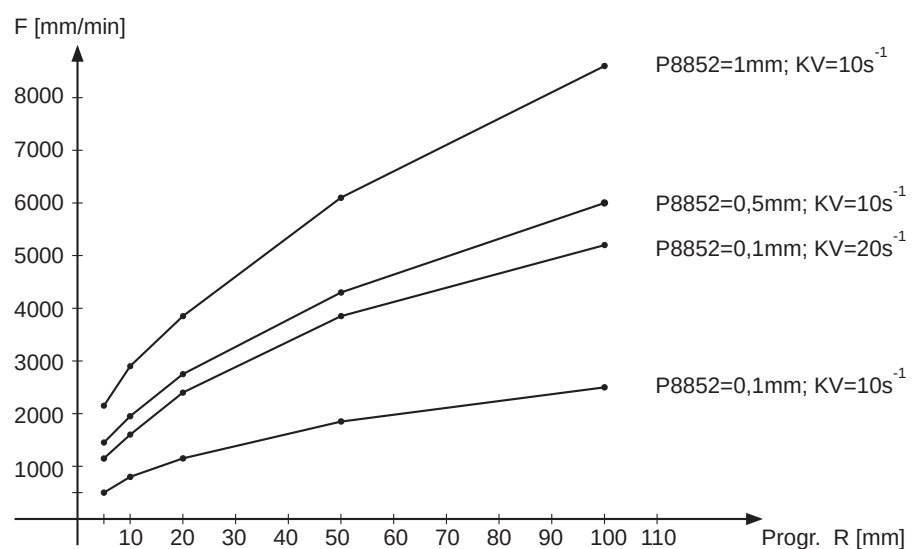
Internal circle feed rate is dependant of

- programmed radius
- KV factor
- P8852

Remark:

P8852 always has to be smaller than the programmed radius, if not error message M1237 appears

Example



8.5 Standards channel parameters (continued)

Program controlling parameters

P8853	Preset coordinate mode at NC program start 0 or -- No coordinate mode selected 49 NC program is starting with the indicated coordinate mode 49
P8854	Radius correction at G49 0 or -- Radius correction in space, spline-contour G50 1 Radius correction in plane
P8855	Measuring position modification (P12153) 0 or -- Store measuring position ref. display position 1 Store measuring position ref. machine position
P8856	Internal parameter (zero point setting CNC < —> Bediendeld)
P8857	Outline dynamics with path interpolation 0 or -- Outline dynamics switched off < > 0 Outline dynamics actively Input value certified path deviation [mm] Function reduction of the feed drive path (G1, G2, G3, G50) The programmed points of path are connected with sets. Thus the calculated circle radii form the basis for one possible path feed reduction. To calculation see P8852.
P8858	Definition of rapid traverse (G00) Rapid traverse rate (see P8816) 0 or -- Rapid traverse always with exact stop, i.e.. at the end of record feed = 0, lag distance < exact stop 1 Rapid traverse always with feed stop i.e.. at the end of record feed = 0, for lag distance < exact stop is not waited 2 Rapid traverse no stop end of record handling as with (G1, G2, G3, G50)

8.5 Standards channel parameters (continued)

Program controlling parameters

- P8859 G92-Modifikation
Parameter must be settinged before the NC program start!
Byte 1
 bit 0 0 G92-Verschiebung rotates with 1. Rotation axis
 1 G92-Verschiebung no rotating with 1. Rotation axis
 bit 1 0 G92-Verschiebung is turned by G45 (starting from version 090)
 1 G92-Verschiebung is not driven by G45
- P8860 G95-Modifikation
Byte 1
 \$xx 0 G95 acquisition data concerning spindle data 1 (P11640)
 1 - 8 G95 reference spindle from spindle data 1-8
 Byte 2
 \$xx 1 - 8 G95 acquisition data bezueghlich coupling data 1-8
 (* tooth number of masters / tooth number of Slave)
- P8861 Feed modification for not interpolated axes
Only effectively if P8893 < > 0;
 0 or -- Axis feed concerning absolute feed P12122
 1 Equal axis feed programmed path feed in the NC program
 2 Axis feed equal programmed path feed proportion everything
 in the NC Progroramm more programmieter (not interpolated axes)
 i.e.. Axis final positions are achieved at the same time.
- P8865 Channel-specific definition of the Overrides for interpolation rate
 0 or -- Default Override 1 (1-8)
 Observe:
 Override Definitions in the axis data (P12125) are superordinate!
- P8866 Channel-specific definition of the Overrides for relative velocity
 0 or -- Default Override 1 (1-8)
 Observe:
 Override Definitions in the axis data (P12126) are superordinate!
- P8867 Channel-specific definition of the Overrides for absolute speed
 0 or -- Default Override 1 (1-8)

Note: Override Definitions in the axis data (P12127) are superordinate!

8.5 Standards channel parameters (continued)

Program controlling parameters

P8880 Axis change, switch on, switch off
 0 or -- Switched off
 1 Axis change on

If an axis change is switched on, the display position is exchanged.

Zero point shifts from G53 to G59 effect on the physical axes, they remain at the same physical axis at an axis change.

Zero point shift G92 and correction G44 effect on logical axes and are influenced therefore by the axis exchange.

P8881 Exchange the two physical axes
 Byte 1: on axis
 Byte 2: from axis
 Input of the logical axis numbers

Example: P8881 : \$0106
 P8882 : \$0601

i.e. axis change between axis 1 and axis 6

Programmed commands in the NC program
for 1st axis are transmitted to 6th axis,
for 6th axis are transmitted to 1st axis.

P8882 Axis change
P8883 Axis change
:
P8889

8.5 Standard channel parameters (continued)

Program controlling parameters

P8890 Tangential axis

0 No tangential axis available in the channel

1-32 logical axis number

The here indicated axis becomes tangential the programmed path of the NC program adjusted.

P8891 Axis specific block locking

Bit 0 1 1st logical axis with axis-specific block locking

Bit 1 1 2nd logical axis

:

Bit 31 1 32nd logical axis

Function:

If the axis-specific block locking is selected, executing the NC program in the interpolator is stopped if axes should be moved which are selected with the axis-specific block locking.

P8892 Axis reflection

Parameter contains bit information

Bit 0 1 1. logical axis reflect

Bit 1 1 2. logical axis reflect

:

Bit 31 1 32. logical axis reflect

Mode of operation:

One reflects around the actual machine position P12150.

Is modified thus the debit position P12151 of + < - > -;

and the indicator position P12154 of + < - > -;

e.g.. P12154: 150,0 P12154 becomes: -150.0

With programmed positive drive, the axis moves around this amount in negative direction.

Parameter is reset with each mode change after HAND.

8.5 Standard channel parameters (continued)

Program controlling parameters

P8893	Traverse axis not interpolating Parameter with bit information
Bit 0	1 1st logical axis with axis-specific block locking
Bit 1	1 2nd logical axis
:	
Bit 31	1 32nd logical axis

Mode of operation:

During the processing of a NC program in the Interpolator, the setting axis becomes from the interpolation removes and parallel (as absolute position with feed P12122... or with progr. To path feed see P8861 driven).

At the NC end of record an exact stop requested waits the CNC to all axes (also the not interpolated) in position, or with not interpolated axes and programmed Vorposition P12113, this is achieved

Parameter is reset in each switching on check.

P8894	Axes reduct switch off Parameter contains bit information
Bit 0	1 1. logical axis no Achsreduct
Bit 1	1 2. logical axis
:	
Bit 31	1 32nd logical axis

Mode of operation:

During processing of a NC program the axes indicated here become with the calculation of the feed dynamics (P8851) does not consider, or with programmed path feed (see P8861) proceed.

Parameter is reset in each switching on routine.

P8899	Bracket axis system modification (see P11830 etc..)
0	Path operation (display as programmed, to axes drive with bracket proportions)
1	Axis operation (drive display with bracket proportions, of axes as programmed)

8.5 Standard channel parameters (continued)

Real time - Information block analysis

P8900	Actual program numbers of the NC - program
P8901	Actual block number of the NCS - program
P8904	Actual cycle number if cleared, no cycle active.
P8905	Actual block number in the cycle if cleared, no cycle active.
P8906	Actual program number when NC program is aborted - is loaded with the actual program number when NC program is aborted - is written 0 at program end with M30
P8907	Actual block number when NC program is aborted - is loaded with the actual program number when NC program is aborted - is written 0 at program end with M30
P8910	Faulty program - When the actual NC - program is aborted by the NC - interpreter (because of error message) the faulty program, which has led to the abort, is indicated here.
P8911	Faulty block - When the actual NC - program is aborted by the NC - interpreter (because of error message) the faulty block, which has led to the abort, is indicated here.
P8912	Actual sub-program plane
P8913	Actual sub-program call up, program number Here the actual program number is placed when switching to a sub-program.
P8914	Actual sub-program call up, block number Here the actual block number is placed when switching to a sub-program.
P8918	I
P8919	J
P8920	K
P8921	R
P8925	S1 programmed in NC - block
:	
P8932	S8 programmed in NC - block

8.5 Standard channel parameters (continued)

Real time - Information block analysis

P8934	Programmed loop counter	M24	
P8935	Actual loop counter	M24	
P8936	Programmed feedrate F		
P8937	Programmed block end feedrate		
P8938	Actual feed F (of the interpolator)		
P8940	Actual interpolation mode	G00 / G01 / G02 / G03	(to the PLC)
	0	G00	(PLC:G00_K1)
	1	G01	(PLC:G01_K1)
	2	G02	(PLC:G02_K1)
	3	G03	(PLC:G03_K1)
P8941	Programmed dwell	G04	[s]
P8942	Actual dwell	G04	[s]
	When running a dwell (G04) programmed in the NC - program, the remaining dwell is indicated here.		
P8943	Actual rotating direction circular axis	G05 / G06 / G07	
P8945	Actual polar coordinate programming	G10 / G11	
P8946	Actual contour programming	G12	
P8947	Actual tangential axis	G13 / G14	
P8948	Actual polar transformation	G15 / G16	
P8950	Actual interpolation plane	G17 / G18 / G19	
P8951	Axis 1		
P8952	Axis 2		
P8953	Axis 3		
P8958	Actual exact stop modal	G28 / G29	
P8964	Actual tool - radius - function	G40 / G41 / G42	
P8965	Actual axis correction	G43 / G44	
P8966	Actual rotating on / off	G45 / G46	
P8967	Actual co-ordinate system	G47 / G48 / G49	
P8968	Actual	G50 / G51 / G52	
P8969	Actual zero point	G53 .. G59	
	Content: G53 .. G59	(actual zero point - shift see P12155..)	

8.5 Standard channel parameters (continued)**Real time - information block analysis**

P8970	Actual reflecting on	G61
P8971	Actual reflecting on	G62
P8972	Actual feedrate 100%	G63 / G64
P8973	Actual	G65
P8974	Actual corrections switched off	G66
P8975	Actual	G67 / G68 / G69
P8978	Actual absolute/chain dimension	G90 / G91
P8979	Actual zero point - shift	G92
	Content: 0 no G92 - shift active	
	92 G92 - shift active	
P8880	Actual feedrate definition actually	G93 / G94 / G95
P8981	Actual number of revolution mode spindle	G96 / G97 / G98
P8982	Actual end feedrate	G99
P9080	Tool group number (T-No.)	
P9083	Tool Sub record (selected)	
P9090	Radius of the tool	
P9091	Length of the tool	
P9092	Radius correction	
P9093	Length correction	
P9094	Type of tool (active quadrant 0... 9)	

Real time - data blocks

P9100	Actual G92 shift 1st. axis	[mm]
P9101	Actual G92 shift 2nd. axis	
:		
P9131	Actual G92 shift 32nd. axis	
:		
:		
P9199		

8.5 Standard channel parameters (continued)**Prealysis-information block of the block interpreter**

P9300	Actual program numbers of the block interpreter	
P9301	Actual block number of the block interpreter	
P9303	Sub-program - plane	
P9304	Actual cycle number of the block interpreter If cleared, no cycle in the block interpreter.	
P9305	Actual block number in the cycle of the block interpreter If cleared, no cycle in the block interpreter.	
P9318	I	
P9319	J	
P9320	K	
P9325	S1	
:		
P9332	S8	
P9334	Loop depth M24	
P9336	Programmed feedrate F	
P9340	Type of interpolation programmed 0, 1, 2, 3, 50, 51, 52 Contents with program start 1	G00 / G01 / G02 / G03 G50 / G51 / G52
P9341	Retention time programmed	G04
P9343	Direction of rotation programmed round axis	G05 / G06 / G07
P9344	Programmed exact stop	G08 / G09
P9345	Polar coordinates programming programmed 10, 11 Contents with program start 11	G10 / G11
P9346	Outline path programming programmed	G12

8.5 Standard channel parameters (continued)**Prealysis-information block of the block interpreter**

P9350	Interpolation level programmed 17, 18, 19, 117 Contents with program start	17	G17 / G18 / G19 / G117
P9351	Axis 1 (1st principal axis)	contents of logical record number	
P9352	Axis 2 (2nd principal axis)	contents of logical record number	
P9353	Axis 3 (delivering axis)	contents of logical record number	
P9358	Programmed exact stop modal 28, 29 Contents with program start	29	G28 / G29
P9364	Tool offset compensation programmed 40, 41, 42 Contents with program start	40	G40 / G41 / G42
P9365	Programmed axis correction 43, 44 Contents with program start	43	G43 / G44
P9366	Programming rotation in/out 45, 46 Contents with program start	46	G45 / G46
P9367	Programmed coordinate system 47, 48, 49, 147 Contents with program start	147	G47... G147
P9369	Programming actual zero point 53, 54, 55, 56, 57, 58, 59, 153, 154, 155... Contents with program start	53	G53... G159
P9370	Programming reflecting 60, 61 Contents with program start	60	G60 / G61
P9371	Programming reflecting 60, 62 Contents with program start	60	G60 / G62

8.5 Standard channel parameters (continued)

Preanalysis-information block of the block interpreter

P9372	Programmed feed 100% 63, 64 Contents with program start	60	G60 / G63 / G64
P9373	Programmed		G65
P9374	Programmed outlines switched off		G66
P9375	Programmed		G67 / G68 / G69
P9378	Programmed absolute measure/chaining absolute 90, 91 Contents with program start	90	G90 / G91
P9379	Zero shift programmed actively 0, 92 Contents with program start	0	G92

8.5 Standard channel parameters (continued)

Prealysis data blocks

P9500	Actual G92 shift 1st. axis	[mm]
P9501	Actual G92 shift 2nd. axis	
:		
P9531	Actual G92 shift 32nd. axis	
:		
:		
P9699		

8.5 Standard channel parameters (continued)

Preanalysis NC-Block - informations

P9700	Programmed position	1st. Axis
:		
P9731	Programmed position	32nd. Axis
P9732	I	
P9733	J	
P9734	K	
P9735	R	
P9736	T	
P9739	F	
P9740	G-function	1
:		
P9747	G-function	8
P9748	G-function	enlargement field
P9750	M-function	1
P9761	M-function	1 enlargement field 1
P9762	M-function	1 enlargement field 2
:		
P9771	M-function	8
P9772	M-function	8 enlargement field 1
P9773	M-function	8 enlargement field 2
P9780	Speed	1
:		
P9787	Speed	8
P9800	Tool data - interface	
:	- Interface to the PLC	
:	- Actual spindle tool - data block	
:	- Actual active data block	
P9999		

8.6 System parameters**Key - switch - information**

The following parameters are copies of the key-switches.

P11000 Key - switch 1 (Info)
 0 : Switch open
 1 : Switch closed
 With the key - switch 1 the conduct of the starting routine is influenced.
 P11000 : 0 —> ESR must be confirmed with pressing the key
 P11000 : 1 —> ESR runs automatically, in so far as no errors appear.
 (e.g.: parameters def., or NC - memory def.)

P11001 Key - switch 2

P11002 Key - switch 3

P11003 Key - switch 4

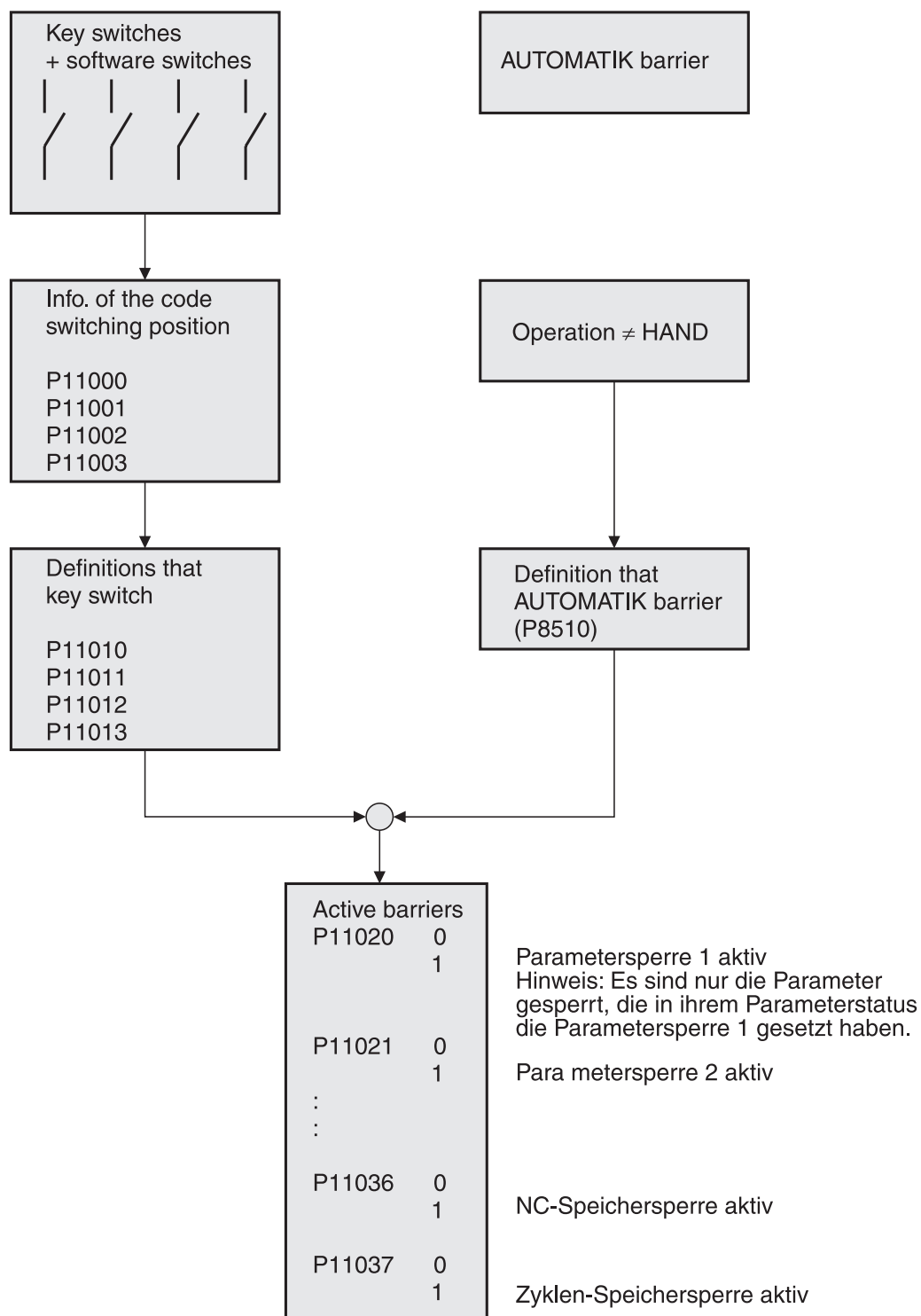
P11008 Software locking 1

 0 not active

 1 active lockings activated according to P11018.

8.6 System parameters (continued)

Overall view parameter and NC memory barriers



8.6 System parameters (continued)

Key - switch - definitions

Definition, which locking is selected with the switch.

P11010 Key-switch 1 (see also P8510)
Observe
With activated parameter barrier
- the parameter status is to be described nevertheless,
- the PLC can change nevertheless the parameter value.

Byte 1 Bit 0 parameter locking 1 (see also parameter status byte 3)
Bit 1 parameter locking 2 (see also parameter status byte 3)
Bit 2 parameter locking 3 (see also parameter status byte 3)
Bit 3 parameter locking 4 (see also parameter status byte 3)

Byte 2

Byte 3 Bit 0 NC memory locking
Bit 1 Cycle memory locking

Byte 4 Editing lockings of the MMI's
Bit 0 editing locking parameter mantissa
Bit 1 editing locking parameter status
Bit 2 editing locking axis / spindle / coupling data
Bit 3 editing locking zero point data
Bit 4 editing locking tool data
Bit 5 editor OFF locked

P11011 Key - switch 2
P11012 Key - switch 3
P11013 Key - switch 4

P11018 Software switch 1

8.6 System parameters (continued)

Active lockings

P11020 0 Locking not active
: 1 Locking active
P11049

This area is updated with each modification of a key switch status and each mode change.

P11020 System - parameter - locking 1
P11021 System - parameter - locking 2
P11022 System - parameter - locking 3
P11023 System - parameter - locking 4

P11036 NC memory locking
P11037 Cycle memory locking

Editing lockings of the MMI's

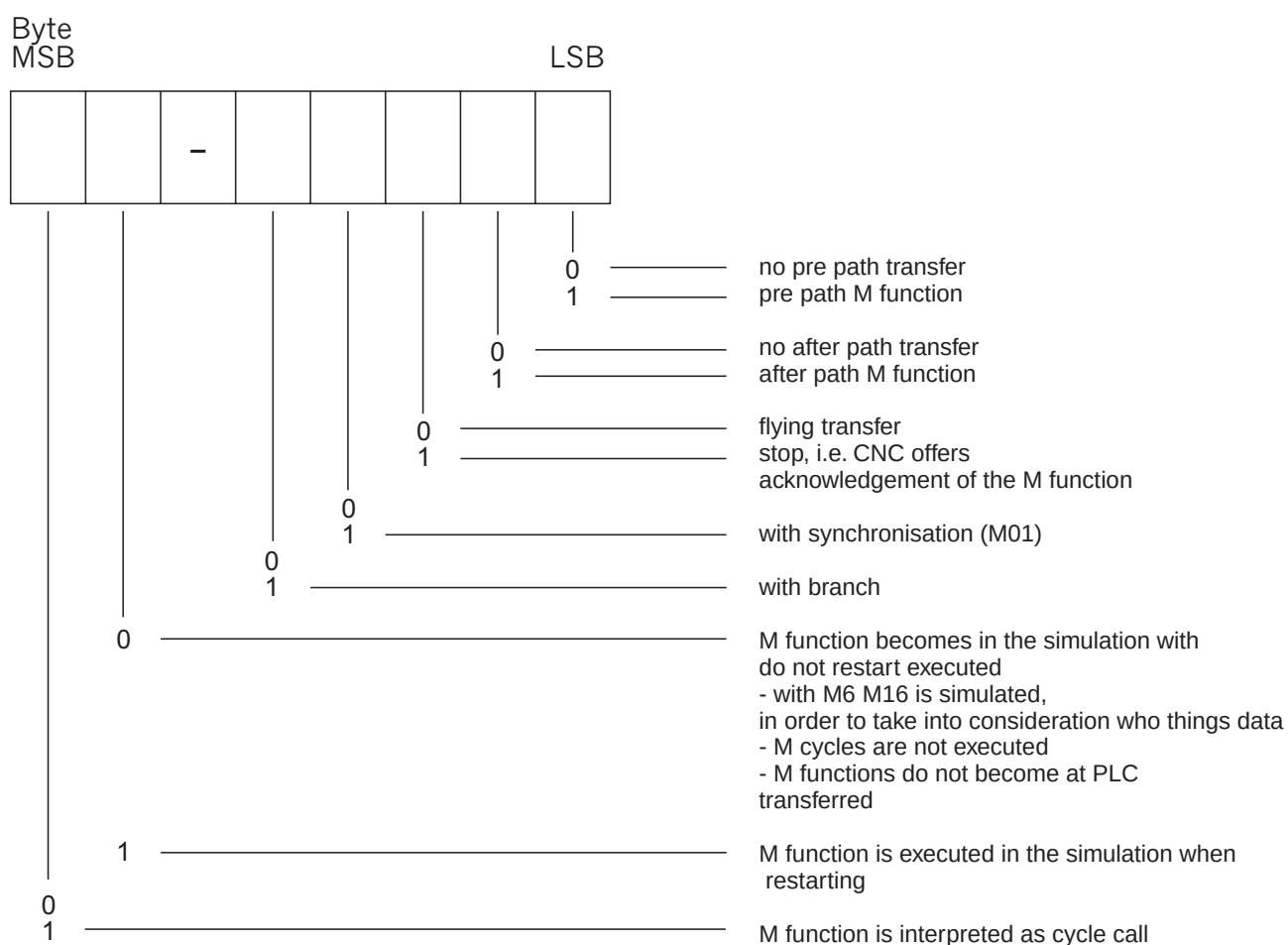
P11044 Editing locking parameter mantissa
P11045 Editing locking parameter status
P11046 Editing locking axis / spindle / coupling data
P11047 Editing locking zero point data
P11048 Editing locking tool data
P11049 Editor OFF locked

8.6 System parameters (continued)

Definitions of the M - functions

Maximum 200 system overlapping M - functions are programmable (M000 ... M199). If more than 200 M - functions are required, those must be defined channel specifically (to M999).
4 M - functions are defined per parameter. Input in hexadecimal!

Info for a M - function :



M-functions without stop are transmitted 'flying' to the PLC according to definition before traverse, after traverse or both. The NC - program runs continuously.

8.6 System parameters (continued)

M-functions with stop are transmitted to the PLC according to definition before traverse, after traverse or both. Axes run directly before the transfer of the M-function approach their end position with exact-stop. The NC-program sequence is stopped until the M -function is confirmed. The program pre analysis continues working. The confirmations are controlled in the PLC-program with enable block (SAFREK1). Therefore the corresponding marker of a M-function must be connected with stop with enable block.

M-functions with skip work always before traverse with stop! The traverse can be cleared at any time through the single - confirmation of the programmed M-function. When clearing the delay traverse, the measuring - position - parameters are written. In this case the NC program branches to the programmed skip target.

If the skip - M - function is not confirmed, the programmed NC - block is processed completely and switched on to the next block. Marker of a M - function with skip in the PLC may not be connected with enable block (SAFREK1).

M - Function as cycle. If this bit is set in the M - function - definition, no M -function code is sent to the PLC, but a cycle with the corresponding number is called up, i.e. M234 starts Z234.

At this definition the other definitions of this M - function are not considered (before traverse, after traverse or with skip).

The programmed M - function must be programmed without extension (e.g.: M1234.56 is not allowed). The cycle becomes active at the block end. The M - function number must be larger than 30!

Example:

P11051	\$	10	05	06	01
M - number		7	6	5	4

i.e.:

M07	with skip
M06	before traverse active, with stop
M05	after traverse active, with stop
M04	before traverse active, without stop

Note: Modifications in P11050... becomes with a mode change by HAND after AUTO effectively.

8.6 System parameters (continued)

Definitions of the M - functions

P11050M	03	02	01	00
P11051M	07	06	05	04
P11052M	11	10	09	08
P11053M	15	14	13	12
P11054M	19	18	17	16
P11055M	23	22	21	20
P11056M	27	26	25	24
P11057M	31	30	29	28
P11058M	35	34	33	32
P11059M	39	38	37	36
P11060M	43	42	41	40
P11061M	47	46	45	44
P11062M	51	50	49	48
P11063M	55	54	53	52
P11064M	59	58	57	56
P11065M	63	62	61	60
P11066M	67	66	65	64
P11067M	71	70	69	68
P11068M	75	74	73	72
P11069M	79	78	77	76
P11070M	83	82	81	80
P11071M	87	86	85	84
P11072M	91	90	89	88
P11073M	95	94	93	92
P11074M	99	98	97	96
P11075M	103	102	101	100
P11076M	107	106	105	104
P11077M	111	110	109	108
P11078M	115	114	113	112
P11079M	119	118	117	116
P11080M	123	122	121	120
P11081M	127	126	125	124
P11082M	131	130	129	128
P11083M	135	134	133	132
P11084M	139	138	137	136
P11085M	143	142	141	140
P11086M	147	146	145	144
P11087M	151	150	149	148
P11088M	155	154	153	152
P11089M	159	158	157	156
P11090M	163	162	161	160
P11091M	167	166	165	164
P11092M	171	170	169	168
P11093M	175	174	173	172
P11094M	179	178	177	176
P11095M	183	182	181	180
P11096M	187	186	185	184
P11097M	191	190	189	188
P11098M	195	194	193	192
P11099M	199	198	197	196

8.6 System parameters (continued)

Internal oscilloscope

P11100	Amount of active tracks	1 to 4	
P11101	Parameter address for track 1		
P11102	Parameter address for track 2		
P11103	Parameter address for track 3		
P11104	Parameter address for track 4		
P11110	Trigger track 1 to 4		
P11111	Trigger level		
P11112	Trigger slope		
	1	trigger on rising edge	
	-1	trigger on dropping edge	
	0	trigger immediately	
P11113	Scanning time		[ms]
P11114	Oscilloscope Start/Stop		
	0	stop	
	1	start	
	2	automatic new start	
P11115	Triggerpoint reached		
	0	not reached	
	1	reached	

8.6 System parameters (continued)

Graphics parameter

P11120	Origin of the co-ordinate system screen X
P11121	Origin of the co-ordinate system screen Y
P11122	Origin of the co-ordinate system screen Z
P11123	Zoom - size (P11123 small _> drawn picture large)
P11124	Graphics display
0	X,Y - Plane
1	Z,X - Plane
2	Y,Z - Plane
3	3-D
P11125	X tilt
P11126	Z tilt
P11127	Forward / backward of the display
P11128	Display bits
Byte 1	Bit 0 free
	Bit 1 free
	Bit 2 free
	Bit 3 1 display with actual path
	Bit 4 1 display with zero point
	Bit 5 1 display with circle centre points
	Bit 6 1 display with bores
	Bit 7 1 display with direction arrows

8.6 System parameters (continued)

System commands / informations

P11130	Selected language 0 or -- 1st language 1 2nd language : :
P11131	Default language If the language text accord. to P11130 is not available, the default language is used. 0 or -- 1st language 1 2nd language : :
P11132	Teachpanel operating mode 0 or -- Teachpanel off 1 Teachpanel switched on
P11133	Teachpanel key pressed / unpressed Byte 1 Key code (see list from P11200 on) Byte 2 0 unpressed 1 pressed Byte 3 Channel number 1..8
P11134	LED's teachpanel (planned)
P11135	Desired channel in MMI
P11136	Selected channel in MMI

8.6 System parameters (continued)

System commands / information

P11137 Keyboard code pressed / unpressed (only CNC keys)
(parameter is transmitted to the PLC)

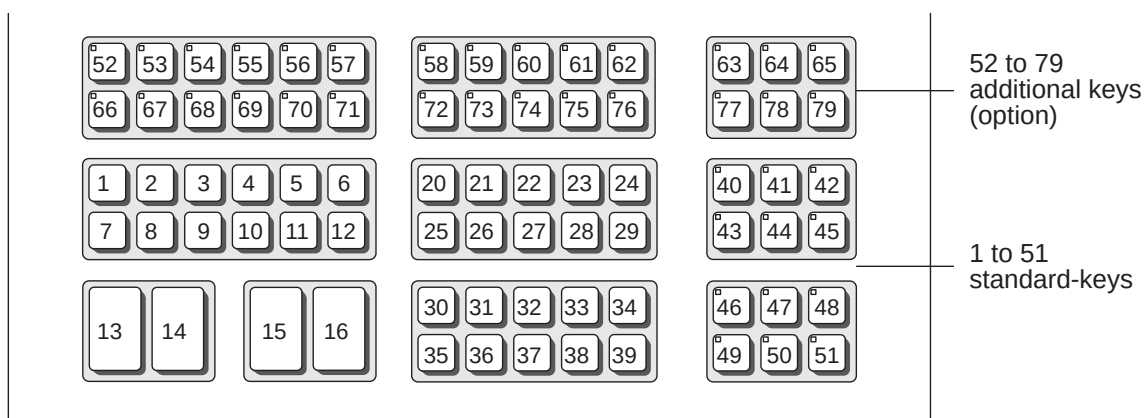
Byte 1 Key code

Byte 2 0 unpressed

1 pressed

Byte 3 Channel number 1..8

Key code CNC keys



8.6 System parameters (continued)

System commands / information

P11138	LEDs 1..12 (bit information)		
	Byte 1	bit 0	0 LED key 40 out
			1 LED key 40 on
		bit 1	key 41
		bit 2	key 42
		bit 3	key 43
		bit 4	key 44
		bit 5	key 45
		bit 6	key 46
		bit 7	key 47
	Byte 2	bit 0	key 48
		bit 1	key 49
		bit 2	key 50
		bit 3	key 51
P11139	LEDs (bit information) extended		
	Byte 1	bit 0	0 LED key 52 out
			1 LED key 52 on
		bit 1	key 53
		bit 2	key 54
		bit 3	key 55
		bit 4	key 56
		bit 5	key 57
		bit 6	key 58
		bit 7	key 59
	Byte 2	bit 0	key 60
		bit 1	key 61
		bit 2	key 62
		bit 3	key 63

8.6 System parameters (continued)**System - memory / Informations**

P11140	Free NC memory
P11141	Amount of NC programs
P11142	Number of NC programs
P11145	Number of latest edited NC - program
P11146	Number of latest edited NC - block
P11149	Display mode in the NC - directory 0 There appears no Z - programs in the directory-list 1 In the directory ALL programs are displayed.
P11150	Display mode 2 in the NC-directory 0 Display of the time stamp and file size 1 Display of the 1st NC block
P11152	First block number when numerating a NC program If not loaded, the first block number is 10.
P11153	Block step width when numerating a NC program If not loaded, the step width is 10.
P11159	OVERLAY insertion in operating panel surface 0 or -- Overlay operation reset 1.. Overlay operation display

8.6 System parameters (continued)**System - Clock**

P11160 Second

P11161 Minute

P11162 Hour

P11163 Day

P11164 Month

P11165 Year

P11166 Weekday

P11169 100 ms timer parameter is incremented in stroke of 100 ms

8.6 System parameters (continued)**I/O circulation Interface 1**

P11170	Interfaces	Mode(planned, I/O etc.)	
P11171	Interfaces	Selector (planned, default = operating panel COMxx)	
	0	hard disk operating panel	
	1	operating panel COM1	
	2	operating panel COM2	
	3	operating panel COM3	
P11172	Baudrate	standard setting 9600 max 38400	[Baud]
P11173	Data bits	standard setting 8	
P11174	Stop bits	standard setting 2	
P11175	Parity check	standard setting 0	
	0	no	
	1	odd	
	2	even	
P11176	Handshake	standard setting 0	
	0	RTS/CTS	
	1	Xon/Xoff	
P11177	File end signal	standard setting 04 (EOT)	
	Input	ASCII sign code	
	Function	At an output (IO-OUTPUT), the file end sign is put as last sign. At an input (IO-INPUT) the I/O is finished with a received file end sign.	
P11178	Controlling information		
	Bit 0	0 Programs can be overwritten 1 Programs cannot be overwritten over I/O inputs. A message seems.	
	Bit 1	0 1 I/O circulation program output 785 - compatibly i.e.. Program number is provided with leading zeros	

8.6 System parameters (continued)

I/O circulation Interface 1

P11179 Block test character with I/O traffic

With P11179 the block test character is switched with I/O IN/COoutputs.

Method of operation: With activated block test character the data link becomes between operating console and external data terminal secured. practical in connection with the archiving program NCARC.EXE. The block test character is stored in no file, but in an educated manner from the sender / recipient to the real time in each case / checks.

0 or -- no block test character

I/O INPUT

The block test character of the data which can be read in is optional. If a block test character is received, it is checked. With not correct test character: M1115 and abort of EA traffic.

I/O OUTPUT

no block test character with data output.

1 block test character activates

I/O INPUT

All read in data must with the block test character provided to be. With missing test character: M1114 and abort of EA traffic With not correct test character: M1115 and abort of EA traffic.

I/O OUTPUT

All data which can be output become with the block test character provide.

8.6 System parameters (continued)

I/O circulation Interface 1

P11181	Parameter output mode Parameter is reset after each knocked against parameter output!																								
0 or --	Parameter EA output from parameter memory																								
1	Parameter EA output from FLASH Memory output: D+, i.e. status are also settinged when rereading in																								
5	Parameter EA output of all parameters from the parameter memory output: D+, i.e. status are also settinged when rereading in																								
	<table><tr><td>q0</td><td>...</td><td>q999</td><td></td></tr><tr><td>q1000</td><td>...</td><td>q1999</td><td></td></tr><tr><td>q2000</td><td>...</td><td>q...</td><td>(number of axes)</td></tr><tr><td>P0</td><td>...</td><td>P5xxx</td><td>(user block 1aller of channels)</td></tr><tr><td>P7000</td><td>...</td><td>P9999</td><td>(fixed channel parameters of all channels)</td></tr><tr><td>P20000</td><td>...</td><td>P2xxx</td><td>(user block 2 of all channels)</td></tr></table>	q0	...	q999		q1000	...	q1999		q2000	...	q...	(number of axes)	P0	...	P5xxx	(user block 1aller of channels)	P7000	...	P9999	(fixed channel parameters of all channels)	P20000	...	P2xxx	(user block 2 of all channels)
q0	...	q999																							
q1000	...	q1999																							
q2000	...	q...	(number of axes)																						
P0	...	P5xxx	(user block 1aller of channels)																						
P7000	...	P9999	(fixed channel parameters of all channels)																						
P20000	...	P2xxx	(user block 2 of all channels)																						
10	output of the SAMPLE buffer (see also P11270...)																								
15	output of the ZSM recordings (see P7950...)																								
50	output of the oscilloscope memory output format: Fixed point (ulongs)																								
P11183	Info. parameter actual program number EA input/output																								
P11184	Info. parameter actual record number EA input/output																								

8.6 System parameters (continued)

I/O circulation Interface 2

P11185 Interfaces 2 (planned)
:
P11199

8.6 System parameters (continued)

I/O circulation Information for diagnostic purposes

P11250 Error messages, which are entered into the error message history of the PLC
i.e. each detailed error message.
(parameter of the PLC is described)

Byte 1 Message paragraph

Byte 2 Message paragraph

Byte 3 Channel number (1... 8)

Byte 4 Axis paragraph (1... 32)

P11251

:

P11259 Actual pending error messages of the actually selected channel
(parameter of the PLC is described)

Byte 1 Message paragraph

Byte 2 Message paragraph

Byte 3 Channel number (1... 8)

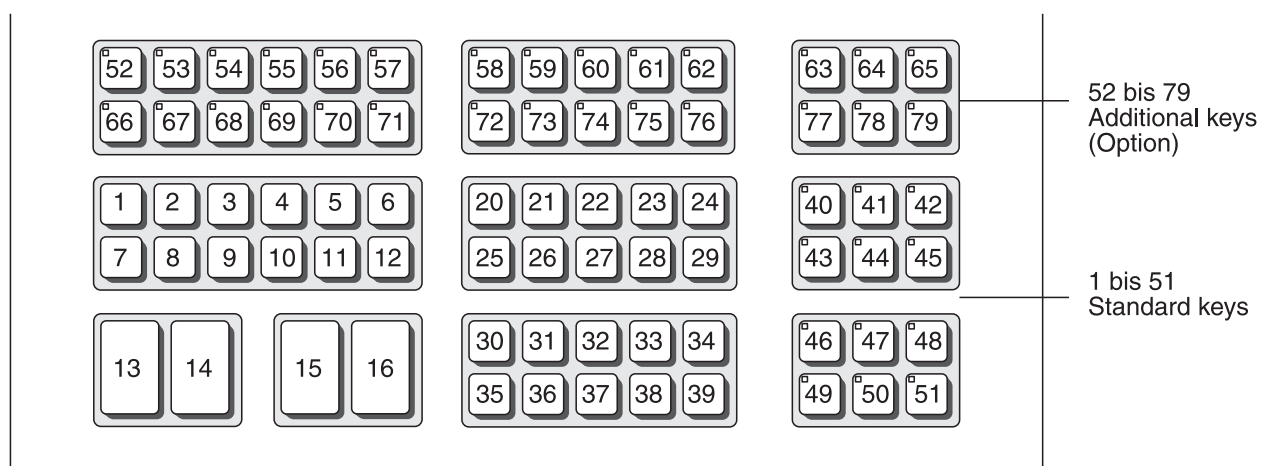
Byte 4 Axis paragraph (1... 32)

8.6 System parameters (continued)

Information for event logging for diagnostic purposes

P11260 Key information (parameter by the operating console one describes)
total palpation printouts in this parameter are logged

Byte 1	Key paragraph or	(CNC keys)
	ASCII character	(keyboard)
Byte 2 0	Key released	(only with CNC Keys)
1	Key pressed	
Byte 3 0		
Byte 4 0	Keyboard key	
1	Function key	
2	CNC Key	
3	Teachpanel key	



P11261 Bildname1 CNC Surface (parameter by the operating console one describes)

Byte 1	CHAR 1
Byte 2	CHAR 2
Byte 3	CHAR 3
Byte 4	CHAR 4

P11262 Bildname2 CNC Surface (parameter by the operating console one describes)

Byte 1	CHAR 5
Byte 2	CHAR 6
Byte 3	CHAR 7
Byte 4	CHAR 8

8.6 System parameters (continued)

Event logging for diagnostic purposes

- P11270 Activation of the recording ring buffer
 (in further Textals SAMPLE buffer marks)
- 0 Events are written into the SAMPLE buffer
 - 1 SAMPLE buffer is not no more described

With active SAMPLE buffer (P11270:0) all CNC Key generally always becomes presses and all messages (CNC messages P8500.. P8503 and SPS messages (P8509 or over P11263) as well as P11279 with a zeitmarke stored. Memory depth corresponds to 100 (083671 before index C) or 2000 (084564) Recordings.

The available recordings can over I/O circulation with parameter output to be read, if before the output the parameter output mode (P11181) = 10 one settings.

Starting from status 082 of 1.2.99

With a function call in the CNC DLL can this SAM polarizing ring buffer as section NC RAM to be specified.

The size of this buffer is freely definable. (number of Samples)

The available NC memory is reduced accordingly.

Contents of this static ring buffer remain after switching off that Controller preserve. (is with back-up battery like the NC memory)

8.6 System parameters (continued)

Event logging for diagnostic purposes

An output could look as follows:

SAM polarizing DATA

Output:

DATE: 1. 2,99 date / time-of-day of the output

Time: 02:12:57

hh:mm:ss, ms cmd

1 00:00:00,000 ===== system boot =====

2 02:08:39,445 PICTURE: INIT picture change

3 02:08:42,455 PICTURE: A_INIT picture change

33 02:11:55,650 C-KEY AX 1

CNC key axis selection 1

34 02:11:56,965 F-KEY F5

function key F5

35 02:11:58,525 KEY ' 1 '

PC key ' 1 '

42 02:12:00,655 F-KEY RETURN

function key RETURN

43 02:12:01,290 F-KEY cursor V

function key cursor

57 02:12:08,990 PARA CNC —> PLC K0 q1137: 65822 Parameter transmitted by CNC at PLC

60 02:12:08,995 PARA CNC< —PLC K1 P8703: 1 parameter transmitted by PLC at CNC

97 02:12:13,820 K0 message: M3498 message M3498

448 02:12:21,015 PROG: K1 P1000 N11160

processing of NC block

449 02:12:21,015 PROG: K1 P1000 N11170

831 02:12:21,340 K1 M30 —> PLC, NR in the Satz:0, without branch
transfer of m functions at PLC

832 02:12:21,340 K1 END OF BLOCK CNC —> PLC, CNC WAITS for acknowledgement

834 02:12:21,340 K1 CNC < — PLC SAFRE: 1

934 02:13:22,540 P11279: 12345 entry over P11279

SAM-POLARIZE-END

8.6 System parameters (continued)

Event logging for diagnostic purposes

P11271	Activation of additional recordings into the SAM polarizing buffer for channel 1 0 or --	No additional recordings
	Byte 1 bit 0 1	Parameter transfers between CNC < —> PLC are recorded.
	bit 1 1	Parameter transfers between CNC < —> operating panel are recorded.
	bit 2 1	Parameter with parameter SAM polarizing identifier are recorded. (see parameter status Byte2 Bit8) (parameters from channel 1 become together with q-parameters recorded)
	bit 4 1	M functions at PLC, end of block, end of record, M function-acknowledgements and block release are recorded.
	Byte 2 bit 0 1	beginning of a NC block with Programmnummer becomes recorded. (pre path acknowledgement in the real time)
P11272	Activation of additional recordings into the SAM polarizing buffer for channel 2	
P11273	Activation of additional recordings into the SAM polarizing buffer for channel 3	
P11274	Activation of additional recordings into the SAM polarizing buffer for channel 4	
P11275	Activation of additional recordings into the SAM polarizing buffer for channel 5	
P11276	Activation of additional recordings into the SAM polarizing buffer for channel 6	
P11277	Activation of additional recordings into the SAM polarizing buffer for channel 7	
P11278	Activation of additional recordings into the SAM polarizing buffer for channel 8	
P11279	SAM-POLARIZE - entry With the describing of P11279 an entry in the SAM polarizing buffer is made.	

8.6 System parameters (continued)

System diagnostic

P11280	Activating the interface diagnostic		
	0	Interface diagnostic off	
	1	PLC <-> CNC interface diagnostic on	
	P11281...P11289	direction CNC —> PLC	
	P11290...P11299	direction CNC <— PLC	
P11281	Event counter	CNC —> PLC	
P11282	Channel number	CNC —> PLC	
P11283	Parameter number	CNC —> PLC	
P11284	Parameter content	CNC —> PLC	
P11291	Event counter	CNC <— PLC	(q1160 is not indicated and not counted as event.)
P11292	Channel number	CNC <— PLC	
P11293	Parameter number	CNC <— PLC	
P11294	Parameter content	CNC <— PLC	

8.6 System parameters (continued)

System data for Interpolator

P11300 Interpolation nicety [INC/mm]
 Specifies the internal path resolution at the Interpolator
 0 preset: 10000
 Input 100, 1000, 10000
 In the case of a modification of this parameter the controller must again be started.

P11301 Position adjustment timer [ms]
 In the case of a modification of this parameter the controller must again be started.

P11302 DSI timer [ms]
 In the case of a modification of this parameter the controller must again be started.

P11305 Definition of the axis card off set
 In the case of a modification of this parameter the controller must again be started.
 This axis allocation can by means of P12003... for each axis separately and to be made axis-card-independently.

0 or -- physical axis numbering sequentially

Example:

1. Axis card	physical numbering
ASM 1	1
2	2
3	3
2. Axis card	
AAZ4 1	4
2	5
3	6
4	7

1 per card slot 4 physical axes are addressed

Example:

1. axis card	physical numbering
ASM 1	1
2	2
3	3
2. Axis card	
AAZ4 1	5
2	6
3	7
4	8

8.6 System parameters (continued)

System data for Interpolator

P11306 Definition for axis cards disable

In the case of a modification of this parameter the controller must again be started.

0 or -- physical axis numbering sequentially

Bit 0-31 No. of the respective slot

e.g.. 0x2 in slot 2 no card (AAZ, DAW, ADW) is detected

P11308 Input system

0 or -- Input system metrically

1 Input system inch, post-decimal positions around a position extends

2 Input system inch, post-decimal positions around two positions extends

3 Input system inch, post-decimal positions around three positions extends

Inch switching

With ' parameter reset ' in the switching on routine becomes

- in the zero point data array,

- all kanalgemappten Achsparametern, (P12153..12157...),

- the tool data interface, (P8110/11/12/13 and P8160/61/62/63),

- and the feed parameters in the channel

the inch bit in the parameter status settinged.

With the axis data of round axes no inch information is settinged. If one is linear axis without inch switching to be, then if the inch bit is to be removed in the q2x54.

After switching the system of units of INCH - > METRIC or METRIC - > INCH

only these parameters become into respective the different one.

System of units converted, which the ZOLL bit in the parameter status settinged.

Step-by-step operation:

Incrementation table is preserved, however the actual incrementation becomes always over factor 10 reduces

(see also G170 / G171).

P11309 System internal command parameter

Interpolator —> CNC

1 trigger for reference status

8.6 System parameters (continued)

Override (1 - 9)

The override allocation is defined depending on the traverse mode per axis (see P12125..).

General: From the operating panel the corresponding override value is written in P11311 (content : 0.. 255). P11311 is a procedure - parameter. In the started system sub-routine the override-schedule is accessed according to P11314 (pointer on table). The result is copied to P11310. P11310 is limited through P11312/P11313.

	Override 1		
P11310	Actual value	[%]	value from table
P11311	Actual value		from digital-to-analogue converter
P11312	Minimum limit	[%]	e.g. 0 %
P11313	Maximum limit	[%]	e.g. 120%
P11314	Pointer on override-table		
	If pointer on override-schedule is cleared or =0, the override is active continuously. Pointer-number shows on a q-parameter.		
P11315	Override 2		
P11320	Override 3		
P11325	Override 4	(Teachpanel)	
P11330	Override 5	(fixed value 0%)	
P11335	Override 6	(fixed value 10%)	
P11340	Override 7	(fixed value 50%)	
P11345	Override 8	(fixed value 100%)	

8.6 System parameters (continued)**Override (1 - 9)**

P11370	Override-table	Amount: Preset 27 values
P11371	0 %	
P11372	1 %	
P11373	2 %	
P11374	5 %	
P11375	10 %	
P11376	15 %	
P11377	20 %	
:		
P11397	120 %	

8.6 System parameters (continued)

Hand-wheels (1 - 8)

P11400	Hand-wheel 1 Hand-wheel connected on axis	(physical axis number)
P11401	Hand-wheel works on axis	(physical axis number)
P11402	Activating the hand-wheel 0 or -- Hand-wheel not active 1 Hand-wheel active	
P11403	Hand-wheel resolution The pulses of the measuring system are quadrupled in the AAZ. Example: resolution 1000, At 1000 INC 1mm is driven. The sign determines the traverse direction.	[INC/mm]
P11404	Actual hand-wheel - multiplier With help of the hand-wheel - multiplier the hand wheel- pulses are multiplied. Example: P11404 = cleared or 0 or 1, 1000 INC -> 1mm distance P11404 = 10 1000 INC -> 10mm distance	
P11405	Switch to next multiplier 1 switch to next	
P11406	Pointer on multiplier, parameters is used from the system.	
P11407	Multiplier 1	
P11408	Multiplier 2	
P11409	Multiplier 3	
P11410	Hand-wheel 2	
:		
P11420	Hand-wheel 3	
:		
P11430	Hand-wheel 4	
:		
P11440	Hand-wheel 5	
:		
P11450	Hand-wheel 6	
:		
P11460	Hand-wheel 7	
:		
P11470	Hand-wheel 8	
:		

8.6 System parameters (continued)

Couplings (1 - 8)

	Coupling 1		
P11480	Master - axis	(physical axis number)	
P11481	Slave - axis	(physical axis number)	
P11482	Coupling mode		
	Byte 1	\$01	Machine coordinates coupling
	Byte 2	\$01	Rigidity coupling
	Byte 3	\$00	Type of status coupling
		\$01	Differential coupling
			master <—> Slave
			master —> Slave
P11483	Coupling modification		
	0 or --		Coupling correction on
	1		Coupling correction off
	2		Coupling correction off, however with coupling error control procedure actively
P11484	Coupling error limit		[mm, degree]
P11485	Coupling error supervision time		[ms]
P11486	Coupling correction P share		[1/s]
P11487	coupling correction I share		[ms]
P11490	Synchronization position of the Masteraxis		[mm, degree]
P11491	Synchronization position of the Slaveaxis		[mm, degree]
P11492	Transmission ratio - relationship masteraxis		
P11493	Transmission ratio - relationship slave axis		
P11494	Differential constant		
P11495	Coupling on / off		
	1	Coupling on	(PLC:KOP1)
	2	Coupling synchronization on (see P11490 or P11491)	(PLC:KOPSYN1)
P11496	Coupling activated		
	1	Coupling on	
	2	Coupling synchronization accomplished	

8.6 System parameters (continued)**Couplings (1 - 8)**

P11500	Coupling 2
:	
P11520	Coupling 3
:	
P11540	Coupling 4
:	
P11560	Coupling 5
:	
P11580	Coupling 6
:	
P11600	Coupling 7
:	
P11620	Coupling 8
:	

8.6 System parameters (continued)

Spindle (1 - 8)

Spindle 1

P11640	Spindle works on axis	(physical axis number)	
P11641	Reference axis for G96	(physical axis number)	
	If P11641 = 0, then reference position in P11642 is valid.		
P11642	Reference position for G96		[mm]
	e.g. grinding wheel diameter		
P11643	Reference factor for G96		[mm/min]
	0 or --	mm/min	
	1000	m/min	
P11644	Maximum speed for G96		[mm/min]
P11645	Maximum speed for G97		[rpm]
P11646	Reference factor for G97		[rpm]
	0 or --	rpm	
	1	degree/min	
P11647	Definition of speed	(G96, G97)	
	Presetting 0 = G97		
P11648	Programmed speed		[rpm or mm/min]
P11649	Actual speed		[rpm or mm/min]
P11650	Spindle in/out		
	0 or --	Spindle out	
	1	Positive direction of rotation	(PLC:SPIRE1)
	-1	Negative direction of rotation	(PLC:SPILI1)
	2	Positively spindle reset	(PLC:SPIRR1)
	-2	Negatively spindle reset	(PLC:SPIRL1)
P11651	Speed achieves or programmed speed = 0		
	0 or --	Speed does not achieve	
	1	Speed achieves	
		(becomes with prog. Speed = 0 not settinged)	(PLC:SPIDZE1)
	2	Spindle resetting position achieves	(PLC:SPIRPE1)

8.6 System parameters (continued)

Spindle (1 - 8)

P11652 Spindle resetting position

P11653 Speed monitoring tolerance limit [%]
0 or -- actual speed monitoring switched off
1... 100 i.e. P11651=1 achieves the info. speed
setting if programmed speed equal actual speed
and the deviation between actual speed (Messsystem) and
smaller than the input value is appropriate for programmed speed.

P11660 Spindle 2

:

P11680 Spindle 3

:

P11700 Spindle 4

:

P11720 Spindle 5

:

P11740 Spindle 6

:

P11760 Spindle 7

:

P11780 Spindle 8

:

8.6 System parameters (continued)

Data for Robot-system 1

P11800 Linear axes (physical axis numbers)

At 5 axes transformation (Robot)

e.g. the first 3 axes (X, Y, Z)

Byte 3, 2, 1 03 02 01 Hex

Byte 4 direction change (Bit 3, 2, 1)

At 3 axes transformation

e.g. the first 2 axes (X, Y)

Byte 3, 2, 1 00 02 01 Hex

Byte 4 direction change (Bit 2, 1)

At 6 axes transformation

e.g. the first 3 axes (X, Y, Z)

Byte 3, 2, 1 03 02 01 Hex

Byte 4 direction change (Bit 3, 2, 1)

P11801 Robots rotation axes (physical axis numbers)

At 5 axes transformation (Robot)

e.g. the 4th and 5th axes (A, B)

Byte 3, 2, 1 00 05 04 Hex

Byte 4 direction change (Bit 3, 2, 1)

At 3 axes transformation

e.g. the 3rd axis (A)

Byte 3, 2, 1 00 00 03 Hex

Byte 4 direction change (Bit 1)

At & axes transformation (Robot)

e.g. the 4th, 5th and sixth axes (A, B, C)

Byte 3, 2, 1 06 05 04 Hex

Byte 4 direction change (Bit 3, 2, 1)

P11802 At 5 axes transformation (Robot)

Offset x, rotation axis - tool axis

[mm]

At 3 axes transformation

Offset radius, tilt - tool peak

[mm]

8.6 System parameters (continued)

Data for Robot-system 1

P11803	At 5 axes transformation (Robot) Offset y, rotation axis - tilt	[mm]
	At 3 axes transformation Offset angle, tilt - tool peak	[degree]
P11804	Offset z, tool carrier length	[mm]
P11805	Offset, tilt - tool axis	[mm]
P11806	Angle, rotation axis - tilt	[degree]
P11807	Angle, at which the tool is downwards	[degree]

8.6 System parameters (continued)**Data for Robot-system 2**

P11810	Robot linear axes To contents see P11800	(physical axis paragraphs)	
P11811	Robot rotation axes To contents see P11801	(physical axis paragraphs)	
P11812	Offset x To contents see P11802		[mm]
P11813	Offset y To contents see P11803		[mm]
P11814	Offset z To contents see P11804		[mm]
P11815	Offset, drag axis - tool axis To contents see P11805		[mm]
P11816	Angle, axis of rotation - drag axis To contents see P11806		[degrees]
P11817	Angle, with that the tool downwards shows To contents see P11807		[degrees]

8.6 System parameters (continued)

Data for polar-system

P11820	Polar axis		(physical axis number)	
	e.g. the first 2 axes (X, Y)			
	Byte 3, 2, 1	00 02 01 Hex		
	Byte 4	direction change (Bit 2, 1)		
P11821	Offset	r0		[mm]
P11822	Offset	w0		[mm]
P11823	Offset	v0		[mm]

8.6 System parameters (continued)

Data for angle system

P11830	Angle axes e.g. the first 2 axes (X, Y) Byte 3, 2, 1 00 02 01 Hex	(physical axis paragraph)
P11831	Angle value	[degrees]

8.6 System parameters (continued)

Configuration parameters for robot systems

P11850	Mechanics	
\$0100		6-Achsen-Knickarm even
\$0101		6-Achsen-Knickarm diagonally
\$0200		3-Achsen-Scara
\$0201		2-Achsen-Scara

P11852	Pendulum axis paragraph
P11853	Pendulum angle

Geometry parameter of the respective robot system

P11854	lever	1
P11855	lever	2
P11856	lever	3
P11857	hand	1
P11858	hand	2
P11859	hand	3

8.6 System parameters (continued)

Parameter for joystick

P11880	Joystick definition	
	Byte 1	Calibration paragraph
	Byte 2	Slot paragraph
P11882	info. joystick calibration value	
P11883	info. joystick calibration value	
P11884	info. joystick calibration value	
P11885	info. joystick calibration value	
P11886	info. joystick calibration value	
P11887	info. joystick calibration value	
P11888	info. joystick calibration value	
P11889	info. joystick calibration value	

Parameter for welding seam tracing

P11890	Pointer on table
--------	------------------

Parameter for Teachfunktion

P11891	Pointer on table
--------	------------------

Parameter for external Robot simulation

P11892	0	Connection off
	1	Connection with ROBOT actively

8.7 Axis parameters

Each physical axis occupies a parameter block of 200 parameters.

In the system has physical axis	the area	In the channel has logical axis	the area
1.	q2000 ... q2199,	1.	P12000 ... P12199,
2.	q2200 ... q2399,	2.	P12200 ... P12399,
3.	q2400 ... q2599,	3.	P12400 ... P12599,
4.	q2600 ... q2799,	4.	P12600 ... P12799,
5.	q2800 ... q2999,	5.	P12800 ... P12999,
6.	q3000 ... q3199,	6.	P13000 ... P13199,
7.	q3200 ... q3399,	7.	P13200 ... P13399,
8.	q3400 ... q3599,	8.	P13400 ... P13599,
9.	q3600 ... q3799,	9.	P13600 ... P13799,
10.	q3800 ... q3999,	10.	P13800 ... P13999,
11.	q4000 ... q4199,	11.	P14000 ... P14199,
12.	q4200 ... q4399,	12.	P14200 ... P14399,
13.	q4400 ... q4599,	13.	P14400 ... P14599,
14.	q4600 ... q4799,	14.	P14600 ... P14799,
15.	q4800 ... q4999,	15.	P14800 ... P14999,
16.	q5000 ... q5199,	16.	P15000 ... P15199,
17.	q5200 ... q5399,	17.	P15200 ... P15399,
18.	q5400 ... q5599,	18.	P15400 ... P15599,
19.	q5600 ... q5799,	19.	P15600 ... P15799,
20.	q5800 ... q5999,	20.	P15800 ... P15999,
21.	q6000 ... q6199,	21.	P16000 ... P16199,
22.	q6200 ... q6399,	22.	P16200 ... P16399,
23.	q6400 ... q6599,	23.	P16400 ... P16599,
24.	q6600 ... q6799,	24.	P16600 ... P16799,
25.	q6800 ... q6999,	25.	P16800 ... P16999,
26.	q7000 ... q7199,	26.	P17000 ... P17199,
27.	q7200 ... q7399,	27.	P17200 ... P17399,
28.	q7400 ... q7599,	28.	P17400 ... P17599,
29.	q7600 ... q7799,	29.	P17600 ... P17799,
30.	q7800 ... q7999,	30.	P17800 ... P17999,
31.	q8000 ... q8199,	31.	P18000 ... P18199,
32.	q8200 ... q8399	32.	P18200 ... P18399

In the channel descriptor physical axes are attached to the channel axes (q110 ... q141, Byte 3).

8.7 Axis parameters (continued)

Machine data for the 1st. axis

P12000	Connected axis	
	0 or —	axis not connected
	1	axis connected
	2	axis may not be driven, otherwise message seems M2020
	-1	axis simulation, Messystem not necessarily, Command value output according to actual axis rate, point of reference taken.
P12001	Round axis	
	0 or —	no round axis
	1	round axis
	2	round axis drives shortest path
	3	round axis drives pursuant to
		G5 positively
		G6 negatively
		G7 shortest path
P12002	Diameter axis	
	0 or —	no diameter axis
	1	diameter axis
P12003	Axis module address	
	0 or —	address recognition internally
	Byte 1	\$xx axis paragraph 1,,8 (axis on the axis module)
	Byte 2	\$xx slot paragraph 1... 32
	Byte 3	\$xx drive address with Sercos Axes 1... 255
		\$00 drive address equal axis paragraph

8.7 Axis parameters (continued)

Machine data for the 1st. axis

P12004 Maximum axis speed [mm/min, degree/min]
with Sercos axes transfer at final drive is affected as:
S-0-0091 speed limiting value bipolar

P12005 Slope speed 1 [mm/min, degree/min]
0 or — Slope rate = 10 % max. axis speed
to Slope to activate see P12136

P12006 Slope speed 2 [mm/min, degree/min]
0 or — Slope rate = 20 % max. axis rate
to Slope to activate see P12136

P12008 Machine dynamics 1 [ms]
0 or — default = 250 msec

The dynamics determine the time in that the axis of 0 on max axis rate one accelerates or one brakes. Always works with manual operation and automatic (G0). With Sercos axes the transfer to the final drive is affected as:
S-0-0138 acceleration bipolar,
S-0-0042 reference driving acceleration.

P12009 Machine dynamics 2 [ms]
0 or — default = dynamics 1
dynamics 2 > dynamics 1, then always work dynamics 2 with
path driving (G1, G2, G3, G50) not with G0.

P12010 Dynamic definition
0 or — linear axis acceleration drive.
1 sine axis acceleration drive.

8.7 Axis parameters (continued)**Machine data for the 1st. axis**

P12012 Measuring system - dissolution numerator [INC/mm, degree]
Input only integral !

P12013 Measuring system - dissolution denominators
The pulses of the measuring system are quadrupled in the AAZ.
Example: measuring system with 2500 INC/r, pitch of the spindle of 10mm/r
i.e. 1 revolution -> 2500INC * 4 = 10000 INC / 10mm
Input: P12012 1000 ; P12013 1
Input only integral !

P12014 Measuring system - counting reverse
Byte 1 \$01 inverted
Byte 2 \$xx number of invalid data bits on the right hand side
Byte 3 \$xx number of invalid data bits on the left hand side (ref. 32 Bit)

Example of an absolute encoder

32 1

xxxxxxxx00000000000000000000xxxx

xxxxxxxx

xxxx

8-bits to the left fade out

4-Bit on the right fade out

Input P12014: \$080400

P20015 Measuring system - absolute encoder (AZA)
Byte 1 \$xx number of data bits that have to be transmitted
00H = 1. Bit ... 1FH = 32. Bit
Byte 2 \$xx Transmitting frequency
00H = 250khz, 01H = 330kHz, 02H = 500 kHz, 03H = 1mhz
Byte 3 \$xx Data mode
00H = binary code, 01H = Gray code
Byte 4: \$01 Actual position is settinged in ESR on old value from P12152
i.e.. Axis reported (indicator REF1=1)

8.7 Axis parameters (continued)**Machine data for the 1st. axis**

P12016 Exact stop boundary finely [mm, degree]
 0 or — default = square root (1 / measuring system resolution)

Example: resolution scrutineer 1000
 denominator 1
 Default = sqrt (1 / (1000 / 1)) = 0,0316 mm

P12017 Exact stop boundary roughly [mm, degree]
 0 or — default = 8 x exact stop boundary finely

Mode of operation: An axis starts a programmed position with exact stop,
 i.e. programmed position is achieved:
 - lag distance (Sollpos being) is smaller than exact stop boundary gross,
 in such a way the drift correction is activated.
 - lag distance is small exact stop boundary finely,
 in such a way the signal driving instruction (P12188) is reset.

P12018 Downtime monitoring [ms]
 0 or — default = 3000 ms

If this monitoring time is exceeded, error message (M2022) is affected.

P12020 KV factor [1/s]
 0 or — default = 16 x 1/s

The KV factor is a valuation (p-proportion) the Lagereglung.
 With Sercos Axes transfer at final drive is affected as:
 S-0-0104 KV factor attitude control

P12021 P-reinforcement speed controlling device
 0 or — default = speed regulation in the drive

With Sercos Axes transfer at final drive is affected as:
 S-0-0100 p-proportion of speed controlling devices

P12022 I-reinforcement (reset time) [ms]
 0 or — default = 10000ms (drift correction)

With Sercos axes transfer at final drive is affected as:
 S-0-0101 i-proportion of speed controlling devices

8.7 Axis parameters (continued)

Machine data for the 1st. axis

P12024	Lag error limit 0 or — default = 50% over debit lag distance	[%]
	With the help of the axis speed and the KV's that can Lag distance to be calculated. $\text{Lag distance [mm]} = \text{feed [mm/min]} / (60 \times \text{KV [1/s]})$	
P12025	Lag error limit monitoring time 0 or — default = 50ms -1 error limit monitoring switched off	[ms]
	If this lag is exceeded, error message (M2001) is affected	
P12026	Admissible command value output Around this monitoring to switch on P12026 must be > 0, and P12142 = 1. With achieving this lag is affected error message (M2002) and analog output = 0 settinged.	[volts]
P12027	Maximum command value output 0 or — default = 9,5V	[volts]
	Those max. output voltage is achieved, if these axis with max. axis speed drives.	
P12028	Command value output direction reversal 1 inverts	
P12029	Command value output axis exchange 0 command value output to this axis 1,,32 command value output to indicated axis (caution: Duplicate of axes avoid)	

8.7 Axis parameters (continued)

Machine data for the 1st. axis

P12030	Software limits positive; if cleared, no limit	[mm, degree]
P12031	Software limits negative; if cleared, no limit	[mm, degree]
P12032	Emergency - position absolute absolute measure, referred to machine zero point approach emergency position see P12131	[mm, degree]
P12033	Emergency - position relative relative measure, referred to machine-location approach emergency position see P12131	[mm, degree]
P12034	Basic position absolute absolute measure, in reference to machines - zero point approach to basic position see P12131	[mm, degree]
P12035	Basic position relative relative measure, referred to machine-location approach basic position see P12131	[mm, degree]
P12036	Fixed position absolute measure, referred to machine zero point approach fixed position see P12132	[mm, degree]
P12037	Pending position relative measure, referred to machine-location approach pending position see P12132	[mm, degree]
P12038	Dwell for pending position 1 0 or cleared Pending position 1 with exact stop approach pending position see P12132	[s]
P12039	Dwell for pending position 2 0 or cleared pending position 2 with exact stop approach pending position see P12132	[s]

8.7 Axis parameters (continued)

Machine data for the 1st. axis

P12040 Reference point offset [mm, degree]
 When taking the reference points (e.g. in the moment of T0), the actual position (P12151) is loaded with P12040. This means if this axis is approached, the axis is standing on it's reference point.

P12041 Modulo measure [degree]
 0 or -- Presetting 360°

P12042 Acceptable distance (reference switch - zero pulse) [mm, degree]
 when exceeding -> error message

P12043 Reference distance (distance coded measuring system) [mm, degree]

P12044 Reference driving logic

Byte 1

\$01 Release of the reference accommodation in positive driving direction
 (see also P12130, byte 1)

Byte 2

\$01 Release of the reference accommodation in negative driving direction
 (see also P12130, byte 2)

Byte 3

Bit0 0 with switch edge
 1 with switch and nullimpuls

Bit4 0 standard measuring system
 1 2. Measuring system

Byte 4

Bit0 0 switch positively switching
 1 switch negatively switching

Bit1 0 reference switch info. (P12180, byte 2) always actually
 1 reference switch info. (P12180, byte 2) becomes after
 point of reference taken no more does not update.

Conditions for the reference accommodation

P12044 Reference driving logic specify

P12079 Byte3 Sercos reference driving control parameter specify

P12130 starts reference accommodation,

Reference accommodation acknowledgement P12180,

so long reference travel actively,

- P12130 Byte 3 \$01 / PLC:REPOF1 = 1 reference position release
 is the drive to be driven as follows

- adjusted without restarting

P12140 Byte 2 \$01 / PLC:NGOW1 = 1

8.7 Axis parameters (continued)**Machine data for the 1st. axis**

P12045 Sensor logic

Byte 1

\$01: Release of measuring position accommodation in positive driving direction

Byte 2

\$01: Release of measuring position accommodation in negative driving direction

Byte 4

Bit0 0 switch edge positively effectively

1 switch edge negatively effectively

Bit4 0 standard pressure foot

1 2. Sensor

Conditions for the measuring position accommodation

P12045 Pressure foot logic specify

P12079 Byte4 Sercos sensor expensive parameter specify

P12082 Sercos sensor of 1 measuring pos parameter specify
(S-0-0130 (pos edge), S-0-0131 (neg edge))P12084 Sercos sensor of 2 measuring pos parameters specify
(S-0-0132 (pos edge), S-0-0133 (neg edge))P8716, P8717, P12131 start measuring accommodation with M26,
Measuring accommodation acknowledgement P8696, P12181
Measuring position P12152

P12046 Error logic

Byte 1

\$01 Wire break T0, T1, T2, inverted signals missing

Byte 2

\$01 UAS signal responded (interference, contamination)

Byte 3

\$01 Measuring system frequency too largely

Byte 4

\$01 Sercos messages actively

P12047 Emergency stop logic

Bit 0 - 31 According to axis 1 - 32

A emergency stop position (P12032, P12033) is started,
the axes indicated in P12046 are stopped.

8.7 Axis parameters (continued)**Machine data for the 1st. axis****Drift correction**

P12049	Drift correction (integral action time in P12022)
0	drift correction only in standstill
1	drift correction always active
2	drift correction switched off

8.7 Axis parameters (continued)

Machine data for the 1st. axis

lot correction

P12052 Backlash correction [mm, degree]
0 or — Backlash correction out

Input value is bisected for both driving directions

Example: Input 0.042mm

- Korrektur +0,021 with positive drive

- Korrektur -0,021 with negative drive

P12053 Backlash correction time [ms]
0 or — Backlash correction in P12052 works as static value
> 0 Backlash correction in P12052 works as dynmischer value
over the time after everyone, input in P12053
travel direction changes
< 0 Backlash correction in P12052 works as dynmischer value
over the time after everyone, input in P12053
start of a movement

Correction dynamics

This dynamics cause that modifications of the axis correction (backlash -, measuring system -, upward gradient correction) with this admissible dynamics to be executed.

P12055 Correction dynamics [ms]
0 or — default (machine dynamics 1 / 2)

8.7 Axis parameters (continued)

Machine data for the 1st. axis

Measuring system correction with 2. Measuring system

P12056 Measuring system correction datum axis (2. Measuring system)

Byte 1

\$xx: 1 - 32 physical axis paragraph 2. Measuring system
2. Measuring system becomes by 1. Measuring system reports.
Debit 2. Measuring system reference system its,
so P12044 must: (byte 4, Bit4=1) to be settinged.
1. Measuring system becomes by 2. Measuring system reports.

Byte 2

\$xx: 1 - 32 physical axis paragraph 2. Measuring system
2. Measuring system as exchange axis,
i.e.. Messsytemposition (all axis positions)
2. Measuring system become on the 1. Measuring system
rerouted and displayed.

Byte 3

\$xx: 1 - 32 physical axis paragraph 2. Measuring system
2. Measuring system as scrutineer axis,
i.e.. Messsytem scrutineer 2. Measuring system
become on the 1. Measuring system rerouted.

Example of activation 2. Measuring system:

q 118: \$00060000 (6th axis log on)

P13001 if round axis

P13012, P13013, P13014 Messsystem resolution

P12057	Measuring system correction reset time	[ms]
	0 or — Correction off	
	> 0 Correction on	

P12058	Measuring system correction admissible correction	[mm]
	0 or — Default 10mm	

8.7 Axis parameters (continued)

Machine data for the 1st. axis

Measuring system correction with 2. Measuring system

P12059	Measuring system correction with internal correction table	
0 or —	Function not actively	
> 0	Measuring system correction with correction table	
	Input of the distance of the corrections	[mm]

Note: This function should be only activated, if those resolution 2. Measuring system more roughly is than the resolution too correcting axis.
(axis for swinging would be lively)

In order to structure the correction table, must after the activation the axis uniquely from the negative software end position to the positive software end position to be moved.

8.7 Axis parameters (continued)

Drive data for digital drives 1st. axis

Pitch correction

P12060	Pitch correction pointer on table Parameter (q-NR.) where table starts.		
P12061	Pitch correction number of corrections 0 or — Correction out > 0 Correction		
P12062	Pitch correction table offset Table access is permitted only with values of item between the end positions. Thus the table offset must become so in against that this applies. Offset = - (machine position (ßt measured value) / distance of the corrections) Example: P12062: -6 = (P12150: 120,000) / P12063: 20,000		
P12063	Pitch correction	distance of the corrections	[mm]
P12064	Pitch correction	datum axis	(interaxis correction, cross correction)
	Input physical axis paragraph		
	0 or —	Correction algorithm uses the axis position (q2x50) the personal axis, over in the correction table the suitable to obtain steigungsfehler.	
	1... 32	Physical axis paragraph correction algorithm uses the axis position (q2x50) the datum axis, over in the correction table the suitable to obtain steigungsfehler.	

Notes to the upward gradient correction:

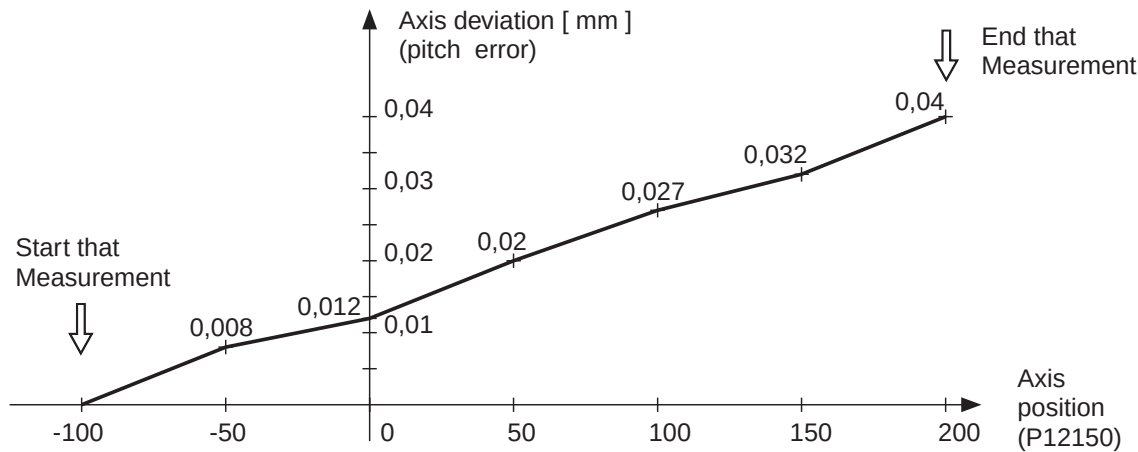
To obtain if the machine position of the axis becomes larger than in the correction table covered correction area, the correction algorithm 'interconnects' start and end the correction table around the entsprechenden correction value, i.e.. Correction values repeat themselves.

Recurring corrections can so in a compact correction table to be stored.
Start and end of the correction table should contain thereby the same values, since it can lead otherwise within this area to striking the axis.

8.7 Axis parameters (continued)

Drive data for digital drives 1st. axis

Example of pitch correction



Allocation of the parameters

				table
				parameter of values
Pointer on table	P12060	20000	>	q20000 0
Number of corrections	P12061	7		q20001 0,008
Table offset	P12062	2		q20002 0,012
Distance of the corrections	P12063	50 [mm]		q20003 0,02
				q20004 0,027
				q20005 0,032
				q20006 0,04

8.7 Axis parameters (continued)

Drive data for Sercos

P12070	Sercos parameter ("S", "p")	*
P12071	Sercos parameter (record)	*
P12072	Sercos parameter (paragraph)	*
P12073	Sercos parameter (attribute)	*
P12074	Sercos parameter (value)	*
P12075	Sercos parameter (minimum)	*
P12076	Sercos parameter (maximum)	*

* In the menu: parameter / axis - parameters / drive - parameter contents of all Sercos (s) - product (p) - know parameters over input - boxes, output - boxes to be displayed and changed.

8.7 Axis parameters (continued)

Drive data for Sercos

- P12078 Sercos drive operating modes (selection over P12144, byte 4)
- Byte 1 S-0-0032 main operating mode
- \$02 Speed control
 - \$03 Position adjustment error limit-afflicted with generator 1(Motor)
 - \$04 Position adjustment error limit-afflicted with generator 2(Ext.)
 - \$0b Position adjustment error limit-free with generator 1(Motor)
 - \$0c Position adjustment error limit-free with generator 2(Ext.)
- Byte 2 S-0-0033 type of subsidiary establishment 1
- \$02 Speed control
 - \$03 Position adjustment error limit-afflicted with generator 1(Motor)
 - \$04 Position adjustment error limit-afflicted with generator 2(Ext.)
 - \$0b Position adjustment error limit-free with generator 1(Motor)
 - \$0c Position adjustment error limit-free with generator 2(Ext.)
- Byte 3 S-0-0034 type of subsidiary establishment 2
- \$xx: (planned)
- Byte 4 S-0-0035 type of subsidiary establishment 3
- \$xx: (planned)

8.7 Axis parameters (continued)

Drive data for Sercos

P12079 Sercos drive definitions

Byte 1

- | | | |
|------|---|------------------------------------|
| Bit0 | 0 | Position data in absolute absolute |
| | 1 | Position data in modulo format |
| Bit1 | 0 | Speed data in m/min |
| | 1 | Speed data in U/mim |

Byte 2

- | | |
|------|---|
| \$xx | External measuring system (paragraph of the axis) |
|------|---|

Byte 3

Sercos S-0-147 reference driving control parameter

- | | | |
|------|---|---|
| Bit0 | 0 | Clockwise rotation of the motor shaft |
| | 1 | Anti-clockwise turn of the motor shaft |
| Bit3 | 0 | Reference take with motor generator |
| | 1 | Reference take with external generator |
| Bit5 | 0 | Reference switch is analysed |
| | 1 | Reference switch is not analysed |
| Bit6 | 0 | Reference label is analysed |
| | 1 | Reference label is not analysed |
| Bit7 | 0 | Any position after reference take |
| | 1 | Point of reference after reference take |

Byte 4

Sercos S-0-169 sensor control parameter

- | | | | |
|------|---|--|--------------------------|
| Bit0 | 0 | Positive edge | sensor 1 is not analysed |
| | 1 | Positive edge | sensor 1 is analysed |
| Bit1 | 0 | Negative edge | sensor 1 is not analysed |
| | 1 | Negative edge | sensor 1 is analysed |
| Bit2 | 0 | Positive edge | sensor 2 is not analysed |
| | 1 | Positive edge | sensor 2 is analysed |
| Bit3 | 0 | Negative edge | sensor 2 is not analysed |
| | 1 | Negative edge | sensor 2 is analysed |
| Bit4 | 0 | Position actual value to operating mode (S-0-0051/S-0-0053) referred | |
| | 1 | Position actual value always to S-0-0051 referred | |
| Bit5 | 0 | Release individual measuring for | sensor 1 |
| | 1 | Release subsequent measurement for | sensor 1 |
| Bit6 | 0 | Release individual measuring for | sensor 2 |
| | 1 | Release subsequent measurement for | sensor 2 |

8.7 Axis parameters (continued)

Drive data for Sercos

P12080	Sercos phase switching (acknowledgement in P12081) 0 Switching on phase 2 Parameter mode 4 Operating mode
P12081	Sercos system status (acknowledgement of P12080) (PLC:SZSA_01) \$E001 Sercos phase 0 \$E002 Sercos phase 1 \$E003 Sercos phase 2 \$E004 Sercos phase 3 \$E005 Sercos phase 4 Sercos drives are ready for use, other values show entsprechende intermediates phase on
P12082	Sercos cyclic actual value 3 request Paragraph by the Sercos parameter z.B.:130 (S-0-0130 measured value 1-positiv)
P12083	Sercos cyclic actual value 3 acknowledgement Worth from Sercos parameter e.g.: Worth to the s-paragraph (S-0-0130 measured value 1-positiv), which over P12082 was called)
P12084	Sercos cyclic actual value 4 request Paragraph by the Sercos parameter z.B.:84 (S-0-0084 torque actual value)
P12085	Sercos cyclic actual value 4 acknowledgement Worth from Sercos parameter e.g.: Worth to the s-paragraph (S-0-0084 torque actual value) which over P12084 was called)
P12089	Sercos speed standardisation 0 or — Standart Sercos priority > 0 Relation between motor priority and load priority

8.7 Axis parameters (continued)

Area monitoring axes

Area 1

P12100	Channel paragraph	
	0 or —	P12101 and P12102 = q-parameter
	1-8	P12101 and P12102 = p-parameter
P12101	Reference position	
	Contents: Pointer on parameters	
	0 or —	Reference position = internal machine position (q2150)
	-2150	Reference position = internal machine position (q2150)
	-2152	Reference position = internal machine position (q2152)
		With the reference position (internal) are these positions immediately for the order, over parameters only time-delayed.
P12102	Control position	
	Contents: Pointer on parameters	
	0 or —	Monitoring logic not actively
P12103	Area 1 relative related to P12101	
	Acknowledgement achieves	P12188 byte 2 = 1
P12104	Area 2 relative related to P12101	
	Acknowledgement achieves	P12188 byte 3 = 1

8.7 Axis parameters (continued)

Area monitoring axes

Area 2

P12105	Channel paragraph 0 or — P12106 and P12107 = q-parameter 1-8 P12106 and P12107 = p-parameter	
P12106	Reference position Contents: Pointer on parameters 0 or — Reference position = internal machine position (q2150) -2150 Reference position = internal machine position (q2150) -2152 Reference position = internal machine position (q2152) With the reference position (internal) are these positions immediately for the order, over parameters only time-delayed.	
P12107	Control position Contents: Pointer on parameters 0 or — Monitoring logic not actively	
P12108	Area 1 relative related to P12106 Acknowledgement achieves	P12189 byte 2 = 1
P12109	Area 2 relative related to P12106 Acknowledgement achieves	P12189 byte 3 = 1

8.7 Axis parameters (continued)

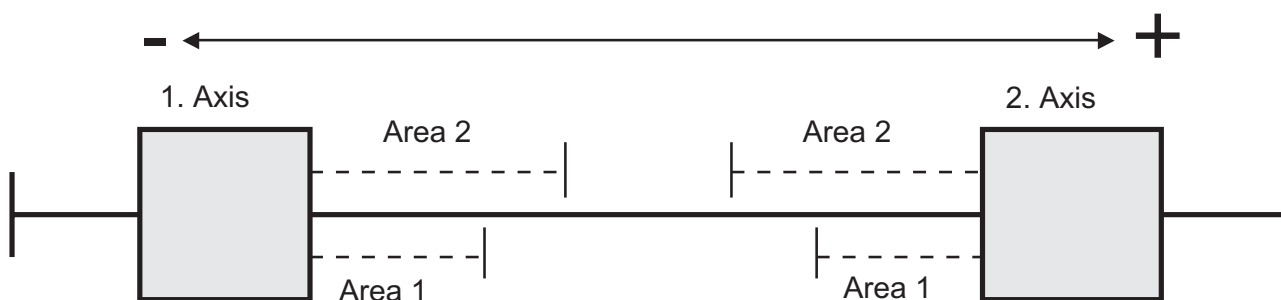
Area monitoring axes

Area 2 relative related to P12106

Acknowledgement achieves P12189 byte 3 = 1

Example: Area monitoring 1. and 2. Axis

P12100	0	P12300	0
P12101	0	P12301	0
P12102	2350	P12302	2150
P12103	10	P12303	-10
P12104	20	P12304	-20



If axis 1 drives 2 from axis 2 into area, indicator K1BE1 is settinged

If axis drives 1 into area 1 from axis 2, indicator K1B1E1 is settinged

If machine pos. Axis 1 = machine pos. Axis 2 is settinged indicator K1B1

If axis drives 2 into area 2 from axis 1, indicator K1BE2 is settinged

If axis 2 drives 1 from axis 1 into area, indicator K1B1E2 is settinged

If machine pos. Axis 2 = machine pos. Axis 1 is settinged indicator K1B2

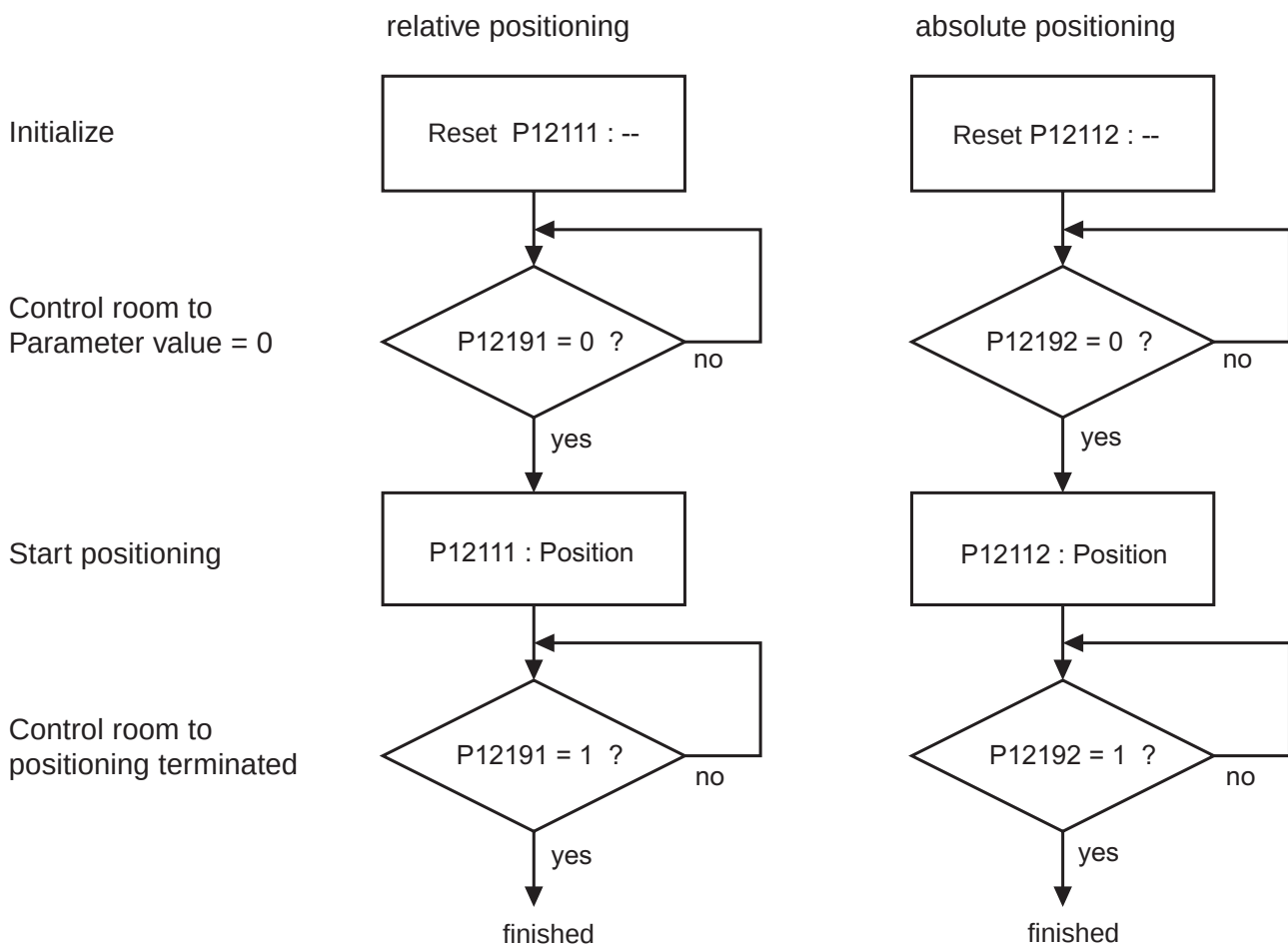
8.7 Axis parameters (continued)**Axis commands / functions**

P12110	Axis position setting Display or debit position is settinged to input value. If parameter is reset, then old value is displayed.	[mm, degree]
P12111	Relative relative start Axis starts when describing. Feed in P12121 Override in P8866 or P12126 Acknowledgement achieves P12191=1 If P12111 reset P12191=0 An active relative positioning is aborted .	[mm, degree]
P12112	Absolute absolute start Axis starts when describing. Feed in P12122, Override in P8867 or P12127 Acknowledgement achieves P12192=1 If P12112 reset P12192=0 An active absolute positioning is aborted.	[mm, degree]
P12113	Absolute before position 0 or — Before position check not actively This before position can, with programmed not-interpolated axes (P8893) in the NC program and active exact stop (G8, G28) for premature step up of the active NC block to be used. With achieving these before position this is settinged in the parameter on zero, i.e. it is active only for a monitoring. Example: N100 G28 F100 X:100 N110 P12113:20 X200 N120 Y100 i.e. with drive into block N110 and path difference to Final position X200 < = P12113 is affected block changes after N120.	[mm, degree]

8.7 Axis parameters (continued)

Axis commands / functions

Example of a relative / an absolute absolute



8.7 Axis parameters (continued)

Axis commands / functions

P12114 Output skip
Axis is moving with the input (speed) without dynamic (skip function) in the selected direction. Axis position is updated.

P12115 Output via output cards (AK, AEK)
0 or — Not actively
-1 i.e. the four signals become into those
PLC Interface (see P12195) written.

Byte 1

\$xx 1-32 AK clip No. for this axis
Axis drives over outputs of a AK, AEK
per axis of 4 binary signals:
example:
Kl. 1 - drive positively
Kl. 2 - drive negatively
Kl. 3 - drive with max axis speed
Kl. 4 - drive with Slope speed
(settinged if indicator SLOP11 = 1)

Byte 2

\$xx: 1-32 slot No. of the AK -, AEK card

8.7 Axis parameters (continued)

Axis commands / functions

P12119	Handwheel speed 0 or — max. Axis speed	[mm/min, degree/min]
P12120	Interpolation speed 0 or — max. Axis speed	[mm/min, degree/min]
P12121	Relative velocity 0 or — max. Axis speed	[mm/min, degree/min]
P12122	Absolute speed 0 or — max. Axis speed	[mm/min, degree/min]
P12123	Fixed position speed 0 or — max. Axis speed	[mm/min, degree/min]
P12124	Spindle speed 0 or — max. Axis speed	[degree/min]

8.7 Axis parameters (continued)**Axis commands / functions**

- P12125 Override with interpolation speed drive
0 or — Default see P8865
 Otherwise Override paragraph 1-8
- P12126 Override with relative speed drive
0 or — Default see P8866
 Otherwise Override paragraph 1-8
- P12127 Override with Absolute speed drive
0 or — Default see P8867
 otherwise Override paragraph 1-8
- P12128 Override with fixed position - speed drive
Default = 1 contents Override paragraph 1-8
- P12129 Override at spindle speed drive
Default = 2 contents Override paragraph 1-8

8.7 Axis parameters (continued)

Parameter block of PLC (Marker interface)

P12130 Approach reference position

Byte 1

- | | | |
|------|--|---------------|
| \$00 | Stop of the positive reference drive | (PLC: REPO+1) |
| \$01 | Start of the reference drive in positive direction.
feed: Hand feed P8755
back message achieves P12180 | |

Byte 2

- | | | |
|------|--|---------------|
| \$00 | Stop of the negative reference drive | (PLC: REPO-1) |
| \$01 | Start of the reference drive in negative direction.
feed: Hand feed P8755
back message achieves P12180 | |

Byte 3

- | | | |
|------|--|---------------|
| \$01 | Reference position release
back message achieves P12180
(see also P12044)
note: If with one already referenzierten axis the reference
position release is again settinged, the reference point reset.
the axis can again be referenziert. | (PLC: REPOF1) |
|------|--|---------------|

Byte 4

- | | | |
|------|--|---------------|
| \$01 | Reference position setting
back message achieves P12180 | (PLC: REPOS1) |
|------|--|---------------|

8.7 Axis parameters (continued)

Parameter block of PLC (Marker interface)

P12131 Approach measuring position

Byte 1

- | | | |
|------|---|---------------|
| \$00 | Stop of the positive measuring travel | (PLC: MEPO+1) |
| \$01 | Start of the measuring drive in positive direction.
feed: Hand feed P8755
back message started P12181 | |

Byte 2

- | | | |
|------|---|---------------|
| \$00 | Stop of the negative measuring drive | (PLC: MEPO-1) |
| \$01 | Start of the measuring drive in negative direction.
feed: Hand feed P8755
back message started P12181 | |

Byte 3

- | | | |
|------|---|---------------|
| \$01 | Measuring position release
back message settinged P12181 | (PLC: MEPOF1) |
|------|---|---------------|

Byte 4

- | | | |
|------|---|---------------|
| \$01 | Measuring position setting
back message settinged P12181 | (PLC: MEPOS1) |
|------|---|---------------|

8.7 Axis parameters (continued)

Direction PLC → interpolator

P12132 Approach emergency position, basic position

- | | | | |
|--------|---|--|---------------|
| Byte 1 | 0 | Stop for emergency position absolutely achieve | (PLC: NOPOA1) |
| | 1 | Start for emergency position absolutely achieve | |
| | | Position in P12032 | |
| | | Feed: max. axes speed | |
| | | Override 100% | |
| | | All other axes in the channel go on axis stop. | |
| | | Back message achieves in P12182 | |
| | | When starting to that emergency position drive becomes those | |
| | | message M2000 settinged. | |
| Byte 2 | 0 | Stop for emergency position relatively achieve | (PLC: NOPOR1) |
| | 1 | Start for emergency position relatively achieve | |
| | | Position in P12033 | |
| | | Feed: max. axes speed | |
| | | Override 100% | |
| | | All other axes in the channel go on axis stop. | |
| | | Back message achieves in P12182 | |
| | | When starting to that emergency position drive becomes those | |
| | | message M2000 settinged. | |
| Byte 3 | 0 | Stop for reason of position absolutely achieve | (PLC: GRPOA1) |
| | 1 | Start for reason of position absolutely achieve | |
| | | Position in P12034 | |
| | | Feed: max. axes speed | |
| | | Back message achieves in P12182 | |
| | | Override P12128 | |
| Byte 4 | 0 | Stop for reason of position relatively achieve | (PLC: GRPOR1) |
| | 1 | Start for reason of position relatively achieve | |
| | | Position in P12035 | |
| | | Feed: max. axes speed | |
| | | Back message achieves in P12182 | |
| | | Override P12128 | |

8.7 Axis parameters (continued)

Direction PLC —> interpolator

P12133 Approach fixed position, pending position

Byte 1 0 Stop for approaching fixed position (PLC: FEPO1)

1 Start for approaching fixed position
Position in P12036,
Feed in P12123,
Feedback reached in P12183

Byte 2 0 Stop for approaching pending position (PLC: PEPO1)

1 Start for approaching pending position
Position in P12037,
Feed in P12123
Feedback reached in P12183

P12134 Drive spindle

Byte 1 0 Stop for driving spindle positive (PLC: SPE+1)

1 Start for driving spindle positive
Speed in P12124,
Feedback reached in P12184

Byte 2 0 Stop for driving spindle negative (PLC: SPE-1)

0 Stop for driving spindle negative
1 Start for driving spindle negative
Speed in P12124,
Feedback reached in P12184

8.7 Axis parameters (continued)

Direction PLC → interpolator

P12138 Axis simulation

Byte 1 1 Simulation without output voltage (PLC: SIMMA1)
i.e. the axis moves controlled (P12139) and
the reference signal is simulated internally.

P12139 Axis controlled

Byte 1 1 Controlled with measuring system (PLC: GSMM1)
i.e. the real axis position is carried internally.
If controlled is cleared (positioning control on), this axis position is taken
as actual position

Byte 2 1 Controlled without measuring system (PLC: GSOM1)

P12140 Axis updated (target = actual)

Byte 1 1 Updating with reapproaching the old position (PLC:NGMW1)

Byte 2 1 Updating without reapproaching (PLC: NGOW1)

P12141 Axis clamped

Byte 1 1 Clamping is switched on (PLC: GEKL1)
i.e. no drive locking for axis;
drift correction is switched off
Axes output = 0 volts

8.7 Axis parameters (continued)**Axis feedbacks / informations**

P12150	Machine position actual mechanical position of the axis	[mm, degree]
P12151	Target position position of the axis referred to the machine reference point G53	[mm, degree]
P12152	Actual position actual measuring position of the axes	[mm, degree]
P12153	Measuring position (display) stored display position at measuring signal (P8855) (Channel mapping) *	[mm, degree]
P12154	Display - position Display = target position - display shift (Channel mapping) *	[mm, degree]
P12155	Programmed position position programmed in the NC block (Channel mapping) *	[mm, degree]
P12156	Delta position Delta = programmed position - display position (Channel mapping) *	[mm, degree]
P12157	Display - shift Sum of all shifts (e.g. zero point, G92 shift, tool length) (Channel mapping) *	[mm, degree]

* Channel mapping parameters are channel specific,
i.e.. it does not exist a channel-spreading q-parameter.
During the switching on routine becomes however the parameter status q-parameter
into the parameter status of the p-parameter copies; i.e. is in a parameter with
channel mapping the parameter status to be redefined, then this must in
suitable status of the q-parameter are affected.

Example: P12153 is to be provided with 4 post-decimal positions
—> setting parameter status of q2153 with \$24xxxxxx

After restarting parameter status in P12153 corresponds
the parameter status q2153

8.7 Axis parameters (continued)**Axis feedbacks / information**

P12158	Position shift (e.g. handwheel-shift in Automatic)	[mm, degree]
P12159	Distance reference switch -> reference mark	[mm, degree]
P12160	Actual lag distance	[mm, degree]
P12161	Actual coupling correction	[mm, degree]
P12162	Actual drift correction	[mm, degree]
P12163	Actual backlash correction	[mm, degree]
P12164	Actual measuring system correction	[mm, degree]
P12165	Actual pitch correction	[mm, degree]

8.7 Axis parameters (continued)**Axis feedbacks / information**

P12167	Command speed (regulator) Access with oscilloscope functions	[mm, degree]
P12168	Actual speed (measuring system) Access with oscilloscope functions	[mm, degree]
P12169	Actual output voltage of the position adjustment	[V]
P12170	Actual axis speed	[mm/min, degree/min]
P12171	Actual relative speed	[mm/min, degree/min]
P12172	Actual absolute speed	[mm/min, degree/min]
P12173	Actual fixed position speed	[mm/min, degree/min]
P12174	Actual spindle speed	[degree/min]

8.7 Axis parameters (continued)

Axis feedbacks / information

P12176 ADW module Address
Byte 1
 \$xx ADW input Paragraph 1... 4
 (selection of the A/D transducer on the ADW Module)
Byte 2
 \$xx slot paragraph 1... 32

P12177 ADW Input value
the A/D of transducer addressed in P12176
Contents: [32767... -32768]

P12178 DAW module address
Byte 1
 \$xx DAW output Paragraph 1... 4
 (selection of the D/A transducer on the DAW module)
Byte 2
 \$xx slot paragraph 1... 32

P12179 DAW output value [V]
the D/A of transducer addressed in P12178
Note:
If P12178 does not specify, the DAW value becomes up
the axis module of this axis output.

8.7 Axis parameters (continued)

Parameter block to the PLC (marker interface)

P12180	Reference position	
	Byte 1 1 Reference point taken	(PLC: REF1)
	Byte 2 1 Switch, active edge going	(PLC: REFS1)
P12181	Measuring position	
	Byte 1 1 measuring position taken	(PLC: MEGT1)
	Byte 2 1 switch, active edge going	(PLC: MES1)
P12182	Emergency position, basic position reached	
	Byte 1 1 emergency position reached	(PLC: NOPOE1)
	Byte 3 1 Basic position reached	(PLC: GRPOE1)
P12183	Fixed position, pendling position reached	
	Byte 1 1 fixed position reached	(PLC: FEPOE1)
	Byte 2 1 pendling position reached	(PLC: PEPOE1)
P12184	Speed reached	
	Byte 1 1 speed reached	(PLC: DREZE1)
P12185	Software end position	
	Byte 1 1 positive software end position	(PLC: SWEL+1)
	Byte 2 1 negative software end position	(PLC: SWEL-1)

8.7 Axis parameters (continued)

Parameter block to the PLC

P12186	Axis drives	
	Byte 1	(PLC: ACHFA1)
	0	No axis specification i.e.: Axis does not drive or axis builds the even lag distance off
	1	Axis does not drive —> axis specification / axis feed to zero i.e.: Axis specifications are available.
P12187	Driving instruction	
	0	No driving instruction pends i.e.: - no verfahrweg for axis - axis finds within exact stop finely (P12016)
	Byte 1	(PLC: FB+1)
	1	Driving instruction for positive driving direction (driving instruction remains pending, if e.g. in the drive path the feed to zero becomes)
	Byte 2	(PLC: FB-1)
	1	Driving instruction for negative driving direction (driving instruction remains pending, if e.g. in the drive path the feed to zero becomes)
	Byte 3	
	1	Axis drive actual actively i.e. the even position actual which can be started yet does not achieve.
P12188	Back message area monitoring axes area 1	
	Byte 1 1	Reference position (P12101) = control position (P12102) (PLC: K1E1)
	Byte 2 1	Control position area 1 (P12103) achieves (PLC: K1B1E1)
	Byte 3 1	Control position area 2 (P12104) achieves (PLC: K1BÈ1)
P12189	Back message area monitoring axes area 2	
	Byte 1 1	Reference position (P12106) = control position (P12107) (PLC: KÈ1)
	Byte 2 1	Control position area 1 (P12108) achieves (PLC: K2B1E1)
	Byte 3 1	Control position area 2 (P12109) achieves (PLC: K2BÈ1)

8.7 Axis parameters (continued)**Parameter block to the PLC**

P12191	Relative position achieves		
Byte 1	1	Relative position achieves i.e.: Axis actual around the error limit from the target position removes.	(PLC: REPOE1)
P12192	Absolute position achieves		
Byte 1	1	Absolute position achieves i.e.: Axis actual around the error limit from the target position removes.	(PLC: ABPOE1)
P12194	Sercos drive status (Sercos drive - > Interpolator - > PLC)		
Byte 2	1		
	\$0000	Drive not yet ready for the performance power, there drive check not finally.	
	\$0001	Drive ready for the performance power,	
	\$0100	Drive actual ready for use and performance supply switched on, note: due to this back message are those to operate drive releases (P12144)	
	\$0101	Drive actual ready for use, drive releases (P12144) are effective, drive output stage actual actively.	
P12195	AK / AEK - outputs		
	Definition in P12115		
Byte 1			
	\$01	drive in positive direction	(PLC:POSFA1)
Byte 2			
	\$01	drive in negative direction	(PLC:NEGFA1)
Byte 3			
	\$01	drive with max. Axis speed	(PLC:SCHFA1)
Byte 4			
	\$01	drive with Slope speed	(PLC:LGSFA1)

8.7 Axis parameters (continued)**Parameter block to the PLC**

P12197	Message number Message display for this axis e.g. M2110 approach reference position	(PLC: MELNR1)
P12198	Channel number Axis belongs to this channel (1...8)	(PLC: KANNR1)
P12199	Logicals axis number Axis has this logical number (1. ..32) in the channel	(PLC: LANA1)