Parameter Description

R67052.0002 - Index 2c (English)

For the SMC1.3 / SMC2.4 safety units

- Supplement to the SMCx operating manual
- Describes the SMCx parameter functions
- Incl. Parameter list as short overview
- For setup and commissioning procedure
- Overview of all registers

Version:	Description:
R67052 01a/ Jan-18/af/cn	First separated version as parameter description
R67052 01b/ Apr-18/af/cn	Small additions
R67052 01c/ Apr-18/af/cn	New parameter Power-Cas Delay
R67052 01d/July-18/af/cn	Additions
R67052 02a/ Feb-20/af/cn	New Parameter 009
R67052 3 / Dez-20 /	OSxx
R67052 02b / July-21/kae	Revised version
R67052 02c / February 22 / kae	Revision in chapter 11.2 / Safety Manual R60047 ➔ PRG Error

German is the original version.

General

This parameter description was created as a separate document for an optimum overview. It contains information about the entire SMC1.3 / SMC2.4 registers as well as a parameter list at the end of the document.

Table of Contents

1 Parameter / Menu Overview

The parameterization of the device is realized via USB interface with a PC and the operating software OSxx. The link to the free download is: https//www.kuebler.com/software.
This section provides an overview of the menus and their assignments to the different unit functions. The menu names are printed bold and associated Parameters are arrayed directly under the menu names.

No.	Menu / Parameter
	Main Menu
000	Sampling Time
001	Wait Time
002	F1-F2 Selection
003	Div. Mode
004	Div. Switch %-f
005	Div. %-Value
006	Div. f-Value
007	Div. Calculation
008	Div. Filter
009	Div. Filter Time
010	Div. Inc-Value
011	Error Simulation
012	Power-up Delay
013	Filter
014	Power-up Error
015	Sensor Overlap
016	Power-Cas Delay
	Sensor1 Menu
017	Op-Mode 1
018	Edge 1
019	Direction 1
020	Multiplier 1
021	Divisor 1
022	Position Drift 1
023	Sense Value 1
024	Sense Tol. 1
025	Phase Error 1
026	Set Frequency 1
027	Error Mask 1
028	Dir Changes 1

No.	Menu / Parameter
	Sensor2 Menu
029	Op-Mode 2
030	Edge 2
031	Direction 2
032	Multiplier 2
033	Divisor 2
034	Position Drift 2
035	Sense Value 2
036	Sense Tol. 2
037	Phase Error 2
038	Set Frequency 2
039	Error Mask 2
040	Dir Changes 2

Continuation **„Parameter / Menu-Overview“:**

No.	Menu / Parameter
	Presel.OUT1 Menu
041	Presel.OUT1.01
042	Presel.OUT1.02
043	Presel.OUT1.03
044	Presel.OUT1.04
045	Presel.OUT1.05
046	Presel.OUT1.06
047	Presel.OUT1.07
048	Presel.OUT1.08
049	Presel.OUT1.09
050	Presel.OUT1.10
051	Presel.OUT1.11
052	Presel.OUT1.12
053	Presel.OUT1.13
054	Presel.OUT1.14
055	Presel.OUT1.15
056	Presel.OUT1.16
057	Presel.OUT1.D
058	Presel.OUT1.M
059	Presel.OUT1.R
060	Reserved
	Presel.OUT2 Menu
061	Presel.OUT2.01
062	Presel.OUT2.02
063	Presel.OUT2.03
064	Presel.OUT2.04
065	Presel.OUT2.05
066	Presel.OUT2.06
067	Presel.OUT2.07
068	Presel.OUT2.08
069	Presel.OUT2.09
070	Presel.OUT2.10
071	Presel.OUT2.11
072	Presel.OUT2.12
073	Presel.OUT2.13
074	Presel.OUT2.14
075	Presel.OUT2.15
076	Presel.OUT2.16
077	Presel.OUT2.D
078	Presel.OUT2.M
079	Presel.OUT2.R
080	Reserved

No.	Menu / Parameter
	Presel.OUT3 Menu
081	Presel.OUT3.01
082	Presel.OUT3.02
083	Presel.OUT3.03
084	Presel.OUT3.04
085	Presel.OUT3.05
086	Presel.OUT3.06
087	Presel.OUT3.07
088	Presel.OUT3.08
089	Presel.OUT3.09
090	Presel.OUT3.10
091	Presel.OUT3.11
092	Presel.OUT3.12
093	Presel.OUT3.13
094	Presel.OUT3.14
095	Presel.OUT3.15
096	Presel.OUT3.16
097	Presel.OUT3.D
098	Presel.OUT3.M
099	Presel.OUT3.R
100	Reserved
	Presel.OUT4 Menu
101	Presel.OUT4.01
102	Presel.OUT4.02
103	Presel.OUT4.03
104	Presel.OUT4.04
105	Presel.OUT4.05
106	Presel.OUT4.06
107	Presel.OUT4.07
108	Presel.OUT4.08
109	Presel.OUT4.09
110	Presel.OUT4.10
111	Presel.OUT4.11
112	Presel.OUT4.12
113	Presel.OUT4.13
114	Presel.OUT4.14
115	Presel.OUT4.15
116	Presel.OUT4.16
117	Presel.OUT4.D
118	Presel.OUT4.M
119	Presel.OUT4.R
120	Reserved

Continuation **„Parameter / Menu-Overview“**:

No.	Menu / Parameter
	Presel.REL1 Menu
121	Presel.REL1.01
122	Presel.REL1.02
123	Presel.REL1.03
124	Presel.REL1.04
125	Presel.REL1.05
126	Presel.REL1.06
127	Presel.REL1.07
128	Presel.REL1.08
129	Presel.REL1.09
130	Presel.REL1.10
131	Presel.REL1.11
132	Presel.REL1.12
133	Presel.REL1.13
134	Presel.REL1.14
135	Presel.REL1.15
136	Presel.REL1.16
137	Presel.REL1.D
138	Presel.REL1.M
139	Presel.REL1.R
140	Reserved
	Switching Menu
141	Switch Mode OUT1
142	Switch Mode OUT2
143	Switch Mode OUT3
144	Switch Mode OUT4
145	Switch Mode REL1
146	Pulse Time OUT1
147	Pulse Time OUT2
148	Pulse Time OUT3
149	Pulse Time OUT4
150	Pulse Time REL1
151	Hysteresis OUT1
152	Hysteresis OUT2
153	Hysteresis OUT3
154	Hysteresis OUT4
155	Hysteresis REL1
156	Matrix OUT1
157	Matrix OUT2
158	Matrix OUT3
159	Matrix OUT4
160	Matrix REL1

No.	Menu / Parameter
161	MIA-Delay OUT1
162	MIA-Delay OUT2
163	MIA-Delay OUT3
164	MIA-Delay OUT4
165	MIA-Delay REL1
166	MAI-Delay OUT1
167	MAI-Delay OUT2
168	MAI-Delay OUT3
169	MAI-Delay OUT4
170	MAI-Delay REL1
171	Delay OUT 1
172	Delay OUT 2
173	Delay OUT 3
174	Delay OUT 4
175	Delay REL 1
176	Startup Mode
177	Startup Output
178	Standstill Time
179	Lock Output
180	Action Output
181	Action Polarity
182	Read Back OUT
183	Output Mode
184	EDM Error Count
185	*Reserved*
	Control Menu
186	Input Mode 1
187	Input Mode 2
188	IN1 Function
189	IN1 Config
190	/IN1 Function
191	/IN1 Config
192	IN2 Function
193	IN2 Config
194	/IN2 Function
195	/IN2 Config
196	IN3 Function
197	IN3 Config
198	/IN3 Function
199	/IN3 Config

Continuation **„Parameter / Menu-Overview**“:

No.	Menu / Parameter
200	IN4 Function
201	IN4 Config
202	/IN4 Function
203	/IN4 Config
204	Read Back Delay
205	GPI Err Time
206	*Reserved*
207	*Reserved*
	Serial Menu
208	Serial Unit Nr.
209	Serial Baud Rate
210	Serial Format
211	Serial Page
212	Serial Init
213	Reserved
	Splitter Menu
214	Split.Level
215	Split.Selector
	Analog Menu
216	Analog Start
217	Analog End
218	Analog Gain
219	Analog Offset
220	*Reserved*
	OPU Menu
221	X Factor 1
222	/ Factor 1
223	+/- Value 1
224	Units 1
225	Decimal Point 1
226	X Factor 2
227	/ Factor 2
228	+/- Value 2
229	Units 2
230	Decimal Point 2
231	*Reserved*
232	*Reserved*
233	*Reserved*
234	*Reserved*
235	*Reserved*

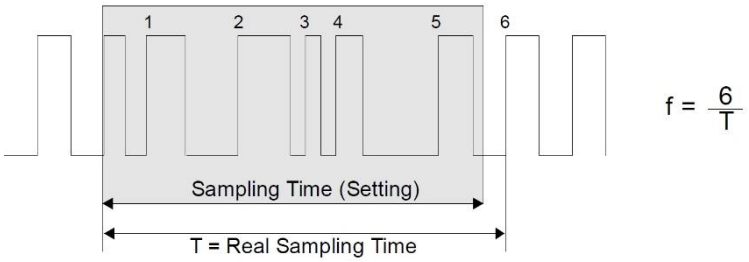
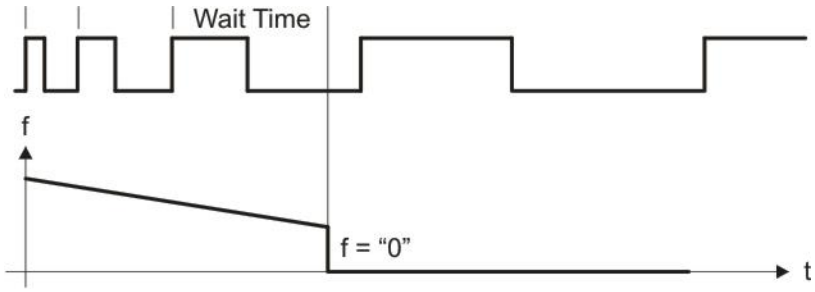
2 Parameter Description

2.1 Important notes for SMC1.3

When using a SMC1.3 variant, the following hints must be observed:
(SMC2.4 is the execution for two independent encoders, SMC1.3 is the execution for a secure encoder).

No.	Parameter	Note für SMC1.3
002	F1-F2 Selection	Both settings have the same effect
017	Op-Mode 1	Op-Mode 1 and Op-Mode 2 must be equal
018	Edge 1	Edge 1 and Edge 2 must be equal
019	Direction 1	Direction1 and Direction2 must be equal
020	Multiplier 1	The setting must be „1“
021	Divisor 1	The setting must be „1
022	Position Drift 1	Position Drift 1 and Position Drift 2 must be equal
025	Phase Error 1	Phase Err Count1 and Phase Err Count2 must be equal
027	Error Mask 1	Error Mask 1 and Error Mask 2 must be equal
188 – 203	*IN* Function	To clear drift errors, Clear Drift 1&2 must be used
215	Split. Selector	Both settings have the same effect

2.2 Main Menu

No.	Parameter	Range	Default
000	**Sampling Time** (minimum frequency measuring time)**:** The configured value corresponds to the minimum measurement time. The Parameter is used as a filter in case of irregular frequencies. This parameter directly affects the response time of the unit. The setting is valid for both inputs channels.  	0.001 – 9.999 (sec.)	0.001
001	**Wait Time** (Zeroing)**:** Defines the period time of the lowest frequency resp. the waiting time between 2 rising edges, which is detected as frequency = 0 Hz by the unit.  All frequencies with a period longer than the Wait Time value will be interpreted as frequency = 0 Hz. **0.010** – Frequency = 0 Hz with frequencies smaller than 100 Hz **…** **9.999** – Frequency = 0 Hz with frequencies smaller than 0.1 Hz The setting is valid for both inputs channels.	0.010 – 9.999 (sec.)	0.100

<table>
<tr><td>002</td><td><u>F1-F2 Selection</u> <u>(Basic Frequency Selection)</u><u>:</u>

This parameter determines which of the two input frequencies of sensor 1 or sensor 2 is subsequently monitored and evaluated as a base frequency.

The basic frequency selection affects the following outputs:
- Analog output
- Control outputs
- Relay outputs

<table><tr><td>0</td><td>Frequency of Sensor 1 serves as basic frequency</td></tr><tr><td>1</td><td>Frequency of Sensor 2 serves as basic frequency</td></tr></table></td><td>0 - 1</td><td>0</td></tr>
<tr><td>003</td><td><u>Div. Mode</u> <u>(Type of comparison)</u><u>:</u>

This parameter defines the type of comparison for sensor evaluation. Frequency comparison compares the two sensor frequencies. Parameters 004 - 008 are relevant. Sensor Position Comparison compares the two sensor positions. Parameter 013 is relevant.

<table><tr><td>0</td><td>Frequency Comparison:
Differences between the two sensor frequencies results in a Run Time error.</td></tr><tr><td>1</td><td>Sensor Position Comparison:
Differences between the two sensor positons results in a Run Time error.</td></tr><tr><td>2</td><td>Frequency und Sensor Position Comparison:
Differences between the two sensor frequencies and the sensor positions results in a Run Time error.</td></tr></table>
Strongly fluctuating frequencies caused by step motors or elastic connections between the encoders, Sensor Position Comparison could be more stable.
Relationship between the encoders which are not adjusted by the parameter Multiplier and Divisor could cause cumulative errors. In this case Frequency comparison is more stable.
The SMC1.3 is normally used with Position Comparison.</td><td>0 - 2</td><td>0</td></tr>
</table>

Continuation **„Main Menu“:**

<table>
<tr><th>No.</th><th><u>Parameter</u></th><th>Range</th><th>Default</th></tr>
<tr><td>004</td><td><u>Div. Switch %-f</u> <u>(Divergence switching point %-Hz)</u>:

Parameters for frequency comparison:
The SMCX unit constantly compares the frequencies of Sensor 1 and Sensor 2 to the adjusted maximum allowed divergence. Application-specific a percentage comparison can be problematic with lower frequencies, so that a direct monitoring of the difference frequency in Hz can deliver better results.

This Parameter allows to define a limit. When undershooting the adjusted value, the comparison will proceed no more percentages, but absolute in Hz.</td><td>0 – 9999.99
(Hz)</td><td>100.00</td></tr>
<tr><td>005</td><td><u>Div. %-Value</u> <u>(maximum Divergence %)</u>:

Defines the maximum allowed percentage divergence between the frequencies of Sensor 1 and Sensor 2. If this value is exceeded, the unit switches to an error state. The calculation is specified by parameter "Div. Calculation ".</td><td>0 - 100
(%)</td><td>10</td></tr>
<tr><td>006</td><td><u>Div. f-Value</u> <u>(maximum Divergence Hz)</u>:

Defines the maximum allowed absolute divergence in Hz between the frequencies of Sensor 1 and Sensor 2. If the adjusted value is exceeded, the unit switches to an error status.</td><td>0 – 999.99
(Hz)</td><td>30.00</td></tr>
<tr><td>007</td><td><u>Div. Calculation</u> <u>(Divergence Calculation Mode)</u>:

Parameters for frequency comparison:
This parameter will calculate the percentage divergence.

<table><tr><td>0</td><td>Reference value is the frequency of Sensor1:
△(%) = (Sensor 1 – Sensor) : Sensor 1 x 100 %</td></tr><tr><td>1</td><td>Reference value is the frequency of Sensor2:
△(%) = (Sensor 2 – Sensor 1) : Sensor 2 x 100 %</td></tr></table></td><td>0 - 1</td><td>0</td></tr>
</table>

Continuation **„Main Menu“:**

<table>
<tr><td>008</td><td><u>Div. Filter</u> <u>(Divergenz-Filter)</u>:

Parameters for frequency comparison:
This digital filter parameter evaluates the divergence between Sensor 1 and Sensor 2.

<table>
<tr><td>0</td><td>The filter is not active:
The unit reacts immediately to each frequency deviation</td></tr>
<tr><td>5</td><td>Medium filter effect:
The unit tolerates temporary deviations and fluctuations, e. g. caused from torsion or mechanical vibrations and reacts delayed to deviations between both input frequencies</td></tr>
<tr><td>10</td><td>Higher filter effect:
The unit tolerates temporary deviations and fluctuations, e. g. caused from torsion or mechanical vibrations and reacts with a very long delay to prolonged deviations between both input frequencies</td></tr>
</table>
</td><td>0 - 20</td><td>1</td></tr>
<tr><td>009</td><td><u>Div. Filter Time</u> <u>(maximum filter time)</u>:

Parameter for Div. Filter:
If the Div. Filter Time = 0 is set, the Div. Filter is updated after each sampling time period or after the completion of a period (at low frequencies greater than the sampling time). This parameter allows a fixed time base for updating the Div. Filters are used.
(Sampling Time <= Div. Filter Time)</td><td>0 – 1,000 (sec.)</td><td>0,000</td></tr>
<tr><td>010</td><td><u>Div. Inc-Value</u> <u>(absolute deviation in increments)</u>:

Parameters for frequency comparison:
This parameter defines the maximum acceptable deviation in increments by Sensor Position Comparison.
If value 1000 is set, a position deviation higher than 1000 or lower than -1000 increments results in a Run-Time error.
This parameter is only used by Sensor Position Comparison.

If the parameter is set to 0, no error is recognized.</td><td>0 - 9999999</td><td>0</td></tr>
</table>

Continuation **„Main Menu“:**

<table>
<tr>
<td>011</td>
<td><u>Error Simulation</u>

This Parameter is only allowed in Programming Mode and serves exclusively for test purposes during the commissioning procedure. It allows to simulate and suppress error messages as follows:

<table>
<tr><td>0</td><td>Error state:
Sets the unit into error status. By using this parameter, it is possible to check, if the entire follow-up system reacts correctly in case of errors.</td></tr>
<tr><td>1</td><td>Normal state:
Before exiting the Programming Mode,
this parameter always must be set to 1.</td></tr>
<tr><td>2</td><td>Error clearing:
All errors reported by the unit will be reset.</td></tr>
</table>

A direct changeover between 0 and 2 should be avoided.

After the test, this parameter must be reset to default (=1).</td>
<td>0 - 2</td>
<td>0</td>
</tr>
<tr>
<td>012</td>
<td><u>Power-up Delay:</u>

A delay time setting is recommended to ensure a safely power up and enough time for stabilization after switching the encoder supply for all connected encoders. The evaluation of the encoder signals will start after the selected delay time has been elapsed.
This parameter can also be used to compensate different start-up times at power up.</td>
<td>0,001 -
19,999 (sec.)</td>
<td>0.100</td>
</tr>
</table>

Continuation **„Main Menu“:**

013	**Filter** (filtering the input frequencies): If value is set to 0, smoothing and filtering of the input frequencies will not be executed. The higher the value setting, the stronger the smoothing of the input frequencies, the lower the dynamic within frequency chances. A combination of Sampling Time and filtering is the best for smoothed input frequencies The Sampling Time affects more on high-frequency range (period time shorter than the Sampling Time). Filtering affects the frequency value determined after the Sampling Time resp. frequencies with period times longer than the Sampling Time. Frequencies > 1/Sampling Time: For Sampling Time = 1ms and Filter = 10, a value approx. 63 % is reached after 10 ms, 95 % after 30 ms and the final value is reached after 50 ms. A tenfold of the Sampling Time occurs a tenfold of the filtering time. Same for a tenfold of Parameter Filter and filtering time. The min. filter time is approx. 100 µs, up to two sampling periods. T (63 %) = Sampling Time x Filter T (95 %) = 3 x Sampling Time x Filter T (100 %) = 5 x Sampling Time x Filter Frequencies < 1/Sampling Time: In this case, you have to look at the period time = 1/f. For Filter = 10, after 10 periods a final value approx. 63 %, and after 30 periods a final value approx. 95 % is reached. T (63 %) = 1/f x Filter T (95 %) = 3 x 1/f x Filter T (100 %) = 5 x 1/f x Filter	0 - 999	0

Continuation **„Main Menu“:**

<table>
<tr><td>014</td><td><u>Power-up Error</u> <u>(saved error)</u><u>:</u>

With this parameter, an error can be stored permanently so that the error is retained even after a renewed power-up. Only part of the run time error can be saved permanently. If the value = 0 is set, there will be no error storage at power-down.
A POE error is triggered during the initialization phase if the error was triggered, saved and activated by this parameter. (corresponding bit = 1 set)
The stored error is also activated in the Run Time Error, independently of the cause of the error still exists.

For delation switch to programming mode. For delete the errors using the parameter "error stimulation" and then switch off the SMC2.4. At next turn on, the error no longer exists.
Delete sequence:
- DIL Switch to Programming mode
- Set parameter error stimulation to 2
- Press transmit change on the OSxx
- Set parameter error stimulation to 1
- Press transmit change on the OSxx
- Now no more errors are visible, otherwise the cause of the error must be corrected first.
- Switch off the SMC2.4 (30s)
- Switch on the SMC2.4
- Now there should be no more errors visible, otherwise the cause of the error still exists.</td><td>0 - 2097151</td><td>0</td></tr>
<tr><td>015</td><td><u>Sensor Overlap:</u>
The overlap of the two sensors can be defined with this parameter in Op.-Mode 1= 3 (A1 Single) and Op. Mode 2 = 3 (A2 Single)

<table><tr><td>0</td><td>Off:
The overlap is disabled. No error evaluation occurs.</td></tr><tr><td>1</td><td>Error at low:
The overlap for both signals of the encoder is active. An error is triggered when both sensors are controlled with low.</td></tr><tr><td>2</td><td>Error at high:
The overlap for both signals of the encoder is active. An error is triggered when both sensors are controlled with high.</td></tr></table></td><td>0 - 2</td><td>0</td></tr>
<tr><td>016</td><td><u>Power-Cas Delay</u> <u>(Power-up Delay</u> in cascade mode<u>)</u><u>:</u>
This parameter can be used to set the power-on delay in cascade mode.</td><td>0 -99,999</td><td>0,000</td></tr>
</table>

2.3 Sensor 1 Menu

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>017</td><td><u>Op-Mode 1</u> <u>(operation mode)</u>:

At SMC1.3 version: Op-Mode 1 = Op-Mode 2

This parameter defines wich input type is assigned to sensor input 1.

<table><tr><td>0</td><td>RS422 differentiel (A,/A,B,/B,Z,/Z with A/B 90°)</td></tr><tr><td>1</td><td>HTL differentiel (A,/A,B,/B,Z,/Z with A/B 90°)</td></tr><tr><td>2</td><td>HTL single-lane (A,B,Z with A/B 90°)</td></tr><tr><td>3</td><td>HTL single-lane (A Single, B Direction)</td></tr></table></td><td>0 - 3</td><td>1</td></tr>
<tr><td>018</td><td><u>Edge 1</u> <u>(edge evaluation)</u>:

At SMC1.3 version: Edge 1 = Edge 2

This parameter defines which edge evaluation is assigned to sensor input 1 in Operational Mode = 3.
The parameter refers to the A-single signal processing. Each edge (Edge 1 = 0) or every second edge (Edge 1 = 1) can be evaluated here. For signals with different pulse-pause times, the parameter must be set to 1, so that a quiet frequency is detected. A faster reaction time can be achieved with the setting = 0.</td><td>0 - 1</td><td>0</td></tr>
<tr><td>019</td><td><u>Direction 1</u> <u>(direction of Sensor1)</u>:

At SMC1.3 version: Direction1 = Direction2

Parameter to assign the direction of Sensor1

<table><tr><td>0</td><td>No changes</td></tr><tr><td>1</td><td>Changes the sign of the direction</td></tr></table>This allows to reverse direction of Sensor 1 in order to adapt Sensor 1 to direction of Sensor 2.</td><td>0 - 1</td><td>0</td></tr>
<tr><td>020</td><td><u>Multiplier1</u> <u>(proportional pulse scaling factor)</u>:

At SMC1.3 version: Multiplier1 = 1, Multiplier2 = 1

Is used to modulate the frequencies of Sensor 1 and Sensor 2.
This scaling affects only the calculation of the divergence.</td><td>1 - 10 000</td><td>1</td></tr>
<tr><td>021</td><td><u>Divisor1</u> <u>(reciprocal pulse scaling factor)</u>:

At SMC1.3 version: Divisor1 = 1, Divisor = 1

To adjust the frequencies of Sensor 1 and Sensor 2.
This scaling affects only the calculation of the divergence.</td><td>1 - 10 000</td><td>1</td></tr>
</table>

Continuation **„Sensor 1 Menu“:**

<table>
<tr><td>022</td><td><u>Position Drift 1</u> <u>(drift monitoring at standstill):</u>

At SMC1.3 version: PositionDrift 1 = PositionDrift 2

This parameter handles drift movements at standstill. If the period time of the input frequency exceeds the adjusted „Wait-Time” parameter, the sensor is assigned to frequency = 0 Hz, even if a slow drift movement is present.

In case of an illegal drift, this parameter allows to preset an error threshold (symmetrical position window +/- xxx pulses). An error status is triggered if the adjusted value is exceeded.

The monitoring is only performed at standstill and begins at position 0, immediately when frequency = 0 Hz is detected.

<table><tr><td>0</td><td>Drift monitoring is not active</td></tr><tr><td>xxx</td><td>An error message appears, if the position is drifting out of the adjusted window of +/- xxx pulses (single edge evaluation).</td></tr></table></td><td>0 - 100 000</td><td>0</td></tr>
<tr><td>023</td><td><u>Sense Value 1</u> <u>(mean value for Sense triggering)</u><u>:</u>

This value returns the mean value. The tolerance range is set by the parameter "Sense Tol. 1".
If the area is left, an error is triggered.
A setting of Sense Value 1 = 24.00 and Sense Tol. 1 of 2.00 triggers an error below 24V-2V = 22V and above 24V + 2V = 26V</td><td>0 – 30.00</td><td>24.00</td></tr>
<tr><td>024</td><td><u>Sense Tol. 1</u> <u>(window for Sence triggering)</u><u>:</u>

This value reflects the tolerance range, the mean value to which the tolerance range relates is determined by the parameter Sense Value1.
If the area is left, an error is triggered.
A setting of Sense Value 1 = 24.00 and Sense Tol. 1 of 2.00 triggers an error below 24V-2V = 22V and above 24V + 2V = 26V.</td><td>0 – 5.00</td><td>1.00</td></tr>
<tr><td>025</td><td><u>Phase Error 1</u> <u>(faulty pulse counting limit)</u><u>:</u>

At SMC1.3 version: Phase Error 1 = Phase Error 2

The SMCX unit is able to detect incorrect pulse sequences as well as faulty phase positions.

Normally, the parameter should remain set to 10. A different setting is useful only in special cases.

The error status will be released if the adjusted number of faulty pulses is exceeded.

Incorrect pulses can be caused by faulty wirings, EMC-problems, incorrect mode settings, when turn up the encoder supply or when reverse the direction Parameter.</td><td>1 - 1000</td><td>10</td></tr>
</table>

Continuation **„Sensor 1 Menu“:**

026	**Set Frequency 1** (simulation of a fixed encoder frequency)**:** This Parameter is used for test purposes and allows to substitute the real encoder frequency by a fixed frequency. The parameter is only effective, while the unit is in the Programming Mode and if the input is assigned to this function.	-500 000.00 - 500 000.00 (Hz)	0
027	**Error Mask 1** (error suppression A/B/Z signals)**:** **At SMC1.3 version:** Error Mask 1 = Error Mask 2 The parameter allows the evaluation of errors on the A, B, Z track. With single HTL configuration no error can be evaluated. For all differential signals, tearing off a track can trigger an error. If the zero track signals are not connected in differential configuration, the Z Spur error must be suppressed Error Mask = 0 All errors are suppressed Error Mask = 1 Evaluation of an error on the A track Error Mask = 2 Evaluation of an error on the B-lane Error Mask = 4 Evaluation of an error on the Z-lane Error Mask = 7 All errors are evaluated	0 - 7	3
028	**Dir Changes 1** (Direction changes)**:** If this value is set to 0, no monitoring of the direction changes occurs. The value indicates the number of consecutive direction changes that raise an error. This can occur in the case of a demolition of a line, so that at the SMC1.3, for example, only the B signal arrives, while the A signal is constantly static. The error counter again gradually degrades to zero, if no direction changes occur within the sampling time.	0-9999	0

When using two encoders with differing pulse rates or in case of a mechanical reduction between both encoders, the higher frequency must be converted to the lower frequency by using the scaling factors.

2.4 Sensor 2 Menu

No.	Parameter		Range	Default
029	**Op-Mode 2:**	The functions of the Sensor2 parameters are identical to Sensor1 menu, but all settings are related to Sensor2.	0 - 3	1
030	**Edge 2:**		0 - 1	0
031	**Direction 2:**		0 - 1	0
032	**Multiplier 2:**		1- 10 000	1
033	**Divisor 2:**		1 - 10 000	1
034	**Position Drift 2:**		0 - 100 000	0
035	**Sense Value 2:**		0 – 30.0	24.00
036	**Sense Tol. 2:**		0 – 5.00	1.00
037	**Phase Error 2:**		1 - 1000	10
038	**Set Frequency 2:**		-500 000.00 - 500 000.00 (Hz)	0
039	**Error Mask 2:**		0 – 7	3
040	**Dir Changes 2**		0 - 9999	0

When using 2 encoders with differing pulse rates or in case of a mechanical reduction between both encoders, the higher frequency must be converted to the lower frequency by using the scaling factors.

2.5 Presel.XXXX Menu

This menu is used to set the switching points of the following outputs:

- 1x relay output [X1/X2 | RELAY OUT]
- 4x control output [X4 | CONTROL OUT]

All limit values are related to the selected basic frequency (parameter “F1-F2 Selection”). The adjustment of the frequencies to each other by the parameter "Multipier" and "Divisor" has no effect on the switching points.

By default, a switching point is available for each output.

If more switching points are required for an output, the control inputs can switch between different switching points. Then up to 16 switching points are available for each output.

-> 2x Control inputs [X23/X24 | CONTROL IN]

Using the input function Preselection Change: (2 switching points):
The function "Preselection Change" must be assigned to a control input (parameter "* IN * Function"). Both parameters "Input Mode 1" and "Input Mode 2" must be set to 1 or 2. It can be switched between the first and the second switching point. (e.g., between "Presel.OUT1.01" and "Presel.OUT1.02")

Switching between the switching points can only be done by an external command via the control input. The changeover affects all outputs.
If a switchover at an output is not required, the same threshold can be specified for both values.

Using the input mode X = 3: (4-16 switching points)
A combination of the parameters "Input Mode X" and the parameter "Presel.XXXX.M "determines whether 4 switching states or 16 switching states are evaluated and whether the Control Input 1 [X23] or the Control Input 2 [X24] is used for the switching point switchover. In addition, no input function Preselection Change may be programmed.

This results in the following settings:

Control input for switching	**Parameter setting**
CONTROL IN 1 [X23] (IN1,/IN1,IN2,/IN2)	Input Mode 1 = 3 Presel.XXX.M = 1 (4 switching point) Presel.XXX.M = 1 (16 switching point)
CONTROL IN 2 [X24] (IN3,/IN3,IN4,/IN4)	Input Mode 2 = 3 Presel.XXX.M = 3 (4 switching point) Presel.XXX.M = 4 (16 switching point)

With 4 switching states, the evaluation of the signals takes place in the Gay Code. If intermediate states are selected, the old state remains until the "GPI Err Time" has elapsed, then an error is triggered.

For 16 switching points, the order must be arranged in ascending order (for example, OUT1.01 minimum overspeed, OUT1.16 largest overspeed) so that the smaller value is always selected at power break.

- **The operator must correctly assign the values to the switching points. The function (for example, overspeed, underspeed), the fault behavior and the safety status of the system must be taken into account.**
- **The drift depends on the parameter "F1-F2 Selection" and refers to the selected encoder channel. A drift error can set the output depending on the setting (Switch Mode = 17, 18), but does not lead to an error condition.**

2.5.1 Presel.OUT1 Menu

No.	Parameter	Range	Default
041	**Presel.OUT1.01:** Switching point 1 of output OUT1 [X4:1,3]	-500 000.00 - 500 000.00 (Hz) (defined by the „F1-F2 Selection“ parameter)	1 000.00
042	**Presel.OUT1.02:** Switching point 2 of output OUT1 [X4:1,3]		2 000.00
043	**Presel.OUT1.03:** Switching point 3 of output OUT1 [X4:1,3]		1 000.00
044	**Presel.OUT1.04:** Switching point 4 of output OUT1 [X4:1,3]		2 000.00
045	**Presel.OUT1.05:** Switching point 5 of output OUT1 [X4:1,3]		1 000.00
046	**Presel.OUT1.06:** Switching point 6 of output OUT1 [X4:1,3]		2 000.00
047	**Presel.OUT1.07:** Switching point 7 of output OUT1 [X4:1,3]		1 000.00
048	**Presel.OUT1.08:** Switching point 8 of output OUT1 [X4:1,3]		2 000.00
049	**Presel.OUT1.09:** Switching point 9 of output OUT1 [X4:1,3]		1 000.00
050	**Presel.OUT1.10:** Switching point 10 of output OUT1 [X4:1,3]		2 000.00
050	**Presel.OUT1.11:** Switching point 11 of output OUT1 [X4:1,3]		1 000.00
052	**Presel.OUT1.12:** Switching point 12 of output OUT1 [X4:1,3]		2 000.00
053	**Presel.OUT1.13:** Switching point 13 of output OUT1 [X4:1,3]		1 000.00
054	**Presel.OUT1.14:** Switching point 14 of output OUT1 [X4:1,3]		2 000.00
055	**Presel.OUT1.15:** Switching point 15 of output OUT1 [X4:1,3]		1 000.00
056	**Presel.OUT1.16:** Switching point 16 of output OUT1 [X4:1,3]		2 000.00
057	**Presel.OUT1.D:** Maximum drift if parameter Switch Mode OUT1 = 17 or 18 Drift values are indicated in ¼ increments		0

Continuation **„Presel.OUT1 Menu“:**

<table>
<tr>
<td>058</td>
<td><u>Presel.OUT1.M</u>:
Mode Parameter for setting the active switching points with parameter "Input Mode X" = 3
<table>
<tr><td>0</td><td>No switching points, only Presel.Out 1.01</td></tr>
<tr><td>1</td><td>4 switching points (OUT1.01-05) Gray Coded; at [X23]
X[23: 2;5]
1000 : modulation with OUT1.01 (IN1)
0100 : modulation with OUT1.02 (/IN1)
0010 : modulation with OUT1.03 (IN2)
0001 : modulation with OUT1.04 (/IN2)
other controls create a GPI error</td></tr>
<tr><td>2</td><td>16 switching points (OUT1.01-16) at [X23]
no fault can be detected on the inputs</td></tr>
<tr><td>3</td><td>4 switching points (OUT1.01-05) Gray Coded; at [X24]
X[24: 2;5]
1000 : modulation with OUT1.01 (IN3)
0100 : modulation with OUT1.02 (/IN3)
0010 : modulation with OUT1.03 (IN4)
0001 : modulation with OUT1.04 (/IN4)
other controls create a GPI error</td></tr>
<tr><td>4</td><td>16 switching points (OUT1.01-16) at [X24]
no fault can be detected on the inputs</td></tr>
</table></td>
<td>0-3</td>
<td>0</td>
</tr>
<tr>
<td>059</td>
<td><u>Presel.OUT1.R</u>:
This parameter is for setting the frequency difference per unit of time for "Switch Mode OUT1" = 21 and 22.

Time = frequency [Hz] / setting [Hz/ms]

It follows: 1000 Hz / 0,1 [Hz/ms] = 10 000ms = 10s
<table>
<tr><th>Frequency</th><th>Setting</th><th>Time</th></tr>
<tr><td>10Hz</td><td>00,0010</td><td>10s</td></tr>
<tr><td>100Hz</td><td>00,0100</td><td>10s</td></tr>
<tr><td>1kHz</td><td>00,1000</td><td>10s</td></tr>
<tr><td>10kHz</td><td>01,0000</td><td>10s</td></tr>
<tr><td>100kHz</td><td>10,0000</td><td>10s</td></tr>
</table>
<table>
<tr><th>Frequency</th><th>Setting</th><th>Time</th></tr>
<tr><td>1kHz</td><td>1,0000</td><td>1s</td></tr>
<tr><td>1kHz</td><td>0,1000</td><td>10s</td></tr>
<tr><td>1kHz</td><td>0,0100</td><td>100s</td></tr>
</table></td>
<td>0 – 5000,0000</td>
<td>0,0000</td>
</tr>
<tr>
<td>060</td>
<td>Reserved</td>
<td></td>
<td></td>
</tr>
</table>

2.5.2 Presel.OUT2 Menu

No.	Parameter	Range	Default
061	**Presel.OUT2.01:** Switching point 1 of output OUT2 [X4:4,6]	-500 000.00 - 500 000.00 (Hz) (defined by the „F1-F2 Selection“ parameter)	3 000.00
062	**Presel.OUT2.02:** Switching point 2 of output OUT2 [X4:4,6]		4 000.00
063	**Presel.OUT2.03:** Switching point 3 of output OUT2 [X4:4,6]		3 000.00
064	**Presel.OUT2.04:** Switching point 4 of output OUT2 [X4:4,6]		4 000.00
065	**Presel.OUT2.05:** Switching point 5 of output OUT2 [X4:4,6]		3 000.00
066	**Presel.OUT2.06:** Switching point 6 of output OUT2 [X4:4,6]		4 000.00
067	**Presel.OUT2.07:** Switching point 7 of output OUT2 [X4:4,6]		3 000.00
068	**Presel.OUT2.08:** Switching point 8 of output OUT2 [X4:4,6]		4 000.00
069	**Presel.OUT2.09:** Switching point 9 of output OUT2 [X4:4,6]		3 000.00
070	**Presel.OUT2.10:** Switching point 10 of output OUT2 [X4:4,6]		4 000.00
070	**Presel.OUT2.11:** Switching point 11 of output OUT2 [X4:4,6]		3 000.00
072	**Presel.OUT2.12:** Switching point 12 of output OUT2 [X4:4,6]		4 000.00
073	**Presel.OUT2.13:** Switching point 13 of output OUT2 [X4:4,6]		3 000.00
074	**Presel.OUT2.14:** Switching point 14 of output OUT2 [X4:4,6]		4 000.00
075	**Presel.OUT2.15:** Switching point 15 of output OUT2 [X4:4,6]		3 000.00
076	**Presel.OUT2.16:** Switching point 16 of output OUT2 [X4:4,6]		4 000.00
077	**Presel.OUT2.D:** Maximum drift if parameter Switch Mode OUT2 = 17 or 18 Drift values are indicated in ¼ increments		0

Continuation **„Presel.OUT2 Menu“:**

<table>
<tr>
<td>078</td>
<td><u>Presel.OUT2.M</u>:
Mode Parameter for setting the active switching points with parameter "Input Mode X" = 3
<table>
<tr><td>0</td><td>No switching points, only Presel.Out 2.01</td></tr>
<tr><td>1</td><td>4 switching points (OUT2.01-05) Gray Coded; at [X23]
X[23: 2;5]
1000 : modulation with OUT2.01 (IN1)
0100 : modulation with OUT2.02 (/IN1)
0010 : modulation with OUT2.03 (IN2)
0001 : modulation with OUT2.04 (/IN2)
other controls create a GPI error</td></tr>
<tr><td>2</td><td>16 switching points (OUT2.01-16) at [X23]
no fault can be detected on the inputs</td></tr>
<tr><td>3</td><td>4 switching points (OUT2.01-05) Gray Coded; at [X24]
X[24: 2;5]
1000 : modulation with OUT2.01 (IN3)
0100 : modulation with OUT2.02 (/IN3)
0010 : modulation with OUT2.03 (IN4)
0001 : modulation with OUT2.04 (/IN4)
other controls create a GPI error</td></tr>
<tr><td>4</td><td>16 switching points (OUT2.01-16) at [X24]
no fault can be detected on the inputs</td></tr>
</table>
</td>
<td>0 - 3</td>
<td>0</td>
</tr>
<tr>
<td>079</td>
<td><u>Presel.OUT2.R</u>:
This parameter is for setting the frequency difference per unit of time for "Switch Mode OUT2" = 21 and 22.

Time = frequency [Hz] / setting [Hz/ms]

It follows: 1000 Hz / 0,1 [Hz/ms] = 10 000ms = 10s
<table>
<tr><th>Frequency</th><th>Setting</th><th>Time</th></tr>
<tr><td>10Hz</td><td>00,0010</td><td>10s</td></tr>
<tr><td>100Hz</td><td>00,0100</td><td>10s</td></tr>
<tr><td>1kHz</td><td>00,1000</td><td>10s</td></tr>
<tr><td>10kHz</td><td>01,0000</td><td>10s</td></tr>
<tr><td>100kHz</td><td>10,0000</td><td>10s</td></tr>
</table>
<table>
<tr><th>Frequency</th><th>Setting</th><th>Time</th></tr>
<tr><td>1kHz</td><td>1,0000</td><td>1s</td></tr>
<tr><td>1kHz</td><td>0,1000</td><td>10s</td></tr>
<tr><td>1kHz</td><td>0,0100</td><td>100s</td></tr>
</table>
</td>
<td>0 – 5000,0000</td>
<td>0,00</td>
</tr>
<tr>
<td>080</td>
<td>Reserved</td>
<td></td>
<td></td>
</tr>
</table>

2.5.3 Presel.OUT3 Menu

No.	Parameter	Range	Default
081	**Presel.OUT3.01:** Switching point 1 of output OUT3 [X4:7,9]	-500 000.00 - 500 000.00 (Hz) (defined by the „F1-F2 Selection“ parameter)	5 000.00
082	**Presel.OUT3.02:** Switching point 2 of output OUT3 [X4:7,9]		6 000.00
083	**Presel.OUT3.03:** Switching point 3 of output OUT3 [X4:7,9]		5 000.00
084	**Presel.OUT3.04:** Switching point 4 of output OUT3 [X4:7,9]		6 000.00
085	**Presel.OUT3.05:** Switching point 5 of output OUT3 [X4:7,9]		5 000.00
086	**Presel.OUT3.06:** Switching point 6 of output OUT3 [X4:7,9]		6 000.00
087	**Presel.OUT3.07:** Switching point 7 of output OUT3 [X4:7,9]		5 000.00
088	**Presel.OUT3.08:** Switching point 8 of output OUT3 [X4:7,9]		6 000.00
089	**Presel.OUT3.09:** Switching point 9 of output OUT3 [X4:7,9]		5 000.00
090	**Presel.OUT3.10:** Switching point 10 of output OUT3 [X4:7,9]		6 000.00
091	**Presel.OUT3.11:** Switching point 10 of output OUT3 [X4:7,9]		5 000.00
092	**Presel.OUT3.12:** Switching point 12 of output OUT3 [X4:7,9]		6 000.00
093	**Presel.OUT3.13:** Switching point 13 of output OUT3 [X4:7,9]		5 000.00
094	**Presel.OUT3.14:** Switching point 14 of output OUT3 [X4:7,9]		6 000.00
095	**Presel.OUT3.15:** Switching point 15 of output OUT3 [X4:7,9]		5 000.00
096	**Presel.OUT3.16:** Switching point 16 of output OUT3 [X4:7,9]		6 000.00
097	**Presel.OUT3.D:** Maximum drift if parameter Switch Mode OUT3 = 17 or 18 Drift values are indicated in ¼ increments		0

Continuation **„Presel.OUT3 Menu“:**

<table>
<tr>
<td>098</td>
<td><u>Presel.OUT3.M</u>:
Mode Parameter for setting the active switching points with parameter "Input Mode X" = 3

<table>
<tr><td>0</td><td>No switching points, only Presel.Out 3.01</td></tr>
<tr><td>1</td><td>4 switching points (OUT3.01-05) Gray Coded; at [X23]
X[23 : 2;5]
1000 : modulation with OUT3.01 (IN1)
0100 : modulation with OUT3.02 (/IN1)
0010 : modulation with OUT3.03 (IN2)
0001 : modulation with OUT3.04 (/IN2)
other controls create a GPI error</td></tr>
<tr><td>2</td><td>16 switching points (OUT3.01-16) at [X23]
no fault can be detected on the inputs</td></tr>
<tr><td>3</td><td>4 switching points (OUT3.01-05) Gray Coded; at [X24]
X[24 : 2;5]
1000 : modulation with OUT3.01 (IN3)
0100 : modulation with OUT3.02 (/IN3)
0010 : modulation with OUT3.03 (IN4)
0001 : modulation with OUT3.04 (/IN4)
other controls create a GPI error</td></tr>
<tr><td>4</td><td>16 switching points (OUT3.01-16) at [X24]
no fault can be detected on the inputs</td></tr>
</table>
</td>
<td>0 - 3</td>
<td>0</td>
</tr>
<tr>
<td>099</td>
<td><u>Presel.OUT3.R</u>:
This parameter is for setting the frequency difference per unit of time for "Switch Mode OUT3" = 21 and 22.

Time = frequency [Hz] / setting [Hz/ms]

It follows: 1000 Hz / 0,1 [Hz/ms] = 10 000ms = 10s

<table>
<tr><th>Frequency</th><th>Setting</th><th>Time</th></tr>
<tr><td>10Hz</td><td>00,0010</td><td>10s</td></tr>
<tr><td>100Hz</td><td>00,0100</td><td>10s</td></tr>
<tr><td>1kHz</td><td>00,1000</td><td>10s</td></tr>
<tr><td>10kHz</td><td>01,0000</td><td>10s</td></tr>
<tr><td>100kHz</td><td>10,0000</td><td>10s</td></tr>
</table>

<table>
<tr><th>Frequency</th><th>Setting</th><th>Time</th></tr>
<tr><td>1kHz</td><td>1,0000</td><td>1s</td></tr>
<tr><td>1kHz</td><td>0,1000</td><td>10s</td></tr>
<tr><td>1kHz</td><td>0,0100</td><td>100s</td></tr>
</table>
</td>
<td>0 – 5000,0000</td>
<td>0,00</td>
</tr>
<tr>
<td>100</td>
<td>Reserved</td>
<td></td>
<td></td>
</tr>
</table>

2.5.4 Presel.OUT4 Menu

No.	Parameter	Range	Default
101	**Presel.OUT4.01:** Switching point 1 of output OUT4 [X4:10-12]	-500 000.00 - 500 000.00 (Hz) (defined by the „F1-F2 Selection“ parameter)	7 000.00
102	**Presel.OUT4.02:** Switching point 2 of output OUT4 [X4:10-12]		8 000.00
103	**Presel.OUT4.03:** Switching point 3 of output OUT4 [X4:10-12]		7 000.00
104	**Presel.OUT4.04:** Switching point 4 of output OUT4 [X4:10-12]		8 000.00
105	**Presel.OUT4.05:** Switching point 5 of output OUT4 [X4:10-12]		7 000.00
105	**Presel.OUT4.06:** Switching point 6 of output OUT4 [X4:10-12]		8 000.00
107	**Presel.OUT4.07:** Switching point 7 of output OUT4 [X4:10-12]		7 000.00
108	**Presel.OUT4.08:** Switching point 8 of output OUT4 [X4:10-12]		8 000.00
109	**Presel.OUT4.09:** Switching point 9 of output OUT4 [X4:10-12]		7 000.00
110	**Presel.OUT4.10:** Switching point 10 of output OUT4 [X4:10-12]		8 000.00
111	**Presel.OUT4.11:** Switching point 11 of output OUT4 [X4:10-12]		7 000.00
112	**Presel.OUT4.12:** Switching point 12 of output OUT4 [X4:10-12]		8 000.00
113	**Presel.OUT4.13:** Switching point 13 of output OUT4 [X4:10-12]		7 000.00
114	**Presel.OUT4.14:** Schaltpunkt 14 von Ausgang OUT4 [X4:10-12]		8 000.00
115	**Presel.OUT4.15:** Schaltpunkt 15 von Ausgang OUT4 [X4:10-12]		7 000.00
116	**Presel.OUT4.16:** Schaltpunkt 16 von Ausgang OUT4 [X4:10-12]		8 000.00
117	**Presel.OUT4.D:** Maximum drift if parameter Switch Mode OUT4 = 17 or 18 Drift values are indicated in ¼ increments		0

Continuation **„Presel.OUT4 Menu“:**

<table>
<tr>
<td>118</td>
<td><u>Presel.OUT4.M</u>:
Mode Parameter for setting the active switching points with parameter "Input Mode X" = 3

<table>
<tr><td>0</td><td>No switching points, only Presel.Out 4.01</td></tr>
<tr><td>1</td><td>4 switching points (OUT4.01-05) Gray Coded; at [X23]
X[23 : 2;5]
1000 : modulation with OUT4.01 (IN1)
0100 : modulation with OUT4.02 (/IN1)
0010 : modulation with OUT4.03 (IN2)
0001 : modulation with OUT4.04 (/IN2)
other controls create a GPI error</td></tr>
<tr><td>2</td><td>16 switching points (OUT4.01-16) at [X23]
no fault can be detected on the inputs</td></tr>
<tr><td>3</td><td>4 switching points (OUT4.01-05) Gray Coded; at [X24]
X[24 : 2;5]
1000 : modulation with OUT4.01 (IN3)
0100 : modulation with OUT4.02 (/IN3)
0010 : modulation with OUT4.03 (IN4)
0001 : modulation with OUT4.04 /IN4)
other controls create a GPI error</td></tr>
<tr><td>4</td><td>16 switching points (OUT4.01-16) at [X24]
no fault can be detected on the inputs</td></tr>
</table>
</td>
<td>0 - 3</td>
<td>0</td>
</tr>
<tr>
<td>119</td>
<td><u>Presel.OUT4.R</u>:
This parameter is for setting the frequency difference per unit of time for "Switch Mode OUT4" = 21 and 22.

Time = frequency [Hz] / setting [Hz/ms]

It follows: 1000 Hz / 0,1 [Hz/ms] = 10 000ms = 10s

<table>
<tr><th>Frequency</th><th>Setting</th><th>Time</th></tr>
<tr><td>10Hz</td><td>00,0010</td><td>10s</td></tr>
<tr><td>100Hz</td><td>00,0100</td><td>10s</td></tr>
<tr><td>1kHz</td><td>00,1000</td><td>10s</td></tr>
<tr><td>10kHz</td><td>01,0000</td><td>10s</td></tr>
<tr><td>100kHz</td><td>10,0000</td><td>10s</td></tr>
</table>

<table>
<tr><th>Frequency</th><th>Setting</th><th>Time</th></tr>
<tr><td>1kHz</td><td>1,0000</td><td>1s</td></tr>
<tr><td>1kHz</td><td>0,1000</td><td>10s</td></tr>
<tr><td>1kHz</td><td>0,0100</td><td>100s</td></tr>
</table>
</td>
<td>0 – 5000,0000</td>
<td>0,00</td>
</tr>
<tr>
<td>120</td>
<td>Reserved</td>
<td></td>
<td></td>
</tr>
</table>

2.5.5 Presel.REL1 Menu

No.	Parameter	Range	Default
121	**Presel.REL1.01:** Switching point 1 of output REL1 [X1/2:1-2]	-500 000.00 - 500 000.00 (Hz) (defined by the „F1-F2 Selection“ parameter)	100.00
122	**Presel.REL1.02:** Switching point 2 of output REL1 [X1/2:1-2]		200.00
123	**Presel.REL1.03:** Switching point 3 of output REL1 [X1/2:1-2]		100.00
124	**Presel.REL1.04:** Switching point 4 of output REL1 [X1/2:1-2]		200.00
125	**Presel.REL1.05:** Switching point 5 of output REL1 [X1/2:1-2]		100.00
126	**Presel.REL1.06:** Switching point 6 of output REL1 [X1/2:1-2]		200.00
127	**Presel.REL1.07:** Switching point 7 of output REL1 [X1/2:1-2]		100.00
128	**Presel.REL1.08:** Switching point 8 of output REL1 [X1/2:1-2]		200.00
129	**Presel.REL1.09:** Switching point 9 of output REL1 [X1/2:1-2]		100.00
130	**Presel.REL1.10:** Switching point 10 of output REL1 [X1/2:1-2]		200.00
131	**Presel.REL1.11:** Switching point 11 of output REL1 [X1/2:1-2]		100.00
132	**Presel.REL1.12:** Switching point 12 of output REL1 [X1/2:1-2]		200.00
133	**Presel.REL1.13:** Switching point 13 of output REL1 [X1/2:1-2]		100.00
134	**Presel.REL1.14:** Switching point 14 of output REL1 [X1/2:1-2]		200.00
135	**Presel.REL1.15:** Switching point 15 of output REL1 [X1/2:1-2]		100.00
136	**Presel.REL1.16:** Switching point 16 of output REL1 [X1/2:1-2]		200.00
137	**Presel.REL1.D:** Maximum drift if parameter Switch Mode REL1 = 17 oder 18 Drift values are indicated in ¼ increments		0

Continuation **„Presel.REL1 Menu“:**

<table>
<tr>
<td>138</td>
<td><u>Presel.REL1.M</u>:
Mode Parameter for setting the active switching points with parameter "Input Mode X" = 3
<table>
<tr><td>0</td><td>No switching points, only Presel.REL1.01</td></tr>
<tr><td>1</td><td>4 switching points (REL1.01-05) Gray Coded; at [X23]
[X23 : 2;5]
1000 : modulation with REL1.01 (IN1)
0100 : modulation with REL1.02 (/IN1)
0010 : modulation with REL1.03 (IN2)
0001 : modulation with REL1.04 (/IN2)
other controls create a GPI error</td></tr>
<tr><td>2</td><td>16 switching points (REL1.01-16) at [X23]
no fault can be detected on the inputs</td></tr>
<tr><td>3</td><td>4 switching points (REL1.01-05) Gray Coded; at [X24]
[X24 : 2;5]
1000 : modulation with REL1.01 (IN3)
0100 : modulation with REL1.02 (/IN3)
0010 : modulation with REL1.03 (IN4)
0001 : modulation with REL1.04 (/IN4)
other controls create a GPI error</td></tr>
<tr><td>4</td><td>16 switching points (REL1.01-16) at [X24]
no fault can be detected on the inputs</td></tr>
</table>
</td>
<td>0 - 3</td>
<td>0</td>
</tr>
<tr>
<td>139</td>
<td><u>Presel.REL1.R</u>:
This parameter is for setting the frequency difference per unit of time for "switch mode REL1" = 21 and 22.

Time = frequency [Hz] / setting [Hz/ms]

It follows: 1000 Hz / 0,1 [Hz/ms] = 10 000ms = 10s

<table>
<tr><th>Frequency</th><th>Setting</th><th>Time</th></tr>
<tr><td>10Hz</td><td>00,0010</td><td>10s</td></tr>
<tr><td>100Hz</td><td>00,0100</td><td>10s</td></tr>
<tr><td>1kHz</td><td>00,1000</td><td>10s</td></tr>
<tr><td>10kHz</td><td>01,0000</td><td>10s</td></tr>
<tr><td>100kHz</td><td>10,0000</td><td>10s</td></tr>
</table>

<table>
<tr><th>Frequency</th><th>Setting</th><th>Time</th></tr>
<tr><td>1kHz</td><td>1,0000</td><td>1s</td></tr>
<tr><td>1kHz</td><td>0,1000</td><td>10s</td></tr>
<tr><td>1kHz</td><td>0,0100</td><td>100s</td></tr>
</table>
</td>
<td>0 – 5000,0000</td>
<td>0,00</td>
</tr>
<tr>
<td>140</td>
<td>Reserved</td>
<td></td>
<td></td>
</tr>
</table>

2.6 Switching Menu

This menu is used to set the switching conditions of the following outputs:

- 1 x relay output [X1/2 | RELAY OUT]
- 4 x control output [X4 | CONTROL OUT]

The following form of writing is used:

|f| = absolute value of the basic frequency
|Preselection| = absolute value of the switching point
f = direction dependent, direction signed basic frequency
Preselection = direction dependent, direction signed switching point

Additional output features:

{S} = self-locking function
{H} = switching hysteresis
{A} = start up delay
{U} = Switching the preselection affects the function

- **With an active self-locking function, no hysteresis setting is necessary, because no bouncing is possible.**
- **With an inactive self-locking function, a hysteresis setting is always useful.**
- **When using Switch Mode 7 or 8, the specified standstill-time must be higher than the adjusted wipe period. This is helpful to prevent a breakdown of the wipe signal before the wipe period has been elapsed.**
- **With Switch Mode 2, 6 and 16, the parameter “Hysteresis” is used for determining the frequency band.**

No.	Parameter			Range	Default
0141	**Switch Mode OUT1** (switching conditions for OUT1)**:**			0 - 22	0
	0	**|f| >= |Preselection|** Output switches in event of overspeed.	{S, H, U}		
	1	**|f| <= |Preselection|** Output switches in event of underspeed.	{S, H, A, U}		
	2	**|f| == |Preselection|** Output switches in event of leaving the frequency band (Preselection +/- Hysteresis).	{S, A, U}		
	3	**Stillstand** Output switches in event of standstill.			
	4	**f >= Preselection** Output switches in event of overspeed. May only be used with positive preselection values!	{S, H, U}		
	5	**f <= Preselection** Output switches in event of underspeed. May only be used with positive preselection values!	{S, H, A, U}		
	6	**f == Preselection** Output switches in event of leaving the frequency band (Preselection +/- Hysteresis). Only used with positive preselection values!	{S, A, U}		
	7	**f > 0** Output switches, if a positive frequency (e.g. clockwise direction) is detected. The directional information will be deleted immediately when „Standstill“ is detected.			
	8	**f < 0** Output switches, if a negative frequency (e.g. anticlockwise direction) is detected. The directional information will be deleted immediately when „Standstill“ is detected.			
	9	**Clock generation for pulsed readback** EDM and pulse monitored inputs			
	10	**STO/SBC/SS1** Enable + external self-locking, without ramp monitoring	{S}		
	11	**SLS |f| >= |Preselection|** Overspeed + enable + external self-locking, without ramp monitoring	{S,U}		
	12	**SMS |f| >= |Preselection|** Overspeed without enable + external self-locking	{S,U}		

Continuation „Switching Menu**“:**

No.	Parameter			Range	Default
141	**13**	**SDI1 f > 0** Enable + external self-holding, frequency monitoring, no position monitoring	{S}	0 - 22	0
	14	**SDI2 f < 0** Enable + external self-locking, frequency monitoring, no position monitoring	{S}		
	15	**SSM1 |f| <= |Preselection|** Underspeed + enable + external self-locking	{S,U}		
	16	**SSM2 |f| innerhalb |Preselection +/- Hysterese|** Underspeed + overspeed + enable + external self-locking	{S,U}		
	17	**SOS/SLI/SS2 |f| > |Preselection| oder Position Error** Overspeed + position + enable + external self-locking	{S,U}		
	18	**Stillstand (bei Stillstand und kein Position Error)** Standstill + position + enable + external self-locking	{S}		
	19	**Reserved**			
	20	**Kein Stillstand** This Mode operates like Mode 3, but only statically and the output is inverted. Here the inverted relay control is important. Output switches if f is not equal to Zero (no standstill)			
	21	**Ramp monitoring 2** Under Speed + Overspeed + Enable + External self-locking The condition is that the braking behaviour is linear. The parameter "Presel. xxx. F" describes the slope. The parameter "Presel. xxx. xx describes the +/- deviation.	{U}		
	22	**Ramp monitoring 2** Under Speed + Overspeed + Enable + External self-locking The condition is that the braking behaviour is linear. The parameter "Presel. xxx. F" describes the slope. The parameter "Presel. xxx. xx describes the +/- deviation.	{U}		

Continuation „Switching Menu**“:**

142	**Switch Mode OUT2** (switching condition for OUT2): Settings are analogous to parameter „Switch Mode OUT1“	0 – 22	0
143	**Switch Mode OUT3** (switching condition for OUT3): Settings are analogous to parameter „Switch Mode OUT1“	0 – 22	0
144	**Switch Mode OUT4** (switching condition for OUT4): Settings are analogous to parameter „Switch Mode OUT1“	0 – 22	0
145	**Switch Mode REL1** (switching condition for the relay output)**:** Settings are analogous to parameter „Switch Mode OUT1“	0 - 22	0

- **With an active self-locking function, no hysteresis setting is necessary, because no bouncing is possible.**
- **With an inactive self-locking function, a hysteresis setting is always useful.**
- **When using Switch Mode 7 or 8, the specified standstill-time must be higher than the adjusted wipe period. This is helpful to prevent a breakdown of the wipe signal before the wipe period has been elapsed.**
- **With Switch Mode 2, 6 and 16, the parameter “Hysteresis” is used for determining the frequency band.**

Continuation **„Switching Menu“:**

No.	Parameter	Range	Default
146	**Pulse Time OUT1** (Wipe Signal Period of OUT1)**:** **0:** static wipe signal ≠**0:** wipe signal period in seconds	0 – 9.999 (sec.)	0
147	**Pulse Time OUT2** (Wipe Signal Period of OUT2)**:** Settings are analogous to parameter „Pulse Time OUT1“		
148	**Pulse Time OUT3** (Wipe Signal Period of OUT3)**:** Settings are analogous to parameter „Pulse Time OUT1“		
149	**Pulse Time OUT4** (Wipe Signal Period of OUT4)**:** Settings are analogous to parameter „Pulse Time OUT1“		
150	**Pulse Time REL1** (Wipe Signal Period of the relay)**:** Settings are analogous to parameter „Pulse Time OUT1“(min. 25 ms)		
	• **The minimum wipe period of the control outputs is 1 msec. The minimum wipe period of the relay is 25 msec.** • **If a wipe signal is adjusted, no self-locking function can be assigned to the corresponding output.**		
151	**Hysteresis OUT1** (switching hysteresis for OUT1)**:** Percental hysteresis of the adjusted switching point of parameter „Preselect OUT1“	0 – 100.0 (%)	0
152	**Hysteresis OUT2** (switching hysteresis for OUT2)**:** Percental hysteresis of the adjusted switching point of parameter „Preselect OUT2“		
153	**Hysteresis OUT3** (switching hysteresis for OUT3)**:** Percental hysteresis of the adjusted switching point of parameter „Preselect OUT3“		
154	**Hysteresis OUT4** (switching hysteresis for OUT4)**:** Percental hysteresis of the adjusted switching point of parameter „Preselect OUT4“		
155	**Hysteresis REL1** (switching hysteresis for Relais)**:** Percental hysteresis of the adjusted switching point of parameter „Preselect REL1“		

- **Due to the variance of the frequency measurement an output-bouncing around the limit value can occur. This behavior can be prevented by setting a hysteresis. A reasonable hysteresis value is approximately 1%.**

Continuation **„Switching Menu“:**

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>156</td><td><u>Matrix OUT1</u> <u>(Enable matrix for output OUT1)</u><u>:</u>
Defines the enable signal (for Switch Mode 10 … 22) of output OUT1 by input selection at terminal X23 or X24 as well as the remaining feedback outputs (see table below). An input as well as a feedback output can be used as enable signal (OR operation in case of several signals).

<table>
<tr><td>Bit 0</td><td>Input IN1</td><td>[X23: 2]</td><td>[X23: 2,3]</td></tr>
<tr><td>Bit 1</td><td>Input /IN1</td><td>[X23: 3]</td><td>-</td></tr>
<tr><td>Bit 2</td><td>Input IN2</td><td>[X23: 4]</td><td>[X23: 4,5]</td></tr>
<tr><td>Bit 3</td><td>Input /IN2</td><td>[X23: 5]</td><td>-</td></tr>
<tr><td>Bit 4</td><td>Input IN3</td><td>[X24: 2]</td><td>[X24: 2,3]</td></tr>
<tr><td>Bit 5</td><td>Input /IN3</td><td>[X24: 3]</td><td>-</td></tr>
<tr><td>Bit 6</td><td>Input IN4</td><td>[X24: 4]</td><td>[X24: 4,5]</td></tr>
<tr><td>Bit 7</td><td>Input /IN4</td><td>[X24: 5]</td><td>-</td></tr>
<tr><td>Bit 8</td><td>Output OUT1</td><td>Not available</td><td>Not available</td></tr>
<tr><td>Bit 9</td><td>Output OUT2</td><td></td><td></td></tr>
<tr><td>Bit 10</td><td>Output OUT3</td><td></td><td></td></tr>
<tr><td>Bit 11</td><td>Output OUT4</td><td></td><td></td></tr>
<tr><td>Bit 12</td><td>Output REL1</td><td></td><td></td></tr>
</table></td><td>0 - 8191</td><td>0</td></tr>
<tr><td>157</td><td><u>Matrix OUT2</u> <u>(Enable matrix for output OUT2)</u><u>:</u>

<table>
<tr><td>Bit 0</td><td>Input IN1</td><td>[X23: 2]</td><td>[X23: 2,3]</td></tr>
<tr><td>Bit 1</td><td>Input /IN1</td><td>[X23: 3]</td><td>-</td></tr>
<tr><td>Bit 2</td><td>Input IN2</td><td>[X23: 4]</td><td>[X23: 4,5]</td></tr>
<tr><td>Bit 3</td><td>Input /IN2</td><td>[X23: 5]</td><td>-</td></tr>
<tr><td>Bit 4</td><td>Input IN3</td><td>[X24: 2]</td><td>[X24: 2,3]</td></tr>
<tr><td>Bit 5</td><td>Input /IN3</td><td>[X24: 3]</td><td>-</td></tr>
<tr><td>Bit 6</td><td>Input IN4</td><td>[X24: 4]</td><td>[X24: 4,5]</td></tr>
<tr><td>Bit 7</td><td>Input /IN4</td><td>[X24: 5]</td><td>-</td></tr>
<tr><td>Bit 8</td><td>Output OUT1</td><td></td><td></td></tr>
<tr><td>Bit 9</td><td>Output OUT2</td><td>Not available</td><td>Not available</td></tr>
<tr><td>Bit 10</td><td>Output OUT3</td><td></td><td></td></tr>
<tr><td>Bit 11</td><td>Output OUT4</td><td></td><td></td></tr>
<tr><td>Bit 12</td><td>Output REL1</td><td></td><td></td></tr>
</table></td><td>0 – 8191</td><td>0</td></tr>
</table>

Continuation **„Switching Menu“:**

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>158</td><td><u>Matrix OUT3</u> <u>(Enable matrix for output OUT3)</u><u>:</u>
<table>
<tr><td>Bit 0</td><td>Input IN1</td><td>[X23: 2]</td><td>[X23: 2,3]</td></tr>
<tr><td>Bit 1</td><td>Input /IN1</td><td>[X23: 3]</td><td>-</td></tr>
<tr><td>Bit 2</td><td>Input IN2</td><td>[X23: 4]</td><td>[X23: 4,5]</td></tr>
<tr><td>Bit 3</td><td>Input /IN2</td><td>[X23: 5]</td><td>-</td></tr>
<tr><td>Bit 4</td><td>Input IN3</td><td>[X24: 2]</td><td>[X24: 2,3]</td></tr>
<tr><td>Bit 5</td><td>Input /IN3</td><td>[X24: 3]</td><td>-</td></tr>
<tr><td>Bit 6</td><td>Input IN4</td><td>[X24: 4]</td><td>[X24: 4,5]</td></tr>
<tr><td>Bit 7</td><td>Input /IN4</td><td>[X24: 5]</td><td>-</td></tr>
<tr><td>Bit 8</td><td>Output OUT1</td><td></td><td></td></tr>
<tr><td>Bit 9</td><td>Output OUT2</td><td></td><td></td></tr>
<tr><td>Bit 10</td><td>Output OUT3</td><td>Not available</td><td>Not available</td></tr>
<tr><td>Bit 11</td><td>Output OUT4</td><td></td><td></td></tr>
<tr><td>Bit 12</td><td>Output REL1</td><td></td><td></td></tr>
</table></td><td>0 - 8191</td><td>0</td></tr>
<tr><td>159</td><td><u>Matrix OUT4</u> <u>(Enable matrix for output OUT4)</u><u>:</u>
<table>
<tr><td>Bit 0</td><td>Input IN1</td><td>[X23: 2]</td><td>[X23: 2,3]</td></tr>
<tr><td>Bit 1</td><td>Input /IN1</td><td>[X23: 3]</td><td>-</td></tr>
<tr><td>Bit 2</td><td>Input IN2</td><td>[X23: 4]</td><td>[X23: 4,5]</td></tr>
<tr><td>Bit 3</td><td>Input /IN2</td><td>[X23: 5]</td><td>-</td></tr>
<tr><td>Bit 4</td><td>Input IN3</td><td>[X24: 2]</td><td>[X24: 2,3]</td></tr>
<tr><td>Bit 5</td><td>Input /IN3</td><td>[X24: 3]</td><td>-</td></tr>
<tr><td>Bit 6</td><td>Input IN4</td><td>[X24: 4]</td><td>[X24: 4,5]</td></tr>
<tr><td>Bit 7</td><td>Input /IN4</td><td>[X24: 5]</td><td>-</td></tr>
<tr><td>Bit 8</td><td>Output OUT1</td><td></td><td></td></tr>
<tr><td>Bit 9</td><td>Output OUT2</td><td></td><td></td></tr>
<tr><td>Bit 10</td><td>Output OUT3</td><td></td><td></td></tr>
<tr><td>Bit 11</td><td>Output OUT4</td><td>Not available</td><td>Not available</td></tr>
<tr><td>Bit 12</td><td>Output REL1</td><td></td><td></td></tr>
</table></td><td>0 - 8191</td><td>0</td></tr>
<tr><td>160</td><td><u>Matrix REL1</u> <u>(Enable matrix for output REL1)</u><u>:</u>
<table>
<tr><td>Bit 0</td><td>Input IN1</td><td>[X23: 2]</td><td>[X23: 2,3]</td></tr>
<tr><td>Bit 1</td><td>Input /IN1</td><td>[X23: 3]</td><td>-</td></tr>
<tr><td>Bit 2</td><td>Input IN2</td><td>[X23: 4]</td><td>[X23: 4,5]</td></tr>
<tr><td>Bit 3</td><td>Input /IN2</td><td>[X23: 5]</td><td>-</td></tr>
<tr><td>Bit 4</td><td>Input IN3</td><td>[X24: 2]</td><td>[X24: 2,3]</td></tr>
<tr><td>Bit 5</td><td>Input /IN3</td><td>[X24: 3]</td><td>-</td></tr>
<tr><td>Bit 6</td><td>Input IN4</td><td>[X24: 4]</td><td>[X24: 4,5]</td></tr>
<tr><td>Bit 7</td><td>Input /IN4</td><td>[X24: 5]</td><td>-</td></tr>
<tr><td>Bit 8</td><td>Output OUT1</td><td></td><td></td></tr>
<tr><td>Bit 9</td><td>Output OUT2</td><td></td><td></td></tr>
<tr><td>Bit 10</td><td>Output OUT3</td><td></td><td></td></tr>
<tr><td>Bit 11</td><td>Output OUT4</td><td></td><td></td></tr>
<tr><td>Bit 12</td><td>Output REL1</td><td>Not available</td><td>Not available</td></tr>
</table></td><td>0 - 8191</td><td>0</td></tr>
</table>

Continuation **„Switching Menu“:**

No.	Parameter	Range	Default
161	**MIA-Delay OUT1** (delay for transition inactive to active)**:** Matrix delay inactive to active for output OUT1 (in seconds). This setting will delay the enable function, if the enable input or the feedback output changes from inactive to active.	0 – 99.999	0
162	**MIA-Delay OUT2** (delay for transition inactive to active)**:**	0 – 99.999	0
163	**MIA-Delay OUT3** (delay for transition inactive to active)**:**	0 – 99.999	0
164	**MIA-Delay OUT4** (delay for transition inactive to active)**:**	0 – 99.999	0
165	**MIA-Delay REL1** (delay for transition inactive to active)**:**	0 – 99.999	0
166	**MAI-Delay OUT1** (delay for transition inactive to active)**:** Matrix delay active to inactive for output OUT1 (in seconds). This setting will delay the enable function, if the enable input or the feedback output changes from active to inactive.	0 – 99.999	0
167	**MAI-Delay OUT2** (delay for transition inactive to active)**:**	0 – 99.999	0
168	**MAI-Delay OUT3** (delay for transition inactive to active)**:**	0 – 99.999	0
169	**MAI-Delay OUT4** (delay for transition inactive to active)**:**	0 – 99.999	0
170	**MAI-Delay REL1** (delay for transition inactive to active)**:**	0 – 99.999	0
171	**Delay OUT1** (Delay of triggering for OUT1)**:** Triggering delay for the output OUT1 in seconds. This delay delays the release of OUT1. If the output has been reset before the delay time has elapsed, no change in the state of OUT1 takes place. The cancellation is made immediately. Oscillating triggering and their cancellation ensure a new delay time refresh. When a wiping time is activated, a new wiper pulse can be emitted only after the cancellation and after the delay period has elapsed. Does not apply for switch mode = 3, 9, 10, and 20	0 - 9,999	0
172	**Delay OUT2** (Delay of triggering for OUT1)**:**	0 - 9,999	0
173	**Delay OUT3** (Delay of triggering for OUT2)**:**	0 - 9,999	0
174	**Delay OUT4** (Delay of triggering for OUT3)**:**	0 - 9,999	0
175	**Delay REL1** (Delay of triggering for OUT4)**:**	0 - 9,999	0

Continuation **„Switching Menu“:**

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>176</td><td><u>Startup Mode</u> <u>(start-up delay time window)</u>:

Window for delay time until the monitoring function is activated.
Only useful in combination with parameter setting
„Switch Mode“ = 1, 2, 5 or 6.

To use the start-up delay, it must be assigned to an output.

The start-up delay will be activated:
- with next power-up
- always when after standstill a frequency is detected again

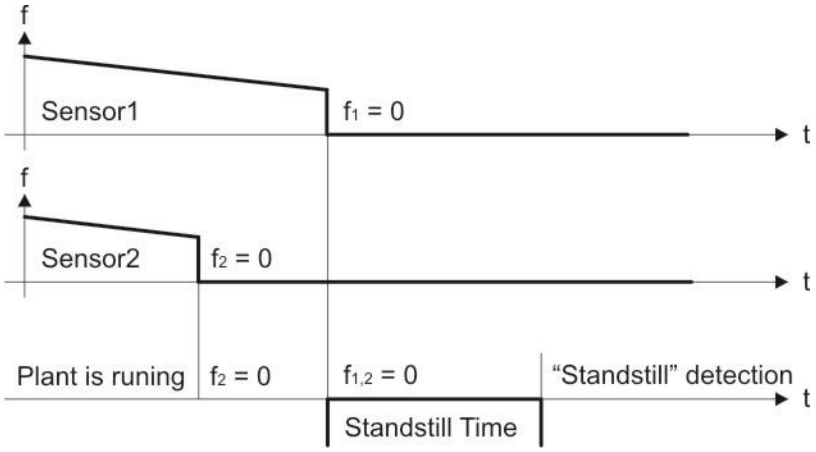
<table>
<tr><td>0</td><td>no start-up delay</td></tr>
<tr><td>1</td><td>start-up delay 1 second</td></tr>
<tr><td>2</td><td>start-up delay 2 seconds</td></tr>
<tr><td>3</td><td>start-up delay 4 seconds</td></tr>
<tr><td>4</td><td>start-up delay 8 seconds</td></tr>
<tr><td>5</td><td>start-up delay 16 seconds</td></tr>
<tr><td>6</td><td>start-up delay 32 seconds</td></tr>
<tr><td>7</td><td>start-up delay 64 seconds</td></tr>
<tr><td>8</td><td>start-up delay 128 seconds</td></tr>
<tr><td>9</td><td>automatically, until the value has been exceeded for the first time</td></tr>
</table>
The defined delay time window is valid for all outputs.</td><td>0 - 9</td><td>0</td></tr>
<tr><td>177</td><td><u>Startup Output</u> <u>(assignment of a start-up delay to outputs)</u>:

By using a 5 bit binary code the start-up delay function can be assigned to an output. Settings see below:

<table>
<tr><th>Output:</th><th>Ausgang</th><th>RELAY</th><th>OUT4</th><th>OUT3</th><th>OUT2</th><th>OUT1</th></tr>
<tr><td>Bit:</td><td>Bit:</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>Binary:</td><td>Binär:</td><td>10000</td><td>01000</td><td>00100</td><td>00010</td><td>00001</td></tr>
<tr><td>Value:</td><td>Wert:</td><td>16</td><td>8</td><td>4</td><td>2</td><td>1</td></tr>
</table>
Example: A setting of Startup Output = 17 (binary 10001) means that a start-up delay is assigned to OUT1 and to the RELAY output.</td><td>0 - 31</td><td>0</td></tr>
</table>

Continuation **„Switching Menu“:**

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>178</td><td><u>Standstill Time</u> <u>(delay time for standstill detection)</u>:

This parameter defines the delay time until the unit detects a standstill after detecting frequency = 0 Hz.
 

Prior condition is that both input frequencies are detected as „Zero“ ($f_{1,2}$ = 0 Hz). From that moment, the standstill period runs off and indicates a standstill when elapsed.</td><td>0 – 9.999 (sec.)</td><td>0</td></tr>
<tr><td>179</td><td><u>Lock Output</u> <u>(assignment of a lock-function to an output)</u>:

The assignment of a self-locking-function to an output can be adjusted by using a 6 bit binary code as follows:
<table>
<tr><th>Output:</th><th>*</th><th>RELAY</th><th>OUT4</th><th>OUT3</th><th>OUT2</th><th>OUT1</th></tr>
<tr><td>Bit</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>Binary:</td><td>100000</td><td>010000</td><td>001000</td><td>000100</td><td>000010</td><td>000001</td></tr>
<tr><td>Value:</td><td>32</td><td>16</td><td>8</td><td>4</td><td>2</td><td>1</td></tr>
</table>
Bits 1 to 5 are used to assign the lock function to the respective outputs.

*) The highest valued bit 6 determines if a locked output can be released exclusively by an external input signal via parameter “*IN* Function” (bit 6 = 0) or additionally by an automatic reset when standstill is indicated (bit 6 = 1).

Example:

An adjustment of Lock Output = 17 (binary 10001) means that a lock is assigned to output OUT1 and to the relay, which can be deactivated exclusively by an external input signal.

Further the adjustment Lock Output = 49 (binary 110001) means that the lock-functions of OUT1 and the relay are deleted additionally when standstill is detected.

Please note: With an active wipe time setting, no self-locking function can be assigned to the corresponding output.</td><td>0 - 63</td><td>0</td></tr>
</table>

Continuation **„Switching Menu“:**

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>180</td><td><u>Action Output</u> <u>(output selection for overwriting)</u>:

The function to set fixed output conditions for OUT1 to OUT4 is only effective in the Programming Mode. It is used for test purposes and allows to force each output to a defined switching condition. It is not allowed that an error has been occured.

The „Action Output“ parameter selects the outputs to be tested. The next Parameter „Action Polarity“ is used to assign the desired switching conditions to the selected outputs.

The outputs are selectable by using a 5 bit binary code:

<table>
<tr><td>Output:</td><td>RELAY</td><td>OUT4</td><td>OUT3</td><td>OUT2</td><td>OUT1</td></tr>
<tr><td>Bit</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>Binary:</td><td>10000</td><td>01000</td><td>00100</td><td>00010</td><td>00001</td></tr>
<tr><td>Value:</td><td>16</td><td>8</td><td>4</td><td>2</td><td>1</td></tr>
</table>
After the test this parameter must be reset to default (= 0).</td><td>0 - 31</td><td>0</td></tr>
<tr><td>181</td><td><u>Action Polarity</u> <u>(setting the output conditions)</u>:

This setting-function is only effective in the Programming Mode and requires a selection of the corresponding outputs by the parameter “Action Output”.

The output-conditions are assignable by a 9 bit binary code:

<table>
<tr><td>OUT:</td><td>REL</td><td>4</td><td>/4</td><td>3</td><td>/3</td><td>2</td><td>/2</td><td>1</td><td>/1</td></tr>
<tr><td>Bit:</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>Binär:</td><td>1 0000 0000</td><td>0 1000 0000</td><td>0 0100 0000</td><td>0 0010 0000</td><td>0 0001 0000</td><td>0 0000 1000</td><td>0 0000 0100</td><td>0 0000 0010</td><td>0 0000 0001</td></tr>
<tr><td>Value:</td><td>256</td><td>128</td><td>64</td><td>32</td><td>16</td><td>8</td><td>4</td><td>2</td><td>1</td></tr>
</table>
After the test, this parameter must be reset to default (= 0).</td><td>0 - 511</td><td>0</td></tr>
</table>

Continuation **„Switching Menu“:**

<table>
<tr><th>No</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>182</td><td><u>Read Back OUT</u> <u>(output for the EDM function)</u><u>:</u>
Defines the read back output for the EDM function - with respect to inverting or non-inverting.
<table><tr><td>Bit 0</td><td>= 0 EDM function of OUT1
= 1 EDM function of /OUT1</td></tr><tr><td>Bit 1</td><td>= 0 EDM function of OUT2
= 1 EDM function of /OUT2</td></tr><tr><td>Bit 2</td><td>= 0 EDM function of OUT3
= 1 EDM function of /OUT3</td></tr><tr><td>Bit 3</td><td>= 0 EDM function of OUT4
= 1 EDM function of /OUT4</td></tr><tr><td>Bit 4</td><td>= 0 EDM function of REL1
= 1 EDM function of REL1 (inverted)</td></tr></table></td><td>0 - 31</td><td>0</td></tr>
<tr><td>183</td><td><u>Output Mode</u> <u>(output configuration)</u><u>:</u>
Defines the configuration of the outputs:
<table><tr><td>Bit 0</td><td>= 0 OUT1 and /OUT1 are inverse
= 1 OUT1 and /OUT1 are homogeneously)</td></tr><tr><td>Bit 1</td><td>= 0 OUT2 and /OUT2 are inverse
= 1 OUT2 and /OUT2 are homogeneously</td></tr><tr><td>Bit 2</td><td>= 0 OUT3 and /OUT3 are inverse
= 1 OUT3 and /OUT3 are homogeneously)</td></tr><tr><td>Bit 3</td><td>= 0 OUT3 and /OUT4 are inverse
= 1 OUT3 and /OUT4 are homogeneously)</td></tr></table></td><td>0 - 15</td><td>0</td></tr>
<tr><td>184</td><td><u>EDM Error Count</u> <u>(number of allowed EDM errors)</u><u>:</u>
Returns the maximum allowed number of EDM errors before an EDM Run Time error is triggered. The actual number may well be higher, because in the meantime also errors can be reduced.</td><td>0 - 99</td><td>0</td></tr>
<tr><td>185</td><td>Reserved</td><td></td><td></td></tr>
</table>

- **With homogeneous outputs, all inputs will be pulled down to GND in case of power or hardware failure. Thereby an error state cannot be clearly transmitted to another device by these outputs.**
- **Using homogeneous outputs will reduce the Safety Integrity Level (SIL).**

2.7 Control Menu

This chapter describes the features and configuration options of the control inputs Depending on the parameter „Input Mode 1“ four different input configurations can be set:

- **Input Mode 1 = 0: two 2-pole inputs (IN1, /IN1 + IN2, /IN2)**
  The control inputs are either homogeneous or inversely. In this case each input requires a dual signal.

Signal pair 1	[X23: 2] **LOW**	[X23: 3] **LOW**	Error if inverse	Configuration by parameter „IN1 Function“ and „IN1 Config“
	[X23: 2] **LOW**	[X23: 3] **HIGH**	Error if homogeneously	
	[X23: 2] **HIGH**	[X23: 3] **LOW**	Error if homogeneously	
	[X23: 2] **HIGH**	[X23: 3] **HIGH**	Error if inverse	
Signal pair 2	[X23: 4] **LOW**	[X23: 5] **LOW**	Error if inverse	Configuration by parameter „IN2 Function“ and „IN2 Config“
	[X23: 4] **LOW**	[X23: 5] **HIGH**	Error if homogeneously	
	[X23: 4] **HIGH**	[X23: 5] **LOW**	Error if homogeneously	
	[X23: 4] **HIGH**	[X23: 5] **HIGH**	Error if inverse	

- **Input Mode 1 = 1: one 2-pole (IN1, /IN1) and two 1-pole inputs (IN2 + /IN2)**
  The 2-pole input is either homogeneous or inversely. The 2-pole control input requires a dual signal, while the 1-pole inputs only require a single signal. Thus three independent inputs are available.

Signal pair 1	[X23: 2] **LOW**	[X23: 3] **LOW**	Error if inverse	Configuration by parameter „IN1 Function“ and „IN1 Config““
	[X23: 2] **LOW**	[X23: 3] **HIGH**	Error if homogeneously	
	[X23: 2] **HIGH**	[X23: 3] **LOW**	Error if homogeneously	
	[X23: 2] **HIGH**	[X23: 3] **HIGH**	Error if inverse	
Signal 2	[X23: 4] **LOW**		Configuration by parameter „IN2 Function“ and „IN2 Config“	
	[X23: 4] **HIGH**			
Signal 3	[X23: 5] **LOW**		Configuration by parameter „/IN2 Function“ and „/IN2 Config“	
	[X23: 5] **HIGH**			

- **Input Mode 1 = 2: four 1-pole inputs (IN1 + /IN1 + IN2 + /IN2)**
  The 1-pole inputs require only a single signal. Thus, four independent inputs are available.

Signal 1	[X23: 2] **LOW**	Configuration by parameter „IN1 Function“ and „IN1 Config““
	[X23: 2] **HIGH**	
Signal 2	[X23: 3] **LOW**	Configuration by parameter „/IN1 Function“ and „/IN1 Config“
	[X23: 3] **HIGH**	
Signal 3	[X23: 4] **LOW**	Configuration by parameter „IN2 Function“ and „IN2 Config“
	[X23: 4] **HIGH**	
Signal 4	[X23: 5] **LOW**	Configuration by parameter „/IN2 Function“ and „/IN2 Config“
	[X23: 5] **HIGH**	

- **Input Mode 1 = 3: A 4-pole preselection input (IN1 + / IN1 + IN2 + / IN2)**
  The 4-pole preselection inputs are used to switch the switching points. Four switching points (gray format) or sixteen are usable.

Signal 1-4	[X23: 2-5] **LOW / HIGH**	Configuration by parameter “Presel.XXX.M”

The parameter "Input Mode 2" can be used to create four different input configurations:

- **Input Mode 2 = 0: Two 2-pole inputs (IN3, /IN3 + IN4, /IN4)**
  The control inputs are either homogeneous or inversely. In this case each input requires a dual signal.

Signal pair 1	[X24: 2] **LOW**	[X24: 3] **LOW**	Error if inverse	Configuration by parameter „IN3 Function“ and „IN3 Config“
	[X24: 2] **LOW**	[X24: 3] **HIGH**	Error if homogeneously	
	[X24: 2] **HIGH**	[X24: 3] **LOW**	Error if homogeneously	
	[X24: 2] **HIGH**	[X24: 3] **HIGH**	Error if inverse	
Signal pair 2	[X24: 4] **LOW**	[X24: 5] **LOW**	Error if inverse	Configuration by parameter „IN4 Function“ and „IN4 Config“
	[X24: 4] **LOW**	[X24: 5] **HIGH**	Error if homogeneously	
	[X24: 4] **HIGH**	[X24: 5] **LOW**	Error if homogeneously	
	[X24: 4] **HIGH**	[X24: 5] **HIGH**	Error if inverse	

- **Input Mode 2 = 1: Ein 2-poliger Eingang (IN3, /IN3) und zwei 1-polige Eingänge (IN4 + /IN4)**
  The 2-pole input is either homogeneous or inversely. The 2-pole control input requires a dual signal, while the 1-pole inputs only require a single signal. Thus three independent inputs are available.

Signal pair 1	[X24: 2] **LOW**	[X24: 3] **LOW**	Error if inverse	Configuration by parameter „IN3 Function“ und „IN3 Config“
	[X24: 2] **LOW**	[X24: 3] **HIGH**	Error if homogeneously	
	[X24: 2] **HIGH**	[X24: 3] **LOW**	Error if homogeneously	
	[X24: 2] **HIGH**	[X24: 3] **HIGH**	Error if inverse	
Signal 2	[X24: 4] **LOW**		Configuration by parameter „IN4 Function“ und „IN4 Config“	
	[X24: 4] **HIGH**			
Signal 3	[X24: 5] **LOW**		Configuration by parameter „/IN4 Function“ und „/IN4 Config“	
	[X24: 5] **HIGH**			

- **Input Mode 2 = 2: Vier 1-polige Eingänge (IN3 + /IN3 + IN4 + /IN4)**
  The 1-pole inputs require only a single signal. Thus, four independent inputs are available

Signal 1	[X24: 2] **LOW**	Configuration by parameter „IN3 Function“ und „IN3 Config“
	[X24: 2] **HIGH**	
Signal 2	[X24: 3] **LOW**	Configuration by parameter „/IN3 Function“ und „/IN3 Config“
	[X24: 3] **HIGH**	
Signal 3	[X24: 4] **LOW**	Configuration by parameter „IN4 Function“ und „IN4 Config“
	[X24: 4] **HIGH**	
Signal 4	[X24: 5] **LOW**	Configuration by parameter „/IN4 Function“ und „/IN4 Config“
	[X24: 5] **HIGH**	

- **Input Mode 2 = 3: A 4-pole preselection input (IN3 + /IN3 + IN4 + /IN4)**
  The 4-pole preselection inputs are used to switch the switching points. Four switching points (gray format) or sixteen are usable.

Signal 1-4	[X24: 2-5] **LOW / HIGH**	Configuration by parameter “Presel.XXX.M”

- The use of homogeneous 1-pole inputs reduces the Safety Integrity Level (SIL). The use of 16 switching points reduces the Safety Integrity Level (SIL).

No.	Parameter	Range	Default
186	**Input Mode 1** (Configuration of the inputs): Defines the type of inputs at [X23]. **0** Two 2-channel input pairs **1** A 2-channel input pair and two single inputs **2** Four single inputs **3** [X23] is used for switching point switching	0 – 3	0
187	**Input Mode 2** (Configuration of the inputs): Defines the type of inputs at [X24]. **0** Two 2-channel input pairs **1** A 2-channel input pair and two single inputs **2** Four single inputs **3** [X24] is used for switching point switching	0 - 3	0

Continuation **„Control Menu“:**

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>188</td><td><u>IN1 Function</u> (Assignment of a function at input <u>[X23 : 2]</u>):

This parameter defines the input function when the corresponding "Input Mode 1" = 0 - 2 is set.
The respective switching behavior can be specified by using the “IN1 Config” parameter.

<table>
<tr><td>0</td><td>No function assigned</td><td></td></tr>
<tr><td>1</td><td>Release lock of output OUT1</td><td>[dyn]</td></tr>
<tr><td>2</td><td>Release lock of output OUT2</td><td>[dyn]</td></tr>
<tr><td>3</td><td>Release lock of output OUT3</td><td>[dyn]</td></tr>
<tr><td>4</td><td>Release lock of output OUT4</td><td>[dyn]</td></tr>
<tr><td>5</td><td>Release lock of output REL1</td><td>[dyn]</td></tr>
<tr><td>6</td><td>Release all output locks together</td><td>[dyn]</td></tr>
<tr><td>7</td><td>Set Frequency1
Frequency simulation of Sensor 1</td><td>[stat]
[PRG]</td></tr>
<tr><td>8</td><td>Set Frequency2
Frequency simulation of Sensor 2</td><td>[stat]
[PRG]</td></tr>
<tr><td>9</td><td>Set Frequency12
Frequency simulation of Sensor 1 und Sensor 2</td><td>[stat]
[PRG]</td></tr>
<tr><td>10</td><td>Freeze Frequency1
Freezes the actual encoder frequency of Sensor 1</td><td>[stat]
[PRG]</td></tr>
<tr><td>11</td><td>Freeze Frequency2
Freezes the actual encoder frequency of Sensor 2</td><td>[stat]
[PRG]</td></tr>
<tr><td>12</td><td>Freeze Frequency12
Freezes the encoder frequency of Sensor 1 and Sensor 2</td><td>[stat]
[PRG]</td></tr>
<tr><td>13</td><td>Preselection Change
Switchover between the upper and lower switching point. The changeover takes effect to all outputs.</td><td>[stat]</td></tr>
<tr><td>14</td><td>Clear Drift 1
Clears the counter of position drift 1</td><td>[dyn]</td></tr>
<tr><td>15</td><td>Clear Drift 2
Clears the counter of position drift 2</td><td>[dyn]</td></tr>
<tr><td>16</td><td>Clear Drift 12
Clears the counter of position drift 1 and drift 2</td><td>[dyn]</td></tr>
<tr><td>17-20</td><td>N.N.</td><td></td></tr>
<tr><td>21</td><td>Enable input for the output function of parameter „Switch Mode“ = 10 - 22</td><td>[stat]</td></tr>
<tr><td>22</td><td>N.N.</td><td></td></tr>
</table>
[dyn] = dynamic function if a rising edge appears at the input
[stat] = static permanent function
[PRG] = function only in the “Programming Mode” active</td><td>0 - 22</td><td>0</td></tr>
</table>

Continuation **„Control Menu“:**

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>189</td><td><u>IN1 Config</u> (<u>switching behavior of input [X23 : 2]</u>):
This parameter defines the switching behavior of the input, when the corresponding "Input Mode 2" = 0-2 is set.
The respective function assignment can be specified by using the “IN1 Function” parameter.
<table>
<tr><td>0</td><td>Inverse dual channel input (statically, LOW)</td></tr>
<tr><td>1</td><td>Inverse dual channel input (statically, HIGH)</td></tr>
<tr><td>2</td><td>Inverse dual channel input (dynamically, LOW)</td></tr>
<tr><td>3</td><td>Inverse dual channel input (dynamically, HIGH)</td></tr>
<tr><td>4</td><td>Homogeneous dual channel input (statically, LOW)</td></tr>
<tr><td>5</td><td>Homogeneous dual channel input (statically, HIGH)</td></tr>
<tr><td>6</td><td>Homogeneous dual channel input (dynamically, LOW)</td></tr>
<tr><td>7</td><td>Homogeneous dual channel input (dynamically, HIGH)</td></tr>
<tr><td>8</td><td>Single channel input (statically, LOW)</td></tr>
<tr><td>9</td><td>Single channel input (statically, HIGH)</td></tr>
<tr><td>10</td><td>Single channel input (dynamically, LOW)</td></tr>
<tr><td>11</td><td>Single channel input (dynamically, HIGH)</td></tr>
</table></td><td>0 - 11</td><td>0</td></tr>
<tr><td>190</td><td><u>/IN1 Function</u> (<u>Assignment of a function at input [X23 : 3):</u>
The function is identical to parameter „IN1 Function“</td><td>0 – 22</td><td>0</td></tr>
<tr><td>191</td><td><u>/IN1 Config</u> (Switching behavior at the input <u>[X23 : 3]</u>:
The configuration is identical to parameter „IN1 Config“</td><td>0 – 11</td><td>0</td></tr>
<tr><td>192</td><td><u>IN2 Function</u> (<u>Assignment of a function at input [X23 : 4]:</u>
The function is identical to parameter „IN1 Function“</td><td>0 – 22</td><td>0</td></tr>
<tr><td>193</td><td><u>IN2 Config</u> (<u>Switching behavior at the input [X23 : 4]</u>):
The configuration is identical to parameter „IN1 Config“</td><td>0 – 11</td><td>0</td></tr>
<tr><td>194</td><td><u>/IN2 Function</u> (<u>Assignment of a function at input [X23 : 5]:</u>
The function is identical to parameter „IN1 Function“</td><td>0 – 22</td><td>0</td></tr>
<tr><td>195</td><td><u>/IN2 Config</u> (<u>Switching behavior of the input [X23 : 5]:</u>
The configuration is identical to parameter „IN1 Config“</td><td>0 – 11</td><td>0</td></tr>
</table>

Continuation **„Control Menu“:**

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>196</td><td><u>IN3 Function</u> (Assignment of a function at input <u>[X24 : 4]):</u>
This parameter defines the input function when the corresponding "Input Mode 2" = 0 - 2 is set.
The respective switching behavior can be specified by using the “IN3 Config” parameter.
<table>
<tr><td>0</td><td>No function assigned</td><td></td></tr>
<tr><td>1</td><td>Release lock of output OUT1</td><td>[dyn]</td></tr>
<tr><td>2</td><td>Release lock of output OUT2</td><td>[dyn]</td></tr>
<tr><td>3</td><td>Release lock of output OUT3</td><td>[dyn]</td></tr>
<tr><td>4</td><td>Release lock of output OUT4</td><td>[dyn]</td></tr>
<tr><td>5</td><td>Release lock of output REL1</td><td>[dyn]</td></tr>
<tr><td>6</td><td>Release all output locks together</td><td>[dyn]</td></tr>
<tr><td>7</td><td>Set Frequency1
Frequency simulation of Sensor1</td><td>[stat]
[PRG]</td></tr>
<tr><td>8</td><td>Set Frequency2
Frequency simulation of Sensor2</td><td>[stat]
[PRG]</td></tr>
<tr><td>9</td><td>Set Frequency12
Frequency simulation of Sensor1 und Sensor2</td><td>[stat]
[PRG]</td></tr>
<tr><td>10</td><td>Freeze Frequency1
Freezes the actual encoder frequency of Sensor1</td><td>[stat]
[PRG]</td></tr>
<tr><td>11</td><td>Freeze Frequency2
Freezes the actual encoder frequency of Sensor2</td><td>[stat]
[PRG]</td></tr>
<tr><td>12</td><td>Freeze Frequency12
Freezes the encoder frequency of Sensor1 and Sensor2</td><td>[stat]
[PRG]</td></tr>
<tr><td>13</td><td>Switch between two switching points. Switching affects all outputs (only if Input mode 1 & 2 are not set to 3).
The switch is made between the parameters "Presel.XXXX.01" and "Presel.XXXX.02".</td><td>[stat]</td></tr>
<tr><td>14</td><td>Clear Drift 1
Clears the counter of position drift 1</td><td>[dyn]</td></tr>
<tr><td>15</td><td>Clear Drift 2
Clears the counter of position drift 2</td><td>[dyn]</td></tr>
<tr><td>16</td><td>Clear Drift 2
Clears the counter of position drift 1 and drift 2</td><td>[dyn]</td></tr>
<tr><td>17</td><td>EDM function of OUT1 OUT1 or /OUT1</td><td></td></tr>
<tr><td>18</td><td>EDM function of OUT2 or /OUT2</td><td></td></tr>
<tr><td>19</td><td>EDM function of OUT3 or /OUT3</td><td></td></tr>
<tr><td>20</td><td>EDM function of OUT4 or /OUT4</td><td></td></tr>
<tr><td>21</td><td>Enable input for the output function of parameter „Switch Mode“ = 10 - 22</td><td>[stat]</td></tr>
<tr><td>22</td><td>EDM function of REL1</td><td></td></tr>
</table>
[dyn] = dynamic function if a rising edge appears at the input
[stat] = static permanent function
[PRG] = function only in the “Programming Mode” active</td><td>0 – 22</td><td>0</td></tr>
</table>

Continuation **„Control Menu“:**

No.	Parameter	Range	Default
197	**IN3 Config** (switching behavior of input [X24 : 4]): This parameter defines the switching behavior of the input, when the corresponding "Input Mode 2" = 0 - 2 is set. The respective function assignment can be specified by using the “IN3 Function” parameter.	0 – 35	0

0	Inverse dual channel input (statically, LOW)
1	Inverse dual channel input (statically, HIGH)
2	Inverse dual channel input (dynamically, LOW)
3	Inverse dual channel input (dynamically, HIGH)
4	Homogeneous dual channel input (statically, LOW)
5	Homogeneous dual channel input (statically, HIGH)
6	Homogeneous dual channel input (dynamically, LOW)
7	Homogeneous dual channel input (dynamically, HIGH)
8	Single channel input (statically, LOW)
9	Single channel input (statically, HIGH)
10	Single channel input (dynamically, LOW)
11	Single channel input (dynamically, HIGH)
12	Single channel input EDM-clock of OUT1
13	Single channel input EDM- clock of /OUT1
14	Single channel input EDM- clock of OUT2
15	Single channel input EDM- clock of /OUT2
16	Single channel input EDM- clock of OUT3
17	Single channel input EDM- clock of /OUT3
18	Single channel input EDM- clock of OUT4
19	Single channel input EDM- clock of /OUT4
20	Single channel pulsed input of OUT1 (statically, HIGH)
21	Single channel pulsed input of /OUT1 (statically, HIGH)
22	Single channel pulsed input of OUT2 (statically, HIGH)
23	Single channel pulsed input of /OUT2 (statically, HIGH)
24	Single channel pulsed input of OUT3 (statically, HIGH)
25	Single channel pulsed input of /OUT3 (statically, HIGH)
26	Single channel pulsed input of OUT4 (statically, HIGH)
27	Single channel pulsed input of /OUT4 (statically, HIGH)
28	Single channel pulsed input of OUT1 (statically, LOW)
29	Single channel pulsed input of /OUT1 (statically, LOW)
30	Single channel pulsed input of OUT2 (statically, LOW)
31	Single channel pulsed input of /OUT2 (statically, LOW)
32	Single channel pulsed input of OUT3 (statically, LOW)
33	Single channel pulsed input of /OUT3 (statically, LOW)
34	Single channel pulsed input of OUT4 (statically, LOW)
35	Single channel pulsed input of /OUT4 (statically, LOW)

Continuation **„Control Menu“:**

No.	Parameter	Range	Default
198	**/IN3 Function** (Assignment of a function at input [X24 : 4]): The function is identical to parameter „IN3 Function“	0 – 22	0
199	**/IN3 Config** (Schaltverhalten des Eingangs [X24 : 4]): The configuration is identical to parameter „IN3 Config“	0 - 35	0
200	**IN4 Function** (Assignment of a function at input [X24 : 4]): The function is identical to parameter „IN3 Function“	0 - 22	0
201	**IN4 Config** (Schaltverhalten des Eingangs [X24 : 4]): The configuration is identical to parameter „IN3 Config“	0 - 35	0
202	**/IN4 Function** (Assignment of a function at input [X24 : 4]): The function is identical to parameter „IN3 Function“	0 - 22	0
203	**/IN4 Config** (Schaltverhalten des Eingangs [X24 : 4]): The configuration is identical to parameter „IN3 Config“	0 - 35	0
204	**Read Back Delay** (Time until the readback is active again): Bounce-time bypass for an external relay of the EDM function	0.000 - 1.000 (sec.)	0
205	**GPI Err Time** (Setting 1 corresponds to the error time of approx. 1 ms): Time until an illegal state at the GPI input leads to the error. The default value of 10 corresponds to an error time of approx. 10 ms.	1 - 9999	10
206	*Reserved*		
207	*Reserved*		

If the “Set frequency” and “Freeze frequency”are applied at the two control inputs, the “Set frequency” function is prioritized.
If input mode x = 3 is used, all affected function parameters must be set to 0.

2.8 Serial Menu

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>208</td><td><u>Serial Unit No.</u> <u>(assigns a serial unit number)</u>:

The devices can be assigned by unit numbers between 11 and 99 (default = 11).

Please note: Unit numbers must not contain a 0 because these numbers are reserved for group- or bulk-addressing.</td><td>11 - 99</td><td>11</td></tr>
<tr><td>209</td><td><u>Serial Baud Rate</u> <u>(serial transmission speed)</u>:

<table>
<tr><td>0</td><td>9 600 Baud</td></tr>
<tr><td>1</td><td>4 800 Baud</td></tr>
<tr><td>2</td><td>2 400 Baud</td></tr>
<tr><td>3</td><td>1 200 Baud</td></tr>
<tr><td>4</td><td>600 Baud</td></tr>
<tr><td>5</td><td>19 200 Baud</td></tr>
<tr><td>6</td><td>38 400 Baud</td></tr>
<tr><td>7</td><td>56 000 Baud</td></tr>
<tr><td>8</td><td>57 600 Baud</td></tr>
<tr><td>9</td><td>76 800 Baud</td></tr>
<tr><td>10</td><td>115 200 Baud</td></tr>
</table></td><td>0 - 10</td><td>0</td></tr>
<tr><td>210</td><td><u>Serial Format</u> <u>(ormat of the serial data)</u>:

<table>
<tr><td>0</td><td>7 data bits,</td><td>parity even,</td><td>1 stop bit</td></tr>
<tr><td>1</td><td>7 data bits,</td><td>parity even,</td><td>2 stop bits</td></tr>
<tr><td>2</td><td>7 data bits,</td><td>parity odd,</td><td>1 stop bit</td></tr>
<tr><td>3</td><td>7 data bits,</td><td>parity odd,</td><td>2 stop bits</td></tr>
<tr><td>4</td><td>7 data bits,</td><td>no parity*,</td><td>1 stop bit</td></tr>
<tr><td>5</td><td>7 data bits,</td><td>no parity*,</td><td>2 stop bits</td></tr>
<tr><td>6</td><td>8 data bits,</td><td>parity even,</td><td>1 stop bit</td></tr>
<tr><td>7</td><td>8 data bits,</td><td>parity odd,</td><td>1 stop bit</td></tr>
<tr><td>8</td><td>8 data bits,</td><td>no parity*,</td><td>1 stop bit</td></tr>
<tr><td>9</td><td>8 data bits,</td><td>no parity*,</td><td>2 stop bits</td></tr>
</table></td><td>0 - 9</td><td>0</td></tr>
</table>

***) With setting „no parity“ no secure data transmission guaranteed.**
For a secure data transmission „Parity even“ or „Parity odd“ must be selected.

Continuation **„Serial Menu**"

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>211</td><td><u>Serial Page:</u>

The Parameter serves only for diagnosis purposes by the manufacturer.</td><td>0 - 20</td><td>0</td></tr>
<tr><td>212</td><td><u>Serial Init:</u>

This parameter determines the baud rate for the transmission of the initialization values to the operator surface OSxx respectively to the SMCB.1 programming and display unit.

<table><tr><td>0</td><td>The initialization values will be transmitted with 9600 baud. After that, the unit returns back to the baud rate set by the user.</td></tr><tr><td>1</td><td>The initialization values will be transmitted with the user setting. After that, the unit continues with this baud rate.</td></tr></table>
With settings higher than 9600 baud the duration of the initialization can be shortened.</td><td>0 - 1</td><td>0</td></tr>
<tr><td>213</td><td>Reserved</td><td></td><td></td></tr>
</table>

2.9 Splitter Menu

(Looping of Sensor Signals for further Target Units)

<table>
<tr><th>No.</th><th>Parameter</th><th>Range</th><th>Default</th></tr>
<tr><td>214</td><td><u>Split.Level:</u> (Determination of the output voltage)

This parameter defines the output voltage of the splitter output [X5 | ENCODER OUT].

<table><tr><td>0</td><td>5.2V
Connection with RS422 compatible inputs possible</td></tr><tr><td>1</td><td>18-30V
Connection with HTL compatible inputs possible</td></tr></table></td><td>0 - 1</td><td>0</td></tr>
<tr><td>215</td><td><u>Split.Selector</u> <u>(determination of the RS422 output source)</u><u>:</u>

This parameter defines which input frequency (Sensor1 or Sensor2) at [X5 | ENCODER OUT] is output.

<table><tr><td>0</td><td>Sensor1
At [X5 | ENCODER OUT], the frequency of the input signal from Sensor1 is output.</td></tr><tr><td>1</td><td>Sensor2
At [X5 | ENCODER OUT], the frequency of the input signal from Sensor2 is output</td></tr></table></td><td>0 - 1</td><td>0</td></tr>
</table>

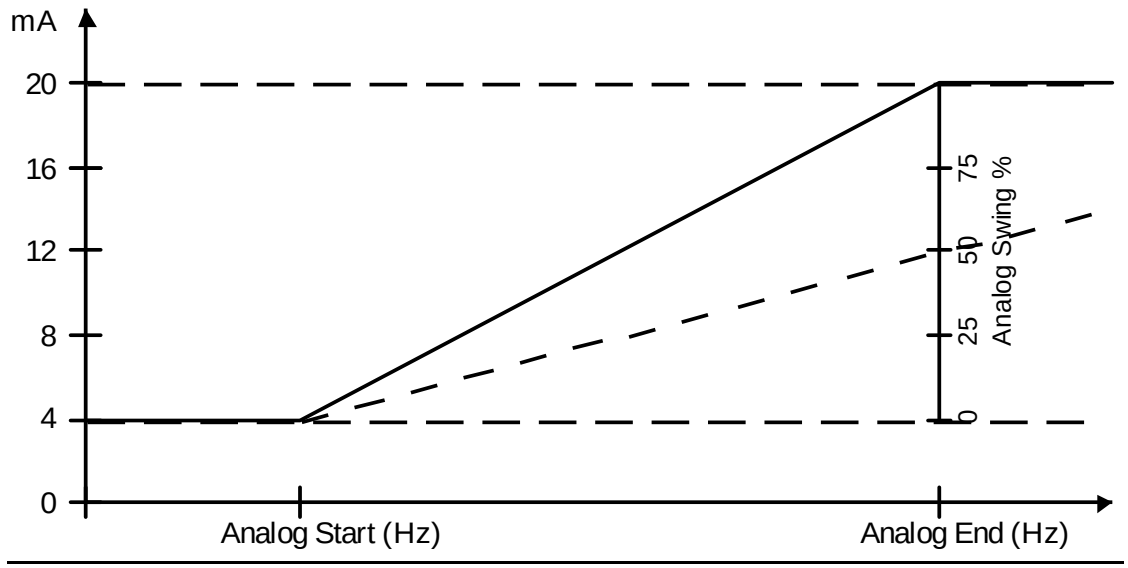
If the parameter “Split Level” is set incorrectly the connected device can be damaged (if setting the output to 18-30V a 5V input can be destroyed).

2.10 Analog Menu

(Analog Output Configuration)

The setting of parameter “F1-F2-Selection” determines whether the frequency of Sensor 1 or Sensor 2 is used to generate the analog output signal.

No.	Parameter	Range	Default
216	**Analog Start** (initial value of the conversion range in Hz)**:** Defines the initial frequency, at which the analog output should set its initial value of 4 mA.	-500 000.00 - 500 000.00 (Hz)	0
217	**Analog End** (final value of the conversion range in Hz)**:** Defines the final frequency, at which the analog output should set its final value of 20 mA.		1 000.00
218	**Analog Gain** (gain of the D/A converter)**:** With a setting of 100, the frequency curve between the parameters „Analog Start“ and „Analog End“ corresponds to the whole stroke of 16 mA (20 mA – 4 mA). With a setting of e. g. 50 the stroke would be only 8 mA and the analog output supplies a value of 4 + 8 = 12 mA when reaching the end frequency of parameter „Analog End“.	1 - 1 000	100
219	**Analog Offset** (fine adjustment of the zero point in µA)**:** Accurate adjustment of the analog offset within a fine range.	-25 … +25 (µA)	0
220	*Reserved*		



2.11 OPU Menu

(Operational Unit Menu in case of a connected SMCB.1)

No.	Parameter	Range	Default
221	**X Factor 1** (no function for SMCx, internal SMCB.1 parameter)	1 - 999 999	1
222	**/ Factor 1** (no function for SMCx, internal SMCB.1 parameter)	1 - 999 999	1
223	**+/- Value 1** (no function for SMCx, internal SMCB.1 parameter)	-999 999 - 999 999	0
224	**Units 1** (no function for SMCx, internal SMCB.1 parameter)	0 - 12	0
225	**Decimal Point 1** (no function for SMCx, internal SMCB.1 parameter)	0 - 5	0
226	**X Factor 2** (no function for SMCx, internal SMCB.1 parameter)	1 - 999 999	1
227	**/ Factor 2** (no function for SMCx, internal SMCB.1 parameter)	1 - 999 999	1
228	**+/- Value 2** (no function for SMCx, internal SMCB.1 parameter)	-999 999 - 999 999	0
229	**Units 2** (no function for SMCx, internal SMCB.1 parameter)	0 - 12	0
230	**Decimal Point 2** (no function for SMCx, internal SMCB.1 parameter)	0 - 5	0
231	*Reserved*		
232	*Reserved*		
233	*Reserved*		
234	*Reserved*		
235	*Reserved*		

Hint: The actual SMCB.1 operating manual describes further details about these parameters.

3 Parameter-List

No.	Parameter	Min. Value	Max. Value	Default	Characters	Decimal Places	Serial Code
000	Sampling Time	1	9999	1	4	3	A0
001	Wait Time	10	9999	100	4	3	A1
002	F1-F2 Selection	0	1	0	1	0	A2
003	Div. Mode	0	2	0	1	0	A3
004	Div. Switch %-f	0	999999	10000	5	2	A4
005	Div. %-Value	1	100	10	3	0	A5
006	Div. f-Value	0	99999	3000	4	2	A6
007	Div. Calculation	0	1	0	1	0	A7
008	Div. Filter	0	20	1	2	0	A8
009	Div. Filter Time	0	1000	0	4	3	N5
010	Div. Inc-Value	0	9999999	0	7	0	A9
011	Error Simulation	0	2	0	1	0	D0
012	Power-up Delay	1	19999	100	5	3	D1
013	Filter	0	999	0	3	0	D2
014	Power-up Error	0	2097151	0	7	0	D3
015	Sensor Overlap	0	2	0	1	0	D4
016	Power-Cas Delay	0	99999	0	5	3	D5
017	Op-Mode 1	0	3	1	1	0	D6
018	Edge 1	0	1	0	1	0	D7
019	Direction 1	0	1	0	1	0	B3
020	Multiplier 1	1	10000	1	5	0	B4
021	Divisor 1	1	10000	1	5	0	B5
022	Position Drift 1	0	100000	0	6	0	E0
023	Sense Value 1	0	3000	2400	4	2	E1
024	Sense Tol. 1	0	500	100	4	2	E2
025	Phase Error 1	1	1000	10	4	0	E3
026	Set Frequency 1	-50000000	50000000	0	88	2	E4
027	Error Mask 1	0	7	3	1	0	E5
028	Dir.Changes 1	0	9999	0	4	0	E6
029	Op-Mode 2	0	3	1	1	0	E7
030	Edge 2	0	1	0	1	0	E8
031	Direction 2	0	1	0	1	0	C0
032	Multiplier 2	1	10000	1	5	0	C1
033	Divisor 2	1	10000	1	5	0	C2
034	Position Drift 2	0	100000	0	6	0	F0
035	Sense Value 2	0	3000	2400	4	2	F1
036	Sense Tol. 2	0	500	100	4	2	F2
037	Phase Error 2	1	1000	10	4	0	F3
038	Set Frequency 2	-50000000	50000000	0	88	2	F4
039	Error Mask 2	0	7	3	1	0	F5
040	Dir.Changes 2	0	9999	0	4	0	F6

Continuation **„Parameter-Liste“:**

No.	Parameter	Min. Value	Max. Value	Default	Characters	Decimal Places	Serial Code
041	Presel.OUT1.01	-50000000	50000000	100000	88	2	a0
042	Presel.OUT1.02	-50000000	50000000	200000	88	2	a1
043	Presel.OUT1.03	-50000000	50000000	100000	88	2	a2
044	Presel.OUT1.04	-50000000	50000000	200000	88	2	a3
045	Presel.OUT1.05	-50000000	50000000	100000	88	2	a4
046	Presel.OUT1.06	-50000000	50000000	200000	88	2	a5
047	Presel.OUT1.07	-50000000	50000000	100000	88	2	a6
048	Presel.OUT1.08	-50000000	50000000	200000	88	2	a7
049	Presel.OUT1.09	-50000000	50000000	100000	88	2	a8
050	Presel.OUT1.10	-50000000	50000000	200000	88	2	a9
051	Presel.OUT1.11	-50000000	50000000	100000	88	2	b0
052	Presel.OUT1.12	-50000000	50000000	200000	88	2	b1
053	Presel.OUT1.13	-50000000	50000000	100000	88	2	b2
054	Presel.OUT1.14	-50000000	50000000	200000	88	2	b3
055	Presel.OUT1.15	-50000000	50000000	100000	88	2	b4
056	Presel.OUT1.16	-50000000	50000000	200000	88	2	b5
057	Presel.OUT1.D	0	9999999	0	07	0	b6
058	Presel.OUT1.M	0	4	0	1	0	b7
059	Presel.OUT1.R	1	50000000	10000000	8	4	b8
060	*Reserved*	0	10000	1000	5	0	b9
061	Presel.OUT2.01	-50000000	50000000	300000	88	2	c0
062	Presel.OUT2.02	-50000000	50000000	400000	88	2	c1
063	Presel.OUT2.03	-50000000	50000000	300000	88	2	c2
064	Presel.OUT2.04	-50000000	50000000	400000	88	2	c3
065	Presel.OUT2.05	-50000000	50000000	300000	88	2	c4
066	Presel.OUT2.06	-50000000	50000000	400000	88	2	c5
067	Presel.OUT2.07	-50000000	50000000	300000	88	2	c6
068	Presel.OUT2.08	-50000000	50000000	400000	88	2	c7
069	Presel.OUT2.09	-50000000	50000000	300000	88	2	c8
070	Presel.OUT2.10	-50000000	50000000	400000	88	2	c9
071	Presel.OUT2.11	-50000000	50000000	300000	88	2	d0
072	Presel.OUT2.12	-50000000	50000000	400000	88	2	d1
073	Presel.OUT2.13	-50000000	50000000	300000	88	2	d2
074	Presel.OUT2.14	-50000000	50000000	400000	88	2	d3
075	Presel.OUT2.15	-50000000	50000000	300000	88	2	d4
076	Presel.OUT2.16	-50000000	50000000	400000	88	2	d5
077	Presel.OUT2.D	0	9999999	0	07	0	d6
078	Presel.OUT2.M	0	4	0	01	0	d7
079	Presel.OUT2.R	1	50000000	10000000	8	4	d8
080	*Reserved*	0	10000	1000	5	0	d9

Continuation **„Parameter-Liste“:**

No.	Parameter	Min. Value	Max. Value	Default	Characters	Decimal Places	Serial Code
081	Presel.OUT3.01	-50000000	50000000	500000	88	2	e0
082	Presel.OUT3.02	-50000000	50000000	600000	88	2	e1
083	Presel.OUT3.03	-50000000	50000000	500000	88	2	e2
084	Presel.OUT3.04	-50000000	50000000	600000	88	2	e3
085	Presel.OUT3.05	-50000000	50000000	500000	88	2	e4
086	Presel.OUT3.06	-50000000	50000000	600000	88	2	e5
087	Presel.OUT3.07	-50000000	50000000	500000	88	2	e6
088	Presel.OUT3.08	-50000000	50000000	600000	88	2	e7
089	Presel.OUT3.09	-50000000	50000000	500000	88	2	e8
090	Presel.OUT3.10	-50000000	50000000	600000	88	2	e9
091	Presel.OUT3.11	-50000000	50000000	500000	88	2	f0
092	Presel.OUT3.12	-50000000	50000000	600000	88	2	f1
093	Presel.OUT3.13	-50000000	50000000	500000	88	2	f2
094	Presel.OUT3.14	-50000000	50000000	600000	88	2	f3
095	Presel.OUT3.15	-50000000	50000000	500000	88	2	f4
096	Presel.OUT3.16	-50000000	50000000	600000	88	2	f5
097	Presel.OUT3.D	0	9999999	0	07	0	f6
098	Presel.OUT3.M	0	4	0	01	0	f7
099	Presel.OUT3.R	1	50000000	10000000	8	4	f8
100	*Reserved*	0	10000	1000	5	0	f9
101	Presel.OUT4.01	-50000000	50000000	700000	88	2	g0
102	Presel.OUT4.02	-50000000	50000000	800000	88	2	g1
103	Presel.OUT4.03	-50000000	50000000	700000	88	2	g2
104	Presel.OUT4.04	-50000000	50000000	800000	88	2	g3
105	Presel.OUT4.05	-50000000	50000000	700000	88	2	g4
106	Presel.OUT4.06	-50000000	50000000	800000	88	2	g5
107	Presel.OUT4.07	-50000000	50000000	700000	88	2	g6
108	Presel.OUT4.08	-50000000	50000000	800000	88	2	g7
109	Presel.OUT4.09	-50000000	50000000	700000	88	2	g8
110	Presel.OUT4.10	-50000000	50000000	800000	88	2	g9
111	Presel.OUT4.11	-50000000	50000000	700000	88	2	h0
112	Presel.OUT4.12	-50000000	50000000	800000	88	2	h1
113	Presel.OUT4.13	-50000000	50000000	700000	88	2	h2
114	Presel.OUT4.14	-50000000	50000000	800000	88	2	h3
115	Presel.OUT4.15	-50000000	50000000	700000	88	2	h4
116	Presel.OUT4.16	-50000000	50000000	800000	88	2	h5
117	Presel.OUT4.D	0	9999999	0	07	0	h6
118	Presel.OUT4.M	0	4	0	01	0	h7
119	Presel.OUT4.R	1	50000000	10000000	8	4	h8
120	*Reserved*	0	10000	1000	5	0	h9

Continuation **„Parameter-Liste“:**

No.	Parameter	Min. Value	Max. Value	Default	Characters	Decimal Places	Serial Code
121	Presel.REL1.01	-50000000	50000000	10000	88	2	i0
122	Presel.REL1.02	-50000000	50000000	20000	88	2	i1
123	Presel.REL1.03	-50000000	50000000	10000	88	2	i2
124	Presel.REL1.04	-50000000	50000000	20000	88	2	i3
125	Presel.REL1.05	-50000000	50000000	10000	88	2	i4
126	Presel.REL1.06	-50000000	50000000	20000	88	2	i5
127	Presel.REL1.07	-50000000	50000000	10000	88	2	i6
128	Presel.REL1.08	-50000000	50000000	20000	88	2	i7
129	Presel.REL1.09	-50000000	50000000	10000	88	2	i8
130	Presel.REL1.10	-50000000	50000000	20000	88	2	i9
131	Presel.REL1.11	-50000000	50000000	10000	88	2	j0
132	Presel.REL1.12	-50000000	50000000	20000	88	2	j1
133	Presel.REL1.13	-50000000	50000000	10000	88	2	j2
134	Presel.REL1.14	-50000000	50000000	20000	88	2	j3
135	Presel.REL1.15	-50000000	50000000	10000	88	2	j4
136	Presel.REL1.16	-50000000	50000000	20000	88	2	j5
137	Presel.REL1.D	0	9999999	0	07	0	j6
138	Presel.REL1.M	0	4	0	01	0	j7
139	Presel.REL1.R	1	50000000	10000000	8	4	j8
140	*Reserved*	0	10000	1000	5	0	j9
141	Switch Mode OUT1	0	20	0	2	0	G0
142	Switch Mode OUT2	0	20	0	2	0	G1
143	Switch Mode OUT3	0	20	0	2	0	G2
144	Switch Mode OUT4	0	20	0	2	0	G3
145	Switch Mode REL1	0	20	0	2	0	G4
146	Pulse Time OUT1	0	9999	0	4	3	G5
147	Pulse Time OUT2	0	9999	0	4	3	G6
148	Pulse Time OUT3	0	9999	0	4	3	G7
149	Pulse Time OUT4	0	9999	0	4	3	G8
150	Pulse Time REL1	0	9999	0	4	3	G9
151	Hysteresis OUT1	0	1000	0	4	1	H0
152	Hysteresis OUT2	0	1000	0	4	1	H1
153	Hysteresis OUT3	0	1000	0	4	1	H2
154	Hysteresis OUT4	0	1000	0	4	1	H3
155	Hysteresis REL1	0	1000	0	4	1	H4
156	Matrix OUT1	0	8191	0	4	0	H5
157	Matrix OUT2	0	8191	0	4	0	H6
158	Matrix OUT3	0	8191	0	4	0	H7
159	Matrix OUT4	0	8191	0	4	0	H8
160	Matrix REL1	0	8191	0	4	0	H9

Continuation **„Parameter-Liste“:**

No.	Parameter	Min. Value	Max. Value	Default	Characters	Decimal Places	Serial Code
161	MIA-Delay OUT1	0	99999	0	5	3	I0
162	MIA-Delay OUT2	0	99999	0	5	3	I1
163	MIA-Delay OUT3	0	99999	0	5	3	I2
164	MIA-Delay OUT4	0	99999	0	5	3	I3
165	MIA-Delay REL1	0	99999	0	5	3	I4
166	MAI-Delay OUT1	0	99999	0	5	3	I5
167	MAI-Delay OUT2	0	99999	0	5	3	I6
168	MAI-Delay OUT3	0	99999	0	5	3	I7
169	MAI-Delay OUT4	0	99999	0	5	3	I8
170	MAI-Delay REL1	0	99999	0	5	3	I9
171	Delay OUT1	0	9999	0	4	3	J0
172	Delay OUT2	0	9999	0	4	3	J1
173	Delay OUT3	0	9999	0	4	3	J2
174	Delay OUT4	0	9999	0	4	3	J3
175	Delay REL1	0	9999	0	4	3	J4
176	Startup Mode	0	9	0	1	0	J5
177	Startup Output	0	31	0	2	0	J6
178	Standstill Time	0	9999	0	4	3	J7
179	Lock Output	0	63	0	2	0	J8
180	Action Output	0	31	0	2	0	J9
181	Action Polarity	0	511	0	3	0	K0
182	Read Back OUT	0	31	0	2	0	K1
183	Output Mode	0	15	0	2	0	K2
184	EDM Error Count	0	99	0	2	0	K3
185	*Reserved*	0	10000	1000	5	0	K4
186	Input Mode 1	0	3	0	1	0	K5
187	Input Mode 2	0	3	0	1	0	K6
188	IN1 Function	0	22	0	2	0	K7
189	IN1 Config	0	11	0	2	0	K8
190	/IN1 Function	0	22	0	2	0	K9
191	/IN1Config	0	11	0	2	0	L0
192	IN2 Function	0	22	0	2	0	L1
193	IN2 Config	0	11	0	2	0	L2
194	/IN2 Function	0	22	0	2	0	K5
195	/IN2 Config	0	11	0	2	0	L4
196	IN3 Function	0	22	0	2	0	L5
197	IN3 Config	0	35	0	2	0	L6
198	/IN3 Function	0	22	0	2	0	L7
199	/IN3 Config	0	35	0	2	0	L8
200	IN4 Function	0	22	0	2	0	L9
201	IN4 Config	0	35	0	2	0	M0
202	/IN4 Function	0	22	0	2	0	M1
203	/IN4 Config	0	35	0	2	0	M2

Continuation **„Parameter-Liste“:**

No.	Parameter	Min. Value	Max. Value	Default	Characters	Decimal Places	Serial Code
204	Read Back Delay	0	1000	0	4	3	M3
205	GPI Err Time	1	999	10	4	0	M4
206	*Reserved*	0	10000	1000	5	0	M5
207	*Reserved*	0	10000	1000	5	0	M6
208	Serial Unit Nr.	11	99	11	2	0	90
209	Serial Baud Rate	0	10	0	2	0	91
210	Serial Format	0	9	0	1	0	92
211	Serial Page	0	20	0	2	0	~0
212	Serial Init	0	1	0	1	0	9~
213	*Reserved*	0	10000	1000	5	0	M7
214	Split.Level	0	1	0	1	0	M8
215	Split.Selector	0	1	0	1	0	M9
216	Analog Start	-50000000	50000000	0	88	2	N0
217	Analog End	-50000000	50000000	100000	88	2	N1
218	Analog Gain	1	1000	100	4	0	N2
219	Analog Offset	-25	25	0	82	0	N3
220	*Reserved*	0	10000	1000	5	0	N4
221	X Factor 1	1	999999	1	6	0	z0
222	/ Factor 1	1	999999	1	6	0	z1
223	+/- Value 1	-999999	999999	0	86	0	z2
224	Units 1	0	12	0	2	0	z3
225	Decimal Point 1	0	5	0	1	0	z4
226	X Factor 2	1	999999	1	6	0	z5
227	/ Factor 2	1	999999	1	6	0	z6
228	+/- Value 2	-999999	999999	0	86	0	z7
229	Units 2	0	12	0	2	0	z8
230	Decimal Point 2	0	5	0	1	0	z9
231	*Reserved*	0	10000	1000	5	0	N6
232	*Reserved*	0	10000	1000	5	0	N7
233	*Reserved*	0	10000	1000	5	0	N8
234	*Reserved*	0	10000	1000	5	0	N9
235	*Reserved*	0	10000	1000	5	0	00

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