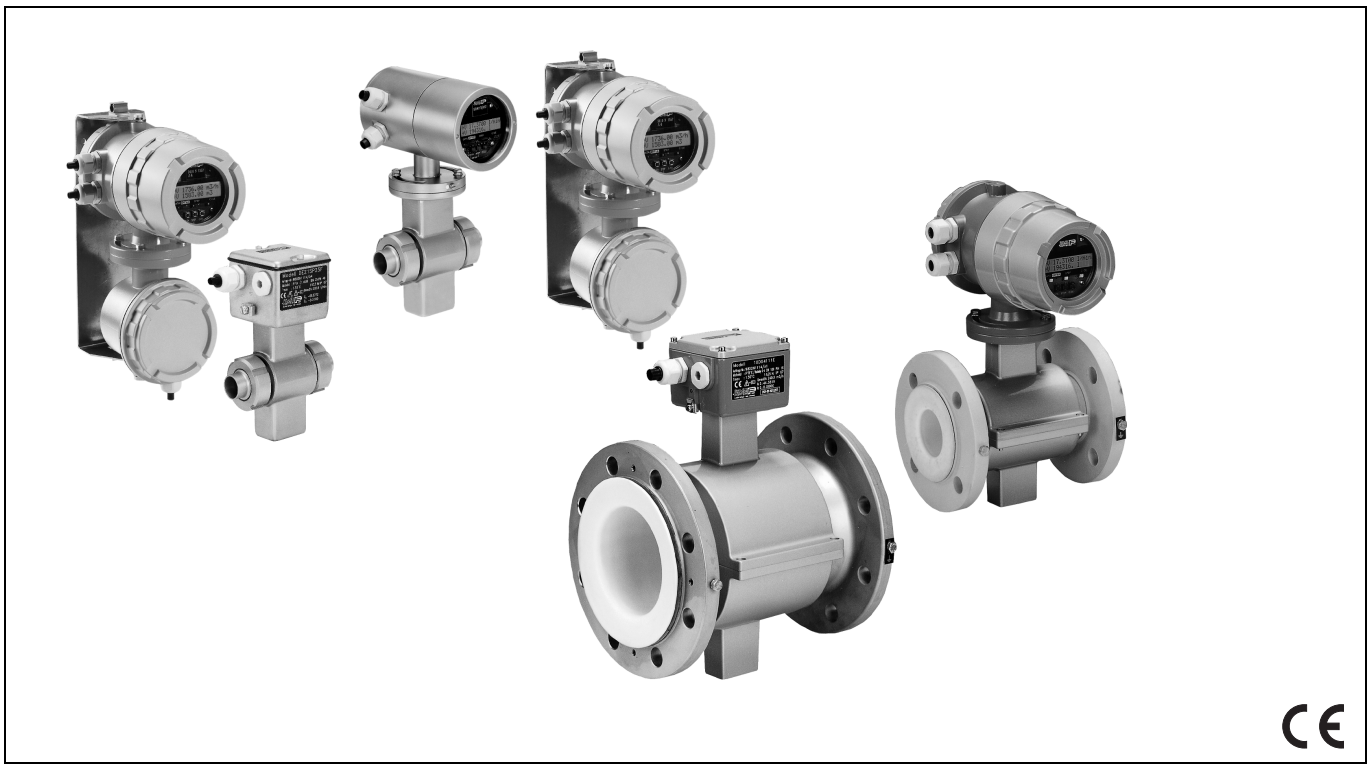
COPA-XE / MAG-XE

Programming Instructions
Model 50XE4000 B
Standard Software D699B179U01B.1x

ASCII- Protocol D184B025U06 Rev. 00 / 02.2000



Programming Instructions Serial Communications		
Prepared by **Name: K. Schäfer** **Date: 13 Feb. 2000**	**Instrument: COPA/MAG-XE, 50XE4000 B** **Software: Standard Software** **Designation: D699B179U01**	**Revision: 0** **Name: K. Schäfer** **Date: 13 Feb. 2000**
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1 Serial Communications

Basically two protocols are available for the serial communications: *ASCII* and *ASCII2w*. The protocol *ASCII2w* was developed for 2-wire communications (RS485) and differs from the *ASCII*-Protocol in the following features:

1. The converter always begins its response with ACK (06H).
2. The command mode code (M for Monitor Mode, P for Programming Mode) and the Instrument Address are always returned.
3. The Instrument Address is always returned with an error message.

➨ **NOTE !**

The Protocol *ProfibusDP* uses *ASCII* exclusively.

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1.1 ASCII-Protocol Description

Transmission Format
All characters are coded in the ASCII-Format. The transmission format has the following characteristics:

1 Startbit, 7 Databits, 1 Parity-Bit (even), 1 Stopbit.

Protocol
The ASCII-Protocol recognizes two operating modes: Monitor Mode and Programming Mode.

Monitor Mode

In the Monitor Mode parameters can be interrogated.
A Monitor Mode command is transmitted in the following format (to the converter):

SOH	M	A1	A0	K1	K0	CR	LF

SOH	Start of Header (01H)
M	´M´ for Monitor Mode
A1 A0	Two character Instrument Address
K1 K0	Function Code Characters
CR	Carriage Return
LF	Line Feed

The format for the response from the converter is:

SOH	K1	K0	D7 ... D0	CR	LF

SOH	Start of Header (01H)
K1 K0	Function Code Characters
D7 ... D0	Maximum eight data bytes (the number is a function of the parameter interrogated)
CR	Carriage Return
LF	Line Feed

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Programming Mode

In the Programming Mode values in the converter can be changed.
A Programming Mode command is transmitted to the converter in the following format:

SOH P A1 A0 K1 K0 D7 ... D0 CR LF

SOH	Start of Header (01H)
P	´P´ for Programming Mode
A1 A0	Two character Instrument Address
K1 K0	Function Code Characters
D7 ... D0	Maximum 8 data bytes (the number is a function of the selected parameter)
CR	Carriage Return
LF	Line Feed

The format for the response from the converter is:

SOH K1 K0 D7 ... D0 CR LF

SOH	Start of Header (01H)
K1 K0	Function Code Characters
D7 ... D0	Maximum 8 data bytes (same as number received by converter)
CR	Carriage Return
LF	Line Feed

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Error Messages

During an error condition (protocol error, exceeding the data range during configuration, etc.) the converter transmits an error string.

The error messages have the following format:

SOH X F1 F0 CR LF

SOH	Start of Header (01H)
X	´X´ for Error Message
F1 F0	Two character Error Code
CR	Carriage Return
LF	Line Feed

1.2 ASCII2w-Protocol Description

Transmission Format
All characters are coded in the ASCII-Format. The transmission format has the following characteristics:

1 Startbit, 7 Databits, 1 Parity-Bit (even), 1 Stopbit.

Protocol
The ASCII-Protocol recognizes two operating modes: Monitor Mode and Programming Mode.

Monitor Mode
In the Monitor Mode parameters can be interrogated.
A Monitor Mode command is transmitted in the following format (to the converter):

SOH	M	A1	A0	K1	K0	CR	LF

SOH	Start of Header (01H)
M	´M´ for Monitor Mode
A1 A0	Two character Instrument Address
K1 K0	Function Code Characters
CR	Carriage Return
LF	Line Feed

The format for the response from the converter is:

ACK	M	A1	A0	K1	K0	D7 ... D0	CR	LF

ACK	Acknowledge (06H)
M	´M´ for Monitor Mode
A1 A0	Two character Instrument Address
K1 K0	Function Code Characters
D7 ... D0	Maximum eight data bytes (the number is a function of the selected parameter)
CR	Carriage Return
LF	Line Feed

Programming Mode

In the Programming Mode values in the converter can be changed.

A Programming Mode command is transmitted to the converter in the following format:

SOH	P	A1	A0	K1	K0	D7 ... D0	CR	LF

SOH	Start of Header (01H)
P	´P´ for Programming Mode
A1 A0	Two character Instrument Address
K1 K0	Function Code Characters
D7 ... D0	Maximum 8 data bytes (is a function of the parameter accessed)
CR	Carriage Return
LF	Line Feed

The format for the response from the converter is:

ACK	P	A1	A0	K1	K0	D7 ... D0	CR	LF

ACK	Acknowledge (06H)
P	´P´ for Programming Mode
A1 A0	Two character Instrument Address
K1 K0	Function Code Characters
D7 ... D0	Maximum 8 data bytes (same as number received by converter)
CR	Carriage Return
LF	Line Feed

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Error Messages

During an error condition (protocol error, exceeding the limits during configuration etc.) the converter transmits an error string.

The error messages have the following format:

ACK X A1 A0 F1 F0 CR LF

ACK	Acknowledge (06H)
X	´X´ for Error Message
A1 A0	Two character Instrument Address
F1 F0	Two character Error Code
CR	Carriage Return
LF	Line Feed

1.3 General Commands

1.3.1 AD - Instrument Address

Function Code Characters: **AD**

Parameter/Function: Instrument Address

Units: -

Comments: The Instrument Address can be changed using this command. The new address must be used the next time communication is established with this converter. See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 99	22	Entry outside of data range	The same address may not be assigned to two different instruments.

1.3.2 AH – Max Alarm

Function Code Characters: **AH**

Parameter/Function: Max alarm setting

Units: %

Comments: Based on the flow range Qmax

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 130	74	Entry outside of data range	

1.3.3 AL – Min Alarm

Function Code Characters: **AL**

Parameter/Function: Min alarm setting

Units: %

Comments: Based on the flow range Qmax

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 130	74	Entry outside of data range	

1.3.4 BA – Baudrate

Function Code Characters: **BA**

Parameter/Function: Baudrate

Units: -

Comments: Changes to the baudrate are executed immediately, i.e. the converter actually confirms the change using the new baudrate. See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

WARNING!
This command is only available beginning with software versions D699B181U01 B.21 or D699B183U01 X.21.

Programming Mode

Data		***Data Range***	***Error Message***		***Comments***	
Format	***Number***		***No.***	***Cause***		
I	3	0 ≤ Entry ≤ 3	99	Entry outside of data range	Data	Baudrate
					0	1200 Baud
					1	2400 Baud
					2	4800 Baud
					3	9600 Baud.

1.3.5 BM - Operating Mode

Function Code Characters: **BM**

Parameter/Function: Operating Mode

Units: -

Comments: Converter operating mode.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	3	**Data**	**Explanation**
		000	Standard
		001	Fast

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Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 1	99	Entry outside of data range	

1.3.6 DF – Flowrate in Direct Reading Units

Function Code Characters: **DF**

Parameter/Function: Instantaneous flowrate in direct reading engineering units

Units: Units see "Units Qmax" (EI).

Comments: -

Monitor Mode

Data		*Comments*
Format	*Number*	
F	7	A negative output indicates reverse flow.

1.3.7 DI - Density

Function Code Characters: **DI**

Parameter/Function: Density

Units: g / cm3

Comments: The density value used for all mass units (Units Qmax, Units Totalizer).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	0.01 ≤ Entry ≤ 5	45 44 40 41	Entry < 0.01 Entry > 5 Frequency > 5kHz Frequency too small	Error 40 and 41 can only occur in the operating modes "Standard conti." and "Standard Batch". The "Frequency" is based on the scaled frequency output at 100% flowrate.

1.3.8 DP - Damping

Function Code Characters: **DP**

Parameter/Function: Damping

Units: s

Comments: The damping [s] value is the response time required by the converter to reach 99% of its final value after a step change.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	0.125 < Entry < 20	20 21	Entry > 99 Entry < 0.125	The value of the lower entry limit (0.125) increases to 0.25s for an excitation frequency of 12½Hz.

1.3.9 DR – Detector Empty Pipe On/Off

Function Code Characters: **DR**

Parameter/Function: Detector empty pipe on/off

Units: -

Comments:

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	1	Data	Explanation
		0	Detector turned off
		1	Detector turned on

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 or 1	99	Entry > 1	Data see Monitor Mode.

1.3.10 DS – Threshold, Detector Empty Pipe

Function Code Characters: **DS**

Parameter/Function: Threshold, detector empty pipe

Units: Hz

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	0 ≤ Entry ≤ 3000	56	Entry > 3000	

1.3.11 EI - Units Qmax

Function Code Characters: **EI**

Parameter/Function: Units for Qmax

Units: -

Comments: The "Units Qmax" are used for the output of the „Flowrate in Direct Reading Units“ (Page 1.3.6-1).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	Data	Explanation

000	l/s
001	l/min
002	l/h
016	hl/s
017	hl/min
018	hl/h
032	m3/s
033	m3/min
034	m3/h
048	igps
049	igpm
050	igph
064	mgd
065	gpm
066	gph
080	bbl/s
081	bbl/min
082	bbl/h
096	bls/day
097	bls/min
098	bls/h
112	kg/s
113	kg/min
114	kg/h
128	t/s
129	t/min
130	t/h
144	g/s
145	g/min
146	g/h
160	ml/s
161	ml/min
162	ml/h
176	Ml/min
177	Ml/h
178	Ml/day
192	lbs/s
193	lbs/min
194	lbs/h
208	uton/min
209	uton/h
210	uton/day
224	User programmable Units / s
225	User programmable Units / min
226	User programmable Units / h

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	See Monitor Mode Data	48	Incorrect data	-

1.3.12 EZ - Units Totalizer

Function Code Characters: **EZ**

Parameter/Function: Units for the totalizer

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	Data	Units
		0	l
		1	hl
		2	m3
		3	igal
		4	gal
		5	mgal
		6	bbl
		7	bls
		8	kg
		9	t
		10	g
		11	ml
		12	Ml
		13	lbs
		14	uton
		15	User programmable Units

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Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 15	99 40 41	Entry > 15 Frequency > 5kHz Frequency too small	The "Frequency" is based on the scaled frequency output at 100% flowrate.

1.3.13 E1 – Error Register 1

Function Code Characters: **E1**

Parameter/Function: Error Register 1

Units: -

Comments: Output the contents of the Error Register 1.

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	The contents of the Error Register are outputted in coded form. The individual errors are identified by the Bit:	
		Bit	Error
		0	Error 0 (Empty pipe)
		1	Error 1 (A/D-Converter saturated)
		2	Error 2 (Reference voltage too small)
		3	Error 3 (Flowrate > 130%)
		4	Error 4 (Ext. zero return)
		5	Error 5 (Data corrupted)
		6	Error 6 (Totalizer defective)
		7	Error 7 (Positive reference voltage too large)

1.3.14 E2 – Error Register 2

Function Code Characters: **E2**

Parameter/Function: Error Register 2

Units: -

Comments: Output the contents of the Error Register 2.

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	The contents of the Error Register are outputted in coded form. The individual errors are identified by the Bit:	
		Bit	Error
		0	Error 8 (Negative reference voltage too large)
		1	Error 9 (Line frequency)
		2	Error A (Max alarm)
		3	Error B (Min alarm)
		4	Error C (Primary data incorrect)
		5	Function test active, converter is not on-line
		6	Error 6 Forward (forward totalizer defective)
		7	Error 6 Reverse (reverse totalizer defective)

1.3.15 EM – Error Log Register Reset

Function Code Characters: **EM**

Parameter/Function: Error Log Register reset

Units: -

Comments: This command is used to reset both error log registers („L1 – Error Log Register 1“, Page 1.3.25-1 and „L2 – Error Log Register 2“, Page 1.3.26-1.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	-

1.3.16 FR – Flow Direction

Function Code Characters: **FR**

Parameter/Function: Flow direction

Units: -

Comments: The command changes the setting of Bit 4 in the Mode Register 1 (M1 – Mode Register 11.3.29-1).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*	
Format	*Number*		*No.*	*Cause*		
I	3	0 ≤ Entry ≤ 1	99	Entry outside of data range	Data	Explanation
					0	Forward/reverse
					1	Only forward

1.3.17 IA – Alarm Current

Function Code Characters: **IA**

Parameter/Function: Alarm current

Units: -

Comments: The current output setting for the alarm current during an error condition. This parameter is only available in converters which include a current output option (Versions 01, 03 and 05).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	3	Data	Alarm Current
		0	0% of the current output range setting.
		1	130% of the current output range setting.
		2	3.6 mA

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 2	99	Entry outside of data range	A value for the error current of 3.6 mA can only be selected when the current output range IO is set to "4-20mA" or "4-12-20mA".

1.3.18 IB – Pulse Width

Function Code Characters: **IB**

Parameter/Function: Pulse width for the scaled pulse output.

Units: ms

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	Pulse width for the scaled pulse output in ms.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	0.1 ≤ Entry ≤ 2000	42 43 46	Entry > 2000 Entry < 0.1 Entry too large	The Error Message “Entry too large” is set when the entry value is greater than 130% of the half period for the pulse output frequency at 100% flowrate.

1.3.19 IO – Current Output Range

Function Code Characters: **IO**

Parameter/Function: Current output range

Units: -

Comments: This command is only available in converters which include a current output option (Versions 01, 03 and 05).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	3	Data	Current Output Range
		0	0 - 20mA
		1	4 - 20mA
		2	0 - 10mA
		3	2 - 10mA
		4	0 - 5mA
		5	0 - 10 - 20mA
		6	4 - 12 - 20mA

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 6	99	Entry outside of data range	Data see Monitor Mode.

1.3.20 I> - Pulse Factor

Function Code Characters: **I>**

Parameter/Function: Pulse factor

Units: 1 / [totalizer units]

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	Pulse factor in pulses/totalizer units.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	0.001 ≤ Entry ≤ 1000	38 39 40 41	Entry > 1000 Entry < 0.001 Frequency > 5kHz Frequency too small	The “Frequency” is based on the scaled output frequency at 100% flowrate.

1.3.21 K1 - Calibration 1

Function Code Characters: **K1**

Parameter/Function: Calibration (1)

Units: %

Comments:

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	Calibration factor in percent.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	-5 ≤ Entry ≤ 5	58	Entry outside of data range	-

1.3.22 LZ – Reset Totalizer

Function Code Characters: **LZ**

Parameter/Function: Reset the totalizer and the overflow counter

Units: -

Comments: This command resets all the totalizers and overflow counters to 0.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	-	-	-	-	No additional data are transmitted.

1.3.23 LV – Reset Forward Flow Totalizer

Function Code Characters: **LV**

Parameter/Function: Reset the forward flow totalizer and its overflow counter

Units: -

Comments: This command resets the forward totalizer and its overflow counter to 0.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	-	-	-	-	No additional data are transmitted.

1.3.24 LR – Reset Reverse Flow Totalizer

Function Code Characters: **LR**

Parameter/Function: Reset the reverse flow totalizer and its overflow counter

Units: -

Comments: This command resets the reverse totalizer and its overflow counter to 0.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	-	-	-	-	No additional data are transmitted.

1.3.25 L1 – Error Log Register 1

Function Code Characters: **L1**

Parameter/Function: Error Register 1

Units: -

Comments: This register can be reset using the command EM („EM – Error Log Register Reset“, Page 1.3.15-1)

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	The contents of the Error Register are outputted in coded form. The individual errors are identified by the Bit:	
		Bit	Error
		0	Error 0
		1	Error 1
		2	Error 2
		3	Error 3
		4	Error 4
		5	Error 5
		6	Error 6
		7	Error 7

1.3.26 L2 – Error Log Register 2

Function Code Characters: **L2**

Parameter/Function: Error Register 2

Units: -

Comments: This register can be reset using the command EM („EM – Error Log Register Reset“, Page 1.3.15-1)

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	The contents of the Error Register are outputted in coded form. The individual errors are identified by the Bit:	
		Bit	Error
		0	Error 8
		1	Error 9
		2	Error A
		3	Error B
		4	Error C
		5	-
		6	-
		7	-

1.3.27 M - Instantaneous Flowrate

Function Code Characters: **M**

Parameter/Function: Output of the instantaneous flowrate in % of Qmax.

Units: %

Comments: The 2nd function character is replaced in the response by the direction arrow:
> for forward, < for reverse.

WARNING!
It is preferable to interrogate the flowrate using the command MD.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	

1.3.28 MD - Instantaneous Flowrate

Function Code Characters: **MD**

Parameter/Function: Output of the instantaneous flowrate in % of Qmax.

Units: %

Comments: A negative value is outputted for the reverse flow direction.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	Positive output value = forward flow direction Negative output value = reverse flow direction

1.3.29 M1 – Mode Register 1

Function Code Characters: **M1**

Parameter/Function: Mode Register 1

Units: -

Comments: The register is read only. In order to make a change, the corresponding functions/parameters must be explicitly reprogrammed.

Monitor Mode

Data		*Comments*
Format	*Number*	
I	3	The contents of this register are outputted in coded form:

Bit	Explanation
0	Detector empty pipe 0 = off 1 = on
1	Flow direction indication 0 = normal 1 = inverse
2	RangeMax Mode 0 = fixed 1 = programmable
3	No function
4	Flow direction to be measured 0 = forward/reverse 1 = only forward
5	RangeMax velocity 0 = 10 m/s 1 = 33.33 ft/s
6	Filter 0 = off 1 = on
7	No function

1.3.30 M2 – Mode Register 2

Function Code Characters: **M2**

Parameter/Function: Mode Register 2

Units: -

Comments: The register is read only. In order to make a change, the corresponding functions/parameters must be explicitly reprogrammed.

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	The contents of this register are outputted in coded form:	
		Bit	**Explanation**
		0	Totalizer mode 0 = Standard (forward and reverse totalization) 1 = Difference totalizer
		1	Power supply type 0 = AC 1 = DC
		2	Allowable lower measurement range (Range < 0.05 RangeMax) 0 = no (i.e. range greater than 0.05 RangeMax) 1 = yes
		3	Detector empty pipe signal 0 = off 1 = on
		4	No function
		5	No function
		6	No function
		7	No function

1.3.31 NG – System Zero

Function Code Characters: **NG**

Parameter/Function: System zero

Units: Hz

Comments: A negative system zero value indicates reverse flow.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	-50 ≤ Entry ≤ 50	54	Entry outside of data range	-

1.3.32 NW – Meter Size

Function Code Characters: **NW**

Parameter/Function: Flowmeter primary size

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	3	**Data**	**Explanation**

000	DN 3	1/10"
001	DN 4	5/32"
002	DN 5	3/16"
003	DN 6	1/4"
004	DN 8	5/16"
005	DN 10	3/8"
006	DN 15	1/2"
007	DN 20	3/4"
008	DN 25	1"
009	DN 32	1-1/4"
010	DN 40	1-1/2"
011	DN 50	2"
012	DN 65	2-1/2"
013	DN 80	3"
014	DN 100	4"
015	DN 125	5"
016	DN 150	6"
017	DN 200	8"
018	DN 250	10"
019	DN 300	12"
020	DN 350	14"
021	DN 400	16"
022	DN 450	18"
023	DN 500	20"
024	DN 600	24"
025	DN 700	28"
026	DN 750	30"
027	DN 800	32"
028	DN 900	36"
029	DN 1000	40"
030	DN 1100	44"
031	DN 1200	48"
032	DN 1300	50"
033	DN 1400	54"
034	DN 1500	60"
035	DN 1600	64"
036	DN 1700	66"
037	DN 1800	72"
038	DN 2000	78"
039	DN 2100	84"
040	DN 2200	88"
041	DN 2300	92"
042	DN 2400	96"
043	DN 1	1/25"
044	DN 1.5	1/16"
045	DN 2	3/32"
046	DN 1350	52"

Programming Instructions Serial Communications		
Prepared by **Name: K. Schäfer** **Date: 13 Feb. 2000**	**Instrument: COPA/MAG-XE, 50XE4000 B** **Software: Standard Software** **Designation: D699B179U01**	**Revision: 0** **Name: K. Schäfer** **Date: 13 Feb. 2000**
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Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 46	99	Entry > 46	When the meter size is programmed the parameters RangeMax, Qmax, Pulse Factor, Units Qmax, Units Totalizer and Density are affected. Therefore the meter size should be programmed before programming the parameters listed above.

1.3.33 O> - Forward Overflow Counter

Function Code Characters: **O>**

Parameter/Function: Forward overflow counter

Units: -

Comments: One overflow is equivalent to 10,000,000 [totalizer units]

Monitor Mode

Data		*Comments*
Format	*Number*	
I	3	The overflow counter can be reset with the command LZ (Reset Totalizer).

1.3.34 O< - Reverse Overflow Counter

Function Code Characters: **O<**

Parameter/Function: Reverse overflow counter

Units: -

Comments: One overflow is equivalent to 10,000,000 [totalizer units]

Monitor Mode

Data		*Comments*
Format	*Number*	
I	3	The overflow counter can be reset with the command LZ (Reset Totalizer).

1.3.35 PR – Program Version

Function Code Characters: **PR**

Parameter/Function: Output the Program Version/Revision

Units: -

Comments:

Monitor Mode

Data		*Comments*
Format	*Number*	
A	8	Output in ASCII-Code. e.g.: "B179 B12" B179 = Software D699B179U01 (standard software COPA/MAG-XE) B12 = Revision B.12

1.3.36 QN - Flowmeter Primary Constant, RangeMax

Function Code Characters: **QN**

Parameter/Function: Flowmeter primary constant, RangeMax

Units: EI - Units Qmax

Comments: The output of RangeMax. The flow velocity (10 m/s or 33.33 ft/s) can be read in Mode Register 1 (M1, Page 1.3.29-1).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	7	-

1.3.37 Q> - Flow Range Qmax

Function Code Characters: **Q>**

Parameter/Function: Flow range Qmax

Units: Units Qmax (EI)

Comments: The flow range setting applies to both flow directions (forward and reverse).

See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	7	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	7	0.05 RangeMax ≤ Entry ≤ RangeMax	10 11	Entry > RangeMax Entry < 0.05 RangeMax	The flow range is always based on RangeMax.

1.3.38 SM - Low Flow Cutoff

Function Code Characters: **SM**

Parameter/Function: Low flow cutoff setting

Units: %

Comments: Low flow cutoff value in % of the flow range Qmax.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	0 ≥ Entry ≥ 10	16 17	Entry > 10 Entry < 0	-

1.3.39 SP - Language

Function Code Characters: **SP**

Parameter/Function: Language (for display indications)

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	3	**Data**	**Explanation**
		000	German
		001	English
		002	French
		003	Finnish
		004	Spanish
		005	Italian
		006	Dutch
		007	Danish
		008	Swedish

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 8	99	Entry outside of data range	

1.3.40 ST – Status Register

Function Code Characters: **ST**

Parameter/Function: Status Register 1

Units: -

Comments: Output of the Status Register 1 in coded form.

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	**Bit**	**Explanation**
		0	Forward totalizer overflow
		1	Reverse totalizer overflow
		2	-
		3	Parameter change from the keypad
		4	An adjustment routine is presently in progress
		5	Flowrate less than low flow cutoff value
		6	
		7	An error condition has been detected. Error see „E1 – Error Register 1“ (Page 1.3.13) and „E2 – Error Register 2“ (Page 1.3.14-1“

1.3.41 SU – Filter On/Off

Function Code Characters: **SU**

Parameter/Function: Turn filter on/off

Units: -

Comments: The present setting can be read in „M1 – Mode Register 1“, Page 1.3.29-1

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≥ Entry ≥ 1	99	Entry outside of data range	0 = Filter off 1 = Filter on

1.3.42 S2 – Status Register 2

Function Code Characters: **S2**

Parameter/Function: Status Register 2

Units: -

Comments: Output of the Status Register 2 in coded form.

Monitor Mode

Data		***Comments***
Format	***Number***	
I	3	

Bit	**Explanation**
0	-
1	-
2	The present flow direction is forward.
3	-
4	Function test „Test Mode“ (operation using simulator is active).
5	Is set after a power outage (Reset).
6	-
7	-

1.3.43 T1 - TAG-Number (1)

Function Code Characters: **T1**

Parameter/Function: First part of the TAG-Number

Units: -

Comments: The first 8 characters of the 16 character TAG-Number

Monitor Mode

Data		*Comments*
Format	*Number*	
A	8	Alphanumeric output (letters, numbers, special characters)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
A	8	Numbers 0...9 Letters a..z, A..Z Spec. char's: -+/*/.:space	-	-	The entry is not checked against the data range limits.

1.3.44 T2 - TAG-Number (2)

Function Code Characters: **T2**

Parameter/Function: Second part of the TAG-Number 2

Units: -

Comments: The second 8 characters of the 16 character TAG-Number

Monitor Mode

Data		*Comments*
Format	*Number*	
A	8	Alphanumeric output (letters, numbers, special characters)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
A	8	Numbers 0...9 Letters a..z, A..Z Spec. char's: -+/*/.:space	-	-	The entry is not checked against the data range limits.

1.3.45 ZM – Totalizer Mode

Function Code Characters: **ZM**

Parameter/Function: Totalizer operating mode

Units: -

Comments: Interrogate in „M2 – Mode Register 2“, Page 1.3.30-1

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 1	99	Entry outside of data range	0 for standard (forward and reverse totalizer) 1 for difference totalizer

1.3.46 Z1 – Display Line 1

Function Code Characters: **Z1**

Parameter/Function: Process display for the 1st line

Units: -

Comments: The lower 4 bits converted to Hex data indicate the value to be displayed in the 1st line, the upper 4 bits the multiplexed function. See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Example:
The output 112 = 70h indicates: 1st line display in [%], multiplex mode OFF.

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	**Data (Halfbyte)**	**Explanation**
		0	Q [%] (display the instantaneous flowrate in percent of Qmax)
		1	Q [Units] (display of the instantaneous flowrate in engineering units; Units see „EI - Units Qmax“, Page 1.3.11-1)
		2	Totalizer value. (Display the forward or reverse flow totalizer based on the present flow direction)
		3	Display forward flow totalizer
		4	Display reverse flow totalizer
		5	Display „TAG-Number“
		6	Q [Bargraph] (display instantaneous flowrate as a bargraph)
		7	Blank line or multiplex operation OFF.

Programming Instructions
Serial Communications

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Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 7	99	Entry outside of data range	WARNING ! In the Programming Mode only the function „Line 1" is programmed. The function „Line 1 multiplex" is programmed with the command „Z3"!

1.3.47 Z2 – Display Line 2

Function Code Characters: **Z2**

Parameter/Function: Process display for the 2nd line

Units: -

Comments: The lower 4 bits converted to Hex data indicate the value to be displayed in the 2nd line, the upper 4 bits the multiplexed function. See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Example:
The output 112 = 70h indicates: 2nd line display in [%], multiplex mode OFF.

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	**Data**	**Explanation**
		0	Q [%] (display the instantaneous flowrate in percent of Qmax)
		1	Q [Units] (display of the instantaneous flowrate in engineering units; Units see „EI - Units Qmax“, Page 1.3.11-1)
		2	Display totalizer value. (Forward or reverse flow totalizer based on the present flow direction)
		3	Display forward flow totalizer
		4	Display reverse flow totalizer
		5	Display „TAG-Number“
		6	Q [Bargraph] (display instantaneous flowrate as a bargraph)
		7	Blank line or multiplex operation OFF.

Programming Instructions
Serial Communications

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Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 7	99	Entry outside of data range	WARNING ! In the Programming Mode only the selection for „Line 2" is programmed. The selection for „Line 2 multiplex" is programmed with the command „Z4"!

1.3.48 Z3 –Display Line 1 Multiplex

Function Code Characters: **Z3**

Parameter/Function: Multiplexed value for 1st display line in Multiplex Mode

Units: -

Comments: For code explanations see „Z1 – Display Line 1“, Page 1.3.46-1.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 7	99	Entry outside of data range	-

1.3.49 Z4 – Display Line 2 Multiplex

Function Code Characters: **Z4**

Parameter/Function: Multiplexed value for 2nd display line in Multiplex Mode

Units: -

Comments: For code explanations see „Z2 – Display Line 2“, Page 1.3.47-1

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 7	99	Entry outside of data range	-

1.3.50 Z> - Forward Totalizer

Function Code Characters: **Z>**

Parameter/Function: Output of the forward flow or difference totalizer value

Units: See „EZ - Units “, Page 1.3.12-1

Comments: -

Monitor Mode

Data		*Comments*
Format	*Number*	
F	7	Output of the forward totalizer value. For a totalizer operating mode setting of „Difference Totalizer“ the value of the difference totalizer is outputted. To reset the totalizers see „LZ – Reset Totalizer“ (Page 1.3.22-1) and „LV – Reset Forward Flow Totalizer“, Page 1.3.23-1

1.3.51 Z< - Reverse Totalizer

Function Code Characters: **Z<**

Parameter/Function: Output of the reverse flow totalizer value

Units: See „EZ - Units “, Page 1.3.12-1

Comments: For a totalizer operating mode setting of „Difference Totalizer“ the value of the difference totalizer is outputted.
To reset the totalizer see „LZ – Reset Totalizer“ (Page 1.3.22-1) and „LR – Reset Reverse Flow Totalizer“, Page 1.3.24-1.

Monitor Mode

Data		*Comments*
Format	*Number*	
F	7	-

1.4 Special Commands

The "Special Commands" can only be accessed after the Service-Code number has been entered.

1.4.1 AM - Analog Flow Range

Function Code Characters: **AM**

Parameter/Function: Analog flow range

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	3	**Data**	**Explanation**
		0	Amplification 8, automatic flow range selection
		1	Amplification 4, automatic flow range selection
		2	Amplification 2, automatic flow range selection
		3	Amplification 1, automatic flow range selection
		4	Amplification 8, manual flow range selection
		5	Amplification 4, manual flow range selection
		6	Amplification 2, manual flow range selection
		7	Amplification 1, manual flow range selection

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 7	99	Entry outside of data range	-

1.4.2 C0 – Flowmeter Primary Span Cs 6¼ Hz

Function Code Characters: **C0**

Parameter/Function: Flowmeter primary span Cs, 6 ¼ Hz

Units: %

Comments: A negative flowmeter primary span value reverses the flow direction.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	7	-200 ≤ Entry ≤ -20 or 20 ≤ Entry ≤ 200	53	Entry outside of data range	7 data bytes are allowed in the Programming Mode.

1.4.3 C1 - Flowmeter Primary Span Cs 12½ Hz

Function Code Characters: **C1**

Parameter/Function: Flowmeter primary span Cs, 12 ½ Hz

Units: %

Comments: A negative flowmeter primary span value reverses the flow direction.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	7	-200 ≤ Entry ≤ -20 or 20 ≤ Entry ≤ 200	53	Entry outside of data range	7 data bytes are allowed in the Programming Mode.

1.4.4 C2 - Flowmeter Primary Span Cs 25 Hz

Function Code Characters: **C2**

Parameter/Function: Flowmeter primary span Cs, 25 Hz

Units: %

Comments: A negative flowmeter primary span value reverses the flow direction.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	7	-200 ≤ Entry ≤ -20 or 20 ≤ Entry ≤ 200	53	Entry outside of data range	7 data bytes are allowed in the Programming Mode.

1.4.5 C3 - Flowmeter Primary Zero Cz 6¼ Hz

Function Code Characters: **C3**

Parameter/Function: Flowmeter primary zero Cz, 6 ¼ Hz

Units: %

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	7	-5 ≤ Entry ≤ 5	52	Entry outside of data range	7 data bytes are allowed in the Programming Mode.

1.4.6 C4 - Flowmeter Primary Zero Cz 12½ Hz

Function Code Characters: **C4**

Parameter/Function: Flowmeter primary zero Cz, 12 ½ Hz

Units: %

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	7	-5 ≤ Entry ≤ 5	52	Entry outside of data range	7 data bytes are allowed in the Programming Mode.

1.4.7 C5 - Flowmeter Primary Zero Cz 25 Hz

Function Code Characters: **C5**

Parameter/Function: Flowmeter primary zero Cz, 25 Hz

Units: %

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	7	-5 ≤ Entry ≤ 5	52	Entry outside of data range	7 data bytes are allowed in the Programming Mode.

1.4.8 cm - Calibration Mode

Function Code Characters: **cm**

Parameter/Function: Calibration mode

Units: -

Comments: This parameter has no function at this time. See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
I	3	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 255	99	Entry outside of data range	-

1.4.9 da - Calibration Date

Function Code Characters: **da**

Parameter/Function: Calibration date

Units: -

Comments: For information only, has no effect on the program operation.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
A	6	Output in the following format: Day Day Month Month Year Year

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
A	6	Numbers 0 ... 9	-	-	Entry is not checked.

1.4.10 EF – Excitation Frequency

Function Code Characters: **EF**

Parameter/Function: Excitation frequency

Units: -

Comments: See also „**Error! Reference source not found.**“ (Page**Error! Bookmark not defined.**) and „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		***Comments***
Format	***Number***	
I	3	Output of the present excitation as a function of the line frequency for AC powered instruments.

Data		**Explanation**
Decimal	**Hex.**	
0	00	6 ¼ Hz, AC
17	11	7 ½ Hz, AC
34	22	12 ½ Hz, AC
51	33	15 Hz, AC
68	44	25 Hz, AC
85	55	30 Hz, AC
96	60	6 ¼ Hz, DC
113	71	7 ½ Hz, DC
130	82	12 ½ Hz, DC
147	93	15 Hz, DC
164	A4	25 Hz, DC
181	B5	30 Hz, DC
198	C6	Negative continuous excitation
199	C7	Positive continuous excitation
216	D8	Error

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 13	99	Entry outside of data range	The excitation frequency can be set using the values in the following table:

Data	Explanation
0	6 ¼ Hz, AC/DC
1	7 ½ Hz, AC/DC
2	12 ½ Hz, AC/DC
3	15 Hz, AC/DC
4	25 Hz, AC/DC
5	30 Hz, AC/DC
6	6 ¼ Hz, DC
7	7 ½ Hz, DC
8	12 ½ Hz, DC
9	15 Hz, DC
10	25 Hz, DC
11	30 Hz, DC
12	Positive continuous excitation
13	Negative continuous excitation

1.4.11 GN – Instrument Number

Function Code Characters: **GN**

Parameter/Function: Instrument Number

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	7	

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	7	0 ≤ Entry ≤ 1000000	18	Entry outside of data range	Only positive integer values can be entered.

1.4.12 IS – Signal Integration Time

Function Code Characters: **IS**

Parameter/Function: Integration time

Units: %

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	3	**Data**	**Explanation**
		0	25 %
		1	50 %

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 1	99	Entry outside of data range	-

1.4.13 KN – Service Code Number

Function Code Characters: **KN**

Parameter/Function: Service Code Number

Units: -

Comments: Only after entry of the Service Code Number can the „Special Commands“ be accessed. The Code Number is: 4000.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	-	-	-	-

1.4.14 mi - 50s Averaged Value

Function Code Characters: **mi**

Parameter/Function: 50s averaged value

Units: %

Comments: The 50s averaged value of the flowrate in %. The averaging procedure can be started using the Programming Command ´mi´. After 50s the Monitor Command ´mi´ can be used to output the result. Bit 4 in the Status Register 1 is set (See also „ST – Status Register“, Page 1.3.40-1).

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	The averaging procedure is started using the Programming Command ´mi´.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	The averaging procedure is started using this command without any additional entries.

1.4.15 m1 - Short Model No. (1)

Function Code Characters: **m1**

Parameter/Function: Short model no. 1

Units: -

Comments: The first 8 characters of the 16 character short model number.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*
Format	*Number*	
A	8	Alphanumeric output (letters, numbers, special characters)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
A	8	Numbers 0...9 Letters a..z, A..Z Spec. char's: -+/*/.:space	-	-	The entry is not checked against the data range limits.

1.4.16 m2 - Short Model No. (2)

Function Code Characters: **m2**

Parameter/Function: Short model no. 2

Units: -

Comments: The second 8 characters of the 16 character short model number.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Monitor Mode

Data		*Comments*
Format	*Number*	
A	8	Alphanumeric output (letters, numbers, special characters)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
A	8	Numbers 0...9 Letters a..z, A..Z Spec. char's: -+/*/.:space	-	-	The entry is not checked against the data range limits.

1.4.17 NI – Current Output Zero

Function Code Characters: **NI**

Parameter/Function: Current output zero value (4mA value)

Units: mA

Comments: The 4mA calibration value for the current output.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	Output of the calibration value in mA.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	2 ≤ Entry ≤ 6	-	-	The entry is not checked against the data range limits.

1.4.18 N> - Instrument Zero

Function Code Characters: **N>**

Parameter/Function: Instrument zero

Units: %

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	7	-1 ≤ Entry ≤ 1	55	Entry outside of data range	-

1.4.19 op - Options

Function Code Characters: **op**

Parameter/Function: Options

Units: -

Comments: The options are stored in a second register. If the contents of these two registers are the same, the contents are not overwritten during an initialization of the converter.

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	3	**Bit**	**Explanation**
		0	-
		1	-
		2	Converter designation (See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**).
		3	Start in English (See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**)
		4	0
		5	0
		6	0
		7	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 15	-	-	The entry is not checked against the data range limits.

1.4.20 pi - Mode Input X1

Function Code Characters: **pi**

Parameter/Function: Mode input X1

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	3	**Data**	**Explanation**
		0	Ext. zero return
		1	Ext. totalizer reset
		2	Ext. totalizer stop
		3	No function

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 3	99	Entry outside of data range	

1.4.21 po - Mode Output P7

Function Code Characters: **po**

Parameter/Function: Mode output P7

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	**Data**	**Explanation**
		0	Max alarm closes
		1	Max alarm opens
		2	Min alarm closes
		3	Min alarm opens
		4	Max/Min alarm closes
		5	Max/Min alarm opens
		6	General alarm closes
		7	General alarm opens
		8	Detector empty pipe closes
		9	Detector empty pipe opens
		10	F/R direction signal
		11	No function

Programming Instructions
Serial Communications

Prepared by **Name: K. Schäfer** **Date: 13 Feb. 2000**	**Instrument: COPA/MAG-XE, 50XE4000 B** **Software: Standard Software** **Designation: D699B179U01**	**Revision: 0** **Name: K. Schäfer** **Date: 13 Feb. 2000**
Page: 1.4.21-2	**Project No: D50E0396**	

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 11	99	Entry outside of data range	

1.4.22 SI – Current Output Span

Function Code Characters: **SI**

Parameter/Function: Current output span (20mA value)

Units: mA

Comments: The 20mA calibration value for the current output.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	Output of the calibration value in mA.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	16 ≤ Entry ≤ 24	-	-	Entry not checked against the data range.

1.4.23 S> - Instrument Span Forward

Function Code Characters: **S>**

Parameter/Function: Forward direction instrument span

Units: %

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	7	250 ≤ Entry ≤ 300	50	Entry outside of data range	-

1.4.24 S< - Instrument Span Reverse

Function Code Characters: **S<**

Parameter/Function: Reverse direction instrument span

Units: %

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
F	6	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	7	-300 ≤ Entry ≤ -250	51	Entry outside of data range	-

1.4.25 TA – Test Mode Off

Function Code Characters: **TA**

Parameter/Function: Turn off the test mode

Units: -

Comments: This command is used to turn off the Test Mode (operation using simulator). Bit 4 in the Status Register is reset („S2 – Status Register 2“, Page 1.3.42-1).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.** and „TE – Test Mode On“, Page 1.4.26-1.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	The Test Mode is automatically reset after a power outage.

1.4.26 TE – Test Mode On

Function Code Characters: **TE**

Parameter/Function: Turn on the test mode

Units: -

Comments: This command is used to turn on the Test Mode (operation using simulator). Bit 4 in the Status Register is set („S2 – Status Register 2“, Page 1.3.42-1).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.** and „TA – Test Mode Off“, Page 1.4.25-1.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	The Test Mode is automatically reset after a power outage.

1.4.27 ESC K – Instrument Code Number

Function Code Characters: **ESC K**

Parameter/Function: Instrument Code Number

Units: -

Comments: Fixed instrument designation. ESC = 1Bh

Monitor Mode

Data		*Comments*
Format	*Number*	
A	8	Output string: ´ 13´

1.4.28 ESC X – Terminal Mode

Function Code Characters: **ESC X**

Parameter/Function: Terminal mode

Units: -

Comments: Switch to the terminal mode. For a detailed description see a separate chapter.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
A	4	See Comments	-	-	

Data	Terminal Mode
ANSI	ANSI-Terminal mode. Uses ANSI-ESC-Sequences.
TERM	Only ASCII characters
FPHT	F&P-Handheld terminal

1.4.29 o1 - Order No. (1)

Function Code Characters: **o1**

Parameter/Function: First part of the Order No.

Units: -

Comments: The first 8 characters of the 16 character Order Number.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
A	8	Alphanumeric output (letters, numbers, special characters)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
A	8	Numbers 0...9 Letters a..z, A..Z Spec. Char's -+/*/.: space	-	-	The entry is not checked against the data range.

1.4.30 o2 - Order No. (2)

Function Code Characters: **o2**

Parameter/Function: Second part of the Order No.

Units: -

Comments: The second 8 characters of the 16 character Order Number.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
A	8	Alphanumeric output (letters, numbers, special characters)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
A	8	Numbers 0...9 Letters a..z, A..Z Spec. Char's -+/*/.: space	-	-	The entry is not checked against the data range.

1.4.31 OD – Output Data Settings

Function Code Characters: **OD**

Parameter/Function: Output the data settings

Units: -

Comments: This command operates identical to the corresponding function in the instrument menu (**Error! Reference source not found.**, Page **Error! Bookmark not defined.**)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	0	-	-	-	-

1.4.32 QG – RangeMax Velocity

Function Code Characters: **QG**

Parameter/Function: Velocity selection for RangeMax

Units: -

Comments: This command toggles the setting in Mode Register 1, Bit 5 (M1 – Mode Register 11.3.29-1).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Programming Mode

Data		***Data Range***	***Error Message***		***Comments***	
Format	***Number***		***No.***	***Cause***		
I	3	0 ≤ Entry ≤ 1	99	Entry outside of data range	Data	Explanation
					0	10 m/s
					1	33.33 ft/s

1.4.33 QM – RangeMax Mode

Function Code Characters: **QM**

Parameter/Function: RangeMax Mode

Units: -

Comments: This command toggles the setting in Mode Register 1, Bit 2 (M1 – Mode Register 11.3.29-1).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*	
Format	*Number*		*No.*	*Cause*		
I	3	0 ≤ Entry ≤ 1	99	Entry outside of data range	Data	Explanation
					0	fixed
					1	programmable

1.4.34 SA – Reset Mains Interrupt Detector

Function Code Characters: **SA**

Parameter/Function: Reset the mains interrupt detector

Units: -

Comments: This command resets Bit 5 in Status Register 2 („S2 – Status Register 2“, Page 1.3.42-1)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	-

1.4.35 va - Converter Versions

Function Code Characters: **va**

Parameter/Function: Converter Versions

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	
I	3	-

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 06	99	Entry outside of data range	WARNING! When a Version is entered the following parameters are reset to their default values: Operating Mode, Input X1, Output P7, 1st and 2nd Display Lines.

1.4.36 %0 – Test Mode Function Off

Function Code Characters: **%0**

Parameter/Function: Turn off the Test Mode function

Units: -

Comments: For a number of function tests the Test Mode must be turned on.. This command is used to turn off the Test Mode.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	-

1.4.37 %1 – Test Mode Function On

Function Code Characters: **%1**

Parameter/Function: Turn on the Test Mode function

Units: -

Comments: The Test Mode must be turned on for the following test functions:
„%2 – Function Test Fout“, Page 1.4.38-1
„%3 – Function Test Iout“, Page 1.4.39-1
„%8 – Function Test Output P7“, Page 1.4.43-1

WARNING!
It is essential that the Test Mode be turned off after completing the tests so that the converter is returned to its normal operating mode („%0 – Test Mode Function Off“, Page 1.4.36-1)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	-

1.4.38 %2 – Function Test Fout

Function Code Characters: **%2**

Parameter/Function: Function Test Frequency Output Fout

Units: %

Comments: This command can be used to set the frequency output between 0 and 100% (0 and 10000Hz). The pulses at the output are the scaled pulses based on the flow range setting.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	0 ≤ Entry ≤ 130	-	-	Entry not checked against data range.

1.4.39 %3 – Function Test Iout

Function Code Characters: **%3**

Parameter/Function: Function Test Current Output Iout

Units: mA

Comments: Set the current output in mA. See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	0 ≤ Entry ≤ 26	-	-	Entry not checked against the data range.

1.4.40 %4 - Function Test EPROM

Function Code Characters: **%4**

Parameter/Function: Function Test EPROM

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	Data	Explanation
		0	Checksum in EPROM is correct.
		1 to 255	Output of the calculated (actual) Checksum.

1.4.41 %5 - Function Test RAM

Function Code Characters: **%5**

Parameter/Function: Function Test RAM

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	Data	Explanation
		0	RAM ok
		1 to 255	Error

1.4.42 %6 - Function Test EEPROM

Function Code Characters: **%6**

Parameter/Function: Function Test EEPROM

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*
Format	*Number*	

Data	Explanation
0	Error free
91	Data in the internal EEPROM is invalid. This Error Message can only be reset with an initialization of the converter. This Error Message corresponds to Error Message "Error 5" in the process display.
96	Database in the EEPROM has a different Version than the installed software. The function "Update" can be used to reset this Error Message.
97	The data for the flowmeter primary in the internal EEPROM are invalid. The function "Load Primary" can be used to reset this Error Message (See also Error 95, ext. EEPROM).
98	EEPROM not installed or corrupted. Access not possible. Hardware defective.

1.4.43 %8 – Function Test Output P7

Function Code Characters: **%8**

Parameter/Function: Function Test Output P7

Units: -

Comments: This function can be used to toggle the Output P7.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
I	3	0 ≤ Entry ≤ 255	-	-	

Data	Explanation
0	Output open
1 to 255	Output closed (active)

1.4.44 %9 - Function Test Switch

Function Code Characters: **%9**

Parameter/Function: Function Test switch / solder jumpers on the digital board

Units: -

Comments: -

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	Bit	Explanation
		0	Status BR203
		1	Status BR204
		2	Status BR205
		3	Status S201
		6	Status BR201
		7	Status BR202

1.4.45 %A – Function Test Flowrate Simulation Off

Function Code Characters: **%A**

Parameter/Function: Function Test flowrate simulation off

Units: -

Comments: This function is used to turn off the flowrate simulation („%S – Function Test Flowrate Simulation“, Page 1.4.52-1).
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	-

1.4.46 %B - Function Test Input X1

Function Code Characters: **%B**

Parameter/Function: Function Test Input X1

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		*Comments*	
Format	*Number*		
I	3	Data	Explanation
		0	Input off
		1	Input on

1.4.47 %C - Function Test CLR Button

Function Code Characters: **%C**

Parameter/Function: Function Test CLR button

Units: -

Comments: -

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	Data	Explanation
		0	Button off
		1	Button on

1.4.48 %D - Function Test DATA Button

Function Code Characters: **%D**

Parameter/Function: Function Test DATA button

Units: -

Comments: -

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	Data	Explanation
		0	Button off
		1	Button on

1.4.49 %E - Function Test STEP Button

Function Code Characters: **%E**

Parameter/Function: Function Test STEP button

Units: -

Comments: -

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	Data	Explanation
		0	Button off
		1	Button on

1.4.50 %F - Function Test Jumper 204

Function Code Characters: **%F**

Parameter/Function: Function Test Jumper BR204

Units: -

Comments: See also „%9 - Function Test Switch“, Page 1.4.44-1

Monitor Mode

Data		***Comments***	
Format	***Number***		
I	3	Data	Explanation
		0	Jumper off
		1	Jumper on

1.4.51 %J - Function Test External EEPROM

Function Code Characters: **%J**

Parameter/Function: Function Test external EEPROM

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Monitor Mode

Data		***Comments***
Format	***Number***	

Data	**Explanation**
0	Error free
92	Data (e.g. Qmax, Damping) in the external EEPROM invalid, access possible. This Error Message can occur when the command "Store Data in ext. EEPROM" was not called. This Error Message can be reset using the command "Store Data in ext. EEPROM".
93	Ext. EEPROM not installed or corrupted. Access not possible, the hardware is defective.
94	The database in the ext. EEPROM is incorrect for the present software version. Calling the command "Load Data from ext. EEPROM" initiates an automatic update of the ext. Data. The command "Store Data in ext. EEPROM" also reset this Error Message.
95	The flowmeter primary data in the external EEPROM are invalid. In this case a check should be made if the data stored in the internal EEPROM (values are outputted in the submenu "Primary") agree with the values for the actual flowmeter primary (see Instrument Tag on the flowmeter primary). If the data agrees, the Error Message can be reset by calling the function "Store Primary". If the data are not identical, the data for the flowmeter primary must be entered before calling the function "Store Primary". The first 3 characters in the parameter "Short Model No." must be "DX4", "DE2" or "DE4".

1.4.52 %S – Function Test Flowrate Simulation

Function Code Characters: **%S**

Parameter/Function: Function Test flowrate simulation

Units: Percent of Qmax

Comments: This function can be used to simulate the flowrate. All in/outputs react exactly as they would during actual flow measurements.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.
WARNING!
At the conclusion of the flowrate simulation the command ... must be called.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
F	6	-130 ≤ Entry ≤ 130	-	-	A negative entry simulates reverse flowrate. WARNING! The entry is not checked against the data range.

1.4.53 !0 – Auto. Adjust Instrument Span Forward

Function Code Characters: **!0**

Parameter/Function: Automatic adjustment of the forward flow direction instrument span

Units: -

Comments: This command operates exactly the same as the corresponding command in the instrument menu („**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**).
During the adjustment Bit 4 in the Status Register is set („ST – Status Register“, Page 1.3.40-1)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	6	A different adjustment routine is being processed	-

1.4.54 !1 – Auto. Adjust Instrument Span Reverse

Function Code Characters: **!1**

Parameter/Function: Automatic adjustment of the reverse flow direction instrument span

Units: -

Comments: This command operates exactly the same as the corresponding command in the instrument menu (**Error! Reference source not found.**, Page **Error! Bookmark not defined.**)
During the adjustment Bit 4 in the Status Register is set („ST – Status Register“, Page 1.3.40-1)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	6	A different adjustment routine is being processed	-

1.4.55 !2 – Auto. Adjust System Zero

Function Code Characters: **!2**

Parameter/Function: Automatic adjustment of the system zero

Units: -

Comments: This command operates exactly the same as the corresponding command in the instrument menu (**Error! Reference source not found.**, Page **Error! Bookmark not defined.**)
During the adjustment Bit 4 in the Status Register is set („ST – Status Register“, Page 1.3.40-1)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	6	A different adjustment routine is being processed	-

1.4.56 !3 – Auto. Adjust Instrument Zero

Function Code Characters: **!3**

Parameter/Function: Automatic adjustment of the instrument zero

Units: -

Comments: This command operates exactly the same as the corresponding command in the instrument menu (**Error! Reference source not found.**, Page **Error! Bookmark not defined.**).
During the adjustment Bit 4 in the Status Register is set („ST – Status Register“, Page 1.3.40-1)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	6	A different adjustment routine is being processed	-

1.4.57 !4 – Auto. Adjust Flowmeter Primary Span Cs

Function Code Characters: **!4**

Parameter/Function: Automatic adjustment of the flowmeter primary span Cs

Units: -

Comments: Differing from the corresponding command in the instrument menu (from „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**) after completion of this adjustment procedure the Cs value must be read from the corresponding parameter and normalized to the Master Meter value („C0 – Flowmeter Primary Span Cs 6¼ Hz“, „C1 - Flowmeter Primary Span Cs 12½ Hz“ or „C2 - Flowmeter Primary Span Cs 25 Hz“). This result, using the same function, must be written into the correct parameter.
During the adjustment Bit 4 in the Status Register is set („ST – Status Register“, Page 1.3.40-1)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	6	A different adjustment routine is being processed	-

1.4.58 !5 – Auto. Adjust Flowmeter Primary Zero Cz

Function Code Characters: **!5**

Parameter/Function: Automatic adjustment of the flowmeter primary zero Cz

Units: -

Comments: The result is written in the correct parameter after completion of the adjustment procedure („C3 - Flowmeter Primary Zero Cz 6¼ Hz“, „C4 - Flowmeter Primary Zero Cz 12½ Hz“ or „C5 - Flowmeter Primary Zero Cz 25 Hz“).
During the adjustment Bit 4 in the Status Register is set („ST – Status Register“, Page 1.3.40-1)

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	6	A different adjustment routine is being processed	-

1.4.59 !S – Warm Restart

Function Code Characters: **!S**

Parameter/Function: Initiate a warm restart

Units: -

Comments: This function initiates a warm restart of the converter. See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	This command is not confirmed.

1.4.60 !I – Instrument Initialization

Function Code Characters: **!I**

Parameter/Function: Instrument initialization

Units: -

Comments: This command initiates an initialization of the converter.
See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.
WARNING!
After the initialization a restart is automatically initiated. If the flowmeter primary data in the ext. EEPROM are not identical, then these and all system data are loaded.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	-

1.4.61 !E – Initialize ext. EEPROM

Function Code Characters: **!E**

Parameter/Function: Initialize ext. EEPROM

Units: -

Comments: See also „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	The Instrument Address in not initialized.

1.4.62 !P – Store Flowmeter Primary Data

Function Code Characters: **!P**

Parameter/Function: Store the flowmeter primary data in the ext. EEPROM

Units: -

Comments: See „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	-

1.4.63 !U – Load Flowmeter Primary Data

Function Code Characters: **!U**

Parameter/Function: Upload the flowmeter primary data from the ext. EEPROM

Units: -

Comments: See **Error! Reference source not found.Error! Bookmark not defined.**.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	-

1.4.64 !D – Store System Date

Function Code Characters: **!D**

Parameter/Function: Store the system data in the ext. EEPROM

Units: -

Comments: See „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	-

1.4.65 1

1.4.66 !L – Load System Data

Function Code Characters: **!L**

Parameter/Function: Upload the system data from the ext. EEPROM

Units: -

Comments: See „**Error! Reference source not found.**“, Page **Error! Bookmark not defined.**.

Programming Mode

Data		*Data Range*	*Error Message*		*Comments*
Format	*Number*		*No.*	*Cause*	
-	0	-	-	-	-

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