
CM 3001/3101

Instruction set of serial interface

Description



ERMA

Electronic GmbH

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Stand : 03.2015
CM3001/3101
Technical subjects to change

1. General

The digital instrument CM 3001/3101 can be equipped with a isolated, bidirectional interface. The digital instrument is available with the RS 485 interface, the RS 2323 interface and the courant-Loop-interface (TTY). The connection of the interfaces is specify in the manual of the instrument CM 3001/3101.

2. Communications protocol

The organization of the communications protocol is conformed to DIN ISO 1745. The information message consist of the transmission control character, the command an the optional datas.

The instrument CM 3001/3101 gives a answer to each command. A host wait for the answer and devaluate them.

Transmission parameters

baud rate: : 300, 1200, 2400, 4800, 9600, 19200
 parity : no
 data bits : 8
 stop bits : 1

Transmission format:

SOH	D	D	STX	C	C	C	X..X	ETX	BCC
-----	---	---	-----	---	---	---	------	-----	-----

Significance of the sign:

SOH (ASCII 01) : start of heading
 D : adress (decimal) of the instrument
 STX (ASCII 02) : start of text
 C : command signal sequence
 : optional datas
 ETX (ASCII 03) : end of text
 BCC : control byte

 ACK (ASCII 06) : positive acknowledge from the receiver
 NAK (ASCII 21) : negative acknowledge from the receiver

Generation of the control byte:

Carry out a exclusive-OR operation (XOR) for all bytes between *STX* (exclusive) and *ETX* (inclusive). The byte can be used direct as the control byte, if the value is higher as 32. If the value of the control byte is lower as 32, it must be added 32 to them.

Possible message formats

Return of datas:

<i>STX</i>	<i>X..X</i>	<i>ETX</i>	<i>BCC</i>
------------	-------------	------------	------------

Positive acknowledge:

<i>ACK</i>

Negative acknowledge (Errors):

<i>NAK</i>

Reasons of a negative acknowledge (Errors):

- command is unknown
- datas are wrong (to short or to long)
- datas contains wrong signs
- datas lies out of the value range
- wrong control byte

3. General commands

3.1. Read the MEASURED-, MIN- and MAX-Value

Read the MEASURED-Value

SOH	D	D	STX	M	S	W	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Read the MIN-Value

SOH	D	D	STX	M	I	N	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Read the MAX-Value

SOH	D	D	STX	M	A	X	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101 to the commands

STX	V or X	X	X	X	X	X	ETX	BCC
-----	--------	---	---	---	---	---	-----	-----

V	sign	positive: ' ' (ASCII 20h) negative: '-' (ASCII 2Dh)
X	MEASURED-, MIN- or MAX-Value valid values	-99999 to 999999

3.2. Main reset

Carry out the main reset

SOH	D	D	STX	G	R	S	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

ACK

3.3. Type designation

Read the type designation

SOH	D	D	STX	G	E	R	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	C	M	3	0	0	1	X	ETX	BCC
-----	---	---	---	---	---	---	---	-----	-----

CM 3001/3101 type designation
 XZ X = 0 => no option analog output
 X = 1 => with option analog output
 X = 2 => two additional relay alarm outputs
 Z = 1 => RS485
 Z = 2 => RS232
 Z = 3 => TTY

3.4. Software version

Read the software version

<i>SOH</i>	D	D	<i>STX</i>	V	E	R	<i>ETX</i>	<i>BCC</i>
------------	---	---	------------	----------	----------	----------	------------	------------

Answer of CM 3001/3101

<i>STX</i>	X	X	X	<i>ETX</i>	<i>BCC</i>
------------	---	---	---	------------	------------

X 000 to 099 => software version of the instrument

3.5. Number of production

Read the number of production

<i>SOH</i>	D	D	<i>STX</i>	S	R	N	<i>ETX</i>	<i>BCC</i>
------------	---	---	------------	----------	----------	----------	------------	------------

Answer of CM 3001/3101

<i>STX</i>	X	X	X	X	X	X	<i>ETX</i>	<i>BCC</i>
------------	---	---	---	---	---	---	------------	------------

X setting number of production

3.6. Date of production

Read the date of production

<i>SOH</i>	D	D	<i>STX</i>	D	A	T	<i>ETX</i>	<i>BCC</i>
------------	---	---	------------	----------	----------	----------	------------	------------

Answer of CM 3001/3101

<i>STX</i>	0	X	X	X	X	X	<i>ETX</i>	<i>BCC</i>
------------	---	---	---	---	---	---	------------	------------

X setting date of production

3.7. Counter preset (not CM 3101)

Setting the counter to a default value

SOH	D	D	STX	S	E	T	V or X	X	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	--------	---	---	---	---	---	-----	-----

V	sign	positive: ' ' (ASCII 20h) negative: '-' (ASCII 2Dh)
X	Preset value valid values	-99999 to 999999

Answer of CM 3001

ACK

Example: Preset value = 200000

SOH	D	D	STX	S	E	T	2	0	0	0	0	0	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

Attention: If the scaling factor of the CM 3001 is set to another value than 1.00000 rounding errors may occur. The actual set value may differ from the sent value.

4. Commands of configuration level (P-00)

4.1. Modes

Read the setting of mode

SOH	D	D	STX	E	N	M	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the mode of CM 3001/3101

SOH	D	D	STX	E	N	M	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X	setting number of mode valid values	000 to 024
---	--	------------

Answer of CM 3001/3101

ACK

Example: Mode adder counter A + counter B

SOH	D	D	STX	E	N	M	0	0	6	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.2. Input level and -logic

Read the setting of input level and - logic

SOH	D	D	STX	I	N	P	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the input level and - logic of CM 3001/3101

SOH	D	D	STX	I	N	P	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of input level and - logic
 valid values 000 to 003

Answer of CM 3001/3101

ACK

4.3. Filter of signal input A and B

Read the setting of the filter for signal input A and B

SOH	D	D	STX	F	I	L	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the filter of signal input A and B

SOH	D	D	STX	F	I	L	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of the filter for signal input A and B
 valid values 000 or 001

Answer of CM 3001/3101

ACK

4.4. Time-Out for mode frequency meter

Read the setting of the time-out

SOH	D	D	STX	T	O	F	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the time-out

SOH	D	D	STX	T	O	F	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of time-out
 valid values 000 to 004

Answer of CM 3001/3101

ACK

4.5. Data buffering

Read the setting of data buffering

SOH	D	D	STX	B	U	F	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the data buffering of CM 3001/3101

SOH	D	D	STX	B	U	F	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of data buffering
 valid values 000 or 001

Answer of CM 3001/3101

ACK

4.6. Decimal points

Read the setting of decimal point

SOH	D	D	STX	A	N	K	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the decimal point of CM 3001/3101

SOH	D	D	STX	A	N	K	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of decimal point
 valid values 000 to 005

Answer of CM 3001/3101

ACK

Example: Number of decimal point = 2

SOH	D	D	STX	A	N	K	0	0	2	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.7. Data source of the display

Read the setting of data source for the display

SOH	D	D	STX	A	N	D	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the data source for the display

SOH	D	D	STX	A	N	D	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of data source for the display
 valid values 000 to 003

Answer of CM 3001/3101

ACK

4. Commands of configuration level (P-00)

Example: Data source for the display = MAX value

SOH	D	D	STX	A	N	D	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.8. Offset value

Read the setting of offset value

SOH	D	D	STX	O	F	F	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	V or X	X	X	X	X	X	ETX	BCC
-----	--------	---	---	---	---	---	-----	-----

Set the offset value

SOH	D	D	STX	O	F	F	V or X	X	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	--------	---	---	---	---	---	-----	-----

V sign positive: ' ' (ASCII 20h)
negative: ' ' (ASCII 2Dh)

X offset value
valid values -99999 to 999999

Answer of CM 3001/3101

ACK

Example: Offset value = 2.00000

SOH	D	D	STX	O	F	F	2	0	0	0	0	0	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

Remark: Do not transfer the decimal point !

4.9. Scaling factor

Read the setting of the scaling factor

SOH	D	D	STX	S	C	A	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	X	X	X	ETX	BCC
-----	---	---	---	---	---	---	-----	-----

Set the scaling factor

SOH	D	D	STX	S	C	A	X	X	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

X setting scaling factor
 valid values 000001 to 999999

Answer of CM 3001/3101

ACK

Example: Scaling factor 1.56748

SOH	D	D	STX	S	C	A	1	5	6	7	4	8	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

Remark: Do not transfer the decimal point !

4.10. Reset time of the MIN/MAX-memory

Read the setting of reset time for MIN/MAX-memory

SOH	D	D	STX	R	S	Z	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the reset time of MIN/MAX-memory

SOH	D	D	STX	R	S	Z	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting reset time in seconds
 valid values 000 to 100

Answer of CM 3001/3101

ACK

Example: Reset tiome of MIN/MAX-memory = 10 (10 seconds)

SOH	D	D	STX	R	S	Z	0	1	0	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.11. Function of digital user input 1

Read the setting for the digital user input 1

SOH	D	D	STX	F	D	1	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the function for the digital user input 1

SOH	D	D	STX	F	D	1	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of the function for the digital user input 1
 valid values 000 to 008

Answer of CM 3001/3101

ACK

Example: Function of the digital user input 1 = 4 (display test)

SOH	D	D	STX	F	D	1	0	0	4	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.12. Function of digital user input 2**Read the setting for the digital user input 2**

SOH	D	D	STX	F	D	2	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the function for the digital user input 2

SOH	D	D	STX	F	D	2	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of the function for the digital user input 2
 valid values 000 to 008

Answer of CM 3001/3101

ACK

Example: Function of digital user input 2 = 0 (no function)

SOH	D	D	STX	F	D	2	0	0	0	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.13. Function of push button '*'

Read the setting of function for the push button *

SOH	D	D	STX	F	T	*	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the function of the push button *

SOH	D	D	STX	F	T	*	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of function for push button *
valid values 000 to 004

Answer of CM 3001/3101

ACK

Example: Function of push button * = 1 (Reset the MIN/MAX-memory)

SOH	D	D	STX	F	T	*	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.14. Function of push button '-'

Read the setting of function for the push button ↓

SOH	D	D	STX	F	T	-	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----


Set the function of push button ↓

SOH	D	D	STX	F	T	-	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of function for push button ↓
valid values 000 to 006

Answer of CM 3001/3101

ACK

Example: Function of push button  = 3 (display the MIN value)

SOH	D	D	STX	F	T	-	0	0	3	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.15. Function of push button '+'

Read the setting of push button 


SOH	D	D	STX	F	T	+	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the function of push button 

SOH	D	D	STX	F	T	+	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of function for push button 
 valid values 000 to 006

Answer of CM 3001/3101

ACK

Example: Function of push button  = 2 (display the MAX value)

SOH	D	D	STX	F	T	+	0	0	2	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.16. Access-code

Read the setting of access-code

SOH	D	D	STX	C	O	D	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	V	X	X	X	X	X	ETX	BCC
-----	---	---	---	---	---	---	-----	-----

5. Commands of alarm output level (P-02)

Setting the access-code

SOH	D	D	STX	C	O	D	V	0	0	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

V sign positive: ' ' (ASCII 20h)
X access-code
valid values 00000 to 00999

Answer of CM 3001/3101

ACK

Example: Access-code = 123

SOH	D	D	STX	C	O	D		0	0	1	2	3	ETX	BCC
-----	---	---	-----	---	---	---	--	---	---	---	---	---	-----	-----

5. Commands of alarm output level (P-02)

5.1. Commands of alarm output 1

5.1.1. Data source for alarm output 1

Read the setting of data source for the alarm output 1

SOH	D	D	STX	G	1	D	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the data source for the alarm output 1

SOH	D	D	STX	G	1	D	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of data source for the alarm output 1
valid values 000 to 004

Answer of CM 3001/3101

ACK

Example: Data source for alarm output 1 = 1 (MEASURED value)

SOH	D	D	STX	G	1	D	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

Example: Alarm point of alarm output 1 = 2500

SOH	D	D	STX	G	1	W		0	0	2	5	0	0	ETX	BCC
-----	---	---	-----	---	---	---	--	---	---	---	---	---	---	-----	-----

5.1.4. Hysteresis of alarm output 1

Read the setting of hysteresis for the alarm output 1

SOH	D	D	STX	G	1	H								ETX	BCC
-----	---	---	-----	---	---	---	--	--	--	--	--	--	--	-----	-----

Answer of CM 3001/3101

STX	X	X	X	X	X	X								ETX	BCC
-----	---	---	---	---	---	---	--	--	--	--	--	--	--	-----	-----

Set the hysteresis of alarm output 1

SOH	D	D	STX	G	1	H	0	0	X	X	X	X		ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	--	-----	-----

X hysteresis
 valid values 000001 to 001000

Answer of CM 3001/3101

ACK

Example: Hysteresis of alarm output 1 = 100

SOH	D	D	STX	G	1	H	0	0	0	1	0	0		ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	--	-----	-----

5.1.5. Release delay time of alarm output 1

Read the setting of release delay time for the alarm output 1

SOH	D	D	STX	G	1	F								ETX	BCC
-----	---	---	-----	---	---	---	--	--	--	--	--	--	--	-----	-----

Answer of CM 3001/3101

STX	X	X	X											ETX	BCC
-----	---	---	---	--	--	--	--	--	--	--	--	--	--	-----	-----

Set the release delay time of alarm output 1

SOH	D	D	STX	G	1	F	X	X	X					ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	--	--	--	--	-----	-----

X release delay time in seconds
 valid values 000 to 060

Answer of CM 3001/3101

ACK

Example: Release delay time of alarm output 1 = 0 (no release delay time)

SOH	D	D	STX	G	1	F	0	0	0	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.1.6. Operate delay time of alarm output 1

Read the setting of operate delay time for alarm output 1

SOH	D	D	STX	G	1	S	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the operate delay time of alarm output 1

SOH	D	D	STX	G	1	S	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X operate delay time in seconds
 valid values 000 to 0 60

Answer of CM 3001/3101

ACK

Example: Operate delay time of alarm output 1 = 12 (12 seconds)

SOH	D	D	STX	G	1	S	0	1	2	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.2. Commands of alarm output 2

5.2.1. Data source for alarm output 2

Read the setting of data source for the alarm output 2

SOH	D	D	STX	G	2	D	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the data source for the alarm output 2

SOH	D	D	STX	G	2	D	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of data source for the alarm output 2
 valid values 000 to 004

Answer of CM 3001/3101

ACK

Example: Data source for alarm output 2 = 1 (MEASURED value)

SOH	D	D	STX	G	2	D	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.2.2. Switching logic of alarm output 2**Read the setting of switching logic for the alarm output 2**

SOH	D	D	STX	G	2	C	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the switching logic of alarm output 2

SOH	D	D	STX	G	2	C	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of switching logic for the alarm output 2
 valid values 000 to 003

Answer of CM 3001/3101

ACK

Example: Switching logic of alarm output 2 = 1 (contact closed at high limit)

SOH	D	D	STX	G	2	C	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.2.3. Alarm point of alarm output 2**Read the setting of alarm point for alarm output 2**

SOH	D	D	STX	G	2	W	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

5. Commands of alarm output level (P-02)

Answer of CM 3001/3101

STX	V or X	X	X	X	X	X	ETX	BCC
-----	--------	---	---	---	---	---	-----	-----

Set the alarm point of alarm output 2

SOH	D	D	STX	G	2	W	V or X	X	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	--------	---	---	---	---	---	-----	-----

V sign positive: ' ' (ASCII 20h)
negative: '-' (ASCII 2Dh)

X alarm point
valid values -99999 to 999999

Answer of CM 3001/3101

ACK

Example: Alarm point of alarm output 2 = - 5000

SOH	D	D	STX	G	2	W	-	0	5	0	0	0	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

5.2.4. Hysteresis of alarm output 2

Read the setting of hysteresis for alarm output 2

SOH	D	D	STX	G	2	H	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	X	X	X	ETX	BCC
-----	---	---	---	---	---	---	-----	-----

Set the hysteresis of alarm output 2

SOH	D	D	STX	G	2	H	0	0	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

X hysteresis
valid values 000001 to 001000

Answer of CM 3001/3101

ACK

Example: Hysteresis of alarm output 2 = 125

SOH	D	D	STX	G	2	H		0	0	1	2	5	ETX	BCC
-----	---	---	-----	---	---	---	--	---	---	---	---	---	-----	-----

5.2.5. Release delay time of alarm output 2

Read the setting of release delay time for alarm output 2

SOH	D	D	STX	G	2	F	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the release delay time of alarm output 2

SOH	D	D	STX	G	2	F	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X release delay time in seconds
 valid values 000 to 060

Answer of CM 3001/3101

ACK

Example: Release delay time of alarm output 2 = 5 (5 seconds)

SOH	D	D	STX	G	2	F	0	0	5	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.2.6. Operate delay time of alarm output 2

Read the setting of operate delay time for alarm output 2

SOH	D	D	STX	G	2	S	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the operate delay time of alarm output 2

SOH	D	D	STX	G	2	S	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X operate delay time in seconds
 valid values 000 to 060

Answer of CM 3001/3101

ACK

Example: Operate delay time of alarm output 2 = 22 (22 seconds)

SOH	D	D	STX	G	2	S	0	2	2	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.3. Commands of alarm output 3

5.3.1. Data source for alarm output 3

Read the setting of data source for the alarm output 3

SOH	D	D	STX	G	3	D	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the data source for the alarm output 3

SOH	D	D	STX	G	3	D	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of data source for the alarm output 3
valid values 000 to 004

Answer of CM 3001/3101

ACK

Example: Data source for alarm output 3 = 1 (MEASURED value)

SOH	D	D	STX	G	3	D	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.3.2. Switching logic of alarm output 3

Read the setting of switching logic for the alarm output 3

SOH	D	D	STX	G	3	C	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the switching logic of alarm output 3

SOH	D	D	STX	G	3	C	X	X	X	ETX	BCC
-----	---	---	-----	----------	----------	----------	---	---	---	-----	-----

X setting number of switching logic for the alarm output 3
valid values 000 to 003

Answer of CM 3001/3101

ACK

Example: Switching logic of alarm output 3 = 1 (contact closed at high limit)

SOH	D	D	STX	G	3	C	0	0	1	ETX	BCC
-----	---	---	-----	----------	----------	----------	---	---	---	-----	-----

5.3.3. Alarm point of alarm output 3**Read the setting of alarm point for alarm output 3**

SOH	D	D	STX	G	3	W	ETX	BCC
-----	---	---	-----	----------	----------	----------	-----	-----

Answer of CM 3001/3101

STX	V or X	X	X	X	X	X	ETX	BCC
-----	--------	---	---	---	---	---	-----	-----

Set the alarm point of alarm output 3

SOH	D	D	STX	G	3	W	V or X	X	X	X	X	X	ETX	BCC
-----	---	---	-----	----------	----------	----------	--------	---	---	---	---	---	-----	-----

V sign positive: ' ' (ASCII 20h)
negative: '-' (ASCII 2Dh)

X alarm point
valid values -99999 to 999999

Answer of CM 3001/3101

ACK

Example: Alarm point of alarm output 3 = - 2000

SOH	D	D	STX	G	3	W	-	0	2	0	0	0	ETX	BCC
-----	---	---	-----	----------	----------	----------	---	---	---	---	---	---	-----	-----

5.3.4. Hysteresis of alarm output 3

Read the setting of hysteresis for alarm output 3

SOH	D	D	STX	G	3	H	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	X	X	X	ETX	BCC
-----	---	---	---	---	---	---	-----	-----

Set the hysteresis of alarm output 3

SOH	D	D	STX	G	3	H	0	0	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

X hysteresis
 valid values 000001 to 001000

Answer of CM 3001/3101

ACK

Example: Hysteresis of alarm output 3 = 150

SOH	D	D	STX	G	3	H		0	0	1	5	0	ETX	BCC
-----	---	---	-----	---	---	---	--	---	---	---	---	---	-----	-----

5.3.5. Release delay time of alarm output 3

Read the setting of release delay time for alarm output 3

SOH	D	D	STX	G	3	F	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the release delay time of alarm output 3

SOH	D	D	STX	G	3	F	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X release delay time in seconds
 valid values 000 to 060

Answer of CM 3001/3101

ACK

Example: Release delay time of alarm output 3 = 8 (8 seconds)

SOH	D	D	STX	G	3	F	0	0	8	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.3.6. Operate delay time of alarm output 3

Read the setting of operate delay time for alarm output 3

SOH	D	D	STX	G	3	S	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the operate delay time of alarm output 3

SOH	D	D	STX	G	3	S	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X operate delay time in seconds
 valid values 000 to 060

Answer of CM 3001/3101

ACK

Example: Operate delay time of alarm output 3 = 45 (45 seconds)

SOH	D	D	STX	G	3	S	0	4	5	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.4. Commands of alarm output 4

5.4.1. Data source for alarm output 4

Read the setting of data source for the alarm output 4

SOH	D	D	STX	G	4	D	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the data source for the alarm output 4

SOH	D	D	STX	G	4	D	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of data source for the alarm output 4
 valid values 000 to 004

Answer of CM 3001/3101

ACK

Example: Data source for alarm output 4 = 1 (MEASURED value)

SOH	D	D	STX	G	4	D	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.4.2. Switching logic of alarm output 4

Read the setting of switching logic for the alarm output 4

SOH	D	D	STX	G	4	C	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the switching logic of alarm output 4

SOH	D	D	STX	G	4	C	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of switching logic for the alarm output 4
 valid values 000 to 003

Answer of CM 3001/3101

ACK

Example: Switching logic of alarm output 4 = 1 (contact closed at high limit)

SOH	D	D	STX	G	4	C	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.4.3. Alarm point of alarm output 4

Read the setting of alarm point for alarm output 4

SOH	D	D	STX	G	4	W	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

5.4.5. Release delay time of alarm output 4**Read the setting of release delay time for alarm output 4**

SOH	D	D	STX	G	4	F	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the release delay time of alarm output 4

SOH	D	D	STX	G	4	F	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X release delay time in seconds
 valid values 000 to 060

Answer of CM 3001/3101

ACK

Example: Release delay time of alarm output 4 = 3 (3 seconds)

SOH	D	D	STX	G	4	F	0	0	3	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.4.6. Operate delay time of alarm output 4**Read the setting of operate delay time for alarm output 4**

SOH	D	D	STX	G	4	S	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the operate delay time of alarm output 4

SOH	D	D	STX	G	4	S	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X operate delay time in seconds
 valid values 000 to 060

Answer of CM 3001/3101

ACK

Example: Operate delay time of alarm output 4 = 12 (12 seconds)

SOH	D	D	STX	G	4	S	0	1	2	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

6. Commands of analog output level (P-03)

6.1. Data source for analog output

Read the setting of data source for the analog output

SOH	D	D	STX	D	A	D	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the data source of analog output

SOH	D	D	STX	D	A	D	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of data source for the analog output
 valid values 000 to 003

Answer of CM 3001/3101

ACK

Example: Data source for analog output = 1 (MAX value)

SOH	D	D	STX	D	A	D	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

6.2. Configuration of analog output

Read the setting of configuration for analog output

SOH	D	D	STX	D	A	C	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the configuration of analog output

SOH	D	D	STX	D	A	C	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of configuration for the analog output
valid values 000 to 003

Answer of CM 3001/3101

ACK

Example: Configuration of analog output = 2 (0 to 20 mA)

SOH	D	D	STX	D	A	C	0	0	2	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

6.3. Display value for minimal analog output signal

Read the display value for minimal analog output signal

SOH	D	D	STX	D	A	A	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	V or X	X	X	X	X	X	ETX	BCC
-----	--------	---	---	---	---	---	-----	-----

Set the display value for minimal analog output signal

SOH	D	D	STX	D	A	A	V or X	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	--------	---	---	---	---	-----	-----

V sign positive: ' ' (ASCII 20h)
negative: '-' (ASCII 2Dh)

X display value
valid values -99999 to 999999

Answer of CM 3001/3101

ACK

Example: Display value for minimal analog output signal = -1000

SOH	D	D	STX	D	A	A	-	0	1	0	0	0	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

6.4. Display value for maximal analog output signal

Read the display value for the maximal analog output signal

SOH	D	D	STX	D	A	E	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

7.2. Interface baud rate

Read the setting of baud rate for the serial interface

SOH	D	D	STX	R	S	B	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set the baud rate of the serial interface

SOH	D	D	STX	R	S	B	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X setting number of baud rate for the serial interface
 valid values 0 to 6

Answer of CM 3001/3101

ACK

Example: number of baudrate = 6 (19200 baud)

SOH	D	D	STX	R	S	B	0	0	6	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

7.3. Transmission-Mode of serial interface

Read the transmission-mode of serial interface

SOH	D	D	STX	R	S	M	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set transmission-mode of serial interface

SOH	D	D	STX	R	S	M	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X number of transmission-mode
 valid values 000 bis 002

Answer of CM 3001/3101

ACK

Example: Number of transmission-mode = 0 (PC-Mode)

SOH	D	D	STX	R	S	M	0	0	0	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

7.4. Timer of timer controlled Terminal-Mode

Read Timer

SOH	D	D	STX	R	T	T	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	V	0	X	X	X	X	ETX	BCC
-----	---	---	---	---	---	---	-----	-----

Set Timer

SOH	D	D	STX	R	T	T	V	0	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

V sign positive: ' ' (ASCII 20h)
 X timer (Sendrate in sec.)
 valid values 00000 bis 03600

Answer of CM 3001/3101

ACK

Example: Timer (Sendrate = 60 sec.)

SOH	D	D	STX	R	T	T		0	0	0	6	0	ETX	BCC
-----	---	---	-----	---	---	---	--	---	---	---	---	---	-----	-----

7.5. Data source for serial interface

Read data source of Terminal-Mode

SOH	D	D	STX	R	S	D	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set data source of Terminal-Mode

SOH	D	D	STX	R	S	D	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X data source of Terminal-Mode
 valid values 000 bis 003

8. Error message NAK

Answer of CM 3001/3101

ACK

Example: Data source of Terminal-Mode = 1 (Max-value)

SOH	D	D	STX	R	S	D	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

7.6. Hardware-Handshake on RS232

Read Handshake

SOH	D	D	STX	R	S	H	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of CM 3001/3101

STX	X	X	X	ETX	BCC
-----	---	---	---	-----	-----

Set Handshake

SOH	D	D	STX	R	S	H	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X Handshake
 valid values 000 bis 001

Answer of CM 3001/3101

ACK

Example: Handshake = 1 (with Handshake)

SOH	D	D	STX	R	S	H	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

8. Error message NAK

Reasons for a error message

- command is unknown
- datas lies out of the valid value range
- datas are wrong (to short or to long)
- the instrument CM 3001/3101 is in the programming mode
(Each command is receipt with a NAK, when the instrument is in the programming mode)

8.1. Error word register**Read the error word register**

<i>SOH</i>	D	D	<i>STX</i>	E	R	R	<i>ETX</i>	<i>BCC</i>
------------	---	---	------------	---	---	---	------------	------------

Answer of CM 3001/3101

<i>STX</i>	X	X	X	<i>ETX</i>	<i>BCC</i>
------------	---	---	---	------------	------------

Explanation of error word register

Error word register	Significance
0	no error
10	command unknown
11	datas are wrong (to shortz)
12	datas are wrong (to long)
13	datas contains wrong signs
14	datas lies out of the valid value range
15	wrong control byte

A error word be preserved as long as the error word register is read through. After the reading the error word register is cleared.

9. Command overview

AND	read or set the data source for the display
ANK	read or set the decimal points
BUF	read or set the status of the data buffering
COD	read or set the access-code for the programming
DAA	read or set the display value for the minimum analog output signal
DAC	read or set the configuration of the analog output
DAD	read or set the data source for the analog output
DAE	read or set the display value for the maximum analog output signal
DAT	read the data of production
ENM	read or set the mode of the CM 3001/3101
ERR	read the error word register
FD1	read or set the function of the digital user input 1
FD2	read or set the function of the digital user input 2
FIL	read or set the filter for the signal input A and B
FT*	read or set the function of push button “ * ”
FT-	read or set the function of push button “ - ”
FT+	read or set the function of push button “ + ”
GER	read the type designation
GRS	carried out the main reset
G1C	read or set the switching logic of alarm output 1
G1D	read or set the data source for alarm output 1
G1F	read or set the release delay time of alarm output 1
G1H	read or set the hysteresis of alarm output 1
G1S	read or set the operate delay time of alarm output 1
G1W	read or set the alarm point of alarm output 1
G2C	read or set the switching logic of alarm output 2
G2D	read or set the data source for alarm output 2

9. Command overview

G2F	read or set the release delay time of alarm output 2
G2H	read or set the hysteresis of alarm output 2
G2S	read or set the operate delay time of alarm output 2
G2W	read or set the alarm point of alarm output 2
G3C	read or set the switching logic of alarm output 3
G3D	read or set the data source for alarm output 3
G3F	read or set the release delay time of alarm output 3
G3H	read or set the hysteresis of alarm output 3
G3S	read or set the operate delay time of alarm output 3
G3W	read or set the alarm point of alarm output 3
G4C	read or set the switching logic of alarm output 4
G4D	read or set the data source for alarm output 4
G4F	read or set the release delay time of alarm output 4
G4H	read or set the hysteresis of alarm output 4
G4S	read or set the operate delay time of alarm output 4
G4W	read or set the alarm point of alarm output 4
INP	read or set the input logic and input level of signal input A and B
MAX	read the MAX value
MIN	read the MIN value
MSW	read the MEASURED value
OFF	read or set the offset value
RSA	read or set the interface address
RSB	read or set the baud rate of the interface
RSZ	read or set the reset time of MIN/MAX-memory
SCA	read or set the scaling factor
SET	set the counter to a default value (not CM 3101)
SRN	read or set the number of production
TOF	read or set the time-out for the mode frequency meter
VER	read the software version

10. Notice

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