
DM 3110

Instruction set of serial interface

Description



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1. General

The digital instrument DM 3110 can be equipped with a isolated, bidirectional interface. The digital instrument is available with the RS 485 interface, the RS 232 interface and the current-Loop-interface (TTY). The connection of the interfaces is specified in the manual of the DM 3110.

2. Transmission protocol

The structure of the transmission protocol is conforming to DIN ISO 1745.

The transmitted character sequence consist of the transmission control bits, the command bits an the optional data bits.

The instrument DM 3110 returns an answer to each command. A host has to wait for this answer and evaluate it.

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
X : 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 an exclusive-OR operation (XOR) for all bytes between STX (exclusive) and ETX (inclusive). The generated 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 than 32, 32 has to be added to the value.

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
- data are wrong (to short or to long)
- data contains wrong signs
- data lies out of the value range
- wrong control byte

3. General commands

3.1. Read the ENCODER-, MIDDLE-, MIN- and MAX-Value

Read the ENCODER-Value

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

Read the AVERAGE-Value

SOH	D	D	STX	M	T	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 DM 3110 to the all commands

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

V sign positive: ' ' (ASCII 20h)
 negative: '-' (ASCII 2Dh)
 X ENCODER-, AVERAGE-, MIN- or MAX-Value

3.2. Main reset

Carry out the main reset

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

Answer of DM 3110

ACK

3.3. Type designation

Read the type designation

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

Answer of DM 3110

STX	D	M	3	1	1	0	X	Y	ETX	BCC
-----	---	---	---	---	---	---	---	---	-----	-----

DM 3110 type designation
 X X = 0 => no option
 X X = 1 => with option analog output
 Y Y = 0 => no interface

3. General commands

Y = 1 => with option RS 485-Interface
Y = 2 => with option RS 232-Interface
Y = 3 => with option Current-Loop-, TTY-Interface

3.4. **Software version**

Read the software version

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

Answer of DM 3110

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

X 000 to 099 => software version of the instrument

3.5. **Serial number**

Read the serial number

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

Answer of DM 3110

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

X serial number of production

3.6. **Date of production**

Read the date of production

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

Answer of DM 3110

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

X date of production

4. Commands of configuration level (P-00)

Example: Signal value for minimal display value = -2500

SOH	D	D	STX	U	M	A	-	0	2	5	0	0	ETX
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----

Read the display value for minimal signal value

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

Answer of DM 3110

SOH	V	X	X	X	X	X	ETX	BCC
-----	---	---	---	---	---	---	-----	-----

V sign positiv: `` (ASCII 20h)
negativ: ` ` (ASCII 2Dh)

X Display value

Set the display value for minimal signal value

SOH	D	D	STX	U	K	A	V	X	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

V sign positiv: `` (ASCII 20h)
negativ: ` ` (ASCII D2h)

X Value of display range
Valid Values -99999 to +99999

Answer of DM 3110

ACK

Example: Display value for minimal signal value = -5000

SOH	D	D	STX	U	K	A	-	0	5	0	0	0	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

Read the signal value for maximal display value

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

Answer of DM 3110

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

V sign positiv: `` (ASCII 20h)
negativ: ` ` (ASCII 2Dh)

X signalvalue

Set the signal value for maximal display value

SOH	D	D	STX	U	M	E	V	X	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

V sign positiv: `` (ASCII 20h)
negativ: ` ` (ASCII 2Dh)

X Value of display range

4.3. **Decimal points**

Read the number of decimal points

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

Answer of DM 3110

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

Set the number of decimal points

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

X Number of decimal points
 valid values 000 to 004

Answer of DM 3110

ACK

Example: Number of decimal points = 2

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

4.4. **Averaging process**

Read the number of average cyclus

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

Answer of DM 3110

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

Set the number of average cycle

SOH	D	D	STX	M	W	Z	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X Number of average cycle
 valid values 001 or 255

Answer of DM 3110

ACK

4.5. **Data source of the display**

Read the settings of data source for the display

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

Answer of DM 3110

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

Set the number of data source

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

X number of the data source of the display
 valid values 000 or 004

Answer of DM 3110

ACK

Example: Data source for display = 0 (measuring value)

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

4.6. **Data source for MAX-, MIN- and Holdvalue**

Read the data source for MAX-, MIN- and Holdvalue

SOH	D	D	STX	D	M	M	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of DM 3110

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

Set the data source for MAX-, MIN- and Holdvalue

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

X number of data source for MAX-, MIN- and Holdvalue
 valid values 000 or 001

Answer of DM 3110

ACK

Example: Data source for MAX-, MIN- and Holdvalue = 1 (average value)

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

4.7. Setting of Digit 1

Read the settings of Digit 1

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

Answer of DM 3110

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

Set the settings of Digit 1

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

X setting of Digit 1
 valid values 000 to 003

Answer of DM 3110

ACK

Example: Setting of Digit 1 = 2 (the last digit displays values in steps of five)

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

4.8. Reset time of the MIN- and Max-Memory

Read the settings of the reset time for MIN- and MAX-Memory

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

Answer of DM 3110

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

Set the reset time for MIN- and MAX-Memory

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

X reset time in seconds
 valid values 000 to 100

Answer of DM 3110

ACK

Example: Reset time for MIN- and MAX-Memory = 10 (10 seconds)

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

4.9. **Function of digital input 1**

Read the settings for the digital user input 1

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

Answer of DM 3110

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

Set the function for the digital input 1

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

X number for the function of the digital user input 1
 valid values 000 to 010

Answer of DM 3110

ACK

Example: Fuction of the digital input 1 = 6 (display test)

SOH	D	D	STX	F	D	1	0	0	6	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.10. **Function of digital input 2**

Read the setting for the digital user input 2

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

Answer of DM 3110

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

Set the function for the digital 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 010

Answer of DM 3110

ACK

Example: Function of the digital input 2 = 2 (Taring)

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

4.11. Function of push button '*'

Read the setting for the push button

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

Answer of DM 3110

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 005

Answer of DM 3110

ACK

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

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

4.12. Function of push button '-'

Read the function for the push button

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

Answer of DM 3110

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 007

Answer of DM 3110

ACK

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

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

4.13. Function of push button '+'

Read the setting of push button 


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

Answer of DM 3110

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 007

Answer of DM 3110

ACK

Example: Function of push button  = 4 (display the MIN value)

SOH	D	D	STX	F	T	+	0	0	4	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.14. Reference junction mode

Read the setting of reference junction mode

SOH	D	D	STX	V	G	M	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of DM 3110

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

Set the reference junction mode

SOH	D	D	STX	V	G	M	0	0	2	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X number of reference junction mode
 valid values 000 to 003

Answer of DM 3110

ACK

Example: Reference junction mode = 2 (Thermoelectric element without Reference junction mode)

SOH	D	D	STX	V	G	M	0	0	2	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.15. Constant reference junction

Read the setting of constant reference junction

SOH	D	D	STX	V	G	K	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of DM 3110

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

Set the function of constant reference junction

SOH	D	D	STX	V	G	K	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X number of Constant reference junction in °C
 valid values 000 to 050

Answer of DM 3110

ACK

Example: Constant reference junction = 20 (20°C)

SOH	D	D	STX	V	G	K	0	2	0	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.16. Switch between Celsius/Fahrenheit

Read the setting of temperature unit in celsius or fahrenheit

SOH	D	D	STX	T	E	H	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of DM 3110

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

Set the function of temperature unit in Celsius or Fahrenheit

SOH	D	D	STX	T	E	H	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

X number of temperature unit
 valid values 000 to 001

Answer of DM 3110

ACK

Example: Temperature unit = 1 (Display infahrenheit)

SOH	D	D	STX	T	E	H	0	0	1	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

4.17. Line resistance for Pt100 2-Conductor

Read the setting of line resistance

SOH	D	D	STX	L	W	D	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of DM 3110

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

Set the line resistance

SOH	D	D	STX	L	W	D	V	X	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

V sign positive: `` (ASCII 20h)
 X line resistance in Ohm
 valid values 00000 at 01000 (0.0 at 100.0)

Answer of DM 3110

ACK

Example: Line resistance = 500 (50.0 Ohm)

SOH	D	D	STX	L	W	D		0	0	5	0	0	ETX	BCC
-----	---	---	-----	---	---	---	--	---	---	---	---	---	-----	-----

4.18. Access-code

Read the setting of access-code

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

Answer of DM 3110

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

Set 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 DM 3110

ACK

Example: Access-code = 123

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

5. Commands of linear level (P-01)

5.1. Number of linear points

Read the setting of linear points

SOH	D	D	STX	L	A	Z	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of DM 3110

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

Set the linear points

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

X number of linear points
 valid values 002 to 010

Answer of DM 3110

ACK

Example: Number of linear points = 5

SOH	D	D	STX	L	A	Z	0	0	5	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

5.2. Linear points

Commands of linear points

Name	Command for input value	Command for output value
Linear points 1	LE0	LA0
Linear points 2	LE1	LA1
Linear points 3	LE2	LA2
Linear points 4	LE3	LA3
Linear points 5	LE4	LA4
Linear points 6	LE5	LA5
Linear points 7	LE6	LA6
Linear points 8	LE7	LA7
Linear points 9	LE8	LA8
Linear points 10	LE9	LA9

5. Commands of linear level (P-01)

Example:

Read the input value of linear point 1

SOH	D	D	STX	L	E	0	ETX	BCC
-----	---	---	-----	---	---	---	-----	-----

Answer of DM 3110

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

Set the number of linear point 1

SOH	D	D	STX	L	E	0	V	X	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

V sign positiv: `` (ASCII 20h)
negativ: ` ` (ASCII 2Dh)
X Number of linear points
valid values in range of the programed indicating range

Answer of DM 3110

ACK

Example: Input value of linear point = 5000

SOH	D	D	STX	L	E	0		0	5	0	0	0	ETX	BCC
-----	---	---	-----	---	---	---	--	---	---	---	---	---	-----	-----

Read the output value of linear point 1

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

Answer of DM 3110

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

Set the number of linear point 1

SOH	D	D	STX	L	A	0	V	X	X	X	X	X	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	---	---	---	-----	-----

V sign positiv: `` (ASCII 20h)
negativ: ` ` (ASCII 2Dh)
X Number of linear points
valid values in range of the programed indicating range

Answer of DM 3110

ACK

Example: Input value of linear point = 5000

SOH	D	D	STX	L	A	0		0	5	0	0	0	ETX	BCC
-----	---	---	-----	---	---	---	--	---	---	---	---	---	-----	-----

6. Commands of limit value level (P-02)

6.1. Commands for limit value 1

6.1.1. Data source for limit value 1

Read the setting of data source for the limit value

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

Answer of DM 3110

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

Set the data source of analog output 1

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

X number of data source for limit value 1
 valid values 000 to 005

Answer of DM 3110

ACK

Example: Data source for limit value 1 = 1 (measuring value)

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

6.1.2. Configuration for limit value 1

Read the setting of limit value 1

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

Answer of DM 3110

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

Set the configuration of analog output 1

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

X configuration for the limit value 1
 valid values 000 to 003

Answer of DM 3110

ACK

Example: Configuration of limit value 1 = 1

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

6.1.3. Alarm point for limit value 1

Read the alarm point for limit value 1

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

Answer of DM 3110

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

Set the display value for minimal analog output signal 1

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

- V sign positive: ‘ ‘ (ASCII 20h)
negative: ‘-’ (ASCII 2Dh)
- X number of alarm point
valid values in range of the programed indicating range

Answer of DM 3110

ACK

Example: Alarm point for limit value 1 = 2500

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

6.1.4. Hysteresis for limit value 1

Read the limit value 1 for hysteresis

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

Answer of DM 3110

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

Set the limit value 1 for hysteresis

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

- X number of hysteresis
valid values 000001 at 001000

Example: Hysteresis of limit values 1 = 100

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

6.1.5. Release time for limit value 1

Read the release time for limit value 1

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

Answer of DM 3110

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

Set the release time of limit value 1

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

X release time in seconds
 valid values 000 to 060

Answer of DM 3110

ACK

Example: Release time for limit value 1 = 0 (no drop-out time)

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

6.1.6. Operate delay time for limit value 1

Read the operate delay time for limit value 1

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

Answer of DM 3110

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

Set the release time of limit value 1

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

X operate delay time in seconds
 valid values 000 to 060

Answer of DM 3110

ACK

Example: Operate delay time for limit value 1 = 12 (12 seconds)

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

6.2. Commands for data source 2

6.2.1. Data source for limit value 2

Read the setting of data source for the limit value

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

Answer of DM 3110

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

Set the data source of analog output 2

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

X number of data source for limit value 2
 valid values 000 to 005

Answer of DM 3110

ACK

Example: Data source for limit value 2 = 1 (measuring value)

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

6.2.2. Configuration for limit value 2

Read the setting of limit value 2

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

Answer of DM 3110

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

Set the configuration of analog output 2

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

X configuration for the limit value 2
 valid values 000 to 003

Answer of DM 3110

ACK

Example: Configuration of limit value 2 = 1

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

6.2.3. Alarm point for limit value 2

Read the alarm point for limit value 2

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

Answer of DM 3110

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

Set the display value for minimal analog output signal 2

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

- V sign positive: ‘ ‘ (ASCII 20h)
negative: ‘-’ (ASCII 2Dh)
- X number of alarm point
valid values in range of the programed indicating range

Answer of DM 3110

ACK

Example: Alarm point for limit value 2 = -5000

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

6.2.4. Hysteresis for limit value 2

Read the limit value 2 for hysteresis

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

Answer of DM 3110

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

Set the limit value 2 for hysteresis

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

- X number of hysteresis
valid values 000001 at 001000

Example: Hysteresis of limit values 2 = 125

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

6.2.5. Release time for limit value 2

Read the release time for limit value 2

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

Answer of DM 3110

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

Set the release time of limit value 2

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

X release time in seconds
 valid values 000 to 060

Answer of DM 3110

ACK

Example: Release time for limit value 2 = 5 (5 seconds)

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

6.2.6. Operate delay time for limit value 2

Read the operate delay time for limit value 2

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

Answer of DM 3110

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

Set the release time of limit value 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 DM 3110

ACK

Example: Operate delay time for limit value 2 = 22 (22 seconds)

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

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

7.1. Data source for analog output

Read the address of the analog output level

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

Answer of DM 3110

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 004

Answer of DM 3110

ACK

Example: Data source for analog output = 2 (MAX value)

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

7.2. Configuration of analog output

Read the setting of configuration for analog output

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

Answer of DM 3110

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 DM 3110

ACK

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

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

7.3. 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 DM 3110

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

Set the display value for minimal analog output signal

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

X sign positiv: `` (ASCII 20h)
 negativ: ` ` (ASCII 2Dh)
 minimal display value
 valid values in range of the programmed indicating range

Answer of DM 3110

ACK

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

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

7.4. 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
-----	---	---	-----	---	---	---	-----	-----

Answer of DM 3110

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

Set the display value for the maximal analog output signal

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

X sign positiv: `` (ASCII 20h)
 negativ: ` ` (ASCII 2Dh)
 maximal display value
 valid values in range of the programmed indicating range

Answer of DM 3110

ACK

Example: Display value for maximal analog output signal = 10000

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

8. Commands of interface level (P-04)

8.1. Interface address

Read the address of the serial interface

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

Answer of DM 3110

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

Set the address of the serial interface

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

X address of the serial interface
 valid values 000 to 031

Answer of DM 3110

ACK

Example: interface address = 5

SOH	D	D	STX	R	S	A	0	0	5	ETX	BCC
-----	---	---	-----	---	---	---	---	---	---	-----	-----

8.2. Interface baud rate

Read the setting of baud rate for the serial interface

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

Answer of DM 3110

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 000 to 006

Answer of DM 3110

ACK

Example: number of baudrate = 6 (19200 baud)

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

8.3. Serial interface transfer mode

Read the transfer mode of the serial interface

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

Answer of DM 3110

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

Set the transfer mode of the serial interface

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

X Number of the transfer mode
 valid values 000 to 002

Answer of DM 3110

ACK

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

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

8.4. Timer for terminal-mode with timing

Read the transfer mode of the serial interface

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

Answer of DM 3110

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

Set the transfer mode of the serial interface

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

V sign positiv: `` (ASCII 20h)
 X timer (transfer cyclus)
 valid values 00000 to 03600

Answer of DM 3110

ACK

Example: Timer (transfer cyclus) = 60 sec

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

8.5. Data source for terminal-mode

Read the data source for the terminal-mode

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

Answer of DM 3110

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

Set the data source for the terminal-mode

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

X Data source for terminal-mode
valid values 000 to 003

Answer of DM 3110

ACK

Example: Data source for terminal-mode = 1 (average value)

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

8.6. Handshake-control for RS232-interface

Read the handshake-control

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

Answer of DM 3110

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

Set the handshake-control

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

X handshake-control
valid values 000 to 001

Answer of DM 3110

ACK

Example: Handshake-control = 1 (with handshake)

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

9. 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 DM 3110 is in the programming mode
(Each command is receipt with a *NAK*, when the instrument is in the programming mode)

9.1. Error word register

Read the error word register

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

Answer of DM 3110

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

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.

10. Command overview

ANC	read or set the configuration for the last position
AND	read or set the data source for the display
ANK	read or set the decimal points
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 ser the display value for the maximum analog output signal
DAT	read the data of production
DMM	read or set the data source for MIN-,Max- and Holdvalue
ENM	read or set the measuring range
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
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

10. 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
LAZ	read or set the linear points
LE0...LE9	read or set the input value of linear points 1...9
LA0...LA9	read or set the output value of linear points 1...9
LWD	read or set the conductor resistance
MAX	read the MAX value
MIN	read the MIN value
MSW	read the MEASURED value
MTW	read the display value
MWZ	read or set the cycle for the measuring value
RSA	read or set the interface address
RSB	read or set the baud rate of the interface
RSD	read or set the data source for terminal-mode
RSH	read or set the handshake-controll for RS232
RSM	read or set the transfer mode for seriall interface
RSZ	read or set the reset time of MIN/MAX-memory
RTT	read or set the timer for the terminal-mode with time controll
SRN	read or set the number of production
TEH	read or set the temperature value in Celsius or Fahrenheit
UKA	display value for minimal signal value
UKE	display value for maximal signal value
UMA	signal value for minimal display value
UME	signal value for maximal display value
VER	read the software version
VGM	read or set the reference junction mode
VGK	read or set the value of constant referencen junction

11. Notice

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