Stratos Evo A402 CC
Stratos Pro A201 CC

Transmitter Specific HART Command Specification

using the HART® Communications Protocol

Document Revision: 2.4

Device Type 0xD1 (A402 CC) Device Revision: 4
Device Type 0xDF (A201 CC) Device Revision: 3

Knick Elektronische Messgeräte GmbH & Co. KG

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1   1. Reference Documents

Document Title	Revision	Document Number
HART® - FSK Physical Layer Specification	8.1	HCF_SPEC-54
HART® - Data Link Layer Specification	8.0	HCF_SPEC-81
HART® - Command Summary Specification	8.1	HCF_SPEC-99
HART® - Universal Command Specification	6.0	HCF_SPEC-127
HART® - Common Practice Command Specification	8.0	HCF_SPEC-151
HART® - Common Tables	16.0	HCF_SPEC-183
Appendix 1 - Command Specific Response Code Definitions	5.0	HCF_SPEC-307
Application Layer Guideline on HART Status Information	1.0	HCF_LIT-5

01-01	Abgeleitet aus Dokument „StratosPro A211-A411 CC HART CMD Spec 01-01.doc", dabei alle bisherigen Änderungen im Dokument angenommen.	mes
02-01	Neue Parameter für Unterstützung von Kationentauscher	rth

Content

2   Common Tables Related to A402 CC and A201 CC

2.1   Device Variable Code Tables

Device Variable Code	Measurement Value	Units Code	Lower Limit	Upper Limit	Mininum Span	Damping
0	Conductivity A	67 – uS/cm	0	9999	0.0	0
1	Specific Resistance A	245 – MOhm * cm	0	99.99	0,0	0
2	Temperature A	32 – °C	-50	200	0,0	0
		33 – °F	-58	392	0,0	0
3	Conductivity B	67 – uS/cm	0	9999	0,0	0
4	Specific Resistance B	245 – MOhm * cm	0	99.99	0,0	0
5	Temperature B	32 – °C	-50	200	0,0	0
		33 – °F	-58	392	0,0	0
6	Difference	67 – uS/cm	-1999	9999	0,0	0
7	Ratio	251 – none	0	19.99	0,0	0
8	Passage	57 – %	0	199.9	0,0	0
9	Rejection	57 – %	-199.9	199.9	0,0	0
10	Deviation	57 – %	-199.9	199.9	0,0	0
11	pH (VBG 450)	59 – pH	-2	16	0,0	0
12	pH (variable)	59 – pH	-2	16	0,0	0
13	User spec (DAC)	67 – uS/cm	0	9999	0,0	0
14	Concentration of alkalising medium(C9)	139 – ppm	0	99.99	0,0	0

Device Variable Code	Device Variable	Device Variable Class	Device Variable Family
0	Conductivity A	81 – Analytical	250 – not used
1	Specific Resistance A	64 – Temperature	250 – not used
2	Temperature A	81 – Analytical	4 – Temperature
3	Conductivity B	81 – Analytical	250 – not used
4	Specific Resistance B	81 – Analytical	250 – not used
5	Temperature B	64 – Temperature	4 – Temperature
6	Difference	81 – Analytical	250 – not used
7	Ratio	81 – Analytical	250 – not used
8	Passage	81 – Analytical	250 – not used
9	Rejection	81 – Analytical	250 – not used
10	Deviation	81 – Analytical	250 – not used
11	pH (VBG 450)	81 – Analytical	8 – pH
12	pH (variable)	81 – Analytical	8 – pH
13	User spec (DAC)	81 – Analytical	250 – not used
14	Concentration of alkalising medium	81 – Analytical	250 – not used

2.2   Analog Channel Code Table

Analog Channel Code	Current Loop of Device
0	Primary Current Loop (OUT1)
1	Secondary Current Loop (OUT2)

2.3   Device Specific Unit Codes Table

Unit Code	Unit
244	1/cm
245	MOhm * cm

3   Universal Commands

3.1   Command 0   Read Unique Identifier

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	*(=254)*
1	Enum	Manufacturer Identification Code *(=97 for Knick)*
2	Enum	Device Type *(=0xD1 for A402 CC)*
3	Unsigned-8	Minimum Number of Preamles *(=5)*
4	Unsigned-8	Universal Command Major Revision Number *(=6)*
5	Unsigned-8	Device Revision Level (=4)
6	Unsigned-8	Software Revision Level (=1)
7	Enum	Hardware Revision Level (=1)
8	Bits	Flags *(=0)*
9-11	Unsigned-24	Device Identification Number
12	Unsigned-8	Number of Preambles
13	Unsigned-8	Maximum Number of Device Variables *(=14, Index of last device variable)*
14-15	Unsigned-16	Configuration Change Counter
16	Bits	Extended Field Device Status

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.2   Command 1   Read Primary Variable

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Primary Variable Units Code (Coding see 2.1)
1-4	Float	Primary Variable

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.3   Command 2   Read Loop Current and Percent of Range

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-3	Float	Primary Variable Loop Current [mA]
4-7	Float	Primary Variable Percent of Range [%]

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.4   Command 3   Read Dynamic Variables and Loop Current

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-3	Float	Primary Variable Loop Current [mA]
4	Enum	Primary Variable Units Code (Coding see 2.1)
5-8	Float	Primary Variable
9	Enum	Secondary Variable Units Code (Coding see 2.1)
10-13	Float	Secondary Variable
14	Enum	Tertiary Variable Units Code (Coding see 2.1)
15-18	Float	Tertiary Variable
19	Enum	Quaternary Variable Units Code (Coding see 2.1)
20-23	Float	Quaternary Variable

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.5 Command 6 Write Polling Address

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Polling Address of Device
1	Enum	Loop Current Mode
		0 – Disabled (= Multidrop Mode)
		1 – Enabled (= Current Signaling Mode)

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Polling Address of Device
1	Enum	Loop Current Mode (Coding see Request)

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Polling Address Selection *(>63)*
5	Error	Too Few Data Bytes Received
16	Error	Access Restricted

3.6 Command 7 Read Loop Configuration

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Polling Address of Device
1	Enum	Loop Current Mode (Coding see Command 6)

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.7   Command 8   Read Dynamic Variable Classifications

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Enum	Primary Variable Classification (Coding see 2.1)
1	Enum	Secondary Variable Classification (Coding see 2.1)
2	Enum	Tertiary Variable Classification (=*250, not supported*)
3	Enum	Quaternary Variable Classification (=*250, not supported*)

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.8   Command 9   Read Device Variables with Status

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Slot 0: Device Variable Code (Coding see 2.1)
1	Unsigned-8	Slot 1: Device Variable Code (Coding see 2.1)
2	Unsigned-8	Slot 2: Device Variable Code (Coding see 2.1)
3	Unsigned-8	Slot 3: Device Variable Code (Coding see 2.1)

Response Data Bytes

Byte	Format	Description
0	Enum	Extended Field Device Status
1	Unsigned-8	Slot 0: Device Variable Code (Coding see 2.1)
2	Enum	Slot 0: Device Variable Classification
3	Enum	Slot 0: Units Code
4-7	Float	Slot 0: Device Variable Value
8	Bits	Slot 0: Device Variable Status
		0x00 – Bad
		0x40 – Poor
		0x80 – Good
9	Unsigned-8	Slot 1: Device Variable Code
10	Enum	Slot 1: Device Variable Classification
11	Enum	Slot 1: Units Code
12-15	Float	Slot 1: Device Variable Value
16	Bits	Slot 1: Device Variable Status (Coding see Byte 8)
17	Unsigned-8	Slot 2: Device Variable Code
18	Enum	Slot 2: Device Variable Classification
19	Enum	Slot 2: Units Code
20-23	Float	Slot 2: Device Variable Value
24	Bits	Slot 2: Device Variable Status (Coding see Byte 8)
25	Unsigned-8	Slot 3: Device Variable Code
26	Enum	Slot 3: Device Variable Classification
27	Enum	Slot 3: Units Code
28-31	Float	Slot 3: Device Variable Value
32	Bits	Slot 3: Device Variable Status (Coding see Byte 8)

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received
8	Warning	Update Failure

3.9   Command 11   Read Unique Identifier Associated with Tag

Request Data Bytes

Byte	Format	Description
0-5	Packed	Tag

Response Data Bytes

Byte	Format	Description
0-16		Same as Command 0 (Read Unique Identifier)
		No response is made unless the Tag matches that of the device.

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.10   Command 12   Read Message

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-23	Packed	Message

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.11   Command 13   Read Tag, Descriptor, Date

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-5	Packed	Tag
6-17	Packed	Descriptor
18-20	Date	Date Code

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.12   Command 14   Read Primary Variable Transducer Information

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-2	Unsigned-24	Numerical Sensor Serialnumber - ISM sensors only (reads 0 if there is no ISM sensor)
3	Enum	Transducer Limits and Minimum Span Units Code (Coding see 2.1)
4-7	Float	Upper Transducer Limit
8-11	Float	Lower Transducer Limit
12-15	Float	Minimum Span (=0.0)

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.13   Command 15   Read Device Information

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Enum	PV Alarm Selection Code 0 – High 239– Last Val 250– not used
1	Enum	PV Transfer Function Code *(=0, linear)*
2	Enum	PV Upper and Lower Range Values Units Code (Coding see 2.1)
3-6	Float	PV Upper Range Value
7-10	Float	PV Lower Range Value
11-14	Float	PV Damping Value [s]
15	Enum	Write Protect Code *(=251, None)*
16	Enum	Private Label Distributor Code *(=97, Knick)*
17	Bits	PV Analog Channel Flags *(=0)*

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.14   Command 16 Read Final Assembly Number

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-2	Unsigned-24	Final Assembly Number

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.15   Command 17 Write Message

Request Data Bytes

Byte	Format	Description
0-23	Packed	Message String Used by the Master for Record Keeping

Response Data Bytes

Byte	Format	Description
0-23	Packed	Message String

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
5	Error	Too Few Data Bytes Received
16	Error	Access Restricted

3.16   Command 18 Write Tag, Descriptor, Date

Request Data Bytes

Byte	Format	Description
0-5	Packed	Tag
6-17	Packed	Descriptor Used by the Master for Record Keeping
18-20	Unsigned-24	A Date Code Used by the Master for Record Keeping (e.g. Last Or Next Calibration Date)

Response Data Bytes

Byte	Format	Description
0-5	Packed	Tag
6-17	Packed	Descriptor
18-20	Date	Date Code

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
5	Error	Too Few Data Bytes Received
9	Error	Invalid Date Code Detected
16	Error	Access Restricted

3.17   Command 19   Write Final Assembly Number

Request Data Bytes

Byte	Format	Description
0-2	Unsigned-24	Final Assembly Number

Response Data Bytes

Byte	Format	Description
0-2	Unsigned-24	Final Assembly Number

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
5	Error	Too Few Data Bytes Received
16	Error	Access Restricted

3.18   Command 20   Read Long Tag

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-31	Latin-1	Long Tag

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.19   Command 21   Read Unique Identifier Associated With Long Tag

Request Data Bytes

Byte	Format	Description
0-31	Latin-1	Long Tag

Response Data Bytes

Byte	Format	Description
0-16		Same as Command 0 (Read Unique Identifier) No response is made unless the Long Tag matches that of the device.

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

3.20   Command 22   Write Long Tag

Request Data Bytes

Byte	Format	Description
0-31	Latin-1	Long Tag

Response Data Bytes

Byte	Format	Description
0-31	Latin-1	Long Tag

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
5	Error	Too Few Data Bytes Received
16	Error	Access Restricted

4   Common Practice Commands

4.1   Command 33   Read Device Variables

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Slot 0: Device Variable Code (Coding see 2.1)
1	Unsigned-8	Slot 1: Device Variable Code (Coding see 2.1)
2	Unsigned-8	Slot 2: Device Variable Code (Coding see 2.1)
3	Unsigned-8	Slot 3: Device Variable Code (Coding see 2.1)

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Slot 0: Device Variable Code
1	Enum	Slot 0: Units Code (Coding see 2.1)
2-5	Float	Slot 0: Device Variable Value
6	Unsigned-8	Slot 1: Device Variable Code
7	Enum	Slot 1: Units Code (Coding see 2.1)
8-11	Float	Slot 1: Device Variable Value
12	Unsigned-8	Slot 2: Device Variable Code
13	Enum	Slot 2: Units Code (Coding see 2.1)
14-17	Float	Slot 2: Device Variable Value
18	Unsigned-8	Slot 3: Device Variable Code
19	Enum	Slot 3: Units Code (Coding see 2.1)
20-23	Float	Slot 3: Device Variable Value

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received
8	Warning	Update Failure

4.2   Command 35   Write Primary Variable Range Values

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Upper and Lower Range Values Units Code (must be the same as the actually used unit) (Coding see 2.1)
1-4	Float	Upper Range Value
5-8	Float	Lower Range Value

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Upper and Lower Range Values Units Code
1-4	Float	Upper Range Value
5-8	Float	Lower Range Value

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received
6	Error	Device-Specific Command Error
9	Error	Lower Range Value Too High
10	Error	Lower Range Value Too Low
11	Error	Upper Range Value Too High
12	Error	Upper Range Value Too Low
16	Error	Access Restricted

4.3   Command 36   Set Primary Variable Upper Range Value

This command sets the actual value of the Primary Variable as the Upper Range Value.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
None		

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
9	Error	Applied Process Too High
10	Error	Applied ProcessToo Low
16	Error	Access Restricted
29	Error	Invalid Span

4.4   Command 37   Set Primary Variable Lower Range Value

This Command sets the actual value of the Primary Variable as the Lower Range Value.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
None		

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
9	Error	Applied Process Too High
10	Error	Applied ProcessToo Low
14	Warning	New Lower Range Value Pushed
16	Error	Access Restricted
29	Error	Invalid Span

4.5   Command 38   Reset Configuration Changed Flag

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
None		

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
16	Error	Access Restricted

4.6   Command 41   Perform Self Test

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
None		

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
16	Error	Access Restricted

4.7   Command 42   Perform Device Reset

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
None		

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
16	Error	Access Restricted

4.8   Command 44   Write Primary Variable Units

Request Data Bytes

Byte	Format	Description
0	Enum	Primary Variable Units Code (switching between °C and °F is allowed, all other units must not be changed)

Response Data Bytes

Byte	Format	Description
0	Enum	Primary Variable Units Code

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received
16	Error	Access Restricted

4.9   Command 47   Write Primary Variable Transfer Function

Request Data Bytes

Byte	Format	Description
0	Enum	Transfer Function Code *(=0, linear)*

Response Data Bytes

Byte	Format	Description
0	Enum	Transfer Function Code *(=0, linear)*

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received
16	Error	Access Restricted

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4.10   Command 48   Read Additional Device Status

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Error number
1	Unsigned-8	Reserved
2	Enum	Device Specific Status: 0 – MEAS 1 – DIAG 2 – CAL 3 – CONF 4 – SERVICE
3	Enum	Sensoface: 0 – Good 1 – Poor 2 – Bad 3 – Unknown
4	Enum	Reserved
5	Bits	State: 0x10 – Alarm 0x08 – Sensors Connected 0x01 – Hold
6	Bits	Extended Device Status: 0x01 – Maintenance required
7-9	Bits	Reserved
10	Bits	Analog Channel Saturation: 0x02 – Channel 2 saturated 0x01 – Channel 1 saturated
11-12	Bits	Reserved
13	Bits	Analog Channel Fixed: 0x02 – Channel 2 fixed 0x01 – Channel 1 fixed
14-21	Bits	Device specific status (see table below)

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

Device specific status bits as result of command 48 (Bytes 14-21)

Error text	Error Description	No.	Status Bits
	No Error	0	00 00 00 00 00 00 00 00
CATION EXCHANGER CAPACITY	Capacity of ion exchanger used up – replace	110	01 00 00 00 00 00 00 00
OUT1 INVALID CORNER X/Y	Bilinear curve: Invalid vertex point	108	02 00 00 00 00 00 00 00
INVALID PARAMETER CONTROLLER	Configuration error controller	104	04 00 00 00 00 00 00 00
INVALID CHANNEL SELECTION RELAYS	Cond-Cond: Relay channel not assigned (disabled)	107	08 00 00 00 00 00 00 00
INVALID CHANNEL SELECTION OUT1/2	Cond-Cond: Out1/Out2 channel not assigned (disabled)	106	10 00 00 00 00 00 00 00
EXCHANGER_CALCULATION	Invalid values of exchanger calculation	74	20 00 00 00 00 00 00 00
ERR_LIMIT_I_INPUT	Overrange of current input	71	40 00 00 00 00 00 00 00
ERR_CONTROL_LEVEL	Overrange of control level	70	80 00 00 00 00 00 00 00
FLOW TOO LOW	Flow too low	72	00 01 00 00 00 00 00 00
FLOW TOO HIGH	Flow too high	73	00 02 00 00 00 00 00 00
OUTPUT 2 TOO HIGH	Output current 2 > 20.5 mA	64	00 04 00 00 00 00 00 00
OUTPUT 2 TOO LOW	Output current 2 < 0 (3.8) mA	63	00 08 00 00 00 00 00 00
OUTPUT 1 TOO HIGH	Output current 1 > 20.5 mA	62	00 10 00 00 00 00 00 00
OUTPUT 1 TOO LOW	Output current 1 < 0 (3.8) mA	61	00 20 00 00 00 00 00 00
OUT2 INVALID CORNER X/Y	Bilinear curve: Invalid vertex point	109	00 40 00 00 00 00 00 00
OUT1 INVALID CORNER X/Y	Bilinear curve: Invalid vertex point	108	00 80 00 00 00 00 00 00

OUTPUT LOAD	Load error	60	00 00 01 00 00 00 00 00
INVALID CALCULATION	Invalid calculations	59	00 00 02 00 00 00 00 00
SENSOCHECK	Sensor or line error channel B	45	00 00 04 00 00 00 00 00
RANGE CONDUCTIVITY	Display range violation channel B conductivity	41	00 00 08 00 00 00 00 00
RANGE CONDUCTIVITY	Display range violation channel B spec. resistance	41	00 00 10 00 00 00 00 00
TEMPERATURE RANGE	Temperature range violation channel B	43	00 00 20 00 00 00 00 00
CONDUCTANCE TOO HIGH	Measuring range of conductance exceeded	40	00 00 40 00 00 00 00 00
SENSOCHECK	Sensor or line error channel A	15	00 00 80 00 00 00 00 00
RANGE CONDUCTIVITY	Display range violation channel A conductivity	11	00 00 00 01 00 00 00 00
RANGE CONDUCTIVITY	Display range violation channel A spec. resistance	11	00 00 00 02 00 00 00 00
TEMPERATURE RANGE	Temperature range violation channel A	13	00 00 00 04 00 00 00 00
CONDUCTANCE TOO HIGH	Measuring range of conductance exceeded channel A	10	00 00 00 08 00 00 00 00
CAL DATA	Error in cal data	5	00 00 00 10 00 00 00 00
INVALID SPAN I-INPUT	Configuration error current input	105	00 00 00 00 02 00 00 00
WRONG MODULE	Module does not correspond to measuring function	96	00 00 00 00 04 00 00 00
NO MODULE INSTALLED	No module installed	97	00 00 00 00 08 00 00 00
SYSTEM ERROR	System error	95	00 00 00 00 10 00 00 00
CONFIGURATION ERROR	Error in configuration or calibration data	98	00 00 00 00 20 00 00 00
DEVICE FAILURE	Error in factory settings	99	00 00 00 00 40 00 00 00

4.11   Command 50   Read Dynamic Variable Assignment

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Device Variable assigned to the Primary Variable (Coding see 2.1)
1	Unsigned-8	Device Variable assigned to the Secondary Variable (Coding see 2.1)
2	Unsigned-8	Device Variable assigned to the Tertiary Variable *(=250, not used)*
3	Unsigned-8	Device Variable assigned to the Quaternary Variable *(=250, not used)*

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

4.12   Command 53   Write Device Variable Units

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Device Variable Code (Coding see 2.1)
1	Enum	Device Variable Units Code (switching between °C and °F is allowed, all other units must not be changed)

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Device Variable Code
1	Enum	Device Variable Units Code

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
5	Error	Too Few Data Bytes Received
11	Error	Unvalid Device Variable Code
12	Error	Invalid Units Code
16	Error	Access Restricted

4.13   Command 54   Read Device Variable Information

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Device Variable Code

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Device Variable Code
1-3	Unsigned-24	Device Variable Transducer Serialnumber (ISM sensors only)
4	Enum	Device Variable Limits/Minimum Span Units Code (Coding see 2.1)
5-8	Float	Device Variable Upper Transducer Limit
9-12	Float	Device Variable Lower Transducer Limit
13-16	Float	Device Variable Damping Value *(=0)*
17-20	Float	Device Variable Minimum Span (=0)
21	Enum	Device Variable Classification (Coding see 2.1)
22	Enum	Device Variable Family (Coding see 2.1)

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

4.14   Command 59   Write Number of Response Preambles

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Number of preambles to be sent with the response message from Slave to the Master

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Number of preambles to be sent with the response message from Slave to the Master

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
5	Error	Too Few Data Bytes Received
8	Warning	Set to Nearest Possible Value
16	Error	Access Restricted

4.15   Command 60   Read Analog Channel and Percent of Range

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code (Coding see 2.2)

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code
1	Enum	Analog Channel Units Code *(=39, mA)*
2-5	Float	Analog Channel Level
6-9	Float	Analog Channel Percent of Range

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

4.16   Command 62   Read Analog Channels

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code assigned to Slot 0 (Coding see 2.2)
1	Unsigned-8	Analog Channel Number Code assigned to Slot 1 (Coding see 2.2)
2	Unsigned-8	Analog Channel Number Code assigned to Slot 2 (Coding see 2.2)
3	Unsigned-8	Analog Channel Number Code assigned to Slot 3 (Coding see 2.2)

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code in Slot 0
1	Enum	Slot 0 Units Code *(=39, mA)*
2-5	Float	Slot 0 Level of selected Analog Channel
6	Unsigned-8	Analog Channel Number Code in Slot 1
7	Enum	Slot 1 Units Code *(=39, mA)*
8-11	Float	Slot 1 Level of selected Analog Channel
12	Unsigned-8	Analog Channel Number Code in Slot 2
13	Enum	Slot 2 Units Code *(=39, mA)*
14-17	Float	Slot 2 Level of selected Analog Channel
18	Unsigned-8	Analog Channel Number Code in Slot 3
19	Enum	Slot 3 Units Code *(=39, mA)*
20-23	Float	Slot 3 Level of selected Analog Channel

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

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4.17   Command 63 Read Analog Channel Information

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code (Coding see 2.2)

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code
1	Enum	Analog Channel Alarm Selection Code
		0 = Alarm Selection High
		239 = Alarm Selection Last Value
		250 = not used
2	Enum	Analog Channel Transfer Function Code *(=0, linear)*
3	Enum	Analog Channel Upper and Lower Range Values Units Code (Coding see 2.1)
4-7	Float	Analog Channel Upper Range Value
8-11	Float	Analog Channel Lower Range Value
12-15	Float	Analog Channel Damping Value [s]
16	Bits	Analog Channel Flags *(=0)*

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

4.18   Command 64 Write Analog Channel Additional Damping Value

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code (Coding see 2.2)
1-4	Float	Analog Channel Additional Damping Value [s]

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code
6-9	Float	Analog Channel Additional Damping Value [s]

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
3	Error	Passed Parameter Too Large
4	Error	Passed Parameter Too Small
5	Error	Too Few Data Bytes Received
16	Error	Access Restricted

4.19   Command 65 Write Analog Channel Range Values

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code (Coding see 2.2)
1	Enum	Analog Channel Upper and Lower Range Values Units Codes (the actually used unit must not be changed) (Coding see 2.1)
2-5	Float	Analog Channel Upper Range Value
6-9	Float	Analog Channel Lower Range Value

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code
1	Enum	Analog Channel Upper and Lower Range Values Units Codes
2-5	Float	Analog Channel Upper Range Value
6-9	Float	Analog Channel Lower Range Value

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received
6	Error	Device-Specific Error Code
9	Error	Lower Range Value Too High
10	Error	Lower Range Value Too Low
11	Error	Upper Range Value Too High
12	Error	Upper Range Value Too Low
15	Error	Invalid Analog Channel Code Number
16	Error	Access Restricted

4.20   Command 69 Write Analog Channel Transfer Function

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code (Coding see 2.2)
1	Enum	Analog Channel Transfer Function Code *(=0, linear)*

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Analog Channel Number Code
1	Enum	Analog Channel Transfer Function Code

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
5	Error	Too Few Data Bytes Received
13	Error	Invalid Transfer Function Code
15	Error	Invalid Analog Channel Code Number
16	Error	Access Restricted

4.21   Command 71 Lock Device

Request Data Bytes

Byte	Format	Description
0	Enum	Lock Code: 0 – Unlocked 1 – Lock – Temporary 2 – Lock – Permanent

Response Data Bytes

Byte	Format	Description
0	Enum	Lock Code

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
5	Error	Too Few Data Bytes Received
10	Error	Invalid Lock Code
16	Error	Access Restricted

4.22   Command 72 Squawk

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
None		

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

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4.23   Command 73   Find Device

The Stratos Evo/Pro must be set to Diag mode manually before using this command. In all other modes the device will not answer this command.

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0-16	Bits	Same as Command 0 (Read Unique Identifier)

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

4.24   Command 76   Read Lock Device State

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Bits	Lock Status: 0x01 – Device Locked 0x02 – Lock is Permanent 0x04 – Locked by Primary Master

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

5   Device Specific Commands

5.1   Command 128   Read Device Configuration

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0	Bits	0x01 – 0=A201, 1= A402
		0x04 – 0= non Ex, 1= Ex
		0x08 – 1= Option Secondary Loop Current activated
		0x20 – 1= Option Logbook activated
		0x40 – 1= Option Current Input activated
1	Bits	0x01 – 1= Option Audit Trail activated
2	Unsigned-8	Reserved
3	Unsigned-8	Reserved

5.2   Command 135   Read Sensor Information

Request Data Bytes

Byte	Format	Description
0	Enum	Sensor selection: 0 – Sensor A 1 – Sensor B

Response Data Bytes

Byte	Format	Description	Parameter Name on Display
0	Enum	Sensor selection	
1-4	Float	Cellfactor [1/cm]	S_A / S_B: CELLFACTOR
5	Enum	TC Type: 0 – OFF 1 – LIN 2 – NLF 3 – NaCL 4 – HCL 5 – NH3 6 – NaOH	S_A / S_B: TC SELECT
6-9	Float	TC Liquid [%/K]	S_A / S_B: TC LIQUID
10-13	Float	Reference Temperature (if compensation = LIN) Value (in the active temperature unit)	S_A / S_B: REF TEMP

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

5.3   Command 136   Write Sensor Information

Request Data Bytes

Byte	Format	Description
0-9		Same as Response of Command 135

Response Data Bytes

Byte	Format	Description
0-9		Same as Response of Command 135

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
3	Error	Passed Parameter Too Large
4	Error	Passed Parameter Too Small
5	Error	Too Few Data Bytes Received
6	Error	Device-Specific Command Error
16	Error	Access Restricted

5.4   Command 137   Read Meas Mode

Request Data Bytes

Byte	Format	Description
0	Enum	*(=0)*

Response Data Bytes

Byte	Format	Description	Parameter Name on Display
0	Enum	*(=0)*	
1	Enum	Meas Range: 0 – o.ooo µS/cm 1 – oo.oo µS/cm 2 – ooo.o µS/cm 3 – oooo µS/cm 4 – oo.oo MΩ*cm	MES: MEAS RANGE
2	Enum	Temperature Unit: 32 – °C 33 – °F	MES: TEMP UNIT
3	Enum	Calculation: 0 – OFF 1 – ON	MES: CALCULATION
4	Enum	Calculation Type: 0 – C1: Difference 1 – C2: Ratio 2 – C3: Passage 3 – C4: Rejection 4 – C5: Deviation 5 – C6: pH (VGB) 6 – C7: pH (variable) 7 – C8: User Spec (DAC) 8 – C9: Alkalising	MES:
5-8	Float	Factor 1 (C7 only)	C7: FACTOR 1
9-12	Float	Factor 2 (C7 only)	C7: FACTOR 2
13-16	Float	Parameter W [10^{-3}] (C8 only)	C8: PARAMETER W
17-20	Float	Parameter A [10^{-3}] (C8 only)	C8: PARAMETER A
21-24	Float	Parameter B [10^{-4}] (C8 only)	C8: PARAMETER B
25	Enum	Solution for Calculation (C6 and C9) 0: NaOH 1: NH3 2: LiOH	C6/9:
26-29	Float	Coefficient for Calculation (C7 only)	C7: COEFFICIENT
30-33	Float	Factor 3 (C7 only)	C7: FACTOR 3

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

5.5   Command 138   Write Meas Mode

Request Data Bytes

Byte	Format	Description
0-33		Same as Response of Command 137

Response Data Bytes

Byte	Format	Description
0-33		Same as Response of Command 137

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
3	Error	Passed Parameter Too Large
4	Error	Passed Parameter Too Small
5	Error	Too Few Data Bytes Received
6	Error	Device-Specific Command Error
16	Error	Access Restricted

5.1   Command 143   Read Cation Exchanger

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description	Parameter Name on Display
0	Enum	Exchanger Capacity Calculation (C6 only) 0 – OFF 1 – ON	C6: EXCHER CAP
1-4	Float	Exchanger Size [l] (C6 only)	C6: EXCHER SIZE
5-8	Float	Capacity [val] (C6 only)	C6: CAPACITY
9-12	Float	Efficiency [%] (C6 only)	C6: EFFICIENCY

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

5.2   Command 144   Write Cation Exchanger

Request Data Bytes

Byte	Format	Description
0-12		Same as Response of Command 143

Response Data Bytes

Byte	Format	Description
0-12		Same as Response of Command 143

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
3	Error	Passed Parameter Too Large
4	Error	Passed Parameter Too Small
5	Error	Too Few Data Bytes Received
6	Error	Device-Specific Command Error
16	Error	Access Restricted

5.3   Command 147   Read OUT1/OUT2

Request Data Bytes

Byte	Format	Description
0	Enum	Analog channel selection: 0 – OUT1 1 – OUT2

Response Data Bytes

Byte	Format	Description	Parameter Name on Display
0	Enum	Analog channel selection	
1	Enum	Channel: 0 – Conductivity Sensor A (COND A) 1 – Conductivity Sensor B (COND B) 2 – Temperature Sensor A (TMP A) 3 – Temperature Sensor B (TMP B) 4 – Calculation (CALC)	OT1/2: CHANNEL
2	Enum	Output Range: 0 – 0-20mA 1 – 4-20mA	OT1/2: RANGE
3	Enum	Output: 0 – linear (LIN) 2 – bilinear (BI LIN)	OT1/2: OUTPUT
4-7	Float	BEGIN Value	OT1/2: BEGIN
8-11	Float	END Value	OT1/2: END
12-15	Float	Filtertime [s]	OT1/2: FILTERTIME
16	Enum	22mA-Fail: 0 – OFF 1 – ON	OT1/2: 22mA-FAIL
17	Enum	Hold Mode: 1 – FIX 2 – LAST	OT1/2: HOLD MODE
18-21	Float	Hold Fix	OT1/2: HOLD FIX
22-25	Float	Corner X for Output = BI LIN	OT1/2: CORNER X
26-29	Float	Corner Y for Output = BI LIN	OT1/2: CORNER Y
30	Enum	22mA on Sensoface Message: 0 – OFF 1 – ON	OT1/2: FACE 22mA

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

5.4   Command 148   Write OUT1/OUT2

Request Data Bytes

Byte	Format	Description
0-30		Same as Response of Command 147

Response Data Bytes

Byte	Format	Description
0-30		Same as Response of Command 147

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
3	Error	Passed Parameter Too Large
4	Error	Passed Parameter Too Small
5	Error	Too Few Data Bytes Received
6	Error	Device-Specific Command Error
16	Error	Access Restricted

5.5   Command 159   Read Control Input

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description	Parameter Name on Display
0	Enum	Control Mode 0 – LEVEL 1 – FLOW	IN: CONTROL
1-4	Float	Adjust Flow for Control Mode = Flow	IN: ADJUST FLOW

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

5.6   Command 160   Write Control Input

Request Data Bytes

Byte	Format	Description
0-4		Same as Response of Command 159

Response Data Bytes

Byte	Format	Description
0-4		Same as Response of Command 159

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
3	Error	Passed Parameter Too Large
4	Error	Passed Parameter Too Small
5	Error	Too Few Data Bytes Received
6	Error	Device-Specific Command Error
16	Error	Access Restricted

5.7   Command 161   Read Alarm

Request Data Bytes

	Format	Description
0	Enum	*(=0)*

Response Data Bytes

	Format	Description	Parameter Name on Display
0	Enum	*(=0)*	
1-4	Float	Delay Time [s]	ALA: DELAYTIME
5	Enum	Sensocheck: 0 – OFF 1 – ON	ALA: SENSOCHECK
6	Enum	Control Input: 0 – OFF 1 – ON	ALA: FLOW CNTR
7-10	Float	Flow Min [l/h]	ALA: FLOW MIN
11-14	Float	Flow Max [l/h]	ALA: FLOW MAX
15	Enum	Limit I-Input: 0 – OFF 1 – ON	ALA: LIMIT I-IN
16	Enum	Function: 0 – Low Level 1 – High Level	ALA: FUNCTION
17-20	Float	Level [mA]	ALA: LEVEL
21-24	Float	Hysteresis [mA]	ALA: HYSTERESIS

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

5.8   Command 162   Write Alarm

Request Data Bytes

Byte	Format	Description
0-24		Same as Response of Command 161

Response Data Bytes

Byte	Format	Description
0-24		Same as Response of Command 161

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
3	Error	Passed Parameter Too Large
4	Error	Passed Parameter Too Small
5	Error	Too Few Data Bytes Received
6	Error	Device-Specific Command Error
16	Error	Access Restricted

5.9   Command 165   Read MinMax

Request Data Bytes

Byte	Format	Description
0	Enum	Relais and analog channel selection: 0 – Rel1 1 – Rel2 2 – Rel3

Response Data Bytes

Byte	Format	Description	Parameter Name on Display
0	Enum	Relais and analog channel selection	
1	Enum	Channel: 0 – Conductivity Sensor A (COND A) 1 – Conductivity Sensor B (COND B) 2 – Temperature Sensor A (TMP A) 3 – Temperature Sensor B (TMP B) 4 – Calculation (CALC) 5 – Control (FLOW) 6 – Input Current (I INPUT)	RL1/2/3: CHANNEL
2	Enum	Function: 0 – Low Level 1 – High Level	RL1/2/3: FUNCTION
3	Enum	Contact Type: 0 – N/O 1 – N/C	RL1/2/3: CONTACT
4-7	Float	Level	RL1/2/3: LEVEL
8-11	Float	Hysteresis	RL1/2/3: HYSTERESIS
12-15	Float	Delay Time [s]	RL1/2/3: DELAYTIME

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

5.10 Command 166 Write MinMax

Request Data Bytes

Byte	Format	Description
0-15		Same as Response of Command 165

Response Data Bytes

Byte	Format	Description
0-15		Same as Response of Command 165

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
3	Error	Passed Parameter Too Large
4	Error	Passed Parameter Too Small
5	Error	Too Few Data Bytes Received
6	Error	Device-Specific Command Error
16	Error	Access Restricted

5.11   Command 173   Read Clock

Request Data Bytes

Byte	Format	Description
		None

Response Data Bytes

Byte	Format	Description
0-1	Unsigned-16	Milliseconds
2	Unsigned-8	Minute
3	Unsigned-8	Hour
4	Unsigned-8	Day
5	Unsigned-8	Month
6	Unsigned-8	Year

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

5.12   Command 174   Write Clock

Request Data Bytes

Byte	Format	Description
0-1	Unsigned-16	Milliseconds (0..59999)
2	Unsigned-8	Minute (0..59)
3	Unsigned-8	Hour (0..23)
4	Unsigned-8	Day (1..31)
5	Unsigned-8	Month (1..12)
6	Unsigned-8	Year (1..255)

Response Data Bytes

Byte	Format	Description
0-6		Same as Response of Command 173

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
5	Error	Too Few Data Bytes Received
9	Error	Invalid Date Code Detected
16	Error	Access Restricted

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5.13   Command 175   Read Logbook Entry

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Group index: Value range depends on setting of Logbook options
		No Logbook option activated: 0
		Logbook activated: 0.. 49
		Logbook + Audit Trail activated: 0.. 99

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Group Index
1	Unsigned-8	Index of latest entry
2	Unsigned-8	Index of the first entry of the requested group index
3-27		Logbook entry
28	Unsigned-8	Index of the second entry of the requested group index
29-53		Logbook entry

Logbook Entry

Byte	Format	Description
0	Unsigned-8	Message ID
1	Unsigned-8	Day
2	Unsigned-8	Month
3	Unsigned-8	Year
4-9	Packed	Time (Format: "hh:mm:ss")
10	Bits	Info Flag:
		0x01 - 0x02: Sensoface
		0 – Good
		1 – Medium
		2 – Bad
		3 – Unknown
		0x04: Parset
		0 – ParsetA
		1 – ParsetB
		0x08 - 0x10: Reserved
		0x20 - 0x80: Kind of Message
		0 – Static
		1 – Begin of event
		2 – End of event
		3 – Float (Bytes 11-14 are valid, 15-18 are reserved)
		4 – Unsigned-32 (Bytes 15-18 are valid, 11-14 and 19-24 are reserved)
		5 – Packed (Bytes 19-24 are valid, 11-18 are reserved)
11-14	Float	Float Value
15-18	Unsigned-32	Integer Value
19-24	Packed	String Value

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

5.14 Command 179 Read Cell Factor

Request Data Bytes

Byte	Format	Description
0	Enum	Sensor selection: 0 – Sensor A 1 – Sensor B

Response Data Bytes

Byte	Format	Description
0	Enum	Sensor selection
1	Unsigned-8	Result of the last calibration, Sensoface: 0 – Good 1 – Medium 2 – Bad 3 – Unknown
2	Unsigned-8	Cell Factor Units Code *(=244, 1/cm)*
3-6	Float	Cell Factor Value

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

5.15 Command 183 Read Device Tag

Request Data Bytes

Byte	Format	Description
		None

Response Data Bytes

Byte	Format	Description
0-31	Latin-1	Device Tag

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

5.16 Command 184 Write Device Tag

Request Data Bytes

Byte	Format	Description
0-31		Same as Response of Command 183

Response Data Bytes

Byte	Format	Description
0-31		Same as Response of Command 183

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
5	Error	Too Few Data Bytes Received
6	Error	Device-Specific Command Error

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16	Error	Access Restricted

5.17   Command 186   Read Unit Code

Request Data Bytes

Byte	Format	Description
0	Enum	Analog channel selection: 0 – OUT1 1 – OUT2

Response Data Bytes

Byte	Format	Description
0	Enum	Analog channel selection
1	Unsigned-8	Units Code (Coding see 2.1)

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

5.18   Command 187   Read Version Info

Request Data Bytes

Byte	Format	Description
0	Enum	Info Request Selector: 0 – Device: Software Version 1 – Device: Hardware Version 2 – Device: Serialnumber 4 – HART IF: Software Version 7 – Meas Unit: Software Version 8 – Meas Unit: Hardware Version 9 – Meas Unit: Serialnumber 16 – Device: Bootloader Version 17 – Meas Unit: Bootloader Version

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Info Request Selector
1-16	Latin-1	Requested Information

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

5.19 Command 189 Read Process Values

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Info Request Selector: 0 – Sensor A: Resistance of Temperature Sensor [Ohm] 1 – Sensor A: Temperature [°C] or [°F] 2 – Sensor A: Resistance [Ohm] 3 – Sensor A: Conductance [uS] 4 – Sensor A: Conductivity temp. comp. [uS/cm] 5 – Sensor B: Resistance of Temperature Sensor [Ohm] 6 – Sensor B: Temperature [°C] or [°F] 7 – Sensor B: Resistance [Ohm] 8 – Sensor B: Conductance [uS] 9 – Sensor B: Conductivity temp. comp. [uS/cm] 10 – Current Input [mA] 11 – Flow [l/h] 12 – Remaining exchanger capacity [%] 13 – Concentration of alkalising media (C9) [ppm]

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Info Request Selector
1	Enum	Unit Codes: 32 – °C 33 – °F 37 – Ohm 39 – mA 56 – uS 57 – % 67 – uS/cm 138 – l/h 139 – ppm
2-5	Float	Process Value

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received

5.20   Command 191   Read Last Calibration Date

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
0..7	Latin-1	Date of latest calibration (Format „dd.mm.yy")

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors

5.21   Command 192   Write TV and QV Assignment

Request Data Bytes

Byte	Format	Description
0	Unsigned-8	Device Variable assigned to the Tertiary Variable
1	Unsigned-8	Device Variable assigned to the Quaternary Variable

Response Data Bytes

Byte	Format	Description
0	Unsigned-8	Device Variable assigned to the Tertiary Variable
1	Unsigned-8	Device Variable assigned to the Quaternary Variable

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
2	Error	Invalid Selection
5	Error	Too Few Data Bytes Received
16	Error	Access Restricted

5.22   Command 201 New Exchanger

Request Data Bytes

Byte	Format	Description
None		

Response Data Bytes

Byte	Format	Description
None		

Command-Specific Response Codes

Code	Class	Description
0	Success	No Command-Specific Errors
16	Error	Access Restricted

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