

Stratos Evo A402 Condl Stratos Pro A201 Condl

Transmitter Specific HART Command Specification

Device Type 0xD2 (A402 Condl) Device Revision: 5
Device Type 0xE4 (A201 Condl) Device Revision: 3

Document Revision 1.3

Knick Elektronische Messgeräte GmbH & Co. KG

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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 |

Version history

| | | |
|-------|---|--|
| 00-01 | Abgeleitet aus Dokument "StratosPro A211-A411 Condl HART CMD Spec 00-14.doc". Alle Änderungen am Dokument angenommen. | |
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Umwandlung dieses Dokuments von Knick zu Mettler

| | | |
|---|---|--|
| 1 | Cmd 135 Byte 1: Ausgeblendete MT Sensoren aktivieren, Knick-Sensoren ausblenden | |
| 2 | | |
| 3 | | |

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2 Common Tables Related to A402 Condl

2.1 Device Variable Code Tables

| Device Variable Code | Measurement Value | Units Code | Lower Limit | Upper Limit | Minimum Span | Damping |
|----------------------|--|------------|-------------|-------------|--------------|---------|
| 0 | Cond (This can be any of Device Variables 2 to 6 depending on the setting of the Channel parameter.) | | | | | |
| 1 | Temperature | 32 – °C | -50 | 200 | 0 | 0 |
| | | 33 – °F | -58 | 392 | 0 | 0 |
| 2 | Conductivity | 66 – mS/cm | 0 | 1999.9 | 0 | 0 |
| 3 | Concentration | 57 – % | 0 | 99.99 | 0 | 0 |
| 4 | Salinity | 246– o/oo | 0 | 45 | 0 | 0 |

| Device Variable Code | Device Variable | Device Variable Class | Device Variable Family |
|----------------------|-----------------|-----------------------|------------------------|
| 0 | Cond | 81 – Analytical | 250 – not used |
| 1 | Temperature | 64 – Temperature | 4 – Temperature |
| 2 | Conductivity | 81 – Analytical | 250 – not used |
| 3 | Concentration | 81 – Analytical | 250 – not used |
| 4 | Salinity | 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 |
| 246 | o/oo |

2.4 Device Specific Transfer Function Codes Table

| Transfer Function Code | Transfer Function |
|------------------------|-------------------|
| 0 | linear |
| 240 | logarithmic |

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 (=0xD2 for A402 Condl) |
| 3 | Unsigned-8 | Minimum Number of Preambles (=5) |
| 4 | Unsigned-8 | Universal Command Major Revision Number (=6) |
| 5 | Unsigned-8 | Device Revision Level |
| 6 | Unsigned-8 | Software Revision Level |
| 7 | Enum | Hardware Revision Level |
| 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 (=4, 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 |

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 (Coding see 2.1) |
| 3 | Enum | Quaternary Variable Classification (Coding see 2.1) |

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 0x80 – 0x40: 00 – Bad 01 – Poor 11 – Good 0x20 – 0x10: 00 - ok 01 - Low Limited 10 - High Limited 11 - Constant |
| 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 | =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 (Coding see 2.4) |
| 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 Process Too 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 Process Too 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) (Coding see 2.1) |

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 (Coding see Fehler! Verweisquelle konnte nicht gefunden werden.) |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---|
| 0 | Enum | Transfer Function Code (Coding see Fehler! Verweisquelle konnte nicht gefunden werden.) |

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 |

4.10 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 | Active Parameter Set: 0 – PARSET A 1 – PARSET B |
| 5 | Bits | State: 0x10 – Alarm 0x08 – Sensor Connected 0x02 – Product Calibration Step 2 Pending 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 |
|-------|------|------------------------|

Command-Specific Response Codes

| Code | Class | Description |
|------|---------|----------------------------|
| 0 | Success | No Command-Specific Errors |

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 (Coding see 2.1) |
| 3 | Unsigned-8 | Device Variable assigned to the Quaternary Variable (Coding see 2.1) |

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) (Coding see 2.1) |

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 | Invalid 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 |

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 (Coding see Fehler! erweisquelle konnte nicht gefunden werden.) |
| 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 (Coding see Fehler! erweisquelle konnte nicht gefunden werden.) |

Response Data Bytes

| Byte | Format | Description |
|------|------------|---|
| 0 | Unsigned-8 | Analog Channel Number Code (Coding see 2.2) |
| 1 | Enum | Analog Channel Transfer Function Code (Coding see Fehler! erweisquelle konnte nicht gefunden werden.) |

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 |

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 | Device type and options 1: 0x01 – 0= A201, 1= A402 0x02 – reserved 0x04 – 0= non Ex, 1= Ex 0x08 – 1= Option Secondary Loop Current activated 0x10 – reserved 0x20 – 1= Option Logbook activated 0x40 – 1= Option Current Input activated 0x80 – reserved |
| 1 | Bits | Device type and options 2: 0x01 – 1= Option Audit Trail activated 0x02 – 1= Option ISM activated |
| 2 | Unsigned-8 | Reserved |
| 3 | Unsigned-8 | Reserved |

Command-Specific Response Codes

| Code | Class | Description |
|------|---------|----------------------------|
| 0 | Success | No Command-Specific Errors |

5.2 Command 135 Read Sensor Information

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| 0 | Enum | (=0) |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|------|--------|---|---------------------------|
| 0 | Enum | (=0) | |
| 1 | Enum | Sensor Type: 0 – SE 655 1 – SE 656 2 – SE 660 3 – SE 670 4 – SE 680...K 5 – SE 680...M 9 – Memosens 6 – OTHER | SNS: |
| 2 | Enum | Meas Mode: 0 – Cond 1 – Conc [%] 2 – SAL [o/oo] | SNS: MEAS MODE |
| 3 | Enum | Meas Range (Meas Mode Cond only): 0 – 0.000 mS/cm 1 – 00.00 mS/cm 2 – 000.0 mS/cm 3 – 0000 mS/cm 4 – 0.000 S/m 5 – 00.00 S/m 6 – 000.0 μS/cm | SNS: MEAS RANGE |
| 4 | Enum | Solution (Meas ModeConc only): 0 – NaCl 1 – HCl (0-18%/-20°C – 0-18%/50°C) 2 – NaOH (0-13%/0°C – 0-24%/100°C) 3 – H2SO4 (0-26%/-17°C – 0-37%/110°C) 4 – HNO3 (0-30%/-20°C – 0-30%/50°C) 5 – H2SO4 (94-99%/-17°C – 89-99%/115°C) 6 – HCl (22-39%/-20°C – 22-39%/50°C) 7 – HNO3 (35-96%/-20°C – 35-96%/50°C) 8 – H2SO4 (28-88%/-17°C – 39-88%/115°C) 9 – NaOH (15-50%/0°C – 35-50%/100°C) 10 – Oleum (A402 only) | SNS: SOLUTION |
| 5 | Enum | Temperature Unit: 32 – °C 33 – °F | SNS: TEMP UNIT |
| 6 | Enum | Temperature Meas Mode: 0 – AUTO 1 – MAN 2 – EXT | SNS: TEMPERATURE |
| 7-10 | Float | Manual Temperature Value | SNS: TEMP MAN |
| 11 | Enum | CIP Count: 0 – OFF 1 – ON | SNS: CIP COUNT |
| 12 | Enum | SIP Count: 0 – OFF 1 – ON | SNS: SIP COUNT |

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 |
|------|--------|---------------------------------|
| 0-26 | | Same as Response of Command 135 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-26 | | 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 Sensor OTHER Information

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| 0 | Enum | (=0) |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|------|--------|--|---------------------------|
| 0 | Enum | (=0) | |
| 1 | Enum | RTD Type: 0 - PT100 1 - PT1000 5 - NTC30K | SNS: RTD TYPE |
| 2-5 | Float | Cellfactor [1/cm] | SNS: CELLFACTOR |
| 6-9 | Float | Transfer Ratio | SNS: TRANS RATIO |

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 Sensor OTHER Information

Request Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0 | Enum | Same as Response of Command 137 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0 | Enum | 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 |
| 16 | Error | Access Restricted |

5.6 Command 139 Read Dynamic Variable Assignments

Request Data Bytes

| Byte | Format | Description |
|------|--------|---|
| 0 | Enum | Parset selection: 0 – Parset A 1 – Parset B |

Response Data Bytes

| Byte | Format | Description |
|------|------------|--|
| 0 | Enum | Parset selection (Coding see Request) |
| 1 | Unsigned-8 | Device Variable assigned to the primary variable (Coding see 2.1) |
| 2 | Unsigned-8 | Device Variable assigned to the secondary variable (Coding see 2.1) |
| 3 | Unsigned-8 | Device Variable assigned to the tertiary variable (Coding see 2.1) |
| 4 | Unsigned-8 | Device variable assigned to the quaternary variable (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 |

5.7 Command 147 Read OUT1/OUT2

Request Data Bytes

| Byte | Format | Description |
|------|--------|--|
| 0 | Enum | Parset and analog channel selection: 0 – OUT1, Parset A 1 – OUT1, Parset B 2 – OUT2, Parset A 3 – OUT2, Parset B |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|-------|--------|---|---------------------------|
| 0 | Enum | Parset and analog channel selection (Coding see Request) | |
| 1 | Enum | Channel: 0 – Conductivity (COND) 1 – Temperature (TMP) | OT1/2: CHANNEL |
| 2 | Enum | Output Range: 0 – 0-20mA 1 – 4-20mA | OT1/2: RANGE |
| 3 | Enum | Output: 0 – linear (LIN) 1 – logarithmic (LOG) | |
| 4-7 | Float | BEGIN Value for Output = LIN | OT1/2: BEGIN |
| 8-11 | Float | END Value for Output = LIN | OT1/2: END |
| 12 | Enum | BEGIN Value for Output = LOG (Meas Mode Cond only): For S/cm: 0 – 0.001 mS/cm 1 – 0.01 mS/cm 2 – 0.1 mS/cm 3 – 1.0 mS/cm 4 – 10.0 mS/cm 5 – 100.0 mS/cm 6 – 1000 mS/cm For S/m: 7 – 0.001 S/m 8 – 0.01 S/m 9 – 0.1 S/m 10 – 1.0 S/m 11 – 10.0 S/m 12 – 100 S/m | OT1/2: BEGIN |
| 13 | Enum | END Value for Output = LOG Coding see BEGIN Value for Output = LOG | OT1/2: END |
| 14-17 | Float | Filtertime [s] | OT1/2: FILTERTIME |
| 18 | Enum | 22mA-Fail: 0 – OFF 1 – ON | OT1/2: 22mA-FAIL |
| 19 | Enum | Hold Mode: 1 – FIX 2 – LAST | OT1/2: HOLD MODE |
| 20-23 | Float | Hold Fix | OT1/2: HOLD FIX |
| 24-27 | Float | Corner X for Output = BI LIN | OT1/2: CORNER X |
| 28-31 | Float | Corner Y for Output = BI LIN | OT1/2: CORNER Y |
| 32 | 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 |

5.8 Command 148 Write OUT1/OUT2

Request Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-32 | | Same as Response of Command 147 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-32 | | 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 |

5.9 Command 157 Read Correction

Request Data Bytes

| Byte | Format | Description |
|------|--------|---|
| 0 | Enum | Parset selection: 0 – Parset A 1 – Parset B |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|-------|--------|---|---------------------------|
| 0 | Enum | Parset selection (Coding see Request) | |
| 1 | Enum | Temperature Compensation Type: 0 – OFF 1 – LIN 2 – NLF 3 – NaCL 4 – HCL 5 – NH3 6 – NaOH | COR: TC SELECT |
| 2-5 | Float | TC Liquid [%/K] | COR: TC LIQUID |
| 6 | Enum | Input Type: 0 – 0-20mA 1 – 4-20mA | COR: I-INPUT |
| 7-10 | Float | Input Begin Temperature Value (in the active temperature unit) | COR: BEGIN |
| 11-14 | Float | Input End Temperature Value (in the active temperature unit) | COR: END |
| 15-18 | Float | Reference Temperature (if compensation = LIN) Value (in the active temperature unit) | COR: 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 |

5.10 Command 158 Write Correction

Request Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-14 | | Same as Response of Command 157 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-14 | | Same as Response of Command 157 |

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 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 – PARSET 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 |

5.12 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 |

5.13 Command 161 Read Alarm

Request Data Bytes

| Byte | Format | Description |
|------|--------|---|
| 0 | Enum | Parset selection: 0 – Parset A 1 – Parset B |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|-------|--------|--|---------------------------|
| 0 | Enum | Parset selection (Coding see Request) | |
| 1-4 | Float | Delay Time [s] | ALA: DELAYTIME |
| 5 | Enum | Sensocheck: 0 – OFF 1 – ON | ALA: SENSOCHECK |
| 6 | Enum | Flow Control: 0 – OFF 1 – ON | ALA: FLOW CONTR |
| 7-10 | Float | Flow Min [l/h] | ALA: FLOW MIN |
| 11-14 | Float | Flow Max [l/h] | ALA: FLOW MAX |
| 15 | Enum | Temperature Check 0 – OFF 1 – ON | ALA: TEMP CHECK |

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 162 Write Alarm

Request Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-15 | | Same as Response of Command 161 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-15 | | 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 |

5.15 Command 163 Read Relais

Request Data Bytes

| Byte | Format | Description |
|------|--------|---|
| 0 | Enum | Parset selection: 0 – Parset A 1 – Parset B |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|------|--------|--|---------------------------|
| 0 | Enum | Parset selection (Coding see Request) | |
| 1 | Enum | Relais Mode: 0 – Limits 1 – Controller | REL: |

Command-Specific Response Codes

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

5.16 Command 164 Write Relais

Request Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-1 | | Same as Response of Command 163 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-1 | | Same as Response of Command 163 |

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 |
| 16 | Error | Access Restricted |

5.17 Command 165 Read Limits

Request Data Bytes

| Byte | Format | Description |
|------|--------|--|
| 0 | Enum | Relais and parset selection: 0 – Rel1, Parset A 1 – Rel1, Parset B 2 – Rel2, Parset A 3 – Rel2, Parset B |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|-------|--------|--|---------------------------|
| 0 | Enum | Relais and parset selection (Coding see Request) | |
| 1 | Enum | Channel: 0 – Cond 1 – Temperature | RL1/2: CHANNEL |
| 2 | Enum | Function: 0 – Low Level 1 – High Level | RL1/2: FUNCTION |
| 3 | Enum | Contact Type: 0 – N/O 1 – N/C | RL1/2: CONTACT |
| 4-7 | Float | Level | RL1/2: LEVEL |
| 8-11 | Float | Hysteresis | RL1/2: HYSTERESIS |
| 12-15 | Float | Delay Time [s] | RL1/2: 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 |

5.18 Command 166 Write Limits

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 |

5.19 Command 167 Read Controller

Request Data Bytes

| Byte | Format | Description |
|------|--------|---|
| 0 | Enum | Parset selection: 0 – Parset A 1 – Parset B |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|-------|--------|---|---------------------------|
| 0 | Enum | Parset selection (Coding see Request) | |
| 1 | Enum | Channel: 0 – Conductivity (COND) 1 – Temperature (TMP) | CTR: CHANNEL |
| 2 | Enum | Controller Type: 0 – Pulse Length (PLC) 1 – Pulse Frequency (PFC) | CTR: TYPE |
| 3-6 | Float | Pulse Length [s] | CTR: PULSE LEN |
| 7-10 | Float | Pulse Frequency [1/min] | CTR: PULSE FREQ |
| 11-14 | Float | Set Point | CTR: SETPOINT |
| 15-18 | Float | Dead Band | CTR: DEAD BAND |
| 19-22 | Float | P Gain [%] | CTR: P-GAIN |
| 23-26 | Float | I Time [s] | CTR: I-TIME |
| 27-30 | Float | D Time [s] | CTR: D-TIME |
| 31 | Enum | Hold Mode: 0 – Y OFF 3 – Y LAST | CTR: HOLD MODE |

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 168 Write Controller

Request Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-31 | | Same as Response of Command 167 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-31 | | Same as Response of Command 167 |

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 |

5.21 Command 171 Read Wash

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| | | None |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|-------|--------|-------------------------------------|---------------------------|
| 0 | Enum | Mode: 0 – Wash 1 – Parset A/B | WSH: |
| 1-4 | Float | Wash Cycle [h] | WSH: WASH CYCLE |
| 5-8 | Float | Wash Time [s] | WSH: WASH TIME |
| 9 | Enum | Contact Type: 0 – N/O 1 – N/C | WSH: CONTACT |
| 10-13 | Float | Wash Relax Time [s] | WSH: RELAX TIME |

Command-Specific Response Codes

| Code | Class | Description |
|------|---------|----------------------------|
| 0 | Success | No Command-Specific Errors |

5.22 Command 172 Write Wash

Request Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-13 | | Same as Response of Command 171 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-13 | | Same as Response of Command 171 |

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 |

5.23 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 |

5.24 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 |

5.25 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 Flags: 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 |

5.26 Command 176 Store Actual Process Value

Command 176 takes a sample of the actual process value and stores it for later correction. This is step 1 of the product calibration.

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| 0 | Enum | (=0) |

Response Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| 0 | Enum | (=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 |
| 16 | Error | Access Restricted |

5.27 Command 177 Read Stored Process Value

Reads the process value stored with Command 176. It returns NaN (not a number) if no value has been stored.

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| 0 | Enum | (=0) |

Response Data Bytes

| Byte | Format | Description |
|------|--------|--------------------------|
| 0 | Enum | (=0) |
| 1 | Enum | Unit Code: 66 – mS/cm |
| 2-5 | Float | Stored value or NaN |

Command-Specific Response Codes

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

5.28 Command 178 Write Calibration Reference Value

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------------------|
| 0 | Enum | (=0) |
| 1 | Enum | (=0) |
| 2-5 | Float | Reference value [mS/cm] |

Response Data Bytes

| Byte | Format | Description |
|------|--------|-------------------------|
| 0 | Enum | (=0) |
| 1-4 | Float | Reference value [mS/cm] |

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 |

5.29 Command 179 Read Cell Factor and Zero Value

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| 0 | Enum | (=0) |

Response Data Bytes

| Byte | Format | Description |
|------|------------|---|
| 0 | Enum | (=0) |
| 1 | Unsigned-8 | Result of the last calibration (manual or via HART), 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 |
| 7 | Unsigned-8 | Zero Value Unit Code (=56, uS) |
| 8-11 | Float | Zero 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 |

5.30 Command 180 Write Active Parset

The parameter set can only be switched in Parset Mode MAN (see Command 181).

Request Data Bytes

| Byte | Format | Description |
|------|--------|---|
| 0 | Enum | Parset selection: 0 – Parset A 1 – Parset B |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------------|
| 0 | Enum | Parset selection (Coding see Request) |

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 |

5.31 Command 181 Read Parset Mode

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| | | none |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|------|--------|--|---------------------------|
| 0 | Enum | Parset Mode: 0 – CNTR Input 1 – MAN 2 – FIX A | PAR: |

Command-Specific Response Codes

| Code | Class | Description |
|------|---------|----------------------------|
| 0 | Success | No Command-Specific Errors |

5.32 Command 182 Write Parset Mode

Request Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0 | | Same as Response of Command 181 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0 | | Same as Response of Command 181 |

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 |
| 16 | Error | Access Restricted |

5.33 Command 183 Read Device Tag

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| | | None |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|------|---------|-------------|---------------------------|
| 0-31 | Latin-1 | Device Tag | TAG: |

Command-Specific Response Codes

| Code | Class | Description |
|------|---------|----------------------------|
| 0 | Success | No Command-Specific Errors |

5.34 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 |
| 16 | Error | Access Restricted |

5.35 Command 185 Read Sensor Identification

Request Data Bytes

| Byte | Format | Description |
|------|--------|--|
| 0 | Enum | Info Request Selector: 0 – Sensortype 1 – Manufacturer 2 – Sensorname 3 – Serialnumber 4 – Date of latest calibration |

Response Data Bytes

| Byte | Format | Description |
|------|---------|---|
| 0 | Enum | Info Request Selector (Coding see Request) |
| 1 | Enum | Sensor Connection State: 0 – disconnected 1 – connected |
| 2-19 | 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 |

5.36 Command 186 Read Unit Code

Request Data Bytes

| Byte | Format | Description |
|------|--------|--|
| 0 | Enum | Parset and analog channel selection: 0 – OUT1, Parset A 1 – OUT1, Parset B 2 – OUT2, Parset A 3 – OUT2, Parset B |

Response Data Bytes

| Byte | Format | Description |
|------|------------|--|
| 0 | Enum | Parset and analog channel selection (Coding see Request) |
| 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 |

5.37 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 15 – Device: Type 16 – Device: Bootloader Software Version 17 – Meas Unit: Bootloader Software Version |

Response Data Bytes

| Byte | Format | Description |
|------|------------|--|
| 0 | Unsigned-8 | Info Request Selector (Coding see Request) |
| 1-21 | 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 |

5.38 Command 188 Read Calibration Values

Request Data Bytes

| Byte | Format | Description |
|------|--------|--|
| 0 | Enum | Info Request Selector: 0 – Cell Factor [1/cm] 1 – Zero [uS] 2 – Installation Factor |

Response Data Bytes

| Byte | Format | Description |
|------|--------|--|
| 0 | Enum | Info Request Selector (Coding see Request) |
| 1 | Enum | Unit Codes: 244 – 1/cm 56 – uS 251 – none |
| 2-5 | Float | Calibration 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 |

5.39 Command 189 Read Process Values

Request Data Bytes

| Byte | Format | Description |
|------|------------|---|
| 0 | Unsigned-8 | Info Request Selector: 0 – Resistance of Temperature Sensor [Ohm] 1 – Temperature [°C] or [°F] 2 – Conductance [uS] 3 – Conductivity temp. comp. [mS/cm] 4 – Current Input [mA] 5 – Resistance of Conductivity Sensor [Ohm] |

Response Data Bytes

| Byte | Format | Description |
|------|------------|---|
| 0 | Unsigned-8 | Info Request Selector (Coding see Request) |
| 1 | Enum | Unit Codes: 32 – °C 33 – °F 37 – Ohm 56 – uS 39 – mA 66 – mS/cm |
| 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 |

5.40 Command 190 Read Digital Sensor Information

Request Data Bytes

| Byte | Format | Description |
|------|------------|---|
| 0 | Unsigned-8 | Value Request Selector: 0 – CIP counter 1 – SIP counter |

Response Data Bytes

| Byte | Format | Description |
|------|------------|---|
| 0 | Unsigned-8 | Value Request Selector (Coding see Request) |
| 1 | Enum | Unit Codes: 53 – d 52 – h 57 – % 251 – none |
| 2-5 | Float | Requested 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 |

5.41 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 |

5.42 Command 192 Read Product Calibration Success

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| 0 | Enum | (=0) |

Response Data Bytes

| Byte | Format | Description |
|------|------------|--|
| 0 | Enum | (=0) |
| 1 | Unsigned-8 | Result of Latest Product Calibration done via HART 0 – Success 1 – Fail 2 – Busy (result not yet available) |

Command-Specific Response Codes

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

5.43 Command 193 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 |

5.1 Command 202 Read Device Group

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| | | None |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|------|-------------|------------------------|---------------------------|
| 0-1 | Unsigned-16 | Group number (0..9999) | TAG: GROUP |

Command-Specific Response Codes

| Code | Class | Description |
|------|---------|----------------------------|
| 0 | Success | No Command-Specific Errors |

5.2 Command 203 Write Device Group

Request Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-1 | | Same as Response of Command 202 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-1 | | Same as Response of Command 202 |

Command-Specific Response Codes

| Code | Class | Description |
|------|---------|-------------------------------|
| 0 | Success | No Command-Specific Errors |
| 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 204 Read Sensor Verification

Request Data Bytes

| Byte | Format | Description |
|------|--------|-------------|
| 0 | Enum | (=0) |

Response Data Bytes

| Byte | Format | Description | Parameter Name on Display |
|------|--------|--|---------------------------|
| 0 | Enum | (=0) | |
| 1 | Enum | Sensor verification TAG-Mode: 0 – on 1 – off | SNS: CHECK TAG |
| 2 | Enum | Sensor verification Group-Mode: 0 – on 1 – off | SNS: CHECK GROUP |

Command-Specific Response Codes

| Code | Class | Description |
|------|---------|----------------------------|
| 0 | Success | No Command-Specific Errors |

5.2 Command 205 Write Sensor Verification

Request Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-2 | | Same as Response of Command 204 |

Response Data Bytes

| Byte | Format | Description |
|------|--------|---------------------------------|
| 0-2 | | Same as Response of Command 204 |

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 |
| 16 | Error | Access Restricted |