O_2 Transmitter 4100 e/2(X)H
Transmitter-Specific Command Specification

68006

using the HART® Communications Protocol

O_2 Transmitter 4100 e/2(X)H

Revision 1.0

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1. Reference Documents:

Document Title	Revision	Document Number
HART® - FSK Physical Layer Specification	8.0	HCF_SPEC-54
HART® - Data Link Layer Specification	7.1	HCF_SPEC-81
HART® - Command Summary Specification	7.1	HCF_SPEC-99
HART® - Universal Command Specification	5.2	HCF_SPEC-127
HART® - Common Practice Command Specification	7.1	HCF_SPEC-151
HART® - Common Tables	9.0	HCF_SPEC-183
Appendix 1 - Command Specific Response Code Definitions	4.1	HCF_SPEC-307
Application Layer Guideline on HART Status Information	1.0	HCF_LIT-5

2. Expanded Device Type Code:

Manufacturer Identification Code:	Mettler	142
Manufacturer's Device Type Code:	O_2 4100 e/2(X)H	121

3. Physical Layer Information:

Field Device Category	Transmitter Type A	(Sink direct current and receive operating power from the Network)
Capacitance Number (CN)	2	(approx. 2 x 5000 pF)

4. Conformance and Command Class Summary

CONFORMANCE CLASS #1

- UNIVERSAL

0 Read Unique Identifier
1 Read Primary Variable

CONFORMANCE CLASS #1A

- UNIVERSAL

0 Read Unique Identifier
2 Read P. V. Current and Percent of Range

CONFORMANCE CLASS #2

- UNIVERSAL

11 Read Unique Identifier Associated with Tag
12 Read Message
13 Read Tag, Descriptor, Date
14 Read Primary Variable Sensor Information
15 Read Primary Variable Output Information
16 Read Final Assembly Number

CONFORMANCE CLASS #3

- UNIVERSAL

3 Read Dynamic Variables and P. V. Current

- COMMON-PRACTICE

48 Read Additional Transmitter Status
54 Read Transmitter Variable Information

CONFORMANCE CLASS #4

-COMMON-PRACTICE

35 Write Primary Variable Range Values
36 Set Primary Variable Upper Range Value
37 Set Primary Variable Lower Range Value
38 Reset Configuration Changed Flag
40 Enter/Exit Fixed Primary Variable Current Mode
41 Perform Transmitter Self Test
42 Perform Master Reset

CONFORMANCE CLASS #5

- UNIVERSAL

6 Write Polling Address
17 Write Message
18 Write Tag, Descriptor, Date
19 Write Final Assembly Number

- COMMON-PRACTICE

59 Write Number of Response Preambles

- TRANSMITTER-SPECIFIC

128 Read One Transmitter-Specific Variable
129 Write One Transmitter-Specific Variable

5. Additional Response Code Information

FIRST BYTE

5.1 **BUSY**
Response Code #32

The Busy Response Code is implemented for Commands #6, #18, #35, #36, #37, #42, #59 and #129. A confirming response is made before execution begins. The Busy Response Code is returned when a command is received during the execution.

SECOND BYTE

5.2 **FIELD DEVICE MALFUNCTION**
Bit #7

Malfunctions detected by the transmitter:
◊ CRC-Error in internal Configuration Data of the transmitter.
◊ After Reset or Power up
(See HCF_LIT-5: Application Layer Guideline on HART Status Information)

5.3 **CONFIGURATION CHANGED**
Bit #6

When the Parameter Setting Data changed, this Bit will be set. The Command #38 resets the Flag.

5.4 **MORE STATUS AVAILABLE**
Bit #4

This Bit is set if more status information can be read with Command #48.

5.5 **PRIMARY VARIABLE ANALOG OUTPUT FIXED**
Bit #3

This bit is set if output current 1 has been frozen by corresponding operation at the transmitter or if the output has been fixed via HART with the Command #40 or in the case of reset or power failure during start-up.

5.6 **PRIMARY VARIABLE ANALOG OUTPUT SATURATED**
Bit #2

This flag is set whenever the Primary Variable Analog Output saturates below 3.8 milliamperes and above 20.5 milliamperes.

5.7 **NON-PRIMARY VARIABLE OUT OF LIMITS**
Bit #1

This flag is set whenever the Non-Primary Variable exceeds the transmitter operating limits. Command #48, Read Additional Transmitter Status, provides additional information.

5.8 **PRIMARY VARIABLE OUT OF LIMITS**
Bit #0

This flag is set whenever the Primary Variable exceeds the Sensor Limits returned with Command #14, Read Primary Variable Sensor Information.

6. General Transmitter Information

6.1 DAMPING IMPLEMENTATION

The O_2 4100 e/2(X)H transmitter has a fixed damping value.

6.2 NONVOLATILE MEMORY DATA STORAGE

The Flags Byte of Command #0 referenced in the Universal Command Specification document, will have Bit #1 (Command #39, EEPROM Control, Required) set to 0, indicating that all data sent to the transmitter will be saved automatically in the nonvolatile memory upon receipt of the Write or Set Command. Command #39, EEPROM Control, is not implemented.

6.3 MULTIDROP OPERATION

This revision of the O_2 4100 e/2(X)H supports Multidrop Operation.

6.4 BURST MODE

This revision of the O_2 4100 e/2(X)H does **not** support Burst Mode.

6.5 UNIT CONVERSIONS

All temperatures are based of degrees Celsius or degrees Fahrenheit. The temperature unit is selected with transmitter-specific variable 10, Byte 1. Command #129, Write One Transmitter-Specific Variable, can write this Byte.

7. Additional Common-Practice Command Specification

The O_2 4100 e/2(X)H implements a subset of the Common-Practice Commands specified in the Common-Practice Command Specification document. This section contains information pertaining to those commands that require clarification.

7.1 COMMAND #35 WRITE PRIMARY VARIABLE RANGE VALUES

The Primary Variable Range Unit Code accepted by this transmitter is only the current Unit Code for the Primary Variable.

7.2 COMMAND #41 PERFORM TRANSMITTER SELF TEST

The Transmitter Self Test (Device Diagnostics) starts immediately after execution of this command. The transmitter display shows the test progress. No measurement at the execution of Selftest. A Display test, RAM test, EPROM test (internal program) and EEPROM test (parameter memory, transmitter calibration data) are performed. The test takes about 20 seconds.
The result can then be retrieved with Command #48, Read Additional Transmitter Status.

7.3 COMMAND #48 READ ADDITIONAL TRANSMITTER STATUS

This Command returns the Global Device Status, the Function Mode, Alarms and Errors, the results of a Transmitter Self Test and other transmitter information.

Byte **#0** Error Status

Bit 0.0	-	Saturation value	Err 01
Bit 0.1	-	Concentration value	Err 02
Bit 0.2	-	Temperature value	Err 03
Bit 0.3	-	Current output < 3.8 mA	Err 11
Bit 0.4	-	Current output > 20.5 mA	Err 12
Bit 0.5	-	Current output span	Err 13
Bit 0.6	-	Configuration data	Err 98
Bit 0.7	-	Transmitter calibration data	Err 99

Byte **#1** Smiley ☺ Status

Bit 1.0	-	Cell response time (= 300 sec)
Bit 1.1	-	Cal timer $\geq$ 80 %
Bit 1.2	-	Undefined
Bit 1.3	-	Undefined
Bit 1.4	-	Undefined
Bit 1.5	-	Zeropoint
Bit 1.6	-	Slope
Bit 1.7	-	Undefined

Byte **#2** Smiley Status

Bit 2.0	-	Cell response time (= 600 sec)
Bit 2.1	-	Cal timer $\geq$ 100 %
Bit 2.2	-	SensoCheck® (Err 33)
Bit 2.3	-	Undefined
Bit 2.4	-	Undefined
Bit 2.5	-	Zeropoint
Bit 2.6	-	Slope
Bit 2.7	-	Temperature O_2-Conc/SAT

Byte **#3 to 5** Undefined

Byte **#6** Operating Mode #1 (Refer to Common Table XIV)
Byte **#7** Operating Mode #2 (Refer to Common Table XIV)

Byte **#8** Analog Output Saturated

Bit 8.0	-	Analog Output saturated
Bit 8.1 to 7	-	Undefined

Byte **#9** Bit 9.0 to 7 - Undefined
Byte **#10** Bit 10.0 to 7 - Undefined

Byte **#11** Analog Output Fixed

Bit 11.0	-	Analog Output fixed
Bit 11.1 to 7	-	Undefined

Byte **#12** Bit 12.0 to 7 - Undefined
Byte **#13** Bit 13.0 to 7 - Undefined

Byte **#14 to 23** Undefined

Byte #**24** Transmitter Mode

Bit 24.0	-	*Configuration*
Bit 24.1	-	*Calibration*
Bit 24.3	-	*Samle was taken*

8. TRANSMITTER-SPECIFIC COMMANDS

8.1 COMMAND #128 READ ONE TRANSMITTER-SPECIFIC VARIABLE

REQUEST DATA BYTES

DATA BYTES	#0
	XMTR VAR CODE

Data Byte #0 : Transmitter Variable, 8-bit unsigned integer, Refer to Transmitter Variable Code Table 9.2.

RESPONSE DATA BYTES

DATA BYTES	#0	#1		
	XMTR VAR CODE	UNITS		
	#2	#3	#4	#5
	DATA MSB			DATA LSB

Data Byte #0 : Transmitter Variable, 8-bit unsigned integer, Refer to Transmitter Variable Code Table 9.2.

Data Byte #1 : Units Code, 8-bit unsigned integer, Refer to Table II; Unit Codes

Data Byte #2 - #5 : Data for selected Transmitter Variable, IEEE 754 or selection data in 4 single bytes, Refer to Transmitter Variable Code Table 9.2.

COMMAND-SPECIFIC RESPONSE CODES

0	No Command-Specific Errors
1	Undefined
2	Invalid Selection
3 - 4	Undefined
5	Too Few Data Bytes Received
6 - 15	Undefined
16	Access Restricted
17 - 127	Undefined

8.2 COMMAND #129 WRITE ONE TRANSMITTER-SPECIFIC VARIABLE

REQUEST DATA BYTES

DATA BYTES	#0	#1		
	XMTR VAR CODE	UNITS		
	#2	#3	#4	#5
	DATA MSB			DATA LSB

Data Byte #0 : Transmitter Variable, 8-bit unsigned integer, Refer to Transmitter Variable Code Table 9.2.

Data Byte #1 : Units Code, 8-bit unsigned integer, Refer to Table II; Unit Codes

Data Byte #2 - #5 : Data for selected Transmitter Variable, IEEE 754 or selection data in 4 single bytes, Refer to Transmitter Variable Code Table 9.2.

RESPONSE DATA BYTES

DATA BYTES	#0	#1		
	XMTR VAR CODE	UNITS		
	#2	#3	#4	#5
	DATA MSB			DATA LSB

Data Byte #0 : Transmitter Variable, 8-bit unsigned integer, Refer to Transmitter Variable Code Table 9.2.

Data Byte #1 : Units Code, 8-bit unsigned integer, Refer to Table II; Unit Codes

Data Byte #2 - #5 : Data for selected Transmitter Variable, IEEE 754 or selection data in 4 single bytes, Refer to Transmitter Variable Code Table 9.2.

COMMAND-SPECIFIC RESPONSE CODES

0	No Command-Specific Errors
1	Undefined
2	Invalid Selection
3	Passed Parameter too Large
4	Passed Parameter too Small
5	Too Few Data Bytes Received
6	Undefined
7	In Write Protect Mode
8 - 11	Undefined
12	Invalid Units Code
13 - 15	Undefined
16	Access Restricted
17 - 127	Undefined

9. TRANSMITTER-SPECIFIC TABLES

Refer to the Common Tables Document for all references in this section to 'Subset of Table'.

9.1 USED COMMON UNIT CODES

Subset of Table II, Unit Codes

6 - psi
8 - mbar
12 - kPa
32 - °C
33 - °F
36 - mV
39 - mA
51 - sec
52 - h
57 - %
97 - g/l
139 - ppm
146 - µg/l
169 - ppb

9.2 TRANSMITTER VARIABLE CODES

Var.No.	Description	Unit	Access	Lower Limit	Upper Limit	Note
0	Saturation value	% %	Read	0.0 0.0	500.0 120.0	 only at GAS
1	Concentration value	g/l ppm ppb µg/l ppm	Read	0.0000 0.0 0.0 0.0 0.0	0.0500 50.0 9999 9999 9999	 only at GAS
2	Temperature value	°C °F	Read	-20.0°C -4°F	150.0°C 302°F	
3	Input Current	mA	Read	0.0E-6	999.9E-6	Range is 0.0nA to 999.9nA
4 to 7	*Undefined*					
8	mA output current	mA	Read	3.8	22.0	
9	Percent value of output current	%	Read	0.0	112.5	
10	Inputs 10.0 Primary variable 10.1 meas function 10.2 Sensortyp 10.3 Pressure unit		R/W			Selections bytewise, see table 9.3
11	Pressure (meas)	mbar	R/W	0	9999	
12	Pressure (cal)	mbar	R/W	0	9999	
13	Output current, lower range value (4 mA)	% g/l ppm µg/l ppb % ppm	R/W	0.0 0.0000 0.0 0.0 0.0 0.0 0.0	500.0 0.0500 50.0 9999 9999 120.0 9999	same Unit as Primary variable only at GAS only at GAS
14	Output current, upper range value (20 mA)	% g/l ppm µg/l ppb % ppm	R/W	0.0 0.0000 0.0 0.0 0.0 0.0 0.0	500.0 0.0500 50.0 9999 9999 120.0 9999	same Unit as Primary variable only at GAS only at GAS
15	Calibration 15.0 Cal Mode 15.1 SensoCheck 15.2 *Undefined* 15.3 *Undefined*		R/W			Selections bytewise, see table 9.4

Var.No.	Description	Unit	Access	Lower Limit	Upper Limit	Note
16	Electrode Slope	mA	R/W	30.0 E-6	110.0 E-6	Range is 30.0nA to 110.0nA
17	Cal Timer	h	R/W	0	9999	
18	Electrode Zero	mA	R/W	-2.0E-6	2.0E-6	
20	Salinity	None	R/W	0.00	45.00	Unit: g/kg
21	Relative Humidity (rH)	%	Read	0	100	
22	Output 22.0 22mA on Error 22.1 HOLD Last/Fix 22.2 *Undefined* 22.3 *Undefined*		R/W			Selections bytewise, see table 9.5
23	Hold-Fix value	mA	R/W	3.8	22.0	
24	24.0 Temperatur 24.1 Sensor 24.2 *Undefined* 24.3 *Undefined*		R/W			Selection bytewise, see table 9.6
25-28	*Undefined*					
29	polarisation voltage	mV	R/W	400.0	1000.0	
30	sample calibration (Step 2)		R/W	-1999	9999	Laborvalue
31	time constant of output filter	sec	R/W	0.0	120.0	Filtertime
32	Alarm delay	sec	R/W	0.0	600.0	
33	33.0 Alarm LED mode	/	R/W	-	-	Selections bytewise, see table 9.7
34-249	*Undefined*					
250	Not Used					
251-255	*Reserved*					

9.3 INPUT SELECTION CODE

Usage of bytes for input selections in Transmitter-Specific Variable 10

Byte	Description	Selections		Note
10.0	meas function	0 - DO 1 - GAS 2-255 - *Undefined*		valid also for output current upper and lower range values
10.1	Primary variable	Für DO 0 - % 1 - µg/l 2 - g/l 3 - ppb 4 - ppm 5-255 Undefined	Für GAS 0 - % 1 - ppm 2-255 undefined	
10.2	Sensortyp	0 - Typ A 1 - Typ B 2-255 - *Undefined*		
10.3	Pressure Unit	0 - bar 1 - kPa 2 - psi 2-255 - *Undefined*		

9.4 CALIBRATION SELECTION CODE

Usage of bytes for calibration selections in Transmitter-Specific Variable 15

Byte	Description	Selections	Note
15.0	Calibration mode	0 - Saturation 1 - Concentration 2-255 - *Undefined*	
15.1	SensoCheck	0 - Off 1 - On 2-255 - *Undefined*	
15.2	*Undefined*		
15.3	*Undefined*		

9.5 OUTPUT SELECTION CODE

Usage of bytes for output selections in Transmitter-Specific Variable 22

Byte	Description	Selections	Note
22.0	22 mA on Error	0 - Off 1 - On 2-255 - *Undefined*	
22.1	HOLD Last / Fix	0 - Last value 1 - Fixed current 2-255 - *Undefined*	
22.2	*Undefined*		
22.3	*Undefined*		

9.6 TEMPERATURE SELECTION CODE

Usage of bytes for Temperatur selections in Transmitter-Specific Variable 24

Byte	Description	Selections	Note
24.0	Temperatur	0 - °C 1 - °F 2-255 - *Undefined*	
24.1	Temperature-Sensor	0 - NTC 22k 1 - NTC 30k 2-255 - *Undefined*	
24.2	*Undefined*		
24.3	*Undefined*		

9.7 EXTENDED SELECTION CODE

Usage of bytes for output selections in Transmitter-Specific Variable 33

Byte	Description	Selections	Note
33.0	Alarm LED Mode	0 - Off 1 - On 2-255 - *Undefined*	
33.1	*Undefined*		
33.2	*Undefined*		
33.3	*Undefined*		

10 RELEASE NOTES

10.1 Preliminary Release

Universal Commands:

Command #0 - Read Unique Identifier

Request Data Bytes	None	
Response Datas	#0 - 254	
	#1 - Manufacturer Id = 142	*(Mettler)*
	#2 - Manufacturer Device Type = 121	*(O_2 4100 e/2(X)H)*
	#3 - Number of Preambles	
	#4 - Univ Cmd Rev	
	#5 - Trans Spec Rev	
	#6 - Soft Rev	*(10 for Version 1.0)*
	#7 - Hard Rev (See Universal Command Spec. Cmd #0)	
	#8 - Flags	
	#9 to #11 - Device Id Number (24-bit unsigned int)	
Response Codes	#0 - No Command-Specific Errors	

Command #1 - Read Primary Variable

Request Data Bytes	None	
Response Data Bytes	#0 - PV Units Code (See Common Table II)	(Spec.Var. 10.0)
	#1 to #4 - Primary Variable	(Spec.Var. 0 or 1)
Response Codes	#0 - No Command-Specific Errors	

Command #2 - Read P.V. Current and Percent of Range

Request Data Bytes	None	
Response Data Bytes	#0 to #3 - P.V. Current [mA]	*(Spec.Var. 8)*
	#4 to #7 - P.V. Percent of Range [%]	*(Spec.Var. 9)*
Response Codes	#0 - No Command-Specific Errors	

Command #3 - Read Dynamic Variables and P.V. Current

Request Data Bytes	None	
Response Data Bytes	#0 to #3 - P.V. Current [mA]	
	#4 - P.V. Units Code (See Common Table II)	*(Spec.Var. 10.0)*
	#5 to #8 - Primary Variable	*(Spec.Var. 0 or 1)*
	#9 - S.V. Units Code	
	#10 to #13 - Secondary Variable	*(Spec.Var. 2)*
Response Codes	#0 - No Command-Specific Errors	
Note	- Data String trancates after last variable supported	

Command #6 - Write Polling Address

Request Data Bytes	#0 - Polling Address of Device	
Response Data Bytes	#0 - Polling Address of Device	
Response Codes	#0 - No Command-Specific Errors	
	#2 - Invalid Selection	*(Address > 15)*
	#5 - Too Few Data Bytes Received	
	#32 - Busy	

Command #11 - Read Unique Identifier associated with Tag

Request Data Bytes	#0 to #5	- Tag (6 Byte Packed-ASCII = 8 Char.)
Response Data Bytes	#0	- 254
	#1	- Manufacturer Id = 142 *(Mettler)*
	#2	- Manufacturer Device Type = 121 *(O_2 4100 e/2(X)H)*
	#3	- Number of Preambles
	#4	- Univ Cmd Rev
	#5	- Trans Spec Rev
	#6	- Soft Rev *(10 for Version 1.0)*
	#7	- Hard Rev (See Universal Command Spec. Cmd #0)
	#8	- Flags
	#9 to #11	- Device Id Number (24-bit unsigned int)
Response Codes	#0	- No Command-Specific Errors
Note		- Response only if Tag corresponds - Only valid for Broadcast Frames

Command #12 - Read Message

Request Data Bytes	None	
Response Data Bytes	#0 to #23	- Message (24 Byte Packed-ASCII = 32 Character)
Response Codes	#0	- No Command-Specific Errors

Command #13 - Read Tag, Descriptor, Date

Request Data Bytes	None	
Response Data Bytes	#0 to #5	- Tag (Packed-ASCII = 8 Char.)
	#6 to #17	- Descriptor (Packed-ASCII = 16 Char.)
	#18 to #20	- Date [dd.mm.yy]
Response Codes	#0	- No Command-Specific Errors

Command #14 - Read Primary Variable Sensor Information

Request Data Bytes	None	
Response Data Bytes	#0 to #2	- P.V. Sensor Serial Number *(000000)*
	#3	- P.V. Sensor Units Code
	#4 to #7	- P.V. Upper Sensor Limit
	#8 to #11	- P.V. Lower Sensor Limit
	#12 to #15	- P.V. Minimum Span
Response Codes	#0	- No Command-Specific Errors

Command #15 - Read Primary Variable Output Information

Request Data Bytes	None	
Response Data Bytes	#0	- Alarm Select Code (See Common Table VI)
	#1	- P.V. Transfer Function Code (See Common Table III)
	#2	- P.V. Range Units Code *(Spec.Var. 10.0)*
	#3 to #6	- P.V. Upper Range Value *(Spec.Var. 14)*
	#7 to #10	- P.V. Lower Range Value *(Spec.Var. 13)*
	#11 to #14	- P.V. Damping Value [s] *(NaN)*
	#15	- Write Protect Code (See Common Table VII)
	#16	- Private Label Distributor Code (See Common Table VIII)
		Parameters not used: Units Code = FA_{HEX} (not used), Value = $7FA00000_{HEX}$ (NaN)
Response Codes	#0	- No Command-Specific Errors

Command #16 - Read Final Assembly Number

Request Data Bytes	None	
Response Data Bytes	#0 to #2	- Final Assembly Number (24-bit unsigned int)
Response Codes	#0	- No Command-Specific Errors

Command #17 - Write Message

Request Data Bytes	#0 to #23 - Message (24 Byte Packed-ASCII = 32 Character)
Response Data Bytes	#0 to #23 - Message
Response Codes	#0 - No Command-Specific Errors #5 - Too Few Data Bytes Received

Command #18 - Write Tag, Descriptor, Date

Request Data Bytes	#0 to #5 - Tag (Packed-ASCII = 8 Character) #6 to #17 - Descriptor (Packed-ASCII = 16 Character) #18 to #20 - Date [dd.mm.yy]
Response Data Bytes	#0 to #5 - Tag #6 to #17 - Descriptor #18 to #20 - Date
Response Codes	#0 - No Command-Specific Errors #5 - Too Few Data Bytes Received

Command #19 - Write Final Assembly Number

Request Data Bytes	#0 to #2 - Final Assembly Number (24-bit unsigned int)
Response Data Bytes	#0 to #2 - Final Assembly Number
Response Codes	#0 - No Command-Specific Errors #5 - Too Few Data Bytes Received

Common Practice Commands:

Command #35 - Write Primary Variable Range Values

Request Data Bytes	#0 - P.V. Range Units Code *(Changes P.V. in Spec.Var. 10.0)* #1 to #4 - P.V. upper range value *(Spec.Var. 14)* #5 to #8 - P.V. lower range value *(Spec.Var. 13)*
Response Data Bytes	#0 - P.V. Range Units Code *(Spec.Var. 10.0)* #1 to #4 - P.V. upper range value *(Spec.Var. 14)* #5 to #8 - P.V. lower range value *(Spec.Var. 13)*
Response Codes	#0 - No Command-Specific Errors #2 - Invalid Selection *(wrong Units Code)* #5 - Too Few Data Bytes #9 - Lower Range Value too High #10 - Lower Range Value too Low #11 - Upper Range Value too High #12 - Upper Range Value too Low #13 - Upper and Lower Range Values Out of Limits #14 - Span too Small #32 - Busy

Command #36 - Set Primary Variable Upper Range Value *(actual value => Upper Range Value)*

Request Data Bytes	None
Response Data Bytes	None
Response Codes	#0 - No Command-Specific Errors #32 - Busy

Command #37 - Set Primary Variable Lower Range Value *(actual value => Lower Range Value)*

Request Data Bytes	None
Response Data Bytes	None
Response Codes	#0 - No Command-Specific Errors #32 - Busy

Command #38 - Reset Configuration Changed Flag

Request Data Bytes	None
Response Data Bytes	None
Response Codes	#0 - No Command-Specific Errors

Command #40 - Enter/Exit Fixed Primary Variable Current Mode

Request Data Bytes	#0 to #3 - Fixed P.V. Current Level [mA] 0.0 = Exits the Fixed P.V. Current Mode
Response Data Bytes	#0 to #3 - Actual Fixed P.V. Current Level [mA]
Response Codes	#0 - No Command-Specific Errors #3 - Passed Parameter too Large *(Current > 22mA)* #4 - Passed Parameter too Small *(Current < 3.8mA)* #5 - Too Few Data Bytes Received

Command #41 - Perform Transmitter Self Test

Request Data Bytes	None
Response Data Bytes	None
Response Codes	#0 - No Command-Specific Errors

Command #42 - Perform Master Reset

Request Data Bytes	None
Response Data Bytes	None
Response Codes	#0 - No Command-Specific Errors #32 - Busy

Command #48 - Read Additional Transmitter Status

Request Data Bytes	None
Response Data Bytes (See 7.3)	#0 to #5 - Transmitter-Specific Status #6 - Operating Mode #1 *(0 = normal)* #7 - Operating Mode #2 *(0 = normal)* #8 to #10 - Analog Output Saturated #11 to #13 - Analog Output Fixed #14 to #24 - Transmitter-Specific Status
Response Codes	#0 - No Command-Specific Errors

Command #54 - Read Transmitter Variable Information

Request Data Bytes	#0 - Transmitter Variable (See Chap. 9.2)
Response Data Bytes	#0 - Transmitter Variable #1 to #3 - Transmitter Variable Sensor Serial Number *(000000)* #4 - Units Code for Limits and Minimum Span #5 to #8 - Upper Limit #9 to #12 - Lower Limit #13 to #16 - Damping Value #17 to #20 - Minimum Span
Response Codes	#0 - No Command-Specific Errors #2 - Invalid Selection #5 - Too Few Data Bytes Received

Command #59 - Write Number of Response Preambles

Request Data Bytes	#0 - Number of Preambles to be sent with the Response message from Slave to the Master
Response Data Bytes	#0 - Number of Preambles
Response Codes	#0 - No Command-Specific Errors #3 - Passed Parameter too Large *(Preambles > 20)* #4 - Passed Parameter too Small *(Preambles < 2)* #5 - Too Few Data Bytes Received

Transmitter-Specific Commands:

Command #128 - Read One Transmitter-Specific Variable

Request Data Bytes	#0	- Transmitter Variable, 8-bit unsigned integer. Refer to Transmitter Variable Code Table 9.2 in this document
Response Data Bytes	#0	- Transmitter Variable
	#1	- Units Code for Transmitter Variable
	#2 to #5	- Data for selected Transmitter Variable, IEEE 754 format or bytewise selections
Response Codes	#0	- No Command-Specific Errors
	#2	- Invalid Selection
	#5	- Too Few Data Bytes Received

Command #129 - Write One Transmitter-Specific Variable

Request Data Bytes	#0	- Transmitter variable, 8-bit unsigned integer. Refer to transmitter Variable code table 9.2 in this document
	#1	- Units code for transmitter variable
	#2 to #5	- Data for selected transmitter variable, IEEE 754 format or bytewise selections
Response Data Bytes	#0	- Transmitter variable
	#1	- Units code for transmitter variable
	#2 to #5	- Data for selected transmitter variable, IEEE 754 format or bytewise selections
Response Codes	#0	- No Command-Specific Errors
	#2	- Invalid Selection
	#3	- Passed parameter too large
	#4	- Passed parameter too small
	#5	- Too few data bytes Received
	#7	- In Write Protect Mode
	#12	- Invalid Units Code
	#32	- Busy

Command #131 – Start product caliration (Calibration by sampling)

Request Data Bytes	none	
Response Data Bytes	none	
Response Codes	#0	- No Command-Specific Errors
	#5	- Too few data bytes Received
	#16	- Access Restricted