



**GREYSTONE**  
ENERGY SYSTEMS INC

# CDD3 Series

## Carbon Dioxide Transmitter

### **SETUP GUIDE MODBUS COMMUNICATION**



## Modbus Protocol

This section describes the implementation of the Modbus protocol used in the CO2/RH/T detector. It is intended to assist control system programmers who may need to add support to their systems to communicate with this device. The CO2/RH/T detector communicates on standard Modbus networks using either RTU or ASCII mode transmission. It operates as a slave device (address from 01 to 255) and expects a Modbus master device to transmit queries, which it will answer.

### RTU Mode Message Format

Modbus Framing	8 bit binary
Data Bits	start bits --- 1 data bits --- 8 parity bits --- none, odd or even stop bits --- 1or 2
Baud Rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800 or 115200
Duplex	Half duplex
Error Checking	Cyclical Redundancy Check (CRC) CRC-16 --- polynomial $x^{16}+x^{15}+x^2+x^0$ 0x8005 or reversed version 0xA001 or CRC-CITT --- polynomial $x^{16}+x^{12}+x^5+x^0$ 0x1021 or reversed version 0x8408
Latency	More than 3.5 characters --- minimum, 50, 100, 150, 200, 250, 300 or 350 mS

### ASCII Mode Message Format

Modbus Framing	ASCII characters 0...9, A...F
Data Bits	start bits --- 1 data bits --- 7 parity bits --- none, odd or even stop bits --- 1or 2
Baud Rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 76800 or 115200
Duplex	Half duplex
Error Checking	Longitudinal Redundancy Check (LRC)
Latency	More than 3.5 characters --- minimum, 50, 100, 150, 200, 250, 300 or 350 mS

### Framing Support and Bit Sequences

RTU Mode	Start	1	2	3	4	5	6	7	8	Stop	
	Start	1	2	3	4	5	6	7	8	Stop	Stop
	Start	1	2	3	4	5	6	7	8	Odd	Stop
	Start	1	2	3	4	5	6	7	8	Even	Stop
ASCII Mode	Start	1	2	3	4	5	6	7	Stop	Stop	
	Start	1	2	3	4	5	6	7	Odd	Stop	
	Start	1	2	3	4	5	6	7	Odd	Stop	Stop
	Start	1	2	3	4	5	6	7	Even	Stop	
	Start	1	2	3	4	5	6	7	Even	Stop	Stop

## Modbus Register Addressing

Modbus Address	Typical Offset	Units	Data Type	Access	Notes
00001	+0		Bit	Read	Unsigned 16-bit integer Bit0 1 = CO2 in normal status, 0 = in abnormal status, Bit1-15 unused
40002	+1	PPM	Word	Read	Unsigned 16-bit integer, CO2 value
40003	+2	%RH	Word	Read	Unsigned 16-bit integer, %RH value
40004	+3	°F/°C	Word	Read	Unsigned 16-bit integer, Temperature value x 10 (the application program must divide the value by 10) (For example: 214 = 21.4 °C)
40005	+4		Word	Read	Unsigned 16-bit integer 1 = relay activated, 0 = relay not activated
40006	+5	%	Word	Read	Unsigned 16-bit integer, UP/DOWN value (may be changed to %RH, ppm, °C or °F via the menu) (all °C or °F values returned are x 10, ppm and % values are x 1)
40007	+6		Word	Read	Unsigned 16-bit integer 1 = override activated, 0 = override not activated
40008	+7	Feet	Word	Write	Unsigned 16-bit integer, SENSOR_ALTITUDE = 0 to 0x0A ALTITUDE = 500 * (SENSOR_ALTITUDE) = 0 to 5000 feet
40009	+8		Word	Write	Unsigned 16-bit integer 1 = auto cal on, 0 = auto cal off
40010	+9		Word	Write	Unsigned 16-bit integer 1 = degrees F, 0 = degrees C
40011	+10		Word	Write	Unsigned 16-bit integer, DISPLAY_MODE = 0 to 0x03 0=CO2, 1=CO2+RH, 2=CO2+T, 3=CO2+RH+T
40012	+11	°F	Word	Write	Unsigned 16-bit integer, TEMPERATURE_OFFSET = 0 to 0x14 T_OFFSET = TEMPERATURE_OFFSET - 10 = -10 to +10 °F
40013	+12	%RH	Word	Write	Unsigned 16-bit integer, RH_OFFSET = 0 to 0x14 RH_OFF = RH_OFFSET - 10 = -10 to +10 %RH
40014	+13	PPM	Word	Write	Unsigned 16-bit integer RELAY_SETPOINT = 0x1F4 to 0x5DC = 500 to 1500 ppm
40015	+14	PPM	Word	Write	Unsigned 16-bit integer RELAY_HYSTERESIS = 0x19 to 0xC8 = 25 to 200 ppm
40016	+15		Word	Write	Unsigned 16-bit integer 1 = reset the override switch status to OFF (0)

Note that °C and °F integer values are used to represent a floating point number. Therefore the multiplier for these values is 10. The application program must divide the value by 10 to obtain the correct value. For example, reading a temperature value of 214 °C actually represents 214/10 = 21.4 °C.

**Function Codes (RTU mode)**

***0x01 --- Read coil status***

Query

Slave address (0x01 to 0xFF)	Function code (0x01)	Starting address MSB *	Starting address LSB	Quantity of coils MSB *	Quantity of coils LSB	CRC LSB	CRC MSB
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\* Starting address = 0x0000 to 0xFFFF, Quantity of coils = 0x0000 to 0x07D0

Response

Slave address (0x01 to 0xFF)	Function code (0x01)	Byte count N*	Coil status MSB	...	Coil status LSB	CRC LSB	CRC MSB
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\* N= Quantity of coils /8 or Quantity of coils /8 +1 (if the remainder is not 0)

***0x03 --- Read holding registers***

Query

Slave address (0x01 to 0xFF)	Function code (0x03)	Starting address MSB *	Starting address LSB	Quantity of registers MSB *	Quantity of registers LSB	CRC LSB	CRC MSB
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\* Starting address = 0x0000 to 0xFFFF, Quantity of registers = 0x0000 to 0x007D

Response

Slave address (0x01 to 0xFF)	Function code (0x03)	Byte count 2N *	Register value MSB	Register value LSB	...	CRC LSB	CRC MSB
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\* N= Quantity of registers

***0x06 --- Write single register***

Query

Slave address (0x01 to 0xFF)	Function code 0x06	Register address MSB *	Register address LSB	Register value MSB *	Register value LSB	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	Function code 0x06	Register address MSB *	Register address LSB	Register value MSB *	Register value LSB	CRC LSB	CRC MSB
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\* Register address = 0x0000 to 0xFFFF, Registers value = 0x0000 to 0xFFFF

***Exception response***

Slave address (0x01 to 0xFF)	Function code + 0x80	Exception code * 0x01, 0x02 or 0x03	CRC LSB	CRC MSB
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\* An exception response is only returned if the CRC is correct  
Exception code 01 --- illegal function, 02 --- illegal address, 03 --- illegal data value

**The RTU function codes supported by the CO2/RH/T are shown below.**

**0x01 --- Read CO2 Status**

Query

Slave address (0x01 to 0xFF)	0x01	0x00	0x00	0x00	0x01	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x01	0x01	Coil Status value	CRC LSB	CRC MSB
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**0x03 --- Read CO2 PPM**

Query

Slave address (0x01 to 0xFF)	0x03	0x00	0x01	0x00	0x01	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x03	0x02	Register value MSB (PPM)	Register value LSB (PPM)	CRC LSB	CRC MSB
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**0x03 --- Read %RH**

Query

Slave address (0x01 to 0xFF)	0x03	0x00	0x02	0x00	0x01	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x03	0x02	Register value 0x00	Register value (%RH)	CRC LSB	CRC MSB
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**0x03 --- Read Temperature**

Query

Slave address (0x01 to 0xFF)	0x03	0x00	0x03	0x00	0x01	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x03	0x02	Register value 0x00	Register value (C/F x 10)	CRC LSB	CRC MSB
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**0x03 --- Read Relay\_Status**

Query

Slave address (0x01 to 0xFF)	0x03	0x00	0x04	0x00	0x01	CRC LSB	CRC MSB
---------------------------------	------	------	------	------	------	------------	------------

Response

Slave address (0x01 to 0xFF)	0x03	0x02	Register value 0x00	Register value (0/1)	CRC LSB	CRC MSB
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**0x03 --- Read Setpoint**

Query

Slave address (0x01 to 0xFF)	0x03	0x00	0x05	0x00	0x01	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x03	0x02	Register value 0x00	Register value (0-100%) *	CRC LSB	CRC MSB
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* Register value for	%	=	0 - 100
	%RH	=	30 - 70
	ppm	=	500 - 1500
	°C1	=	180 - 240 (must/10)
	°C2	=	100 - 300 (must/10)
	°C3	=	160 - 260 (must /10)
	°F1	=	670 - 730 (must /10)
	°F2	=	600 - 800 (must /10)

**0x03 --- Read Override\_Status**

Query

Slave address (0x01 to 0xFF)	0x03	0x00	0x06	0x00	0x01	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x03	0x02	Register value 0x00	Register value (0/1)	CRC LSB	CRC MSB
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**0x06 --- Write single register (SENSOR\_ALTITUDE)**

Query

Slave address (0x01 to 0xFF)	0x06	0x00	0x07	0x00	Register value LSB*	CRC LSB	CRC MSB
---------------------------------	------	------	------	------	------------------------	------------	------------

Response

Slave address (0x01 to 0xFF)	0x06	0x00	0x07	0x00	Register value LSB*	CRC LSB	CRC MSB
---------------------------------	------	------	------	------	------------------------	------------	------------

\* Registers value = 0x0000 to 0x000A, corresponding to 0 to 5,000 Feet

**0x06 --- Write single register (AUTO\_CAL)**

Query

Slave address (0x01 to 0xFF)	0x06	0x00	0x08	0x00	Register value LSB*	CRC LSB	CRC MSB
---------------------------------	------	------	------	------	------------------------	------------	------------

Response

Slave address (0x01 to 0xFF)	0x06	0x00	0x08	0x00	Register value LSB*	CRC LSB	CRC MSB
---------------------------------	------	------	------	------	------------------------	------------	------------

\* Registers value = 0x0000 to 0x0001, corresponding to 0 = OFF and 1 = ON

**0x06 --- Write single register (C/F)**

Query

Slave address (0x01 to 0xFF)	0x06	0x00	0x09	0x00	Register value LSB*	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x06	0x00	0x09	0x00	Register value LSB*	CRC LSB	CRC MSB
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\* Registers value = 0x0000 to 0x0001, corresponding to 0 = C and 1 = F

**0x06 --- Write single register (DISPLAY\_MODE)**

Query

Slave address (0x01 to 0xFF)	0x06	0x00	0x0A	0x00	Register value LSB*	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x06	0x00	0x0A	0x00	Register value LSB*	CRC LSB	CRC MSB
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\* Registers value = 0x0000 to 0x0003, corresponding to 0 = CO2 only, 1 = CO2 + RH, 2 = CO2 + T and 3 = CO2 + RH + T

**0x06 --- Write single register (TEMPERATURE\_OFFSET)**

Query

Slave address (0x01 to 0xFF)	0x06	0x00	0x0B	0x00	Register value LSB*	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x06	0x00	0x0B	0x00	Register value LSB*	CRC LSB	CRC MSB
---------------------------------	------	------	------	------	------------------------	------------	------------

\* Registers value = 0x0000 to 0x0014, corresponding to -10 to +10 Degrees F

**0x06 --- Write single register (RH\_OFFSET)**

Query

Slave address (0x01 to 0xFF)	0x06	0x00	0x0C	0x00	Register value LSB*	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x06	0x00	0x0C	0x00	Register value LSB*	CRC LSB	CRC MSB
---------------------------------	------	------	------	------	------------------------	------------	------------

\* Registers value = 0x0000 to 0x0014, corresponding to -10 to +10 %RH

**0x06 --- Write single register (RELAY\_SETPOINT)**

Query

Slave address (0x01 to 0xFF)	0x06	0x00	0x0D	0x00	Register value LSB*	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x06	0x00	0x0D	0x00	Register value LSB*	CRC LSB	CRC MSB
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\* Registers value = 0x01F4 to 0x05DC, corresponding to 500 to 1500 PPM

**0x06 --- Write single register (RELAY\_HYSTERESIS)**

Query

Slave address (0x01 to 0xFF)	0x06	0x00	0x0E	0x00	Register value LSB*	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x06	0x00	0x0E	0x00	Register value LSB*	CRC LSB	CRC MSB
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\* Registers value = 0x0019 to 0x00C8, corresponding to 25 to 200 PPM

**0x06 --- Write single register (OVERRIDE\_SWITCH\_RESET)**

Query

Slave address (0x01 to 0xFF)	0x06	0x00	0x0F	0x00	Register value LSB*	CRC LSB	CRC MSB
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Response

Slave address (0x01 to 0xFF)	0x06	0x00	0x0F	0x00	Register value LSB*	CRC LSB	CRC MSB
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\* Registers value = 0x0001, corresponding to 1 = Reset the switch status to OFF (0)

**Exception response**

Slave address (0x01 to 0xFF)	Function code + 0x80	Exception code * 0x01, 0x02 or 0x03	CRC LSB	CRC MSB
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\* An exception response is only returned if the CRC is correct  
Exception code 01 --- illegal function, 02 --- illegal address, 03 --- illegal data value



**Function codes (ASCII mode)**

***0x01 --- Read coil status***

Query

Start character (:) 0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	Function code (0x01) MSB (0x30)	Function code (0x01) LSB (0x31)	Starting address MSB *	Starting address	Starting address	Starting address LSB
Quantity of coils MSB *	Quantity of coils	Quantity of coils	Quantity of coils LSB	LRC MSB	LRC LSB	Return-line feed (CRLF) 0x0D	Return-line feed (CRLF) 0x0A	

\* Starting address = 0x0000 to 0xFFFF, Quantity of coils = 0x0000 to 0x07D0

Response

Start character (:) 0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	Function code (0x01) MSB (0x30)	Function code (0x01) LSB (0x31)	Byte count N * MSB	Byte count N LSB
Coil status MSB	...	Coil status LSB	LRC MSB	LRC LSB	Return-line feed (CRLF) 0x0D	Return-line feed (CRLF) 0x0A

\* N = Quantity of coils /8 or Quantity of coils /8 +1 (if the remainder is not 0)

***0x03 --- Read holding registers***

Query

Start character (:) 0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	Function code (0x01) MSB (0x30)	Function code (0x01) LSB (0x33)	Starting address MSB *	Starting address	Starting address	Starting address LSB
Quantity of registers MSB *	Quantity of registers	Quantity of registers	Quantity of registers LSB	LRC MSB	LRC LSB	Return-line feed (CRLF) 0x0D	Return-line feed (CRLF) 0x0A	

\* Starting address = 0x0000 to 0xFFFF, Quantity of registers = 0x0000 to 0x007D

Response

Start character (:) 0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	Function code (0x01) MSB (0x30)	Function code (0x01) LSB (0x33)	Byte count MSB *	Byte count LSB	
Register value MSB (PPM)	Register value (PPM)	Register value (PPM)	Register value LSB (PPM)	LRC MSB	LRC LSB	Return-line feed (CRLF) 0x0D	Return-line feed (CRLF) 0x0A

\* N= Quantity of registers

**0x06 --- Write single register**

Query

Start character (:): 0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	Function Code (0x01) MSB (0x30)	Function Code (0x01) LSB (0x36)	Register address MSB *	Register address	Register address	Register address LSB
Register value MSB	Register value	Register value	Register value LSB	LRC MSB	LRC LSB	Return-line feed (CRLF) 0x0D	Return-line feed (CRLF) 0x0A	

\* Register address = 0x0000 to 0xFFFF  
Registers value = 0x0000 to 0xFFFF

Response

Start character (:): 0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	Function Code (0x01) MSB (0x30)	Function Code (0x01) LSB (0x36)	Register address MSB *	Register address	Register address	Register address LSB
Register value MSB	Register value	Register value	Register value LSB	LRC MSB	LRC LSB	Return-line feed (CRLF) 0x0D	Return-line feed (CRLF) 0x0A	

**Exception response**

Start character (:): 0x3A	Slave address (0x01 to 0xFF) MSB	Slave address (0x01 to 0xFF) LSB	Function Code + 0x80 MSB	Function Code + 0x80 LSB	Exception code * 0x30	
Exception code * 0x01, 0x02 or 0x03 (0x31, 0x32 or 0x33)			LRC MSB	LRC LSB	Return-line feed (CRLF) 0x0D	Return-line feed (CRLF) 0x0A

\* An exception response is only returned if the LRC is correct  
Exception code 01 --- illegal function, 02 --- illegal address, 03 --- illegal data value

**The ASCII function codes supported by the CO2/RH/T are shown below.**

**0x01 --- Read CO2 Status**

Query

0x3A	Slave address * 0x01 to 0xFF MSB	Slave address * 0x01 to 0xFF LSB	0x30	0x31	0x30	0x30	0x30	0x30
0x30	0x30	0x30	0x31	LRC MSB	LRC LSB	0x0D	0x0A	

\* If Slave address = 0x12, then MSB = 0x31, LSB = 0x32, for example

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x31	0x30	0x32
0x30	Coil LSB (0x30 or 0x31)		LRC MSB	LRC LSB	0x0D	0x0A

**0x03 --- Read CO2 PPM**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x30	0x30	0x31
0x30	0x30	0x30	0x31	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x32		
Register value MSB (PPM)	Register value (PPM)	Register value (PPM)	Register value LSB (PPM)	LRC MSB	LRC LSB	0x0D	0x0A	

**0x03 --- Read %RH**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x30	0x30	0x32
0x30	0x30	0x30	0x31	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x32		
Register value 0x30	Register value 0x30	Register value (%RH)	Register value LSB (%RH)	LRC MSB	LRC LSB	0x0D	0x0A	

**0x03 --- Read Temperature**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x30	0x30	0x33
0x30	0x30	0x30	0x31	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x32		
Register value 0x30	Register value 0x30	Register value (C/F)	Register value LSB (C/F) x 10	LRC MSB	LRC LSB	0x0D	0x0A	

**0x03 --- Read Relay\_Status**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x30	0x30	0x34
0x30	0x30	0x30	0x31	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x32		
Register value 0x30	Register value 0x30	Register value (?)	Register value LSB (?)	LRC MSB	LRC LSB	0x0D	0x0A	

**0x03 --- Read Setpoint**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x30	0x30	0x35
0x30	0x30	0x30	0x31	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x32		
Register value 0x30	Register value 0x30	Register value (?)	Register value LSB (?)	LRC MSB	LRC LSB	0x0D	0x0A	

**0x03 --- Read Override\_Status**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x30	0x30	0x36
0x30	0x30	0x30	0x31	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x33	0x30	0x32		
Register value 0x30	Register value 0x30	Register value (?)	Register value LSB (?)	LRC MSB	LRC LSB	0x0D	0x0A	

**0x06 --- Write single register (SENSOR\_ALTITUDE)**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x37
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x37
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

**0x06 --- Write single register (AUTO\_CAL)**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x38
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x38
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

**0x06 --- Write single register (C/F)**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x39
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x39
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

**0x06 --- Write single register (DISPLAY\_MODE)**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x40
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x40
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

**0x06 --- Write single register (TEMPERATURE\_OFFSET)**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x41
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x41
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

**0x06 --- Write single register (RH\_OFFSET)**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x42
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x42
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

**0x06 --- Write single register (RELAY\_SETPOINT)**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x43
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x43
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

**0x06 --- Write single register (RELAY\_HYSTERESIS)**

Query

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x44
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB	Slave address 0x01 to 0xFF LSB	0x30	0x36	0x30	0x30	0x30	0x44
0x30	0x30	Register value	Register value LSB	LRC MSB	LRC LSB	0x0D	0x0A	

**0x06 --- Write single register (OVERRIDE\_SWITCH\_RESET)**

Query

0x3A	Slave address 0x01 to 0xFF MSB		Slave address 0x01 to 0xFF LSB		0x30	0x36	0x30	0x30	0x30	0x45
0x30	0x30	Register value	Register value LSB	LRC MSB		LRC LSB		0x0D	0x0A	

Response

0x3A	Slave address 0x01 to 0xFF MSB		Slave address 0x01 to 0xFF LSB		0x30	0x36	0x30	0x30	0x30	0x45
0x30	0x30	Register value	Register value LSB	LRC MSB		LRC LSB		0x0D	0x0A	

**Exception response**

0x3A	Slave address (0x01 to 0xFF) MSB	Slave address (0x01 to 0xFF) LSB	Function Code * + 0x80 MSB		Function Code * + 0x80 LSB		0x30
Exception code 0x01, 0x02 or 0x03 (0x31, 0x32 or 0x33)			LRC MSB	LRC LSB	Return-line feed (CRLF) 0x0D		Return-line feed (CRLF) 0x0A

\* If Function Code = 03, then MSB = 0x38, LSB = 0x33, for example