# GREYSTONE ENERGY SYSTEMS INC

# **Dewpoint Transmitter**

**DPDD ModBus - Installation Instructions** 



#### INTRODUCTION

The dewpoint transmitters are designed for use in environmental monitoring and control systems where high performance and stability are demanded. It's state-of-the art design combines digital linearization and temperature compensation with a highly accurate and reliable thermoset polymer based capacitance humidity sensor and curve-matched MTC thermistor temperature sensor for reliability and accuracy in the most critical applications. The dewpoint transmitter has four measurement variables which include dewpoint, dry-bulb temperature, wet-bulb temperature and enthalpy which are available Modbus signal to provide the most efficient monitoring and control solution.

#### **BEFORE INSTALLATION**

Read these instructions carefully before installing and commissioning the dewpoint transmitter. Failure to follow these instructions may result in product damage. Do not use in an explosive or hazardous environment, with combustible or flammable gases, as a safety or emergency stop device or in any other application where failure of the product could result in personal injury. Take electrostatic discharge precautions during installation and do not exceed the device ratings.

#### MOUNTING

The dewpoint transmitter installs directly into any air duct with a minimum width/diameter of 25.5 cm (10"). Select a suitable installation area in the middle of the duct wall. To achieve the best reading, do not place in an area where air stratification may be present. Mount the sensor at least 1.5 m (5') in either direction from elbows, dampers, filters or other duct restrictions. Avoid areas where the transmitter is exposed to vibrations or rapid temperature changes.

Drill or punch a 32-35mm (1.25" x1.375") hole in the duct at the preferred location and insert the probe into the hole to mark the enclosure mounting holes. Remove the unit and drill the four mounting holes. Clean all drilled holes of debris before mounting the device. Mount the enclosure to the duct with four #10 sheet metal screws (not included). To prevent air leaks, ensure the gasket is compressed around the probe between the device enclosure and the air duct. As shown in Figure 1.



### WIRING

- Deactivate the 24 Vac/dc power supply until all connections are made to the device to prevent electrical shock or equipment damage.
- Follow proper electrostatic discharge (ESD) handling procedures when installing the device or equipment damage may occur.
- Use 22 AWG shielded wiring for all connections and do not locate the device wires in the same conduit with wiring used to supply inductive loads such as motors.
- Make all connections in accordance with national and local codes.

Connect the 24 Vac/dc power supply to the terminals labeled PWR (power) and COM (common) as shown in Figure 6. This device has a half-wave type power supply so use caution when wiring multiple devices so that the circuit ground point is the same on all devices and the controller. Use caution if 24 Vac power is used and one side of the transformer is earth-grounded. In general, the transformer should NOT be connected to earth ground when using devices with RS-485 network connections. The device is reverse voltage protected and will not operate if connected backwards.

Connect the RS-485 network with twisted shielded pair to the terminals marked A-, B+ and SHLD (shield) as shown in Figure 6. The positive wire connects to B(+) and the negative wire connects to A(-) and the cable shield must be connected to the SHLD terminal on each device. If the device is installed at either end of the network, an end-of-line (EOL) termination resistor (121 ohm) should be installed in parallel to the A(-) and B(+) terminals. This device includes a network termination jumper and will connect the resistor correctly on the pcb. Simply move the pcb jumper to the EOL position and no external resistor is required as shown in Figure 7. The ground wire of the shielded pair should be connected to earth ground at the end of the network and the master is not grounded. Do not run bus wiring in the same conduit as line voltage wiring.



### **OPERATION**

### Start-Up Mode

When the device is powered on, it will go through a brief start-up mode. The LCD will display a sequence of information depending on the model. At the end of the start-up sequence, normal operation will begin.

### **STEP 1** LCD Test

All seaments lit for 2 seconds

### STEP 2 Model

Displays the model type (modbus) for 2 sec.

**STEP 3** Software Version for 2 sec

**STEP 4** Address for 2 sec

**STEP 5** Baud rate for 2 sec



### Normal Mode

In normal operation the device:

- reads the temperature ap
- calculates values for dewpoint, wet bulb and enthalpy .
- updates the LCD values
- updates the Modbus bject values
- monitors the menu key fo ctivity

If the <MENU> key is pressed, normal operation is suspended while the menu functions are serviced. The program will automatically exit the menu after a period of inactivity.

### MENU

The device has several parameters that can be configured locally via the User mentuusing the k d LCD. All parameters default to typical values but the installer may want to change some values. In some cases, such as the device network address, the installer MUST change the settings before operation. Any changes made are saved in non-volatile memory and are restored in case of a power loss. Only the menu items relevant to the device model will be shown. The menu can be accessed at any time after the start up mode and if there is 5 minutes of inactivity the menu will close and normal operation will continue.

#### **User Menu - Network Device**

To enter the menu, press and release the <MENU> key. This will enter the User menu step 1, pressing the <MENU> key a second time advances to step 2. Each press of the <MENU> key saves the current setting and advances the menu item. The <UP> and <DOWN> keys are used to make changes to program variables by scrolling through the available option When a value is changed, use the <MENU> key to save it to memory and advance to the next menu item.

<MENU> Press and release to enter the User menu.

#### ADDRESS (default = 1)

Use <UP> or <DOWN> to set the address 1-255. °C and Td blink to indicate the mode.

<MFNU>

#### **BAUD RATE** (default = 9600)Use <UP> or <DOWN> to select a baud rate of 30 (300), 60 (600), 120 (1200), 240 (2400), 480 (4800), 960 (9600), 192 (19200) or 384 (38400), °F and Tw blink to indicate the mode.

### <MFNU>

**MODBUS PARITY** 

Use <UP> or <DOWN> to select a parity value of n (none), O (odd) or E (even). <MENU>

inc

#### **MODBUS STOP BIT** (default = 1)

the stop bits to 1 or 2. Use <UP> or <DOWN> to se

#### <MENU>

#### MODBUS CRC

default = 1) Use <UP> or <DOWN> ect a CRC value of 1 (A001 = CRC-16 reverse), 3 (8005 = CRC-16) or 4 (8408 = CITT reverse). 2(1021 = CITT),

### <MENU>

**MODBUS DELAY** (default = 0)

Use <UP> or <DOWN> to change the value from 0 (minimum) to 50, 100, 150, 200, 250, 300 or 350 ms. BTU/lb blinks to indicate the mode.

<MENU> Exits the menu and returns to normal operation.

88	C Td
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8	8	8	°F Tw
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### DIMENSIONS



Wet Bulb

Enthalpy

-20.0 – 50.0 °C Tw (0.5 °C resolution) or -4 – 122 °F Tw (1 °F resolution)

0 – 340 kJ/kg (1 kJ/kg resolution) or 0 – 146 BTU/lb (1 BTU/lb resolution)

### MODBUS

MODBUS ADDRESS	TYPICAL OFFSET	UNITS	DATA TYPE	ACCESS	NOTES
40001	+0	°C/°F	Word	Read	16-bit integer, Temperature value x 10 (multiplier = 10) -300 to 500 for -30.0 to 50.0 °C, -220 to 1220 for -22.0 to 122.0 °F
40002	+1	%RH	Word	Read	16-bit integer, %RH value x 10 (multiplier = 10) 0 to 1000 for 0 to 100.0 %RH
40003	+2	°C/°F	Word	Read	16-bit integer, Dewpoint Temperature value x 10 (multiplier = 10) -300 to 500 for -30.0 to 50.0 °C, -220 to 1220 for -22.0 to 122.0 °F
40004	+3	°C/°F	Word	Read	16-bit integer, Wet Bulb Temperature x 10 (multiplier = 10) -300 to 500 for -30.0 to 50.0 °C, -220 to 1220 for -22.0 to 122.0 °F
40005	+4	kJ/Kg BTU/lb	Word	Read	16-bit integer, Enthalpy value (multiplier = 1) 0 to 340 kJ/kg, 0 to 146 BTU/lb
40006	+5	°C/°F	Word	R/W	16-bit integer, Temperature Offset (multiplier = 10) -100 to 100 for -10.0 to 10.0 °F or -50 to 50 for -5.0 to 5.0 °C (Note: resolution is 10 for °F and 5 for °C)
40007	+6	%RH	Word	R/W	16-bit integer, RH Offset (multiplier = 10) -100 to 100 for -10.0 to 10.0 %RH (Note: resolution is 10)
40008	+7	hPa	Word	R/W	16-bit integet, Atmospheric Pressure 812 to 1013 hPa
40009	+8	Feet	Word	R/W	16-bit integer, Altitude 0 to 6000 ft
40010	+9		Word	R/W	16 bit integer. Display Mode 0 to 10
40011	+10		Word	R/W	16-bit integer, Temperature Units 0 = °C, 1 = °F
40012	+11		Word	R/W	16-bit integer, Enthalpy Units 0 = kJ/kg, 1 = BTU/lb

This section describes the implementation of the Modbus protocol. This device communicates on standard Modbus networks using RTU mode transmission. It operates as a slave device (address from 1 to 255) and expects a Modbus master device to transmit queries, which it will answer.

### **RTU 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 or 38400
Duplex	Halfduplex
Error Checking	Cyclical Regundancy Check (CRC) CRC-16 polynomial x16+x15+x2+x0 0x8005 or reversed version 0xA001 or CRC-CITT polynomial x16+x12+x5+x0 0x1021 or reversed version 0x8408
Latency	More than 3.5 characters minimum, 50, 100, 150, 200, 250, 300 or 350 mS

#### **RTU Framing Support and Bit Sequences**

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

### **RTU Function Codes**

#### 0x03 --- Read holding registers

Query								
Slave address	Function	Starting	Starting	Quantity of registers	Quant	ity of regis-	CRC	CRC
(0x01 to 0xFF)	code (0x03)	address MSB	address LSB	MSB	ters LS	SB	LSB	MSB

\* 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	
	• •								

\* N= Quantity of registers

### 0x06 --- Write single register

### Query

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

Slave addressFunctionRegister(0x01 to 0xFF)code 0x06address MSB	Register address LSB value MSB	Register value LSB	CRC CRC LSB MSB	
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\* Register address = 0x0000 to 0xFFFF, Registers value = 0x0000 to 0xFFFF

#### Exception response

	-				
Slave address	Function	Exception code		CRC	CRC
(0x01 to 0xFF)	code + 0x80	0x01, 0x02 or 0	x03	LSB	MSB

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

#### The RTU function codes supported by the dewpoint sensor are shown below.

#### 0x03 ---- Read TEMPERATURE\_VALUE

Query

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

#### Response

Slave address	0x03	0x02	Register value	Register value	CRC	CRC
(0x01 to 0xFF)			MSB	LSB	LSB	MSB
• D		0154		)C (maxikingling 10)		
Register value	$= 0 \times FED4 to 0$	x01F4, correspo	200 200 200 200 200 200 200 200 200 200	C (multiplier = 10)		
Or	$= 0 \times FF24 10 0 $	x04C4, correspo	onding to -22.0 to 122.0	F(multiplier = 10)		
The temperature	valuo is oithor i	n°C (dofault) o	r °E doponding on the v	value of the TEMPERATIN		r 🌔
This register has a	multiplier of 1	0 the application	on must divide by 10 to	obtain the correct value		
This register has a	multiplier of 1	o, the application	on must divide by TO to		с.	
				•		•
						•
)x03 Read REL	ATIVE_HUMID	DITY_VALUE				•
<b>)x03 Read REL</b> Query	ATIVE_HUMID	DITY_VALUE				•
<b>Dx03 Read REL</b> Query Slave address	ATIVE_HUMID	DITY_VALUE	0x01 0x0	0 0x01	CRC	CRC
<b>)x03 Read REL</b> Query Slave address (0x01 to 0xFF)	ATIVE_HUMID	DITY_VALUE	0x01 0x00	0 0x01	CRC LSB	CRC MSB
<b>Dx03 Read REL</b> Query Slave address (0x01 to 0xFF)	ATIVE_HUMID	0x00	0x01 0x00	D 0x01	CRC LSB	CRC MSB
<b>Dx03 Read REL</b> Query Slave address (0x01 to 0xFF)	ATIVE_HUMID	DITY_VALUE	0x01 0x0	D 0x01	CRC LSB	CRC MSB
<b>Dx03 Read REL</b> Query Slave address (0x01 to 0xFF) Response	ATIVE_HUMID	0x00	0x01 0x0		CRC LSB	CRC MSB
Dx03 Read REL Query Slave address (0x01 to 0xFF) Response Slave address	ATIVE_HUMID	0x00 0x02	0x01     0x01       Register value	0 0x01 Register value	CRC LSB CRC	CRC MSB CRC

\* Register value = 0x0000 to 0x03E8, corresponding to 0 to 100 %RH (multiplier = 10) This register has a multiplier of 10, the application must divide by 10 to obtain the correct value.

Queru							
Slave address (0x01 to 0xFF)	0x03	0x00	0x02	0x00	0x01	CRC LSB	CRC MSB
Response							
Slave address	0x03	0x02	Register v	alue	Register value	CRC	CRC

\* Register value = 0xFLD4 to 0x01F4, corresponding to -30.0 to 50.0 °C (multiplier = 10) or = 0xFF24 to 0x04C4, corresponding to -22.0 to 122.0 °F (multiplier = 10)

The dewpoint temperature value is either in °C (default) or °F depending on the value of the TEMPERATURE\_UNITS register.

This register has a multiplier of 10, the application must divide by 10 to obtain the correct value.

#### 0x03 --- Read WET\_BULB\_TEMPERATURE\_VALUE

Query

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

#### Response

Slave address (0x01 to 0xFF)	0x03	0x02	Register value MSB	Register value LSB	CRC LSB	CRC MSB
<ul> <li>* Register value or</li> <li>The wet bulb temp</li> <li>This register has a noise</li> <li>Ox03 Read EN</li> <li>Ouery</li> </ul>	= 0xFED4 to 03 = 0xFF24 to 0x eerature value is multiplier of 10	x01F4, correspo :04C4, correspo s either in °C (d , the applicatio LUE	onding to -30.0 to 50 onding to -22.0 to 12 efault) or °F dependi on must divide by 10	0 °C (multiplier = 10) 2.0 °F (multiplier = 10) ng on the value of the TEM to obtain the correct value	PERATURE_UNIT	S register
Slave address (0x01 to 0xFF)	0x03	0x00	0x04 0.	x00 0x01	CRC LSB	CRC MSB
Response	1	I				I
	0.00	0.00		Destingent	CDC	

\* Register value = 0x0000 to 0x0154, corresponding to 0 to 340 KJ/kg (multiplier = 1) or = 0x0000 to 0x0092, corresponding to 0 to 146 BTU/lb (multiplier = 1)

The enthalpy value is either in kJ/kg (default) or BTU/lb depending on the value of the ENTHALPY\_UNITS register.

## 0x06 --- Write TEMPERATURE\_OFFSET

Query							
Slave address (0x01 to 0xFF)	0x06	0x00	0x05	Register Value MSB	Register value LSB	CRC LSB	CRC MSB
Response							
Slave address (0x01 to 0xFF)	0x06	0x00	0x05	Register Value MSB	Register value LSB	CRC LSB	CRC MSB

\* This register is used to add or subtract an offset to the temperature value if necessary to conform to a local reference.

For °F operation, Register value = 0xFF9C to 0x0064 for -100 to 100, corresponds to T\_OFFSET / 10 = -10.0 to 10.0 °F. ie: 0xFFC4 => -60/10 = -6.0 °F offset resolution is 10, ie: °F offset must be -1.0, 0, +1.0, +2.0, etc. -1.3 is not valid

For °C operation, Register value = 0xFFCE to 0x0032 for -50 to 50,

corresponds to T\_OFFSET / 10 = -5.0 to 5.0 °C. ie: 0x0023 => 35/10 = +3.5 °C offset resolution is 5, ie: °C offset must be -1.5, -1.0, -0.5, 0, +0.5, +1.0,etc. +2.3 is not valid

esolution is 5, ie: °C onset must be -1.5, -1.0, -0.5, 0, +0.5, +1.0, etc. +2.3 is not valid

The operating temperature units (°C or °F) for the device should be selected first, and then add any offset if necessary.

This register has a multiplier of 10, the application must divide by 10 to obtain the correct value.

### 0x06 ---- Write RH\_OFFSET

Query

Classica al dura da							
(0x01 to 0xFF)	0x06	0x00	0x06	Register Value MSB	Register value LSB	CRC LSB	CRC MSB
esponse		I			1		
Slavo addross	0×06	0×00	0×06	Pogistor	Pogistor	CPC	CPC
0x01 to 0xFF)	0,00	0,00	0,00	Value MSB	value LSB	LSB	MSB
his register is use Register v ie: 0x001	ed to add or s value = 0xFF9 E => 30/10 = -	ubtract an offs C to 0x0064 for +3.0 %RH offse	et to the RH v -100 to 100, t.	value if necessary corresponding to	to conform to a loc o RH_OFFSET = -10	al reference. 0 to 10.0 %RH.	$\mathbf{X}$
resolutio	n is 10, ie: offs	et must be -5.0	 , -4.0, -3.0, -2	.0, etc4.3 is not	valid		
nis register has a i	multiplier of 1	0, the applicati	on must divi	de by 10 to obtai	n the correct value.		
x06 Write A	MOSPHERI	C_PRESSURE					
uerv							
Slavo addross	0×06	0×00	0×07	Pogistor	Pogistor	CPC	CPC
Slave address	0000	0000	0x07	Register	Register		MSB
(0x01  to  0xFF)						1 11 1	
(0x01 to 0xFF)				Value MSB	Value LSD	LJD	mob
(0x01 to 0xFF)				Value MSB	value LSB	LJD	
(0x01 to 0xFF) Response				Value MBB	Value LSS	LJD	
(0x01 to 0xFF) esponse Slave address	0x06	0×00	0x07	Register	Register	CRC	CRC
(0x01 to 0xFF) esponse Slave address (0x01 to 0xFF)	0x06	0x00	0x07	Register Value MSB	Register value LSB	CRC LSB	CRC MSB
(0x01 to 0xFF) esponse Slave address (0x01 to 0xFF) This register is use	0x06 ed to set the a	0x00 atmospheric pro	0x07 essure value	Register Value MSB to conform to loc	Register value LSB al conditions. This v	CRC LSB value is used in ca	CRC MSB Iculations.
(0x01 to 0xFF) esponse Slave address (0x01 to 0xFF) This register is use	0x06 ed to set the a	0x00 atmospheric pre	0x07 essure value	Register Value MSB to conform to loc	Register value LSB al conditions. This v	CRC LSB value is used in ca	CRC MSB Iculations.
(0x01 to 0xFF) esponse Slave address (0x01 to 0xFF) This register is use Register v	0x06 ed to set the a value = 0x032	0x00 atmospheric pro	0x07 essure value	Register Value MSB to conform to loc	Register value LSB al conditions. This v	CRC LSB value is used in ca to 1013 hPa.	CRC MSB Iculations.
(0x01 to 0xFF) esponse Slave address (0x01 to 0xFF) This register is use Register v	0x06 ed to set the a value = 0x032	0x00 atmospheric pro C to 0x03F5, cc	0x07 essure value prresponding	Régister Value MSB to conform to loc	Register value LSB al conditions. This v C_PRESSURE = 812	CRC LSB value is used in ca to 1013 hPa.	CRC MSB Iculations.
(0x01 to 0xFF) esponse Slave address (0x01 to 0xFF) This register is use Register v	0x06 ed to set the a value = 0x032	0x00 atmospheric pro C to 0x03F5, cc	0x07 essure value prresponding	Register Value MSB to conform to loc	Register Value LSB al conditions. This v C_PRESSURE = 812	CRC LSB value is used in ca to 1013 hPa.	CRC MSB Iculations.
(0x01 to 0xFF) Response Slave address (0x01 to 0xFF) This register is use Register v	0x06 ed to set the a value = 0x032	0x00 atmospheric pro	0x07 essure value prresponding	Register Value MSB to conform to loc	Register value LSB al conditions. This v	CRC LSB value is used in ca	CRC MSB Iculations.
(0x01 to 0xFF) Response Slave address (0x01 to 0xFF) This register is use Register v	0x06 ed to set the a value = 0x032 <b>.TITUDE</b>	0x00 atmospheric pro	0x07 essure value prrespondine	Register Value MSB to conform to loc	Register value LSB al conditions. This v	CRC LSB value is used in ca	CRC MSB Iculations.
(0x01 to 0xFF) Response Slave address (0x01 to 0xFF) This register is use Register v Dx06 Write Al	0x06 ed to set the a /alue = 0x032 .TITUDE	0x00 atmospheric pro	0x07 essure value prresponding	Register Value MSB to conform to loc	Register value LSB al conditions. This v	CRC LSB value is used in ca	CRC MSB Iculations.
(0x01 to 0xFF) Response Slave address (0x01 to 0xFF) This register is uso Register v <b>0x06 Write Al</b> Query	0x06 ed to set the a value = 0x032 <b>.TITUDE</b>	0x00 atmospheric pro	0x07 essure value prresponding	Register Value MSB to conform to loc	Register value LSB al conditions. This v C_PRESSURE = 812	CRC LSB value is used in ca to 1013 hPa.	CRC MSB Iculations.
(0x01 to 0xFF) esponse Slave address (0x01 to 0xFF) This register is use Register v vx06 Write Al uery Slave address (0x01 to 0xEE)	0x06 ed to set the a value = 0x032 .TITUDE 0x06	0x00 atmospheric pro C to 0x03F5, cc	0x07 essure value prresponding	Register Value MSB to conform to loc to ATMOSPHERIC	Register value LSB al conditions. This v C_PRESSURE = 812 f	CRC LSB /alue is used in ca to 1013 hPa.	CRC MSB Iculations.
(0x01 to 0xFF) esponse Slave address (0x01 to 0xFF) This register is use Register v <b>0x06 Write Al</b> Query Slave address (0x01 to 0xFF)	0x06 ed to set the a value = 0x032 .TITUDE 0x06	0x00 atmospheric pro C to 0x03F5, cc	0x07 essure value prresponding	Register Value MSB to conform to loc to ATMOSPHERIC Register Value MSB	Register value LSB al conditions. This v C_PRESSURE = 812 t Register value LSB	CRC LSB /alue is used in ca to 1013 hPa.	CRC MSB Iculations.
(0x01 to 0xFF) esponse Slave address (0x01 to 0xFF) This register is use Register v <b>0x06 Write Al</b> Query Slave address (0x01 to 0xFF)	0x06 ed to set the a value = 0x032 .TITUDE 0x06	0x00 atmospheric pro 2C to 0x03F5, cc 0x00	0x07 essure value prresponding 0x08	Register Value MSB to conform to loc to ATMOSPHERIC Register Value MSB	Register value LSB al conditions. This v C_PRESSURE = 812 1 Register value LSB	CRC LSB /alue is used in ca to 1013 hPa. CRC LSB	CRC MSB Iculations.
(0x01 to 0xFF) Response Slave address (0x01 to 0xFF) This register is use Register v <b>0x06 Write Al</b> Juery Slave address (0x01 to 0xFF) esponse	0x06 ed to set the a value = 0x032 .TITUDE 0x06	0x00 atmospheric pro C to 0x03F5, cc	0x07 essure value prresponding	Register Value MSB to conform to loc to ATMOSPHERIC Register Value MSB	Register value LSB al conditions. This w C_PRESSURE = 812 f Register value LSB	CRC LSB value is used in ca to 1013 hPa. CRC LSB	CRC MSB Iculations.
(0x01 to 0xFF) Response Slave address (0x01 to 0xFF) This register is use Register v Dx06 Write Al Query Slave address (0x01 to 0xFF) Response Slave address	0x06 ed to set the a value = 0x032 .TITUDE 0x06	0x00 atmospheric pro C to 0x03F5, cc 0x00	0x07 essure value prresponding 0x08	Register Value MSB to conform to loc to ATMOSPHERIC Register Value MSB	Register value LSB al conditions. This v C_PRESSURE = 812 f Register value LSB	CRC LSB value is used in ca to 1013 hPa. CRC LSB	CRC MSB Iculations.
(0x01 to 0xFF) esponse Slave address (0x01 to 0xFF) This register is use Register v vx06 Write Al uery Slave address (0x01 to 0xFF) esponse Slave address (0x01 to 0xFF)	0x06 ed to set the a value = 0x032 .TITUDE 0x06	0x00 atmospheric pro C to 0x03F5, cc 0x00	0x07 essure value prresponding 0x08	Register Value MSB to conform to loc to ATMOSPHERIC Register Value MSB	Register value LSB al conditions. This v C_PRESSURE = 812 f Register value LSB	CRC LSB value is used in ca to 1013 hPa. CRC LSB	CRC MSB Iculations.

Register value = 0x0000 to 0x1770, corresponding to ALTITUDE = 0 to 6000 feet.

### 0x06 ---- Write DISPLAY\_MODE

Query

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

Response

nesponse							
Slave address (0x01 to 0xFF)	0x06	0x00	0x09	Register Value MSB	Register value LSB	CRC LSB	CRC MSB
* This register is use The available sett 0 = no dis 1 = Temp 2 = Dewp 3 = Wet B 4 = Entha 5 = Temp	ed to set the p ings are: splay (menu w erature point temperat sulb temperat lpy erature plus d	arameters d rill still displa ture ure ewpoint to <u>c</u>	isplayed on the ay if key pressed ggle every 5 seco	local LCD in the ) 6 = Tem 7 = Tem 8 = Dew 9 = Dew 10 = We ponds	e normal operating perature plus wet l perature plus enth point plus wet bul point plus enthalp t bulb plus enthalp	y mode. bulb toggle alpy toggle b toggle by toggle by toggle	
0x06 Write TE	MPERATUR	E_UNITS					
Query							
Slave address (0x01 to 0xFF)	0x06	0x00	0x0A	0x00	Register value LSB	CRC LSB	CRC MSB
Response							
Slave address (0x01 to 0xFF)	0x06	0x00	0x0A	0x00	Register value LSB	CRC LSB	CRC MSB
<b>0x06 Write EN</b> Query Slave address (0x01 to 0xFF)	<b>NTHALPY_U</b> 0x06	NITS	Охов	0x00	Register value LSB	CRC LSB	CRC MSB
Response							
Slave address (0x01 to 0xFF)	0x06	0x00	0x0B	0x00	Register value LSB	CRC LSB	CRC MSB
* Register value = 0x0001	= 0x0000 = sets the dev	ets the devic vice to BTU/	e to kJ/kg opera b operation	ition			
Slave address	Function	80	Exception coo	de *	CRC		CRC MSB
* An exception resp Exception Exception Exception Exception	code 01 il code 02 il n code 03 il	eturned if th legal functic legal addres legal data va	ne CRC is correct on s alue				