



The TxTH91-XP, TxTCD92-XP, TxT93-XP, and TxTHV94-XP Series Sensors have been designed for monitoring and control CO<sub>2</sub>, VOC, Temperature and Humidity in room spaces. The sensors have modern design and are mounted on the wall surface directly or to standard wall mounting boxes.

The sensors can have an optional colour display with high hardness glass front. The sensors are available with Modbus or BACnet communication.

## Features

- Room Sensors for monitoring temperature, CO<sub>2</sub>, VOC and humidity
- BACnet MS/TP or Modbus RS485 RTU for system integration
- Optional 2.4" Colour LCD Screen for Displaying Measurements
- Configuration through Device Configuration Tool Software (Windows, connection via Bluetooth or USB-SERIAL) or Smart Phone iOS App (using Bluetooth Device Dongles)
- Available in both White and Black.
- User display language customisable using the language packs

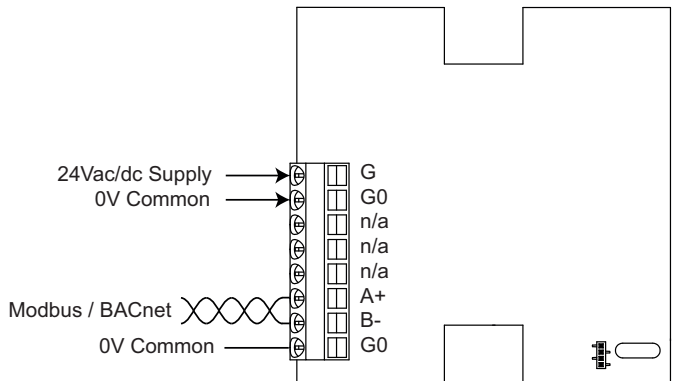
## Technical Specifications

<b>Power Supply:</b>	Power:	24Vac/dc -10%/+15%, max 80mA with display
<b>Measurements:</b>	CO2 (TxTCD Models)	
	Range:	0..10,000ppm
	Accuracy:	+/-50ppm + 5% of the reading
	Temperature (All Models)	
	Range:	0..50° (32..122°F)
	Accuracy:	+/-0.5°C
	Humidity (Option / TxTH Models)	
	Range:	0..100%rH
	Accuracy:	+/-2%rH (within 20 to 80%rH)
	VOC (Volatile Organic Compound) (Option / TxTHV Models);	
	Range:	0..500 (Air Quality Index)
<b>Communication:</b>	Physical Interface	1 x RS485 driver, recommended max 63 devices
	Protocol:	Modbus RTU or BACnet MS/TP (order relevant model)
	Addressing:	Via Software: 1..247 for Modbus, 1..127 for BACnet MS/TP
	Settings:	Baud Rate: 9600/19200/38400/57600/76800/115200 (software) Modbus Parity: None/Even/Odd, Modbus Stop Bits: 1 or 2 (Default: 9600/None/1)
<b>Display:</b>	LCD Option	Optional 2.4" Full Colour Display with Glass Overlay, 240 x 320px
<b>Mechanical:</b>	Wiring Terminals:	Rising Cage Screw Terminals, 0.2 to 2.5mm <sup>2</sup> / 26 to 12 AWG
	Enclosure:	ABS ULV0 Plastics - White or Black
	Mounting:	Wall or Junction Box Mounting (60mm screw distance)
	Dimensions	W86 x H86 x D24mm

## Wiring Connections

The diagram illustrates the wiring connections to the sensors.

Terminal	Description
G	24Vac/dc -10/+15% Supply
G0	0V Common
A+	Modbus / BACnet RS485 A+
B-	Modbus / BACnet RS485 B-
G0	0V Common



### WIRING GUIDELINES

In order to wire the device, remove the front cover by pressing the clip on the bottom of the display e.g. using a flat headed screwdriver. Be careful not to use excess force. Whilst pressing the clip lift the front cover from the bottom edges of the enclosure.

Make sure that power is switched off and carry out wiring according to the wiring connections drawing and local wiring guidelines. Insert the front cover and power up the device.

**NOTE: For opening and mounting the enclosure please refer to the Dimensions and Installation Chapter.**

## Model Selection

Refer to the below table to select the required model.

Part Number		SKU# Number
<b>Product Name</b>		Product Options
TxTH91-XP	Room Humidity and Temperature Sensor	
TxTCD92-XP	Room CO2 and Temperature Sensor	
TxT93-XP	Temperature Sensor,	
TxTHV94-XP	Room VOC, Humidity and Temperature Sensor	
<b>Communication Options</b>		
MOD	Modbus RS485	1
BAC	BACnet MS/TP	2
<b>Interface Options</b>		
	No Interface	1
LCD	Colour Display	2
<b>Colour Options</b>		
	Black	B
	White	W

## Measurements

### CO2 (CARBON DIOXIDE) MEASUREMENT (TxTCD MODELS)

CO2 (Carbon Dioxide) measurement is available via Modbus and BACnet communication network.

The CO2 sensor provides Automatic Self Calibration logic keeping the measurements accurate over the time.

### TEMPERATURE MEASUREMENT (ALL MODELS)

Temperature measurement is available via Modbus and BACnet communication network.

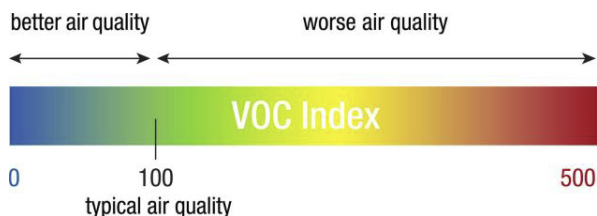
**NOTE: For accurate temperature measurement it is important that correct installation instructions are followed - see Dimensions and Installation Chapter.**

### HUMIDITY MEASUREMENT (TxTH MODELS / OPTION)

Humidity measurement is available via Modbus and BACnet communication network.

### RH-VOC VOLATILE ORGANIC COMPOUND MEASUREMENT (TxTHV MODELS / OPTION)

The VOC sensor option measures Volatile Organic Compounds with automatic humidity compensation providing relative indoor air quality index signal (see below diagram). The measurement can be read over Modbus/BACnet communication network.



Measured air pollutants include harmful gases (acetone from paints and glues, toluene from furniture, mattresses and building products), other gases (ethanol from alcohol, perfumes and cleaners), odours (hydrogen sulfide and volatile sulfuric compounds from rotten food and farts; ammonia and amines from pet urine), smoke (benzene and nitrosamines from cigarette smoke).

## Colour Display

The sensors can have optional full colour 240 x 320 pixel high resolution glass fronted display. The display can be used to indicate the current measurements. The colour display has been designed to display measurements in up to 4 locations. Each of the locations can be individually configured according to the requirements.

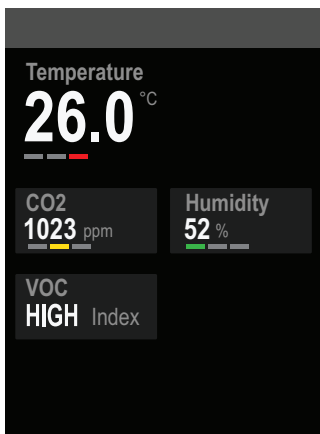
Each of the four display locations can be configured to show

- CO2, VOC, Temperature, or Humidity Measurement
- Alarm Conditions of the Measurements (Green, Amber, Red)
- Descriptive Text instead of Measurement Value (Low / Normal / High )

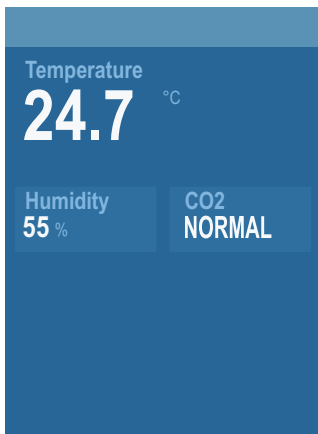
The display can be furthermore customised to:-

- Change the resolution of the temperature display; Fine (0.1°C/0.1°F), Normal (0.5°C/0.5°F), and Coarse (1°C/1°F). Please note Humidity, CO2 and VOC are displayed with resolution of one integer.
- The skin colour of the display can be changed according to the preference; White, Blue, Green, Grey and Black
- Brightness of the display can be adjusted
- Using Language Pack it is possible to change the text language

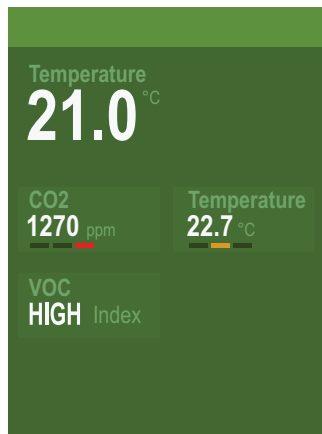
-LCD DISPLAY  
BLACK COLOUR



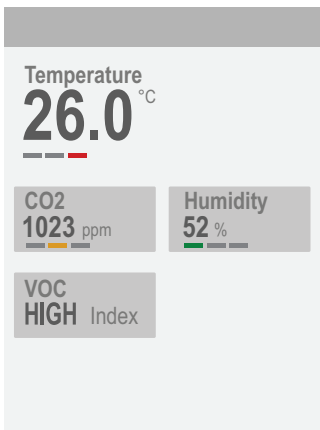
-LCD DISPLAY  
BLUE COLOUR



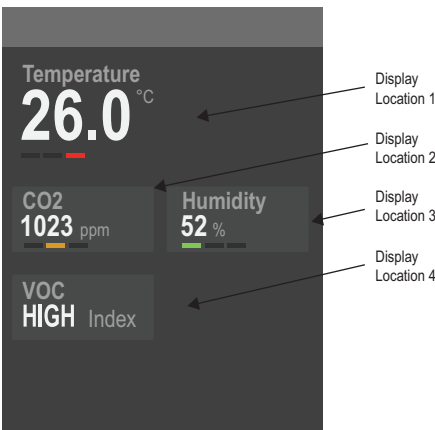
-LCD DISPLAY  
GREEN COLOUR



-LCD DISPLAY  
WHITE COLOUR



-LCD DISPLAY  
GREY COLOUR

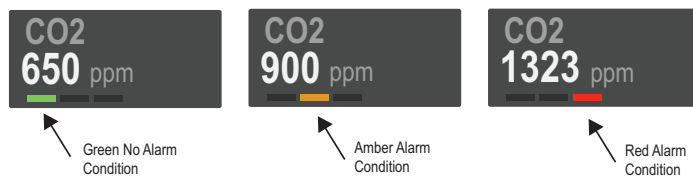


- Up to 4 Display Locations to Show Measurements
- Descriptive Text Indication (Low / Normal / High)
- Alarm Indication (Measurement or Network Signal)

### TRAFFIC LIGHT ALARM FUNCTION

Each of the 4 locations can be activated to display alarm condition based on the Amber and Red Limits. When measurement is above the Amber Limit, the location goes to Amber alarm (amber bar icon). When measurement is above the Red Limit, the location goes to Red Alarm (red bar icon)..

#### ALARMING USING BAR DISPLAY

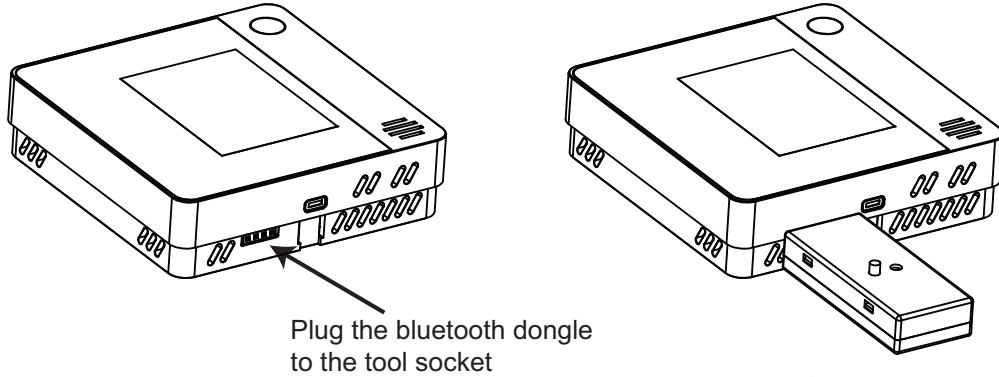


## Device Setup and Modbus/BACnet Communications

The devices are available with Modbus RTU or BACnet MS/TP communication for system integration. Please also note that the devices can be configured via Modbus or via BACnet MS/TP. Alternatively the devices can be configured locally using via PC Based Smart Config Tool or via iOS Smart Phone Application. Using any of these methods the device settings can be altered to suit the site requirements and the current device status can be interrogated.

Modbus and BACnet communication is carried out over RS485 serial network.

The Windows Smart Config Tool and iOS Smart Phone Application are connected to the device using Bluetooth dongle set (part no BLE-TOOLSET) that are plugged into the PC USB port and to the device (connection to device illustrated below). The SmartConfig PC tool can also be connected using USB-SERIAL cable to the devices.



### **MODBUS / BACNET NETWORK SETUP**

**NOTE: Modbus RS485 or BACnet MS/TP versions are hardware specific models. It is not possible to change the communication protocol on the device. Please make sure to order the required model.**

The devices can operate either as Modbus RTU RS485 slave device, or BACnet MS/TP Server. The device (slave/MAC) address and baud rate are set up through Windows Smart Configuration Tool / iOS Smart Phone App.

NOTE: Please note that Modbus register addresses start with 0 (0-based). If your Modbus master addresses start from one (1), then you will need to add one to the register values on the below table. If your Modbus master uses zero based addressing then the registers can be used as is.

NOTE: BACnet configuration parameter addresses are split to multiple Device Configuration objects.

**NOTE: \*) Reg Field shows the Modbus register offset. The Reg field is also used with BACnet Device Configuration Objects.**

LIVE DATA						
Parameter	Description	MODBUS INPUT REGISTERS - FUNCTION CODE 04 MODBUS HOLDING REGISTER - FUNCTION CODES 03, (06), 16				
		Reg	Type	Data Range (multiplier)	Value Range / Enumerations	R/W
Temperature Sensor	Displays current temperature measurement reading (built-in sensor) Note: Value depends on the temperature unit °C/°F selection	400	int16	-400..2480 (x10)	-40.0..120.0°C / -40.0..248.0°F	R
Humidity Sensor	Diplays current humidity measurement reading (With RH option)	401	int16	0..1000 (x10)	0..100%rH	R
CO2 Sensor	Displays current measurement CO2 reading (QER multisensors)	402	int16	0..10,000 (x1)	0..10,000ppm	R
VOC Sensor	Display current VOC (Volatile Organic Compound) Index Value	403	int16	0..500 (x1)	0..500 index	R

CALIBRATION SETTINGS						
Parameter	Description	Modbus Register / BACnet Property	MODBUS HOLDING REGISTER - FUNCTION CODES 03, 06, 16			
			Type	Data Range (multiplier)	Value Range / Enumerations	R/W
Temperature Offset	Built-In Temperature Single Point Sensor Calibration Offset	580	int16	-100..100 (x10)	-10.0..+10.0deg (Default 0)	R/W

Humidity Offset	Humidity Single Point Calibration Offset	581	int16	-100..100 (x10)	-10.0..+10.0%rH (Default 0)	R/W
CO2 Offset	CO2 Single Point Calibration Offset (adjusts CO2 reading the specified amount)	582	int16	-500..500 (x1)	-500..+500ppm (Default 0)	R/W
CO2 Auto-Calibration	Shows if the auto-calibration of the CO2 has been Activated	583	uint16	0..1	0 = Disabled 1 = Enabled (Default)	R/W
CO2 Calibration Value	Single Point Calibration Value for the CO2 Sensor. Note: Writing this value will reset the calibration settings of the sensor to the value set. Only recommended for advanced users.	584	uint16	350..3,000 (x1)	350..3,000ppm	R/W
Force CO2 Calibration	Forces CO2 Calibration to the CO2 Calibration Value. Use when CO2 level known e.g with calibration gas or outside air.	585	uint16	0..1	0 = None 1 = Force Calibration	R/W
CO2 Calibration Persist	Store CO2 Calibration Settings in the Permanent Memory	586	uint16	0..1	0 = None 1 = Save Data	R/W

DISPLAY SETTINGS						
Parameter	Description	Modbus Register / BACnet Property	MODBUS HOLDING REGISTER - FUNCTION CODES 03, 06, 16		Value Range / Enumerations	R/W
			Type	Data Range (multiplier)		
<b>GENERAL</b>						
Display Colour	Sets the display colour (display skin).	600	uint16	0..4	0 = White 1 = Green 2 = Blue 3 = Grey (default) 4 = Black	R/W
Display Brightness	Controls display brightness. By setting to Off, the display switches off after the timeout. Display wakes up when it is touched (TS models only)	601	uint16	0..6	0 = Off 1 = 5% 2 = 10% 3 = 25% 4 = 50% (default) 5 = 75% 6 = 100%	R/W
Temperature Display Resolution	Sets temperature display resolution (for built-in sensor only)	602	uint16	0..2 (x1)	0 = Fine (0.1°C/F) 1 = Normal (0.5°C/F) 2 = Coarse (1°C/F)	R/W
Temperature Units	Selects between Celcius and Fahrenheit Note: The display and network measurements will automatically reflect reading in the selected units.	522	uint16	0..1 (x1)	0 = Celcius (Default) 1 = Fahrenheit	R/W
<b>DISPLAY LOCATION 1 (PRIMARY DISPLAY LOCATION)</b>						
Location 1 Display	Location 1 Display Source. Sets what is displayed in Location 1.	610	uint16	0..8	0 = None 1 = n/a 2 = n/a 3 = Temperature (Default) 4 = n/a 5 = n/a 6 = Humidity 7 = CO2 8 = VOC Index	R/W
Location 1 Description	Location 1 Description. Sets description for Location 1.	611	uint16	0..4	0 = None 1 = Temperature 2 = Humidity 3 = CO2 (Default) 4 = VOC	R/W
Location 1 Unit	Location 1 Unit. Sets unit for Location 1.	612	uint16	0..9	0 = None 1 = °C (Default) 2 = °F 3 = ppm 4 = Lux 5 = Pa 6 = kWh 7 = m3 8 = % 9 = index (air quality index)	R/W

Location 1 Alarm	Activates Location 1 Alarm Bar or Descriptive Text indication. Using 1=Bar activates Green, Amber, Red alarm icon indication underneath the current displayed parameter. Using 2=Text activates LOW, MEDIUM HIGH text indication instead of the measurement.	613	uint16	0..2	0 = Disabled 1 = Bar 2 = Text	R/W
Location 1 Red Alarm Limit	Red Limit for Alarm 1 / High Limit for Descriptive Display	614	uint16	0..10,000 (x1)	0..10,000 (default 30)	R/W
Location 1 Amber Alarm Limit	Amber Limit for Alarm 1 / Medium Limit for Descriptive Displays	615	uint16	0..10,000 (x1)	0..10,000 (default 25)	R/W
Location 1 Hysteresis	Hysteresis for Alarm 1 / Low Limit for Descriptive Displays	616	uint16	0..10,000 (x1)	0..10,000 (default 1)	R/W

**DISPLAY LOCATION 2**

Location 2 Display	Location 2 Display Source. Sets what is displayed in Location 2.	617	uint16	0..8	0 = None 1 = n/a 2 = n/a 3 = Temperature 4 = n/a 5 = n/a 6 = Humidity 7 = CO2 (Default) 8 = VOC Index	R/W
Location 2 Description	Location 2 Description	618	uint16	0..4	0 = None 1 = Temperature 2 = Humidity 3 = CO2 (Default) 4 = VOC	R/W
Location 2 Unit	Location 2 Unit	619	uint16	0..9	0 = None 1 = °C 2 = °F 3 = ppm (Default) 4 = Lux 5 = Pa 6 = kWh 7 = m3 8 = % 9 = index (air quality index)	R/W
Location 2 Alarm	Activates Location 1 Alarm Bar or Descriptive Text indication. Using 1=Bar activates Green, Amber, Red alarm icon indication underneath the current displayed parameter. Using 2=Text activates LOW, MEDIUM HIGH text indication instead of the measurement.	620	uint16	0..2	0 = Disabled 1 = Bar 2 = Text	R/W
Location 2 Red Alarm Limit	Red Limit for Alarm 2 / High Limit for Descriptive Display	621	uint16	0..10,000 (x1)	0..10,000 (default 1250)	R/W
Location 2 Amber Alarm Limit	Amber Limit for Alarm 2 / Medium Limit for Descriptive Displays	622	uint16	0..10,000 (x1)	0..10,000 (default 750)	R/W
Location 2 Hysteresis	Hysteresis for Alarm 2 / Low Limit for Descriptive Displays	623	uint16	0..10,000 (x1)	0..10,000 (default 100)	R/W

**DISPLAY LOCATION 3**

Location 3 Display	Location 3 Display Source. Sets what is displayed in Location 3.	624	uint16	0..8	0 = None 1 = n/a 2 = n/a 3 = Temperature 4 = n/a 5 = n/a 6 = Humidity (Default) 7 = CO2 8 = VOC Index	R/W
Location 3 Description	Location 3 Description	625	uint16	0..4	0 = None 1 = Temperature 2 = Humidity 3 = CO2 (Default) 4 = VOC	R/W

Location 3 Unit	Location 3 Unit	626	uint16	0..9	0 = None 1 = °C 2 = °F 3 = ppm 4 = Lux 5 = Pa 6 = kWh 7 = m3 8 = % (Default) 9 = index (air quality index)	R/W
Location 3 Alarm	Activates Location 1 Alarm Bar or Descriptive Text indication. Using 1=Bar activates Green, Amber, Red alarm icon indication underneath the current displayed parameter. Using 2=Text activates LOW, MEDIUM HIGH text indication instead of the measurement.	627	uint16	0..2	0 = Disabled 1 = Bar 2 = Text	R/W
Location 3 Red Alarm Limit	Red Limit for Alarm 3 / High Limit for Descriptive Display	628	uint16	0..10,000 (x1)	0..10,000 (default 80)	R/W
Location 3 Amber Alarm Limit	Amber Limit for Alarm 3 / Medium Limit for Descriptive Displays	629	uint16	0..10,000 (x1)	0..10,000 (default 60)	R/W
Location 3 Hysteresis	Hysteresis for Alarm 3 / Low Limit for Descriptive Displays	630	uint16	0..10,000 (x1)	0..10,000 (default 10)	R/W
<b>DISPLAY LOCATION 4</b>						
Location 4 Display	Location 4 Display Source. Sets what is displayed in Location 4.	631	uint16	0..8	0 = None 1 = n/a 2 = n/a 3 = Temperature 4 = n/a 5 = n/a 6 = Humidity 7 = CO2 8 = VOC Index (Default)	R/W
Location 4 Description	Location 4 Description	632	uint16	0..4	0 = None 1 = Temperature 2 = Humidity 3 = CO2 (Default) 4 = VOC	R/W
Location 4 Unit	Location 4 Unit	633	uint16	0..9	0 = None 1 = °C 2 = °F 3 = ppm 4 = Lux 5 = Pa 6 = kWh 7 = m3 8 = % 9 = index (default)	R/W
Location 4 Alarm	Activates Location 1 Alarm Bar or Descriptive Text indication. Using 1=Bar activates Green, Amber, Red alarm icon indication underneath the current displayed parameter. Using 2=Text activates LOW, MEDIUM HIGH text indication instead of the measurement.	634	uint16	0..2	0 = Disabled 1 = Bar 2 = Text	R/W
Location 4 Red Alarm Limit	Red Limit for Alarm 4 / High Limit for Descriptive Display	635	uint16	0..10,000 (x1)	0..10,000 (default 140)	R/W
Location 4 Amber Alarm Limit	Amber Limit for Alarm 4 / Medium Limit for Descriptive Displays	636	uint16	0..10,000 (x1)	0..10,000 (default 120)	R/W
Location 4 Hysteresis	Hysteresis for Alarm 4 / Low Limit for Descriptive Displays	637	uint16	0..10,000 (x1)	0..10,000 (default 10)	R/W



SYSTEM AND COMMUNICATION SETTINGS						
Parameter	Description	Modbus Register / BACnet Property	MODBUS HOLDING REGISTER - FUNCTION CODES 03, 06, 16		Value Range / Enumerations	R/W
			Type	Data Range (multiplier)		
Address	Modbus Address BACnet MAC Address	800	uint16	1..247 (x1) 1..127 (x1)	Modbus: 1..247 BACnet: 1..127	R/W
Baud Rate	Baud Rate	801	uint16	0..5	0 = 9600 1 = 19200 2 = 38400 3 = 57600 4 = 76800 5 = 115200	R/W
Modbus Parity	Modbus Parity	802	uint16	0..2	0 = None 1 = Odd 2 = Even	R/W
Modbus Stopbits	Modbus Stopbits	803	uint16	0..1	0 = 1 Stop Bit 1 = 2 Stop Bits	R/W
Soft Reset	Soft Reset	810	uint16	0..1	0 = Normal 1 = Reset	R/W
Persist	Persist (Store Parameters in Non-Volatile Memory)	811	uint16	0..1	0 = Normal 1 = Persist	R/W
Reload Defaults	Reload Defaults (NOTE: Resets all settings to factory defaults)	812	uint16	0..1	0 = Normal 1 = Factory Defaults	R/W
Service Pin	Service Pin (BACnet Only)	813	uint16	0..1	0 = Normal 1 = Service Pin	R/W
Language Pack Enable	Enables the Language Pack (using language pack it is possible to change the user text entries on the screen)	814	uint16	0..1	0 = English 1 = Language Pack Enabled	R/W
Logo Timer	Time after which the Logo is displayed on the Display after background level is activated. Set to 0 to disable the logo.	815	uint16	0..255 (x1)	1..255 seconds 0 = Logo Disabled	R/W
Firmware Version	Firmware Version	820	uint16	N/A	N/A	R
Serial Number	Serial Number	821	uint16	N/A	N/A	R
Date Code	Date Code	822	uint16	N/A	N/A	R
Product ID	Product ID	823	uint16	N/A	N/A	R
Device ID	BACnet Device ID. Set to 0 to use Automatically generated ID. Follow change with "Persist" and "Reset".	825	uint32	0..4,194,303 (x1)	0..4,194,303	R/W

The following registers are available with Modbus only. The registers combine two parameters to a single 16-bit (2 Bytes) Modbus register.

MODBUS SPECIFIC COMBINATION REGISTERS						
Parameter	Description		MODBUS INPUT REGISTERS - FUNCTION CODE 04 MODBUS HOLDING REGISTER - FUNCTION CODES 03, 16			
			Type	Data Range (multiplier)	Value Range / Enumerations	R/W
Y1/Y2	Combined 16-Bit Register for Outputs Y1 and Y2. E.g. Y1=0x64 (100%), Y2=0x64 (100%) Register=0x6464 (25700)	450	uint16	0..25700 (x1) 0x0000..0x6464	Byte 1: Y1 (0x00..0x64), Byte 2: Y2 (0x00..0x64)	R
Y3/Y4	Combined 16-Bit Register for Outputs Y3 and Y4	451	uint16	0..25700 (x1) 0x0000..0x6464	Byte 1: Y3 (0x00..0x64), Byte 2: Y4 (0x00..0x64)	R
Device Status	Combined 16-Bit Register for Binary Status of the Device	455	uint16	0..25700 (x1)	Bit0 - DI1, Bit1 = DI2, Bit3 = PIR, Bit4 = Relay, Bit5= Boost, Bit6 = Screen Lock	R

## Bacnet Protocol Implementation Statement (PICS) and BACnet Objects

The -BAC versions of the sensors come with BACnet MS/TP communication. The following tables describe the PICS (Protocol Implementation Conformance Statement) and BACnet Objects (Standard and Proprietary). The Proprietary Objects are used for the device configuration.

GENERAL INFORMATION			
<b>Date:</b>	Sep 1, 2022		
<b>Vendor Name:</b>	NeoWave		
<b>Vendor ID:</b>			
<b>Product Name:</b>			
<b>Product Models:</b>	TxT, TxTH, TxTCD, TxTHV		
<b>Applications Software Version:</b>	1.0		
<b>Firmware Revision:</b>	1.0.0		
<b>BACnet Prorocol Revision</b>	1.19		
<b>Product Description:</b>	Communicating Room Sensors		
<b>BACnet Standard Device Profile:</b>	BACnet Application Specific Controller (B-ASC)		
<b>BACnet Interoperability Blocks Supported:</b>	Data Sharing - ReadProperty-B (DS-RP-B) Data Sharing - ReadPropertyMultiple-B (DS-RPM-B) Data Sharing - WriteProperty-B (DS-WP-B) Data Sharing - COV-B (DS-COVU-B) Device Management - DynamicDeviceBinding-B (DM-DDB-B) Device Management - DynamicObjectBinding-B (DM-DOB-B) Device Management - DeviceCommunicationControl-B (DM-DCC-B)		
<b>Segmentation Capability:</b>	No		
<b>Data Link Layer Options:</b>	MS/TP Master; Supported Baud 9600/19200/38400/57600/76800/115200		
<b>Device Address Binding:</b>	No static device binding supported		
<b>Networking Options:</b>	None		
<b>Character Sets Supported:</b>	ISO 10646 (UTF-8)		
<b>Gateway Options:</b>	None		
<b>Network Security Options:</b>	Non-Secure Device		
<b>Standard Object Types Supported:</b>	<b>Object Type:</b>	<b>Optional Properties</b>	<b>Writeable Properties</b>
	Analog Value:	Description, COV Increment, Relinquish Default	Present Value COV Increment
	Binary Value:	Description, Inactive_Text, Active_Text	Present Value
	Device Object:	Description Active COV Subscriptions Max Master	Object Identifier Object Name APDU Timeout (0...60000) Number Of APDU Retries (0...10) Max Master (1...127)
<p><i>For all supported objects, device does not support CreateObject or DeleteObject.</i></p> <p><i>For Analog Value objects that are classified as read only, there is the following behavior:</i></p> <ul style="list-style-type: none"> <li>- HVAC application overwrites the present value that has been written with the Write Property Service.</li> <li>- In this case, no error message will be sent.</li> </ul> <p><i>The device application checks the ranges of the Present Value and the COV Increment of the Analog Objects. For this reason, there is the following behavior:</i></p> <ul style="list-style-type: none"> <li>- No error message, if the limits have been exceeded</li> <li>- Too high values are set to the range maximum</li> <li>- Too small values are set to the range minimum</li> </ul>			

OBJECT TYPE: DEVICE OBJECT				
Object Instance	Property Identifier	Value Range	Default Value	R/W
Device[x]	Object Identifier		MAC_Address	R/W
	Object Name	32 chars max.		R/W
	Object_Type		8	R
	System_Status		Status_Operational	R
	Vendor_Name		NeoWave	R
	Vendor_Identifier			R
	Model_Name		---	R
	Firmware_Revision		1.0.0	R
	Application_Software_Version		1.0	R
	Protocol_Version		1	R
	Protocol_Revision		19	R
	Protocol_Services_Supported		See General Information	R
	Protocol_Object_Types_Supporte		See General Information	R
	Object_List		See Objects List	R
	Max_APDU_Length_Accepted		480	R
	Segmentation_Supported		No	R
	APDU_Timeout		6000 ms	R/W
	Number_Of_APDU_Retries		3	R/W
	Max_Master		127	R/W
	Device_Address_Binding			R
Database_Revision		0	R	
Property_List			R	

OBJECT TYPE: ANALOGUE VALUE						
Object Instance	Object Name	Value Range	Relinquish_Default	Units	COV Increment	R/W
AV(0)	Temperature	-40.0..120.0°C / -40.0..248.0°F	-	DEGREES_CELCIUS or DEGREES_FAHRENHEIT	0.0..100 (Default 1)	R
AV(1)	Humidity	0..100.0	-	RELATIVE_HUMIDITY	0.0..100 (Default 5)	R
AV(2)	CO2	0..10,000	-	PARTS_PER_MILLION	0.0..100 (Default 50)	R
AV(3)	VOC	0..1,000	-	NO_UNITS	0.0..100 (Default 10)	R
AV(4)	n/a					
AV(5)	n/a					
AV(6)	n/a					
AV(7)	n/a					
AV(8)	n/a					
AV(9)	n/a					
AV(10)	n/a					
AV(11)	n/a					
AV(12)	Fan_Speed	0..4.0	Nonvol_FanSpeed	NO_UNITS	1	R/W
AV(13)	Network_Decimal	-999.0..999.0	Nonvol_Setpoint	NO_UNITS	0	R/W
AV(14)	Network_Integer	0..65535.0	Nonvol_Setpoint	NO_UNITS	0	R/W

**NOTE: Priority Input 16 is reserved for internal value. If COV increment is set to 0.0 (default), the COV is disabled.**

**NOTE: AV(10), AV(11) and AV(12) Priority Inputs 1 to 15 have to be set to 'Null' in order for the user to be able to change the settings from the display (Setpoint\_1, Setpoint\_2 and Fan\_Speed).**

**NOTE:**

PROPRIETARY OBJECT
<b>OBJECT NAME / TYPE: "CONFIGx" / 128</b>
The devices have five instances of proprietary Device Configuration objects split as with the configuration tools; Cfg_Calibration, Cfg_Display, Cfg_System. The devices can be fully configured using the properties of these configuration objects. Full list of available properties are listed in the <i>Device Setup and Modbus/BACnet Communication</i> section tables.

In addition to the generic parameters, the BACnet AV (AV0 to AV12) and BV (BV0 to BV4) objects have proprietary property to enable COV (Unsubscribed COV) function. For the AV0 to AV5 objects the modified COV increment is stored in the non-volatile memory. For the BV objects data is transmitted when the state changes.

**NOTE: Enabling COV increases network load as the messages are broadcasted to all devices. For efficient network performance limit the number of COV objects to minimal and configure routers to allow broadcasts only on the subnets.**

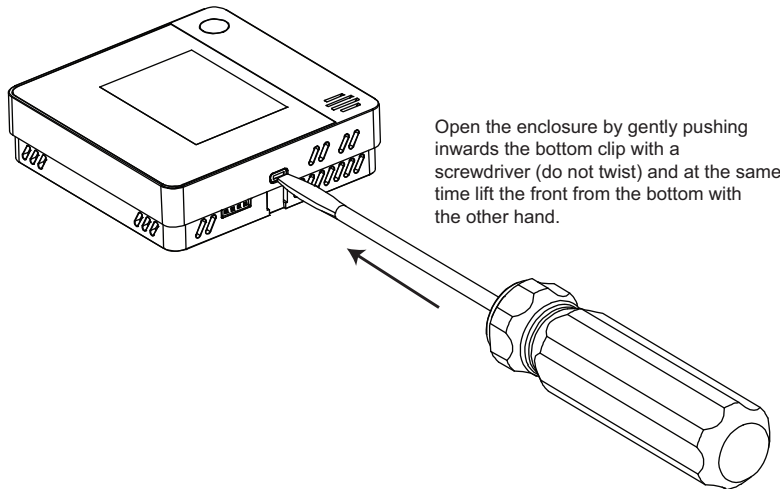
BACNET COV OBJECT SETTINGS						
Parameter	Description	BACnet Property	Type	Data Range (multiplier)	Value Range / Enumerations	R/W
AVx COV	AV Object COV Enable Flag x = AV Object Number	100x	uint16	0..1(x1)	0 = COV Disabled 1 = COV Enabled	R/W
BVx COV	BV Object COV Enable Flag x = BV Object Number	110x	uint16	0..1(x1)	0 = COV Disabled 1 = COV Enabled	R/W

## Dimensions and Installation

The devices typically mounted on the flat wall surfaces or on the junction boxes. The enclosure has 56/60mm screw distance for standard mounting boxes.

### Installation Notes:

- Follow the diagram below to open the enclosure to access the mounting holes and the wiring terminals.
- Install the sensors away from the sources of heat and cool e.g. from direct sunlight or cold external walls.
- Install the sensors at 120-150 cm height for optimal performance.
- Make sure that the cable entries and junction boxes are sealed from air flows. This is the most common reason for inaccuracies in temperature measurement.
- Bring the cables through the dedicated hole (black area) marked on the dimensions drawing.
- If surface mounted cable is required to be used, the top of the enclosure (center) has a thin wall section that can be cut.



### DIMENSIONS

