Senticon
SENTIENT CONTROL SOLUTIONS

Technical Data Sheet PS3.04

xER10 / xER14 SERIES 0-10V

QER / VER / TER / MER Series CO2, VOC, Temperature and Humidity Multi-Sensors, 0-10V Outputs, 24V and 85-265VAC Powered

QER10 / TER10 / MER10 / VER10

QER14 / TER14 / MER14 / VER14

The QER10/14, VER10/14, TER10/14 and MER10/14 (xER10) Series Sensors have been designed for monitoring and control CO2, VOC, Temperature and Humidity in room spaces. The xER10 aeries sensors are mounted on the wall surface directly or to standard wall mounting boxes. The xER14 range sensors are flush mounted with slimline 14mm profile using the standard wall boxes.

The sensors can have an optional colour display with high hardness glass front, and/or additional PIR sensor. Touchscreen option is available for interactive sensor operations such as trending and setting setpoint (to 0-10Vdc output). Optional Bluetooth wireless interface provides Smart Phone App interface (iOS).

Features

- Sensors for monitoring temperature, CO2, VOC (TVOC), humidity and passive infrared movement
- TVOC calculations compliant by WELL Building Standard ® and RESET ® Air
- 4 x Analogue 0..10Vdc Outputs, max. 2mA, for measurements and control
- Optional 2.4" Colour Screen / Touchscreen for Alarms, Trend Graphs and User Interface Functions such as setpoint, window position, blinds and lights position control etc.
- xER10 models have optional 24V pilot relay (RL-option) allows equipment switching locally
- xER14 models have optional 250VAC 7A (resistive load) allwing equipment switching
- 2 x Built-In PI Control Loops that allow local control of Temperature, Humidity, CO2, VOC or combination of them
- Bluetooth wireless connection (Smart Phone App) and LoraWan wireless communcation options
- Configuration through Device Configuration Tool Software (Windows, connection via Bluetooth or USB-SERIAL) or Smart Phone iOS App (via Built-In Bluetooth or using Bluetooth Dongles)
- xER10 range have surface mounting enclosure, xER14 range have slimline flush mounted enclosure for wall mounting boxes
- Available in both White and Black. The screen has number of different skin colour options for user preferences.
- User display language customisable using the language packs

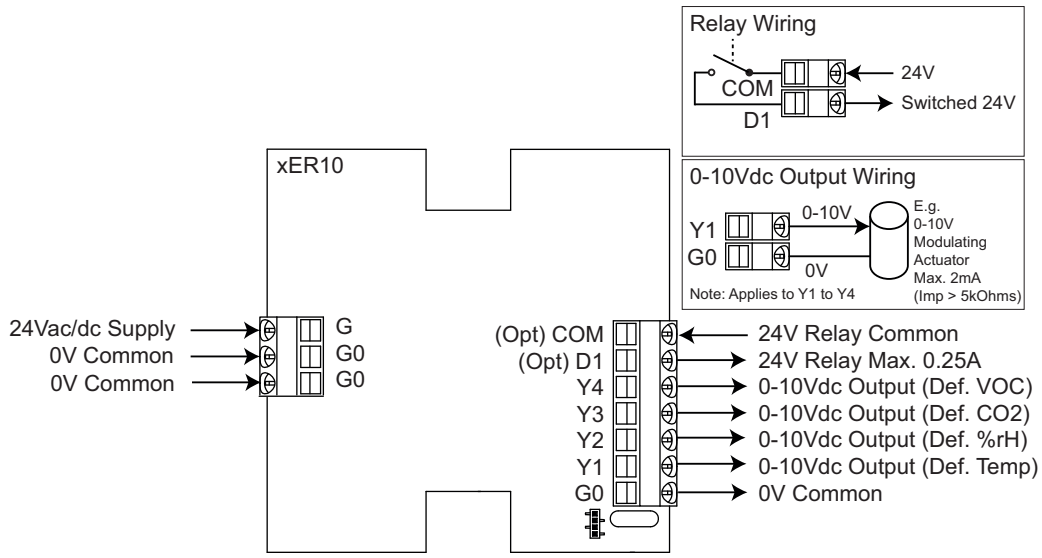
Technical Specifications

Power Supply:	Power (xER10 Range):	24Vac/dc -10%/+15%, max 80mA with display
	Power (xER14 Range)	85 -265 VAC, 50/60Hz, max 0.15mA
Measurements:	CO2 (QER 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 / MER Models)	
	Range:	0..100%rH
	Accuracy:	+/-2%rH (within 20 to 80%rH)
	VOC (Volatile Organic Compound) (Option / VER Models);	
	Range:	0..500 (Air Quality Index)
	PIR (Option)	
	Type/Range:	Passive Infrared Occupancy/Movement Detection, Range up to 5m
Outputs:	Analogue Outputs:	4 x 0..10Vdc, min. load resistance >5 kOhms (max. 2mA @ 10V)
	Relay Output (Option):	xER10 Range: 1 x 24V Pilot Relay, max 0.25A (resistive load) xER14 Range 1 x 250VAC Rated Relay, max 7A resistive load
Wireless Interface:	Bluetooth (Option):	Bluetooth Low Energy - iOS Smart Phone App Interface
Display:	LCD Option	Optional 2.4" Full Colour Display with Glass Overlay, 240 x 320px
	Touchscreen Option	Capacitive Touchscreen
Mechanical:	Wiring Terminals:	Rising Cage Screw Terminals, 0.2 to 2.5mm^2 / 26 to 12 AWG
	Enclosure:	ABS ULV0 Plastics - White or Black
	Mounting:	xER10 Range: Wall or Junction Box Mounting (60mm screw distance) xER14 Range: Junction Box Mounting (60mm screw distance)
	Dimensions	xER10 Range: W86 x H86 x D24mm xER14 Range: W86 x H86 x D14mm (wall profile), D39mm (full depth)

Wiring Connections

xER10 RANGE WIRING (QER10 / MER10 / TER10 / VER10)

The diagram below illustrates the wiring connections to the xER10 Range sensors,

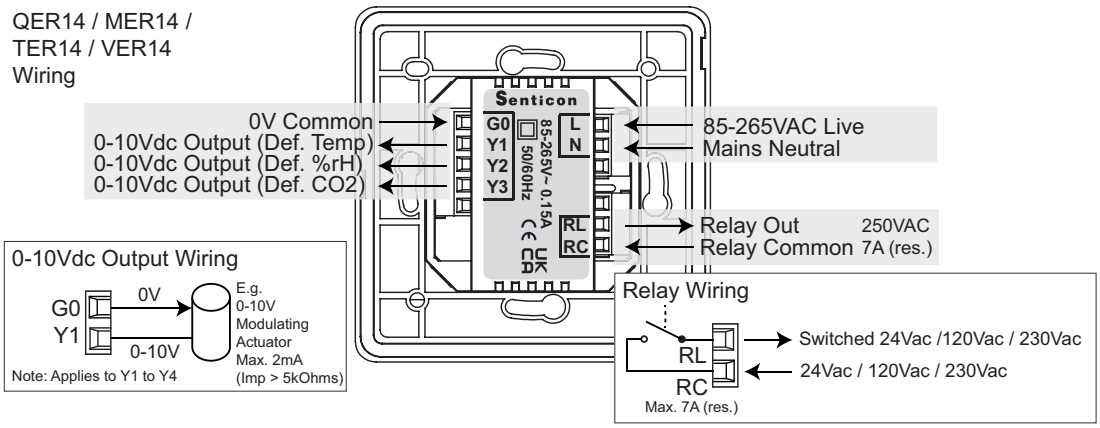


Terminal	Description
G	24Vac/dc -10/+15% Supply
G0	0V Common

Terminal	Description
COM	24V Relay Common (Option)
D1	24V Relay Max 0.25A (Option)
Y4	0-10Vdc Output max. 2mA - Default: VOC
Y3	0-10Vdc Output max. 2mA - Def: CO2
Y2	0-10Vdc Output max. 2mA - Def: Humidity
Y1	0-10Vdc Output max. 2mA - Def: Temperature
G0	0V Common

xER14 RANGE WIRING (QER14 / MER14 / TER14 / VER14)

The diagrams below illustrate the wiring to the xER14 range sensors.



Terminal	Description
G0	0V Common
Y1	0-10Vdc Output max. 2mA - Def: Temperature
Y2	0-10Vdc Output max. 2mA - Def: Humidity
Y3	0-10Vdc Output max. 2mA - Def: CO2t
Y4	0-10Vdc Output max. 2mA - Default: VOC

Terminal	Description
COM	24V Relay Common (Option)
D1	24V Relay Max 0.25A (Option)
Y4	0-10Vdc Output max. 2mA - Default: Temperature
Y3	0-10Vdc Output max. 2mA - Def: Humidit
Y2	0-10Vdc Output max. 2mA - Def: CO2
Y1	0-10Vdc Output max. 2mA - Def: VOC
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. The part number offers descriptive method for the product and options selection, and the SKU# number provides unique reference number for the part. It is possible to order products using either.

Part Number		SKU# Number				
Product Name		Product	Product Options			
QER10	Room CO2 and Temperature Multi-Sensor, 4AO, 24V Supply	1000				
MER10	Room Humidity and Temperature Multi-Sensor, 4AO, 24V Supply	1100				
TER10	Smart Room Temperature Sensor, 4AO, 24V Supply	1200				
VER10	Room VOC, Humidity and Temperature Multi-Sensor, 4AO, 24V Supply	1300				
QER14	Room CO2 and Temperature Multi-Sensor, 3AO, 1RO, 85-265V Supply	1040				
MER14	Room Humidity and Temperature Multi-Sensor, 3AO, 1RO, 85-265V Supply	1140				
TER14	Smart Room Temperature Sensor, 3AO, 1RO, 85-265V Supply	1240				
VER14	Room VOC, Humidity and Temperature Multi-Sensor, 3AO, 1RO, 85-265V Supply	1340				
Communication Options						
	0-10V Outputs		0			
Interface Options						
	No Interface			00		
LCD	Colour Display			01		
TS	Colour Capacitive Touchscreen			02		
BLE	Bluetooth App Interface			03		
LCD-BLE	Colour Display and Bluetooth			04		
TS-BLE	Touchscreen and Bluetooth			05		
Measurement Options						
	No Extra Measurements				00	
RH	Relative Humidity (QER Only)				01	
RH-VOC	Volatile Organic Compound and Humidity (QER Only)				02	
OE	Passive Infrared Sensor (PIR)				03	
RH-OE	Relative Humidity and PIR (QER Only)				04	
RH-VOC-OE	VOC, Relative Humidity and PIR (QER Only)				05	
Output Options						
	No Output Options					00
RL	24V Relay Output (Only available with xER10 Series)					01
Colour Options						
B	Black					01
W	White					02

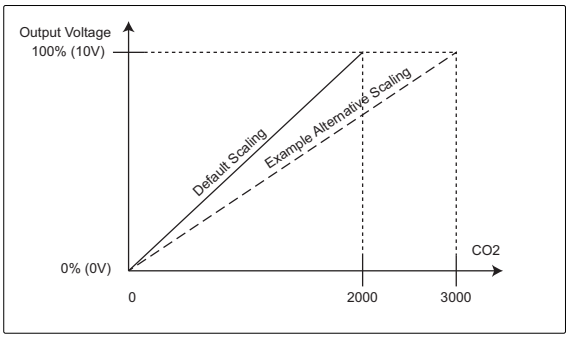
Measurements

CO2 (CARBON DIOXIDE) MEASUREMENT (QER MODELS)

CO2 (Carbon Dioxide) measurement is available through the analogue outputs Y1 to Y4 as proportional 0..10Vdc signal. As default Y3 has been configured for CO2 reading. .

The output signal is scaled as default 0..2,000ppm = 0..10Vdc. The output scaling can be modified by changing the max scaled CO2 parameter. The maximum scaling is the full range of the CO2 sensor (10,000ppm).

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

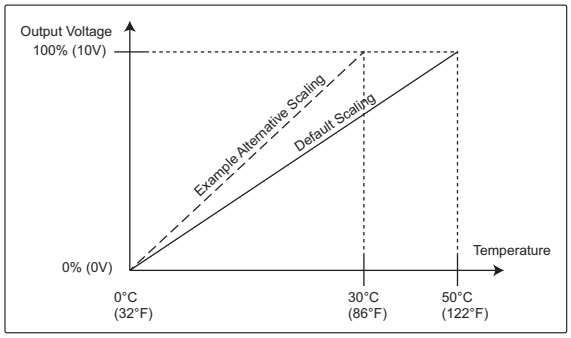


TEMPERATURE MEASUREMENT (ALL MODELS)

Temperature measurement is available through the analogue outputs Y1 to Y4 as proportional 0..10Vdc signal. As default Y1 has been configured for temperature. .

The output signal is scaled as default 0..50°C (32..122°F) = 0..10Vdc. The output scaling can be modified by changing the max scaled temperature parameter.

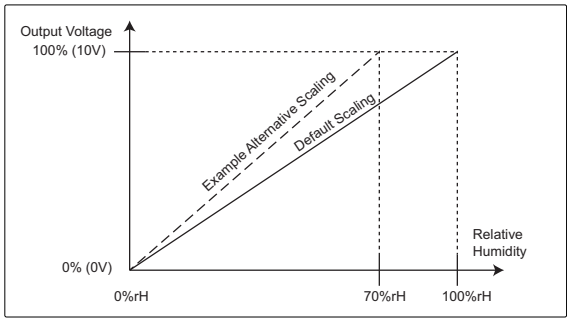
NOTE: For accurate temperature measurement it is important that correct installation instructions are followed - see Dimensions and Installation Chapter.



HUMIDITY MEASUREMENT (MER MODELS / OPTION)

Humidity measurement is available through the analogue outputs Y1 to Y4 as proportional 0..10Vdc signal. As default Y2 has been configured for relative humidity.

The output signal is scaled as default 0..100%rH = 0..10Vdc. The output scaling can be modified by changing the max scaled humidity parameter.



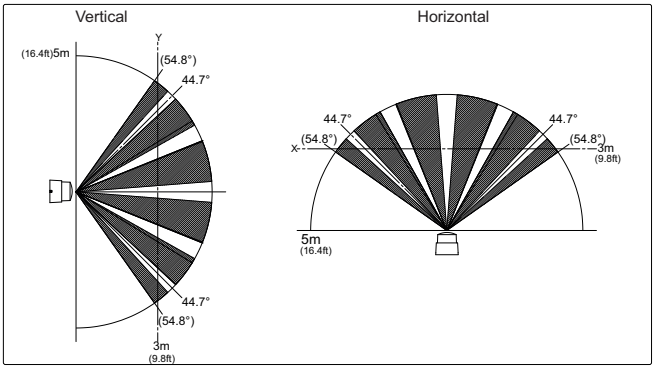
MOVEMENT DETECTION USING PASSIVE INFRARED SENSOR (OPTION)

The sensors can be fitted with an optional pyroelectric infrared motion sensor for the occupancy and movement detection. The sensor element is designed for optimal usability and reliability with low power consumption, better sensitivity and signal-to-noise ratio reducing the false detections.

The movement sensor status is available over the network or through the optional relay output.

The diagram illustrates the detection area.

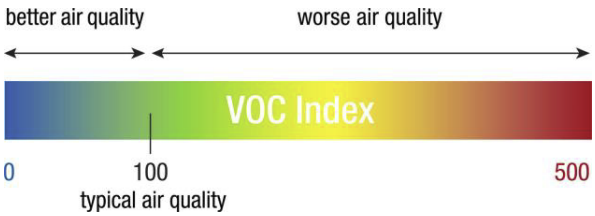
The movement sensor *Delay Off Timer* (10..28,800 seconds) parameter sets the time that the status latches ON after detection of movement.



NOTE: Any new detected movement resets the timer. The movement sensor has 30 seconds warm-up delay on power up.

RH-VOC VOLATILE ORGANIC COMPOUND MEASUREMENT (VER 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 outputted to 0..10Vdc output.

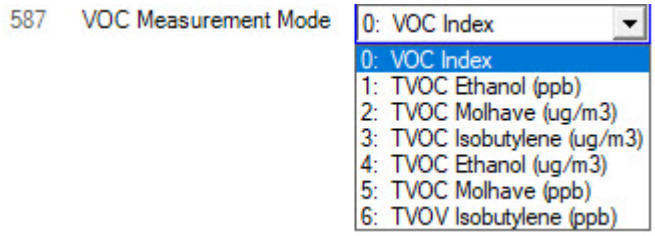


Measured air pollutants include harmful gases (acetone from paints and glues, toluene from furniture, mattresses and building products), other gases (ethanol from alcohol, perfumes and cleaners), odours (hydrogen sulfide and volatile sulfuric compounds from rotten food and farts; ammonia and amines from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

The output signal is scaled as 0..500 index = 0..10Vdc.

TVOC Ethanol Concentration Calculation

The xER10 Series Sensors can calculate and display $TVOC_{Ethanol}$ by selecting *VOC Measurement Mode*/ *TVOC Ethanol* from the *Calibration and VOC Mode Settings* Menu. $TVOC_{Ethanol}$ setting provides Total Volatile Organic Compounds (ppb - parts per billion) with Ethanol as the reference gas. The maximum value is 2383 ppb (or 4491 ug/m^3).



WELL Building Standard ® Compliant TVOC Concentration

According to the Performance Guidebook v.2 of the WELL Building Standard®, performance of an IAQ monitor can be assessed by using ethanol as calibration gas and the Mølhave gas mixture to convert the ethanol concentration into the Mølhave equivalent of TVOC or $TVOC_{Mølhave.}$ The xER10 Series Sensors can calculate and display $TVOC_{Mølhave}$ by selecting *587 VOC Measurement Mode* = *TVOC Molhave* from the *Calibration and VOC Mode Settings* Menu. Two options for both ppb and ug/m^3 calculation are available. The maximum value is 1321 ppb (or 5482 ug/m^3).

Now Parameter *403 VOC Sensor (index)* shows the TVOC conentration based on the $TVOC_{Mølhave}$ index. .

RESET® Air compliant TVOC concentration

The xER10 Series Sensors can calculate and display $TVOC_{Isobutylene}$ by selecting *VOC Measurement Mode*/*TVOC Isobutylene* from the *Calibration and VOC Mode Settings* Menu. $TVOC_{Isobutylene}$ setting provides RESET® Air compliant TVOC concentration. Two options for both ppb and ug/m^3 calculation are available. The maximum value is 2389 ppb (or 5482 ug/m^3).

Analogue Outputs

The sensors have 4 x 0..10Vdc outputs. The Y1/Y2/Y3/Y4 0..10V outputs can be configured to transmit the temperature, humidity, VOC (tVOC), CO2 and UI measurements.In addition the outputs can be configured for Control Loop output and for Max Loop1/Loop2 outputs (see Control Loops chapter for further details).

The outputs can be also configured giving 0-10Vdc setpoint signal. Using the touchscreen model the device can be used e.g. as setpoint adjuster, window position adjusted, blinds position adjuster or light level adjuster.

If the analogue output is configured for the Universal Input measurement, the output voltage depends on the Input configuration. In case of the NTC10, the 0..10V output is scaled based on the Max. Scaled Temperature. If 0..10V input option is selected, the input voltage is transmitted to the output directly. In case of digital mode, the output voltage is 0V when input is OFF and the output voltage is 10V when the input is ON.

Relay Output (RL Option)

The xER10 series sensors can have optional 24V relay output (-RL option). The relay contacts are volt-free. The relay can be controlled from the network, transmit UI or PIR status, or used for control (see Relay Output Control section for further details).

Colour Display and Capacitive Touchscreen Options

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 and indicate alarm conditions. Additional capacitive touchscreen option allows the users to interact with the system.

COLOUR DISPLAY OPTION (-LCD)

The colour display has been designed to display measurements in up to five (5) locations. Each of the locations can be individually configured according to the requirements.

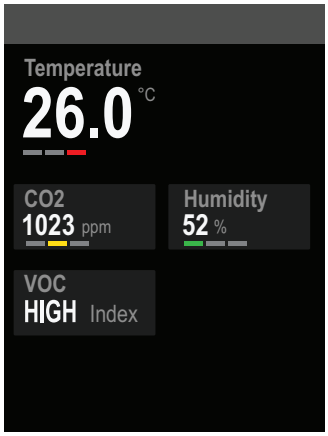
Each of the five display locations can be configured to show

- CO2, VOC, Temperature, or Humidity Measurement
- TVOC, RESET® Air compliant TVOC concentration and WELL Building Standard® Index Display
- Alarm Conditions of the Measurements (Green, Amber, Red)
- Descriptive Text instead of Measurement Value (Low / Normal / High)

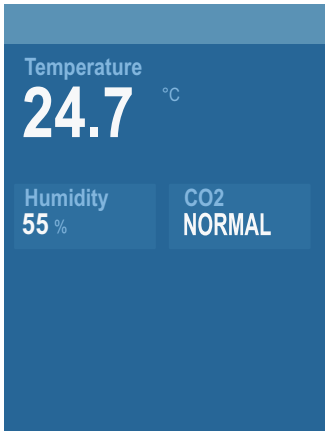
The display can be furthermore customised to:-

- 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 description and units of each location can be customised
- The skin colour of the display can 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

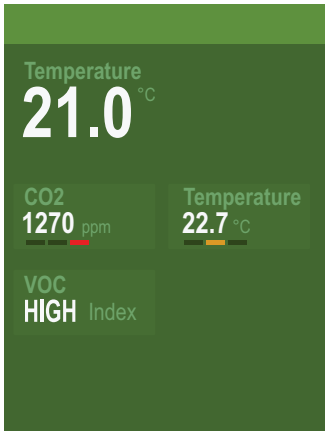
-LCD DISPLAY BLACK COLOUR



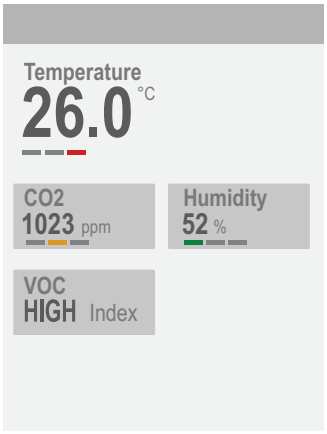
-LCD DISPLAY BLUE COLOUR



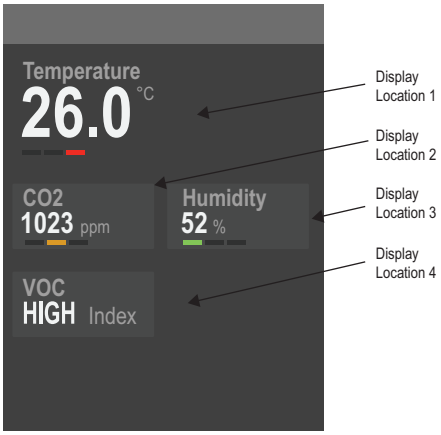
-LCD DISPLAY GREEN COLOUR

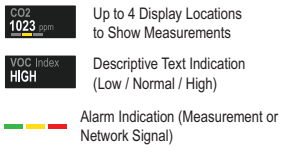


-LCD DISPLAY WHITE COLOUR



-LCD DISPLAY GREY COLOUR

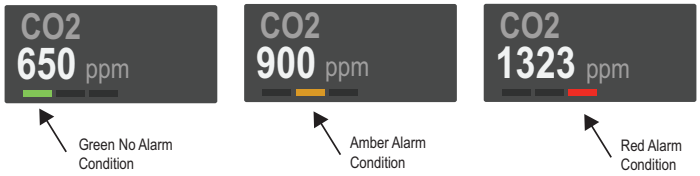




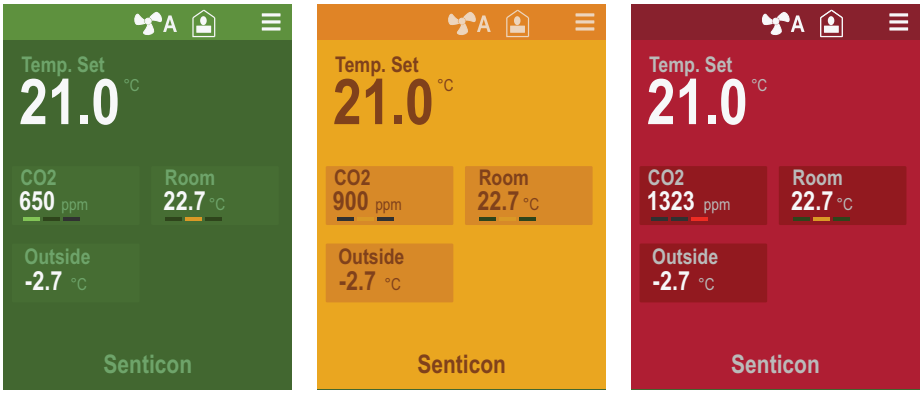
TRAFFIC LIGHT ALARM FUNCTION

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, or amber skin colour). When measurement is above the Red Limit, the location goes to Red Alarm (red bar icon or red skin colour).

ALARMING USING BAR DISPLAY



ALARMING USING SKIN COLOUR



Green No Alarm Condition (Set display colour to green)

Amber Alarm Condition

Red Alarm Condition

CAPACITIVE COLOUR TOUCHSCREEN OPTION (-TS)

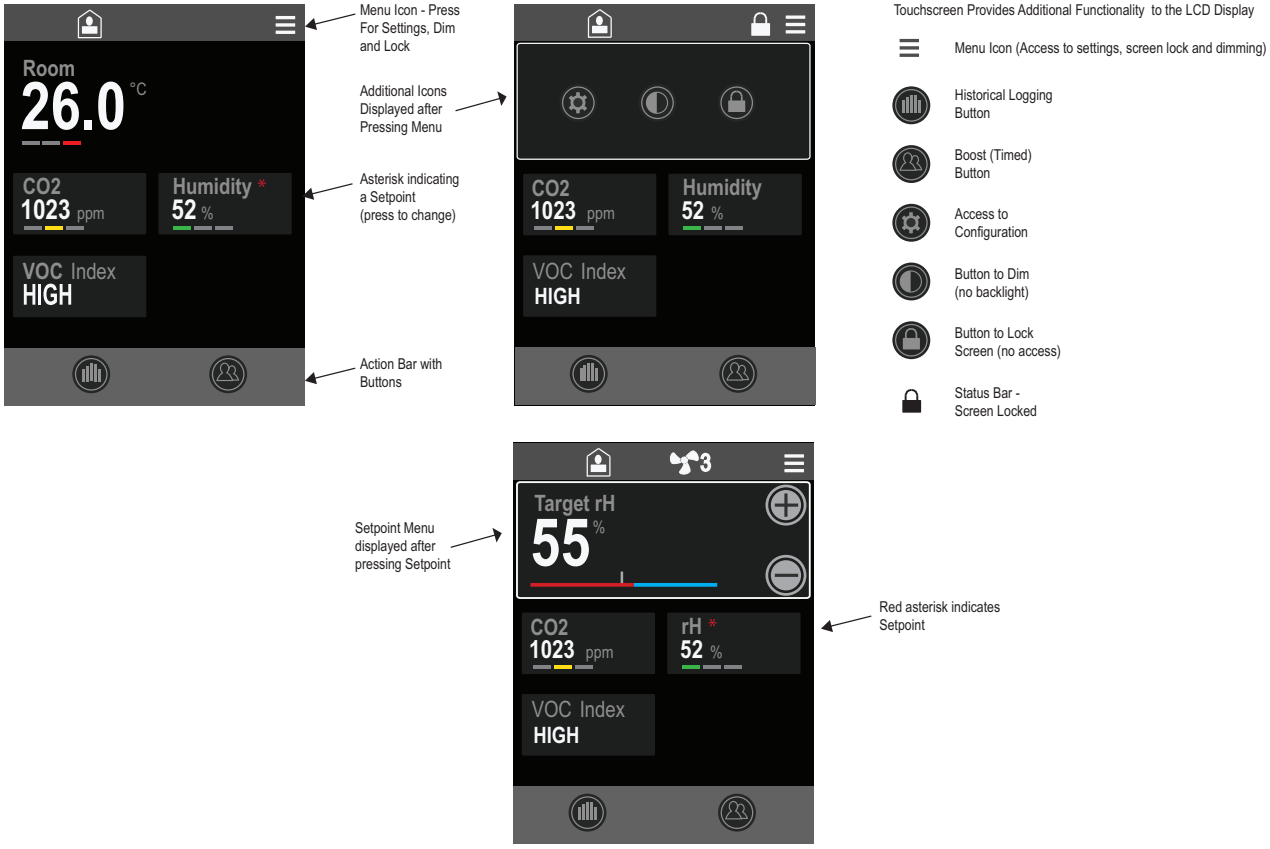
With the capacitive touchscreen option the display becomes interactive to the users. The capacitive touchscreen offers an accurate touch capability to the room sensors. With touchscreen the following additonal user interface options become available.

- Boost button with an adjustable timer
- Setpoint adjustment option for any of the four (4) locations - max. 2 setpoints
- Window/blinds position adjustment and light level adjustment using the setpoint options
- Two historical trend (data logging) functions - Note. Data stored in volatile memory only

Furthermore the status bar will have menu option, that allows

- The display to be dimmed
- The display to be locked from unauthorised access
- Access to the Configration Menu (network settings)

TOUCHSCREEN DISPLAY (SKIN COLOUR SELECTABLE)

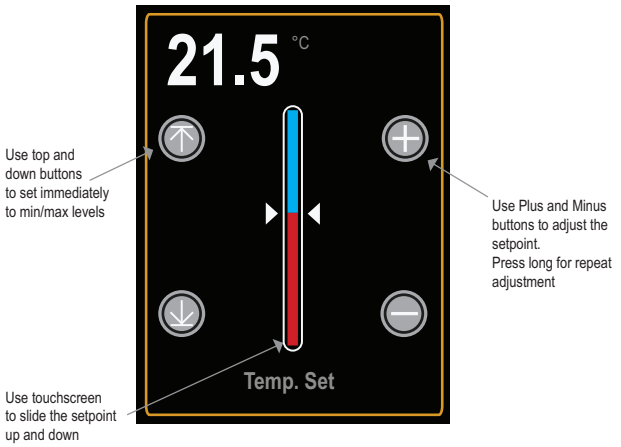


SETPOINT ADJUSTMENT

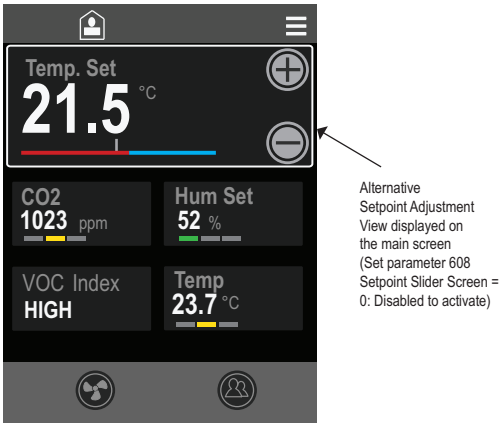
Two setpoint adjustments can be set to any of the five display locations. The setpoints can be confgured to operate with decimal point (e.g. temperature) or with integer (e.g. CO2) accuracy. Each setpoint can have minimum and maximum adjustment limits for the user. The adjustment steps (resolution) can also be controlled. The nominal (initial) setpoint can be set from the network.

The setpoint can be showed on the home screen or on a separate setpoint adjustment screen by enabling Parameter *608 : Setpoint Slider Screen*.

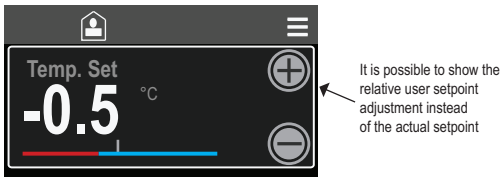
SETPOINT SLIDER SCREEN (DEFAULT)



ALTERNATIVE SETPOINT VIEW



RELATIVE SETPOINT ADJUSTMENT



LIGHT LEVEL ADJUSTMENT

Enabling Lights option for DisplayLocations 2 to 4 (Parameters 617/624/631/638), theSensor can be used for Lights Level adjustment. In the selected location on the home screen the light icon is yellow when lights level is set > 0% and in grey when the lights are switched off.

When the Lights icon is pressed, the Light Level adjustment screen is displayed (if the number of steps is configured 3 or more through parameter 682). By pressing the +/- buttons the Lights level can be incremented in steps. Pressing top and down icons the levels can be immediately set to 100% and 0%, respectively. As default the lights icon has been configured as an On/Off toggle button and it is set to 100% (On) on controller reset/power up.

The lights level can be sent the 0-10Vdc outputs to set the lights level on e.g. lighting ballasts.

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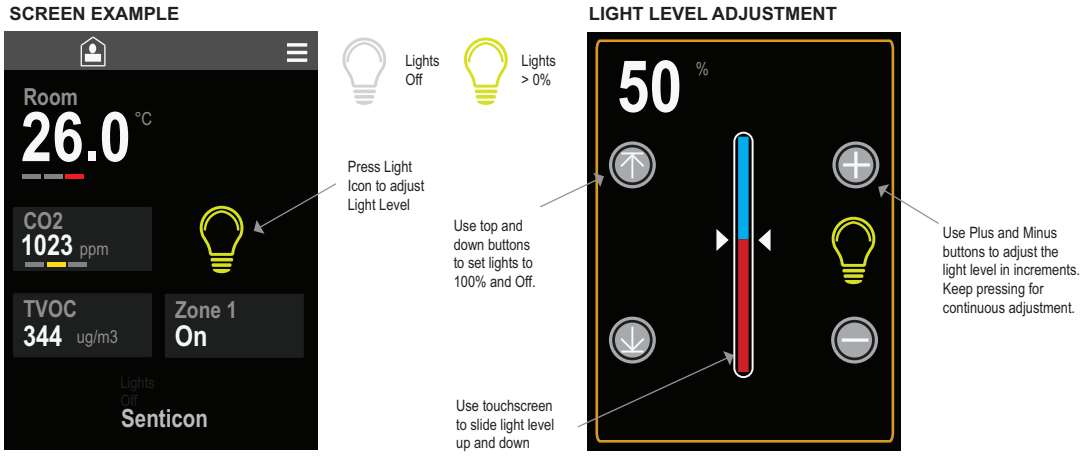
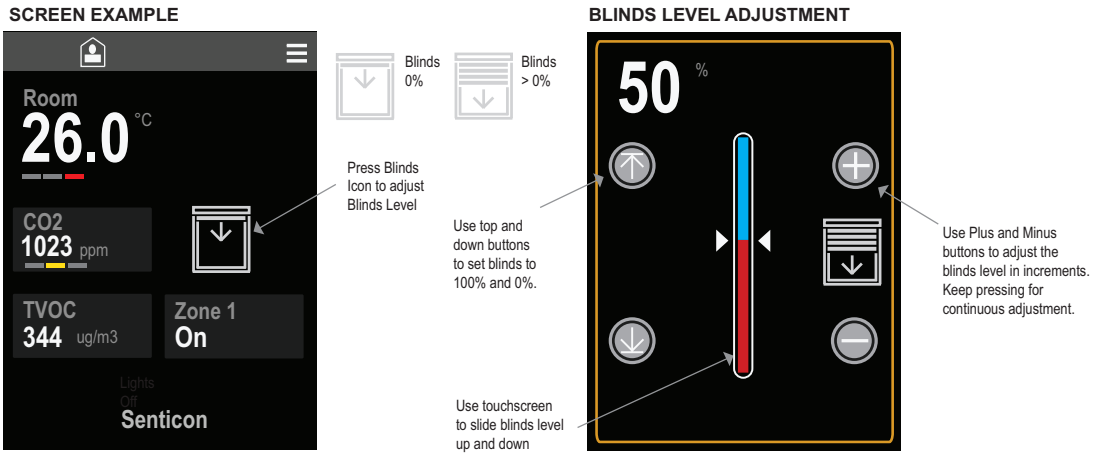


BLINDS AND WINDOW ADJUSTMENT

Enabling Blinds/Window option for Display Locations 2 to 4 (Parameters 617/624/631/638), the Sensor can be used for the Blinds/Window Level adjustment. In the selected location on the home screen the blinds icon indicates if the blinds/windows are fully open or closed.

When the Blinds/Window icon is pressed, the Blind/Window Level adjustment screen is displayed (if number of steps is set to 3 or more through parameter 683). By pressing the +/- buttons the Blinds level/Window opening can be incremented in steps. Pressing top and down icons the levels can be immediately set to 100% and 0%, respectively. As default the Blinds / Window icon has been configured as Off/On (0/100%) toggle button.

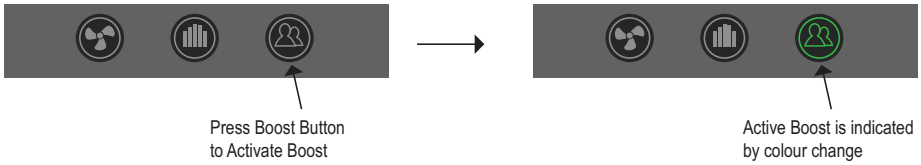
The blinds level/window opening can be sent to the 0-10Vdc outputs to se the blinds level to control the blinds / window position directly.



BOOST BUTTON (TIMED)

Pressing the Boost Button the device switches to Occupied Mode - Button Colour Changes and the Occupancy Icon on the Status Bar (if activated) indicates occupancy. The boost button has adjustable timer between 0..28,800 seconds. By setting boost time to 0 seconds, the Boost is permanent. The boost can be cancelled by pressing the boost button again.

The boost button and the boost time is activated through the configuration parameters.



It is also possible to set the boost target to one of the control loop outputs (which can be linked to any of the analogue outputs or to the relay output). When the boost is active the output is set fully on to 100%.

HISTORICAL TREND LOGGING

If the historical logging function has been activated the Action Bar shows the Button to Access the historical log data. The history function will automatically log all measurements. It is possible to configure one or two history logs displayed on the screen. Once on the screen the different measurements can be selected by pressing the buttons for comparison. The historical logging interval can be configured between from the selectable options; 10 seconds, 30 seconds, 1 minute, 3 minutes, 30 minutes, 90 minutes.

Up to 240 historical logging samples per measurement are stored in the volatile memory (Note. The historical logs are not stored during the power off). The table below illustrates the maximum data period for each logging interval setting.

Logging Interval	Maximum Data Period
10 Second	40 minutes
30 seconds	120 minutes - 2 hours
1 minute	240 minutes - 4 hours
3 minutes	720 minutes - 12 hours
30 minutes	120 hours - 5 days
90 minutes	360 hours - 15 days

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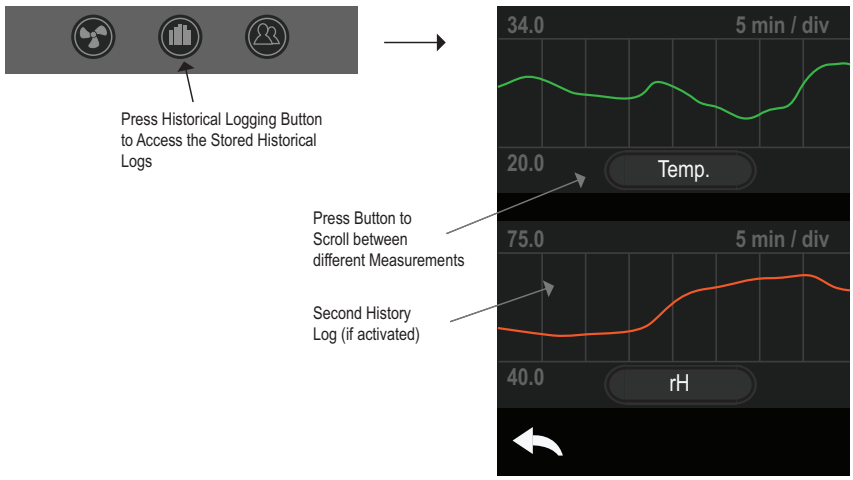

SCREEN LOCK

By selecting the Lock icon from the menu bar the screen is locked (buttons disabled, except menu and lock icons). If the Lock code is 0000, no code is required to lock and unlock the screen. By setting the lock code to any other value, the user needs to enter the code to lock and unlock the screen.

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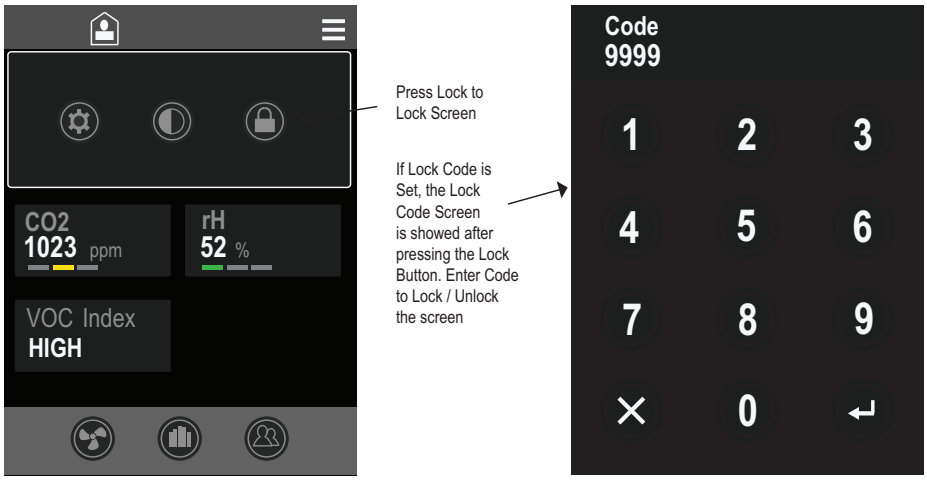

CONFIGURATION SCREEN

To access the Configuration Screen (for network settings), Press the Configuration Icon. If the configuration code is set, default 8000, the Configuration Menu is displayed. If the code is set to 0000 then no passcode is required. To store the new configuration settings in the Non Volatile memory press the back arrow to return to the main screen. In the Configuration menu it is possible to review the firmware version.

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Control Functions

RELAY OUTPUT CONTROL (RL AND RLM OPTIONS)

The devices can be fitted with additional relay (-RL or -RLMoption). Using the relay it is possible to switch system on/off based on the configured switching points and selected measurement. E.g. relay can be switched ON/OFF based on the CO2 reading. For available options please see the Sensor Configuration parameters.

NOTE: By reversing the switching points the relay operation is reversed.

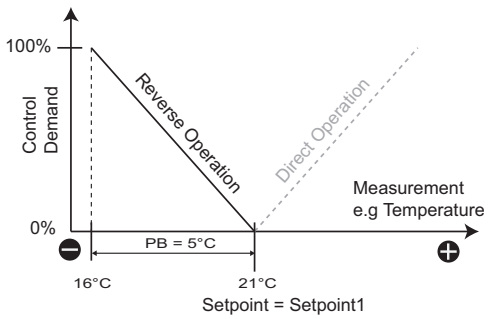
CONTROL LOOPS (ALL MODELS)

The devices have two PI (Proportional + Integral) control loops that can be configured to control temperature, humidity, CO2 or VOC. The control loops can operate as in reverse or direct mode. In reverse mode when the measurement e.g. temperature drops from the setpoint, the control loop output will increase based on the proportional band and integral action settings. If integral action is disabled the control output increases proportionallly (image below illustrates this).

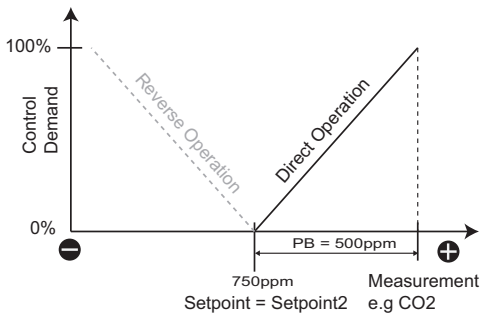
In direct mode when the measurement e.g. CO2 increases above the setpoint the control output also proportionally increases base on the proportional band (and integral action) settings.

The control loop outputs can be linked to any of the analogue outputs. The output of two control loops can be combined by selecting Max Loop 1 and Loop 2 setting. This can be useful in cases where e.g. supply air flow is required to be controlled both by temperature and air quality level, or by both CO2 and VOC..

CONTROL LOOP 1
Note: Default Settings Illustrated



CONTROL LOOP 2



NOTE: The control outputs can also be boosted for a set period by the boost button (with TS models).

Wireless Interafaces

BLUETOOTH WIRELESS INTERFACE

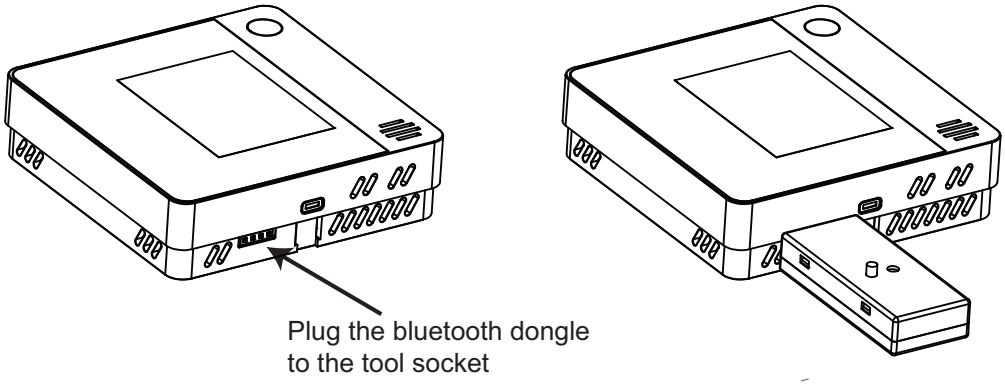
With the -BLE option the devices are fitted with integrated Bluetooth Low Energy. The Bluetooth interface provides wireless connection point to SmartPhone app (iOS) to be able to interrogate and change the controller settings. Using the SmartView application the end users can change the device settings and see the current measurements. The SmartView application can be used as a complement to the display, or with non-display versions it can be used as the user interface.

NOTE: The SmartView application uses the device's display configuration to create the user view. If the device has no display, the display configuration settings can still be used to customise the user views on the App.

Device Setup

The devices can be configured locally using via PC Based Smart Config Tool or via iOS Smart Phone Application. Using these methods the device settings can be altered to suit the site requirements and the current device status can be interrogated.

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). If the device is supplied with Built-In Bluetooth App interface (an option), then this can also be used for the tool communication connection. The SmartConfig PC tool can also be connected using USB-SERIAL cable to the devices.



LIVE DATA						
		MODBUS INPUT REGISTERS - FUNCTION CODE 04 MODBUS HOLDING REGISTER - FUNCTION CODES 03				
Parameter	**Description**	**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, TVOC Value, $TVOC_{Molhave}$ or $TVOC_{Isobutylene}$ Value	**403**	int16	0..500 (x1) 0..5,000	0..500 index 0...5,000 TVOC	R

Y1	Analogue Output 1 Value (Default Output Mode: Built-In Temperature)	**412**	uint16	0..1000 (x10)	0..100% = 0..10V	R
Y2	Analogue Output 2 Value (Default Output Mode: Humidity)	**413**	uint16	0..1000 (x10)	0..100% = 0..10V	R
Y3	Analogue Output 3 Value (Default Output Mode: CO2 Reading)	**414**	uint16	0..1000 (x10)	0..100% = 0..10V	R
Y4	Analogue Output 4 Value (Default Output Mode: VOC Index)	**415**	uint16	0..1000 (x10)	0..100% = 0..10V	R
Calculated Setpoint 1	Calculated Setpoint (Nominal Network Setpoint + User Adjustment, or the Absolute Setpoint)	**418**	uint16	-32000..32000 (x10)	-3200.0..3200.0	R
Calculated Setpoint 2	Calculated Setpoint (Nominal Network Setpoint + User Adjustment, or the Absolutele Setpoint)	**419**	uint16	-32000..32000 (x10)	-3200.0..3200.0	R
		DISCRETE INPUTS - FUNCTION CODE 02				
Movement Status	PIR (OE Option) Status	**202**		0..1	0..1	R
Relay Status	Relay Output Status (RL or RLM Option)	**203**		0..1	0..1	R
Boost Status	Boost Button Status (TS Option) - Shows if Boost Button has been activated by the user.	**204**		0..1	0 = No Boost 1 = Boost	R
Screen Lock Status	Screen Lock Status	**205**		0..1	0 = Not Locked 1 = Locked	R

INPUT/OUTPUT SETTINGS						
		Modbus Register / BACnet Property	**MODBUS HOLDING REGISTER - FUNCTION CODES 03, 06, 16**			
Parameter	**Description**		**Type**	**Data Range (multiplier)**	**Value Range / Enumerations**	**R/W**
MEASUREMENT SCALING AND SETTINGS						
Temperature Units	Selects between Celcius and Fahrenheit Note: The display and network measurements will automatically reflect reading in the selected units.	**522**	unit16	0..1 (x1)	0 = Celcius (Default) 1 = Fahrenheit	R/W
Min Scaled Temperature	Scales the 0-10V output for temperature. Linear scaling, temperature value at 0V.	**540**	uint16	0..2120 (x10)	0..100° (32..212°F) Default 0°C	R/W
Max Scaled Temperature	Scales the 0-10V output for temperature. Linear scaling, temperature value at 10V.	**527**	uint16	0..2120 (x10)	0..100° (32..212°F) Default 50°C (122°F)	R/W
Min Scaled Humidity	Scales the 0-10V output for humidity. Linear scaling, humidity value at 0V.	**541**	uint16	0..1000 (x10)	0..100%rh (Default 0%)	R/W
Max Scaled Humidity	Scales the 0-10V output for humidity. Linear scaling, humidity value at 10V.	**528**	uint16	0..1000 (x10)	0..100%rh (Default 100%)	R/W
Min Scaled CO2	Scales the 0-10V output for CO2. Linear scaling, CO2 value at 0V.	**542**	uint16	0..10000 (x1)	0..10,000ppm (Default 400)	R/W
Max Scaled CO2	Scales the 0-10V output for CO2. Linear scaling, CO2 value at 10V.	**529**	uint16	0..10000 (x1)	0..10,000ppm (Default 2000)	R/W
Max Scaled VOC	Scales the 0-10V output for VOC Linear scaling, VOC value at 10V. Note: VOC units are selected by the VOC measurement mode.	**543**	uint16	0..10000 (x1)	0..10,000 (Default 500)	R/W
ANALOGUE OUTPUTS						
Y1 Mode	Analogue Output Y1 Mode Default: Built-In Temperature Universal Input Mode: NTC - Output scaled 0..10V based on Max Scaled Temperature Analogue - 0..10V input scaled to 0..10V Digital Mode - Off = 0V, On = 10V Setpoint 1&2: Scales the setpoint value based on min/max settings to 0-10Vdc output signal.	**530**	unit16	0..11 (x1)	0 - Network 1 = Built-In Temperature 2 = Humidity 3 = CO2 Reading 4 = VOC Reading 5 = Universal Input 1 6 = Universal Input 2 7 = Control Loop 1 8 = Control Loop 2 9 = Max Loop 1 and 2 10 = Setpoint 1 11 = Setpoint 2	R/W
Y2 Mode	Analogue Output Y2 Mode Default: Humdity	**531**	unit16	0..11 (x1)		R/W
Y3 Mode	Analogue Output Y3 Mode Default: CO2 Reading	**532**	unit16	0..11 (x1)		R/W
Y4 Mode	Analogue Output Y4 Mode Default: VOC Reading	**533**	unit16	0..11 (x1)		R/W
Y1 Override	Analogue Output Y1 Override Value	**534**	unit16	0..1000 (x10)	0.0..100.0% (Default 0)	R/W
Y2 Override	Analogue Output Y2 Override Value	**535**	unit16	0..1000 (x10)	0.0..100.0% (Default 0)	R/W

Y3 Override	Analogue Output Y3 Override Value	**536**	unit16	0..1000 (x10)	0.0..100.0% (Default 0)	R/W
Y4 Override	Analogue Output Y4 Override Value	**537**	unit16	0..1000 (x10)	0.0..100.0% (Default 0)	R/W

DIGITAL INPUTS AND OUTPUTS						
Relay Control Mode	Relay (RL or RLM Option) control mode. Relay can be configured to switch on measurements or based on the internal control logic.	**552**	uint16	0..11 (x1)	0 = Network 1 = Digital - PIR Status 2 = Digital UI1 3 = Digital UI2 4 = Control - Built-In Temp 5 = Control -UI1 6 = Control -UI2 7 = Control- Humidity 8 = Control - CO2 9 = Control - VOC Index 10 = Control - Loop 1 11 = Control - Loop 2	R/W
Relay High Setpoint	Relay High Setpoint. Measurement where the relay switches ON. Only applicable when Relay Control mode is set to Control (options 4-9). Note: If Low Setpoint is higher than the High Setpoint, the relay operation is reversed.	**553**	uint16	0..65000 (x10)	0..6500 (default 850.0)	R/W
Relay Low Setpoint	Relay Low Setpoint. Measurement where the relay switches OFF. Only applicable when Relay Control mode is set to Control.	**554**	uint16	0..65000 (x10)	0..6500 (default 750.0)	R/W
Relay Override	Overrides the current output status of the relay permanently (overrides the local control).	**555**	uint16	0..2 (x1)	0 = No override 1 = Override OFF 2 = Override ON	R/W
Movement Off Delay	Delay Off Timer for the PIR (movement) sensor	**556**	uint16	10..28,800 (x1)	10..28,800 seconds (default 600 secs)	R/W

CALIBRATION AND VOC MODE SETTINGS						
		Modbus Register / BACnet Property	**MODBUS HOLDING REGISTER - FUNCTION CODES 03, 06, 16**			
Parameter	**Description**		**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
VOC Measurement Mode	VOC Measurement Mode Selection (Index, TVOC, Well Standard, Reaser Air Standard)	**587**	uint16	0..6	0 = VOC Index 1 = TVOC Ethanol (TVOC) 2 = TVOC Molhave (Well) 3 = TVOC Isobutylene (Reset) 4 = TVOC Ethanol, ug/m3 (TVOC) 5 = TVOC Molhave, ppb (Well) 6 = TVOC Isobutylene, ppb (Reset)	R/W
VOC Learning Time Offset	VOC Learning Time Offset. Set to 12 for Index mode and 720 for Building Standards Mode (from V1.62)	**589**	uint16	1..1,000 (x1)	1..1,000hours (Default 12)	R/W

DISPLAY SETTINGS						
		Modbus Register / BACnet Property	MODBUS HOLDING REGISTER - FUNCTION CODES 03, 06, 16			
Parameter	**Description**		**Type**	**Data Range (multiplier)**	**Value Range / Enumerations**	**R/W**
GENERAL						
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 = Norrmal (0.5°C/F) 2 = Coarse (1°C/F)	R/W
Occupancy Icon	Activates Occupancy Icon display (Man in the House) on the top status bar.	**603**	uint16	0..1	0 = Disabled (default) 1 = Enabled	R/W
Occupancy Icon Override	Occupancy Icon Network Override (Man In the House). Override the icon status between occupied and unoccupied. The display uses the last transition. Please note PIR (OE option) uses also the Occupancy Icon and it affects the icon status.	**604**	uint16	0..2	0 = No Override 1 =Override OFF 2 = Override ON	R/W
DISPLAY LOCATION 1 (PRIMARY DISPLAY LOCATION)						
Location 1 Display	Location 1 Display Source. Sets what is displayed in Location 1.	**610**	uint16	0..10	0 = None 1 = n/a 2 = n/a 3 = Temperature (Default) 4 = Universal Input 1 5 = Universal Input 2 6 = Humidity 7 = CO2 8 = VOC Index With Touchscreen 9 = Setpoint 1 10 = Setpoint 2	R/W
Location 1 Description	Location 1 Description. Sets description for Location 1. Default = Temperature	**611**	uint16	0..27	0 = None 1 = Temperature 2 = Humidity 3 = CO2 4 = VOC 5 = Light Level 6 = Pressure 7 = Room 8 = Outside 9 = Fan 10 = Energy 11 = Water 12 = Electricity 13 = Heating 14 = Cooling 15 = Zone 1 16 = Zone 2 17 = Temp. Set 18 = Hum. Set 19 = CO2 Set 20 = Aux. Set 21 = Room Set 22 = Zone 1 Set 23 = Zone 2 Set 24 = Window 25 = Blinds 26 = TVOC 27 = Flow	R/W

Location 1 Unit	Location 1 Unit. Sets unit for Location 1.	**612**	uint16	0..14	0 = None 1 = °C (Default) 2 = °F 3 = ppm 4 = Lux 5 = Pa 6 = kWh 7 = m3 8 = % 9 = index (air quality index) 10 = ppb 11 = ug/m3 12 = l/s 13 = m3/h 14 = cfm	R/W
Location 1 Alarm	Activates Location 1 Alarm Bar, Alarm Skin Colour or Descriptive Text indication. Using 1=Bar activates Green, Amber, Red alarm icon indication underneath the current displayed parameter. Using 3=Text activates LOW, MEDIUM HIGH text indication instead of the measurement. Using 3= Skin activates the skin colour changing based on alarm condition.	**613**	uint16	0..3	0 = Disabled 1 = Bar 2 = Text 3 = Skin	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
Location 1 Read Only	Sets the location 1 to be Read Only, Read/Write or Read-Write-NoLock. In Read Only mode touch functions are disabled for this location. In Read-Write-NoLock mode the touch actions are enabled even if the screen is locked.	**645**	uint16	0..2	0 = Read-Write (default) 1 = Read Only 2 = Read-Write-NoLock	R/W

DISPLAY LOCATION 2						
Location 2 Display	Location 2 Display Source. Sets what is displayed in Location 2.	**617**	uint16	0..10	0 = None 1 = n/a 2 = n/a 3 = Temperature 4 = Universal Input 1 5 = Universal Input 2 6 = Humidity 7 = CO2 (Default) 8 = VOC Index With Touchscreen 9 = Setpoint 1 10 = Setpoint 2	R/W
Location 2 Description	Location 2 Description Default: Humidity	**618**	uint16	0..27	0 = None 1 = Temperature 2 = Humidity 3 = CO2 4 = VOC 5 = Light Level 6 = Pressure 7 = Room 8 = Outside 9 = Fan 10 = Energy 11 = Water 12 = Electricity 13 = Heating 14 = Cooling 15 = Zone 1 16 = Zone 2 17 = Temp. Set 18 = Hum. Set 19 = CO2 Set 20 = Aux. Set 21 = Room Set 22 = Zone 1 Set 23 = Zone 2 Set 24 = Window 25 = Blinds 26 = TVOC 27 = Flow	R/W

Location 2 Unit	Location 2 Unit	**619**	uint16	0..14	0 = None 1 = °C (Default) 2 = °F 3 = ppm 4 = Lux 5 = Pa 6 = kWh 7 = m3 8 = % 9 = index (air quality index) 10 = ppb 11 = ug/m3 12 = l/s 13 = m3/h 14 = cfm	R/W
Location 2 Alarm	Activates Location 1 Alarm Bar, Alarm Skin Colour or Descriptive Text indication. Using 1=Bar activates Green, Amber, Red alarm icon indication underneath the current displayed parameter. Using 3=Text activates LOW, MEDIUM HIGH text indication instead of the measurement. Using 3= Skin activates the skin colour changing based on alarm condition.	**620**	uint16	0..3	0 = Disabled 1 = Bar 2 = Text 3 = Skin	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
Location 2 Read Only	Sets the location 2 to be Read Only, Read/Write or Read-Write-NoLock. In Read Only mode touch functions are disabled for this location. In Read-Write-NoLock mode the touch actions are enabled even if the screen is locked.	**646**	uint16	0..2	0 = Read-Write (default) 1 = Read Only 2 = Read-Write-NoLock	R/W

DISPLAY LOCATION 3						
Location 3 Display	Location 3 Display Source. Sets what is displayed in Location 3.	**624**	uint16	0..10	0 = None 1 = n/a 2 = n/a 3 = Temperature 4 = Universal Input 1 5 = Universal Input 2 6 = Humidity (Default) 7 = CO2 8 = VOC Index With Touchscreen 9 = Setpoint 1 10 = Setpoint 2	R/W

Location 3 Description	Location 3 Description Default = CO2	**625**	uint16	0..27	0 = None 1 = Temperature 2 = Humidity 3 = CO2 4 = VOC 5 = Light Level 6 = Pressure 7 = Room 8 = Outside 9 = Fan 10 = Energy 11 = Water 12 = Electricity 13 = Heating 14 = Cooling 15 = Zone 1 16 = Zone 2 17 = Temp. Set 18 = Hum. Set 19 = CO2 Set 20 = Aux. Set 21 = Room Set 22 = Zone 1 Set 23 = Zone 2 Set 24 = Window 25 = Blinds 26 = TVOC 27 = Flow	R/W
Location 3 Unit	Location 3 Unit	**626**	uint16	0..14	0 = None 1 = °C 2 = °F 3 = ppm 4 = Lux 5 = Pa 6 = kWh 7 = m3 8 = % (default) 9 = index (air quality index) 10 = ppb 11 = ug/m3 12 = l/s 13 = m3/h 14 = cfm	R/W
Location 3 Alarm	Activates Location 1 Alarm Bar, Alarm Skin Colour or Descriptive Text indication. Using 1=Bar activates Green, Amber, Red alarm icon indication underneath the current displayed parameter. Using 3=Text activates LOW, MEDIUM HIGH text indication instead of the measurement. Using 3=Skin activates the skin colour changing based on alarm condition.	**627**	uint16	0..3	0 = Disabled 1 = Bar 2 = Text 3 = Skin	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
Location 3 Read Only	Sets the location 3 to be Read Only, Read/Write or Read-Write-NoLock. In Read Only mode touch functions are disabled for this location. In Read-Write-NoLock mode the touch actions are enabled even if the screen is locked.	**647**	uint16	0..2	0 = Read-Write (default) 1 = Read Only 2 = Read-Write-NoLock	R/W
DISPLAY LOCATION 4						
Location 4 Display	Location 4 Display Source. Sets what is displayed in Location 4.	**631**	uint16	0..10	0 = None 1 = n/a 2 = n/a 3 = Temperature 4 = Universal Input 1 5 = Universal Input 2 6 = Humidity 7 = CO2 8 = VOC Index (Default) With Touchscreen 9 = Setpoint 1 10 = Setpoint 2	R/W

Location 4 Description	Location 4 Description Default = VOC	**632**	uint16	0..27	0 = None 1 = Temperature 2 = Humidity 3 = CO2 4 = VOC 5 = Light Level 6 = Pressure 7 = Room 8 = Outside 9 = Fan 10 = Energy 11 = Water 12 = Electricity 13 = Heating 14 = Cooling 15 = Zone 1 16 = Zone 2 17 = Temp. Set 18 = Hum. Set 19 = CO2 Set 20 = Aux. Set 21 = Room Set 22 = Zone 1 Set 23 = Zone 2 Set 24 = Window 25 = Blinds 26 = TVOC 27 = Flow	R/W
Location 4 Unit	Location 4 Unit Default = index	**633**	uint16	0..14	0 = None 1 = °C (Default) 2 = °F 3 = ppm 4 = Lux 5 = Pa 6 = kWh 7 = m3 8 = % 9 = index (air quality index) 10 = ppb 11 = ug/m3 12 = l/s 13 = m3/h 14 = cfm	R/W
Location 4 Alarm	Activates Location 1 Alarm Bar, Alarm Skin Colour or Descriptive Text indication. Using 1=Bar activates Green, Amber, Red alarm icon indication underneath the current displayed parameter. Using 3=Text activates LOW, MEDIUM HIGH text indication instead of the measurement. Using 3= Skin activates the skin colour changing based on alarm condition.	**634**	uint16	0..3	0 = Disabled 1 = Bar 2 = Text 3 = Skin	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
Location 4 Read Only	Sets the location 4 to be Read Only, Read/Write or Read-Write-NoLock. In Read Only mode touch functions are disabled for this location. In Read-Write-NoLock mode the touch actions are enabled even if the screen is locked.	**648**	uint16	0..2	0 = Read-Write (default) 1 = Read Only 2 = Read-Write-NoLock	R/W

DISPLAY LOCATION 5						
		Modbus Register / BACnet Property	**MODBUS HOLDING REGISTER - FUNCTION CODES 03, 06, 16**			
Location 5 Display	Location 5 Display Source. Sets what is displayed in Location 5.	**638**	uint16	0..10	0 = None 1 = Network Decimal Value 2 = Network Integer Value 3 = Temperature 4 = Universal Input 1 5 = Universal Input 2 6 = Humidity 7 = CO2 8 = VOC Index (Default) With Touchscreen 9 = Setpoint 1 10 = Setpoint 2	R/W
Location 5 Description	Location 5 Description Default = None	**639**	uint16	0..27	0 = None 1 = Temperature 2 = Humidity 3 = CO2 4 = VOC 5 = Light Level 6 = Pressure 7 = Room 8 = Outside 9 = Fan 10 = Energy 11 = Water 12 = Electricity 13 = Heating 14 = Cooling 15 = Zone 1 16 = Zone 2 17 = Temp. Set 18 = Hum. Set 19 = CO2 Set 20 = Aux. Set 21 = Room Set 22 = Zone 1 Set 23 = Zone 2 Set 24 = Window 25 = Blinds 26 = TVOC 27 = Flow	R/W
Location 5 Unit	Location 5 Unit	**640**	uint16	0..14	0 = None 1 = °C 2 = °F 3 = ppm 4 = Lux 5 = Pa 6 = kWh 7 = m3 8 = % 9 = index (default) 10 = ppb 11 = ug/m3 12 = l/s 13 = m3/h 14 = cfm	R/W
Location 5 Alarm	Activates Location 5 Alarm Bar, Alarm Skin Colour or Descriptive Text indication. Using 1=Bar activates Green, Amber, Red alarm icon indication underneath the current displayed parameter. Using 3=Text activates LOW, MEDIUM HIGH text indication instead of the measurement. Using 3= Skin activates the skin colour changing based on alarm condition.	**641**	uint16	0..3	0 = Disabled 1 = Bar 2 = Text 3 = Skin	R/W
Location 5 Red Alarm Limit	Red Limit for Alarm 5 / High Limit for Descriptive Display	**642**	uint16	0..10,000 (x1)	0..10,000 (default 140)	R/W
Location 5 Amber Alarm Limit	Amber Limit for Alarm 5 / Medium Limit for Descriptive Displays	**643**	uint16	0..10,000 (x1)	0..10,000 (default 120)	R/W

Location 5 Hysteresis	Hysteresis for Alarm 5 / Low Limit for Descriptive Displays	**644**	uint16	0..10,000 (x1)	0..10,000 (default 10)	R/W
Location 5 Read Only	Sets the location 5 to be Read Only, Read/Write or Read-Write-NoLock. In Read Only mode touch functions are disabled for this location. In Read-Write-NoLock mode the touch actions are enabled even if the screen is locked.	**649**	uint16	0..2	0 = Read-Write (default) 1 = Read Only 2 = Read-Write-NoLock	R/W

TOUCHSCREEN SETTINGS (TS MODELS ONLY)						
		Modbus Register / BACnet Property	**MODBUS HOLDING REGISTER - FUNCTION CODES 03, 06, 16**			
Parameter	**Description**		**Type**	**Data Range (multiplier)**	**Value Range / Enumerations**	**R/W**
GENERAL						
Enable Boost Button	Enables Boost Button on the bottom action bar	**650**	uint16	0..1	0 = Disabled (default) 1 = Enabled	R/W
Boost Time	Delay Off Timer for the Boost Button	**651**	uint16	0..28,800 (x1)	0..28,800 seconds 0 = Timer disabled, toggle functionality	R/W
Boost Target	Sets the boost operation target	**652**	uint16	0..2	0 = None 1 = Control Loop 1 Output 2 = Control Loop 2 Output	R/W
Lock Code	Screen Lock Code - 0000 = User requires no code to lock the screen	**653**	unit16	0..9,999 (x1)	0..9,999 (Default 0000)	R/W
Auto Lock	Enables Auto Lock of the Screen (approx 3 minutes after unlocking the screen)	**656**	uint16	0..1	0 = Disabled (default) 1 = Enabled	R/W
Screen Lock Override	Overrides the Current State of the Screen Lock	**654**	unit16	0..2 (x1)	0 = No Override 1 = Unlock Screen 2 = Lock Screen	R/W
Config Code	Code to Enter Configuration Screen, Set to 0000 to bypass the requirement to enter the code.	**655**	unit16	0..9,999 (x1)	0..9,999 (Default 8000)	R/W
Setpoint Slider Screen	When enabled shows the Setpoint Slider Screen when adjusting setpoint. Disabled shows setpoint on the main screen.	**608**	unit16	0..1 (x1)	0 = Disabled 1 = Enabled (Default)	R/W

DATA LOGGING						
History 1 Display	Default Display for Historical Logging Location 1. Activates the history acces button on the bottom action bar.	**660**	uint16	0..6	0 = Disabled 1 = Built-In Temp 2 = Universal Input 1 3 = Universal Input 2 4 = Humidity 5 = CO2 6 = VOC Index 7 = PIR (Movement) 8 = DI1 (UI1) 9 = DI2 (UI2)	R/W
History 2 Display	Default Display for Historical Logging Location 2. Activates the history acces button on the bottom action bar. Note: History is stored in the RAM memory only and is lost during the power interrupt.	**661**	uint16	0..6		R/W
Logging Interval	History Logging Interval	**662**	uint16	0..5	0 = 10 seconds 1 = 30 seconds 2 = 1 minute 3 = 3 minutes 4 = 30 minutes 5 = 90 minutes	R/W
SETPOINT (NETWORK DISPLAY) - DATA TYPE ADJUSTABLE TO INTEGER (x1) OR DECIMAL(x10)						
Nominal Setpoint 1	Nominal Setpoint 1. The calculated setpoint is displayed at Register 418 Note: If setpoint changed from network, the user adjustment is reset to zero	**670**	uint16	-27000..27000 (x1/x10) Note: Scaling set by 'Setpoint 1 Data Type'	x1: -27000..+27000 x10: -2700.0..2700.0 - Default 21.0 (x10)	R/W
Setpoint 1 Min Adj Limit	Minimum Setpoint Adjustment Limit for Setpoint 1	**671**	int16	-27000..27000 (x1/x10)	x1: -5000..0 x10: -500.0..0 (default -3.0)	R/W
Setpoint 1 Max Adj Limit	Maximum Setpoint Adjustment Limit for Setpoint 1	**672**	int16	-27000..27000 (x1/x10)	x1: 0..5000 x10: 0..500.0 (default +3.0)	R/W
Setpoint 1 Resolution	Setpoint 1 Adjustment Resolution	**673**	uint16	1..100 (x1/x10)	x1: 1..100 x10: 0.1..10.0 (default 0.1)	R/W
Setpoint 1 Data Type	Setpoint 1 Data Type. Data Type parameter defines if the parameters 670-673 are scaled with x1 or with x10 (multiplier 10).	**674**	unint16	0..1	0 = Integer (x1) 1 = Decimal (x10) - Default	R/W

Setpoint 1 Adjustment	Sets the Setpoint 1 user adjustment limits to use relative or absolute min/max settings.	**668**	unint16	0..1	0 = Relative - Default 1 = Absolute	R/W
Nominal Setpoint 2	Nominal Setpoint 2 The calculated setpoint is displayed at Register 419 Note: If setpoint changed from network, the user adjustment is reset to zero	**675**	uint16	-27000..27000 (x1/x10) Note: Scaling set by 'Setpoint 2 Data Type'	x1: -27000..+27000 - Default 750 (x1) x10: -2700.0..2700.0	R/W
Setpoint 2 Min Adj Limit	Minimum Setpoint Adjustment Limit for Setpoint 2	**676**	int16	-27000..27000 (x1/x10)	x1: -5000..0 (default -250) x10: -500.0..0	R/W
Setpoint 2 Max Adj Limit	Maximum Setpoint Adjustment Limit for Setpoint 2	**677**	int16	-27000..27000 (x1/x10)	x1: 0..5000 (default 250) x10: 0..500.0	R/W
Setpoint 2 Resolution	Setpoint 2 Adjustment Resolution	**678**	uint16	1..100 (x1/x10)	x1: 1..100 (default 50) x10: 0.1..10.0	R/W
Setpoint 2 Data Type	Setpoint 2 Data Type. Data Type parameter defines if the parameters 675-678 are scaled with x1 or with x10 (multiplier 10).	**679**	unint16	0..1	0 = Integer (x1) (Default) 1 = Decimal (x10)	R/W
Setpoint 2 Adjustment	Sets the Setpoint 2 user adjustment limits to use relative or absolute min/max settings.	**669**	unint16	0..1	0 = Relative - Default 1 = Absolute	R/W

CONTROL SETTINGS						
		Modbus Register / BACnet Property	**MODBUS HOLDING REGISTER - FUNCTION CODES 03, 06, 16**			
Parameter	**Description**		**Type**	**Data Range (multiplier)**	**Value Range / Enumerations**	**R/W**
Control Loop 1 Source	Control Loop Source Note: Setting to 'None' allows the control loop output be controlled only by Boost button (TS models)	**700**	uint16	0..5 (x1)	0 = None 1 = Temperature (default) 2 = Humidity 3 = CO2 4 = VOC	R/W
Control Loop 1 Setpoint	Control Loop Setpoint	**701**	uint16	0..1 (x1)	0 = Setpoint 1 (default) 1 = Setpoint 2	R/W
Contro Loop 1 PB	Control Loop Proportional Band	**702**	uint16	1..5000 (x1)	1..5000 (Default 5)	R/W
Control 1 IA	Control Loop 1 Integral Action Time	**703**	unit16	0..3600 (x1)	0..3600 sec (default 0s) 0 = Disabled	R/W
Control 1 Direction	Control Loop 1 Direction; For Temperature Reverse = Heating, Direct = Cooling	**704**	uint16	0..1 (x1)	0 = Reverse 1 = Direct (Default)	R/W
Control 2 Loop Source	Control Loop 2 Source Note: Setting to 'None' allows the control loop output be controlled only by Boost button (TS models)	**705**	uint16	0..5 (x1)	0 = None 1 = Temperature 2 = Humidity 3 = CO2 (Default) 4 = VOC	R/W
Control 2 Loop Setpoint	Control Loop 2 Setpoint	**706**	uint16	0..1 (x1)	0 = Setpoint 1 1 = Setpoint 2 (Default)	R/W
Contro Loop 2 PB	Control Loop 2 Proportional Band	**707**	uint16	1..5000 (x1)	1..5000 (Default 500)	R/W
Control 2 IA	Control Loop 2 Integral Action Time	**708**	unit16	0..3600 (x1)	0..3600 sec (default 0s) 0 = Disabled	R/W
Control 2 Direction	Control Loop 2 Direction; For CO2 Control Set Direct	**709**	uint16	0..1 (x1)	0 = Reverse 1 = Direct (Default)	R/W

SYSTEM AND COMMUNICATION SETTINGS						
		Modbus Register / BACnet Property	**MODBUS HOLDING REGISTER - FUNCTION CODES 03, 06, 16**			
Parameter	**Description**		**Type**	**Data Range (multiplier)**	**Value Range / Enumerations**	**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

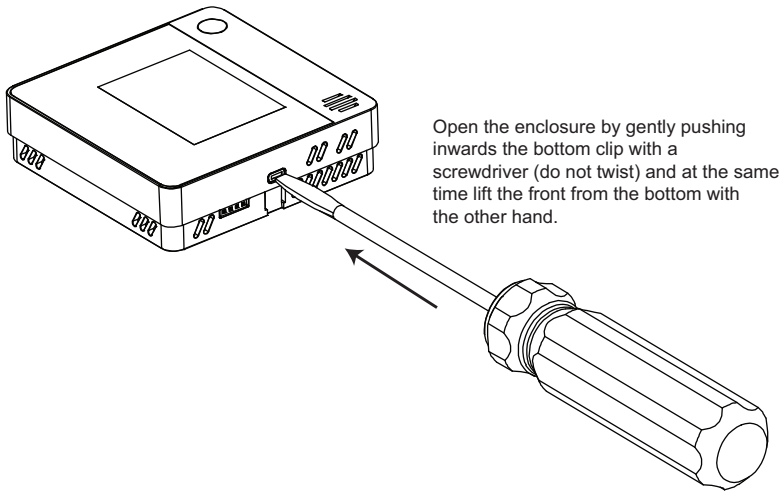
Language Pack Enable	Enables the Language Pack (using language pack it is possible to change the user text entries on the screen)	**814**	uint16	0..1	0 = English 1 = Language Pack Enabled	R/W
Logo Timer	Time after which the Logo is displayed on the Display after background level is activated. Set to 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**	unit32	0..4,194,303 (x1)	0..4,194,303	R/W

Dimensions and Installation

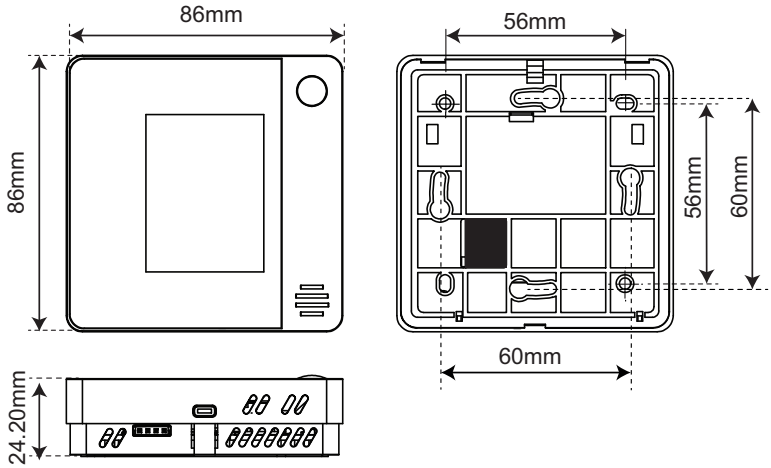
The devices typically mounted on the flat wall surfaces or on the junction boxes. The enclosure has 56/60mm screw distance for standard mounting boxes.

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.
- For correct movement (PIR) sensor operation consider the location of the sensor carefully.
- 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 (xER10 SERIES)



DIMENSIONS (xER14 SERIES)