Display Navigation Guide
TotalSense Series

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TotalSense™ Series

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Rev.	Release Date	By	Description of Change	ECR
0A		NAK	Initial Release	---
0B	6/10/2022	NJS	Updates for engineering CI release	---
0C	9/22/2022	NJS	Updates for CO and Ozone readings	---
0D	1/9/2024	NJS	Updates for new features	---
0E	05/16/24	NAK	Fixed typos, fixed table of contents	

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See Also:

152-0401 TotalSense Installation Instructions

154-0043 TotalSense BACnet Protocol Guide

154-0044 TotalSense Modbus Protocol Guide

Display Navigation

Congratulations on installing your new Senva TotalSense Air Quality Sensor! This OLED Parameter Map assumes the first stage of installation is complete, with the TotalSense connected and powered. The OLED display should show the home screen when any button is pressed. If you see a lock icon, hold the up and down arrows for 5 seconds to unlock.



Figure 1: Default Home Display

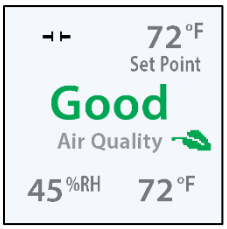
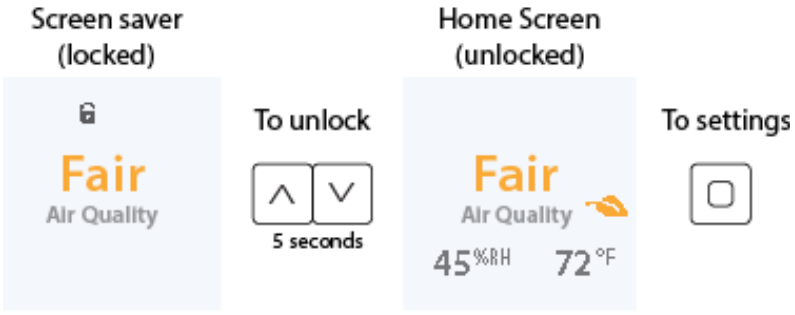
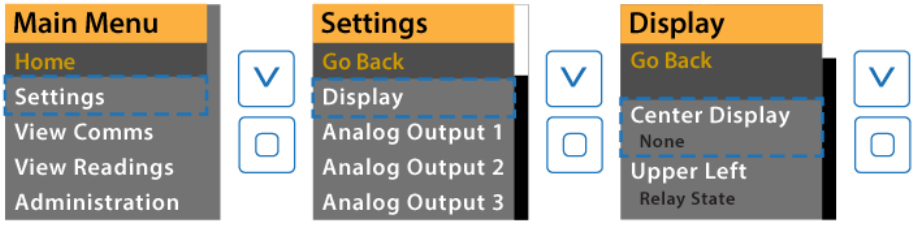


Figure 2: Sample Display

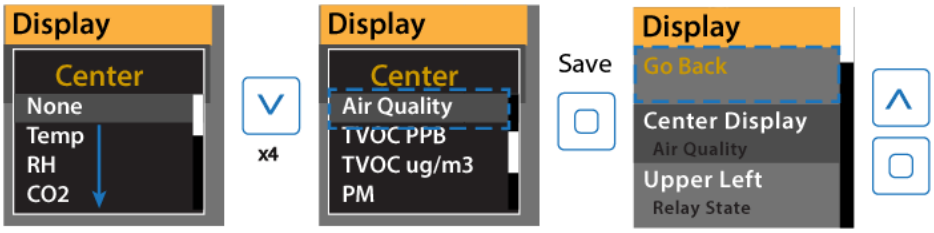
If you see a lock icon, hold the up and down arrows for 5 seconds to unlock.



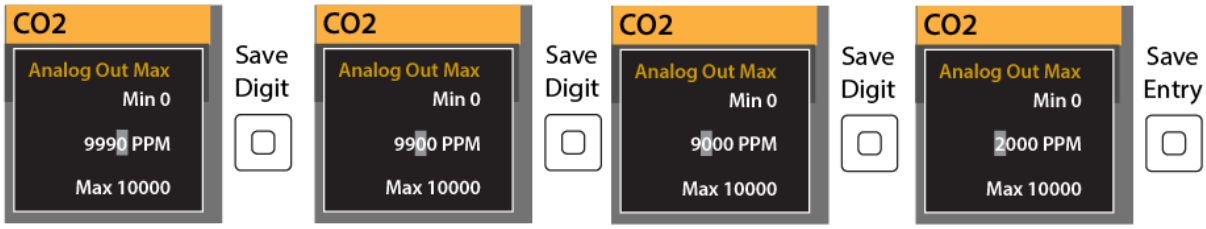
To change any setting, press enter to see setup menu and navigate to desired parameter and press enter again to choose. For example, to adjust display parameters, access the setup menu by pressing the 'enter' button once to access the setup and once more to access the "display" menu and then select "center display".



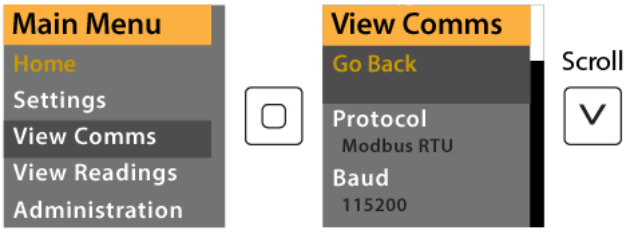
Select your value for center display and then select "go back" until you are back at the home screen.



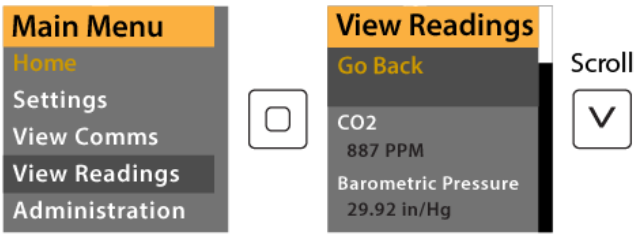
To adjust a numerical setting, set each digit individually and press enter to move cursor to the left. When all digits are set, the value will be saved when enter is pressed again.



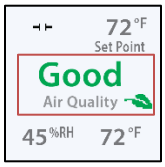
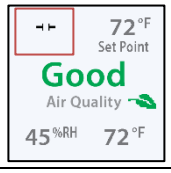
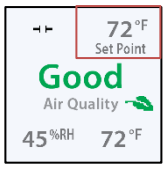
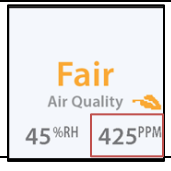
To view comms, navigate to “view comms” in the main menu.



To view current readings without configuring display, navigate to “view readings” in the main menu.



Display Settings

Parameter	Description	Selections	Functionality
Settings > Display> **Center**	*Choose the value to show in the center of the display* 	None	No value will be shown.
		Temp	Current temperature reading will be shown. Choose F or C in **Temp Settings.**
		RH	Current relative humidity reading value will be shown (%).
		CO2	Current CO2 reading will be shown (PPM).
		Air Quality (default)	Good air quality (green), Fair air quality (yellow), or poor (red) air quality will be displayed when inactive based on **Air Quality Settings.**
		TVOC PPB	Current TVOC reading will be displayed in center (PPB).
		TVOC µg/m³	Current TVOC reading will be displayed in center (µg/m³). Readings over 999 will be shown as mg/m³.
		PM	PMx value will be displayed in center (µg/m³). Choose particle size in **PM Settings**. Readings over 999 will be shown as mg/m³.
		Slider Setpoint	Value corresponding to position of slider set point will be displayed in center. Slider range can be adjusted in Temp Setpoint Settings. Choose F or C in **Temp Setpoint Settings.**
		CO	Current CO readings will be shown (PPM).
		Ozone	Current Ozone (O3) readings will be shown (PPB).
Settings > Display> **Upper Left**		None (default)	Nothing will be shown in the upper left corner of display.
		Relay State Icon	Relay state will be shown either open (as pictured in Figure 2) or closed, depending on Relay Settings and current status.
Settings > Display> **Upper Right**		None (default)	No value will be shown.
		See center	Options described in display settings > Center. Air Quality is not an option for this corner.
Settings > Display> **Lower Left**		None	No value will be shown.
		See center (default: RH if present)	Options described in display settings > Center. Air Quality is not an option for this corner.
Settings > Display> **Lower Right**		None	No value will be shown.
		See center (default: CO2 if present)	Options described in display settings > Center. Air Quality is not an option for this corner.

Parameter	Description	Selections	Functionality
Settings > Display> **Screen Lock**	*Lock out access to home screen and settings*	Enable	Screen lock mode will initiate after 60s of inactivity. Screen saver will be shown until device is unlocked by holding the up and down buttons for 5s.
		Disable (default)	Display will show home screen when any button is pressed.
Settings > Display> **Screen Saver**	*Choose what to display when inactive*	Off	Display will turn off after 60s of inactivity. No screen saver will be displayed. Screen will remain blank until any button is pushed.
		Air Quality Icon	The AQ leaf icon will be displayed when inactive in either green, yellow, or red depending on **Air Quality Settings.**
		Air Quality Msg (default)	Good air quality (green), Fair air quality (yellow), or poor (red) air quality will be displayed when inactive based on **Air Quality Settings.**
		CO2 reading	Current CO2 reading will be displayed in PPM.
		Temp reading	Current Temp reading will be displayed in either °F or °C. See **Temp Settings.**
		RH reading	Current RH reading will be displayed in %.
		PM	PMx value will be displayed in center (µg/m^3). Choose particle size in **PM Settings**. Readings over 999 will be shown as mg/m^3.
		TVOC PPB	Current TVOC reading will be displayed in center (PPB).
		TVOC µg/m^3	Current TVOC reading will be displayed in center (µg/m^3). Readings over 999 will be shown as mg/m^3.
		CO	Current CO readings will be shown (PPM).
		Ozone	Current Ozone (O3) readings will be shown (PPB).
		Home Readings	Display will cycle through all present sensor readings that are chosen to be displayed on the main screen. See parameters: Center, Upper right, Lower Left, and Lower Right.
		All Readings	Display will cycle through all present sensor readings from this list: temp, RH, CO2, TVOC, PM, and Air Quality.
Settings > Display> **Menu Brightness**	*Adjust brightness of screen*	Low, medium, high (default: high)	Adjust value to increase or decrease brightness of home screen and menu display.

Parameter	Description	Selections	Functionality
Settings > Display> **SS Brightness**	*Adjust brightness of screen saver*	Low, medium, high (default: low)	Adjust value to increase or decrease brightness of screen saver.
Settings > Display> **SS Timeout**	*Adjust how long before screen saver comes on*	1-120 minutes (Default: 1)	This will set how long the main screen shows before it times out and the screen saver comes on.

Analog Parameters

Parameter	Description	Selections	Functionality
Settings > Analog Output 1> **Source**	*Analog out 1 reading (terminals O1 or O2)* *Default will be set to first available sensor in this order: CO2, TVOC, RH, Temp, slider*	None	No signal will be generated
		CO2	CO2 reading will be output by analog output 1. Adjust output scale in PPM in **CO2 Settings**.
		RH	Relative humidity reading will be output by analog output 1. Adjust output scale in % in **RH** Settings**.**
		Temp	Temp reading will be output by analog output 1. Adjust output scale in °F in **Temp Settings**.
		TVOC	TVOC reading will be output by analog output 1. Adjust output scale in PPM in **TVOC Settings**.
		Temp Slider	Slider reading will be output by analog output 1. Adjust output scale in °F in **Temp Setpoint Settings**. Please note this reading is in addition to a resistive reading that can be read on "slider" terminals.
		PID Temp	Sets the output to a PID controller using the temperature setpoint as the baseline, adjust this setpoint in **Temp Settings**.
		PID CO2	Sets the output to a PID controller using the CO2 setpoint as the baseline, adjust this setpoint in **CO2 Settings.**
		PID Temp Set-Point	Sets the output to a PID controller using the temperature slider as the baseline, adjust this setpoint in **Temp Settings**.
		CO	CO reading will be output by analog output 1. Adjust output scale in PPM in **CO Settings.**
		Ozone	Ozone (O3) reading will be output by analog output 1. Adjust output scale in PPM in **Ozone Settings.**
Settings > Analog Output 1> **Min V**	*Min voltage output for O1*	0-10V (default 0V)	This value corresponds to the lowest point on an analog scale. For a 0-10V signal, set to 0V. For a 2-10V signal, set to 2V. This will override any analog dip switch settings.
Settings > Analog Output 1> **Max V**	*Max voltage output for O1*	0-10V (default 10V)	This value corresponds to the highest point on an analog scale. For a 0-10V signal, set to 10V. For a 0-5V signal, set to 5V. This will override any analog dip switch settings.
Settings > Analog Output 1> **Min A**	*Min current output for O2*	0-20mA (default 4mA)	This value corresponds to the lowest point on an analog scale. For a 4-20mA signal, set to 4mA. For a 0-20mA signal, set to 0mA.

Settings > Analog Output 1> **Max A**	*Max current output for O2*	0-20mA (default 20mA)	This value corresponds to the highest point on an analog scale. For a 0-20mA or 4-20mA signal, set to 20mA.
Settings > Analog Output 1> **PID Invert**	PID Invert	Enable	This setting will invert the overall error signal (R - SP instead of (SP - R)
		Disable	This setting disabled will leave the overall error signal calculated as SP-R
		For CO2 and cooling applications do not enable the PID invert. These applications require more cooling or airflow when the temperature or CO2 level increases and vice versa, no inversion is necessary. Enable PID if you need the analog signal to decrease when your measurement increases and vice-versa. For example, a heating process would need to increase the amount of heat when the temperature decreases.	
Settings > Analog Output 1> **PID K_P**	*Proportional Coefficient*	0-100 (default 0)	Sets the Proportional gain PID Coefficient
Settings > Analog Output 1> **PID K_i**	*Integral Coefficient*	0-100 (default 0)	Sets the Integral gain PID Coefficient
Settings > Analog Output 1> **PID K_d**	*Derivative Coefficient*	0-100 (default 0)	Sets the Derivative gain PID Coefficient

Settings for Analog Out 2 (four outputs O3 and O4) and Analog Out 3 (for outputs O5 and O6) will have the same options as shown above*.

- *Default source setting for analog out 2 (if at least 2 of 'source' sensors are present) is first available sensor in this order: TVOC, RH, Temp, slider.*
- *Default source setting for analog out 3 (if at least 3 of 'source' sensors are present) is first available sensor in this order: RH, Temp, slider.*

**PID output controls are only available on Analog output 1 or Analog output 3 for the comms+analog device.*

Air Quality Settings

Parameter	Description	Selections	Functionality
Air Quality Settings > **Good-Fair**	*Adjust good-to-fair threshold for air quality on display*	0-100 (default: 70)	When using the Air Quality setting in **Display Settings**, this value may be adjusted to change the threshold below which the display will show a "Fair" rating.
Air Quality Settings > **Fair-Poor**	*Adjust fair-to-poor threshold for air quality on display*	0-100 (default: 40)	When using the Air Quality setting in **Display Settings**, this value may be adjusted to change the threshold below which the display will show a "Poor" rating.
Settings > Air Quality> **Use Temp**	Use Temperature in the Air Quality calculation	Enabled	These settings are used to enable or disable a sensor being used for the Air Quality calculation. For a sensor to be enabled it must be installed on the device. All sensors will be shipped with present elements enabled in the Air Quality calculation.
		Disabled	
Settings > Air Quality> **Use RH**	Use Humidity in the Air Quality calculation	Enabled	
		Disabled	
Settings > Air Quality> **Use CO2**	Use CO2 in the Air Quality calculation	Enabled	
		Disabled	
Settings > Air Quality> **Use PM**	Use PM in the Air Quality calculation	Enabled	
		Disabled	
Settings > Air Quality> **Use VOC**	Use VOC in the Air Quality calculation	Enabled	
		Disabled	
Settings > Air Quality> **Use CO**	Use CO in the Air Quality calculation	Enabled	
		Disabled	
Settings > Air Quality> **Use Ozone**	Use Ozone in the Air Quality calculation	Enabled	
		Disabled	
Settings > Air Quality> **AQ Temp Lo**	*Set Lo good IAQ threshold*	-40.0-122.0 (default: 64)	Low window threshold for good temperature quality
Settings > Air Quality> **AQ Temp Hi**	*Set Hi good IAQ threshold*	-40.0-122.0 (default: 79)	Hi window threshold for good temperature quality
Settings > Air Quality> **AQ RH Lo**	*Set Lo good IAQ threshold*	0-100 (default: 30)	Low window threshold for good humidity quality

Settings > Air Quality> **AQ RH Hi**	*Set Hi good IAQ threshold*	0-100 (default: 60)	Hi window threshold for good humidity quality
Settings > Air Quality> **AQ CO2 Poor**	*Sets Poor IAQ threshold*	0-10000 (default: 2000)	Threshold where CO2 quality becomes Poor
Settings > Air Quality> **AQ CO2 Good**	*Sets Good IAQ threshold*	0-10000 (default: 800)	Threshold where CO2 quality becomes Good
Settings > Air Quality> **AQ VOC Poor**	*Sets Poor IAQ threshold*	0-32000 (default: 3000)	Threshold where VOC quality becomes Poor
Settings > Air Quality> **AQ VOC Good**	*Sets Good IAQ threshold*	0-10000 (default: 300)	Threshold where VOC quality becomes Good
Settings > Air Quality> **AQ PM Poor**	*Sets Poor IAQ threshold*	0-1000 (default: 55)	Threshold where PM quality becomes Poor
Settings > Air Quality> **AQ PM Good**	*Sets Good IAQ threshold*	0-1000 (default: 35)	Threshold where PM quality becomes Good
Settings > Air Quality> **AQ CO Poor**	*Sets Poor IAQ threshold*	0-200 (default: 25)	Threshold where CO quality becomes Poor
Settings > Air Quality> **AQ CO Good**	*Sets Good IAQ threshold*	0-200 (default: 0)	Threshold where CO quality becomes Good
Settings > Air Quality> **AQ Ozone Poor**	*Sets Poor IAQ threshold*	0-5000 (default: 100)	Threshold where Ozone quality becomes Poor
Settings > Air Quality> **AQ Ozone Good**	*Sets Good IAQ threshold*	0-5000 (default: 0)	Threshold where Ozone quality becomes Good
Settings > Air Quality> **PID Setpoint**	*Sets the PID control setpoint*	0-100 (default: 90)	Sets the PID control loop setpoint for Air quality.
Language	*Set the Language of the Air Quality display*	French English (default)	When displaying the Air Quality on the center of the main screen, this determines the language for the Good – Fair – Poor reading to be displayed.

Source Parameters

CO2 Settings

Parameter	Description	Selections	Functionality
CO2 Settings > **Cal Offset**	*Adjust CO2 reading*	-250 to 250 PPM (default 0 PPM)	Offset CO2 reading by ±250 PPM.
CO2 Settings > **Analog Min Out**	*Min PPM scale for CO2 analog*	0-10,000 PPM (default 0 PPM)	This value corresponds to the lowest point on an analog scale for a CO2 reading. This will correspond to any analog output that has CO2 selected as a source in **Analog Parameters**.
CO2 Settings > **Analog Max Out**	*Max PPM scale for CO2 analog*	0-10,000 PPM (default 2,000 PPM)	This value corresponds to the highest point on an analog scale for a CO2 reading. This will correspond to any analog output that has CO2 selected as a source in **Analog Parameters**.
CO2 Settings > **PID Setpoint**	*Sets the PID output setpoint*	0-10,000 PPM (default 800 PPM)	This is used to set the setpoint for the PID output when enabled.
CO2 Settings > **Auto-Calibration Disable**	*Enable ABC*	Enable (default), Disable (default if dual channel CO2 is selected)	Enable or disable ABC function for CO2 sensor calibration. It is not recommended to disable this unless you are using a dual channel CO2 element.
CO2 Settings > **Auto-Calibration**	*Baseline value for ABC*	300-1000 PPM (default 400 PPM)	This sets the baseline value for the automatic baseline calibration. This should correspond to expected "unoccupied" levels of CO2.
CO2 Settings > **Auto-Calibration Period**	*Period ABC uses to calibrate*	1-15 days (14 default)	This sets the period for which ABC will calculate its unoccupied level and calibrate.
CO2 Settings > **Calibrate One Time**	*Sets a onetime calibration*	0-15 days (0 default)	This will set a time period for a one-time ABC calibration. This setting will return to "0 days" when completed.

PM Settings

Parameter	Description	Selections	Functionality
PM Settings > **Size Range**	*Choose particle size for analog and display*	0.3-1.0, 0.3-2.5 (default), 0.3-4.0, 0.3-10.0	Each selection will display particle count for all measurable particles less than selected size (minimum size is 0.3µm). For example, PM2.5 will show particle count for particles sized 0.3-2.5µm.
PM Settings > **Clean Interval**	*Choose the interval in hours for the clean cycle*	0-8760 hours (186 hours default)	This will set the time in hours when the PM sensor runs its clean function.
PM Settings > **PM Command**	*Selects the state of the PM sensor*	Ready	This sets the PM sensor into its default mode
		Clean	This sets the PM sensor into a manual cleaning cycle. The internal fan will run to clean out the sensor.
		Reset	This will reset the PM sensor
PM Settings > **Analog Out Min**	*Min scale for RH analog*	0-1000 ug/m^3 (default: 0 ug/m^3)	This value corresponds to the lowest point on an analog scale for a PM reading. This will correspond to any analog output that has PM selected as a source in **Analog Parameters**.
PM Settings > **Analog Out Max**	*Max scale for RH analog*	0-1000 ug/m^3 (default: 100 ug/m^3)	This value corresponds to the highest point on an analog scale for a PM reading. This will correspond to any analog output that has PM selected as a source in **Analog Parameters**.

RH Settings

Parameter	Description	Selections	Functionality
RH Settings > **Offset**	*RH offset*	-5 to 5% (default: 0)	Adjust RH reading by up to 5%.
RH Settings > **Analog Out Min**	*Min scale for RH analog*	0-100% (default: 0%)	This value corresponds to the lowest point on an analog scale for a RH reading. This will correspond to any analog output that has RH selected as a source in **Analog Parameters**.
RH Settings > **Analog Out Max**	*Max scale for RH analog*	0-100% (default: 100%)	This value corresponds to the highest point on an analog scale for a RH reading. This will correspond to any analog output that has RH selected as a source in **Analog Parameters**.

Temp Settings

Parameter	Description	Selections	Functionality
T Settings > **Units**	*T units*	°F (default), °C	Select whether display shows degrees Fahrenheit or Celsius
T Settings > **Offset**	*T offset*	-5 to 5°C (default: 0)	Adjust T reading by up to 5°C (or 9°F).
T Settings > **Analog Out Min**	*Min scale for T analog*	-40 to 122°F (default: 50°F)	This value corresponds to the lowest point on an analog scale for a temp reading. This will correspond to any analog output that has temp selected as a source in **Analog Parameters**.
T Settings > **Analog Out Max**	*Max scale for T analog*	-40 to 122°F (default: 95°F)	This value corresponds to the highest point on an analog scale for a temp reading. This will correspond to any analog output that has temp selected as a source in **Analog Parameters**.
T Settings > **PID Setpoint**	*Sets the PID output setpoint*	-40 to 122°F (default: 71.6°F)	This is used to set the setpoint for the PID output when enabled.

TVOC Settings

Parameter	Description	Selections	Functionality
TVOC Settings > **TVOC Scale**	*Scale factor for TVOC reading*	0.000 to 10.000 (default: 1.000)	This value can be used to adjust the TVOC reading. The standard readings are based on an Ethanol equivalent. See "TVOC Molecular Weights" section for more information.
TVOC Settings > **TVOC Mode**	*Sets the mode for the TVOC sensor*	Ready	Will set the device into its normal operation mode.
		Stabilization	Will set the device into a 3-minute stabilization mode.
		Training	Will set the device into a 48-hour training mode.
TVOC Settings > **Show SN**	*TVOC sensor serial number*	Read only	Will show the serial number of the TVOC sensor installed on the device.
TVOC Settings > **Analog Out Min**	*Min scale for TVOC analog*	0-5000 µg/m^3 (default: 0 µg/m^3)	This value corresponds to the lowest point on an analog scale for a TVOC reading. This will correspond to any analog output that has TVOC selected as a source **Analog Parameters**.
TVOC Settings > **Analog Out Max**	*Max scale for TVOC analog*	0-5000 µg/m^3 (default: 2000 µg/m^3)	This value corresponds to the highest point on an analog scale for a TVOC reading. This will correspond to any analog output that has TVOC selected as a source in **Analog Parameters**.

CO Settings

Parameter	Description	Selections	Functionality
CO Settings > **Cal Expiration**	*Days left until calibration*	Read only	This will show how many days until the device needs to be recalibrated.
CO Settings > **Sensor Life**	*Days left of sensor life*	Read Only	This will show how many days are left in the sensor's lifetime. The CO sensor has a 5-year expected lifetime.
CO Settings > **Test Gas**	*Calibration Test gas used*	45-205PPM (default: 100PPM)	This is to set the concentration of CO gas that is used for device calibration. This value will be used to adjust the readings of the CO sensor when calibration is performed.
CO Settings > **CO**	*Current reading of the CO*	Ready Only	This will allow the user to view the current CO readings in the menu, so the user can see when sensor readings have stabilized while calibrating.
CO Settings > **Apply Span**	*Starts the CO calibration process*	---- APPLY	To calibrate the sensor this setting is to be used. See the Total sense CO calibration guide for further instructions.
CO Settings > **Apply Zero**	*Applies a Zero offset to the CO*	---- APPLY	To apply a zero calibration to the sensor this setting is to be used. See the Total sense CO calibration guide for further instructions.
CO Settings > **Reset Factory Cal**	*Resets device calibration*	---- APPLY	This setting will be used to reset the CO sensor to it factory default calibration scaling.
CO Settings > **Analog Out Min**	*Min scale for CO analog*	0-200 (default: 0)	This value corresponds to the lowest point on an analog scale for a CO reading. This will correspond to any analog output that has CO selected as a source in **Analog Parameters**.
CO Settings > **Analog Out Max**	*Max scale for CO analog*	0-200 (default: 200)	This value corresponds to the highest point on an analog scale for a CO reading. This will correspond to any analog output that has CO selected as a source in **Analog Parameters**.

Ozone Settings

Parameter	Description	Selections	Functionality
O3 Settings > **Cal Expiration**	*Days left until calibration*	Read only	This will show how many days until the device needs to be recalibrated.
O3 Settings > **Sensor Life**	*Days left of sensor life*	Read Only	This will show how many days are left in the sensor's lifetime. The ozone sensor has a 5-year expected lifetime.
O3 Settings > **Test Gas**	*Calibration Test gas used*	default: 1000PPM	This is to set the concentration of Ozone gas that is used for device calibration. This value will be used to adjust the readings of the Ozone sensor when calibration is performed.
O3 Settings > **Ozone**	*Current reading of the CO*	Ready Only	This will allow the user to view the current Ozone readings in the menu, so the user can see when sensor readings have stabilized while calibrating.
O3 Settings > **Apply Span**	*Starts the CO calibration process*	---- APPLY	To calibrate the sensor this setting is to be used. See the Total sense ozone calibration guide for further instructions.
O3 Settings > **Apply Zero**	*Applies a Zero offset to the CO*	---- APPLY	To apply a zero calibration to the sensor this setting is to be used. See the Total sense ozone calibration guide for further instructions.
O3 Settings > **Reset Factory Cal**	*Resets device calibration*	---- APPLY	This setting will be used to reset the ozone sensor to its factory default calibration scaling.
O3 Settings > **Analog Out Min**	*Min scale for CO analog*	0-200 (default: 0)	This value corresponds to the lowest point on an analog scale for ozone reading. This will correspond to any analog output that has ozone selected as a source in **Analog Parameters**.
O3 Settings > **Analog Out Max**	*Max scale for CO analog*	0-200 (default: 200)	This value corresponds to the highest point on an analog scale for ozone reading. This will correspond to any analog output that has ozone selected as a source in **Analog Parameters**.

Temp Setpoint Settings

Parameter	Description	Selections	Functionality
Temp setpoint Settings > **Show Update**	*Display slider changes*	Show	This will set the device so that the display will show when the Temp setpoint is adjusted.
		Hide	
Temp setpoint Settings > **Min Temp**	*Min scale for slider analog and display*	-40 to 122°F (default: 50°F)	This value corresponds to the lowest position of the slider and, if using slider as analog output, the minimum analog point. This will correspond to any analog output that has temp slider selected as a source in **Analog Parameters**. This will not affect the slider resistive output.
Temp Setpoint Settings > **Max temp**	*Max scale for slider analog and display*	-40 to 122°F (default: 95°F)	This value corresponds to the highest position of the slider and, if using slider as analog output, the maximum analog point. This will correspond to any analog output that has temp slider selected as a source in **Analog Parameters**. This will not affect the slider resistive output.

Relay Settings

Parameter	Description	Selections	Functionality
Relay Settings > **Source**	*Which measurement will activate setpoint relay*	None	Relay will never change from "normal" state.
		CO2 (default)	Relay will change state when CO2 reading exceeds Turn-On value, set as a %.
		RH	Relay will change state when RH reading exceeds Turn-On value, set as a %.
		Temp	Relay will change state when Temp reading exceeds Turn-On value, set as a %.
		TVOC	Relay will change state when TVOC reading exceeds Turn-On value, set as a %.
		PIR	Relay will change state when PIR senses motion.
		Air Quality	Relay will change state when any sensor reading exceeds "fair" thresholds described in chart in Relay Settings > **Turn On**
		CO	Relay will change state when CO reading exceeds Turn-On value, set as a %.

<table>
<tr><th>Parameter</th><th>Description</th><th>Selections</th><th>Functionality</th></tr>
<tr><td>Relay Settings > Turn On</td><td>Threshold for relay activation</td><td>0-100.00% (default: depends on source selection)</td><td>Based on full scale range of the selected sensor, set the value above which the relay will activate. For example, if CO_2 is selected, its full available range is 0-10,000 PPM, so a setpoint of 800 PPM would correspond to an 8.00% threshold setting. For temperature, the full range is -40 to 122°F, so a setpoint of 70°F would correspond to a threshold value of 68%. Use this equation to determine threshold setting for temp in °F: (T+40)/162*100. This setting is ignored for PIR and G/F source selections. Display will show the calculated value as you adjust this setting. The below shows the values that are set by default when each source is selected as well as the calculated value for each.
<table>
<tr><th>Source Selection</th><th>Range</th><th>Default Turn-on Threshold</th><th>Calculated Turn-on value</th><th>Default Turn-off Threshold</th><th>Calculated Turn-off value</th></tr>
<tr><td>CO2</td><td>0-10,000 PPM</td><td>8.0%</td><td>800 PPM</td><td>7.0%</td><td>700 PPM</td></tr>
<tr><td>RH</td><td>0-100% RH</td><td>60%</td><td>60% RH</td><td>55%</td><td>55% RH</td></tr>
<tr><td>Temp*</td><td>-40 - 122 °F</td><td>74%</td><td>80°F</td><td>73%</td><td>78°F</td></tr>
<tr><td>TVOC</td><td>0-10000 µg/m^3</td><td>4.0%</td><td>400 µg/m^3</td><td>3.5%</td><td>350 µg/m^3</td></tr>
<tr><td>CO</td><td>0-200 PPM</td><td>50%</td><td>100PPM</td><td>40%</td><td>80PPM</td></tr>
<tr><td>Ozone</td><td>0-500 PPM</td><td>20%</td><td>100PPM</td><td>16%</td><td>80PPM</td></tr>
</table></td></tr>
<tr><td>Relay Settings > Turn Off</td><td>Threshold for relay deactivation</td><td>0-100.00% (default: depends on source selection)</td><td>Based on full scale range of the selected sensor, set the value below which the relay will de-activate. For example, to deactivate relay when CO_2 setting reaches 790, set this threshold value to 7.90%.</td></tr>
<tr><td>Relay Settings > Polarity</td><td>N.O./N.C. selection</td><td>N.O. (default), N.C.</td><td>A N.O. (normally open) relay will be in the open state until it is activated, i.e., turn-on threshold is met, at which time it will close. A N.C. (normally closed) relay will be in the closed state until it is activated, at which time it will open.</td></tr>
<tr><td>Relay Settings > Min On</td><td>Min on time</td><td>1-240s (default: 3s)</td><td>When relay activates, it will not deactivate until this time has lapsed, regardless of the turn-off setting. The relay will deactivate only when this time has expired AND the turn-off threshold is met.</td></tr>
</table>

Parameter	Description	Selections	Functionality
Relay Settings > **Min Off**	*Min off time*	1-240s (default: 3s)	When relay de-activates, it will not activate again until this time has lapsed, regardless of the turn-on setting. The relay will re-activate only when this time has expired AND the turn-on threshold is met.

PIR Settings

Parameter	Description	Selections	Functionality
PIR Settings > **Sensitivity**	*Adjust sensitivity of PIR motion sensor*	0-100 (default: 80)	Sensor sensitivity can be adjusted from 0-100. The default of 80 achieves the specified distance and degree. If nuisance triggers occur or a further sensing distance is required, this value can be decreased and increased accordingly. See Figure 3 for a visual representation of this sensitivity value.
PIR Settings > **Occupied Delay**	*Time PIR stays active after event*	1-120 min (default: 10 min)	This is the number of minutes the occupancy state will remain active after each motion event is detected. This applies to the "occupancy" BACnet and Modbus point as well as the output relay state, if set to PIR in **Relay Settings**.

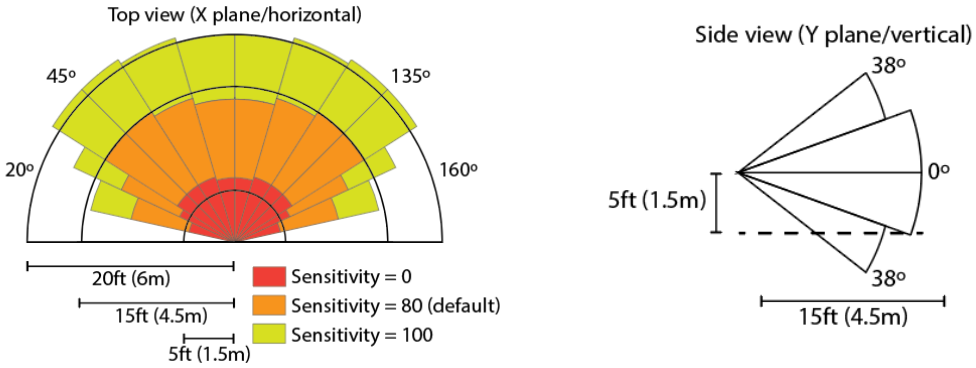


Figure 3: PIR Sensitivity

Advanced Settings & Diagnostics

Advanced Settings

Parameter	Description	Selections	Functionality
Advanced Settings > **Reset**	*Reset factory defaults*	No (default), Yes	Set to "yes" to restore all factory default settings.

Diagnostics

Parameter	Description	Status	Action
Advanced Settings > Diagnostics **> System Status**	*This will display several possible statuses in binary. All zeros indicate no errors or warnings are present.*	00000001 = EEPROM hardware fault	Consult factory.
		00000010 = EEPROM data corruption	Consult factory.
		00000100 = EEPROM write error	Consult factory.
		00001000 = Device is currently using factory defaults	Reset to factory defaults. Consult factory.
		00010000 = Sensor alert	See individual sensor statuses for more information. **Bolded** statuses will trigger this alert.
Advanced Settings > Diagnostics **> CO2 Status**	*This will display several possible statuses in binary. All zeros indicate no errors or warnings are present.*	**00000001 = Sensor hardware fault**	Consult factory.
		00000010 = Sensor data error	Consult factory.
		00000100 = Sensor not Ready	Consult factory.
		00001000 = Pressure Compensation not applied	No action necessary. Default value (101kPA) is used for pressure compensation.

Parameter	Description	Status	Action
Advanced Settings > Diagnostics **> RH Status**	*This will display several possible statuses in binary. All zeros indicate no errors or warnings are present.*	**00000001 = Sensor hardware fault**	Consult factory.
		00000010 = Sensor data error	Consult factory.
Advanced Settings > Diagnostics **> Temp Status**	*This will display several possible statuses in binary. All zeros indicate no errors or warnings are present.*	**00000001 = Sensor hardware fault**	Consult factory.
		00000010 = Sensor data error	Consult factory.
Advanced Settings > Diagnostics **> TVOC Status**	*This will display several possible statuses in binary. All zeros indicate no errors or warnings are present.*	**00000001 = Sensor hardware (I2C) fault**	Consult factory.
		00000010 = Sensor error (bad initialization range)	Consult factory.
		00000100 = Sensor error (Gas timeout)	Consult factory.
		00001000 = Sensor error (other) error	Consult factory.
		00010000 = Training cycle not complete	No action necessary. Sensor is in "training mode". This may take up to 7 days. See Installation Manual for explanation.
		00100000 = Sensor not ready (4-minute warmup)	No action necessary. Please wait for the 4-minute warm up period to expire.
		01000000 = Temperature compensation not applied	No action necessary. Default value (25C) is used for temperature compensation.

Parameter	Description	Status	Action
		10000000 = Pressure compensation not applied	No action necessary. Default value (101kPA) is used for pressure compensation.
Advanced Settings > Diagnostics **> PM Status**	*This will display several possible statuses in binary. All zeros indicate no errors or warnings are present.*	**00000001 = Sensor communication error**	Consult factory.
		00000010 = Sensor Data Error	Consult factory.
		00000100 = Sensor not ready	Consult factory.
		00001000 = Sensor fan speed warning	Warning only. No action necessary.
		00010000 = Sensor fan failure	Consult factory.
		00100000 = Sensor laser failure	Consult factory.
Advanced Settings > Diagnostics **> Pressure Status**	*This will display several possible statuses in binary. All zeros indicate no errors or warnings are present.*	**00000001 = Sensor hardware fault**	Consult factory.
		00000010 = Sensor data error	Consult factory.
		00000100 = Sensor not ready	Consult factory.

TVOC Molecular Weights

Senva's TVOC sensor uses an Ethanol reading to determine a raw TVOC value. Additionally, conversion from µg/m^3 uses the molecular weight of Ethanol. To scale based on a different gas baseline, choose the appropriate gas from the list below and enter the scale factor in **TVOC Settings.**

Please note that the sensor is measuring TOTAL VOCs, so adjusting the scale factor will not necessarily result in a gas-specific reading unless, in special cases, that is the only expected VOC present in the area. It is recommended to use the 1.0 scale factor in most cases. The RESET standard suggests calculating TVOC based on the molecular weight of Isobutelyne (scale factor: 1.218).

Data Source: http://aqt-vru.com/emissions/complete-list-of-vocs/

Contamination	Name	Molecular Weight	Scale factor
ACETYLENE	ACETYLEN	26.04	0.565
FORMALDEHYDE	FORMALD	30.03	0.652
METHANOL	MEOH	32.04	0.695
PROPANE	PROPANE	44.1	0.957
ETHANOL	ETOH	46.07	1.000
DIMETHYL ETHER	ME-O-ME	46.07	1.000
METHYL CHLORIDE	CH3-CL	50.49	1.096
1,3-BUTADIENE	13-BUTDE	54.09	1.174
ISOBUTENE	ISOBUTEN	56.11	1.218
N-BUTANE	N-C4	58.12	1.262
ISOBUTANE	2-ME-C3	58.12	1.262
ACETIC ACID	ACETACID	60.05	1.303
ISOPROPYL ALCOHOL	I-C3-OH	60.1	1.305
ETHYLENE GLYCOL	ET-GLYCL	62.07	1.347
ISOPRENE	ISOPRENE	68.12	1.479
BUTANAL	1C4RCHO	72.11	1.565
N-PENTANE	N-C5	72.15	1.566
ISOPENTANE	2-ME-C4	72.15	1.566
HYDROXY ACETONE	HOACET	74.08	1.608
ISOBUTYL ALCOHOL	I-C4-OH	74.12	1.609
BENZENE	BENZENE	78.11	1.695
TOLUENE	TOLUENE	92.14	2.000
M-XYLENE	M-XYLENE	106.17	2.305
O-XYLENE	O-XYLENE	106.17	2.305
P-XYLENE	P-XYLENE	106.17	2.305
TERPENE	TERPENE	136.24	2.957