HK INSTRUMENTS SIRO-MOD Indoor Air Quality Transmitters User Guide

Contents

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Introduction

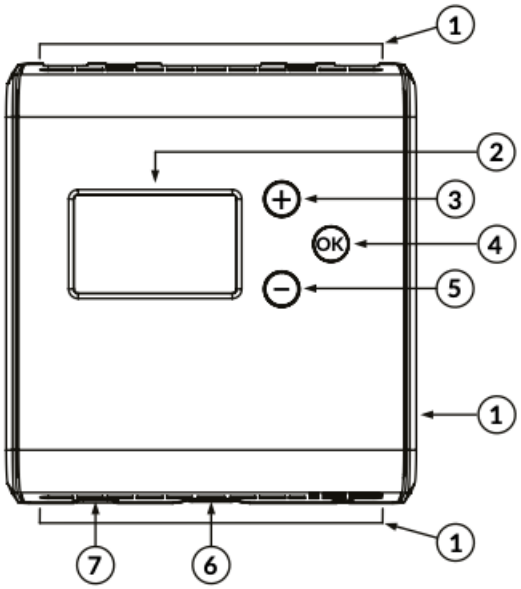
This document contains information about configuring and using Siro indoor air quality transmitter. Before reading this guide, check that the transmitter has been installed according to the installation instructions.

Siro is available with several optional air quality sensors. The modular device can be equipped with CO_2 concentration and VOC (Volatile Organic Compounds) measurements or alternatively PM (Particulate Matter) measurement, and in addition temperature and humidity measurements. Siro is available with a user interface that includes an LCD display and three pushbuttons. The device is always equipped with voltage outputs, and optionally with Modbus communication and current outputs.

The use and configuration of Siro is simple and easy by following this guide describing a Siro device with a display (-D).

Please note that this guide includes all measurement options. The device menu only shows the options that have been chosen to that particular device. You can find more information about the measurment options in the end of this document.

Schematics



1	Air flow aperture
2	Display
3	Pushbutton + (up/increase)
4	Pushbutton OK (choose/confirm)
5	Pushbutton – (down/decrease)
6	Lid opening button
7	Opening for the wires

Navigating the Menu

The device's physical interface includes a display and three pushbuttons.
By using the user interface, it is possible to choose the desired measurement values on the display and to adjust the settings of the device.
Note that when the menu locking jumper is installed, it is not possible to open the menu and the display will not react when pressing the OK button. Please see the installation instructions for more details about the locking jumper.

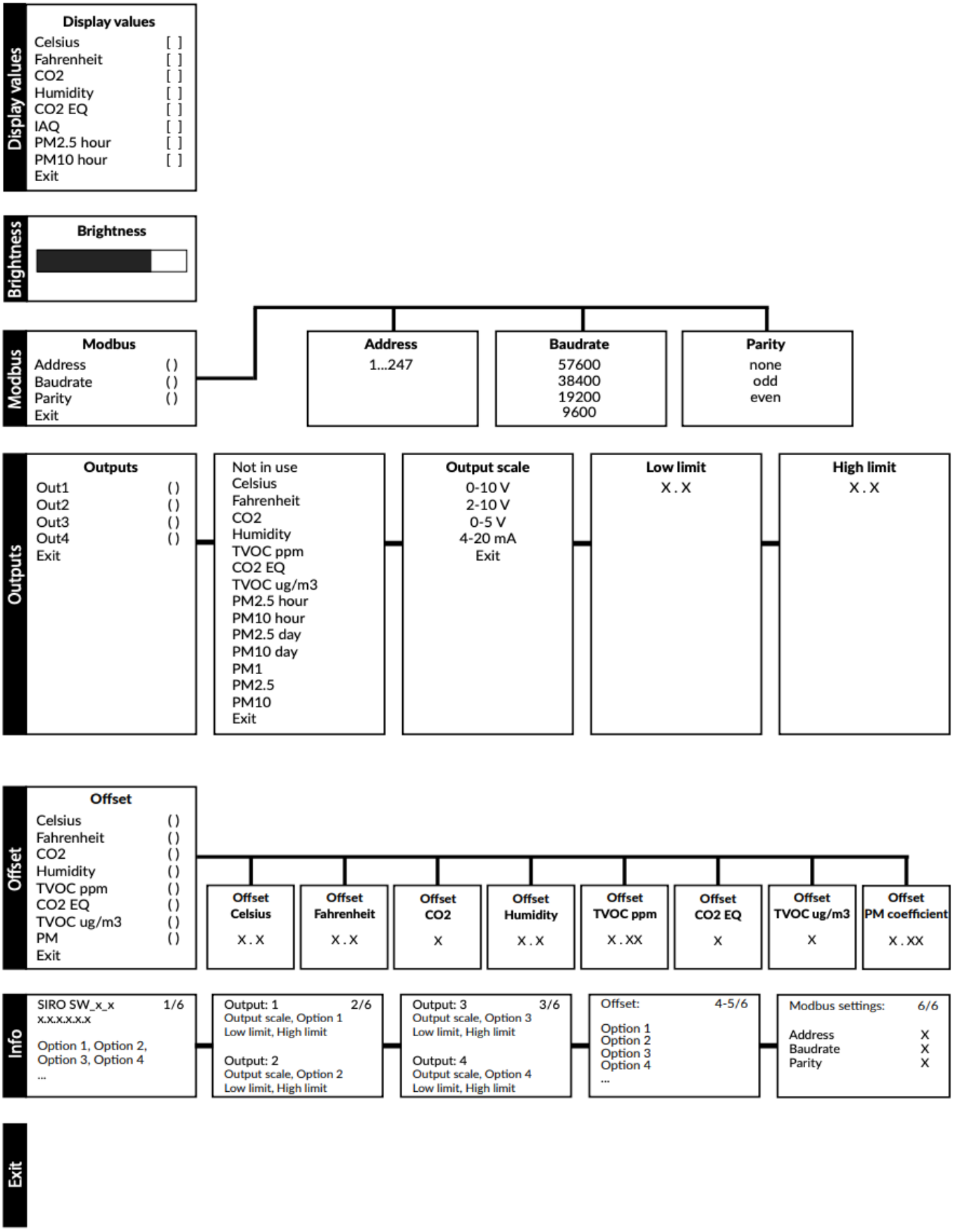
The button functions:

⊕
Scroll up in the menu / increase the value

⊖
Scroll down in the menu / decrease the value

OK
Open the menu / confirm (press shortly) / go back to the basic view (keep the button down/press longer

Menu Structure



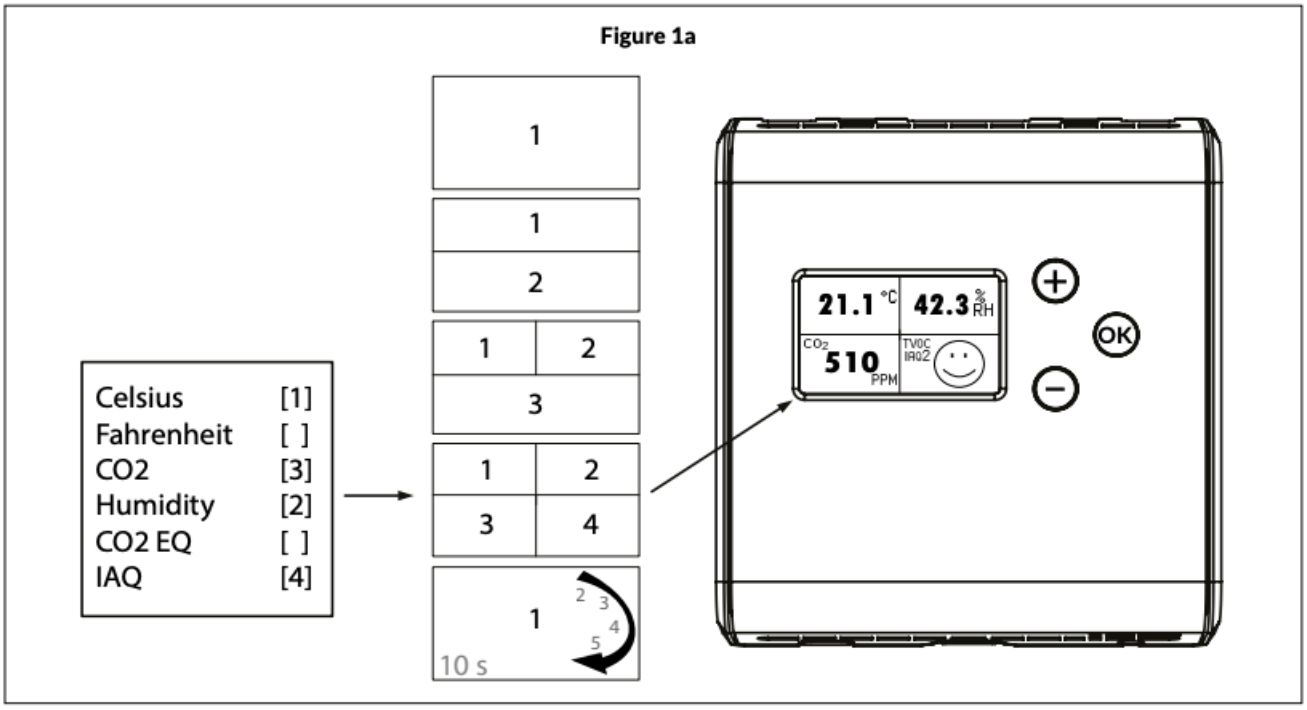
Step 1: Choosing the measurement values on the display

Step 1.1: Display View

The basic view on the display is scaled based on how many measurement values have been chosen to be viewed on the display. 1-4 measurement values can be shown simultaneously (see figure 1a). If five or more values are selected, the measurements are shown one by one and the view changes every 10 seconds. Individual

measurements can be scrolled in the basic view with ⊕ and ⊖ buttons. If the buttons are unused for 30 minutes, the basic view will reappear automatically.

Figure 1a

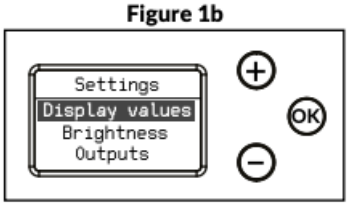


Step 1.2: Choosing the measurement values

For more information about the measurements, please see page 8.

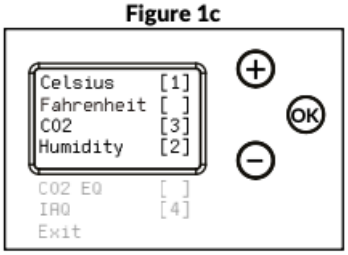
1. Press OK to enter the settings menu.
2. Choose ***Display values***.

Figure 1b



3. Choose the desired measurement values to be shown on the display.

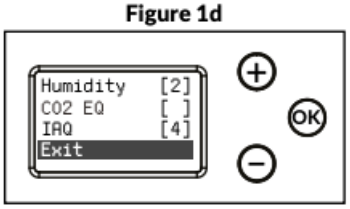
Figure 1c



- Scroll the menu by pressing the ⊕ and ⊖ buttons.
- Add/remove the desired measurement values by pressing the OK button.

4. Choose ***Exit*** to exit the menu.

Figure 1d



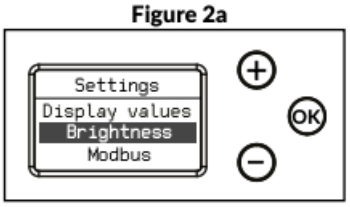
- Scroll the menu to ***Exit*** and press OK to return to the settings menu or keep the OK button down to return to the basic view.

Step 2: Brightness Control

This adjusts the brightness of the display in stand-by mode.
The brightness of the display is always at the maximum level when the buttons are used.

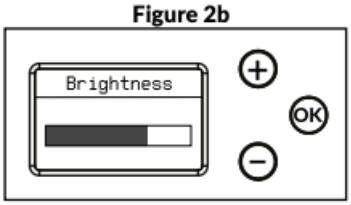
1. Press OK to enter the settings menu.
2. Choose ***Brightness***.

Figure 2a



3. Adjust the brightness.

Figure 2b



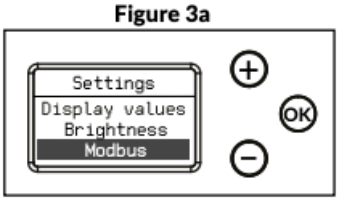
- Increase/decrease the brightness by pressing ⊕ and ⊖.

4. Saving the chosen brightness level and exiting.
    - Save the brightness level and return to the settings menu by pressing the OK button or keep the OK button down to return to the basic view.
    - The chosen brightness level will settle when the buttons have been unpressed for 30 seconds.

Step 3: Modbus Settings (Modbus devices only)

1. Press OK to enter the settings menu.
2. Choose ***Modbus***.

Figure 3a



3. Choose the desired parameters in the Modbus menu.

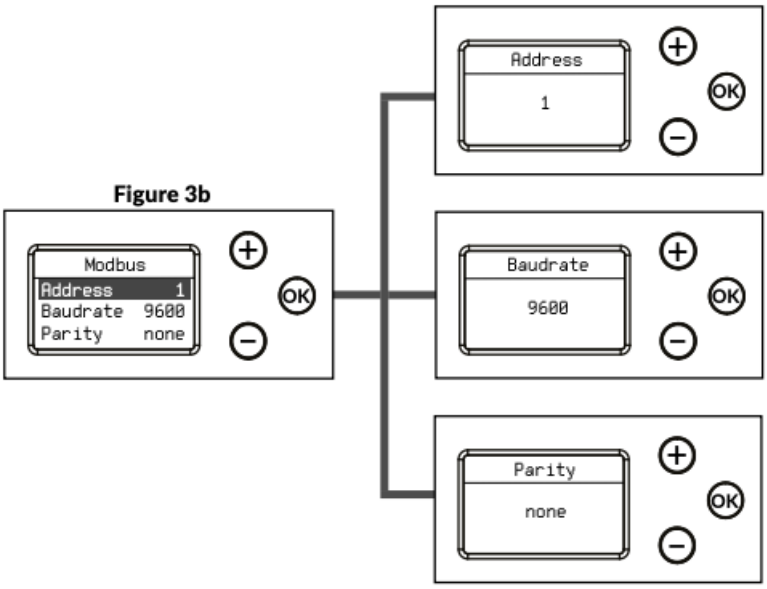


Figure 3b

- The parameters can be scrolled by pressing the ⊕ and ⊖ buttons and chosen by pressing OK.
  Address: 1 – 247 (default = 1)
  Baud rate: 9600 / 19200 / 38400 / 57600
  Parity: none / even / odd

4. Choose ***Exit*** to exit the Modbus menu.

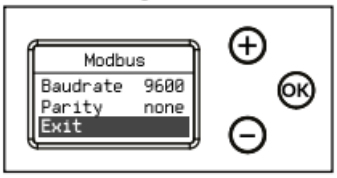


Figure 3c

- Scroll to ***Exit*** and press OK to return to the settings menu or keep the OK button down to return to the basic view.

Step 4: Outputs

The device includes four freely configurable outputs. Current (optional) or voltage output can be chosen for each of them. The output signal has to be chosen first with a jumper (see the installation instructions), after which the output settings can be changed in the ***Outputs*** menu.

1. Press OK to enter the settings menu.
2. Choose ***Outputs***.

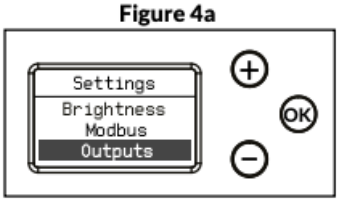
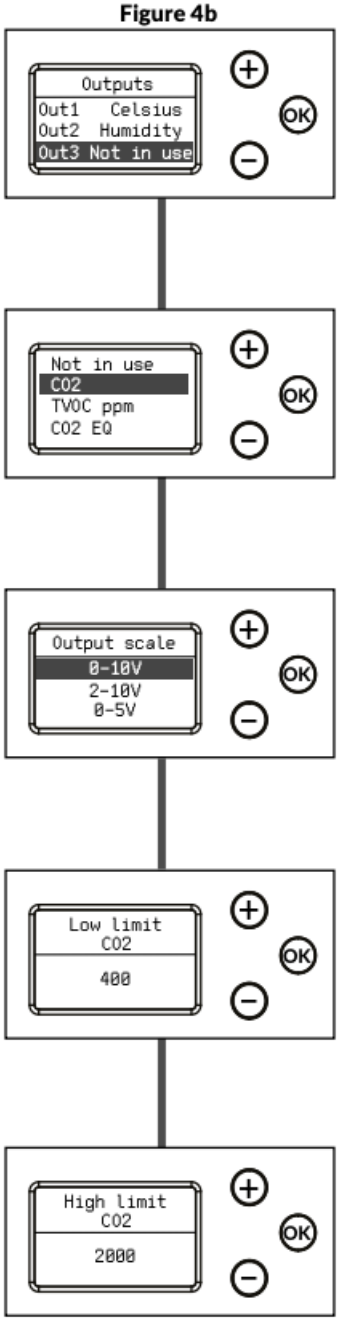


Figure 4a

3. Choose measurement, scale and limits for each output.

Figure 4b



Measurement: Not in use / Celsius [1*] / Fahrenheit [1*] / CO2 / Humidity / TVOC ppm [2*] / CO2 EQ / TVOC ug/m3 [2*] / PM2.5 hour / PM10 hour / PM2.5 day / PM10 day / PM1 / PM2.5 / PM10

1*) Only one of these can be chosen for outputs.

2*) Only one of these can be chosen for outputs.

Scale: 0–10 V / 2–10 V / 0–5 V [1*] / 4–20 mA [2*]

1*) When using voltage output, the jumper setting of that output must be set to V.

2*) When using current output, the jumper setting of that output must be set to mA.

Low limit: See Table 1 - Output limits

High limit: See Table 1 - Output limits

Table 1 - Output limits

Measurement	Default limits	Adjustable low limit	Adjustable high limit	Smallest range available
Celsius [1*]	0.0...50.0 °C	0.0...45.0 °C	5.0...50.0 °C	5.0 °C
Fahrenheit [1*]	32...122 °F	32...113 °F	41...122 °F	9 °F
CO_2	400...2000 ppm	0...1900 ppm	500...2000 ppm	100 ppm
Humidity	0.0...100.0 %	0.0...90.0 %	10.0...100.0 %	10.0 %
TVOC ppm	0.00...30.00 ppm	0.00...28.00 ppm	2.00...30.00 ppm	2.00 ppm
CO_2 EQ	400...2000 ppm	0...9900 ppm	500...10000 ppm	100 ppm
TVOC µg/m^3	0...3000 µg/m3	0...9900 µg/m3	100...10000 µg/m3	100 µg/m3
PM (all) [2*]	0...500 µg/m3	0...480 µg/m3	20...500 µg/m3	20 µg/m3

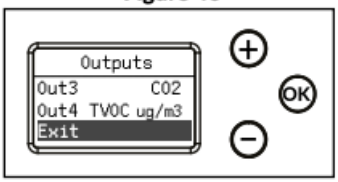
1*) Celsius and Fahrenheit limits are interdependent, and thus a change in one limit of a measurement will also change the limits of the other measurement.

2*) PM2.5, PM2.5 hour and PM2.5 day share the same limits.
PM10, PM10 hour and PM10 day share the same limits.
Changing one limit will also change the limits of the two other measurements.

- The menus and limits can be scrolled by pressing the ⊕ and ⊖ buttons. Choose the measurement and scale and set the limits by pressing the OK button.

4. Choose ***Exit*** to exit the Outputs menu.

Figure 4c



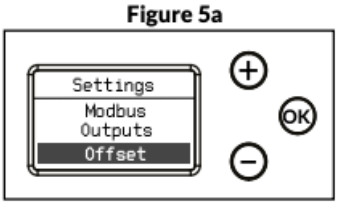
- Scroll to ***Exit*** and press OK to return to the settings menu or keep the OK button down to return to the basic view.

Step 5: Offset

The offset feature enables field calibration. This is necessary in applications that need annual calibration.

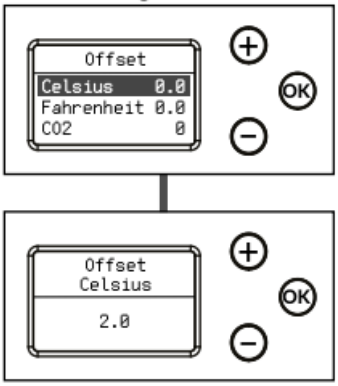
1. Press OK to enter the settings menu.
2. Choose ***Offset***.

Figure 5a



3. Choose offset value for every measurement.

Figure 5b



- The Offset menu and limits can be scrolled by pressing the ⊕ and ⊖ buttons. Choose the measurement and set the limits by pressing the OK button.
  See Table 2 – Offset limits.

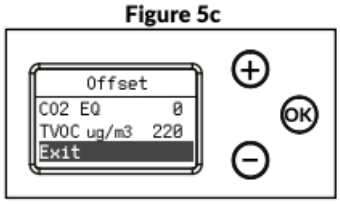
Table 2 - Offset limits

Measurement	Limit
Celsius 1*	±5.0 °C
Fahrenheit 1*	±9.0 °F
CO_2	±200 ppm
Humidity	±10.0 %
TVOC ppm	±3.00 ppm
CO_2 EQ	±200 ppm
TVOC ug/m^3 2*	±1000 µg/m3
PM 3*	0.30...2.00 (offset multiplier)

1*) Celsius and Fahrenheit limits are interdependent, and thus a change in one limit of a measurement will also change the limits of the other measurement.
2*) TVOC µg/m3 offset will also affect the IAQ value based on TVOC.
3*) PM offset will also affect the IAQ value based on PM.

4. Choose ***Exit*** to exit the Offset menu.

Figure 5c



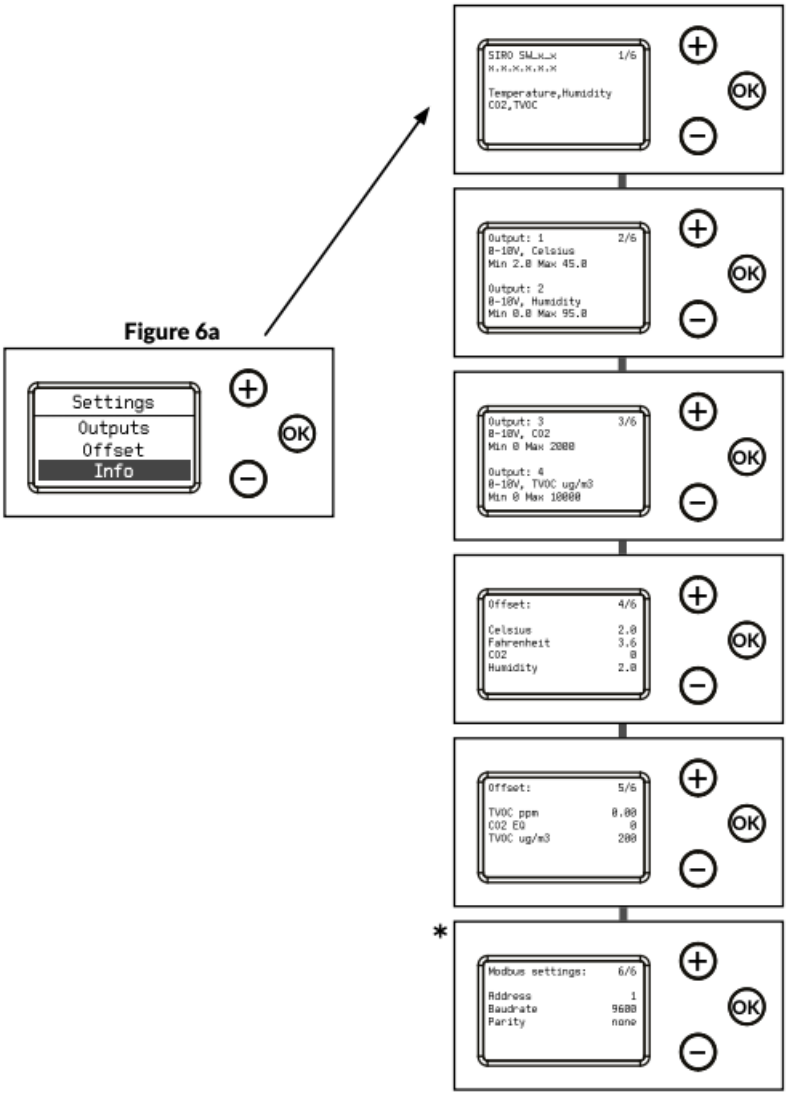
- Scroll to ***Exit*** and press OK to return to the settings menu or keep the OK button down to return to the basic view.

Step 6: Info View

Info view is a summary of the information and settings of the device.

1. Press OK to enter the settings menu.
2. Choose ***Info***.

Figure 6a



- Scroll by pressing ⊕ and ⊖.

  Page 1: Version number and buildup of the device.

  Page 2-3: Outputs

  Page 4-5: Offsets

  Page 6: Modbus settings (Modbus devices only)*

3. Press OK to exit the Info view.
    - Press OK to return to the settings menu or keep the OK button down to return to the basic view.

Information about the Measurements

Table 3 – Additional information about the measurements

Measurement	Text in the Siro user interface	Description	Unit
T (Temperature)	Celsius	Temperature	°C
	Fahrenheit	Temperature	°F
rH (Relative humidity)	Humidity	Relative humidity	%rH
CO_2 (Carbon dioxide)	CO2	Carbon dioxide concentration	ppm
VOC (Volatile Organic Compounds)*	TVOC ppm	Total concentration of organic volatile compounds	ppm
	TVOC ug/m3	Total concentration of organic volatile compounds	µg/m3
	CO2 EQ	Organic volatile compounds value converted into CO_2 equivalent	ppm
	IAQ	Indoor air quality index, based on TVOC µg/m3 concentration, see Table 4	1-5, emoticon
PM (Particulate Matter)	PM2.5 hour	1-hour mean of particulate matter concentration for particulates with diameter under 2.5 µm	µg/m3
	PM10 hour	1-hour mean of particulate matter concentration for particulates with diameter under 10 µm	µg/m3
	PM2.5 day	24-hour mean of particulate matter concentration for particulates with diameter under 2.5 µm	µg/m3
	PM10 day	24-hour mean of particulate matter concentration for particulates with diameter under 10 µm	µg/m3
	PM1	Momentary value of particulate matter concentration for particulates with diameter under 1 µm	µg/m3
	PM2.5	Momentary value of particulate matter concentration for particulates with diameter under 2.5 µm	µg/m3
	PM10	Momentary value of particulate matter concentration for particulates with diameter under 10 µm	µg/m3
	IAQ	Indoor air quality index, based on hourly average of PM2.5, see Table 5	1-5, emoticon

*VOC sensor is tuned for typical IAQ Mix of 22 VOCs as defined by Mølhave et al. (1997)

Table 4 – TVOC levels

TVOC IAQ		
IAQ level	**TVOC [µg/m3]**	**Air quality**
1	<300	Very good
2	300 – 1 000	Good
3	1 000 – 3 000	Moderate
4	3 000 – 10 000	Bad
5	>10 000	Very bad

Based on the German Environment Agency (UBA) reasearch.

Table 5 – PM levels

PM IAQ		
IAQ level	PM2.5 1h avg. [µg/m3]	Air quality
1	<25	Very good
2	26 - 37	Good
3	38-50	Moderate
4	51-75	Bad
5	>75	Very bad

Based on the World Health Organization (WHO) research and hourly average of PM2.5 concentration.

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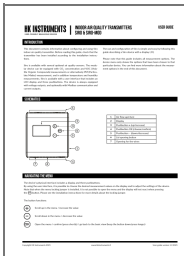
Documents / Resources

	HK INSTRUMENTS SIRO-MOD Indoor Air Quality Transmitters [pdf] User Guide SIRO-MOD, SIRO, Indoor Air Quality Transmitters