User manual

tSENSE EFA

CO_2- and temperature transmitter

General

tSENSE EFA for wall mounting measures indoor air carbon dioxide concentration, temperature and relative humidity in rooms. *tSENSE EFA* is available with or without colour touch display (LCD).
The unit connects to Direct Digital Control (DDC).
Linear outputs are pre-programmed as CO_2-, temperature- and relative humidity transmitter. Measuring ranges can be modified from PC (Windows) software UIP (version 5 or higher) and USB communication cable, alternative via Modbus or BACnet.

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Opening of housing

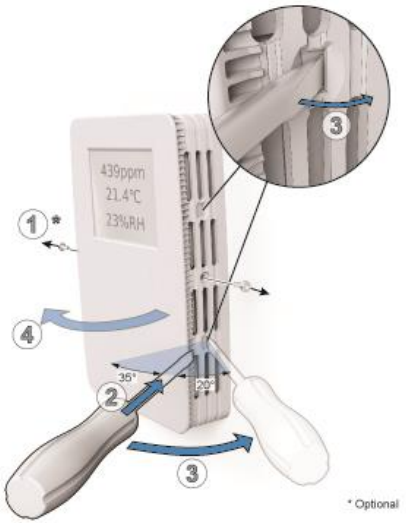


Figure 1

Download of software UIP

senseair.se/products/software/uip-5/

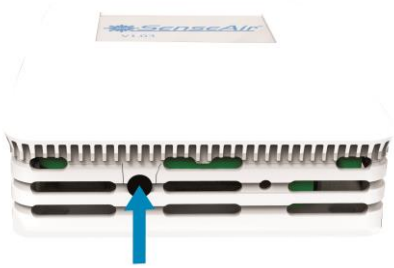
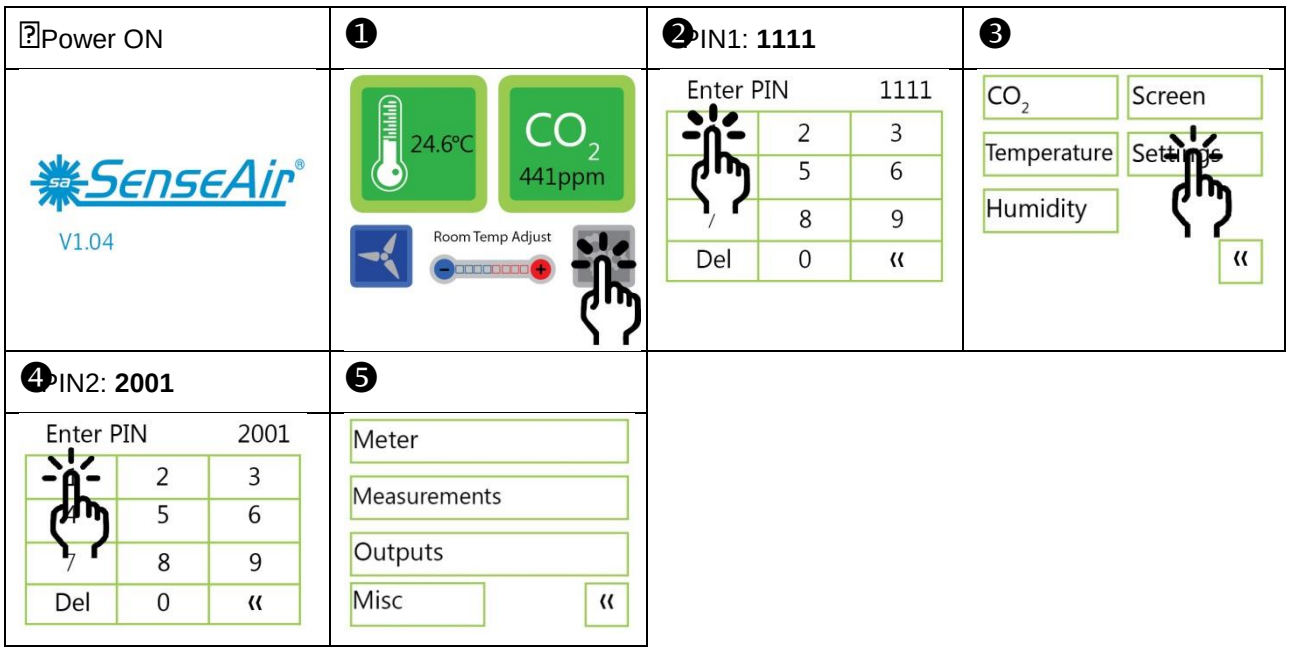


Figure 2: Connection to PC via phone jack

Connect Interface cable USB – 3.5mm Art.no.:00-0-0070

Enter PIN code



Output Configurations

Terminal	Default Output	Default Output Range	Outputs of this sensor	Output Ranges of this sensor
OUT(1)	2 - 10 VDC	0 - 3000ppm CO_2	See label	See label
OUT(2)	2 - 10 VDC	0 - 50°C	See label	See label
OUT(3)	2 - 10 VDC	? Ch7	See label	See label

Table 1. Default output configurations of tSENSE EFA

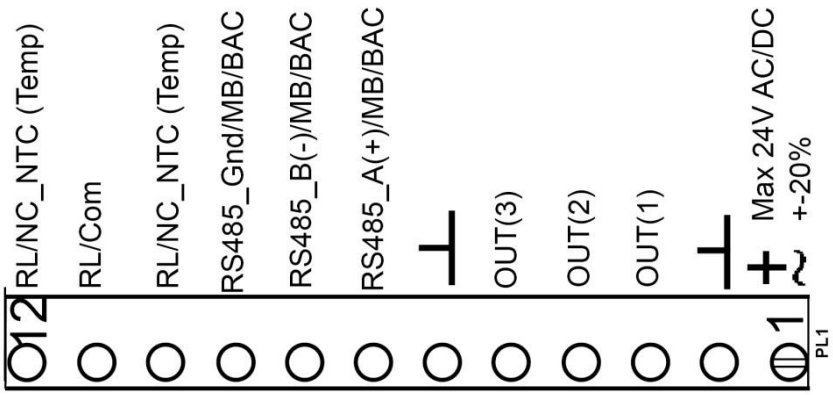


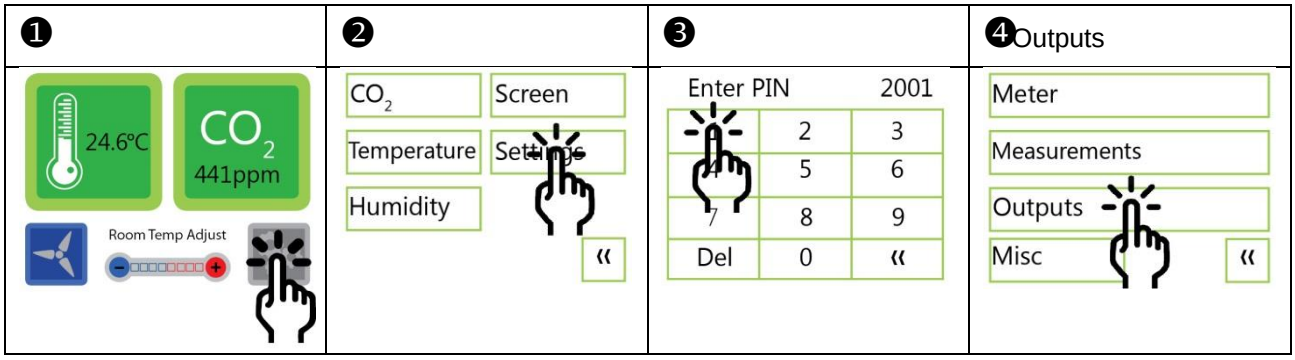
Figure3: Screw Terminal

Connect the sensor to PC with the connect interface cable USB – 3.5mm Art.no.: 00-0-0070

The sensor is supplied with 0 - 10VDC linear outputs for Out(1), Out(2) and Out(3) (see Table 1). Alternative output ranges can be configured with PC software UIP (version 5 or higher). See information at senseair.com.

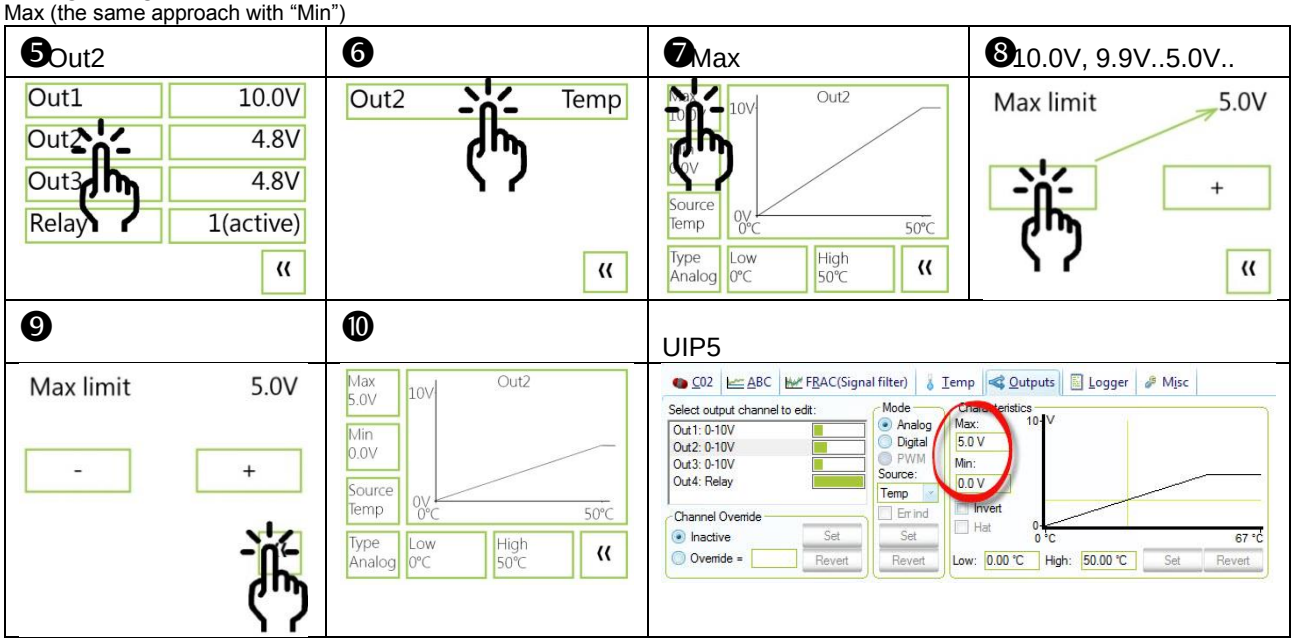
Outputs

Out1/Out2/Out3

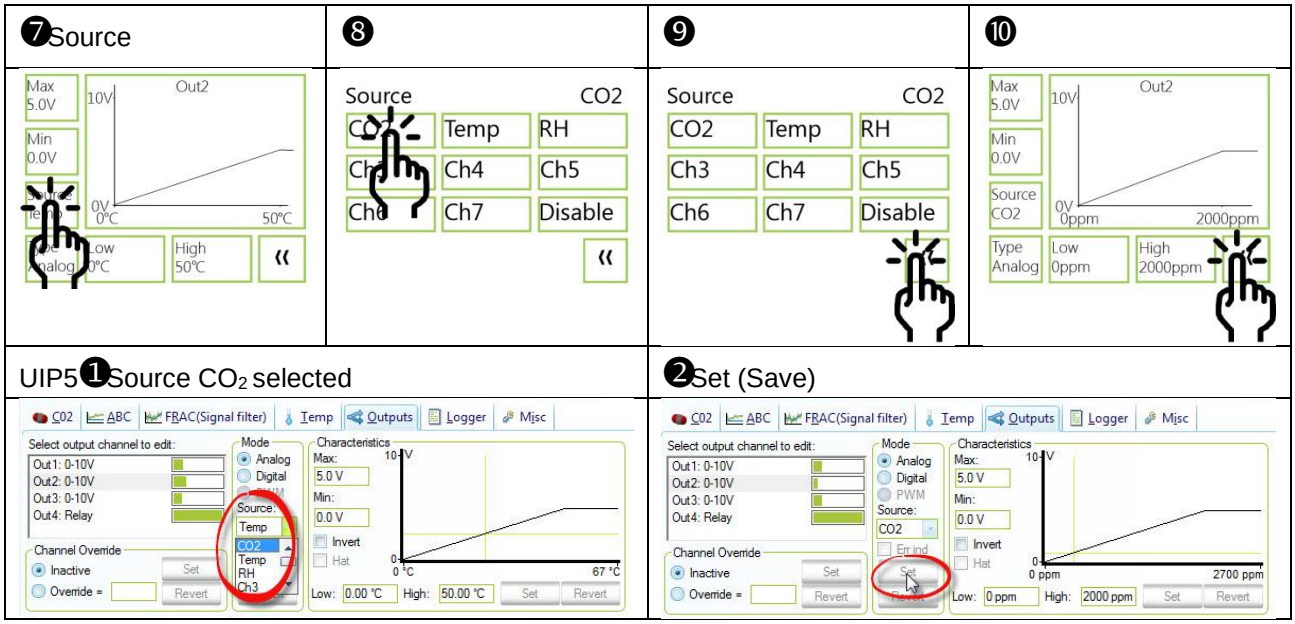


Voltage range

Max (the same approach with “Min”)

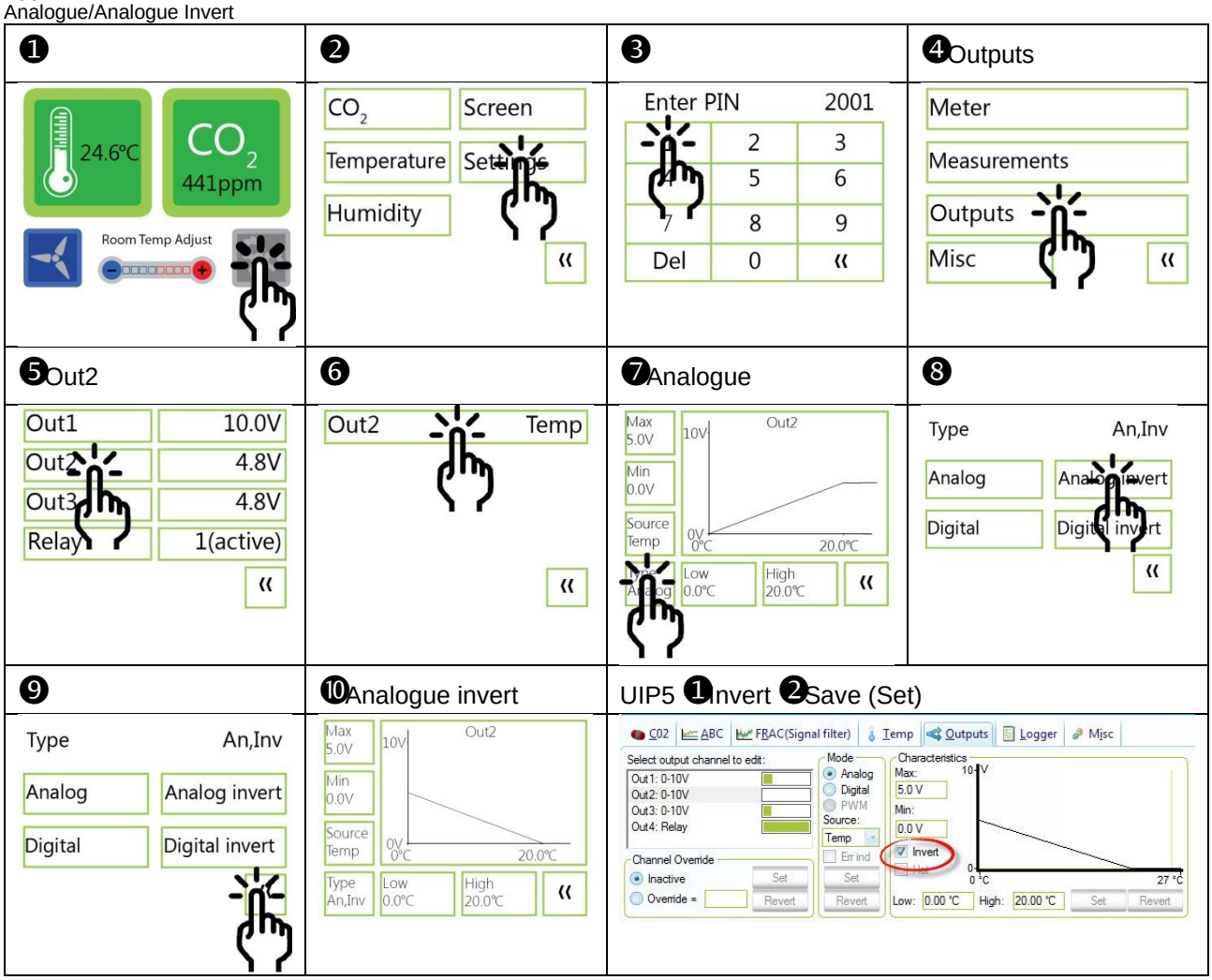


Select source

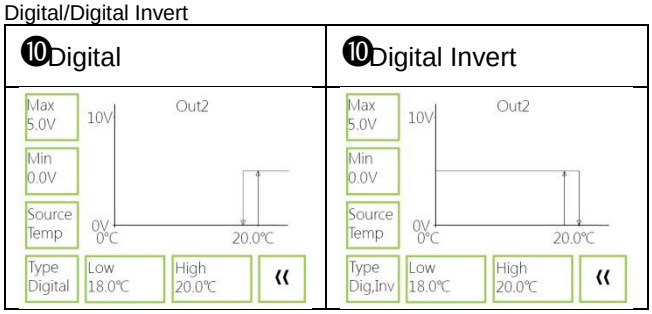


Types

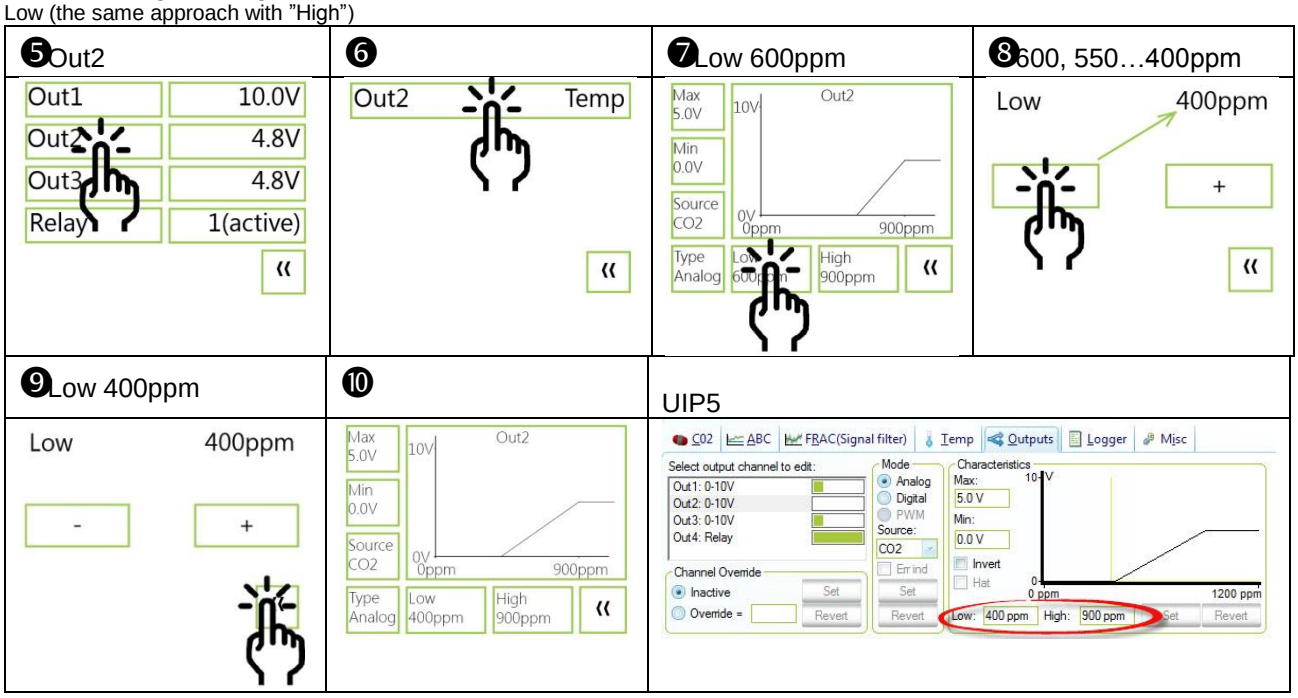
Analogue/Analogue Invert



Digital/Digital Invert

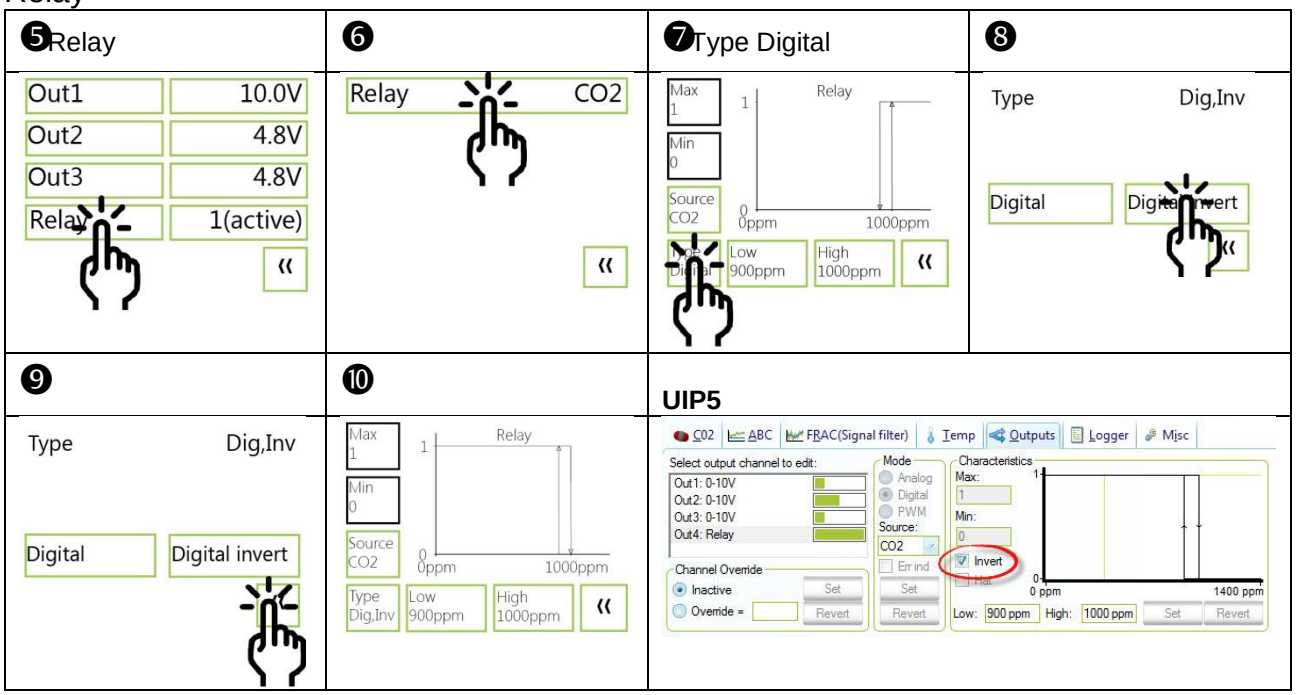


Measure range settings
Low (the same approach with ”High”)



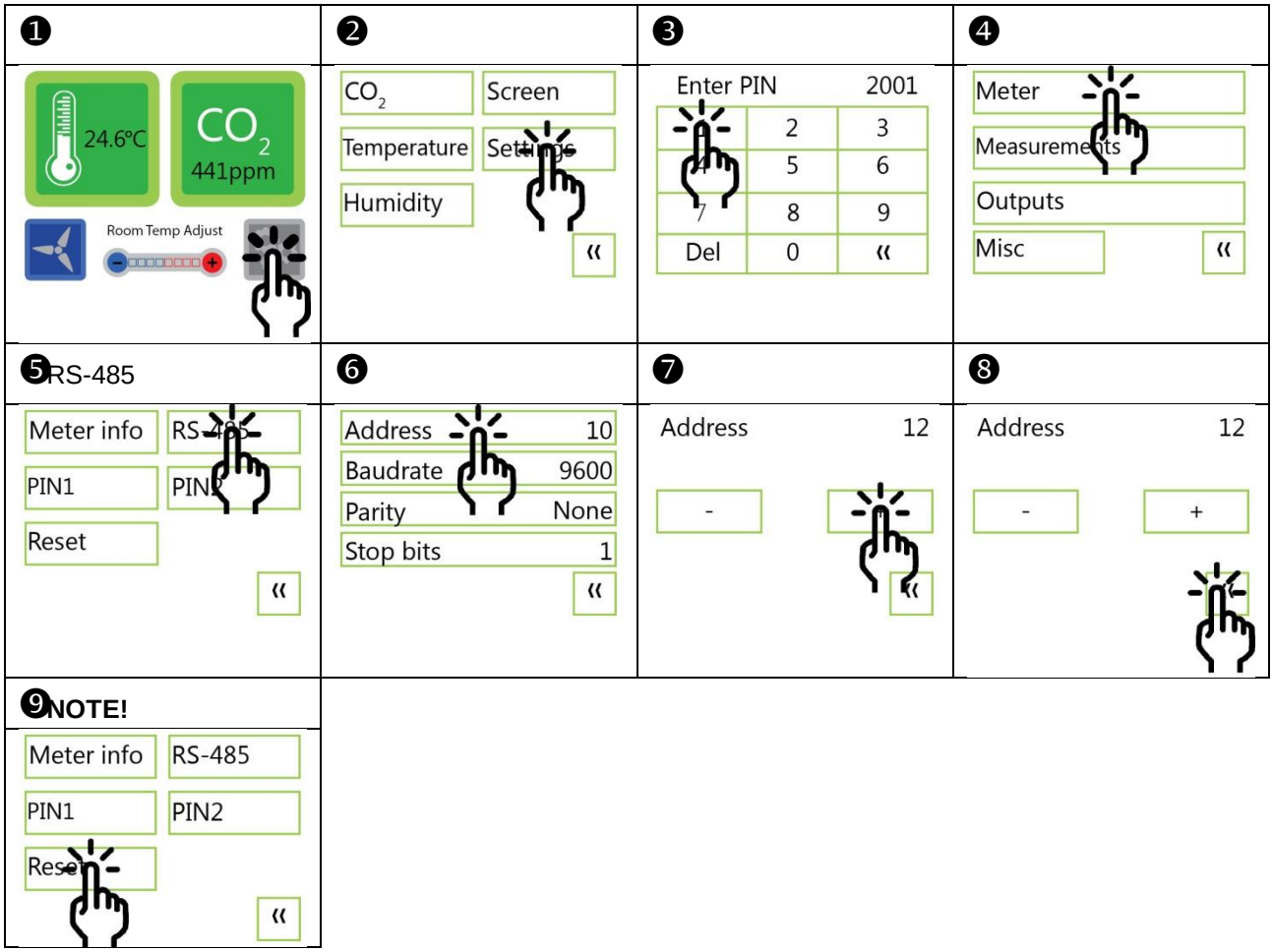
Outputs

Relay

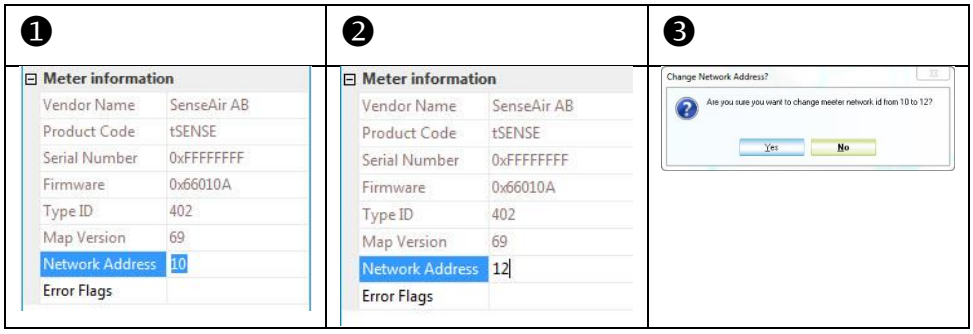


Communication settings

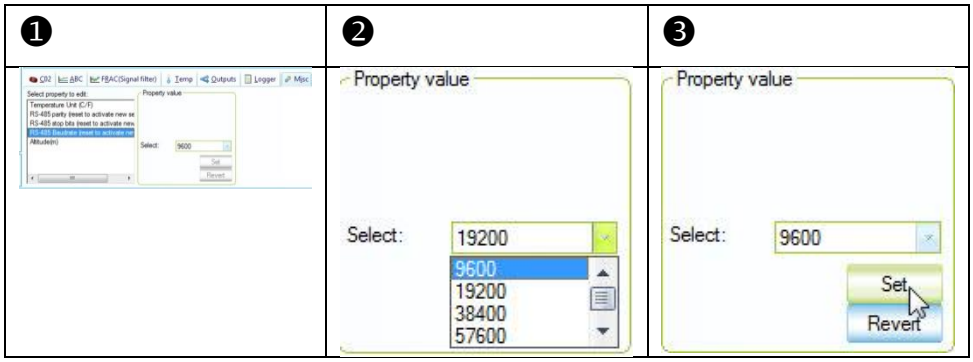
Address/Baudrate



UIP Address



UIP Baudrate

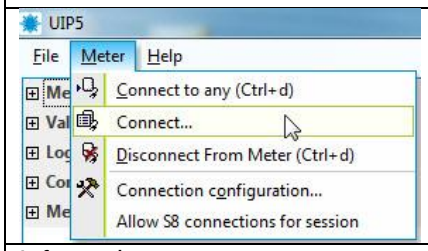


NOTE!
UIP baudrate ≠ RS-485 baudrate if *tSENSE (Disp)* is connected *via phone jack* (see fig. 2).
UIP baudrate = RS-485 baudrate if *tSENSE (Disp)* is connected *via screw terminal* (see fig. 3).

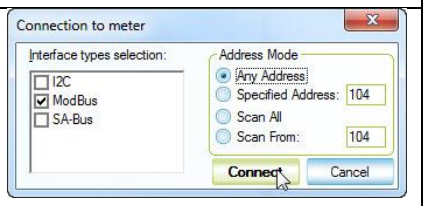
Change communication settings via UIP requires Reset (Power OFF – Power ON) to be executed.

Connect meter

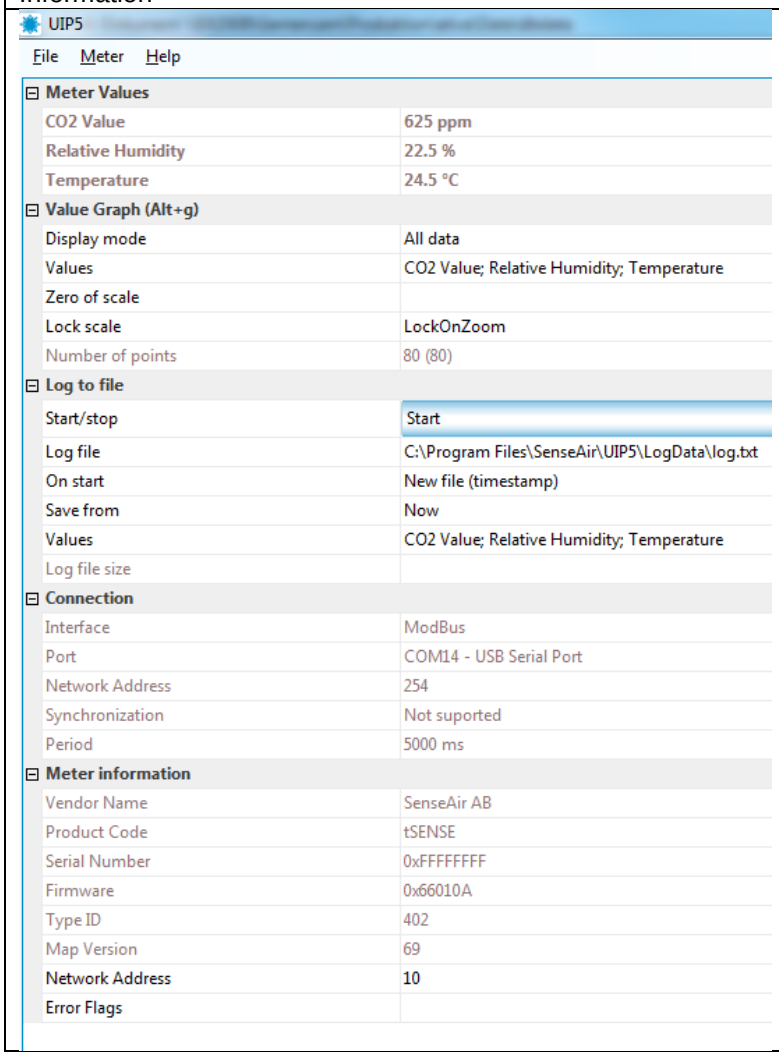
❶Connect meter



❷

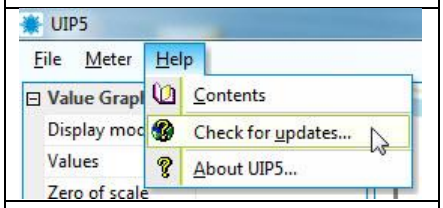


Information

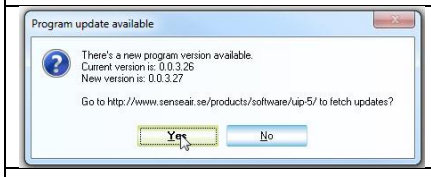


Check for updates

❶

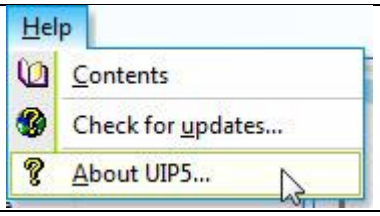


❷New version available

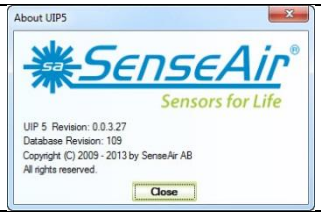


❷

❸

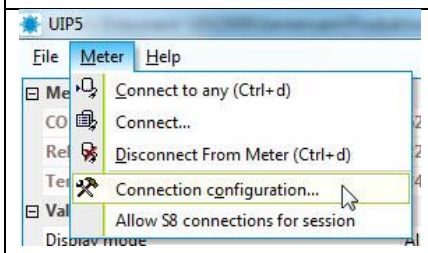


❹

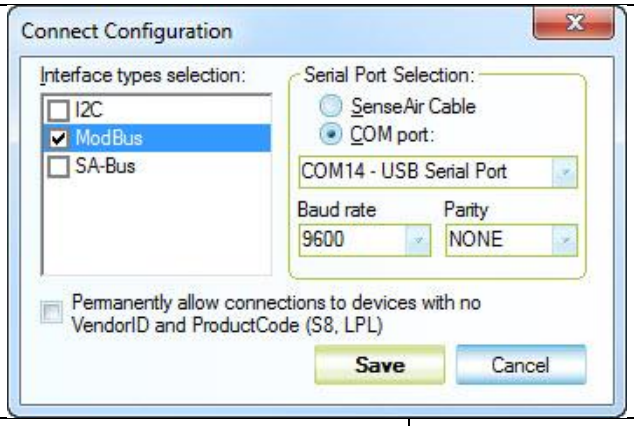


Connection configurations

❶



❷ModBus ❸COM14-USB Serial Port ❹Save



❺Lower right corner of screen

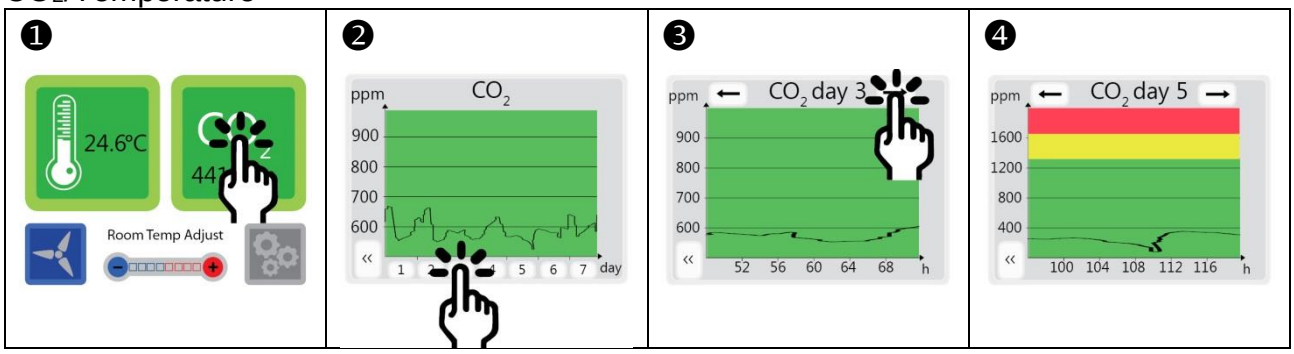
❻

NOTE!
UIP baudrate ≠ RS-485 baudrate if *tSENSE (Disp)* is connected *via phone jack* (see fig. 2).
UIP baudrate = RS-485 baudrate if *tSENSE (Disp)* is connected *via screw terminal* (see fig. 3).

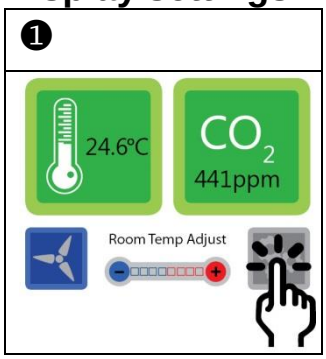
Change communication settings via UIP requires Reset (Power OFF – Power ON) to be executed.

Measured values

CO_2/Temperature



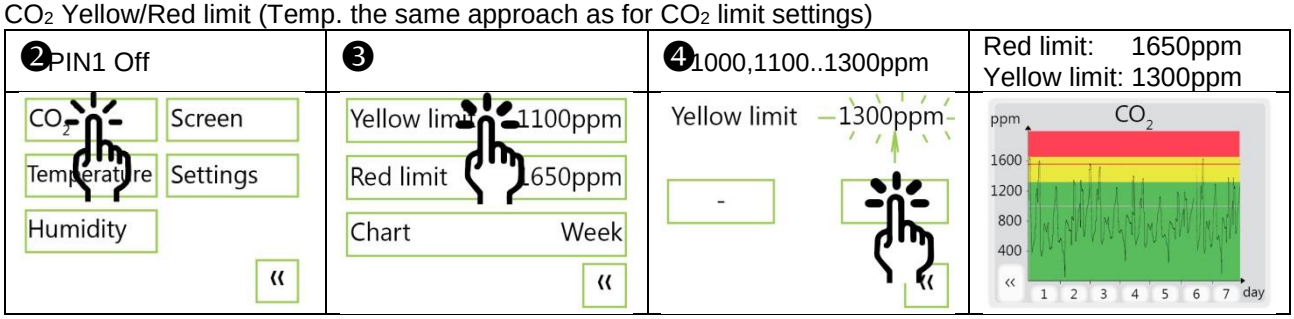
Display settings



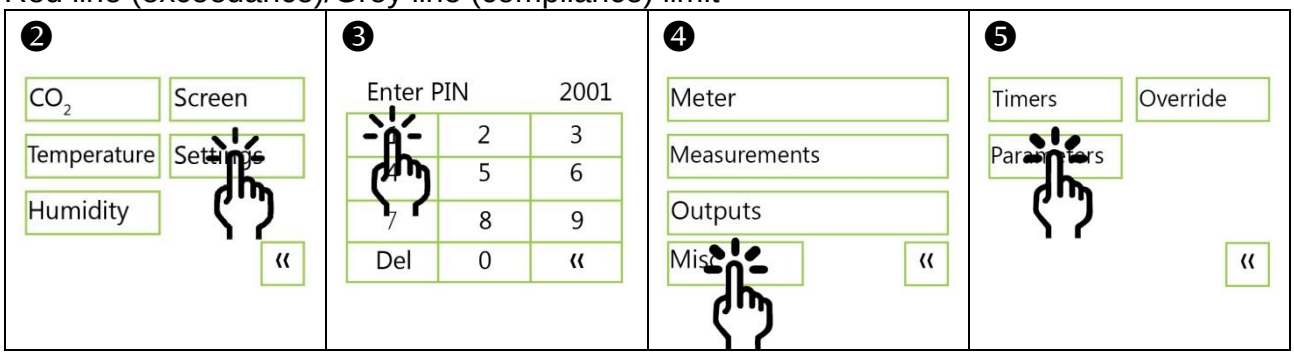
Limits

CO_2/(Temperature)

CO_2 Yellow/Red limit (Temp. the same approach as for CO_2 limit settings)



Red line (exceedance)/Grey line (compliance) limit



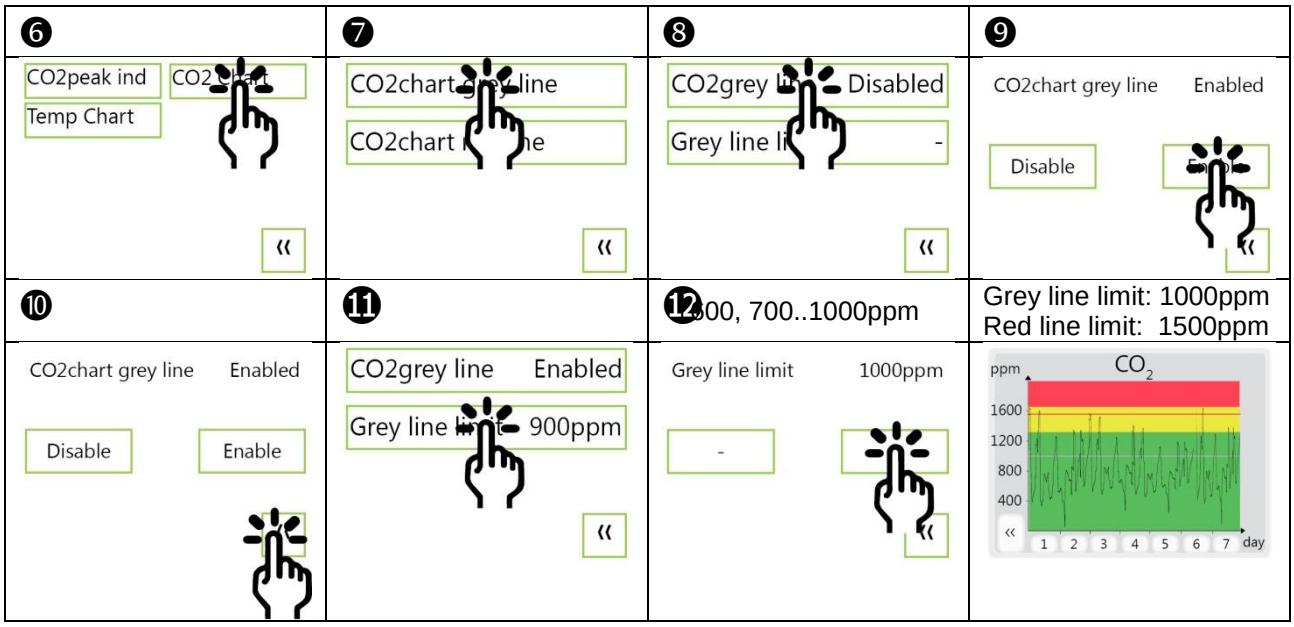
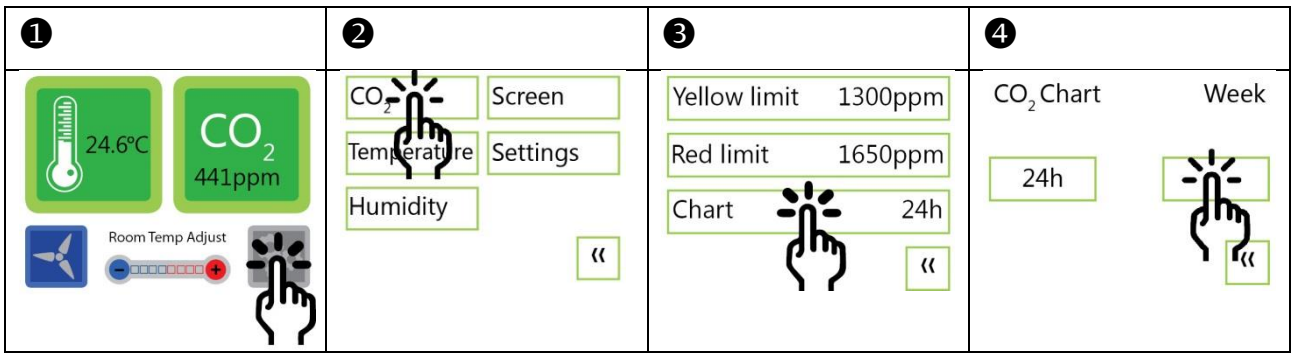
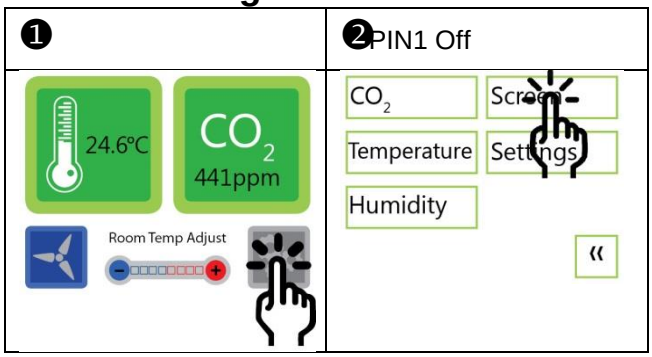


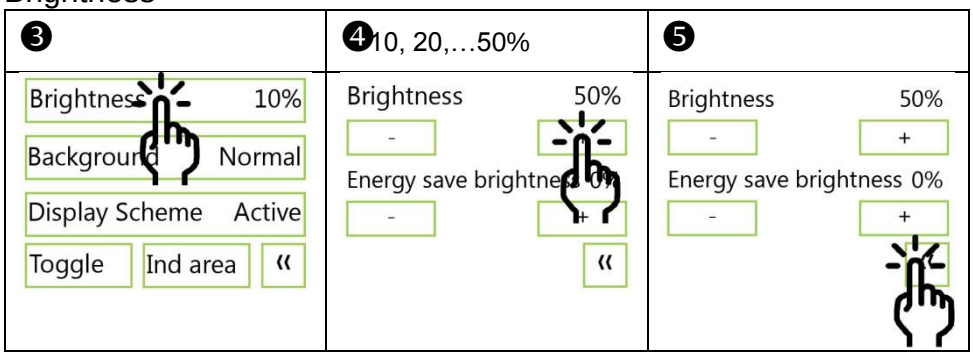
Chart 24h/Week



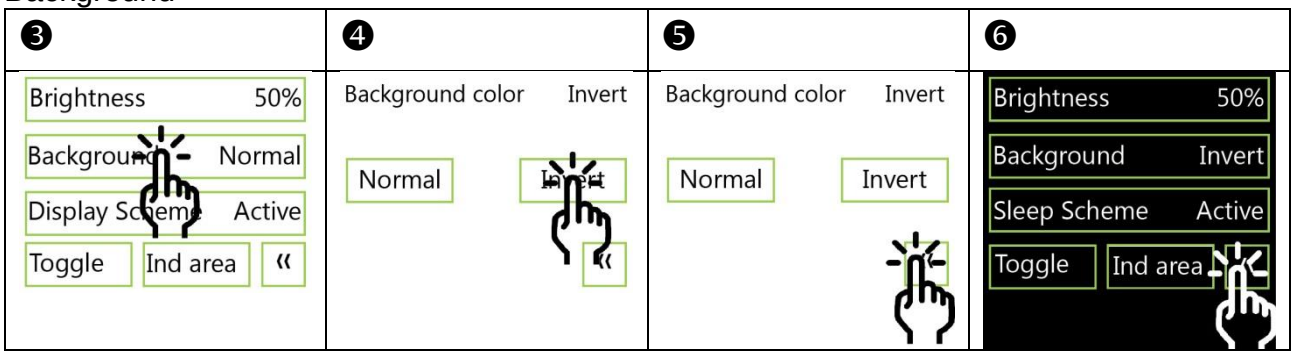
Screen settings



Brightness

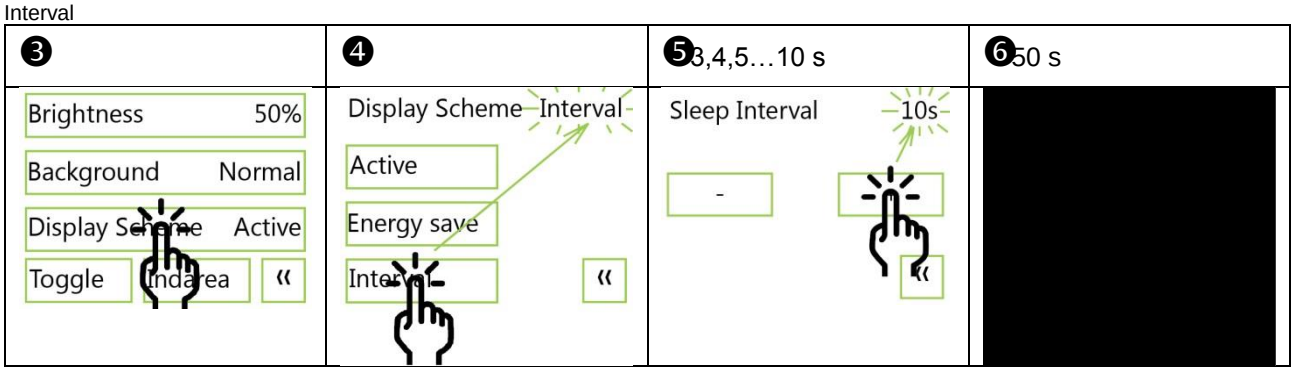


Background

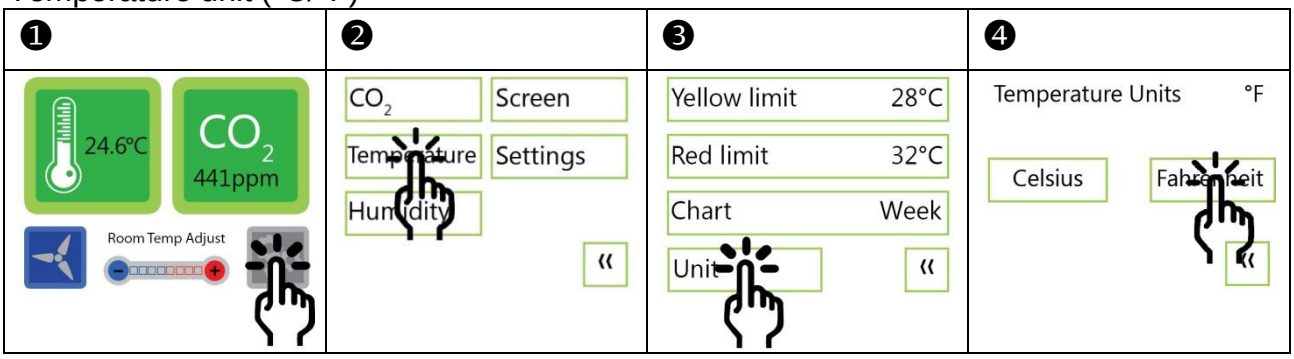


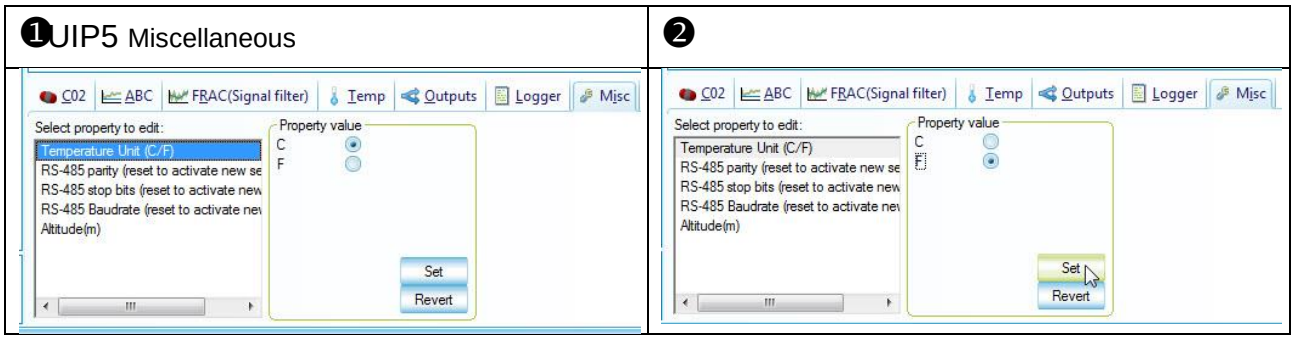
Screensaver, Time setting

Interval

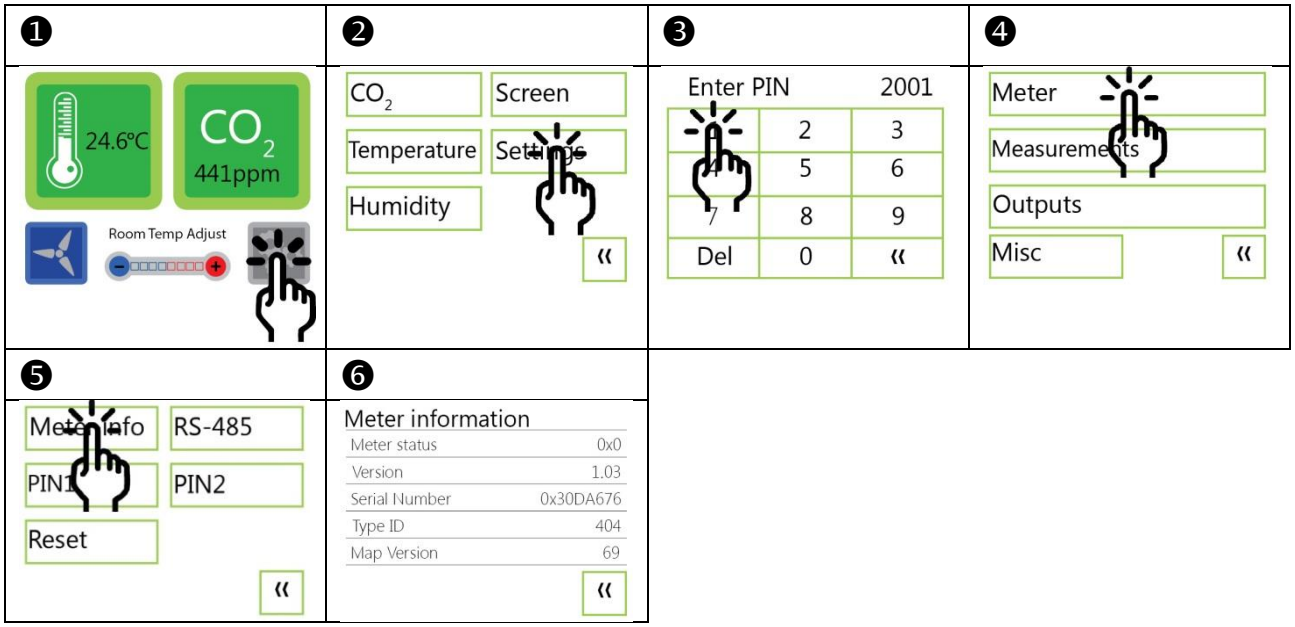


Temperature unit (°C/°F)

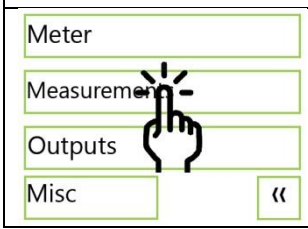
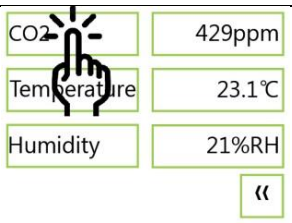




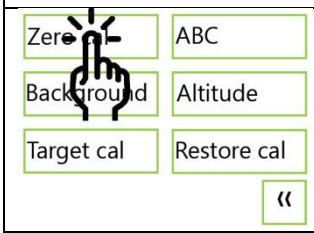
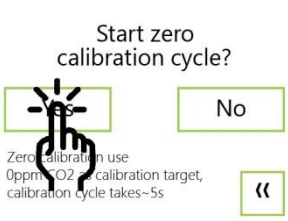
Meter information

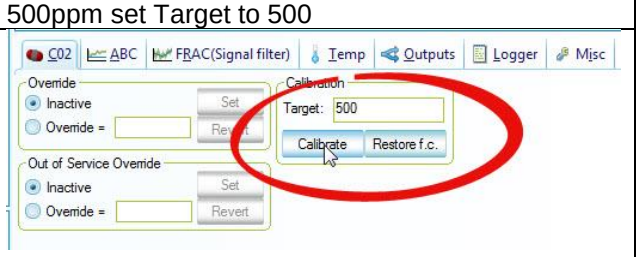


Calibration options CO_2

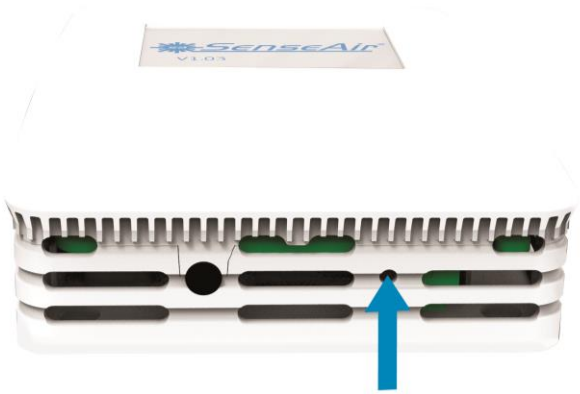
❹	❺
	

Zero cal/Background/Target cal

❻	❼	❽	❾
			

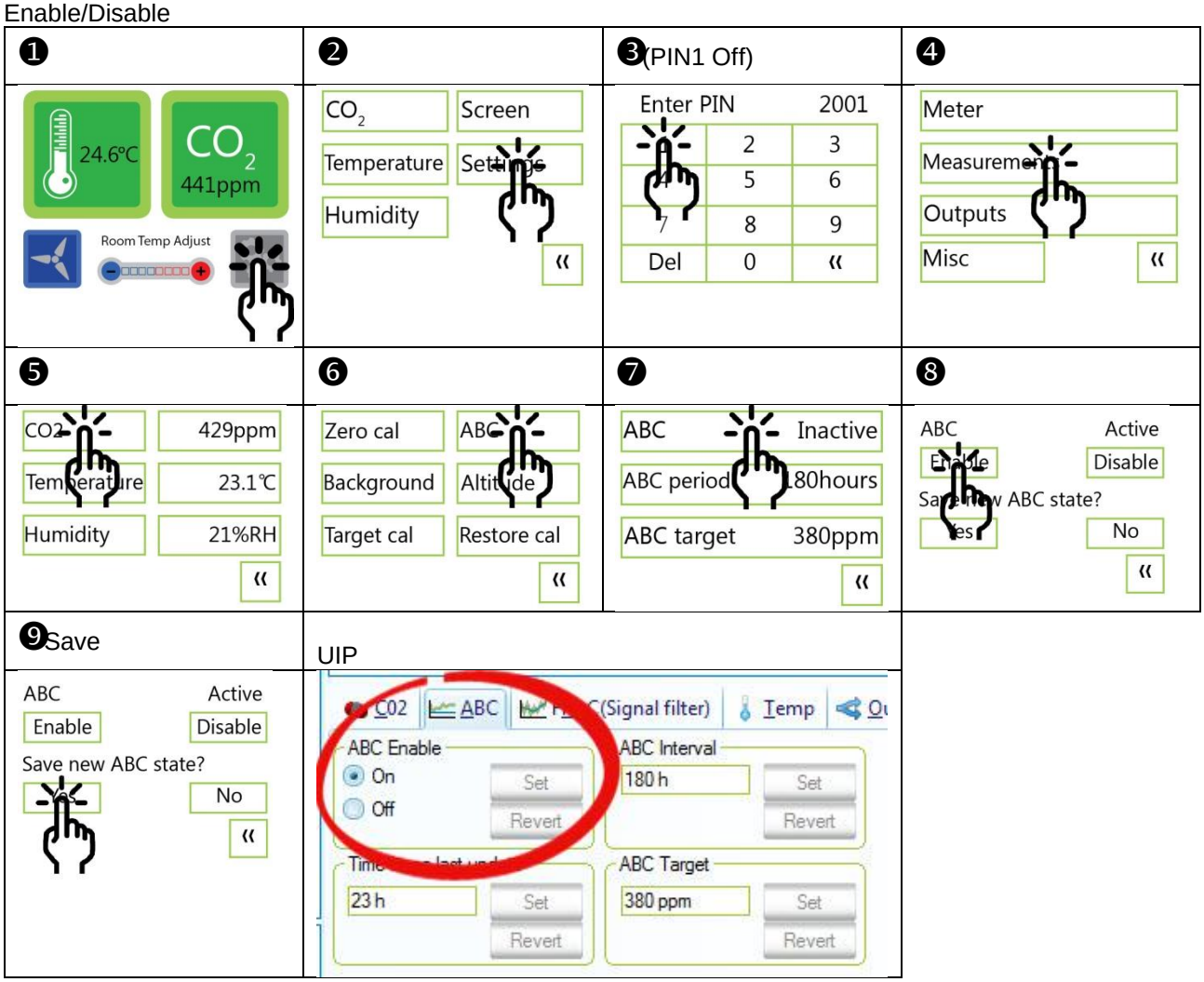
❿	⓫	UIP: If reference meter shows e.g. CO_2-value 500ppm set Target to 500
Zero calibration succeeded		

Background calibration button

❶ Press for 15s, until…	❷ green LED blinks twice
	

ABC

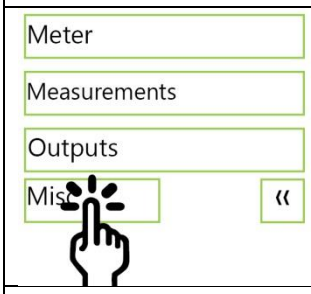
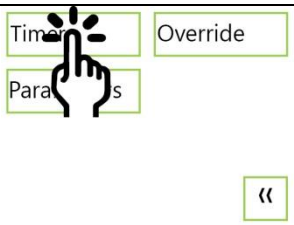
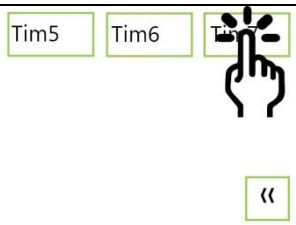
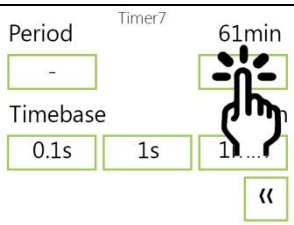
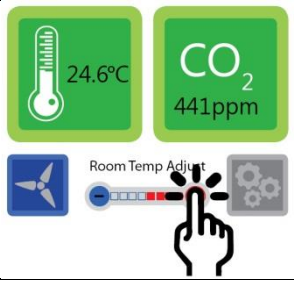
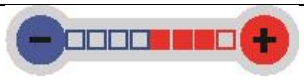
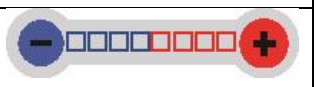
Enable/Disable



Timers

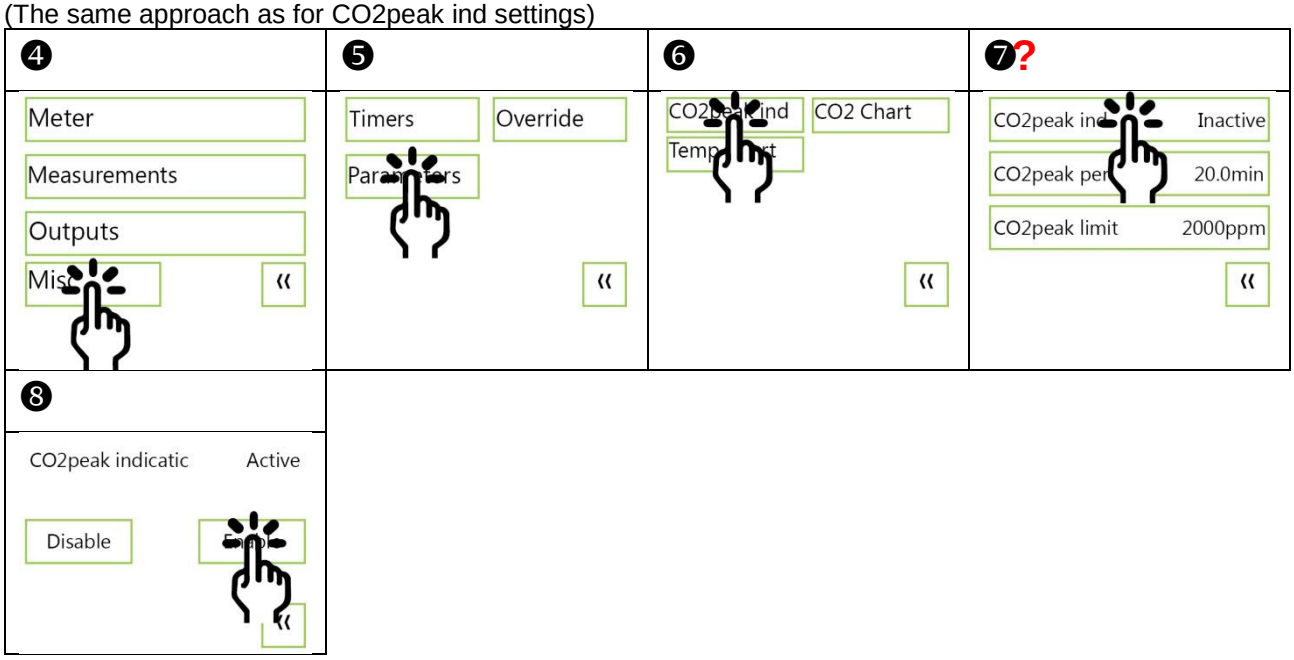
Fan

Room Temp Adjust
(the same approach as for Fan settings)

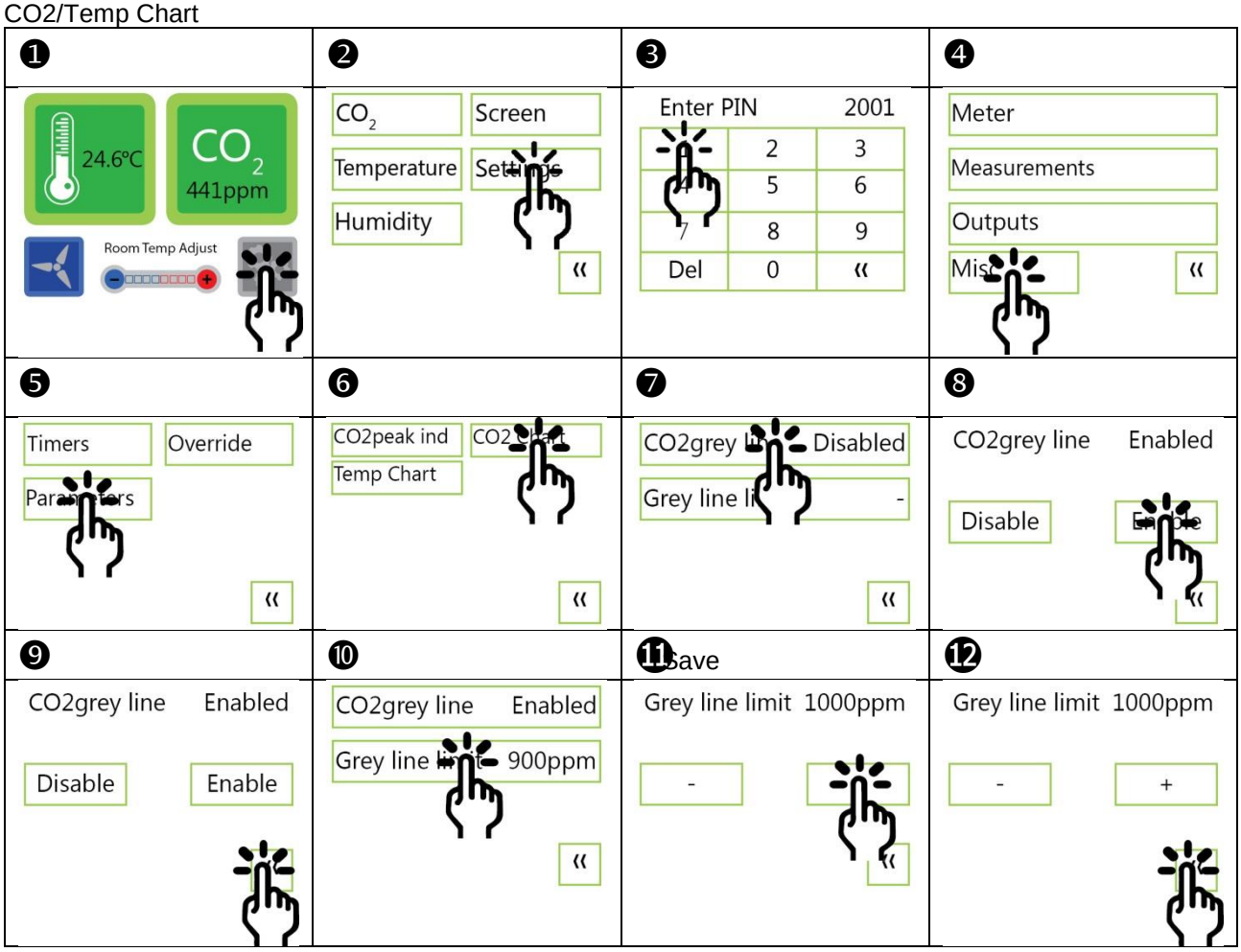
❹	❺	❻ Room Temp Adjust	❼ 61, 62…90min
			
❽ Period: 90min Timebase: 1min	One step (click) =x°C/F (depends on control system settings)	1, 2, 3…89min	90min after adjusting Back to init value
			

Parameters

CO2peak ind Enable/Disable?/ CO2peak period/ CO2peak limit
(The same approach as for CO2peak ind settings)

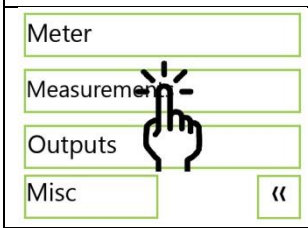


CO2/Temp Chart



ABC period (ABC target/Altitude (msl)/Restore cal)

❹



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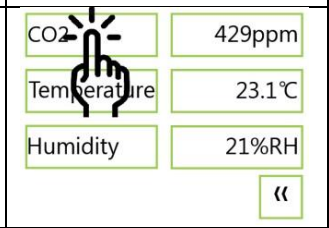

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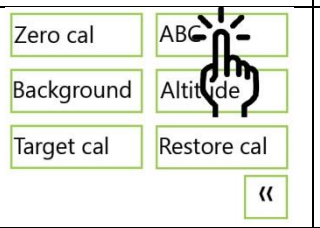

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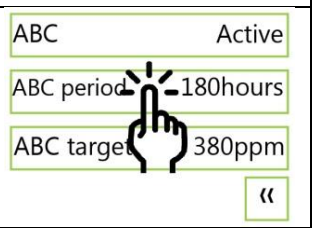

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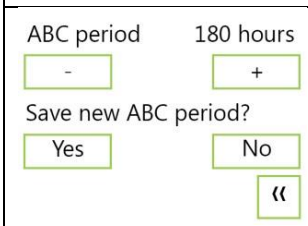

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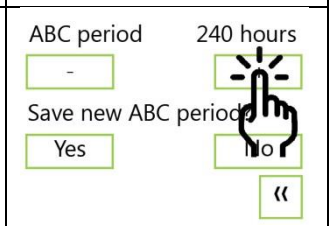
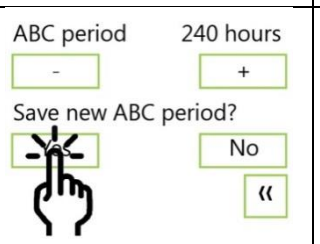


❿ 180, 181, 240hours



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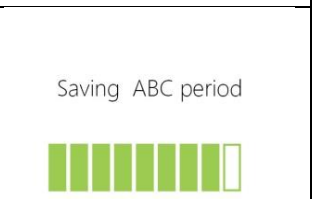

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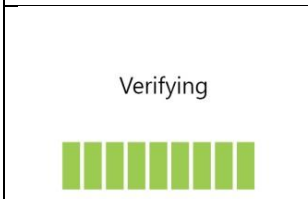

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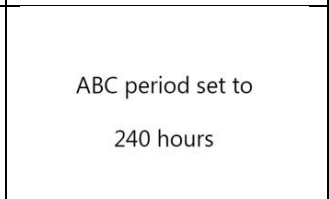

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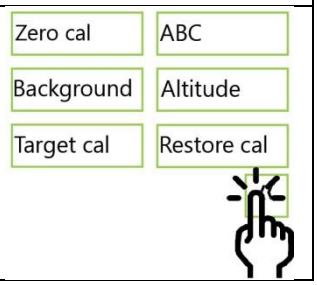
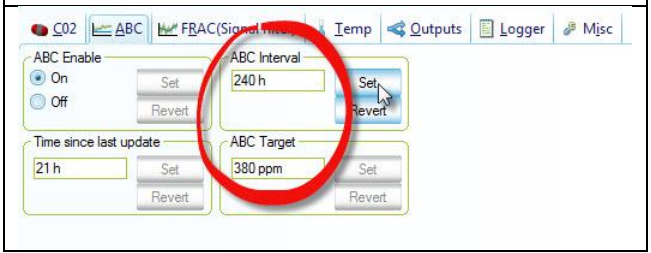
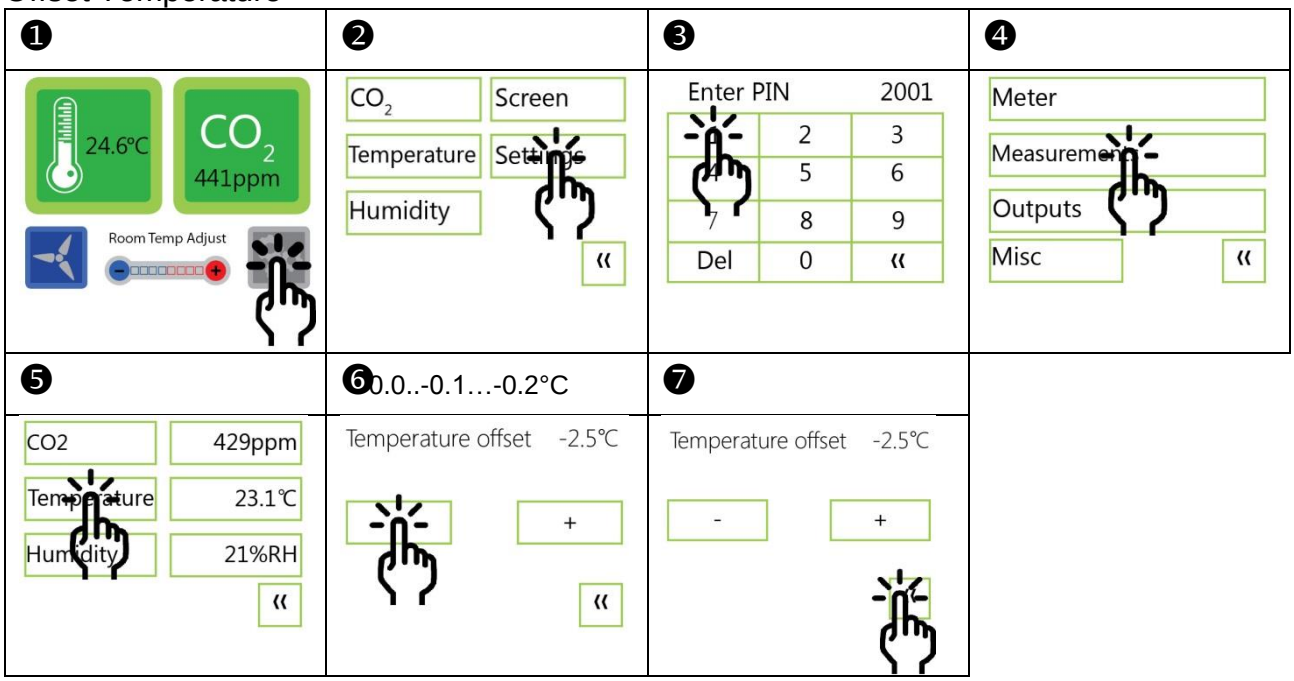


UIP



Offset Temperature



Automatic system test

A full system test is executed automatically at every power-up. Sensor probes are checked constantly during operation against failure by checking valid dynamic measurement ranges.

System checks returns error bytes to RAM. Error codes are available by connecting the sensors to a PC with a special USB cable (art.no. 00-0-0070) connected (see fig. 2). Error codes are shown in software UIP (version 5 or higher) and in the display at “Meter status”.

Error codes and action plans

Red LED indicates that one or several error codes are active

Bit #	Error code	Error description	Suggested action
0	CO_2 sensor Com. error	No ability to communicate with CO2 sensor module.	Try to restart sensor by power OFF - power ON. Contact local distributor.
1	CO_2 sensor CO_2 measure error	CO_2 measurement error.	Try Background calibration (“Calibration options CO_2” p.16). Contact local distributor. *See Note 1!*
2	T sensor T measure error	Temp measurement error.	Try to restart sensor by power OFF - power ON. Contact local distributor.
3	RH/T sensor com error	No ability to communicate with RH/T sensor module.	
4	RH/T sensor RH measure error	RH measurement error.	
5	RH/T sensor T measure error	Temp measurement error, sensor will use CO_2 sensor temperature if RH/T Temperature is unavailable. S_Temp will be set to NTC_Temp.	
6			
7			
8	Output config. error	Error in output configuration. Output is still updated, i.e. can be 0-10V	Check connections and loads of outputs. Check detailed settings and configuration with UIP software version 5 or higher. Contact local distributor.
9	Memory error	One or several bytes of sensors parameter memory (settings) are corrupt	Try to restart sensor by power OFF/ON Contact local distributor.

Table 2: Error codes and action plans.

NOTE!

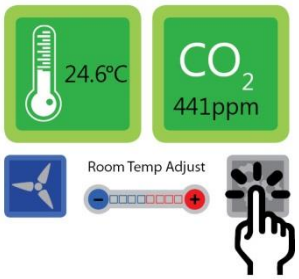
Occurs if probe is out of range, at very high CO_2 values. Error code resets automatically when measured values returns to normal. May also indicate need of zero point calibration. If CO_2 values are normal and error code remains, the sensor can be defect or the connections to it are broken.

If several errors are detected at the same time, different error code numbers will be added together into one single error code!

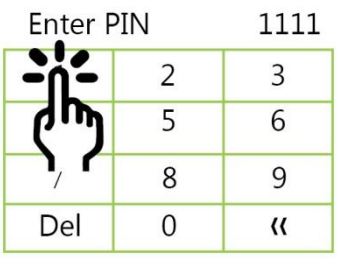
Sensor accuracy is defined at continuous operation (at least three (3) weeks after installation).

PIN codes

❶



❷ PIN1



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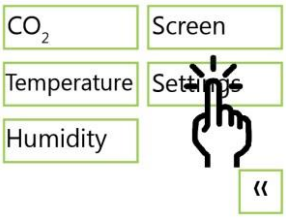
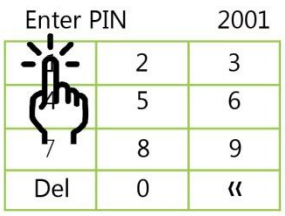


❹ PIN2



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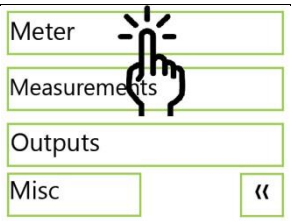
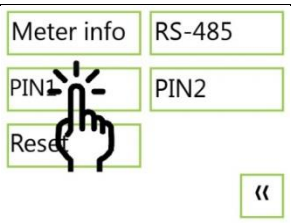
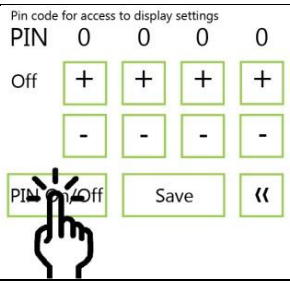


Create PIN code for access to display settings (PIN1)

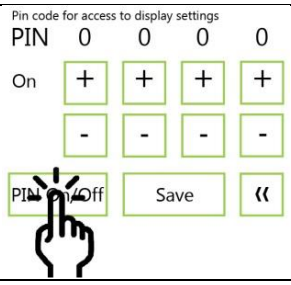
❻ PIN1



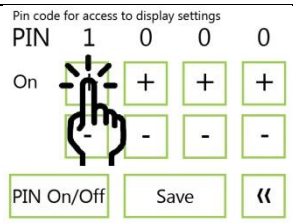
❼ PIN1 Code Off...



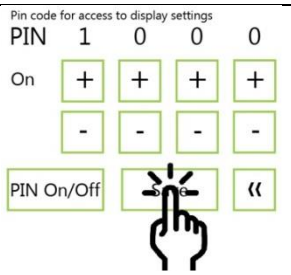
❽ PIN(1) Code On

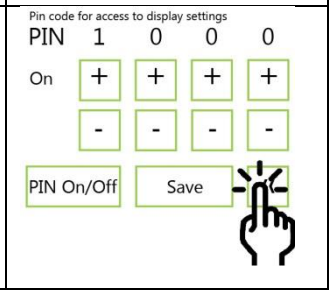


❾ Create PIN(1) Code



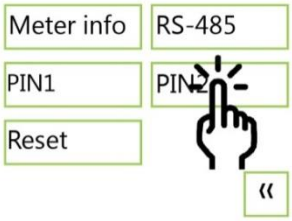
❿ Save



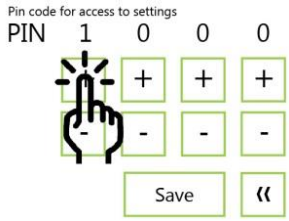


Create PIN code for access to meter settings (PIN2)

❺ PIN2



❻ Create PIN2 Code



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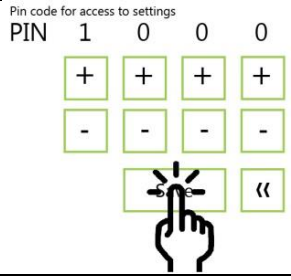

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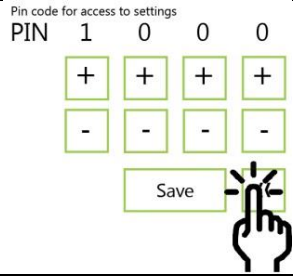

Maintenance

tSENSE EFA is maintenance free. Internal self-adjusting calibration (ABC) function takes care of normal long term drift. To secure highest accuracy, a time interval of five years is recommended between CO_2 calibrations, unless some special situations have occurred.

Software can be downloaded free at www.senseair.com.
USB-cable and zero calibration kit can be ordered from SenseAir.

Check can be done on site without interfering with ventilation system.

Directives

This product is in accordance with the
EMC 2004/108/EC, 92/31/EEG, RoHS 2011/65/EU
including amendments by the CE-marking Directive 93/68/EEC
The product fulfils the following demands:
EN 61000-4-2 level 2,
EN 61000-4-3 level 2,
EN 61000-4-4 level 4,
EN 61000-4-6,
EN 61000-4-8 level 4,
EN 55022 class B

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