User Manual

# *tSENSE (Disp) T RH RL*

## $CO_2$-, temperature- and relative humidity transmitter


## General

*tSENSE (Disp)* for wall mounting measures indoor air carbon dioxide concentration, temperature and relative humidity in rooms. *tSENSE (Disp)* 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.

# Table of contents

## Opening of housing

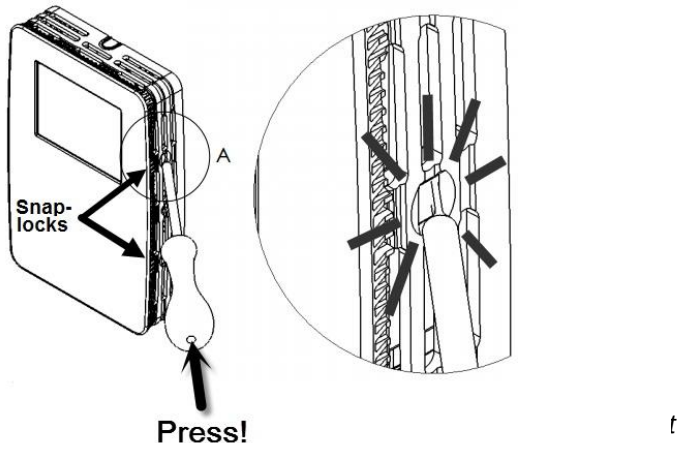



*Figure 1*

## Download of software UIP

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

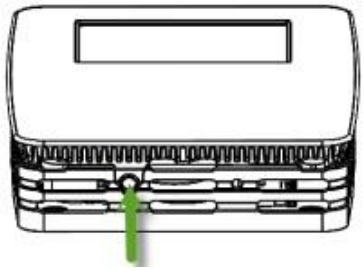
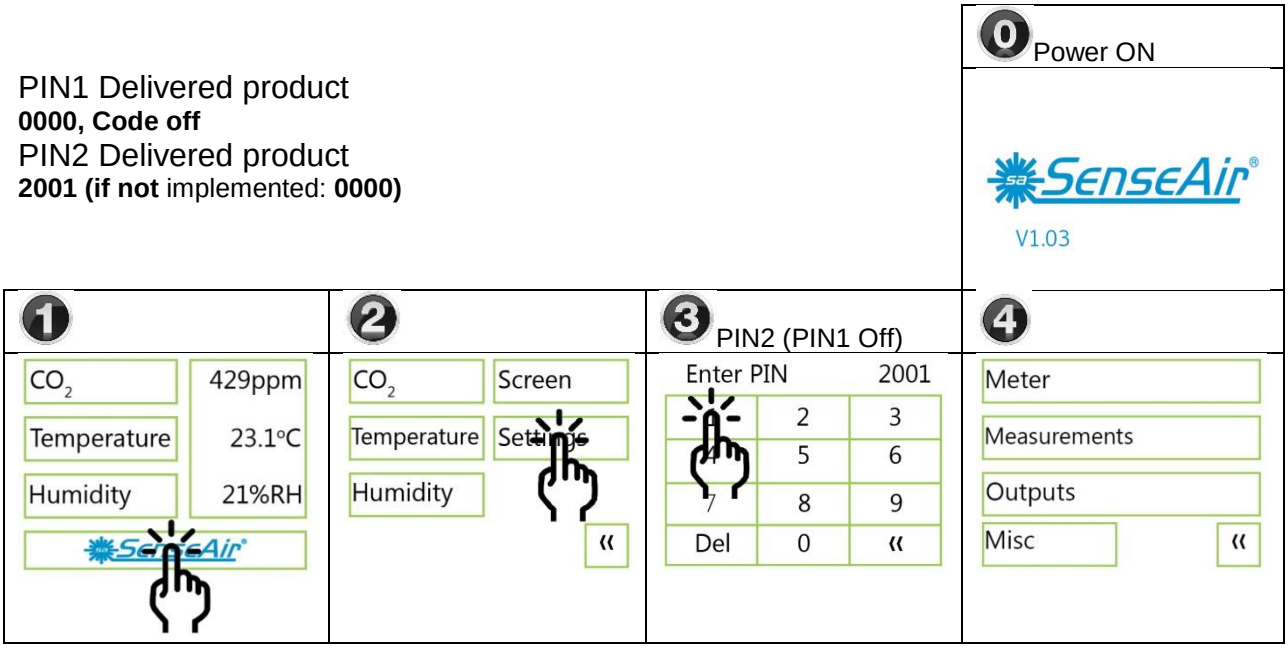


*Figure 2: Connection to PC via phone jack*

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

## Enter PIN code

PIN1 Delivered product
**0000, Code off**
PIN2 Delivered product
**2001 (if not** implemented: **0000)**



## Output Configurations

| Terminal | Default Output | Default Output Range | Outputs of this sensor | Output Ranges of this sensor |
|---|---|---|---|---|
| OUT(1) | 0 - 10 VDC | 0 - 2000ppm $CO_2$ | See label | See label |
| OUT(2) | 0 - 10 VDC | 0 - 50°C | See label | See label |
| OUT(3) | 0 - 10 VDC | 0 - 100%RH | See label | See label |

*Table 1. Default output configurations of tSENSE (Disp)*

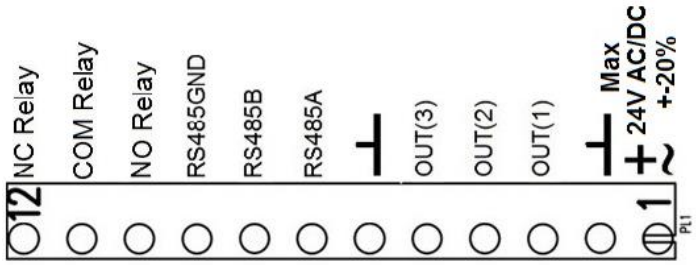


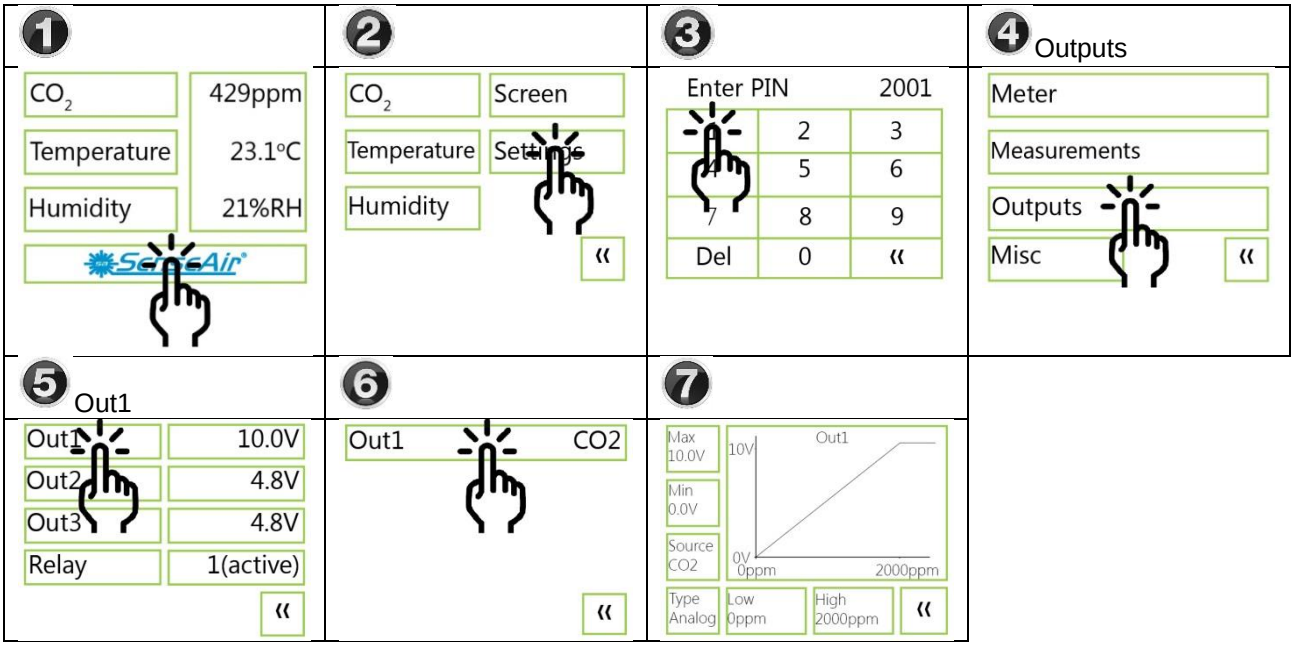

*Figure3: Screw Terminal*

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.

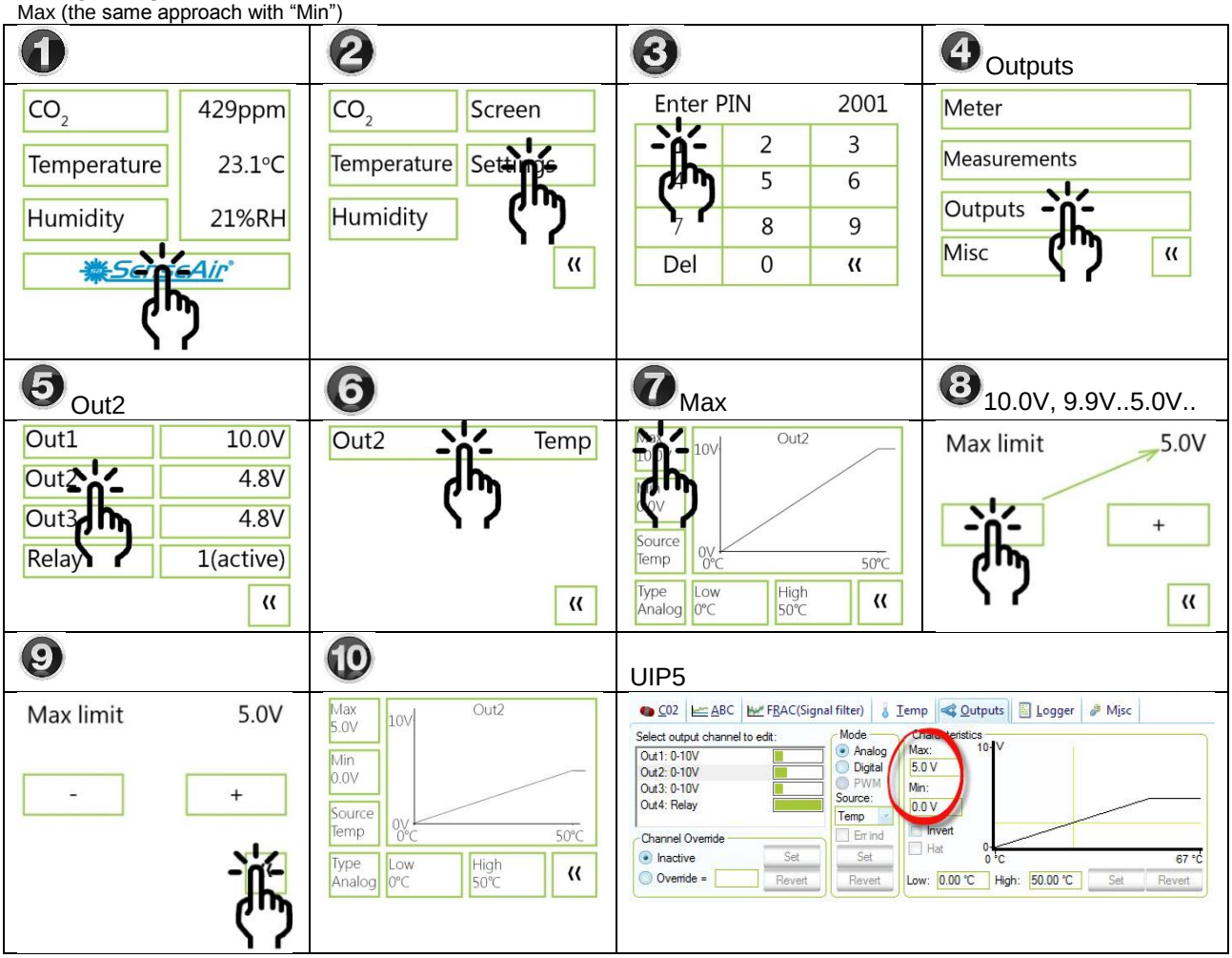
## Outputs

Out1/Out2/Out3

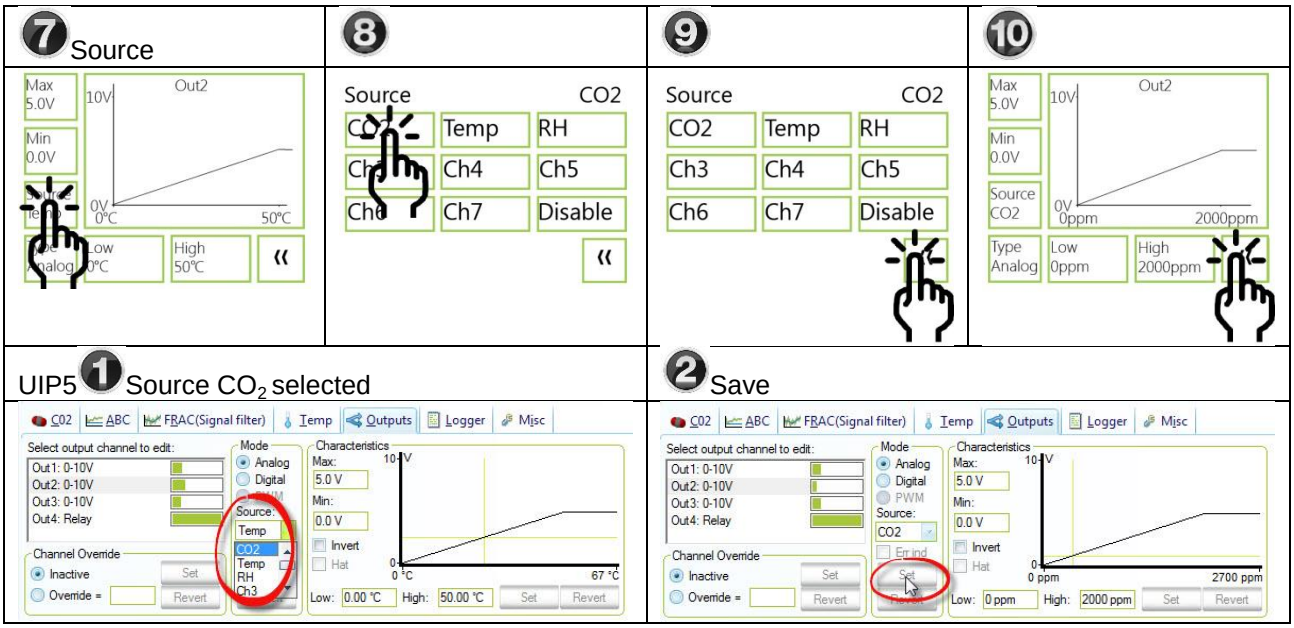


Voltage range

Max (the same approach with “Min”)

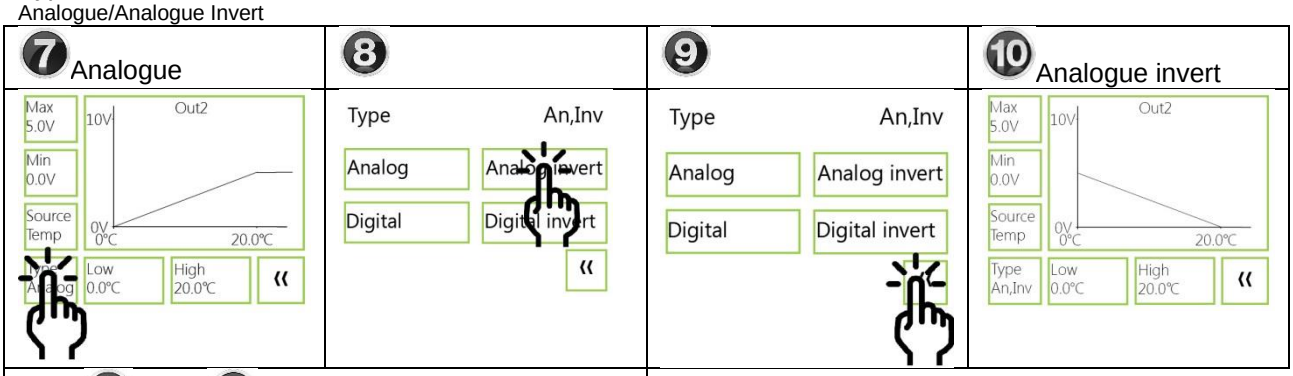



Select source

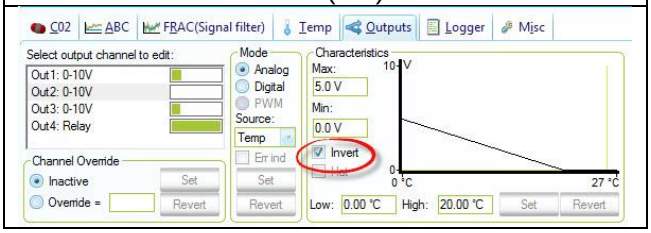


## Types

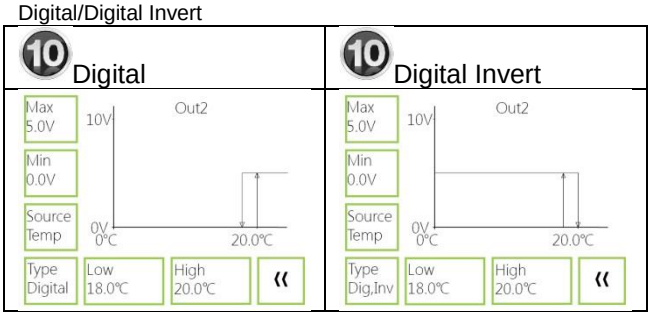
Analogue/Analogue Invert




UIP5 1 Invert 2 Save (Set)

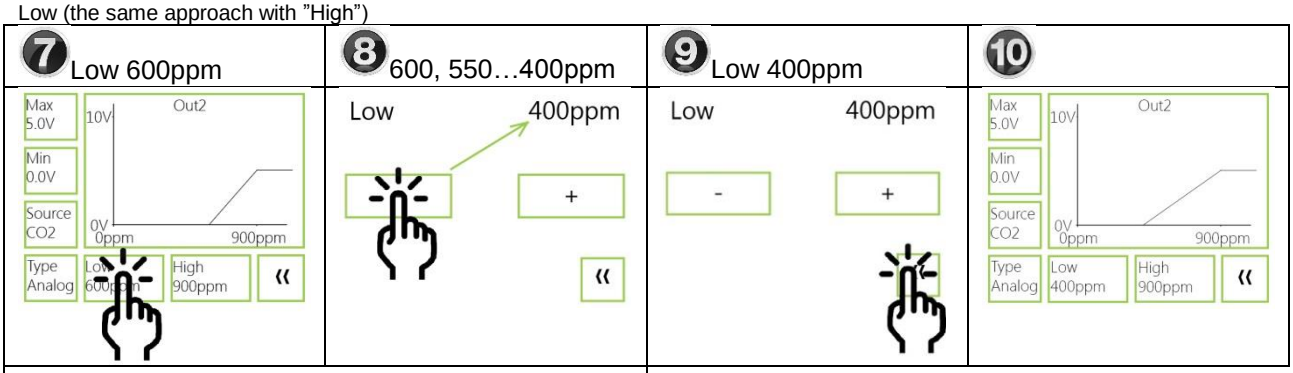



Digital/Digital Invert

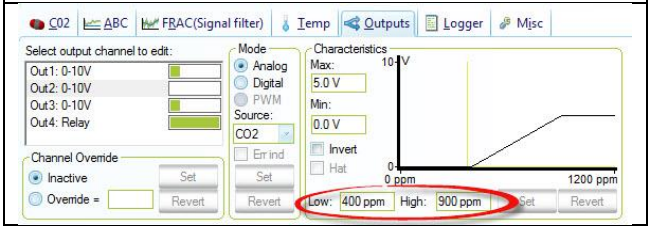



## Measure range settings

Low (the same approach with ”High”)

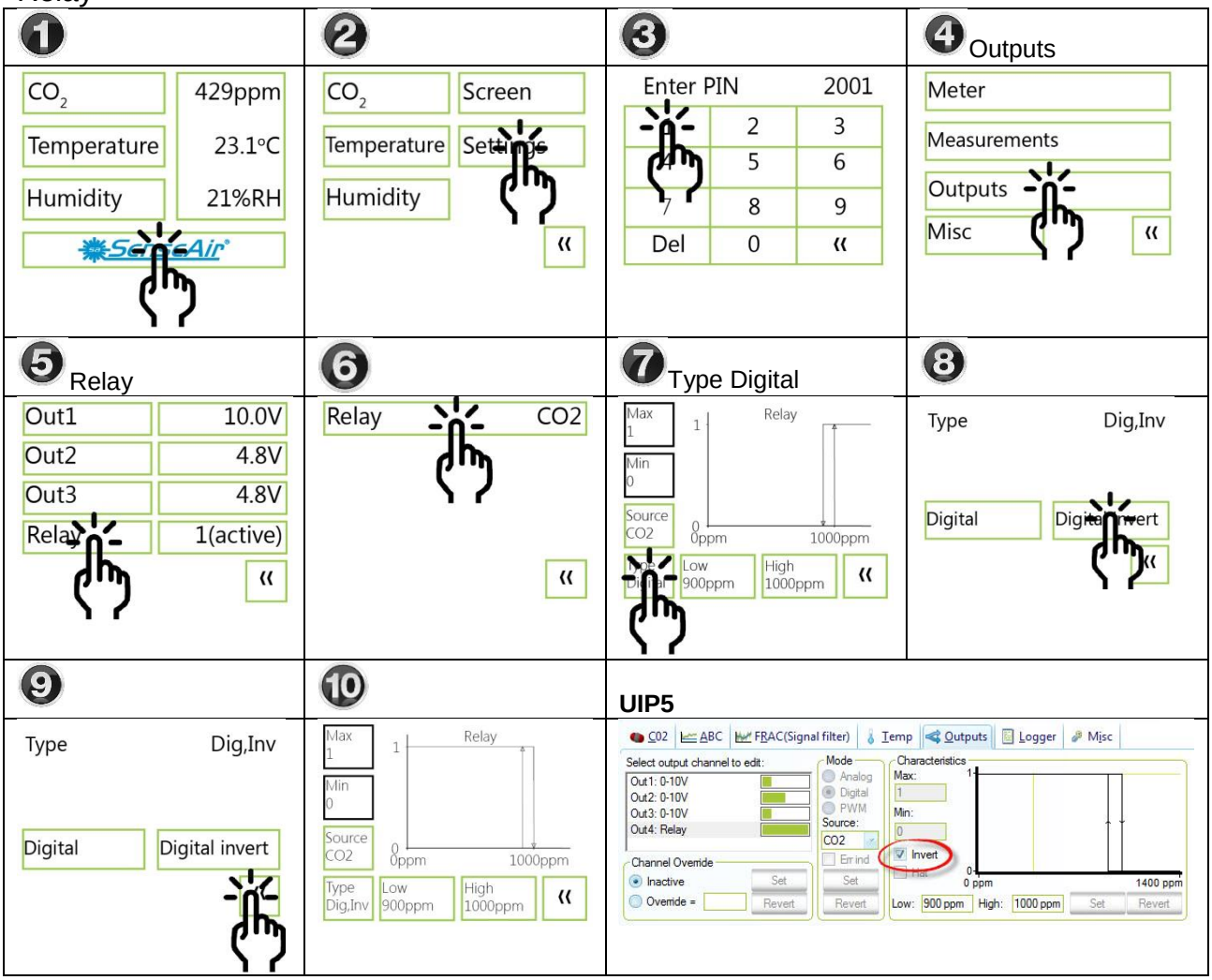



UIP5



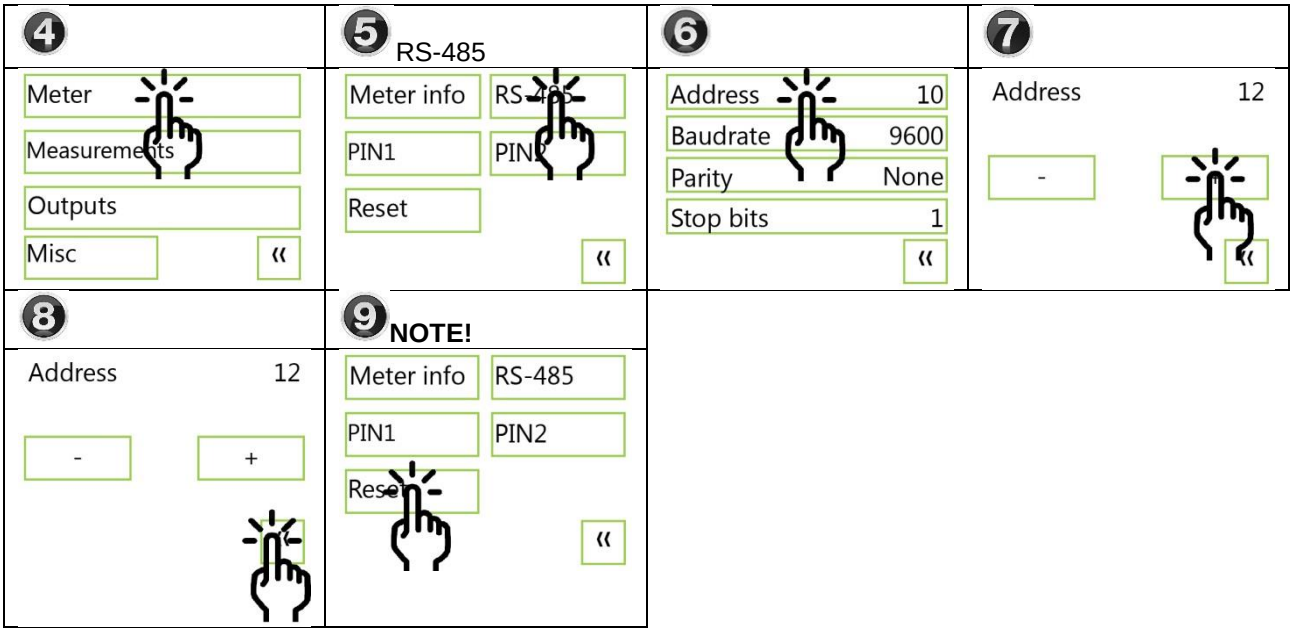
# Outputs

Relay

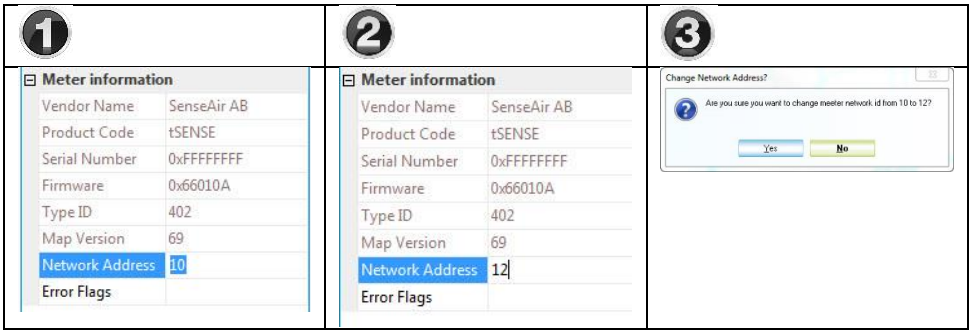


## Communication settings

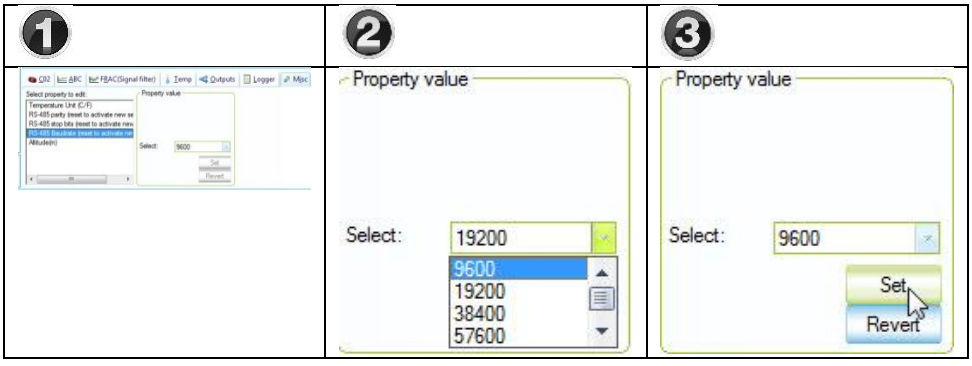
Address/Baudrate




UIP Address




UIP Baudrate

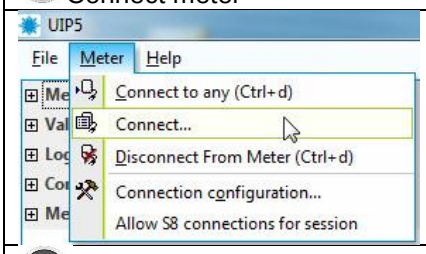



**NOTE!**
UIP baudrate ≠ RS-485 baudrate if *tSENSE (Disp)* is connected *via phone jack* (see fig. 2).
UIP baudrate = RS-485 baudrate if *tSENSE (Disp)* is connected *via screw terminal* (see fig. 3).

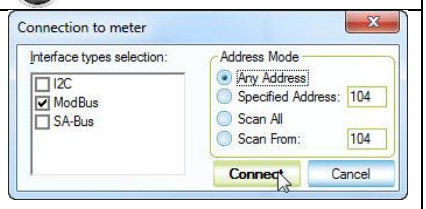
Change communication settings via UIP requires Reset (Power OFF – Power ON) to be executed.

# Connect meter

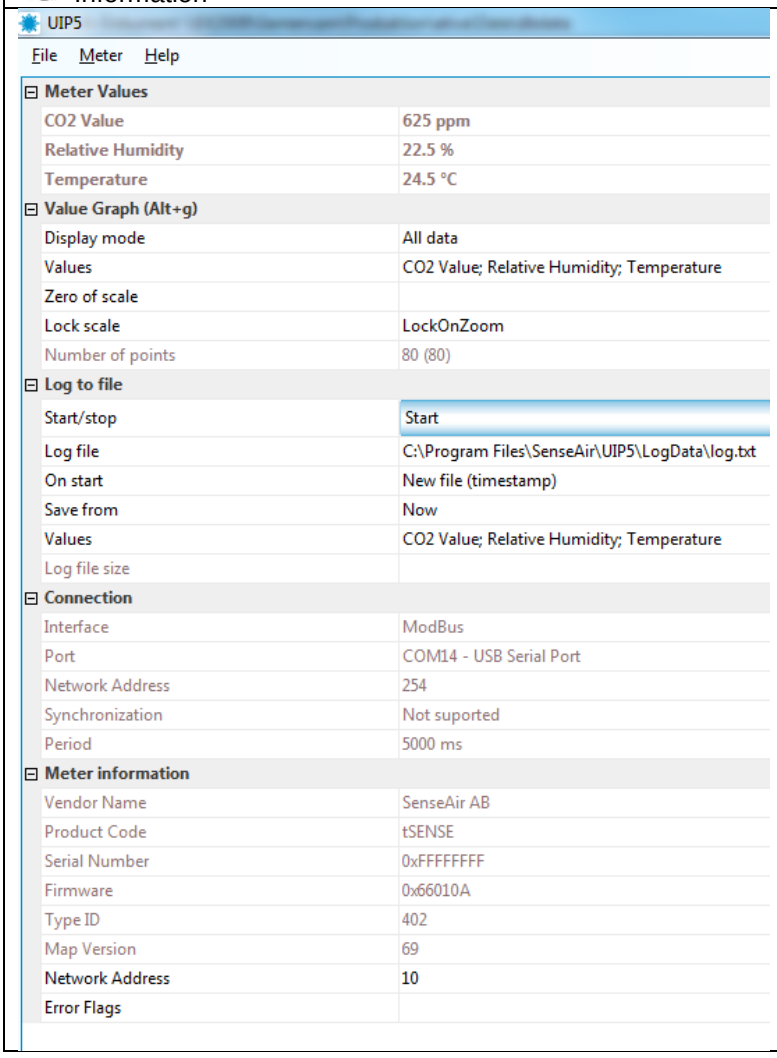
1 Connect meter




2

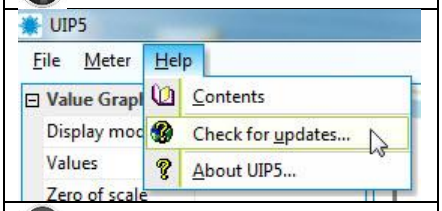



3 Information

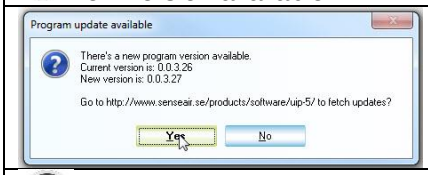


## Check for updates

1

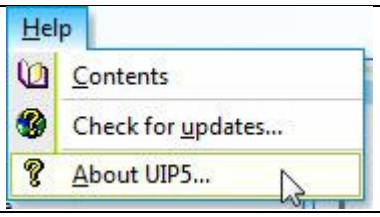



2 New version available




2


3

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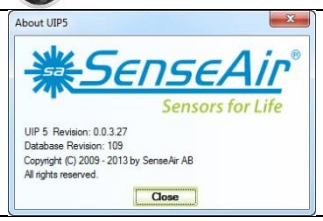
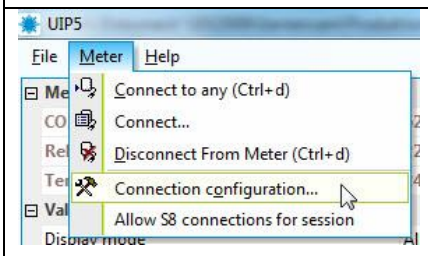
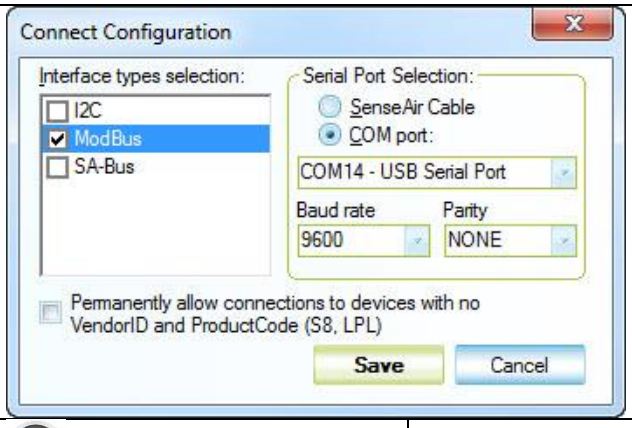



## Connection configurations

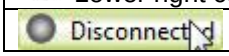
1




2 ModBus 3 COM14-USB Serial Port 4 Save




5 Lower right corner of screen




6


**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).

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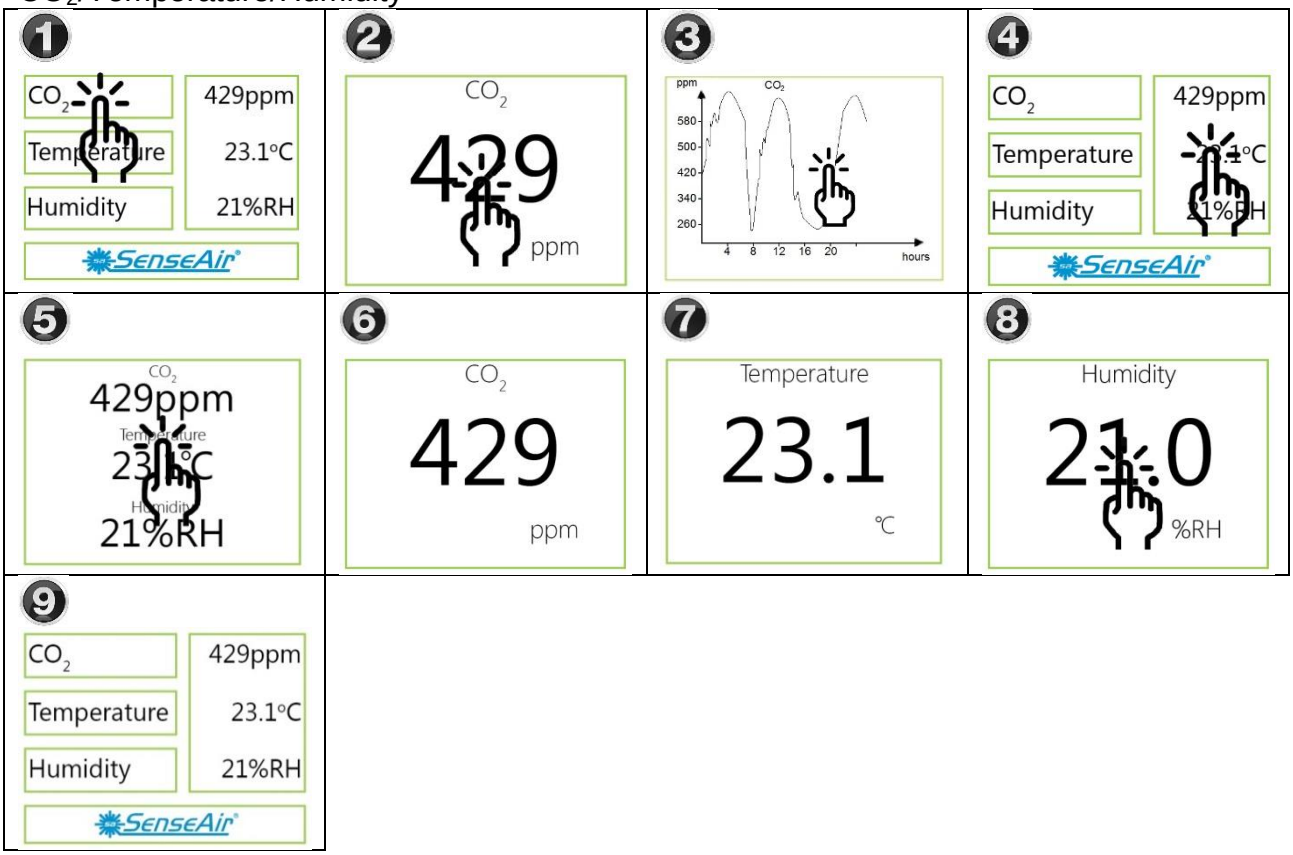
## Measured values

$CO_2$/Temperature/Humidity

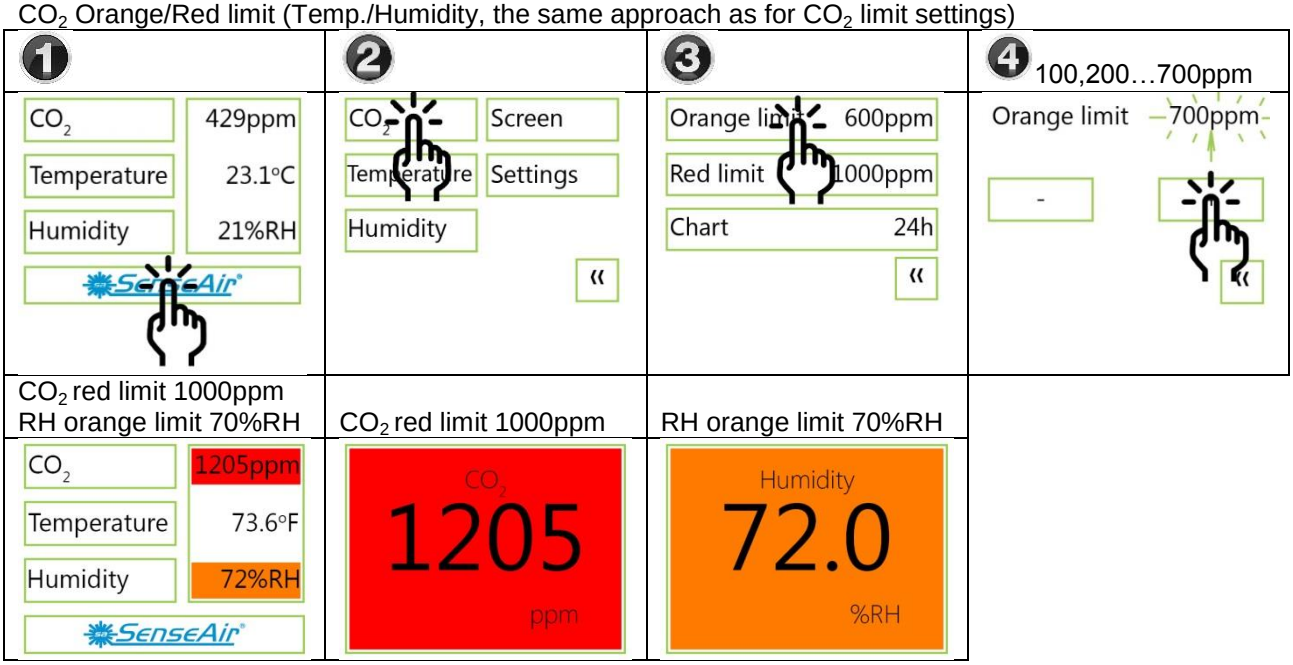


# Display settings

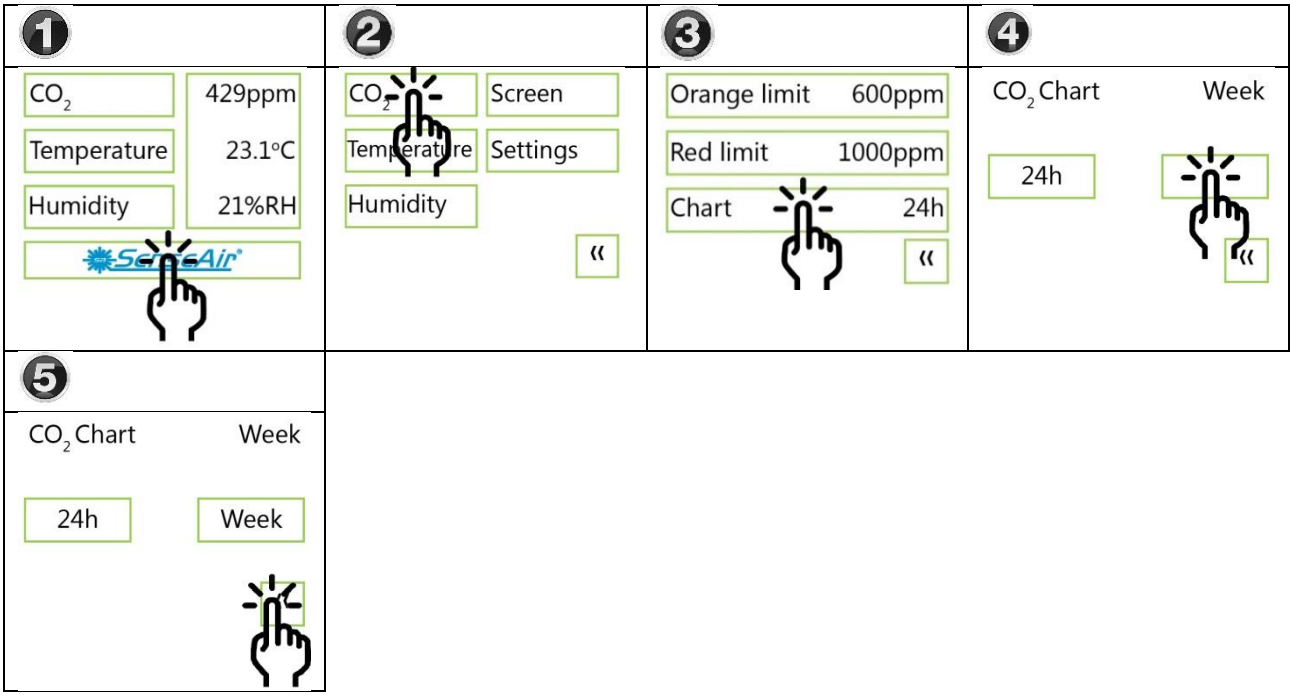
## Limits

$CO_2$/(Temperature)/(Humidity)

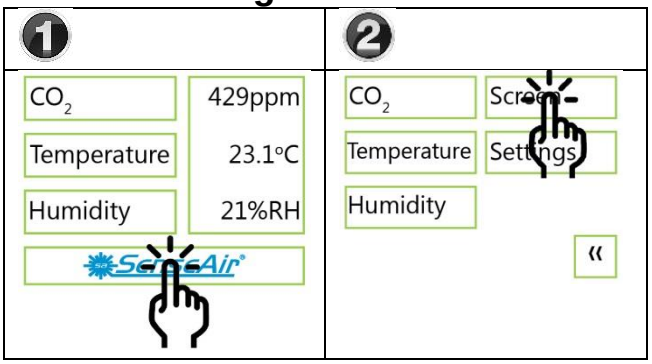
$CO_2$ Orange/Red limit (Temp./Humidity, the same approach as for $CO_2$ limit settings)



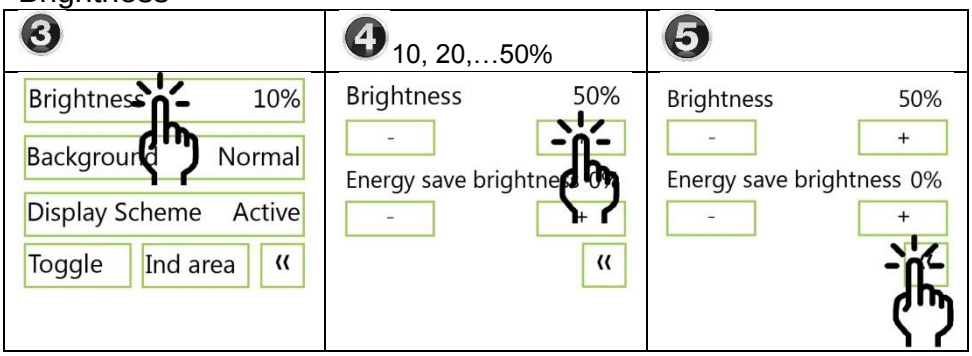

## Chart 24h/Week



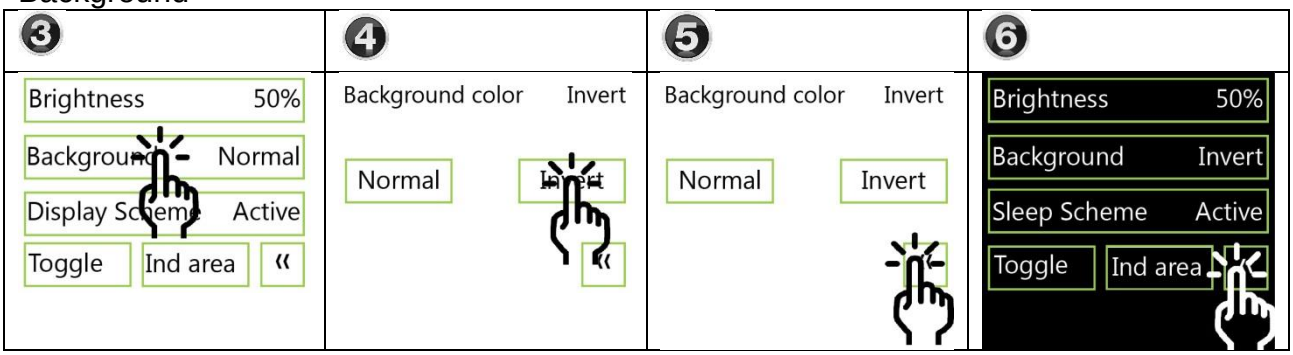
## Screen settings




Brightness

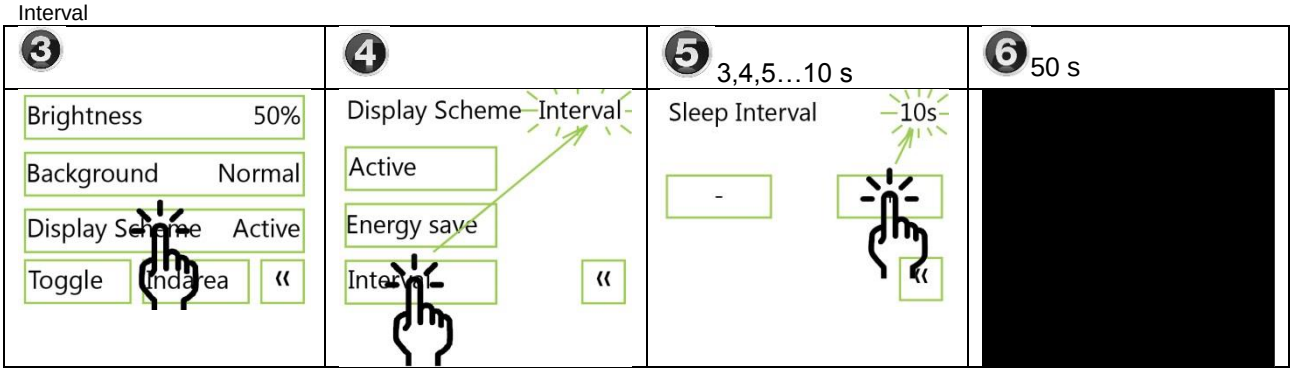



Background



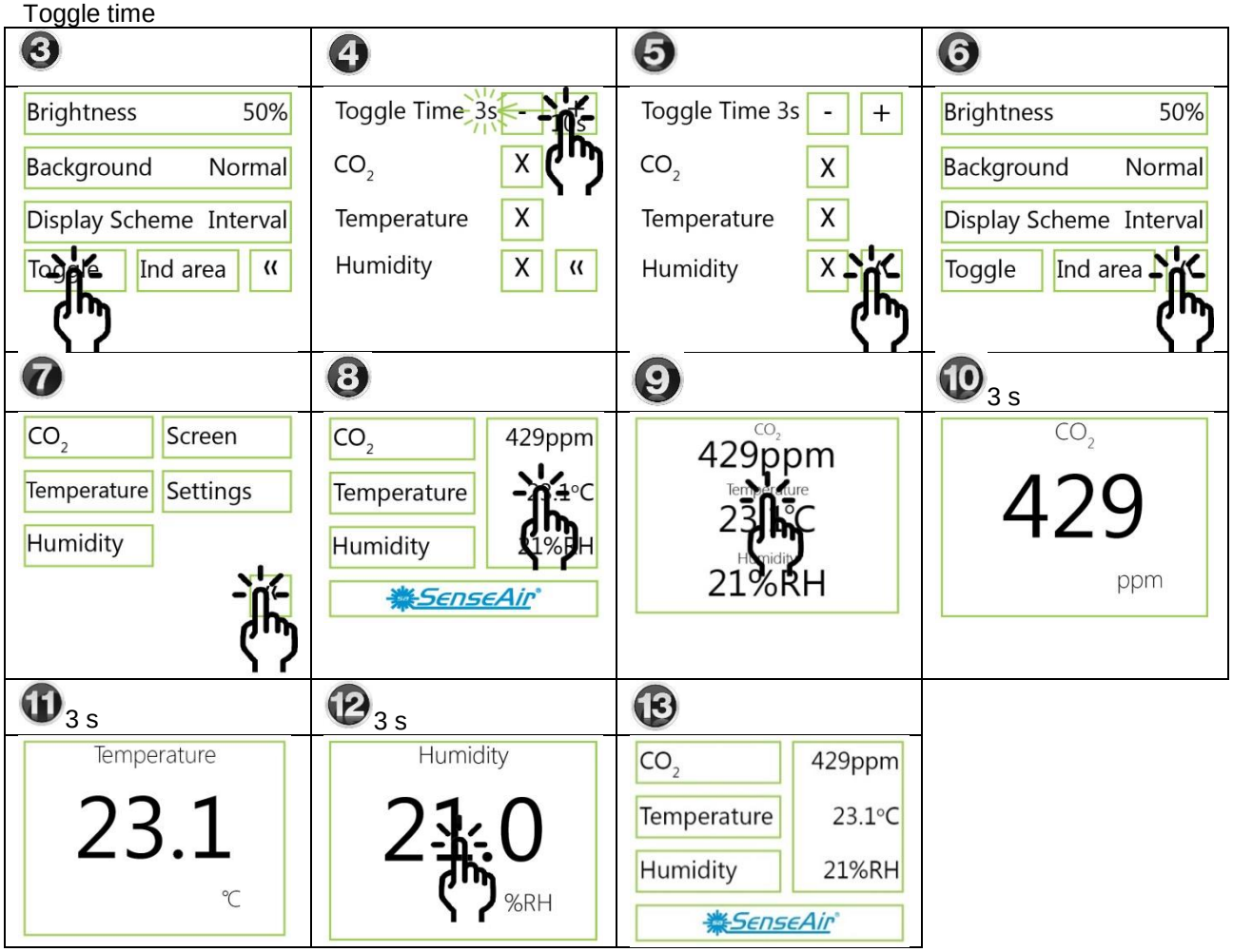

Screensaver, Time setting

Interval

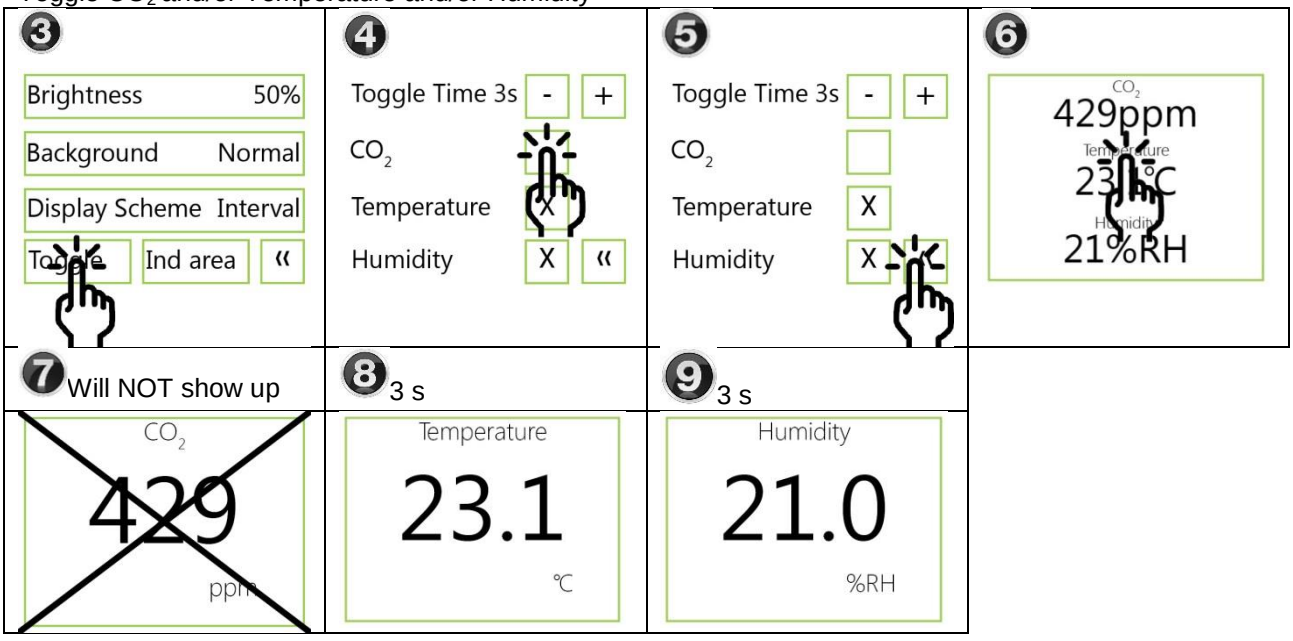


## Toggle (Time and $CO_2$ and/or Temperature and/or Humidity)

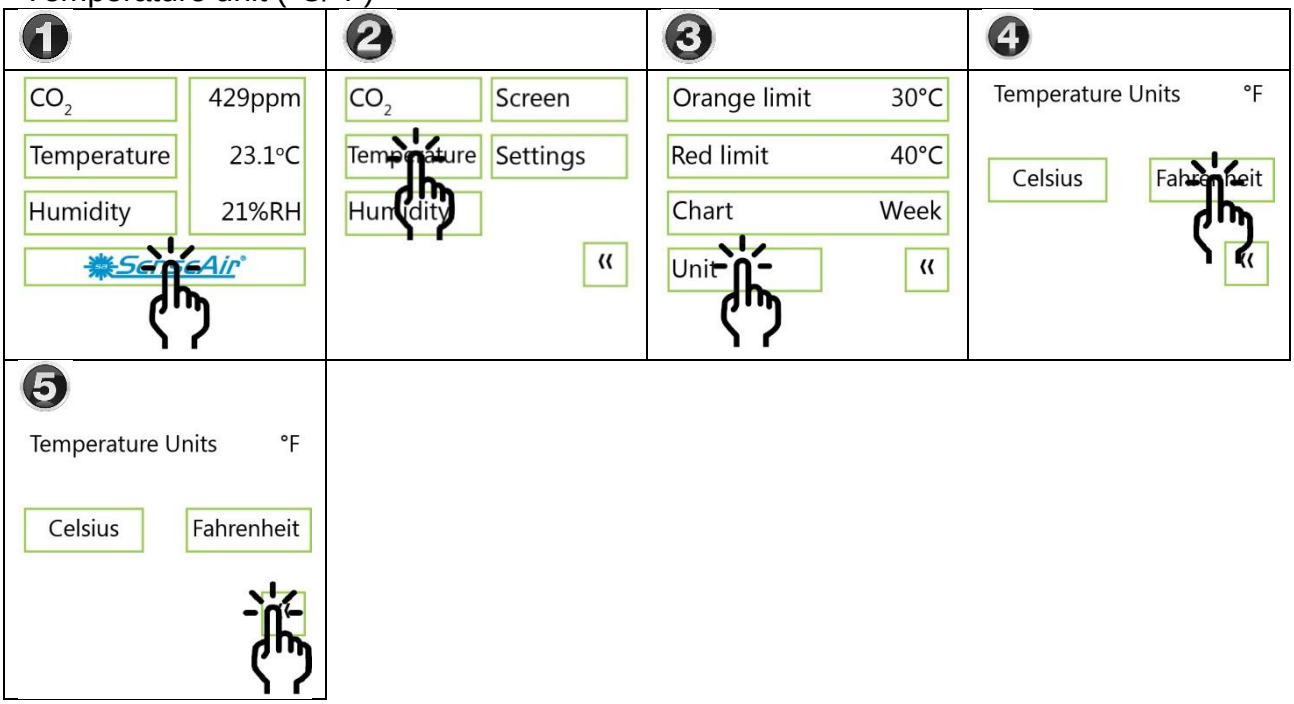
Toggle time

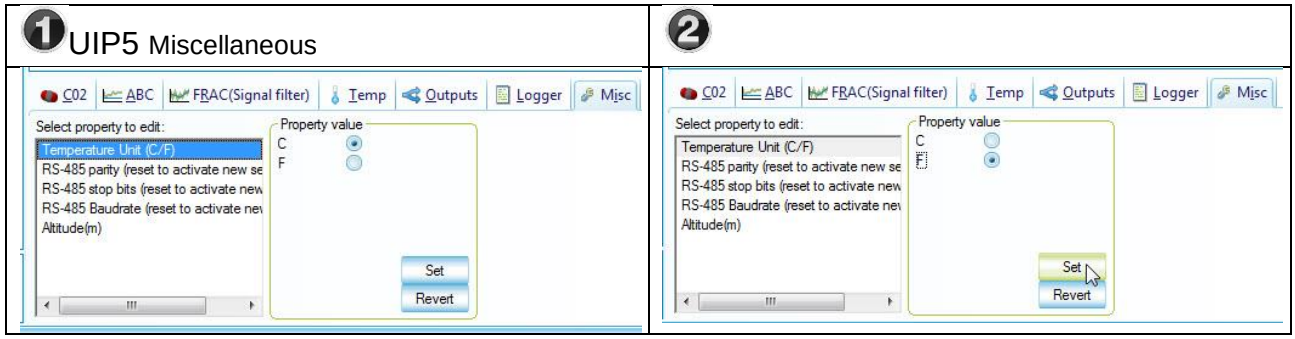



Toggle $CO_2$ and/or Temperature and/or Humidity

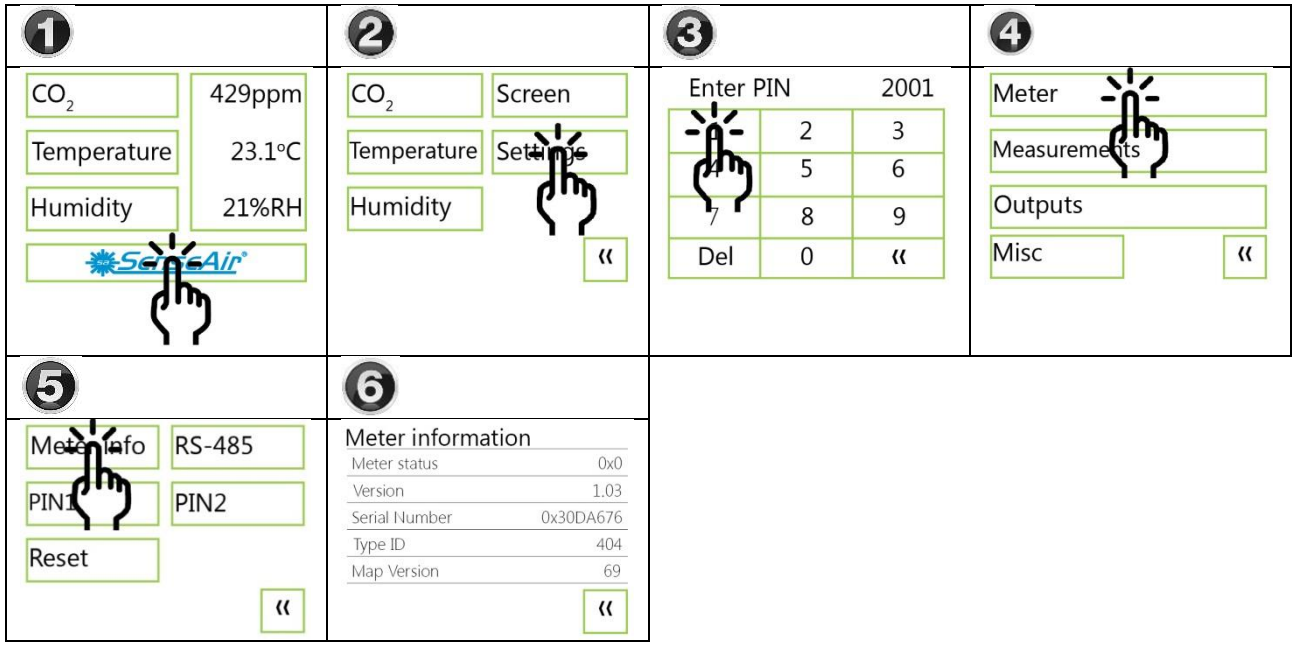


Temperature unit (°C/°F)

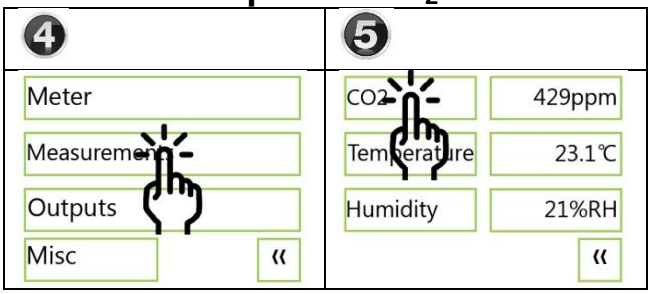


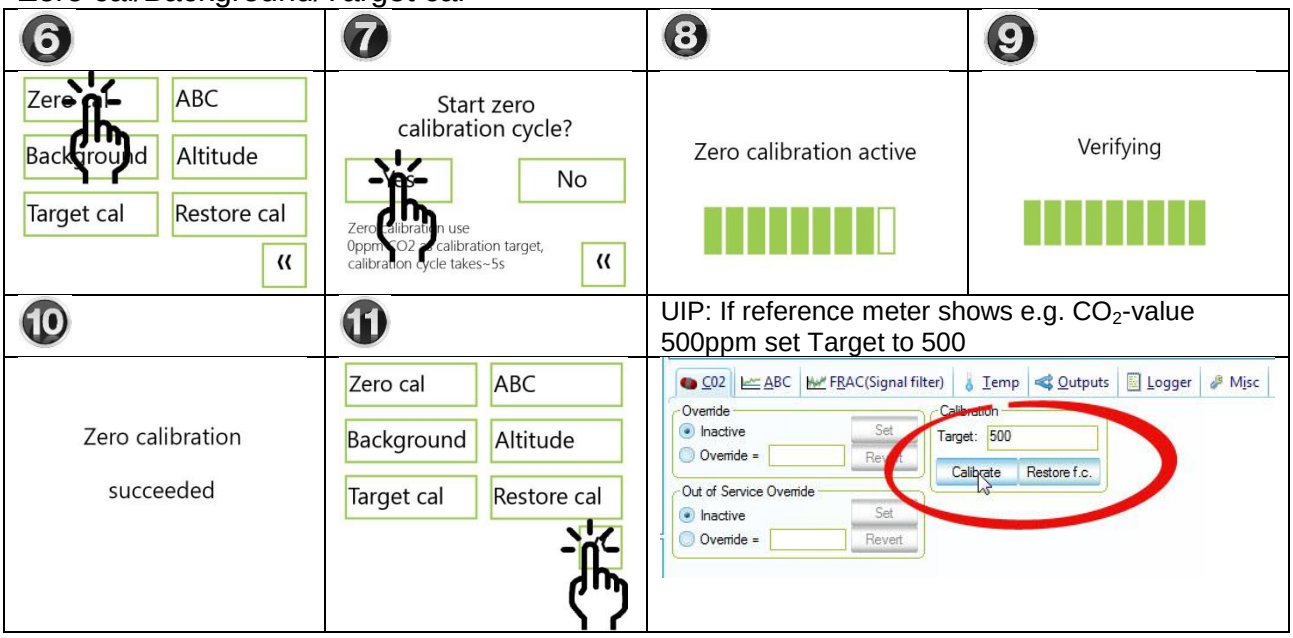

## Meter information



## Calibration options $CO_2$



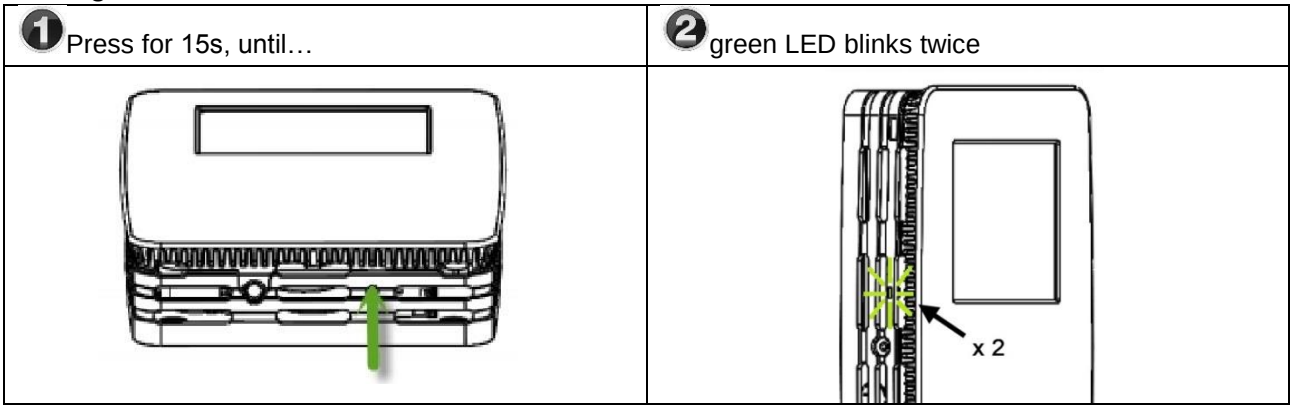

Zero cal/Background/Target cal




UIP: If reference meter shows e.g. $CO_2$-value 500ppm set Target to 500

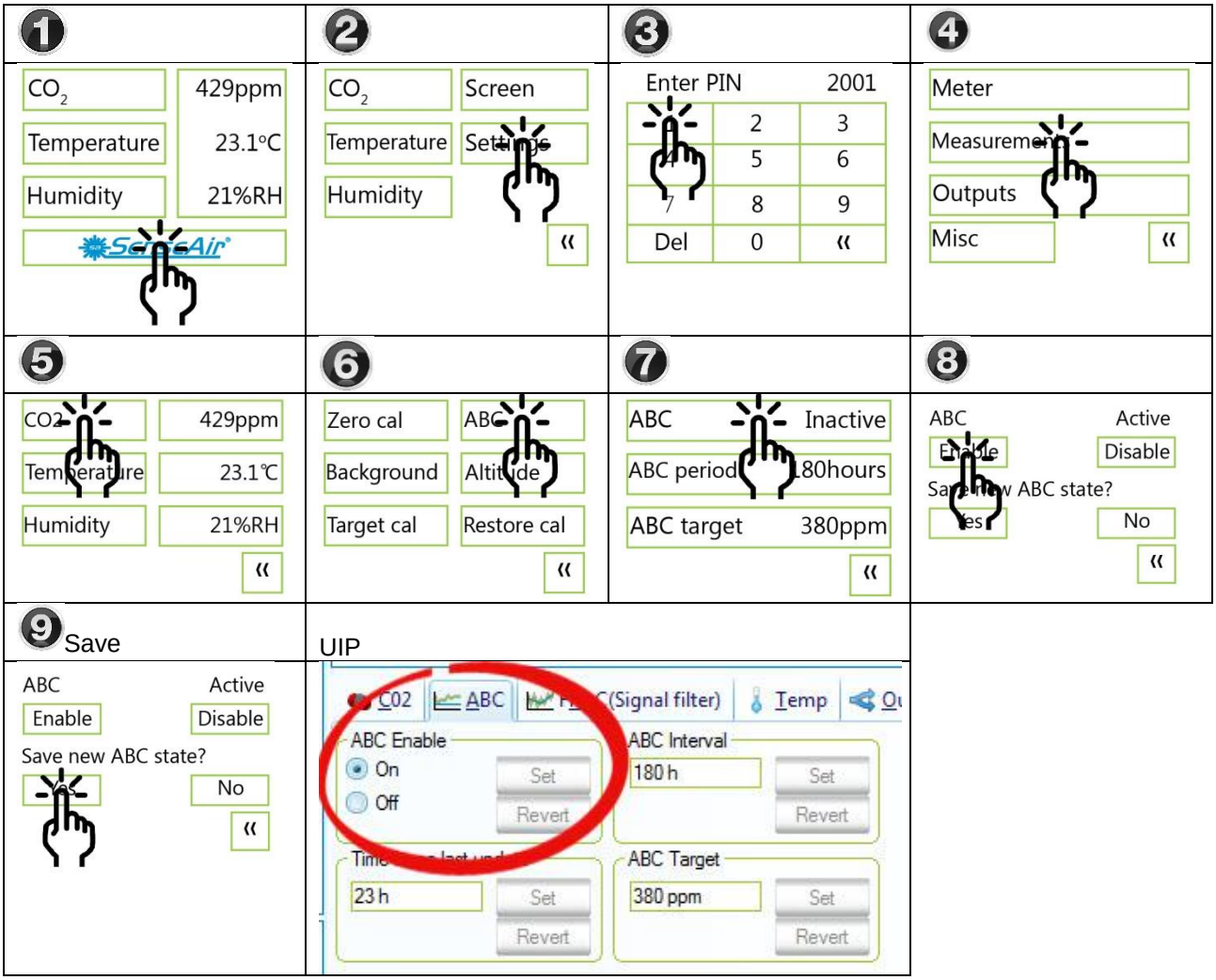



Background calibration button

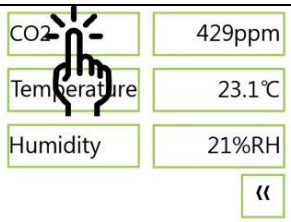
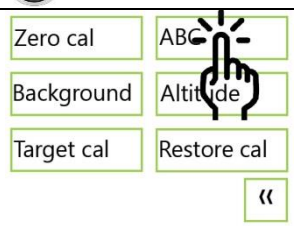
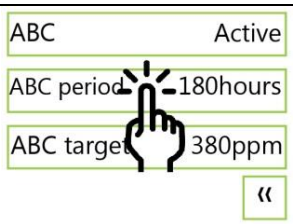
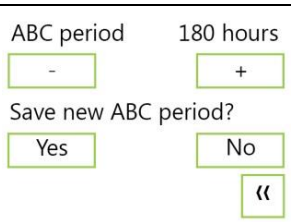
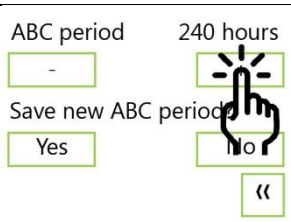
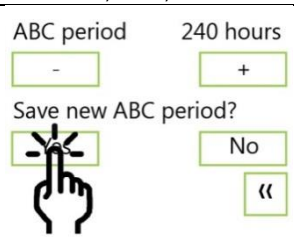
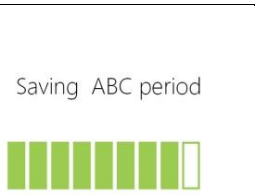
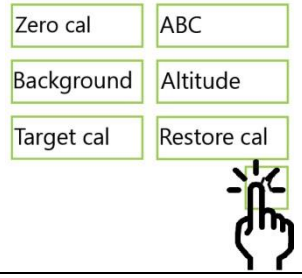
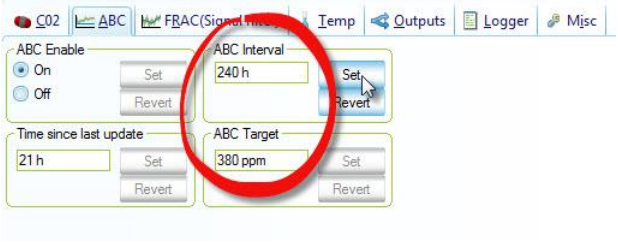


## ABC

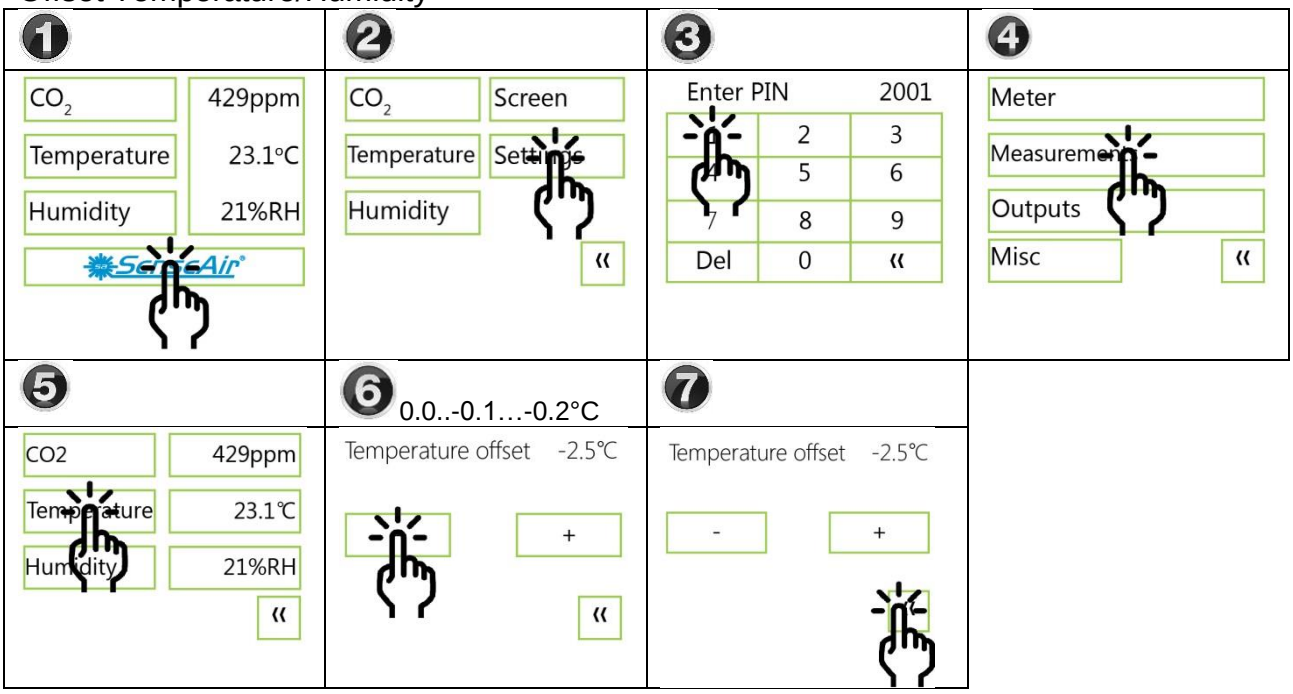
Enable/Disable



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

| 5 | 6 | 7 | 8 |
|---|---|---|---|
|  |  |  |  |
| **9** | **10** 180, 181, 240hours | **11** Save | **12** |
|  |  |  |  |
| **13** | **14** | UIP | |
| ABC period set to<br>240 hours |  |  | |

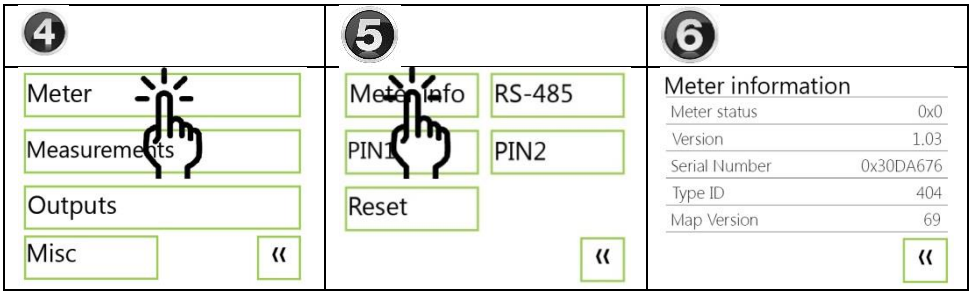
Offset Temperature/Humidity




## 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

Error symbol (a wrench appears when 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.*

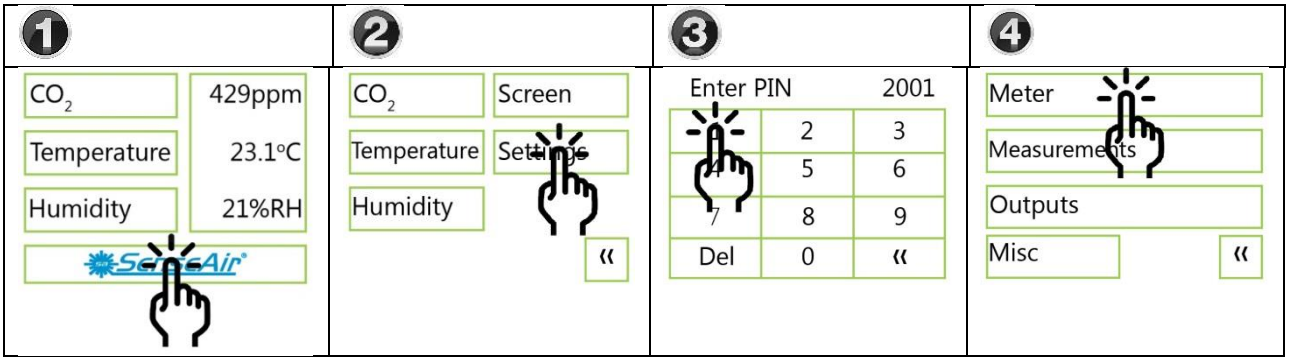
**NOTE!**

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.

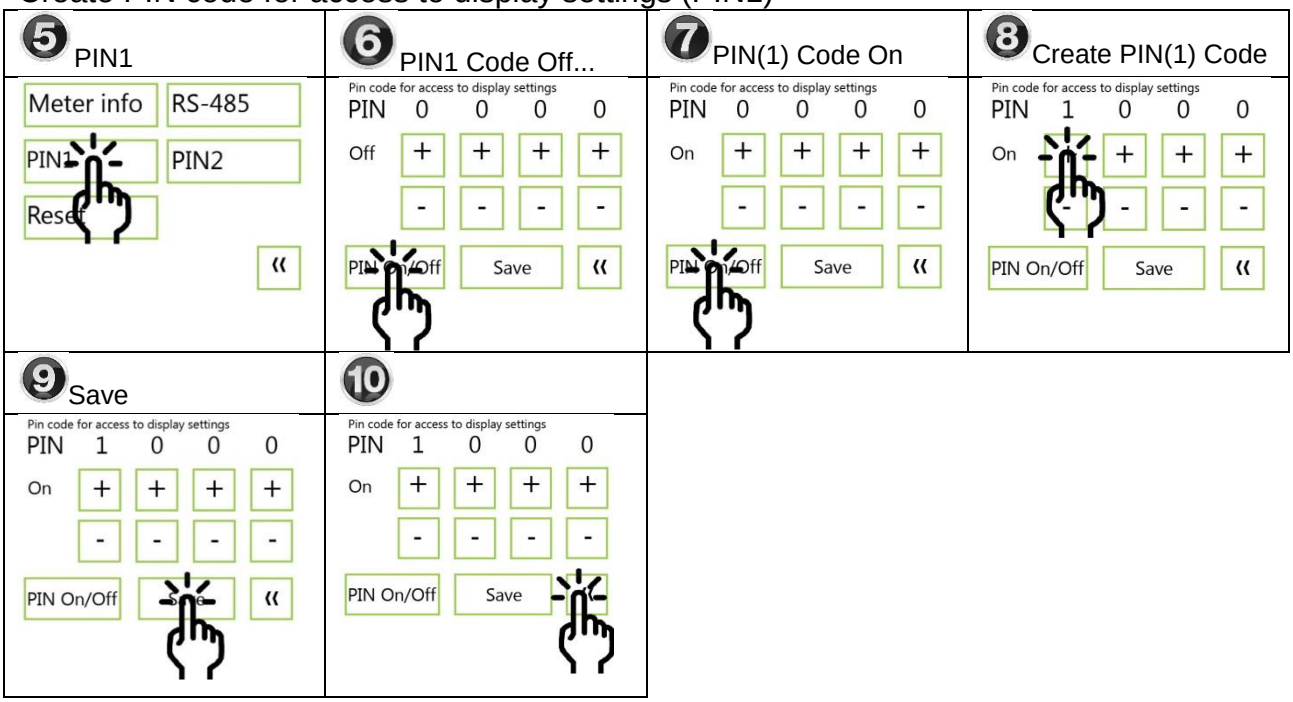
If several errors are detected at the same time, different error code numbers will be added together into one single error code!

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

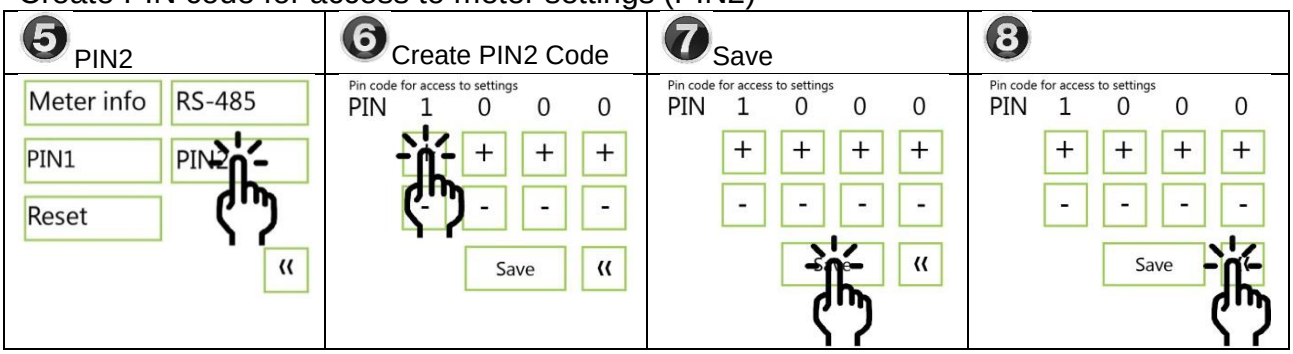
## PIN codes




Create PIN code for access to display settings (PIN1)




Create PIN code for access to meter settings (PIN2)



## Maintenance

*tSENSE (Disp)* 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

CE

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