Senseair CO2 Temperature and Relative Humidity Sensor User Manual

Contents [hide

Senseair

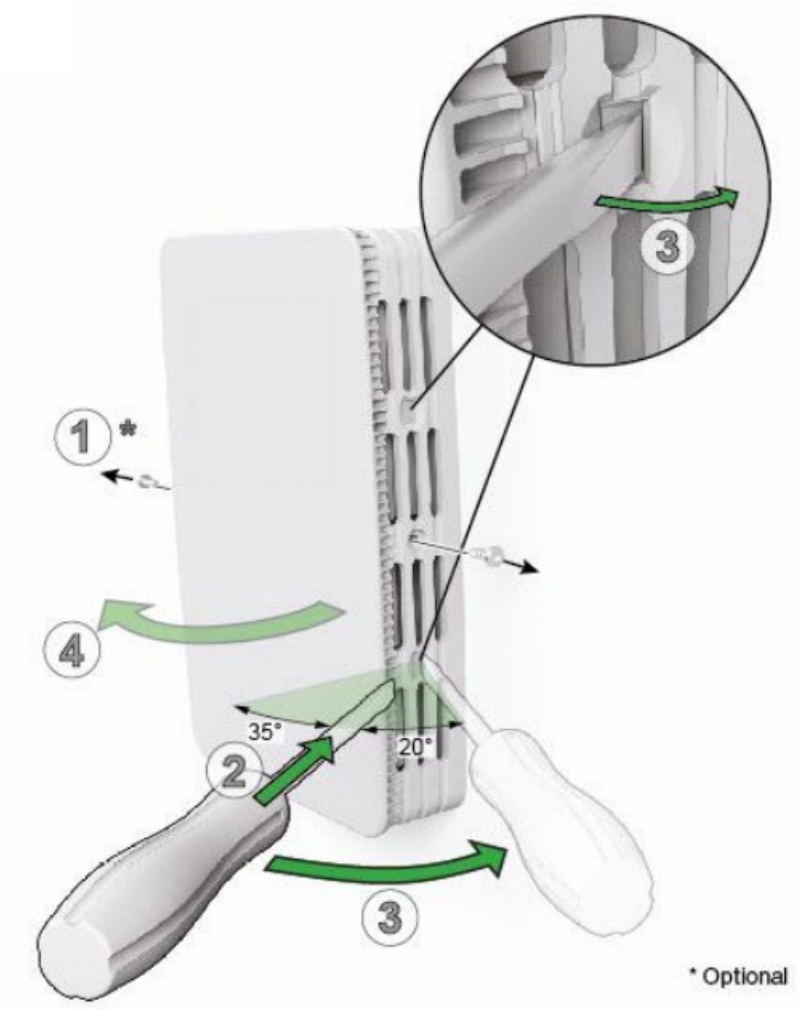
Senseair CO2 Temperature and Relative Humidity Sensor

General

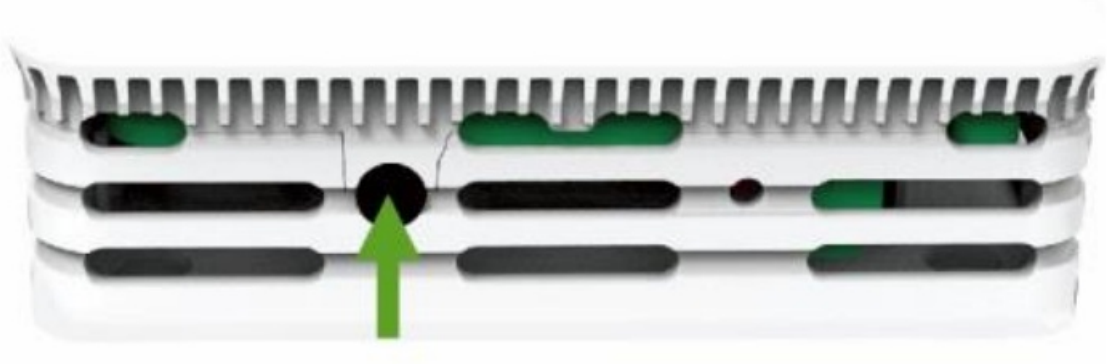
TSENSE VAV No Disp for wall mounting measures indoor air carbon dioxide concentration, temperature, and relative humidity in rooms. The unit connects to Direct Digital Control (DDC). Linear outputs are pre-programmed as CO2, temperature, and relative humidity controllers. Output parameters can be modified from PC (Windows) software UIP (version 5 or higher) and USB communication cable, alternative via Modbus or BACnet.

Opening of housing

Installation Manual

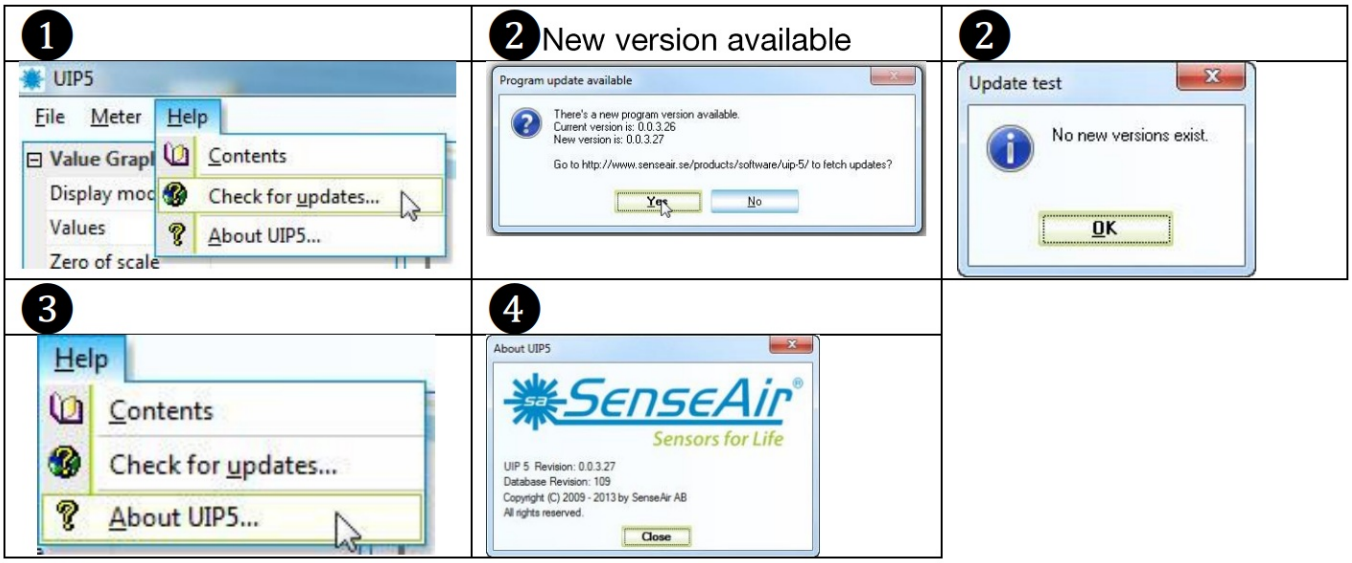


Download software UIP5 [senseair.com]



Connection to PC via a phone jack Connect Interface cable USB- 3.5mm Art.no.:00-0-0070

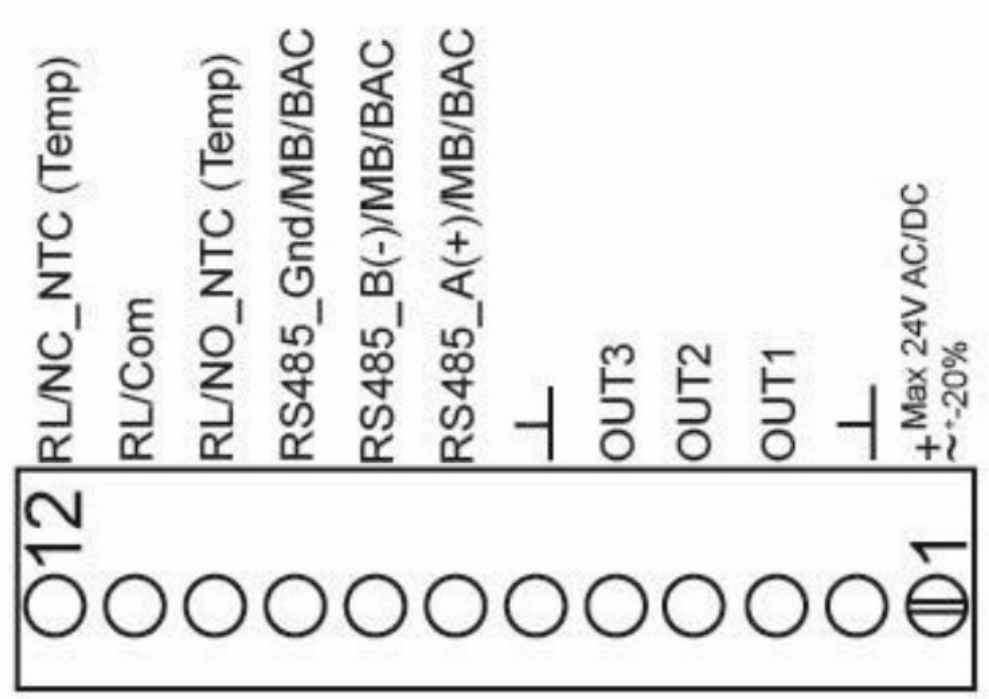
Check for updates



Output configurations

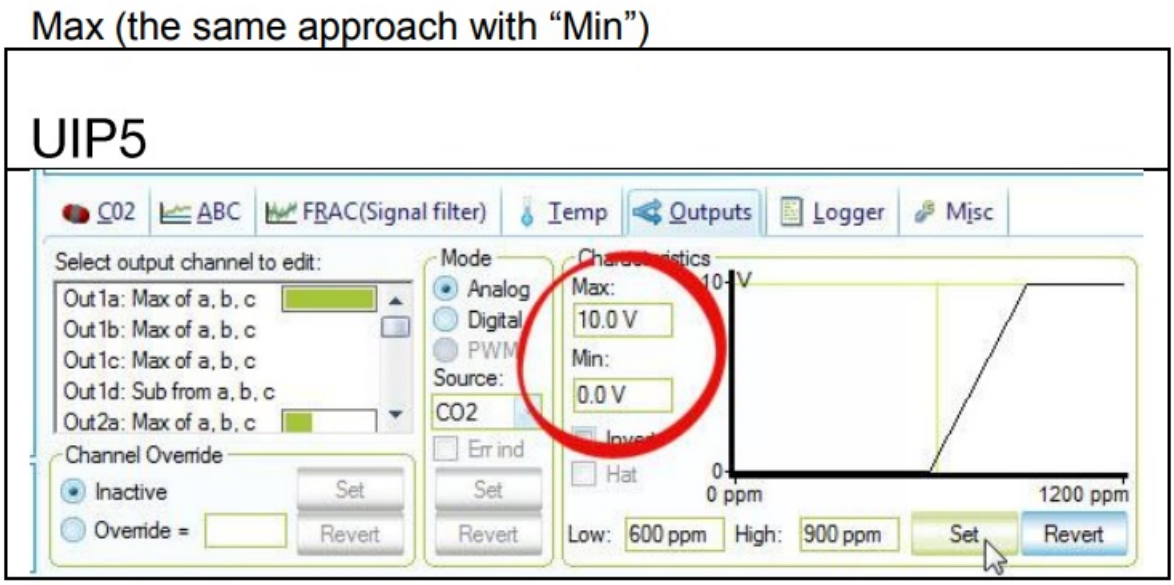
Terminal	Default output	Default output range	Outputs of this sensor	Output ranges of this sensor
OUT1 CO_2: Temperature: Relative Huminity:	0 - 10 VDC	 600 - 900ppm 22 - 23°C 75 - 85%	See label	See label
OUT2 CO_2:	0 - 10 VDC	0 - 2000ppm	See label	See label
OUT3 Temp:	0 - 10 VDC	0 - 50°C	See label	See label
Relay CO_2:	0 - 10 VDC	900 - 1000ppm	See label	See label

Table 1. Default output configurations of tSENSE VAV No Disp



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

Out1/Out2/Out3 e.g Each output consists of four blocks. Each block has nine source options. OUT1 (OUT2/ OUT3/(Relay)) is the largest (Max of a, b, c) demand from Proportional-bands.



- OUT1=Max of Out1_a/ Out1_b/ Out1_c minus (sub)
- Out1_d 5V (Out1o) – 0V (Out1_d Disabled) = 5V => OUT1=5V

The (e.g.) VAV valve opens from minimum set-point position with full opened state at the maximum set-point.

U_{Out} = 0V if space has the value:	U_{Out} will be increased if space has the value:	U_{Out} = 10V if space has the value:
$CO_2 \leq$ 600ppm *and* Temp ≤ 22°C *and* RH ≤ 75%RH (Out1_d = Disabled)	600ppm ≤ CO_2 < 900ppm *or* 22°C ≤ Temp < 23°C *or* 75%RH ≤ RH < 85%RH (Out1_d = Disabled)	CO_2 > 900ppm *or* Temp > 23°C *or* RH > 85% (Out1_d = Disabled)

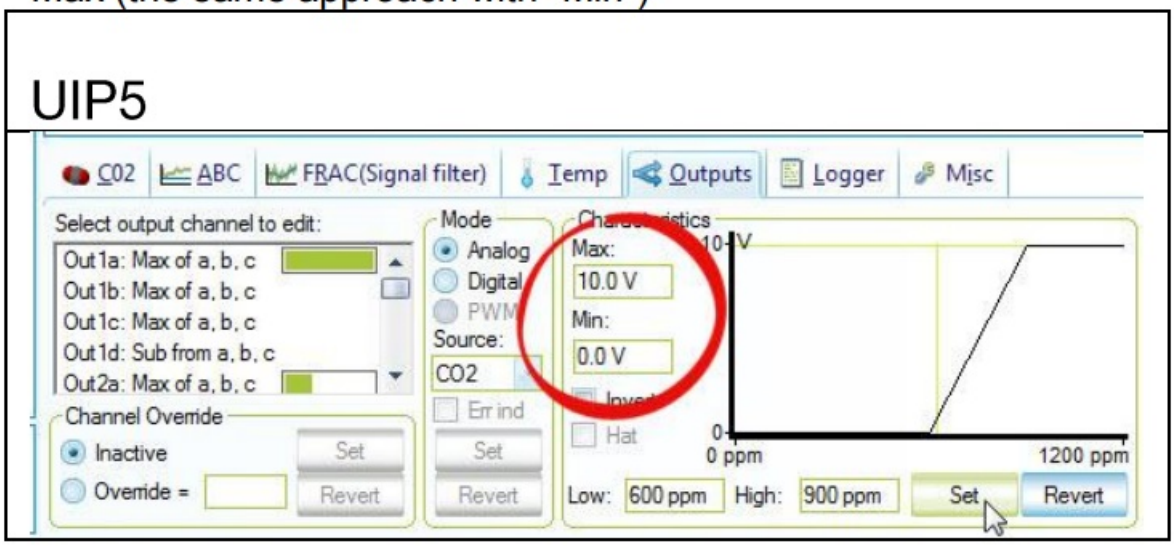
e.g. Temp protection (Out1_d) Enabled

Out1_a CO_2: 1205ppm=> 10V	Out1_b Temp: 16.4°C => 0V	Out1_c Humidity: 80%RH=>5V	Out1_d Temp: 16.4°C =>10V NOTE! (sub) (Temp protection)

Voltage range

Max (the same approach with “Min”)

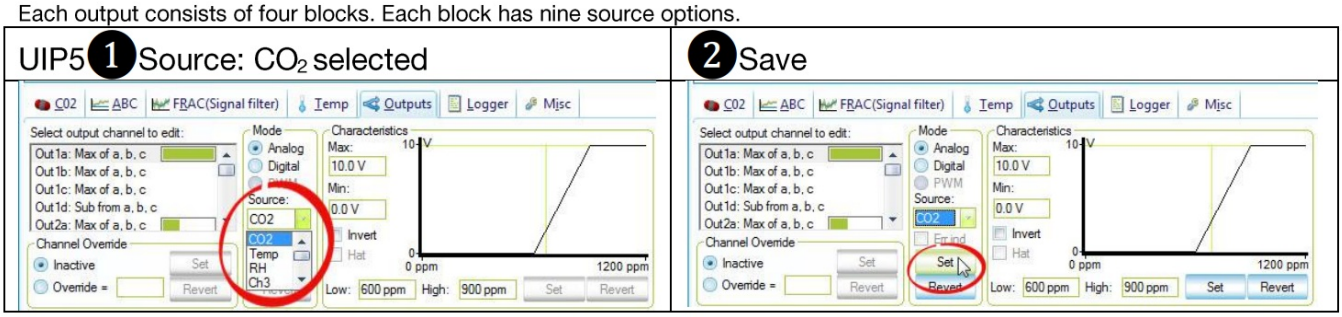
Max (the same approach with “Min”)



Select source

Each output consists of four blocks. Each block has nine source options.

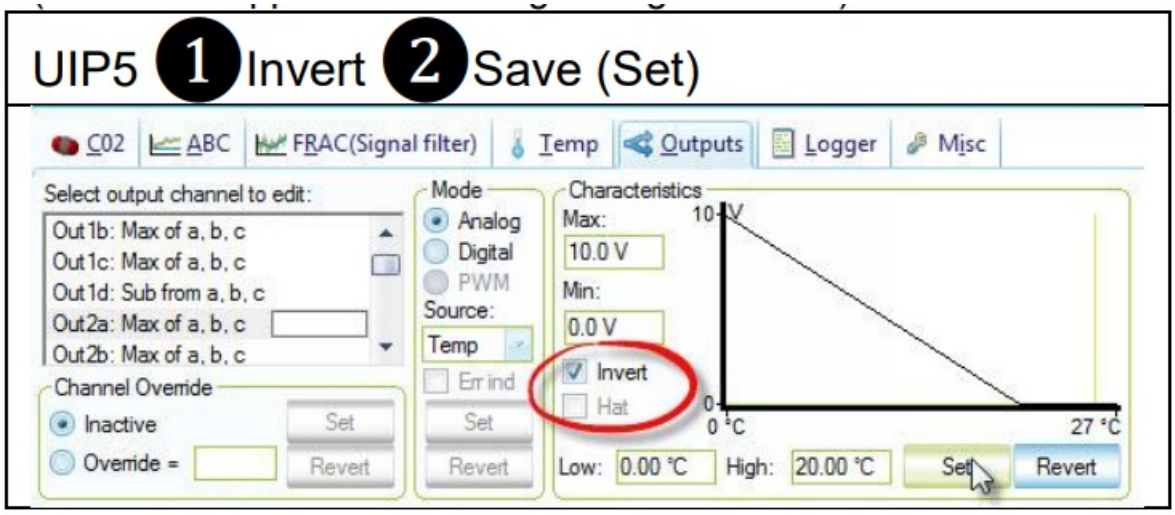
Each output consists of four blocks. Each block has nine source options.



Types

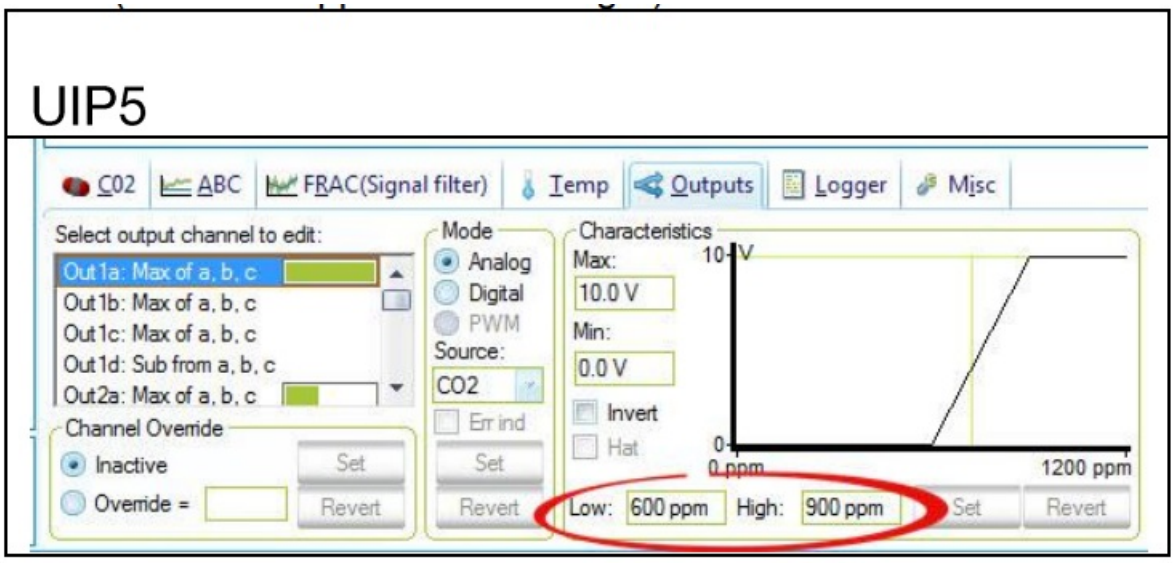
Analogue/Analogue Invert

(The same approach with “Digital/Digital Invert”)



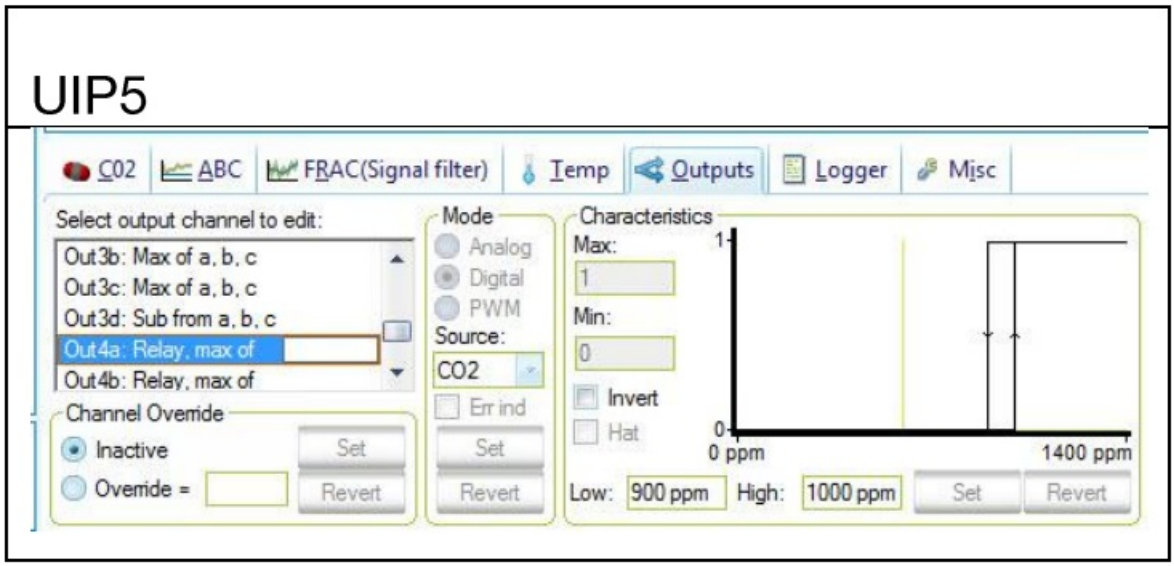
Proportional-band settings

Low (the same approach as “High”)



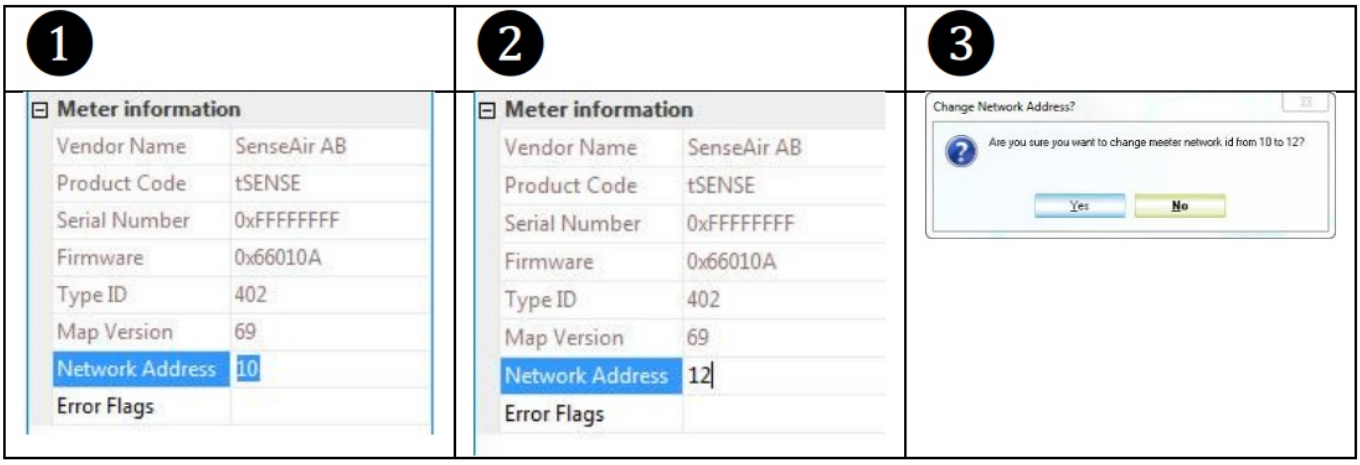
Outputs

Relay

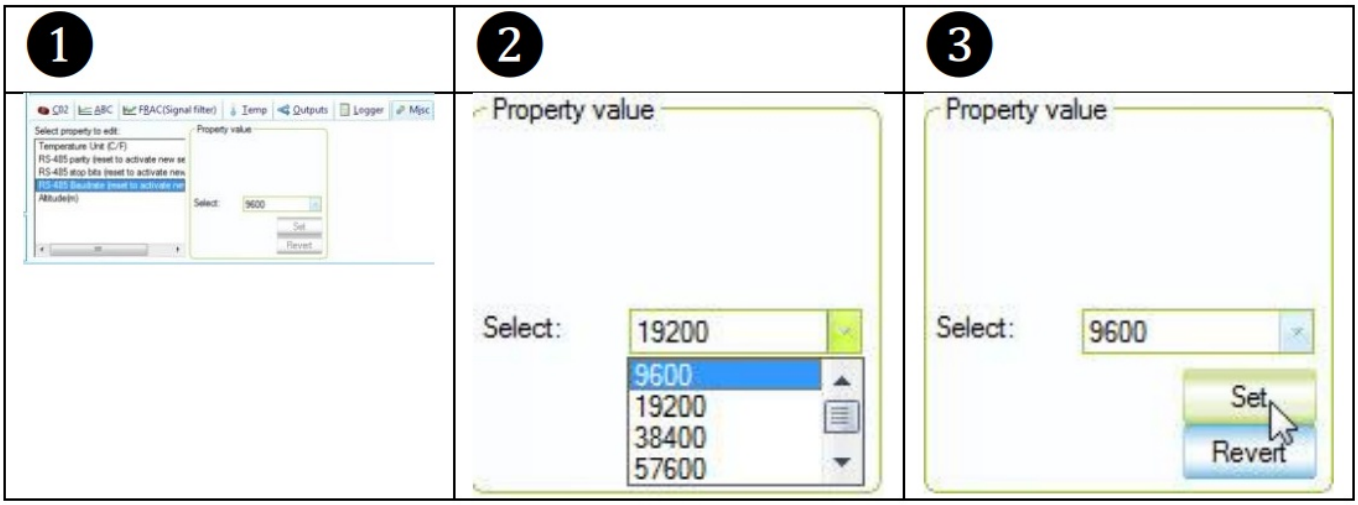


Communication settings

Address/Baudrate UIP5 Address



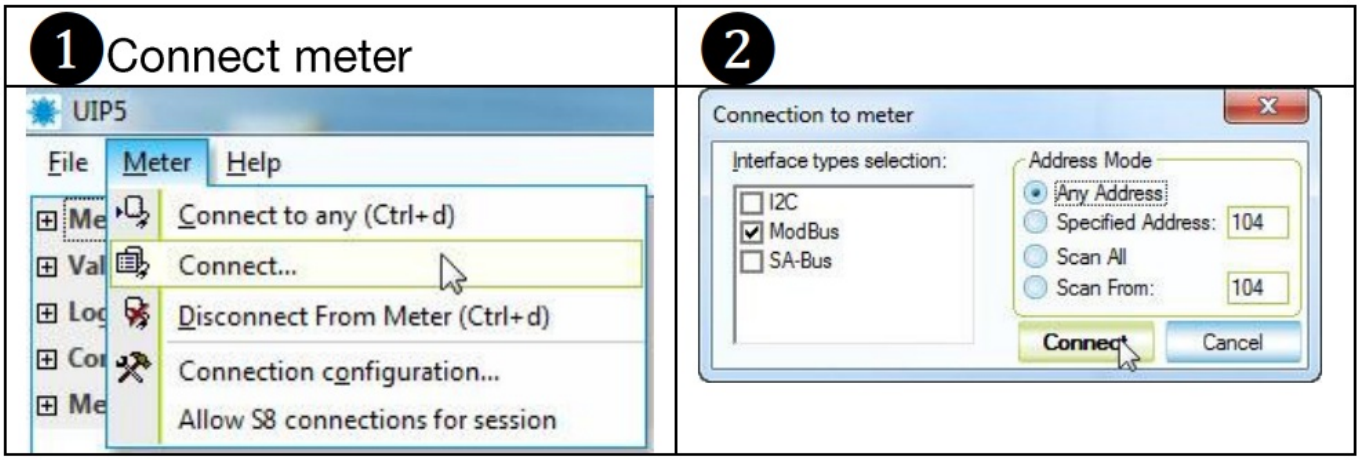
UIP5 Baudrate



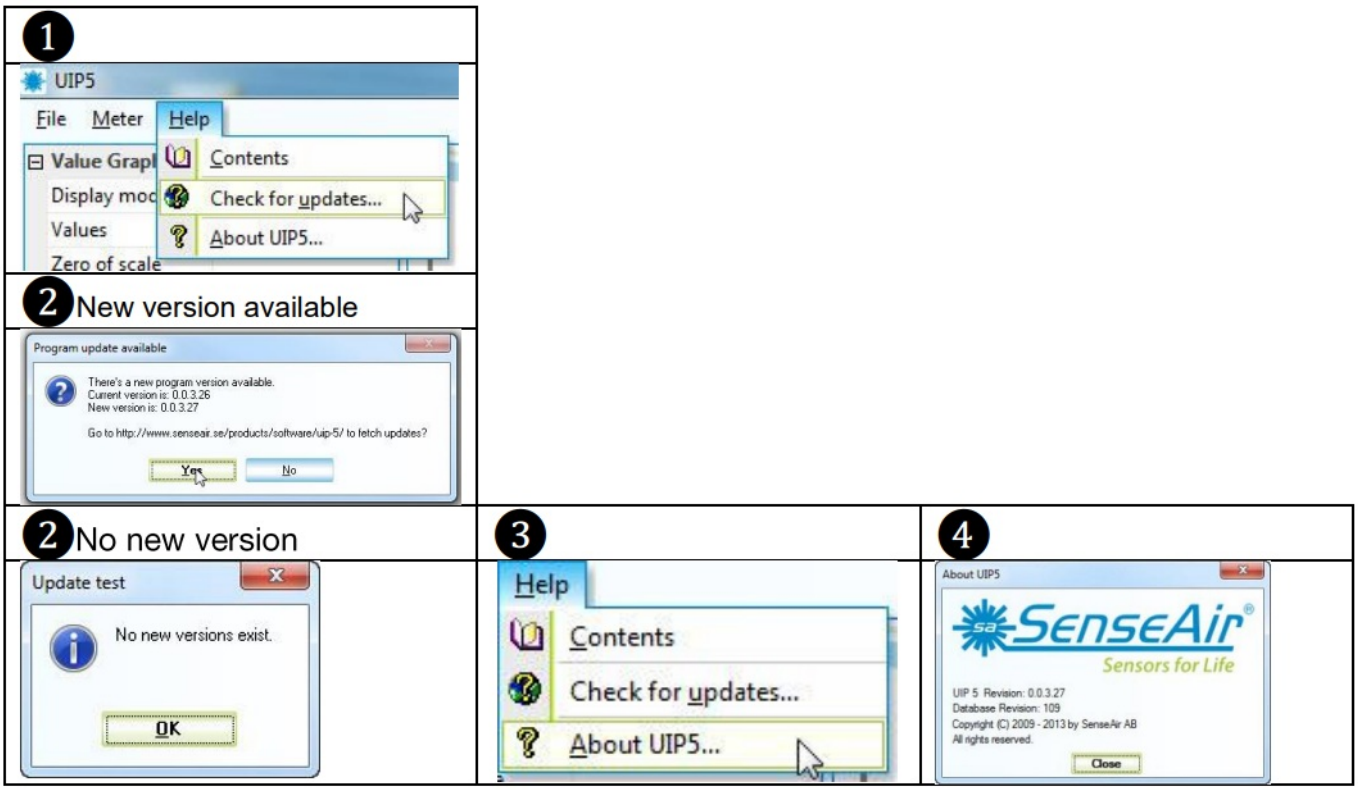
NOTE!

- UIP baudrate : RS-485 baudrate if tSENSE VAV No Disp is connected via phone jack (see fig. 2).
- UIP baud rate = RS-485 baud rate if tSENSE VAV No Disp is connected via screw terminal (see fig. 3).
- To change settings via UIP requires Reset (Power OFF- Power ON) to execute them.

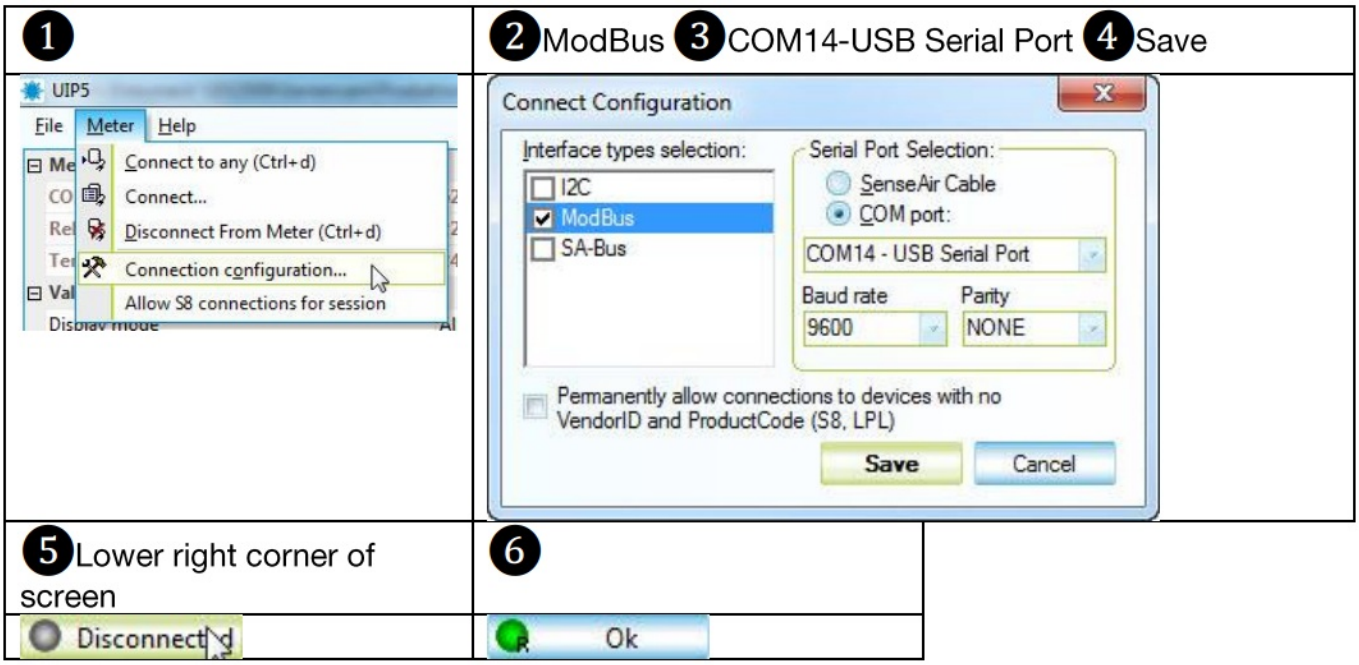
Connect meter



Check for updates



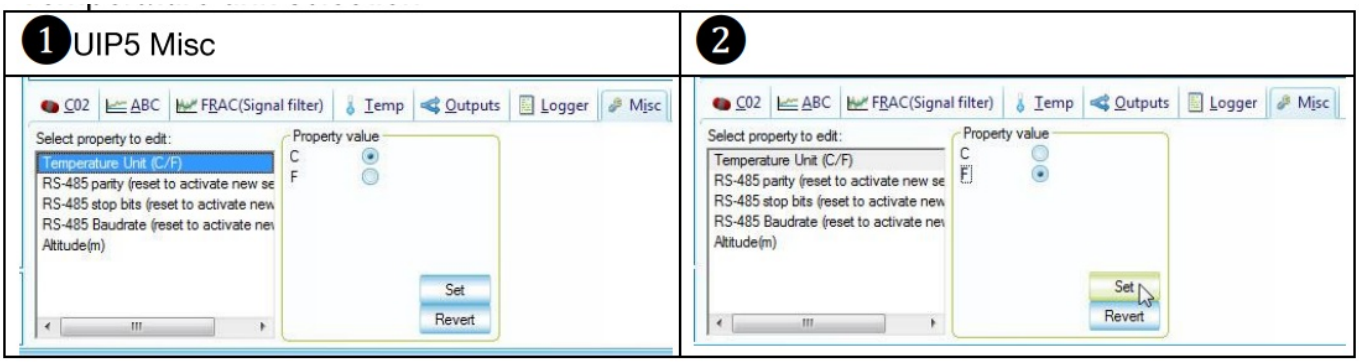
Connection configurations



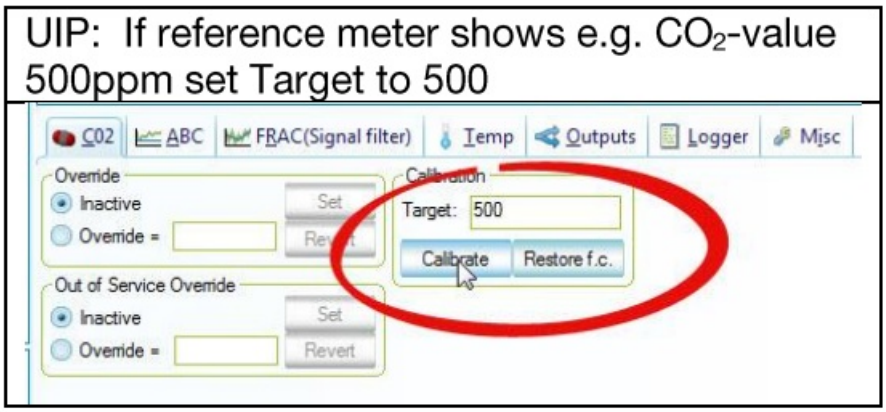
- UIP baudrate + RS-485 baudrate if tSENSE VAV No Disp is connected via phone jack (see fig. 2).
- UIP baudrate = RS-485 baudrate if tSENSE VAV No Disp is connected via screw terminal (see fig. 3).
- To change settings via UIP requires Reset (Power OFF – Power ON) to execute them.

Measured values

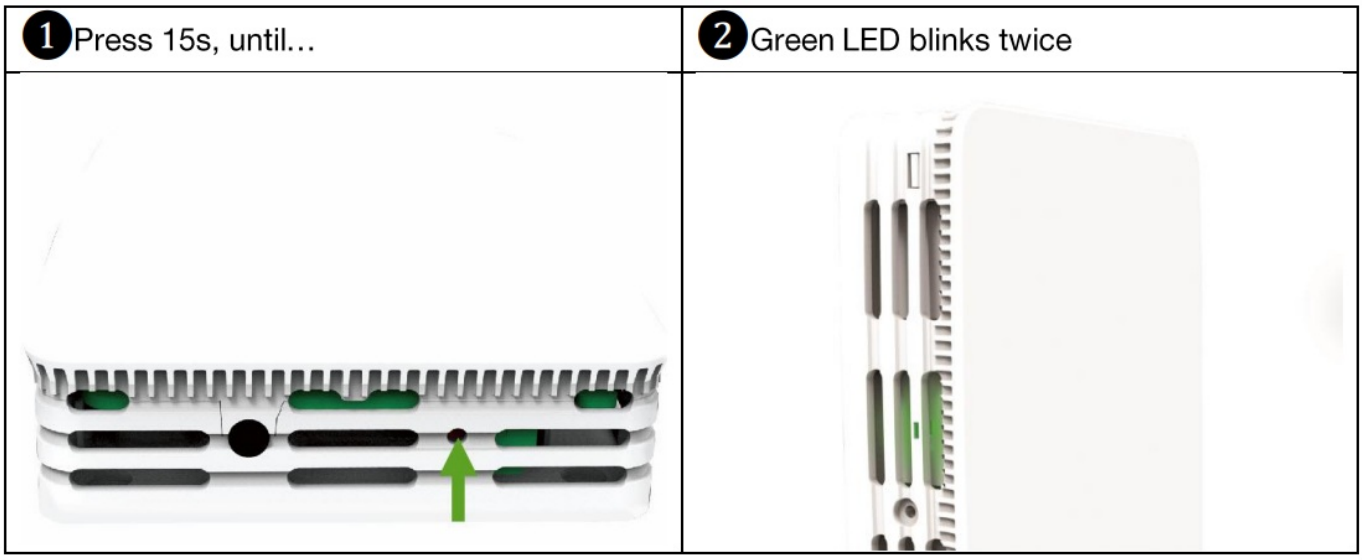
Temperature unit selection



- Calibration options cO2
- Zero ca/Background/Target cal



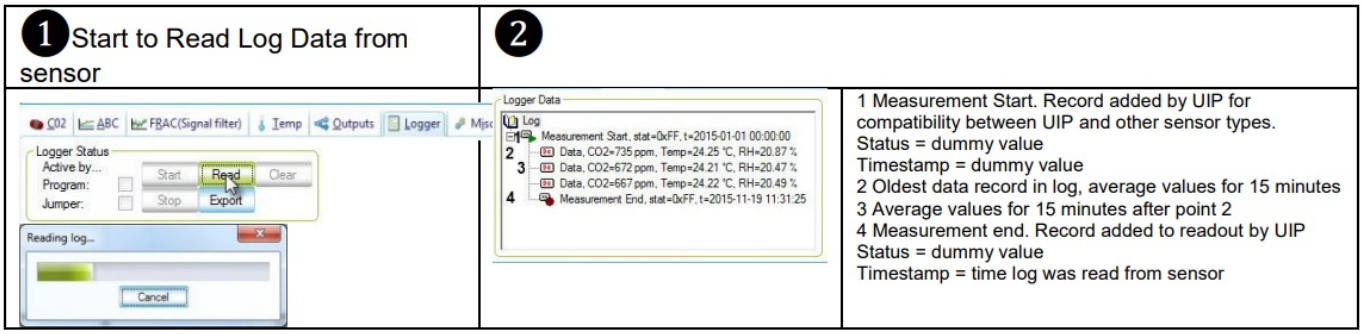
Background calibration button

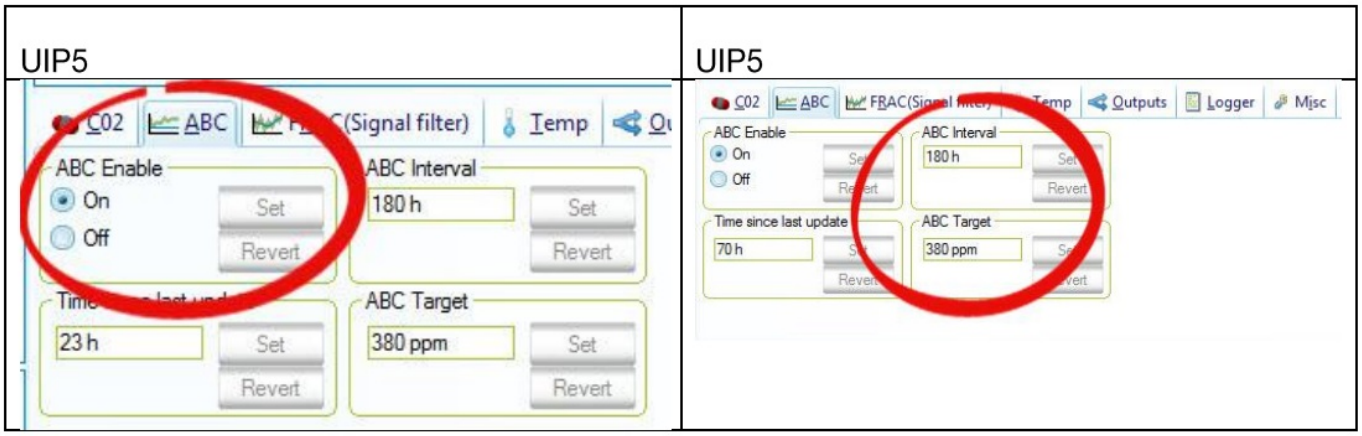


ABC

Enable/Disable

ABC period (ABC target/ Altitude/ Restore cal)



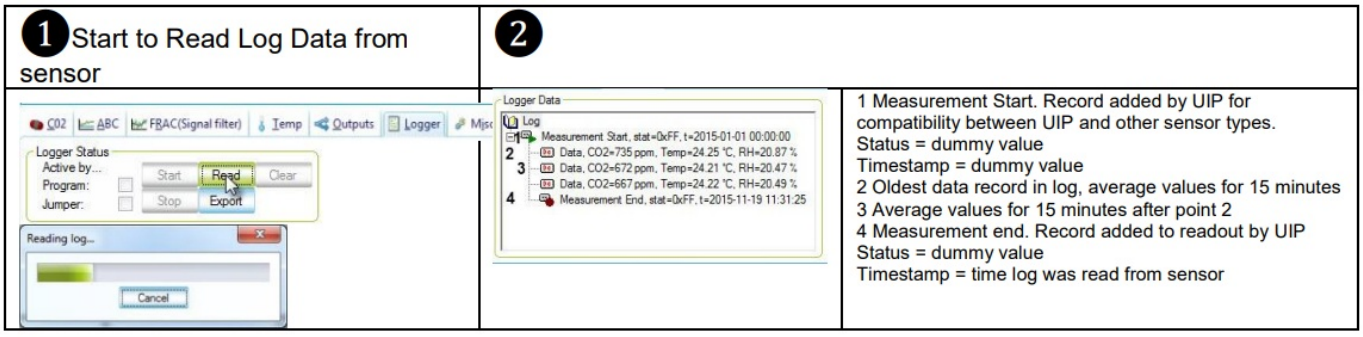


Automatic system test

A full system test is executed automatically at every power-up. Sensor probes are checked constantly during an operation against failure by checking valid dynamic measurement ranges. System checks return error bytes to RAM. Error codes are available by connecting the sensors to a PC with a special USB cable (art.no. O0-0-0070) connected (see fig. 2). Error codes are shown in software UIP (version 5 or higher) at “Meter information – Error Flags”

UIP Logger

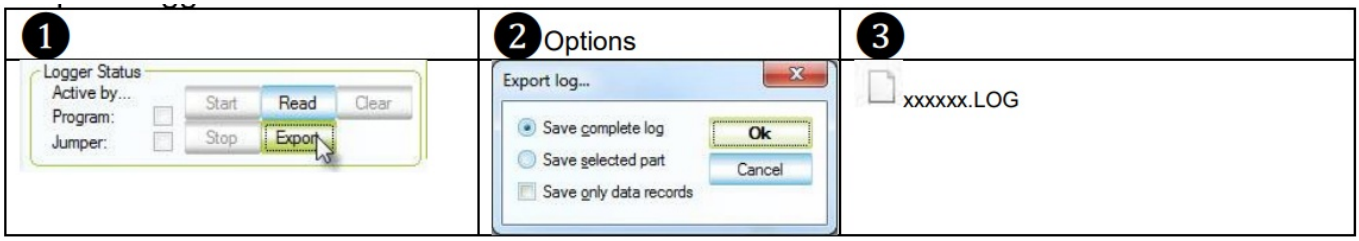
Alternative 1



NOTE!

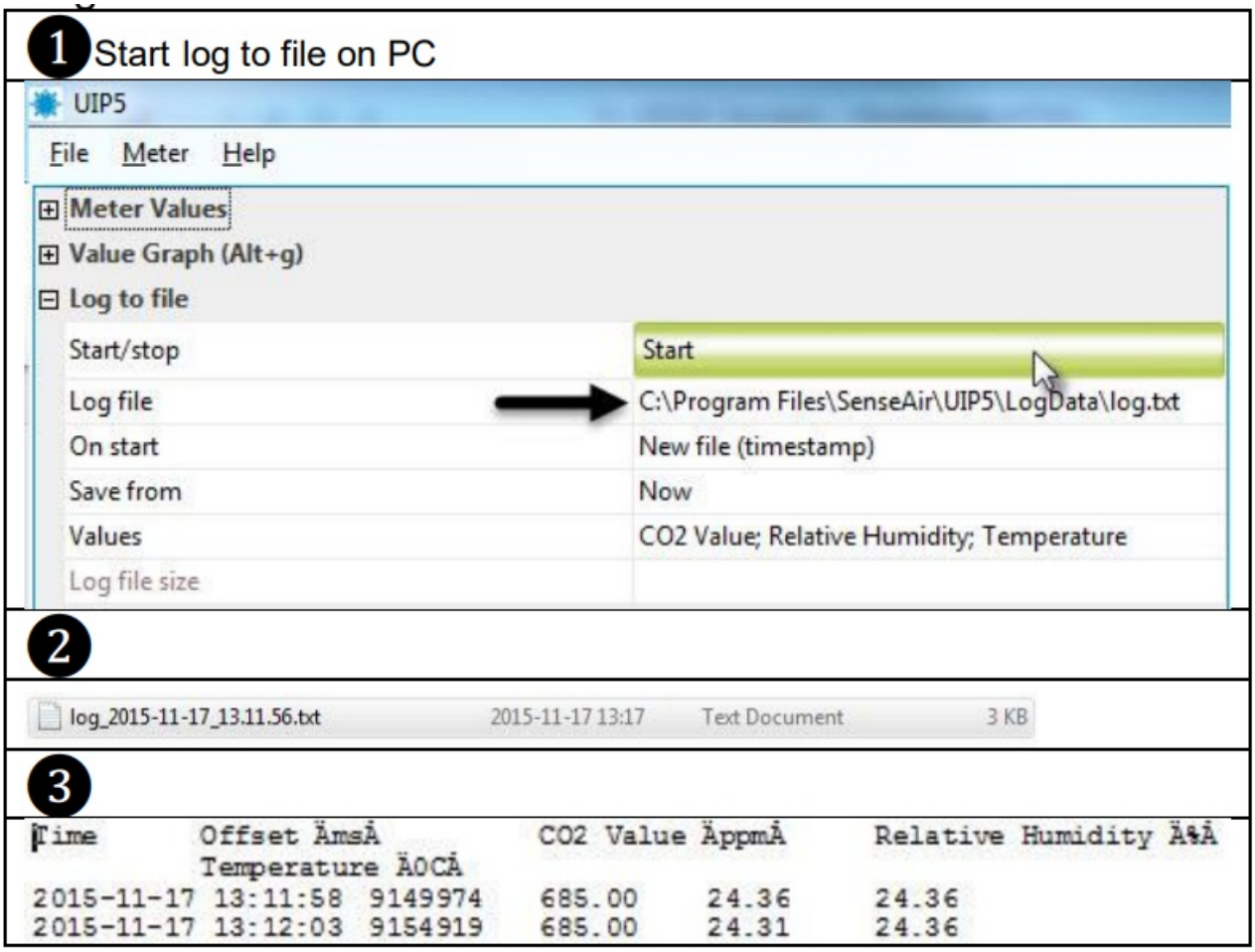
The log consists of 15 min averages, 672 (4 x 24h x 7d) data points for each value. tSENSE has no real-time clock (no timestamps in the sensors log). If the sensor has not been powered on continuously, time between data points can be much longer than 15 minutes. Timestamps in UIP log file are added by UIP. Chart 24h and Week (7 days) plots use data from the same log.

Export Logger Data



Alternative 2

Log to file



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/ON. Contact local distributor.
1	CO_2 sensor CO_2 measure error	CO_2 measurement error.	Try Background calibration (see fig. 4 and 5). Contact local distributor. *See Note 1!*
2	T sensor T measure error	Temp measurement error.	Try to restart sensor by power OFF/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 later. Contact local distributor.

Table 2: Error codes and action plans

1. Occurs if the probe is out of range, at very high CO2 values. Error code resets measured values return to normal. May also indicate the need for zero point caliber normal and error code remains, the sensor can be a defect or the connection
2. If several errors are detected at the same time, different error code numbers into one single error code!
3. Sensor accuracy is defined at continuous operation (at least three (3) weeks:

4. **Maintenance**
5. TSENSE VAV No Disp is maintenance-free. Internal self-adjusting calibration normal long-term drift. To secure the highest accuracy, a time interval of five yea between CO2 calibrations, unless some special situations have occurred.
6. The software can be downloaded free at **www.senseair.com** USB-cable and a zero calibration kit can be ordered from Sinclair.
7. Check can be done on site without interfering with a ventilation system.
8. **Cleaning (exterior only)**
9. Use mild detergent (no harsh chemicals) and wipe dry with a dry cloth.

Documents / Resources

	Senseair CO2 Temperature and Relative Humidity Sensor [pdf] User Manual CO2 Temperature and Relative Humidity Sensor, Relative Humidity Sensor, Humidity Sensor

References

- Air quality & Gas sensing technology from Senseair