

HD4817CAL SOFTWARE MANUAL

(FOR HD48S... WITH RS485 MODBUS OUTPUT)

INTRODUCTION

HD4817CAL software allows to manage from the PC in a simple and intuitive way the configuration and the calibration of the relative humidity, dew point and temperature transmitters of the series:

HD48S07T, HD48S07ET Temperature transmitters with RS485 Modbus output

HD48S01T, HD48S01ET: Relative Humidity transmitters with RS485 Modbus output

HD48S17T, HD48S17ET: Relative Humidity and Temperature transmitters with RS485 Modbus output

HD48S77T: Dew Point and Temperature transmitters with RS485 Modbus output

It is possible to display in real time the measures of the instrument on the PC monitor and to calibrate the relative humidity sensor.

The software is equipped with an automatic search function for the devices connected to your computer.

See the paper manual or the pdf file available in the *Documentation* section of the CD-ROM for complete details.

SOFTWARE STARTUP

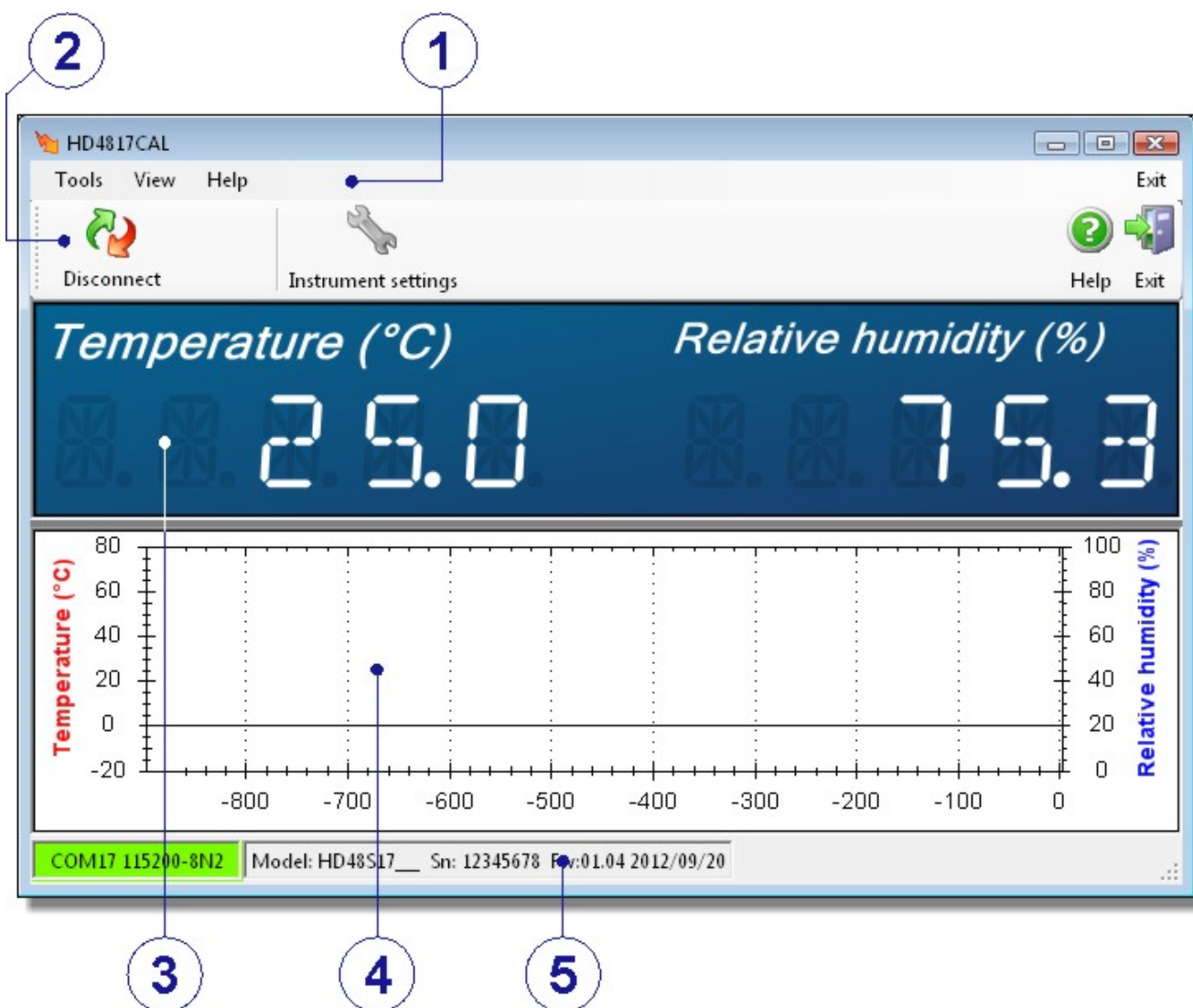
1. Connect the transmitter to a free USB port of the PC through the serial cable **RS48**.

Note: USB connection needs previous installation of the specific drivers supplied with the CD-ROM: see detailed instructions in "*Guide to the USB drivers installation*" in the "*Documentation*" section of CD-ROM.

Note: **with 64-bit operating systems, for the connection it is necessary to disable the driver signature request when the PC is started** (see "*Guide to the USB drivers installation*").

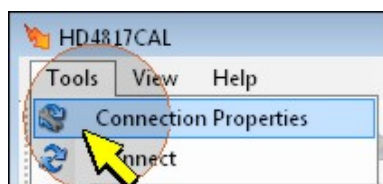
2. Start the program by double-clicking on the program icon on the desktop or by selecting the *HD4817CAL* item in the *DeltaOhm* folder in the Startup menu.

If you are connected to the internet, the program will firstly check if a software update is available and, if so, it will ask if you wish to install the update. If the program doesn't detect any connection to the internet or if no updates are available, the message will not be displayed and the program main screen will appear.

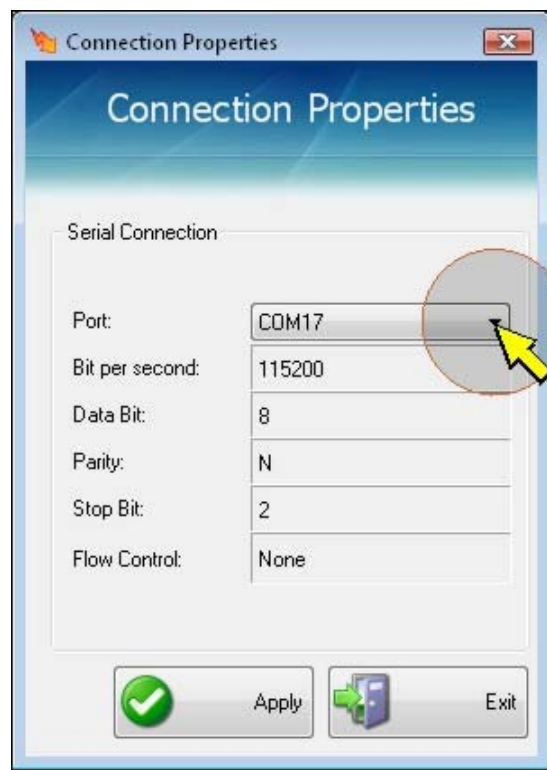


The following areas can be found in the main screen:

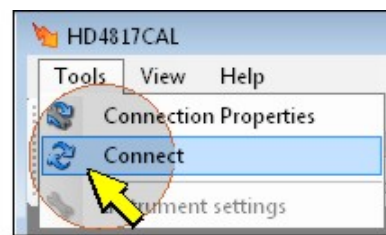
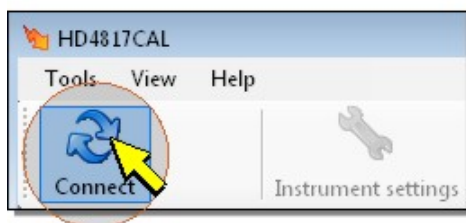
1. **Menu:** contains the menu items.
 2. **Command Bar:** includes the icons representing the program main commands.
 3. **Measurements window:** displays in real time the instant measurements detected by the instrument.
 4. **Graph window:** displays the graph of the measurements detected by the instrument.
 5. **Status Bar:** supplies info on the serial connection and on the connected device.
3. At startup, the program automatically tries to connect to the instrument using the settings of the last connection. If the transmitter does not connect automatically, select the *Connection Properties* item from the *Tools* menu.



4. Select the number of the COM port of the computer the instrument is connected to, then press *Apply* to return to the main window. The remaining communication parameters cannot be changed.

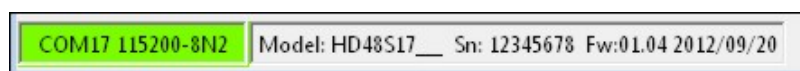


5. Select the *Connect* icon on the command bar, or the *Connect* item in the *Tools* menu.



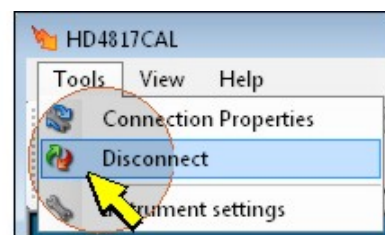
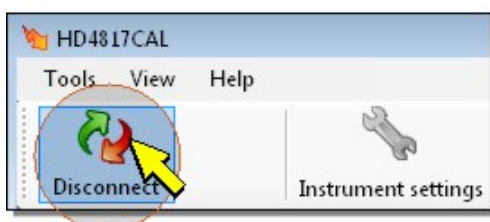
If connection is performed successfully, the values acquired by the instrument will appear in the measurements window in real time.

A correct connection is highlighted by a green label on the left of the status bar. Additionally, the status bar shows in the order: instrument model, serial number and firmware version.



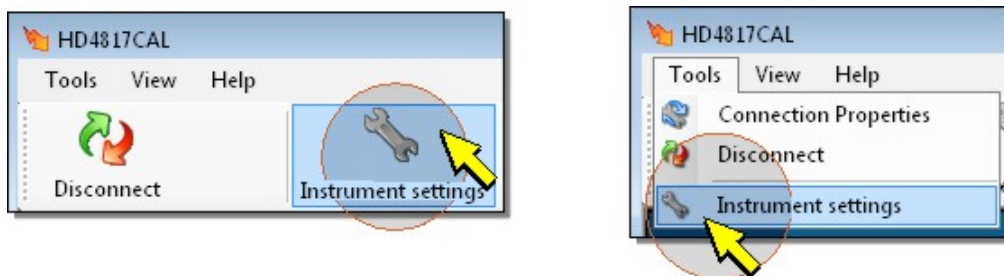
If connection fails, an error message will be displayed; in this case, check the correctness of connections and settings of the serial connection.

At the end of a connection and **before disconnecting the cable**, select the *Disconnect* icon in the command bar, or the *Disconnect* item in the *Tools* menu.

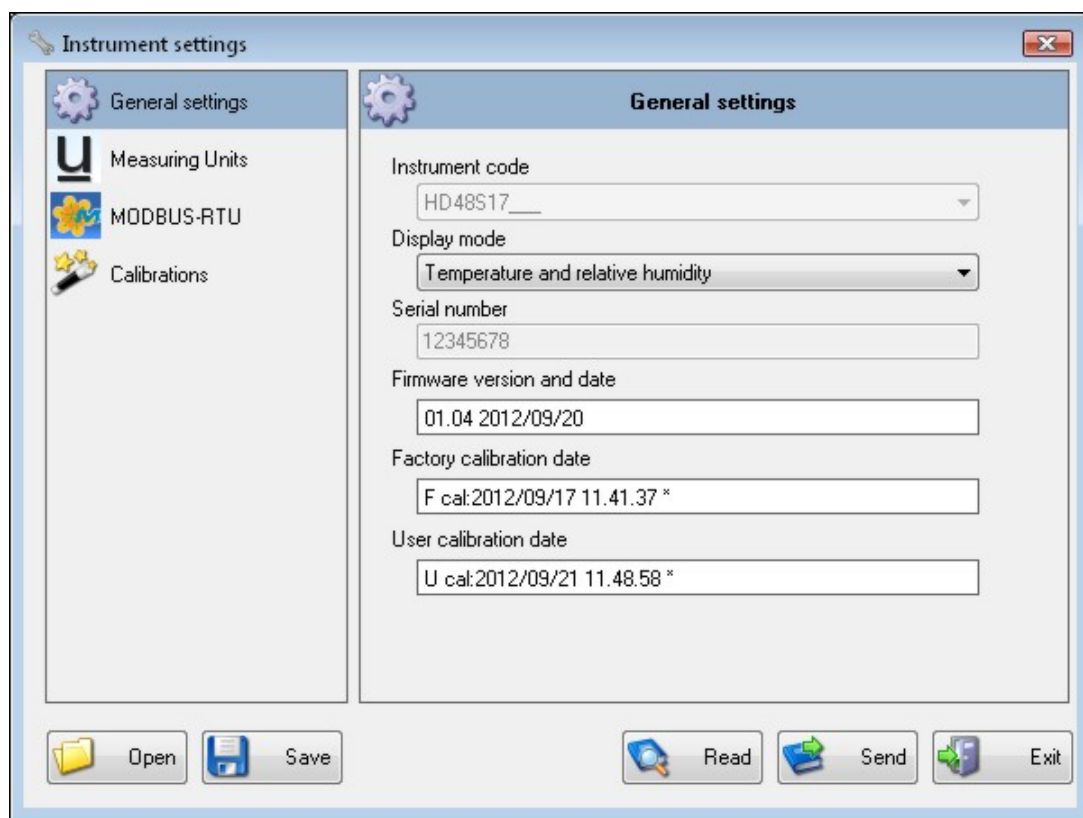


CONFIGURATION OF THE INSTRUMENT

To configure the instrument, select the *Instrument settings* icon in the command bar, or the *Instrument settings* item in the *Tools* menu.



The *Instrument settings* window will appear.



The window is divided into several sections, listed on the left of the window, that allow to perform the following settings:

[General settings](#): in the models provided with LCD it is possible to set the measure type to be displayed.

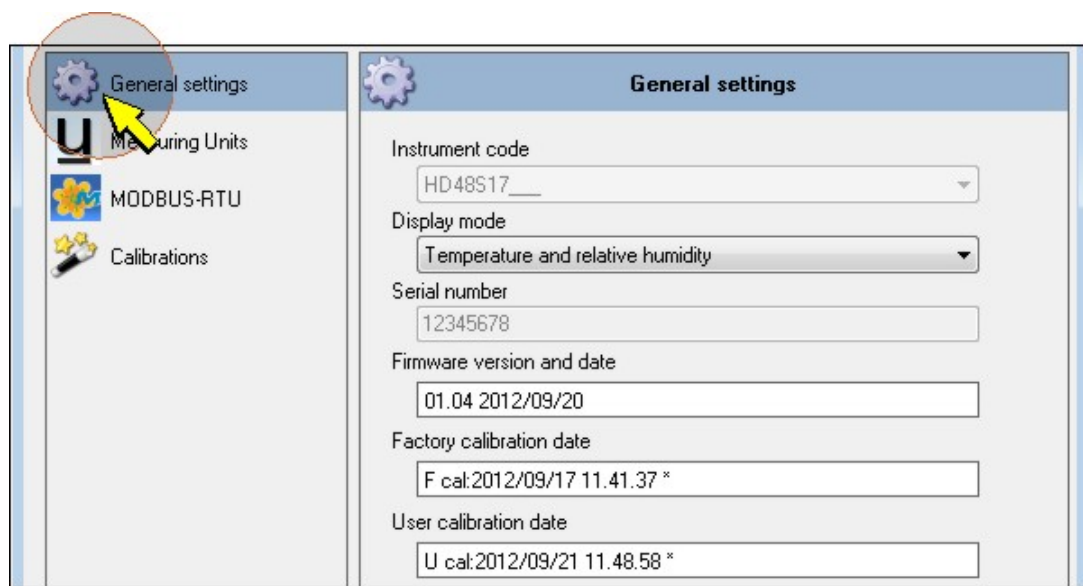
[Setting of temperature measurement unit](#)

[Settings for MODBUS-RTU](#)

[R.H. calibration](#)

GENERAL SETTINGS

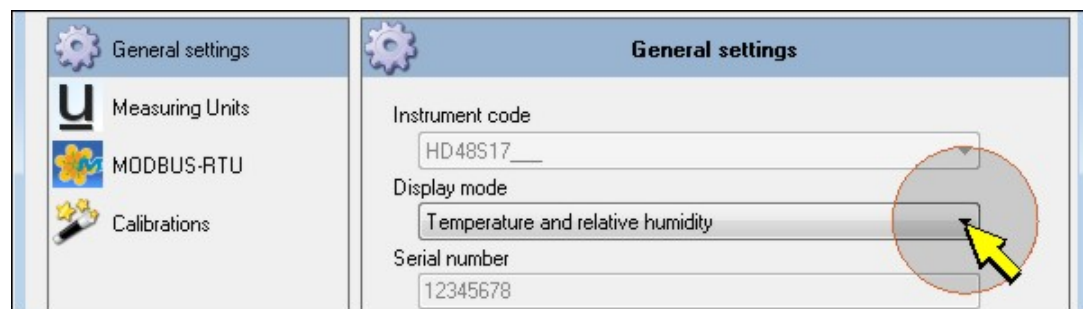
At startup, the *Instrument settings* window displays the *General settings* window:



This section allows to display info concerning the connected instrument, and to configure the type of measure to be displayed in the models provided with LCD.

The following info are displayed: instrument code, serial number, firmware version and date, factory calibration date and user calibration date.

To configure the visualization mode, choose the desired option in the *Display mode* field.



The available settings are the following:

- *Temperature*

The instrument displays the temperature value only:



- *Relative Humidity or Dew Point* (depending on the transmitter model)

Depending on the instrument model the display shows the relative humidity value only:



or the dew point only:



- *Temperature and Relative Humidity or Dew Point* (depending on the transmitter model)

Depending on the instrument model the display alternatively shows the temperature and the relative humidity values (the values are swapped every 5 seconds approximately):



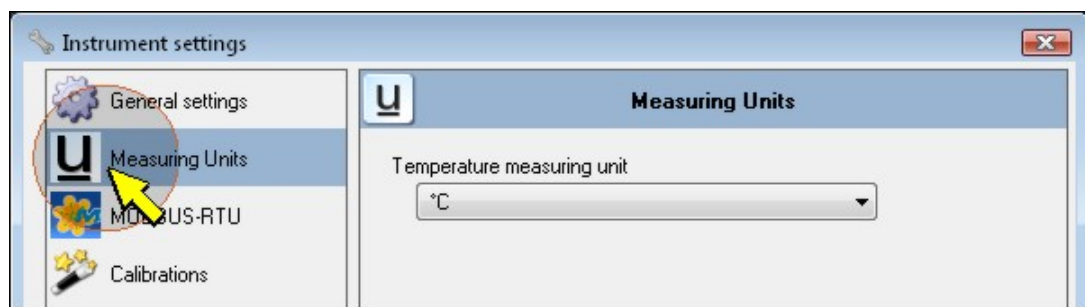
or the temperature and the dew point values:



When both the temperature and dew point values are displayed, the temperature is identified by an upward arrow, while the dew point is identified by a downward arrow.

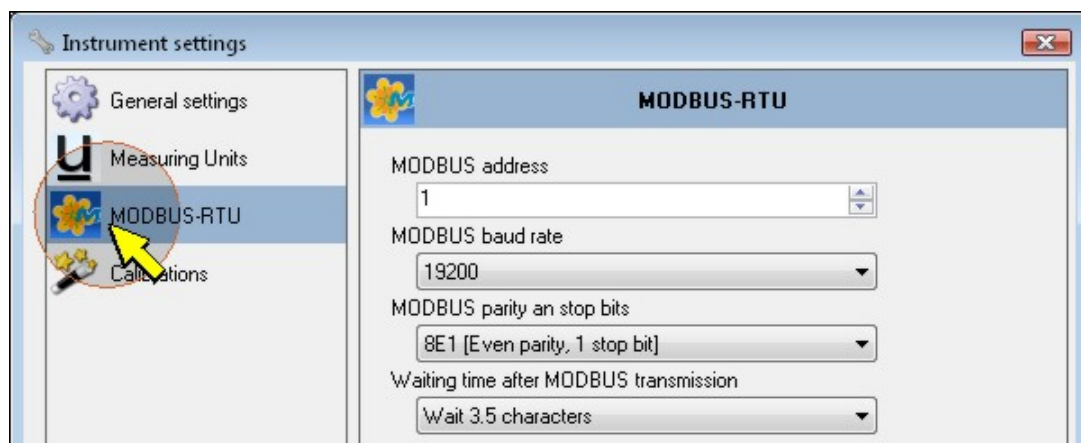
SETTING OF TEMPERATURE MEASUREMENT UNIT

Select the *Measuring Units* section to set the measurement unit for the temperature; optional selection between °C and °F.



SETTINGS FOR MODBUS-RTU

Select *MODBUS-RTU* section for the configuration of the communication parameters.

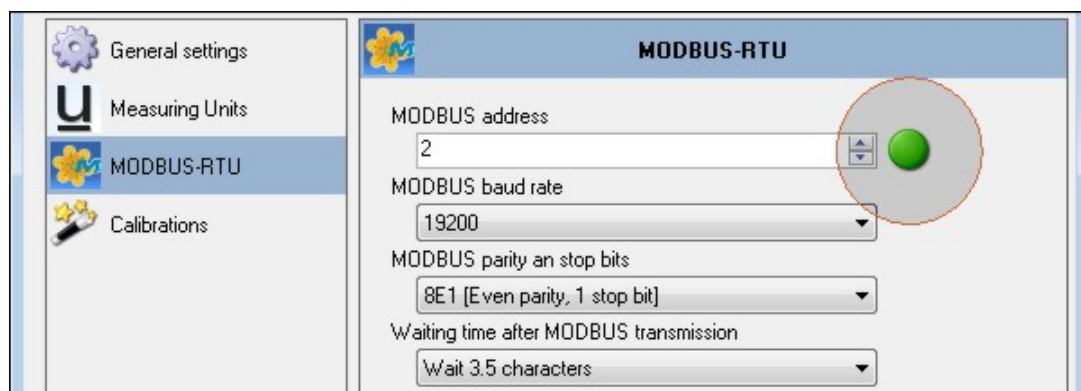


The following parameters can be set:

- *MODBUS address* : sets the instrument address. The address should range within 1 and 247.
- *MODBUS baud rate* : sets the Baud Rate.
- *MODBUS parity and stop bits* : sets parity and number of stop bits.
- *Waiting time after MODBUS transmission* : selects the waiting time between *Wait 3.5 characters* (option that respects the MODBUS-RTU protocol) and *Immediate Reception* (option that violates the MODBUS-RTU protocol).

TRANSFERRING THE CONFIGURATION TO THE INSTRUMENT

The modified configuration parameters are highlighted by a green circle at the right of the parameter.



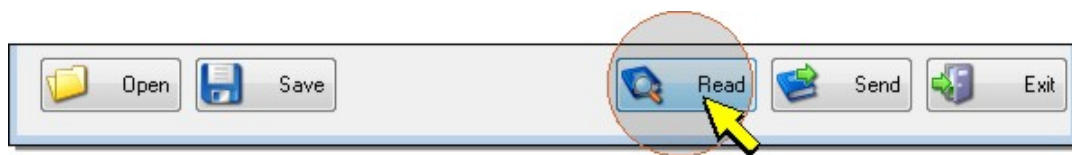
Select the *Send* key to store the new settings in the instrument.



After transmission of the new settings to the instrument, the green circles next to parameters disappear.

READING OF THE INSTRUMENT CURRENT CONFIGURATION

When opening the *Instrument settings* window, the displayed values are those set in the instrument. Select the *Read* key if you wish to read again the set values, for example to check that the configuration transmission operation was successful.



SAVING SETTINGS IN YOUR COMPUTER

Select the *Save* key to save the values of the set parameters in a configuration file (in txt format) in your computer.



The values of all the sections of the *Instrument settings* window are saved in a single file.

OPENING OF AN EXISTING CONFIGURATION FILE.

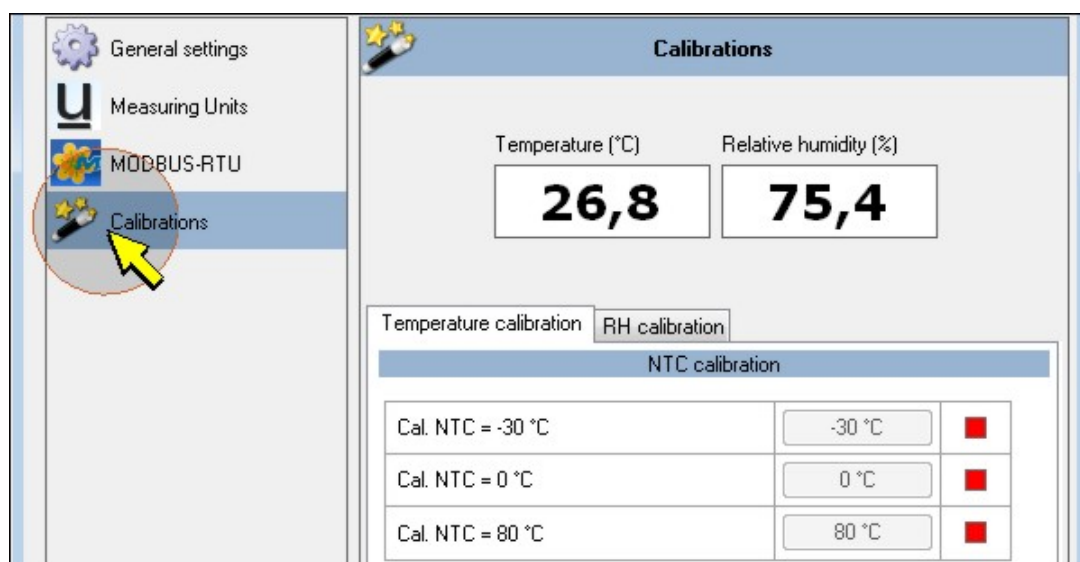
Select the *Open* key to upload the values regarding a previously saved configuration in the *Instrument settings* window.



Then select the desired configuration file and press *Open*.

RELATIVE HUMIDITY (R.H.) CALIBRATION

In the *Instrument settings* window, select the *Calibrations* section to perform the relative humidity sensor calibration in the two points 33% and 75%RH.



It is not possible to calibrate the temperature sensor.

For a correct probe calibration it is fundamental the knowledge and the respect of the physical phenomena on which the measurement is based: for that reason it is highly recommended to strictly follow what it is reported below and to perform new calibrations only if you have adequate technical know-how.

Before starting the calibration process, it is convenient to verify, with the help of the 33%RH and 75.4%RH saturated salt solutions, the need for a new calibration: only if a measurement error of a few percentage points of relative humidity in at least one of the two verified points occurs, proceed with the calibration.

For the verification and the calibration use **only** the saturated solutions HD75 - HD33 marked "R 2009".



The calibration procedure deletes the data of the previous calibrations.

For a correct sensor calibration, the first point must be at 75%RH and the second one at 33%RH.

Preliminary calibration operations:

Check that inside the chamber with the saturated salt solution are present at the same time:

- salt in the solid state,
- liquid solution or wet salt, especially for the 75%RH solution.

The instrument and the saturated solution to be used must be placed in an environment with a stable temperature for the entire time of the calibration. Wait for at least a couple of hours at stable temperature to allow the instrument and the saturated solution to reach the thermal equilibrium with the environment before starting the calibration procedure. For a good calibration it is important that the sensor and the solution are at the same temperature. Keep in mind that the plastics is a bad heat transfer material.

Procedure

1. Unscrew the probe protection grid and the saturated solution closing cap.

Note: to prolong the saturated solutions life, it is important that the solutions remain open only the time strictly necessary to insert the sensor.

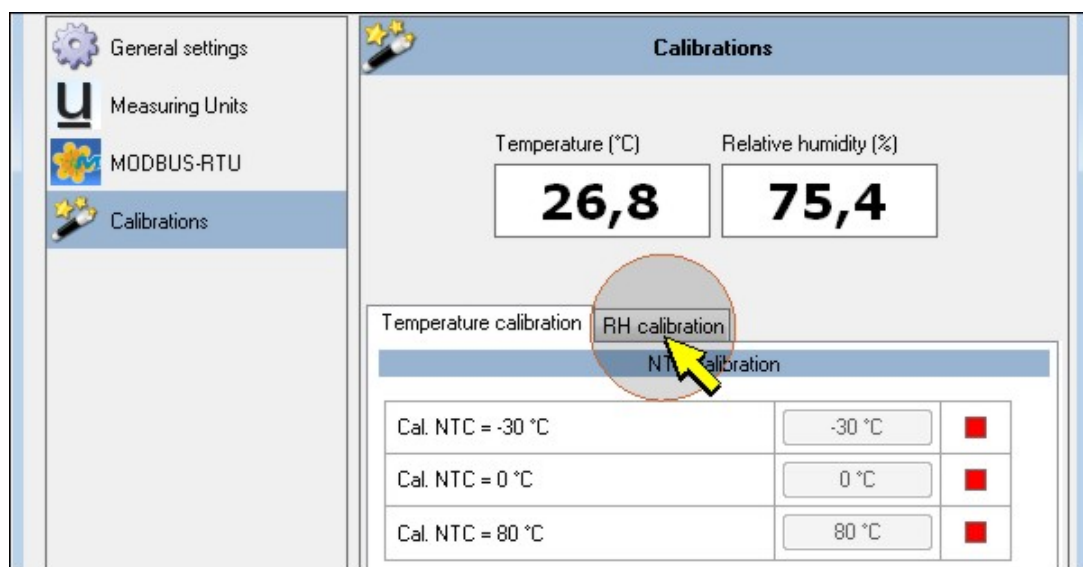
2. **It could happen that some liquid is formed inside the measuring chamber, in such a case dry it with clean absorbing paper.**

3. Screw the provided M12X1 threaded adapter to the measuring probe.

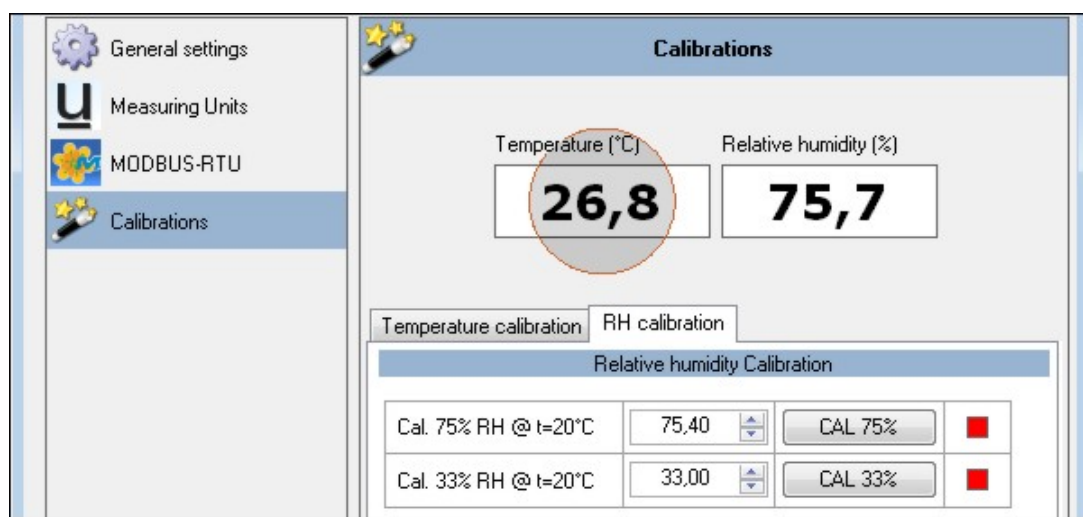
4. Screw the adapter with the probe to the saturated solution bottle. Avoid any contact of the sensor with hands or other objects or liquids.

5. Once the sensor is inserted, wait for at least 30÷45 minutes.

6. Select the *RH Calibration* folder.



7. A message will appear recommending to proceed only if in possession of appropriate technical training. Press Yes to proceed.
8. Read the temperature measured by the probe.



9. Read in the relative humidity-temperature correspondence table of the saturated solution the relative humidity value correspondent to the measured temperature. For the 75%RH saturated solution (code HD75) the table is the following.

Temp. °C	Solution 75%RH
10	75.6
15	75.6
20	75.4
25	75.2
30	75.0
35	74.8
40	74.6
45	74.5
50	74.4

Note: the calibration must be performed at a temperature between 15 and 30°C. If the temperature is outside such interval, the calibration value will not be accepted by the instrument and on the monitor it will appear a warning message.

10. Insert the relative humidity value of the saturated solution read from the correspondence table, using the small arrows on the right of the field or directly writing the value.

The screenshot shows the 'Calibrations' menu with a sidebar on the left containing 'General settings', 'Measuring Units', 'MODBUS-RTU', and 'Calibrations'. The main area displays 'Temperature (°C)' as 26,7 and 'Relative humidity (%)' as 75,7. Below this, there are tabs for 'Temperature calibration' and 'RH calibration'. The 'RH calibration' tab is active, showing a 'Relative humidity Calibration' section with two rows: 'Cal. 75% RH @ t=20°C' with a value of 75,20 and a 'CAL 75%' button with a red indicator, and 'Cal. 33% RH @ t=20°C' with a value of 33,00 and a 'CAL 33%' button with a red indicator. A yellow arrow points to the 'CAL 75%' button.

11. Press the CAL 75% key to calibrate the point at 75%RH, the indicator on the right of the field changes from red to green.

The screenshot shows the 'Calibrations' menu after the 75% RH calibration. The 'Relative humidity (%)' value has changed to 75,2. The 'CAL 75%' button now has a green indicator, and the 'CAL 33%' button still has a red indicator. A yellow arrow points to the 'CAL 75%' button.

12. Repeat the previous steps using the second saturated solution to calibrate the point at 33%RH.

The screenshot shows the 'Calibrations' menu after the 33% RH calibration. The 'Relative humidity (%)' value has changed to 75,2. The 'CAL 75%' button has a green indicator, and the 'CAL 33%' button now has a green indicator. A yellow arrow points to the 'CAL 33%' button.

Following is the relative humidity-temperature correspondence table of the 33%RH saturated solution (code HD33).

Temp. °C	Solution 33%RH
10	33.4
15	33.3
20	33.0
25	32.7
30	32.4
35	32.0
40	31.6
45	31.1
50	30.5

- 13.** Unscrew the M12X1 adapter from the probe and replace the sensor protection grid, avoiding to touch the sensor. Immediately close with its cap, after the use, the saturated solution used.

CLOSING THE CONFIGURATION WINDOW

Select the *Exit* key to close the *Instrument settings* window.



If changes were made and were not transmitted to the instrument, a message will be displayed asking if you wish to transmit the performed changes before exiting.

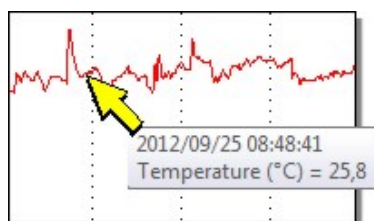
MONITOR

During connection, the instant values measured by the instrument are displayed in real time in the program main window.

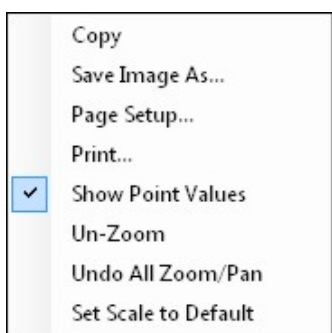
Selecting (checkmark ticked) or deselecting (checkmark not ticked) *Data*, *Graphs* or *Data and Graphs* items in the *View* menu, both the current measurement in numeric form and the trend in graph form of the last 900 values can be displayed, or else you can display only the current measurement in numeric form or only the graph of the last 900 values.

Trends are represented starting from "0" point and move to the left on the computer screen. The graph horizontal axis shows the number of measurements. The temperature is indicated with the red color, while the relative humidity or the dew point (depending on the model connected) is indicated with the blue color.

Pointing the mouse cursor on a point of the graph, the acquisition time and the trend value on that point are displayed.



Clicking with the right key of your mouse, the following list of commands is displayed:



Copy: copies the graph in the "Notes"

Save Image As: saves the graph as a "bitmap" image in *emf*, *png*, *gif*, *jpg*, *tif* or *bmp* format.

Page Setup: allows to set the page format for the graph print.

Print: prints the graph.

Show Point Values: enables or disables display of acquired values when pointing the mouse on a point of the graph.

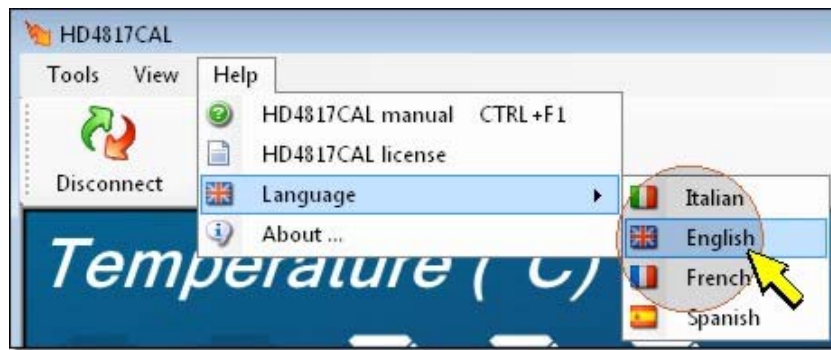
Un-Zoom: cancels a previous zoom.

Undo All Zoom/Pan: cancels all zooms.

Set Scale to Default: adapts the vertical scale to measured values, that is applies the zoom maximum level that allows the complete display of the trend.

SOFTWARE LANGUAGE

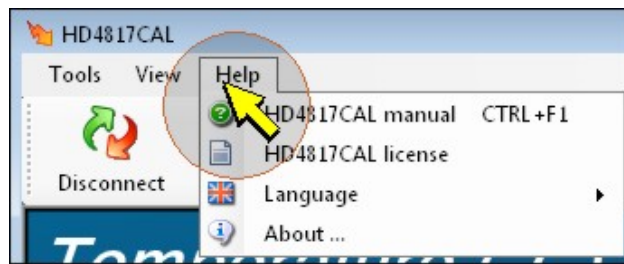
To change the software language, select the *Language* item in the *Help* menu, then choose the desired language.



To update the language in the measurements and graph windows, disconnect and reconnect the instrument.

INFO ON THE SOFTWARE

Select the *Help* menu to obtain additional info on software version and license terms, as well as to open the program manual.



On-line Help can be opened quickly by selecting the icon marked with a question mark in the command bar.



COMMAND ICONS



Connect

Connects the instrument to the computer (available only if the instrument is not connected).



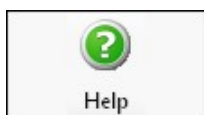
Disconnect

Disconnects the instrument from the computer (available only if the instrument is connected).



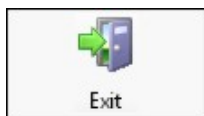
Instrument settings

Configures the instrument operation parameters.



Help

Opens the program manual.



Exit

Closes the opened program or window.

MENU COMMANDS

Tools >> Connection properties: sets parameters for computer connection.

Tools >> Connect: connects the instrument to the computer (command active only if the instrument is not connected).

Tools >> Disconnect: disconnects the instrument from the computer (command active only if the instrument is connected).

Tools >> Instrument settings: configuration of instrument operation parameters.

View >> Toolbar: enables or disables display of command icons.

View >> Status Bar: enables or disables info display in the status bar.

View >> Graphs: displays only the trend in graph form.

View >> Data: displays only the current measurement in numeric form.

View >> Data and graphs: displays both the current measurement in numeric form and the trend in graph form.

Help >> HD4817CAL Manual: opens the program manual.

Help >> HD4817CAL License: displays the license of use of the program.

Help >> Language: selects the software language.

Help >> About...: displays the program version.