Custom8 NV
Romeinsestraat 18
3001 Heverlee, België
+32 (0) 16 409055 tel
+32 (0) 16 400019 fax
www.custom8.com web
BE0474773230 vat
BE94 4312 7045 0114 iban
KREDBEBB bic

User Manual
µCliMon.Expert

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Feedback

Requests for information or usage of these –or parts of these- instructions can be addressed to :

Custom8 nv
Romeinsestraat 18
B-3001 Heverlee
BELGIUM
info@custom8.be

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V 1.0.4 (March 16, 2020)

Corrections / suggestions may always be addressed to :
support@custom8.be
Your help is greatly appreciated.

Table of Contents

INSTALLATION OF THE SOFTWARE

The latest version of the software can be downloaded from http://www.custom8.be/uclimon. The auto-update function will automatically check for newer versions at the interval specified under the settings.

File locations

After installing, the software normally creates a shortcut on the desktop, but can also be found at one of the following locations:

C:\Program Files (x86)\custom8\µCliMat.Expert

C:\Program Files\custom8\µCliMat.Expert

Furthermore, the installer has created a number of default folders at the following location:

C:\Users\(Current User)\Documents\custom8\µCliMat.Expert

- **Configurations**: contains the configuration files of the units, setups and sensor mats. The software checks the last folder to build a list of sensor mats that can be connected while scanning
- **Data**: default folder to save the measurements
- **logfiles**: contains usage and debug information

License

Without a valid and activated license, the software will work in DEMO mode. The software has both a 'per client' and 'per machine' license activation model. This means that with each License-Key the software can be installed and activated on a predefined number of computers ("seats") within the client's company. If a particular computer is no longer used, the corresponding activation key can be de-activated, and this will release one of the seats (except for offline activations).

1. Import Company License

In a first step, the company license needs to be imported. This can be done by opening the user settings, and choosing the License tab:

2. Activate the software license

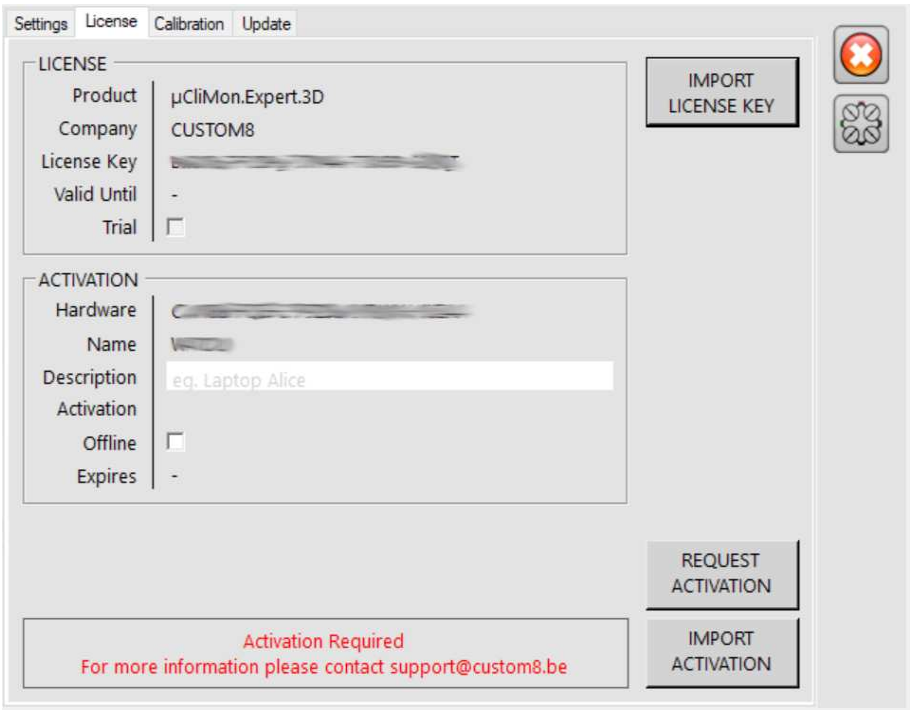
In a second step, the software license needs to be activated for this computer. There are 2 options for activating a license on a computer:

1. Normal activation
2. Offline activation

A normal activation requires an active internet connection, and will check the status of the activation on the license server at least once every 2 weeks.

If your computer has no internet access, you can choose an offline activation. Please note however that this type of activation can never be undone, and therefore the corresponding seat can never be released.

After activation, the License file contains both the License-Key, Hardware fingerprint and Activation-Key.



2.1. Normal activation:

During the t normal activation procedure, the license server is contacted and the activation is performed automatically.

Procedure:

1. supply a human readable description for your computer
2. start the automatic activation procedure by clicking on 'Request Activation'

2.2. Offline activation:

The offline activation is similar to the normal activation, but requires a manual exchange of the activation request and the activation import.

Procedure:

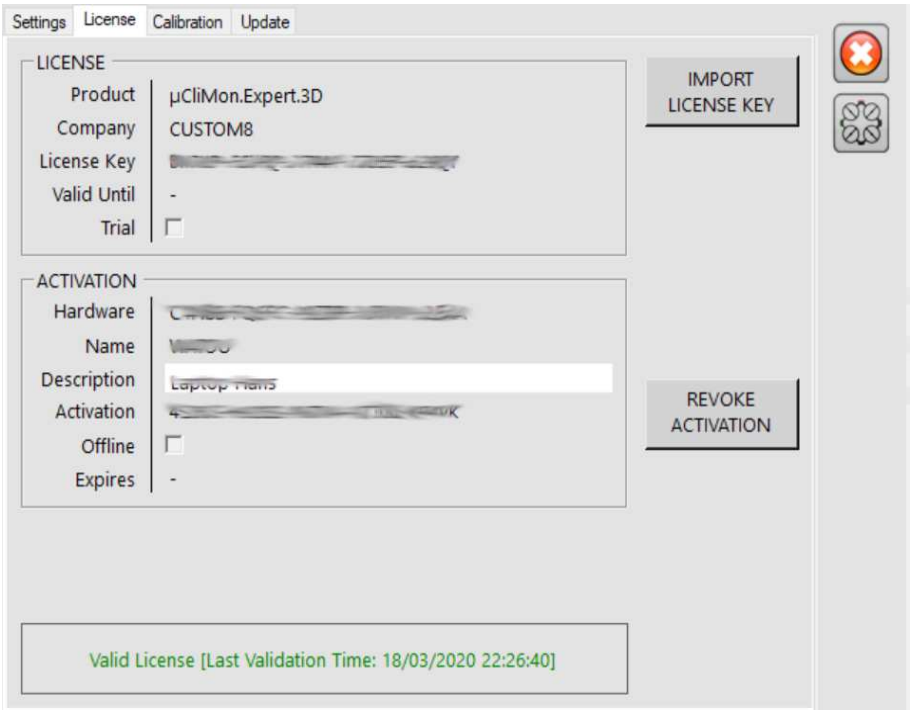
1. supply a human readable description for your computer
2. check "Offline activation"
3. safe the License activation request (click on 'Request Activation') and mail it to support@custom8.be
4. upon receipt of the Activation-Key, go to settings > license and import the Activation-Key

Remark	
	**Offline** activations are **permanent**, and can never be revoked!

3. Revoke the software activation

In case of a normal installation and activation, the activation can be revoked to release one of the seats. This will allow the activation of the software on another computer (if the maximum number of seats was reached).

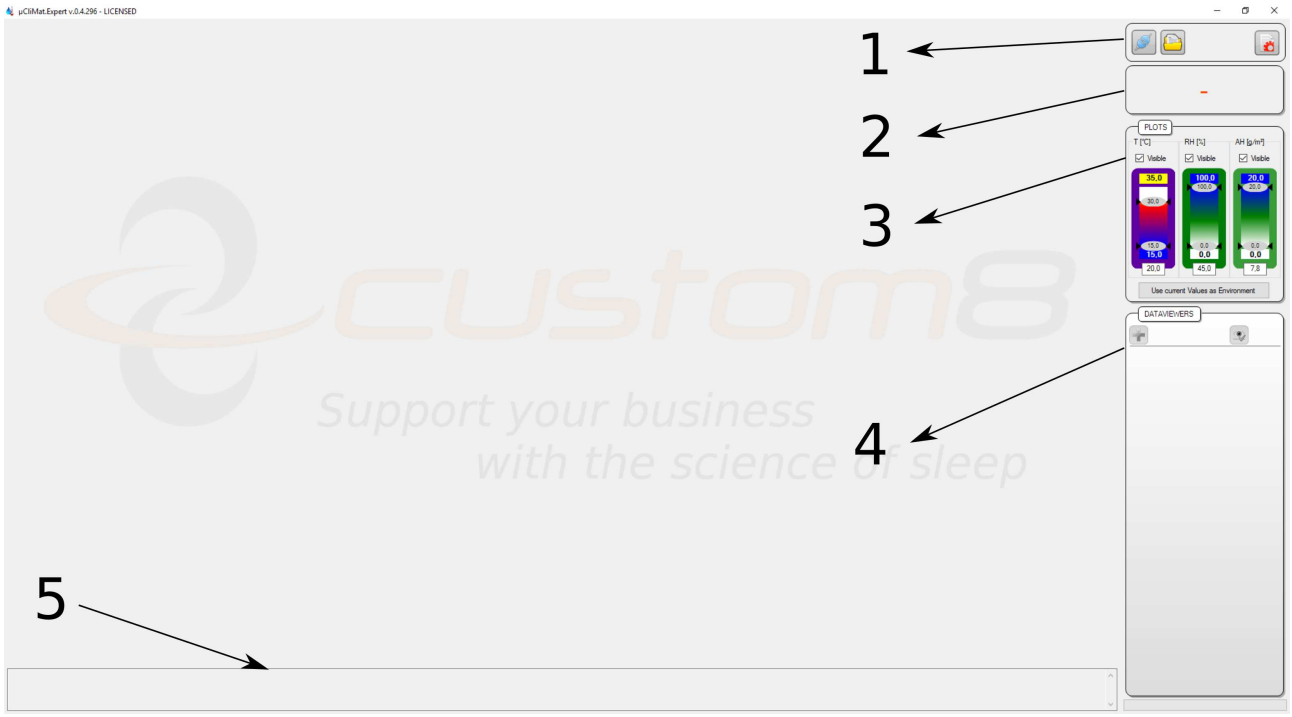
The procedure can only be performed with an active internet connection, and is started by pressing the 'Revoke Activation' button.



THE MAIN SCREEN AND THE SUB WINDOWS

1. Overview

After starting up the software (µCliMat.Expert.exe), the following screen appears:



The following sub-windows are visible to the user (in clockwise sequence), which will be discussed in the following paragraphs:

1. control buttons
2. status window
3. color scales
4. data viewers
5. log window

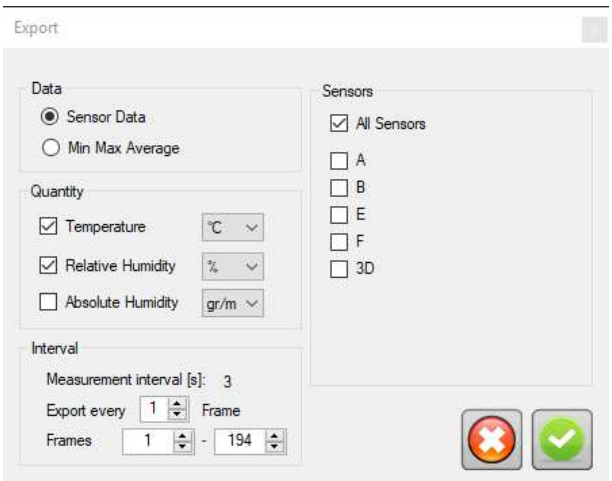
The window header contains the current software version number, and the license status (demo or licensed)

2. Control buttons

Depending on the current status, one or more of the following control buttons will be visible:

	**Connect µCliMats:** automatically loads the default data-viewer for the connected µCliMats
	**Open existing data file:** loads a previously recorded file
	**Save data file:** open a file dialog to indicate the filename and directory, and start recording data (only available after connecting to the sensor mats)
	**Save changes:** update the data file with the latest changes (data-viewers and annotations)
	**Edit Properties:** add annotations to the measurement
	**Export to CSV:** export the current data file to a comma separated format for easy import in a spreadsheet program (only available for a previously recorded measurement)
	**Settings:** various application settings

The data export function asks the user to choose a file location for the exported data. It also allows the user to filter the export data:



- the data can be exported as individual data from the sensors, or as minimal, maximal and average values over time.
- the user can choose which parameters should be exported (Temperature, Relative Humidity, Absolute Humidity). Temperature can be exported in °C or in °F.
- the exported data can be limited by exporting a specific range of frames, or by decimating the number of frames (for example every 10th frame).
- the user can choose to export all data ('All sensors') or only the values from specific sensor mats or data viewers.

3. Status window / playback control

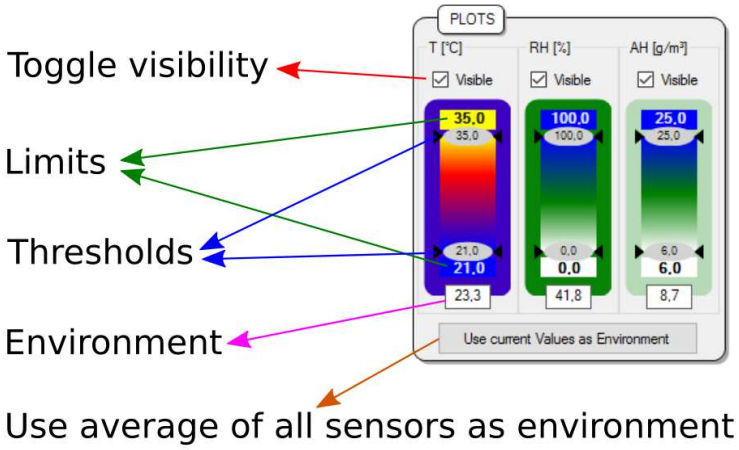
The status window shows one of the following items:

1. not connected (“-”)
2. scanning for sensor mats (“scanning”)
3. preview of connected sensors (“preview”)
4. recording of data (“recording”)
5. playback (player buttons, including current frame and number of recorded frames)

The playback buttons only appear after recalling a recorded measurement, where the user can choose between manually or adjusting the current frame or playback the measurement as a movie. The current frame can be set manually by clicking the back and forward buttons, by clicking on the frame axis or by dragging the button.

Tip	A specific frame can also be chosen by clicking on the frame number value and entering a new value

4. Color scales



Each measurement variable has its own set of parameters defining the way the data is represented in the data viewers, and can be switched on or off using the toggle visibility switch. These parameters are saved when closing the program, and are used as starting values the next time.

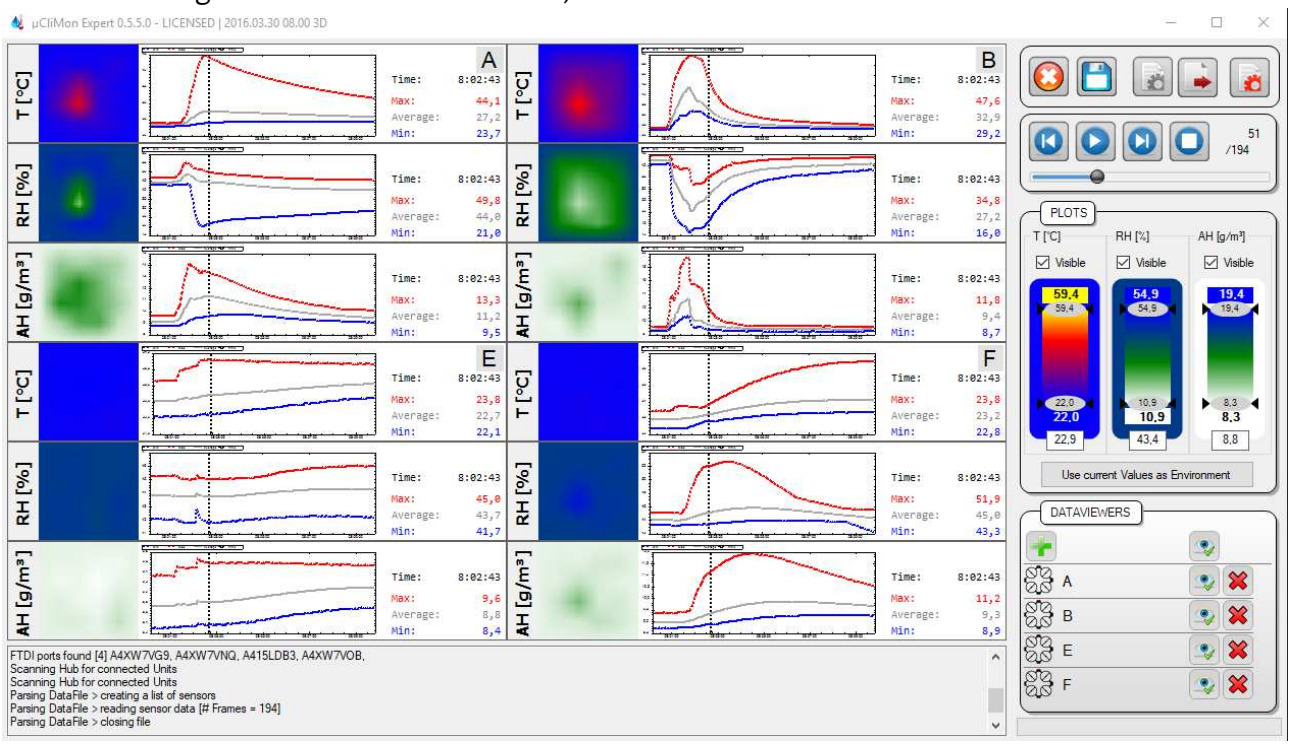
- The limits define the **boundaries** for the color scale. This means that the color is interpolated from the lower color to the higher color. For optimal representation, these limits should be chosen to match the variability in the data set as closely as possible. The limits can be changed by double clicking and entering the value.

- The thresholds define the **visible part** of the data in each data viewer. All data outside the threshold is blocked from visualization. The thresholds can be changed by dragging and dropping the corresponding ellipse, or by double-clicking and entering the value.

- The environment is used to draw an additional **virtual border** around the sensor values. The button below the color scales can be used at a certain moment to average all sensor values and use that as the environment value.

5. Data viewers

After connecting to the available sensor mats, the default data viewer is loaded for each sensor mat:



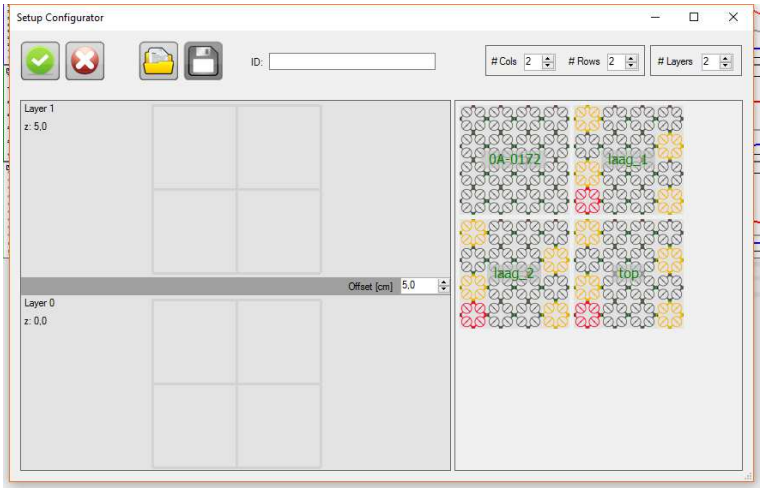
Each data viewer contains by default a 2D map per parameter value (Temperature, Relative Humidity and Absolute Humidity) and a history curve for the minimal, maximal and average value of this parameter.

Tip	By right-clicking on a 2D map or a history curve, the underlying image can be **exported to a bitmap**.

In case 2 or more sensor mats are used in the measurement, additional data viewers can be added to represent the current setup (in case several sensor mats are arranged in a stack or in a grid).

	**Add Data viewer:** opens the setup configurator
	**Show / Hide Data viewer**
	**Remove Data viewer**

The setup configurator shows the available sensor mats on the right column. The available sensor mats determines the flexibility of the actual setup (number of layers and maximal size of the grid):



First, the user should indicate the **number of layers** (3D expert only)**,** the **distance** between two layers (3D expert only) and the **number of columns and rows** in each layer (top right corner).

Remark	The distance between 2 layers can be different, but each layer should have **the same number of columns and rows!**

Next the available sensor mats can be added to the setup by dragging and dropping them in the corresponding square.

Finally a name can be added for the data viewer, and it can be added to the other data viewers by clicking on the green arrow.

6. Log window

The log window provides information about the scanning process:

```
02.21 10:46:04 - Parsing defined µCliMat Sensor mats
02.21 10:46:04 - Generating list of UnitIDs
02.21 10:46:04 - list of UnitIDs: 1 [029.08.00070]
02.21 10:46:05 - FTDI ports found [4] A4XW7VG9, A4XW7VNQ, A4XW7VO0, A4XW7VOB
02.21 10:46:05 - Scanning Hub for connected Units
...
```

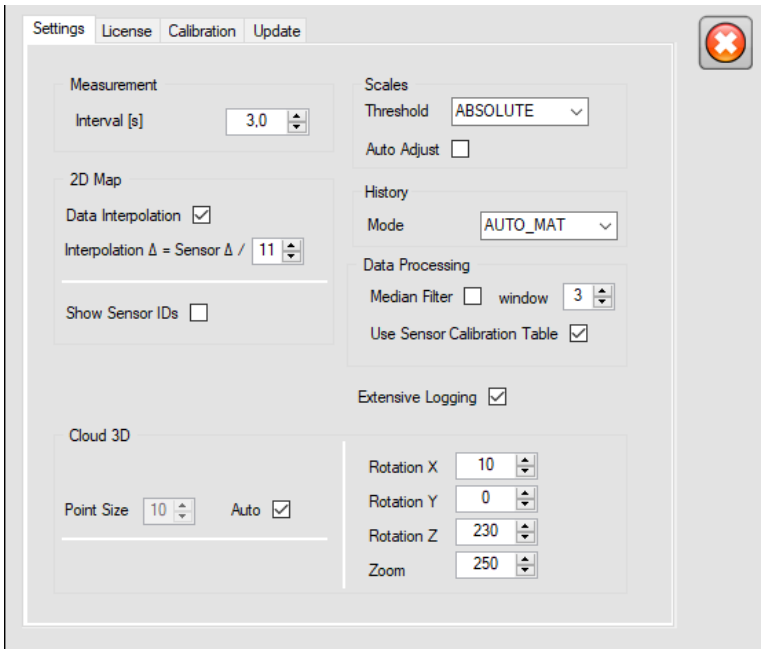
In case no sensor hub is connected, this shows in the log window as follows:

```
02.21 10:47:43 - FTDI ports found [0] 02.21 10:47:43 - ERROR Initializing
FTDI ports - Index was outside the bounds of the array.
02.21 10:47:43 - Error Connecting to FTDI port
...
```

Change the Configuration

The settings window can be shown by pressing on the settings icon in the top right corner:

The following window appears:



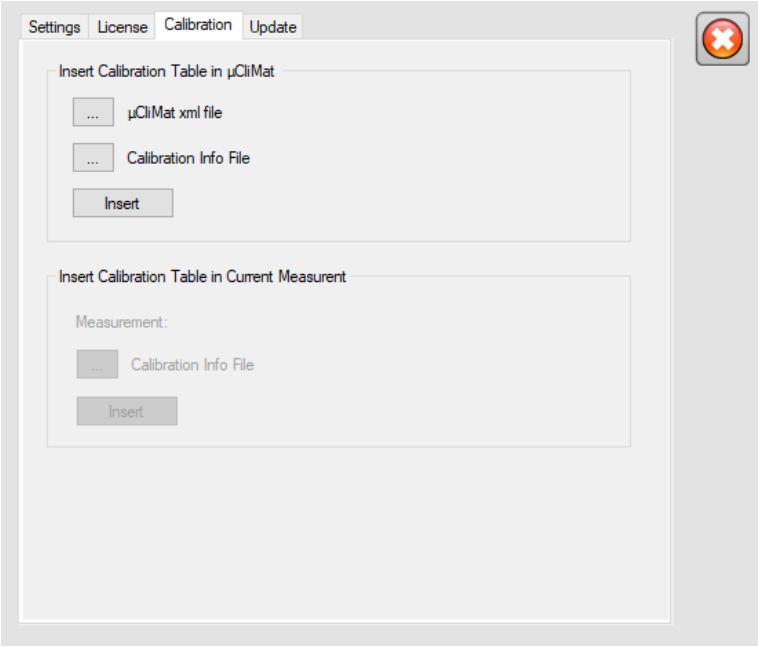
This first tab ("Settings") gives access to the following settings

1. **Measurement**: change the default polling interval (recommended value: 3 sec)
2. **2D map**: adjust the 2D data viewer visualization by changing the interpolation subset
3. **Sensor ID's**: toggle the sensor ID's on the 2D map data viewer (useful for checking the orientation of sensor mats)
4. **Cloud 3D (3D expert only)**: adjust the voxel size of the 3D visualization, and set the rotation axes and zoom level for the 3D clouds (useful for comparative imaging of different measurements)
5. **Scales**: the threshold values can be set by absolute values or by relative values (percentage of the limit range). The limits can also follow the data values of the measurement automatically (Auto Adjust).
6. **History**: the scales of the history windows from the data viewers can be set to **SCALE** (from the color scale setting), **AUTO** (optimal for all sensormats together) or **AUTO_MAT** (optimal for each sensor mat separately)
7. **Extensive logging**: by default a debugging log file is produced
8. **Data processing**: A median filter can be applied to data when loading previously recorded data sets. The user can also toggle the use of the calibration data (if available)

The second tab ("License") gives access to the License information:

More information about obtaining a license can be found in a separate document (available on the website ('How to get a license').

The "Calibration" tab allows the user to insert predefined calibration info into either a sensor mat definition file ("µCliMat xml file") or into the current measurement file.

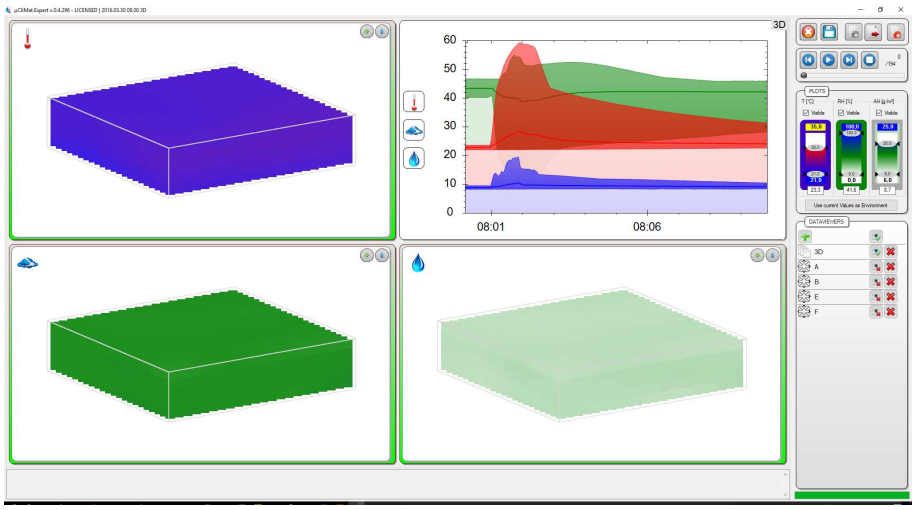


More information about the calibration procedure can be found in a separate document (available on the website ('How to re-calibrate the sensors')

The last tab ("Update") allows the user to change the auto-update settings, or to check for a new version manually.

3D Cloud Visualization (3D expert only)

After a setup data viewer has been created, the data can be visualized in 3D:



The 3D cloud view appears with 4 sub windows:

- 3D cloud temperature
- 3D cloud relative humidity
- 3D cloud absolute humidity
- Overall parameters values of Temperature, Relative humidity and Absolute humidity

Tip	By right-clicking on a sub-window of the 3D data viewer, the underlying image can be **exported to a bitmap**.

By clicking on the buttons next to the overall view of the parameters, the corresponding time-history curve is visualized or omitted:

In the top right corner of each 3D visualization sub window, 2 additional buttons are available:

	**Cross sections**: opens 3 sub windows showing the cross sections in 3 perpendicular planes. The position of these planes can be changed by moving the corresponding sliders
	**Maximize** parameter: maximizes the current parameter to the full (sub)window of this data viewer

General remarks

- Always close the software and power down the measurement hub before changing connections between islands or between islands and hub to prevent short circuits and damage to the electronics
- Maximal number of mating cycles: 30
- Avoid direct contact forces on the sensors; apply a pressure distributing material when used as a top layer.
- Avoid the use of an uneven subsurface like metal grids or similar directly underneath the sensor mat; apply a pressure distributing material when necessary.