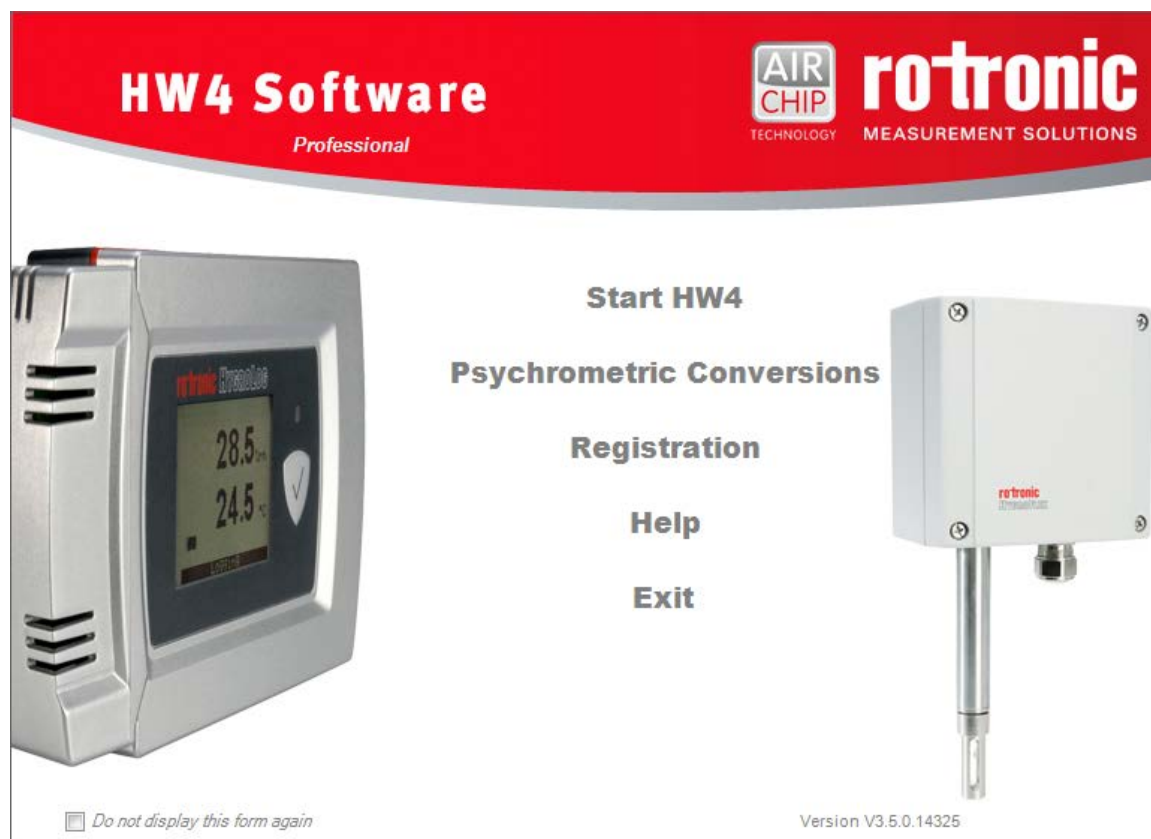


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HW4 Software

Device Manager and Data Logging HL-1D and TL-1D Data Loggers



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1 Organization of the HW4 Manuals

The HW4 manuals are organized in separate books so as to limit the size of the individual documents. A list of the HW4 manuals is provided in document **E-M-HW4v3-DIR**

HW4 Manuals	Contents
HW4 Main Book	General software description Installation, start-up and settings Device connection methods Functions common to all devices used with HW4
Device Specific Functions 1 (separate book for each device type or model)	Legacy devices (original HygroClip technology): - o HygroLog NT data logger - o HygroFlex 2, HygroFlex 3 and M3 transmitters (same icon in device tree) - o HygroLab 2 and HygroLab 3 bench indicators - o HygroPalm 2 and HygroPalm 3 portable indicators - o HygroClip DI digital interface - o HygroClip Alarm programmable logic - o HygroStat MB Device Manager (device configuration) and other device specific functions
Probe Adjustment 1	Humidity and temperature adjustment function common to all legacy devices (original HygroClip technology)
Device Specific Functions 2 (separate book for each device type or model)	Devices based on the AirChip 3000 technology: - o HygroClip 2 (HC2) probes - o HF3 transmitters and thermo-hygrostats - o HF4 transmitters - o HF5 transmitters - o HF6 transmitters - o HF7 transmitters - o HF8 transmitters - o HL20 and HL21 data loggers - o HP21, HP22 and HP23 hand-held indicators - o HygroLab C1 table-top indicator - o LOG-RC Wireless Data Loggers - o Custom designed OEM products Device Manager (device configuration) and Data Logging functions
Probe Adjustment 2	Humidity and temperature adjustment function common to all devices based on the AirChip 3000 technology
Data Recording Function	Data recording function common to all devices based on the AirChip 3000 technology

Both the HW4 manuals (software) and device specific manuals (hardware) are available from the HW4 CD. The manuals can also be downloaded from several of the ROTRONIC web sites.

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2 OVERVIEW

This section of the HW4 manual covers only the following HW4 modules:

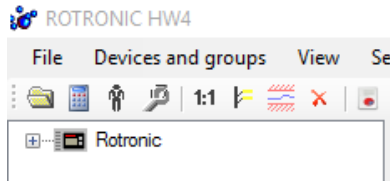
HW4 Functional Modules HL-1D / TL-1D	Usage
Device Manager	o HL-1D and TL-1D user configurable settings
Data Logging	o HL-1D and TL-1D
Probe Adjustment	o HL-1D (%RH only)

- o HW4 functions that are not device dependent are covered in the HW4 manual **E-M-HW4v3-Main**.

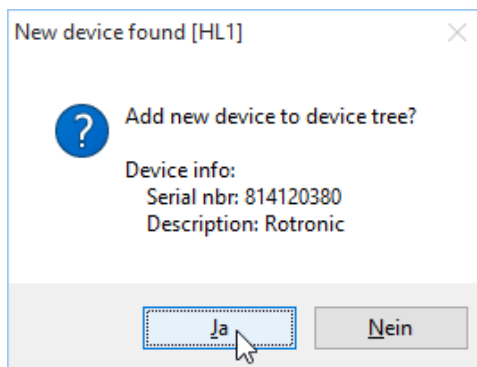
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3 Accessing HL-1D / TL-1D by HW4

Open HW4 and connect HL-1D or TL-1D by means of an USB cable (standard USB plug – mini USB plug) to an USB-Port of the PC, where HW4 is installed.

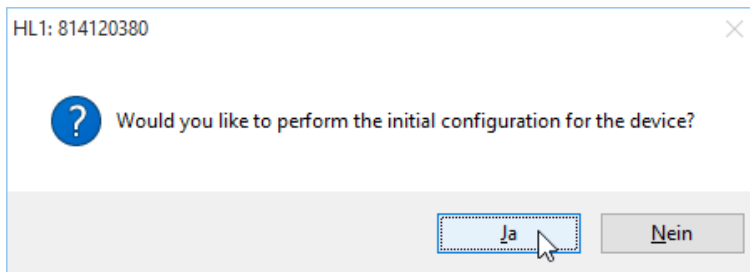


An icon with the name of the detected device appears in the left pane of the HW4 main screen.



Simultaneously a window opens, which informs you, that a new device [HL1] was found and asks you whether it shall be added to the device tree.

If you confirm an installation wizard opens and asks you “Would you like to perform the initial configuration for the device?”.



Click on “Yes” and a form named “Initial configuration” opens, where you can input the desired configuration parameters.

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Initial configuration

Load template
Save template

General

Device HL1
Serial 814120380
Battery 99,0 %
Description Rotronic
Time 01.01.2013 01:06:10 ☒ Update

Limits

	Low Limit	Hi Limit	Hysteresis
☒ Humidity	20	80	5
☒ Temperature	10	50	3

Logging

Recording mode Loop
Log interval 00:00:30
Start logging immediately ☐
Lock start/stop key ☐

Finish

General

Here you get some general information on the device like Device type, Serial Number, Battery capacity, and time. The field "Description" is filled in by default with "Rotronic". You may change it to a meaningful word with 8 characters max. like "Office-1". Checkmark "Update" for an automatic synchronization with the HW4 date and time.

Limits

Here you may change preset values for Low and High Limits and Hysteresis of Humidity and Temperature and switch the monitoring of these values on or off.

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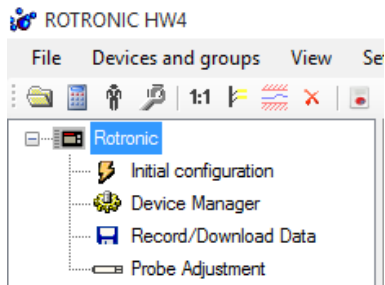
Logging

Decide whether the Logging Mode is "Loop" (if the memory is full the oldest logs are overwritten by the new log values) or "Stop if full". Select the Logging interval between 30 seconds and 23 hours 59 minutes in 1-sec-increments. Checkmark "Start logging immediately" to start logging immediately when the wizard is completed. Set a checkmark in the "Lock start/stop key" box to lock the key labeled START/STOP in the front plate of the logger.

A click on "Save template" saves the current configuration data to HW4, "Load template" retrieves them and overwrites the respective entries in the form. This is especially useful to configure a great many of loggers with identical parameters.

Press "Finish" and the entries will be written to the logger.

When the initial configuration was successful. Click on the + sign to the left of the icon to expand the device tree. Thereby a list of the available function modules is displayed: "Initial configuration", "Device Manager", "Record/Download Data" and "Probe Adjustment".



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4 Initial configuration

Here the same form opens which was presented by the configuration wizard, which started when HW4 found the logger for the first time. So you can easily reconfigure the device if desired.

Initial configuration

Load template
Save template

General

Device	HL1
Serial	814120380
Battery	99,0 %
Description	Rotronic
Time	28.11.2015 22:28:18 ☒ Update

Limits

	Low Limit	Hi Limit	Hysteresis
☒ Humidity	20	80	5
☒ Temperature	10	50	3

Logging

Recording mode	Loop
Log interval	00:00:30
Start logging immediately	☐
Lock start/stop key	☐

Finish

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5 Device manager

Device Manager is used to configure the data logger. It automatically interrogates the data logger and downloads its current configuration. To select the Device Manager module, click on it with the left mouse button. HW4 opens the Device Manager form named "Device information".

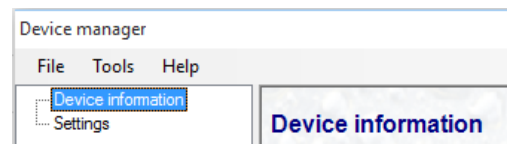
HL-1D data logger:



The sub-forms "Device information" and "Settings" that are available within the Device Manager form are listed in a tree located on the left pane of the form. To select a sub-form, click on it with the left mouse button.

5.1 Device Manager Menu Bar

The Device Manager menu bar is located at the top of the Device Manager form.

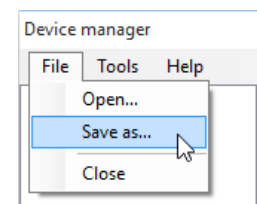


File

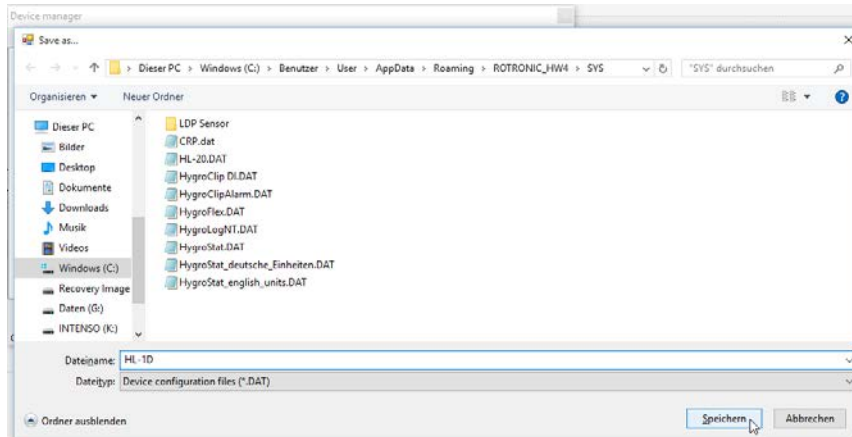
The file menu is used to save the configuration settings of the data logger to the PC, or to retrieve them from the PC. The settings are saved in an XML file with the extension DAT. Saving the configuration settings to a file is useful for several reasons:

- provides a backup when the device configuration has been changed in error
- provides a means of quickly configuring a replacement device in the exact same manner as the original device
- provides a means of quickly configuring a number of identical devices

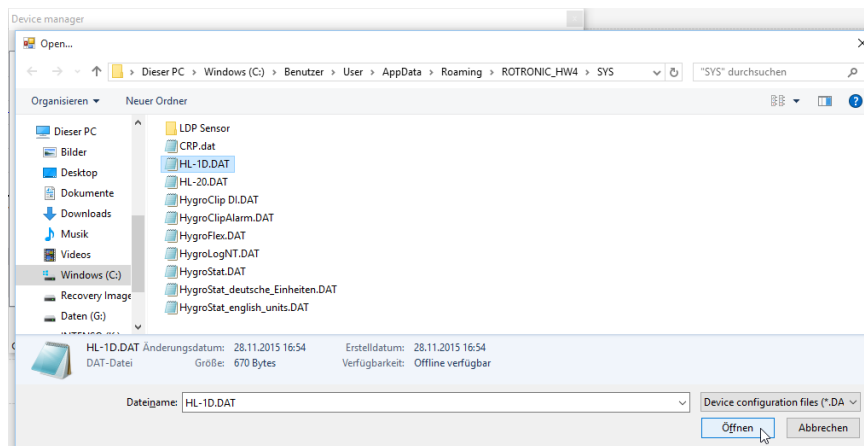
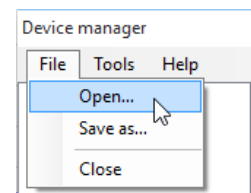
Save as ... saves the current configuration to an XML file with the extension DAT) in the device configuration folder specified in HW4 Global Settings - File Locations Tab. If so desired, any directory and any file type may be specified.



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Open: opens the device configuration folder specified in HW4 Global Settings - File Locations Tab - and displays all available probe and device configuration files (extension DAT). Select the appropriate file and click on Open in the explorer form. The contents of the configuration file are loaded to the Device Manager form. Review the contents of the Device Manager sub-forms. Click on the Device Manager OK button to write the configuration settings to the device or click on the Cancel button to leave the device unchanged.

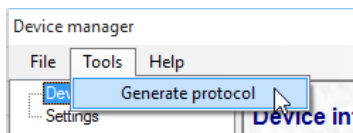


Close: exits Device manager.

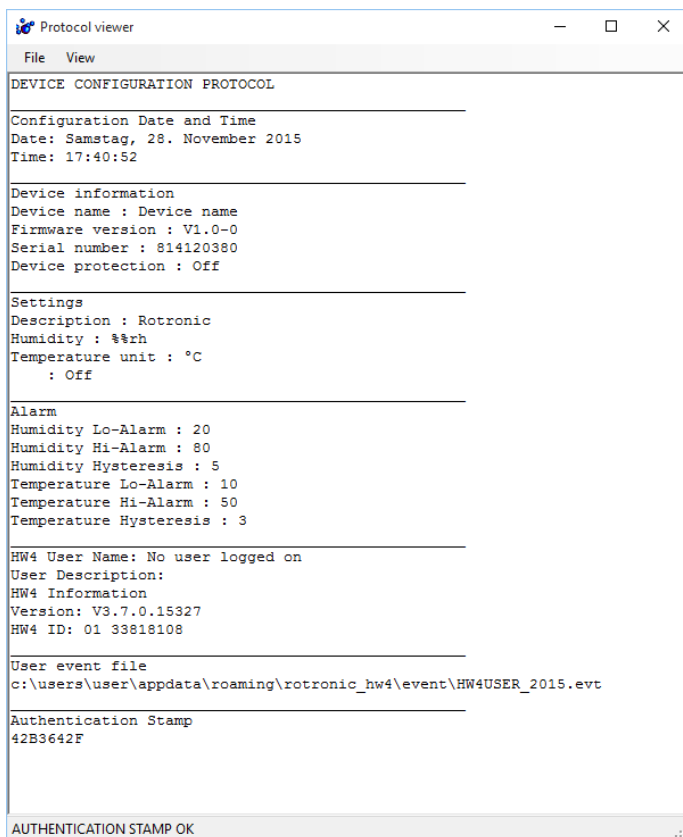


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Tools



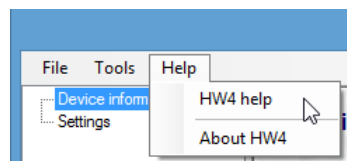
Generate Protocol: generates a Device Configuration Protocol. This text file is automatically saved in the folder specified in HW4 Global Settings - File Locations Tab. If so desired, any directory and any file type may be specified. This action is not recorded in the User Event file.



Help

HW4 help: Opens HW4 Help

About HW4: Displays the version number and ID number of HW4



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5.2 Device Information



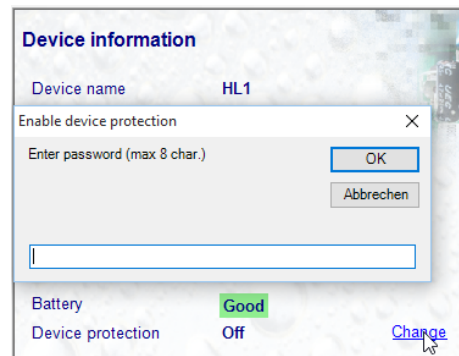
Battery: battery status is simplified by following explanations

Good 90 to 100 %
Normal 15 to 90 %
Poor 0 to 15 %

Device protection: This function is used to prevent unauthorized access to critical functions such as configuration changes, humidity and temperature adjustment, etc.

Click on the underlined link [Change](#) next to "Device protection". HW4 opens a form named "Enable device protection" if the current device protection status is "Off". Input a password (max. 8 characters) and confirm with "OK". The device protection status changes to "On".

To reverse a Device protection "On" status to "Off", click [Change](#). A form "Disable device protection" appears, where you input the password and confirm with "OK". The device protection status changes to "Off".

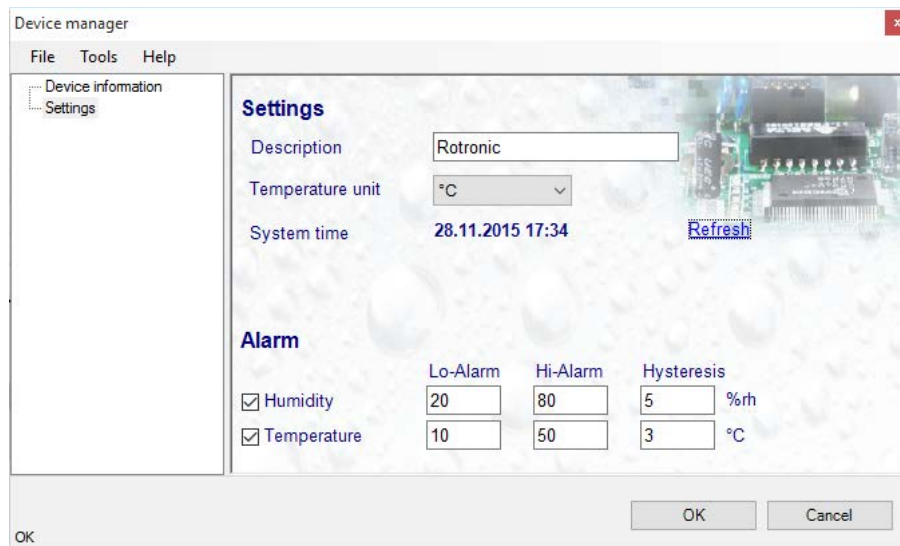


Click on the Device Manager OK button to write the new protection settings to the data logger.

FORGOT THE PASSWORD? – Remove the battery from the data logger and disconnect the data logger from the PC. After re-inserting the battery and re-connecting the data logger to the PC, you have about one minute to use the default password **!resume!** (include the exclamation marks). After one minute the default password is no longer accepted.

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5.3 Settings



Settings (HL-1D data logger)

Description: As far as possible use a unique device name (maximum 8 characters)

- **Temperature unit:** Left click on the arrow to the right of the text box and select the temperature engineering unit (°C or °F).
- **System Time:** click on the blue link labeled “Refresh” to set the data logger internal real time clock to the date and time of the PC.
- **Lock Start/Stop key:** enables or disables the Start/Stop button on the data logger.

Alarm

Depending on the data logger model, alarm conditions can be defined for humidity and / or temperature. Values that are below the low alarm value or above the high alarm value will trigger an alarm. The value specified for the alarm function hysteresis is used for both the low and the high alarm.

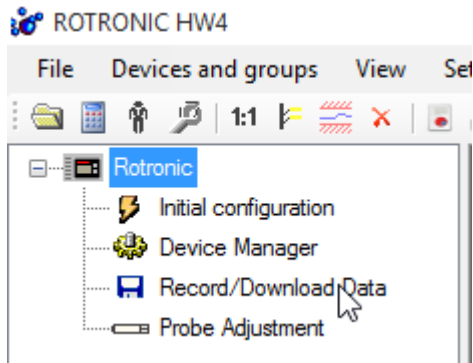
The alarm function is activated by clicking on the box next to humidity or temperature. The check mark shows that the alarm is activated.

This function applies only to the data logger display (a red LED flashes and either Hi or Lo appears on the display below the parameter unit symbol). No alarm appears in HW4.

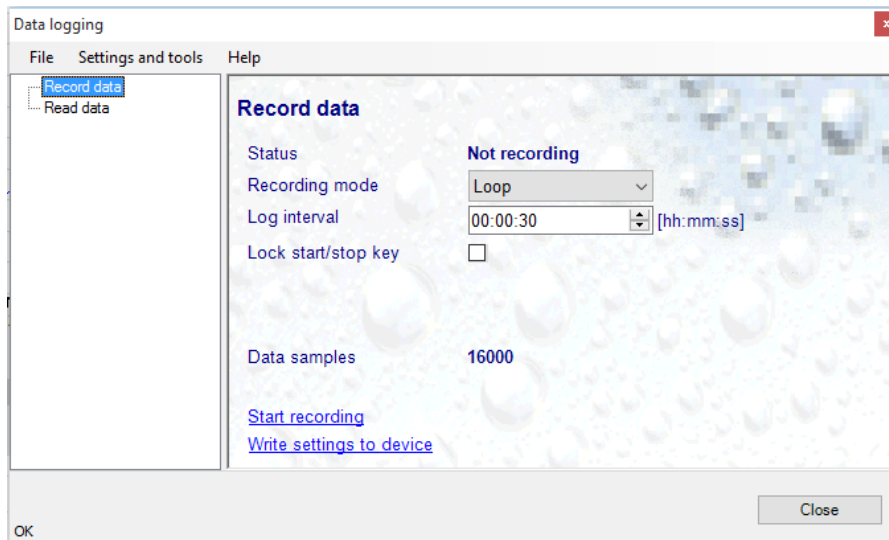
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6 Record/Download Data

Record/Download Data is used to configure the data logging function, to start and stop data logging and to download the recorded data to the HW4 PC.



To select Record/Download Data, click on it with the left mouse button. HW4 opens the Data Logging form.



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6.1 Record Data

This form is used to select the following:

Recording mode:

- **Stop if full:** ends the recording when the memory is full
- **Loop:** when the memory is full, keep recording and dump the oldest data record

Log Interval: 30 seconds to 23 hours 59 Minutes in 1 second increments.

[Start recording](#): click on this link to start recording data

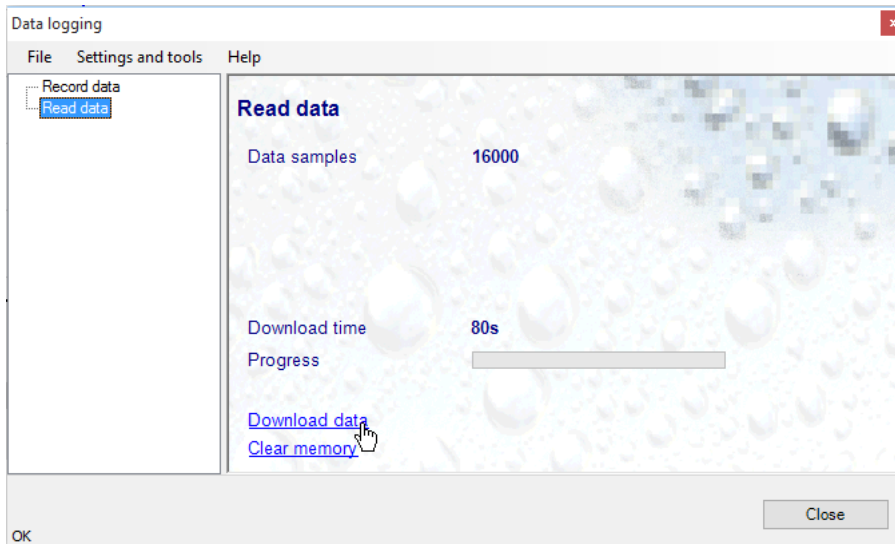
[Write setting to device](#): click on this link to write the recording settings to the data logger

When the recording is started the data logging form changes to

[Stop recording](#): click on this link to stop recording data immediately and the "Data Logging - Record Data" form reappears.

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6.2 Read Data



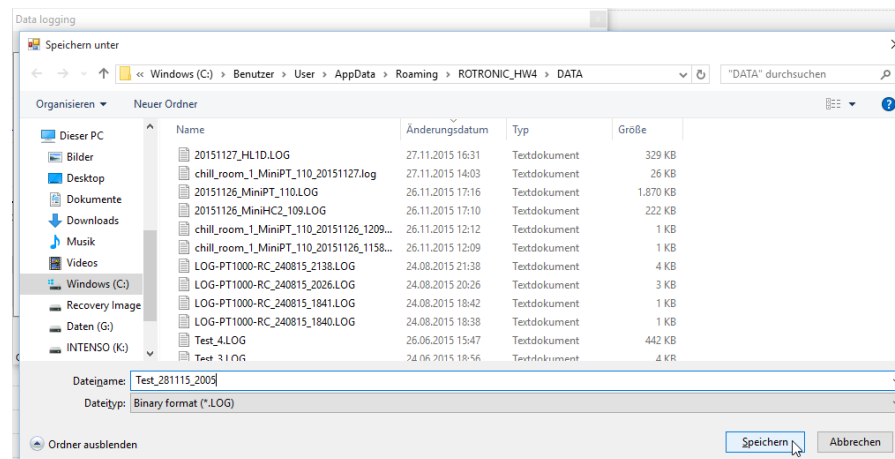
This form is used to download to the PC the data present in the data logger memory. The file can be downloaded even when data is still being recorded.

Notes:

- o The file format (text file - .txt or binary - .log) used by HW4 when saving the data to disk can be configured from the menu bar of the Data Logging form: Settings and Tools > Log File Format
- o HW4 can print a protocol of the Data Logging settings: Settings and Tools > Generate Protocol

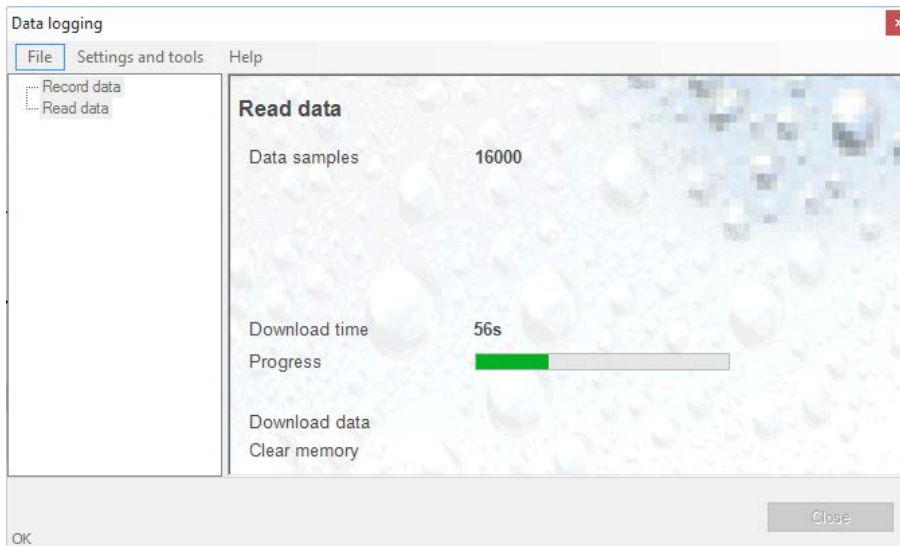
Download Data: click on this link to download and view the recorded data

Enter a file name when the following form opens and click on "Save"



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During the download the following form appears:



A green progress bar indicates the status of the download. The form disappears when the download is finished and the data saved in the specified file.

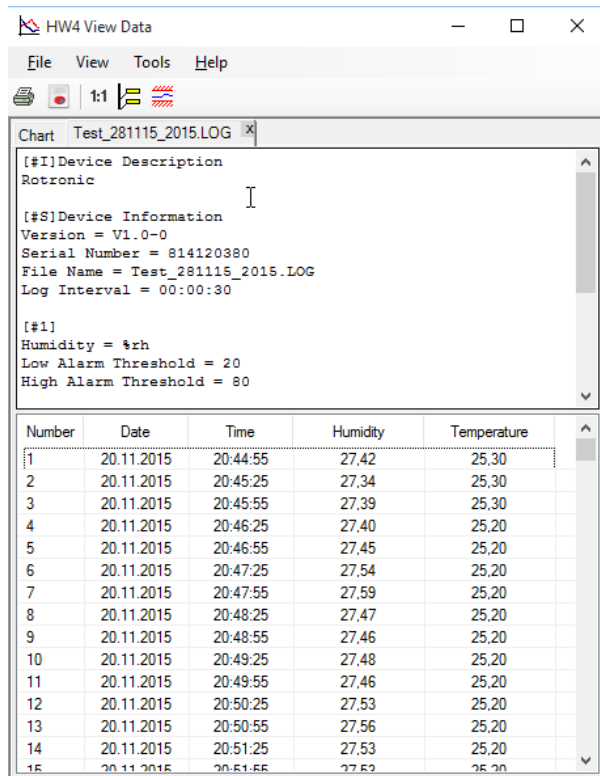
"Download time" gives an estimation of the remaining download time.

After saving the data, HW4 automatically opens HW4 Data View (see HW4 manual **E-M-HW4v3-Main** for details)



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For a list view of the saved data click on "Test_281115_2015.LOG".



The screenshot shows the 'HW4 View Data' window. It has a menu bar with 'File', 'View', 'Tools', and 'Help'. Below the menu is a toolbar with icons for file operations and a zoom level of '1:1'. The main area is titled 'Chart Test_281115_2015.LOG'. It contains a text area with the following information:

```
[#I]Device Description
Rotronic

[#S]Device Information
Version = V1.0-0
Serial Number = 814120380
File Name = Test_281115_2015.LOG
Log Interval = 00:00:30

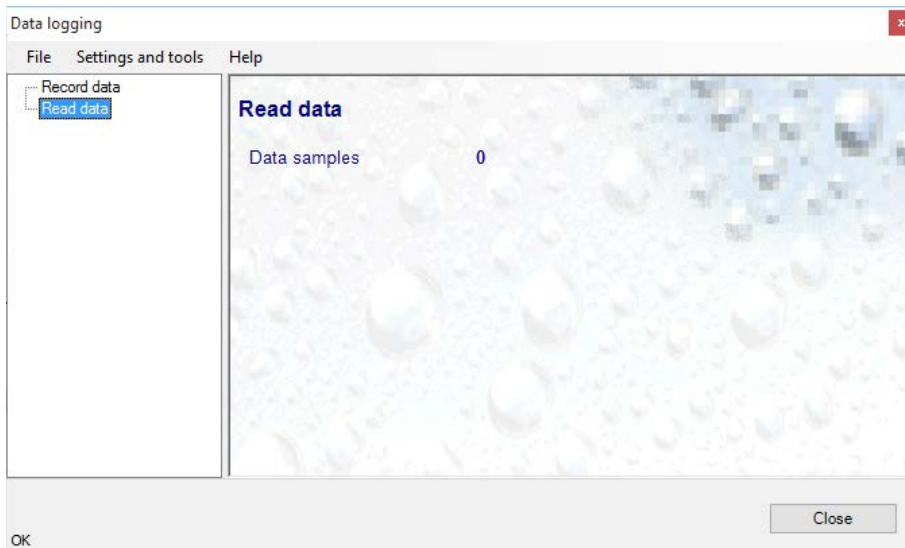
[#1]
Humidity = %rh
Low Alarm Threshold = 20
High Alarm Threshold = 80
```

Below the text area is a table with 5 columns: Number, Date, Time, Humidity, and Temperature. The table contains 15 rows of data.

Number	Date	Time	Humidity	Temperature
1	20.11.2015	20:44:55	27.42	25.30
2	20.11.2015	20:45:25	27.34	25.30
3	20.11.2015	20:45:55	27.39	25.30
4	20.11.2015	20:46:25	27.40	25.20
5	20.11.2015	20:46:55	27.45	25.20
6	20.11.2015	20:47:25	27.54	25.20
7	20.11.2015	20:47:55	27.59	25.20
8	20.11.2015	20:48:25	27.47	25.20
9	20.11.2015	20:48:55	27.46	25.20
10	20.11.2015	20:49:25	27.48	25.20
11	20.11.2015	20:49:55	27.46	25.20
12	20.11.2015	20:50:25	27.53	25.20
13	20.11.2015	20:50:55	27.56	25.20
14	20.11.2015	20:51:25	27.53	25.20
15	20.11.2015	20:51:55	27.52	25.20

When done close HW4 View Data:

Clear memory: click on this link to erase the logger memory prior to a new recording. The Data samples counter is thus reset to 0.



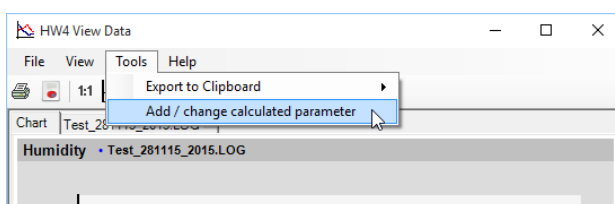
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6.3 Adding a calculated parameter to the log file (HL-1D only)

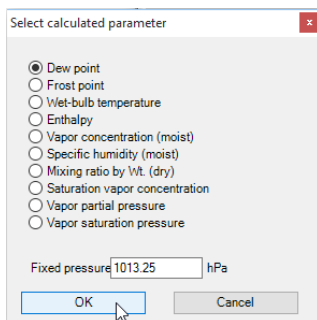
HW4 View Data can be used to add a calculated parameter such as dew point to a log file comprised of relative humidity and temperature records. The parameter is calculated for each data record based on the relative humidity and temperature values.

HW4 View Data can also be used to replace the calculated parameter in a log file with a different one.

HW4 View Data opens automatically after reading data from the data logger. Files that have already been downloaded can be opened from the HW4 main menu bar by selecting File > Open.

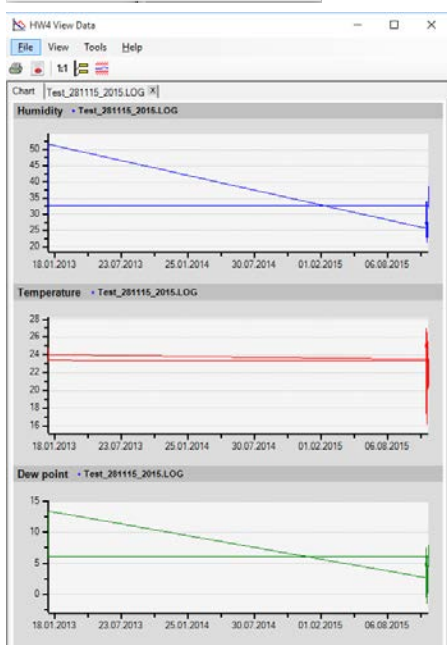


To access the “Add / Change Calculated Parameter” function, click on “Tools” in the HW4 View Data menu bar and select “Add / Change calculated parameter”. This opens the following form named “Select calculated parameter”. Use this form to select one of the available calculated parameters (here Dew point).



NOTE: some parameters such as Enthalpy, Mixing Ratio etc. require barometric pressure as a calculation input. Be sure to enter the correct pressure value in the form.

Click on the OK button to add the selected calculated parameter or change the existing calculated parameter. See the result below: A Dew Point graph in the Chart and a new column named Dew point is added. If a value over a red background should occur, this would denote an alarm condition.

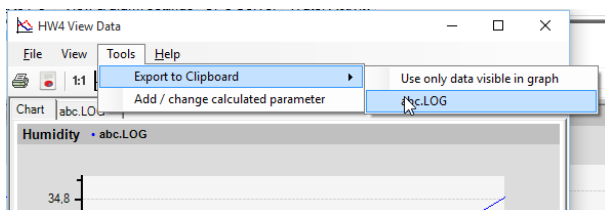


Number	Date	Time	Humidity	Temperature	Dew point
1	20.11.2015	20:44:55	27,42	25,30	5,201
2	20.11.2015	20:45:25	27,34	25,30	5,159
3	20.11.2015	20:45:55	27,39	25,30	5,185
4	20.11.2015	20:46:25	27,40	25,20	5,105
5	20.11.2015	20:46:55	27,45	25,20	5,131
6	20.11.2015	20:47:25	27,54	25,20	5,178

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6.4 *Export to clipboard*

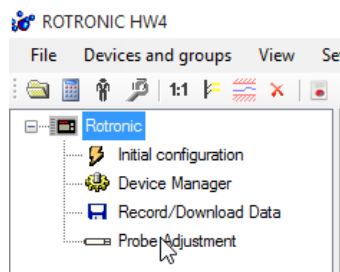
To access “Export to Clipboard” click on “Tools” and position the mouse pointer over “Export to Clipboard”. Two alternatives are presented: “Use only data visible in graph” or the full LOG file. The data may be copied by pressing Ctrl-C from the clipboard into any appropriate application. Sometimes an adjustment of the column positions may be necessary.



Number	Date	Time	Humidity	Temperature
1	28.11.2015	20:44:00	34,09	23,80
2	28.11.2015	20:44:30	33,80	23,80
3	28.11.2015	20:45:00	34,38	23,80
4	28.11.2015	20:45:30	34,81	23,80

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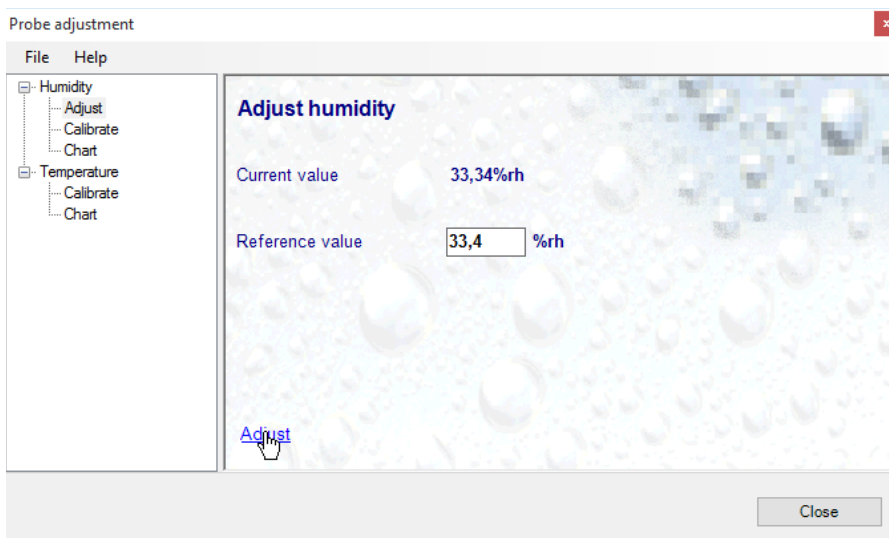
7 Probe Adjustment



7.1 Humidity (HL-1D only)

7.1.1 Adjust

The HL-1D allows a 1-point adjustment of relative humidity (offset). The “Adjust humidity” form displays the currently measured humidity value.



Reference value: when the measurement is stable, enter the reference humidity value in this box.

Note prior to entering the reference value you may want to use the “Chart” utility to verify that the measured data is stable

Adjust: when ready click on the blue link labeled “Adjust”

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7.1.2 Calibrate

The "Calibrate Humidity" form displays the currently measured humidity value. This form can be used to capture a number of calibration point (no adjustment) and to generate a calibration protocol.

Reference value: when the measurement is stable, enter the reference humidity value in this box

Note: prior to entering the reference value you may want to use the "Chart" utility to verify that the measured data is stable

[Save Calibration Point:](#) click on this link to have HW4 capture the calibration point.

The table on the right shows the calibration points that have been captured by HW4. Note that calibrations points are not retained in the data logger and that they will be lost as soon as the form is closed.

To remove a specific calibration point or all calibration points right click on the table. This opens the small menu shown below:

No.	Reference	Measured
1	20.00%rh	19.95%rh
2	80.00%rh	78.94%rh

Delete selected calibration point
Delete all calibration points

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[Calibration Protocol](#): click on this link to generate a calibration report when calibration data is present in the table.



Calibration protocol

Date: Samstag, 28. November 2015
Time: 21:52:41

Device info
Version: V1.0-0
Serial number: 814120380
Description: Rotronic
Device protection: Off

Calibrate humidity
Reference 1
Reference value: 34,00%rh
Measured: 33,64%rh
Reference 2
Reference value: 60,00%rh
Measured: 60,67%rh
Reference 3
Reference value: 90,00%rh
Measured: 89,08%rh

User: No user logged on
Description:

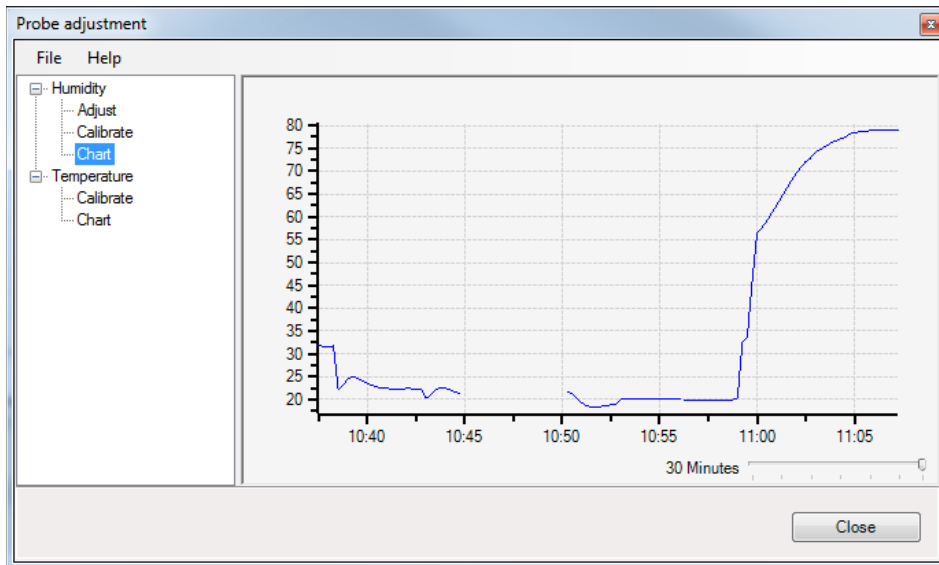
HW4 version: V3.7.0.15327
HW4 ID: 01 33818108

User events file:
c:\users\user\appdata\roaming\rotronic_hw4\event\HW4USER_2015.evt

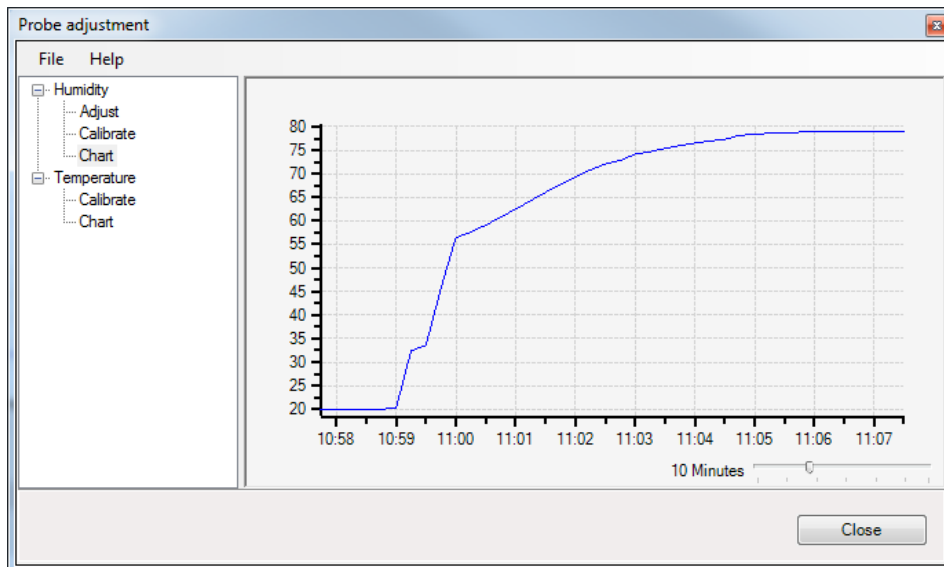
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7.1.3 Chart

Chart displays the most recent measurement data in graphical form and can be used as a tool to verify that the data has been stable during the period of time immediately preceding the acquisition of the calibration point.



With the slider at the bottom right of the graph the period of time immediately preceding the acquisition of the calibration point can be reduced.



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[Save Calibration Protocol](#): click on this link to generate a calibration report when calibration data is present in the table.

Calibration Protocol



Calibration protocol

Date: Samstag, 28. November 2015
Time: 22:11:03

Device info
Version: V1.0-0
Serial number: 814120380
Description: Rotronic
Device protection: Off

Calibrate temperature
Reference 1
Reference value: 25,00
Measured: 24,88
Reference 2
Reference value: 50,00
Measured: 50,50
Reference 3
Reference value: 60,00
Measured: 60,64

User: No user logged on
Description:

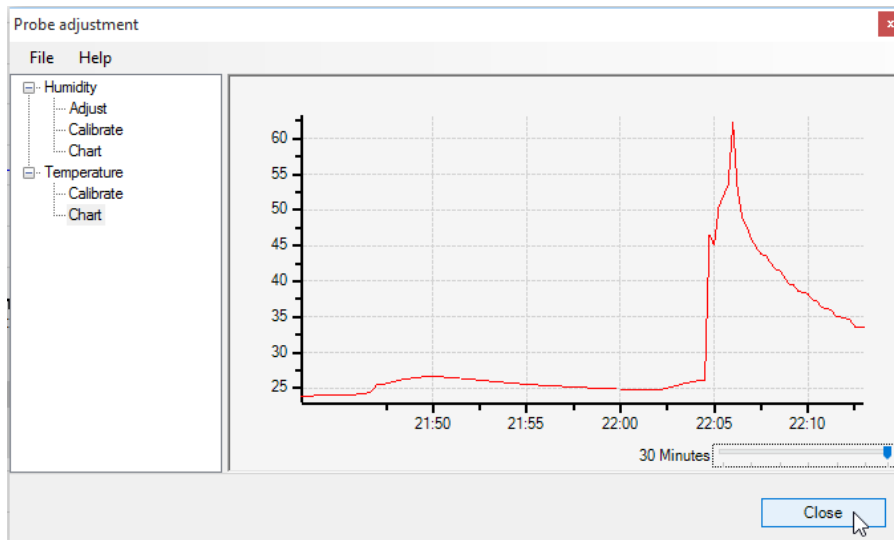
HW4 version: V3.7.0.15327
HW4 ID: 01 33818108

User events file:
c:\users\user\appdata\roaming\rotronic_hw4\event\HW4USER_2015.evt

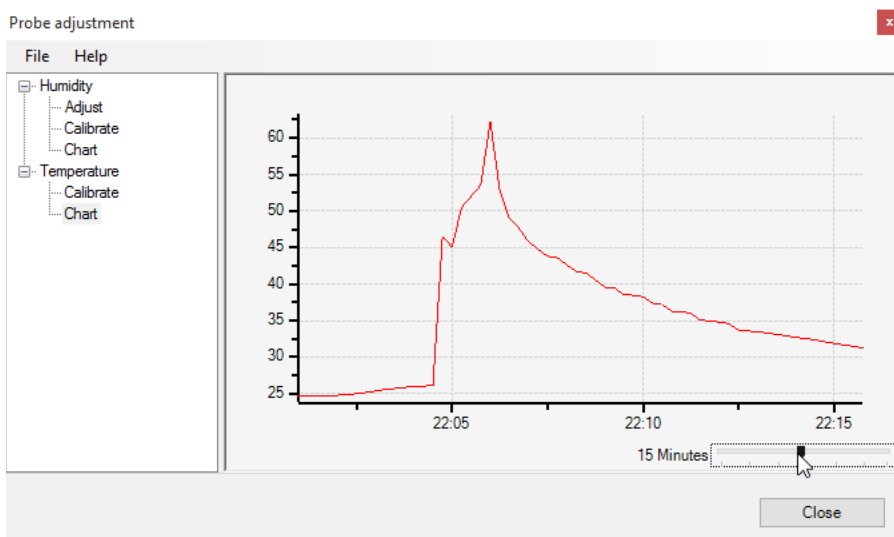
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7.2.2 Chart

Chart displays the most recent measurement data in graphical form and can be used as a tool to verify that the data has been stable during the period of time immediately preceding the acquisition of the calibration point.



With the slider at the bottom right of the graph the period of time immediately preceding the acquisition of the calibration point can be reduced.



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8 Document Releases

Release	Software Ver.	Date	Notes
_10	3.4.0	Apr. 16, 2014	Original release
_11	3.5.0	Dec. 15, 2014	- Updated to HW4 v3.5.0 - Added calibration of %RH (HL-1D) and temperature (HL-1D and TL-1D)
_12	3.6.0	June 29, 2015	- Updated to HW4 v3.6.0 - Addition of an initial configuration wizard
_13	3.7.0	November 2015	- Updated to HW4 v3.7.0 - Update of initial configurator