NOVUS
We Measure, We Control, We Record

LogBox-RHT-LCD

TEMPERATURE AND HUMIDITY LOGGER – INSTRUCTIONS MANUAL V2.0x A

1 PRESENTATION

LogBox-RHT-LCD is an electronic temperature and relative humidity logger. Sensors measure these quantities and the values obtained are visualized on the LCD display and stored in electronic memory. The stored data is later sent to a computer, which allows it to be viewed and analyzed in the form of tables or graphs. It is possible to configure the humidity output to display the measured **Relative Humidity** value or the **Dew Point** temperature value.

The **NXperience** software is the tool used to set up the device and view the data downloaded by the logger. Parameters such as acquisition start and end times and intervals between acquisitions, for example, can be easily configured through the **NXperience** software.

The data acquired by the logger can be exported for analysis in other programs, such as spreadsheet programas.

1.1 IDENTIFICATION

The identification label is attached to the logger housing. Verify that the characteristics described on this label are in accordance with what was requested. The **RHT-LCD** model measures temperature and relative humidity.

The following elements are shown in the logger front:

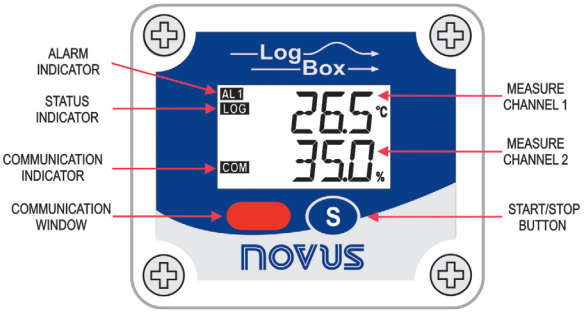


Figure 1 – Logger Front

START / STOP button: Button that can be configured to start or stop acquisitions. When pressed, it also used to navigate or change screens.

Status Indicator (LOG): This indicator will be active when the logger is performing acquisitions and will be deactivated when the acquisitions are finished or while they are not started.

Alarm Indicator (AL1 and/or AL2): This indicator informs you of alarm situations that have occurred and will be active whenever an alarm situation occurs. It will remain in this condition until a new configuration is applied to the logger.

IR Communication Window (COM): This indicator is activated when a communication attempt is made or when communication between the logger and the computer is established.

2 SPECIFICATIONS

Operating temperature	From -40 °C to 70 °C
Sensor measurement range	Temperature: -40.0 °C to 80.0 °C. Relative Humidity (RH): 0.0 to 100.0 %, without condensation. Dew Point: -40.0 °C and 100.0 °C
Accuracy	See **Figure 2**. **Note**: In the **Offset** parameter of the **NXperience** software, you can erase the measurement error found.
Measurement resolutions	Temperature: 0.1 °C 14 bits (16383 levels) Relative Humidity (RH): 0.1 % 12 bits (4095 levels)
Response time	Temperature: Up to 30 seconds with fairly still air. Humidity: Up to 8 seconds with fairly still air (20 to 80 % RH).
Memory capacity	32.000 (32 k) logs: **Half** for each channel or **total** when one of the channels is not enabled.
Measurement interval	1 second min. 18 hours max.
Power supply	3.6 Vdc lithium battery (1/2 AA), built-in
Estimated autonomy	Higher than 200 days with weekly data reading. Frequent logged data readings may shorten battery life and the interval between acquisitions is too short.
Housing	Polycarbonate
Protection	Suitable for products with protection level **IP40**.
Dimensions	60 x 70 x 35 mm
Logger-PC data transfer time	According to the number of logs. 40 seconds for 16.000 logs.
PC interface	Interface IR/USB or IR/Serial.
NXperience software	Configurator software for Windows 10, 8, 7 and XP. Menus in Portuguese, English, French or Spanish.

2.1 MEASUREMENT ACCURACY

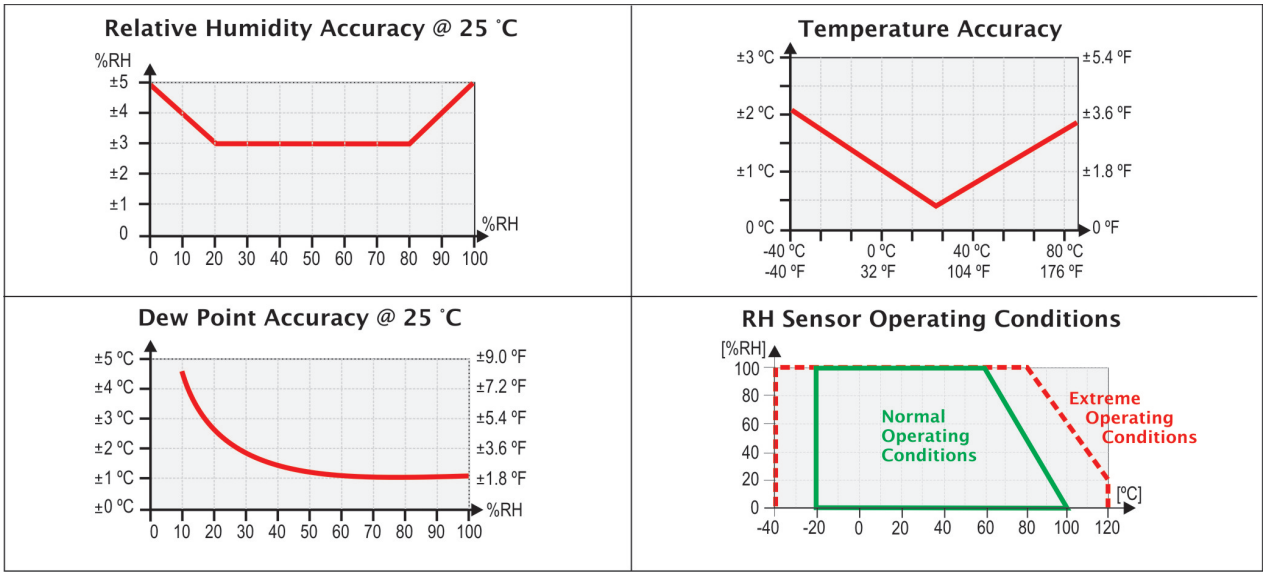


Figure 2 – Accuracy

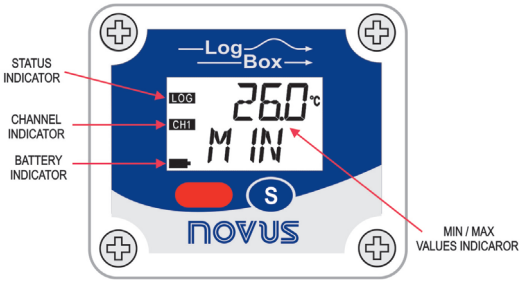


Figure 3 – Logger front (CH1)

Channel Indicator: Indicates the channel selected.

Battery Indicator: When the battery voltage is low, the battery symbol will be shown.

MIN / MAX Values Indicator: **Minimum** and **maximum** value of each channel during readings.

3 OPERATION

To use the device, you must install the NXperience software on a PC, according to the steps described in the NXPERIENCE SOFTWARE section.

The communication between logger and PC is performed with a **IR-Link Interface**.

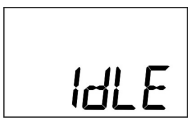
The logger operation mode set up is defined by using **NXprience** software. The configuration is sent to the logger through the **IR-Link Interface**.

The logger starts and ends the acquisitions according to the configuration made.

3.1 REGISTER SCREENS

BATTERY SAVING MODE – IdLE

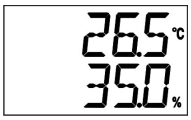
Low battery consumption mode. The logger does not communicate. It always stays in this mode after reset; register does not make acquisitions and does not up-date screen measures. For skipping IdLE mode, press S button for activating communication temporarily. After an acquisition configuration has been sent, it will definitely be out of IdLE mode.



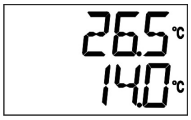
Battery Saving Mode

MAIN SCREEN

Indication screen for values measured by the register:



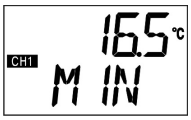
1st Screen – Temperature and Humidity



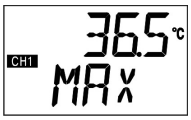
2nd Screen – Temperature and dew point

INDICATOR SCREEN MIN / MAX – CH1

It indicates the minimum and maximum value of **Chanel 1** during the acquisitions.



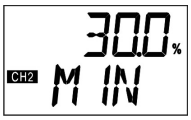
3rd Screen – CH1 Minimum Value



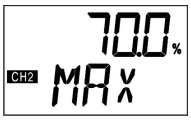
4th Screen – CH1 Maximum Value

INDICATOR SCREEN MIN / MAX – CH2

It indicates the minimum and maximum value of **Chanel 2** during the acquisitions.



5th Screen – CH2 Minimum Value



6th Screen – CH2 Maximum Value

COMMUNICATION SCREEN IR - COM

It sets IR communication to automatic or manual:

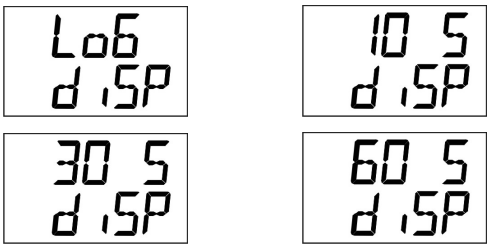
- In the **automatic** mode (AUt), communication will be always active. For communicating, just direct the interface and use **NXperience** or **LogChart II** software. It always stays in this mode after *reset*.
- In the **manual** mode (mnAn) communication will be active 20 seconds, after pressing the S button. During this time, a communication shall be initiated for keeping the IR Communication active.

7th Screen – IR Communication Screens

DISPLAY UPDATING INTERVAL SCREEN - diSP

It sets the reading time of the sensor for the display updating. When selected by **LoG**, it performs the sensor reading and the display updating, according to the interval set for acquisition.

When selected by **10 S**, **30 S** or **60 S** it performs sensor reading for display updating every 10, 30 or 60 seconds. In this mode if the acquisition interval is shorter than the time set in the screen **diSP**, display will be updated according the acquisition interval.



8th Screen – Updating Interval Screens

4 BATTERY AUTONOMY

The estimated battery autonomy is above 200 days. This autonomy is directly related to the register using mode. The shorter is the interval of the sensor reading, the smaller will be the autonomy, and it can last only 30 days, in the worst case.

For saving battery energy it has to set the longest interval possible between acquisitions, as well as for display updating.

Examples:

Example 1: Acquisitions interval equal to 10 minutes and **diSP** screen in **LoG** mode. In this case, logger remains sleeping and actives only in every 10 minutes to read the sensor, update the display and make the acquisitions.

Example 2: Acquisitions interval equal to 10 minutes and **diSP** screen in **60 S** (60 seconds). In this case, logger remains sleeping and activates in every 1 minute to measure the sensor and update the display. And every 10 minutes, it activates and measures the sensor for making the acquisitions.

Comparing the **Ex. 1** and the **Ex. 2** with same acquisitions interval, the second example consumes 10 times more battery regarding the first one, due to the constant sensor reading for display updating.

Example 3: Medium, minimum and maximum mode.

When one of these acquisition modes is used, 10 sensor readings are performed to make one acquisition. If the acquisition interval is equal to 10 minutes and **diSP** screen is in **LoG** mode, in every 1 minute a measure will be made to make the 10 necessary measures for an acquisition. In this case consumption will be same as **Ex. 2**.

Example 4: Starting and ending of acquisitions.

It has to observe the best start and end acquisitions mode to save battery, due to necessity of the measures.

If the process in which the measures are performed, only a short interval happens. The best is to use start and end of acquisitions by S button.

If process occurs on a daily basis during the day, the best way is to use the start and end by date and daily repetition.

5 INTERFACE INSTALLATION

In the **IR-Link3 / RS232** model there is a RSR232 / Ir communication interface. It must be connected to the serial port at the PC.

In the **IR-Link3 / USB** model there is a USB / Ir communication interface, which must be connected to the available USB port.

6 REGISTER CONFIGURATION

You can configure the **LogBox-RHT-LCD** using **NXperience** software. To do this, however, the Communication Interface must be connected to the computer.

The interface must be facing the front panel of the logger (communication window) at all times and at a maximum distance of 15 cm, as shown in the figure below:

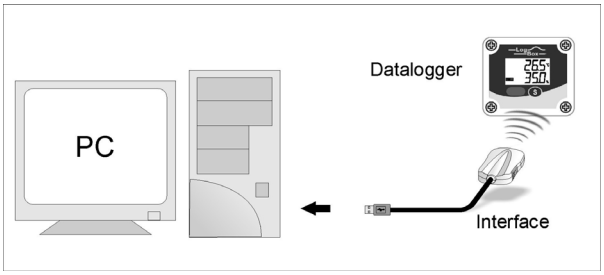


Figure 4 – Infrared communication interface position

7 NXPERIENCE SOFTWARE

7.1 INSTALLING NXPERIENCE

NXperience software allows you to explore all the features of the device by communicating through its USB interface. It is also a complete tool to perform the analysis of the data logged by **LogBox-RHT-LCD**.

To install **NXperience**, just run the ***NXperience.exe*** file, available from our website www.novusautomation.com.

7.2 RUNNING NXPERIENCE

When you open **NXperience**, the main window is displayed:

Figure 5 – **NXperience** main window

7.3 CONFIGURING THE DEVICE

For device configuration is necessary that the device is connected to the computer. See **Fig. 5**.

Once connected, you must run **NXperience**, click **Configure**, and then click on **Read Device**.

7.3.1 GENERAL PARAMETERS

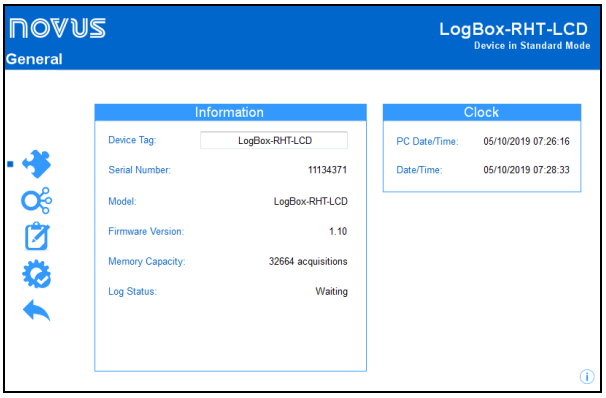


Figure 6 – General parameters

INFORMATION

- **Device Tag**: Allows you to set a name, which will be used as channel identification during a download, for the digital channel. The field accepts up to 16 characters.
- **Serial Number**: Shows the device unique identification number.
- **Model**: Shows the device model name.
- **Firmware Version**: Shows the firmware version recorded in the device.
- **Memory Capacity**: Shows memory space still available for new logs.
- **Log Status**: Informs if the device is registering or not.

CLOCK

- **PC Date/Time:** Shows the date and time of the computer.
- **Date/Time:** Shows the date and time of the device when it was read by **NXperience**.

7.3.2 CHANNELS PARAMETERS

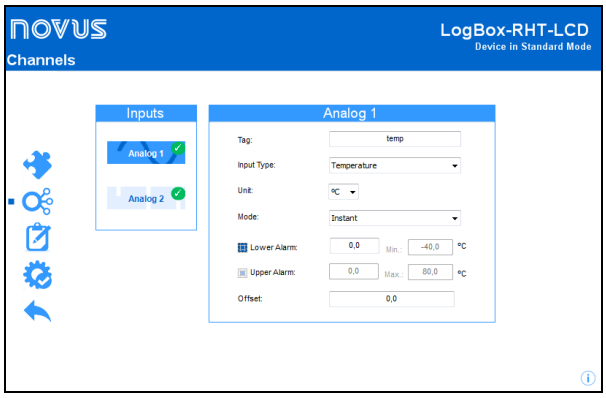


Figure 7 – Channels parameters

- **Tag:** Allows you to set a name, which will be used as channel identification during a download, for the channel. The field allows up to 16 characters.
- **Input Type:** Displays the channel input type: Temperature for Analog Channel 1 and Relative Humidity for Analog Channel 2.
- **Unit**: Allows you to select the channel unit display mode: Celsius (°C) or Fahrenheit (°F) for Analog Channel 1 and percentage of relative humidity (%) for Analog Channel 2.
- **Mode**: It defines how the value measured will be registered.
  - **Instant**: The value logged will be exactly the value measured at each interval defined. Measurement is taken at the end of the defined interval. The minimum interval between measurements is 1 seconds.
  - **Maximum**: The value logged will be the maximum value found within ten consecutive measurements taken within a predefined interval. The minimum interval between measurements is 10 seconds.
  - **Minimum**: The value logged will be the minimum value found within ten consecutive measurements taken within a predefined interval. The minimum interval between measurements is 10 seconds.
  - **Medium**: The registered value will be the average of ten measurements made on log interval. The minimum time between each record is 10 seconds.
- **Lower Alarm:** Allows you to enable and configure a lower alarm setpoint (option available only if the Start Mode is set to "Immediate Start" or "Date/Time").
  - **Minimum:** Displays the minimum temperature supported by the device.
- **Upper Alarm:** Allows you to enable and configure a higher alarm setpoint (option available only if the Start Mode is set to "Immediate Start" or "Date/Time").
  - **Maximum:** Displays the maximum temperature supported by the device.
- **Lower Setpoint:** When the measured temperature is lower than the value set in this parameter, the device will start the logs (option available only if the log Start Mode is set to "Setpoint").
  - **Minimum:** Displays the minimum temperature supported by the device.
- **Upper Setpoint:** When the measured temperature is higher than the value set in this parameter, the device will start the logs (option available only if the log Start Mode is set to "Setpoint").
  - **Maximum:** Displays the maximum temperature supported by the device.
- **Offset**: Allows you to make small adjustments to the channel readings. The configured offset will be added to all readings performed.

7.3.3 CONFIGURATION OF LOG REGISTER

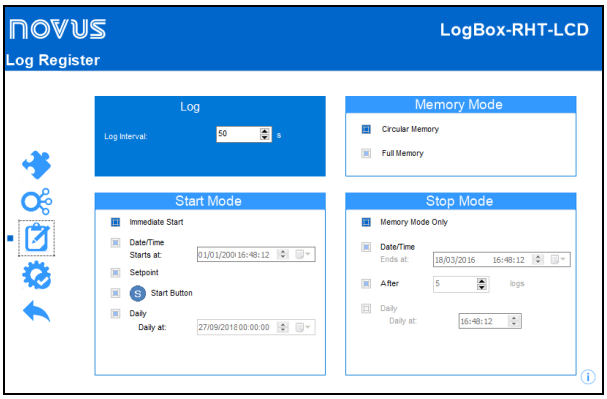


Figure 8 – Configuration of log register

LOG

- **Log Interval:** Allows you to select the frequency (in hours, minutes or seconds) with which a log must be made and logged in the memory.

MEMORY MODE

- **Circular Memory:** Logs are continuous, replacing old logs with new ones as the number of logs overpasses the memory capacity.
- **Full Memory:** Logs can be stored up to the full memory capacity is reached.

START MODE

- **Immediate Start**: Start as soon as set up is ready and sent (OK) to the device.
- **Date/Time**: Logs start at predefined date and time.
- **Setpoint**: Logs start when a certain temperature value is reached. In this option, the setpoint value is set in the **Channels** field, in the **Upper Setpoint** and **Lower Setpoint** parameters (these options appear only when this log mode is selected).
- **Start Button** : Starts and stops the logs by pressing for two seconds the Start/Stop button on the front of the recorder.
- **Daily:** Logs start daily, at the configured time.

STOP MODE

- **Memory Mode Only:** The device will log data until it reaches the capacity of the available memory.
- **Date/Time:** The device will stop logging data at the date and time set in this parameter. If the data logger memory capacity is reached before the set date, acquisitions will also be stopped.
- **After (x) logs:** The device will stop logging data after the configured number of logs.
- **Daily:** Logs stop every day, at the configured time.

7.3.4 FINALIZATION

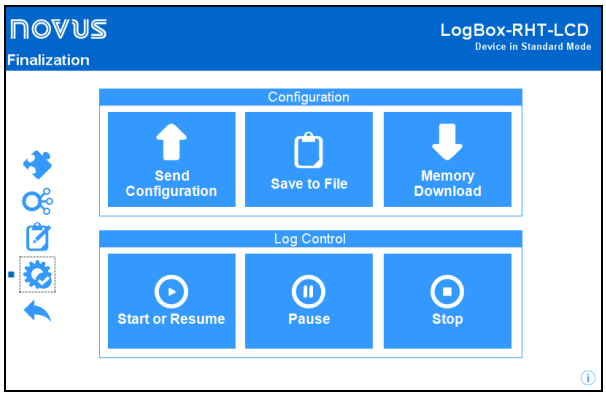


Figure 9 – Finalization

CONFIGURATION

- **Send Configurations:** Allows you to send the configuration to the device.
- **Save to File:** Allows you to save the configuration to a file that can later be used.
- **Memory Download:** Allows you to download logs from memory.

LOG CONTROL

- **Start or Resume:** Allows you to start or resume logs that have been interrupted by the **Pause** command, without discarding logs that are in the device's memory, using the configured parameters.
- **Pause:** Allows you to stop logs, allowing them to be resumed in the future using the **Start** button.
- **Stop:** Allows you to permanently stop logs, so that the device will only re-register when it receives a new configuration.

7.4 DOWNLOADING AND DATA VISUALIZATION

Data downloaded are send from device to PC.

Data can be downloaded any time: at the end of the registering process or while they are being acquired. If data download takes place during the registering process, **the process will not be interrupted**, following the device configuration.

7.4.1 DOWNLOADING DATA

Data download is accomplished by clicking the button **Download Logs** in the **Download** screen from **NXperience**.

During data transference, a status bar indicates remaining data to be transferred. Data downloading time is proportional to the number of readings logged.

7.4.2 VISUALIZING DATA

At the end of values transfer, the data will be displayed in a graphical form.

CHART WINDOW

It is possible to select a region of the chart to zoom in. Zoom commands can be accessed through zoom icons from the task bar.

It is also possible to select an area from the chart to zoom in by clicking and dragging the mouse, thus creating a zoom region starting from the upper left corner on the chart area.

The graphic curves can be vertically dragged with a right-click and dragging the mouse up and down.

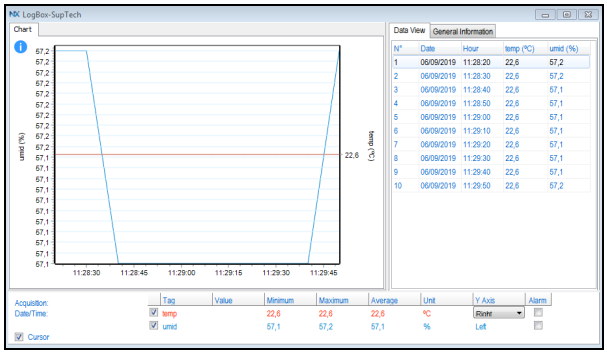
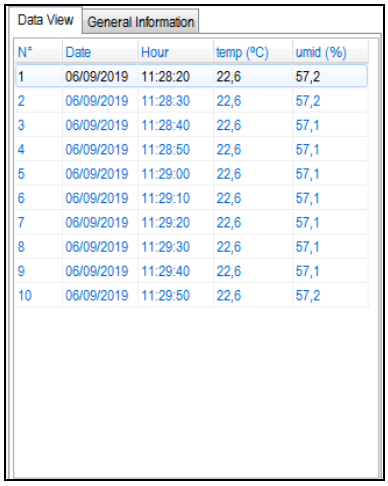


Figure 10 – NXperience chart window

DATA VIEW TABLE

Values are presented in a tabular form, listing the measurement time and value.



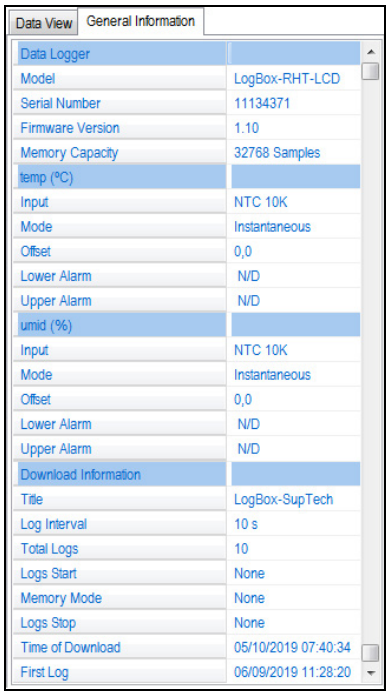
Data View | General Information

N°	Date	Hour	temp (°C)	umid (%)
1	06/09/2019	11:28:20	22,6	57,2
2	06/09/2019	11:28:30	22,6	57,2
3	06/09/2019	11:28:40	22,6	57,1
4	06/09/2019	11:28:50	22,6	57,1
5	06/09/2019	11:29:00	22,6	57,1
6	06/09/2019	11:29:10	22,6	57,1
7	06/09/2019	11:29:20	22,6	57,1
8	06/09/2019	11:29:30	22,6	57,1
9	06/09/2019	11:29:40	22,6	57,1
10	06/09/2019	11:29:50	22,6	57,2

Figure 11 – Data view

GENERAL INFORMATION

In addition to the configuration you have made, this window shows general information about the device whose data has just been read:



Data View | General Information

Data Logger	
Model	LogBox-RHT-LCD
Serial Number	11134371
Firmware Version	1.10
Memory Capacity	32768 Samples
temp (°C)	
Input	NTC 10K
Mode	Instantaneous
Offset	0,0
Lower Alarm	N/D
Upper Alarm	N/D
umid (%)	
Input	NTC 10K
Mode	Instantaneous
Offset	0,0
Lower Alarm	N/D
Upper Alarm	N/D
Download Information	
Title	LogBox-SupTech
Log Interval	10 s
Total Logs	10
Logs Start	None
Memory Mode	None
Logs Stop	None
Time of Download	05/10/2019 07:40:34
First Log	06/09/2019 11:28:20

Figure 12 – General information

7.5 OTHER FEATURES

Check the **NXperience** Operations Manual for more information on the other features offered by the software, such as exporting to other formats, filter logs, chart junction, etc.

8 TROUBLESHOOTING

Unable to communicate with the logger:

Make sure that the COM port is correctly selected and that other software is not using that port during communication attempts.

Make sure that there is no obstacle blocking the infrared signal.

Make sure that the cable is well connected to the computer port.

Make sure that the selected port is working properly.

Logger reset:

When you are unsure about the working condition of the logger, you can reset it. To do this, simply remove the battery and wait 2 minutes. After that, put the battery back in place.

After the reset, the logger returns to the stand-by state. If it is performing acquisitions, it stops the process and only starts the acquisitions when a new configuration is sent. The implemented configuration remains unchanged after reset.

Additional information:

For further information, see the manufacturer web site.

9 SPECIAL CARE

The logger is an electronic device and some basic care is required:

- When opening the device for battery replacement or connecting sensors, you should avoid contact with the electronic circuitry due to the risk of damage from static electricity.
- Carefully check the battery polarity.
- When closing the housing, the cover must be properly tightened back in its place such as to assure the sealing protection.
- Used batteries should not be recharged, dismantled or incinerated. After use, batteries must be disposed according to local legal rules or returned to supplier.

Note: To ensure the specified accuracy and protection level, the transmitter must be fixed with the sensor capsule directed downwards.

9.1 ATTENTION WITH SENSORS

If the humidity and temperature sensor is exposed to contaminating vapors or extreme humidity and temperature conditions for extended periods, the sensor calibration may change. To restore the calibration, proceed as follows:

- Remove the sensor from the capsule.
- If solid particles are deposited on the sensor, wash it with water.
- Place the sensor in an oven at 80 °C (+-10 °C) for 24 hours.
- Put the sensor for 48 hours in a place with a temperature between 20 and 30 °C and a humidity higher than 75 % RH.
- Replace the sensor in the capsule.

IMPORTANT

The sensor from this device may be damaged or uncalibrated if exposed to chemical agents-contaminated atmosphere. Chloridric Acid, Nitric Acid, Sulphuric Acid and Ammonia in high concentrations may damage the sensor. Acetone, Ethanol and Propylene Glycol may cause a reversible measure error.

10 WARRANTY

Warranty conditions are available on our website www.novusautomation.com/warranty.