



LogBox-RHT-LCD

TEMPERATURE AND HUMIDITY LOGGER – INSTRUCTIONS MANUAL V1.1x B

1 PRESENTATION

LogBox-RHT-LCD is an electronic logger of temperature and relative humidity. There are sensors that measure such data and values (data) obtained are displayed in an LCD screen and stored in an electronic memory. Data can be later viewed and analyzed on a PC where they can be opened in tabular and graphical forms. The humidity output can be configured to display **Relative Humidity** values or the temperature value of **Dew Point**.

The logger is supplied with **LogChart II** software, which enables to set up the logger operation mode. It is also used for visualization of collected data. Other parameters such as end of measurements, logging interval, etc., are easily defined through the **LogChart II** software.

Measurements can be exported to and opened in other applications, such as spreadsheet programs.

1.1 Identification

The identification label is on the logger body. Check if the features described are in accordance with your order. The **RHT-LCD** model is designed to measure temperature and relative humidity.

The following elements are shown in the logger front:

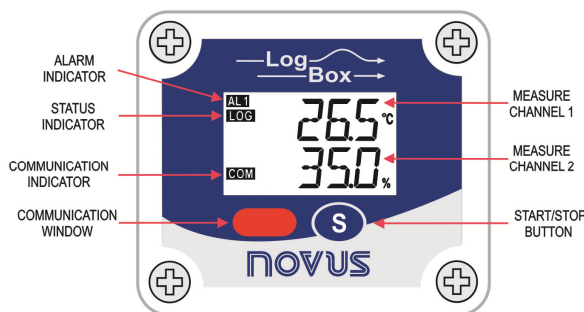


Fig. 1 – Logger Front

START / STOP button: Can be configured to start or stop logging when pressed. It can also be used to browse and change screens.

Status indicator (LOG): Indicates when the device is logging.

Note: When logs are finished or not started, the indicator remains deactivated.

Alarm Indicator (AL1 and/or AL2): Warns the user as to alarm conditions. It remains active whenever an alarm condition occurs, until a new configuration is applied to the logger.

IR Communication Window (COM): Activated when there is a communication attempt or when communication between logger and PC is activated.

2 SPECIFICATIONS

Operating temperature	From -40 °C to 70 °C
Sensor measure 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 Fig. 2. Note: A measure error can be ruled out using the OFFSET parameter in the LogChart II software.
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	64,000 (64 k) logs: Half for each channel or total when one of the channels is not enabled.
Measurement interval	1 second min. 18 hours max.
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.
Case	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.
LogChart II software operation environment	Set up Software for Windows 98, NT, 2000, XP, Vista and 7. Menus in Portuguese, English or Spanish. Sets up, reads and displays data on the screen.

2.1 Measurement Accuracy

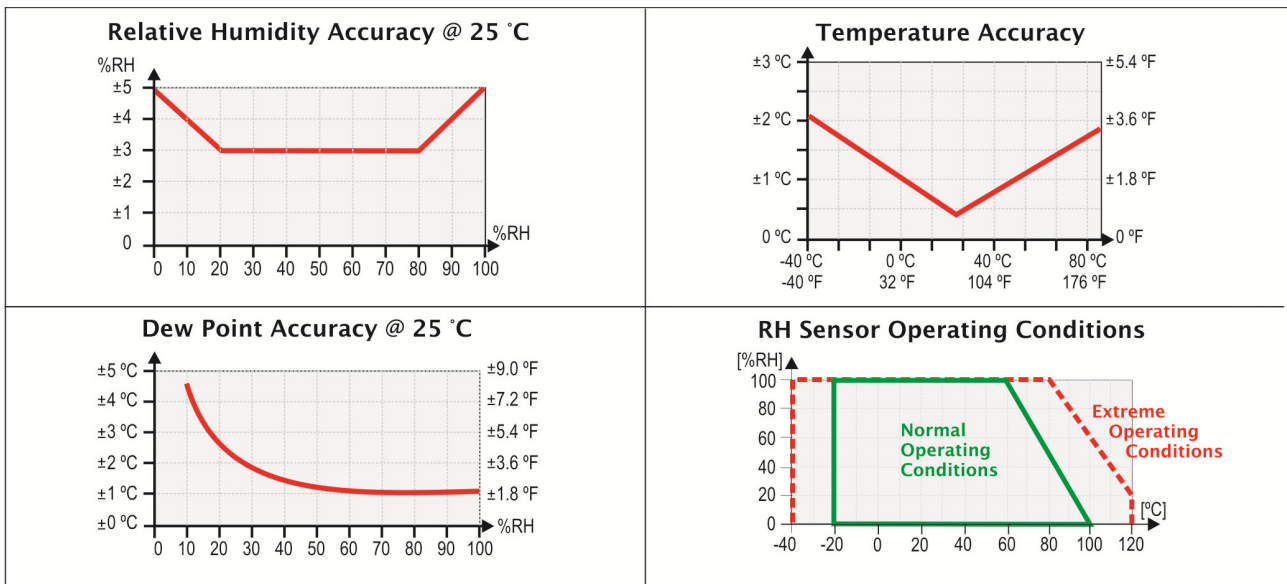


Fig. 2 - Accuracy

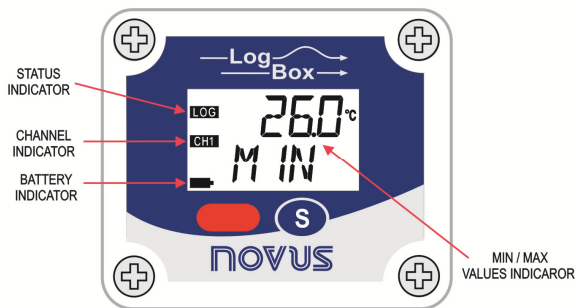


Fig. 3 – Logger front (CH1)

Channel Indicator: Indicates the channel selected.

Battery Indicator: The battery symbol is shown when the battery voltage is low.

MIN / MAX values indicator: Minimum and maximum value of each channel during readings.

3 OPERATION

It is only possible to operate the logger after the LogChart II software is installed to a PC, according to the steps described in **LogChart II Software** section of this manual.

The communication between logger and PC is performed with the use of the **IR-Link Interface**.

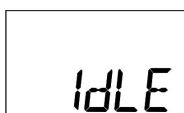
The logger operation mode set up is defined in advance by using the **LogChart II** software. The configuration is sent to the logger through the IR-Link Interface.

The logger starts and stops logging as defined in the setup.

3.1 Registers Screens

Battery Saving Mode - **IdLE**

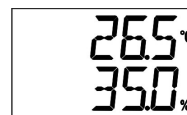
Low battery consumption mode the register does not communicate. It always stays in this mode after reset; register does not make acquisitions and does not up-date screen measures. For skipping **IdLE** mode, press button **S** for activating communication temporarily. After an acquisition configuration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



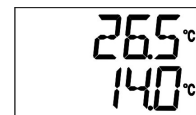
Battery Saving Mode

Main Screen

Indication screen for values measured by the register:



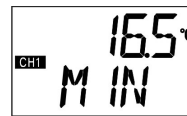
1st Screen – Temperature and Humidity



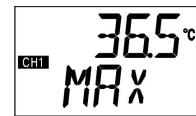
2nd Screen – Temperature and dew point

Indicator Screen MIN / MAX – CH1

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



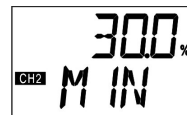
3rd Screen – CH1 Minimum Value



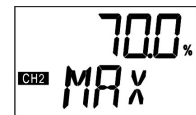
4th Screen – CH1 Maximum Value

Indicator Screen MIN / MAX – CH2

It indicates the minimum and maximum value of **Channel 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 **LogChart II** software. It always stays in this mode after **reset**.
- In the **manual** mode (**MAN**) 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.

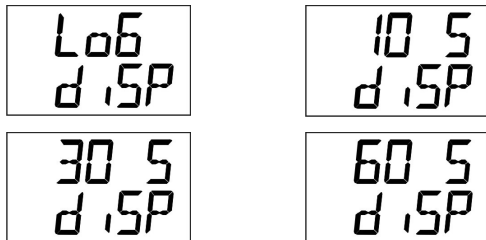


7th Screen – IR Communication Screens

Display Updating Interval Screen - **d.SP**

It sets the reading time of the sensor for the display updating. When selected by **Lo6**, 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 **d.SP**, display will be updated according to 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:

Ex. 1: Acquisitions interval equal to 10 minutes and **d.SP** screen in **Lo6** mode. In this case register remains sleeping and activates only in every 10 minutes to read the sensor, update the display and make the acquisitions.

Ex. 2: Acquisitions interval equal to 10 minutes and **d.SP** screen in **60 S** (60 seconds). In this case, register 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.

Ex. 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 **d.SP** screen is in **Lo6** 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**.

Ex. 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. Windows will request the proper driver installation, which is found on our website.

5.1 USB Drivers Installation

The drives installation steps may vary according to the machine, even for the same version of an operating system. The following screenshots and steps are only to provide guidance.

1. Run the driver file available on our web site.
2. Connect the serial communication interface IrLink-3 to the PC USB port. Windows® will acknowledge the presence of new hardware and a few seconds later it will start the drivers installation process.
3. The found new hardware wizard will be displayed, and you will be asked if you want to install the driver from the Windows Update website. Select “No, not this time”, and then click Next (**Fig. 4**).
4. Select “Install from a list or specific location (Advanced)” and click “Next” (**Fig. 5**).
5. Select “Search for the best driver in these locations” and check “Search removable media”. Click “Next”. If installation files are not in a CD, check “Include this location in the search” and show the file path (**Fig. 6**).
6. If a prompt warns you that it does not support Windows® XP, click “Continue anyway”.
7. The interface driver files will be copied to the computer and after a few seconds a screen is displayed informing that the software installation has been concluded. Click “Finish” (**Fig. 7**).
8. In some situations, the steps described above may be repeated again. Follow the same procedures.

In later uses of the interface, Windows® may require the driver installation again. In this case, the same installation wizard will be displayed, and you will have to select the option “Install software automatically (recommended), as the driver may already be in the computer.

The following screenshots show examples of Windows XP® installation wizard. The screens in Windows 2000® are slightly different, but the content is basically the same.



Fig. 4 – USB drivers installation wizard screen (First)

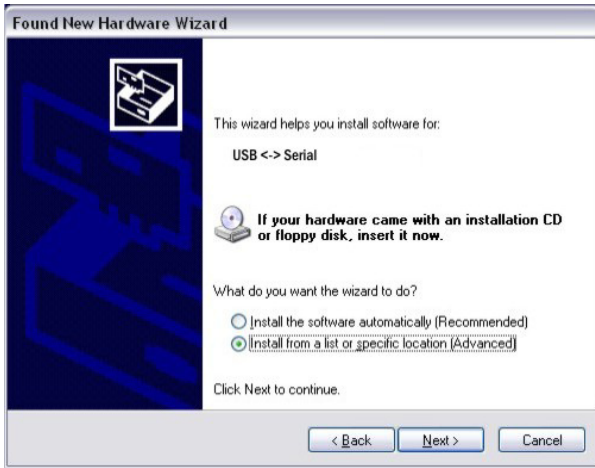


Fig. 5 – USB drivers installation wizard screen (Second)

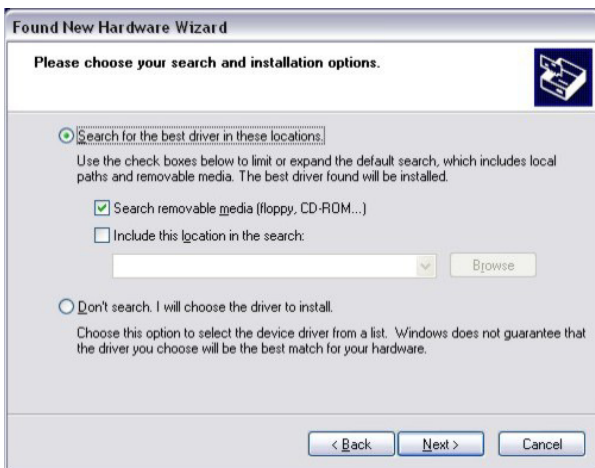


Fig. 6 – USB drivers installation wizard screen (Third)



Fig. 7 – USB drivers installation wizard screen (Conclusion)

6 LOGCHART II SOFTWARE

6.1 Installing LogChart II

LogChart II is the software the logger to for configuration and data offload. To install, run the **LC_II_Setup.exe**.

Note: Be sure your Windows date separator is configured as a slash: dd/mm/yy or dd/mm/yyyy.

6.2 Running LogChart II

When you open LogChart II the main window is displayed:

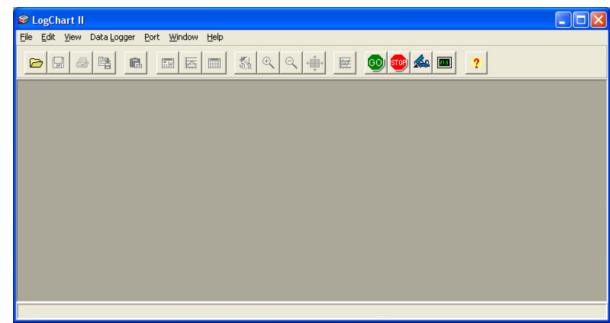


Fig. 8 – LogChart II main window

Next, select the serial port that the communication interface will use in the "Port" menu.

- For **IR-Link3/RS232** model:

Check which is the free serial port in your computer. The selected COM port will be considered as the standard port next times the LogChart II is run.

- For **IR-Link3/USB** model:

Select the USB serial port where the interface is connected.



Figure 9 – Icons enabled when the communication port selected is a valid port

6.3 Configuring the logger

Make sure the communication interface is connected to the PC port selected. The interface must be constantly directed towards the front part of the logger (communication window) at a maximum distance of 50 cm. (See Fig. 10).

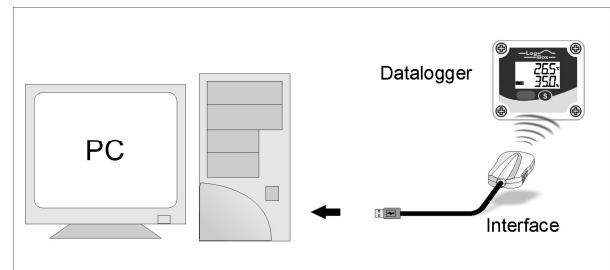


Fig. 10 – Infrared communication interface position



When communication is established, select

The **Parameters Configuration** screen is displayed. In this screen the user can define the logger operation mode and also obtains general information about the device (Fig. 11).

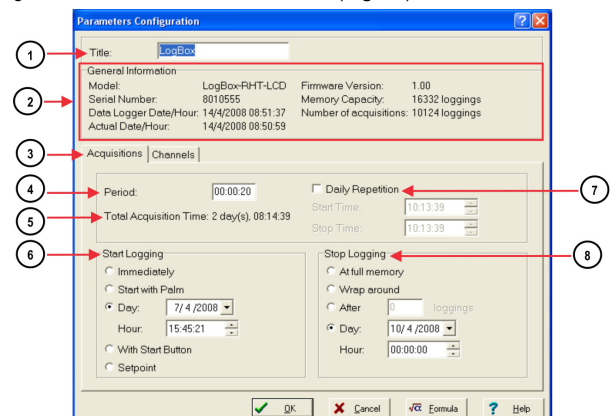


Fig. 11 – Logger Set Up (Readings)

Fields are:

① **Title:** In this field, the user identifies the logger by assigning it a name.

② **General Information:** Area with information about the logger, such as Model, Serial Number, Logger current Date/Time, PC Date/Time, firmware version, memory capacity and number of acquisitions stored in memory.

In this field, time is constantly updated while the communication between logger and computer is taking place.

③ **Acquisitions:** Presents a series of parameters that define how measurements will take place.

④ **Interval:** Defines the interval between readings: Minimum interval is 1 (one) second.

Note: When the type of value logged is mean, maximum and minimum values, the minimum interval is 10 seconds.

In **Daily repetitions** the user defines the time that daily logs will take place.

⑤ **Estimated time:** In this parameter, the logger informs the user how long it will take to occupy the full memory, in the conditions set up during configuration.

⑥ **Start of Readings:** Readings can be started in one of five different modes:

- **Immediately:** start as soon as programming is considered to be ready, and is then sent (OK) to the logger.
- **Date:** readings start at predefined date and time.
- **Through Start Button:** starts and interrupts readings by pressing the Start button, in the frontal part of the logger, for two seconds. See Fig. 1.
- **Setpoint:** measurements start when a **temperature** setpoint is reached. In this option, the setpoint value is defined in the Channels field, where the Alarm parameter is replaced by setpoint.

⑦ **Daily Repetition:** In **Daily repetitions** the user defines the time that daily logs will take place.

⑧ **Stop loggings:** Options for the end of readings are:

- **Full Memory:** readings can be stored up to the full memory capacity is reached.
- **Wrap around:** readings are continuous, replacing old records with new ones as the number of readings overpass the memory capacity.
- **After:** the logger stops readings after a certain number of readings.
- **Date:** Readings stop at user-predefined date and time. In case the logger memory capacity is reached before the date defined, readings are stopped.

⑨ **Channels:** Shows parameters referring to each channel separately. Channel 1 is the Temperature channel, and Channel 2 the Relative Humidity channel.

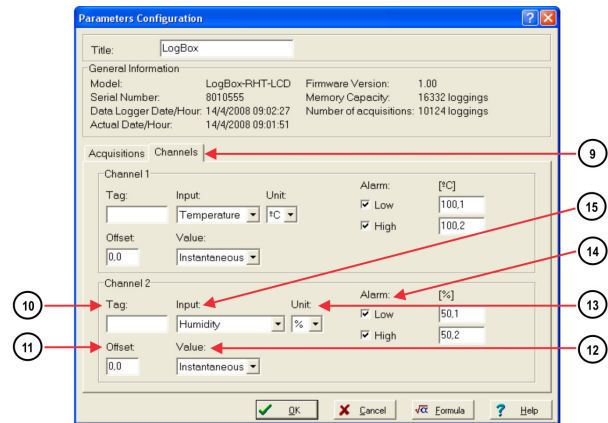


Fig. 12 – Logger Set Up (Channels)

⑩ **Tag:** Defines a name for the temperature registers.

⑪ **Offset:** Makes possible to correct the value logged.

⑫ **Value:** It defines how the value measured will be registered. Options are:

- **Instantaneous:** The value logged will be exactly the value measured at each interval defined. The minimum interval between measurements is 1 seconds.
- **Average:** The value logged will be the mean of ten measures taken within a predefined interval. The minimum interval between measurements is 10 seconds.
- **Maximum:** The value logged will be the maximum value found within ten 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 measurements taken within a predefined interval. The minimum interval between measurements is 10 seconds.

⑬ **Unit:** Defines the unit of the value measured: °C or °F for channel 1 (temperature) and only % for channel 2 (relative humidity or dew point).

⑭ **Alarm:** Defines limit values that, when exceeded, characterize an alarm condition. Alarm events are informed to the user through the **Alarm Indicator**. The alarm limit value is shown with a dotted line with the same color of the channel in the chart from *LogChart II* software.

⑮ **Input:** Parameter available in channel 1 (**temperature**) and channel 2 (**humidity** or **dew point**). It is also possible to deactivate channel 1 and keep the entire memory for humidity. It is possible to select the Dew Point logging.

After filling all the fields select OK and settings are sent to the logger.

7 OFFLOAD AND DATA VISUALIZATION

The transference of data to a PC is accomplished with the LogChart II software. Measurements are displayed in tabular and graphical form. Data can be saved in files for future analysis and comparisons.

7.1 Offloading data



To offload data, click the icon **Offloading Data**, and turn the interface towards the logger front. During data transference, a status bar indicates remaining data to be transferred. Data offloading time is proportional to the number of readings logged.

7.2 Visualizing data

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

7.2.1 Chart window



It is possible to select a region of the chart to zoom in. Zoom commands can be accessed through the *View* menu or 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.

This window shows minimum and maximum values of each channel. It also shows the horizontal line of alarm values defined.

A text can be associated to the chart points by double-clicking a curve point.

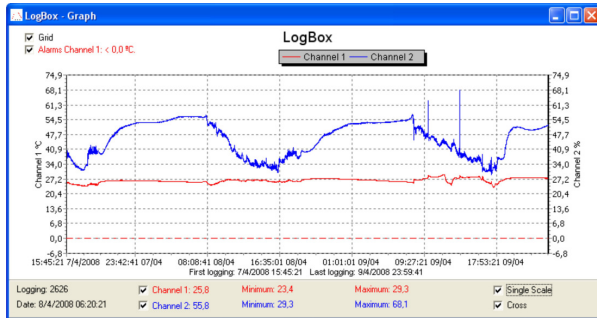


Fig. 13 - Logged data graph window.

Offloading measurements does not stop the process of data logging and reading.

7.2.2 Measurements Table Window



To display measurements in a tabular form, press the icon **Table View**. Values are presented in a tabular form, listing the measurement time and value (Fig. 14).

Logging Nr.	Time	Date	Oven 1 [°C]	Oven 2 [%]
00001	10:06:00	14/4/2008	24,5	41,7
00002	10:06:20	14/4/2008	24,6	41,1
00003	10:06:40	14/4/2008	24,6	41,7
00004	10:07:00	14/4/2008	24,6	41,4
00005	10:07:20	14/4/2008	24,6	41,0

Fig. 14 – Acquisitions table

7.2.3 General information table



This window shows some information about the logger whose data were just read and its configuration. The screen can be displayed by pressing the icon **Parameter Viewing**.

A text with notes about offloaded data can be inserted in the *General Information* window (Fig. 15).

General Information	
Data Logger	
Model:	LogBox-RHT-LCD
Serial Number:	8010555
Firmware Version:	1.00
Memory Capacity:	16332 loggings
Oven 1 [°C]	
Input:	Temperature
Value:	Instantaneous Value
Offset:	0.0
Alarm Low:	101.1
Alarm High:	101.2
Oven 2 [%]	
Input:	Humidity
Value:	Instantaneous Value
Offset:	0.0
Alarm Low:	50.1
Alarm High:	50.2
Logging Information	
Title:	LogBox
Interval between readings:	20 sec
Total Number of Loggings:	162
Start Logging:	Day: 4/14/2008 Hour: 10:06:00 AM
Stop Logging:	Day: 4/14/2008 Hour: 11:00:00 AM
Download Time:	Monday, April 14, 2008 at 11:28:23 AM
First logging:	Monday, April 14, 2008 at 10:06:00 AM
Last logging:	Monday, April 14, 2008 at 10:59:40 AM
Place here a comment to identify the downloaded data.	

Fig. 15 – General Information

8 MOST FREQUENTLY FOUND PROBLEMS

Communication with the logger fails:

Make sure the COM port is selected correctly and there is no other program using the same port during communication attempts.

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

Make sure the cable is well connected to the PC port.

Make sure the port selected does not present any problem.

8.1 Logger Reset

When the user is not sure about the real condition of the logger operation, it is possible to perform an enforced Reset by removing the battery and waiting for 2 seconds to replace it. The logger will return to the stand-by mode. If measurements were being made, it will interrupt the process and start measurements again only when a new set up is made. Implemented setup remains the same after reset.

8.2 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 avoid touching the circuit for not causing damages resulting from static electricity.
- Check battery polarity carefully.
- When closing the case, the cover must be properly tightened back in its place such as to assure the sealing protection.
- Worn batteries should not be recharged, dismantled or incinerated. After use, batteries must be disposed according to local legal rules or returned to supplier.

Note: The transmitter must be fixed with the sensor capsule directed downwards in order to assure the specific accuracy and protection level.

9.1 ATTENTION WITH SENSORS

Calibration of the humidity sensor can be changed whenever it is exposed to contaminant vapor or external conditions of temperature and humidity for prolonged time. To configure this function, follow the steps below:

- Take the sensor out from the case.
- In case there are solid specks on the sensor, clean it with water.
- Put the sensor in an oven at 80 °C (+ -10 °C) for 24 hours.
- Let the sensor for 48 hours in a place with temperature between 20 and 30 °C and humidity over 75 % RH.
- Replace the sensor in the case.

Note: 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.