Log Box-RHT

Temperature and Humidity Logger

User Manual

ABUS TECHNOLOGIES INC.

WARNING

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- Please note that changes in the specifications, construction, or component parts of the instrument may not immediately be reflected in this manual at the time of change.
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HEALTH AND SAFETY

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given. Any deviation from these instructions will transfer the complete liability to the user.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.

CATALOGUE

1. INTRODUCTION

LogBox–RHT is an electronic logger of temperature and relative humidity. There are sensors that measure such data and store them 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 logger is supplied with **Logchart-II** software, which enables to set up the logger operation mode. It is also used for data visualization. Other parameters such as end of measurements, logging interval, etc., are easily selected through the **LogChart-II** software.

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

2. PRESENTATION

Technical Parameters

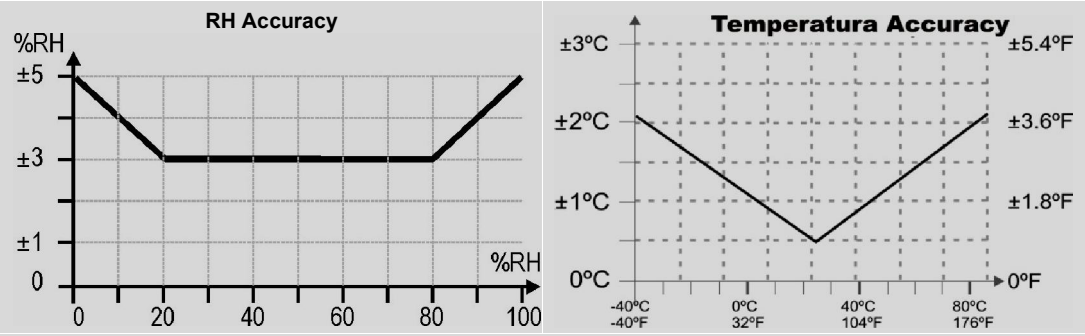
Measure Range:	*Temperature:*	-40 °C to 120 °C.
	Relative Humidity (RH):	0 to 100 %.
Accuracy:		Refer to figure *Measurement Accuracy*.

Note: A measure error can be ruled out using the OFFSET parameter in the Logchart-II software.

Measurement Resolutions:		
	Temperature:	0.1 °C.
	Relative Humidity (RH):	0.1 %.
Memory capacity:		32,000 (32 k) logs. 16,000 temperature and 16,000 humidity logs or 32,000 temperature logs when relative humidity is disabled.
Measurement Interval:		1 second min. 18 hours max.
Power supply:		3.6 V lithium battery (1/2 AA), built-in
Estimated autonomy:		Higher than 2000 days, with daily data reading. Too frequent logged data readings may shorten battery life.
Operating temperature:		From –40 °C to 80 °C
Case:		Polycarbonate

Protection:	Suitable for products with protection level **IP65**.
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:	Ir/USB or Ir/Serial
LogChart-II software operation environment:	Set up Software for Windows 95, 98, NT, 2000 and XP. Sets up, reads and displays data on the screen.

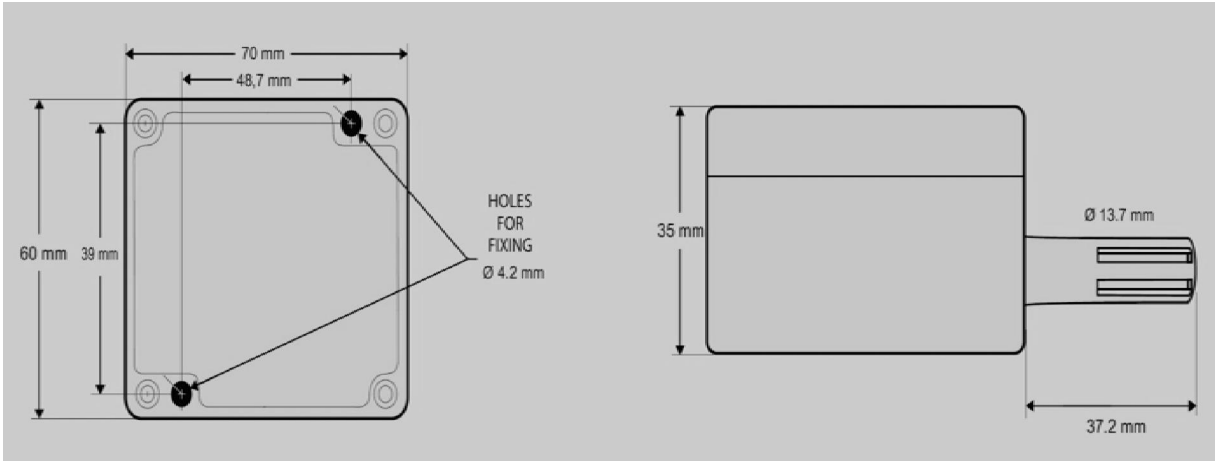
Measurement Accuracy:



Measurement Accuracy

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.

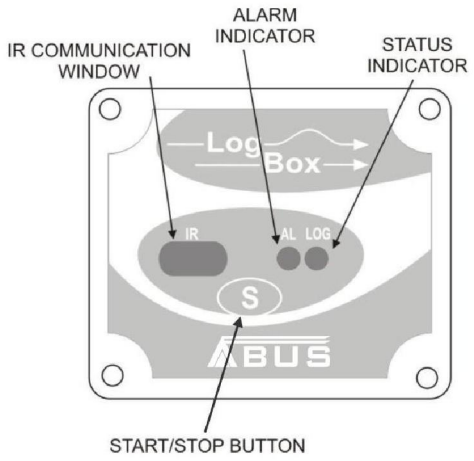
3. DIMENSIONS



4. INSTALLATION

4.1 Panel

The identification label is on the logger body. Check if the features described are in accordance with your order. The RHT model is designed to measure temperature and relative humidity. The following elements are shown in the Figure *Logger Front,* below:



Logger Front

START / STOP button: Can be configured to start or stop logging when pressed.

IR Communication Window: PC-Logger communication area. The communication interface should be pointed towards this window.

State indicator (LOG): While in stand-by (not logging) or after a series of measurements is ended, it flashes once at every four seconds. During logging it flashes twice at every four seconds.

Alarm Indicator (AL): Warns the user as to alarm conditions. Whenever an alarm situation takes place it will flash once at every four seconds, until a new configuration is applied to the logger.

4.2 LogChart-II

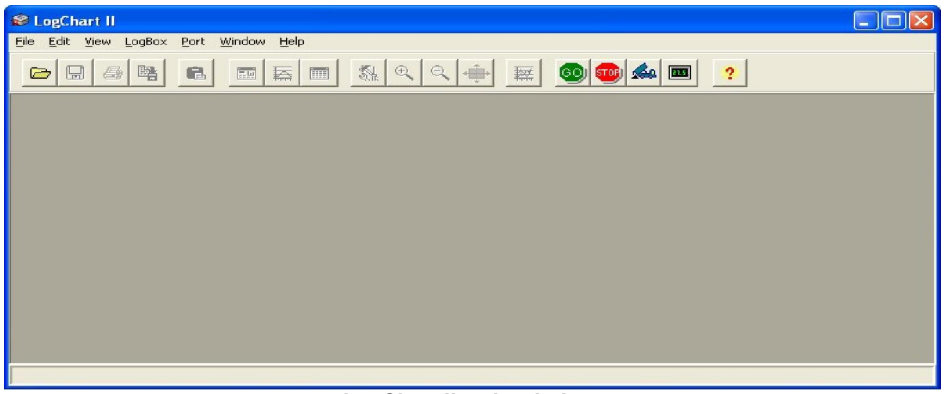
4.2.1 INSTALLING LOGCHART-II

The LogChart II is the software provided with the logger to allow for configuration and data collection. To install the LogChart II, execute the **LC_II_Setup.exe** program provided in the CD. The installation wizard will then guide you throughout the installation process.

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

4.2.2 RUNNING LOGCHART-II

Start the program. The main window will appear on the screen, as shown in Figure below.



LogChart-II main window

The LogChart II requires a communication port to talk to the logger. Select one and connect the corresponding wand IR-LINK3 to it. Click on the menu **Port.** Clicking on the menu **Port**, all free communication ports available in the computer will be listed (usually COM2, once the mouse is frequently connected at COM1). The chosen port will be remembered next times the LogChart II is initiated. When the selected port is successfully opened, the LogChart II initial screen is opened, enabling the buttons below:

Buttons enabled when the communication port of choice is valid

In case the user wants to stop the process while data logging is running, the button “Stop” must be pressed: 

4.3 Optic Interface IR-Link3

Configuring, monitoring or downloading data from the logger through LogChart-II requires that the IR-LINK3 communication interface be connected to your PC. This interface is sold separately. The IR-LINK3 interface sends and receives data to/from the logger through infrared signals.

4.3.1 IR-Link3 for RS232

This interface has a DB9 terminal that must be connected to the PC serial port. In the “Port” menu, select the port which corresponds to the physical port where the interface is connected.

4.3.2 IR-Link3 for USB

This interface has a USB terminal. Plugging this USB interface to the PC, the Windows wizard for new USB devices pops-up automatically. Select then the ***IRLink*** driver provided in **d:\IRLink_Driver**. (**d:** is the driver used in the installation). After installation is completed, the IR-LINK3 interface is recognized whenever it is connected to the PC.

Note: After the USB driver installation, the LogChart II must be opened again. In the "Port" menu, choose the same port selected for the optical interface communication using the menu ***Port.***

4.4 Palmtop User

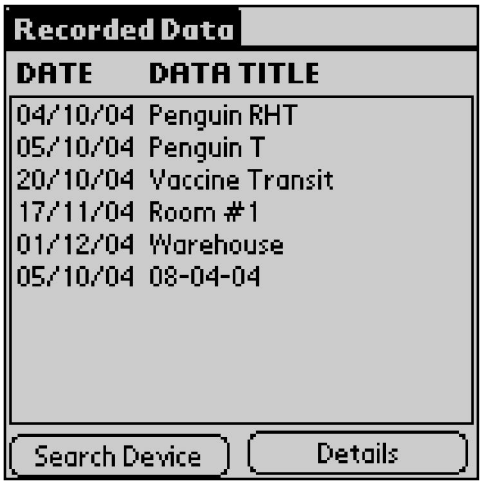
Most of the functionality of the LogChart II is available for the PDA Palm running the **LogChart PalmOS** software. The program is delivered with the logger. The stalled in the Palmtop through a HotSync process (data synchronization between a Palmtop and a PC).

The user needs the **Palm Desktop** and the **LogChart II** software installed in his machine. It is recommended to execute the Palm HotSync before installing the **LogChart PalmOS.**

To install the software, insert the disk in the driver, click on Start and Execute in the windows task bar. Then, type **d:\LogChart PalmOS\LCP_Setup**, d: is the driver used in this example. Press "OK". The software will guide you over the installation process.

Executing a new *HotSync* will install the **LogChart PalmOs** software in the Palm. The LogChart icon will be added to the Palm home screen.

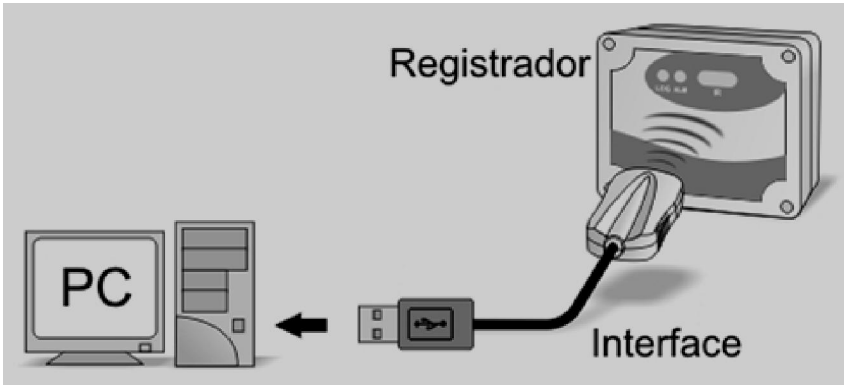
Starting the LogChart PalmOS application will display the **Recorded Data** screen on the Palm from where it is possible to access the logger to change settings and collect data, as well as to access collected data.



Recorded Data screen

5. CONFIGURATION

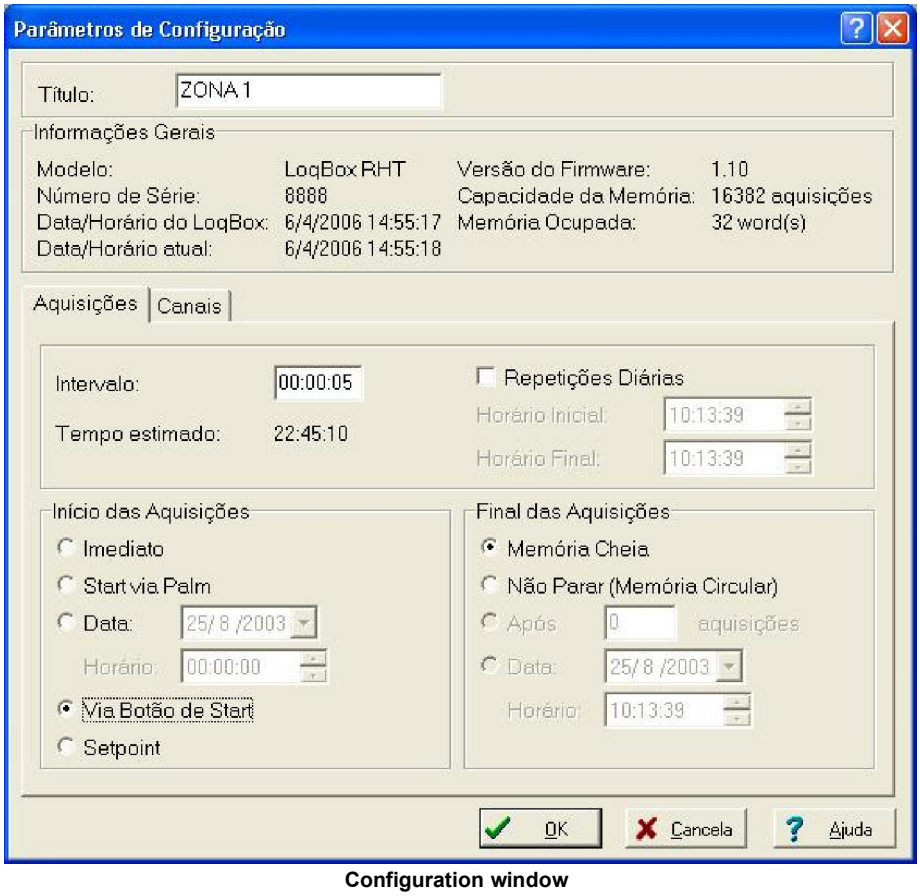
Make sure the IR-LINK3 wand is connected to the PC. The interface must be pointed towards the logger communication window (see Figure below) at a distance of about 15 cm.



Infrared interface position

Click the  button to start the communication between the logger and the software; the **Parameters Configuration** window is then displayed (as shown in figure *Configuration Window,* below), showing the current configuration and information about the logger.

New configuration parameters defining the operation mode for a new application can be entered. The user can also obtain general information about the device. The fields of the configuration window are described below:



Configuration window

FIELDS ARE:

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

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

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

Readings: Presents a series of parameters that define how measurements will be.

Interval between readings: 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.

Daily repetitions: The user defines the time that daily logs will take place.

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.

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

Immediately: It starts as soon as programming is considered to be ready, and is then sent (OK) to the logger.

Start via Palm: It starts with a command sent via Palmtop, which runs the software Log Chart Palm-OS.

Date: Readings start at predefined date and time.

Through Start Button: It starts and interrupts readings by pressuring the Start button, in the frontal part of the logger, for two seconds.

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.

End of readings: 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 registers by 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.

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

Tag: Defines a name for the temperature registers.

Value: It defines how the value measured will be logged. The available options are:

Instantaneous: The value logged will be exactly the value measured at each interval defined. The minimum interval between measurements is 1 second.

Average: The value logged will be the mean of ten consecutive measures taken within a predefined interval. The minimum interval between measurements is 10 seconds.

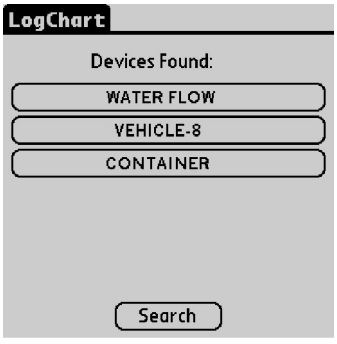
Maximum: The value logged will be the maximum value found within ten consecutive measurements taken within a predefined interval. The minimum interval between measurements is 10 seconds.

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.
Offset:	Makes possible to correct the value logged.
Unit:	Defines the unit of the value measured: ºC or ºF for channel 1 (temperature) and only % for channel 2 (relative humidity).
Alarm:	Available only in the temperature channel. Defines limit values that, when exceeded, characterize an alarm condition. Alarm events are informed to the user through a flashing mode of the Alarm Indicator.
Input:	Parameter available only in channel 2 (humidity). With this parameter it is possible to disable the humidity measurement, saving all memory capacity for temperature measurement.

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

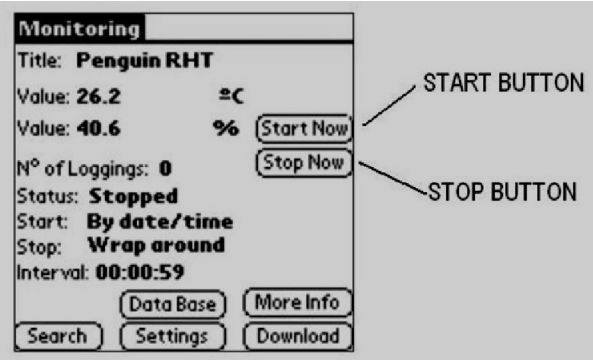
Palmtop User

To set up the communication between the handheld device and the logger(s), run LogChart Palm-OS, press the **Search Device** button from the **Recorded Data** screen and align the Infrared Port of the PDA to the logger(s) communication window. If more than one loggers are detected, the Devices Found screen is exhibited.



Devices Found screen

The user must select a device to start the communication. The **Monitoring** screen is soon displayed. If your Palm detects only one device, the **Devices Found** screen is skipped and the **Monitoring** screen is exhibited.



Monitoring screen

The screen exhibits instant values of variables measured, configuration information and current logger status. Buttons are assigned the following functions:

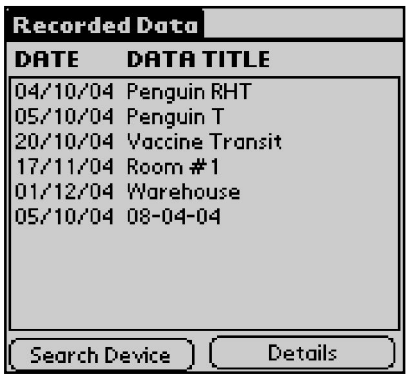
Search: It allows you to "search" for another logger or reconnect communication lost for any reason. When the handheld device finds a logger, it exhibits a new Monitoring screen with the logger information. When other loggers are found, the Devices Found screen is exhibited again.

Download: Downloads logged data. Download can be partial and it does not interfere in the ongoing acquisition process.

More Info: Displays further information on the connected logger, such as model, serial number, memory capacity and version.

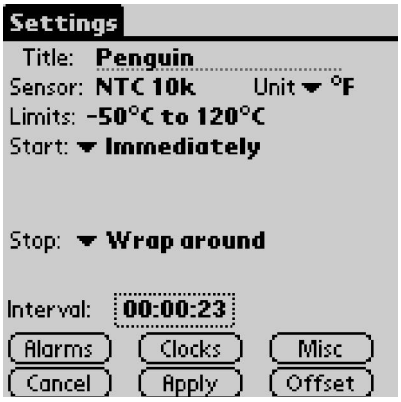
Settings: Accesses the Settings screen, which allows modifying the logger configuration.

Data Base: Exhibits the Recorded Data screen listing all the processes stored and processed in the PDA data base. To access the data, tap on Details. Information required is displayed. View Data: displays data in a list containing date, time and measured value.



Recorded Data screen

During configuration, the logger and the Palm ports must be aligned. Tap on **Settings** in the **Monitoring** screen. The screen **Settings** is opened and contains the required parameters for configuring the logger.



Settings screen

The parameters are analogous to the LogChart II parameters. They are:

Title: Name of the process.

Input 1 and 2: Informs the variables measured. Monitoring of relative humidity can be disabled.

Start: *Defines the measurement start mode. Options are:*

Immediately: The logger starts logging as soon as configuration is sent to the logger.

By date/time: Start in defined data and time, always after current time. It is possible to perform daily repetitions. If this option is selected, a new box to define the stop logging time is displayed.

By <Start> Button: Press the **Start_Now** button from the **Monitoring** screen to start logging.

By Set-point value: Measurements starts when a temperature set-point is reached. With this option, it is also possibletostart measurements above (**log above**) or below (**log below**) a temperature set-point (channel 1). This option is not valid for alarms that have already been setup.

By <Start/Stop> Button: It starts when the **Start/Stop** button at the frontal side of the logger is pressed.

Stop: *Defines logging stop mode: Options are:*

Full memory: Loggings can be stored **up to** the logger full memory capacity is reached.

Wrap around: Logging never stops. The LogBox will keep on recording the readings and when the memory is full it will overwrite the oldest record in a circular or wrap around manner.

After loggings: The logging will stop after the number of readings here defined.

By date/time: Logging is stopped on user-defined day and time.

Interval: Defines the interval between readings: hour, minute and second. When the logging mode is set to the **instantaneous** the minimum interval is 1 second. For mean, maximum and minimum values, the shortest interval between loggings is 10 seconds.

Channel 1: *Opens the Channel1 Settings screen, where channel 1 can be set up. This channel is for temperature measurements.*

Tag: Defines a name for the temperature registers.

Sensor: Informs the sensor present in channel 1: NTC. It can not be changed. It can not be disabled.

Unit: Defines the measurement unit: ºC or ºF.

Limits: Informs the temperature measurement range. It can not be changed.

Logging Mode: It defines how the value measured will be logged. Options are:

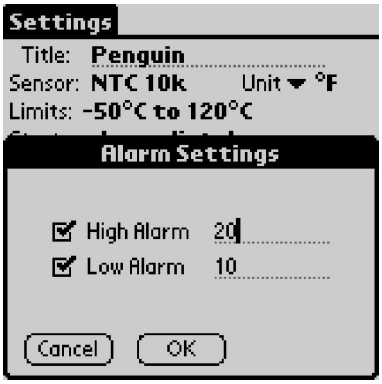
Instantaneous: The value logged will be exactly the value measured. The minimum interval between measurements is 10 seconds.

Average: The value logged will be the mean of ten consecutive measurements taken within a minimum predefined interval of 10 seconds.

Minimum: The value logged will be the minimum value found in ten consecutive measurements taken within a minimum interval of 10 seconds.

Maximum: The value logged will be the maximum value found in ten consecutive measurements taken within a maximum interval of 10 seconds.

Alarms: Enables an alarm that is triggered according to user-defined parameters.



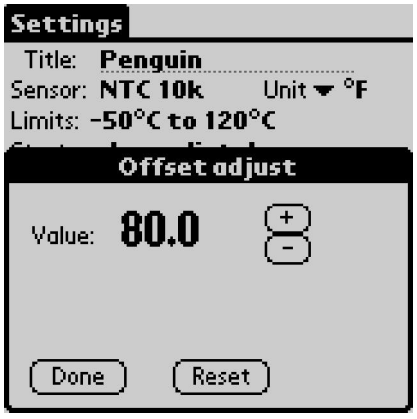
Alarm settings screen

Channel 2: *Opens the **Channel 2 Settings** screen, where channel 2 can be set up. This channel is for relative humidity measurements.*

The fields of this screen are the same as the ones from **Channel 1 Setting** screen, however, for relative humidity measurements it is not possible to associate alarms, but it is possible to disable the relative humidity measurements. **Cancel** and **OK** buttons cancel and save configurations defined in the **Channel Settings** screen.

Clocks: Provides access to Logger and Palm clocks. When a new configuration is sent to the logger, clocks are updated.

Offset: It allows fine offset adjustment on the measured value. The **Reset** button clears changes made and the logged values are the measured values again.



Offset adjust screen

After configuring clocks in the **Settings** screen, click **Apply** to send this configuration to the Logger, returning to the **Monitoring** screen. Sending a new configuration implies the **exclusion** of all data collected present in the logger memory.

6. OPERATION

It is only possible to operate the logger after the Logchart-II software is installed to a PC, according to the steps described at **Logchart-II Software** section of this manual. The communication between logger and PC is performed with the aid of the **IR-Link wand**.

The logger operation mode set up is defined in advance by using the **LogChart-II** software**.** Definitions are sent to the logger through the IR-Link wand. The logger starts and stops logging as defined in the setup.

6.1 Offloading Data

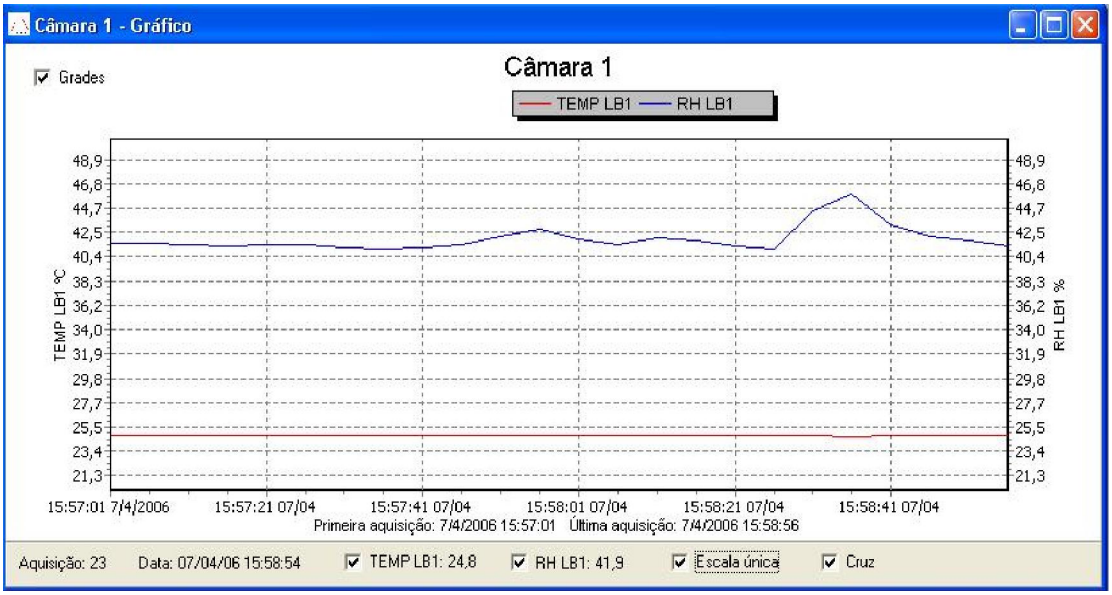
The transference of data to a PC is accomplished by using the LogChart II software. Data can be collected anytime and saved in files for future analysis (menu “File Save” or “File Save as”). Help can be accessed from the LogChart-II software when necessary. Offloading data: data offload is accomplished by clicking on the button  , or using the LogChart-II menu. During data transference, a status bar indicates remaining data to be transferred. Data offloading time is proportional to the number of readings logged. At the end of data transference, the *Graph* window is displayed as shown blow.

6.1.1 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.

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

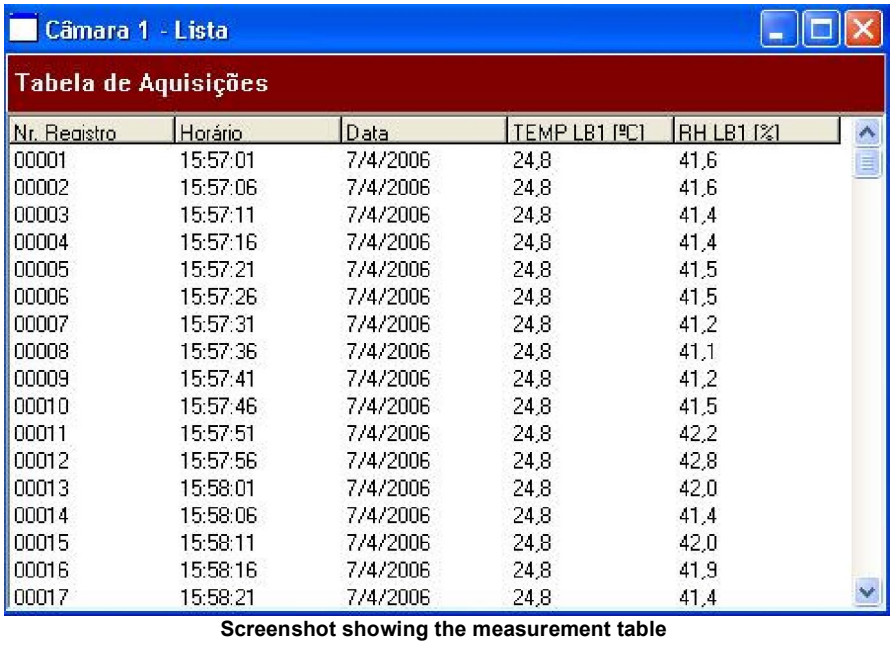


Graph window.

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

6.1.2 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.

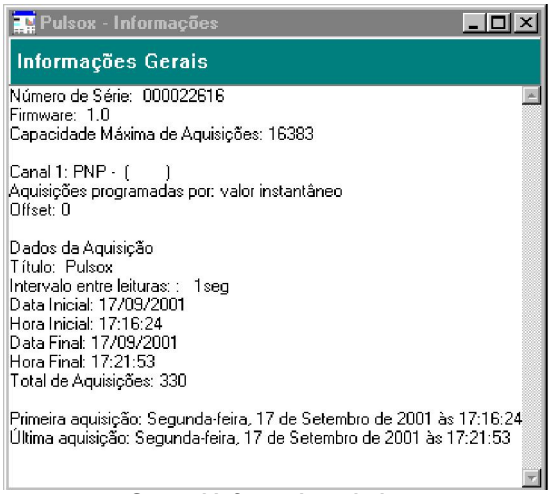


Nr. Registro	Horário	Data	TEMP LB1 [ºC]	RH LB1 [%]
00001	15:57:01	7/4/2006	24,8	41,6
00002	15:57:06	7/4/2006	24,8	41,6
00003	15:57:11	7/4/2006	24,8	41,4
00004	15:57:16	7/4/2006	24,8	41,4
00005	15:57:21	7/4/2006	24,8	41,5
00006	15:57:26	7/4/2006	24,8	41,5
00007	15:57:31	7/4/2006	24,8	41,2
00008	15:57:36	7/4/2006	24,8	41,1
00009	15:57:41	7/4/2006	24,8	41,2
00010	15:57:46	7/4/2006	24,8	41,5
00011	15:57:51	7/4/2006	24,8	42,2
00012	15:57:56	7/4/2006	24,8	42,8
00013	15:58:01	7/4/2006	24,8	42,0
00014	15:58:06	7/4/2006	24,8	41,4
00015	15:58:11	7/4/2006	24,8	42,0
00016	15:58:16	7/4/2006	24,8	41,9
00017	15:58:21	7/4/2006	24,8	41,4

Screenshot showing the measurement table

6.1.3 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 **Parameters Visualization:** 



General Information window

6.2 Visualization Data

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

6.3 Palmtop User

6.3.1 DOWNLOADING DATA FROM THE LOGGER

In the **Monitoring** screen, the **Download** button performs the transfer of the data from the Log Box to the PDA. Download can be partial and it does not interfere in the ongoing acquisition process. The data base of loggings is displayed in the **Recording Data** screen, identified with the name assigned to the process (Title) and the date it was downloaded.

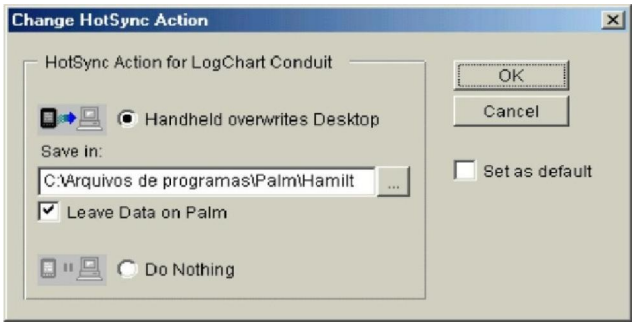
6.3.2 FILES VISUALIZATION

The **Recorded Data** screen lists the data base logged and stored in the PDA. To access data, select the desired data base and tap on **Details**. **Recorded Data Details** screen shows information about the data base. **View Data** shows in table format the logged values and the date and time they were performed. Press **Delete** to erase the selected data base.

6.3.3 TRANSFERRING DATA TO YOUR DESKTOP

HotSync of data stored in a PDA to a PC is performed through a conduit installed together with the LogChart Palm-OS. The conduit converts the data collected by the LogChart Palm-OS to a file compatible with the LogChart-II software.

To access the conduit options, the HotSync Manager software must be active. Click with the right mouse button on the HotSync Manager in the Windows Taskbar. Select in the drop-down menu the option *Custom.* Select **ABUS LogChart Conduit** and click *Change.* The following window will be exhibited:



LogChart Conduit options

Handheld overwrites Desktop: LogChart Palm-OS files are transferred to the Desktop.

Save in: Choose a directory to record files generated during data synchronization.

Leave Data on Palm: Option to keep or delete the data in the PDA after HotSync.

Do nothing: Data synchronization will not be performed;

Set as default: The same settings will be used in the next HotSync processes.

7. MAINTENANCE

7.1 Troubleshooting

FAULT	POSSIBLE CAUSE	RESOLUTION
LED is not Flashing	1. The LED flashing light is intentionally weak, and it can be difficult to see it in illuminated environments. 2. Make sure it is not flashing at all.	1. Make sure the battery is installed correctly; 2. Make sure the battery is not discharged;
No Communication	Communication with the logger fails	1. Make sure the COMM port is selected correctly and there is no other program using the same port during communication attempts; 2. Make sure there is no physical obstacle blocking the infrared signal; 3. Make sure the cable is well connected to the PC port; 4. Make sure the port selected does not present any problem;

7.2 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. SAFETY PRECAUTIONS

1. The unit should be powered for 15 minutes before use.
2. Use in ambient temperature of 0-60˚C.
3. Avoid vibrations, shock, excessive dust, corrosive chemical materials or gaseous environment.
4. Input wire should not be too long. If measured signal have to be far away from the unit, please use 2-core shielded cable.
5. Use this instrument in the scope of its specifications, otherwise fire or malfunctions may result.
6. Contact of the instrument, with organic solvents or oils should be avoided.
7. Do not turn on the power supply until all of the wiring is completed. Otherwise electrical shock, fire or malfunction may result.
8. Do not disassemble, repair or modify the instrument.
9. All connections should be tightened properly.
10. Power supply should be constant, should not be fluctuating.

9. WARRANTY

ABUS provides the original purchaser of this instrument a one (1) year warranty against defects in material and workmanship under the following terms:

- The one year warranty begins on the day of shipment as stated on the sales bill.
- During the warranty period all costs of material and labor will be free of charge provided that the instrument does not show any evidence of misuse.
- For maintenance, return the instrument with a copy of the sales bill to our factory.
- All transportation and insurance costs should be covered by the owner of the equipment.
- Should any sign of electrical or mechanical shock, abuse, bad handling or misuse be evident the warranty voids and maintenance costs will be charged.