INSTRUCTION MANUAL

LogBox RHT
Temperature and Humidity Data Logger

Technical changes reserved
0141 0315-14   07.06.2016

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1 / 18

INSTRUCTION MANUAL

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Table of contents

Technical changes reserved
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2 / 18

INSTRUCTION MANUAL

LogBox RHT
Temperature and Humidity Data Logger

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1. FOREWORD

Dear customer,

We thank you for having purchased the LogBox RHT and are very glad that you decided in favour of a product of **B+B Thermo-Technik GmbH**. We hope this product will fully satisfy you and will assist you effectively in your work.

This Device has been developed to be technically highly up-to date. This product has been designed in accordance with the regnant European and German national directives and rules. For a proper and effective usage of the product the customer shall observe the following Operating Instructions. In the case that against one's expectations any troubles occur which you can not resolve yourself, please contact our service centres or your salesperson. We go after giving you rapid and competent help to minimize the risk of long time outfalls.

The following operating Instruction is an indispensable part of this Product. It contains important advices for the starting up and further use of the device.

2. GENERAL INFORMATION

This documentation contains information which must be paid in attention to assure a highly effective and secure use of the supplied product

Please read through the following instructions and make yourself familiar with the handling of the product before you insert it in your processes. Keep this document always readily to hand so you can consult it by need.

2.1 Labels

Darstellung	Bedeutung	Hinweis
	Advice	It is necessary to read the following advices before beginning the operations. The used symbols in the manual acts first of all as eye catcher for security risks. The symbols **do not** replace the security advices. **The text must be read to the end.**
	Necessary to observe	This symbol designates important advices and tips that are necessary for the success a work step. They have to be followed in order to get good results.

Warning sign	Meaning	Warning sign	Meaning
	This symbol advises the user of danger for persons, material or environment. The text gives information that must be necessarily followed to avoid any risks		Caution against electromagnetic fields (BGV A8, GUV-V A8/W12)
	Caution against hot surfaces (BGV A8, GUV-V A8/W26) and hot liquids or substances		Caution against severe cold (BGV A8, GUV-V A8/W17)
	Caution against liquids and hot substances		Caution against dangerous high electrical voltage (BGV A8, GUV-V A8/W08)
	Caution against dangerous explosive substances (BGV A8, GUV-V A8/W02)		Caution against dangerous explosive atmosphere (BGV A8, GUV-V A8/W21)
	Caution against mobile engines (W29) Caution against moving parts		Electronic waste

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0141 0315-14   07.06.2016

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CE   3 / 18

INSTRUCTION MANUAL

LogBox RHT
Temperature and Humidity Data Logger

3. SECURITY ADVICE

The B+B Thermo-Technik GmbH assumes no liability for damages occurred through failure to observe these security advices. A usage non conform to the instructions given in this manual can damage the device

Body and property damages

- The use of the measurement system must be restricted to qualified personal.
- The system is not adequate for use in atmosphere with explosion danger.
- Do not use the system in a high electric or magnetic field area.

Ensuring of product security

- The system must be operated only within the limits given in the technical Data
- Exposing the system to hot temperatures (higher than the operating temperature) will cause damages in the electronic circuits and also damage the housing.

4. WASTE AND DISPOSAL ADVICE

Please return the device to B+B Thermo-Technik GmbH after expiration of its lifetime

5. USAGE ACCORDING TO PURPOSE

Please use the product only for the purposes for which it is conceived. In case of doubt, please first contact B+B Thermo-Technik GmbH

6. PRODUCT DESCRIPTION

LogBox RHT is a small portable electronic temperature and humidity logger. Its internal sensor measures local environment temperature humidity and logs the values in an electronic memory. Logged data, or ACQUISITIONS, can be later viewed and analyzed on a PC where they can be opened in tabular and graph forms.
The logger is supplied with **Logchart-II** software, which enables to set up the logger operation mode. It is also used for viewing acquisitions. Other parameters such as end of measurements, logging interval, etc., are easily defined through the **LogChart-II** software. Acquisitions can also be exported to be analyzed in other applications, such as spreadsheet programs.

6.1. Supply voltage
The Temperature and humidity Data logger LogBox RHT is a highly autonomic measurement device. It is supplied with a built-in 3.6 V lithium battery (CR2032).

6.2. Unpacking
The following items must be included in the package:
- The electronic logger LogBox RHT;
- A CD-ROM with the Logchart-II software and a USB driver;
- Quick logger operation guide.
- The present operating instructions
- Optional : a communication interface (upon request)

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0141 0315-14   07.06.2016

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4 / 18

6.3.   Identification

The identification label is on the logger body. Check if the features described are in accordance with your order. The following elements are shown in the logger front.
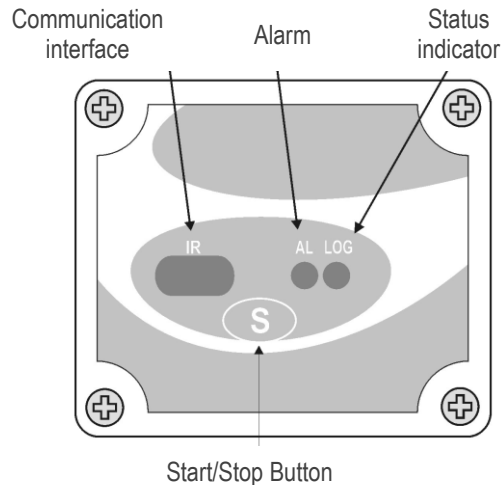
Start/Stop Button

Start/stop button (S)	This button can be configured to start or stop the temperature measurement process.
IR communication Window	PC - Logger communication area. During download, the communication interface must be directed towards this window.
Status indicator (LOG)	While in stand-by (not logging) or after a series of measurements, 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.

7.   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 aid of the **IR-Link wand**.

Requirements:

- A PC system or a Laptop with Windows® 2000- or XP
- CD-ROM device
- A free USB interface

The logger must be "woken up" before communication is attempted. To do so, press the **Start/Stop** button.

The logger starts flashing the **Status Indicator** according to its current status:

One flash every four seconds (stand-by) indicates the logger is waiting to start measuring or that a series of measures was concluded and the logger is waiting for a new command.

Two flashes every four seconds indicate measures ongoing.

The logger operation mode set up is defined in advance by using the **LogChart-II** software**.** Each setting must be defined and the consequences observed. The logger starts and stops logging as defined in settings.

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0141 0315-14   07.06.2016

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5 / 18

INSTRUCTION MANUAL

LogBox RHT
Temperature and Humidity Data Logger

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7.1. Drivers and software 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 in the CD-ROM that is provided with the logger.

The driver 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.
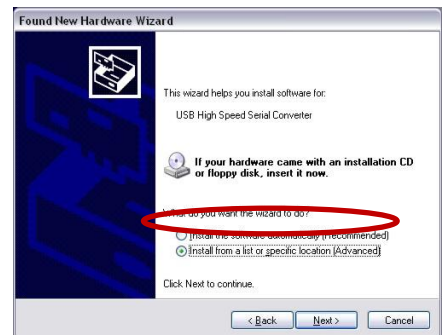
1. Insert the CD shipped with the logger in the CD-ROM drive.
2. Connect the communication interface IrLink-3 to the PC USB port. Windows® will acknowledge the presence of new hardware and a few seconds later it will start the driver installation process.
3. The "found new hardware wizard" will be displayed, 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.

4. Select "Install from a list or specific location (Advanced)" and click "Next".
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.
6. If a prompt warns you that it does not support Windows® XP or that signature verification failed, click "**Continue anyway**".
7. The interface driver files will be copied to the computer and after a few seconds a screen is displayed informing you that the software installation has been concluded. Click "Finish".
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.

Logchart-II Software installation:
*   Insert the supplied CD-ROM in the CD-drive of the PCs/Laptop.
*   The software installation wizard will start automatically. If it does not, please run the **LC_II_Setup.exe** program provided from your CD drive. To do so please follow the steps below:
*   From the start menu of Windows run Windows Explorer. Choose the CD drive
*   Double click on the icon **LC_II_Setup.exe** to run the setup program.
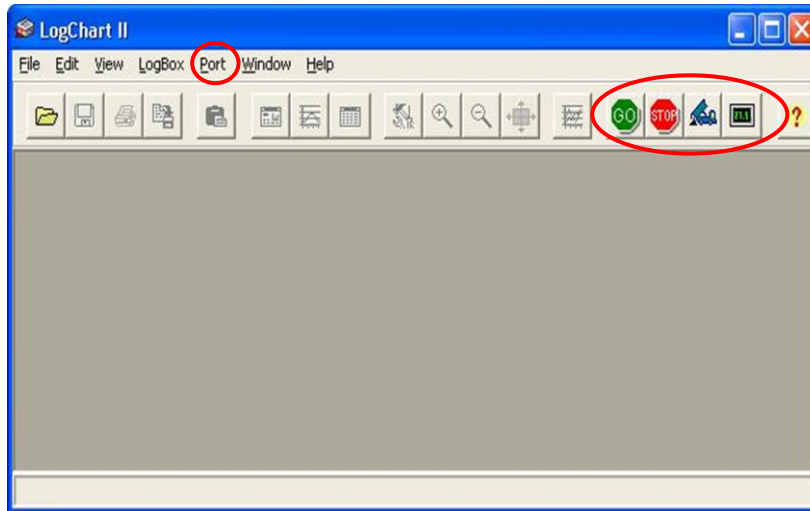*   Follow the steps described in the Setup wizard

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0141 0315-14   07.06.2016

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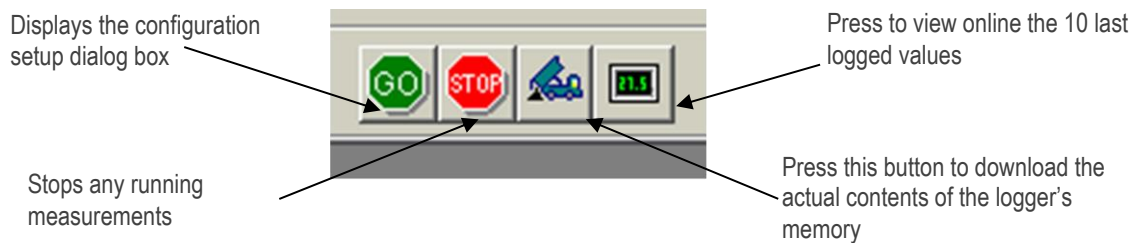
6 / 18

7.2. Running LogChart_II
When you open Logchart-II the following main window is displayed

Next, select the serial port that the communication interface will use in the "**Port**" menu.
If using the serial port check which serial is available. Usually COM2 is free, once the mouse uses COM1. In the case of **Ir-Link3/USB** choose **USB port.** The chosen port will be chosen by default next times the LogChart II is initiated. When a valid port is selected, the icons below are highlighted.

Displays the configuration setup dialog box

Stops any running measurements

Press to view online the 10 last logged values

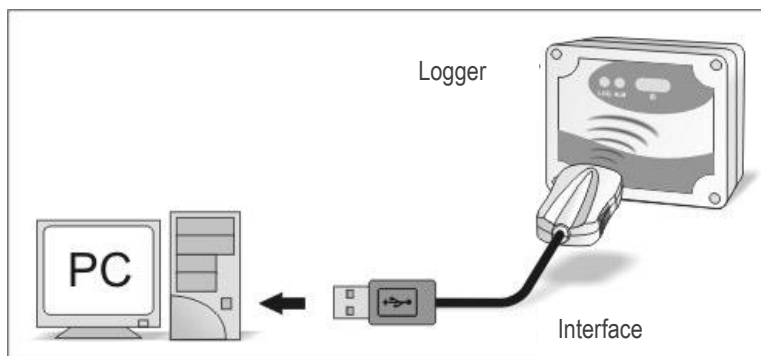Press this button to download the actual contents of the logger's memory

7.3. Configuring the logger
Make sure the communication interface is connected to the PC port selected. The interface must be constantly directed towards the communication window on front part of the logger at a maximum distance of 0.5 m.
The logger must be first "woken up" by pressing once the **Start/Stop (S)** button on its front side.

After the serial port is selected, click the

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0141 0315-14   07.06.2016

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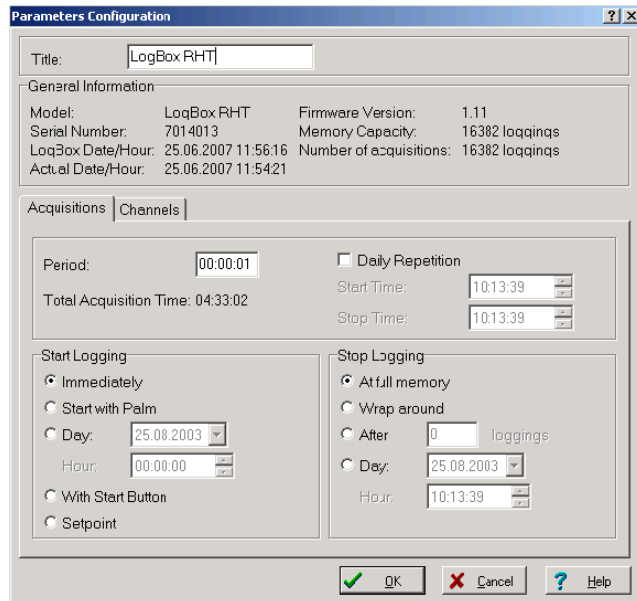
7 / 18

INSTRUCTION MANUAL

LogBox RHT
Temperature and Humidity Data Logger

"GO" button: The following **Parameters Configuration** dialog box is then displayed

In this dialog box the user can define the logger operation mode and also obtains general information about the device.

The different Fields and their meaning are listed in the following:

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
Acquisition	Register card where a series of parameters that define the acquisition process are determined.
Period	Defines the interval between readings: The minimum interval is (1) one second and the maximum is (18) eighteen hours. Note: When the type of value logged is **Average**, **Maximum** or **Minimum** values (see **Value**), the minimum interval is 10 seconds.
Daily Operations	Here the user defines the time at which daily logs will take place
Estimated time	In this field, 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	Start as soon as set up is ready and sent (OK) to the logger.
Start via Palm	Start with a command sent via PDA, which runs the software Log Chart Palm-OS. For further information, see **PDA User** section in this guide.
Date	Readings start at predefined date and time.
Via Start/ Stop	To start the measurement press the Start/Stop button, in the frontal part of the logger, for three seconds. To stop the measurement press again the Start/Stop button for three seconds.
Set point	Acquisitions start when a **temperature** set point is reached. In this option, the set point value is defined in the Channels register card, where the Alarm parameter is replaced by set point.
Stop loggings	Defines the event that initiates the end of measurement. The following options are possible

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0141 0315-14   07.06.2016

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8 / 18

LogBox RHT
Temperature and Humidity Data Logger

Full Memory	Measurement is stopped when the memory is full (32 000 values)
Wrap around	Readings never stop, The oldest records are replaced with newest ones as the number of readings exceeds the memory capacity.
After	The logger stops readings after a number of readings defined in the corresponding edit field
Date	Readings stop at user-predefined date and time. In case the logger memory capacity is reached before the date defined, readings are also stopped
Channels	Register Card with parameters related to temperature measurement. There are two separate Channels: Channel 1 for Temperature and Channel 2 for Humidity
Unit	Defines the unit of the Temperature (channel 1) value measured: ºC or ºF and % RH only for the humidity (channel 2)
Value	Defines how the value measured will be registered. 3 Options are available:
Instantaneous	The logger measures the temperature once at the end of the predefined measurement interval (Period) and save the measured value in the internal memory. The minimum interval between measurements is 1 seconds.
Average	The Logger takes 10 equidistant measurements within the predefined measurement interval (Period), build the average of these ten values and store the result in the internal memory. The minimum interval between measurements is 10 seconds.
Maximum	The Logger takes 10 equidistant measurements within the predefined measurement interval (Period) and stores the highest value of them in the internal memory. The minimum interval between measurements is 10 seconds.
Minimum	The Logger takes 10 equidistant measurements within the predefined measurement interval (Period), and stores the lowest value of them in the internal memory. The minimum interval between measurements is 10 seconds.
Offset	Gives the user the possibility to automatically correct the value logged.
Alarm	Defines limit values that, when exceeded (high) or undershot (low), characterize an alarm condition. Alarm events are informed to the user through a flashing mode of the Alarm Indicator.
Input	Parameter only available in Channel 2 (humidity). It allows disabling of humidity measurements, hence, saving all memory capacity for temperature measurements.

After filling all the fields select OK and settings will be sent to the logger
Note: After clicking the OK button all previous settings and previous data logged are lost.

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9 / 18

8. DATATRANSFER AND VISUALISATION

Data collected are sent from logger to PC. Data can be collected any time, at the end of the acquisition process or while they are being acquired. If data collection takes place during the acquisition process, the process will not be interrupted.

8.1. Offloading data

Data offload is accomplished by clicking the button **Offload Data**:

During data transfer, a status bar indicates remaining data to be transferred. Data offloading time is proportional to the number of readings logged (40 Seconds for 16 000 values).

8.2. Visualizing data

At the end of values transfer, data are automatically displayed in a graphical form.
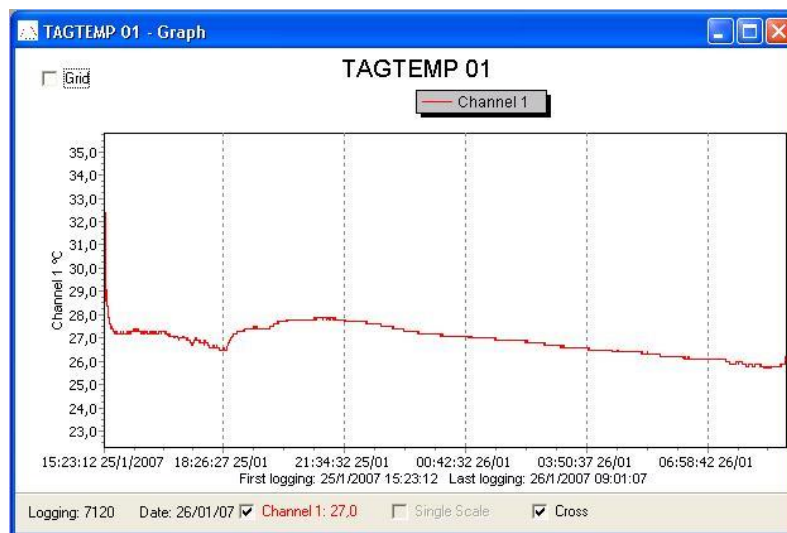
8.3. Chart view

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

8.4. Sheet view

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.

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10 / 18

LogBox RHT
Temperature and Humidity Data Logger

8.5. General information sheet

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

8.6. Exporting data

Logged data can be exported to different file formats, for further analysis. To export, access File/Export or click the icon:

and store/open the data in the desired format.
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11 / 18

9. PDA USER

It is possible to set up the logger and collect acquired data with a PDA that supports the Palm-OS system. The application **LogChart Palm-OS** is shipped with the logger. The stalled in the PDA through a HotSync process (data synchronization between PDA and 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. Type d:\LCP_Setup, where d: is the disk drive unit. Press "OK". The installation wizard will guide you through the installation process.
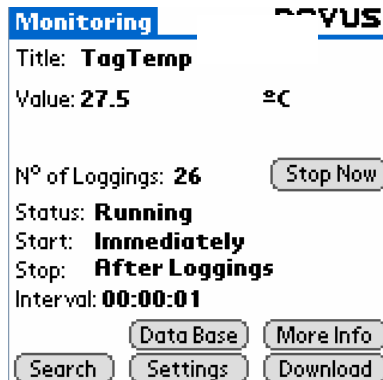
```
Recorded Data
DATE      DATA TITLE
04/10/04  Penguin RHT
05/10/04  Penguin T
20/10/04  Vaccine Transit
17/11/04  Room #1
01/12/04  Warehouse
05/10/04  08-04-04


( Search Device )  ( Details )
```

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

Starting the LogChart PalmOS application will display the Recorded Data on the PDA screen, where it is possible to access the logger to change settings and offload data, as well as to access recorded data.

9.1. Accessing the Logger

```
Monitoring          NOVUS
Title: TagTemp

Value: 27.5        ºC


Nº of Loggings: 26    ( Stop Now )
Status: Running
Start:  Immediately
Stop:   After Loggings
Interval: 00:00:01
                ( Data Base ) ( More Info )
( Search )  ( Settings )  ( Download )
```

To have communication between the logger and the PDA established, the user must align the PDA infrared wand to the logger communication window, run the LogChart Palm-OS software, and press **Search Device** in the **Recorded Data** screen. When the PDA finds the logger, the **Monitoring** screen will be displayed. The screen displays values of variables measured, configuration information and current logger status.

Buttons are assigned the following functions:

Search	It allows "searching" for another logger or reconnect communication lost for any reason. After finding a logger, the PDA displays a new Monitoring screen.
Download	Offload logged data. Download can be partial and it does not interfere in the ongoing measurement process
More Info	Displays further information on the connected logger, such as model, serial number, version and memory capacity
Settings	Accesses the Settings screen, which allows to modify the logger configuration.
Data	Displays the **Recorded Data** screen listing all the processes stored and processed

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12 / 18

Base   in the PDA data base.

9.2.   Configuring the Logger- Settings

During configuration, the logger and the PDA ports must be aligned. Press **Settings** in the **Monitoring** screen. The screen **Settings** is opened and provides the required parameters for configuring the logger.

The parameters to be defined are:

Title:	Name of the process.
Input:	Enables the user to select the temperature unit.
Start	(start of acquisitions): Defines the measurement start mode. Options are:

|	
Immediately:	The logger starts logging as soon as configuration is sent to the logger.
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.
<Start> Button:	Press the **Start_Now** button from the **Monitoring** screen to start logging. The PDA must be turned towards the logger.
Set point value:	Measurements start when a temperature set point is reached. With this option it is also possible to start 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 set up.
TagTemp button:	Starts when the **Start/Stop** button at the frontal side of the logger is pressed.
Stop:	Defines the measurements stop mode: Options are:
Full memory:	Loggings can be stored **up to** the logger full memory capacity is reached.
Wrap around:	Logging never stops. When the logger maximum memory capacity is reached, oldest records are overwritten by newest data.

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13 / 18

After loggings:	The logging will stop after the pre-defined number of readings has been reached.
By date/time:	Logging is stopped on user-defined date and time
Interval:	Defines the interval between readings: hour, minutes and seconds. When the logging mode is set to the
Instantaneous	the minimum interval is 1 second. For **maximum** and **minimum** values, the minimum interval is 10 seconds in both models.
Misc:	Shows the Logging Mode parameter that defines how measured value will be logged. Options are:
Instantaneous:	The value logged will be exactly the value measured at each interval. Measurement is taken at the end of the defined interval. The minimum interval between measurements is 1 second.
Average	The Logger takes 10 equidistant measurements within the predefined measurement interval (Period), build the average of these ten values and store the result in the internal memory. The minimum interval between measurements is 10 seconds
Minimum:	The value logged will be the minimum value found within ten consecutives measurements taken within an interval. The minimum interval between measurements is 10 second.
Maximum:	The value logged will be the maximum value found within ten consecutives measurements taken within an interval. The minimum interval between measurements is 10 second.
Alarms:	Enables an alarm that is triggered according to user defined parameters. Values shown in the temperature unit selected.
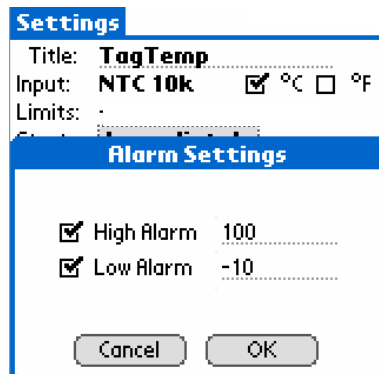
Clocks:	Provides access to Logger and PDA clocks. When a new configuration is sent to the logger, clocks are updated.
Offset:	allows fine offset adjustment on the measured value. The **Reset** button clears changes made and the logged values are the measured values again.
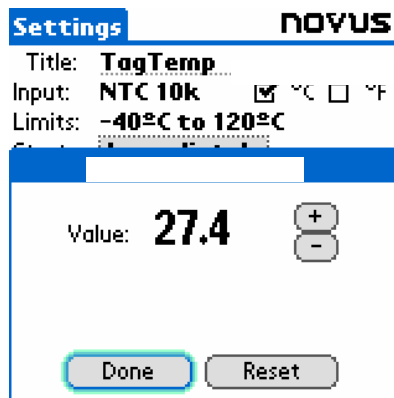
⚠ Click **Apply** to send this configuration to the Logger, returning to the **Monitoring** screen. Sending a new configuration implies the **exclusion** of all data collected present in the logger memory

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0141 0315-14   07.06.2016

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14 / 18

9.3. Downloading data from the Logger

In the Monitoring screen, the Download button performs the transfer of the data from de LogBox 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 Recorded Data screen, identified with the name assigned to the process (Data Title) and the date it was downloaded. Should the PDA batteries be discharged, all readings will be lost.

9.4. File Visualisation

The Recorded Data screen lists the data base logged and stored in the PDA. To access data, select the desired data base and press Details. The Recorded Data Details screen shows several 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.

Technical changes reserved
0141 0315-14   07.06.2016

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15 / 18

9.5. Transferring the data to the desktop

HotSync of data stored in a PDA with the Desktop 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 on the HotSync Manager in the Windows taskbar. Select in the drop-down menu the option Custom. Select Novus LogChart Conduit and click Change. The following window will be exhibited:
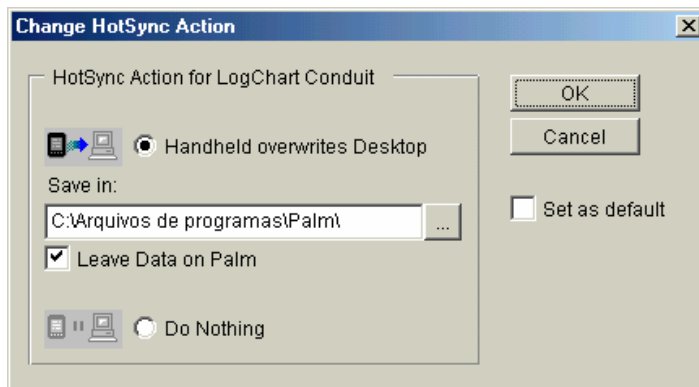
Handheld overwrites Desktop: LogChart Palm-OS files are transferred to the Desktop.
Choose a directory to record files generated during data synchronization.

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**

10. MOST FREQUENTLY FOUND PROBLEMS

The LED is not flashing: The LED flashing light is intentionally weak, and it can be difficult to see in clear environments. Be sure it is really not flashing

Communication with the logger fails:
- Make sure the COM port is correctly selected and there is no other programs using the same port during the communication attempts.
- Make sure there is no physical obstacle blocking the IR signal.
- Make sure the cable is well connected to the PC.
- Make sure the port selected does not present any problem.

11. MAINTENANCE

The housing can be cleaned with a wet cloth. Do not use chemical solvents. With the exception of exchanging empty batteries the logger is widely maintenance free

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16 / 18

12. **QUESTIONS?**

If you still have other questions concerning this or other product of B+B Thermo-Technik GmbH, contact us at:

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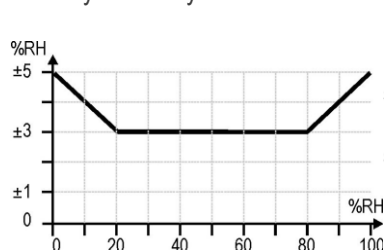Your partner for temperature
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17 / 18

LogBox RHT
Temperature and Humidity Data Logger

B|B
S E N S O R S

13. TECHNICAL DATA

Features	Values
Measurement Range	Temperature: –40.0 °C to 80.0 °C. Humidity 0 to 100 % RH
Accuracy	See figure below.
Measurement resolution	°C 0,1 % RH
Memory capacity	32 000 (32 K) logs
Measurement Interval	1 second min. 18 hours max.
Supply	3.6 V lithium battery (1/ 2 AA), built-in
Estimated autonomy	Higher than 1 year, with weekly data reading. More frequent logged data readings may shorten battery life.
Operating temperature	From -20°C to 80°C
Case / Body	Polycarbonate
Protection	Suitable for products with protection level IP65. (excepting the Sensor Head)
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-ll Software Umgebung	Windows 95, 98, NT, 2000 and XP. Menus in Portugiesisch, English oder Spanisch. Einstellungen, Datentransfer und Anzeige auf dem Bildschirm
0568 0038	Data Logger LogBox RHT with internal temperature (Pt100) and humidity sensors. Up to 32 000 values memory capacity. Operating Temperature -40°C …80 °C,
0568 0036	**IrLink 3** infra red communication interface with USB Connector and **LogChart II** software. To use with TagTemp and LogBox serie Data loggers
CE-conformance	2014/30/EU
Electromagnetic compatibility	EN 61326-1

Humidity accuracy

Temperature accuracy

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CE   18 / 18