

Log Box-DA

Data Logger
User Manual



ABUS TECHNOLOGIES INC.

WARNING

- ❖ This manual should be passed on to the end user.
- ❖ The contents of this manual are subject to change without prior notice.
- ❖ All rights reserved.
- ❖ ABUS gives no warranty of any kind with regard to this manual, including, but not limited to, fitness for a particular purpose.
- ❖ If any question arises or errors are found, or if any information is missing from this manual, please inform your supplier or inform at info@abustek.com.
- ❖ The specifications mentioned in this manual are limited to those for the standard type under the specified model number break-down and do not necessarily apply for customized instruments.
- ❖ 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.
- ❖ If the customer or any third party is harmed by the use of this product, ABUS assumes no responsibility for any such harm owing to any defects in the product which were not predictable, or for any indirect damages.

Although Warning hazards are related to personal injury, and Caution hazards are associated with equipment or property damage, it must be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process system performance leading to personal injury or death. Therefore, comply fully with all Warning and Caution notices.

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of Technical Communications Department, ABUS Technologies

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

Contents	Page No.
1. Introduction	4
2. Presentation	4
1. Technical Parameters	4
2. Memory capacity	5
3. Input signals	5
4. Data acquisition (logging)	5
3. Dimensions	5
4. Connections	6
1. IP65 Model	6
2. IP67/IP68 Model	6
3. Input Connection	8
4. External Battery Switch	9
5. Installation	9
1. Recommendation	9
2. Panel	10
3. LogChat-II	10
4. Optic Interface IR-Link3	11
5. Palmtop User	12
6. Configuration	12
1. General information Field	13
2. Acquisition Field	14
3. Start Loggings Field	14
4. Stop Loggings Field	14
5. Channels Field	15
6. Palmtop User	17
7. Operation	20
1. Offloading Data	20
2. Visualization Data	22
3. Monitoring Acquisition	22
4. Palmtop User	23
8. Maintenance	24
1. Observation	24
2. Troubleshooting	24
9. Safety Precautions	25
10. Warranty	25

1. INTRODUCTION

LogBox-DA is an electronic data logger with two input channels, one analog and one digital. Input data is stored in the logger internal memory, for later download to a PC for visualization and analysis in the form of tables or graphs. The data is easily exported to spreadsheets.

The **LogChart-II** is the software used to configure the logger, download and visualize data. The logger configuration allows defining the logger operation mode, including programming the start/stop time of data acquisition. Other parameters such as signal input type, logging interval, multiplication factor, scale range, etc, are easily selected through the **LogChart-II** software.

The LogBox-DA also provides a signal for commanding an external power supply (battery) of a device connected to the logger. This feature allows that external devices, such as a transmitter, be powered only during the measurement sample time, thus extending the autonomy of these external batteries.

2. PRESENTATION

2.1 Technical Parameters

Inputs:

Channel 1:	NPN, PNP, Pulse or Dry Contact
<i>Level 0:</i>	0.0 up to 1.0 Volts
<i>Level 1:</i>	2.0 up to 24.0 Volts
<i>Max. Frequency:</i>	4000 Hz for NPN, PNP and Pulse 20 Hz for dry-contact (internal <i>De-bounce</i>)
<i>Input Impedance:</i>	
<i>NPN, PNP and Pulse:</i>	105 k Ω
<i>Dry contact:</i>	Capacitance of 100 nF
<i>Maximum counting:</i>	65,535 per period.
Channel 2:	0-20mA, 4-20mA, 0-50mV and 0-10Vdc
<i>Input Impedance:</i>	
	0-20mA and 4-20mA: 120 Ω
	0-50mV: >>10M Ω
	0-10Vdc: >120k Ω

Memory capacity:	32000 (32k) or 64000 (64k)
Interval between readings:	<i>Minimum:</i> 10 seconds, <i>Maximum:</i> 18 hours
External battery switch time:	0 to 10 s
Power:	3.6V lithium battery (1/2 AA)
Estimated autonomy:	Over 2000 days (one daily download)
Working temperature:	From -40°C to 70°C .
Protection:	IP65, IP67 and IP68 models (see lateral label on product)
Material:	ABC + PC case, Polycarbonate film;
Dimensions:	60x70x35mm

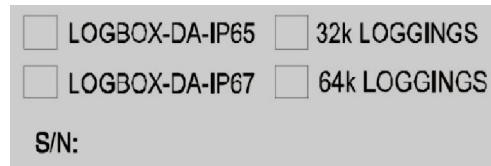
2.2 Memory Capacity

Two memory storage capacities are offered: 32K or 64K records:

32k Model: Allows up to 32,000 records;

64k Model: Allows up to 64,000 records;

Memory capacity is always shared between enabled channels. In case there are two channels enabled, each gets 50 percent of the memory available. When only a single channel is enabled, it has the entire memory at its disposal. Memory capacity is indicated on the identification label placed on the logger case.



Lateral Identification label

2.3 Input Signals

Channel 1 (IN 1) counts electric pulse signals. They can be voltage pulses, a dry contact (switch) or open collector signals, as selected in the configuration.

Channel 2 (IN 2) measures linear analog signals, which can be 0-20mA, 4-20mA, 0-50mV or 0-5V, user defined.

Note: For the channel 2, depending on the input signal selected, it may be necessary to configure an internal jumper.

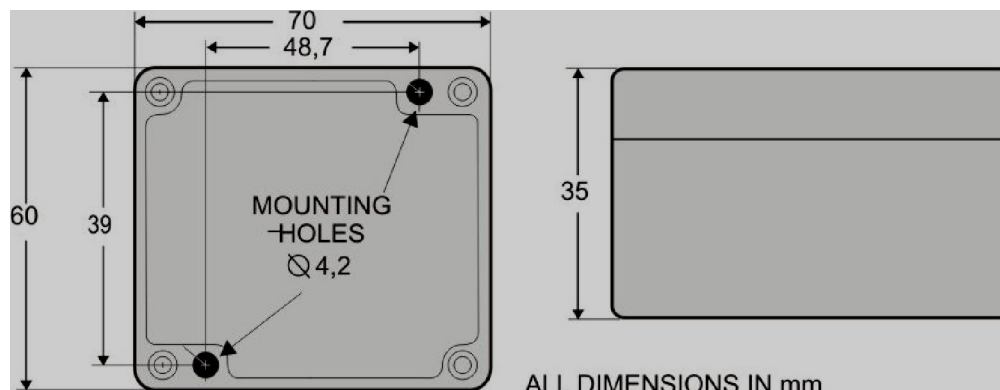
2.4 Data Acquisition (logging)

Data can be acquired by means of two different modes.

In channel 1, which counts pulses, the number of input pulses counted in the logging time interval is stored in the logger memory at the end of the interval. The maximum number of loggings that can be stored depends on the memory capacity of the device model.

In channel 2, specific for analog signals, the logger can be configured to perform a single measurement at the end of the selected time interval storing the value read; 10 measurements within the time interval and store the mean of values read, or, yet, record the minimum or maximum values read in the interval.

3. DIMENSIONS

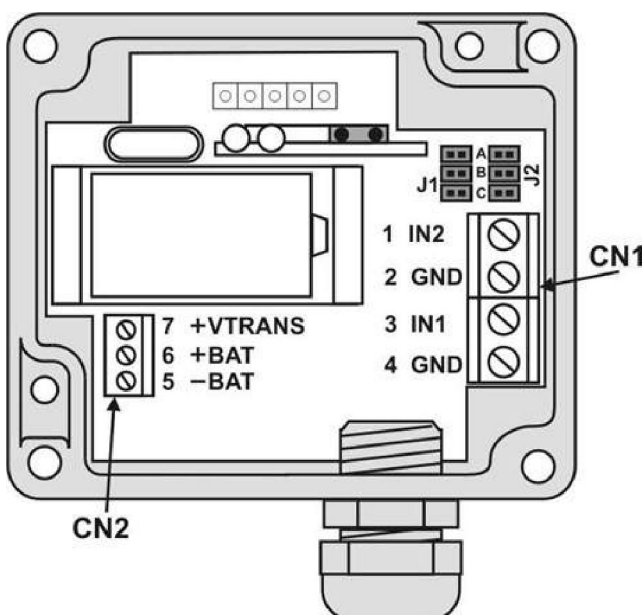


4. CONNECTIONS

Only the input connections and the External Battery Switch (when used) are needed. The logger is exclusively powered by its internal battery. In the IP65 models, the inputs and the signal for activating the external power supply are located inside the logger case, which must be opened for accomplishing the connections. In the IP67 and IP68 models, proper connectors are provided for this purpose, as shown in Figure *IP67/IP68 connectors*, below.

4.1 IP65 Model

Open the logger's cover to get access to the block terminals and the configuration jumpers. Connection cables must pass through the compress fitting located at the bottom of the case. Figure *IP65 connections internal view*, below indicates signal polarity.



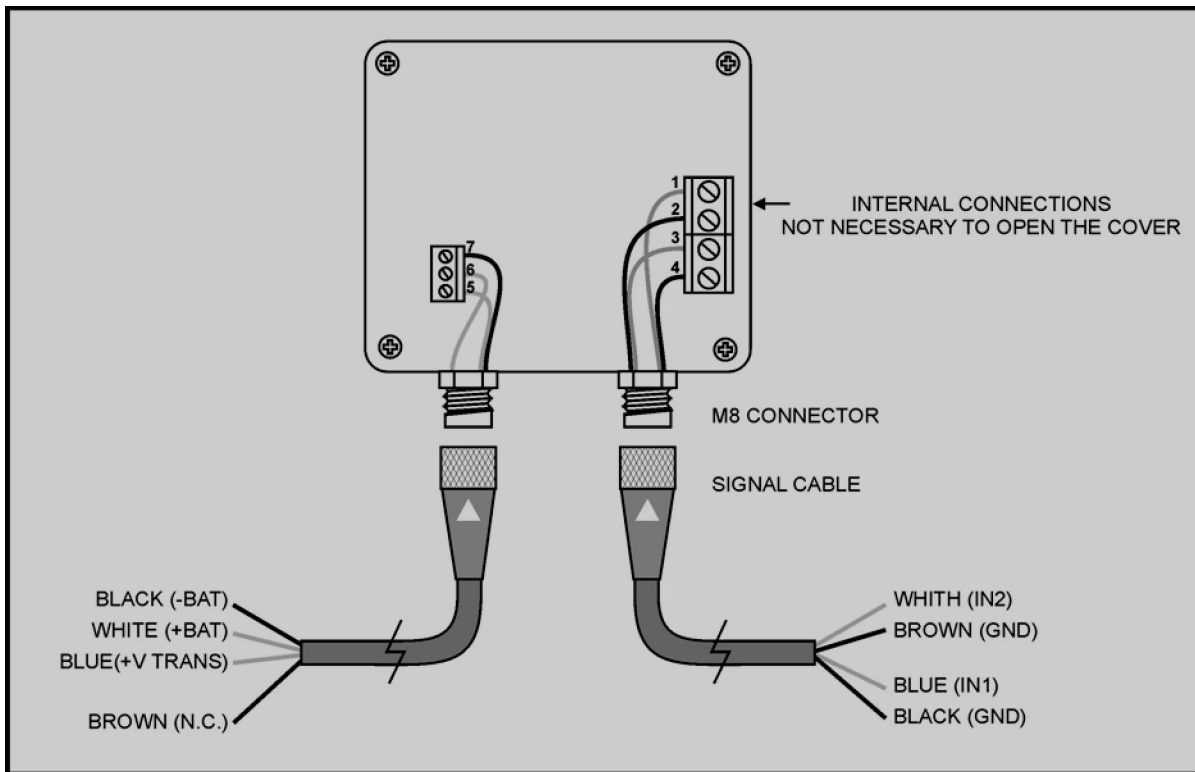
IP65 connections internal view

Note: Make sure that the compress fitting is perfectly tightening the cables, thus assuring proper IP65 protection: (totally dust-tight and protected against water jets).

4.2 IP67/IP68 Model

In the IP67/IP68 version, a M8 connector is provided for signal input, as in Figure 9. When required, a second M8 connector can be installed to output the signal for commanding the external power supply. The cables are supplied with the logger.

Note: The case cover should not be opened unless battery replacement is required. If this is the case, the cover must be properly tightened back in its place such as to assure the IP67 / 68 protection.



IP67/IP68 external connectors

CHANNEL CABLE (RIGHT)	CONNECTION
Blue	Channel 1 - IN1 - positive (+)
Black	Channel 1 - GND - negative (-)
White	Channel 2 - IN2 - positive (+)
Brown	Channel 2 - GND - negative (-)

SWITCH CABLE (LEFT)	CONNECTION
Blue	Transducer +V TRANS
Black	External Battery (-BAT)
White	External Battery (+BAT)
Brown	Not Connected

4.3 Input Connections

4.3.1 INPUT CONNECTIONS – CHANNEL 1

The following figures show connections for the various input types accepted in channel 1. No jumper is required to adjust the channel 1 input type (the circuit is reconfigured automatically according to the input type selected).

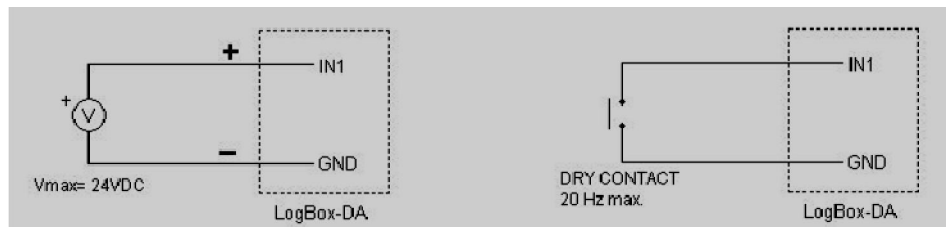
4.3.2 INPUT CONNECTIONS – CHANNEL 2

For adequate use of channel 2, set internal J1 and J2 positioning according to the input signal chosen, as shown in the table below (factory default is 4-20mA / 0-20mA signals).

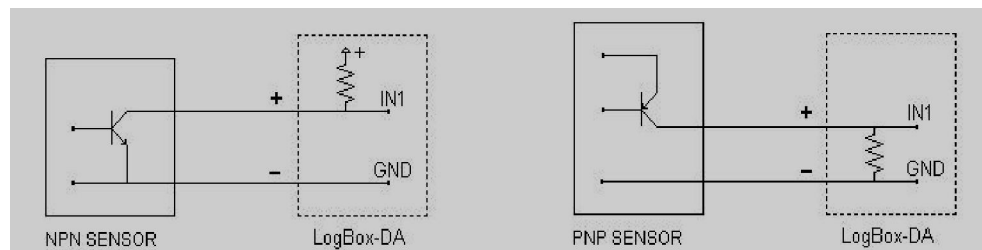
INPUT SIGNAL	J1 POSITION	J2 POSITION
4-20 mA / 0-20 mA	A	A
0-10V	B	B
0-50 mV	C	C

J1 and J2 positioning

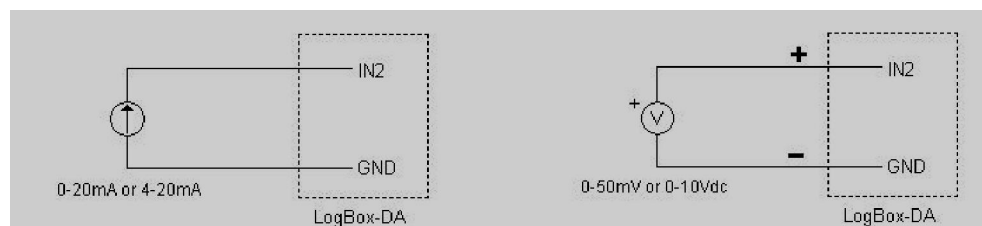
The following figures show connections for different types of signals applied to channel 2.



Voltage pulse and dry contact channel 1 input



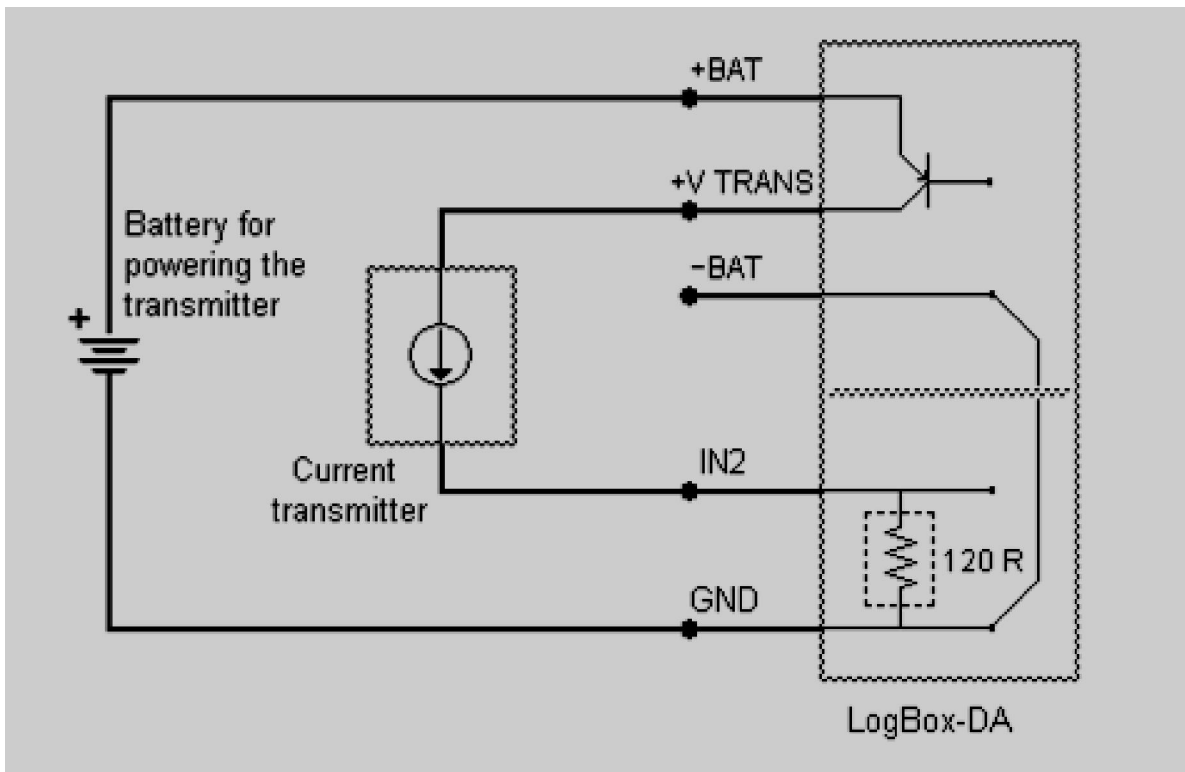
NPN and PNP open collector input for channel 1



Current and voltage inputs for channel 2

4.4 External Battery Switch

The example below shows the usage of the external battery switch for commanding the power supply of external devices. - Channel 1 is configured to 4-20mA input signal. A battery is used to provide power to the 4-20 mA loop. The battery switch “turns on” the power to the loop a moment (defined in the configuration) before the measurement is taken, enabling the transmitter (pressure, temperature, etc) to start up and stabilize the output. This approach saves the battery energy, as the power is turned on only when required (before each measurement).



Example of the battery switch powering a transmitter.

5. INSTALLATION

5.1 Recommendation

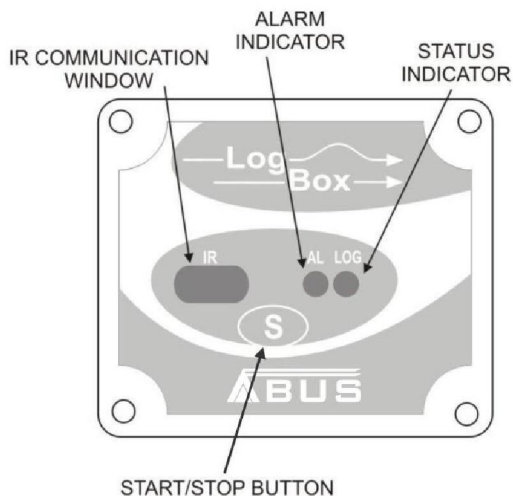
1. Signal wires should be installed in grounded conduits and away from power or contactor wires.
2. Instruments must be powered only by an exclusive power supply.
3. System failure should always be taken into account when designing a control panel to avoid irreversible damage to equipment or people.

5.2 Panel

The Status Indicators (see Figure *LED Indicators and IR communication*) are located in the logger front panel. They indicate the current working conditions of the unit.

LOG Indicator (*Logging*): While in stand-by (not logging) or after a series of acquisitions is ended, it flashes once at every four seconds. While logging is active, it flashes twice every four seconds.

ALM Indicator (*alarm*): Alerts the user regarding alarm conditions. Once triggered, the alarm LED keeps flashing once at every four seconds until a new configuration is entered.



LED Indicators and IR communication

CHANNEL 1 MULTIPLICATION FACTOR

Channel 1 was designed to count electric pulses from liquid flow meters (litters per pulse, for example). The amount of liquid corresponding to each pulse and the unit of flow can be easily configured.

Although suited to flow measurements, channel 1 can measure any variable whose signal is an electric pulse (energy, production batches, etc). The user can define a new unit by typing it in the corresponding text box. The expression **l/pulse** in the multiplication factor is meaningless in this case, so please disregard it.

5.3 LogChart-II

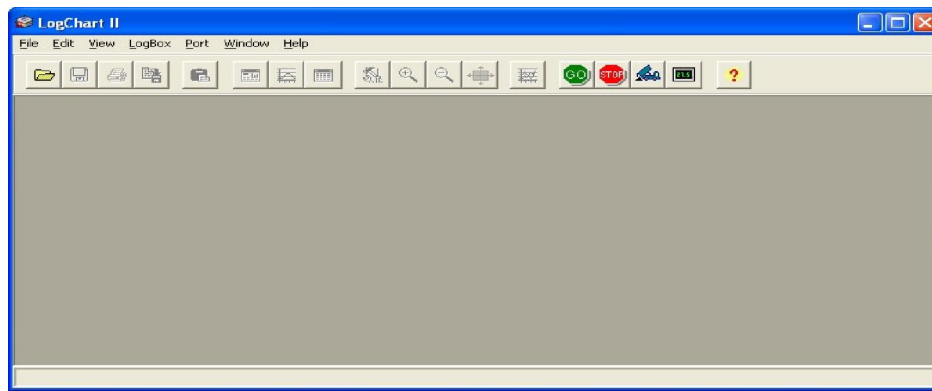
5.3.1 INSTALLING LOGCHART-II

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.

5.3.2 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: 

5.4 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.

5.4.1 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.

5.4.2 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**.*

5.5 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.

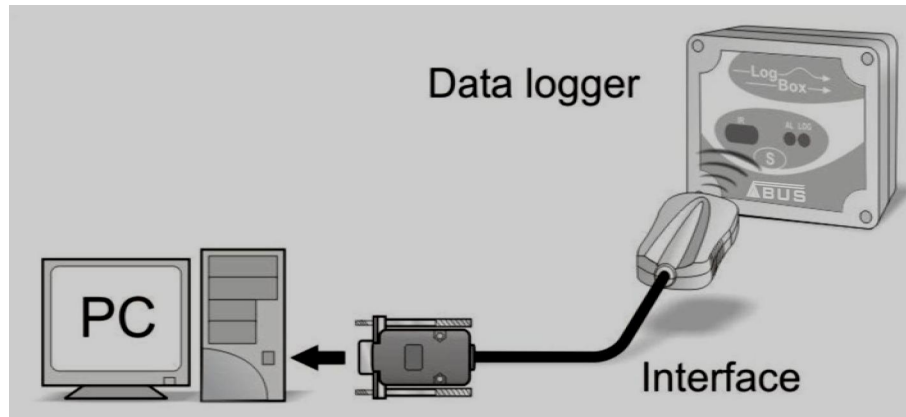
Starting the LogChart PalmOS application will display the **Recorded Data** screen on the Palm from where it is possible to access the logger to change settings and collect data, as well as to access collected data.




Recorded Data screen

6. CONFIGURATION

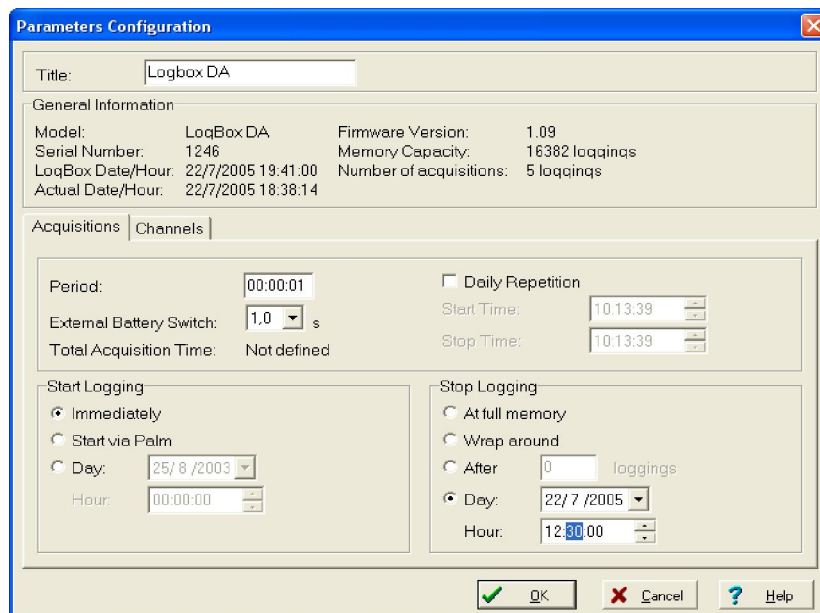
Make sure the IR-LINK3 wand is connected to the PC. The interface must be pointed towards the logger communication window (see Figure below) at a distance of about 15 cm.



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

6.1 General Information Field

General information on the top of the screen informs the model, serial number, logger current date/time, PC date/time, firmware version (logger model version), memory capacity and used memory. This information is displayed in the upper part of the LogChart-II configuration screen. The time is constantly updated in this screen, provided that the logger and the PC are communicating.

6.2 Acquisitions Field

- Interval:** It determines the interval between readings in the hh:mm:ss format. New data is stored in the logger memory after each time interval.
- External Battery Switch time:** Defines an interval of time preceding each measurement for turning on the power supply of external devices (4-20 mA transmitters, for example). This feature is intended for saving power when the external power supply is battery powered and the logging interval is long. This signal is disabled when a measurement is completed. This time is limited to 10 seconds and must be less than half of the interval between readings.
- Estimated time:** It informs the estimated time for the accomplishment of programmed readings based on the logging “**Interval**” and on the number of programmed readings.
- Daily Repetition:** Allows loggings to be repeated everyday, for example, recording data from 8 AM to 5 PM day after day. The start and stop times are defined in the fields “**Start time**” and “**Stop time.**”

6.3 Start Loggings Field

- Immediately:** The logger starts logging as soon as the configuration is applied. Not valid when the option ‘Daily Repetition’ is selected.
- Start via Palm:** Logging is started via Palm. The LogPalm software must be installed in the PDA. (See **Palm User** under this section)
- Day / Hour:** Logging starts at a defined date and time. The date defined is used for the Daily Repetitions option as well. **Through Start Button** Starts and stops logging by pressing the Star button for two seconds.

6.4 Stop Loggings Field

- At Full Memory:** Loggings can be stored up to the full memory capacity is reached.
- Wrap around:** Logging never stops. The LogBox-DA 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 a defined number of readings:** The logger will stop logging after the number of readings here defined is reached. Not valid when the option ‘Daily Repetition’ is selected.
- Day / Hour:** The LogBox-DA will stop logging at the user-defined date and time. Not valid when the option ‘Daily Repetition’ is selected.

6.5 Channels Field


By selecting the “**Channels**” option, the user is able to choose the individual settings for each input channel, as Figure below shows.

The screenshot shows the 'Parameters Configuration' window for 'Logbox DA'. It has two tabs: 'Acquisitions' and 'Channels'. The 'Channels' tab is active, showing settings for two channels. Channel 1 has a tag 'Flow1', sensor 'PNP/Voltage', unit 'm³/min', sensor factor '0.667', and scale factor '3'. Channel 2 has a tag 'Level', sensor '4-20mA', unit 'meters', scale factors '0.25' and '9.60', and an offset of '0'. Both channels have alarm settings for 'Low' and 'High' values.

Parameters for Input Channels Configuration

6.5.1 CHANNEL 1 – DIGITAL PULSE LOGGINGS

Configuration options provided for Channel 1 are:

- Tag:** Defines a name (up to 8 characters) for identifying the variable to be measured.
- Sensor:** Selects the input type of the channel: *Unabled, PNP/Voltage, NPN, Dry Contact*
- Unit:** Defines the input variable unit. Flow measurement is default, however, other units can be defined by typing the unit in the text box.
- Sensor Factor:** Defines the amount of input per pulse. Liquids flow measurement is default (liters per pulse.) It can assume any value between 0.000001 and 16383.
- Scale Factor:** Adjusts the readings such as to represent a particular flow measurement unit. This factor can be automatically calculated (the software computes the value taking into account the interval between loggings and the sensor factor) by using the button . It can assume values between 0,000001 and 65535.
- Alarm:** The routines for alarms **LOW** and **HIGH** are executed at the end of the logging period, informing the occurrence of an alarm by flashing the alarm LED in the front panel.

LOW defines the minimum value under which the alarm is triggered; **HIGH** defines the maximum value above which the alarm is triggered. Once activated, the alarm LED indicator stays so even after the alarm-triggering situation has ceased.

6.5.2 CHANNEL 2 – ANALOG INPUT

The options provided for Channel 2 configurations are:

Tag: Defines a name (up to 8 characters) for identifying the variable to be measured.

Input: The signal applied to the logger second input is defined here. The following options are offered: *None* (disabled) *4-20 mA*, *0-20 mA*, *0-50 mV*, *0-10 V*. The option selected must be compatible with the LogBox internal jumper configuration. See configurations on Table 1.

Unit: Defines the variable unit.

Scale: Defines the range, in engineering units, for representing the input variable measured in input 2. Adjustable is from -32000 to $+32000$.

Offset: Allows fine offset corrections on the measured value.

Value: Defines readings recording mode:

Instantaneous: The instant value read at the logging time.

Average: Arithmetic average of 10 consecutive samples equally spaced over the logging interval.

Minimum: Records in memory the minimum value of 10 consecutive readings in the logging interval.

Maximum: Records in memory the minimum value of 10 consecutive readings in the logging interval.

Alarm: The routines for alarms **LOW** and **HIGH** are executed every time the logger samples the inputs, informing the occurrence of an alarm by flashing the alarm LED in the front panel.

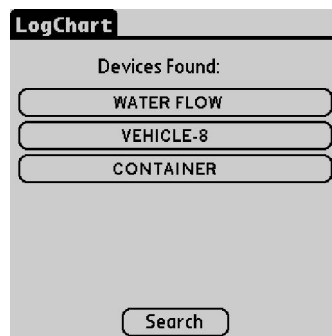
LOW defines the minimum value under which the alarm is triggered; **HIGH** defines the maximum value above which the alarm sensor is triggered. Once activated, the alarm LED indicator stays so even after the alarm-triggering situation has ceased. After filling all the fields, send the configuration to the logger by clicking on the button.



To stop loggings, click on the button 

6.6 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.

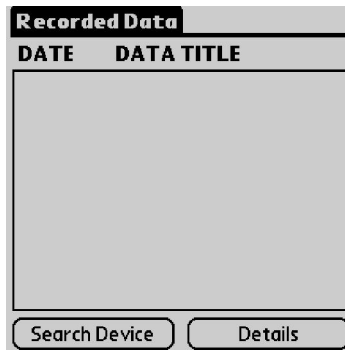


Monitoring screen

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

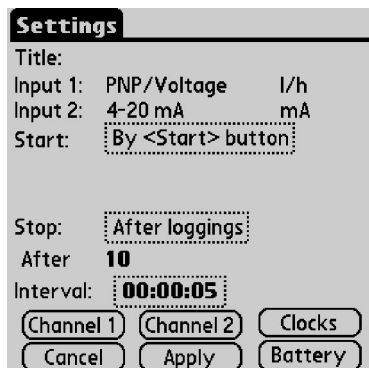
- Search:** It allows you to "search" for another logger or reconnect communication lost for any reason. When the handheld device finds a logger, it exhibits a new Monitoring screen with the logger information. When other loggers are found, the Devices Found screen is exhibited again.
- Download:** Downloads 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 inputs used by channels 1 and 2 respectively.
- Start:** *Defines the strategy for the logging start. 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 LogBox Button: Press the **Start_Now** button from the **Monitoring** screen, the Palmtop should be pointed towards the logger.

By Digital Input: Readings are performed while the digital input is enabled (closed / 1) and interrupted when the digital input is disabled (open / 0).

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. For mean, maximum and minimum values, the shortest interval between loggings is 10 seconds.

Channel 1: *Opens the Input 1 Settings screen.*

Tag: Defines a name for Channel 1.

Input: Informs the input type used in Channel 1:

Unit: Defines the unit of the variable. Options are set up for flow measurement, however, other units can be defined by typing the unit in the text box.

Input Factor: Defines the amount of input per pulse. It is set up to measure liquid flow (liters per pulse.) It may be a value between 0.000001 and 16383.

Scale Factor: Adjusts the readings such as to represent a particular flow measurement unit. This factor can be automatically calculated by tapping on the button Calc. It may be a value between 0.000001 and 65535.

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



Alarm settings screen

Cancel and **OK** buttons cancel and save configurations defined in Channel 2 screen.

Channel 2: Opens the Input 2 Settings screen.

Tag, Input and Unit fields are identical to Channel 1 definitions,

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

Instantaneous: One reading and one logging at each reading “Interval”;

Average: Ten readings at each reading interval. The average value of readings is the value recorded.

Minimum: Ten readings at each reading interval. The lowest value found is recorded.

Maximum: Ten readings at each reading interval. The highest value found is recorded.

Offset: allows fine offset adjustment on the measured value.

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

Cancel and **OK** buttons cancel and save configurations defined in Channel 2 screen.

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


After configuring clocks, click **Apply** to send this configuration to the Logger, returning to the Monitoring screen.

7. OPERATION

The logger operation mode is user-defined in the **LogChart-II** software. To access or change this configuration, the **IR-LINK3** interface is required. The user must install the LogChart-II software in a computer and run the logger configuration according to instructions defined in the LogChart-II installation section of this manual.

After configuration and input electric connections are made, the device is ready to measure and log input signals. The status indicator shows the logger current status.

7.1 Offloading Data

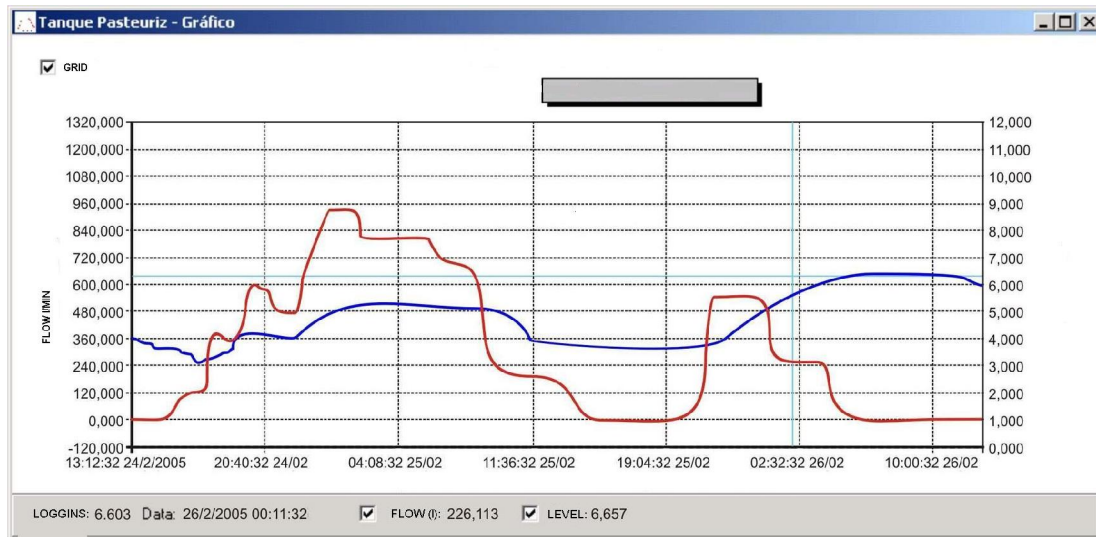
The transference of data to a PC is accomplished by using the LogChart II software. Data can be collected anytime and saved in files for future analysis (menu “File Save” or “File Save as”). Help can be accessed from the LogChart-II software when necessary. Offloading data: data offload is accomplished 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.

7.1.1 GRAPH WINDOW

The Graph is a convenient tool for analysis. It enables the logger acquisitions to be read in the form of a “values x time” graph. As one moves the mouse in the chart area, the time and the value of the records of each channel are shown in the field located in the bottom of the window.

Zooming in and out are implemented. It is possible to select an area by clicking and dragging the mouse, thus creating a zoom region, starting at the upper left position of the region of interest.



Graph window.

NOTE: The command Offload acquisitions does not interrupt the process of data logging and reading. Other two windows can be easily opened: General information window and Tables window.

7.1.2 GENERAL INFORMATION TABLE

Displays information about the logger that registered data: its features and configurations, and details about data acquired.

General Information	
LogBox:	
Model:	LogBox DA
Serial Number:	1246
Firmware Version:	1.08
Memory Capacity:	16382 loggins
Flow [l/min]:	
Sensor:	PNP/Voltage
Value:	Instantaneous Value
Offset:	0
Level [meters]:	
Sensor:	4-20mA
Value:	Instantaneous Value
Offset:	0
Logging Information	
Title:	Pasteuriz. Tank
Interval between readings:	5 sec
Total Number of Loggins:	4
Start Logging:	Immediately
Stop Logging:	At full memory
Download Time:	
First logging:	
Last logging:	

General Information window

7.1.3 ACQUISITIONS TABLE WINDOW

Here is the Data acquired and is presented in engineering units in a table format. The table displays register number, date/time and the record values.




Record Nr.	Time	Date	Flow (l/min)	Level (meters)
00001	15:02:44	26/7/2005	0	-24,9
00002	15:02:49	26/7/2005	0	-25,0
00003	15:02:54	26/7/2005	0	-25,0
00004	15:02:59	26/7/2005	0	-24,9

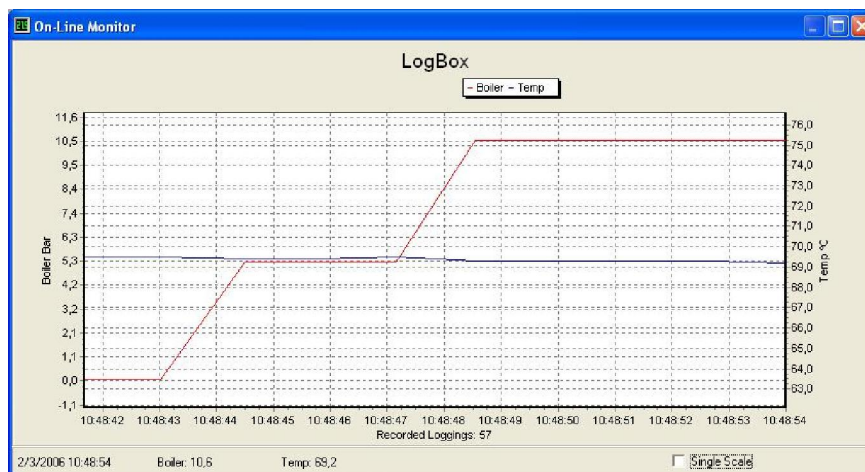
Screenshot showing the acquisitions table

7.2 Visualization Data

Three windows support data visualization: Graph, Acquisitions Table and General Information windows. Data can be originated from direct reading from the logger or from a file previously recorded in a computer. Once the windows are open, data can be saved in a file (.lch), printed on a graph or exported to a text file (.txt or .dat).

7.3 Monitoring Acquisitions

To visualize current measurements in a graph format, use the *Monitor On-Line* command by clicking on the button , while pointing the IR-LINK3 interface to the logger.



7.4 Palmtop User

7.4.1 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.

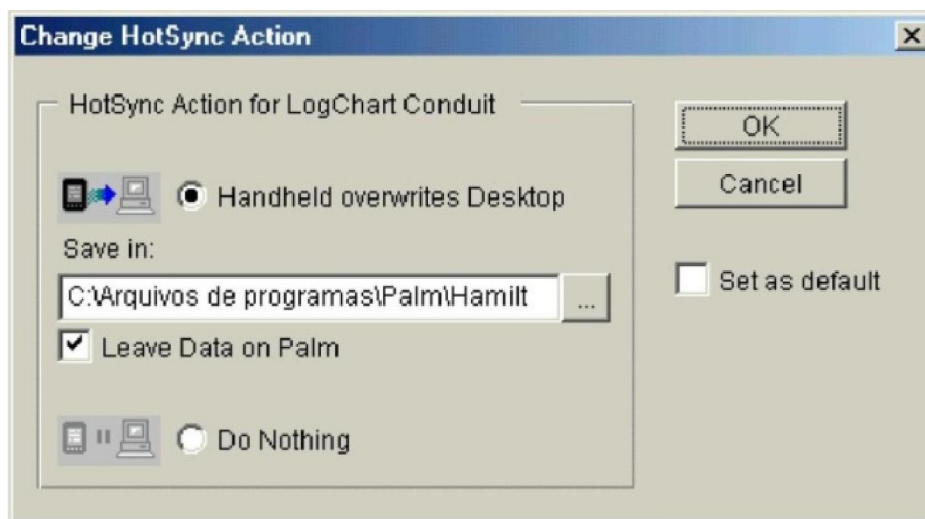
7.4.2 FILES VISUALIZATION

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.

7.4.3 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.

8. MAINTENANCE

8.1 Observation

1. The logger is an electronic device and some basic care is required:
2. When opening the device for battery replacement or connecting sensors avoid touching the circuit for not causing damages resulting from static electricity.
3. When the device is opened, avoid liquid and/or dust contact.
4. Use a screwdriver to open the case cover.
5. Pay attention to batteries polarity: The positive terminal should be placed directed towards the center of the device.
6. Worn batteries should not be recharged, dismantled or incinerated. After use, batteries must be disposed according to local legal rules or returned to ABUS.
7. After placing batteries back to the logger, make sure the cover is firmly attached to the socket.

8.2 Troubleshooting

FAULT	POSSIBLE CAUSE	RESOLUTION
LED is not Flashing	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Make sure the battery is installed correctly; 2. Make sure the battery is not discharged;
No Communication	Communication with the logger fails	<ol style="list-style-type: none"> 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;

9. 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.

10. 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.

ABUS TECHNOLOGIES INC.

www.abustek.com, E-Mail: info@abustek.com