



LogBox-AA

ELECTRONIC DATA LOGGER – MANUAL V1.1x H

PRESENTATION

LogBox-AA is an electronic data logger with two analog input channels. The values measured by these channels (data) are stored in the logger electronic memory and later sent to a computer in table or graphical form. It is possible to export them for use in programs such as spreadsheets.

To configure the logger and view or download data, you must use the **NXperience** software. When you configure it, you can set the start and end mode of the recordings, the parameters of each input, among other functions.

LogBox-AA provides an **auxiliary electronic switch**, which can be used in series with the power supply of external instruments, connected to the logger. With this feature, you can configure the logger to close the switch and power these instruments only at the instant of acquisition, extending the battery life of the external instrument.

MEMORY CAPACITY

- **64 k Model:** It allows up to 64,000 logs.

The memory capacity is divided between the enabled channels. When there are two enabled channels, each has half of the available memory. When a single channel is enabled, it has all the memory at its disposal.

The available memory capacity is indicated on the identification label, attached to the housing of the logger:

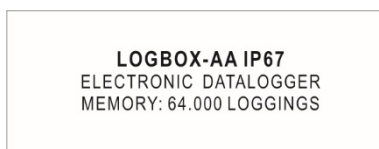


Figure 1 – Identification label

INPUT SIGNALS

Input channels 1 and 2 of the logger measure the following analog electrical signals: Pt100, Thermocouple (J, K, T, E, N, R, S or B), voltage (0 to 50 mV or 0 to 10 V) or current (0 to 20 mA or 4 to 20 mA), depending on the configuration made.

Note: In addition to performing the configuration via software, you must properly position the internal jumper.

DATA ACQUISITION (LOGGING)

The logger can: 1) Perform a single measurement within a defined period and log the value read or 2) perform ten measurements in this period and log in memory the average of the values read or log the minimum value or maximum value measured.

OPERATION

In the **NXperience** software, which must be previously installed on the computer to be used, you can configure logger operation mode (see [CONFIGURING THE LOGGER](#) item). To read or change this configuration, you must use the **IR-LINK3 Communication Interface** (see [IR-LINK3 OPTICAL INTERFACE](#) item).

Once the device has been configured and the electrical input connections have been made, it is ready to measure and record the signals applied to the input channels. Status indicators display the current condition of the logger.

STATUS INDICATORS (LEDS)

The **Status Indicators** (see **Figure 2**), located on the front of the logger, serve to indicate the current operating condition of the device:

LOG Indicator (Logging): If it is waiting to begin acquisitions (stand-by) or after a series of acquisitions has been completed, the LED blinks once every four seconds. If it is performing acquisitions, it blinks twice every four seconds.

AL Indicator (Alarm): This indicator informs about alarm situations. Whenever an alarm situation occurs, it blinks once every four seconds. It remains in this condition until a new setting is applied to the logger.

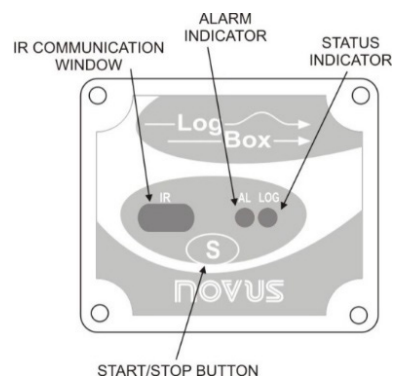


Figure 2 – LEDs and IR communication

NXPERIENCE SOFTWARE

You must use **NXperience** software to configure and download data from LogBox-AA. To install the software, simply run the file **NXperience_Setup.exe**, available on our website.

RUNNING NXPERIENCE

When you start **NXperience**, the home screen will appear:

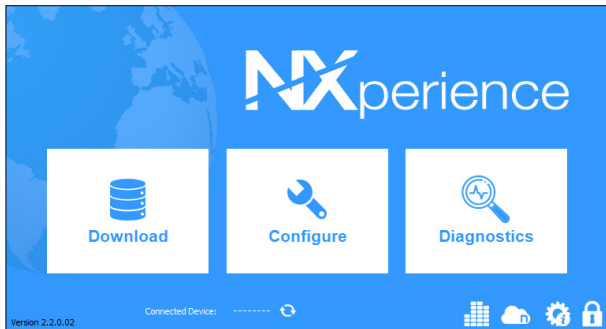



Figure 3 – NXperience home screen

Next, at the bottom of the screen, you must click on the  button to indicate the serial port to be used by the **IR-LINK3 Optical Interface**, which must be connected to the computer USB:

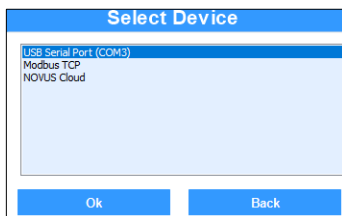


Figure 4 – Select a device

In the example above you should select the option "USB Serial Port (COM3)" and click **Ok**. After that, simply click on the **Configure** button and then on **Read Device** to perform the connection process.

Note: This manual provides basic information on how to configure the device. For more specific information about other features, please refer to the **NXperience** manual, available on our website.

IR-LINK3 OPTICAL INTERFACE

To configure, monitor, or download data from the logger through the **NXperience** software, you must use an **IR-LINK3 Communication Interface** (purchased separately).

IR-LINK3 acts as an intermediary between the device and the computer being used and allows you to transmit and receive data from the logger via infrared signals.

The driver will be installed during the **NXperience** installation process. Once this is done, **IR-LINK3** will be recognized whenever it is connected to the computer.

CONFIGURING THE LOGGER

To configure the logger, **IR-LINK3 Communication Interface** must be connected to the computer being used.

IR-LINK3 must be directed constantly towards the logger communication window (see **Figure 5**) and kept at approximately 15 cm:

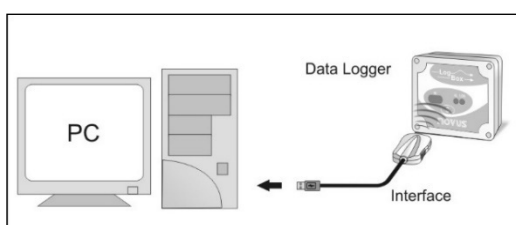


Figure 5 – Interface directed to the logger

According to the instructions defined in the [NXPERIENCE SOFTWARE](#) item, you must click the **Read Device** button to start the communication between the recorder and the software. Then, the general settings screen will be presented:

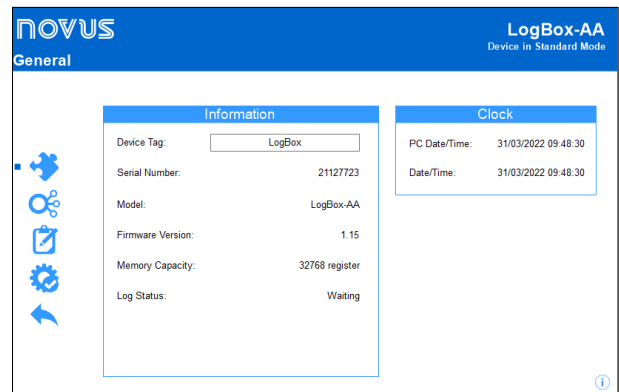




Figure 6 – General settings

This screen displays general information about the device, such as serial number, firmware version, and model. In the **Device Tag** parameter, you can set a specific name for **LogBox-AA**.

If the communication between the logger and the computer is established, the date and time displayed on the screen will be constantly updated.

Afterwards, if you need to return to this screen, just click on the  button.

CHANNELS

By clicking the  button, you can access the configuration fields of the logger analog channels:

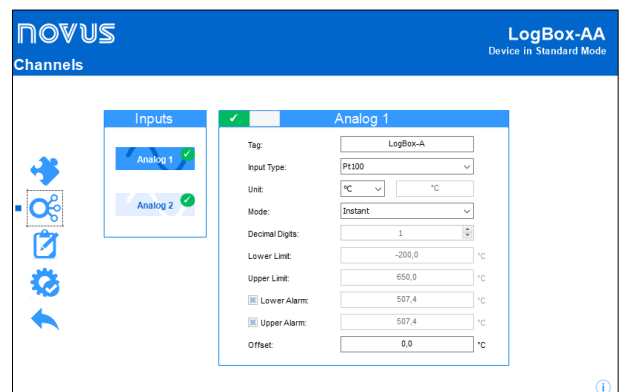


Figure 7 – Analog channel

The configuration fields for the analog channels are the following:

Tag: Set of up to 8 characters that allows you to identify the variable.

Input Type: Allows you to define the signal applied to the analog input of the logger. The list shows all the available input options. The option adopted must be according to the jumper configuration (see [INPUT CONNECTIONS](#) item).

Unit: Allows you to define the unit to be used for the measured variable.

Mode: Allows you to define the recording mode:

Instant: The device performs a measurement. The value is recorded at each acquisition "Interval".

Medium: The device periodically takes ten measurements over each acquisition "Interval". The recorded value is the average of these measurements.

Minimum: The device periodically takes ten measurements over each acquisition "Interval". The recorded value corresponds to the smallest measurement.

Maximum: The device periodically takes ten measurements over each acquisition "Interval". The recorded value corresponds to the largest measure.

Decimal Digits: Allows you to define how many decimal places after the comma will be displayed in the Lower and Upper Limits, Upper and Lower Alarms and Offset parameters.

Lower Limit and Upper Limit: Allows you to define upper and lower limit values for the inputs.


Alarm: Allows you to define limit values for the measured variable. Once they are exceeded, the alarm will be triggered. In this case, even if the alarm condition no longer occurs, the alarm indicator will remain blinking.

The "**Lower Alarm**" parameter allows you to define the value below which the alarm will be triggered.

The "**Upper Alarm**" parameter allows you to define the value above which the alarm will be triggered.

Offset: Allows you to correct small errors presented by the input signal. Errors that occur, for example, when changing a sensor or replacing a transmitter.

LOG REGISTER

By clicking the  button, you can access the configuration fields of the logger data:

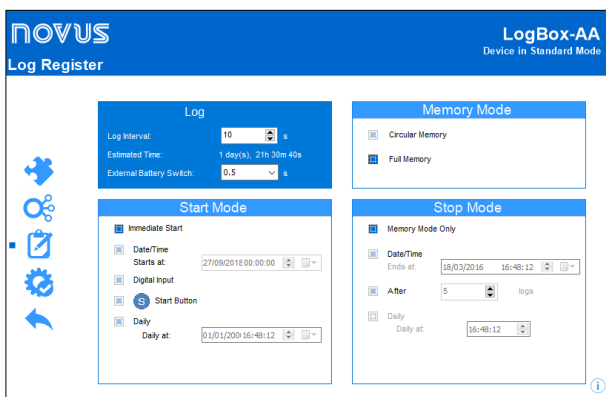


Figure 8 – Log register

LOG

Log Interval: Allows you to determine the time interval (hh:mm:ss) between acquisitions. At the end of this period, the data will be saved in the memory of the logger.

Estimated Time: Based on the "Interval" of the acquisitions and the number of programmed acquisitions, it informs you how long it should take the logger to perform all the programmed acquisitions. Available if the Memory Mode is set to "Full Memory" mode.

External Battery Switch: Allows you to set the time interval that the logger takes to turn on the electronic switch before each measurement. This time cannot exceed half the time between measurements (limited to 10 seconds).

MEMORY MODE

Circular Memory: The logger performs acquisitions continuously. Once the logger reaches maximum memory capacity, the oldest data will be overwritten.

Full Memory: The logger performs acquisitions until the available memory capacity of the logger is reached.

START MODE

Immediate Start: Allows to start the acquisition process right after sending the configuration to the logger.

Date/Time: Allows to start the acquisitions at a defined date and time.

Digital Input: Allows to perform acquisitions while the digital input is triggered (closed) and to stop acquisitions when the digital input is disabled (open).

Start Button: Allows to start the acquisitions using the Start button.

Daily: Allows to start the acquisitions daily and at a previously defined time.

STOP MODE


Memory Mode Only: Allows to link the stop mode to the memory mode of the logger. That is, the acquisitions will be interrupted if the memory limit is reached (if **Full Memory** mode is set) or will never be interrupted (if **Circular Memory** mode is set).

Date/Time: Allows to stop the acquisitions at a defined date and time.

After a specific number of logs: Allows to set a number of acquisitions that, when reached, will stop the acquisition process.

Daily: Allows to stop the acquisitions daily and at a previously defined time.

FINALIZATION

Once the settings have been made, you must click the  button to open the finalization screen:

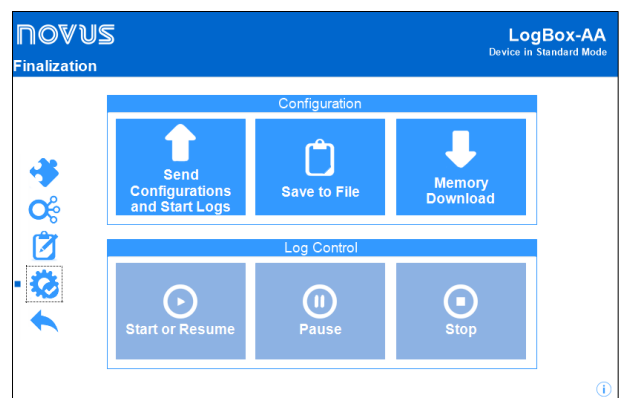


Figure 9 – Finalization

From this screen you can send and start logs, save the configuration to file, download data from memory, and start, pause, or stop the logging control.

ELECTRICAL INSTALLATION

Only the input channel connections and the internal electronic switch (when used) are required. The electrical power supply is provided exclusively by the internal battery.

For the **IP65** model, input and external trigger terminals are available internally. To make the connections, you will need to open the housing.

For the **IP67** model, the terminals are outside the housing, at the connectors shown in **Figure 11**.

IP65 MODEL

In the **IP65** model, the connections are made internally. To access the terminals and the configuration jumper, it is necessary to remove the cover from the logger.

The connection wires enter the logger through the cable gland located on the bottom of the housing. **Figure 10** shows the polarity of these connections:

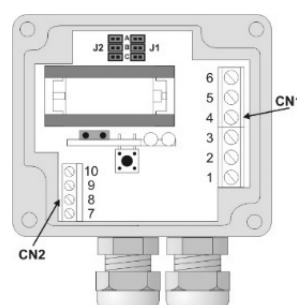


Figure 10 – IP65 Version (Inside view of the connections)

CHANNEL 1	CN1 Connector – Terminals 1, 2 and 3
CHANNEL 2	CN1 Connector – Terminals 4, 5 and 6
ELECTRONIC SWITCH	CN2 Connector – Terminals 7, 8 and 9
DIGITAL INPUT	CN2 Connector – Terminals 7 and 10

Table 1 – Connectors

Note: Be sure that the cable gland holds the wires, ensuring the protection level of this model: **IP65** – Fully protected against the entry of dust and against water jets, according to NBR-6146 standard.

IP67 MODEL

In the **IP67** model, the connections are external. As shown in **Figure 11**, two connectors provide external access to the input channels. Cables compatible with these connectors are included with the logger.

Note: You should remove the logger cover only when it is necessary to change the battery. On this occasion, the cover must be put back properly, ensuring the protection degree of this model: **IP67** – Fully protected against the entry of dust and against immersion in water, according to NBR-6146 standard.

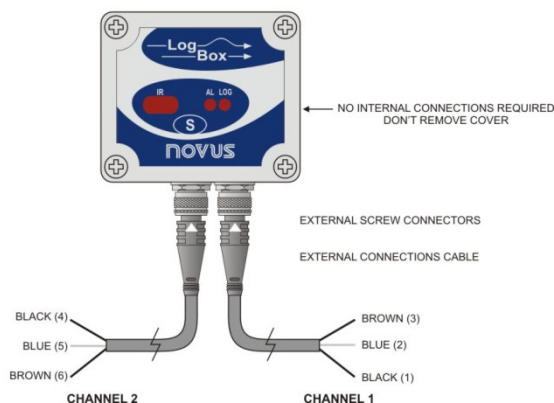


Figure 11 – IP67 Version (External connectors)

The wires have the following connections:

CHANNEL 1 CABLE (RIGHT)	CONNECTION
Brown wire	CN1 – 3
Blue wire	CN1 – 2
Black wire	CN1 – 1

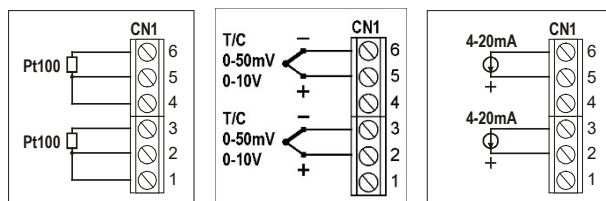
Table 2 – Channel 1 cable

CHANNEL 2 CABLE (LEFT)	CONNECTION
Brown wire	CN1 – 6
Blue wire	CN1 – 5
Black wire	CN1 – 4

Table 3 – Channel 2 cable

INPUT CONNECTIONS

Both models have the same input connection scheme:



Before using the logger, you must set the internal jumpers, according to the input type used.

The factory setting of these jumpers is to measure Pt100 / Thermocouple / 0-50 mV signals.

The figures below show the positions for the possible input types used:

INPUT SIGNAL	CHANNEL 1 J1 POSITION	CHANNEL 2 J2 POSITION
4-20 mA / 0-20 mA	A	A
Pt100 / Thermocouple / 0-50 mV	B	B
0-10 V	C	C

Table 4 – J1 and J2 jumpers

INTERNAL ELECTRONIC SWITCH

The following figure shows an example of using the internal electronic switch to drive external devices.

In this example, channel 1 is configured for a 4-20 mA signal. The transmitter that generates this signal is powered by an external battery. This power supply is commanded by the logger via the Electronic Switch, which "turns on" the power to the external transmitter seconds before the logger takes a channel 1 measurement.

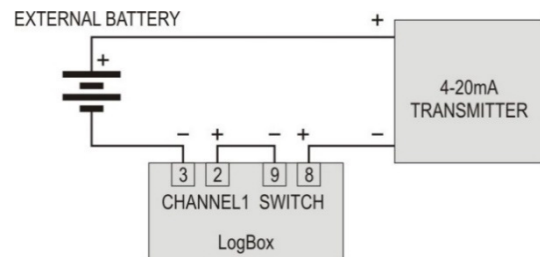


Figure 12 – Example of using the external drive for 1 channel

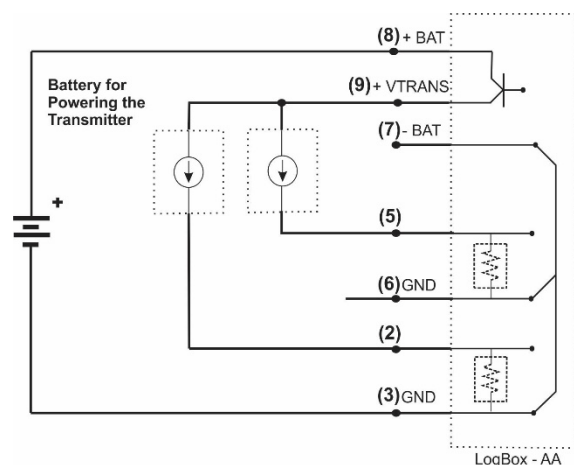


Figure 13 – Example of using the external drive for 2 channels

INSTALLATION RECOMMENDATIONS

Small electrical signal conductors should run through the plant separately from drive conductors or conductors with high current or voltage values. If possible, in grounded conduits.

The instrumentation supply must come from a proper instrumentation network.

DIGITAL INPUT (ED)

The Digital Input, which can be used to command the acquisitions made to the logger, is available at CN2 terminals 7 (-) and 10 (+).

DOWNLOADING AND VISUALIZING DATA

Through **NXperience**, you can view the data acquired by the logger. To do this, you click on the **Download** button on the software home screen, and then on **Download Logs**:

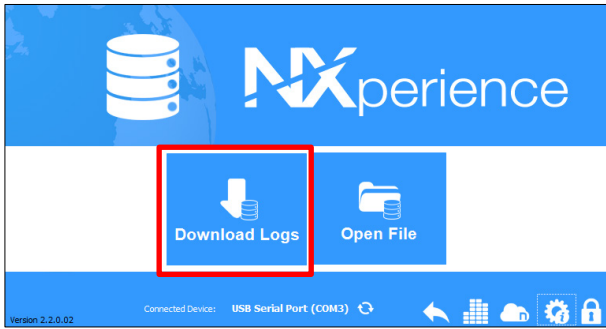


Figure 14 – Download logs

You can also click on the **Open File** button to view files of previously downloaded logs.

Once **NXperience** has downloaded the logs, it will display a graph of these values:

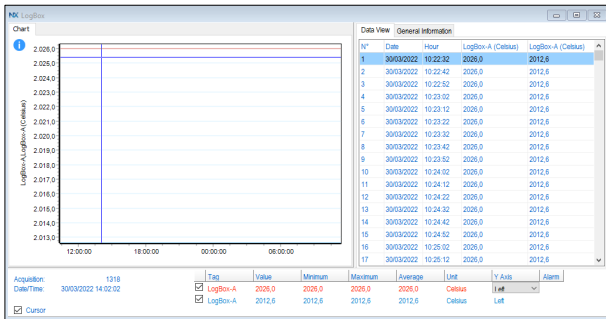


Figure 15 – Graph

The graph allows you to see the acquisitions made by the logger in the form of a 'values x time' graph. Scrolling with the mouse pointer over the graph area will display the information at the bottom of the window.

Using the zoom commands on the toolbar, you can select a region of the graph to view in detail. You can also use the left mouse button to select an area of the graph to view in detail or drag the curves vertically with the right mouse button.

On the right side of the graph there are two tabs: **Data View** and **General Information**.

Through the toolbar at the bottom of the download screen, **NXperience** allows you to save, save to file, merge graphs, filter, and even export this information to several types of reports:



Figure 16 – Toolbar

Specific information about each of these features can be found in the **NXperience** manual, available on our website.

DATA VIEW

N°	Date	Hour	LogBox-A (Celsius)	LogBox-A (Celsius)
1	30/03/2022	10:22:32	2026,0	2012,6
2	30/03/2022	10:22:42	2026,0	2012,6
3	30/03/2022	10:22:52	2026,0	2012,6
4	30/03/2022	10:23:02	2026,0	2012,6
5	30/03/2022	10:23:12	2026,0	2012,6
6	30/03/2022	10:23:22	2026,0	2012,6
7	30/03/2022	10:23:32	2026,0	2012,6
8	30/03/2022	10:23:42	2026,0	2012,6
9	30/03/2022	10:23:52	2026,0	2012,6
10	30/03/2022	10:24:02	2026,0	2012,6
11	30/03/2022	10:24:12	2026,0	2012,6
12	30/03/2022	10:24:22	2026,0	2012,6
13	30/03/2022	10:24:32	2026,0	2012,6
14	30/03/2022	10:24:42	2026,0	2012,6
15	30/03/2022	10:24:52	2026,0	2012,6
16	30/03/2022	10:25:02	2026,0	2012,6
17	30/03/2022	10:25:12	2026,0	2012,6

Figure 17 – Data View

This table provides in engineering units the values acquired by one or both input channels (depending on the configuration made). Each occurrence of this table consists of the log number, the time, the date, and the log values.


GENERAL INFORMATION

Data Logger	
Model	LogBox-AA
Serial Number	21127723
Firmware Version	1.15
Memory Capacity	32768 Samples
LogBox-A (Celsius)	
Input	Pt100
Mode	Instantaneous
Offset	0,0
Lower Alarm	N/D
Upper Alarm	N/D
LogBox-A (Celsius)	
Input	Pt100
Mode	Instantaneous
Offset	0,0
Lower Alarm	N/D
Upper Alarm	N/D
Download Information	

Figure 18 – General Information

Displays information about the logger and its settings.

MONITORING LOGS

By clicking the  button located at the bottom of the **NXperience** home screen, you can monitor the real-time operation of the logger:

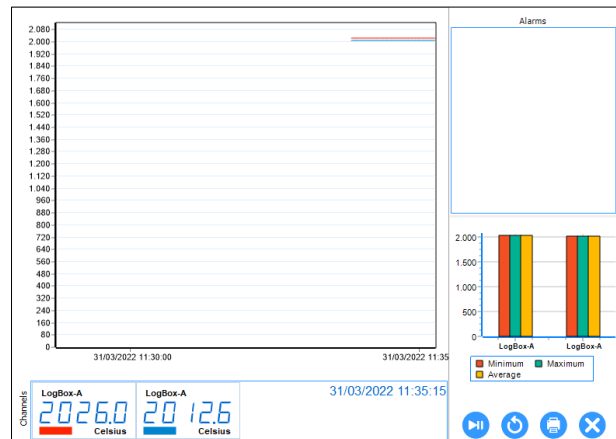


Figure 19 – Monitoring logs

This screen presents information about the configured channels, the values currently logged, the occurrence of alarms, among other data, and allows you to pause and print the displayed graph.

Specific information about each of these features can be found in the **NXperience** manual, available on our website.

SPECIAL PRECAUTIONS

Because it is an electronic device, the logger requires some basic precautions:

- When opening the unit to change the battery or attach sensors, you should avoid contact with the circuitry due to the risk of damage from static electricity.
- You should pay attention to the battery polarity. The battery should be placed with the positive terminal toward the center of the device.
- When closing the housing, the cover must be put back on properly, ensuring the degree of protection of this model.
- Used batteries must not be recharged, disassembled, or incinerated. After use, they must be collected according to local legislation or sent back to the supplier.

TROUBLESHOOTING

The indicator does not blink:

The indicator blinks intentionally dimly and can be difficult to see it in high-light locations. Therefore, you need to make sure that it is not actually blinking.

Check that the battery is correctly installed.

Make sure that the battery is not discharged.

It is not possible to communicate with the logger:

Make sure that there are no obstacles blocking the infrared signal.

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

Make sure that the selected port is working properly.

SPECIFICATIONS

Inputs:

Thermocouples according NBR 12771/99 standard; Pt100 RTD's NBR 13773/97.

TYPE	FEATURES
T/C J	Range: -50 to 760 °C (-58 to 1400 °F)
T/C K	Range: -90 to 1370 °C (-130 to 2498 °F)
T/C T	Range: -100 to 400 °C (-148 to 752 °F)
T/C N	Range: -90 to 1300 °C (-130 to 2372 °F)
T/C R	Range: 0 to 1760 °C (32 to 3200 °F)
T/C S	Range: 0 to 1760 °C (32 to 3200 °F)
T/C B	Range: 150 to 1820 °C (32 to 3308 °F)
Pt100	Range: -200.0 to 650.0 °C (-328 to 1202 °F)
0 – 50 mV*	Linear. Programmable range of -32768 to 32767
4-20 mA*	Linear. Programmable range of -32768 to 32767
0-20 mA*	Linear. Programmable range of -32768 to 32767
0 – 10 Vcc*	Linear. Programmable range of -32768 to 32767

Table 5 – Input types

(*) **Software ranges allowed:** 0 to 65535, 65535 to 0, -32768 to 32767, 32767 to -32768.

Input Resistance: 0-50 mV, Pt100 and thermocouples: > 10 MΩ

0-10 V: > 1 MΩ

0 to 20 mA and 4 to 20 mA: 100 Ω + 2 Vcc

Accuracy: Thermocouples J, K, T: 0.25 % of max. range ±1 °C

Thermocouples N, R, S, B: 0.25 % of max. range ±3 °C

Pt100: 0.2 % of max. range

mA, mV, V: 0.2 % of max. range

Memory Capacity: 64.000 (64 k) logs.

Log Interval: Minimum: 1 second, maximum: 18 hours

Logger power supply: Lithium battery 3.6 Volts (1/2 AA)

Typical Battery Life: 200 days with one weekly download and 5 minutes measuring interval. Battery life depends heavily on data retrieval frequency.

Operation Temperature: From -40 °C to 70 °C.

Protection Degree: IP65 and IP67 models (see label).

Housing Material: ABS with polycarbonate film case

Polycarbonate film.

Dimensions: 60 x 70 x 35 mm

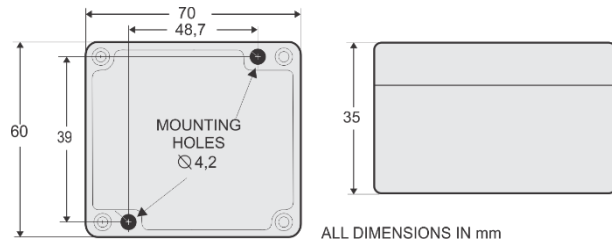


Figure 20 – Dimensions

PACKAGE CONTENTS

When unpacking the logger, in addition to the manual, you should find:

- One **LogBox-AA** data logger.
- Two external connection cables (IP67 model only).

WARRANTY

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