TagTemp-NFC

TEMPERATURE LOGGER – INSTRUCTIONS MANUAL V 1.0x D

1 INTRODUCTION

The **TagTemp-NFC** is an electronic temperature logger. The sensor measures this physical quantity and the values are stored in memory. This data is transferred through a smartphone application (LogChart-NFC) embedded with an NFC or an NFC interface connected to a computer through an USB port (both not included).

Android **LogChart NFC** and *Windows* **Nx Software** applications are the software tools used for the operation mode settings and the collection and visualization of data. With these applications, you can easily set the parameters such as starting or ending of acquisitions, interval between acquisitions, alarm set points and other parameters.

You can download the operating manual and **Nx Software** from the manufacturer's website. You can download the **ANDROID™ LogChart-NFC** application from the **Google Play Store**.

2 MECHANICAL INSTALATION

The **TagTemp-NFC** can be fixed in two ways: by using of screws or double-sided tape.

For mounting with screws, you should detach the front film of the equipment carefully, exposing two through holes where **TagTemp-NFC** may be screwed, as shown in **Fig.1**. They should be used M3 flathead screws. When finished, you should stick extra film that comes with the product to cover again the front of the device.

The other way is to use a double-sided adhesive tape on the back of the equipment, avoiding placing it above the identification label.

In both cases, the temperature sensor should be placed near the place where you want to measure the temperature.
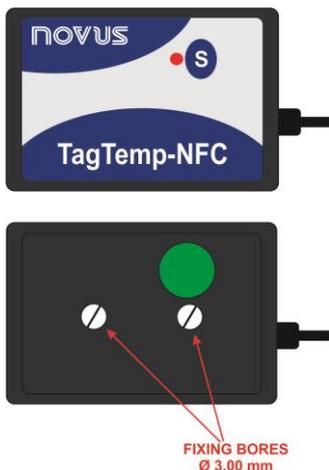
Fig. 01 - Mounting holes on the **TagTemp-NFC**

3 TECHNICAL DATA

Measure Range	Temperature: -40.0 °C to 70.0 °C.
Accuracy	$\pm$ 0.5 ºC @ 25 ºC. $\pm$ 1 °C max. over the full measuring range. **Note**: You can correct the measurement error in the **OFFSET** parameter using the configuration software.
Measurement Resolutions	Temperature: 0.1 °C / 0.1 ° F.
Memory capacity	Up to 4020 logs.
Measurement Interval	1-minute min. 4 minutes max. (Models with no digital input). 2 hours max. (Models with digital input).
Supply	2 x 3.0 V lithium battery, built-in, non-replaceable.
Estimated battery autonomy	• Above 300 days – 5-minute logging interval. • Above 400 days – 30-minute logging interval.
Operating temperature	From -10 °C to 60 °C
Dimensions (L x W x H)	Main body: 65 x 45 x 8 mm.
RF Interface	ISO 15693 (NFC-V) compatible.
Logger-Smartphone data transfer time	Approx. 20 seconds (depends on the smartphone processing speed).
LogChart-NFC software	Android version: 4.0 or above. Languages: Portuguese and English.
NFC PC Interface	USB to NFC converter interface (optional), compatible with **Nx Software** for Windows ®.
Material	Polyamide
Protection	All electronics are protected by the housing.
Certification	CE

4   OPERATION

To operate the device, the user must install the **Nx Software** or **LogChart-NFC** application, according to the instructions in Section 5 and 6 in this manual.

To communicate with the **TagTemp-NFC**, place the smart phone over the device or a NFC interface. The distance range for communication is relatively short, something few inches, this being a feature of the NFC technology.

4.1 Low Power Mode

The **TagTemp-NFC** comes from the factory in a mode of ultra-low power consumption (idle mode), in order to preserve your batteries when not in use. For operation of the product, you must first remove it from de idle mode. You can do that removing the device from low power mode via configuration software, and then pressing the button on **TagTemp-NFC**.

If the equipment will remain a long time without use, we recommend putting it back into low power mode through the application. You can accomplish this by simply activate this mode via **Nx Software** or **LogChart-NFC** configuration software.

4.2 Operation Mode

The use of computer memory may be:

- Memory full: the records stops when there is more space in memory.
- Circular buffer: when reaching the end of memory, continuous recording, overwriting the oldest records.

You can select the start and end of the records with the **TagTemp-NFC**.

The start of the records may be immediate or linked to the squeeze the button (one or the other).

The start of records may be immediate or by pressing the button.

The ending of the records can be one of the following (whichever comes first): Out of memory (when configured this memory usage), command of the smartphone, pressing the application button or **TagTemp-NFC** button (when configured this option).

If you pressed the **TagTemp-NFC** button to stop the recording data, and after a while, you pressed again to resume, the recording will continue with a period without data information in memory. This operation will occupy memory device data, resulting in less temperature records on the available memory.

4.3 LED Indication

TagTemp-NFC has a LED for indication of its operation

- One flash every 10 seconds: active;
- Two flashes every 10 seconds: logging;
- Three flashes every 10 seconds: alarm occurred;
- A quick flash followed by a slow one: beginning or ending of records.

If the LED is always off, there are two possible reasons:

1. The equipment is in low power mode.
2. The battery is dead.

Note: The LED flashing light is intentionally weak and can be difficult to be viewed in bright places.

Start Delay

The Start Delay is a start-up delay, set by the user, in which **TagTemp-NFC** will wait before starting the logs. During this delay time, the LED flashes every 5 seconds.

4.4 ⓢ Button

The "S" button on the front panel can be used to start and/or stop the records, depending on the configuration chosen.

To start the start or stop the records, you must press this button until the LED lights up and release it before the LED is turn off.

If the LED turns off before the button is released, the command will be invalid and the button will be disabled for the next 30 seconds. This is a protective measure to prevent accidental touches on the button to discharge the battery.

This button is also used to remove the device from the low power mode (see the section on Low Power Mode).

4.5 Selecting the Temperature Unit

The temperature unit may be choosing by the user between *Celsius* (standard) and *Fahrenheit*. Changing the temperature unit causes the need to send a new configuration.

4.6 Alarms

It is common, in the transport of perishable goods or sensitive loads; there is a predetermined temperature range in which the transported load must to be maintained. With **TagTemp-NFC**, is possible to program alarms that indicate if the temperature went outside this range.

Can be configured the use of two alarm conditions:

- Temperature above the upper setpoint.
- Temperature below the lower setpoint.

Each alarm can be activated individually.

The alarm indication can be displayed through the LEDs and also through the application. With the application, you can verify all the records in case of alarm occurrence.

4.7 User Offset

The user can set an offset up to ± 3 °C for the temperature data. This allows to reduce (and in some cases eliminate) the error of the temperature measurement for a given point.

4.8 Digital Input

A digital input is available on some models of **TagTemp-NFC**. It allows to record state changes, i.e., records the moment when the digital input changed from OFF (logic "0") to ON (logic "1") and vice-versa.

The input must remain in the new state for at least 1 second; otherwise the state change event may not be detected.

The digital input events share memory with temperature records. Therefore, the more events there for digital input, less temperature records may be registered in the available memory.

When collecting the data from **TagTemp-NFC**, digital input events have their time and state displayed by the application, being the last event displayed on the start screen.

5 LOGCHART-NFC APPLICATION

The **LogChart-NFC** is an app for **ANDROID™** platform that allows the configuration, collection, viewing and sharing of **TagTemp- NFC** data.

Follow the steps below to installation/use the application.

5.1 Installing the Application

To install the app, browse the site **Google Play Store** for "**LogChart-NFC**" and install the application. After the download is complete, open the application. If the application is not available, your smartphone is probably not compatible with NFC.
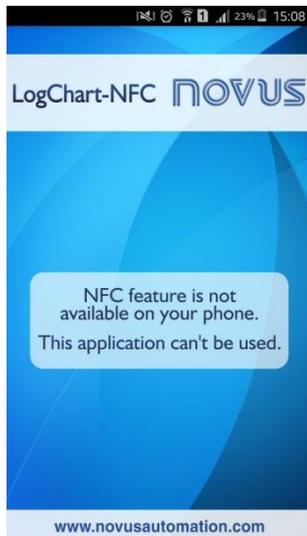
Fig. 02 – Warning screen when the NFC interface it is not available

5.2 App Operation

The communication between application and **TagTemp-NFC** is done through the NFC interface of the smartphone and, therefore, it must be enabled.
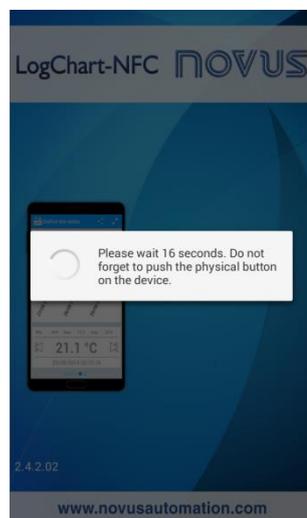
Fig. 03 – Home screen of the app

Fig. 04 – NFC Communication

After the application has been started (see **Fig. 03**), just approach the smartphone to **TagTemp-NFC** until the equipment data have been loaded. This usually takes a few seconds, depending on the smartphone model.

The application has six screens:

1. Device Status
2. Device Configuration
3. Events
4. Data Chart
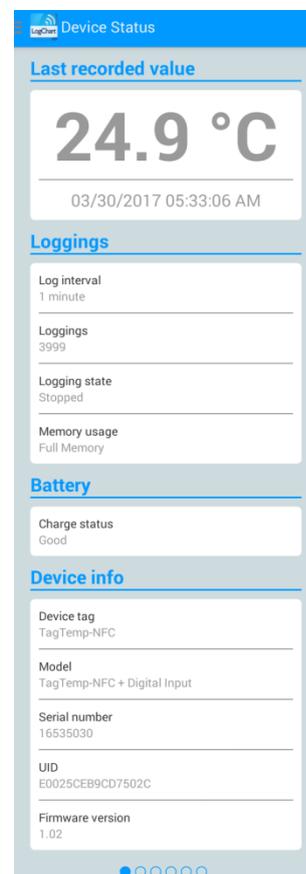5. Preferences
6. Manage Collects

5.2.1 Device Status Screen

Fig. 05 – Status Screen

- **Last Recorded Value -** Displays the last recorded value performed by the **TagTemp-NFC**. Not necessarily the actual temperature.
- **Loggings -** Displays the basic information of the **TagTemp-NFC**.

Log Interval: Displays the value of the interval between acquisitions configured.

Loggings: Number of records stored by the **TagTemp-NFC**, to the maximum of 4020 records.

Logging State: Displays whether or not the device is recording data.

Memory Usage: Indicates if the circular buffer is enabled.

- **Battery**: Indicates the battery condition.

  Good: Perfect for use.

  Average: Already a considerable battery discharge was detected. It should be monitored.

  Low: It is not recommended to use of the device in this condition.

- **Device Info**: Indicates specific information of **TagTemp-NFC**.

  Device Tag: Name configured by the user.

  Serial Number: Factory serial number.

  Firmware Version: Firmware version of the device.

5.2.2   Device Configuration Screen
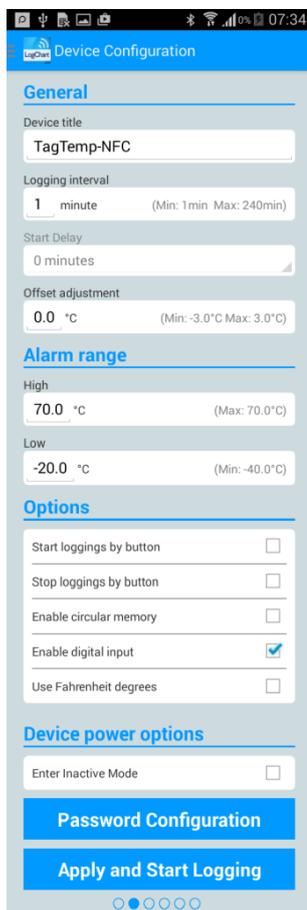
Fig. 06 – Device Configuration Screen

- **General**: General Settings.

  Device Title: Field to configure (or view) the title of the device.

  Logging Interval: Field to configure (or view) the interval between data acquisitions.

  Start delay: This is the delay time between the **TagTemp-NFC** configuration and the start of the logs.

  Offset Adjustment: Field to configure (or view) the user offset defined for the device.

- **Alarm Range**: Range of operation where the user defines the limits that, in case of exceedance, result in alarm. The device signals alarm via the LED. For more details on alarm activations, the data must be collected through the **LogChart-NFC** or **Nx Software** applications.

  High: Valid range of operation (Maximum), connected to the maximum alarm.

Low: Valid range of operation (Minimum), connected to the minimum alarm.

- **Options**: The following options can be configured:

  Start loggings by button: When you enable this option, you can start logging data by pressing the logger button.

  Stop loggings by button: When you enable this option, you can stop logging by pressing the logger button.

  Enable circular memory: When this option is enabled, when the memory is complete, the recording will continue overwriting the oldest records.

  Use Fahrenheit degrees: when this option is enabled, the temperature unit of *Celsius* (default) is changed to *Fahrenheit*.

- **Device Power Options**: the device can be placed in idle mode.

  Idle mode is a low-power option, in which the device does   not operate.

- **Password Configuration:** The user can set a four-digit password for device security. Using a password prevents unauthorized persons from starting or stopping data logging by the **LogChart-NFC** or **Nx Software** applications or even reconfiguring the device, but does not prevent log data from being collected and shared.

- **Apply and Start Logging**: Applies the settings and starts recording the temperature.
  Stop Logging: You can stop logging using the smartphone.
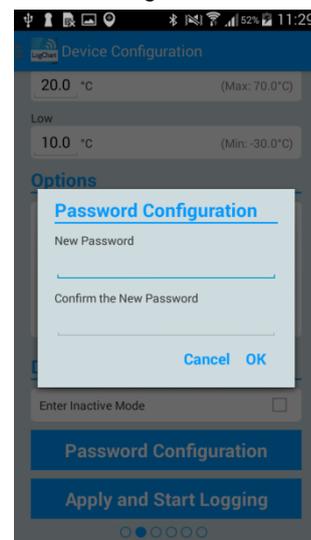
5.2.2.1   Password Configuration Screen
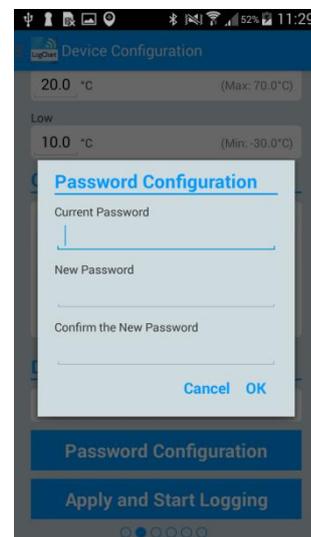

Fig. 07 – Password Configuration Screen

Fig. 08 – Password Configuration Screen

Note: **Fig. 08** shows the screen to change the password.
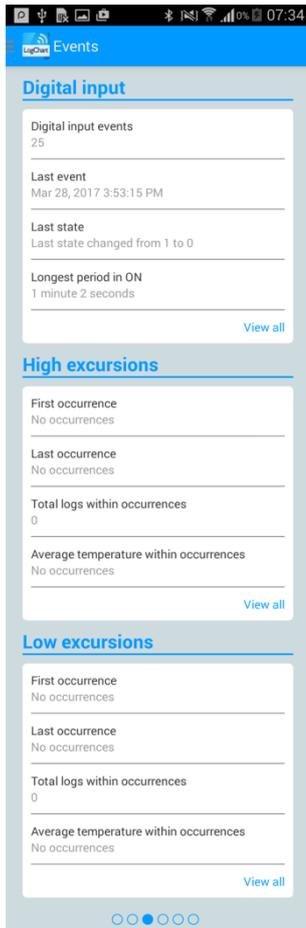
5.2.3 Events Screen

Fig. 09 – Events Screen

- **Digital Input**: Information about events on the digital input.

  Digital Input Events: Number of events occurred.

  Last Event: Indicates the time of the last event occurred.

  Last State: Indicates the state of the last event occurred.

  Longest Period in ON: Indicates the longest time that remained in ON state.

- **High Excursions**: Indicates when the measured value exceeds the upper limit specified.

  First Occurrence: Time and value of the first occurrence above the upper limit of range.

  Last Occurrence: Time and value of the last occurrence above the upper limit of range.

  Total Logs within Occurrences: Number of acquisitions for events above the upper limit of range.

  Average Temperature within Occurrences: Average value of the temperatures above the maximum range.

- **Low Excursions**: Indicates when the measured value exceeds the lower limit under the specified range.

  First Occurrence: Time and value of the first occurrence below the lower limit of range.

  Last Occurrence: Time and value of the last occurrence below the lower limit of range.

  Total logs within Occurrences: Number of acquisitions for events below the lower limit of range.

  Average Temperature within Occurrences: Average value of the temperatures below the minimum range.

5.2.3.1 Occurrences Screen

By clicking the icon "View All" the user can view the list of digital input events and occurrences of high and low temperatures, showing the value and time of the event/occurrence, as shown in **Fig.10**, **Fig 11** and **Fig.12**.

If there is no occurrences in the Digital input, neither high or low Excursions, messages appear in the **Fig.13**, **Fig.14** and **Fig.15**.

Digital input events	
28/08/2014 16:34:47	1
28/08/2014 16:35:00	0
28/08/2014 16:45:38	1
28/08/2014 16:45:39	0
28/08/2014 16:45:42	1
28/08/2014 16:46:02	0
28/08/2014 17:20:37	1
28/08/2014 17:20:55	0

Fig. 10 – Digital Input Events Screen

High excursions	
Sep 30, 2014 11:06:38 AM	81.7 °F
Sep 30, 2014 11:07:08 AM	83.0 °F
Sep 30, 2014 11:07:38 AM	84.0 °F
Sep 30, 2014 11:08:08 AM	84.6 °F
Sep 30, 2014 11:08:38 AM	85.0 °F
Sep 30, 2014 11:09:08 AM	85.6 °F
Sep 30, 2014 11:09:38 AM	85.8 °F
Sep 30, 2014 11:10:08 AM	85.8 °F
Sep 30, 2014 11:10:38 AM	86.0 °F
Sep 30, 2014 11:11:08 AM	86.2 °F

Fig. 11 – High Excursions Screen

Low excursions	
Sep 30, 2014 10:43:08 AM	66.9 °F
Sep 30, 2014 10:43:38 AM	63.6 °F
Sep 30, 2014 10:44:08 AM	61.2 °F
Sep 30, 2014 10:44:38 AM	59.3 °F
Sep 30, 2014 10:45:08 AM	58.0 °F
Sep 30, 2014 10:45:38 AM	57.1 °F
Sep 30, 2014 10:46:08 AM	56.2 °F
Sep 30, 2014 10:46:38 AM	55.6 °F
Sep 30, 2014 10:47:08 AM	55.2 °F
Sep 30, 2014 10:47:38 AM	54.8 °F

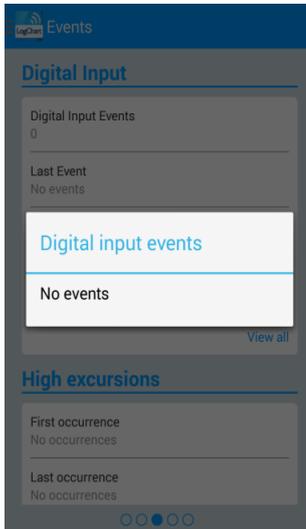**Fig. 12** – Low Excursions Screen

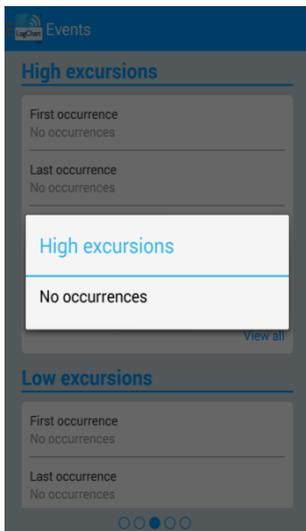**Fig. 13** – Message for Events in the Digital Input screen for "No event"

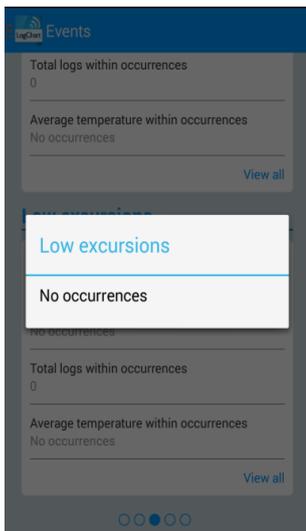**Fig. 14** – Message for High Excursions for "No occurrences"

Fig. 15 – Message for Low Excursions for "No occurrences"
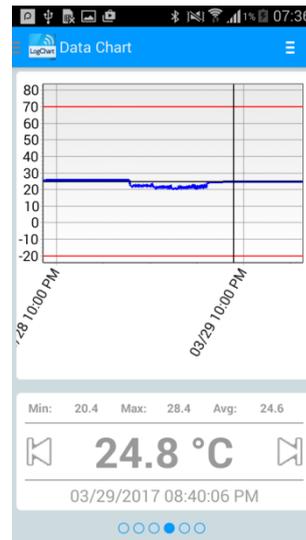
5.2.4 Data Chart

Fig. 16 – Data Chart Screen

Screen where the user can view the historical data at different time intervals. You can also check the values that produced alarms, maximum, minimum and average value of the temperatures.

Allow you to touch a point on the chart to see their value and its time. For a navigation record by record, you should use the "Previous" and "Next" arrows on the sides of the value shown.

When more than 2000 data are registered, the graph will show only the last 2000. To select a graph display range, the "Chart range" option can be used.

5.2.4.1 Data Chart Options Screen

When you select the icon [≡] in the upper right of the screen, the chart options will appear.
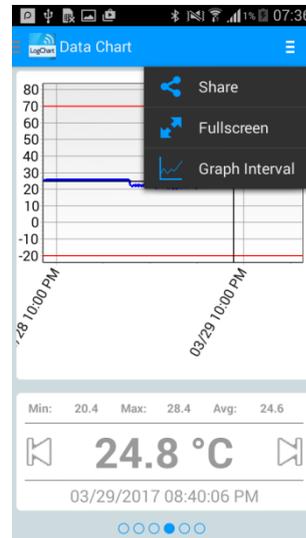
Fig. 17 – Data Chart Options screen

1. By pressing the icon [share], you can share the obtained data, using sharing applications already installed on the smartphone as well the option to send data to **NOVUS Cloud** (requires the creation of an account in **NOVUS Cloud**) and also the option to send to an FTP server (requires an active FTP server). To include the geographical location of the data log in **NOVUS Cloud**, the GPS must be activated on the smartphone.

The way in which the data will be shared is chosen in "Share with" in the **Preferences screen**.
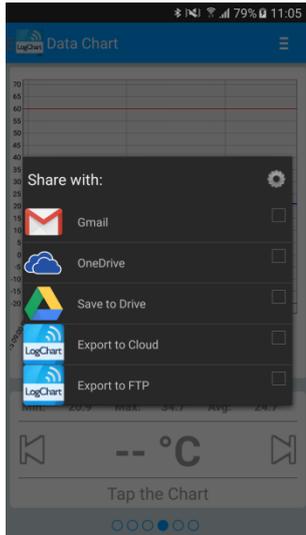

Fig. 18 – Share Screen

2. "Full Screen" option : with this option, the chart will be displayed in full screen in landscape mode.

Fig. 19 – Full Screen Chart

3. Chart range : Using this option allows you to select the range of values that will be displayed in the chart. This range can include up to 2000 records.

    Preview options: option to choose the start and end date for the range of the records to see the data collected.
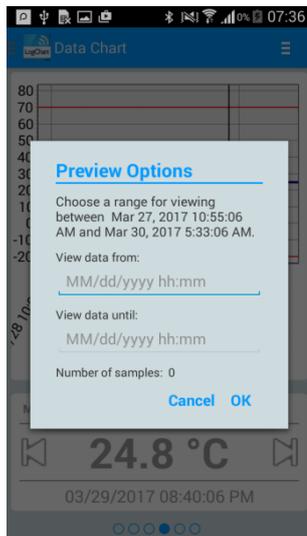
Fig. 20 – Preview Options Screen

5.2.5   Preference Settings Screen
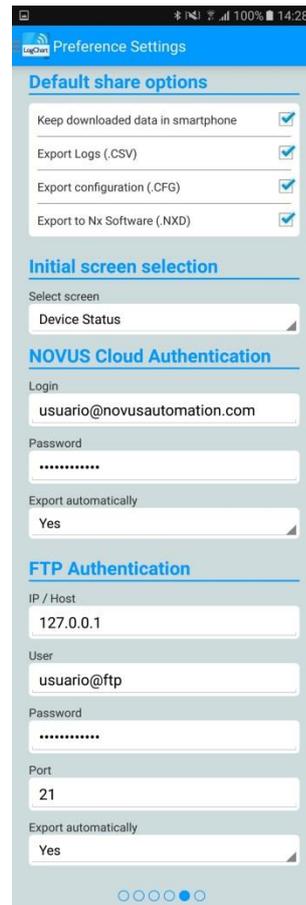
Fig. 21 – Preference Settings Screen

- **Default share options**: The user can set the preferences screen according to the desired data received through sharing.

    Keep downloaded data in smartphone: Maintains files, previously selected in the sharing options, in a folder named **LogChartNFCFiles** in the internal memory of the smartphone.

    Export Logs (.CSV): Share a file in CSV format with all records from the last collection.

    Export configuration (.CFG): Share a CFG extension file with the settings of the **TagTemp-NFC**.

    Export digital inputs (.CSV): Share a CSV format file with all digital input records of the last collection. This option is available only in **TagTemp-NFC** with digital input.

    Export to Nx Software (.NXD): Shares a file with the collected data in a format compatible with **Nx Software** (.nxd), so that the data can be read and displayed by this application.

    Initial screen selection: Allows you to select the startup screen after reading the data from the device.

    NOVUS Cloud Authentication: Hire an account in the **NOVUS Cloud** to store the **TagTemp-NFC** data. Enter your login credentials in the Username and Password fields to send the data. Export automatically: If this option is selected, whenever a device's data is collected, the application will try to send them automatically to **NOVUS Cloud**.

    FTP Authentication: With an active **FTP** server, enter the host address, user credentials, and connection port for this server. Automatically Export: With this option checked, whenever a data download of a TagTemp is performed, the application will attempt to automatically send the data to the **FTP** server.
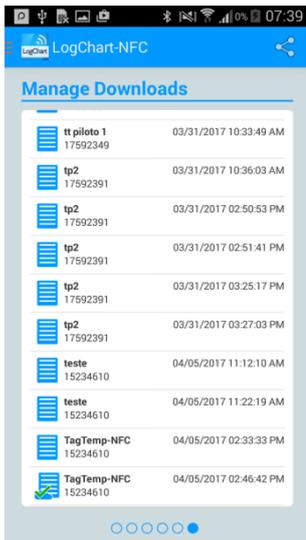
5.2.6 Manage Collects Screen
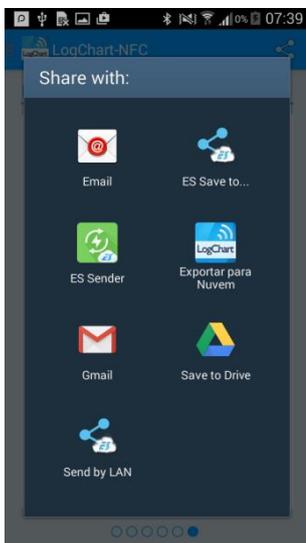

Fig. 22 – Manage Collects screen

Fig. 23 – Share screen

This screen allows you to delete and share the data previously acquired. It shown a list of data acquisitions and you can select one or more rows (files) to share or delete.

To share the selected items, simply press the button on the top right.

To delete a selected item, simply press and hold the item in the list to remove (long press), then it will emerge a message asking to confirm or not the deletion.

6 NX SOFTWARE

6.1 Installing the Nx Software

The **Nx Software** application is used to adjust the configuration and collection parameters of the acquired data. To install it just download and run the **NxSoftwareSetup.exe** file available on our website.

6.2 Running Nx Software

Opening the **Nx Software** shows the main screen:

Fig. 24 – **Nx Software** Main screen

To communicate with the software, the **NFC-USB** reader must be connected to the computer and the USB drivers must be installed.

You can then choose "**Configure**" or "**Download**". The "**Monitor**" option is not available for this device model. The first time the device is read, the application prompts the user to choose which device he wants to connect. Just double click on the desired device and press the "**Ok**" button, as shown in the next image. This device will be set by default the next time the application communicates with the device.
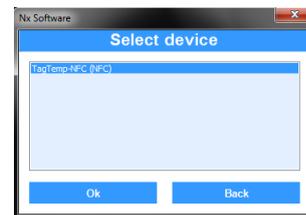

Fig. 25 – Select Device Screen

6.3 Configuring the device

To configure the device, it is necessary to place the **TagTemp-NFC** on top of the **NFC-USB** reader.

When choosing the "**Configure**" button, the following screen will appear:

Fig. 26 – Configuration Selection Screen

The "**Create Configuration**" option creates a new configuration, without the need of the device. This setting can be saved to a file for future use, or recorded to a connected device. The "**Configuration File**" option is used to read an existing configuration file.

The reading of the device is done by choosing the option "**Read the Device**". If the machine is logging data, the following message will be displayed.

Fig. 27 – Reading Device Screen

Stop logging: This option stops data logging and is read, allowing the device to be configured.

Show Only: By choosing this option, you can only view the device's settings. Functions such as saving settings, changing the password or setting the device to idle mode will be disabled.

After reading the device, the configuration screen is shown below in **Fig. 28**.
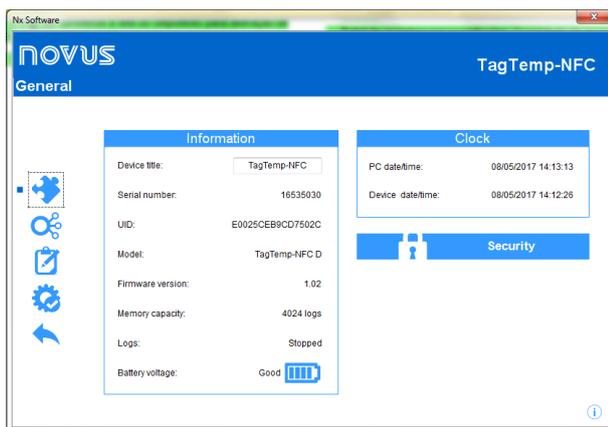
Fig. 28 – Configuration Screen

The configuration of the **TagTemp-NFC** is distributed in several screens. The "**General**" screen contains the following information:

Information: Shows information about the device, such as: Model, Serial Number, Firmware Version, Memory Capacity, Log Status, and Battery Charge.

Device title: This field is used to identify the device, giving it a unique name.

Clock: Shows the date and time of the device and the computer respectively. When a configuration is sent, the date and time of the device are synchronized with those of the computer.

Security: Selecting this option can create, delete or change the password of the computer. This procedure is explained in detail in the "**Finalization**" section.
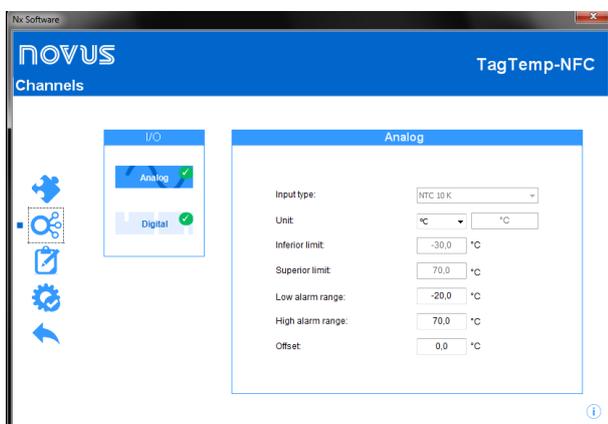
Fig. 29 – Channels Screen

The "**Channels**" screen displays the following parameters:

Input Type: Displays the type of sensor in the device.

Mode: Displays the registration mode. The instantaneous temperature is stored at each acquisition.

Unit: Sets the unit for the monitored quantity: **°C** or **°F** for the temperature channel.

Inferior and Superior Limit: Displays sensor limits.

Low and High alarm range: Allows to define the limits of values, which, when exceeded, characterize an alarm condition. The alarm events are indicated to the user through the **Alarm Indicator**.

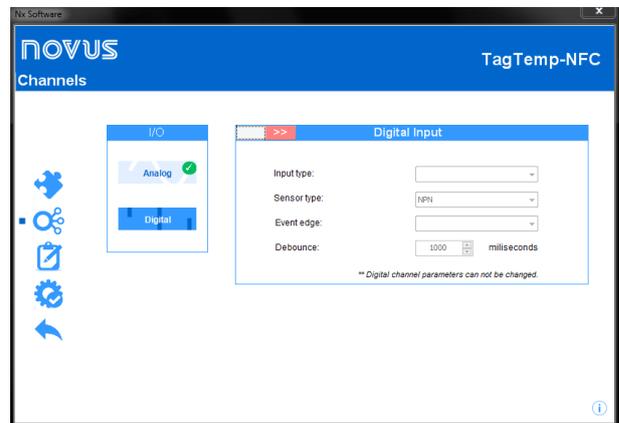**Offset**: Allows to make adjustments to the registered values.

Fig. 30 – Digitals Channels Screen

Note: This screen is only displayed when reading **TagTemp-NFC** model which has a digital input. In order to enable the digital input, please slide the red button.
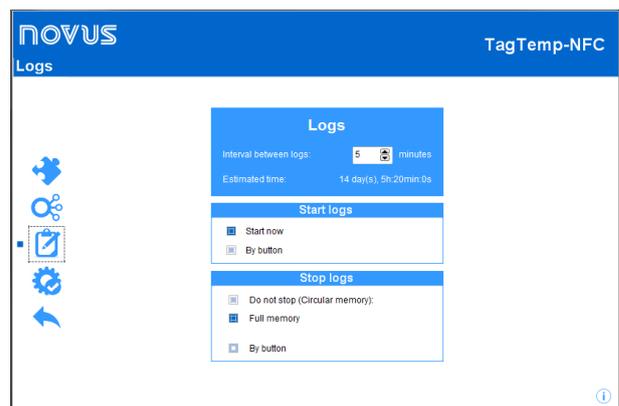

Fig. 31 – Data Logs Screen

The "**Data Log**" screen displays the following parameters:

Interval between logs: sets the time interval between data acquisitions. The minimum interval is one (1) minute and the maximum is four (4) hours.

Estimated time: Informs how long it will take to fill the available memory, with the conditions defined in the configuration.

Start logs: The recording of data can begin in two ways: by immediate "Start now" or by using the device "By button".

Stop loggs: The logging can be stopped in two ways, when the memory is completed or by pressing the button on the device. Both modes can be configured to operate independently. If the option is set to "Do not Stop", the registration is done in a circular way, in which, when the memory is full, the oldest records will be overwritten with the new values.
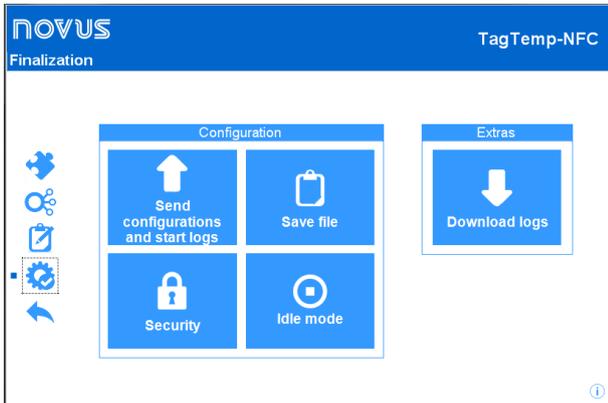
Fig. 32 – Finalization Screen

The "**Finalization**" screen is where the configuration settings are sent and allows you to perform some other useful functions.

Send Configuration: Selecting this option will send the settings made for the connected device.

Save file: This option allows you to save the configuration settings made to a file, so it can be reused to configure other devices.

Security: This option allows you to create, change or delete a password. The password must be four digits long. **Fig. 29** shows the definition and password change screen.

Idle Mode: This option places the device in low power mode, which consumes practically no power, but also cannot perform any of its functions. Selecting this option will display the following screen:

Fig. 33 – Enable Idle Mode

When you select "Yes", the application will place the device in idle mode and display the following message:
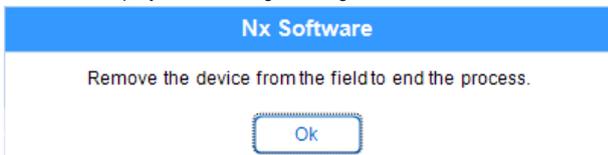
Fig. 34 – NFC Field Remove

To remove the device from the idle mode, you only have to do a read of it, and in doing so, the application will display the following message:
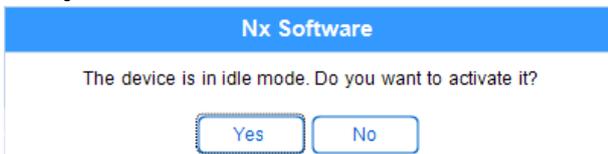
Fig. 35 – Device Activation

If "Yes" is selected, the application will remove the computer from idle mode, but there will still be a need to interact with the device to complete the process, according to the following message:
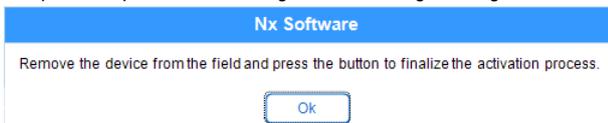

Fig. 36 – Finalization of Activation

Data Collection: This option allows the data in the device memory to be transferred to the application. For more information, see "**Collecting Data**".

Stop: This option is only displayed when the configuration is being read and the device is logging, so that to send a new configuration, you need to stop the current log. See the following image.

Fig. 37 – Finalization - Stop loggings

6.4 Collecting and Viewing Data

The data collection transfers the values recorded by the device to the computer. The collect can occur at any time, during or after the completion of the data acquisition process. If data collection occurs during the acquisition process, this process **is not interrupted**, and the operation is set according to the device configuration settings.

Collecting Data

When you select the "Collect" option in the application start screen, another screen with the following options will be displayed:

Fig. 38 – Menu de Coleta

Open File: This option allows you to upload stored log files for viewing, customizing, preparing reports, or other functions.

Collect: This option allows transferring data from the connected device. When you perform data collection, a progress bar is displayed that indicates the progress of the transfer. The transfer time will be proportional to the number of acquisitions recorded.
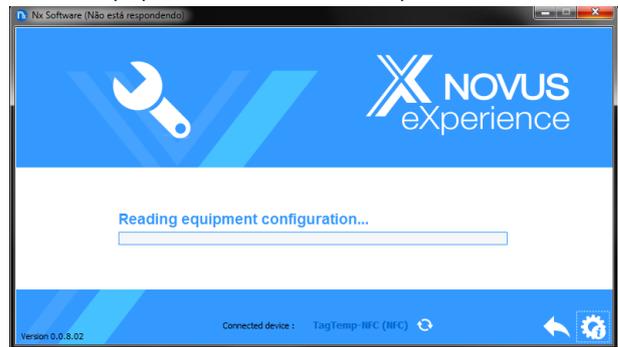

Fig. 39 – Transferring Collect

Viewing Collected Data

After the transfer of the records, the data collected are presented graphically, as shown in the images below.
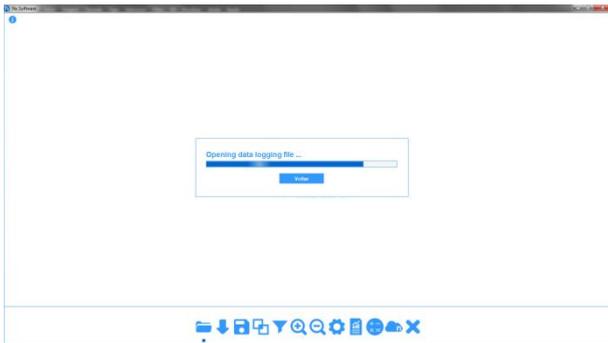

Fig. 40 – Register Collect

Fig. 41 – Register Collect

6.4.1 Sharing and processing data

After completing the collection, a screen will be displayed with the collected data and these are presented in two forms: in graph form and table form. In the same screen, the general information of the device and the data of the collected registers are shown.

Chart: You can select a region of the chart to be viewed in detail (zoom). The zoom functions are accessed from the toolbar. You can also expand a chart area with a click and drag the mouse by creating a zoom region from the upper left corner of the desired chart area. You can also display or not, the lines that delimit the alarm values, to facilitate the visualization of the periods of these events.
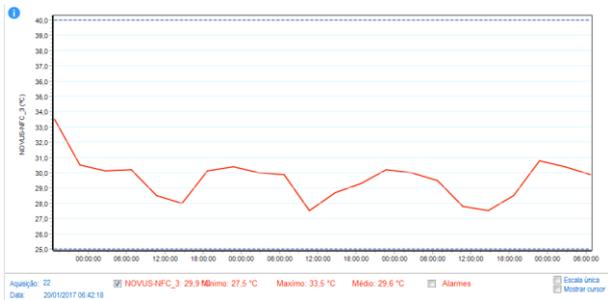
Fig. 42 – Chart

Table of values: Shows the values acquired in table format, indicating the moment of the measurement with its respective value.

Fig. 43 – Data view

General Information: This tab shows the basic information of the device, from which the data was collected recently and about its configuration.

Fig. 44 – General Information

6.4.2 Available Tools

The **NX Software** application offers several ways to customize charts, data filters, export and data sharing. All these features are easily accessible from the bottom menu of the main collection screen. The function of each option in this menu is detailed below. For more information on each of these features, check the informational content available in the application.


1. *Open log file*
2. *Collect from the device*
3. *Save the log file*
4. *Merge graphs*
5. *Filter*
6. *Zoom +*
7. *Zoom -*
8. *Chart Properties*
9. *Reports and Data Export*
10. *Formulas*
11. *Sending data to* **NOVUS Cloud**
12. *Exit*

6.5 Exporting and creating reports with the data collected

Using the **NX Software**, you can export the collected data to various file formats or create reports from the available templates. These two features are accessed by clicking the Reports button in the function menu.

Export: Selecting this option from the "Templates" options list displays a second list of options where you can choose different formats for exporting data.
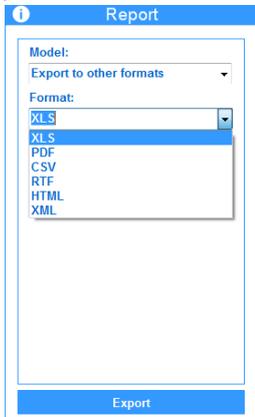
Reports: There are five report templates available, each of them has configurable parameters that can be changed before generating the report. For more information on each template, see the information available in the application.
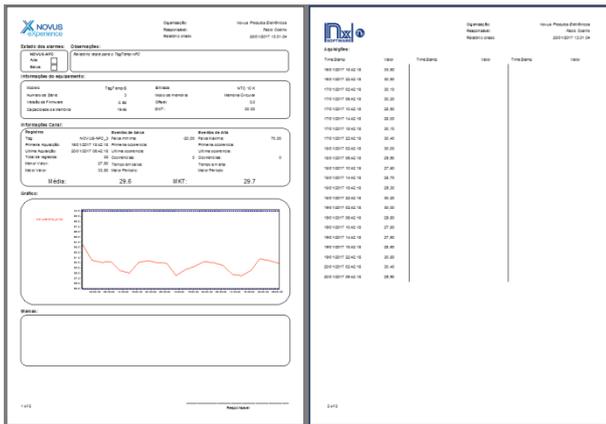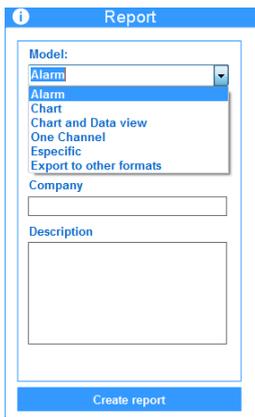

Fig. 47 – Example Report

7 WARRANTY

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