Installation guide

LOG03V3-3G: Wireless 3G data logger

2x analog inputs (4-20mA), 2x digital inputs (1 or 0), 1x voltage input (7Vcc...30V)

1x open collector output, 1x voltage output (7Vcc...30V)

SUMMARY

1   Introduction

The logger is autonomous, and battery powered (long-life lithium battery), it logs the data of the connected equipment. A mobile programming kit (M0C00001) or Wijikey (WIJIKEY-8) is used to connect on-site by radio (Wiji protocol) to the logger, to configure it and to retrieve locally the data. Depending on the data logger model, it can have a modem allowing to automatically send data remotely to the web platform ijitrack.com, or to a client server.

2   Equipment

Data logger with its GSM antenna	Non rechargeable lithium battery 3.6V 34Ah	Programming kits
External antenna (option)	Bracket	Extension cable with bare wire ends

First, connect the battery (details in chapter 4.3) and insert the sim card (beveled side-up, details in chapter 4.2) on its holder.

3   Configuration of the logger using the software Avelour

3.1   Necessary equipment

- The software Avelour in 6.7 version minimum

- Programing Wiji kit (with its cable and antenna) **or** Wiji key (USB/HF stick)

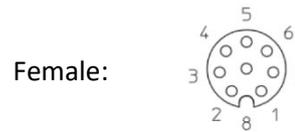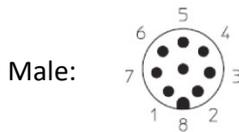Software Avelour 6   Programming kit   Wiji Key (USB stick with RFID)

- The data logger LOG03V3 must be connected to the equipment using the provided cable. Wiring information are presented below:

Male: Female:

Cable color	White	Brown	Green	Yellow	Grey	Pink	Blue	Red
Connector 8Pts	1	2	3	4	5	6	7	8
Signal	Vin	GND	Vout	Input	Input	Input	Input	Output Open drain (2A/30V)
Type	7V...30Vdc	Ground	7...30Vdc	Current 1	Current 2	Digital 1	Digital 2	Grounding contact
Feature	Power in		Switch	4-20 mA	4-20 mA	1 or 0	1 or 0	Open drain (1A/30V)

The output voltage of pin 3 can either comes directly from the input voltage using the internal switch or generated by the logger from the internal power, this setting can be done using Avelour software. When using the internal generator, the output voltage can be set using DIP switches. Below is the table of possible output voltage. the default setting is 8,8V. If a different power supply is needed for the external sensor, it is possible to change manually the switch code located on the bottom daughter board of the logger.

| Switch Settings			
x000	24V	x100	12V
x001	20V	x101	10,9V
x010	16V	x110	9,6V
x011	14V	x111	8,8V

3.2   Run Avelour and connect to the sensor to configure

After connection of the Wiji kit equipped with its antenna (or the Wiji key) on the laptop or PC USB port, run the software Avelour.

NB: at least 1 meter distance is needed between the Wiji antenna and the datalogger for a correct radio connection.

Click the button "Connect to a wireless device" then the sensor or logger will be directly visible by its part number (SN) without the need to activate anything else on the device. Locate the sensor's serial number (SN) on the sensor label (ex: IJA0101-0000 **3559)** and on the connection screen and click "**OK**".

On the first connection with the sensor only the serial number will appear. The full name of the installation site will appear at the next connections.
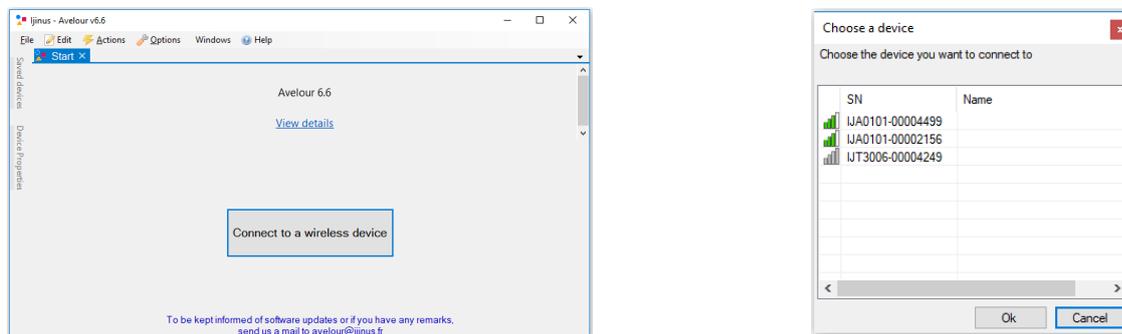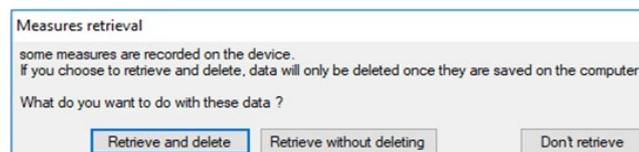

Selection of the logger to configure

During its connection with the logger, the following pop up appears:
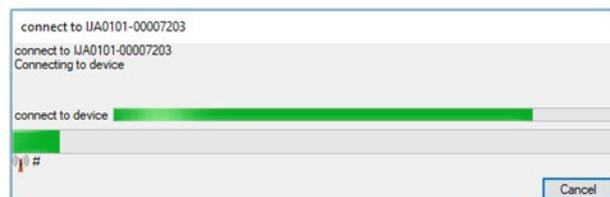
When connected, and only if the sensor already has measures in memory, the following options will suggest retrieving the measures:

After choosing one of these options, if the sensor is not up to date (case of new firmware developed in a new version of the software Avelour since the last connection). It is strongly recommended to read carefully the different messages in the options windows.

The firmware update process can last a moment. On-site prefer the best radio connection (so not if the metal cover of a manhole is closed).

When the logger has finished these checks, Avelour will look bellow figure:
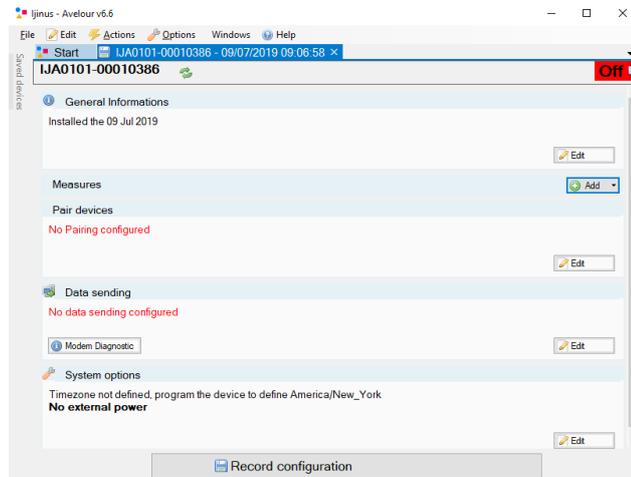
3.3   General information and name of the logger

This part is useful to describe the measurement point.

The most important information would be the name that will help to find the sensor at a future connection.

3.4   Application: 4-20 mA measure

To set the logger, it is necessary to choose one or several applications, and then define the desired configuration. Several applications are available with the LOG03V3, using 4-20 mA and / or Modbus input and /or open-drain output.

This chapter describes the configuration of the sensor. First, select in the "Add menu" the application "4-20mA measure"
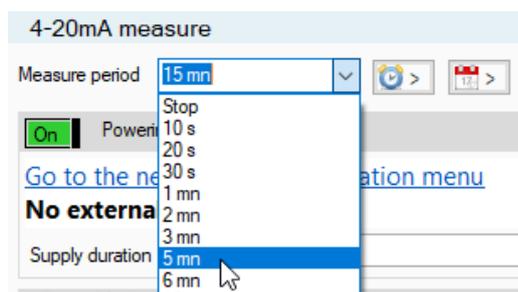

The configuration table while the template is selected is as follow:
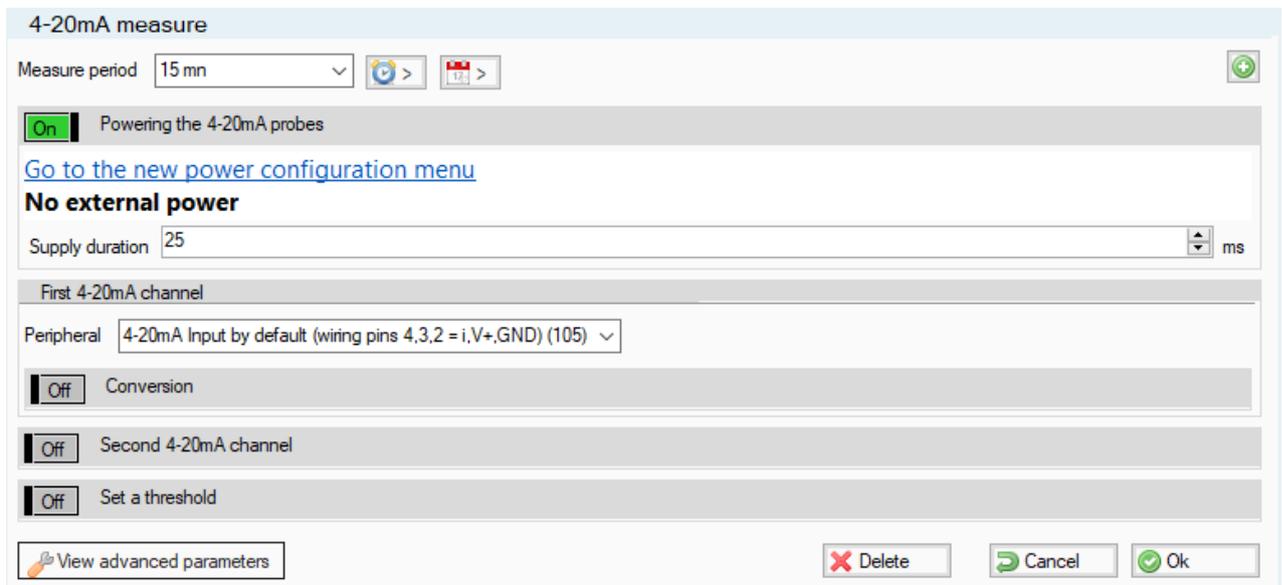
Choice of the Measuring period

In this menu, please select the desired measuring frequency (in this example every 5 minutes).

At the right of the Measure period selector are 2 icons allowing to choose a different measuring frequency based on specific days of the week and/or time.

Choice of the duration of supply of the probe

If the 4-20 mA probe is to be powered, a duration should be set according to the needs of the probe. By default, the duration is set at 25 ms which corresponds to the need of the pressure probes provided by Ijinus. For example, for the inclinometer provided by Ijinus, the duration must be set to 500ms.

Setting the 4-20mA signal conversion:

- **Peripheral**: Choose: « 4-20mA input by default (wiring pins 4,3,2 = i, V+, GND)

- **Conversion**: Click on the « Off » button to display the green « On » and be able to do the conversion of the 4-20 mA signal into one of the five possible units: water height (mm), pressure (bar), temperature (°C), angle (°) or quantify without unit.

For each of the five units, four parameters could be set:

1. Value at 4mA: the minimum value (in most cases 0) of the sensor connected to the logger

2. Value at 20mA: the maximum value of the sensor connected to the logger

**3. Offset on conversion**: to define if needed for the measure

4. Set a threshold: It is possible to define a threshold like the following example.

This threshold is based on the Channel 1 conversion and "Rising edge" but you may choose "Falling edge" for the direction if it is more relevant for your application. The Delay can also be set on activation and/or deactivation.

An acceleration of the measured frequency is an option you can choose. Define it as active and enter the new value.

If the data logger has a modem, it is possible to activate an "Anticipated data sending". It would be based on the activation and/or deactivation of the threshold.

An output activation is also possible with the activation of the threshold by using the open-drain output.
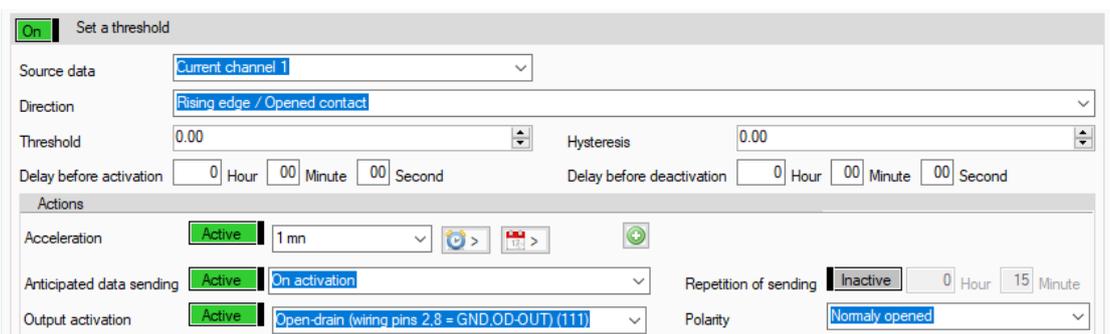
If the current is converted in water height, three more parameters can be set:

1. Calibration: a calibration of the connected sensor is possible to put an offset on the converted height measurement

2. Flowrate / Volume: it is possible to convert the height measurement into a flowrate measurement. To calculate the flowrate, a relationship between the water height and the flowrate must be indicated in the logger. To do so, a table should be created by clicking in the "Edit table" button to have the possibility to create the table by clicking on the "Edit table" button.

With the flowrate, two calculation of the volume accumulation can be done and recorded in the logger: periodic (hourly, daily or monthly) and/or infinite.

3. Sampler enslaving: If the flowrate calculation has been set, it is possible to enslave a sampler with the open-drain output. The enslaving volume can be adjusted and a verification of the good relationship between the logger and the sampler can be verified by clicking on the "Launch" button.

Five enslaving conditions are available: none, height over a high level threshold (mm), height under a low level threshold (mm), flow over a high level threshold (m3/s), flow under a low level threshold (m3/s).

Advanced parameters

The "View advanced parameters" button allows more functionalities:


Displaying the configuration summary

Once the configuration is complete, a summary synthesizes the preferences. To change the preferences, click the "Edit" button.

Saving the configuration

You must save the configuration by clicking on the "Program the device" button, to send it to the logger's memory.

After few seconds, a pop-up window appears to indicate that the configuration has been saved successfully in the logger.
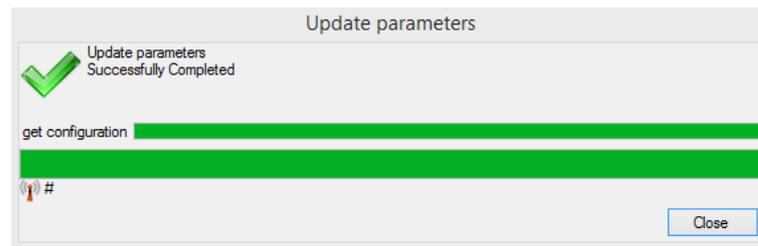
3.5   Data sending by cellular communication

As explain at the beginning of the document, different ways to send data are possible like SMS and FTP transfer using 2G or 3G connection. This chapter explains the way to do it by FTP.

First, if no operator signal is available in surface on the installation location, it will be even more difficult through a metal cover in the manhole.

Second:

- Insert in the logger sim holder a regular size data sim card with at least 5Mbytes data/month on your plan.

While buying the Sim card please ask the **APN of the operator, as well as the Pin code if there is any**. This information will be needed. The cellular antenna has also to be connected to the connector on top of the logger.
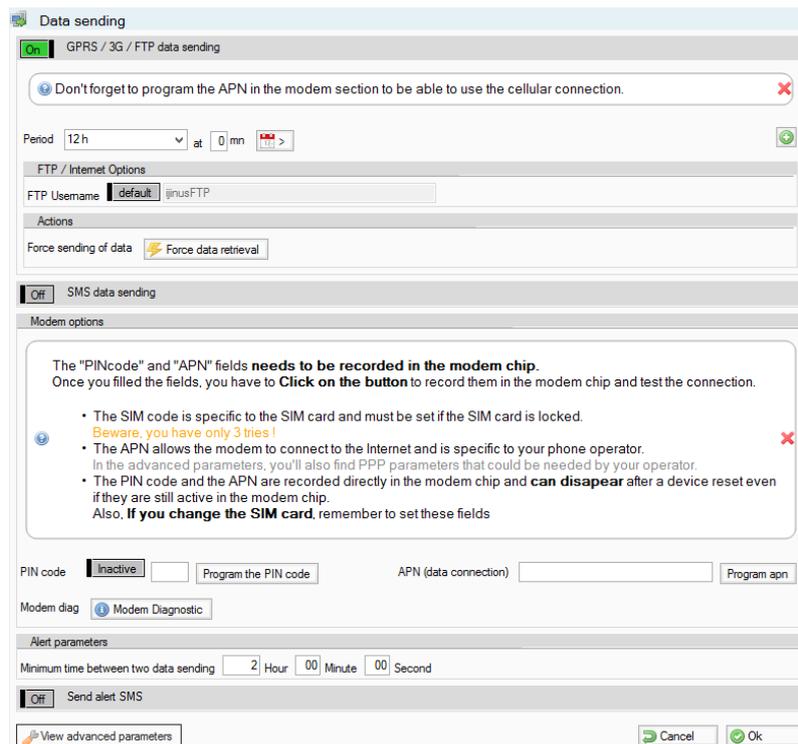
- Set now the time zone in the **System options** menu:
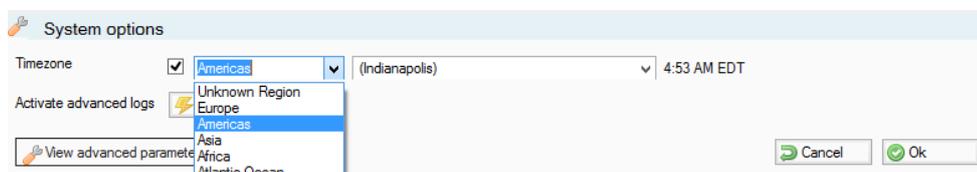
- After clicking the Edit button, choose the sending period, define to send every day or only some of them. It is possible to define several periods by clicking on the green + icon. Depending on the needed configuration, choose a minimum delay between 2 anticipated data sending.
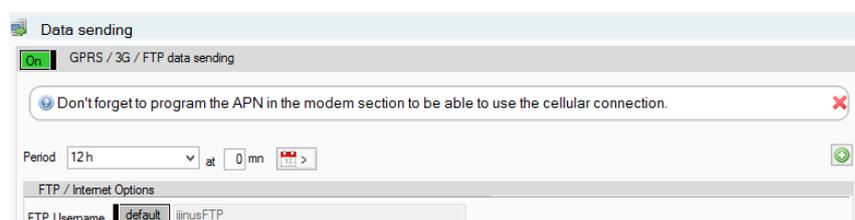
- If the Sim card id is locked, please enter the code and press the **Inactive** button (that will turn green and become **Active**) and **Program the pin code** button.

- Enter **the** APN code and press the **Program APN** button. A message will confirm the success for each operation.

By default, the parameters are set to send the data to our server as we propose a **web platform ijitrack.com** with different services to manage them. So, **if this option is selected, no change is needed in the FTP Username**.

Before forcing a data sending, click on "Program the device" button to send the configuration in the logger memory.
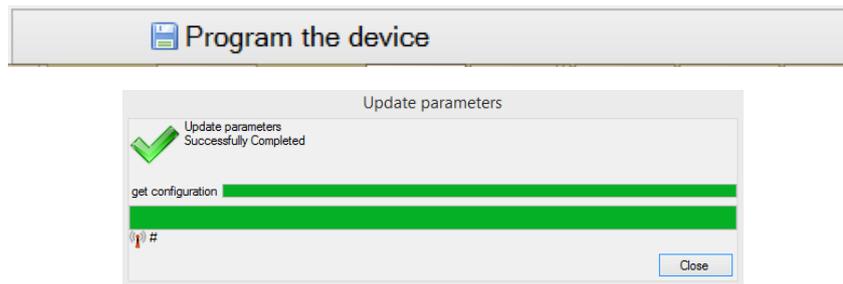
At this stage it is possible to run a sending test by pressing the "**Force data retrieval"** button and check on ijitrack.com if the sensors data appears.

If your account is not already created, please ask to the customer service to do it.

The "**modem diagnostic"** button, available on the modem configuration, allows a better diagnosis of the 2G / 3G reception by doing multiple measurements.

In the advanced mode, it is possible to do continuous modem measurements on a longer period. These options are practical to know on which side of the manhole the antenna should be placed, before drilling in the concrete under the cover plate and inserting it.

RSSI information: Usual values are:

<p style="color:green">**RSSI > -90 dBm: Very good**</p>

<p style="color:orange">**RSSI between - 90 up to -105 dBm: Acceptable**</p>

<p style="color:red">**RSSI < - 105 dB: No network**</p>

While testing the network, some special values could appear: -1 or 0, meaning no network available for communication.

Advanced parameters

If you need to send the data to **your server**, first click the "View advanced parameters", then the FTP / internet Options will appear as the PPP options in the modem options. You need to fill in **your own information details** regarding your server access. Your server administrator can provide to you this information.
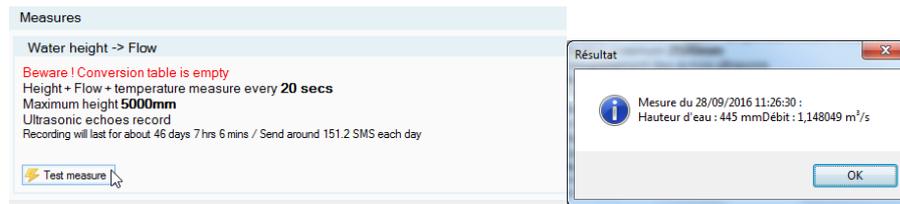

After completing this chapter please press the Program the devise button, the configuration will be sent by radio to the sensor.
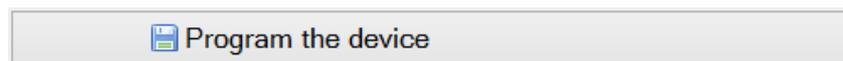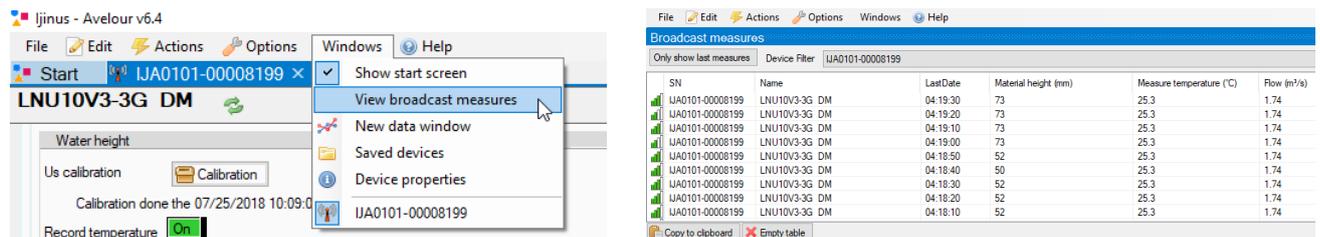
3.6   Local data reading in real time and data download

You Have few possibilities to read the data in real time: By pressing the "**Test measure**" button,

or by selecting on the main menu the window "View broadcast measures"

(**Main menu > Windows > View broadcast measures**)

View broadcast measures: this option opens a window showing the measures received by radio from Ijinus sensors and loggers nearby.

If you want to download the data locally if your logger is programmed with FTP transfer, you need to use:

Menu > Actions > Auxiliary Measures (for SMS) > Retrieve measures.
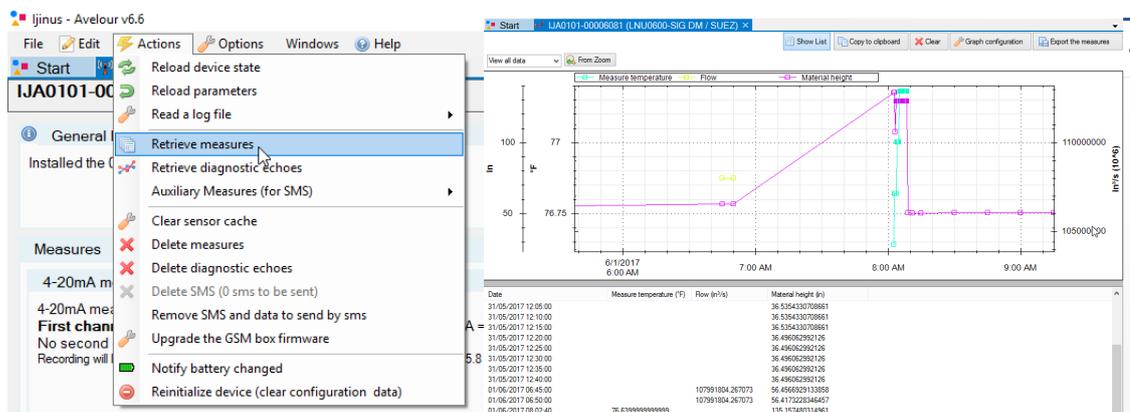
You can view the data, even offline, on graphic and list. A graph configuration module allows you to change colors, thickness of lines, …, but also to apply statistical filters and formula to your data.

3.7   Data export

From the graph and/or list of data you find the tab "**Export the measures**" with the choice of different files format and style of reports, from date to date, by month, or simply all data.
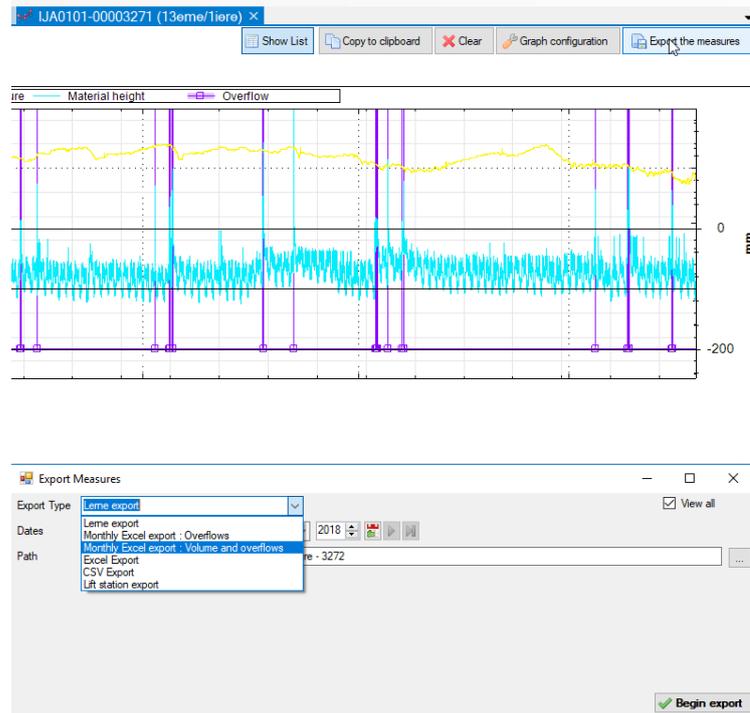
4   Maintenance

4.1   External antenna connection

Use only an external antenna provide by Ijinus.

Three lengths are available as standard: 1, 3 or 5m. In exceptional cases a length of 10m can be proposed. Antennas are suitable for sewer network applications with thick cable and reinforced sealing.

Important: The antenna should be connected to the sensor by screwing it completely to ensure a good seal.

Identify the best antenna installation conditions, including the drilling direction for the best quality of communication. A positioning and data sending test is available from the Avelour 6 software (described in section 3.6 of this document "sending data in GPRS"). This test is to be done before and after installation (closed manhole cover).

4.2   Setting up a Sim card

Our sensors and loggers contain components that can be damaged by electrostatic discharge. Unload the body of electrical charges before opening and handling the device.

Our sensors and recorders with integrated GSM / GPRS / 3G modem need a SIM card to work.

The following steps must be followed to ensure the correct operation of the sensor:

- The sensor must not be in radio communication with the software or connected via USB, in order to recognize the SIM card.

- Unscrew the protective ring and remove the cover.

- Take care not to leave the sensor open for too long (max 2 min) to avoid that the desiccant bags absorb too much moisture.

- Insert the Sim card (beveled edge facing up).

- To close the cover, place the cover on the body of the sensor by locating with the key and screw the clamping ring at the end
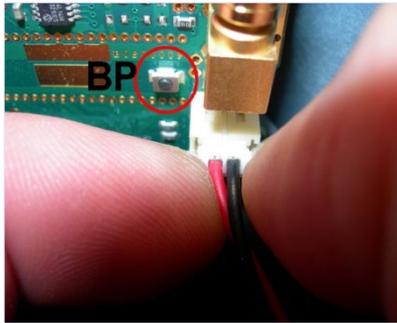
4.3   Battery removal

- Unscrew the clamping ring and remove the cover.

- Remove the battery from its housing and disconnect it.

- Change desiccant bags if they are green.

- Connect the new battery and push the button to restart the sensor. When restarting, the LED should flash Red / Green, then only one green flash every 10 seconds.

- Insert the new battery into the logger and insert the new desiccant bags on the side of the battery. Place the cover on the body of the sensor by locating with the key and screw back the clamping ring.

5   Revision of the document

Date	Revision	Writer(s)	Modifications
03/07/2019	2A03	D. MAHE A. TRIBALLIER	Creation of the document