iJiNUS GROUPE CLAIRE

Connected instrumentation
Sensors - Web services

USER GUIDE

Tipping bucket rain gauge templates

SUMMARY

1 Introduction

This solution combine the tipping bucket model RG20 or RG25, a battery powered logger data logger (long-life lithium battery) that 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 built-in modem allowing to automatically send data remotely to the web platform ijitrack.com, or to a client server.

From our range of data loggers, 3 of them can be use with a rain gauge, they each have their own specialities. We will show to you the configuration of the rain gauge using the logger LOG03V3 as an example. LOG04V3 and LOG10V3 can also be used to monitor rainfalls.

2 Equipments

Data logger with its GSM antenna

Non rechargeable lithium battery 3.6V 34Ah

Programming kits

External antenna (option)

Bracket H0T00060 or H0T00055

Tipping bucket rain gauge RG20 or RG25

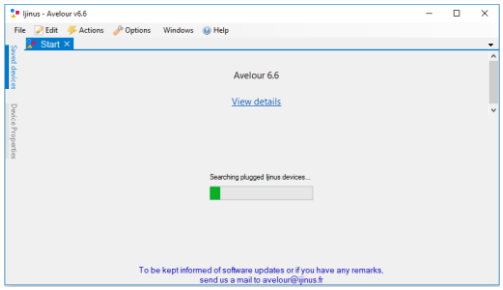
First, connect the data logger battery (details in chapter 4.3) and insert the sim card (beveled side-up, details in chapter 4.2) on its holder.

3 Configuration of the logger using the software Avelour

3.1 Necessary equipments

- The software Avelour in 6.6 version minimum

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



Software Avelour 6

Programming kit

Wiji Key

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

Male:

Female:

Cable color LOG03V3	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	Open drain Output
Type	7V...30Vdc	Ground	7...30Vdc Vout = Vin	Current 1	Current 2	Digital 1	Digital 2	Grounding contact
Feature	Power in		Switch	4-20mA	4-20mA	Contact	Contact	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

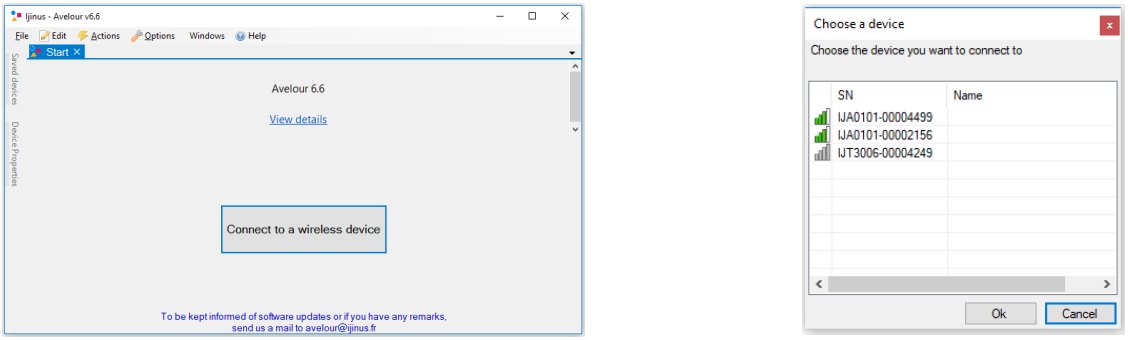
3.2 Launch the software Avelour and connect to the the data logger to configure

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.

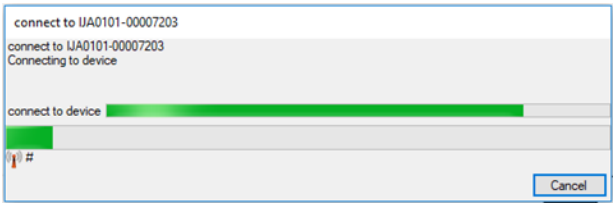
Click the button "Connect to a wireless device" then the sensor or logger will be directly visible by its part number (SN) without the need to activate anything else on the device. Locate the sensor's serial number (SN) on the sensor label (ex: IJA0101-0000 **3559)** and on the connection screen and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

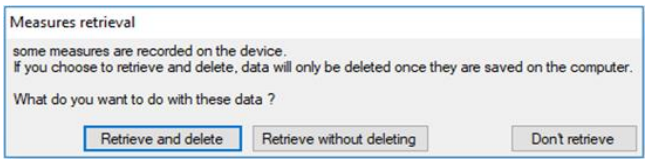


Selection of the logger to configure

During its connection with the logger, the following pop up appears:



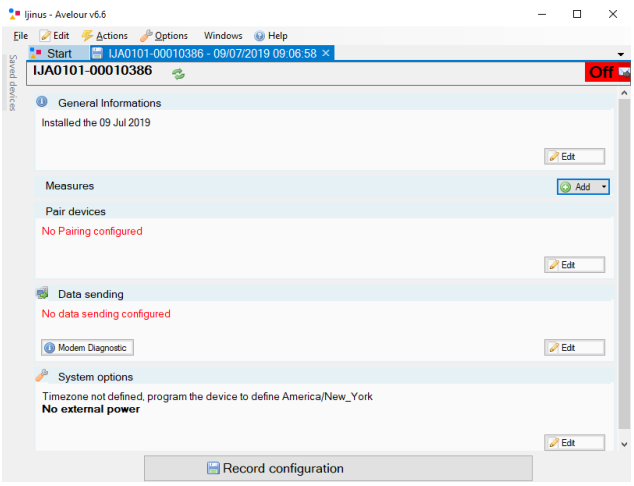
When connected, and only if the sensor already has measures in memory, the following options will suggest to retrieve the measures:



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.

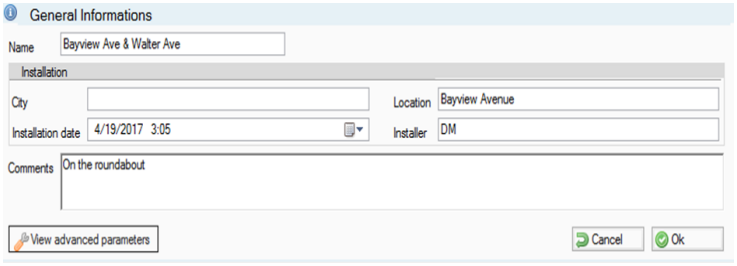
The firmware update process can last a moment. On-site prefer the best radio connection.

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.



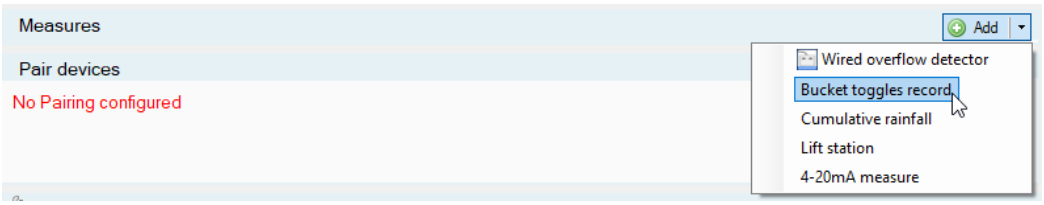
3.4 Applications :

This part is the one of the most important, it allows to configure the logger. It is necessary to choose one or several applications, and then define the desired configuration. Several applications are available with the LOG09V3, using 4-20 mA and / or Modbus input and /or open-drain output.

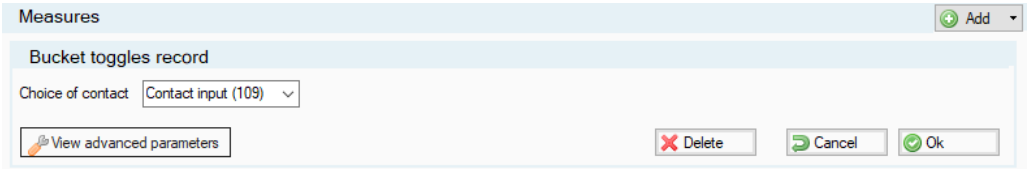
3.4.1 Application : Bucket toggles record

Choice of the application

This part describe the configuration of the application template in Avelour. First of all click on the add button and choose the application "Bucket toggles record"



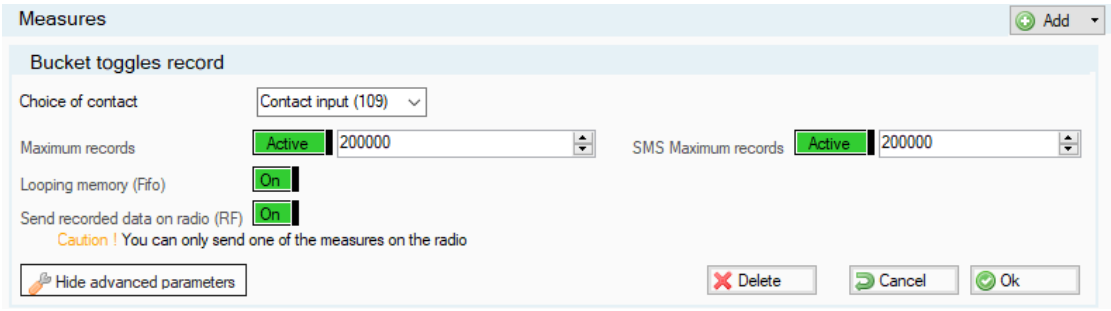
The configuration then opens :



This template allows the timestamp of each bucket toggle of the rain gauge connected to the logger.
Concerning the choice of the contact input:
The contact input 109 corresponds to the first digital input (dry contact) of the logger. For the connection cable between the logger and the rain gauge, this input corresponds to the pink wire.
The contact input 110 corresponds to the second digital input (dry contact) of the logger. For the connection cable between the logger and the rain gauge, this input corresponds to the blue wire.

Advanced parameters

This button allows to reveal advanced parameters for more functionalities :

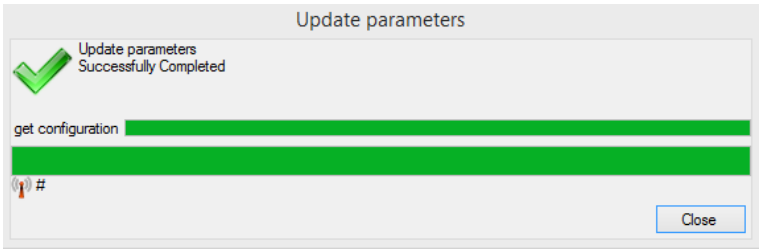


Once the configuration is done, a resume shows your choices:

Saving your 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.

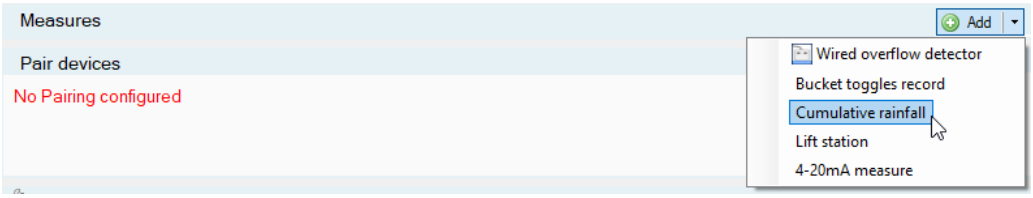


3.4.2 Application : Cumulative rainfall

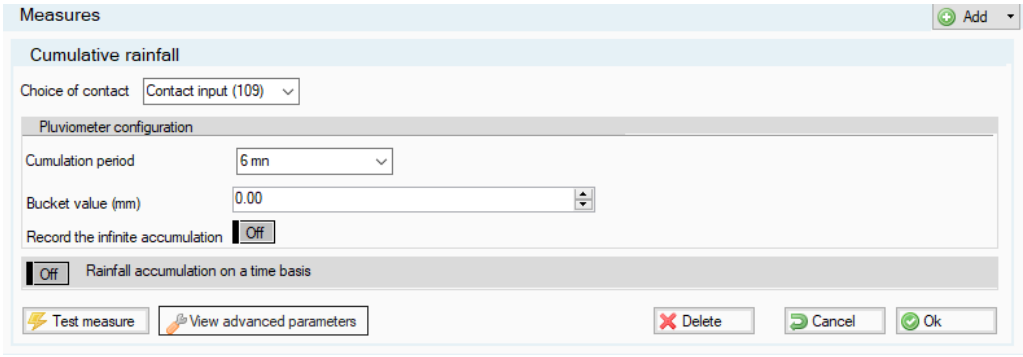
Choice of an application to configure

This part describes the configuration of the data logger in Avelour.

First click on the Add button and choose "**Cumulative rainfall**"



The configuration template then shows up :

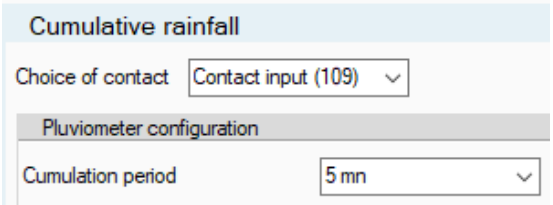


Choice of the contact :

The contact input 109 corresponds to the first digital input (dry contact) of the logger. For the connection cable between the logger and the rain gauge, this input corresponds to the pink wire.
The contact input 110 corresponds to the second digital input (dry contact) of the logger. For the connection cable between the logger and the rain gauge, this input corresponds to the blue wire.

Choice of the cumulative period :

In this menu, select the desired period (in this example every 5min). This is the period during which teh cumulative rainfall will be taken in account.

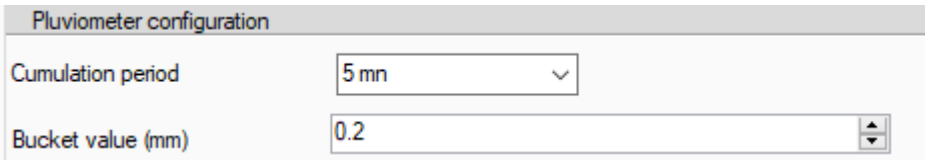


Bucket value

Depending on the rain gauge model connected to the logger, the tip weight can be different. Ijinus has 3 different models, their values are as follow :

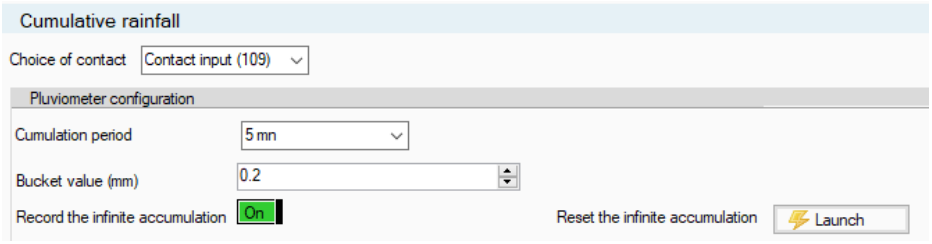
Rain gauges	Bucket weight
RG10	0,1 mm
RG20	0,2 mm
RG25	0,254 mm

Fill in the field the bucket value corresponding to the rain gauge you are using (in this example 0,2 mm).



Infinite accumulation recording

By clicking on the "Off" button, this one will be modified to "Yes" and an infinite accumulation of precipitation will be realized. You can reset this counter by clicking on the "Launch" button after the line "Reset the infinite accumulation".



Rainfall accumulation on a time basis

By clicking on the "Off" button, this one will be modified to "Yes" and a cumulative sliding of precipitation will be realized on a period to be defined (in this example 1h). This sliding accumulation of rainfall will be updated by the logger according to the period of previously defined (in this example 5 minutes).

The definition of a sliding accumulation of precipitation makes it possible to define a threshold on this accumulation. Several options are available to do so :

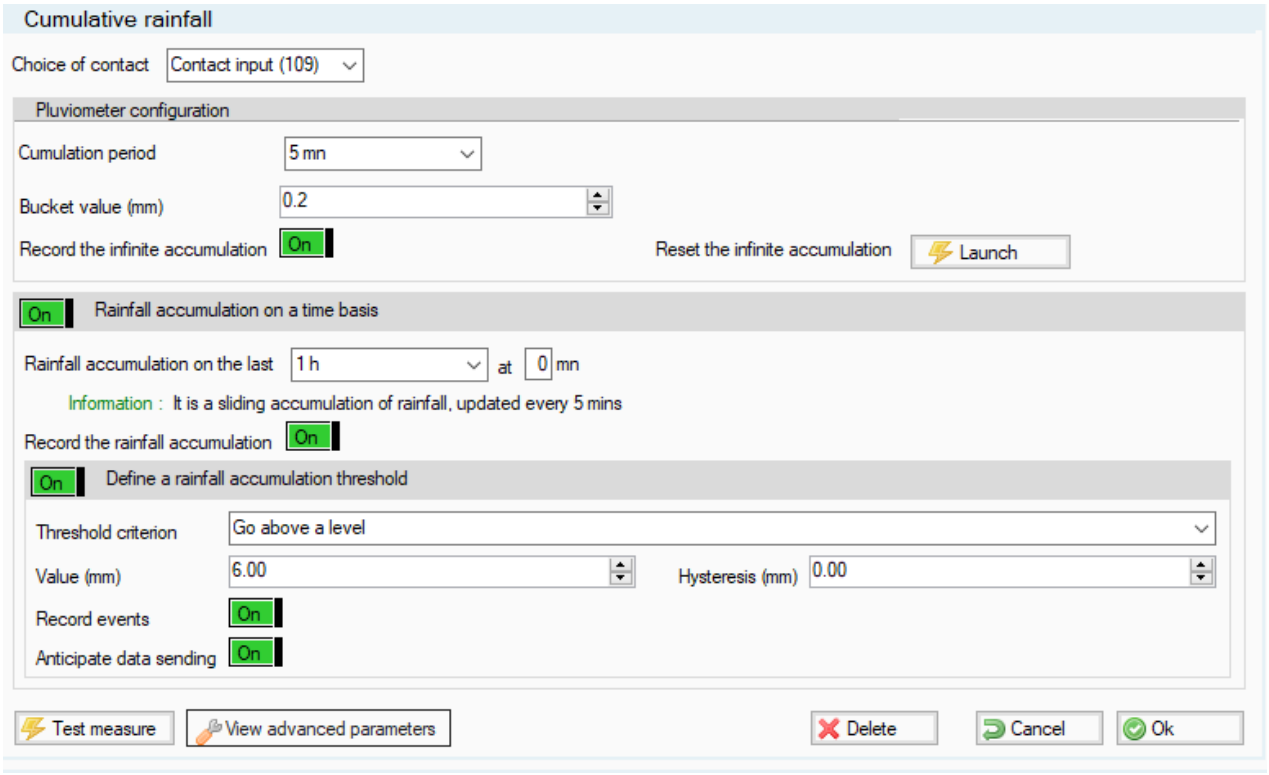
- Go under a level
- Go above a level
- On rise of at least
- On lowering of at least
- On rise or on lowering of at least

When the threshold is reached then an event is recorded corresponding to reaching this threshold.
In addition, it is possible to anticipate the data sending (for loggers equipped with data communication only) when the threshold is reached. For this, it is necessary to click on the "No" button located after the line "Anticipate the sending of the data" so that the button is modified in "Yes".

Quand le seuil est atteint alors un évènement est enregistré correspondant à l'atteinte du seuil.

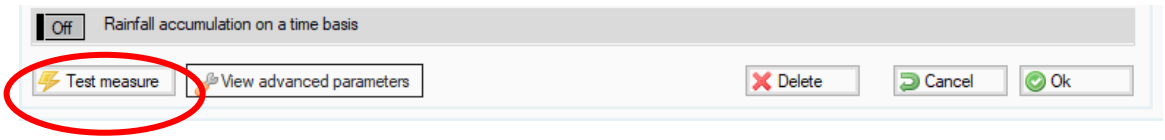
De plus, il est possible d'anticiper l'envoi des données (pour les loggers équipés d'une communication des données) lorsque le seuil est atteint. Pour cela, il est nécessaire de cliquer sur le bouton "Non" situé après la ligne "Anticiper l'envoi des données" afin que le bouton soit modifié en "Oui".

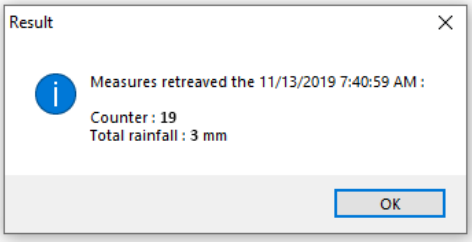
In below example, if a cumulative rainfall exceeds 6 mm in 1 hour then an event will be recorded by the logger and anticipated data will be sent (for loggers equipped with a data communication).



Test measure

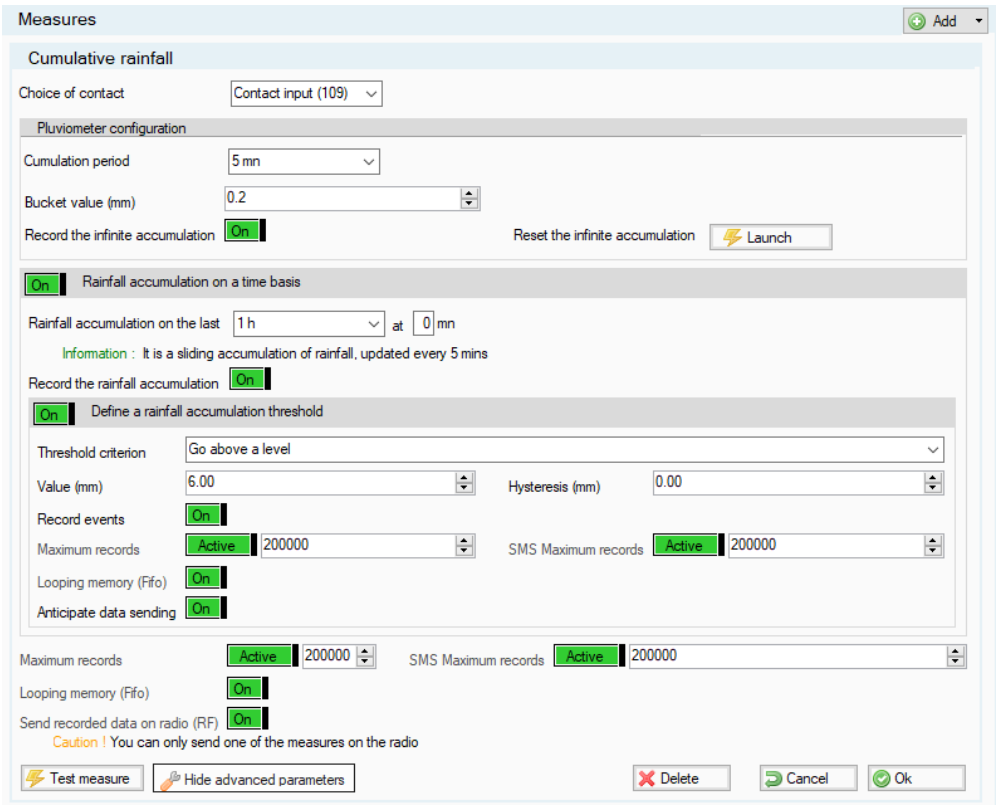
To check the counter and total rainfall value recorded in the logger, simply click on the " Test measure" button.





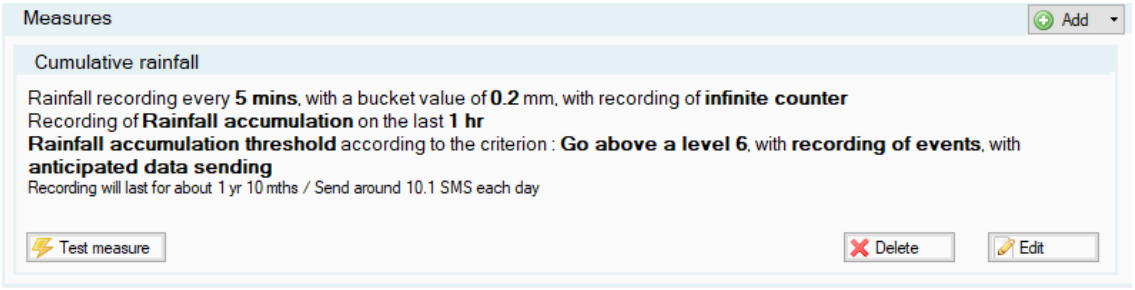
Advanced parameters

The "View advanced parameters" button reveals more options and functionalities :



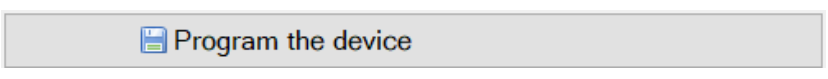
Displaying the configuration summary

Once you have finished your configuration, a summary synthesizes the preferences :

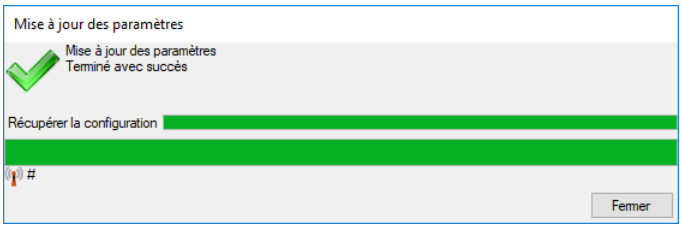


Saving the configuration

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



Après quelques secondes, un écran s'affiche pour indiquer le bon enregistrement du paramétrage dans l'enregistreur



3.5 Data sending by cellular communication

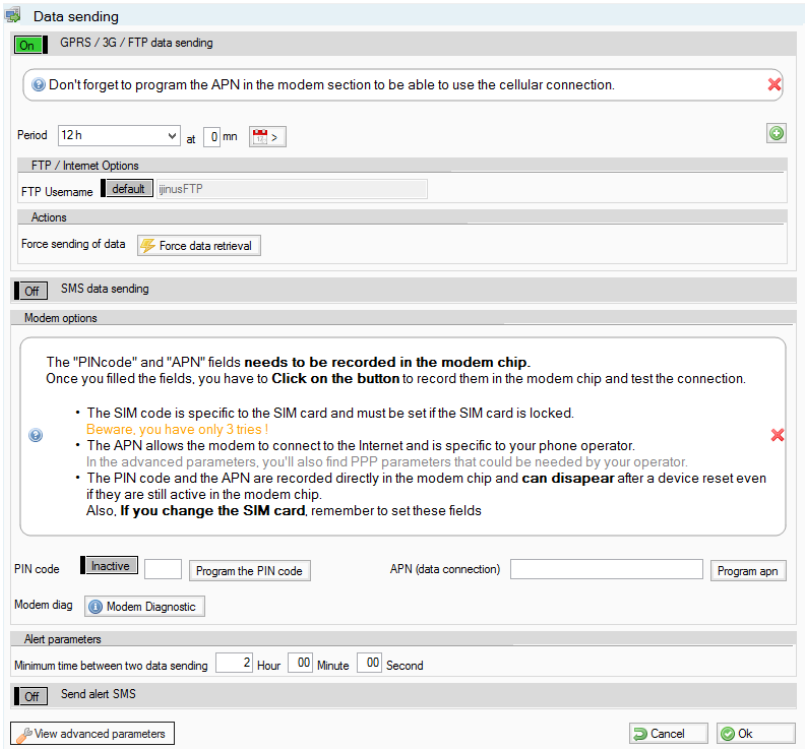
As explain at the beginning of the document, different ways to send data are possible like SMS and FTP transfer using 2G or 3G connection. This chapter explains the way to do it by FTP.

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.

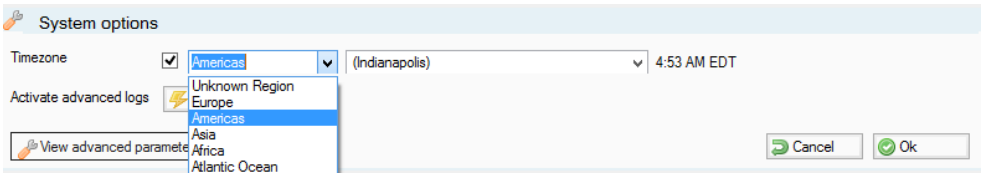
Second:

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

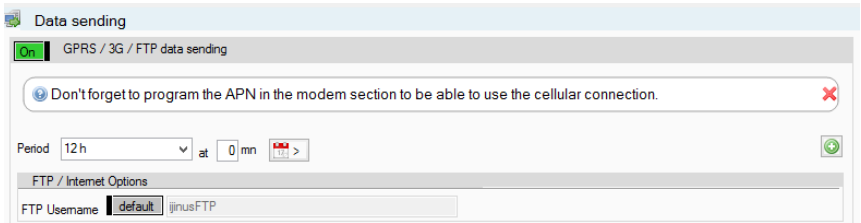
While buying the Sim card please ask the **APN of the operator, as well as the Pin code if there is any**. This information will be needed. The cellular antenna has also to be connected to the connector on top of the logger.



- Set now the time zone in the **System options** menu:

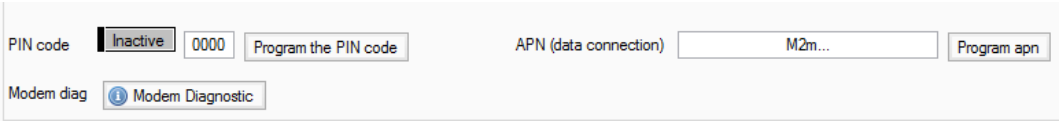


- After clicking the Edit button, choose the sending period, define to send every day or only some of them. It is possible to define several periods by clicking on the green + icon. Depending on the needed configuration, choose a minimum delay between 2 anticipated data sending.



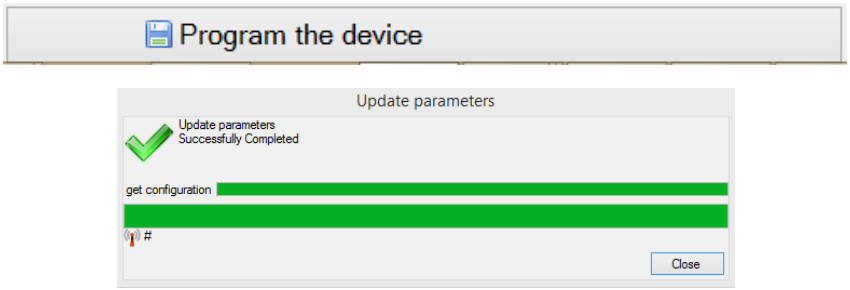
- If the Sim card id is locked, please enter the code and press the **Inactive** button (that will turn green and become **Active**) and **Program the pin code** button.

- 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**.

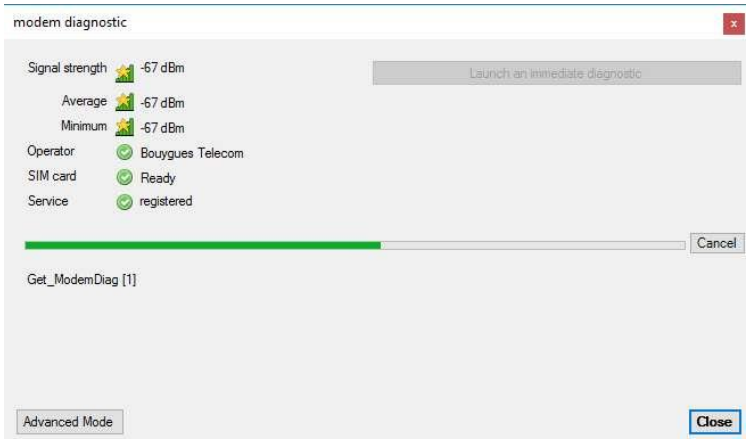
Before forcing a data sending, click on "Program the device" button to send the configuration in the logger memory.



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:

RSSI > -90 dBm: Very good

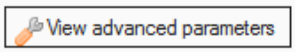
RSSI between - 90 up to -105 dBm: Acceptable

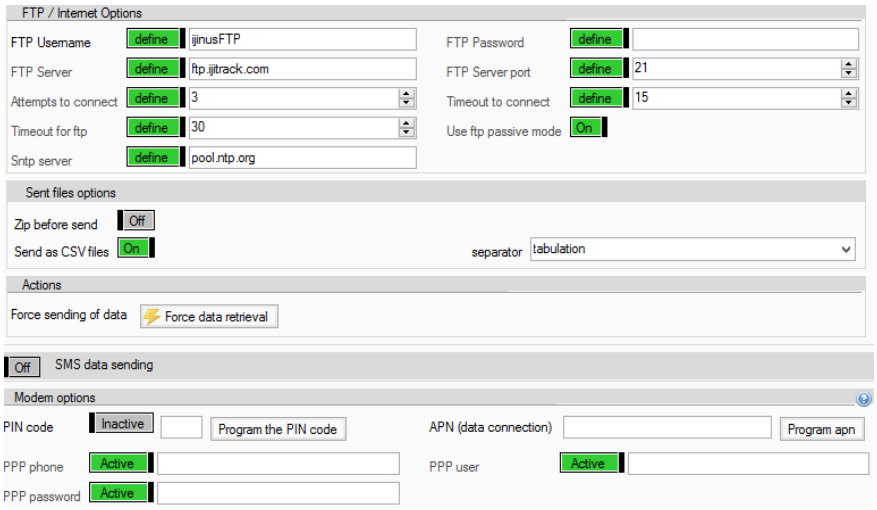
RSSI < - 105 dB: No network

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

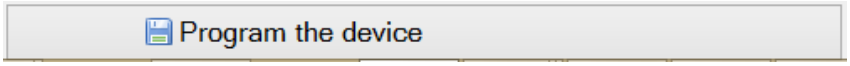
Advanced parameters

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.



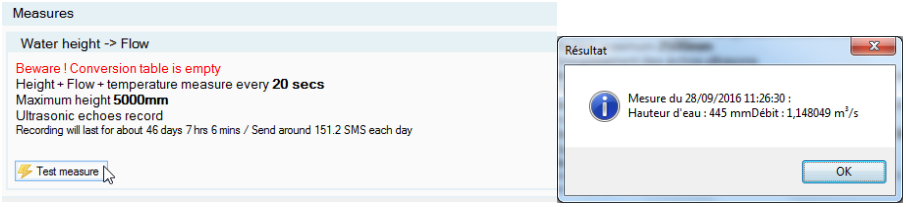


After completing this chapter please press the Program the devise button, the configuration will be sent by radio to the sensor.



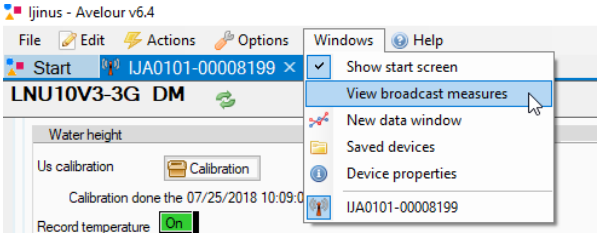
3.6 Local data reading in real time and data download

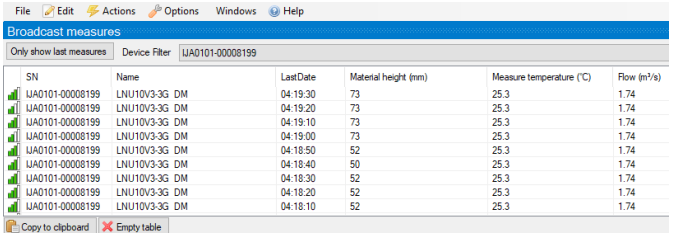
You Have few possibilities to read the data in real time: By pressing the "**Test measure**" button,



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

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

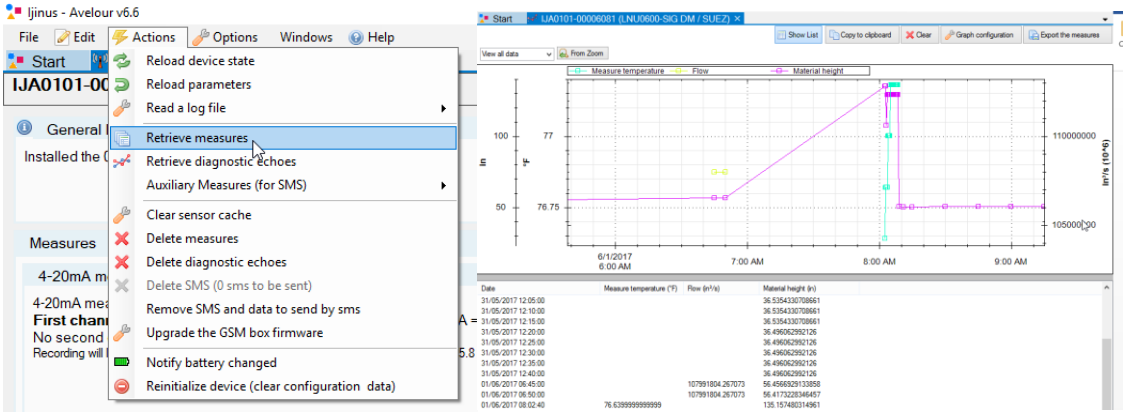




View broadcast measures: this option opens a window showing the measures received by radio from Ijinus sensors and loggers nearby.

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

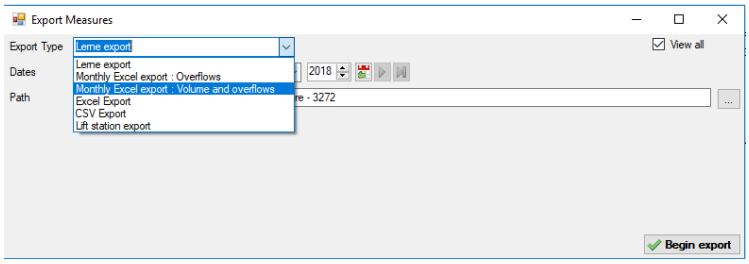
Menu > Actions > Auxiliary Measures (for SMS) > Retrieve measures.



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 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

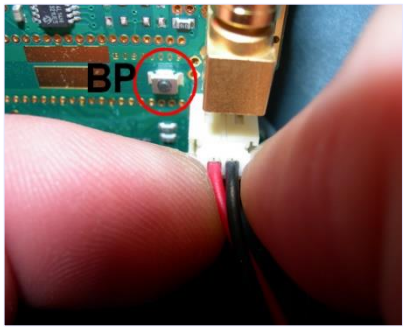
4.2 Battery removal

- 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.

Revision of the document

Date	Revision	Writer(s)	Modifications
11/08/2019	2A01	A. TRIBALLIER D. MAHE	Creation of the document and translation