SKF DataFly Sensor

Technical Features & Specifications, Installation and Setup.

CMDF 3000 – SKF DataFly Sensor

The SKF DataFly Sensor is a fixed and easy-to-use device that is enabled via wi-fi network and interconnected with the SKF @ptitude Analyst software platform.

The SKF DataFly Sensor is ideal for automating vibration and temperature data collection in a secure and qualified way in order to monitor rotating equipment for industrial plant.

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Technical Features

- Capacitive Accelerometer
- Wi-fi range up to 100m when free of obstacles or interference from external noise
- Two-year battery life working under normal conditions
- Direct connection with SKF @ptitude Analyst platform
- Wake-up every 8 hours to collect data (data will be send only in alarm conditions)
- Records data every 15 days (data will be send to SKF @ptitude Analyst)
- Dashboard with battery indicators and Wi-fi connection
- Easy to install and configure
- Temperature measurements (ºC)
- Acceleration Measurements in time and the frequency domain
- Parameters collected: acceleration, envelope filter 3 and velocity

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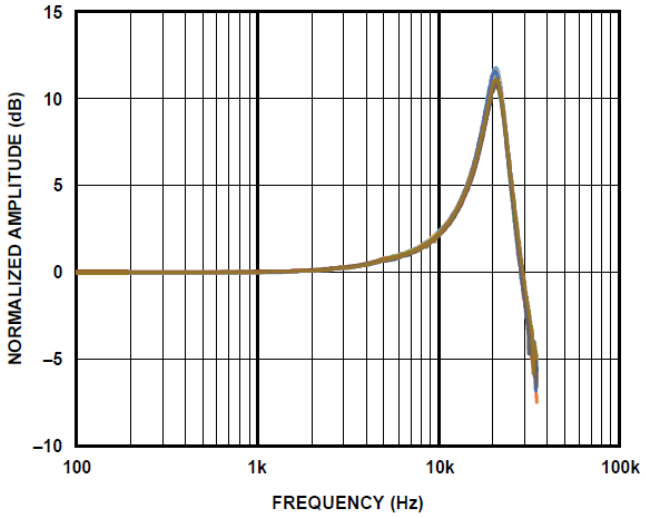
Technical Specifications

- Operating Range: ± 50g
- 16-bit A/D converter
- Number of lines: 12800 lines
- 0.5 Hz resolution
- Maximum sampling frequency: 250 kHz
- Wifi communication protocol: 802.11 b/g/n
- Battery voltage: 3V/4500mAh non-rechargeable (can be replaced by SKF Solution Factory)
- Accelerometer sensitivity: 40 mV/g
- Linear frequency response range: 3dB at 10KHz
- Sensitivity sensor temperature: 5,5mV/ºC
- Typical frequency response of the accelerometer



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Technical specifications

- Measurement Range
  - Acceleration - g peak: 20Hz to 10KHz
  - Envelope acceleration - peak to peak gE (filter 3: 500Hz to 10KHz): 5 to 2KHz
  - Velocity - mm/s rms: 5Hz to 2KHz
  - Temperature: -55ºC to 125ºC

- Physical characteristics
  - Internal antenna
  - Drop test: 1m to concrete
  - Dimensions: 54 x 60 x 94 mm
  - Mounting screw: M6 thread 1mm
  - Weight: 0.23Kg

- Environmental and Regulatory Specifications
  - Temperature range: -40ºC to 85ºC
  - Degree of protection: IP67 (dust and water infiltration protection standard)
  - Anatel Certification: 08781-18-11962
  - Meets RoHS compliant

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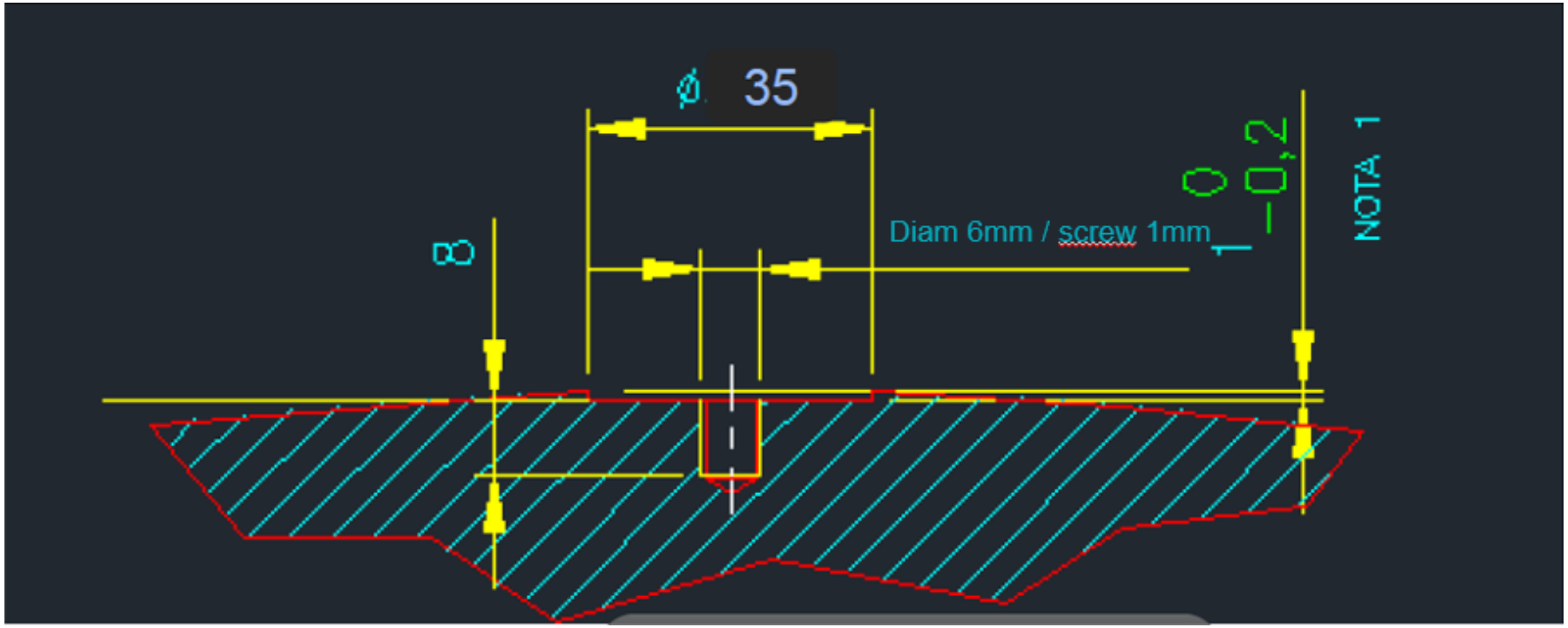
Bearing housing drilling recommendation.

The sensor must be mounted on the bearing house. It has to be fixed with a stud where it ensures reliable mounting with better quality of the signal.



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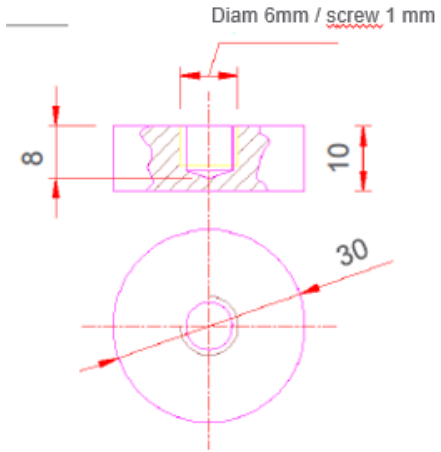
Fixing Preparation

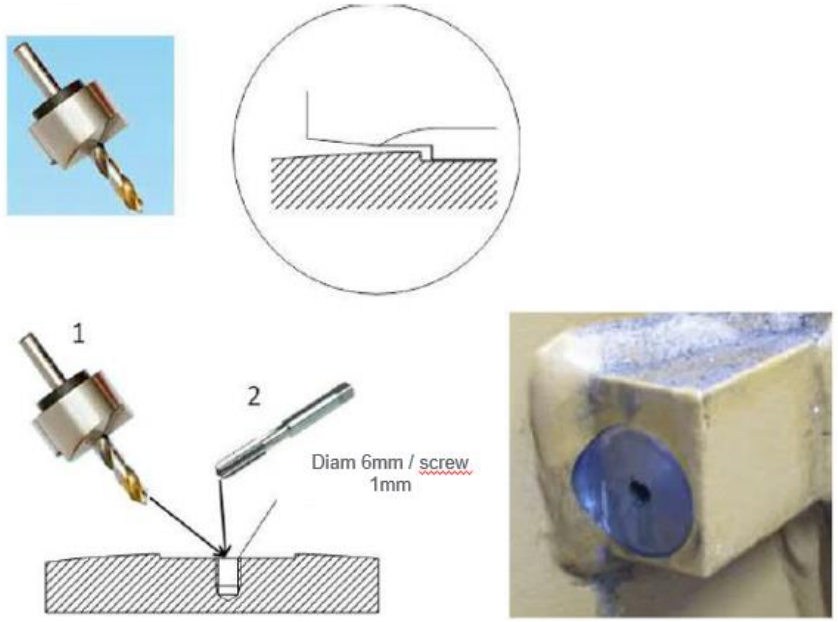
Some bearings housings by definition of size and fabrication can not be punctured. For this situation it will be necessary to use a mounting pad, where they must be fixed to the surface where the drilling would be carried out.

Follow the specifications as detailed below for the mounting pad.

The drill bit must be 35mm diameter.

Mounting Pad





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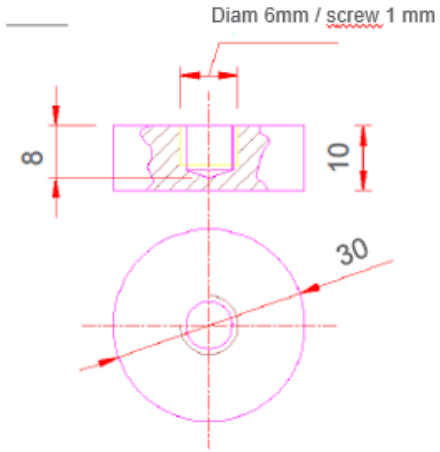
Fixing Preparation

The bearing house must be prepared in a way that the sensor can be mounted in a flat surface.

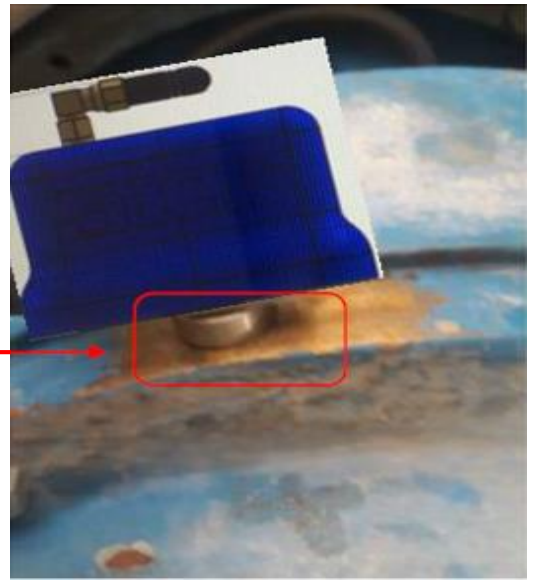
The flat surface around the local of installation should be as detailed below.

Loctite 330 Adhesive

Mounting Pad



Mounting Pad



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Setup and Data view procedure

Energy supply:

- Lithium Battery CR.123A 3V.
- Battery used in Photo Camera

Pre-requisites:

- Magnet component (example: magnet base used in accelerometer)
- Wi-fi with internet access
- Port UDP 123 opened for pool.ntp.org
- Port TCP 20010 opened for www.cdr-skf.com.br
- Laptop with Citrix receiver installed

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Steps to setup the sensor

1º step

First step for setup the sensor is to pass a magnet component on top of sensor (see orange area below)

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Steps to setup the sensor

2º step

The sensor will create an access point.

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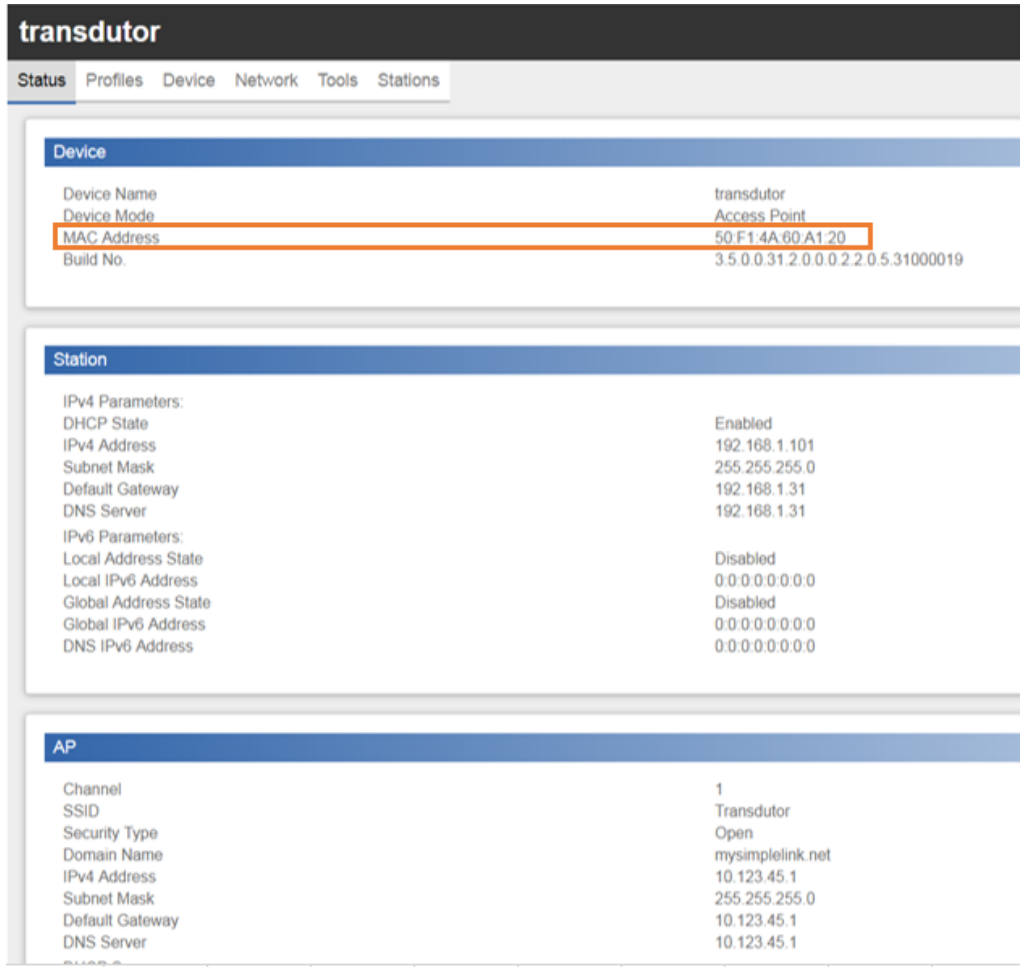
Steps to setup the sensor

3º step

WAN Network setup

- When connected, you need to open a web browser and access address: **10.123.45.1.**
- Take note of MAC Address, you'll need it for recognize on @aptitude Analyst.



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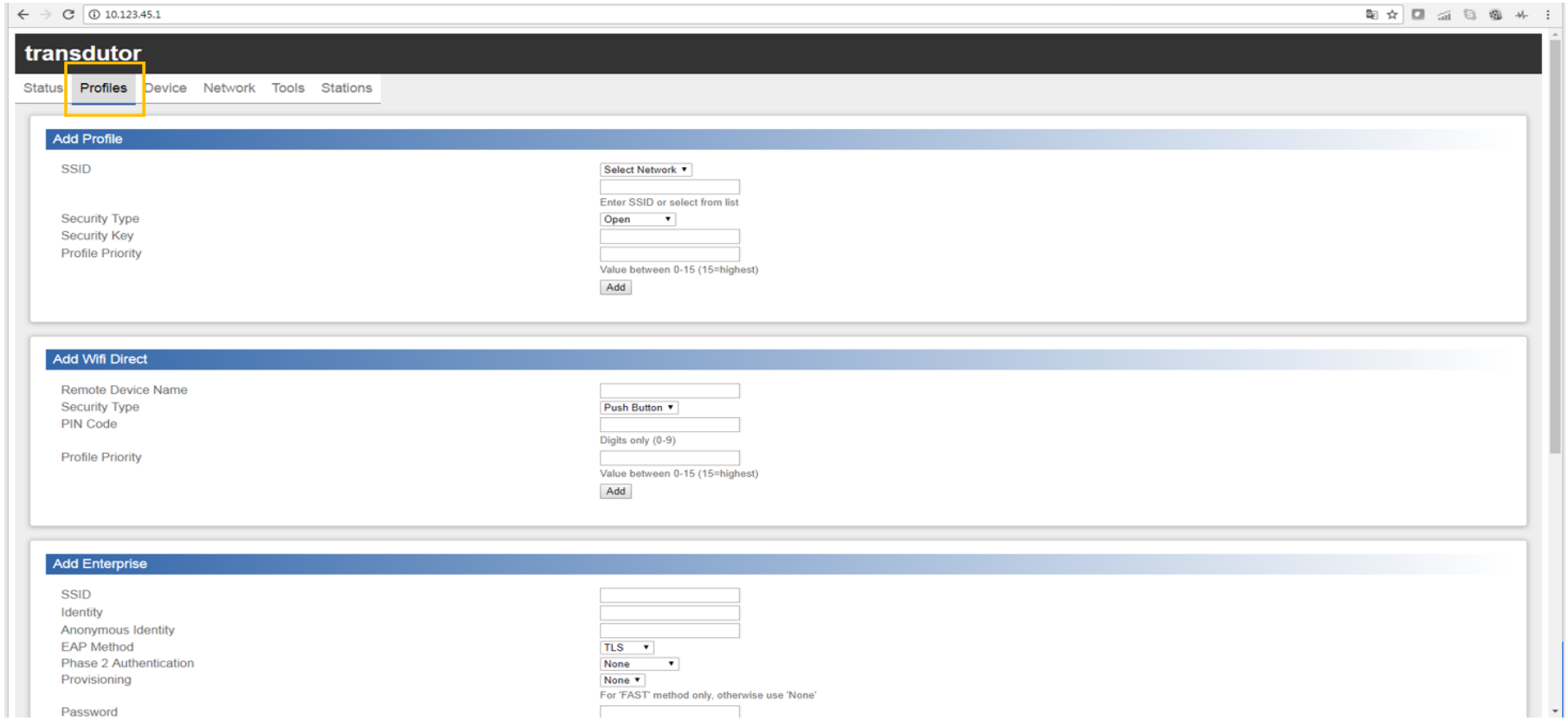
Steps to setup the sensor

4º step

Click on Profile



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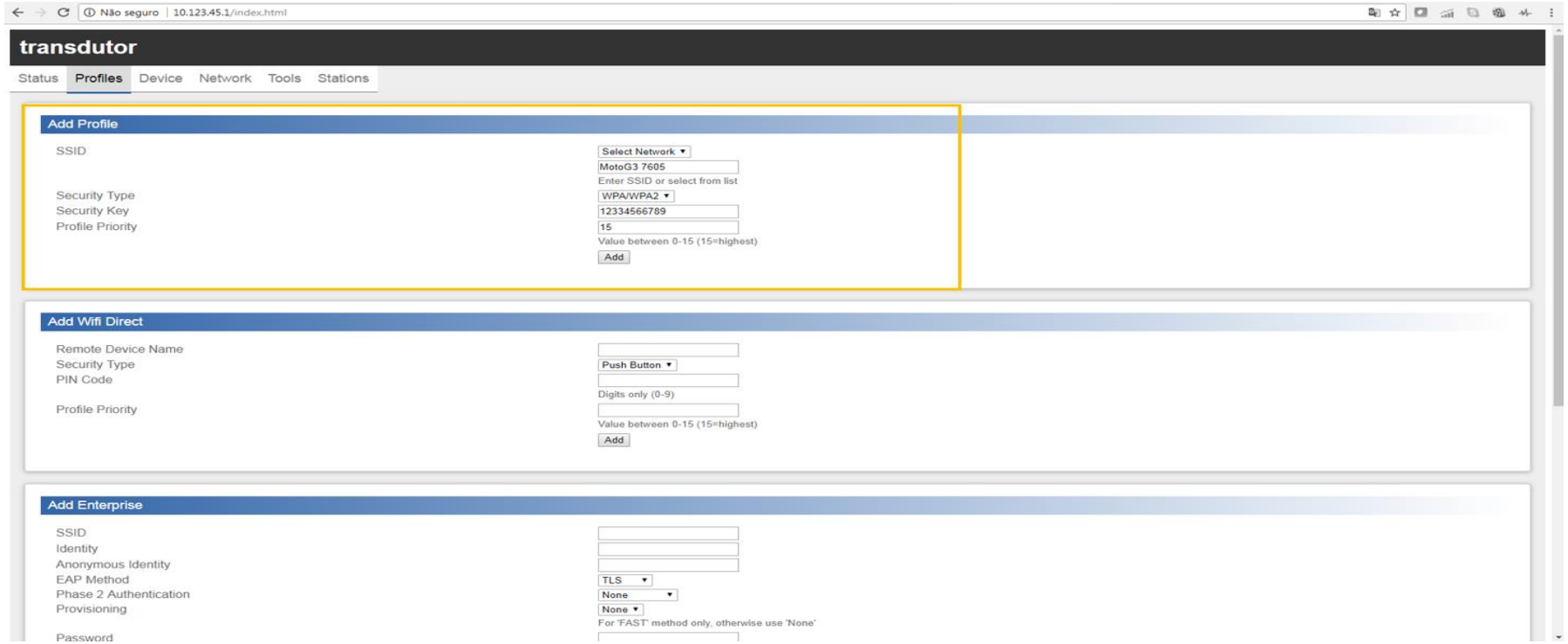
Steps to setup the sensor

5º step

Configure WI-FI for sensor's use and Click Add.



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Steps to setup the sensor

6º step

Wait until the sensor disconnects from your computer and it will connect to the configured wi-fi. If the sensor goes back as an access point it means that you need to check the connections parameter in the wi-fi setup, please check all steps again.

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Checking Communication

IMPORTANT: Check if sensor is communicating with cloud accessing:

http://www.cdr-skf.com.br/mqtt/mqtt_listener_chart.aspx

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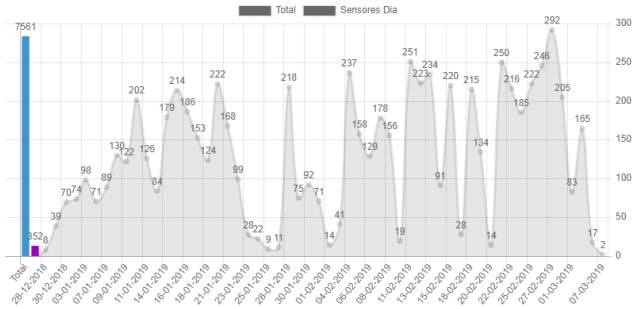

If you can see macaddress of your sensor in this column it means your sensor is communicating correctly with cloud.

Ultimas Comunicações com o MQTT

Data	Cliente	Topico	Mensagem
08/03/2019 10:11:25	AEO20	64cfd90083a1/data	{ "Date" : 1552050879, "Pck" : 9, "QtdPck" : 21, "Points" : ["bfcc5cf7","3ff59da3","3f2af8f7","bfacd...
08/03/2019 10:11:16	AEO20	64cfd90083a1/data	{ "Date" : 1552050879, "Pck" : 8, "QtdPck" : 21, "Points" : ["c00566fa","3e09acd4","4031eb48","3f604...
08/03/2019 10:10:58	AEO20	64cfd90083a1/data	{ "Date" : 1552050879, "Pck" : 7, "QtdPck" : 21, "Points" : ["c030c06d","3be011b2","3fe9aa86","c02fd...
08/03/2019 10:10:50	AEO20	64cfd90083a1/data	{ "Date" : 1552050879, "Pck" : 6, "QtdPck" : 21, "Points" : ["3f51c99c","3f16b79f","3ec1f49b","bf968...
08/03/2019 10:10:41	AEO20	64cfd90083a1/data	{ "Date" : 1552050879, "Pck" : 5, "QtdPck" : 21, "Points" : ["c03ce464","bf1acffe","4088983b","3fb2a...
08/03/2019 10:10:32	AEO20	64cfd90083a1/data	{ "Date" : 1552050879, "Pck" : 4, "QtdPck" : 21, "Points" : ["3fa48a91","3eebd5bd","c036eb0f","bf3b2...
08/03/2019 10:10:19	AEO20	64cfd90083a1/data	{ "Date" : 1552050879, "Pck" : 3, "QtdPck" : 21, "Points" : ["bf1ef0c4","c0312c71","3ee80af6","3e287...
08/03/2019 10:10:10	AEO20	64cfd90083a1/data	{ "Date" : 1552050879, "Pck" : 2, "QtdPck" : 21, "Points" : ["bed4cb90","40004190","bd14d671","bf9ad...
08/03/2019 10:10:02	AEO20	64cfd90083a1/data	{ "Date" : 1552050879, "Pck" : 1, "QtdPck" : 21, "Points" : ["bfb733f5","bf0d25bb","400ae758","bf3d0...
08/03/2019 10:09:55	AEO20	64cfd90083a1/data	{ "Date" : 1552050879, "Pck" : 0, "QtdPck" : 21, "Acel_pk" : 2.149379, "Acel_RMS" : 1.519840, "Vel_RMS" : 0.773627, "EnvE1_pkpk" : 0.000000, "EnvE2_pkpk" : 0.000000, "EnvE3_pkpk" : 4.415417, "Temp" : 29.86001, "Voltage" : 2.934716, "Alarm_Status" : 5642, "QtdPts" : 52400, "PtsType" : "AW", "TColeta" : 2.000000, "dT" : 38.16793, "Retry_ADC" : 0, "RSSI_%" : 38}
08/03/2019 10:09:44	AEO20	64cfd90083a1/cfg	{ "Date" : 1552050868, "Pck" : 1, "Num_Version" : "V1.23a", "Num_Ver_Wifi" : "1.00.21b", "FW_DATE" : ""}
08/03/2019 10:09:44	AEO20	64cfd90083a1/cfg	{ "Date" : 1552050868, "Pck" : 1, "QtdPck" : 1, "NORMAL_MODE" : 4}
08/03/2019 10:09:42	AEO20	64cfd90083a1/cfg	{ "Date" : 1552050866, "Pck" : 1, "QtdPck" : 1, "Alarm_Limit_G_Yellow" : 0.000000, "Alarm_Limit_G_Red" : 0.000000, "Alarm_Limit_V_Yellow" : 0.000000, "Alarm_Limit_V_Red" : 0.000000, "Alarm_Limit_E1_Yellow" : 0.000000, "Alarm_Limit_E1_Red" : 0.000000, "Alarm_Limit_E2_Yellow" : 0.000000, "Alarm_Limit_E2_Red" : 0.000000, "Alarm_Limit_E3_Yellow" : 2.000000, "Alarm_Limit_E3_Red" : 4.000000, "Alarm_Limit_Temp_Yellow" : 0.000000, "Alarm_Limit_Temp_Red" : 70.00000, "Alarm_Hyster_G" : 0.000000, "Alarm_Hyster_V" : 0.000000, "Alarm_Hyster_E1" : 0.000000, "Alarm_Hyster_E2" : 0.000000, "Alarm_Hyster_E3" : 0.000000, "Alarm_Hyster_Temp" : 0.000000}
08/03/2019 10:09:42	AEO20	64cfd90083a1/cfg	{ "Date" : 1552050866, "Pck" : 1, "QtdPck" : 1, "Time_BT_AQS" : 1296000}
08/03/2019 10:09:42	AEO20	64cfd90083a1/cfg	{ "Date" : 1552050867, "Pck" : 1, "QtdPck" : 1, "ACTIVATED" : "64cfd90083a1"}
08/03/2019 09:00:13		Client	Client Stopped

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Sensor’s recognition and collected data view.

1º step

Access SKF REP Center Brasil web site

IMPORTANT: You will need to ask for the access to customer folder. Please, contact TSG-AMERICAS@skf.com and inform who is the customer to get access.

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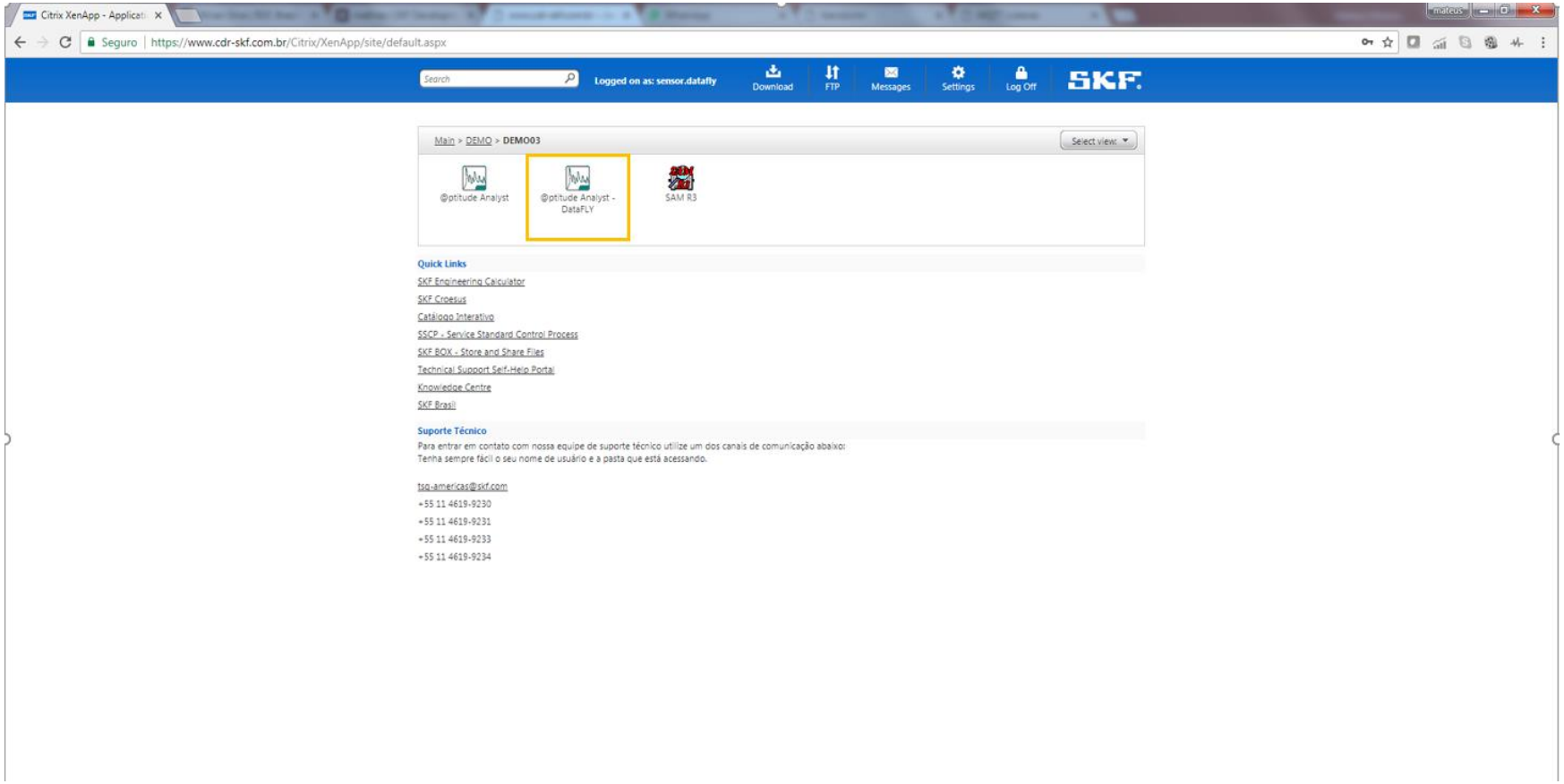
Sensor’s recognition and collected data view.

2º step

Open @ptitude Analyst



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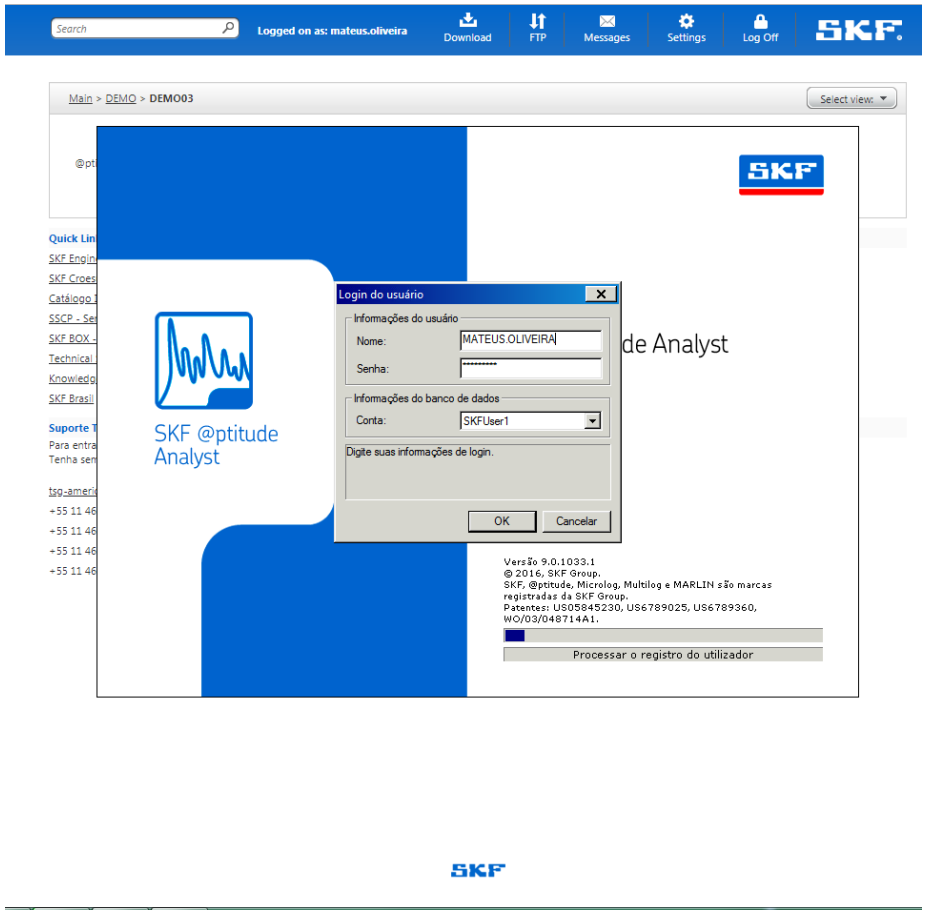
Sensor’s recognition and collected data view.

3º step

Enter credentials



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Sensor’s recognition and collected data view.

4º step

Access SKF Data Fly setup and management on Transfer menu.

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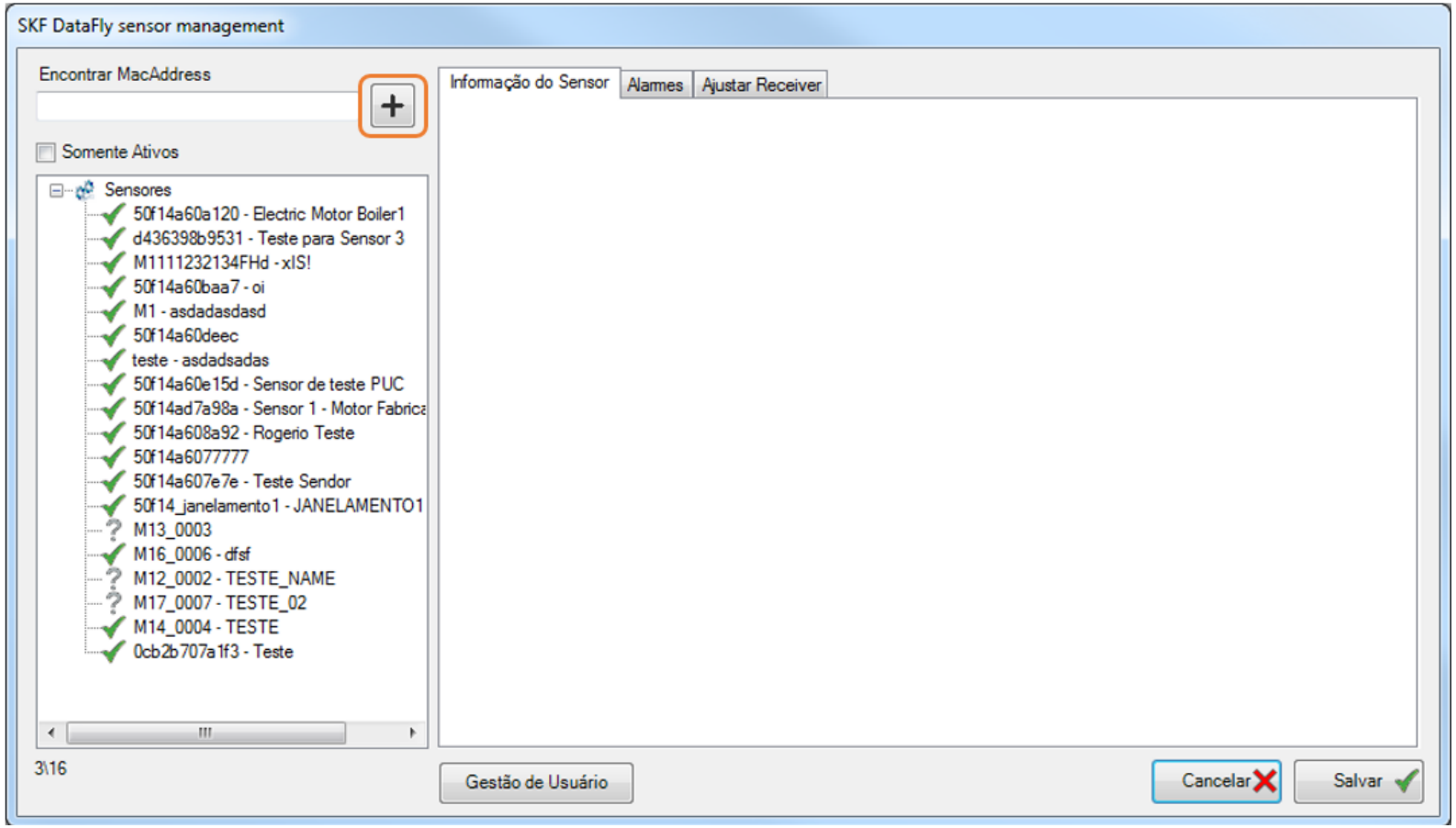
Sensor’s recognition and collected data view.

5º step

To add a new sensor you need click at [+] button.



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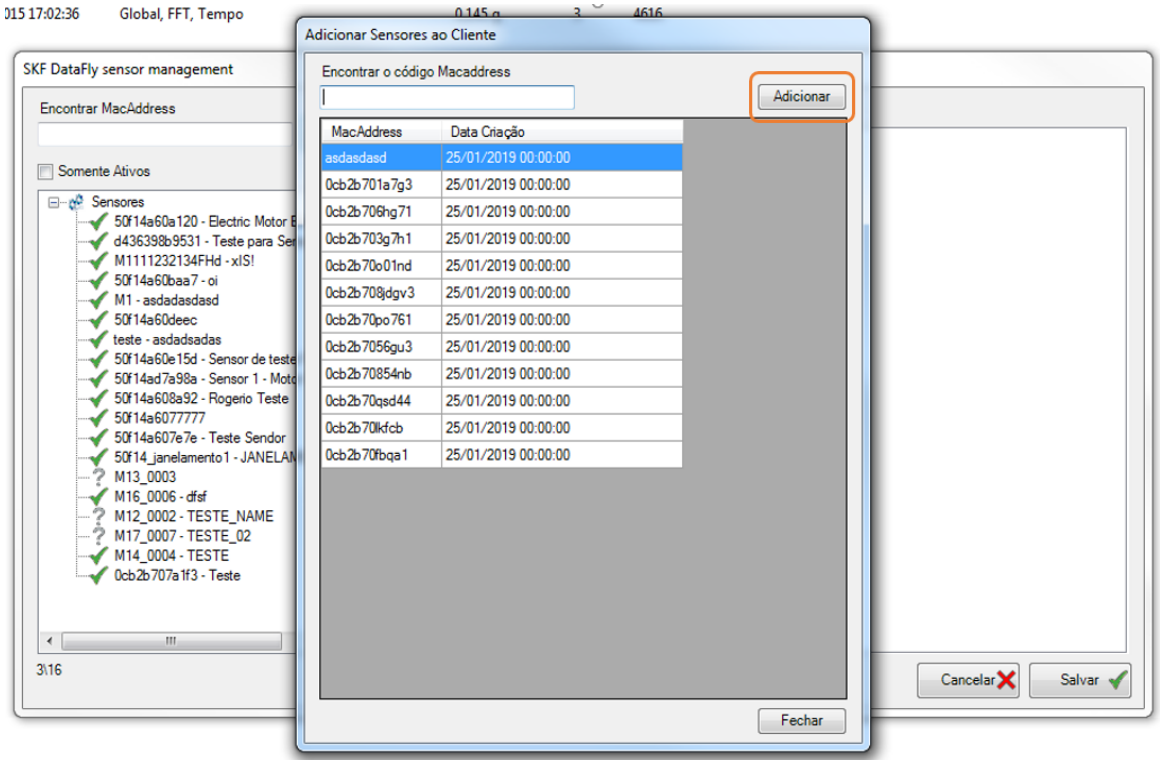
Sensor’s recognition and collected data view.

6º step

Next window will show all sensors that had communication with SKF Broker and still waiting for customer setup.

The user also can find the sensor using textbox. To link this sensor to the Database one needs to click on Add or Double Click on the selected sensor.



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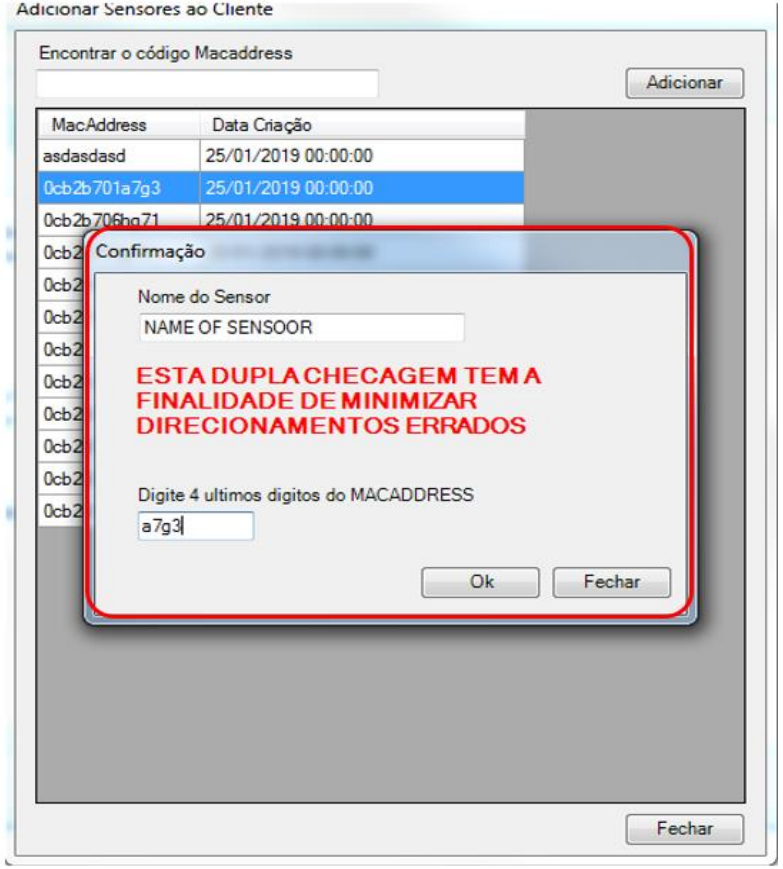
Sensor’s recognition and collected data view.

7º step

For security, it was created a double check window where the user needs to write the Name of sensor and also input the last 4 digits of sensor’s MacAddress.

Click on ok to conclude.



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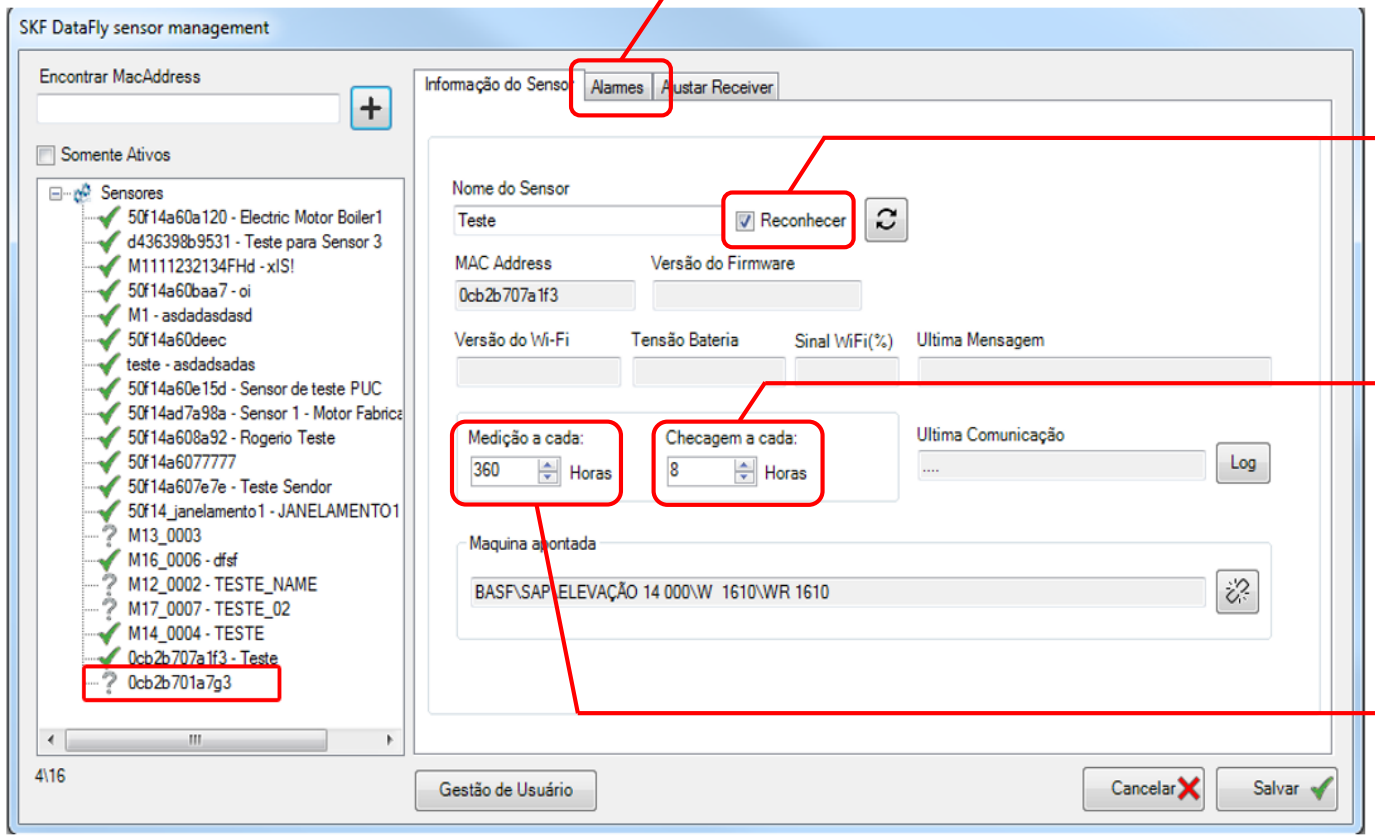
Sensor's recognition and collected data view.

8º step

Now the sensor is added on the customer sensor's list.



** Enabled just for administrator or REP Center

Alarm Levels: This tab you can set alarms in to sensor. **

Recognize: It's necessary to activate the sensor. It will send message to enable automatic collect.

Time between Check
Cicle of collect and check. Just send measurement if have exceeded alarm. **

Time between Measurement
Cicle of mandatory collect and send measurement. **

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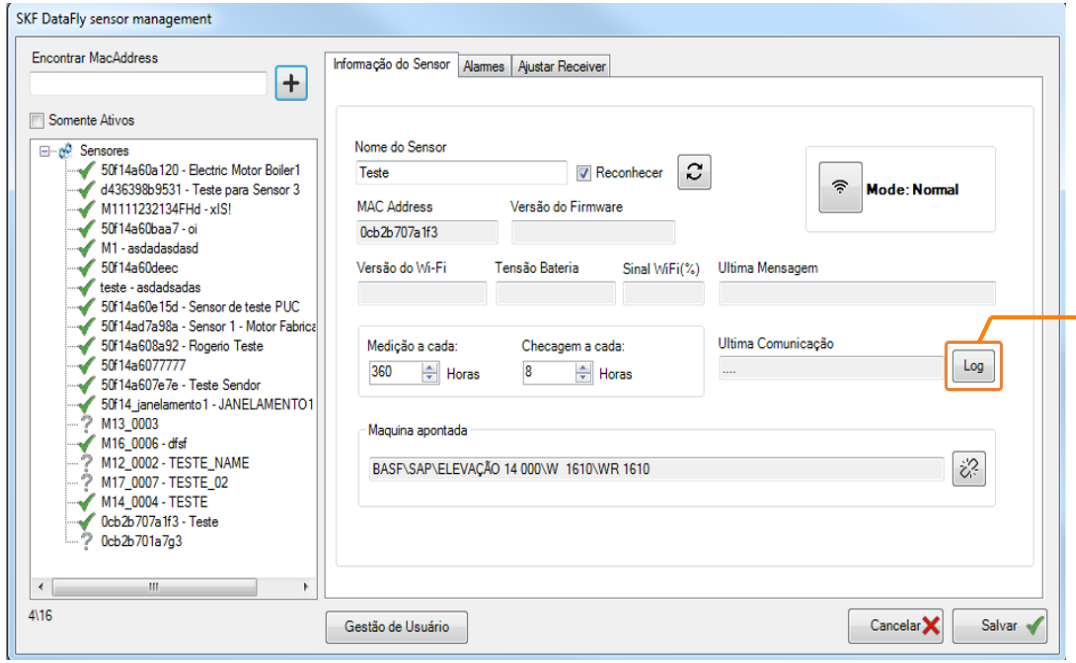
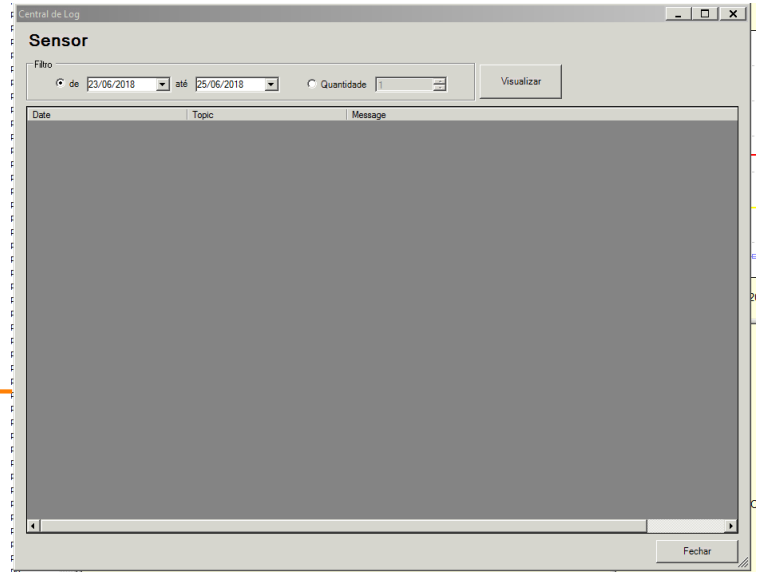
Sensor’s recognition and collected data view.

9º step

Clicking on log, the user can see the log window of the sensor.





Log window (it isn’t fast window)

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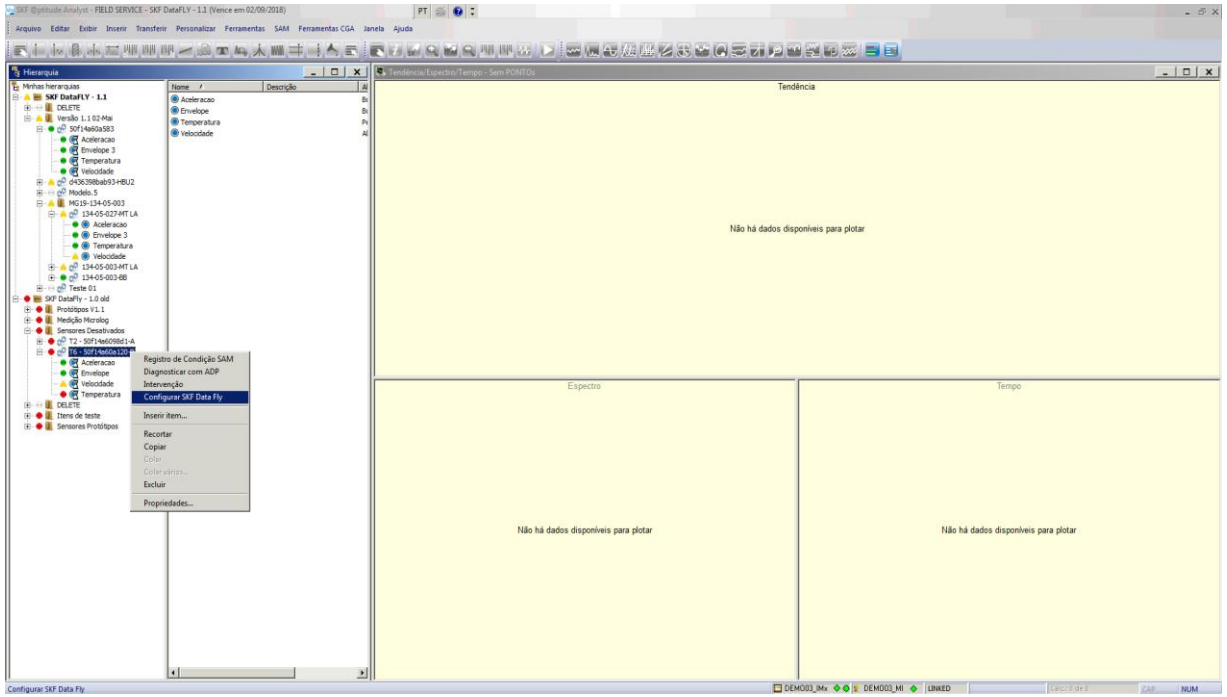
Sensor’s recognition and collected data view.

10º step

Link the machine and points to stored data on the sensor.

You must create machine and point (Manual types) of parameters “Acceleration”, “Envelope” “Velocity” and “Temperature”.

INFORMATION: the vibration setup of point will not be used to collect data on sensor. The setup is inside on firmware. Acceleration (20 to 7000 Hz), Velocity (5 to 1000 Hz) and Envelope (5 to 2000 Hz).



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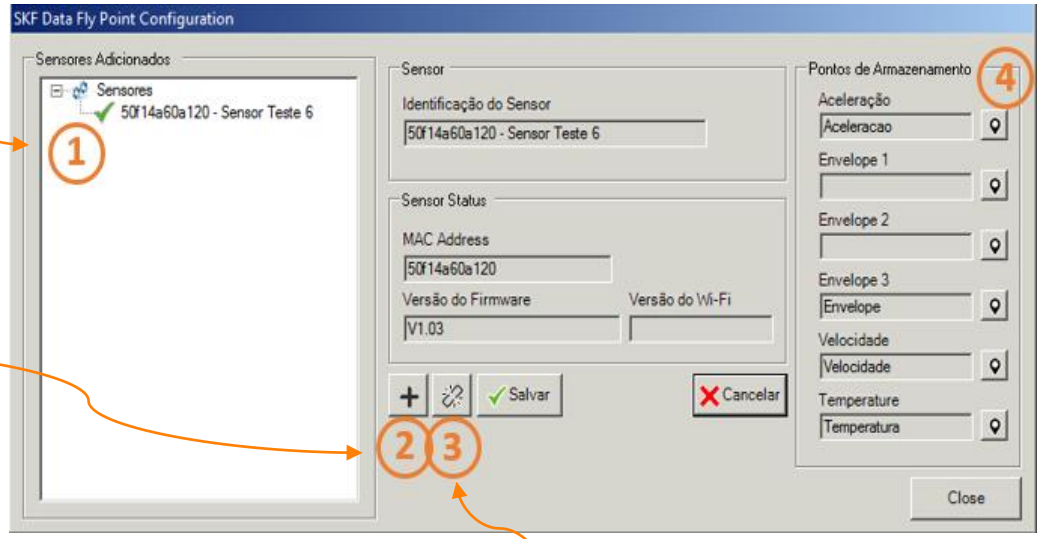
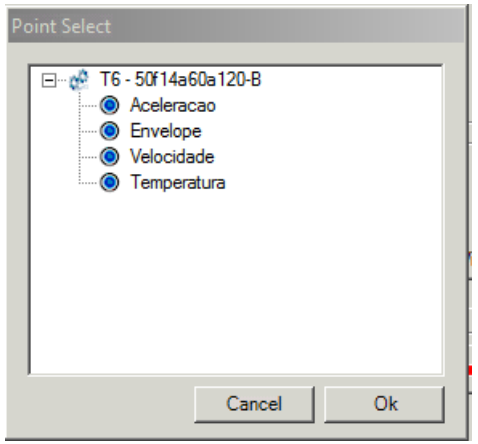
Sensor’s recognition and collected data view.

10º step

1-Configured sensor on this machine. You can have more than one sensor by machine.

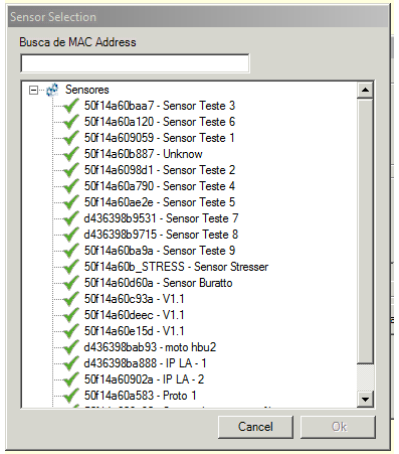


4- Select points to store data



2- Add Sensor Button

Select sensor and click Ok to add it to machine



3- Remove link between sensor and machine

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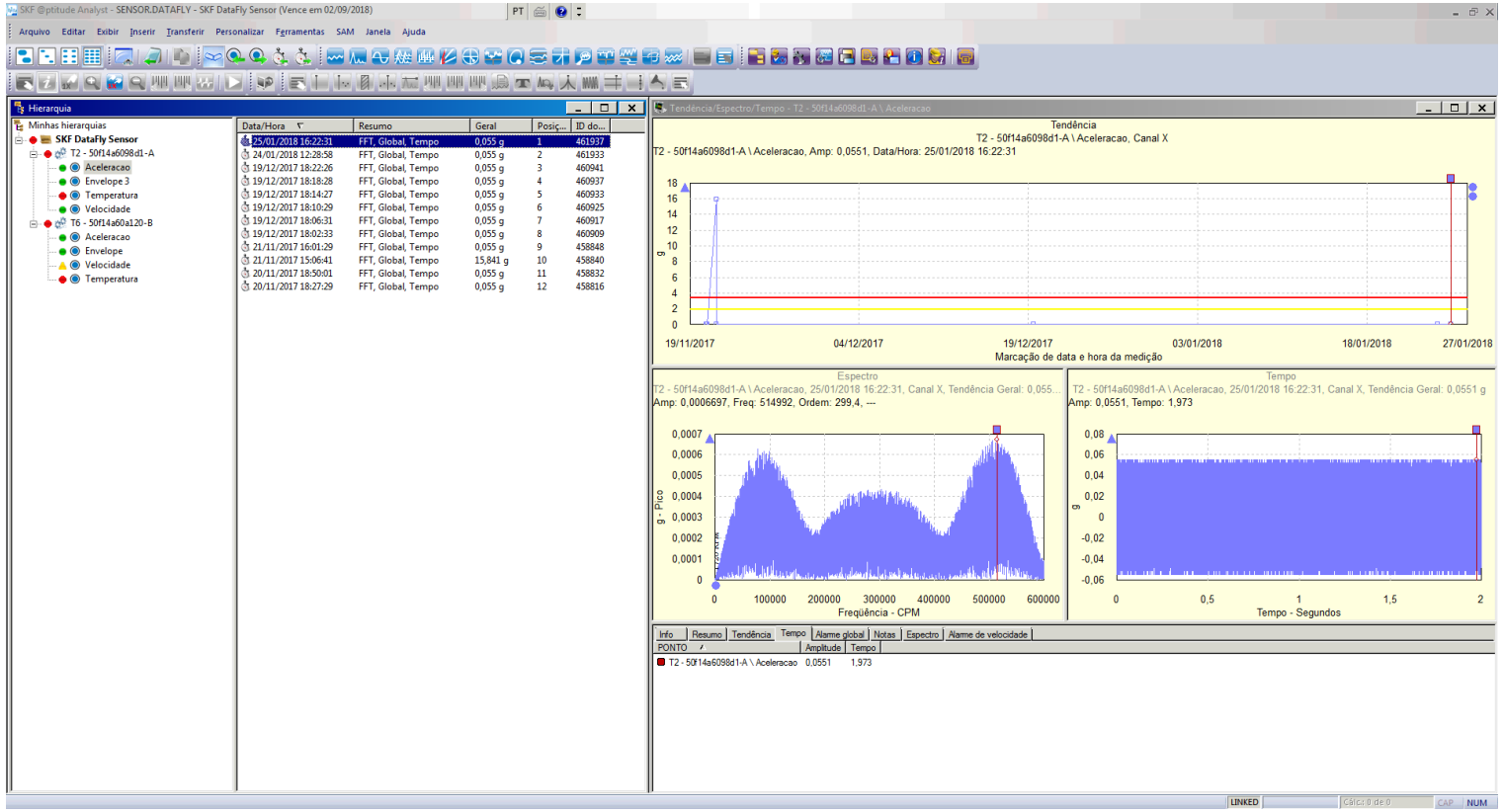
Sensor’s recognition and collected data view.

11º step

Wait for a new collection and view the data collected.

You can activate spotty measurement using magnet component on top of the sensor.



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FAQ

1. How can I check if sensor is communicating with cloud?
   - ✓ Check MQTT Listener, all communication are showed in this portal
     http://www.cdr-skf.com.br/mqtt/mqtt_listener_chart.aspx

2. Sensor was configured correctly and not communicating with cloud.
   - ✓ Check if all needed ports and firewall release are corrects.
     Port UDP pool.ntp.org – PORT: 123
     Port TCP www.cdr-skf.com.br – PORT: 20010

3. Wi-Fi was configured and now sensor not doing communication with cloud and isn't opening like access point. How can I do access sensor again?
   - ✓ Take the sensor where there is no configured Wi-Fi signal coverage

4. I made change in alarm parameter (or other) and save it but when I close the window and open again it show the value before change. Why?
   - ✓ The window show exactly data configured in sensor. When you click Save, it sends a message to cloud that next time sensor connect it will receive the changes and update information in window.

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FAQ

5. What is the type of point can receive Data Fly information?
   - ✓ There is not specific point type and DataFly will not check it just store.
6. Can I use an existing point to receive?
   - ✓ Yes. It’s just will store new data like new measurement.
7. The point setup have influence in Data Fly data collection?
   - ✓ No. All data collection use internal fixed parameter
8. Do I have a information what is status of sensor?
   - ✓ Yes. You can follow packages are sending or processing in DataFly Management.
9. Sensor are stopping of sending messages.
   - ✓ You need check if Wi-Fi signal are bigger than 25% and if it is stable

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FAQ

10. If drop WiFi connection of sensor when sending information to cloud.
    - ✓ Next time sensor connect it will send missing information.
11. When the sensor will try connect again?
    - ✓ In next window of activity. 8 hour or 15 days what happen first.
12. How can I see if have sensor measurement in delay?
    - ✓ There are dashboard development in progress to overview.
13. Battery replace
    - ✓ SKF IXION will be the supplier to battery replacement

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