



# USER MANUAL

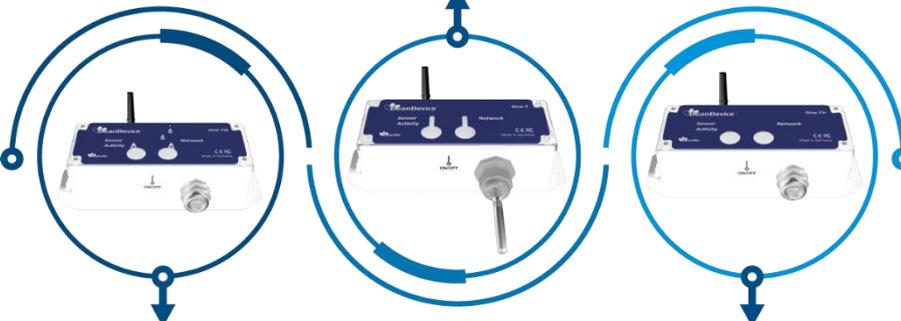
## BeanDevice® 2.4GHz



### BeanDevice® 2.4GHz

#### ONE-T

Wireless IIOT temperature sensor  
built-in datalogger



#### ONE-TH

Wireless IIOT Temperature & humidity sensors  
built-in datalogger

#### ONE-Tir

Wireless IIOT Sensor | IR(Infrared)  
temperature sensor  
built-in datalogger



## DOCUMENT

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## UPDATES

UPDATES			
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## 1. TECHNICAL SUPPORT

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For general contact, technical support, to report documentation errors and to order manuals, contact *Beanair Technical Support Center* (BTSC) at:

[tech-support@Beanair.com](mailto:tech-support@Beanair.com)

For detailed information about where you can buy the Beanair equipment/software or for recommendations on accessories and components visit:

[www.Beanair.com](http://www.Beanair.com)

To register for product news and announcements or for product questions contact Beanair's Technical Support Center (BTSC).

Our aim is to make this user manual as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Beanair appreciates feedback from the users of our information.

## 2. VISUAL SYMBOLS DEFINITION

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<i>Symbols</i>	<i>Definition</i>
	<i><u>Caution or Warning</u> – Alerts the user with important information about Beanair wireless sensor networks (WSN), if this information is not followed, the equipment /software may fail or malfunction.</i>
	<i><u>Danger</u> – This information <b>MUST</b> be followed if not you may damage the equipment permanently or bodily injury may occur.</i>
	<i><u>Tip or Information</u> – Provides advice and suggestions that may be useful when installing Beanair Wireless Sensor Networks.</i>

### 3. ACRONYMS AND ABBREVIATIONS

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<i>AES</i>	Advanced Encryption Standard
<i>CCA</i>	Clear Channel Assessment
<i>CSMA/CA</i>	Carrier Sense Multiple Access/Collision Avoidance
<i>GTS</i>	Guaranteed Time-Slot
<i>Ksps</i>	Kilo samples per second
<i>LLC</i>	Logical Link Control
<i>LQI</i>	Link quality indicator
<i>LDCDA</i>	Low duty cycle data acquisition
<i>MAC</i>	Media Access Control
<i>PAN</i>	Personal Area Network
<i>PER</i>	Packet error rate
<i>RF</i>	Radio Frequency
<i>SD</i>	Secure Digital
<i>WSN</i>	Wireless sensor Network

## 1. DOCUMENT ORGANISATION

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This manual is organized in 7 chapters, as follows:

### BeanDevice® product presentation

- Introduces BeanDevice® Ecosensor products line :
- BeanDevice® ONE-T
- BeanDevice® ONE-TH
- BeanDevice® ONE-TIR

### Data acquisition mode description

- Details the data acquisition mode available on the BeanDevice®

### BeanDevice® installation guidelines

- Details the installation guidelines of the BeanDevice®:
- Power Management
- BeanDevice® power supply
- BeanDevice® network association
- Datalogger feature
- OTAC (over-the-air configuration) process

### BeanDevice® supervision from the Beanscape®

- Details the BeanDevice® supervision from the Beanscape®

### BeanDevice® maintenance & supervision (for experienced user)

- Details the BeanDevice® maintenance (for experienced user)

### Installation procedures

- Details the installation procedures

## 2. ECOSENSOR PRODUCT LINE PRESENTATION



***It is highly recommended to read all the user manual related to Beanair software & equipment (BeanScope®, BeanGateway®, BeanDevice®) before getting start your BeanDevice®.***

### 2.1 COMMON SPECIFICATIONS

This section describes the common technical features for the following BeanDevice®

- ✓ **BeanDevice® ONE-T**
- ✓ **BeanDevice® ONE-TH**
- ✓ **BeanDevice® ONE-TIR**

RF Specifications	
Wireless Technology	Ultra-Low-Power and license-free 2.4Ghz radio technology (IEEE 802.15.4E)
Network Topology	Point-to-Point / Star
Data rate	250 Kbits/s
RF Characteristics	ISM 2.4GHz – 16 Channels
TX Power	+18 dBm
Receiver Sensitivity	-95.5 dBm to -104 dBm
Max. Radio Range	300 m (Line of Sight) , 30-80m (Non Line of Sight)
Antenna	Omnidirectional antenna 2.2dBi

Configurable settings (from the BeanScope® )	
Data Acquisition mode	Low Duty Cycle Data Acquisition (LDCDA) Mode: 4s to 24 hour Alarm mode: 4s to 24 hour
Alarm Threshold	3 levels of Alarms : Alarm>Action>Alert
Power Mode	Battery saver mode only

Embedded data logger	
Storage capacity	up to 1 million data points
Wireless data downloading	3 minutes to download the full memory (average time)

Environmental and Mechanical	
Casing	Polycarbonate, Waterproof IP67 – Fire Protection : ULV94 Casing dimensions (LxIxh) : 119 mm x 35 mm x 35 mm Weight (battery included): 120g
Operating Temperature	-40°C to +75°C
Norms	FCC & CE compliant ROHS - Directive 2002/95/EC

**Power supply**

<b>Current consumption @3.3 Volts</b>	· During data acquisition : 20 to 30 mA
	· During Radio transmission : 60 mA
	· During battery saver mode : < 10 $\mu$ A
<b>Included primary cell</b>	Lithium-thionyl chloride battery with 2100 mAh capacity (AA size)

**Option(s)**

<b>Calibration</b>	DakkS connected calibration
--------------------	-----------------------------

**Choose an ultra low power wireless sensor**

<b>RF transmission in minutes</b>	<b>Battery life (temperature room 25°C)</b>
Every 2 minutes	22 months
Every 5 minutes	51 months
Every 10 minutes	102 months

## 2.2 BEANDEVICE® ONE-T



*Figure 1: BeanDevice® ONE-T*

### 2.2.1 Applications

This product is adapted for the following applications:

- ✓ Technical Building Management
- ✓ Cold chain traceability
- ✓ Medical lab & white room
- ✓ Solar Panels Monitoring
- ✓ Transport
- ✓ Air-conditioning System (HVAC)

2.2.2 Product reference

Product Reference	
BND-2.4GHZ-ONE-T-SA-CL	
<p><b>SA—temperature sensor accuracy &amp; design</b></p> <ul style="list-style-type: none"> <li>• <b>ST</b> : standard accuracy</li> <li>• <b>HA</b>: High accuracy</li> <li>• <b>HAEY</b>: High accuracy with eyelet probe for wall mounting (minimum cable length 25 cm)</li> <li>• <b>STCORE</b>: Temperature core probe with straight stainless steel Handle - standard accuracy (minimum cable length 25 cm)</li> </ul>	<p><b>CL—Sensor Cable length</b></p> <p>Sensor cable length in cm</p> <p><b>Maximum cable length: 150 cm</b></p> <p>If this field is empty: no cable length (only for HA and ST versions)</p>
<p><b>Example 1</b> : BND-2.4GHZ-ONE-T-ST, wireless temperature sensor with 1 probe, standard accuracy (temperature range -25°C to +75°C), no cable length</p>	
<p><b>Example 2</b>: BND-2.4GHZ-ONE-T-HA-120, wireless temperature sensor with 1 probe, High accuracy (temperature range -10°C to +60°C), cable length 120 cm</p>	
<p><b>Example 3</b>: BND-2.4GHZ-ONE-T-HAEY-25, wireless temperature sensor with eyelet probe for wall mounting , high accuracy (temperature range -10°C to +60°C), cable length 25 cm</p>	
<p><b>Example 4</b>: BND-2.4GHZ-ONE-T-STCORE-100, Temperature core probe with straight stainless steel Handle, standard accuracy (-50 °C to +150 °C ), cable length 100 cm</p>	

2.2.3 Temperature sensor specification

Temperature probe types	
<p><b>Probe type HAEY</b></p>	<p>Temperature probe with eyelet mounting</p>  <p>(Length 50 mm, Diameter 6 mm, Hole diam. 5.3 mm)</p>
<p><b>Probe type ST &amp; HA</b></p>	<p>Length 40 mm, Diameter 6 mm</p> 
<p><b>Probe type STCORE</b></p>	<p>Stainless steel handle length 9.5cm Diameter 9mm, Temp. core probe length 13.5cm Diameter 6mm</p> 

Temperature sensor specifications		
Temperature Sensor technology	Silicon temperature probe — Probe watertightness : IP67 Mechanical assembly type : steel tube	
Measurement range	High accuracy temperature probe: <b>BND-2.4GHZ-ONE-T-HA-CL</b> <b>BND-2.4GHZ-ONE-T-HAEY-CL</b>	-10 °C to +60 °C
	Standard accuracy temperature probe with cable : <b>BND-2.4GHZ-ONE-T-ST-CL</b> <b>BND-2.4GHZ-ONE-T-STCORE-CL</b>	-50 °C to +150 °C
	Standard accuracy temperature probe without cable : <b>BND-2.4GHZ-ONE-T-ST</b>	-25 °C to +75 °C
Measurement accuracy	High accuracy temperature probe: <b>BND-2.4GHZ-ONE-T-HA-CL</b> <b>BND-2.4GHZ-ONE-T-HAEY-CL</b>	±0.2°C between -10°C and -5 °C ±0.1°C between -5°C and +45°C ±0.2°C between +45°C and +60°C
	Standard accuracy temperature probe : <b>BND-ONE-T-ST-CL</b> <b>BND-2.4GHZ-ONE-T-STCORE-CL</b>	±0.3 °C between -10 °C and +60 °C ±(0.3 + 0.012(T-60)) °C between +60 °C and +150 °C +/- (0.3 - 0.012(T+10)) °C between -50 °C and -10 °C
Sensor resolution	High accuracy temperature probe: <b>BND-ONE-T-HA-CL</b> <b>BND-ONE-T-HAEY-CL</b>	0.0034 °C
	Standard accuracy temperature probe : <b>BND-ONE-T-ST-CL</b> <b>BND-2.4GHZ-ONE-T-STCORE-CL</b>	0.1 °C

### 2.3 BEANDEVICE® ONE-TIR



**Figure 2 : BeanDevice® ONE-TIR**

### 2.3.1 Applications

---

This product is adapted for the following applications:

- ✓ Railway temperature control
- ✓ Industrial temperature control of moving parts
- ✓ Gas detection
- ✓ Plastic, glass & metal processing
- ✓ Movement Detection
- ✓ Chemistry & pharmaceutical industry
- ✓ Automotive diagnosis
- ✓ Electrical Systems & equipment monitoring
- ✓ Healthcare

### 2.3.2 Product reference

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<i>Product reference</i>
BND-2.4GHz-ONE-TIR

### 2.3.3 IR temperature sensor specifications

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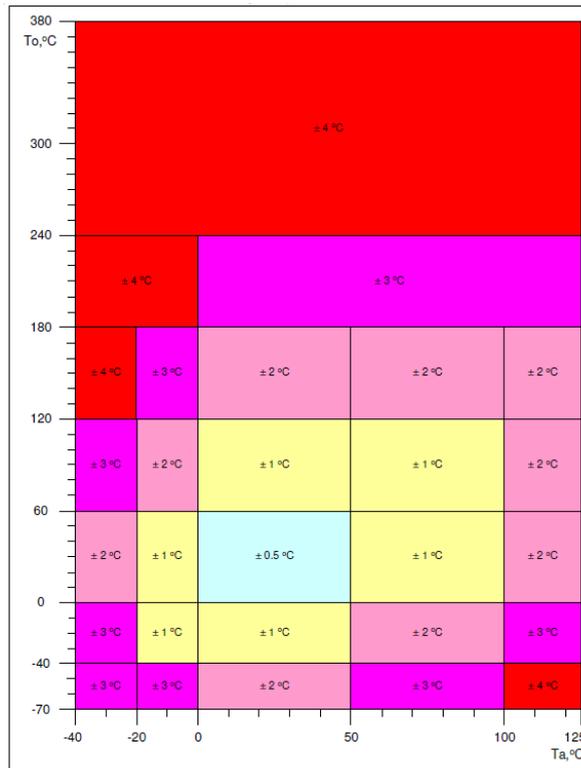
IR temperature Sensor Specification	
<b>Measurement range</b>	-40°C to +85°C for ambient temperature (Ta) -70°C to +380°C for object temperature (To)
<b>Sensor Technology</b>	Thermopile
<b>Emissivity coefficient</b>	0 to 1 (Configurable from the BeanScope®)
<b>Accuracy</b>	CF. IR Temperature Table
<b>Measurement resolution</b>	0.02 °C
<b>Field of View (FOV)</b>	Cf. Type FOV curve

### 2.3.4 Sensor field of view and accuracy

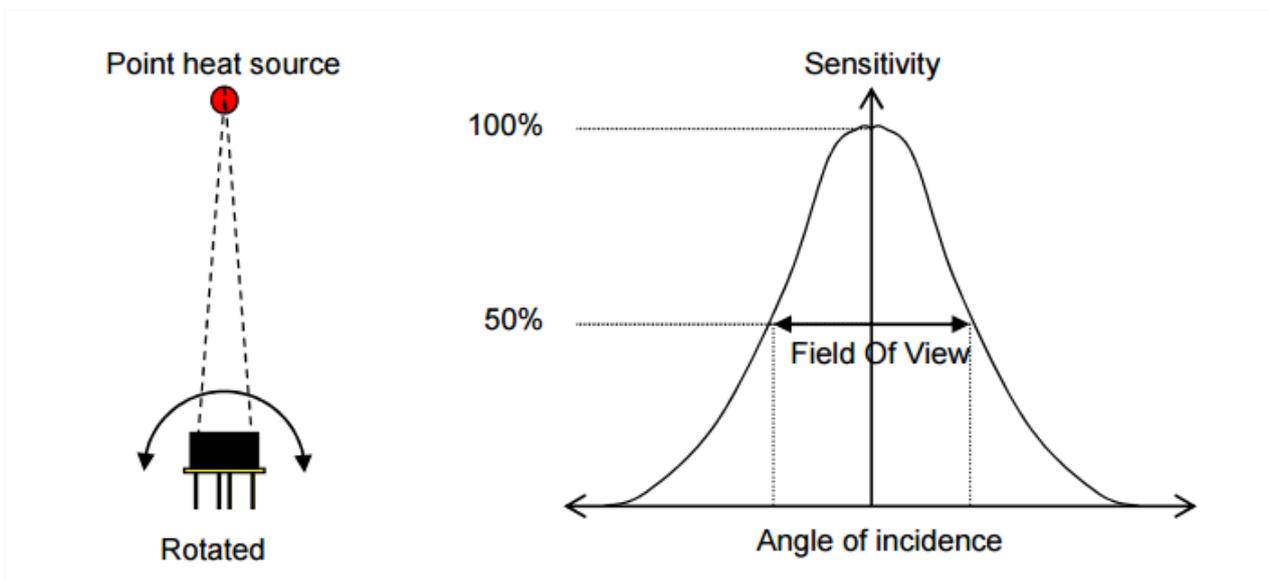
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All accuracy specifications apply under settled isothermal conditions only. Furthermore, the accuracy is only valid if the object fills the FOV of the sensor completely.

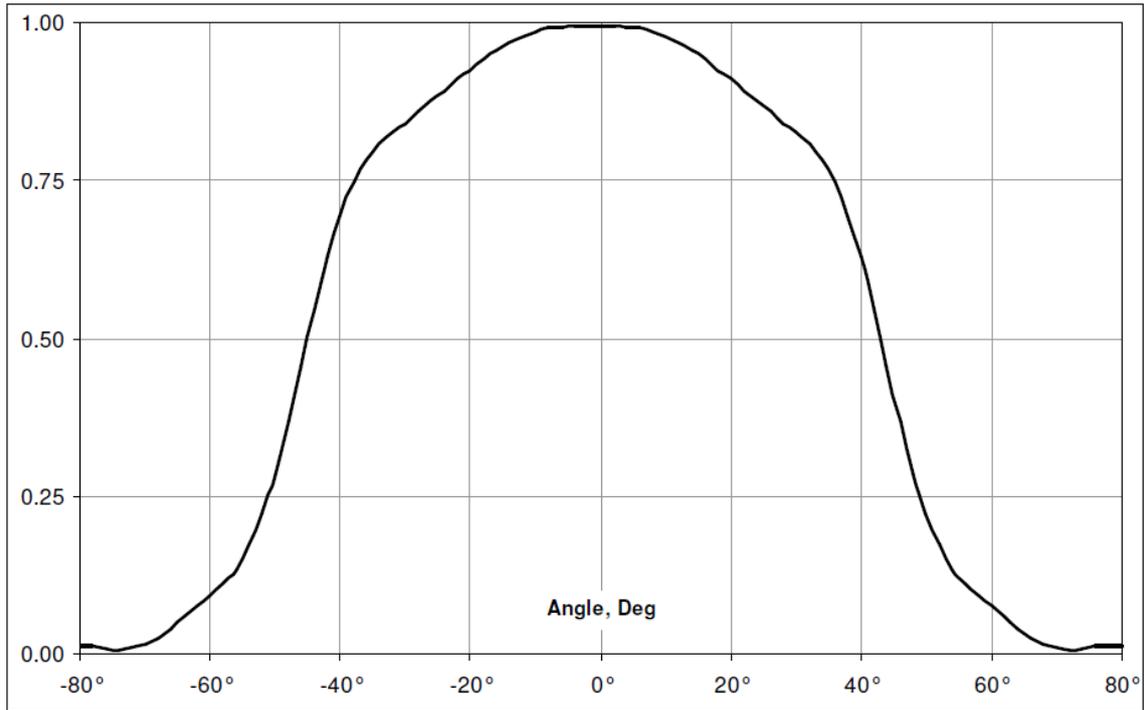
**Ta (Ambient temperature) and To (Object temperature)**



**Figure 3: ONE-TIR sensor accuracy**



**Figure 4: Field of view measurement**



**Figure 5 : Typical FOV curve**

## 2.4 BEANDEVICE ONE-TIR-MED

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### 2.4.1 Overview

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The BeanDevice® 2.4GHz ONE-TIR-MED is a wireless temperature IR sensor with medical precision ( $\pm 0.2^{\circ}\text{C}$ ). It complies with ASTM standard Section 5.3 (Designation E1965 - 98(2009) - Standard Specification for Infrared Thermometers for Intermittent Determination of Patient Temperature).

This BeanDevice® 2.4GHz ONE-TIR-MED is designed for human body temperature screening, mostly for forehead temperature screening. It helps to limit the spread of infectious diseases such as the novel COVID-19.

Thanks to its wireless connectivity (worldwide license-free band 2.4 GHz), this device can be installed in an isolated area and temperature records are wirelessly transmitted to a supervision software installed in another room.

Two version are available:

- A transportable and autonomous version which is **battery powered** with a **minimum refresh rate of 4seconds**.
- A version for **fast temperature screening from 1s** for a better queue management, this version is **mains powered**.



*Figure 6 : BeanDevice® ONE-TIR-MED*

### 2.4.2 Applications

---

This product is adapted for the following applications:

- ✓ Shopping Center
- ✓ Factories
- ✓ Offices
- ✓ Hospitals
- ✓ Airport
- ✓ Train Station

### 2.4.3 Product reference

Product reference	
BND-2.4GHZ-ONE-TIR-MED- <b>MA-EXR-SA</b>	
<b>MA-MAIN OPTION:</b>	
<b>TRA :</b> Transportable version, powered with a non-rechargeable battery (Lithium-thionyl chloride primary cell with 2200 mAh capacity)	
<b>FTS :</b> Fast temperature screening version, mains powered	
<b>EXR:</b> External relays controller option Compatible with FTS Option only Output for controlling external relays - 2 x Trigger outputs - 2 x 5VDC Power output <b>Blank field, if external Relay option is not needed</b>	
<b>SA– Sensor Arm Extension</b> 15CM - default sensor arm extension extension can be incremented by 15 cm and the maximum length is 105 cm	
<b>Example 1:</b> BND-2.4GHZ-ONE-TIR-MED-TRA-15CM , transportable version, default sensor arm length 15 cm <b>Example 2:</b> BND-2.4GHZ-ONE-TIR-MED-FTS-30CM , fast temperature screening, sensor arm length 30 cm <b>Example 2:</b> BND-2.4GHZ-ONE-TIR-MED-EXRC-FTS-15CM , fast temperature screening, External Relays option, default sensor arm length 15 cm	

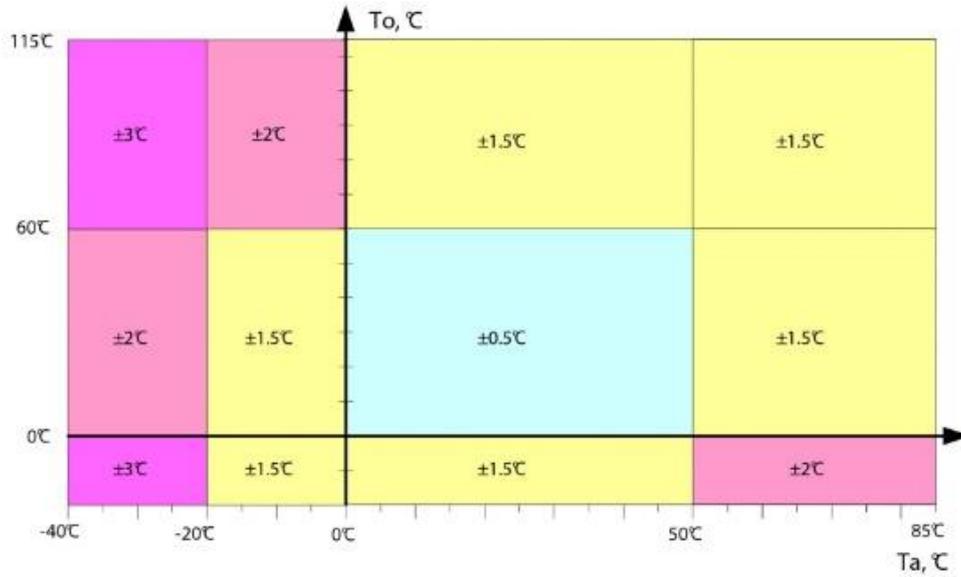
### 2.4.4 IR temperature sensor specifications

IR temperature Sensor Specification	
Measurement range	-40°C to +85°C for ambient temperature (Ta) -70°C to +115°C for object temperature (To)
Sensor Technology	Thermopile
Emissivity coefficient	Fixed value: 0.97 (Human Body Skin) In calibration mode: 0.15 to 1 (Configurable from the BeanScape®)
Accuracy	±0.3°C for body temperature 32°C to 36°C, Ambient Temperature 16°C to 40°C ±0.2°C for body temperature 36°C to 39°C, Ambient Temperature 16°C to 40°C ±0.3°C for body temperature 39°C to 42°C, Ambient Temperature 16°C to 40°C Comply with ASTM standard Section 5.3 (Designation E1965 - 98(2009) - Standard Specification for Infrared Thermometers for Intermittent Determination of Patient Temperature)
Measurement resolution	0.02 °C
Optimum Distance to Forehead	2cm to 4cm
Field of View (FOV)	80°

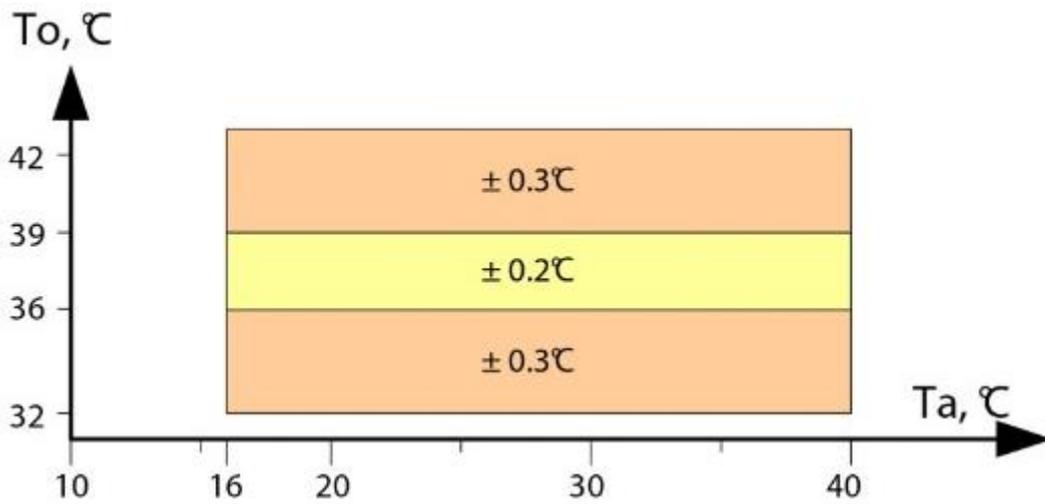
#### 2.4.1 IR Temperature Sensor Precision & Field of view

All accuracy specifications apply under settled isothermal conditions only. Furthermore, the accuracy is only valid if the object fills the FOV of the sensor completely.

**Ta (Ambient temperature) and To (Object temperature)**

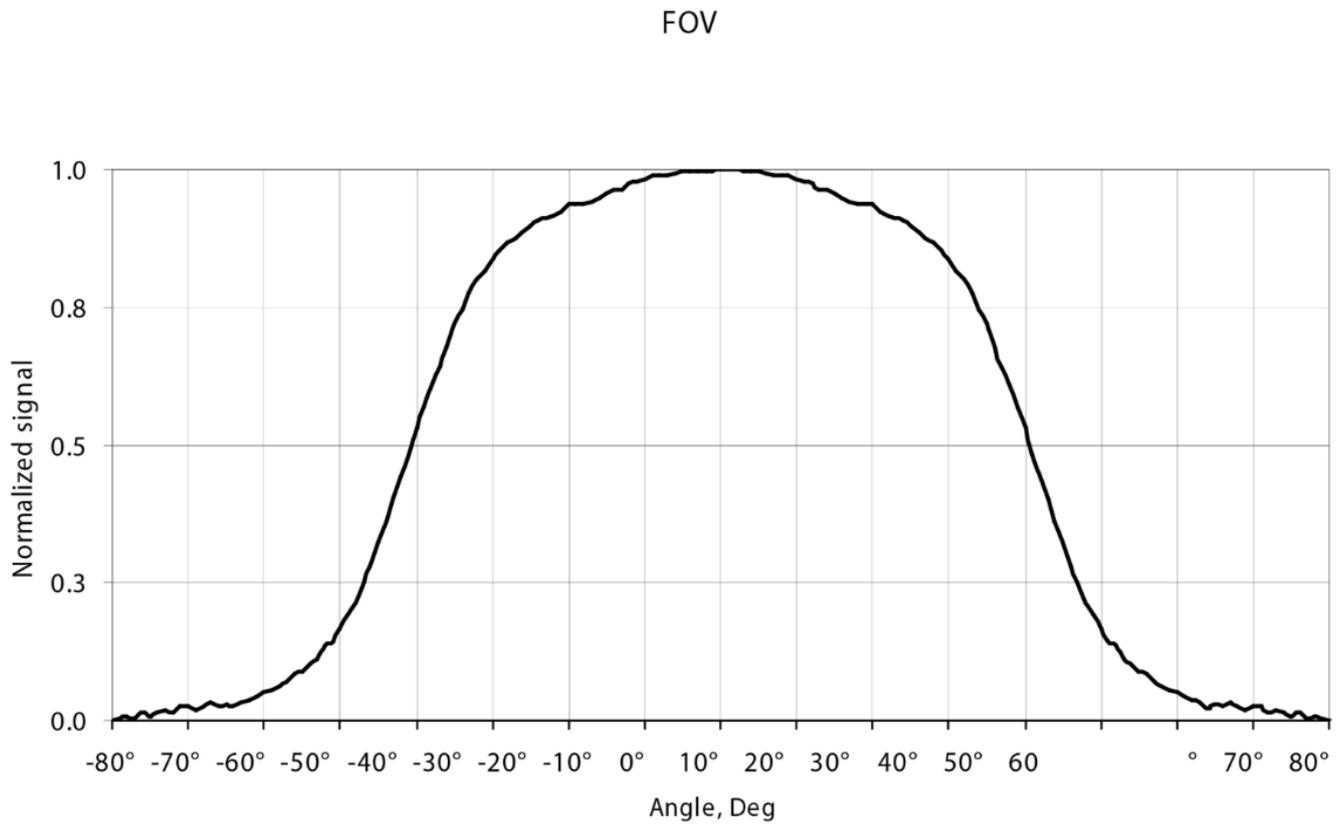


*Figure 7: T<sub>Object</sub> Vs T<sub>Ambient</sub>*



*Figure 8: IR Temperature Sensor accuracy*

Accuracy of IR Temperature Sensor in range T<sub>Ambient</sub> =16°C to 40°C, T<sub>Object</sub> = 32°C ...42°C comply with ASTM standard section 5.3 (Designation: E1965 – 98 (2009) -Standard Specification for Infrared Thermometers for Intermittent Determination of Patient Temperature).



*Figure 9: Typical FOV Curve*

## 2.5 BEANDEVICE® ONE-TH



*Figure 10: BeanDevice® ONE-TH*

### 2.5.1 Applications

- ✓ HVAC (heating, ventilation, and air conditioning)
- ✓ Cold chain traceability
- ✓ Medical lab & clean room
- ✓ Agriculture & Greenhouse
- ✓ Environment

### 2.5.2 Product reference

<i>Product Reference</i>	
BND-2.4GHz-ONE-TH-CL	
CL: Cable length in cm (minimum cable length 20 cm, maximum cable length 150 cm)	

### 2.5.3 Temperature/Humidity sensors specifications

Sensor filter cap mechanical specifications		
<b>Filter cap</b>	Glass grommet and sinter filter	
<b>Pressure Resistant</b>	Up to 16 bars	
<b>Dew formation resistant</b>	Yes	

Temperature sensor specifications	
<b>Temperature Sensor technology</b>	Thermistor
<b>Measurement range</b>	-40°C to +85°C
<b>Accuracy Tolreance</b>	±0.1 °C , for temperature range +20°C to +60°C See Figure 3 more information
<b>Repeatability</b>	±0.04 °C
<b>Sensor resolution</b>	0.01 °C
<b>Long term drift</b>	< 0.03 °C / year
<b>Response time</b>	< 20s with sensor cap

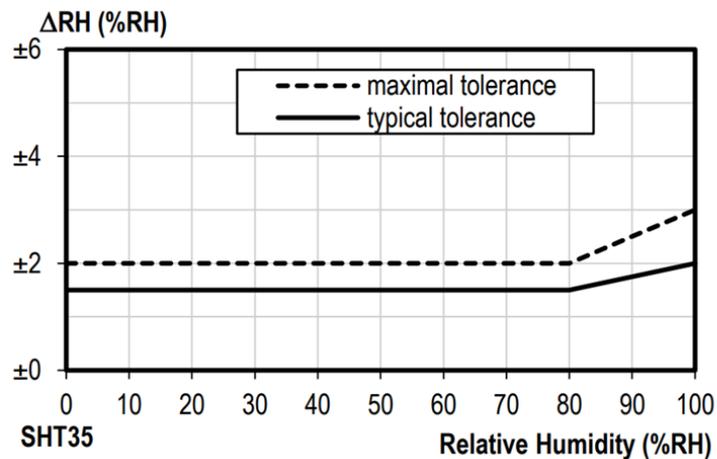
Humidity sensor specifications	
<b>Humidity Sensor technology</b>	Capacitive polymer humidity sensor
<b>Measurement range</b>	0 to 100 %RH
<b>Accuracy Tolerance</b>	±1.5 %RH for Humidity range 0 to 90 %RH and temperature range +10°C to +60°C See Figures 1 and 2 for more information
<b>Repeatability</b>	±0.08 %RH
<b>Sensor resolution</b>	0.01% RH
<b>Hysteresis (10 %RH to 70 %RH)</b>	< ±0.8% RH
<b>Response time</b>	<20s with sensor housing
<b>Long term drift</b>	0.25 % RH / year

Sensor housing	
Dimensions	Diameter 18 mm, Length: 57 mm
Sensor housing	Waterproof (IP66) stainless steel with 30-45µm of pore size
Pressure Resistant	Up to 16 bar
Operating Temperature	-40°C to +85°C
Dew formation resistant	Yes

## 2.5.4 Usage recommendations

### 2.5.4.1 Hysteresis

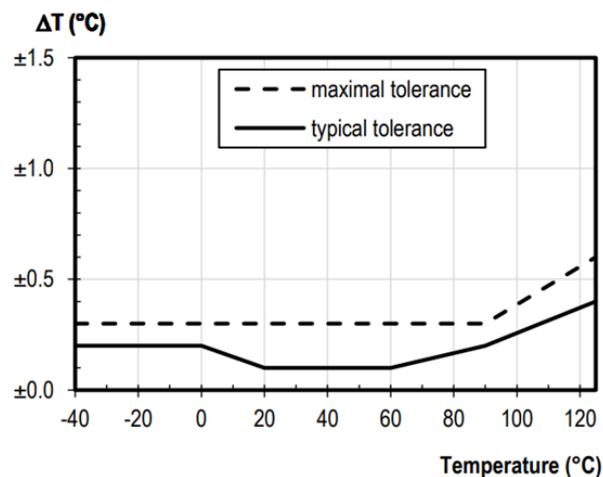
The hysteresis value is the difference between an RH measurement in a rising and falling RH environment, at a specific RH point



**Figure 11: Tolerance of %RH over Temperature**

### 2.5.4.2 Long-term drift

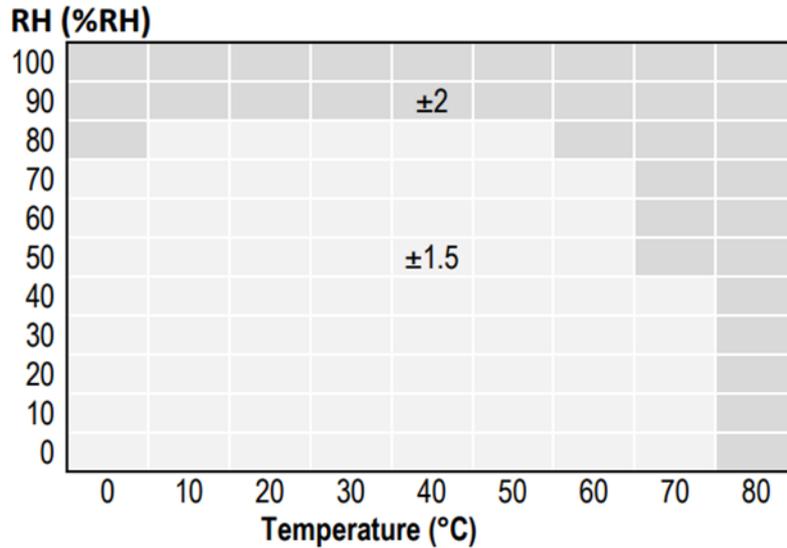
Drift due to aging effects at typical conditions (30°C and 20% to 50% RH). This value may be impacted by dust, vaporized solvents, outgassing tapes, adhesives, packaging materials, etc.



**Figure 12: Temperature Tolerance accuracy**

### 2.5.4.3 High temperature and Humidity

Recommended humidity operating range is 10% to 70% RH. Prolonged operation outside this range may result in a measurement offset. The measurement offset will decrease after operating the sensor in this recommended operating range.



**Figure 13: Relative Humidity Accuracy vs Temperature**

The following table shows the RH offset values that can be expected for exposure to 85 °C and 85 % RH for durations between 12 and 500 hours (continuous).

85°C/85% RH Duration (hours)	12	24	168	500
RH Offset (%)	3	6	12	15

## 2.6 PRODUCTS FOCUS

### 2.6.1 BeanDevice® ONE-TIR

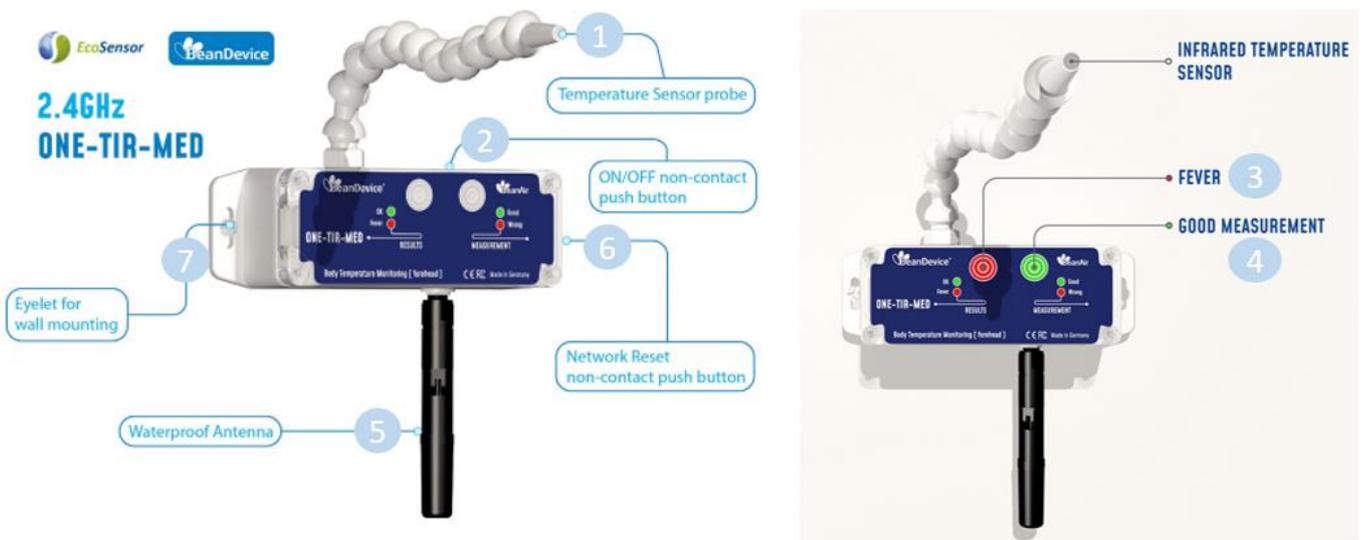


**Figure 14: BeanDevice® ONE-TIR -Product description**

Number	Function	Description
1	IR Sensor	Waterproof (IP67) infrared Sensor
2	ON/OFF	ON/OFF Reed Switch. Activated using a magnet. (waiting time: 2 seconds) If the “ <b>Network LED</b> ” illuminates in <b>GREEN</b> color, the BeanDevice® is powered on. If the “ <b>Network LED</b> ” illuminates in <b>RED</b> color, the BeanDevice® is powered off.
3	Sensor/Activity LED	Bi-color led light, either displays in <b>GREEN</b> or <b>RED</b> color depending up on the status of the device <a href="#">See Led Description table</a>
4	Network LED	Bi-color led light for network status, <b>GREEN</b> or <b>RED</b> depending upon the status of the network. <a href="#">See Led Description table</a>
5	Antenna	2.2 dBi omnidirectional antenna <a href="#">See antenna description section</a>

6	Network	<p>“<b>Network</b>” non-contact button restores the factory settings on the BeanDevice®.</p> <p>Point the pole of the Neodymium magnet that was provided with your BeanDevice® towards the “Network” label circle. Hold the magnet for approximately <b>2s</b></p> <p><i>Please read the following section for more information “<a href="#">click here</a>”</i></p>
7	Eyelet	Eyelet for screw mounting

**2.6.2 BeanDevice® ONE-TIR-MED**

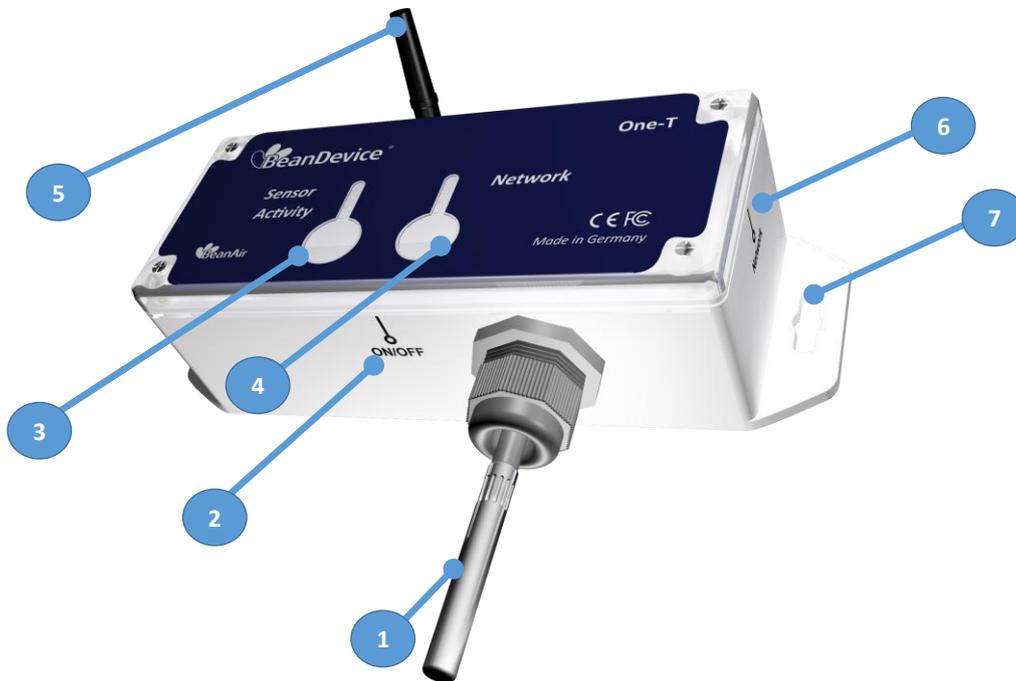


*Figure 15: BeanDevice® ONE-TIR -Product description*

Number	Function	Description
1	IR Temperature Sensor	Waterproof (IP67) infrared Sensor
2	ON/OFF	<p>ON/OFF Reed Switch. Activated using a magnet. (waiting time: 2 seconds)</p> <p>If the “<b>Measurement LED</b>” illuminates in <b>GREEN</b> color, the BeanDevice® is powered on.</p> <p>If the “<b>Measurement LED</b>” illuminates in <b>RED</b> color, the BeanDevice® is powered off.</p>

3	Results LED	<p>Bi-color led light, either displays in <b>GREEN</b> or <b>RED</b> color depending up on the measurement results</p> <ul style="list-style-type: none"> <li>• If the body temperature is lower than Fever Alarms, the LED blinks in <b>GREEN</b> color</li> <li>• If the body temperature is higher than Fever Alarms, the LED blinks in <b>RED</b> color</li> </ul> <p>The refresh rate starts from 1s (fast temperature screening version), for the mains powered version, and can be changed by the user from the software.</p> <p>For the battery powered version, the minimum refresh rate starts from 4 seconds.</p>
4	Measurement LED	<p>Bi-color led light for network status, <b>GREEN</b> or <b>RED</b> depending upon the measurement status</p> <ul style="list-style-type: none"> <li>• If the measurement object temperature is outside body temperature range (individual/patient is in front of the sensor head), the LED blinks in <b>GREEN</b> color</li> <li>• If the measurement object temperature is matching body temperature range (individual/patient is in front of the sensor head), the LED blinks in <b>RED</b> color</li> </ul>
5	Antenna	<p>2.2 dBi omnidirectional antenna</p> <p><a href="#">See antenna description section</a></p>
6	Network	<p>“<b>Network</b>” non-contact button restores the factory settings on the BeanDevice®.</p> <p>Point the pole of the Neodymium magnet that was provided with your BeanDevice® towards the “Network” label circle. Hold the magnet for approximately <b>2s</b></p> <p><i>Please read the following section for more information</i> <a href="#">“click here”</a></p>
7	Eyelet	<p>Eyelet for screw mounting</p>

### 2.6.3 BeanDevice® ONE-T

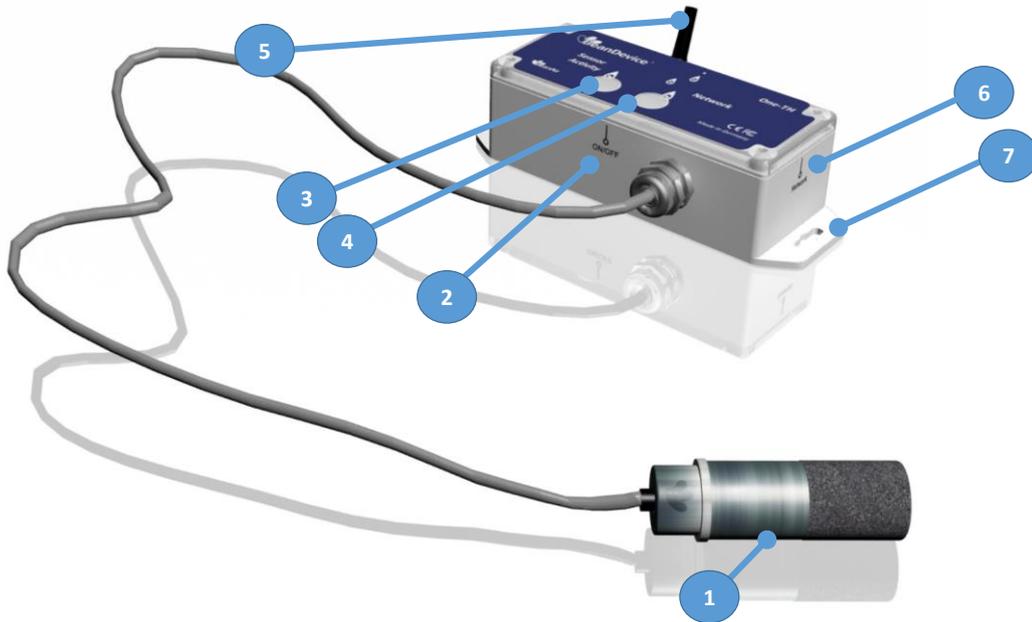


**Figure 16: BeanDevice® ONE-T - Product description**

Number	Function	Description
1	Silicon Temperature Sensor	Silicon temperature sensor Up to 1.5 meters of cable length
2	ON/OFF	ON/OFF Reed Switch. Activated using a magnet. (waiting time: 2 seconds)  If the “ <b>Network LED</b> ” illuminates in <b>GREEN</b> color, the BeanDevice® is powered on.  If the “ <b>Network LED</b> ” illuminates in <b>RED</b> color, the BeanDevice® is powered off.
3	Sensor/Activity LED	Bi-color led light, either displays in <b>GREEN</b> or <b>RED</b> color depending up on the status of the device <a href="#">See Led Description table</a>
4	Network LED	Bi-color led light for network status, <b>GREEN</b> or <b>RED</b> depending upon the status of the network. <a href="#">See Led Description table</a>
5	Antenna	2.2 dBi omnidirectional antenna <a href="#">See antenna description section</a>

6	Network	<p><b>“Network”</b> non-contact button restores the factory settings on the BeanDevice®.</p> <p>Point the pole of the Neodymium magnet that was provided with your BeanDevice® towards the “Network” label circle. Hold the magnet for approximately <b>2s</b></p> <p><i>Please read the following section for more information “<a href="#">click here</a>”</i></p>
7	Eyelet	Eyelet for screw mounting

### 2.6.4 BeanDevice® ONE-TH



***Figure 17: BeanDevice® ONE-TH - Product description***

Number	Function	Description
1	Temperature/Humidity/Dew Point sensor probe	Temperature/Humidity sensor coming with IP67 sensor filter with 1.5 meters of cable maximum
2	ON/OFF	ON/OFF Reed Switch. Activated using a magnet. (waiting time: 2 seconds)  If the “ <b>Network LED</b> ” illuminates in <b>GREEN</b> color, the BeanDevice® is powered on.  If the “ <b>Network LED</b> ” illuminates in <b>RED</b> color, the BeanDevice® is powered off.
3	Sensor/Activity LED	Bi-color led light, either displays in <b>GREEN</b> or <b>RED</b> color depending up on the status of the device  <a href="#">See Led Description table</a>
4	Network LED	Bi-color led light for network status, <b>GREEN</b> or <b>RED</b> depending upon the status of the network.  <a href="#">See Led Description table</a>
5	Antenna	2.2 dBi omnidirectional antenna

		<a href="#">See antenna description section</a>
6	Network	<p>“Network” non-contact button restores the factory settings on the BeanDevice®.</p> <p>Point the pole of the Neodymium magnet that was provided with your BeanDevice® towards the “Network” label circle. Hold the magnet for approximately <b>2s</b></p> <p><a href="#">Please read the following section for more information “click here”</a></p>
7	Eyelet	Eyelet for screw mounting

### 2.6.5 Led description

This table shows the led description depending on the BeanDevice® status:

<i>BeanDevice® status</i>	<i>Leds Description</i>
The <b>BeanDevice®</b> is power on	<b>Network Led</b> flashes one time in <b>GREEN</b>
The <b>BeanDevice®</b> is power off	<b>Network Led</b> flashes one time in <b>RED</b>
The <b>BeanDevice®</b> starts successfully a Network association	<b>Network Led</b> flashes slowly in <b>GREEN</b>
The <b>BeanDevice®</b> transmits a data to the BeanGateway®	<b>Network Led</b> flashes quickly in <b>GREEN</b>
The <b>BeanDevice®</b> fails to start a Network association	<b>Network Led</b> flashes one time in <b>RED</b> and then restart flashing in <b>GREEN</b> for a new Network association
The <b>BeanDevice®</b> fails to transmit a data to the <b>BeanGateway®</b>	<b>Network Led</b> flashes quickly in <b>RED</b>
Data acquisition and/or data logging are correctly performed on the <b>BeanDevice®</b>	<b>Sensor activity Led</b> flashes one time in <b>GREEN</b>
Data acquisition and/or data logging fails	<b>Sensor activity Led</b> flashes one time in <b>RED</b>
The measured object temperature is outside body temperature range (individual/patient is in front of the sensor head)	<b>Sensor Measurement LED</b> blinks in <b>GREEN</b>
The measured object temperature is matching body temperature range (individual/patient is in front of the sensor head)	<b>Sensor Measurement LED</b> blinks in <b>RED</b>
The body temperature is Lower than Fever Alarms	<b>Sensor Results LED</b> blinks in <b>GREEN</b>
The body temperature is Higher than Fever Alarms	<b>Sensor Results LED</b> blinks in <b>RED</b>

2.6.6 Enclosure mechanical drawing

<b>Material type</b>	PUR (Polycarbonate)
<b>Enclosure size (w/o external sensor &amp; antenna) in mm LxIxH</b>	110 x 30 x 34
<b>Impact EN 50 102</b>	IK 08
<b>Protection</b>	IP67

2.6.6.1 BeanDevice® ONE-T

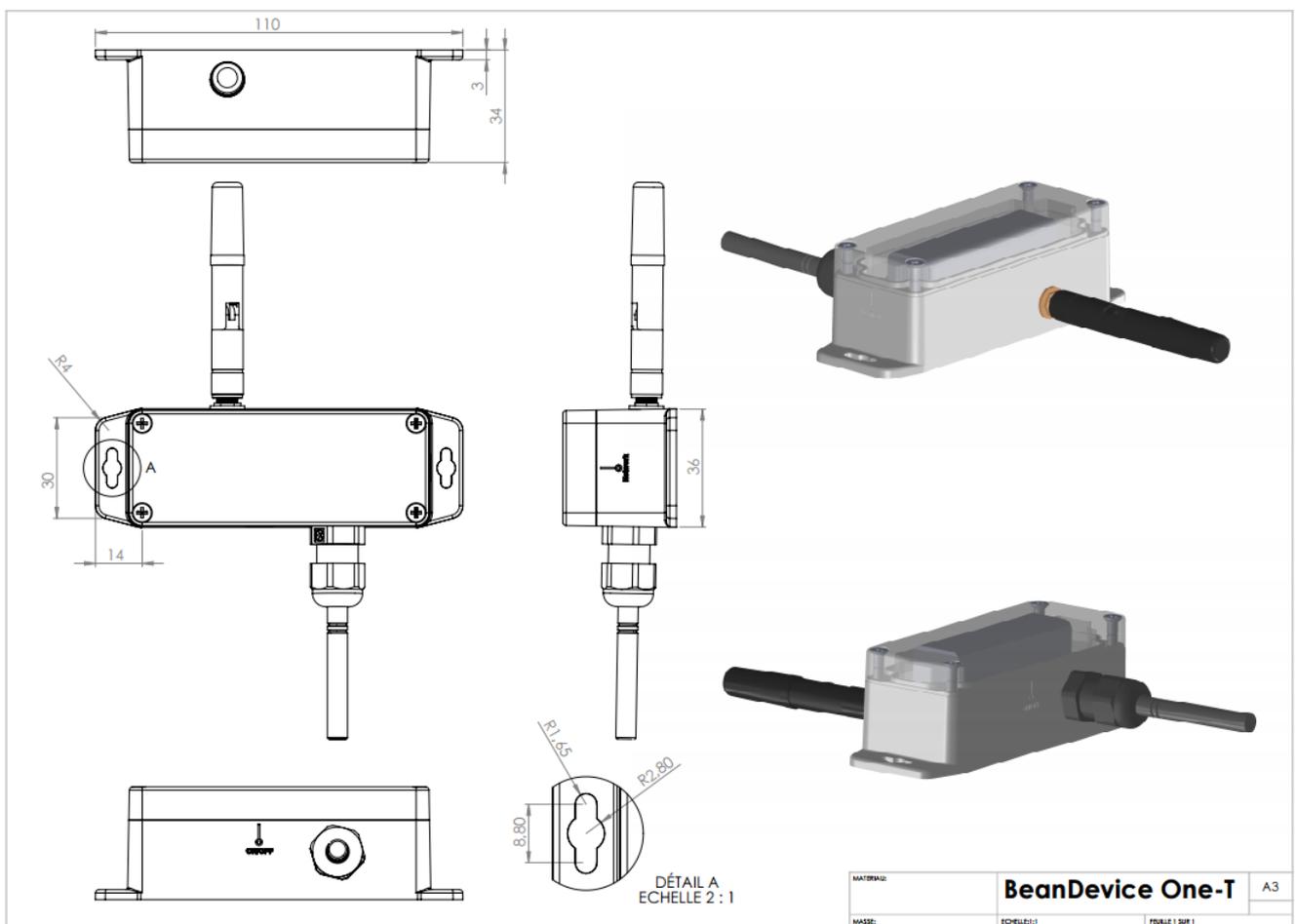
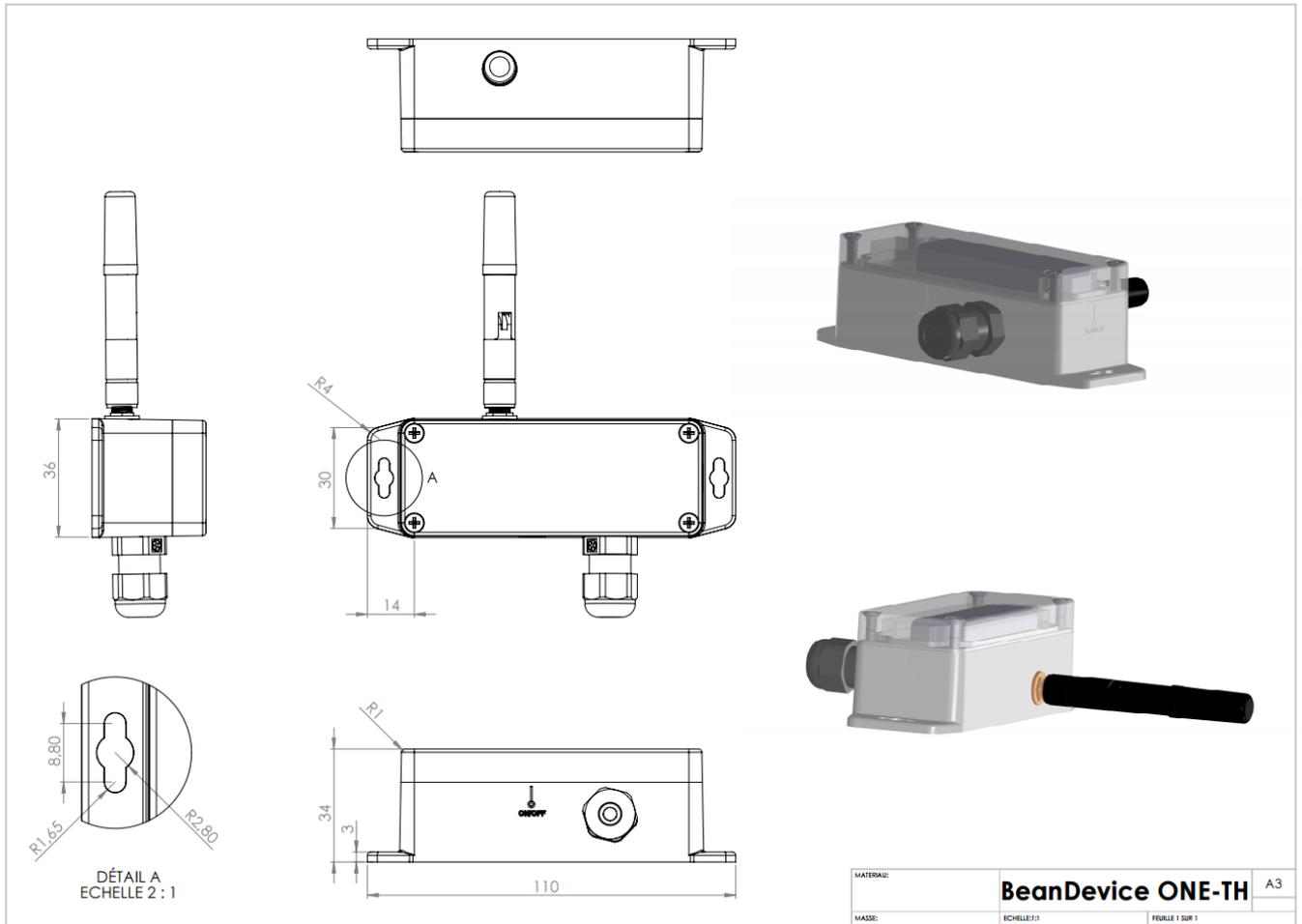


Figure 18: BeanDevice® ONE-T Mechanical drawing

2.6.6.2 BeanDevice® ONE-TIR



**Figure 19 : BeanDevice® ONE-TIR Mechanical drawing**

2.6.6.3 BeanDevice® ONE-TIR-MED

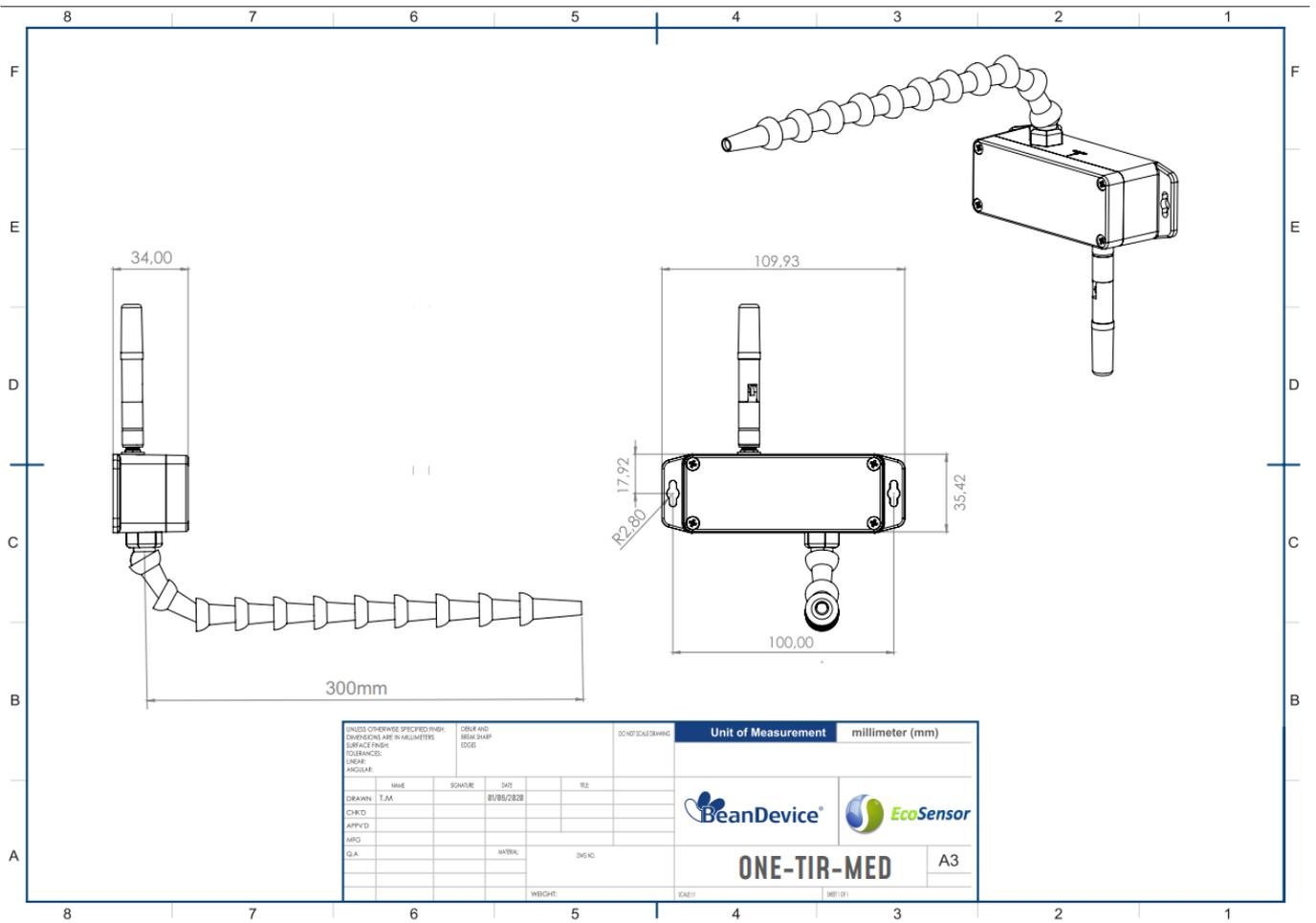
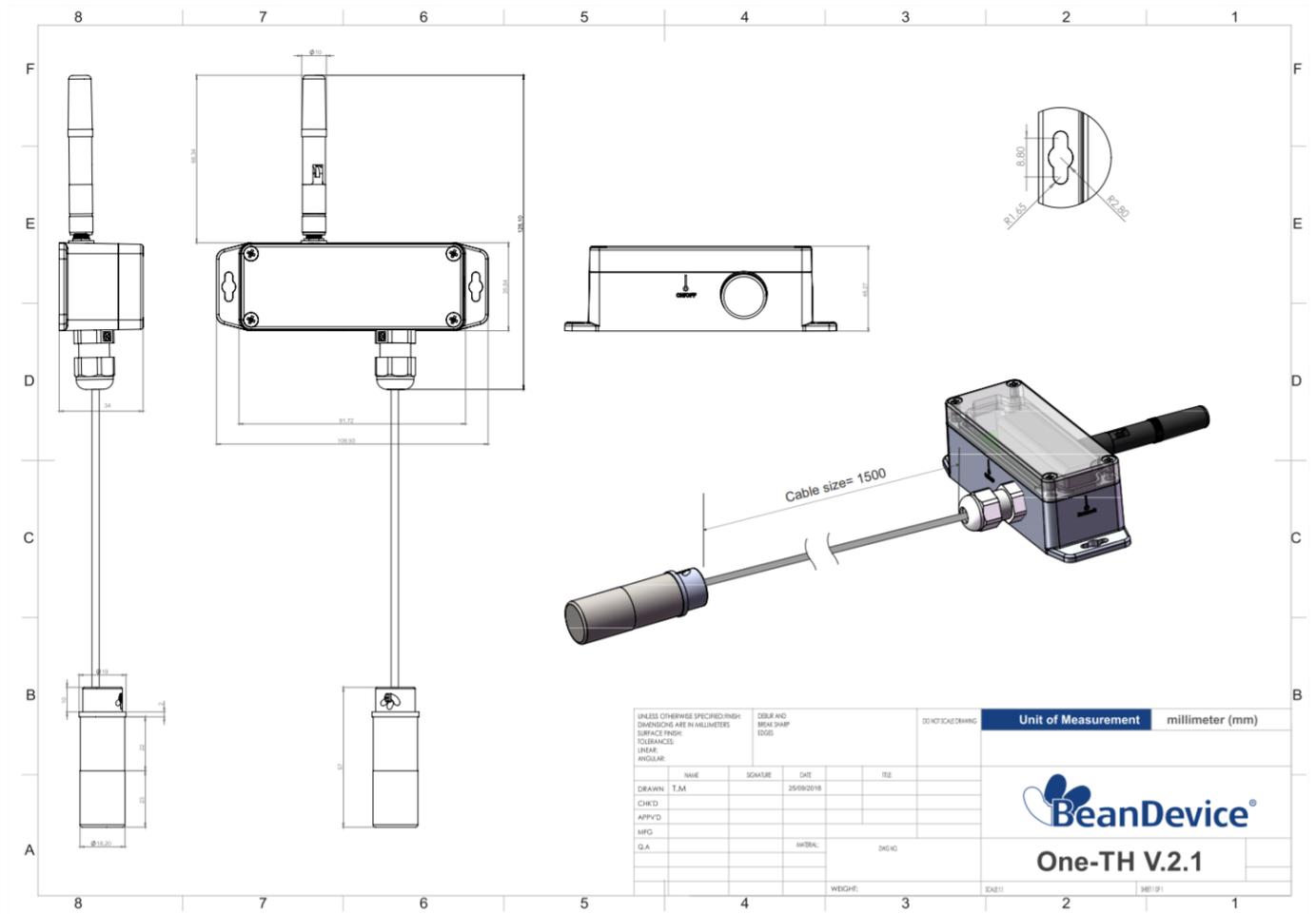


Figure 20: BeanDevice® ONE-TIR-MED mechanical drawing

2.6.6.4 BeanDevice® ONE-TH



### 2.6.7 Antenna specifications

The BeanDevice® Ecosensor range comes with an external omnidirectional antenna.



**Figure 21 : Omnidirectional 2.2dBi Antenna**

<i>RF Properties</i>	<i>Value</i>	<i>Unit</i>	<i>Tol.</i>
<b>Frequency range</b>	<b>2400 ... 2500</b>	<b>MHz</b>	
<b>VSWR</b>	<b>1.5</b>		<b>max</b>
<b>Impedance</b>	<b>50</b>	<b>Ω</b>	
<b>Peak Gain</b>	<b>2.8</b>	<b>dBi</b>	<b>Typ.</b>
<b>Average Gain</b>	<b>2.2</b>	<b>dBi</b>	<b>Typ.</b>

**Table 1 : Antenna Specifications table**

During BeanDevice® installation, test several orientations of the antenna in order to get best wireless link quality. Check the LQI (Link Quality Indicator) of your BeanDevice® for being sure that your antenna is right oriented.



*For further information, read the application note: [AN RF 007:“Beanair WSN Deployment”](#)*

## 2.7 BEANDEVICE® POWER SUPPLY

The BeanDevice® ONE-TH/ONE-T/ONE-TIR/ONE-TIR-MED are power supplied by a Lithium-thionyl chloride primary cell with a very low leakage current (less than 2%/year)

The BenDevice® ONE-TIR-MED is available also with a mains power supply.



***A primary cell is not a rechargeable battery, don't try to recharge it. You will damage your primary cell and your BeanDevice®.***

Primary cell technology	LiSOCl <sub>2</sub> (Lithium -thionyl chloride)
Nominal Voltage	3,6V
Nominal capacity	1800 mAh
Size	14.5*33.5mm (AA)
Maximum continuous current	500mA
Maximum pulse current	1A
Type	ER14505M

***Table 2 : Primary cell specifications table***

List of LiSOCl<sub>2</sub> primary cell manufacturer:

Manufacturer	Product Reference
<i>EEMB</i>	<i>ER14505M</i>
<i>BIPOWER CORP</i>	
<i>EVE</i>	
<i>Ultralife</i>	



***Important Precautions to follow:***

- ✓ ***Lithium-thionyl chloride primary cell with a size of AA must be used. Don't try to use another primary cell technology, you will damage your BeanDevice®;***
- ✓ ***Use only the ER14505M battery type with the "M" extension for high power management;***
- ✓ ***Primary cell is not a rechargeable battery. Don't try to recharge a primary cell; you will damage your BeanDevice®.***

### 3. BEANDEVICE® INSTALLATION GUIDELINE

#### 3.1 POWERING ON YOUR BEANDEVICE®

The BeanDevice® ONE includes a reed switch that allows switching ON or OFF the wireless sensor. The device could be powered ON by hovering the magnet on the ON-OFF label.

This technology allows you to power on your BeanDevice® instantly and without any physical contact between the magnet and the BeanDevice® enclosure.

Powering ON your BeanDevice® ONE is very simple:

1. Please make sure that your *BeanDevice® ONE-T/ONE-TIR/ONE-TH* is provided with a magnet (the magnet is provided in another box separated from the BeanDevice®)



***Figure 22: Powering ON/OFF the BeanDevice®***

2. As shown in the picture below, hover your magnet slowly above the ON-OFF label for about 2 seconds, your BeanDevice® turns on automatically. The LED light illuminates **GREEN**. You can hold your magnet position diagonally or in parallel to your device label.



**Figure 23: Using Magnet to Power ON/OFF**

3. Repeat the same process to Power OFF your BeanDevice®. The LED illuminates in RED. Your BeanScape will specify that the device is no longer active.

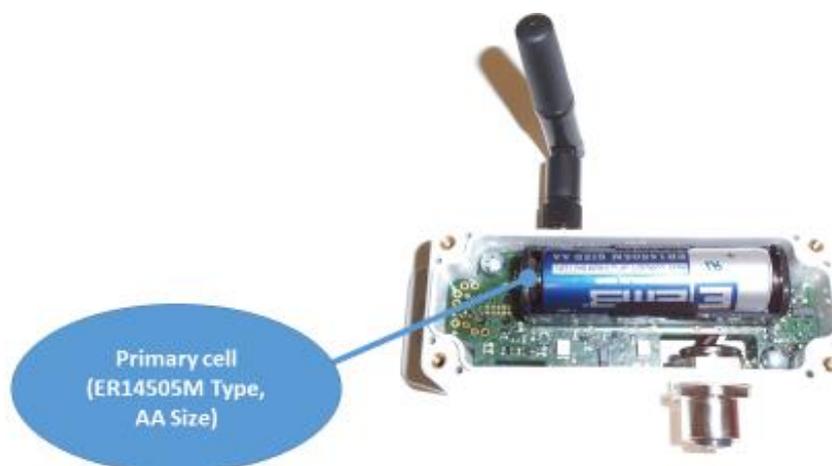
### 3.2 PRIMARY CELL REPLACEMENT

Located inside the BeanDevice® enclosure, the primary cell provides the BeanDevice® power supply. The self-discharge rate is very low on a primary cell (2% / year).

The BeanScape® displays the battery charge level, if it is in low state you will need to change the battery as follows.

Step n°1: Open the BeanDevice® casing

- Power down your BeanDevice®
- Use a Philips screwdriver with the right size
- Unscrew the cover



**Figure 24: AA size Primary Cell**

### Step n°2: Primary cell replacement

- Remove the primary cell from the battery holder
- Replace the primary cell. Follow the electrical polarity on the battery holder(see picture)
- Close the cover

## 3.3 BEANDEVICE® NETWORK ASSOCIATION

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Please read the technical note [TN\\_RF\\_006 – “WSN Association process”](#)

## 3.4 DATALOGGER FUNCTION

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Please read the technical note [TN\\_RF\\_007 – “BeanDevice® DataLogger User Guide ”](#)

## 3.5 OTAC (OVER-THE-AIR-CONFIGURATION) PROCESS

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Please read the technical note [TN\\_RF\\_010 – « BeanDevice® Power Management »](#)

## 3.6 COEXISTENCE WITH OTHER FREQUENCIES AT 2.4 GHZ

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The BeanDevice® is sensitive to noise 2.4GHz (Wi-Fi as a source for example), but many protections are already in place, particularly in the IEEE 802.15.4®.

It should however be careful when installing the product, check all the possibilities of radio channels on the frequency range 2.4-2.5GHz. The operation of the product will be improved.



For further information, read the application note: [TN\\_RF\\_011 – “Coexistence of Beanair WSN at 2.4GHz”](#)

### 3.7 OPERATING TEMPERATURE

---

The table below shows the BeanDevice® operating temperature:

Operating temperature
-40°C to +75 ° C

BeanDevice® can operate in an area with 90% humidity.

However, the wireless range can be reduced in the presence of water. Avoid mounting the BeanDevice® in an enclosure surrounded by water, or near bushy plants (plants are composed of 90% water), ...

### 3.8 MECHANICAL MOUNTING

---

The BeanDevice® ONE-XX enclosure can be easily mounted to the wall through 2 mounting holes provided on the back of the box.

The diameters of these holes are 4.2mm respectively.



***Figure 25: Wall mounting option***

### 3.9 FACTORY SETTINGS

If desired, the user can perform a Network context deletion. It allows to restore default parameters on the BeanDevice®:

Parameter	
Power Mode	Battery Saver mode
Data Acquisition duty cycle	2 minutes
Data Acquisition mode	LowDutyCycle

To restore these default parameters, you must perform a *Network context deletion*. The “Network” non-contact button is outside the product. Hold the magnet on the button network (“Network”) for more than 2 seconds.



**Figure 26: Network Reset button**

## 4. BEANDEVICE® SUPERVISION FROM THE BEANSCAPE

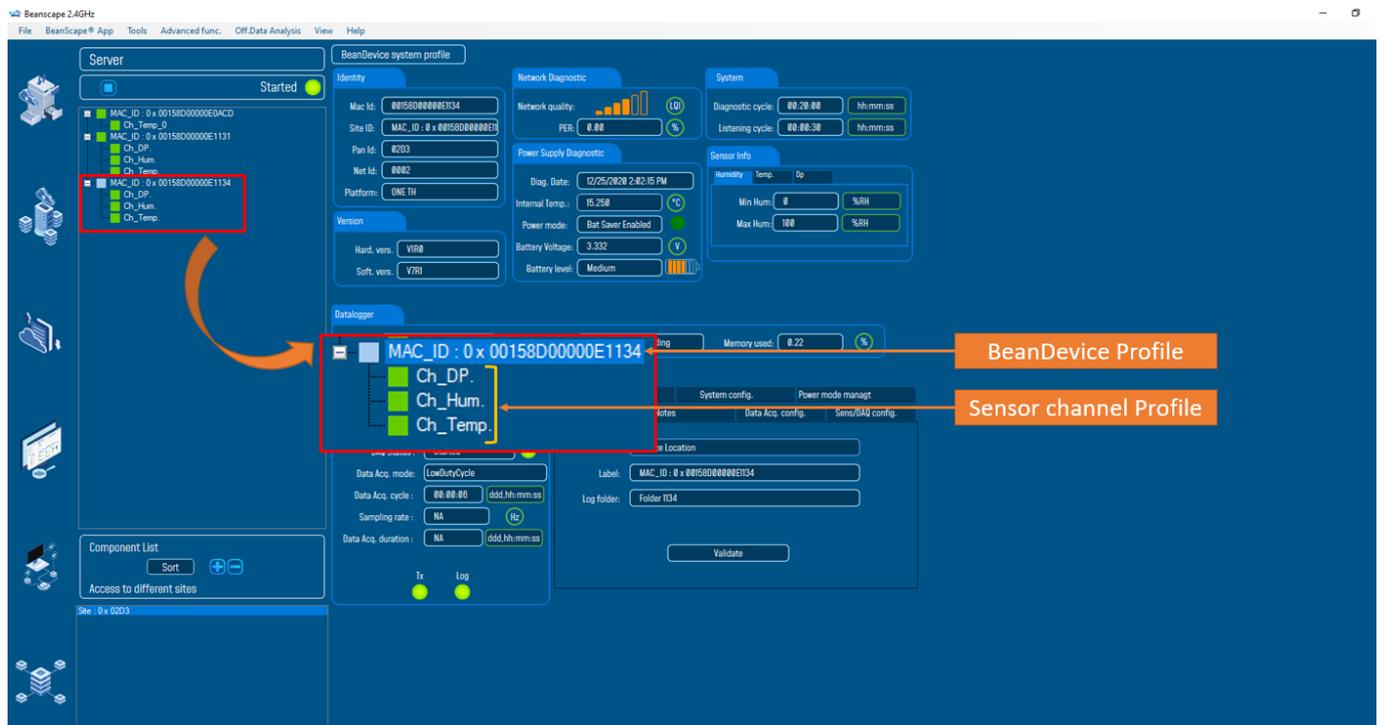


*Don't hesitate to read the BeanScape® user manual for further information about the BeanScape®*

### 4.1 STARTING THE BEANSCAPE®

The BeanScape® is a supervision software monitor fully dedicated to Beanair WSN (Wireless Sensor Networks):

1. Start the BeanScape® by double-clicking on the BeanScape® icon 
2. Click on the button « start » 
3. All the BeanDevice® connected to the WSN will appear on your left window
4. Select the BeanDevice® you want to configure. You can configure your BeanDevice® and its attached sensors.



**Figure 27: BeanDevice® display on BeanScape®**

**The user interface is organized as follow:**

- White on blue background is displaying information



- Black on white background and white on blue background are customizable field;

Data Acq. mode: LowDutyCycle -----:--:5

You can configure your BeanDevice® from the page "**BeanDevice® System Profile**". This page is composed of two parts:

- ✓ BeanDevice® information display
- ✓ BeanDevice® configuration

The screenshot displays the 'BeanDevice system profile' page in the BeanScape 2.4GHz application. The interface is organized into several functional areas:

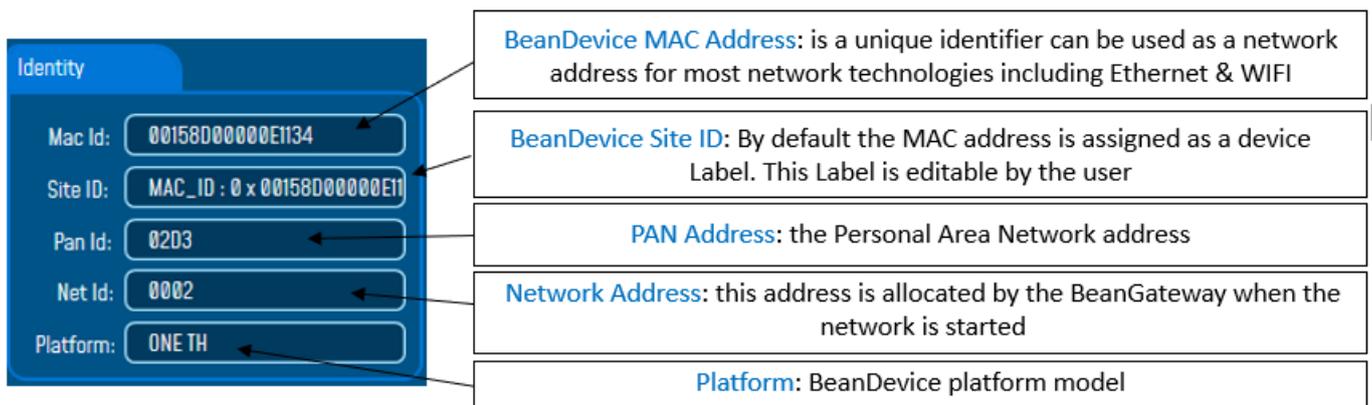
- Server List (Left):** A tree view showing a 'Server' with a 'Started' status and a list of components (Ch\_X, Ch\_Y, Ch\_Z) for multiple MAC IDs.
- BeanDevice system profile (Main):**
  - Identity:** Mac ID: 00158D0000E1049, Site ID: MAC\_ID : 0 x 00158D0000E1049, Pan ID: 391A, Net ID: 0001, Platform: AX 30.
  - Network Diagnostic:** Network quality: (LQI bar chart), PER: 3.92 %.
  - System:** Diagnostic cycle: 00:01:00 hh:mm:ss, Listening cycle: 00:00:01 hh:mm:ss.
  - Power Supply Diagnostic:** Diag. Date: 12/9/2020 10:27:03 AM, Internal Temp.: 23.500 °C, Power supply: Mains, Power mode: Bat Saver Disabled, Battery Voltage: 4.230 V, Battery level: Good.
  - Sensor Info:** Meas. Range: -2 / +2 g, Cut off frequency: 1000 Hz.
- Datalogger (Bottom):** Status: Ready, Memory option: "Stop DAQ" recording, Memory used: 0 %.
- Listening Mode Status (Bottom Left):** Waiting (red), Sent (yellow), Deleted (red). Config. frame is: (red).
- Data acquisition mode configuration (Bottom Right):**
  - DAQ Status: Stopped (red).
  - Data Acq. mode: NA.
  - Data Acq. cycle: NA ddd.hh:mm:ss.
  - Sampling rate: NA Hz.
  - Data Acq. duration: NA ddd.hh:mm:ss.
  - Options: Tx (red), Log (red).
  - Configuration panel: Data Acq. mode: LowDutyCycle, Data Acq. cycle: -----:--:5, Start/Stop buttons, and options for Tx Only, Log Only, or Tx & Log.

**Figure 28: Overview: BeanDevice® System Profile on BeanScape®**

## 4.2 BEANDEVICE® STATUS INFORMATION

You will find below a description of the data information fields for each frame.

### 4.2.1 Frame: Identity



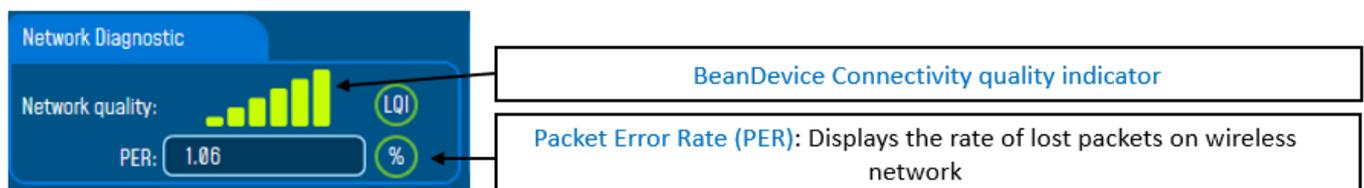
**Figure 29: BeanDevice® Identity**



#### ***How the PAN ID is assigned ?***

**The BeanGateway® starts the WSN, assigning a PAN ID (Personal Area Network identifier) to the network. The PAN ID is pre-determined and cannot be modified. If you use several WSN, before deploying your BeanDevice® check to which WSN is assigned your BeanDevice®.**

### 4.2.2 Frame : Wireless Network Diagnostic

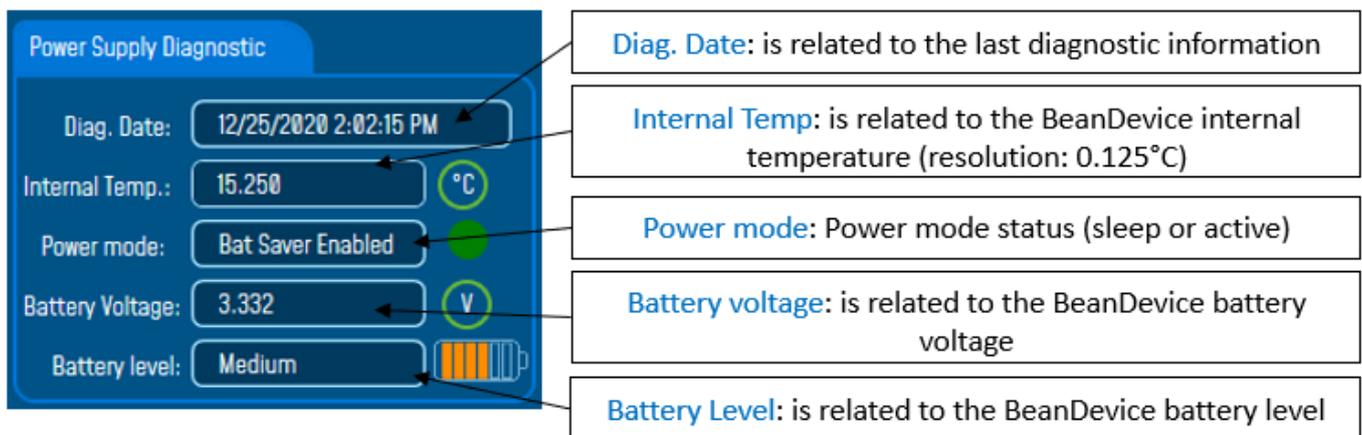


**Figure 30: BeanDevice® network-link status**

$PER = \text{Number of lost packet} / \text{Total of packet transmitted}$

Number of bars	Color	Link quality indicator
5 to 6 bars	Green	Very good
4 bars	Green	Good
3 bars	Red	medium
to 2 bars	Red	bad

#### 4.2.3 Frame: Power supply diagnostic



**Figure 31: BeanDevice® Power Supply information**



The BeanDevice® incorporates an internal temperature sensor:

- ✓ Battery temperature monitoring during charging ;
- ✓ Temperature compensation of the analog conditioning chain ;
- ✓ An alarm notification is send to the BeanGaeway® if the internal temperature is anormally high ;

When you plug the BeanDevice® on an external power supply, the power supply status is automatically detected.

If your primary cell charge level is low, it is highly recommended to recharge your battery. Your BeanDevice® from SmartSensor product lines integrates a battery charger.



For further information about Power mode management, please read the technical note [TN\\_RF\\_010 – « BeanDevice® Power Management »](#)



When using the Streaming mode or the S.E.T mode, BeanScape® stops to display the full Battery health status information on the Power Supply Diagnostic frame until stopping the acquisition.

**Power Supply Diagnostic**

Diag. Date: 12/25/2020 2:02:15 PM

Internal Temp.: 15.250 °C

Power mode: down

Battery Voltage: 3.332 V

Battery level: Medium

**Blue LED:** The BeanDevice is powered off

**Power Supply Diagnostic**

Diag. Date: 12/25/2020 2:02:15 PM

Internal Temp.: 15.250 °C

Power mode: Bat Saver Enabled

Battery Voltage: 3.332 V

Battery level: Medium

**Battery Saver mode is enabled (sleep)**

**Green LED:** The BeanDevice is on battery saver mode

**Power Supply Diagnostic**

Diag. Date: 12/25/2020 2:02:15 PM

Internal Temp.: 15.250 °C

Power mode: Bat Saver Disabled

Battery Voltage: 3.332 V

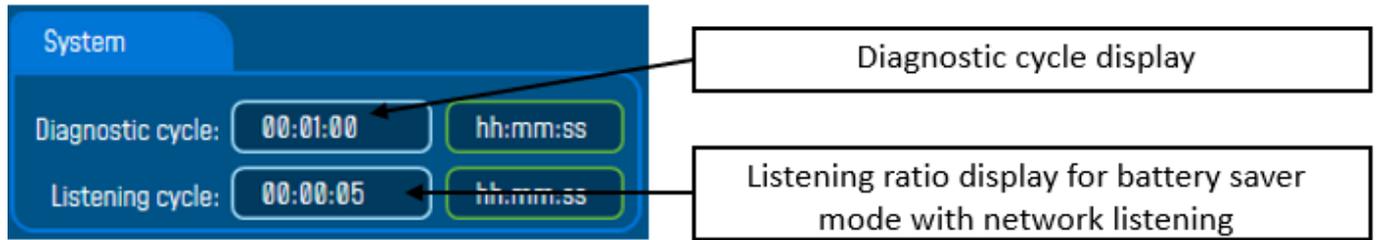
Battery level: Medium

**Active power mode (Mains)**

**Yellow LED:** The BeanDevice is on active power mode

Figure 32: BeanDevice® Power modes

#### 4.2.4 Frame : System



**Figure 33: BeanDevice® Diagnostic cycle information**

\* The diagnostic cycle is a regular period during which the system collects information about the BeanDevice® (battery charge status, internal temperature, LQI, PER ..).



#### How to convert dBm to mW

Zero dBm equals one milliwatt. A 3dB increase represents roughly doubling the power, which means that 3 dBm equals roughly 2 mW. For a 3 dB decrease, the power is reduced by about one half, making -3 dBm equal to about 0.5 milliwatt. To express an arbitrary power  $P$  as  $x$  dBm, or go in the other direction, the following equations may be used:

$$x = 10 \log_{10}(1000P) \text{ Or, } x = 10 \log_{10} P + 30$$

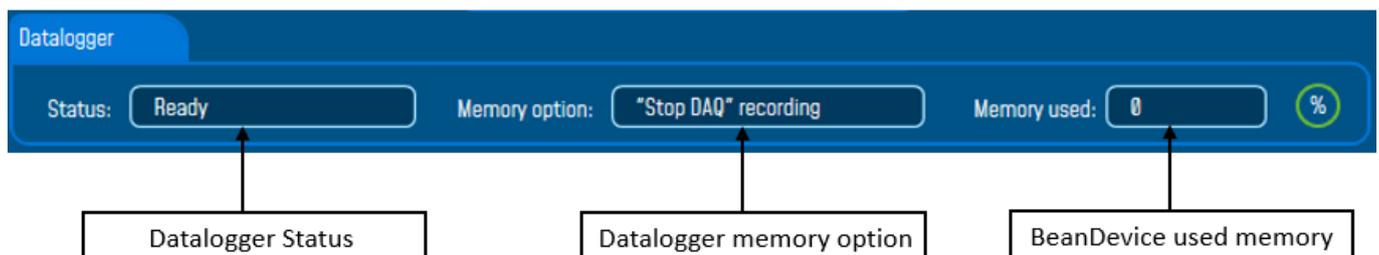
And

$$P = 10^{(x/10)}/1000 \text{ Or, } P = 10^{(x-30)/10}$$

Where  $P$  is the power in W and  $x$  is the power ratio in dBm.

### 4.3 FRAME : BEANDEVICE®

According to the BeanDevice® version, the information displayed in the frame will not be the same. For example (BeanDevice® ONE-TH):



**Figure 34: Frame BeanDevice® on BeanScope®**

4.3.1 Frame: Product Version



Figure 35: BeanDevice® Product version frame

**V (version)** related to a major modification of the embedded software.

**R (Release)** related to a minor modification of the embedded software



*These ID versions should be transmitted to our technical support center when having material or software dysfunction.*

4.3.2 Frame: current data acquisition mode

This frame displays the current data acquisition mode :

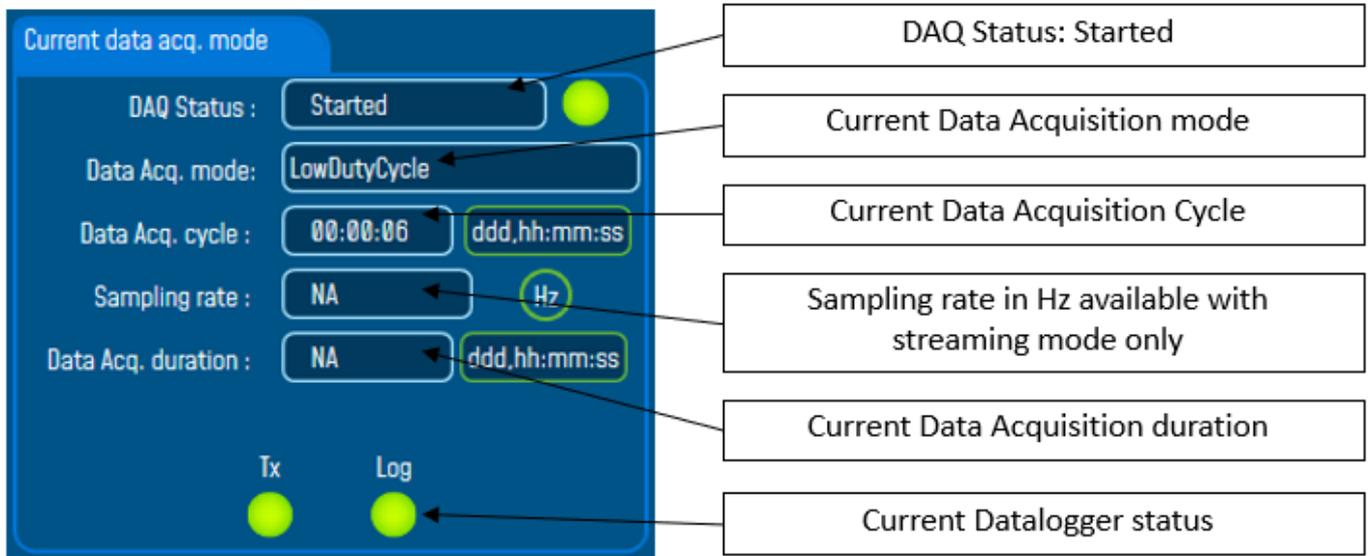


Figure 36: Frame: Current data acquisition mode

### 4.4 MAIN SETTINGS

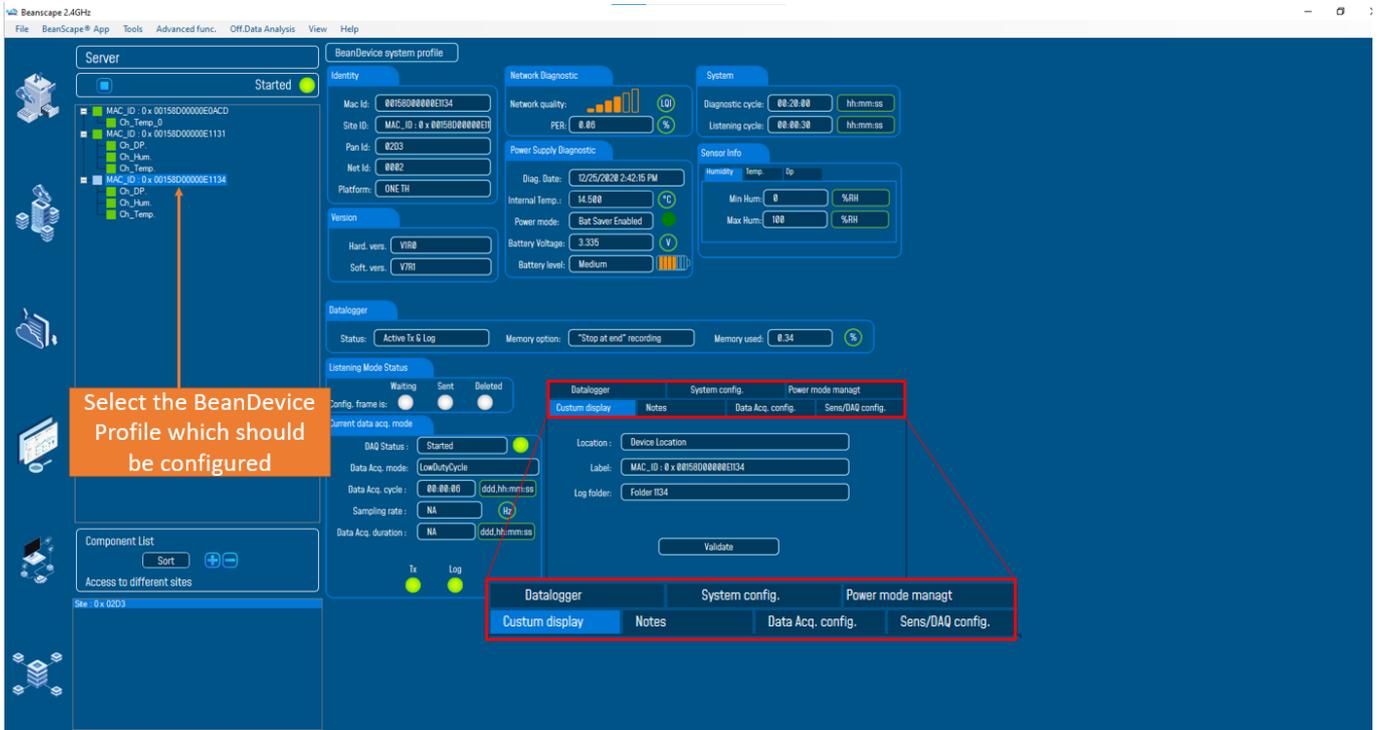


Figure 37: BeanDevice® configuration frame

This frame is composed of several Tabs and includes BeanDevice® OTAC (Over the Air Configuration) Parameters:

Tab	Description
Custom Display	Customize the BeanDevice® label
Notes	This area contains the notes related to the BeanDevice®.
Data acquisition mode configuration	Configure the data acquisition mode, set the acquisition cycle, enable/disable the data logger function.
Data logger	Data logger function on the BeanDevice®
System configuration	Diagnostic cycle and the TX Power
Power Mode Management	Configure the Power Mode (Sleep)

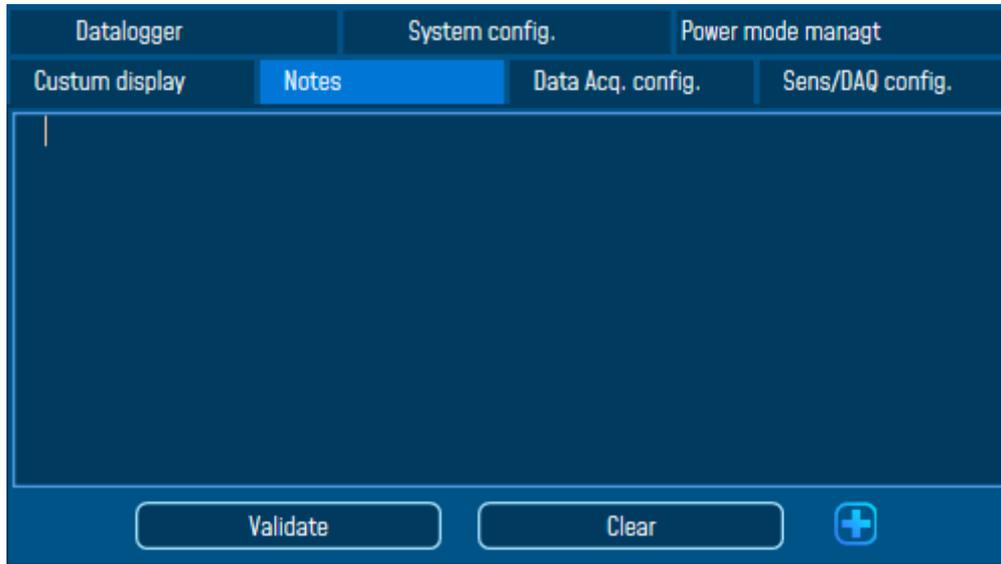
#### 4.4.1 Tab: Custom Display

*Figure 38: BeanDevice® custom display tab*

<i>Parameter</i>	<i>Description</i>
<i>Type</i>	Enter here the type of BeanDevice® you want to use
<i>Reference</i>	Assign an internal reference to the BeanDevice®
<i>Label</i>	Assign any sort of Label to your BeanDevice®. Therefore, the user can easily associate the BeanDevice® with its equipment (example: Room_N521_Second_Floor)

Then click on “**Validate**” to confirm these new settings.

#### 4.4.2 Tab: Notes



*Figure 39: Tab : Notes*

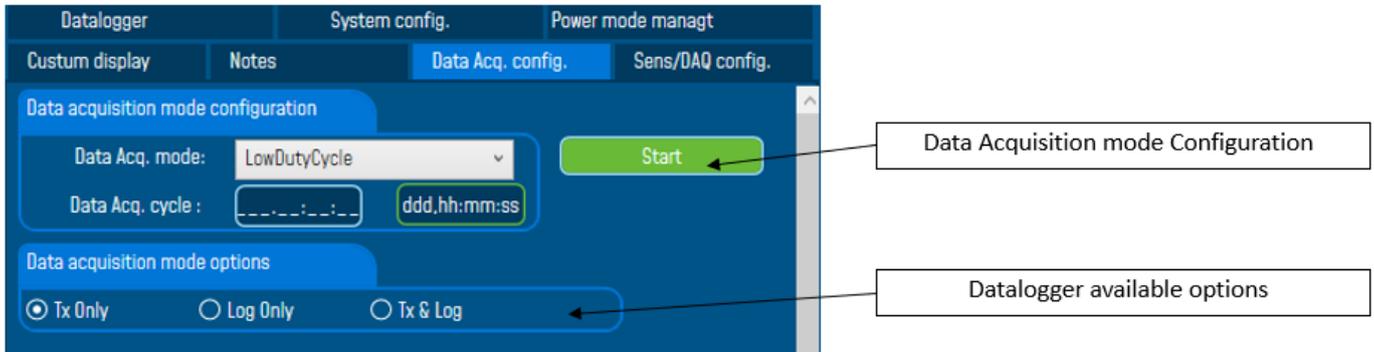
This field contains the user notes related to the BeanDevice®.

To change this field, enter your text and click on « **Validate** » button. To back up your text, press the icon 

**Example:** Machine failure n°XX, requested intervention.

**4.4.3 Tab: Data Acquisition configuration**

**4.4.3.1 Data Acquisition configuration tab-BeanDevice® ONE-T/ONE-TH/ONE-TIR**



**Figure 40: Tab: Data acquisition configuration**

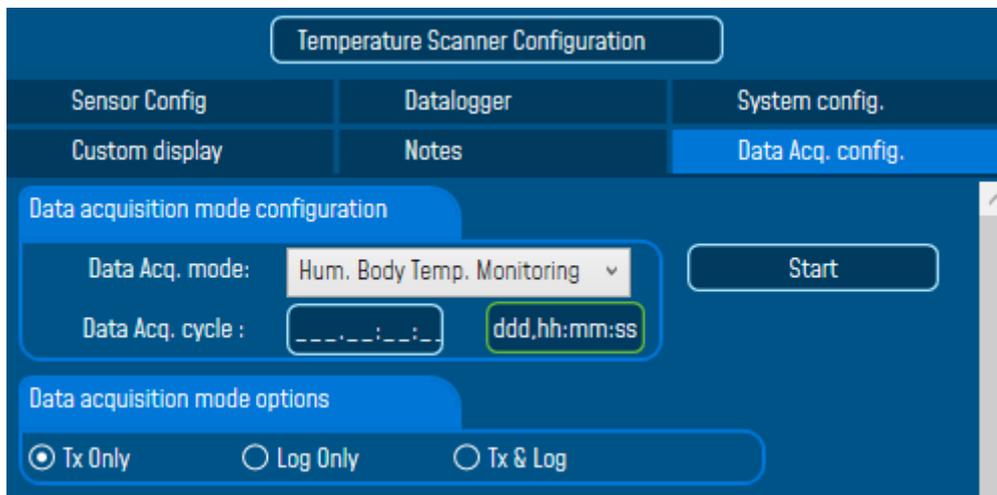
Parameter	Different values	Description
Data Acquisition mode	<b>Low duty cycle Data Acquisition (LDCDA)</b>	Low duty cycle data acquisition is adapted for static measurement (tilt, pressure, temperature) requiring a low power consumption on your BeanDevice®. The duty cycle can be configured between 1 data acquisition & transmission per second to 1 data acquisition & transmission per day.
	<b>Survey</b>	Survey mode is a mix between the LDCDA mode and Alarm mode. A data acquisition is transmitted <ul style="list-style-type: none"> <li>Whenever an alarm threshold (fixed by the user) is reached (4 alarm threshold levels High/Low).</li> <li>A transmission cycle is reached, the transmission cycle is configurable through the BeanScope® 1s to 24h ;</li> </ul>
Data acquisition Cycle	Select the Data acquisition cycle between 1s and 24hours. The format is: Day: Hour : Minute :Second	
Sampling rate	<b>Not available on Ecosensor product lines</b>	

Data acquisition duration	Not available on Ecosensor product lines
Options	<p><b>TX only:</b> The BeanDevice® transmits the data acquisition without Datalogging</p> <p><b>Log only:</b> The BeanDevice® logs the data acquisition without wireless transmission</p> <p><b>TX &amp; Log:</b> The BeanDevice® transmits and logs the data acquisition;</p> <p><b>SA: Standalone:</b> The BeanDevice® logs the data acquisition without wireless transmission. The BeanDevice stores all the measurements on its embedded datalogger. Thus, a direct connection with the BeanGateway® is not needed.</p>



For further information about the Datalogger, please read the technical note [TN\\_RF\\_007 – “BeanDevice® DataLogger User Guide”](#)

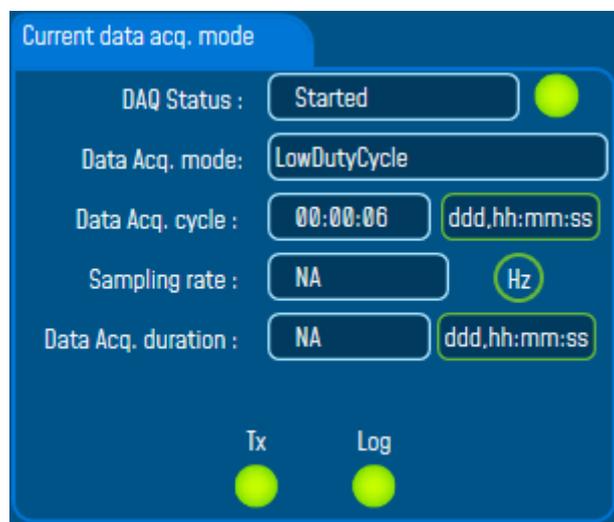
4.4.3.2 Data Acquisition configuration tab-BeanDevice® ONE-TIR-MED



**Figure 41: ONE-TIR-MED DAQ Tab**

Parameter	Different values	Description
DAQ mode	<b>Low duty cycle Data Acquisition (LDCDA)</b>	Low duty cycle data acquisition is adapted for static measurement (tilt, pressure, temperature) requiring a low power consumption on your BeanDevice®. The duty cycle can be configured between 1 data acquisition & transmission per second to 1 data acquisition & transmission per day.
	<b>Hum. Body Temp. Monitoring</b>	HBTM mode is a mix between the LDCDA mode and Alarm mode. A data acquisition is transmitted whenever an alarm threshold (fixed by the user) is reached (3 alarm threshold levels).
Data acquisition Cycle	<p>Select the Data acquisition cycle between 1s and 24hours for LDCDA mode.</p> <p>Select the Data acquisition cycle between 4s and 24hours for HBTM mode.</p> <p>The format is: Day: Hour: Minute: Second</p>	
Options	<p><b>TX only:</b> The BeanDevice® transmits the data acquisition without Datalogging</p> <p><b>Log only:</b> The BeanDevice® logs the data acquisition without wireless transmission</p> <p><b>TX &amp; Log:</b> The BeanDevice® transmits and logs the data acquisition;</p>	

All the new modifications are displayed on “**Current data acquisition mode**” frame:



*Figure 42: Current data acquisition mode display*



For further information, please read to the technical note [TN\\_RF\\_008 – “Data acquisition modes available on the BeanDevice®”](#)

#### 4.4.4 Sensor Config.

Sensor Config. tab is available only on the BeanDevice® ONE-TIR-MED

*Figure 43: Sensor Config Tab*

In the Sensor Config tab, user have access to the following functionalities:

- **Emissivity:** used to set the Emissivity value
- **Measurement Unit:** used to choose the suitable measurement unit for the application

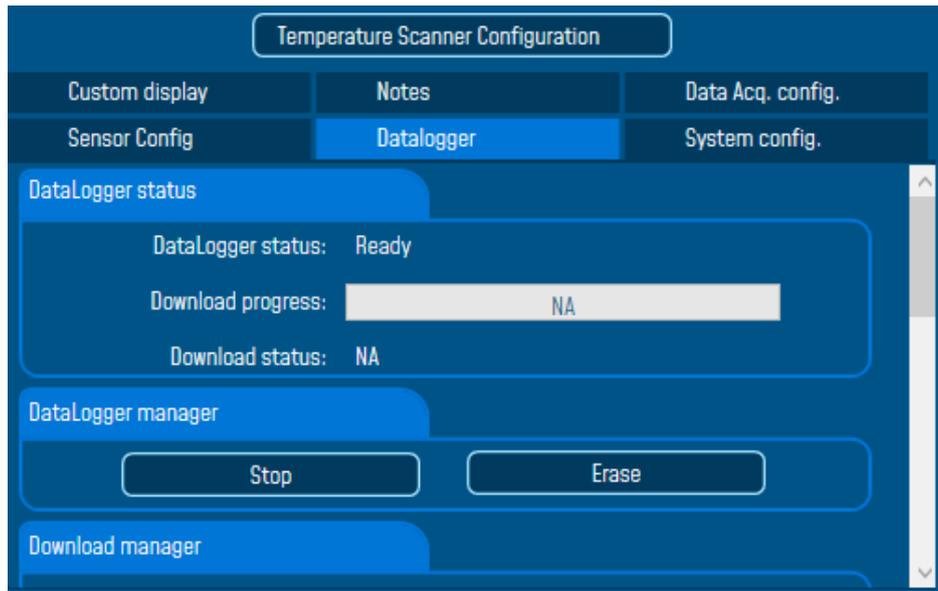
Several Measurement units are available as °Celsius, °Fahrenheit and °Kelvin.

*Figure 44: Measurement Unit*

#### 4.4.5 Tab: Datalogger



For further information about the Datalogger, please read the technical note [TN\\_RF\\_007 – “BeanDevice® Datalogger User Guide”](#)

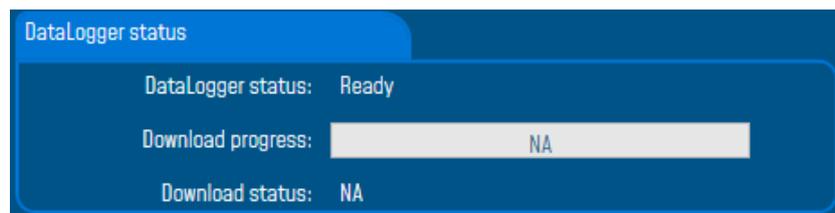


*Figure 45: Datalogger Tab*

Data logger tab is composed of five different fields:

- **Datalogger Status**
- **Datalogger manager**
- **Download manager**
- **Acquisition information**
- **Datalogger memory configuration**

#### 4.4.5.1 Datalogger status



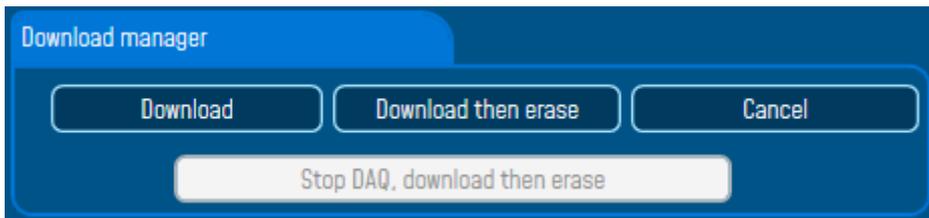
- **Datalogger status:** Displays logger status, four status are available:
  - **Ready:** the Datalogger is ready to register data
  - **NotInit:** the Datalogger is not initialized;
  - **Active logs only:** Data acquisition is logged only;
  - **Active TX and Log:** Data acquisition is logged & transmitted by Radio;
  - **Stopped:** Datalogger is stopped;
- **Download process:** Displays the download process 0 to 100%. If 100%, all the data logs are successfully downloaded on your PC.
- **Download status:** Displays the download status, two types of status are available:
  - **Processing:** Data logs download is under process;
  - **Completed:** Data Logs are completely downloaded on your PC;

4.4.5.2 Datalogger manager



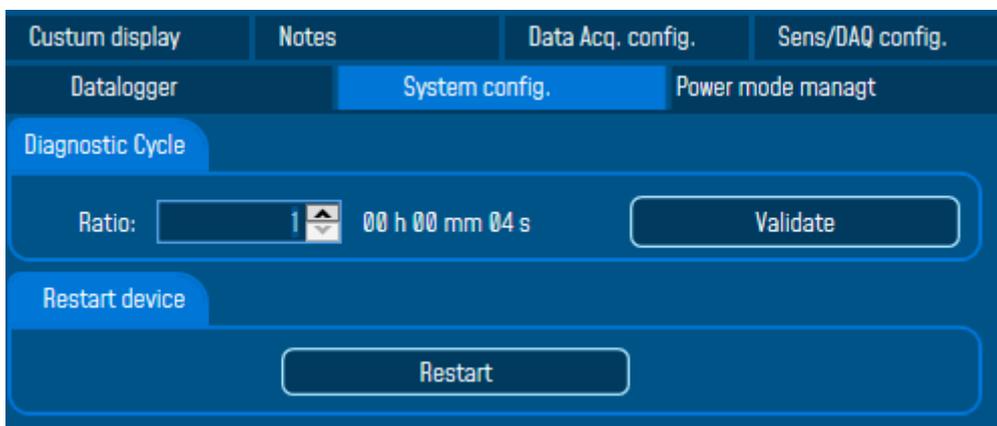
- **Stop:** Stops Data Logging process
- **Erase:** Stops & Erases all the logs on flash memory

4.4.5.3 Download manager



- **Download:** Starts to download all the logs on the flash memory
- **Download then erase:** downloads all the logs and the erase them.
- **Cancel:** Stops the download process
- **Stop DAQ, download then erase.**

4.4.6 **Tab : System config.**



*Figure 46: System Configuration Tab*

Parameter	Description
<b>Diagnostic cycle</b>	You can set the BeanDevice® diagnostic cycle (Battery status, LQI, PER ...). The Diagnostic cycle is modulo the data acquisition cycle. <i>Ex:</i> If you try to set the diagnostic cycle at 10s while the data acquisition cycle is set at 20s, the diagnostic cycle will be adjusted to 10s;
<b>Restart device</b>	You can restart the BeanDevice® from BeanScape

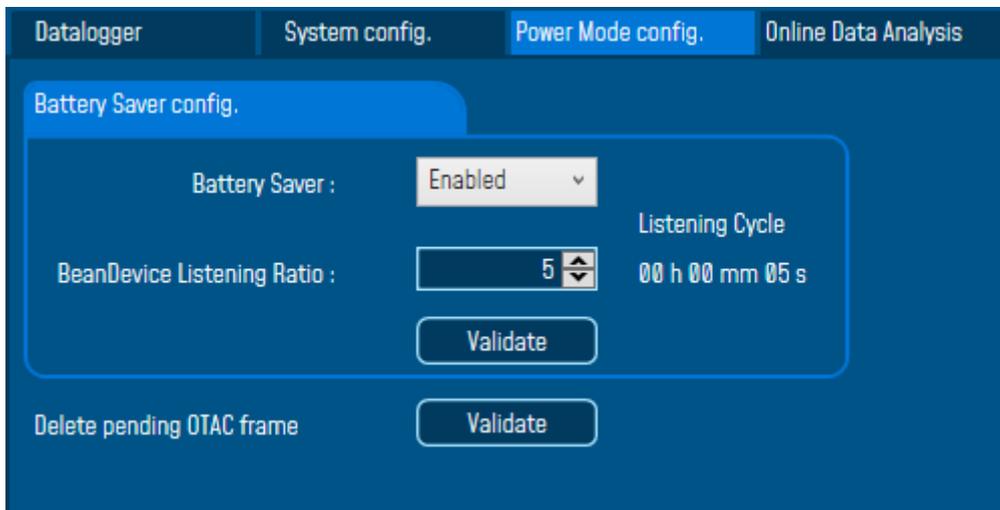
#### 4.4.7 Tab : Power mode management



For further information about Power mode management, please read the technical note *TN\_RF\_010: "BeanDevice® Power management"*

This Tab is composed of three options:

- ✓ **Battery Saver Power mode configuration:** Configure the Power mode on your BeanDevice® (active / Battery saver mode)
- ✓ **BeanDevice Listening Ratio:** Configuration settings for Battery Saver power mode with network listening
- ✓ **Delete Pending OTAC frame:** Delete the last performed OTAC



**Figure 47: Power Mode Management Tab**

Parameter	Description
<b>Battery Saver configuration</b>	<p><b>Enable:</b> Battery Saver power mode is enabled. The BeanDevice® operates on Saver battery power mode to decrease the power consumption.</p> <p><b>Disable:</b> Battery Saver power mode is disabled, the BeanDevice® works in active power mode.</p> <p><b>Ratio:</b> Fix the Ratio of the listening cycle. This ratio depends on the data acquisition low duty cycle.</p> <p><b>Example:</b> If the data acquisition is 30 seconds and the ratio is set to 5, the Listening cycle will be 150 seconds (5*30).</p>
<b>Delete pending OTAC frame</b>	By clicking on "validate", the pending OTAC frame is deleted



There is no battery saver mode available on the BeanDevice® ONE-TIR-MED mains powered version.

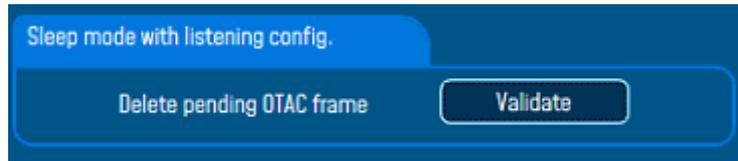


Figure 48: Power mode management on the ONE-TIR-MED mains powered version



How to enable battery saver power mode

#### 4.5 SENSOR CHANNEL PROFILE

The screen « *Sensor profile* » consists of three parts:



General information on the measurement channel;



Measurement channel configuration;



A graph which displays in real-time sensor signals during data acquisition;

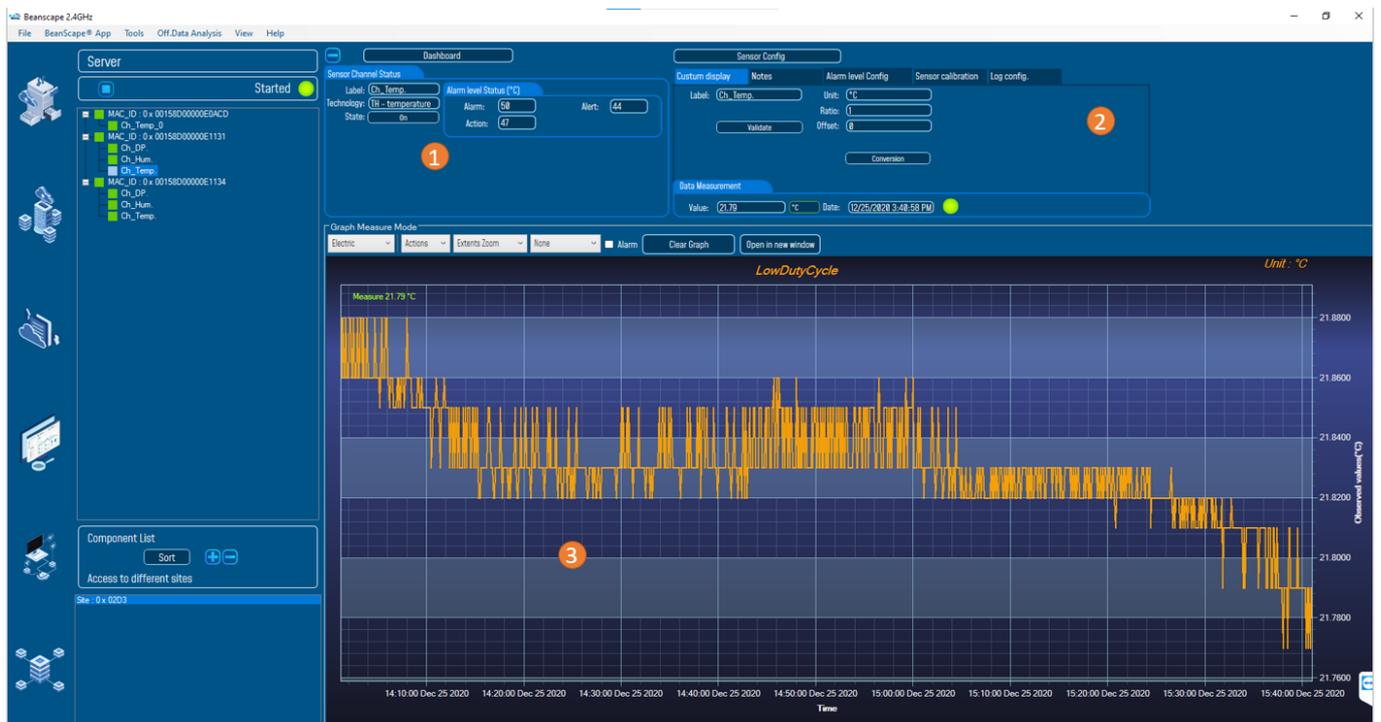


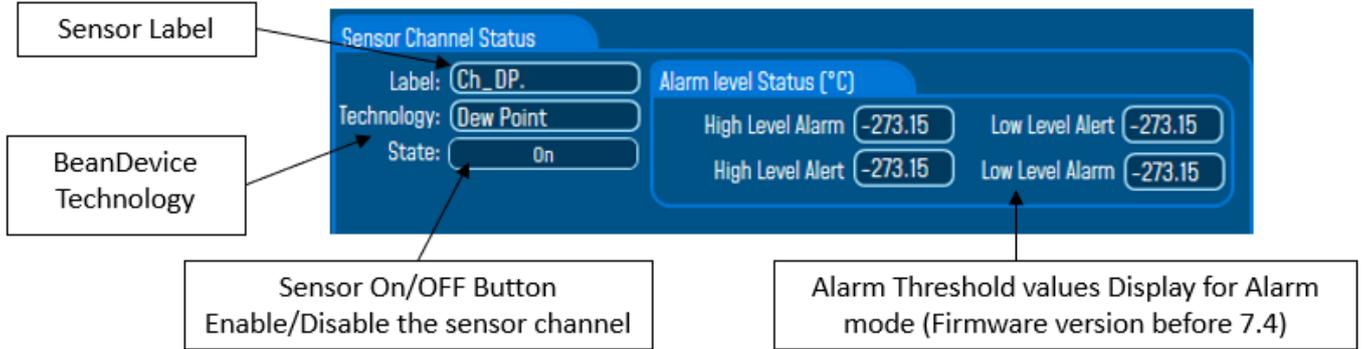
Figure 49: Overview: Sensor channel profile

**4.5.1 Sensor channel status**

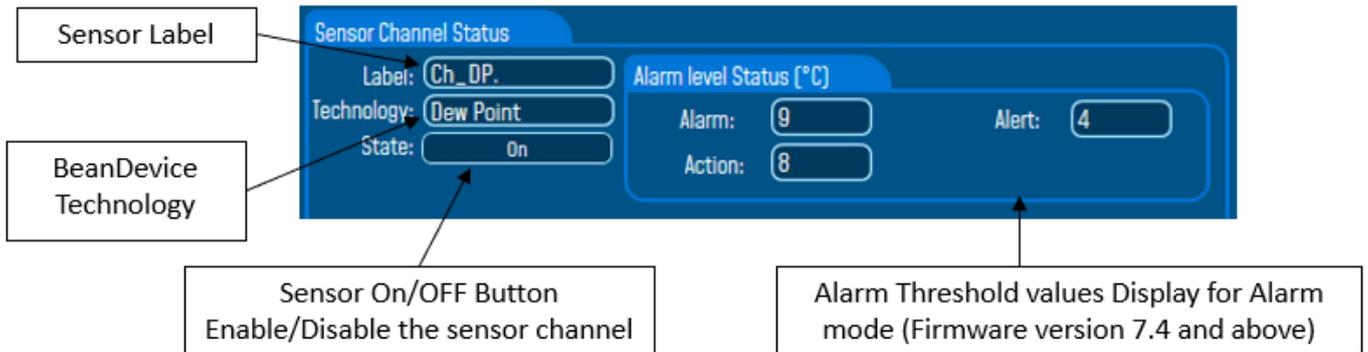
The sensor Channel Status displays different functionalities according to the nature of the BeanDevice®.

**4.5.1.1 BeanDevice® ONE-T/ONE-TH General information on Temperature sensor**

The Alarm threshold topology is based on 4 alarm levels on the firmware version before 7.5

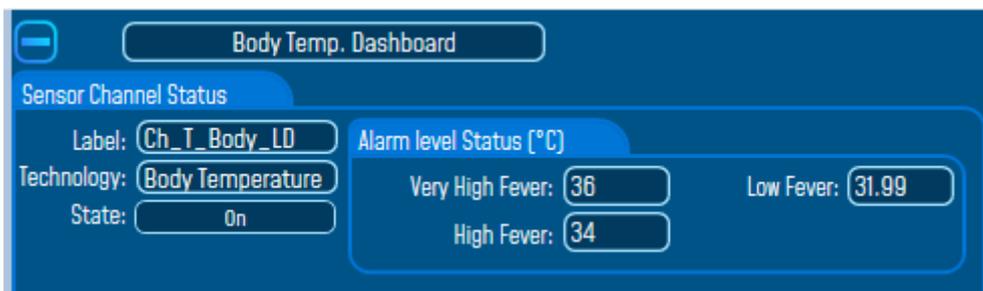


The Alarm thresholds architecture is based on 3 alarm levels (triple A) starting from the firmware version 7.5 and above.



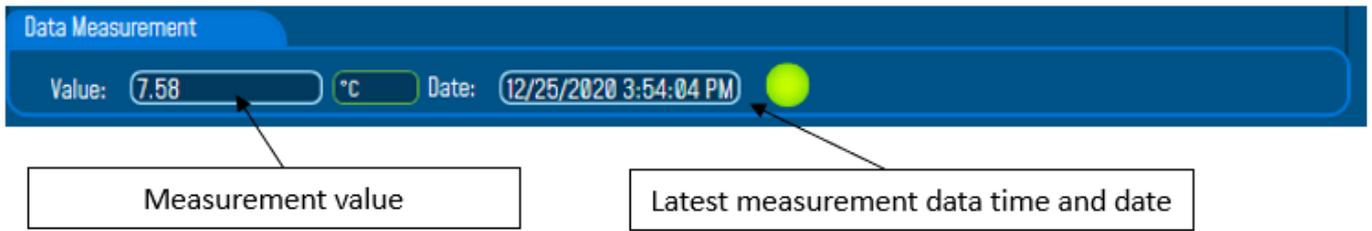
*Figure 50: Sensor channel General information frame (BeanDevice® ONE-T)*

**4.5.1.2 BeanDevice® ONET-TIR-MED Sensor Channel Status**



*Figure 51: CH T Body SD Channel Status*

4.5.1.3 Frame: Measurement data-BeanDevice® ONE-T/ONE-TIR/ONET-TH



*Figure 52: Measurement data frame*

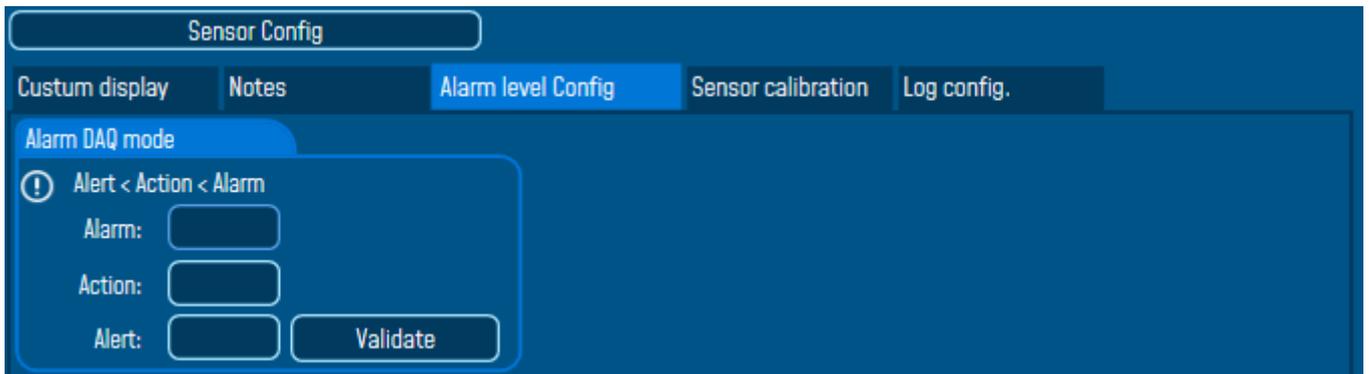
4.5.1.4 Frame: Measurement data BeanDevice® ONE-TIR-MED

By default, sensor unit format is

- **BeanDevice® ONE-T** : °C for the temperature sensor
- **BeanDevice® ONE-TIR** : °C for IR & ambient temperature sensors
- **BeanDevice® ONE-TH** : °C for the temperature sensor, %RH for humidity sensor

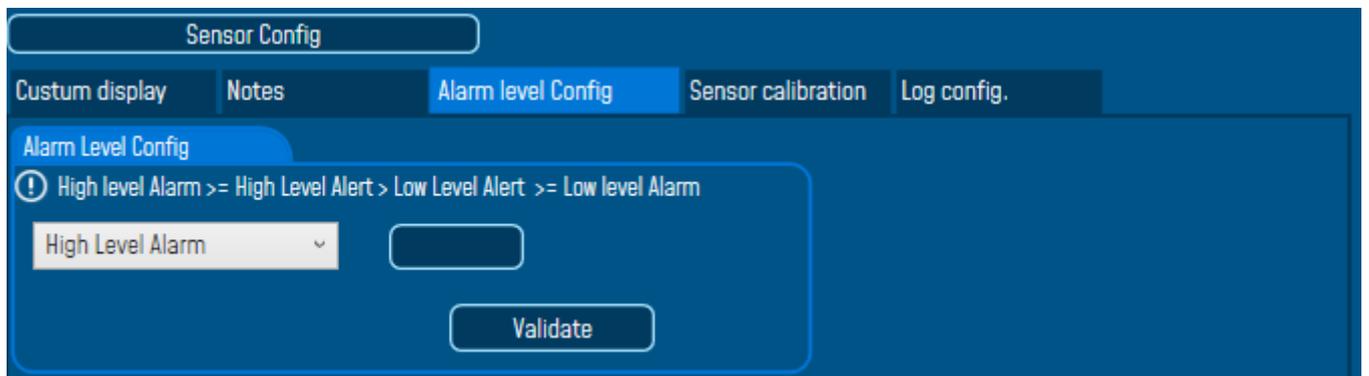
4.5.1.5 Frame : Alarm threshold-BeanDevice® ONE-T/ONE-TIR/ONE-TH

- On Firmware version 7.4 and above



*Figure 53: Frame Threshold*

- On firmware version before 7.4



*Figure 54: Alarm thresholds frame*

Alarm threshold are displayed in this frame:



*Figure 55: Alarm threshold*



*Depending on your sensor resolution, the displayed threshold value can differ from the reference value.*

#### 4.5.1.6 Frame: Fever Alarm Configuration-BeanDevice® ONE-TIR-MED



*Figure 56: Fever Alarms Configuration*

### 4.5.2 Sensor configuration & calibration frame

This frame contains a set of 5 tabs:

Custom Display	<ul style="list-style-type: none"> <li>Allows the end user to customzie the sensor</li> </ul>
Notes	<ul style="list-style-type: none"> <li>Contains notes relating to the BeanDevice® sensor</li> </ul>
Configuration	<ul style="list-style-type: none"> <li>Sensor configuration interface. The user can configure the alarm thresholds related to the sensor</li> <li>Depending on the BeanDevice® version which is used, other configuration parameters are available</li> </ul>
Measurement conditioning & calibration	<ul style="list-style-type: none"> <li>Sensor or measurement channel calibration</li> </ul>
Log configuration	<ul style="list-style-type: none"> <li>Logs configuration on the BeanScape®</li> </ul>

#### 4.5.2.1 Tab: Custom display

These parameters allow the user to customize his sensor:

The screenshot shows a configuration window titled "Configuration du capteur de Temp. du corps". It has five tabs: "Custom display" (selected), "Notes", "Alarm level Config", "Sensor calibration", and "Log config.". Under the "Custom display" tab, there are four input fields: "Label" with the value "Ch\_DP", "Unit" with "°C", "Ratio" with "1", and "Offset" with "0". Below these fields are three buttons: "Validate", "Conversion", and "Log config.".

*Figure 57: Sensor channel custom display tab*

- **Type:** Describe the sensor type (ex: load cell, pressure, Strain gage +/- 2 Mv/v, LVDT,.... )
- **Unit:** customer sensor unit (bar, °C, l/h....)
- **Ratio :** Sensor Ratio coefficient (**RAT**);
- **Offset :** Sensor Offset Coefficient (**OFF**);
- **Label:** Give a name to your sensor. (**ex:** Sensor on Stator Machine 1, sensor in Room 2 Floor 3)

**Measurement conversion formula:**

$$\text{Converted Measurement} = \text{Measurement} \times \text{RAT} + \text{OFF}$$

**Example with a temperature sensor:** By default the temperature unit is in degree Celsius. The user wants to convert the unit of his temperature sensor in degree Fahrenheit.

$$\text{Converted Measurement}[^{\circ}\text{F}] = \text{Measurement}[^{\circ}\text{C}] \times \text{RAT} + \text{OFF}$$

With **RAT** = 1.8 and **OFF** = 32

#### **Conversion assistant**

To avoid conversion error, a conversion assistant is available to help you to setup quickly your measurement channel of your BeanDevice®.

Click on conversion assistant from the tab "Custom display", a window will open allowing you to do a linear conversion.

Configuration du capteur de Temp. du corps

Custum display | Notes | Alarm level Config | Sensor calibration | Log config.

Label:  Unit:

Ratio:

Offset:

On the left column, the user can enter the non-converted measurement data. On the right column, the user can enter the converted measurement values with the desired unit.

The ratio and offset values are calculated automatically by the conversion assistant.

Unit Conversion Assistant

Linear Conversion

	Input	Output
Value 1	<input type="text" value="-273.15"/> °C	<input type="text" value="0"/> not defined
Value 2	<input type="text" value="382.2"/> °C	<input type="text" value="1"/> not defined

Target Unit:

*Figure 58: Unit Conversion Assistant*

#### 4.5.2.2 Tab : Notes

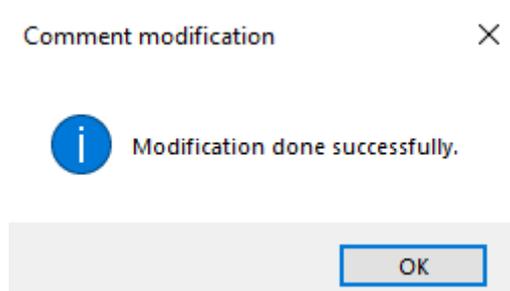
Configuration du capteur de Temp. du corps

Custum display | Notes | Alarm level Config | Sensor calibration | Log config.

*Figure 59: Sensor channel notes tab*

This field contains notes relating to the BeanDevice® sensor. To change this field, enter a value or free text and click the “*Validate*” button.

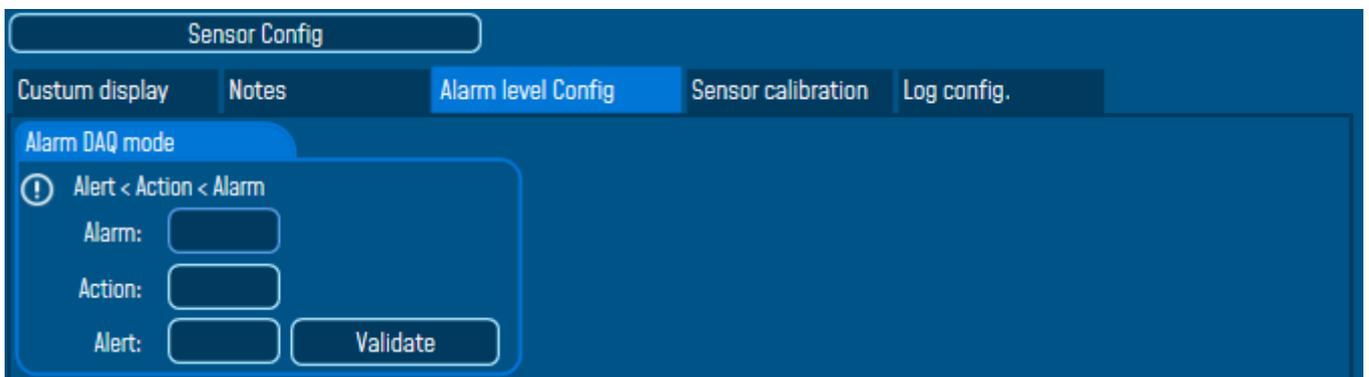
A new window opens; accept your modifications by clicking on “OK”.



To backup your text click on the icon “Backup your Database” 

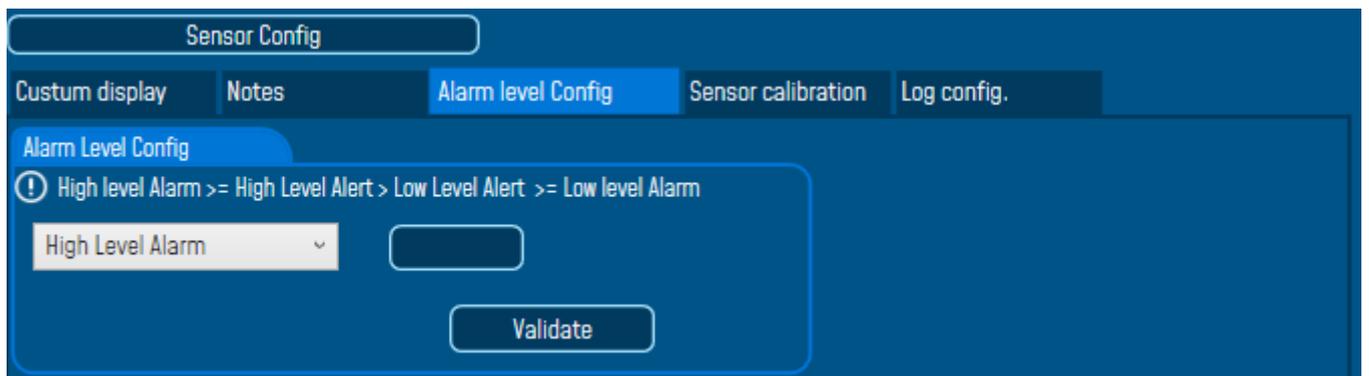
#### 4.5.2.3 Tab: Alarm Configuration-BeanDevice® ONE-T/ONE-TIR/ONE-TH

- On firmware version 7.4 and above



*Figure 60: Alarm configuration tab*

- On firmware version before 7.4



*Figure 61: Alarm config tab*

Parameter	Description
<b>Alarm threshold</b>	<p>You can configure threshold high values (High level alarm, High level alert) and low values (Low level alarm, Low level alert). In alarm mode, when a higher low threshold value is reached, an alarm notification is transmitted to the BeanGateway;</p> <ul style="list-style-type: none"> <li>✓ If the sensor value is higher than High level alarm/High level alert, notification is sent to the BeanGateway/BeanScape;</li> <li>✓ If the sensor value is lower than Low level alarm/Low level alert, notification is sent to the BeanGateway/BeanScape.</li> </ul> <p>Threshold values must be organized in this manner: High level alarm &gt;= High level alert &gt; Low level alarm &gt;= Low level alert</p>



For further information about the alarms threshold configuration, please read the technical note [penseTN\\_RF\\_008 – “Data acquisition modes available on the BeanDevice®”](#)

4.5.2.4 Tab: Alarm Configuration-BeanDevice® ONE-TIR-MED

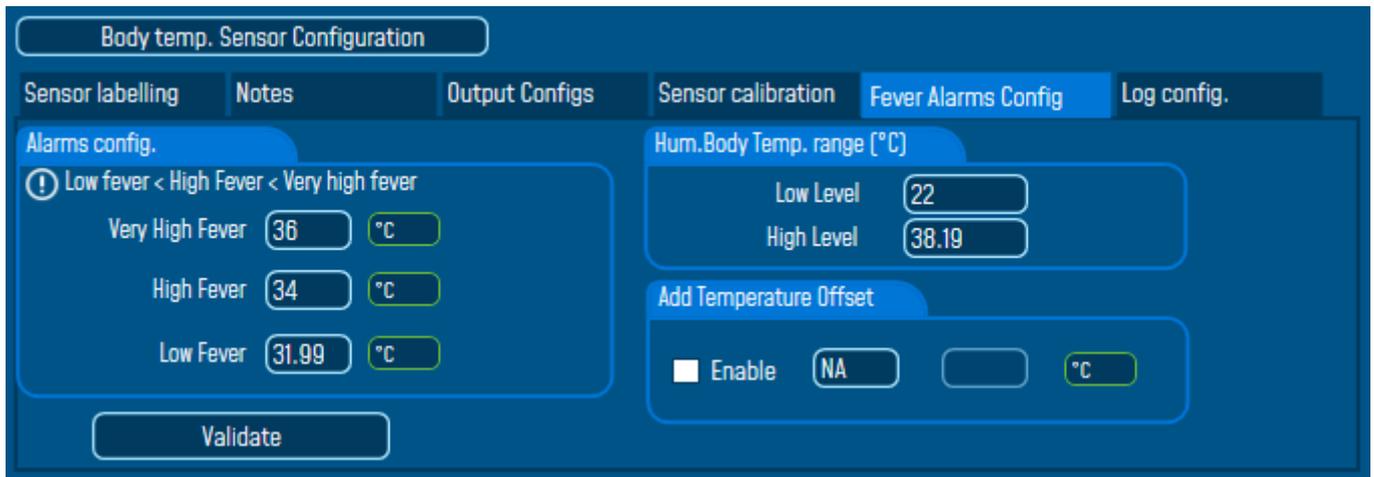


Figure 62: Alarms Config

Parameter	Description
<b>Alarms Config</b>	<p>For the BeanDevice® ONE-TIR-MED the threshold configuration is based on the triple A (AAA) topology [Alarm/Action/Alert] with:</p> <p>Alarm value &gt; Action value &gt; Alert value</p> <p>Each measurement exceeding one of the threshold values will result a notification displayed in the measurement frame and a notification sent by Email.</p> <p>The AAA threshold values should not exceed the Human Body temperature range.</p>

<b>Human Body Temperature Range</b>	<p><b>Low Level:</b> Enter the low-level human body temperature value.</p> <p><b>High Level:</b> Enter the high-level human body temperature value.</p>
<b>Add Temperature Offset</b>	<p>Check <b>Disable</b> box to disable the temperature offset</p> <p>Uncheck <b>Disable</b> box to Enable temperature offset</p>

#### 4.5.2.5 Tab : Sensor & Analog conditioning calibration

These coefficients are used to calibrate the *external sensors (temperature, IR Temperature, Humidity....)* sensor.

*Figure 63: Sensor calibration tab*

The BeanScape® provides a calibration interface for each measurement channel:

- **Ratio:** multiplier coefficient
- **Offset:** adder/subtracted coefficient. Its unit is the sensor unit.

$$\text{Calibrated\_value} = (\text{Ratio} \times \text{Non\_Calibrated\_Value}) + \text{Offset}$$

Enter the calibration coefficients and then click on Validate.



*The calibrations coefficients are backed up on the BeanDevice® flash memory and are conserved during the lifetime of your product.*



**WARNING:** These calibration coefficients should be accessible to an advanced user. A wrong calibration will result in false measurements.

4.5.2.6 Tab: Log configuration

*This tab should not be confused with the Datalogger function available on the BeanDevice®:*

**Figure 64: Log configuration tab**

By default, Log file name is built with the measurement channel & BeanDevice® MAC Address:

< **Sensor Channel Number** > < **MAC\_ID** >

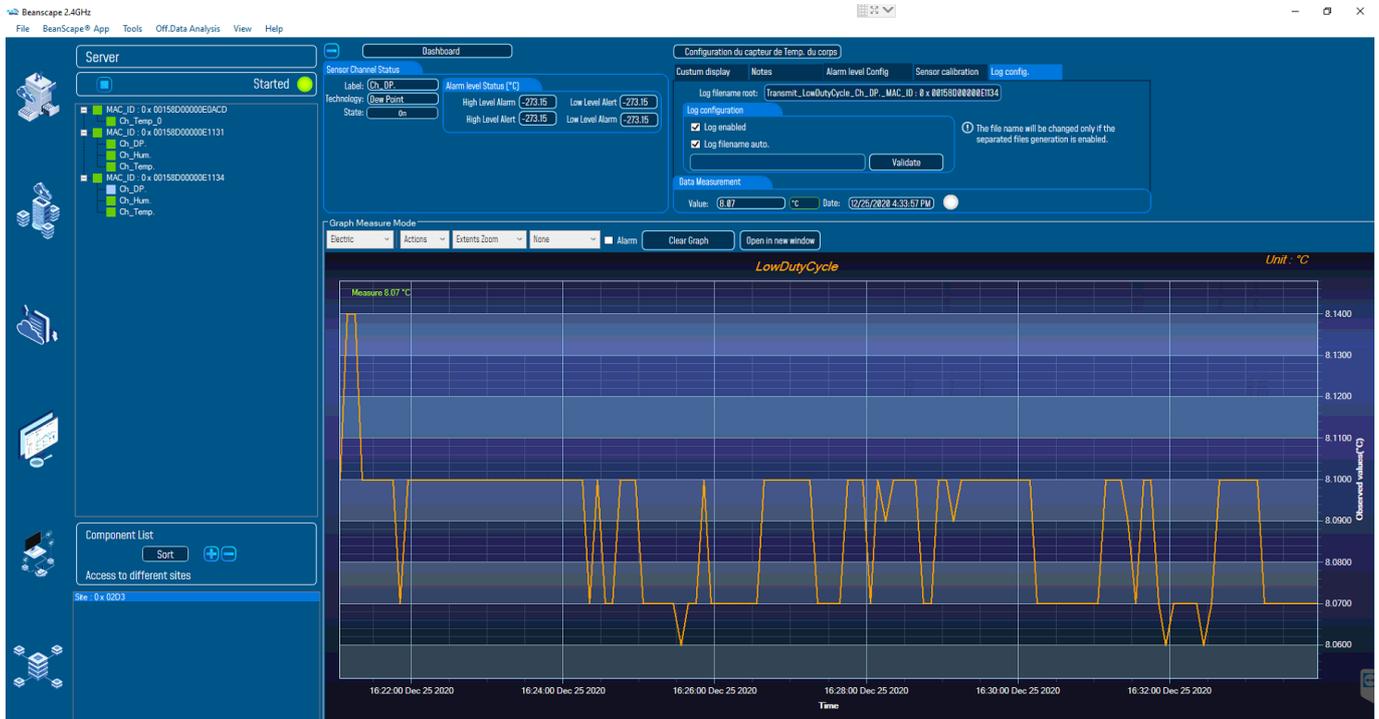
- ✓ **Log enabled:** If checked, Log is enabled on the BeanScape®
- ✓ **Log filename auto.:** If checked, Log file name is named automatically

Click on **validate** in order to validate all your modifications.

For users who want to rename the log file, two solutions are provided:

<b>Solution 1</b>	<b>Add automatically the channel "Label" in your log file name:</b> <Label><Sensor channel Number> <MAC_ID>
<b>Solution 2</b>	<b>The log file name can be fully customized:</b> Uncheck the case « Log filename auto" and add your own label

### 4.5.3 Graphical display



**Figure 65: Channel acquisition graph visualization**

The chart is composed of two parts:

- ✓ **Part 1:** This is a preview window, allowing you to observe sensors acquisitions:
- ✓ **Part 2:** A strip on the side composed of different frames allows customizing the graph;

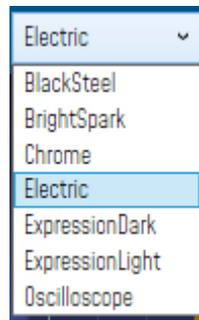
The graph has two axes : X: Time Line & Y: measurement data value

The BeanDevice® data acquisition mode and the last data acquisition can be visualized directly from the graph.



**Figure 66: Example: Graph visualization**

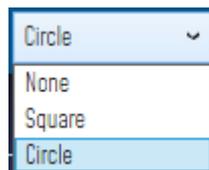
#### 4.5.3.1 Frame: Display



**Figure 67: Graph measure mode: Frame Display**

#### 4.5.3.2 Frame: Symbols

From this frame you can select the display mode of action of the chart. Three types of symbols are available:



**Circle:** Brings up a point on each bar graph

**Square:** brings up a square on each measure of the graph

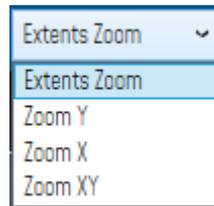
**None:** No logs is displayed on the graph



**Figure 68: Graph measure mode: Frame Marks**

#### 4.5.3.3 Frame : Scale

From this frame, the scaling of the graphics can be customized to suit your needs.

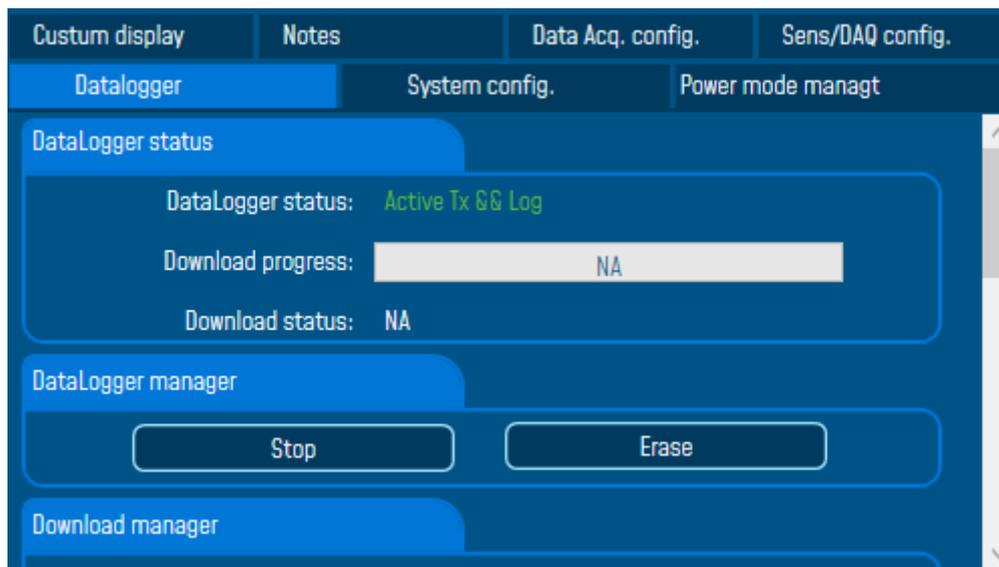


#### **Checkbox "Zoom X and Y Zoom"**

These boxes are useful for performing a graph zoom from the mouse wheel, there are four cases:

- **Case 1**: Case "Zoom X " ticked. The graph zoom will only affect the X axis.
- **Case 2**: Case "Zoom Y" ticked. The graph zoom will only affect the Y axis.
- **Case 3**: Case "Zoom XY " ticked." Zoom will affect both X and Y axes
- **Case 4**: Case "Zoom X ", "Zoom XY " and "Zoom Y " not ticked. The zoom function from the mouse wheel is disabled.

## 4.6 DATALOGGER CONFIGURATION



*Figure 69: Data logger tab*



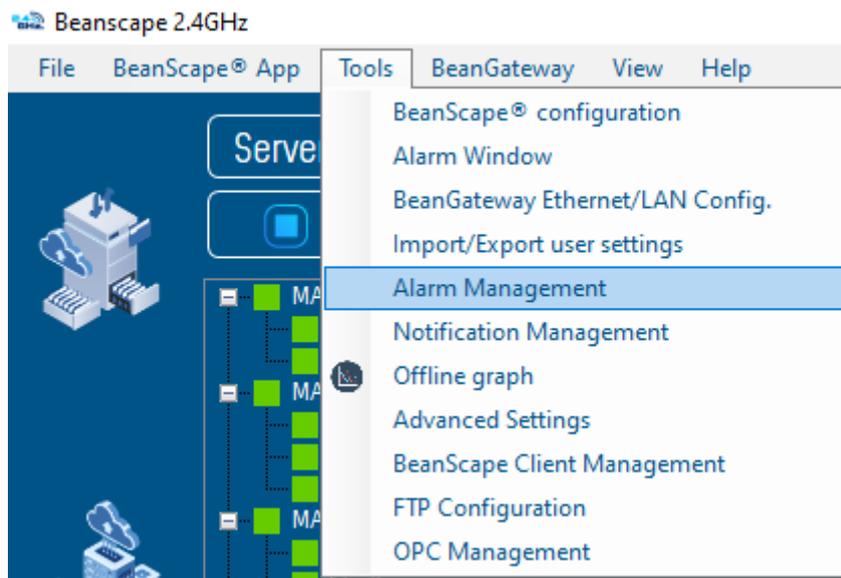
Please read the technical note [TN\\_RF\\_007 – “BeanDevice® DataLogger User Guide”](#)

See [“Exporting a log file to Excel” Youtube video](#)

## 5. ALARM MANAGEMENT

### 5.1 DAQ ALARM

User can receive alarms notification by email. This function is only available with “**Survey**” data acquisition mode. From your BeanScape® software click on “**Tools**” tab then “**Alarm Management**”



**Figure 70: Alarm management menu**

A new window will pop up with **DAQ alarm SMTP configuration** and reports management, also other system related notification alarm (Internal temperature, Battery level, Packet Error Rate, Link Quality Indicator) are configured from this window

Check on **Enable Notification by email**:  **Enable Notification by email** and fill out the parameters described below:

Field	Description
<i>From</i>	<i>Enter the email address sending the alarm notification</i>
<i>To</i>	<i>Enter the receiver address for alarm notification</i>
<i>SMTP server</i>	<i>Enter your Outgoing SMTP server</i>
<i>Port</i>	<i>Enter your port Number for your outgoing SMTP server</i>
<i>User name</i>	<i>Enter your full email address</i>
<i>Password</i>	<i>Enter the password (case sensitive) of your email account</i>
<i>Max Email per minute</i>	<i>Maximum number of emails allowed to be sent in one minute</i>

following fields:

Alarm Management

Email Config. DAQ Alarm Health Status SSD DAQ Mode Alarm DAQ Mode File Format DIN 4150-3 Config Crash report

Enable Notification by email

Note: Required Fields are marked with \*

From\*: host@host.com

To Contact 1: host@host.com

To Contact 2: host@host.com

To Contact 3: host@host.com

Smtp Server\*: smtpserver Port\*: 25

User Name\*: userName

Password\*: .....

SMTP Test

Validate

*Figure 71: Alarm management window*



Users who use the Gmail or Hotmail emails, it's recommended to use the port number 25 while setting the SMTP configuration. Otherwise, users will face issues concerning receiving the Alarm emails.



Do not use the port number 488 instead of 25 while configuring the SMTP server in order to cancel all the issues that might affect the process of receiving the Alarm Emails.

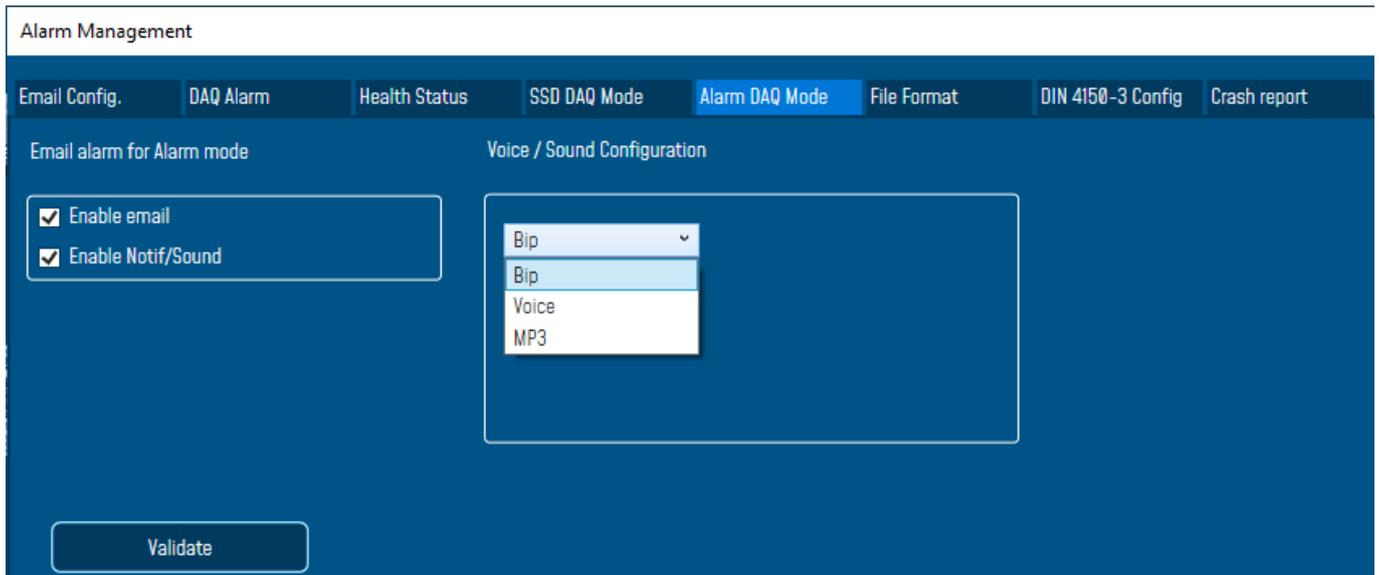


Concerning the number port of the Gmail and Hotmail SMTP, it's highly recommended to use the port number 25 for both servers. DO NOT use any other port number

## 5.2 ALARM DAQ MODE

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Only the ALARM DAQ Mode tab is related to the Eco sensor BeanDevices®

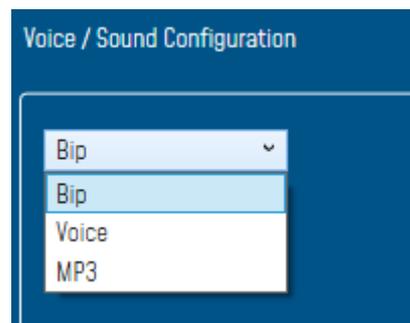


**Figure 72: Frame: Email alarm for Alarm mode**

Also the user will chose which report and which log file to receive, more details can be found on the [Data acquisition modes available on the BeanDevice](#) Technical note



**See « Alarm by email » Youtube video**



**Figure 73: Frame: Sound config**

To enable email notification for survey mode and Smart Shock Detection, check **Enable email**, for Audio notification on PC check **Enable Notif/Sound**



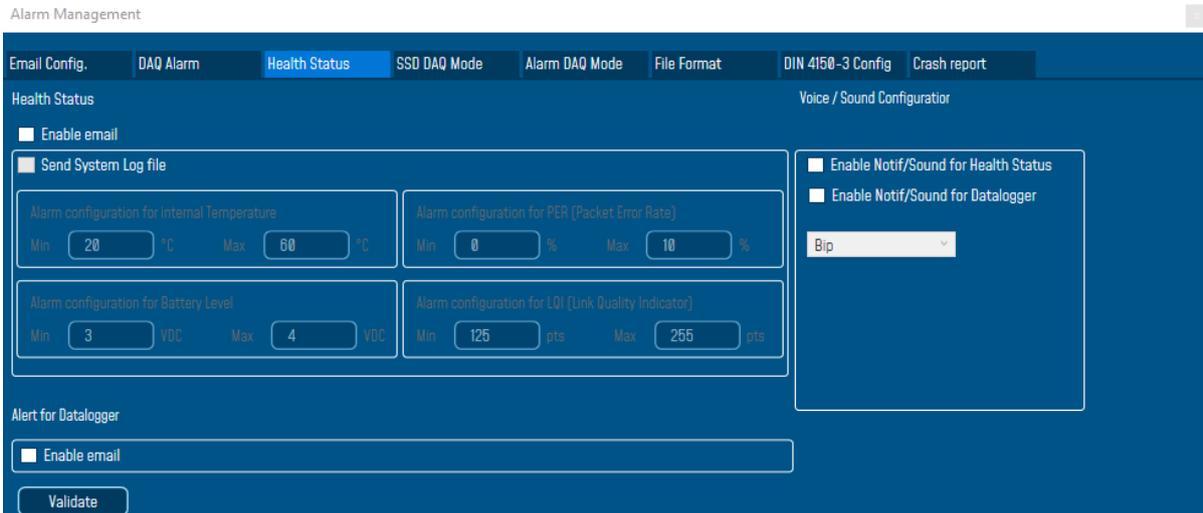
**Figure 74: Email alarm for Alarm mode**

To Test your Configuration, you can send a test email by clicking on SMTP Test, if everything is ok and you received your email then Validate and close the window.



### 5.3 SYSTEM ALARM

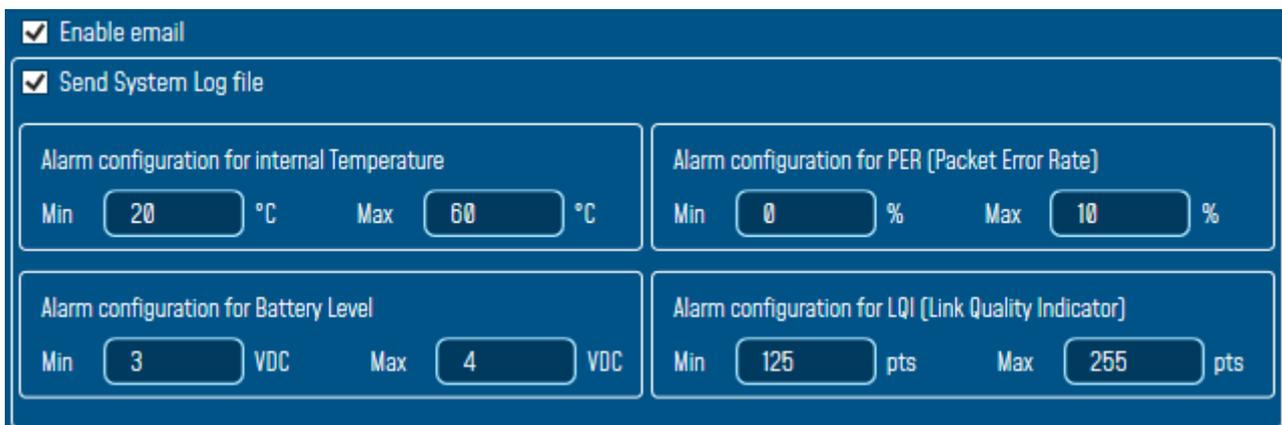
Same as the DAQ Alarm tab, the **System Alarm tab** contains SMTP configuration in order to receive notification on system status:



*Figure 75: BeanDevice® Health Status management*

- **Internal temperature:** email notification if the internal temperature reached the pre-defined levels.
- **Battery level:** email notification if the battery level reached the pre-defined minimum and maximum voltages.
- **Packer error rate (PER):** email notification if the PER reaches the pre-defined levels
- **Link quality indicator (LQI):** email notification when the LQI reaches the pre-defined levels

Check Send System Log file to receive all the related information within a log file.



*Figure 76: System Alarm Settings*

From System Alarm, user can receive Alert for Datalogger by enabling Notification or Emails, also receiving Alert for Diagnostic.

## Alert for Datalogger

 Enable email

## Voice / Sound Configurati

 Enable Notif/Sound for Health Status

 Enable Notif/Sound for Datalogger

Bip

Bip

MP3

*Figure 77: Enable/Disable Notif/mail for Diagnostic and Datalogger*

## 5.4 FILE FORMAT

In this area, user can choose the report format and apply a custom document header setting as uploading a logo and other textual information related to monitoring site:

## Alarm Management

Email Config.	DAQ Alarm	Health Status	SSD DAQ Mode	Alarm DAQ Mode	File Format	DIN 4150-3 Config	Crash report
Report and Alarms File Format							
Report Format:	PDF						
	WORD						
Document Header	PDF						
	PNG						

*Figure 78: File Format settings*

- **Logo:** Choose a picture to define it as a logo
- **User Name:** Use a specific User name
- **Monitoring Site:** Name you Monitoring Site
- **Location:** Your Monitoring Site location

Document Header	
Logo:	<input type="button" value="Browse"/>
User Name:	<input type="text"/>
Monitoring Site:	<input type="text"/>
Location:	<input type="text"/>

*Figure 79: Alarm Note settings*

## 5.5 CRASH REPORT

If the software crashes down, the user can send us a detailed report within all the information related to this crash.

Alarm Management

Email Config. DAQ Alarm Health Status SSD DAQ Mode Alarm DAQ Mode File Format DIN 4150-3 Config **Crash report**

Send crash report to BeanScape Tech Team

Note: Required Fields are marked with \*

Company Name\*:

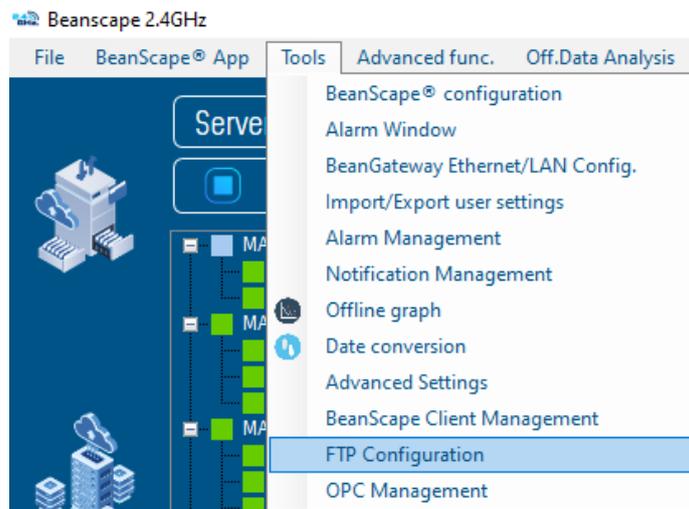
User Name:

To (for test purpos

*Figure 80: Crash Report settings*

## 5.6 FTP CONFIGURATION

The user has the ability to send all his measurement data log files to the FTP Server through the FTP feature.



*Figure 81: FTP Configuration*

Check FTP enable check box then enter the right FTP Server setting using the following window

**Figure 82: FTP configuration window**

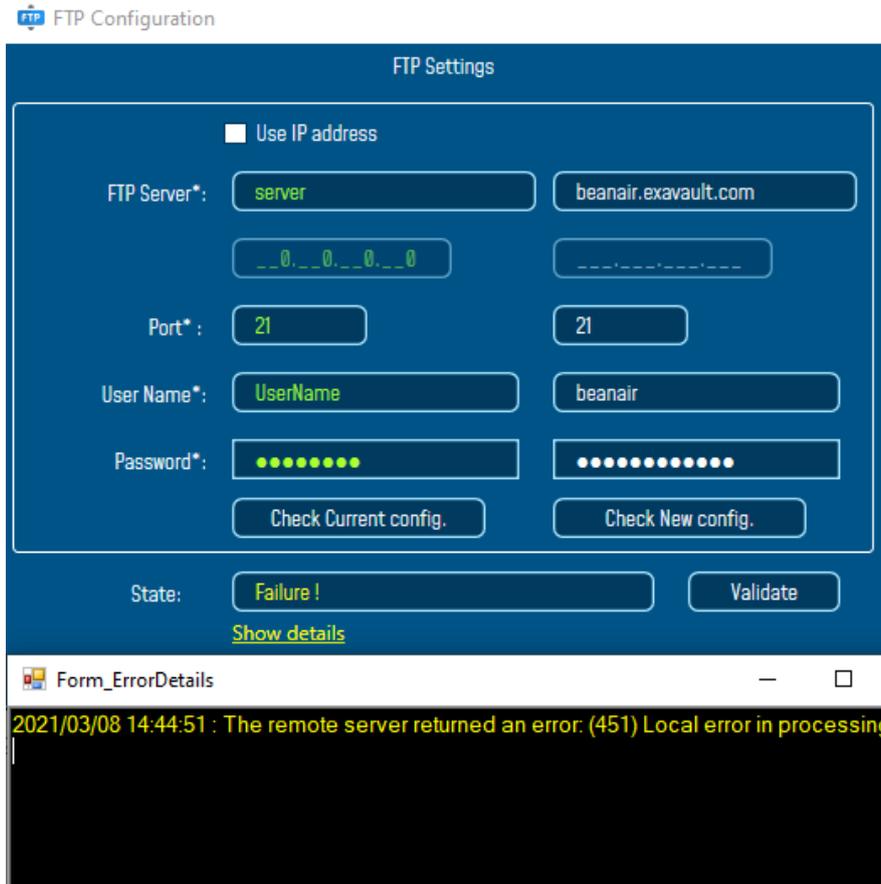
You should connect to your FTP server before setting up the FTP configuration on the BeanScope software.

**Figure 83: FTP Server settings**

- **FTP Server:** Enter your FTP Server DNS or IP address by checking use IP address checkbox
- **User Name:** Enter your FTP user name
- **Password:** Enter your right FTP password
- **Port:** By default, the FTP port is 21, you can change it also
- **Check New Configuration:** click on check new configuration to make sure the settings are correct.
- **Validate:** click on validate to save the setting and proceed

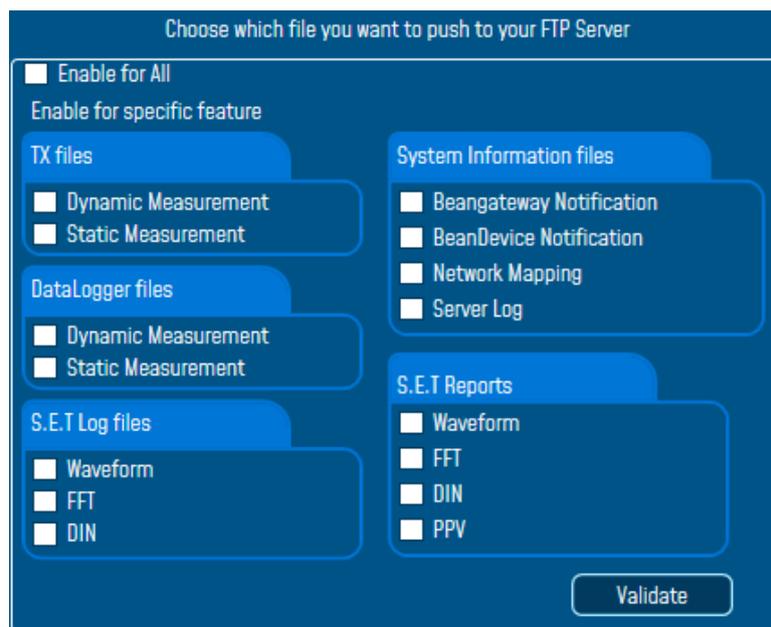
- **State:** display if the connection status successfully established or failed.

If the connection was failed please click the Show details link to see the cause of the issue.



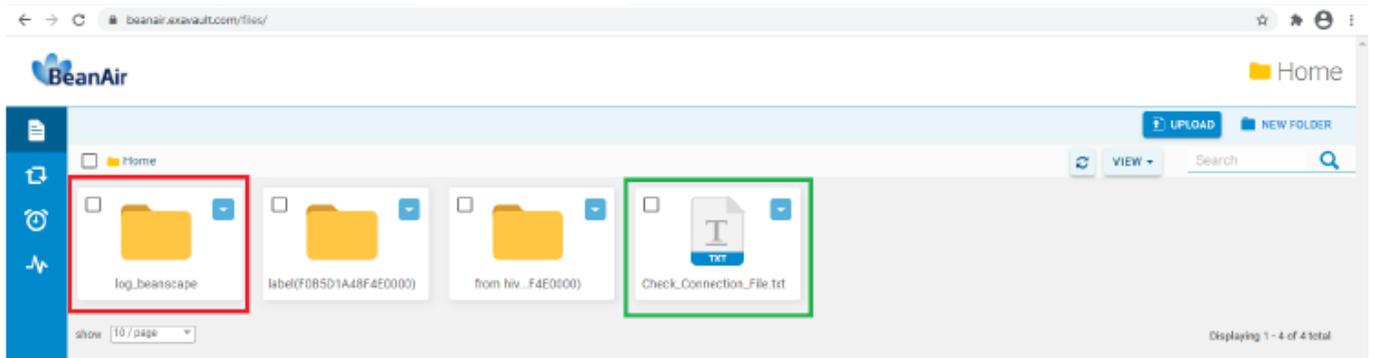
**Figure 84: Failure details**

Then check the type of files which you want to send to you FTP server, and click on Validate



**Figure 85: the available type of files**

The files will be stored on your FTP server every 1 min.



***Figure 86: Files stored on the FTP server***

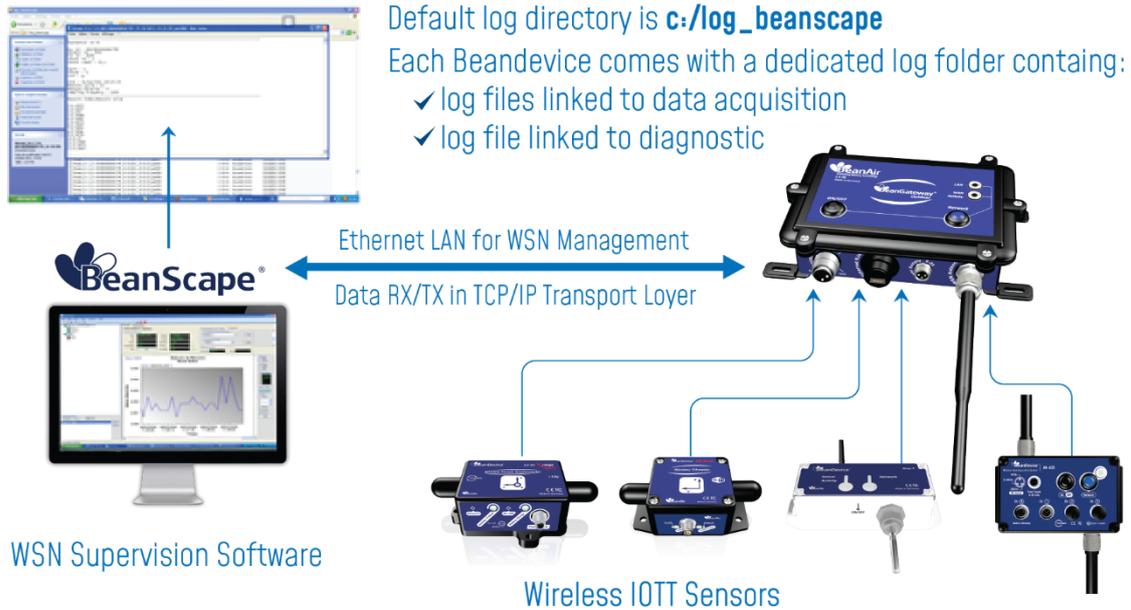


*The user have the possibility to select only Tx files and Datalogger Static measurement with the addition of the system information files options, all the other options are not compatible and available on the Eco sensors.*

## 6. APPENDICES

### 6.1 APPENDICE 1: LOG FILE & FOLDER ORGANIZATION

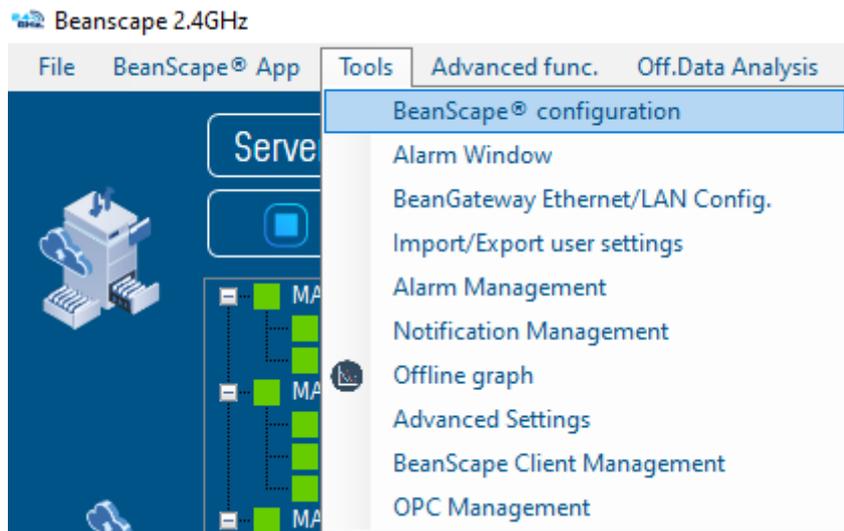
#### 6.1.1 Log file system overview



#### 6.1.2 Log file directory

By default the Log file directory is: **C:\log\_beanscape**

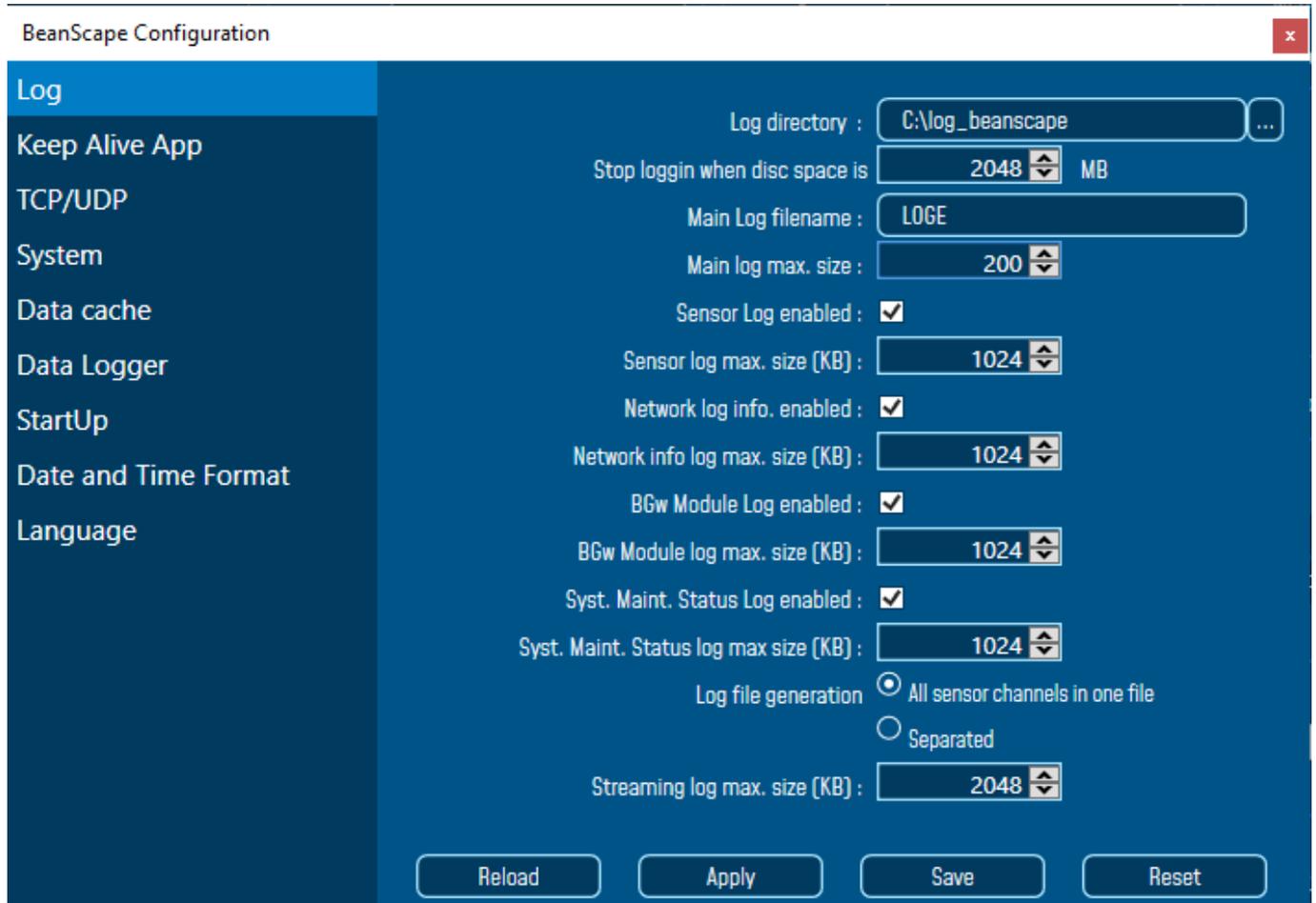
Click on the tab Tools then Options to configure advanced settings in **BeanScape®**:



**Figure 87: BeanScape® configuration menu**

This window lets you configure the logs, and the data cache.

- ✓ A second window is displayed:



*Figure 88: BeanScape® configuration window*

- ✓ Clicking the button  reverts back to its original configuration.

### 6.1.3 Log folder

By Default, log files linked to the **BeanDevice®** are stored in the log folder (located in C:/log\_beanscape directory):

**“Folder MAC\_ID”**

Only the last 4 Char of BeanDevice® MAC ID are displayed.

User can change log folder name by clicking on “Custom display” tab located on the **BeanDevice®** profile:

Datalogger	System config.	Power mode managt	Online Data Analysis
<b>Custum display</b>	Notes	Data Acq. config.	DAQ Config

Location :	<input type="text" value="Device Location"/>
Label:	<input type="text" value="MAC_ID : 0 x 00158D00000E0AE9"/>
Log folder:	<input type="text" value="Folder 0AE9"/>

**Figure 89: BeanDevice® Custom Display tab**

Enter your own log folder name, then click on validate.

The following example shows the log folder changed to “Factory2”:

<b>Custum display</b>	Notes	Data Acq. config.	DAQ Config
Location :	<input type="text" value="Device Location"/>		
Label:	<input type="text" value="MAC_ID : 0 x 00158D00000E0AE9"/>		
Log folder:	<input type="text" value="Factory"/>		

### 6.1.4 Log file size configuration

The screenshot shows the 'BeanScape Configuration' window with the 'Log' tab selected. The settings are as follows:

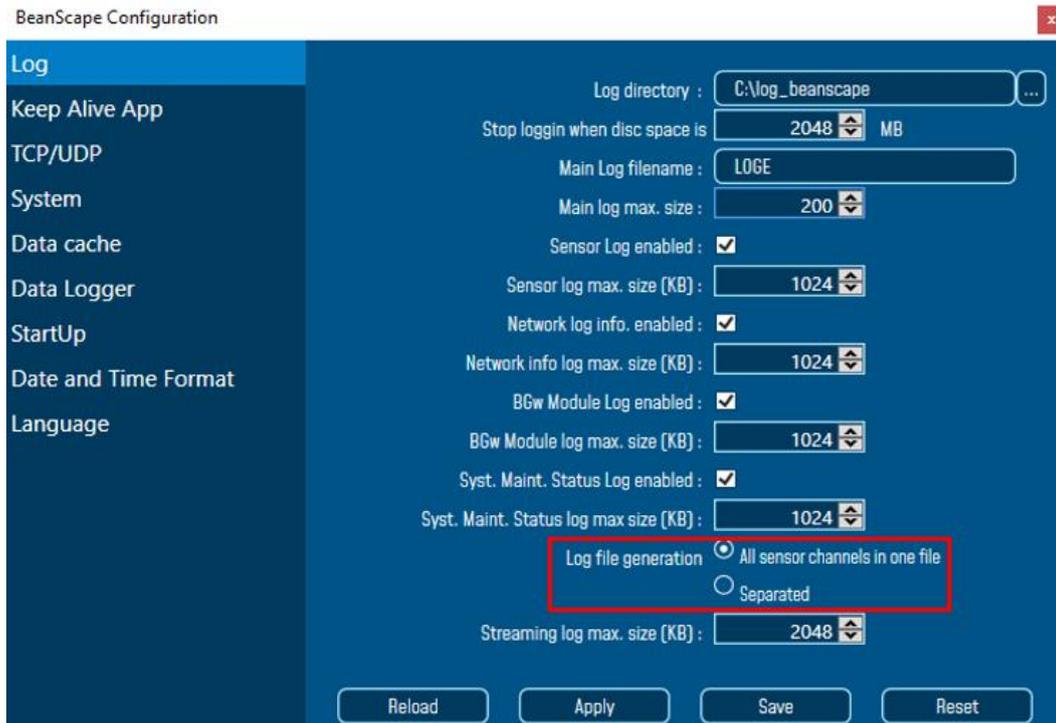
- Log directory: C:\log\_beanscape
- Stop logging when disc space is: 2048 MB
- Main Log filename: LOGE
- Main log max. size: 200
- Sensor Log enabled:
- Sensor log max. size (KB): 1024
- Network log info. enabled:
- Network info log max. size (KB): 1024
- BGw Module Log enabled:
- BGw Module log max. size (KB): 1024
- Syst. Maint. Status Log enabled:
- Syst. Maint. Status log max size (KB): 1024
- Log file generation:  All sensor channels in one file,  Separated
- Streaming log max. size (KB): 2048

Buttons at the bottom: Reload, Apply, Save, Reset.

- ✓ **LOG directory:** Enter here the path/folder where you would want to save the LOG files.
- ✓ **Main log filename:** Here you may enter the desired name in order to save the LOG file.
- ✓ **Main log max. size (KB):** Maximum file size in Kilobytes (KB) for your principal LOG file
- ✓ **Sensor Log Enabled:** Check this box if you want to enable the sensor(s) data acquisition in your LOG file
- ✓ **Sensor log max. size (KB) :** Maximum size in Kilobytes (KB) of sensor log files (**except** for streaming data acquisition mode)
- ✓ **Network log info. enabled:** Check this box if you want to enable network information in your LOG file
- ✓ **Network info log max. size (KB) :** Maximum size in Kilobytes for your network information LOG file
- ✓ **Streaming log max. size:** Maximum size in Kilobytes (KB) of sensor log files (**only** for streaming data acquisition mode)

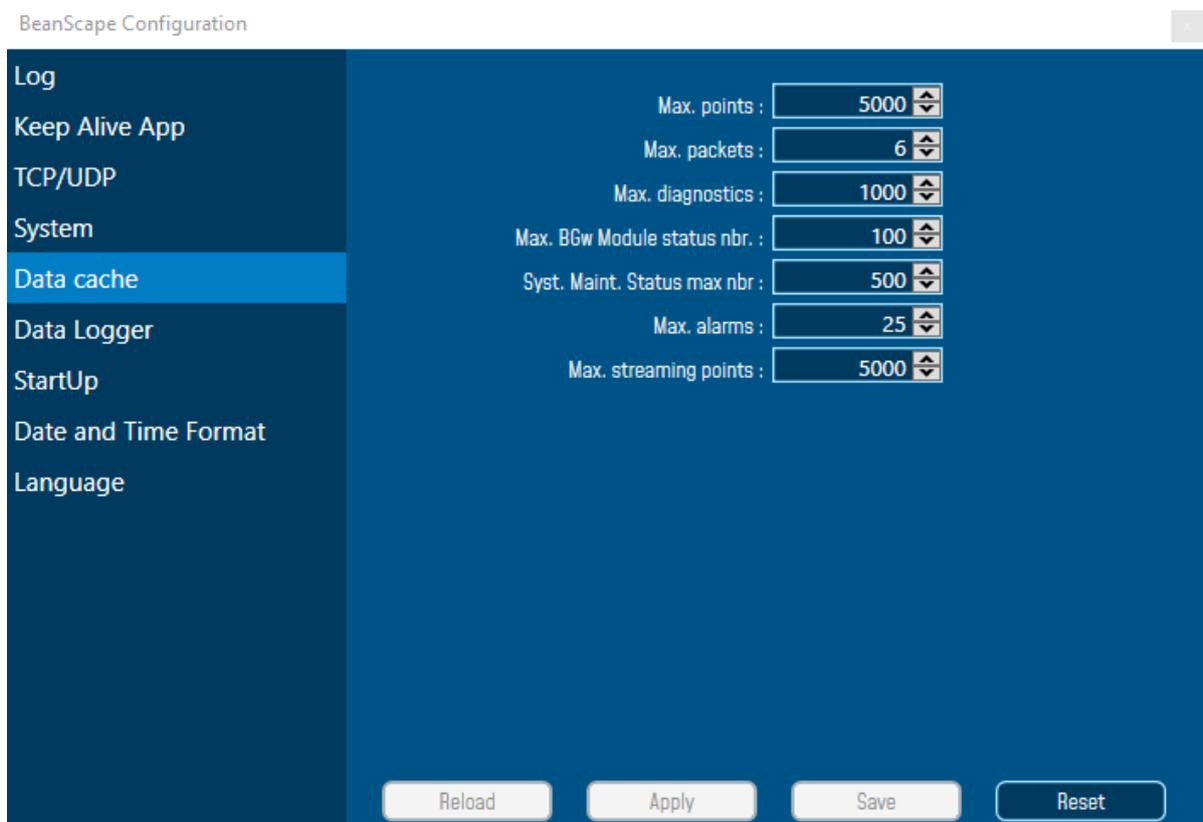
### 6.1.5 Log file generation

By default, 1 log file is linked to 1 sensor channel. The user can select a log file linked to all the sensor channels present on the BeanDevice®.



**Figure 90: Log file generation options**

### 6.1.6 Cache Data configuration (for Graph)



**Figure 91: Data cache configuration options**

- ✓ **Maximum number of points:** Set here the maximum number of points displayed on the BeanScope® graph
- ✓ **Maximum number of packets:** Set here the maximum number of packets displayed on the BeanScope® graph
- ✓ **Max number of diagnostics:** Set here the maximum number of diagnostics displayed on the BeanScope® graph
- ✓ **Max number of alarms:** Set here the maximum number of alarms displayed on the BeanScope® graph
- ✓ **Maximum number of GPS coordinates:** Set here the maximum number of GPS information;
- ✓ **Maximum streaming points:** Set here the maximum number of points displayed in Streaming on the BeanScope® graph



**Please note that the values backed up by the BeanScope® may affect the memory capacity of your computer depending upon the size of every file.**

## 6.1.7 Log file related to data acquisition

### 6.1.7.1 Log filename root

For each sensor channel a log file is automatically created by the BeanScope®.

The user can easily change the log file root:

Click on sensor channel profile

Click on Log Config tab

**Figure 92: Overview: Log Config tab on BeanScope®**



**This tab should not be confused with the Datalogger feature available on the BeanDevice®.**

Log filename root: Transmit\_LowDutyCycle\_Ch\_DP\_MAC\_ID : 0 x 00158D00000E1134

Log configuration

Log enabled

Log filename auto.

Validate

The file name will be changed only if the separated files generation is enabled.

**Figure 93: Log config tab**

By default, Log file name is built with the measurement channel & **BeanDevice®** MAC Address:

< Sensor Channel Number > <MAC\_ID>

- ✓ **Log enabled:** If checked, Log is enabled on the BeanScape®
- ✓ **Log filename auto.:** If checked, Log file name is named automatically

Click on **validate** in order to validate all your modifications.

For users who want to rename the log file, two solutions are provided:

<b>Solution 1</b>	<p><i>Add automatically the channel "Label" in your log file name:</i></p> <p><i>&lt;Label&gt;&lt;Sensor channel Number&gt; &lt;MAC_ID&gt;</i></p>
<b>Solution 2</b>	<p><i>The log file name can be fully customized:</i></p> <p><i>Uncheck the case « Log filename auto" and add your own label</i></p>

### 6.1.8 Log file related to Wireless Network diagnostic

#### 6.1.8.1 Log filename organization

Wireless Diagnostic log filename is built as follow:

**MAC\_ID\_WirelessNetwkInfo**

- ✓ **MAC\_ID:** *BeanDevice® MAC ID*
- ✓ **DATE:** *date when the streaming mode starts*

#### 6.1.8.2 Log file analysis

Log file related to wireless network diagnostic provides the following information:

- **Date:** diagnostic date
- **LQI TX:** Link quality indicator on the BeanDevice® side
- **LQI RX:** Link quality indicator on the BeanGateway® side
- **Local PER TX:** Local Packet Error Rate on the BeanDevice® side
- **Local PER Rx:** Local Packet Error Rate on the BeanGateway® side
- **Global PER:** N.A.
- **Battery voltage:** internal battery voltage
- **Battery level:** battery level of charge
- **Internal temperature:** Local temperature of the BeanDevice®

```

00158D0000E1134_WirelessNetwInfo.txt - Notepad
File Edit Format View Help
-----
BeanComponent Wireless Network Information
DATE_FORMAT : M/d/yyyy h:mm:ss tt
Date : 12/25/2020 12:40:42 PM
PAN_ID : 02D3
MAC_ID : 00158D0000E1134
-----
Date ; LQI Tx ; LQI Rx ; Local PER Tx ; Local PER Rx ; Battery Voltage ; Battery Level ; Internal Temperature ; DisableDischarge ; DisableCharge ; DischargeOverCurrent ; Charg
12/25/2020 12:40:40 PM;120;0;0;0;3.517;80.33;15.000;NA;NA;NA;NA;NA;0.00
12/25/2020 12:41:11 PM;198;0;0;0;3.213;41.66;16.375;NA;NA;NA;NA;NA;0.00
12/25/2020 12:42:19 PM;168;0;0;0;3.334;47.33;16.875;NA;NA;NA;NA;NA;0.00
12/25/2020 1:02:15 PM;174;0;0;4.44;3.335;47.83;14.625;NA;NA;NA;NA;NA;0.05
12/25/2020 1:22:15 PM;156;0;0;2.35;3.334;47.33;15.625;NA;NA;NA;NA;NA;0.11
12/25/2020 1:42:15 PM;150;0;0;1.6;3.333;47.16;15.000;NA;NA;NA;NA;NA;0.17
12/25/2020 2:02:15 PM;150;0;0;3.55;3.332;46.83;15.250;NA;NA;NA;NA;NA;0.22
12/25/2020 2:22:15 PM;156;0;0.08;2.87;3.334;47.83;14.875;NA;NA;NA;NA;NA;0.28
12/25/2020 2:42:15 PM;156;0;0.06;2.4;3.335;47.83;14.500;NA;NA;NA;NA;NA;0.34
12/25/2020 3:02:15 PM;192;0;0.05;2.74;3.335;47.50;16.000;NA;NA;NA;NA;NA;0.40
12/25/2020 3:22:15 PM;186;0;0.05;2.41;3.331;46.16;14.875;NA;NA;NA;NA;NA;0.45
12/25/2020 3:42:15 PM;156;0;0.04;2.15;3.332;47.33;15.250;NA;NA;NA;NA;NA;0.51
12/25/2020 4:02:15 PM;192;0;0.04;2.42;3.333;47.33;14.875;NA;NA;NA;NA;NA;0.57
12/25/2020 4:22:15 PM;156;0;0.03;3.06;3.331;46.66;15.375;NA;NA;NA;NA;NA;0.63
12/25/2020 4:42:15 PM;156;0;0.03;2.81;3.334;47.83;14.375;NA;NA;NA;NA;NA;0.68
    
```

If the BeanDevice® is configured with the streaming data acquisition mode, the following diagnostic information are not refreshed:

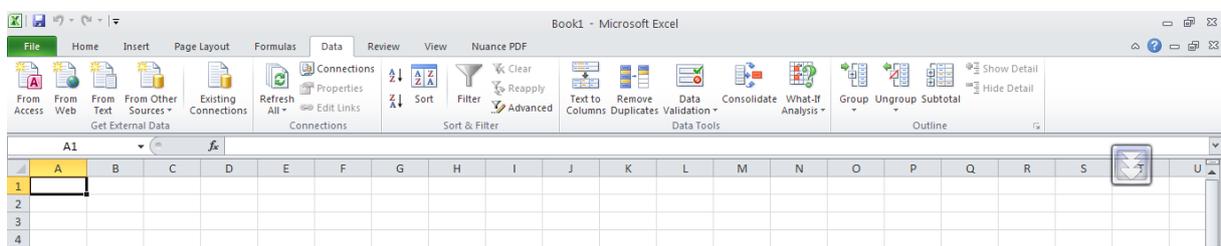
- **Battery voltage**
- **Battery level**
- **Internal temperature**

```

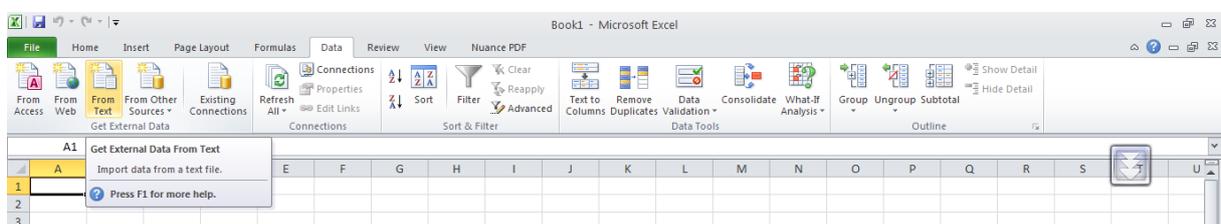
Fichier Edition Format Affichage ?
-----
BeanComponent Wireless Network Information
Date : 5/15/2014 4:50:44 PM
PAN_ID : 31BB
MAC_ID : 00158D0000AD564
-----
Date ; LQI Tx ; LQI Rx ; Local PER Tx ; Local PER Rx ; Global PER ; Battery Voltage ; Battery Level ; Internal Temperature
5/15/2014 4:50:43 PM;174;NA;0.00;NA;0.00;4.094;0.00;24.625;N;N;N;N;N; NA
15/05/2014 16:50:45.000000;168;;0.00;;;;
15/05/2014 16:50:45.150000;180;;0.00;;;;
15/05/2014 16:50:45.300000;162;;0.00;;;;
15/05/2014 16:50:45.450000;168;;0.00;;;;
15/05/2014 16:50:45.600000;174;;0.00;;;;
15/05/2014 16:50:45.750000;186;;0.00;;;;
15/05/2014 16:50:45.900000;138;;0.00;;;;
15/05/2014 16:50:46.050000;144;;0.00;;;;
15/05/2014 16:50:46.200000;168;;0.00;;;;
    
```

6.1.8.3 How to open a measurement file with excel

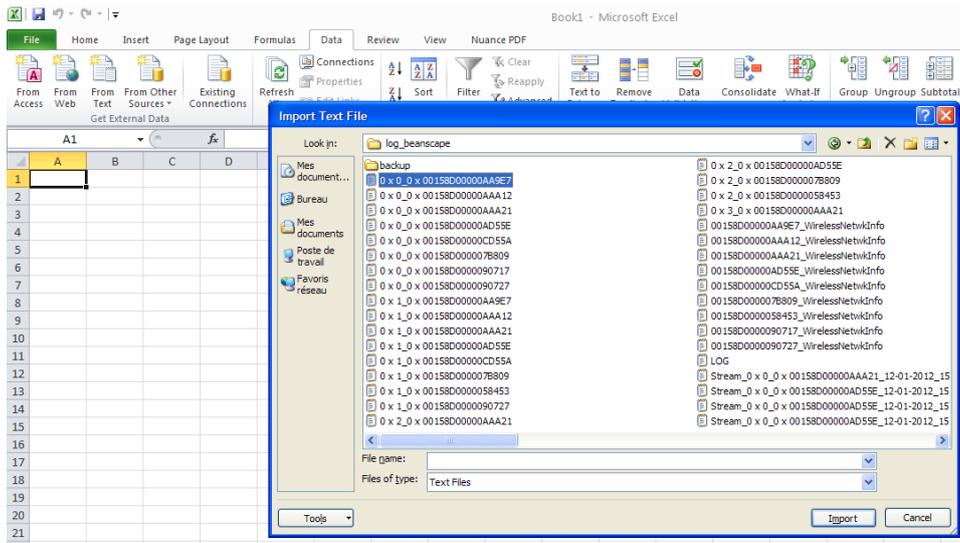
Step 1 : Open Excel



Step 2: Go on « Data » Tab, then select “From Text”

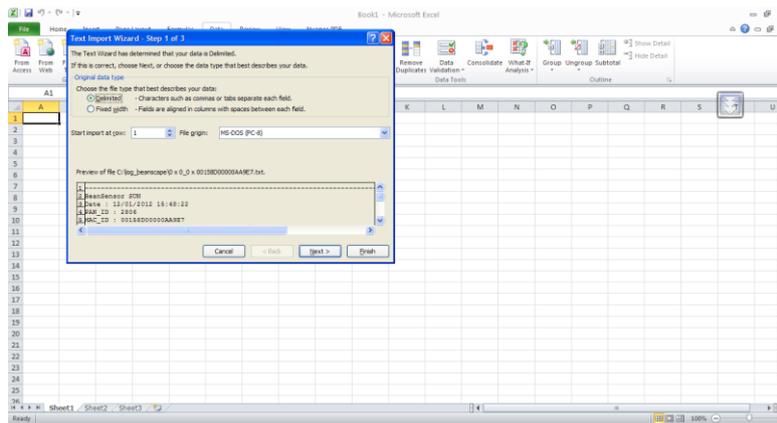


**Step 3 : Choose your log file**



**Step 4 : Text import wizard will open, select « Delimited » for Characters such as commas or tabs separate each field.**

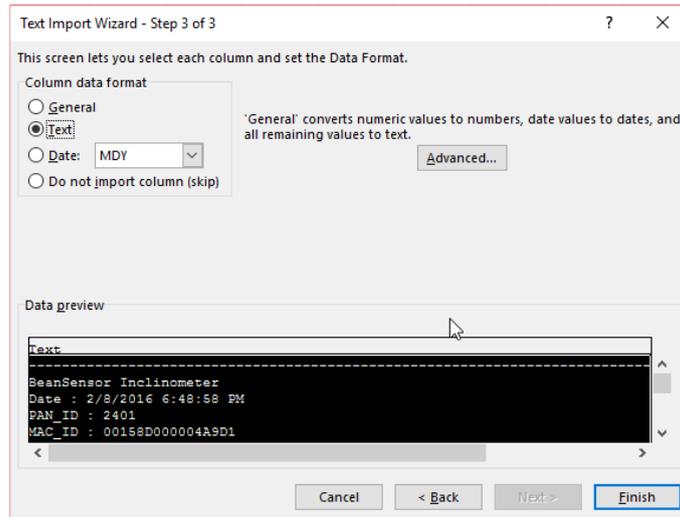
On “**Start import at row**” field: Select the number of lines that you want to suppress from the header:



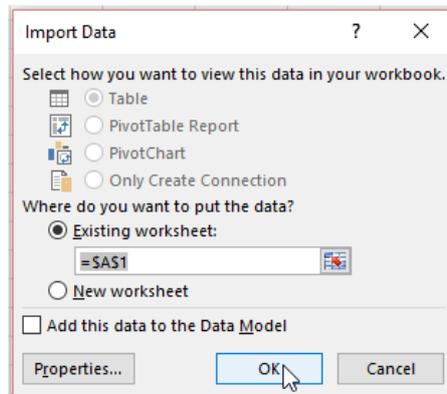
Select semicolon



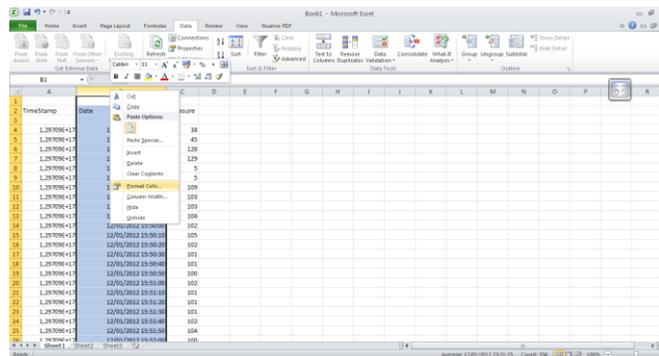
Select Text



Click on OK



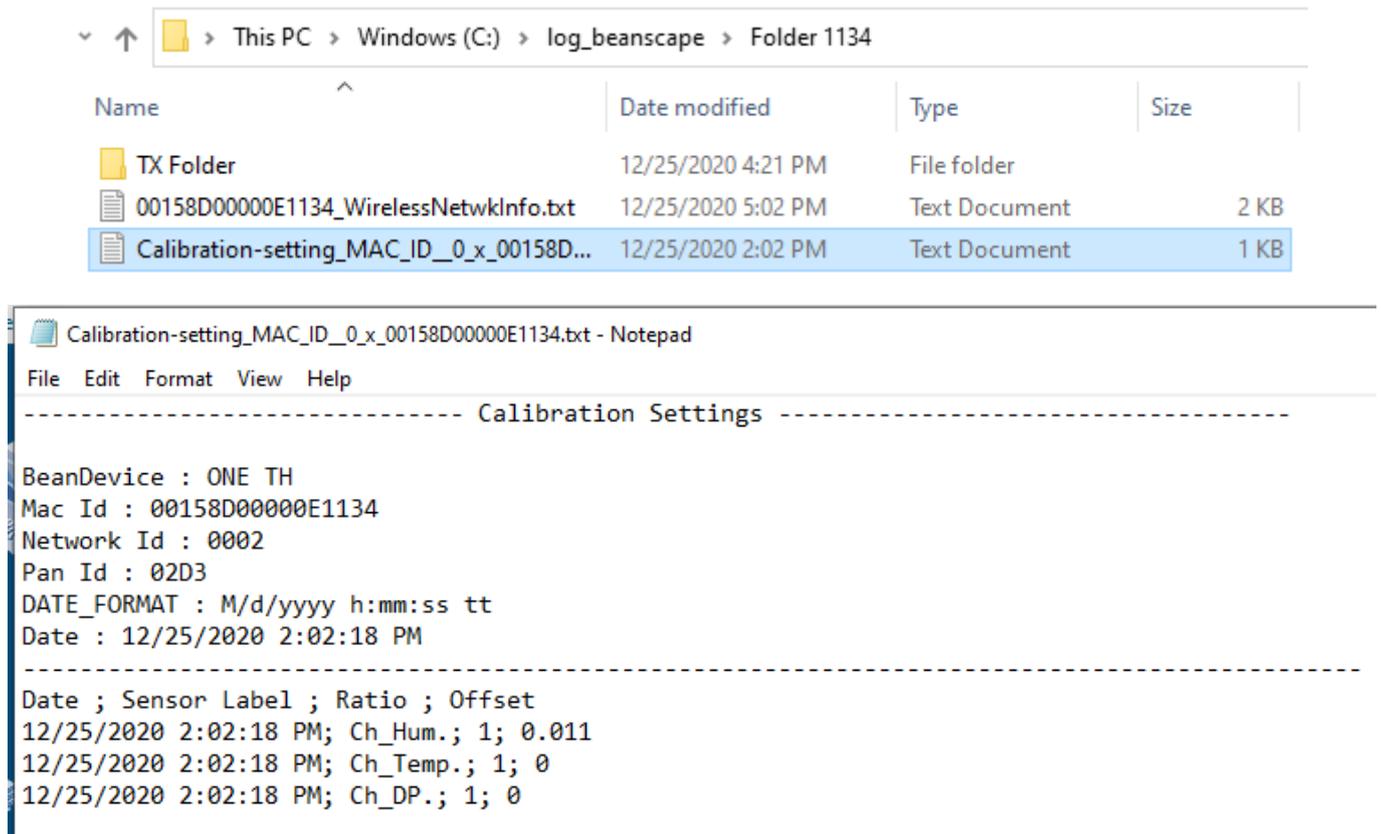
Click on format cells:



[See “Exporting a log file to Excel” YouTube video](#)

#### 6.1.8.4 Calibration settings log file

Once you connect the BeanDevice® to the BeanGateway® for the first time, all the calibration values will be backed up in the Calibration settings log file inside the BeanDevice folder.



File Explorer path: This PC > Windows (C:) > log\_beanscape > Folder 1134

Name	Date modified	Type	Size
TX Folder	12/25/2020 4:21 PM	File folder	
00158D00000E1134_WirelessNetwkInfo.txt	12/25/2020 5:02 PM	Text Document	2 KB
Calibration-setting_MAC_ID_0_x_00158D...	12/25/2020 2:02 PM	Text Document	1 KB

```
Calibration-setting_MAC_ID_0_x_00158D00000E1134.txt - Notepad
File Edit Format View Help
----- Calibration Settings -----
BeanDevice : ONE TH
Mac Id : 00158D00000E1134
Network Id : 0002
Pan Id : 02D3
DATE_FORMAT : M/d/yyyy h:mm:ss tt
Date : 12/25/2020 2:02:18 PM
-----
Date ; Sensor Label ; Ratio ; Offset
12/25/2020 2:02:18 PM; Ch_Hum.; 1; 0.011
12/25/2020 2:02:18 PM; Ch_Temp.; 1; 0
12/25/2020 2:02:18 PM; Ch_DP.; 1; 0
```

***Figure 94: Calibration log file***

If you change the your BeanDevice® calibration values, you can easily retrieve them from the calibration settings log file.

## 6.2 APPENDICE 2: BEANDEVICE® MAINTENANCE & SUPERVISION

This section allows to an experienced user to configure correctly the Wireless Sensor Networks.

### 6.2.1 Extending the battery life

The battery life depends on several parameters:

- ✓ Operating temperature
- ✓ Data acquisition cycle & mode



*For further information about the current consumption on a BeanDevice® during sleeping & active power mode, please read the technical note: [TN RF 002 - Current consumption in active & sleeping mode](#)*

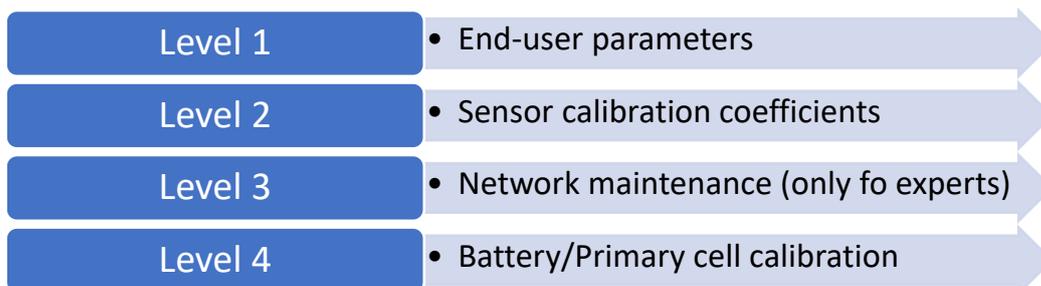
The following table gives you a list of recommendations in order to extend the battery autonomy of your BeanDevice®:

Influence factors on battery autonomy	Observations	Recommendations
<i>Data acquisition cycle</i>		
<i>TX Power</i>	Power consumption will grow with the TX Power	If your wireless range is low, try to use a lower TX Power.
<i>Packet Error Rate (PER)</i>	A high packet error rate can cause a higher retransmission data and this increase the current consumption.	Try to replace your BeanDevice® in an area where the radio link is much better (see Link Quality Indicator value).

### 6.2.2 Over-the-air Configuration (OTAC) parameters

The BeanDevice® integrates an internal flash memory used for backing up OTAC (Over-the-air configuration) parameters.

This memory is organized into several levels:



### 6.2.3 Level 1: End-user OTAC parameters

The following table presents all the defaults configuration parameters:

Parameter	BeanDevice® version		
	ONE-T	ONE-TH	ONE-TIR
Power Mode	Sleeping		
Data Acquisition duty cycle	1 minute		
Data Acquisition mode	LowDutyCycle		
TX Power	+15dBm		
Alarms Threshold	H1 :2 ou10 H2 :2 ou 10 L2 :-2 ou -10 L1 :-2 ou -10	H1 :20 H2 :20 L2 :0 L1 :0	H1 :20 H2 :20 L2 :0 L1 :0



To restore these defaults parameters, you must perform a Network context deletion. The user should press the button network ("Network") network for more than 2 seconds.



Level 2, 3 & 4 of Configuration parameters are not affected by network context deletion (by hardware or software)

### 6.2.4 Network diagnostic from your BeanScape® software

This chapter describes the network diagnostic tool available on the BeanScape®.

### 6.2.5 Sensor operating status

Two states of the sensor operating status exist:

- **On** : the sensor is enabled
- **Off** : the sensor is disabled

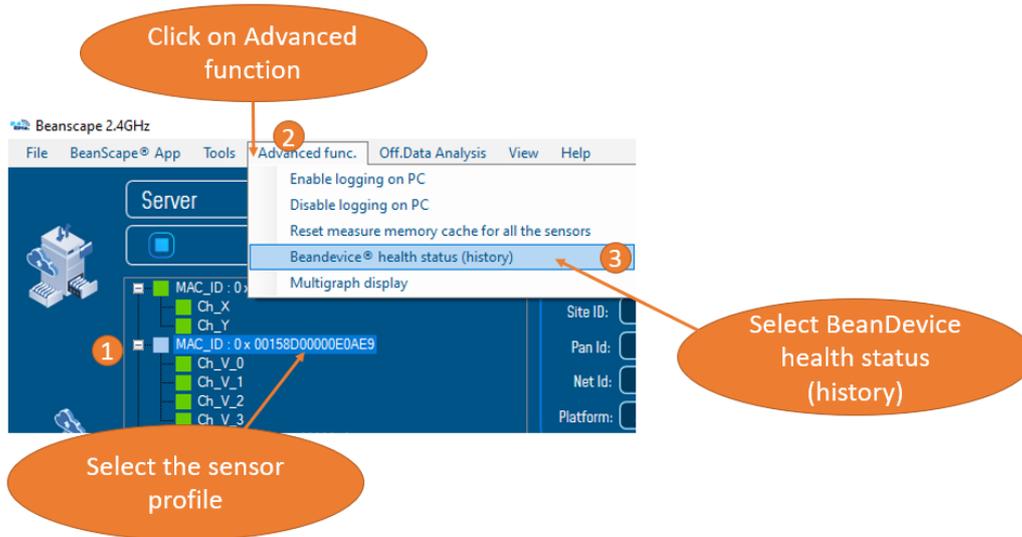


The BeanDevice® checks the sensor connection and its status. It decides to disable the sensor when:

- ✓ The sensor is disconnected;
- ✓ A short-circuit is present on the sensor;
- ✓ The sensor doesn't respond;

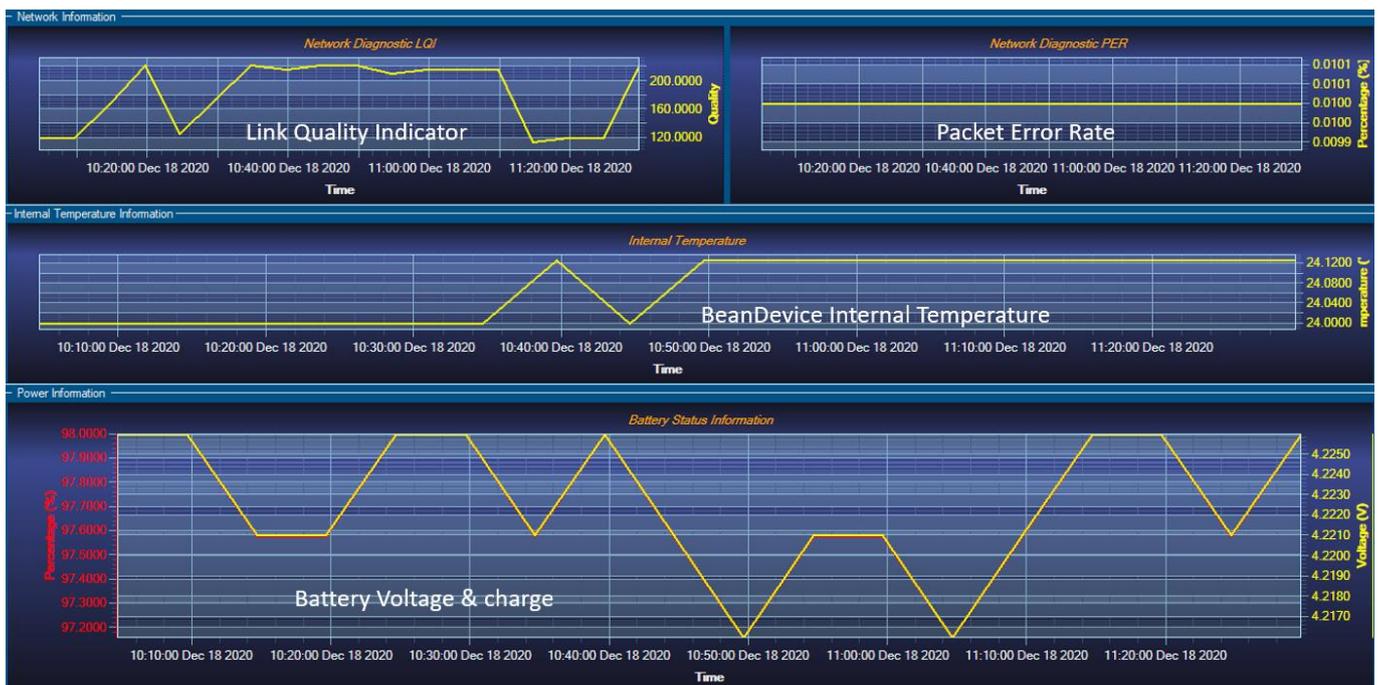
**6.2.6 Displaying BeanDevice® health status information**

From your BeanScope® interface, click on a BeanDevice® profile displayed on the left window, a tab “Advanced Func.” will appear on the top of the window. Click on this tab, and then click “BeanDevice® health status (History)”.



**Figure 95: BeanDevice® health status option**

**A new window will appear:**



**Figure 96: BeanDevice® health status window**

✓ **PER (Packet Error Rate):**

**Packet error rate** (PER) is the number packet errors divided by the total number of transferred packets during a studied time interval. PER is a unit less performance measure, often expressed as a percentage number.

PER is only available with IEEE 802.15.4 Network, it represents the ratio of “lost data/data send” between the BeanDevice® and the BeanGateway®.

✓ **LQI (Link Quality Indicator)**

LQI (Link Quality Indicator) represents the radio signal quality in your Environment. It is possible that LQI is low due to EMC interference or metal presence in the environment.

**If you encounter such problems, several solutions are proposed to increase your LQI:**

- ✓ Use the Maximum TX Power on your BeanDevice. The maximum TX Power authorized in Europe for indoor application is 12 dBm. For Outdoor application, you are authorized to extend the TX Power to 18 dBm. You can easily configure the TX Power on your BeanDevice from your BeanScape WSN software supervision.
- ✓ Try to configure your receiver antenna and your transmitter antenna on the same antenna pattern (cf. the Beam with of your antenna)
- ✓ Use a high gain antenna (in outdoor use only) for a better RF Link Budget
- ✓ Fix your BeanDevice & BeanGateway on a top of a mast or a building.



*For further information, read the application note on “How to extend your wireless range?”*

■ **Internal temperature monitoring**

An internal temperature sensor is used for onboard & battery temperature monitoring

■ **Battery charge monitoring**

Battery charge is based on current accumulation. The BeanDevice® integrates a current accumulator circuit which facilitates remaining capacity estimation by tracking the net current flow into and out of the battery. Current flow into the battery increments the current accumulator while current flow out of the battery decrements it.

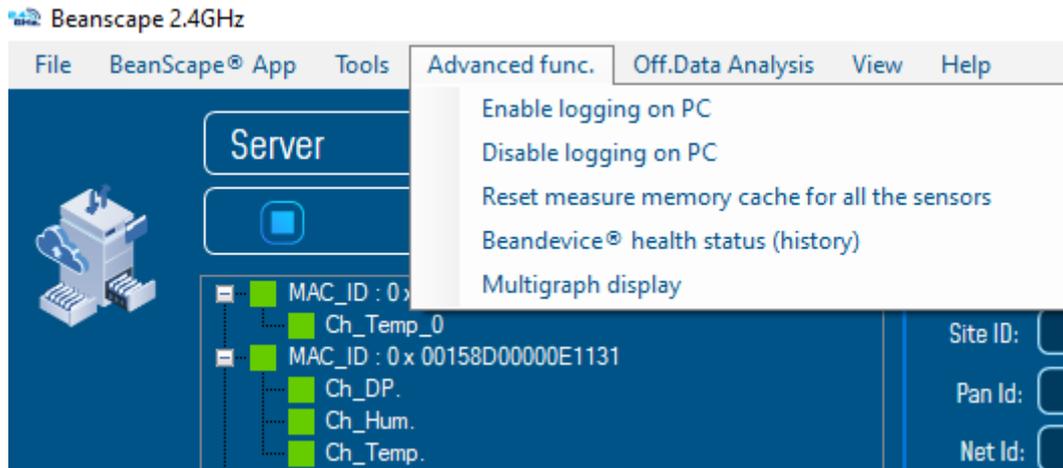
Voltage measurement corresponds to battery voltage.

### **6.2.7 Scrolling menu « BeanSensor »**

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The BeanSensor® scrolling menu provides access to additional features: like the multi-graph mode (display of multiple windows on a graph measuring the same screen), deleting graphs displayed and the activation / deactivation of logging measurements.

To access to this scrolling menu, click on the sensor attached to your BeanDevice®. You will then see the BeanSensor® scrolling menu appearing.



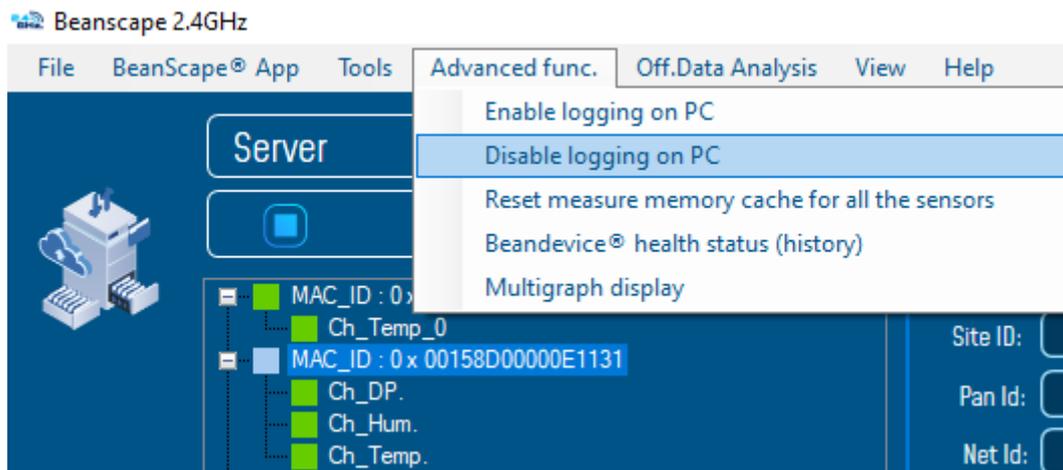
**Figure 97: BeanDevice® Scrolling menu**

By clicking on the scrolling menu « BeanSensor », you can access to the following features :

#### **Disable/Enable log**

All the data received on the BeanScape® are stored in a log file in CSV format.

This feature allows you to enable / disable data logging on your log file.



**Figure 98: BeanSensor: Enable/Disable Log**



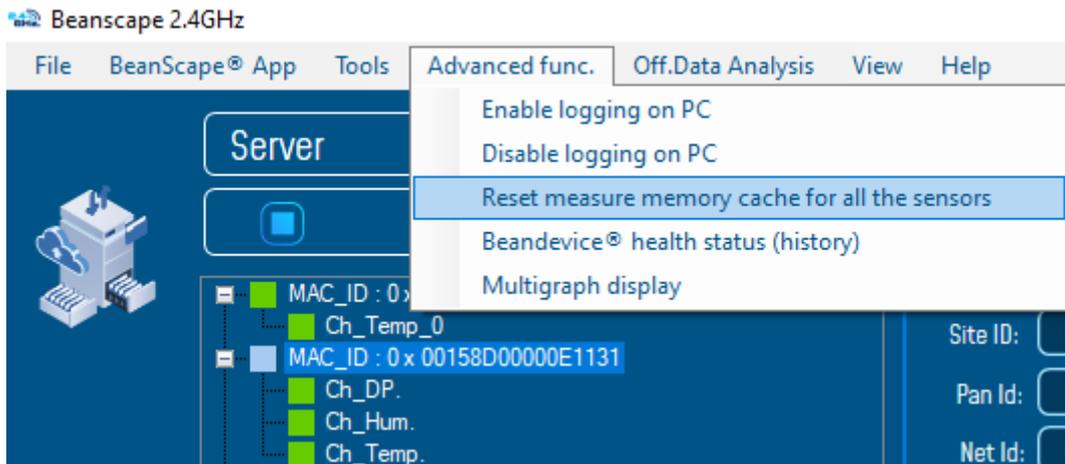
*For further information about CSV log file, please read the Beanscape® user manual.*

#### **Buffer reset**

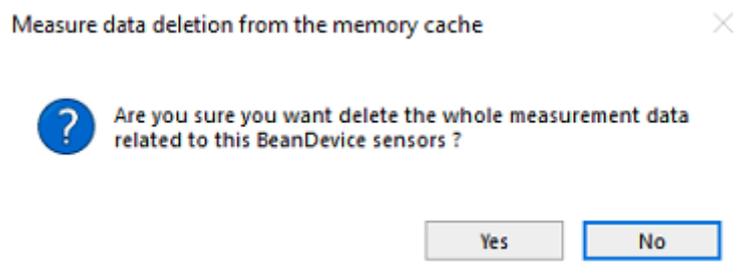
This function clears the graphical display concerning recorded measurements of your sensor. The data stored in a log are not affected by this function.

By clicking on « Buffer reset », a second window appears asking you to confirm your choice:

- ✓ Yes, you accept to delete the whole measure data of this BeanSensor;
- ✓ No, don't delete the whole measure data of this BeanSensor;



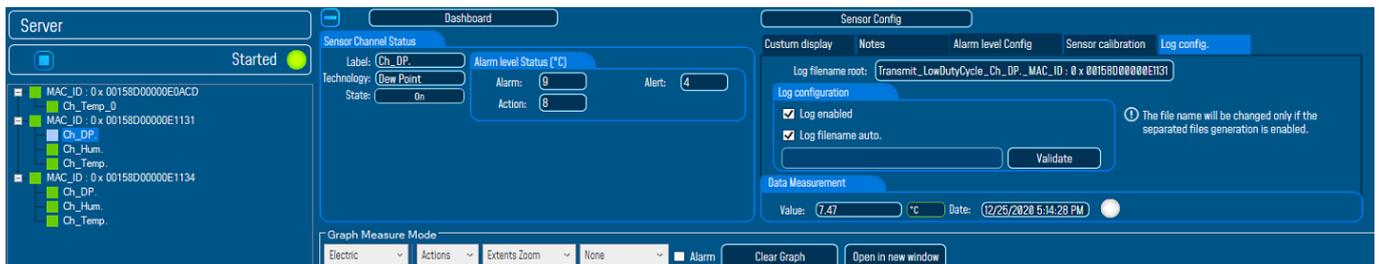
**Figure 99: BeanSensor: Buffer Reset option**



**Figure 100: Buffer Reset**

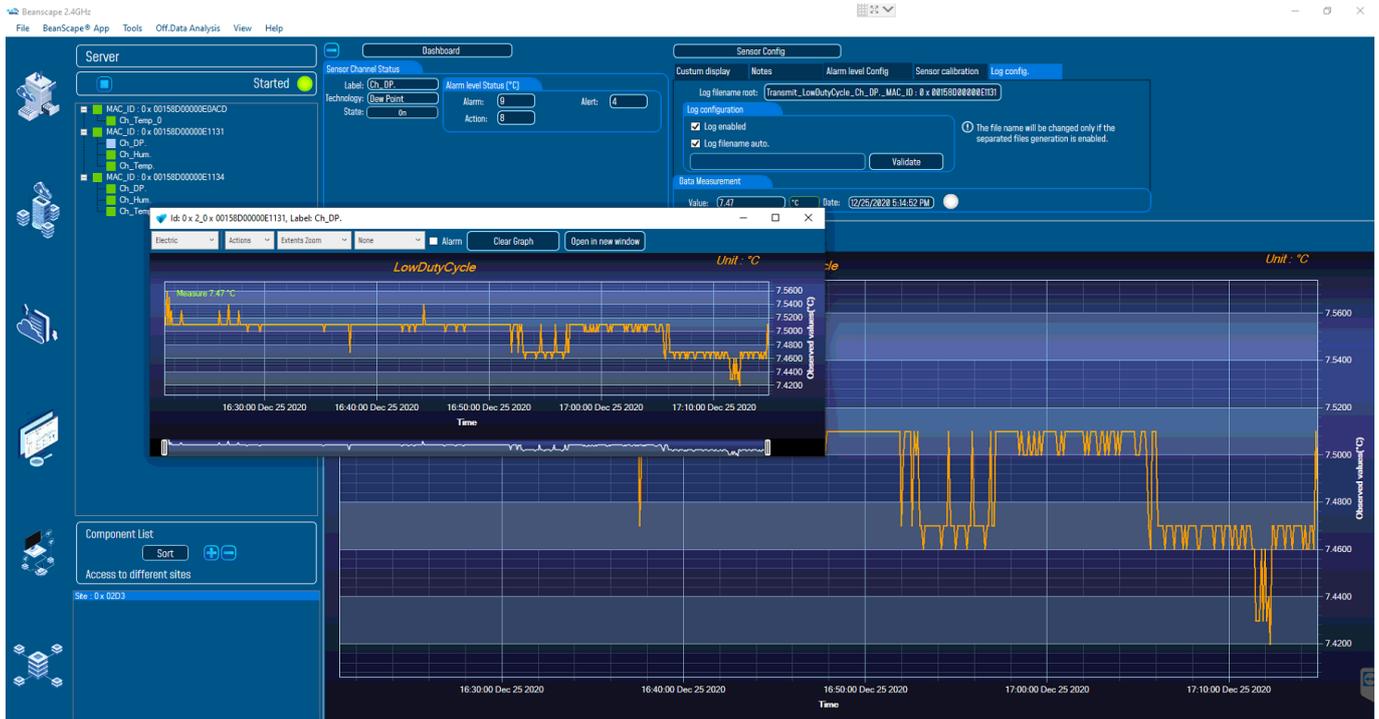
### **Open the graph in a new window**

By clicking on “Open the graph in a new window”, you can open a graph corresponding to your sensor.



**Figure 101: BeanSensor: Open the graph in a new window**

You can easily open several graphs in a window.



**Figure 102: Graph displayed in separated windows**



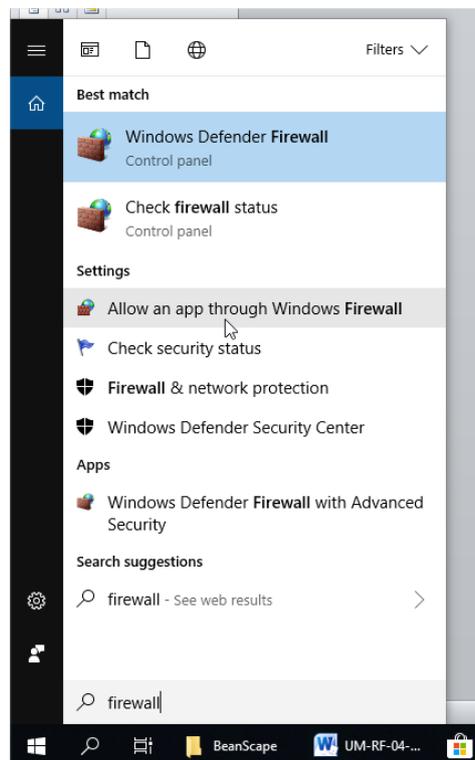
**The multi-graph mode requires a lot of resources on your computer, it is recommended to install the BeanScope® software on a powerful computer.**

### 6.3 FIREWALL EXCEPTION FOR BEANSCAPE®

By default, firewall blocks all unknown network traffic coming in to the network. To permit traffic through the firewall we create exceptions (or rules) that allow certain traffic on the network. In our case the rules are defined by the software which is BeanScape.

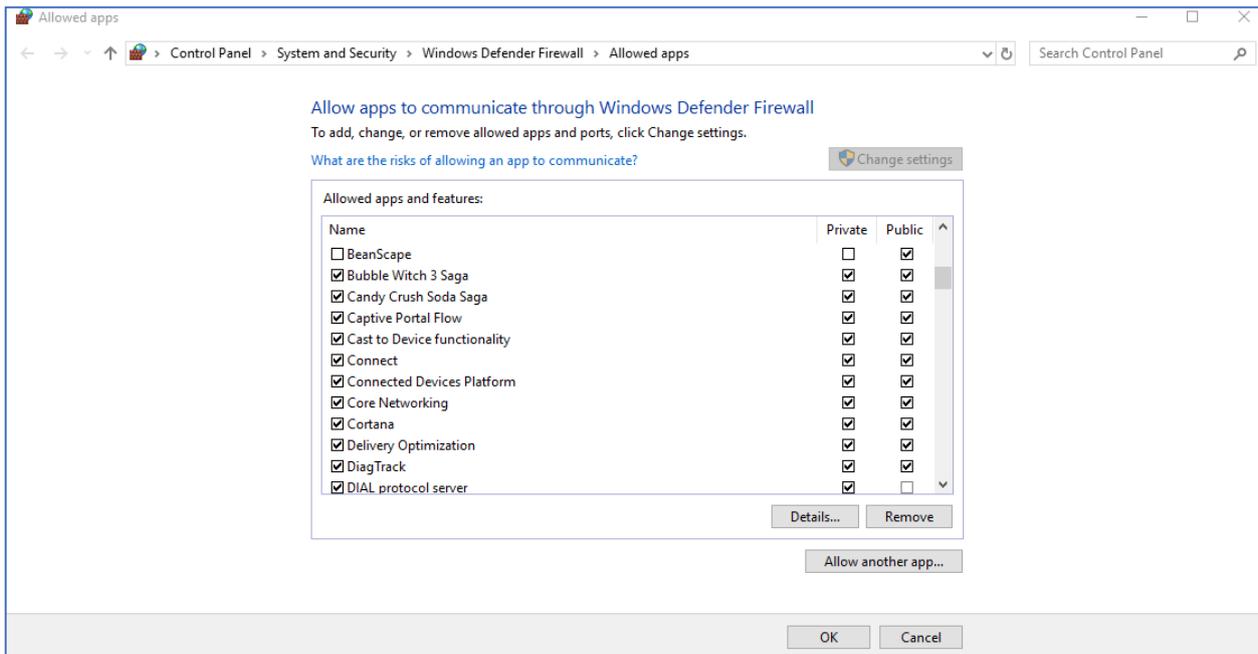
Usually when launching BeanScape for the first time your Windows OS will ask you to add an exception and to allow the software to use your network resources, however in case this doesn't occur or rejected, manually adding BeanScape to exceptions list is possible through these following steps:

1. Use your Search bar at the windows launcher and look for “[Allow an app through Windows Firewall](#)”



*Figure 103 :Windows search for firewall screenshot*

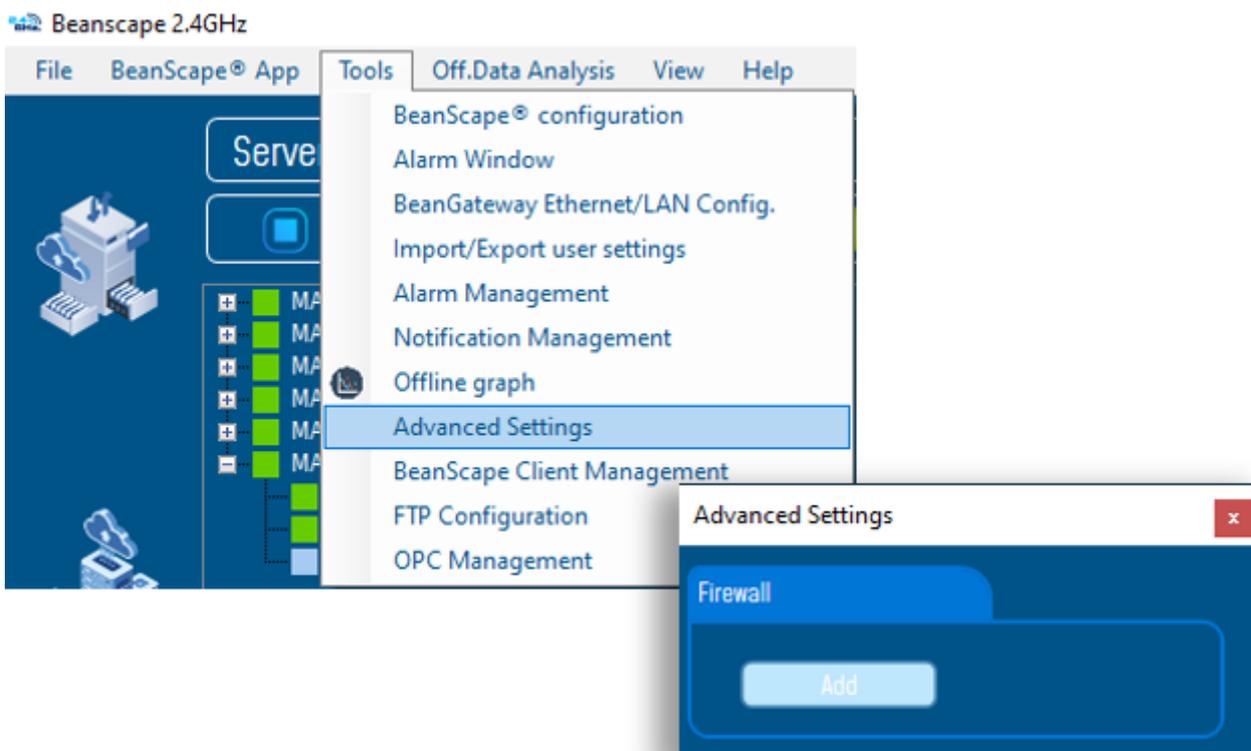
2. Look for BeanScape in the list and check its box, check Private if you are only willing to use BeanScape in your LAN or Public for allowing remote access from outside the LAN. Validate and your BeanScape will be allowed in your network.



**Figure 104: allowed apps window**

If you are not familiar to configure a firewall exception, you can directly from BeanScape® add this rule automatically.

On the BeanScape® menu select Tools, then Advanced Settings then click on validate to add BeanScape® to the Firewall.



**Figure 105: Firewall auto exception**

## 7. TROUBLESHOOTING

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### ■ *Why the Red LED is flashing?*

Each time a packet is lost by the BeanDevice®, Nwk/Activity led will blink in red. Try to decrease the wireless range between the BeanGateway® and the BeanDevice®.

### ■ *Why the BeanDevice® LEDS are not activated?*

If there is no wireless network activity, the led will be inactive. Make sure you have powered your BeanDevice® with a charged battery.

### ■ *What should I do if the radio channel is perturbed?*

Please turn off your BeanDevice®, and then choose an appropriate channel. The channel selection is done from the BeanGateway®.

For further information, please Read BeanGateway User's Manual BeanGateway®.

### ■ *Why the BeanDevice® does not provide the right measurement value?*

- Check if your sensor channel is activated on your BeanScope® interface (ON Position)?;
- Check if your BeanDevice® is powered up;
- Check your LQI quality, if your LQI is under 50-60. You must change your antenna position, or your product position;
- Check your data acquisition mode, maybe you have specified a data acquisition which is too long ;
- If you use a BeanDevice® AN-XX :
  - Check your sensor power supply, maybe you need to increase/decrease your power supply;
  - Check your sensor preprocess time. Maybe your sensor preprocess time is too short ?
  - Check the wiring code of your sensor plug ;

### ■ *Why the BeanDevice® doesn't respond when I try to configure it (Over-the-air-configuration)?*

- ✓ If your BeanDevice® operates in sleep mode, the RF Hardware is also in sleep mode. Therefore an Over-the-air-configuration will not be possible.
- ✓ Check the LQI (Link Quality Indicator) value, if this value is under 80, the over-the-air configuration will not be easy. Try to decrease the wireless range between the BeanDevice® and the BeanGateway®.

- ✓ If your BeanDevice® works in streaming mode, in order to keep a full synchronization of the data acquisition, any over-the-air-configuration is authorized.

■ **Why do I have too much noise on my sensor signal ?**

- ✓ If you use a BeanDevice® AX3D/HI-INC/AX-HD : don't forget to configure the cutoff frequency of your anti-aliasing filter
- ✓ If you use a BeanDevice® AN-mV: use a shielded cable.