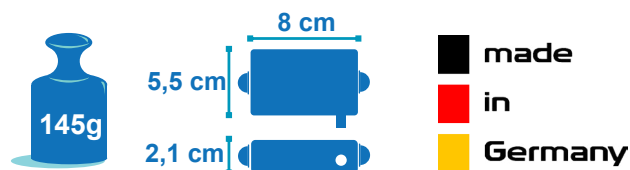


WIRELESS ACCELEROMETER DEDICATED TO SHOCK MEASUREMENT WITH INTEGRATED DATA LOGGER

2year
Warranty



//MAIN FEATURES



Wireless accelerometer dedicated to shock
Scalable measurement range :
 $\pm 6g/\pm 12g/\pm 24g$ or $\pm 2g/\pm 4g/\pm 8g$



Embedded data logger : up to 1 million data points (with events dating)



Fully autonomous system with an integrated Lithium-Ion battery charger

//APPLICATIONS

FEATURED VIDEO



BeanDevice® AX-3DS main presentation video



BeanDevice® AX-3DS - Wireless Sensor Network dedicated to health monitoring on bridge

USER MANUAL



BeanDevice® SmartSensor user manual

MECHANICAL DRAWING



BeanDevice® AX-3DS drawing

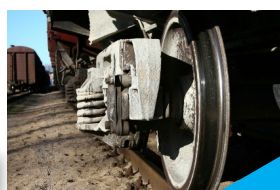
SMART SHOCK DETECTION



Waterproof for IP67 casing (Nema 6)



Excellent radio link relying on the radio antenna diversity developed by Beanair®





//SMART SHOCK DETECTION TECHNOLOGY

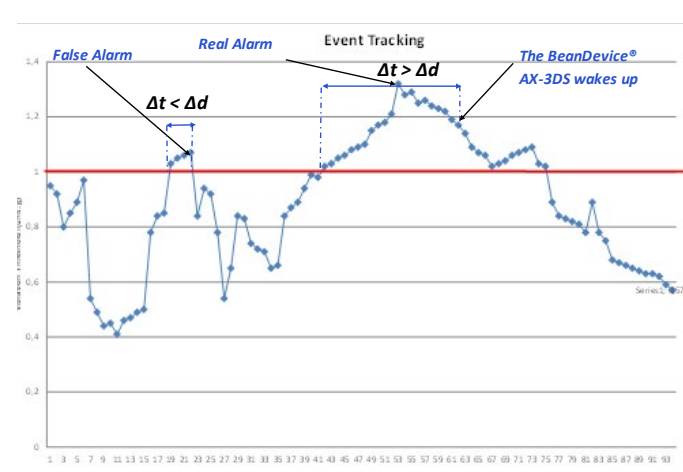
SMART SHOCK DETECTION



The **BeanDevice® AX-3DS** integrates a smart shock detection technology which permits to detect & recognize a shock event during the sleeping or deep sleeping mode of the **BeanDevice® AX-3DS**. When the **BeanDevice® AX-3DS** is in sleeping mode, the accelerometer continues to track a shock event with a power consumption of 68 uA in sleeping mode and 28uA in deep sleeping mode.

A hysteresis on the shock event, fully configurable through the **BeanScape®**, allows to avoid false alarm.

EXAMPLE : THIS CURVE SHOWS TWO SHOCK EVENTS, ONE CONSIDERED AS SIGNIFICANT (REAL ALARM) AND ANOTHER CONSIDERED AS NOT SIGNIFICANT (FALSE ALARM).



Δd : shock detection hysteresis.
Δt : Observed duration
 If **Δt = Δd**, the shock event is detected and recognized, the **BeanDevice®** wakes up and start data sampling in “streaming mode”.

The following tables show the accelerometer sampling rate and the hysteresis time value in deep sleeping mode and sleeping mode of the **BeanDevice® AX-3DS**.

Accelerometer sampling rate during deep sleeping mode (in HZ)	Δd max value(s)	Resolution
0.5	128 s	2 s
1	64 s	1 s
2	32 s	500 ms
5	12,8 s	200 ms
10	6,4 s	100 ms

Accelerometer sampling rate during deep sleeping mode (in HZ)	Δd max value(s)	Resolution
50	1,28 s	20 ms
100	640 ms	10 ms
400	160 ms	2,5 ms
1000	64 ms	1 ms

//SHOCK MEASUREMENT ON PANTOGRAPH



//SHOCK TRACKING ON HIGH-VALUE ITEMS



//REMOTE CONFIGURATION & MONITORING

BeanScape® Basic

The **BeanScape®** application allows the user to view all the data transmitted by the **BeanDevice® AX-3DS**. With the OTAC (Over-the-Air configuration) feature, the user can remotely configure the **BeanDevice® AX-3DS**.

SEVERAL DATA ACQUISITION MODES ARE AVAILABLE ON THE BEANDEVICE® AX-3D :

- **Low Duty Cycle Data Acquisition mode (LDCDA)** : the data acquisition is immediately transmitted by radio. The transmission frequency can be configured from 1s to 24h.
- **Survey Mode**: the measured value is transmitted by radio whenever an alarm threshold (fixed by the user) is detected (4 alarms threshold levels High/Low). Meanwhile, the device sends frequently a beacon frame informing its current status.
- **Streaming Packet Mode** : all measured values are transmitted by packet within a continuous flow at 3 kbps maximum

BeanScape® Premium+

The **BeanScape® Premium+** integrates an OPC DA server (Data Access). OPC DA is particularly well suited for real time measurement and data sharing.

Each data/measurement can be associated to a tag or its attributes and shared with one or many OPC clients.

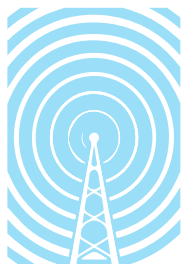


*Over-the-Air Configuration



For further information about the different data acquisition modes:
[TN_RF_008 – "Data acquisition modes available on the BeanDevice®"](#)

//ANTENNA DIVERSITY



While the vast majority of wireless sensors show their limits in harsh industrial environment, the **BeanDevice® AX-3DS** integrates an innovative antenna diversity design, boosting the radio link quality in environments subject to random and diverse disturbances. Antenna Diversity improves both the quality and reliability of a wireless link by 30%.

//EMBEDDED DATA LOGGER UP TO 1 MILLION DATA POINTS

The **BeanDevice® AX-3DS** integrates an embedded data logger, which can be used to log data when a Wireless Sensor network can not be easily deployed on your site. All the data acquisition are stored on the embedded flash and then transmitted to the **BeanGateway®** when a Wireless Sensor Network is established.

The data logger function is compatible with all the data acquisition mode available on your **BeanDevice® AX-3DS** :

- LowDutyCycle Data Acquisition
- Survey
- Shock detection
- Streaming packet

EXAMPLE : SHOCK DETECTION ON A TRAIN



- In standalone operation, the **BeanDevice® AX-3DS** stores all the measurements on its embedded datalogger. Thus, a direct connection with the **BeanGateway®** is not needed.
- When the train is moving, all the acquired measurements are stored on datalogger.
- Data logs can be transmitted to the **BeanGateway®** on request. Once a successful transmission is done, the user can choose to erase automatically the logs from the datalogger memory, so new ones can be stored.

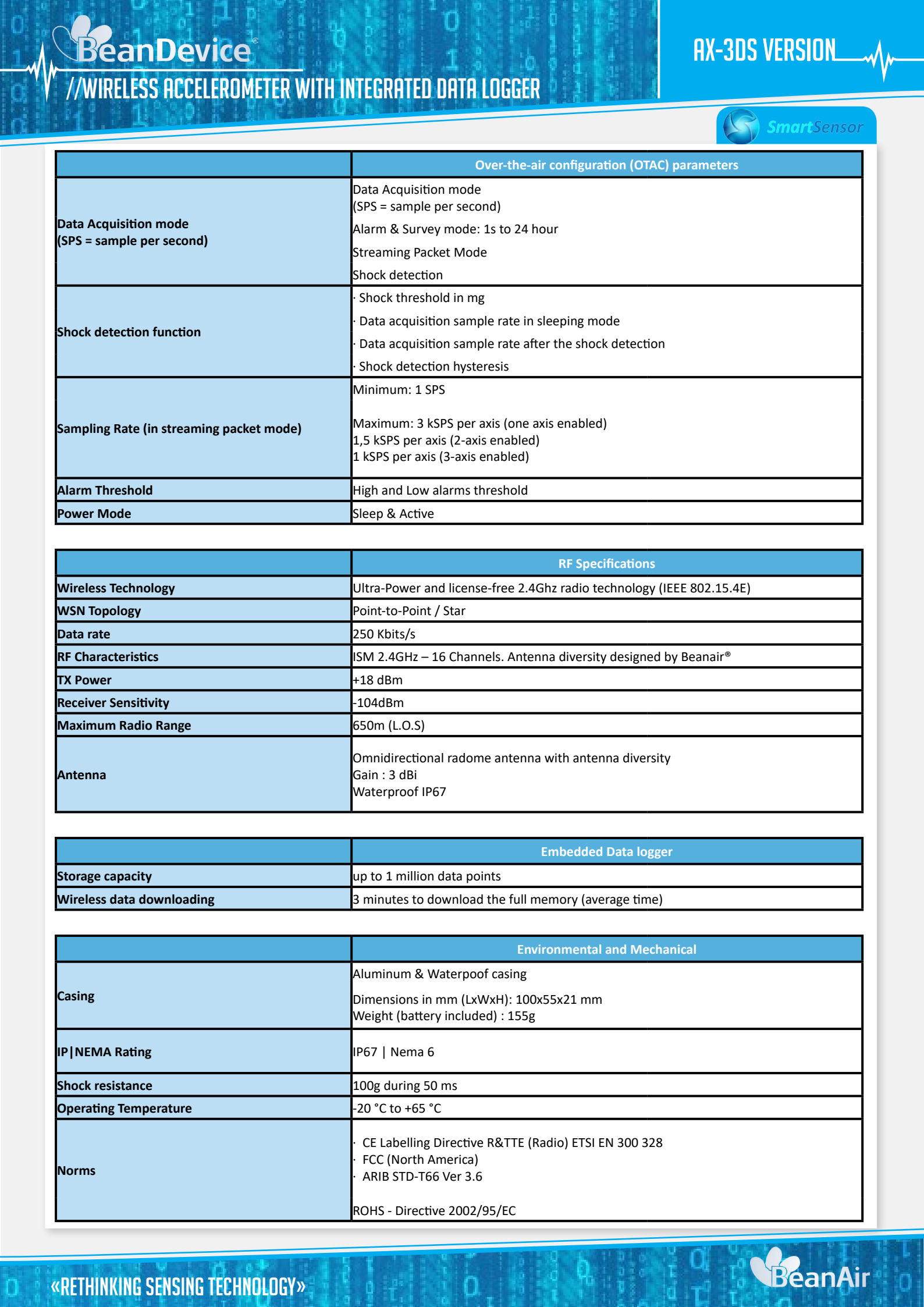


For further information about the Datalogger, please read the following technical note :
[TN_RF_007 – “BeanDevice® DataLogger User Guide”](#)



Product reference
BND-AX3DS - MR-PS-SCM
MR – Measurement Range: 24G: ±6/12/24g measurement range 8G: ±2/4/8g measurement range
PS - Power supply : RB : Rechargeable battery XT : External Primary cell
MO - Mounting Option SCM - Screw Mounting Lid MM - Magnet Mounting Lid Leave it empty if there is no mounting option
Example 1: BND-AX3DS-24G-RB—Wireless Accelerometer with ±6/12/24g measurement range , rechargeable battery Example 2: BND-AX3DS-8G-RB-SCM—Wireless Accelerometer with ±2/4/8g measurement range , rechargeable battery, screw mounting option

	Sensor specifications
Accelerometer Technology	Low power MEMS technology
Scalable measurement range	24G Version: ±6g / ±12g/ ±24g 8G Version: ±2g / ±4g/ ±8g
Measurement resolution	24G Version: 3 mg/digit @±6g , 6 mg/digit @±12g , 12 mg/digit @±24g 8G Version: 1mg/digit @±2g , 2 mg/digit @±4g , 3.9 mg/digit @±8g
Typical non-linearity	±0,15%
Sensitivity change Vs temperature	±0,01% /°C
Zero-g level change vs temperature (max delta from 25°C)	24G Version: ±0,4 mg/°C 8G Version: ±0,1 mg/°C
Typical zero-g level offset accuracy	24G Version: ±70 mg 8G Version: ±20 mg
Analog to Digital converter	12-bit with temperature compensation
Noise spectral density @ BW 10Hz	24G Version: 650 µg/√Hz 8G Version: 218 µg/ √Hz
Anti-aliasing filter	Butterworth 2th order filter



	Over-the-air configuration (OTAC) parameters
Data Acquisition mode (SPS = sample per second)	Data Acquisition mode (SPS = sample per second) Alarm & Survey mode: 1s to 24 hour Streaming Packet Mode Shock detection
Shock detection function	· Shock threshold in mg · Data acquisition sample rate in sleeping mode · Data acquisition sample rate after the shock detection · Shock detection hysteresis
Sampling Rate (in streaming packet mode)	Minimum: 1 SPS Maximum: 3 kSPS per axis (one axis enabled) 1,5 kSPS per axis (2-axis enabled) 1 kSPS per axis (3-axis enabled)
Alarm Threshold	High and Low alarms threshold
Power Mode	Sleep & Active

	RF Specifications
Wireless Technology	Ultra-Power and license-free 2.4Ghz radio technology (IEEE 802.15.4E)
WSN Topology	Point-to-Point / Star
Data rate	250 Kbits/s
RF Characteristics	ISM 2.4GHz – 16 Channels. Antenna diversity designed by Beanair®
TX Power	+18 dBm
Receiver Sensitivity	-104dBm
Maximum Radio Range	650m (L.O.S)
Antenna	Omnidirectional radome antenna with antenna diversity Gain : 3 dBi Waterproof IP67

	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	Aluminum & Waterproof casing Dimensions in mm (LxWxH): 100x55x21 mm Weight (battery included) : 155g
IP NEMA Rating	IP67 Nema 6
Shock resistance	100g during 50 ms
Operating Temperature	-20 °C to +65 °C
Norms	· CE Labelling Directive R&TTE (Radio) ETSI EN 300 328 · FCC (North America) · ARIB STD-T66 Ver 3.6 ROHS - Directive 2002/95/EC



	Power Supply
Integrated battery charger	Integrated Lithium-ion battery charger with high precision battery monitoring : <ul style="list-style-type: none"> · Overvoltage/Overcurrent/Short-Circuit/Undervoltage protection · Battery Temperature monitoring
Current consumption @3,3V	<ul style="list-style-type: none"> · During data acquisition : 20 to 30 mA · During Radio transmission : 60 mA @ 18 dBm · During sleeping mode: 68uA · During deep sleeping mode : 28 uA
External power supply	+8V to +28V
Rechargeable battery	Capacity 1.25 Ah

	Options
External Power Supply	Wall plug-in, Switchmode power Supply 12V @ 1,25A with sealed M8 Plug (IP67/Nema 6) Ref: M8-PWR-12V
M8 extension cable for external power supply	Molded cable with M8-3pins male plug Material: PVC with shield protection IP Rating : IP67 Nema 6 Cable length: 2 meters , Ref: CBL-M8-2M Cable length : 5 meters, Ref: CBL-M8-5M Cable length: 10 meters, Ref: CBL-M8-10M
Calibration certificate	Calibration certificate provided by Beanair GmbH A static calibration method is used on a granite surface plate DIN876

//SCREW MOUNTING OPTION

The **BeanDevice® AX-3DS** comes with screw mounting option. The sensor module is to be mounted on a flat and smooth surface with 3 screws; dimension M5. Mounting torque $5 \pm 1\text{Nm}$

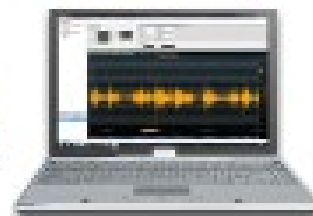


//GETTING STARTED WITH A WIRELESS SENSOR NETWORK

The **BeanDevice® AX-3DS** operates only on our Wireless Sensor Networks, you will need the **BeanGateway®** and the **BeanScape®** for starting a wireless sensor Network.



OR

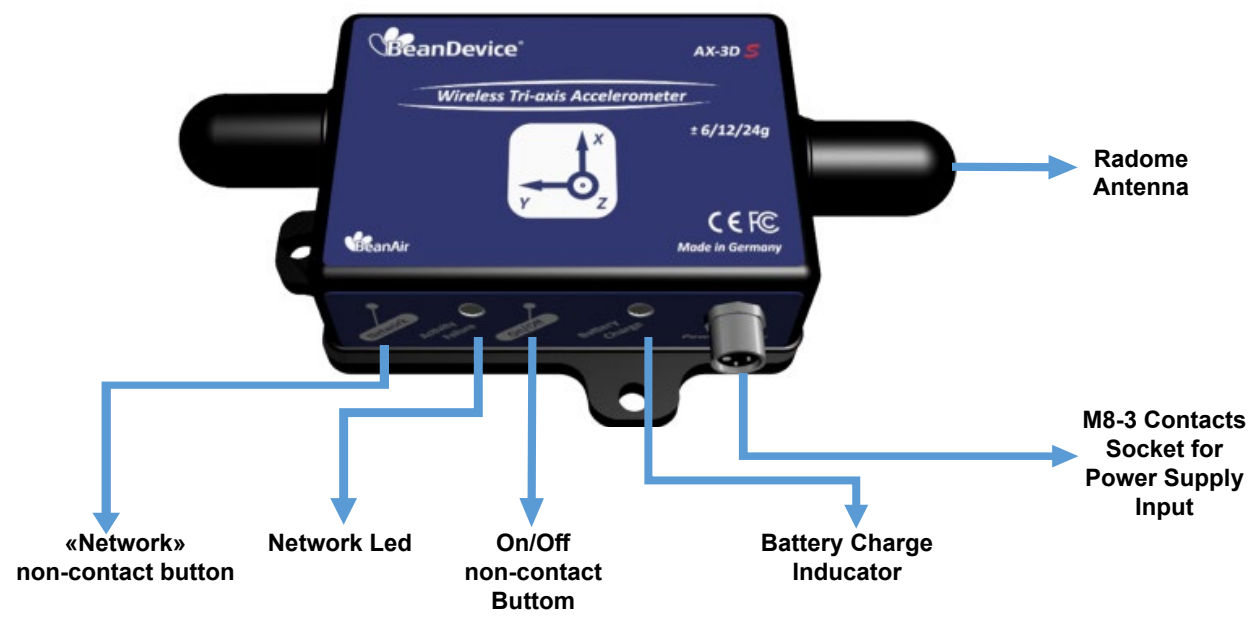


For further information about the **BeanDevice®** battery life :
[TN_RF_002 Current consumption in active & sleeping mode](#)
[TN_RF_012 Beandevic autonomy in Streaming and Streaming Packet Mode](#)

Product specifications are subject to change without notice. Contact Beanair for latest specifications.



//PRODUCT OVERVIEW



//ACCESSORIES



External power supply | Ref: M8-PWR-12V

- . Wall plug-in power supply, Output: 12VDC, M8-3Pins plug
- . AC Power plug: Europe/UK/North america/China/Australia
- . Waterproof - IP67



Molded Cable with M8 plug | Ref: CBL-M8-2M (cable length: 2meters) CBL-M8-5M (cable length : 5 meters) CBL-M8-10M (cable length : 10 meters)

- . 3pole - Male, PVC with shield protection
- . Waterproof - IP67



90° Bracket | Ref: SMART-BRACK-MNT

- . 90° bracket for screw mounting suitable for : BeanDevice AX-3DS , AX-3D Xrange, HI-INC Xrange



//CONTACT US

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