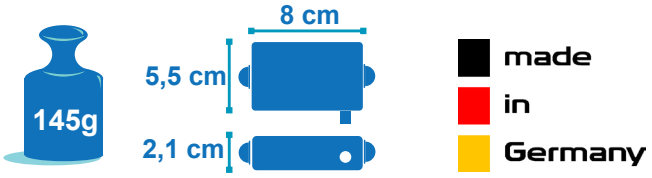
WIRELESS ACCELEROMETER WITH INTEGRATED DATA LOGGER

2year Warranty

TimeSync



made in Germany

//APPLICATIONS

- Structural health monitoring (SHM)
- Condition Monitoring Systems (CMS)
- Ground and building vibration
- Test and measurement
- Movement detection

FEATURED VIDEO

BeanDevice® AX-3D main presentation video

Wireless Sensor Networks dedicated to structural health monitoring

USER MANUAL

BeanDevice® SmartSensor user manual

MECHANICAL DRAWING

BeanDevice® AX-3D drawing

// MAIN FEATURES

Wireless accelerometer (measurement range ±2g or ±10g) FFT and DIN4150-3 (Ground Vibration) modules available

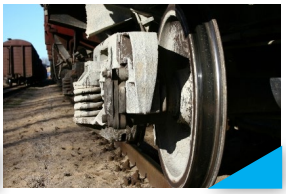
Time-synchronized wireless sensor networks (±2.5ms of accuracy)

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

Waterproof IP67 casing (Nema 6)

Integrated Lithium-Ion battery charger

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



//TYPICAL CUSTOMER APPLICATIONS

Condition Monitoring on Wind Turbine

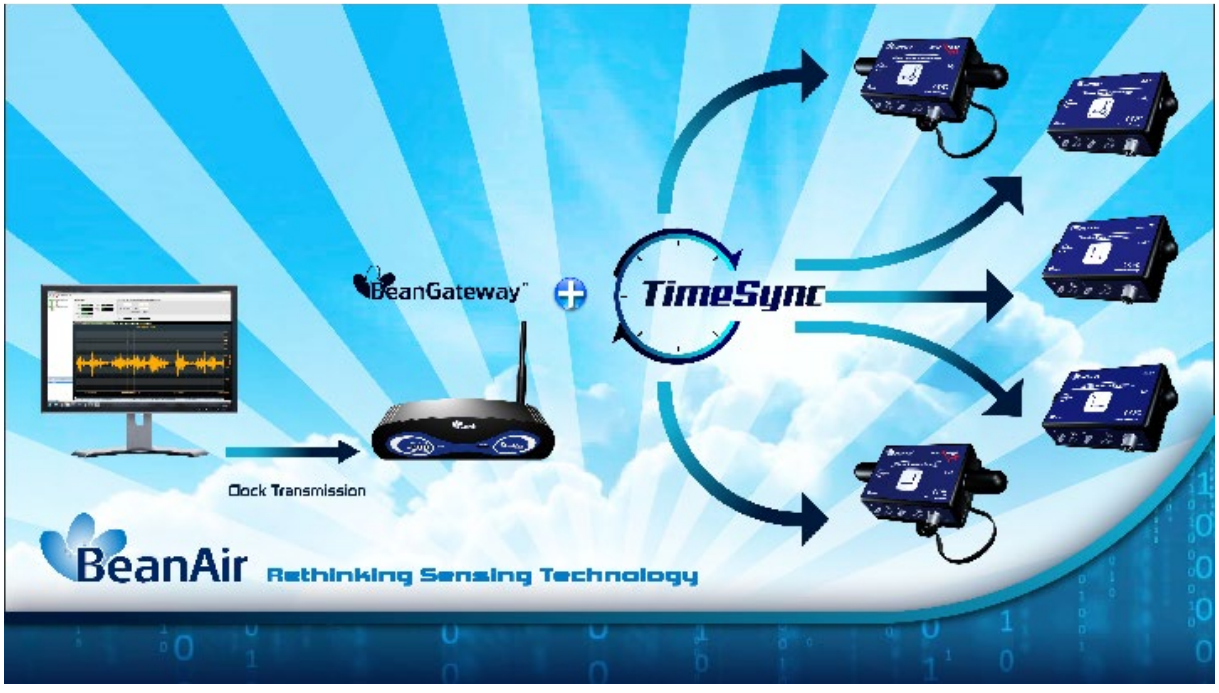
Vibration Analysis on Train Wheels

Ground and builidng vibration

Structural Health Monitoring

//TIME-SYNCHRONIZED WIRELESS SENSOR NETWORKS

TimeSync function brings time-synchronization over the Wireless Sensor Network (±2.5ms of accuracy between each wireless sensor) and contributes to enhance user experience about correlation of remote sensing data and modal analysis.



//REMOTE CONFIGURATION & MONITORING

Configure and monitor your Wireless Sensor Networks from an unique software

BeanScape®, a powerful Wireless Sensor Networks supervision software, allows the user to:
- visualize in real-time sensing data
- remotely configure the BeanDevice® AX-3D.

Several data acquisition are available on the BeanDevice® AX-3D
- Low Duty Cycle Data Acquisition mode (LDCDA) : the data acquisition is immediately transmitted by radio. Transmission frequency can be configured from 1s to 24h ;
- Streaming packet Mode : All measured values are transmitted by packet within a continuous flow at 3 ksps/s maximum
- Standalone: The BeanDevice® AX-3D operates in standalone without being connected to the BeanGateway®. All the measurements are backed up on the onboard data logger;

Connect our Wireless Sensor Networks to a third-party supervision software

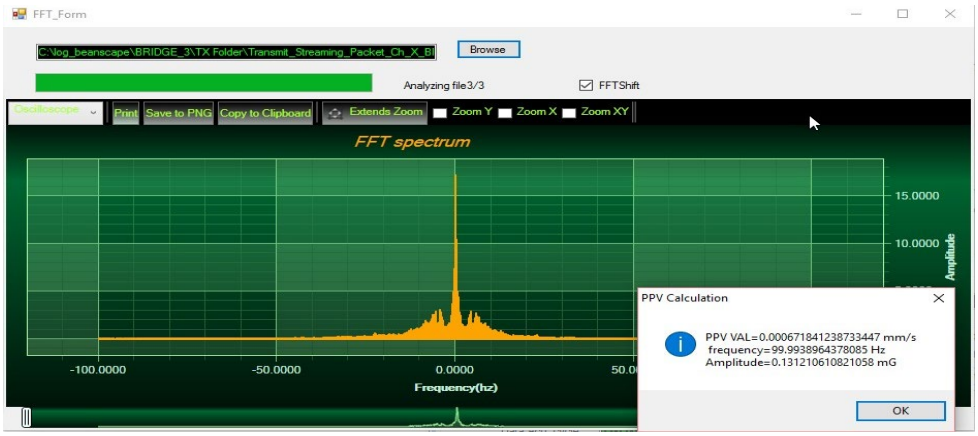
BeanScape® Premium+ integrates an OPC DA server (Data Access). OPC DA is particularly well suited for real time measurement and data sharing. Each data/measurement can be associated to a tag or its attributes and shared with one or many OPC clients.

For further information about the different data acquisition modes:

TN_RF_008 – "Data acquisition modes available on the BeanDevice®"

//VIBRATION ANALYSIS REPORT AT A GLANCE

The BeanScape® comes with advanced tools for user working on building and ground vibration:
- Vibration Analysis tools: FFT, PPV (Peak Particle Velocity), Velocity
- Automatic report meeting the DIN4150-3 standard (Excel, PDF and Word)



//ANTENNA DIVERSITY

While the vast majority of wireless sensors show their limits in harsh industrial environment, the BeanDevice® AX-3D 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-3D integrates an embedded datalogger, 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 the BeanDevice® AX-3D :

- Low Duty Cycle
- Streaming packet

EXAMPLE : CONDITION MONITORING ON WIND TURBINE

- In standalone operation, the BeanDevice® AX-3D stores all the measurements on its embedded datalogger. Thus, a direct connection with the BeanGateway® is not needed.
- Datalogging will start after powering on the BeanDevice® AX-3D
- Data logs can be transmitted to the BeanGateway® on request. Once a successful logs donwload is done, user can choose to erase automatically the logs from the datalogger memory;

For further information about data logger, please read the following technical note :
TN_RF_007 – "BeanDevice® DataLogger User Guide "

Product reference
BND-AX3D -*MR*G
MR – ***Measurement Range***: ***2***:±2g measurement range ***10*** :±10g measurement range
Example: BND-AX3D-10G-Wireless Accelerometer with 10g measurement range

	Accelerometer Specifications
Accelerometer technology	Accurate and low power MEMS technology
Sensitivity	±2g Version : 61 µg/digit ±10g version: 305 µg/digit
Typical non-linearity	±0.1% FS
Analog to Digital converter	16-bits, SAR architecture (Successive Approximation Register) with temperature compensation
Sensor frequency response (-3 dB)	DC to 800 Hz
Noise spectral density	±2g Version : 45 µg/√Hz ±10g version: 100 µg/√Hz
Zero-g Offset Variation from RT over Temp	±2g Version : ±0.2 mg/°C ±10g version: ±0.1 mg/°C
Sensitivity Variation from RT over Temp	±2g Version : ±0.01 %/°C (XY) , ±0.02 %/°C (Z) ±10g version: ±0.01 %/°C
Offset Ratiometric Error	±2g Version : 4mg ±10g version: ±0.2% (XY) , ±0.1% (Z)
Sensitivity Ratiometric Error	±2g Version : ±1.25 % (X-Y) , ±0.2 % (Z) ±10g Version : ±1.6% (X-Y) , ±0.2 % (Z)
Cross Axis Sensitivity	2%
Anti-aliasing filter	Butterworth 5th order filter – cut-off frequency : 1 Hz to 2000 Hz remotely programmable (BeanScape®)

	Over-the-air configuration (OTAC) parameters
Data Acquisition mode (**SPS** = sample per second)	Low Duty Cycle Data Acquisition (LDCDA) Mode: 1s to 24 hour Alarm & Survey mode: 1s to 24 hour Streaming Packet Mode
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
Programmable Cut-off frequency (Anti-aliasing filter)	1– 2000 Hz
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)

TimeSync function : Clock synchronization over the Wireless Sensor Networks (WSN)	
Clock synchronization accuracy	±2.5 ms (at 25°C)
Crystal specifications	Tolerance ±10ppm, stability ±10ppm

	Environmental and Mechanical
Casing	Aluminum & Waterpoof 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 & Radio certifications	· 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 : · Overvoltage/Overcurrent/Short-Circuit/Undervoltage protection · Battery Temperature monitoring
Current consumption @ 3,3V	· During data acquisition : 20 to 30 mA · During Radio transmission : 70 mA @ 18 dBm · During sleeping : < 30 µA
External power supply	+8V to +28V
Rechargeable Lithium-Polymer 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

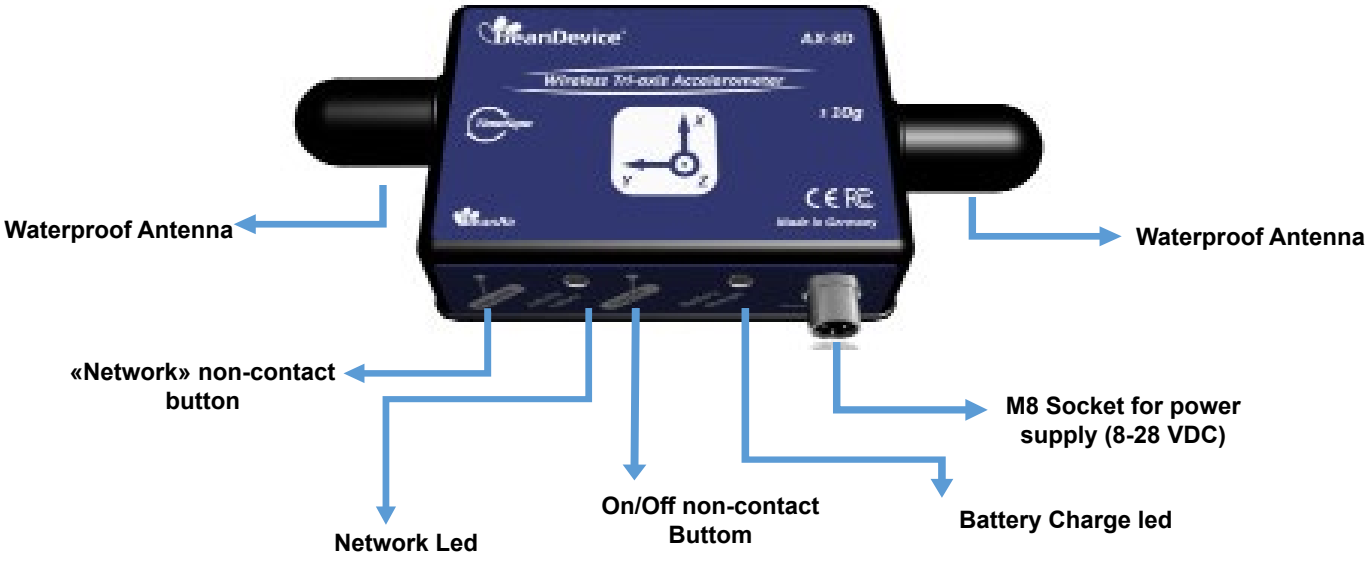
For further information about aggregation capacity of wireless sensor networks :
TN_RF_003 Aggregation capacity of wireless sensor networks

//GETTING STARTED WITH A WIRELESS SENSOR NETWORK

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

For further information about BeanDevice® battery life :
TN_RF_002 Current consumption in active & sleeping mode
TN_RF_012 Beandevice autonomy in Streaming and Streaming Packet Mode

//PRODUCT OVERVIEW



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

//OPTIONS AND 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

//CONTACT US

FOR MORE INFORMATION:

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Visit our website : ***www.beanair.com***
Visit our blog : ***www.industrial-wsn.com***

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