

BeanDevice® 2.4GHz AX-3D

High Performance wireless vibration sensor | acceleration and velocity monitoring

PRODUCT VIDEO



APPLICATION VIDEO



USER GUIDE



QUICK START



MECHANICAL DRAWING



STEP FILE

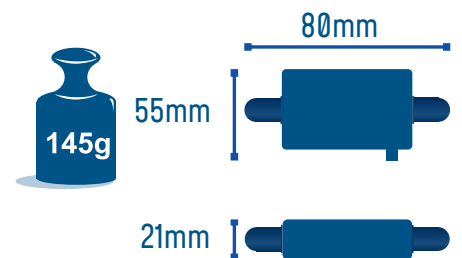


SmartSensor



2year
Warranty

MADE IN GERMANY



MAIN FEATURES



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



• Wireless accelerometer (measurement range $\pm 2g$ or $\pm 10g$) FFT and DIN4150-3 (Ground Vibration) modules available



• Waterproof IP67 casing (Nema 6)



• Time-synchronized wireless sensor networks ($\pm 2.5ms$ of accuracy)



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



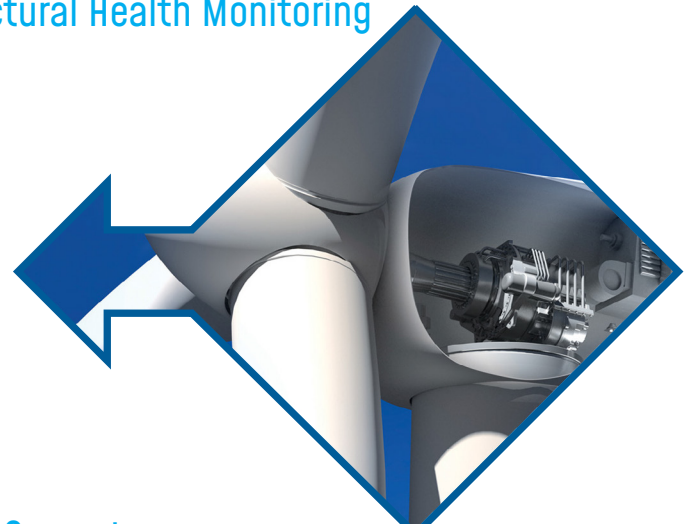
• Integrated Lithium-Ion battery charger

APPLICATIONS



Structural Health Monitoring

Condition Monitoring



Land Surveying

Test and Measurement



TIME-SYNCHRONIZED WIRELESS IIOT SENSORS



REMOTE CONFIGURATION & MONITORING

Configure and monitor your Wireless IIOT Sensors from an unique

BeanScope®2.4Ghz , a powerful Wireless IIOT Sensors supervision software, allows the user to:

- visualize in real-time sensing data
- remotely configure the BeanDevice®2.4Ghz AX-3D

Several data acquisition are available on the BeanDevice®2.4Ghz 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 kbps/s maximum
- **Standalone**: The BeanDevice®2.4Ghz AX-3D operates in standalone without being connected to the BeanGateway®2.4Ghz. All the measurements are backed up on the onboard data logger;



BeanDevice® 2.4GHz AX-3D

Connect our Wireless IIOT Sensors to a third-party supervision software software

BeanScape®2.4Ghz 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.

i For further information about the different data acquisition modes:
TN-RF-008 – “Data acquisition modes available on the BeanDevice®2.4Ghz”

VIBRATION ANALYSIS REPORT AT A GLANCE

The BeanScape®2.4Ghz 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 IIOT sensors show their limits in harsh industrial environment, the BeanDevice®2.4Ghz 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®2.4Ghz AX-3D integrates an embedded datalogger, which can be used to log data when a Wireless IIOT Sensors can not be easily deployed on your site. All the data acquisition are stored on the embedded flash and then transmitted to the BeanGateway® 2.4 GHz when a Wireless IIOT Sensors is established.

The data logger function is compatible with all the data acquisition mode available on the BeanDevice®2.4Ghz AX-3D :

- Low Duty Cycle
- Streaming packet

EXAMPLE : CONDITION MONITORING ON WIND TURBINE

- In standalone operation, the BeanDevice®2.4Ghz AX-3D stores all the measurements on its embedded datalogger. Thus, a direct connection with the BeanGateway®2.4GHz is not needed.
- Datalogging will start after powering on the BeanDevice®2.4Ghz AX-3D
- Data logs can be transmitted to the BeanGateway®2.4Ghz on request. Once a successful logs download is done, user can choose to erase automatically the logs from the datalogger memory;

BeanDevice® 2.4GHz AX-3D



For further information about data logger, please read the following technical note :
TN-RF-007 – “BeanDevice® DataLogger User Guide ”

TECHNICAL SPECIFICATIONS

PRODUCT REFERENCE

BND-2.4GHZ-AX-3D-MRG-RB

MR – Measurement Range (1g = 9806.65 mm/s²)

2: ±2g measurement range

10 : ±10g measurement range

Example n°1: BND-2.4GHZ-AX-3D-10G-RB, Wireless Accelerometer with 10g measurement range

TECHNICAL SPECIFICATIONS

ACCELEROMETER SPECIFICATIONS

Accelerometer technology	Accurate and low power MEMS technology
Sensitivity	±2g Version : 660 mV/g ±10g version: 200 mV/g
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 Streaming 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)
Programmable cut-off frequency (Anti-aliasing filter)	1– 2000 Hz
Alarm Threshold	High and Low alarms threshold
Power Mode	Sleep & Active

TECHNICAL SPECIFICATIONS

RF SPECIFICATIONS

Wireless Protocol Stack	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 (Line of Sight) , 30-100m (Non Line of Sight)
Antenna	Omnidirectional radome antenna with antenna diversity Gain : 3 dBi Waterproof IP67

EMBEDDED DATA LOGGER

Storage capacity	up to 1 millions 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

TECHNICAL SPECIFICATIONS

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 during battery discharge 0 to 45°C during battery charge
Norms & Radio Certifications	<ul style="list-style-type: none"> · 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 Protection, Overcurrent/Short-Circuit Protection, 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 : 70 mA @ 18 dBm · During sleeping : < 30 µA
External power supply	8-28VDC
Rechargeable battery	Capacity 1.25 Ah

OPTION(S)

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

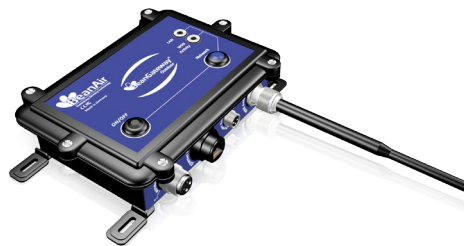
BeanDevice® 2.4GHz AX-3D

GETTING STARTED WITH A WIRELESS IIOT SENSORS

The **BeanDevice®2.4Ghz AX-3D** operates only on our Wireless IIOT Sensors, you will need the **BeanGateway®2.4Ghz** and the **BeanScape®2.4Ghz** for starting a Wireless IIOT Sensors.



BeanDevice
2.4GHz AX3D



BeanScape
Wireless IIOT Sensor Supervision Software

BeanGateway
Outdoor Version

2year
Warranty



For further information about **BeanDevice®** battery life :
 TN-RF-002 Current consumption in active & sleeping mode
 TN-RF-012 Beandevic autonomy in Streaming and Streaming Packet Mode

BeanDevice® 2.4GHz AX-3D

BEANDEVICE® 2.4GHz AX-3D FRONT VIEW

Waterproof Antenna

Battery charge led

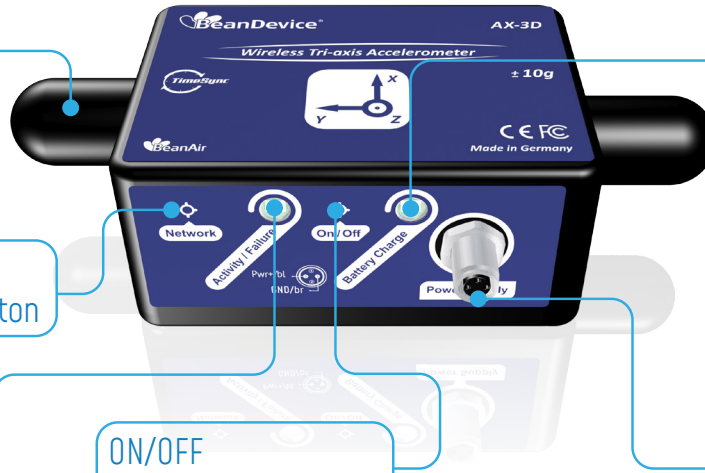
Network Reset
non-contact push button

BeanDevice®
2.4 GHz AX-3D

Network led

ON/OFF
non-contact button

M8 Socket for power
supply (8-28 VDC)



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

OPTIONS AND ACCESSORIES



**AC/DC Power supply
with M8 Plug**

Ref: M8-PWR-12V

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



X-SOLAR

(SOLAR Charging Controller)

High efficiency Solar Panel
with Solar Charging Controller
and Lead-acid battery



Molded Cable with M8 plug

Ref: CBL-M8-2M

- (cable length : 2 meters)
- CBL-M8-5M
(cable length : 5 meters)
- CBL-M8-10M
(cable length : 10 meters)

CONTACT US

Headquarter:

BeanAir GmbH
Wolfener Straße 32 - 34
12681 Berlin

Email:

info@beanair.com

Phone number:

+49 30 98366680



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