

BeanDevice® 2.4GHz AX-3D XRange

High Performance wireless IIOT vibration sensor | acceleration and Particle Velocity monitoring

PRODUCT VIDEO



APPLICATION VIDEO



USER GUIDE



QUICK START



MECHANICAL DRAWING



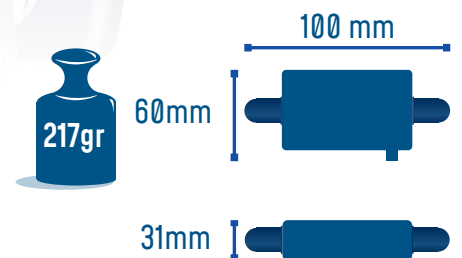
STEP FILE



SmartSensor



MADE IN GERMANY



MAIN FEATURES

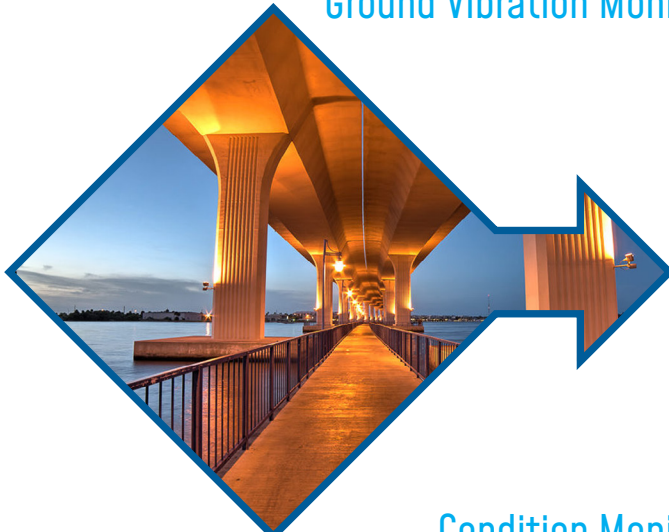
- Embedded data logger : up to 8 million data points (with events dating)
- Excellent radio link relying on the radio antenna diversity developed by Beanair®
- Wireless accelerometer (measurement range $\pm 2g$ or $\pm 10g$) FFT and DIN4150-3 (Ground Vibration) modules available
- Time-synchronized wireless sensor networks ($\pm 2.5ms$ of accuracy)
- Waterproof IP67 casing (Nema 6)
- Integrated Lithium-Ion battery charger

APPLICATIONS

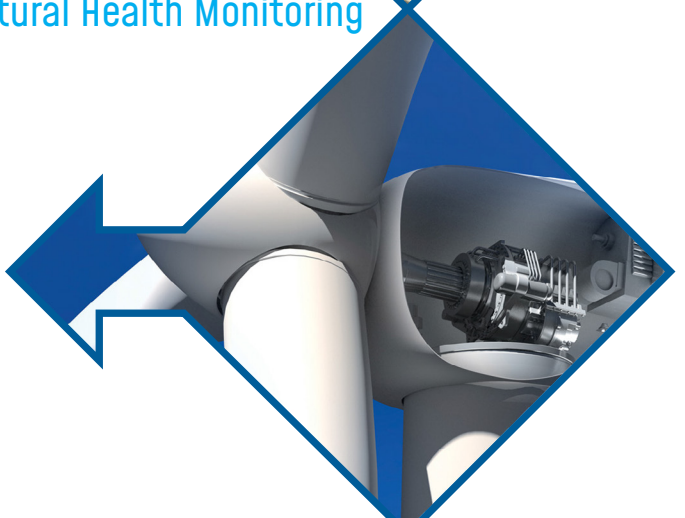
Ground Vibration Monitoring



Structural Health Monitoring



Condition Monitoring



Land Surveying



Test and Measurement



BeanDevice® 2.4GHz AX-3D XRange

TIME-SYNCHRONIZED WIRELESS IIOT SENSORS



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

REMOTE CONFIGURATION & MONITORING

Configure and monitor your Wireless IIOT Sensors from an unique software

The BeanScope® 2.4GHZ application allows the user to view all the data transmitted by the BeanDevice® 2.4GHZ AX-3D XRange. Thanks to the OTAC (Over-the-Air configuration) feature, the user can remotely configure the BeanDevice® 2.4GHZ AX-3D XRange.

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

- **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.
- **Streaming Packet Mode** : all measured values are transmitted by packet within a continuous flow at 4000 samples per second maximum



BeanScape® 2.4GHz Premium+ Add-on

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®”

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 sensors show their limits in harsh industrial environment, the BeanDevice® 2.4GHz AX-3D XRange 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 8 MILLION DATA POINTS

The BeanDevice® 2.4GHz AX-3D XRange integrates an embedded datalogger, which can be used to log data when a Wireless IIOT Sensor can not be easily deployed on your site.

All the data acquisition are stored on the embedded flash and then transmitted to the BeanGateway® 2.4GHz 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 XRange :

- Low Duty Cycle
- Streaming packet

BeanDevice® 2.4GHz AX-3D XRange

EXAMPLE : VIBRATION ANALYSIS ON WINDMILLS BLADES

- In standalone operation, the **BeanDevice® 2.4GHz AX-3D XRange** stores all the measurements on its embedded datalogger. Thus, a direct connection with the **BeanGateway® 2.4GHz** is not needed.
- When the blades start rotating, all the acquired measurements are stored on datalogger.
- Data logs can be transmitted to the **BeanGateway® 2.4GHz** 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 data logger, please read the following technical note :
TN-RF-007 – “BeanDevice® DataLogger User Guide ”

TECHNICAL SPECIFICATIONS

PRODUCT REFERENCE

BND-2.4GHZ-AX-3D-MR-XR-PS-MO

MR - Measurement Range (1g = 9806.65 mm/s ²)	PS - Power Supply	MO - Mounting Option
- 2: ±2g measurement range	RB : Built-in rechargeable Lithium-Polymer battery 2Ah	SCM - Screw Mounting Lid
- 10: ±10g measurement range		MM - Magnetic Mounting Lid

Example n°1: BND-2.4GHZ-AX-3D-10G-XR-RB-SCM, High performance wireless accelerometer with 10g measurement range, built-in rechargeable battery, screw mounting

Example n°2: BND-2.4GHZ-AX-3D-2G-XR-XT-MM, High performance wireless accelerometer with ±2g measurement range, external power supply, Magnet Mounting

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®)

TECHNICAL SPECIFICATIONS

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)
Sampling Rate (in streaming packet mode with data logger only)	Minimum: 1 SPS Maximum: 4 kSPS maximum per axis (one or two axis enabled) 3.5 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

EMBEDDED DATA LOGGER

Storage capacity	up to 8 millions data point
Wireless data downloading	20 minutes to download the full memory (average time)

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

TECHNICAL SPECIFICATIONS

ENVIRONMENTAL AND MECHANICAL

Casing	Aluminum & Waterproof casing · Dimensions in mm (LxWxH): 100 x 60 x 31 (without antennas and mounting eyelet) · Weight (with internal battery) : 217g (screw mounting) and 245g (magnetic mounting)
IP NEMA Rating	IP67 Nema 6
Base plate	· Aluminum black anodized AL 7075 with rugged three-point-mounting · Screw Mounting Option: the device should be mounted on a flat and smooth surface with 3 screws, dimension M5. Mounting torque 5 ±1Nm · Magnetic Mounting Option: the device should be mounted on a steel surface
Shock resistance	150g during 50 ms
Operating Temperature	-20 °C to +65 °C during battery discharge 0 to 45°C during battery charge · CE Labelling Directive R&TTE (Radio) ETSI EN 300 328 · FCC (North America)
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 Protection, Overcurrent/Short-Circuit Protection, Undervoltage Protection · Battery Temperature monitoring
Current consumption @3.3V	· During data acquisition: 20 to 30 mA · During Radio transmission: 40 mA @ 0dBm , 80 mA @ 18 dBm · During sleeping : < 30 µA
External power supply	8-28VDC
Rechargeable battery	Capacity 2.2 Ah

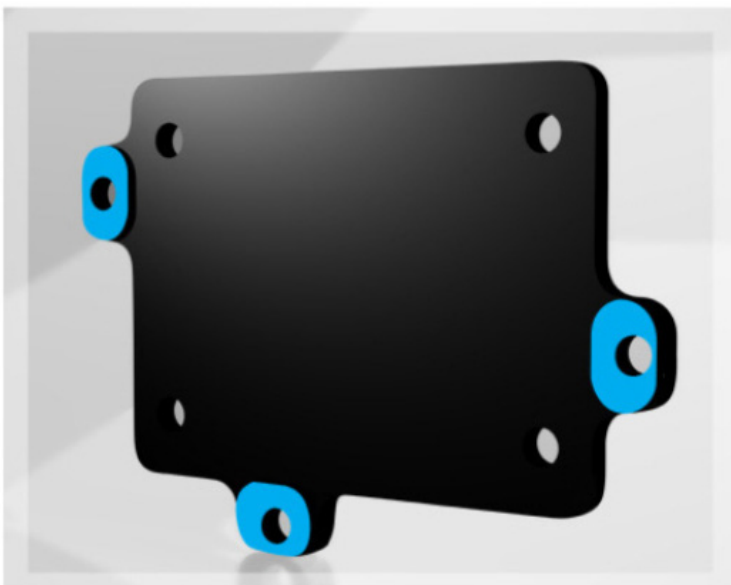
TECHNICAL SPECIFICATIONS

	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
Solar Panel Kit (compatible with External Power Supply version only)	Solar panel- Polycrystalline solar cell technology with Solar charging controller and Lead-acid battery Ref: X-SOL-5W-M8-2M
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

TIMESYNC FUNCTION : CLOCK SYNCHRONIZATION OVER THE WIRELESS IIOT SENSORS (WSN)

Clock synchronization accuracy	±2.5 ms (at 25°C)
Crystal specifications	Tolerance ±10ppm, stability ±10ppm

RUGGED BASE PLATE WITH THREE-POINT-MOUNTING



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 XRange

BEANDEVICE® 2.4GHz AX-3D X-RANGE FRONT VIEW



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



Bracket



Magnetic Mounting

Mounting Option

- Bracket
- Screws Mounting
- Magnetic Mounting



Screws Mounting

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)



X-SOLAR

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



CONTACT US

Headquarter:

BeanAir GmbH
Wolfener Straße 32 - 34
12681 Berlin

Email:

info@beanair.com

Phone number:

+49 30 98366680



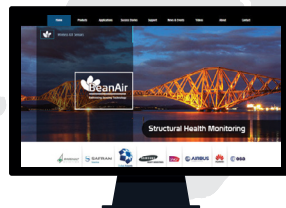
www.industrial-wsn.com



www.facebook.com/BeanAir



www.beanair.com



www.youtube.com/user/BeanairSensors



www.twitter.com/beanair

