BeanAir
WIRELESS IIOT SENSORS

2.4 GHz

BeanDevice® 2.4GHz AX-3D

High Performance wireless vibration sensor | acceleration and velocity monitoring

SmartSensor

2year Warranty

MADE IN GERMANY

CE FC R 207-132085

PRODUCT VIDEO

APPLICATION VIDEO

USER GUIDE

QUICK START

MECHANICAL DRAWING

STEP FILE

80mm
55mm
145g
21mm
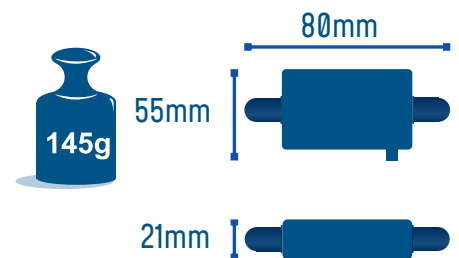
MAIN FEATURES

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

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

- Waterproof IP67 casing (Nema 6)

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

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

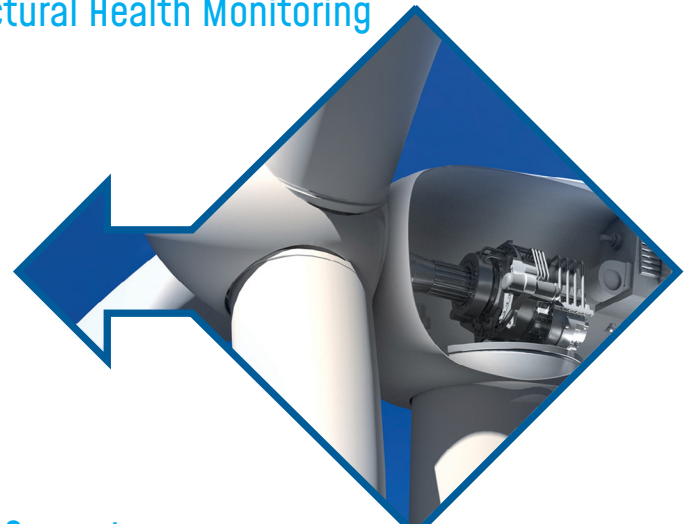- Integrated Lithium-Ion battery charger

APPLICATIONS

Structural Health Monitoring

Condition Monitoring

Land Surveying

Test and Measurment

TIME-SYNCHRONIZED WIRELESS IIOT SENSORS

Clock Transmission

2.4 GHz

BeanGateway®

REMOTE CONFIGURATION & MONITORING

Configure and monitor your Wireless IIOT Sensors from an unique

BeanScape®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 ksps/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;

BeanScape®
2.4GHz PREMIUM+

BeanGateway®

BeanDevice®
Over-the-Air Configuration

2.4GHz AX-3D

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 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 "

BeanDevice® 2.4GHz AX-3D

TECHNICAL SPECIFICATIONS

PRODUCT REFERENCE
BND-2.4GHZ-AX3D-MRG-RB

MR – Measurement Range (1g = 9806.65 mm/s^2)

2: ±2g measurement range

10 : ±10g measurement range

Example : BND-2.4GHZ-AX-3D-10G-RB, 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 (Full scale, @ 25°C)	±0.1%
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 Hardware filter	Butterworth 5th order filter – cut-off frequency : 1 Hz to 2000 Hz remotely programmable (BeanScape®)

CONFIGURABLE SETTINGS FROM THE BEANSCAPE® 2.4GHZ SOFTWARE	
Data Acquisition mode (SPS = sample per second)	Static Data Acquisition : Low Duty Cycle Data Acquisition (LDCDA) Mode Measurement heartbeat 1s to 24 hour Dynamic data acquisition : Streaming and S.E.T. (Streaming with Event Trigger)
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
Power Mode	Battery saver mode & Active power mode

BeanDevice® 2.4GHz AX-3D

TECHNICAL SPECIFICATIONS

RF SPECIFICATIONS	
Wireless Technology	Ultra-Low-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	500 m in Line-Of-Sight 30-100 m in 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 IOT SENSOR	
Clock synchronization accuracy	±2.5 ms (at 25°C)
Crystal specifications	Tolerance ±10ppm, stability ±10ppm

ENVIRONMENTAL AND MECHANICAL	
Casing	Aluminum AL6061 & 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	-40 °C to +60 °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

TECHNICAL SPECIFICATIONS

POWER SUPPLY	
Integrated battery charger	IIntegrated 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 Battery Saver Mode : < 30 µA
External power supply	8-28VDC with reverse polarity protection
Rechargeable Lithium-Polymer battery	Capacity 1.25 Ah

INCLUDED ACCESSORIES	
	1x Magnet to Power ON/Power OFF the device
	1x M8 Cap for Power Supply

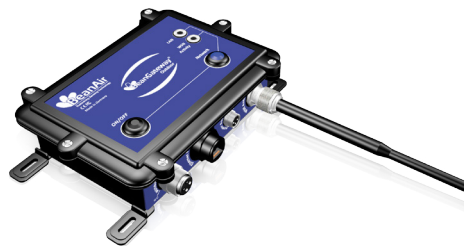| OPTIONAL ACCESSORIES AND SERVICES	
External Power Supply	Wall plug-in, Switchmode power Supply 12V @ 1,25A with sealed M8 Plug (IP67/Nema 6) Ref : M8-PWR-12V
M8 extension cable for external power supply	Molded cable with M8-3pins male plug Material: PVC with shield protection IP Rating : IP67 | Nema 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 Ref: CERT-CAL-SMART

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.

BeanAir
Rethinking Sensing Technology

BeanGateway
Indoor Version

OPC FOUNDATION ®
OPC SERVER

BeanDevice
2.4GHz AX3D

OR

BeanGateway
Outdoor Version

BeanScape
Wireless IIOT Sensor Supervision Software

2year
Warranty

ⓘ **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

BeanDevice® 2.4GHz AX-3D

2.4 GHz

BEANDEVICE® 2.4GHZ AX-3D FRONT VIEW
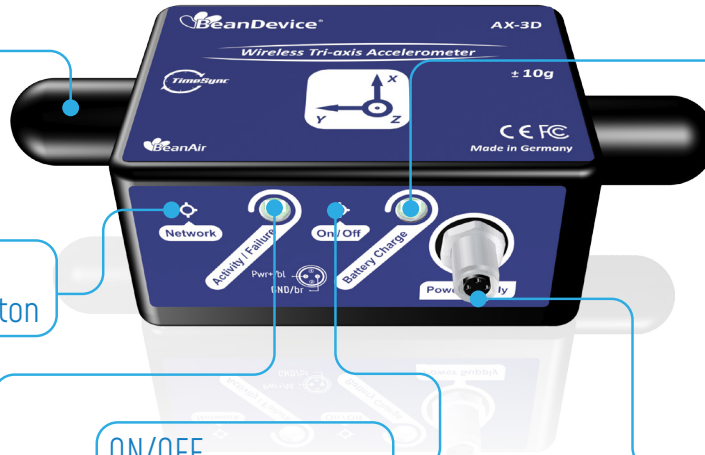

- Waterproof Antenna
- Network Reset non-contact push button
- Network led
- ON/OFF non-contact button
- Battery charge led
- M8 Socket for power supply (8-28 VDC)

BeanDevice® 2.4 GHz AX-3D

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)

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CONTACT US

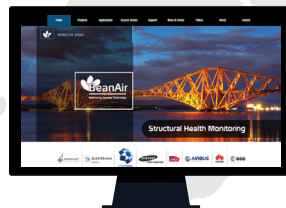| Headquarter:	Email:	Phone number:
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