BeanAir
WIRELESS IIOT SENSORS

2.4 GHz

BeanDevice® 2.4GHz AX-3D

High Performance wireless vibration sensor | acceleration and velocity monitoring

PRODUCT VIDEO

APPLICATION VIDEO

USER GUIDE

QUICK START

MECHANICAL DRAWING

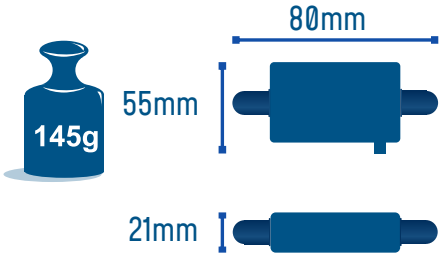
STEP FILE

SmartSensor

2year Warranty

MADE IN GERMANY

CE FC R 207-132085



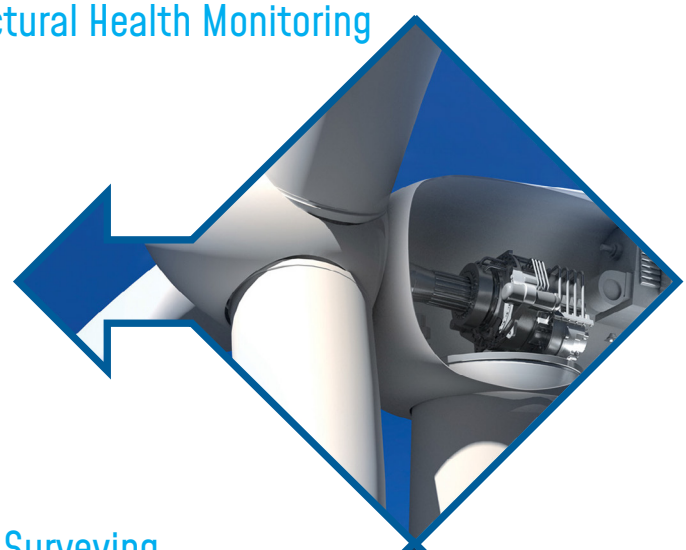
MAIN FEATURES

- Embedded data logger : up to 1 million data points (with events dating)
- Time-synchronized wireless sensor networks (±2.5ms of accuracy)
- Wireless accelerometer (measurement range ±2g or ±10g) FFT and DIN4150-3 (Ground Vibration) modules available
- Excellent radio link relying on the radio antenna diversity developed by Beanair®
- Waterproof IP67 casing (Nema 6)
- Integrated Lithium-Ion battery charger

APPLICATIONS

Structural Health Monitoring

Condition Monitoring



Land Surveying

Test and Measurment

BeanDevice® 2.4GHz AX-3D

TIME-SYNCHRONIZED WIRELESS IIOT SENSORS

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;

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.

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;

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/s^2)
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

BeanDevice® 2.4GHz AX-3D

TECHNICAL SPECIFICATIONS

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 during battery discharge 0 to 45°C during battery charge
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	IIntegrated 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 : 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.

BeanAir
Rethinking Sensing Technology

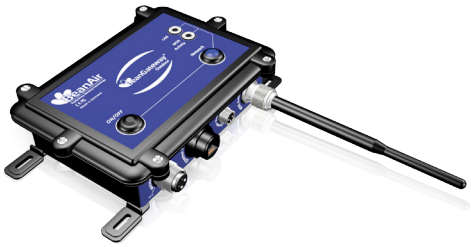
BeanGateway
Indoor Version

OPC FOUNDATION
OPC SERVER

BeanDevice
2.4GHz AX3D

OR

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 Beandevice autonomy in Streaming and Streaming Packet Mode

BeanDevice® 2.4GHz AX-3D

BEANDEVICE® 2.4GHZ AX-3D 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

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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