BeanAir
WIRELESS IIOT SENSORS

2.4 GHz

# BeanDevice® 2.4GHz AX-3DS

## Wireless IIOT accelerometer sensor| Shock and impact monitoring

PRODUCT VIDEO

FEATURED VIDEO

USER GUIDE

QUICK START

MECHANICAL DRAWING

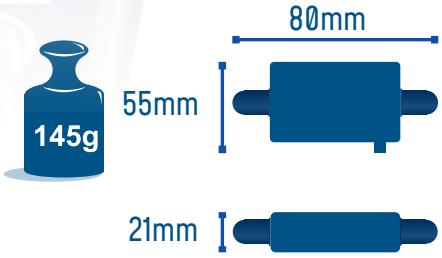
STEP FILE

SmartSensor

2year Warranty

MADE IN GERMANY

CE FC R 207-132085

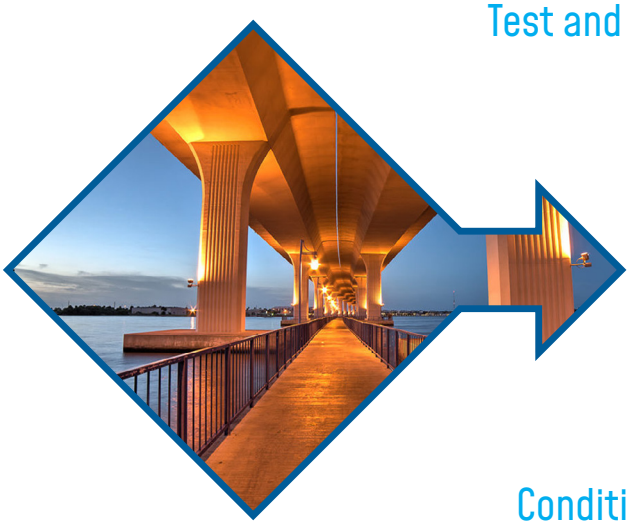

## MAIN FEATURES

- Embedded data logger : up to 1 million data points (with events dating)
- Excellent radio link relying on the radio antenna diversity developed by Beanair®
- Wireless accelerometer dedicated to shock Scalable measurement range : ±6g/±12g/±24g or ±2g/±4g/±8g
- SSD (Smart Shock Detection), wireless sensor can wakeup on shock detection (software configurable)
- Waterproof IP67 casing (Nema 6)
- Integrated Lithium-Ion battery charger

# BeanDevice® 2.4GHz AX-3DS

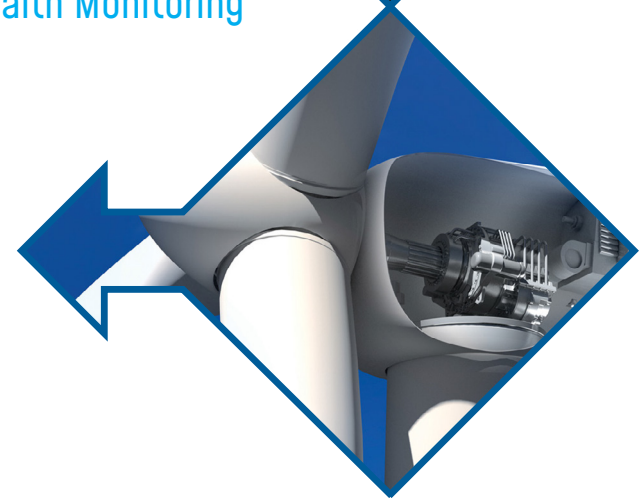
## APPLICATIONS

Test and Measurement



Structural Health Monitoring

Condition Monitoring

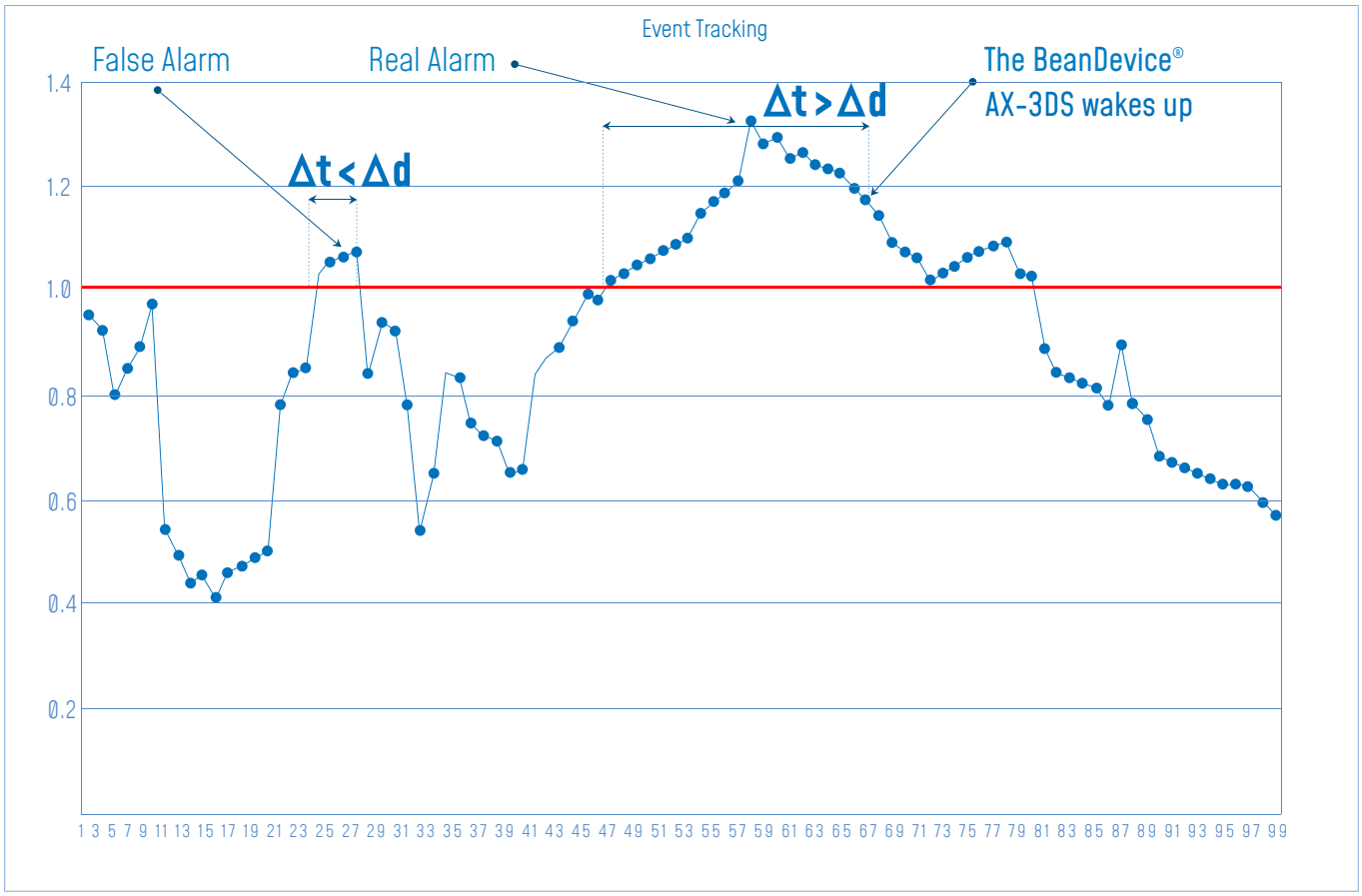


## SMART SHOCK DETECTION TECHNOLOGY

The BeanDevice® 2.4GHz AX-3DS integrates a smart shock detection technology which permits to detect & recognize a shock event during the sleeping or deep sleeping mode of the BeanDevice® 2.4GHz AX-3DS. When the BeanDevice® 2.4GHz AX-3DS is in sleeping mode, the accelerometer continues to track a shock event with a power consumption of 68 uA in sleeping mode and 28uA in deep sleeping mode. A hystereris on the shock event, fully configurable through the BeanScape® 2.4GHz, allows to avoid false alarm.

EXAMPLE : THIS CURVE SHOWS TWO SHOCK EVENTS, ONE CONSIDERED AS SIGNIFICANT (REAL ALARM) AND ANOTHER CONSIDERED AS NOT SIGNIFICANT (FALSE ALARM).

# BeanDevice® 2.4GHz AX-3DS




**Δd :** shock detection hysteresis.
**Δt :** Observed duration
If **Δt = Δd**, the shock event is detected and recognized, the BeanDevice® wakes up and start data sampling in “streaming mode”.

The following tables show the accelerometer sampling rate and the hysteresis time value in deep sleeping mode and sleeping mode of the BeanDevice® 2.4GHz AX-3DS.

| Accelerometer sampling rate during deep sleeping mode (in HZ) | Δd max value(s) | Resolution |
|---|---|---|
| 0.5 | 128 s | 2 s |
| 1 | 64 s | 1 s |
| 2 | 32 s | 500 ms |
| 5 | 12.8 s | 200 ms |
| 10 | 6.4 s | 100 ms |

| Accelerometer sampling rate during deep sleeping mode (in HZ) | Δd max value(s) | Resolution |
|---|---|---|
| 50 | 1.28 s | 20 ms |
| 100 | 640 ms | 10 ms |
| 400 | 160 ms | 2.5 ms |
| 1000 | 64 ms | 1 ms |

# BeanDevice® 2.4GHz AX-3DS

## SHOCK MEASUREMENT ON PANTOGRAPH


## REMOTE CONFIGURATION & MONITORING

BeanScape® 2.4GHz Basic

The BeanScape® 2.4GHz application allows the user to view all the data transmitted by the BeanDevice®2.4 GHz AX-3DS
With the OTAC (Over-the-Air configuration) feature, the user can remotely configure the V

### SEVERAL DATA ACQUISITION MODES ARE AVAILABLE ON THE BEANDEVICE® 2.4 GHz AX-3DS :

- 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.
- Survey Mode: the measured value is transmitted by radio whenever an alarm threshold (fixed by the user) is detected (4 alarms threshold levels High/Low). Meanwhile, the device sends frequently a beacon frame informing its current status.
- Streaming Packet Mode : all measured values are transmitted by packet within a continuous flow at 3 ksps/s maximum

# BeanDevice® 2.4GHz AX-3DS

## REMOTE CONFIGURATION & MONITORING

BeanScape® 2.4 GHz Premium+

The 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®"**

## ANTENNA DIVERSITY

While the vast majority of wireless IIOT sensors show their limits in harsh industrial environment, the BeanDevice® 2.4GHz AX-3DS 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-3DS integrates an embedded data logger, 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 your BeanDevice® 2.4 GHz AX-3DS :

- LowDutyCycle Data Acquisition
- Survey
- Shock detection
- Streaming packet

# BeanDevice® 2.4GHz AX-3DS

## EXAMPLE : SHOCK DETECTION ON A TRAIN


- In standalone operation, the BeanDevice® 2.4GHz AX-3DS stores all the measurements on its embedded datalogger. Thus, a direct connection with the BeanGateway® 2.4GHz is not needed.
- When the train is moving, 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 the Datalogger, please read the following technical note :**
**TN-RF-007 – "BeanDevice® DataLogger User Guide "**

## TECHNICAL SPECIFICATIONS

### PRODUCT REFERENCE

**BND-2.4GHZ-AX-3DS-MR-PS-SCM**

| MR – Measurement Range (1g = 9806.65 mm/s^2) | PS - Power Supply | MO - Mounting Option |
|---|---|---|
| 24G : ±6/12/24g measurement range | RB : Built-in rechargeable Lithium-Polymer battery 2Ah | SCM - Screw Mounting Lid |
| 8G : ±2/4/8g measurement range | | MM - Magnetic Mounting Lid |

Example n°1: BND-2.4GHZ-AX-3DS-24G-RB, Wireless Accelerometer with ±6/12/24g measurement range, rechargeable battery
Example n°2: BND-2.4GHZ-AX-3DS-8G-RB-SCM, Wireless Accelerometer with ±2/4/8g measurement range, rechargeable battery, screw mounting option

## TECHNICAL SPECIFICATIONS

| SENSOR SPECIFICATIONS | |
|---|---|
| Accelerometer Technology | Low power MEMS technology |
| Scalable measurement range | 24G Version:±6g / ±12g/ ±24g<br>8G Version:±2g / ±4g/ ±8g |
| Measurement resolution | 24G Version:3 mg/digit @±6g , 6 mg/digit @±12g , 12 mg/digit @±24g<br>8G Version: 1mg/digit @±2g , 2 mg/digit @±4g , 3.9 mg/digit @±8g |
| Typical non-linearity | ±0,15% |
| Sensitivity change Vs temperature | ±0,01% /°C |
| Zero-g level change vs temperature (max delta from 25°C) | 24G Version:±0,4 mg/°C<br>8G Version:±0,1 mg/°C |
| Typical zero-g level offset accuracy | 24G Version: ±70 mg<br>8G Version: ±20 mg |
| Analog to Digital converter | 12-bit with temperature compensation |
| Noise spectral density @ BW 10Hz | 24G Version: 650 µg/√Hz<br>8G Version: 218 µg/ √Hz |
| Anti-aliasing filter | Butterworth 2th order filter |

| OVER-THE-AIR CONFIGURATION (OTAC) PARAMETERS | |
|---|---|
| Data Acquisition mode (SPS = sample per second) | Data Acquisition mode (SPS = sample per second)<br>Alarm & Survey mode: 1s to 24 hour<br>Streaming Mode<br>Shock detection |
| Shock detection function | · Shock threshold in mg<br>· Data acquisition sample rate in sleeping mode<br>· Data acquisition sample rate after the shock detection<br>· Shock detection hysteresis |
| Sampling Rate (in streaming packet mode) | Minimum: 1 SPS<br>Maximum: 3 kSPS per axis (one axis enabled)<br>1.5 kSPS per axis (2-axis enabled)<br>1 kSPS per axis (3-axis enabled) |
| Alarm Threshold | High and Low alarms threshold |
| Power Mode | Sleep & Active |

# BeanDevice® 2.4GHz AX-3DS

## 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<br>Gain : 3 dBi<br>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) |

| ENVIRONMENTAL AND MECHANICAL | |
|---|---|
| Casing | Aluminum & Waterpoof casing<br>Dimensions in mm (LxWxH): 100x55x21 mm<br>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<br>· FCC (North America)<br>· ARIB STD-T66 Ver 3.6<br>ROHS - Directive 2002/95/EC |

| POWER SUPPLY | |
|---|---|
| Integrated battery charger | Integrated Lithium-ion battery charger with high precision battery monitoring :<br>· Overvoltage Protection, Overcurrent/Short-Circuit Protection, Undervoltage Protection<br>· Battery Temperature monitoring |
| Current consumption @3,3V | · During data acquisition : 20 to 30 mA<br>· During Radio transmission : 60 mA @ 18 dBm<br>· During sleeping mode: 68uA<br>· During deep sleeping mode : 28 uA |
| External power supply | 8-28VDC |
| Rechargeable battery | Capacity 1.25 Ah |

# BeanDevice® 2.4GHz AX-3DS

## 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 |
| M8 extension cable for external power supply | Molded cable with M8-3pins male plug<br>Material: PVC with shield protection<br>IP Rating : IP67 \| Nema 6<br>Cable length: 2 meters , Ref: CBL-M8-2M<br>Cable length : 5 meters, Ref: CBL-M8-5M<br>Cable length: 10 meters, Ref: CBL-M8-10M |
| Calibration certificate | Calibration certificate provided by Beanair GmbH<br>A static calibration method is used on a granite surface plate DIN876 |

## GETTING STARTED WITH A WIRELESS IIOT SENSORS

BeanAir
Rethinking Sensing Technology

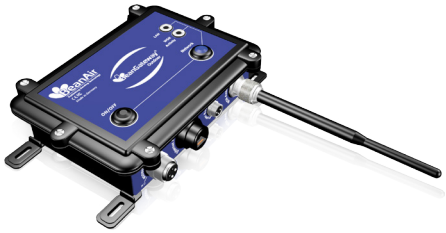
BeanGateway
Indoor Version

OPC FOUNDATION
OPC SERVER

BeanDevice
2.4GHz AX3DS

OR

BeanScape
Wireless IIOT Sensors Supervision Software



BeanGateway
Outdoor Version

2year
Warranty

The BeanDevice® 2.4 GHz AX-3DS 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

**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-3DS

## BEANDEVICE® 2.4GHZ AX-3DS FRONT VIEW


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

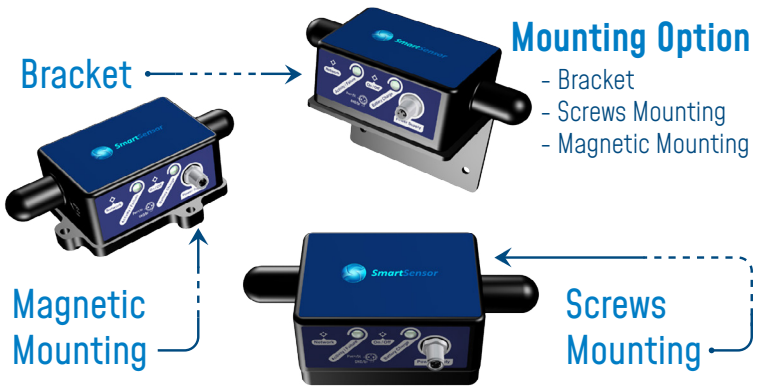
## OPTIONS AND ACCESSORIES

### 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

### Mounting Option

- Bracket
- Screws Mounting
- Magnetic 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

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