Quick Start

Wireless IOT accelerometer sensor
Shock and impact monitoring

Wireless IOT vibration sensor
Acceleration and Particle Velocity monitoring

Wireless IOT inclinometer sensor
tilt, inclination, slope monitoring | low-cost version

High performance wireless IOT inclinometer sensor
tilt, inclination, slope monitoring

SmartSensor

AX-3D XRange
High Performance wireless IOT vibration sensor | acceleration and Particle Velocity monitoring

AX-3D
Wireless IOT vibration sensor
Acceleration and Particle Velocity monitoring

Hi-Inc XRange
High performance wireless IOT inclinometer sensor | tilt, inclination, slope monitoring

INC
Wireless IOT inclinometer sensor
Tilt, inclination, slope monitoring | low-cost version
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1. TECHNICAL SUPPORT

For general contact, technical support, to report documentation errors and to order manuals, contact BeanAir Technical Support Center (BTSC) at:
tech-support@beanair.com

For detailed information about where you can buy the BeanAir equipment/software or for recommendations on accessories and components visit:
www.beanair.com

To register for product news and announcements or for product questions contact BeanAir’s Technical Support Center (BTSC).

Our aim is to make this user manual as helpful as possible. Please keep us informed of your comments and suggestions for improvements. BeanAir appreciates feedback from the users.

2. VISUAL SYMBOLS DEFINITION

<table>
<thead>
<tr>
<th>Symbols</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Caution or Warning" /></td>
<td>Caution or Warning – Alerts the user with important information about BeanAir® wireless IOT Sensors. If this information is not followed, the equipment/software may fail or malfunction</td>
</tr>
<tr>
<td><img src="image" alt="Danger" /></td>
<td>Danger – This information MUST be followed if not you may damage the equipment permanently or bodily injury may occur.</td>
</tr>
<tr>
<td><img src="image" alt="Tip or Information" /></td>
<td>Tip or Information – Provides advice and suggestions that may be useful when installing BeanAir Wireless IOT Sensors.</td>
</tr>
</tbody>
</table>
3. ACRONYMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AES</td>
<td>Advanced Encryption Standard</td>
<td></td>
</tr>
<tr>
<td>CCA</td>
<td>Clear Channel Assessment</td>
<td></td>
</tr>
<tr>
<td>CSMA/CA</td>
<td>Carrier Sense Multiple Access/Collision Avoidance</td>
<td></td>
</tr>
<tr>
<td>GTS</td>
<td>Guaranteed Time-Slot</td>
<td></td>
</tr>
<tr>
<td>kSps</td>
<td>Kilo samples per second</td>
<td></td>
</tr>
<tr>
<td>LDCDA</td>
<td>Low duty cycle data acquisition</td>
<td></td>
</tr>
<tr>
<td>LLC</td>
<td>Logical Link Control</td>
<td></td>
</tr>
<tr>
<td>LQI</td>
<td>Link quality indicator</td>
<td></td>
</tr>
<tr>
<td>MAC</td>
<td>Media Access Control</td>
<td></td>
</tr>
<tr>
<td>PER</td>
<td>Packet error rate</td>
<td></td>
</tr>
<tr>
<td>POE</td>
<td>Power Over Ethernet</td>
<td></td>
</tr>
<tr>
<td>RF</td>
<td>Radio Frequency</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>Secure Digital</td>
<td></td>
</tr>
<tr>
<td>UPS</td>
<td>Uninterruptible power supply</td>
<td></td>
</tr>
<tr>
<td>USB OTG</td>
<td>USB On The Go</td>
<td></td>
</tr>
<tr>
<td>WDAQ</td>
<td>Wireless DAQ</td>
<td></td>
</tr>
<tr>
<td>WSN</td>
<td>Wireless Sensor Networks</td>
<td></td>
</tr>
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</table>

4. Beandevic® 2.4GHz HI-INC/AX-3D/AX-3DS

4.1 Unbox your Beandevic®

Open the Beandevic® box

The Beandevic® is provided with a wall plug-in power supply (optional) and a magnet.

Use the Magnet to:
- Power ON/Power OFF the Beandevic®
- Pair the Beandevic® to your BeanGateway®
4.2 Product overview

SmartSensor® sensor series is suitable for Test & Measurement and Structural Health Monitoring (SHM):

**BeanDevice® 2.4GHz AX-3D**
Wireless IOT vibration sensor  
Acceleration and Particle Velocity monitoring

**BeanDevice® 2.4GHz AX-3DS**
Wireless IOT accelerometer sensor  
Shock and Impact monitoring

**BeanDevice® 2.4GHz INC**
Wireless IOT inclinometer sensor  
tilt, inclination, slope monitoring | low-cost version

**BeanDevice® 2.4GHz HI-INC**
Wireless IIOT inclinometer  
tilt, inclination, slope monitoring

**BeanDevice® 2.4GHz HI-INC Xrange**
High performance wireless IOT inclinometer sensor  
tilt, inclination, slope monitoring

**BeanDevice® 2.4GHz AX-3D Xrange**
High Performance wireless IOT vibration sensor  
acceleration and Particle Velocity monitoring
4.3 Non-Contact Buttons and LEDs description

<table>
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<tr>
<th>Operating status</th>
<th>Network LED</th>
<th>Battery Charge LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>The BeanDevice® is power off</td>
<td>LED OFF</td>
<td>No connection to external power supply: LED OFF</td>
</tr>
<tr>
<td>The BeanDevice® is power on with wireless TX/RX activity</td>
<td>Green LED: Wireless Network Activity&lt;br&gt;Red LED: Wireless transmission failure</td>
<td>Connection to External Power supply: Green LED ON: Battery charged&lt;br&gt;Red LED ON: Battery not charged</td>
</tr>
<tr>
<td>The BeanDevice® is power on</td>
<td>Green LED blinks twice</td>
<td></td>
</tr>
<tr>
<td>The BeanDevice® is power off&lt;br&gt;then&lt;br&gt;Red LED ON during 2s&lt;br&gt;then&lt;br&gt;Green LED blinks&lt;br&gt;constantly until connection to BeanGetway®</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The BeanDevice® is power on &amp; a network Reset is performed</td>
<td>Red LED ON during 2s&lt;br&gt;then&lt;br&gt;Green LED ON during 2s&lt;br&gt;then&lt;br&gt;Green LED blinks</td>
<td></td>
</tr>
</tbody>
</table>

Do not turn the Radome Antenna, you will unscrew it from its base and the device will not work properly.
5. Wireless IOT Coordinator (BEANGATEWAY®)

The BeanGateway® is a wireless coordinator used to build and manage BeanAir® Wireless IOT Sensors. It supports the conversation of data exchanged, compression and IP connectivity with the network thereby reducing the intelligence required in these platforms, maintenance and therefore the associated cost. The BeanGateway is available in two versions: Indoor (IP40) and Outdoor (IP67).

5.1 UNBOX YOUR BEANGATEWAY® OUTDOOR

Open the BeanGateway® Outdoor box

5.2 UNBOX YOUR BEANGATEWAY® INDOOR

Open the BeanGateway® box

The BeanGateway® Outdoor is provided with a wall plug-in power supply, a power adapter for your country, a N-Type antenna, a Wall mounting kit and an Ethernet cable.
The BeanGateway® Indoor is provided with a wall plug-in power supply, a power adapter for your country, a RPSMA antenna and an Ethernet cable.

**Figure 6**: BeanGateway® Indoor version

**Figure 7**: BeanGateway® Indoor Accessories

## 5.3 INDOOR VERSION

**Front View**
- Reset LAN Settings
- Wireless Link
- LAN Link

**Rear View**
- Antenna
- Ethernet
- RS232 / ModBus
- RS485 / ModBus
- Power Supply 8-28 VDC
- OFF/ON
- Reboot
5.4 OUTDOOR VERSION

6. START YOUR APPLICATION

1. Insert the BeanScape® 2.4GHz DVD in your DVD drive then follow the installation instructions.

2. Connect your Beangateway® directly to your PC or your WIFI/LAN router by using an Ethernet cable.

If you connect your Beangateway® to your WIFI/LAN router, you can go for Static or Dynamic IP. If your Beangateway® is directly connected to your PC, Static IP should be selected as there is no DHCP server hosted on your PC.
Direct connection:

The BeanGateway® comes with the default IP address 192.168.4.123. Assign manually a static IP address to your PC with the same subnet as your BeanGateway®, 192.168.4.2.

3. Make sure that your Beanscape® software is already installed on your PC and running.

4. Turn on the BeanGateway® by pushing on the ON/OFF button if you are using the outdoor version or slide the ON/OFF button to the right side if you are using the indoor version.

Via LAN Router connection:

You can go for Dynamic IP address on both PC and BeanGateway®.

5. Go to Tools tab then select BeanGateway® Ethernet/LAN Config. and select your PC IP address from the scroll down menu then click on localize, your BeanGateway® MAC ID will appear on a scrolling list, select it then click on validate.
6. Click on “Start” to start the server or click on BeanScape® App tab

The Beanscape® launches, and creates a mapping of the BeanGateway® on the bottom of the left side pane.

Click on the BeanGateway® identified by the PAN ID in the lower left screen. The screen for monitoring and configuring your BeanGateway® will show up.

Via LAN Router connection:

Make sure that DHCP check box is enabled

Direct connection:

Allocate a static IP to your BeanGateway® before to click on validate

If the BeanGateway® scroll down menu appears empty, push on the CNC/Network push button for 10s until the network LED turns to red color. You will restore LAN settings from the factory (static IP address: 192.168.1.123) then redo the localization process.

Make sure you have no antivirus/firewall blocking the network activity between the BeanGateway® and the BeanScape® software.
7. QUICK SETTINGS

7.1 DATA ACQUISITION CONFIGURATION

1. Go to the configuration frame and select Data Acq. Config tab

2. Setup your Acquisition mode

3. Click on the sensor profile to see real-time measurement graph

Find more info on the data acquisition modes available on the BeanDevice® 2.4 GHZ and how to configure it on this technical note: http://www.wireless-iot.beanair.com/files/TN-RF-008-Data-acquisition-modes-available-on-the-BeanDevice.pdf

7.2 USING THE DATALOGGER

The BeanDevice® comes equipped with an embedded datalogger up to 8 millions data points (with events dating) in the Xrange version.

You can start the datalogging from the previously demonstrated data acquisition tab, you can select Log only as data acquisition option for only using the embedded datalogger without transmitting data to BeanScape or you can select TX & LOG for jointly save data on your BeanScape® Host computer and also in the datalogger at the same time.
Brief information on the status of the datalogger and progress of download can be seen on this tab.

![DataLogger status](image)

**Figure 21**: DataLogger status

Four status are available:
- **Ready**: the datalogger is ready to register data
- **Active logs only**: Data acquisition is logged only
- **Active TX and Log**: Data acquisition is logged & transmitted by Radio
- **Stopped**: Datalogger is stopped

Two buttons, one to stop the logging and the other to erase stored data and initialize the Datalogger.

![DataLogger manager](image)

**Figure 22**: DataLogger manager

Below, in the download manager, different options to control the datalogger.

![Download manager](image)

**Figure 23**: DataLogger Management

From this status frame, you can monitor the Datalogger status, Memory option when the Datalogger is full and percent of memory used.

![DataLogger Status](image)

**Figure 19**: DataLogger Status

These settings can be changed from the DataLogger tab present on configuration panel:

![DataLogger Options](image)

**Figure 18**: DataLogger Options

With the Data acquisition mode options, you can choose between Tx Only, Log Only, or Tx & Log.

![Data Logger](image)

**Figure 20**: DataLogger tab

Download: Starts to download all the logs on the BeanDevice® flash memory to your computer
Download then erase: downloads all the logs and the erase them.
Cancel: Stops the download process
Stop DAQ, download then erase: stop recording data, download the data logged then erase it

Below, we can configure the datalogger when it's full. Several choices are available:

- "Stop DAQ" recording: Stop recording when the memory is full
- "stop at end" recording: Data recording stops when the memory is full
- "Stop DAQ DE" recording: Stop recording, download then erase the stored data

Figure 24: Datalogger memory configuration

8. WHERE TO FIND MORE TECHNICAL INFORMATION?

- For mode technical litterature, please visit our White Paper Page:
  http://beanair.com/wireless-iot-sensors-white-paper.html

- Please refer to the BeanDevice® 2.4GHz Smart Sensors user manual section for more information

- For detailed information on the available Data Acquisition mode, please refer to our technical note

Facing technical problems?
Contact our technical support team at:
tech-support@beanair.com