BeanAir
WIRELESS IOT SENSORS

PRODUCTS CATALOG 2024

WIFI | WIRELESS IOT SENSORS

2.4GHZ | WIRELESS IOT SENSORS

IOT

www.beanair.com

ABOUT US

HEADQUARTER

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Recent developments in sensor technology, especially when wireless technology is considered, have opened up new gates in terms of health monitoring and preemptive fault detection.

To meet these new challenges, BeanAir®, a leading German company in sensing technology, designs and manufactures smart, rugged and open-standard wireless IOT sensors.

BeanAir® Wireless IOT sensors constitute an outstanding technology for various applications : Structural Health Monitoring, Test and Measurement, Land Surveying, Condition Monitoring, Environmental Monitoring ...

Furthermore, the high level of versatility, performance, and reliability of its wireless IOT sensors, in addition to a worldwide presence thanks to effective system integrators partners, Beanair® has acquired an international outreach and continues to maintain a strong reputation with major customers in numerous sectors.

www.facebook.com/BeanAir

WWW.BEANAIR.COM

www.youtube.com/user/BeanairSensors

www.twitter.com/beanair

Date: 04/01/2024

APPLICATIONS

GROUND VIBRATION MONITORING

Monitoring and control of ground and structural vibrations provide the rational to select measures for prevention or mitigation of vibration problems.

Discover how our wireless vibration sensors can provide a great flexibility in terms of deployment and performances.

ENVIRONMENTAL MONITORING

Beanair provides a wireless IOT sensors system perfectly adapted to any environmental need:
- Autonomous wireless sensors (ultra low battery consumption with an autonomy than can go up to 7 years)
- Various information transmission protocols
- Data acquisition and storage device
- Wireless IOT sensors supervision and monitoring software

LAND SURVEYING

Surveying and land surveying is the measurement and mapping of our surrounding environment using mathematics, specialized technology and equipment.

Discover how Beanair provides field-proven and cost-effective wireless IOT sensors for land surveying.

STRUCTURAL HEALTH MONITORING

The recent developments in sensor technology, especially when wireless technology is considered, have opened up new gates in terms of health monitoring and preemptive fault detection.

BeanAir®'s wireless sensor technology offers great reliability, versatility, maintainability and easy to deploy technology

CONDITION MONITORING

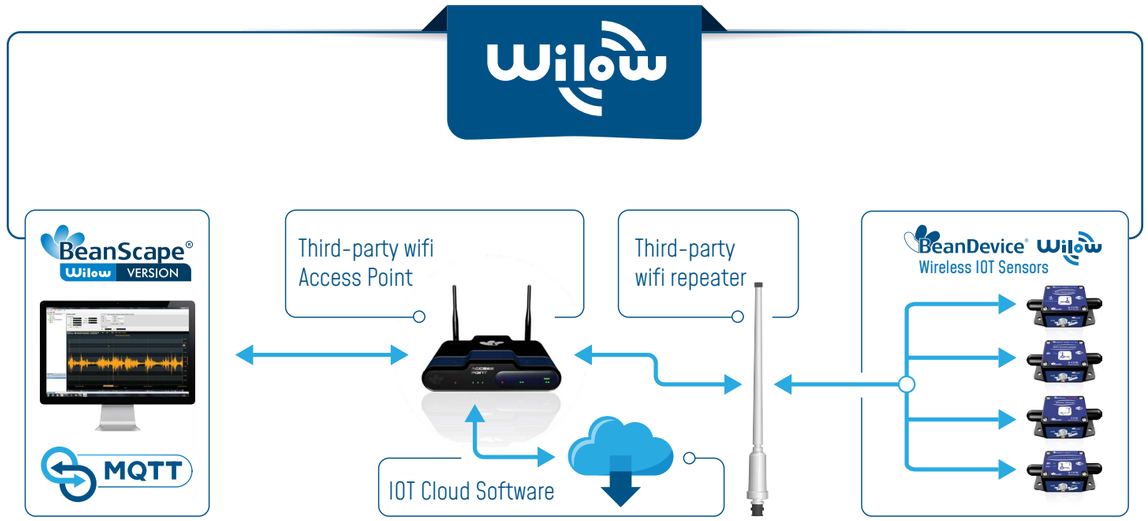
BeanAir® offers the ideal solution to your needs in terms of measurement and instrumentation to improve equipment energy efficiency and get better knowledge about equipment availability.

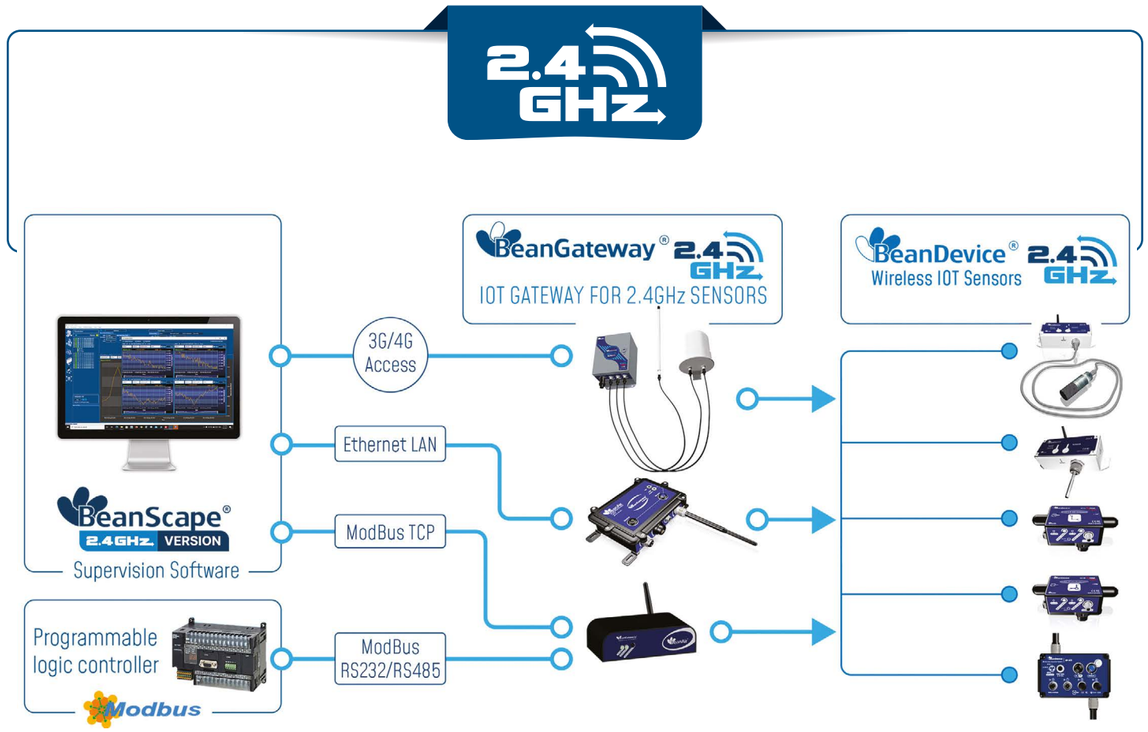
TEST AND MEASUREMENT

Offer a True Flexibility to your Testbench !

BeanAir technology offers solutions for rolling stock, naval and aeronautic manufacturer in terms of test and measurement, aiming at reducing costs related to test bench.

FINDING THE WIRELESS SENSOR FITTING YOUR APPLICATION





COMPARISON TABLE

	Wilow	2.4 GHz
Wireless range in Line-of- Sight (L.O.S.) and Non Line-of-Sight (NLOS)	200 m in L.O.S. 20-50 m in N.L.O.S. Wireless range can be extended by adding WIFI bridge/repeaters	500 m in L.OS. 30-100 m in N.L.O.S
Wireless Technology	IEEE 802.11 b/g/n @2.4GHz	2.4GHz wireless based on IEEE 802.15.4E
Open Standard or proprietary protocol	Open-Standard protocol	Proprietary Protocol
Need a specific Wireless Network Coordinator (Gateway) ?	✗	✓
Low Power	⊕⊕	⊕⊕⊕⊕
Network Aggregation capacity	✓✓✓	✓
Available sensors/DAQ	Vibration & Peak Particle Velocity, shock, Inclinometer	temperature, IR temperature, humidity, dew point, Vibration & Peak Particle Velocity, shock, inclinometer, analog DAQ (4-20mA,±20 mV, ±5V, ±10V)
IOT Ready (MQTT protocol)	YES, Free source codes available in C#, Labview, Android and NodeRed	✗
Energy Harvesting (Solar power supply)	✓	✗
USB Link	USB 2.0	✗
USB power supply	✓	✗
Easy Firmware update	USB and Wifi	✗
Store and Forward+	✓	✗
Clock- synchronization	±30 ms	±2.5 ms
Encryption on Wireless Link	WEP, WAP, WAP2	✗
Wakeup function	Timer	Timer

WIFI | WIRELESS IOT SENSORS

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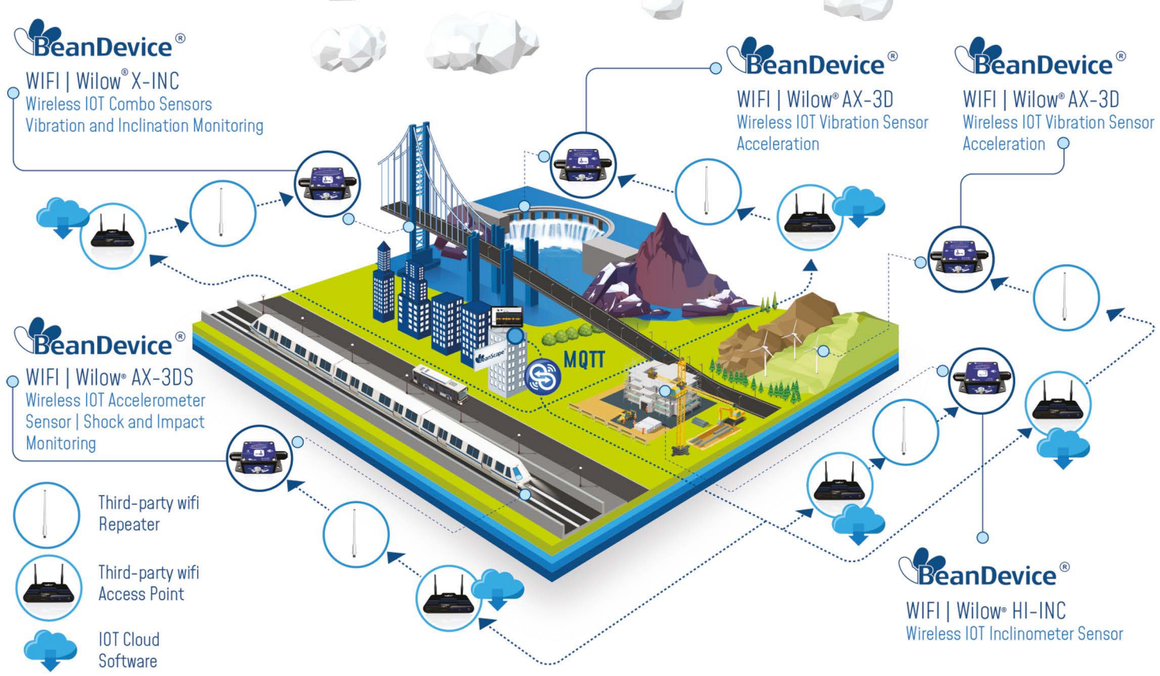
WIRELESS IOT SENSORS

OPEN-STANDARD WIFI SENSORS FOR INDUSTRIAL INTERNET OF THINGS

Until now, WIFI technology was extremely energy greedy and unreliable. Users working on Structural Health Monitoring (SHM) and condition monitoring were more favorable to deploy proprietary wireless IOT sensors offering a better reliability and a low power operation.

Thanks to more than 13 years of experience in sensing technology and wireless IOT sensors, our research and development team worked intensively with our customers to bring out WiLow® (Wifi Low Power) technology, a new generation of WIFI IOT sensors (vibration, inclination and shock) which is reliable, ultra-low power, open-standard and adapted to dynamic data acquisition.

WILOW® SENSOR SERIES DEPLOYMENT



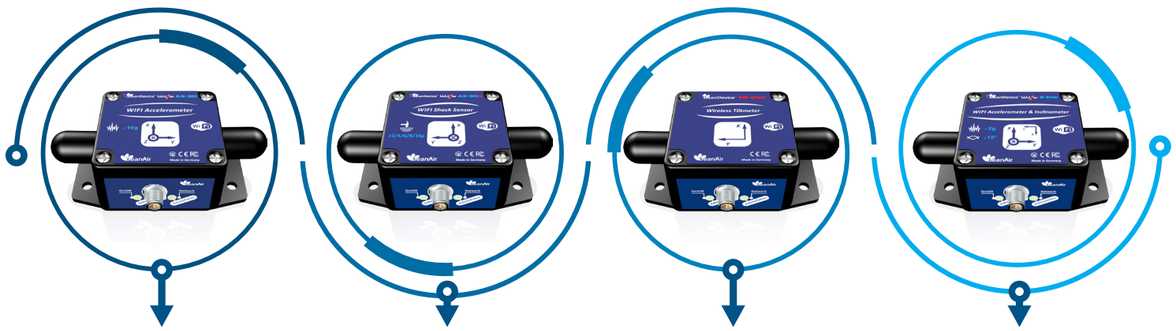
WIRELESS IOT SENSORS

MAIN FEATURES

- ULP (Ultra Low Power) Wifi Technology - IEEE 802.11 b/g/n (2.4 Ghz frequency band)
- Rugged aluminum casing Waterproof IP67/NEMA 6
- Embedded Data Logger: up to 5 million data points (with events dating)
- USB 2.0 for device configuration (including firmware update)
- Over the Air Firmware Upgrade via WIFI.
- Store and Forward+: Lossless data transmission with hard real-time
- SSD (Smart Shock Detection), WILOW® sensor can wakeup on shock detection (BeanDevice Wilow® AX-3DS only)
- Industrial temperature range -40 °C to +65 °C
- Onboard SNTP (Simple Net Time Protocol) Client with ±30ms of precision
- SSL/TLS Encryption over MQTT Data exchange
- Solar Power Supply (option)
- Integrated MQTT Data exchange with SSL/TLS Encryption. A lightweight and open-standard Internet of Things protocol.

By connecting WILOW® IOT Sensors to existing WIFI infrastructure, user can benefit from a rapid return on investment:

- Lower total cost of ownership-works
- Large installed base and consequent broad-based familiarity with configuration, use and troubleshooting at the physical and link layers
- Easy provisioning & IT friendly: WILOW® IOT sensors use IP-over-Ethernet networking environment



BEANDEVICE® WIFI WILOW® AX-3D
Wireless IOT Vibration Sensor
±2g

BEANDEVICE® WIFI WILOW® HI-INC
Wireless IOT Inclinometer Sensor with great measurement repeatability
±15° or ±30°

BEANDEVICE® WIFI WILOW® AX-3DS
Wireless IOT Shock Sensor
±2/4/8/16g

BEANDEVICE® WIFI WILOW® X-INC
Wireless IOT Combo Sensors Vibration and Inclination Monitorining
±15°/30° AND ±2g

WIRELESS IOT SENSORS

GET READY FOR INDUSTRIAL INTERNET OF THINGS (IOT)

Industrial Internet of things

Ready for Industrial Internet of things (IOT) applications, WiLow® sensors integrate natively MQTT (Message Queuing Telemetry Transport) data frame, a lightweight and open-source (OASIS & ISO/IEC 20922:2016 standards) Internet of Things protocol.
MQTT is based on publish/subscribe paradigm, therefore user can easily connect, configure and manage several WiLow® sensors at the same time from a unique IOT software platform.
Users looking for a high level of security can count on a mechanism to notify interested parties to an abnormal disconnection of a client using the Last Will and Testament feature.
No need to spend several months to develop a specific and complex supervision software, user can easily integrate WiLow® sensors in a third-party IOT Cloud platform (Amazon web services, IBM Watson, Microsoft Azure, Facebook Messenger, Alibaba Cloud....).
Non-developer users can still use the BeanScape® software to setup a quick and affordable Wifi sensor network.

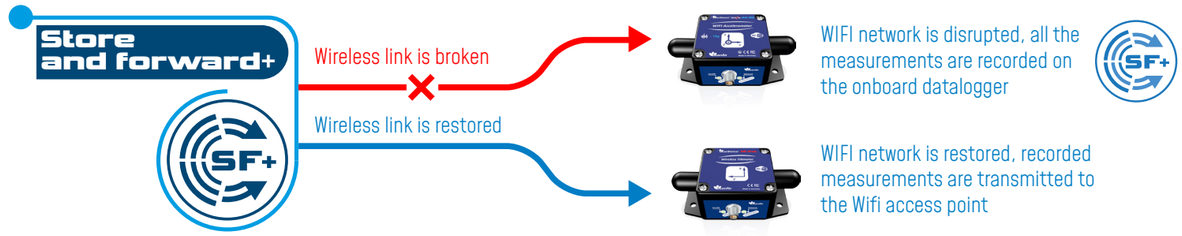
TRIGGER DATA ACQUISITION ON SHOCK DETECTION

SSD

Thanks to our Smart Shock Detection (SSD) technology, the BeanDevice Wilow AX-3DS can wake up on a shock detection and starts immediately data acquisition and real-time wireless transmission. Unsolicited wakeup can be avoided by configuring both shock threshold (up to 16g) and a delay timer. User will spend less time to analyze data acquisition as both data recording & wireless transmission start when a shock threshold is reached. Battery life can be extended as Wilow® IOT sensors are most of the time in sleep power mode.

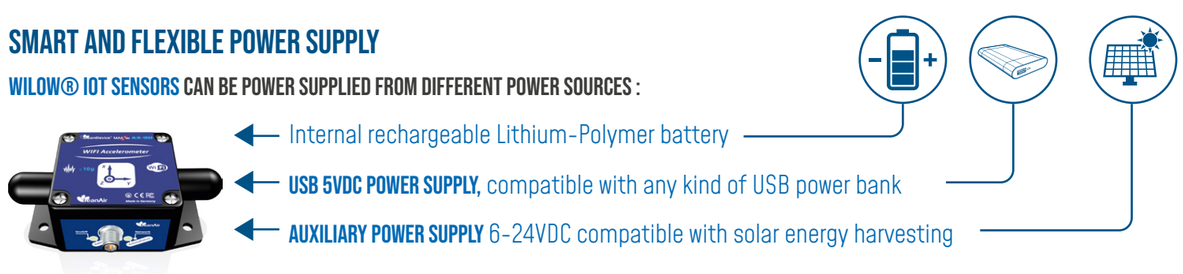
RELIABLE WIFI TECHNOLOGY THANKS TO OUR "STORE AND FORWARD+" FUNCTION

The store and forward technique operates by storing the message transmitted by WiLow® IOT sensors to a WIFI access point/ WIFI receiver. If the message is not received due to a network disruption, it will be retransmitted on the next transmission cycle.
This technique enables a Lossless data transmission.



SMART AND FLEXIBLE POWER SUPPLY

WILOW® IOT SENSORS CAN BE POWER SUPPLIED FROM DIFFERENT POWER SOURCES :



WILOW®—ULTRA LOW POWER WIFI ACCELEROMETER SELECTION GUIDE

Main Features	BeanDevice® Wilow® AX-3D	BeanDevice® Wilow® AX-3DS
Reference & measurement range	BND-WILOW-AX-3D-2G	BND-WILOW-AX-3DS-16G
		
Measurement Range	±2g	±2/4/8/16g
Spectral noise density@ BW 10Hz	45 µg/√Hz	150 µg/√Hz
Applications	Vibration Monitoring	Mechanical Shock Monitoring
Maximum sampling rate per channel (SPS–sample per second)	2000 SPS	1600 SPS

WILOW®—ULTRA LOW POWER WIFI INCLINOMETER SELECTION GUIDE

Main Features	BeanDevice® Wilow® HI-INC	
Reference & measurement range	BND-WILOW-HI-INC-15B	BND-WILOW-HI-INC-30B
		
Sensor Repeatbility	±0.003°	±0.004°
Measurement Range	±15°	±30°
Sensor Resolution	0.001°	
Spectral noise density@ BW 10Hz	0.0004 °/√Hz	
Maximum sampling rate per axis (SPS–sample per second)	2000 SPS	

WILOW®—ULTRA LOW POWER WIFI | COMMON SPECIFICATIONS

- Maximum wireless Range (L.O.S.): 200 m, can be extended by adding WIFI Repeater/Bridge
- Data Logger Size: 5 million data points
- Mounting techniques: Screw mountion by default, options: 90 degree bracket (add the extension –BR) or magnetic mounting (add the extension -M)
- Internal Battery/ External Power Supply:
  - Internal Rechargeable Lithium-Ion 780 mAh
  - External Power supply:
    - USB power supply (5VDC)
    - Option for auxiliary power supply : 8-24VDC compatible with solar energy harvesting (add the extension –EHR)
- Casing : Aluminum casing - Dimensions in mm (LxWxH):35x59x65 mm without antenna & eyelet, Weight (with internal battery, w/o mounting option) : 220g

OPTIONAL ACCESSORIES AND SERVICES

X-SOLAR | STAND-ALONE SOLAR POWER SYSTEMS

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

REF : X-SOL-WILOW-12AH-20W-4CH-5V-CL

REF: X-SOL-7AH-SLP-VOUT-CL

Input voltage solar cell panel: 14-30VDC
Number of output voltage: 1
Output Voltage: 5VDC
Battery Capacity: 7Ah
Dimensions: 260 mm x160 mm x 90 mm
IP Rating: Waterproof IP67 | NEMA 6
Weight: 4.5 kg

SOLAR PANEL

High effciency Monocrystalline solar cell technology

MECHANICAL MOUNTING OPTIONS

By default, the BeanDevice® Wilow® comes with a screw mounting lid.
Two other mounting options are available:

- Magnetic mounting
- 90° bracket

WIRELESS IOT SENSORS

A RUGGEDIZED OUTDOOR IOT GATEWAY FOR YOUR MONITORING SITE

The Wilow® IOT Gateway is a ruggedized outdoor (IP66) IOT gateway designed for Harsh Industrial Environment. It supports both WIFI and 3G/4G/LTE wireless protocols and allows a very easy connection to our Wilow® IOT sensors.
Thanks to WDS (Wireless Distribution System, only available on Mains Power version) function, a wireless bridging with other WIFI Bridges/Repeaters can be configured for a better wireless network coverage. The combination of MQTT protocol and 4G connectivity enables effortless data transmission from the sensor to the cloud.
The BeanScape® Wilow® RA, a supervision software dedicated to IOT sensors with remote access, can display in real-time all the collected data from the monitoring site.
Provided with high gain outdoor antennas (12dBi for LTE, 9dBi for WIFI), the connection will be secured from the wireless IOT sensor to the remote supervision software.
The Wilow® IOT Gateway can be powered from an external AC Power supply (90 ~ 264VAC) with UPS Battery or solar power supply. The internal Lead-acid battery provides instantaneous protection from external power supply interruptions, the wireless network activity is maintained during this time.

IOT GATEWAY WITH 4G CONNECTIVITY DEDICATED TO WILOW® SENSORS

IOT Gateway with 4G connectivity dedicated to Wilow® sensors:

- Remote access to monitoring site thanks to the integrated 3G/4G/LTE Router (4G Connectivity CAT4 up to 150 Mbps) and the built-in MQTT broker
- WIFI connectivity (IEEE 802.11 b/g/n) 2.4GHz
- WDS (Wireless Distribution System) with WIFI AP/ Station/Bridge network configuration
- Robust, Waterproof (IP67) and High Gain antennas:
  - 3G/4G/LTE antenna (2x2 MIMO) with 12dBi of Gain
  - 2.4GHz antenna with 9dBi of Gain
- UPS Battery (Lead Acid Battery 12Ah)
- Ruggedized and watertight (IP66 | Nema 4) steel casing (LxWxh: 65x59x35mm, 9.8 Kg) with anti-thief protection
- Certifications for European Market (CE), North America (FCC) and Japan (Giteki)
- Industrial operating temperature (-15°C to +50°C)

APPLICATIONS

The Wilow® IOT GATEWAY 4G is the right solution for different monitoring applications:

- Structural Health Monitoring.
- Land Surveying.
- Industrial Applications
- Ground vibration monitoring on construction site.

Important: BeanScape® Wilow® RA is needed for Remote Accces

WIRELESS IOT SENSORS SUPERVISION SOFTWARE

OVERVIEW AND MAIN FEATURES

The BeanScape® Wilow® is a real time Supervision software dedicated to Wilow® Wireless IOT sensors. It's is also equipped with a smart expert system that allows users to interpret elements such as data acquisition or alarms related to the Wireless IIOT sensors network.

The BeanScape® Wilow® comes with outstanding features:

- Supervision software fully dedicated to Wilow® Wireless IOT sensors
- Integrated MQTT Broker for a remote access to monitoring site (BeanScape® Wilow® RA)
- Fully integrated Wireless IOT Sensors maintenance tool
- User friendly and highly adaptable to user's environment
- Highly intuitive and easy to use GUI (Graphical User Interface)
- Real time integrated database
- The BeanScape® Wilow® Premium/RA provides a complete vibration diagnostic and report:
  - Real-Time vibration, FFT and Peak Particle Velocity display
  - Advanced vibration analysis tool: FFT, PPV (Peak Particle Velocity) on the ±2g version only,
  - Amplitude measurement for structure movement monitoring
  - Automatic FFT and Peak Particle Velocity reports (meeting the DIN4150-3 standard)
  - Alarm generation by email when a vibration threshold is reached
- Highly customizable data panel board
- No hidden fees, and no additional subscription

SEVERAL VERSIONS ARE AVAILABLE (SEE COMPARISON TABLE FOR MORE DETAILS):

- BeanScape® Wilow® Manager: the right software version for configuring Beanair Wireless IOT Sensors
- BeanScape® Wilow® Lite: the right software version to evaluate quickly Beanair Wireless IOT Sensors
- BeanScape® Wilow® Basic: Same features than BeanScape® Wilow® Lite, with Alarm notification by email
- BeanScape® Wilow® Premium : Same features than BeanScape® Wilow® Basic, with advanced vibration analysis tools (Real-Time Velocity and FFT, PPV values).
- BeanScape® Wilow® RA: Same features than BeanScape® Wilow® Premium, with remote access to monitoring site (MQTT Architecture)

REAL TIME & FULLY INTEGRATED DATA BASE :

The real time database records high sampling measurement plots and Wireless IOT Sensors activities with a small memory footprint :

- No installation is needed
- Data backup (activable/disactivable functionality).
- Easily exportable data in CSV format (Access, Excel, Matlab, Labview...).

BeanAir IoT

Wilow

WIRELESS IOT SENSORS SUPERVISION SOFTWARE

SOFTWARE VERSIONS

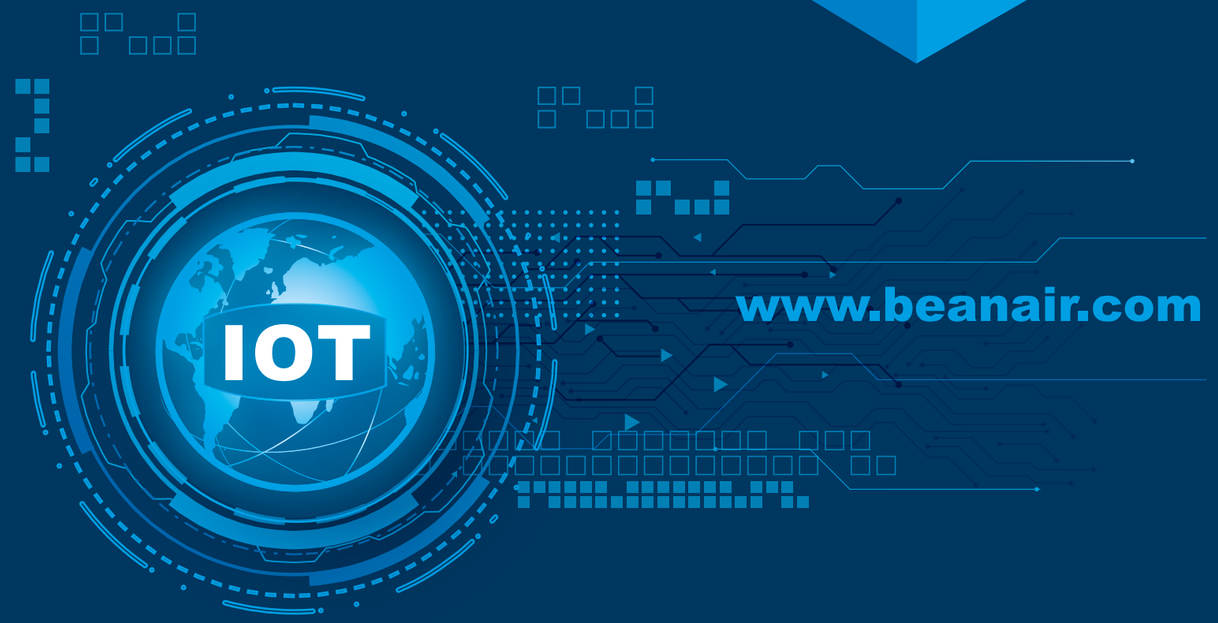
	BeanScape® Wilow MANAGER	BeanScape® Wilow LITE	BeanScape® Wilow BASIC	BeanScape® Wilow PREMIUM	BeanScape® Wilow R.A. Version
Period technical assistance	6 months	6 months	1 year	1 year	1 year
Free of cost ?	✓	✓	✗	✗	✗
Number of managed Beandevice® Wilow	35	5	35	unlimited	unlimited
Real-time graph display	✗	✓	✓	✓	✓
Alarm notification by email: System and Data Acquisition alarms	✗	✗	✓	✓	✓
Streaming with Event-Trigger (S.E.T.) mode	✗	✓	✓	✓	✓
Real-Time FFT, Real-Time Velocity	✗	✗	✗	✓	✓
Automatic reports by email (Waveform, FFT, PPV, Particle Velocity)	✗	✗	Only Waveform report	✓	✓
Remote access (based on MQTT Architecture)	✗	✗	✗	✗	✓
Integrated MQTT Broker	✗	✗	✗	✗	✓
MQTT full services (Diagnostics, Measurement and remote configuration)	✓	✓	✓	✓	✓
Free updates	✓	✓	1 year	1 year	1 year

MINIMUM SYSTEM REQUIREMENTS

- 2.33GHz or faster x86-compatible processor
- Microsoft® Windows® XP (32-bit), Windows Server® 2003 (32-bit), Windows Server 2008 (32-bit), Windows Vista® (32-bit), Windows 7 (32-bit and 64-bit), Windows 10 (32-bit and 64-bit)
- 4GB of RAM
- 10 GB of disk space
- 1 GB of graphics memory

2.4 GHz

2.4GHZ | WIRELESS IOT SENSORS



WIRELESS IOT SENSORS FOR INDUSTRIAL APPLICATIONS

Our 2.4GHz sensor series is a field-proven wireless IOT sensors for Industrial applications. It integrates a great diversity of measurements: vibration, Inclination, Temperature, Humidity, Shock and analog data acquisition for an easy connection to your own sensor.

WIRELESS IOT SENSORS WITH INTEGRATED DATA LOGGER

The BeanDevice® 2.4GHz is a wireless sensor / DAQ providing a real-time wireless transmission and a high capacity data logger with low power operation.
It can be used for both dynamic and static measurement.

WIRELESS IOT GATEWAY

The BeanGateway® 2.4GHz is used to Build 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.

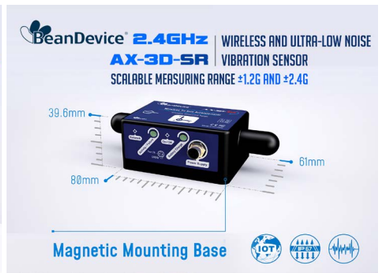
WIRELESS IOT SENSORS FOR INDUSTRIAL APPLICATIONS

SmartSensor | WIRELESS IOT ACCELEROMETER SELECTION GUIDE

Main Features	BeanDevice® AX-3D	BeanDevice® AX-3DS	BeanDevice® AX-3D X-Range
			
Reference	BND-2.4GHz-AX-3D-2G-RB BND-2.4GHz-AX-3D-10G-RB	BND-2.4GHz-AX-3DS-8G-RB ±2G BND-2.4GHz-AX-3DS-8G-RB-SCM ±4G BND-2.4GHz-AX-3DS-8G-RB-MM ±8G BND-2.4GHz-AX-3DS-24G-RB ±6G BND-2.4GHz-AX-3DS-24G-RB-SCM ±12G BND-2.4GHz-AX-3DS-24G-RB-MM ±24G	BND-2.4GHz-AX-3D-XR-2G-RB-MM BND-2.4GHz-AX-3D-XR-2G-RB-SCM BND-2.4GHz-AX-3D-XR-10G-RB-MM BND-2.4GHz-AX-3D-XR-10G-RB-SCM
Measurement Range	±2g or ±10g	±2/4/8g or ±6/12/24g	±2g or ±10g
Spectral noise density@ BW 10Hz	±2g Version : 45 µg/√Hz ±10g version: 100 µg/√Hz	±24G Version: 650 µg/ √Hz ±8G Version: 218 µg/ √Hz	±2g Version : 45 µg/√Hz ±10g version: 100 µg/√Hz
Applications	Vibration Monitoring	Shock, Impact and vibration monitoring	High-Accuracy Vibration Monitoring
Maximum wireless Range (L.O.S. and N.L.O.S.)	500 m in L.O.S 30-100 meters in N.L.O.S		
Maximum sampling rate per channel (SPS—sample per second)	1000 SPS	1000 SPS	1000 SPS
Available Measurement mode	Low Duty Cycle 1s to 24h Streaming	Low Duty Cycle 1s to 24h Smart Shock Detection (SSD) Streaming	Low Duty Cycle 1s to 24h Streaming
Data Logger Size	1 million logs		8 million logs
Internal Battery	Rechargeable Lithium-Polymer battery 1250mAh		Rechargeable Lithium-Polymer battery 2200mAh
Mounting option	Adhesive Mounting	Screw Mounting Magnetic Mounting	
Casing	Waterproof IP67 aluminum enclosure Dimensions in mm (LxWxH): 80x55x36 Weight : 155g		Waterproof IP67 Aluminum enclosure , Dimensions in mm (LxWxH): 100 x 71 x 38 Weight : 225g (screw mounting) 252g (magnetic mounting)

BEANDEVICE® 2.4GHZ | WIRELESS AND ULTRA-LOW NOISE VIBRATION SENSOR
AX-3D-SR | SCALABLE MEASURING RANGE ±1.2G AND ±2.4G

BND-2.4GHZ-AX-3D-SR-MR-PS-MO		
MR– Measurement Range، 1.2T ،tri-axis Low noise vibration sensor ±1.2g/±2.4g	PS - Power Supply RB ، Built-in rechargeable Lithium-Polymer battery 2Ah	MO - Mounting Option SCM - Screw Mounting Lid MM - Magnetic Mounting Lid
Accelerometer technology	Accurate and low power MEMS technology	
Scalable Measuring Range	user-seletctable range ±1.2g or ±2.4g, with automatic range adjustment depending on the application	
Sensor resolution	0.085mg	
Noise density	20 µg/√Hz for ±1.2G measurement range 32 µg/√Hz for ±2.4G measurement range	
Sensor precision (full scale, @ 25°C @1HZ sampling rate)	±0.7mg for ±1.2g measurement range ±1.3mg for ±2.4g measurement range	
Sensitivity temperature dependency (temperature range –25°C to +85°C)	±0.1 %	
Offset LifeTime Drift (@25°C)	±4mg	
Sensor frequency Response (-3 dB)	DC to 40 Hz for ±1.2g measurement range DC to 70 Hz for ±1.2g measurement range	
Integrated battery charger	Integrated Lithium-ion battery charger with high precision battery monitoring ، • Overvoltage/Overcurrent/Short-Circuit/Undervoltage protection • Battery Temperature monitoring	
Casing	• Aluminum AL6061 & Waterpoof casing • Dimensions in mm (LxWxH)، 100 x 71 x 38 (without Radome antennas, with mounting eyelet) • Weight (with internal battery) ، 225g (screw mounting) 252g (magnetic mounting)	



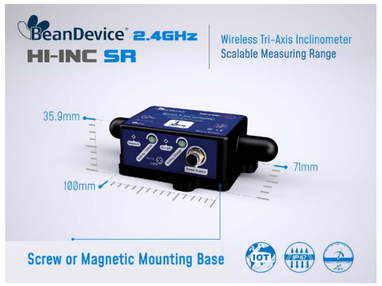
BeanAir IoT 2.4 GHz WIRELESS IOT SENSORS FOR INDUSTRIAL APPLICATIONS

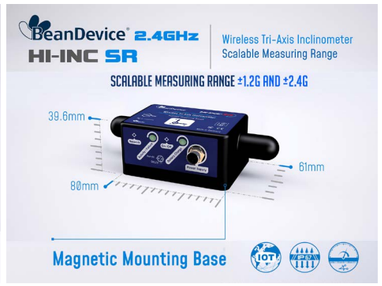
SmartSensor | WIRELESS INCLINOMETER SELECTION GUIDE

Main Features	BeanDevice® INC	BeanDevice® HI-INC	BeanDevice® HI-INC X-Range
			
Reference	BND-2.4GHz-INC-30B-RB BND-2.4GHz-INC-90B-RB BND-2.4GHz-INC-30B-XT BND-2.4GHz-INC-90B-XT	BND-2.4GHz-HI-INC-30B-RB BND-2.4GHz-HI-INC-30B-XT	BND-2.4GHz-HI-INC-30B-XR-RB-SCM BND-2.4GHz-HI-INC-30B-XR-XT-SCM BND-2.4GHz-HI-INC-30B-XR-RB-MM BND-2.4GHz-HI-INC-30B-XR-XT-MM
Measurement Range	±30°or ±90°	±30°	±30°
Sensor Technology	Bi-Axis Inclinometer		
Sensor Resolution	±0.0025°	±0.001°	
Noise spectral density DC to 100 Hz	0.0008 °/ √Hz	0.0004 °/ √Hz	0.0004 °/ √Hz
Sensor repeatability (full scale @25 °C)	±0.04° for bi-axis ±30° version ±0.08° for bi-axis ±90° version	±0.006° for bi-axis ±30° version	
Maximum wireless Range (L.O.S. and N.L.O.S.)	500 m in L.O.S 30-100 meters in N.L.O.S		
Data Logger Size	1 million logs		8 million logs
Internal Battery	Rechargeable Lithium-Polymer battery 950mAh		Rechargeable Lithium-Polymer battery 2200mAh
Mounting option	Adhesive Mounting		Screw Mounting Magnetic Mounting
Casing	Waterproof IP67 aluminum enclosure Dimensions in mm (LxWxH)، 80x55x36 Weight ، 155g		Waterproof IP67 Aluminum enclosure ، Dimensions in mm (LxWxH)، 100 x 71 x 38 Weight ، 225g (screw mounting) 252g (magnetic mounting)

BEANDEVICE® 2.4GHZ | WIRELESS TRI AXIS INCLINOMETER SENSOR
HI-INC-SR | SCALABLE MEASURING RANGE ±10° AND ±90°

BND-2.4GHZ-HI-INC-SR-MR-PS-MO		
MR– Measurement Range 10T : Tri-axis ±10° / ±90°	PS - Power Supply RB : Built-in rechargeable Lithium-Polymer battery 2Ah	MO - Mounting Option SCM - Screw Mounting Lid MM - Magnetic Mounting Lid
Inclinometer technology	Accurate and low power MEMS technology	
Scalable Measuring Range	user-seletctable range ±10° or ±90°, with automatic range adjustment depending on the application	
Sensor resolution	0.0055°	
Noise density	for ±10° range : 0.0007 °/√Hz on Y Axis, 0.008 °/√Hz on X, Z Axis for ±90° range : 0.0012 °/√Hz on all axis	
Sensor precision (full scale, @ 25°C, Static Measurement Mode every 2s)	±0.005° for ±10° measurement range ±0.009° for ±90° measurement range	
Offset temperature dependency (temperature range –25°C to +85°C)	±0.0008 °/°C	
Sensitivity temperature dependency (temperature range –25°C to +85°C)	±0.1 %	
Offset LifeTime Drift (@25°C)	±0.08 °	
Integrated battery charger	Integrated Lithium-ion battery charger with high precision battery monitoring : • Overvoltage/Overcurrent/Short-Circuit/Undervoltage protection • Battery Temperature monitoring	
Casing	• Aluminum AL6061 & Waterpoof casing • Dimensions in mm (LxWxH): 100 x 71 x 38 (without Radome antennas, with mounting eyelet) • Weight (with internal battery) : 225g (screw mounting) 252g (magnetic mounting)	





SmartSensor | OPTIONAL ACCESSORIES AND SERVICES

X-SOLAR | HIGH EFFICIENCY SOLAR PANEL WITH SOLAR CHARGING CONTROLLER AND LEAD-ACID BATTERY

REF : X-SOL-14AH-SLP-VOUT-CL
Input voltage solar cell panel: 14-30VDC
Number of output voltage: 4
Output Voltage: 4VDC or 12VDC
Battery Capacity: 14Ah
Dimensions: 204 mm x169 mm x156 mm
IP Rating: Waterproof IP67 | NEMA 6
Weight: 8 kg

REF: X-SOL-7AH-SLP-VOUT-CL
Input voltage solar cell panel: 14-30VDC
Number of output voltage: 1
Output Voltage: 4VDC or 12VDC
Battery Capacity: 7Ah
Dimensions: 260 mm x160 mm x 90 mm
IP Rating: Waterproof IP67 | NEMA 6
Weight: 4.5 kg

PRIM-XTEND | REF : PRIM-XTEND

WATERPROOF IP67 BATTERY BOX FOR LONG-TERM MONITORING APPLICATIONS

- Battery Pack with 3 x C size primary cell, Li-SOCL2 Lithium Primary cell 3.6VDC Type (Ref : ER26500M)
- Suitable for BeanDevice® INC / HI-INC Xtender version (-XT extension in product reference)
- Waterproof (IP67) aluminum casing with 4 x eyelets for screw mouting
- Waterproof M8 plug , cable length : 2 meters, 5 meters and 10 meters
- Dimensions (with eyelets) : 155 x 80 x 40 mm
- Weight : 700 g

ProcessSensor | WIRELESS IOT DATA ACQUISITION (DAQ) INSTRUMENT

Main Features	BeanDevice® AN-420	BeanDevice® AN-V	BeanDevice® AN-mV
			
Reference	BND-2.4GHz-AN420-4CH	BND-2.4GHz-AN-V-4CH-MR	BND-2.4GHz-AN-mV-4CH
Measurement Range	4-20mA	±5V or ±10V	±20mV
Sensor Technology	Industrial sensors with 4-20mA output	Sensors with single-end or differential voltage output	Strain gage sensors (full bridge) Load Cell, Pressure sensor
Measurement Repeatability (full scale, @ 25°C)	< ±0.01%	< ±0.01%	< ±0.025% Static Measurement mode 2s < ±0.35% Dynamic Measurement mode 10Hz
External sensor power supply	4.5 to 20 volts, configurable from the BeanScape® software		
Number of channels	4 channels		
Maximum wireless Range	650 meters (Line of Sight) , 30-100 meters (Non Line of Sight)		
Maximum sampling rate per channel	400 Samples per second (16-bit ADC)		
Data Logger Size	1 million data points		
Battery	Lithium-polymer Rechargeable battery with 2200 mAh of capacity		
Operating temperature	-40°C to +65°C		
Casing	Aluminum, Watertight IP67 | NEMA 4 casing dimensions (without antenna) L x w x h , 156mm x 82mm x 57mm Weight , 760g		

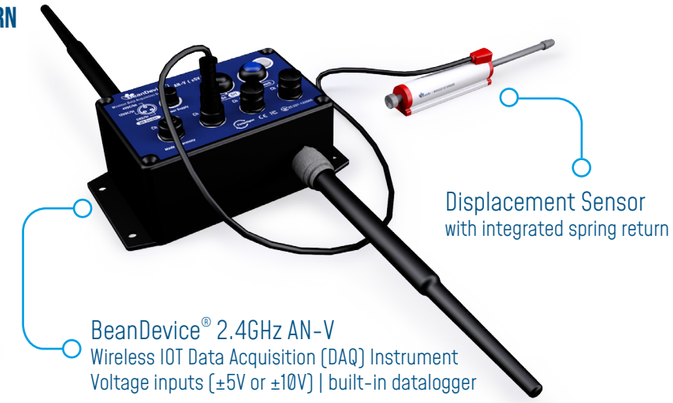
BeanAir IoT 2.4 GHz WIRELESS IOT SENSORS FOR INDUSTRIAL APPLICATIONS

OPTIONAL ACCESSORIES

DISPLACEMENT SENSOR WITH INTEGRATED SPRING RETURN

Displacement Sensors compatible with Beandevice® 2.4GHz | AN-V
- Measurement range 10 - 100 mm
- Long mechanical life
- Excellent repeatability <0.01 mm

REF : DISP-SENS-SR-MS-YY-CL-XX



DISPLACEMENT SENSOR WITH BALL JOINT

Displacement Sensors compatible with Beandevice® 2.4GHz | AN-V
- Measurement range 10 - 400 mm
- Long mechanical life
- Excellent repeatability <0.01 mm

REF : DISP-SENS-BJ-MS-YY-CL-XX

EcoSensor | WIRELESS IOT SENSORS FOR ENVIRONMENTAL MONITORING

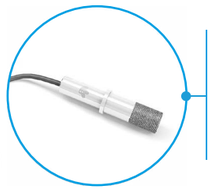
Main Features	BeanDevice® ONE-T-ST	BeanDevice® ONE-T-HA	BeanDevice® ONE-T-HAEY	BeanDevice® ONE-T-STCORE	BeanDevice® ONE-T-ST-CL
					
Reference	BND-2.4GHz-ONE-T-ST	BND-2.4GHz-ONE-T-HA	BND-2.4GHz-ONE-T-HAEY	BND-2.4GHz-ONE-T-STCORE	BND-2.4GHz-ONE-T-ST-CL
Sensor Technology	standard accuracy	High accuracy	High accuracy with eyelet probe for wall mounting	standard accuracy with Temperature core probe with straight stainless steel Handle	standard accuracy with cable
Measurement Range	-25°C to +75°C	-10°C to +60°C	-10°C to +60°C	-50°C to +150°C	-50°C to +150°C
Sensor Resolution	0.1 °C	0.0034 °C	0.0034 °C	0.1 °C	0.1 °C
Sensor Accuracy	• ±0.3 °C between -10 °C and +60 °C	• ±0.2°C between -10°C and -5 °C • ±0.1°C between -5°C and +45°C • ±0.2°C between +45°C and +60°C		• ±0.3 °C between -10 °C and +60 °C • ±[0.3 + 0.012(T-60)] °C between +60 °C and +150 °C • ± [0.3 - 0.012(T+10)] °C between -50 °C and -10 °C	
Maximum wireless Range (L.O.S.)	300m				
Data Logger Size	1 million logs				
Battery size	2100 mAh				
Mounting Techniques	Screw Mounting				
Casing	Waterproof IP67 Polycarbonate enclosure Dimensions in mm (LxWxH): 119 mm x 35 mm x 35 mm Weight (battery included): 120g				

BeanAir IoT 2.4 GHz WIRELESS IOT SENSORS FOR INDUSTRIAL APPLICATIONS

Main Features	BeanDevice® ONE-TH	BeanDevice® ONE-TIR
		
Reference	BND-2.4GHz-ONE-TH-CL	BND-2.4GHz-ONE-TIR
Sensor Technology	Temperature, Humidity & Dew Point	IR temperature (non-contact tempertaure sensor)
Measurement Range	Temperature: - 40°C to +85 °C Humidity: 0 to 100% RH	-40°C to +85°C for ambient temperature (Ta) -70°C to +380°C for object temperature (To)
Sensor Resolution	Temperature: 0.01 °C Humidity: 0.01% RH	0.02 °C
Sensor Accuracy	±0.1 °C , for temperature range +20°C to +60°C ±1.5 %RH for Humidity range 0 to 90 %RH and temperature range +10°C to +60°C	±0.5 °C
Maximum wireless Range (L.O.S.)	300m	
Data Logger Size	1 million logs	
Battery size	2100 mAh	
Mounting Techniques	Screw Mounting	
Casing	Waterproof IP67 Polycarbonate enclosure Dimensions in mm (LxWxH): 119 mm x 35 mm x 35 mm Weight (battery included): 120g	

DIGITAL SENSOR B-TH-01 | DIGITAL HUMIDITY AND TEMPERATURE SENSOR

DIGITAL SENSOR

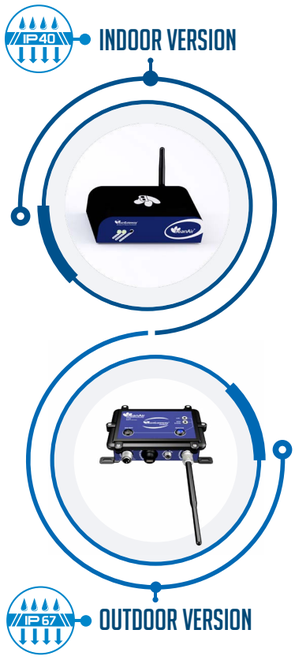


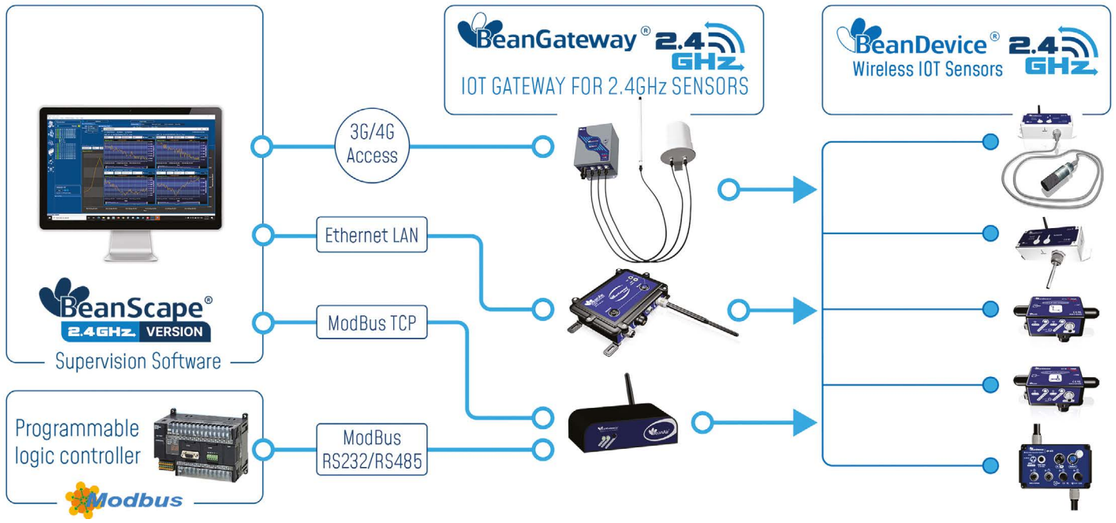
Temperature Sensor technology: Thermistor
Measurement range: -40°C to +85 °C
Accuracy Tolerance: ±0.1 °C , for temperature range +20°C to +60°C
Sensor resolution: 0.01 °C
Dimensions(DxL): 18mm x 57mm

BeanGateway® | WIRELESS IOT SENSORS COORDINATOR

MAIN FEATURES

- Builds and manages Beanair® Wireless IOT sensors
- Wireless protocol stack: IEEE 802.15.4
- Several versions: Ethernet, Modbus TCP / IP & Modbus RS485 / RS232
- Maximus Radio range: 1km (LOS)
- Embedded wireless IOT sensors diagnostic tool
- Advanced UPS (Uninterruptible power supply)
- Wireless IOT Sensors mapping & context is stored on embedded flash
- << Plug & Play >> installation: no knowledge regarding Wireless IOT Sensors is necessary
- Integrated Lithium-Ion battery charger with high-precision battery monitoring
- Standard interface with our Wireless IOT Sensors Scada supervision Software (BeanScape® 2.4GHz)





BeanAir IoT 2.4GHz WIRELESS IOT SENSORS FOR INDUSTRIAL APPLICATIONS

WIRELESS IOT SENSORS COORDINATOR | 3G/4G/LTE LINKS | REMOTE ACCESS

OUTDOOR VERSION (WATERPROOF)

The BeanGateway® 2.4Ghz-4G version is a ruggedized outdoor wireless coordinator (IP66) designed for Structural Health Monitoring, Ground vibration monitoring and Land Surveying applications. Integrating both 2.4GHz and 3G/4G/LTE wireless protocols, it is used to build and manage Beanair® wireless wireless sensor network. The BeanGateway® 2.4Ghz-4G version comes with two power supply versions:

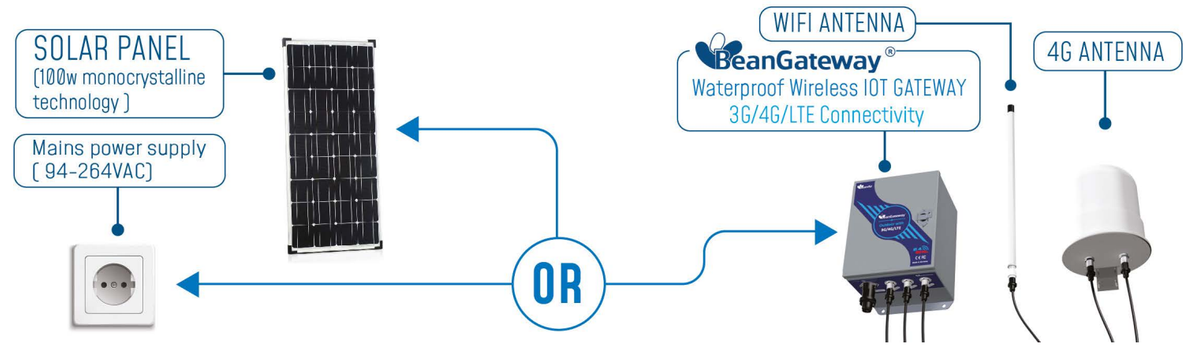
- Solar Panel (50W Monocrystalline Technology)
- Mains power supply (94-264VAC)

An integrated rechargeable Lead-acid battery with a capacity of 12Ah is used as an UPS battery (uninterruptible power supply).
It provides instantaneous protection from external power supply interruption; wireless sensor networks & 3G/4G/LTE activities are maintained during this time. Users looking for a safe deployment on a remote site will appreciate our powerful WSN (Wireless Sensor Networks) mapping management:

- Automatic backup on both flash memory and BeanScape® 2.4GHz software.
- Export/Import function on others BeanGateway® 2.4Ghz

APPLICATIONS

- LAND SURVEYING
- GROUND VIBRATION MONITORING
- STRUCTURAL HEALTH MONITORING



MAIN FEATURES

- Wireless IOT sensors Coordinator
- Ultra-Low-Power and license-free 2.4Ghz radio technology (IEEE 802.15.4E)
- Remote access thanks to the integrated 3G/4G/LTE Router (4G Connectivity CAT4 up to 150 Mbps)
- Configuration and supervision of Wireless IOT sensors
- Advanced Wireless IOT sensors diagnostic tool
- Data Organization from the various Wireless IOT sensors
- Data exchange with the BeanScape® 2.4Ghz (Wireless IOT sensors supervision software)
- Robust, Waterproof and High Gain antennas:
  - 3G/4G/LTE antenna (2x2 MIMO) with 12dBi of Gain
  - 2.4GHz antenna with 9dBi of Gain
- Advanced UPS (Uninterruptible power supply) with lead-acid battery (capacity: 12Ah)
- Ruggedized and Waterproof IP66 casing with anti-thief protection
- Two power-supply versions: AC power supply and solar panel

WIRELESS IOT COORDINATOR SELECTION GUIDE

Product description	Product Ref.	Ethernet Interface	ModBus ASCII / RTU over RS485	ModBus ASCII / RTU over RS232	ModBus IP	Waterproof IP66/IP67	3G/4G/LTE	Power Supply
BeanGateway® Ethernet Indoor casing	BGTW-2.4GHz-ETH-IND	✓						Mains 8-28VDC
BeanGateway® Ethernet Outdoor casing	BGTW-2.4GHz-ETH-OUT	✓				✓		Mains 8-28VDC
BeanGateway® Ethernet ModBus TCP/IP Indoor casing	BGTW-2.4GHz-ETH-MODIP-IND	✓			✓			Mains 8-28VDC
BeanGateway® Ethernet ModBus TCP/IP Outdoor casing	BGTW-2.4GHz-ETH-MODIP-OUT	✓			✓	✓		Mains 8-28VDC
BeanGateway® Ethernet ModBus TCP/IP & Modbus over RS485 Indoor casing	BGTW-2.4GHz-ETH-MODRS485-IND	✓	✓		✓			Mains 8-28VDC
BeanGateway® Ethernet ModBus TCP/IP & Modbus over RS485 Outdoor casing	BGTW-2.4GHz-ETH-MODRS485-OUT	✓	✓		✓	✓		Mains 8-28VDC
BeanGateway® Ethernet ModBus TCP/IP & Modbus over RS232 Indoor casing	BGTW-2.4GHz-ETH-MODRS232-IND	✓		✓	✓			Mains 8-28VDC
BeanGateway® Ethernet ModBus TCP/IP & Modbus over RS232/RS485 Indoor casing	BGTW-2.4GHz-ETH-MODSERIAL-IND	✓	✓	✓	✓			Mains 8-28VDC
BeanGateway® 3G/4G/LTE Outdoor casing	BGTW-2.4GHz-4G-MPWR-OUT					✓	✓	Mains 8-28VDC
BeanGateway® 3G/4G/LTE Outdoor casing	BGTW-2.4GHz-4G-SOLAR-OUT					✓	✓	Solar Power Supply

AN EASY INTEGRATION INTO YOUR IT SYSTEM

Thanks to ModBus protocol available on our BeanGateway® 2.4Ghz, seamless integration with a third-party PLC / Embedded PC is possible.
ModBus registers enable data collection from the wireless sensor networks.

The BeanScape® 2.4GHz is a real time wireless IOT sensors supervision and control monitor. It allows the user to monitor and operate in real time BeanAir® wireless IOT sensors.
The BeanScape® 2.4GHz is also equipped with a smart expert system that allows users to interpret elements such as data acquisition or alarms related to the sensor network.

SOFTWARE VERSIONS

	BeanScape® 2.4GHz LITE	BeanScape® 2.4GHz MANAGER	BeanScape® 2.4GHz BASIC	BeanScape® 2.4GHz PREMIUM
Number of managed BeanDevice® 2.4GHz	5	35	35	Unlimited
Multiple BeanGateway® (Wireless IOT Gateway) connections	✗	✗	✗	✓
Period technical assistance (e-mail)	1 month	1 month	1 year	1 year
OPC Server DA	✗	✗	✗	✗
Free of cost ?	✓	✓	✗	✗
Real-time graph dispay	✓	✗	✓	✓
Alarm notification by email: System and Data Acquisition alarms	✗	✗	✓	✓
Streaming with Event-Trigger (S.E.T.) mode	✗	✗	✓	✓
FTP client	✗	✗	✗	✓
NTP client	✗	✗	✓	✓
Real-Time FFT, Real-Time Velocity	✗	✗	✗	✓
Automatic Reports (Waveform , FFT, PPV, Velocity)	✗	✗	Only Waveform report	✓
Multi-user access	✗	✗	✗	✗
Free updates	✓	✓	1 year	1 year

MINIMUM SYSTEM REQUIREMENTS

- 2.33GHz or faster x86-compatible processor
- Microsoft® Windows® XP (32-bit), Windows Server® 2003 (32-bit), Windows Server 2008 (32-bit), Windows Vista® (32-bit), Windows 7 (32-bit and 64-bit), Windows 10 (32-bit and 64-bit)
- 2GB of RAM
- 5 GB of disk space
- 128MB of graphics memory

WIRELESS IOT SENSORS SUPERVISION SOFTWARE

OVERVIEW AND MAIN FEATURES :

The BeanScape® 2.4GHz is a real time Wireless IOT Sensors supervision and control monitor. It allows the user to monitor and operate in real time BeanAir® Wireless IOT Sensors. The BeanScape® 2.4GHz is also equipped with a smart expert system that allows users to interpret elements such as data acquisition or alarms related to the sensor network.

BeanScape® 2.4GHz comes with outstanding features:

- Supervision software fully dedicated to Beanair® Wireless IOT Sensors.
- Fully integrated Wireless IOT Sensors maintenance tool
- User friendly and highly adaptable to user's environment
- Highly intuitive and easy to use GUI (Graphical User Interface)
- Real time integrated database
- For user working on building and ground vibration (Ref. sensor: BeanDevice® AX-3D and BeanDevice® AX-3D Xrange), the BeanScape® (except Manager and Basic) provides advanced vibration analysis tools:
  - Real-Time vibration and Velocity display
  - Advanced vibration analysis tool: FFT, PPV (Peak Particle Velocity), Velocity
  - Automatic FFT (with PPV values) and Velocity reports (meeting the DIN4150-3 standard)
  - Alarm and reports notifications by email when a trigger is reached
- Simultaneous Multi-Wireless IOT Sensors handling (can be connected to several BeanGateway®)
- Highly customizable data panel board
- No hidden fees, and no specific subscription

Several versions are available:

- BeanScape® 2.4GHz Manager: free of cost, no real-time measurement display
- BeanScape® 2.4GHz Basic: can manage 1 Wireless IOT Sensors, real-time measurement display
- BeanScape® 2.4GHz Premium: same features than BeanScape® 2.4GHz Basic, can manage several Wireless IOT Sensors, advanced vibration analysis tools (Real-Time Velocity and FFT, PPV values)

MINIMUM SYSTEM REQUIREMENTS

- 2.33GHz or faster x86-compatible processor
- Microsoft® Windows® XP (32-bit), Windows Server® 2003 (32-bit), Windows Server 2008 (32-bit), Windows Vista® (32-bit), Windows 7 (32-bit and 64-bit), Windows 10 (32-bit and 64-bit)
- 2GB of RAM
- 5 GB of disk space
- 128MB of graphics memory

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