

BeanDevice® **Wilow AX-3D**

ULP (Ultra-Low-Power)

Wifi accelerometer with built-in data logger



SCIENCE GATE
Your Automation Partner



SCIGATE AUTOMATION (S) PTE LTD

No.1 Bukit Batok Street 22 #01-01 Singapore 659592

Tel: (65) 6561 0488

Fax: (65) 6562 0588

Email: sales@scigate.com.sg

Web: www.scigate.com.sg

Business Hours: Monday - Friday 8.30am - 6.15pm

Wilow DATASHEET



www.beanair.com



MADE
IN
GERMANY

Product Video



User Guide



Quick Start



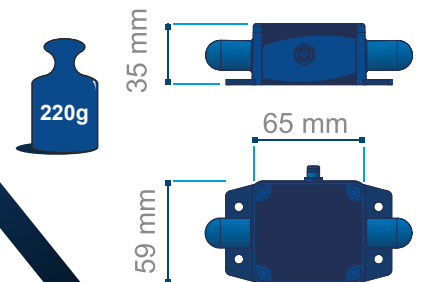
Mechanical Drawing



STEP File



MQTT Toolkit for IOT Sensors



OVERVIEW



- ULP (Ultra Low Power) Wifi technology



- Embedded data logger: up to 5 million data points (with events dating)



- High accuracy Accelerometer (measurement range $\pm 2g$ or $\pm 10g$) FFT and DIN4150-3 (Ground Vibration) modules available



- SSD (Smart Shock Detection) allows to trigger data acquisition on a shock detection



- Rugged aluminum enclosure, Waterproof IP67 | NEMA 6



- USB 2.0 link for device configuration (including firmware upgrade)



- Store & Forward+ : lossless data transmission with hard real-time



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



- IOT Ready : Integrated MQTT data exchange, lightweight and open-source Internet of Things (IOT) protocol

APPLICATIONS

-  • Dynamic measurement on rolling stock
-  • Condition Monitoring
-  • Structural Health Monitoring
-  • Ground Vibration Monitoring
-  • Vibration Analysis



AN OPEN-STANDARD & INDUSTRIAL WIFI TECHNOLOGY

- ULP (Ultra Low power) Wifi – IEEE 802.11 b/g/n
- Lower total cost of ownership-works with existing access points
- Large installed base and consequent broad-based familiarity with configuration, use and troubleshooting at the physical and link layers
- Easy provisioning & IT friendly: our ULP wifi sensors use IP-over-Ethernet networking environment

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



The store and forward technique works by storing the message transmitted by **the BeanDevice® Wilow** (wireless DAQ/sensor) 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 allows to bring a lossless data transmission.

User can also enable the Hard real-time option; i.e. the message must be received by the Wifi Access Point/Wifi Receiver within the confines of a stringent deadline. It is automatically deleted if it failed to reach its destination within the allotted time span

TECHNICAL SPECIFICATIONS

Product reference	
BND-WILOW-AX3D -MR-MO	
MR – Measurement Range:	MO - Mounting option
2: ±2g measurement range	BR - 90° Mounting bracket
10: ±10g measurement range	M - Magnetic Mounting
<p>Example 1: BND-WILOW-AX3D-10G-BR ULP WIFI accelerometer with ±10g range with 90° Mounting bracket</p> <p>Example 2: BND-WILOW-AX3D-2G-M ULP WIFI accelerometer with ±2g range with magnet mounting</p> <p>Example 3: BND-WILOW-AX3D-10G ULP WIFI accelerometer with ±10g range</p>	

Accelerometer specifications	
Accelerometer technology	High precision accelerometer based on MEMS technology
Accelerometer measurement range	two versions: ±2g and ±10g
Sensitivity	±2g Version : 660 mV/g ±10g version: 200 mV/g
Typical non-linearity	±0.1% FS
Analog to Digital converter	24-bit delta-sigma with temperature compensation Synchronous measurement channel
Sensor frequency response (-3 dB)	DC to 800 Hz
Maximum sampling rate	2 kSPS per axis
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

TECHNICAL SPECIFICATIONS

Accelerometer specifications

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	0,02
Onboard temperature sensor	Range -40°C to +65°C , accuracy ±1°C

Shock sensor specifications

Shock Sensor technology	MEMS technology
Shock sensor range	±2g/±4g/±6g/±8g/±16g dynamically selectable from the BeanScape software
Sensitivity	±2g range: 0.06 mg/digit
	±4g range: 0.12 mg/digit
	±6g range: 0.06 mg/digit
	±8g range: 0.12 mg/digit
	±16g range: 0.12 mg/digit
Typical non-linearity	±0.15% on the FS
Analog to Digital converter	12-bits with temperature compensation
Sensor frequency response (-3 dB)	DC to 800 Hz
Maximum sampling rate	1.6 kSPS per axis
Noise spectral density	150 µg/√Hz

TECHNICAL SPECIFICATIONS

Shock sensor specifications

Sensitivity change Vs temperature	$\pm 0,01\%$ /°C
Zero-g level change vs temperature (max delta from 25°C)	± 0.5 mg/°C
Typical zero-g level offset accuracy	± 40 mg
Anti-aliasing filter	Butterworth 2th order filter

Remote configuration parameters

Data Acquisition mode (SPS = sample per second)	Low Duty Cycle Data Acquisition (LDCDA) Mode: 1s to 24 hour
	Alarm -Low duty cycle: 1s to 24 hour
	Streaming mode : 100 SPS by default
	Streaming with event-trigger (SET) Mode : 100 SPS by default
Sampling Rate (in streaming mode)	Minimum: 1 SPS
	Maximum: 3 kSPS per axis
Alarm Threshold	High and Low Levels alarms
Power Mode	Sleep & Active power modes

RF Specifications

Wireless Protocol Stack	IEEE 802.11 b/g/n
WSN Topology	Point-to-Point / Star / Cluster-Tree
Crypto Engine	WPA2, WPS2
Data rate	UDP: 16 Mbps TCP: 13 Mbps

TECHNICAL SPECIFICATIONS

RF Specifications

RF Characteristics	ISM 2.4GHz. Antenna diversity designed by Beanair®
TX Power	18 dBm @ 1 DSSS
	14.5 dBm @ 54 OFDM
Rx Sensitivity	-95.7 dBm @1 DSSS
	-74.0 dBm @54 OFDM
Maximum Radio Range	200m (L.O.S), Radio range be extended by adding Wifi Bridge/Repeater
Antenna	Antenna diversity : 2 omnidirectional antenna with a gain of 2,8 dBi

USB specifications

USB standard	USB 2.0
Data Rate	Full speed operation(12MB/s)
Related functions	<ul style="list-style-type: none">- Firmware update- Wifi & system configuration"

Embedded Data logger

Storage capacity	up to 5 million data points
Wireless data downloading	3 minutes to download the full memory (average time)

TECHNICAL SPECIFICATIONS

Environmental and Mechanical

Casing

Aluminum casing
 Dimensions in mm (LxWxH):35x59x65 mm without antenna & eyelet, Weight (with internal battery, w/o mounting option) : 220g

IP | NEMA Rating

Ip67 | Nema 6

Shock resistance

100g during 50 ms

Operating Temperature

-40 °C to +65 °C

Norms & Radio Certifications

CE Labelling Directive R&TTE (Radio) ETSI EN 300 328 (Europe)

FCC (North America)

ARIB STD-T66 Ver. 3.6 (Japan)

ROHS - Directive 2002/95/EC

Power supply

Rechargeable battery

High density Lithium-Ion rechargeable battery with a capacity of 780 mAh

Integrated battery charger

Integrated Lithium-ion battery charger with high precision battery monitoring

Current consumption @ 3,3V

During data acquisition : 20 to 30 mA

During Radio transmission :

- 1 DSSS - 278 mA

- 54 OFDM - 229 mA

During sleep power mode : < 100 µA

Power supply

External power supply

Two power supplies available:

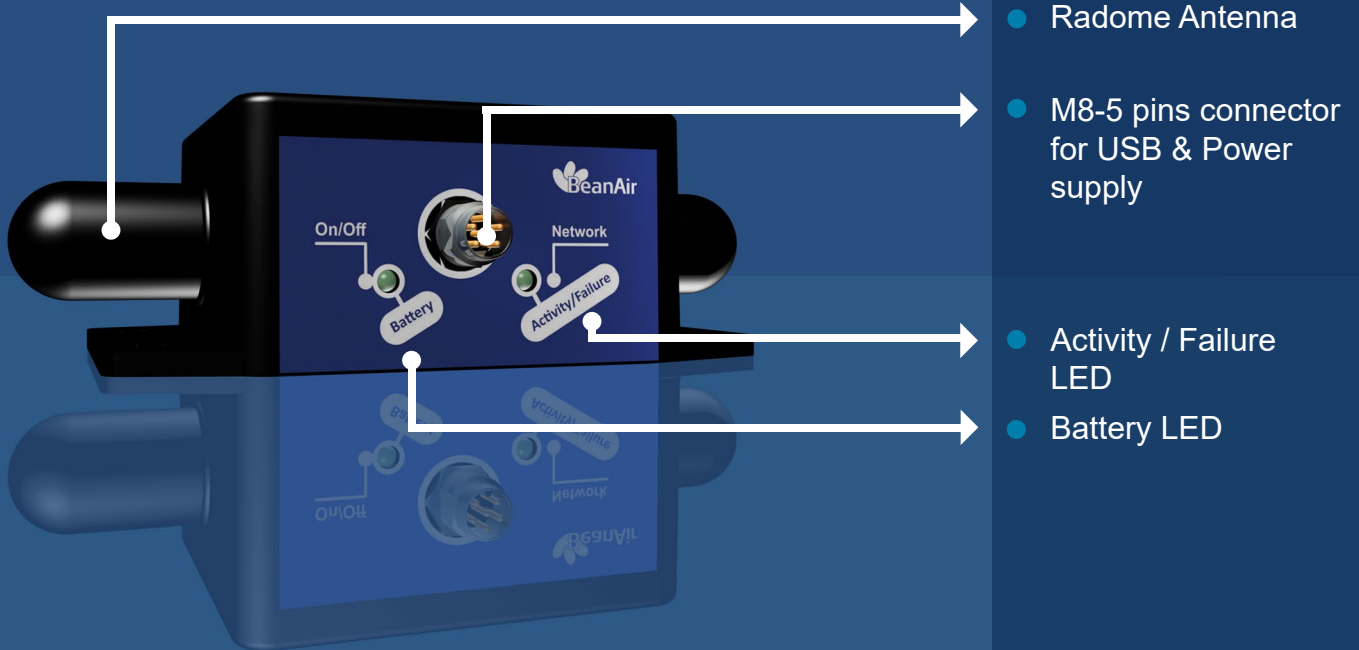
- USB Power supply 5V

- 5VDC to 17VDC compatible with solar energy harvesting

TECHNICAL SPECIFICATIONS

Included accessories	
M8 plastic cap	1pcs, Ref: WL-PC
M8 to USB cable	1pcs M8-5pins to USB Cable, 2 meters length. Ref:WL-CBL-M8-USB-2M
Magnet for power on/power off	1pcs Magnet. Ref: WL-MGN
Wall mounting kit	4 pcs M5 screws+ Locknut. Ref:WL-SCMKIT
Options (not included)	
Power-supply	Wall plug-in, Switchmode power Supply 12V @ 1,25A with USB plug
M8 Cable	M8-5Pins Cable , cable length : - 2 meters. Ref: WL-CBL-M8-2M - 5 meters.Ref: WL-CBL-M8-5M
WIFI AP/Repeater (wifi link extension)	Wireless AP/Repeater with an integrated N-Type RF connector + High Gain Antenna Casing : Polycarbonate Waterproof casing Dimensions: 190 x 46 mm Weight: 196 g Antenna Connector: N-Type Connector (male) Power Supply: 24V, 0.5A PoE Adapter (included) Power Method: Passive Power over Ethernet Max. Power Consumption: 6 Watts Operating Temperature: -40 to 80° C Shock and Vibration: ETSI300-019-1.4 Ref: WL-AP-UBIQ-TIT-7DBI for 7dBi Antenna Ref: WL-AP-UBIQ-TIT-9DBI for 9dBi Antenna
Solar Panel	Polycrystalline Solar Panel for BeanDevice® Willow® power supply Maximum Power : 3W Optimum operating Voltage: 12 VDC Dimension: 235 mm x 135 mm x 17mm Protection Frame: Aluminum Frame , Waterproof IP67 Length : 2 meters (Ref: WL-SLP-3W-2M) or 5 meters (Ref: WL-SLP-3W-5M) with M8 plug for a direct to connection to the BeanDevice® Willow® Country of origin: solar panel from China, assembled and tested in Germany
Calibration certificate	Calibration certificate linked to national and international standards (DRAKKS) (Ref: WL-CERT-CAL)

Beandevic® Wilow® Front View



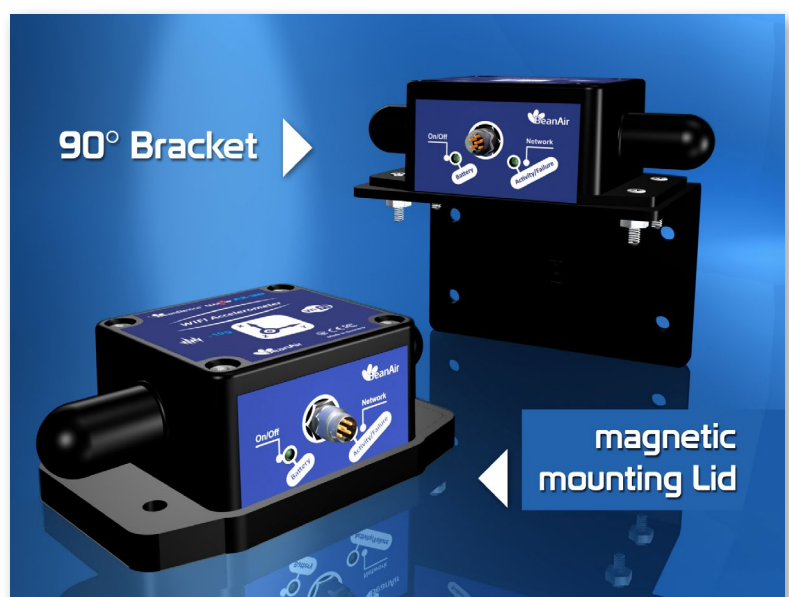
Mechanical Mounting Options

By default, the **BeanDevice® Wilow®** comes with a screw mounting lid.

Two other mounting options are available:

- Magnetic mounting , add the extension –M on your product reference
- 90° bracket, add the extension –BR on your product reference

Mechanical Mounting Options Video



CONTACT US

Headquarter:

BeanAir GmbH
Wolfener Straße 32 - 34
12681 Berlin

Email:

info@beanair.com

Phone number:

+49 30 98366680

**SCIENCE
GATE**
Your Automation Partner



SCIGATE AUTOMATION (S) PTE LTD

No.1 Bukit Batok Street 22 #01-01 Singapore 659592

Tel: (65) 6561 0488

Fax: (65) 6562 0588

Email: sales@scigate.com.sg

Web: www.scigate.com.sg

Business Hours: Monday - Friday 8.30am - 6.15pm

Visit our Websites

www.beanair.com

www.space-wireless.com

