BeanDevice® Wilow Hi-Inc

ULP (Ultra-Low-Power) Wifi Inclinometer with built-in datalogger

Wilow **DATASHEET**

Wi Fi

www.beanair.com

Wireless Tiltmeter

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MADE IN GERMANY

Product Video

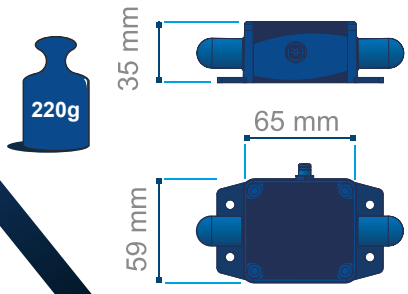
User Guide

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 bi-axis inclinometer ±15° or ±30°
- 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®
- IIOT Ready : Integrated MQTT data exchange, lightweight and open-source Internet of Things (IIOT) protocol

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APPLICATIONS

- **Structural Health Monitoring**
- **Platform Leveling and stabilization**
- **Built-in test equipment**
- **Oil drilling**
- **Axial rotor measurement**

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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

STORE & FORWARD +

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

Wireless Tiltmeter

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TECHNICAL SPECIFICATIONS

Product reference	
BND-WILOW-Hi-Inc -MR-MO	
MR – Measurement Range:	**MO - Mounting option**
15B : bi-axis ±15°	**BR** - 90° Mounting bracket
30B : bi-axis ±30°	**M -** Magnet Mounting
Example 1: BND-WILOW-HI-INC-15B-BR - ULP WIFI bi-axis inclinometer (measurement range ±15°) with 90° bracket mounting **Example 2: BND-WILOW-HI-INC-30B-M** - ULP WIFI bi-axis inclinometer (measurement range ±30°) with magnet mounting **Example 3: BND-WILOW-HI-INC-15B** - ULP WIFI bi-axis inclinometer (measurement range ±15°)	

Inclinometer sensor specifications	
Inclinometer Technology	Inclinometer based on MEMS Technology
Measurement resolution (Bandwidth 10 Hz)	0.001°
Noise density	0.0004 °/√Hz
Accuracy (Full scale)	±0.05°
Offset temperature dependency (temperature range –25°C to +85°C)	±0.002 °/°C
Sensitivity temperature dependency (temperature range –25°C to +85°C)	±0.005 %/°C with temperature compensation ±0.013 %/°C without temperature compensation
Long term stability (@23°C)	< 0.004 °
Analog to Digital converter	-24-bit delta-sigma analog-to-digital with temperature compensation -Synchronous measurement channel
Sensor frequency Response (-3dB)	DC to 28 Hz
Noise spectral density DC to 100 Hz	0.0004 °/ √Hz

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TECHNICAL SPECIFICATIONS

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
	Alarm Streaming Mode : 100 SPS by default
Sampling Rate (in streaming mode)	Minimum: 1 SPS
	Maximum: 100 SPS
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
Data rate	UDP: 16 Mbps TCP: 13 Mbps
RF Characteristics	ISM 2.4GHz. Antenna diversity designed by Beanair®
Receiver 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

Wireless Tiltmeter

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TECHNICAL SPECIFICATIONS

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

Environmental and Mechanical	
Casing	Aluminum casing
	Dimensions in mm (LxWxH):59x65.x35 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

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

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TECHNICAL SPECIFICATIONS

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
External power supply	Two power supplies available: - USB Power supply 5V -5VDC to 17VDC compatible with solar energy harvesting

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
Calibration certificate	Calibration certificate linked to national and internatiional standards (DRAKKS) (Ref: WL-CERT-CAL)

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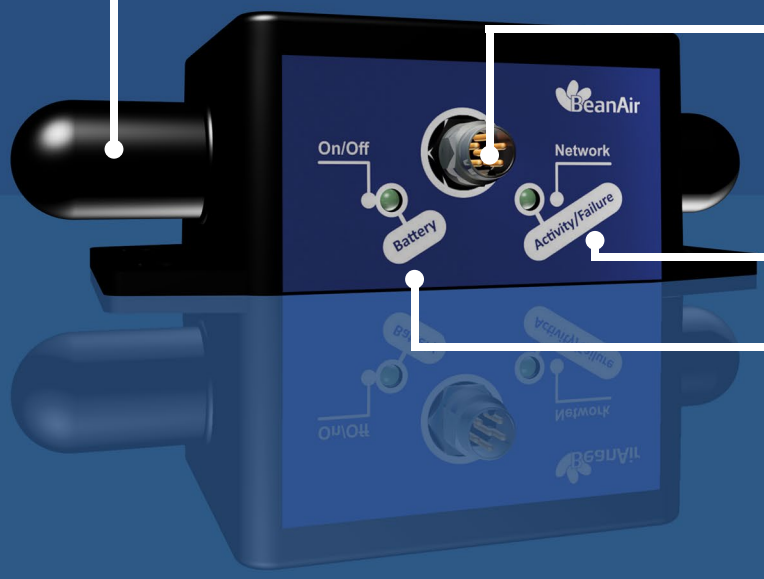
BeanDevice Front View



- Radome Antenna
- M8-5 pins connector for USB & Power supply
- Activity / Failure LED
- Battery LED

Mechanical Mounting Options

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

Two other mounting options are available:

• Magnet mounting , add the extension –M on your product reference

• 90° bracket, add the extension –BR on your product reference

Mechanical Mounting Options Video

VIDEO

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