

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



Wilow DATASHEET



Wireless Tiltmeter



MADE
IN
GERMANY

Product Video



User Guide



Quick Start



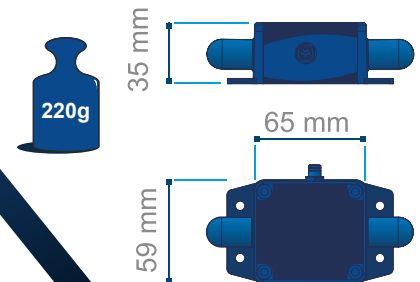
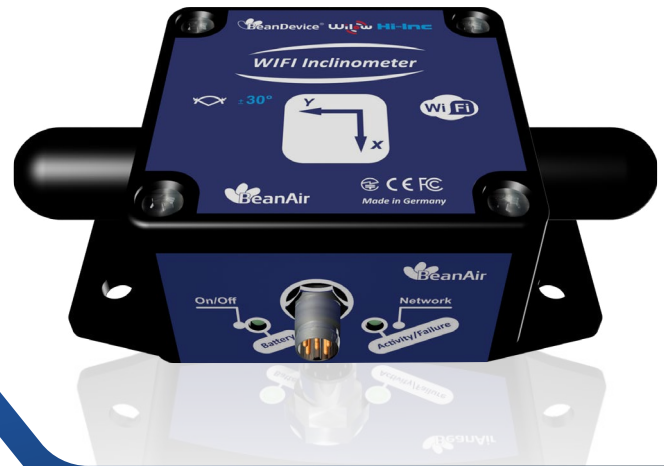
Mechanical Drawing



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 $\pm 15^\circ$ or $\pm 30^\circ$



- 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

APPLICATIONS

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



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-Hi-Inc -MR-MO

MR – Measurement Range:

15B : bi-axis $\pm 15^\circ$

30B : bi-axis $\pm 30^\circ$

MO - Mounting option

BR - 90° Mounting bracket

M - Magnetic Mounting

Example 1: BND-WILOW-HI-INC-15B-BR - ULP WIFI bi-axis inclinometer (measurement range $\pm 15^\circ$) with 90° bracket mounting

Example 2: BND-WILOW-HI-INC-30B-M - ULP WIFI bi-axis inclinometer (measurement range $\pm 30^\circ$) with magnet mounting

Example 3: BND-WILOW-HI-INC-15B - ULP WIFI bi-axis inclinometer (measurement range $\pm 15^\circ$)

Inclinometer sensor specifications

Inclinometer Technology	Inclinometer based on MEMS Technology
Measurement resolution (Bandwidth 10 Hz)	0.001°
Noise density	0.0004 °/ $\sqrt{\text{Hz}}$
Accuracy (Full scale)	$\pm 0.05^\circ$ ($\pm 0.02^\circ$ on customer request)
Offset temperature dependency (temperature range -25°C to $+85^\circ\text{C}$)	$\pm 0.002^\circ/\text{C}$
Sensitivity temperature dependency (temperature range -25°C to $+85^\circ\text{C}$)	$\pm 0.005\%/^\circ\text{C}$ with temperature compensation $\pm 0.013\%/^\circ\text{C}$ without temperature compensation
Long term stability (@23°C)	$< 0.004^\circ$
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 °/ $\sqrt{\text{Hz}}$
Onboard temperature sensor	Range -40°C to $+65^\circ\text{C}$, accuracy $\pm 1^\circ\text{C}$

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
	Streaming with event-trigger (SET) 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	WPA2, WPS2
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

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):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

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

TECHNICAL SPECIFICATIONS

	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® Wilow® 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® Wilow® 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)

Wireless Tiltmeter



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

BeanDevice Front View



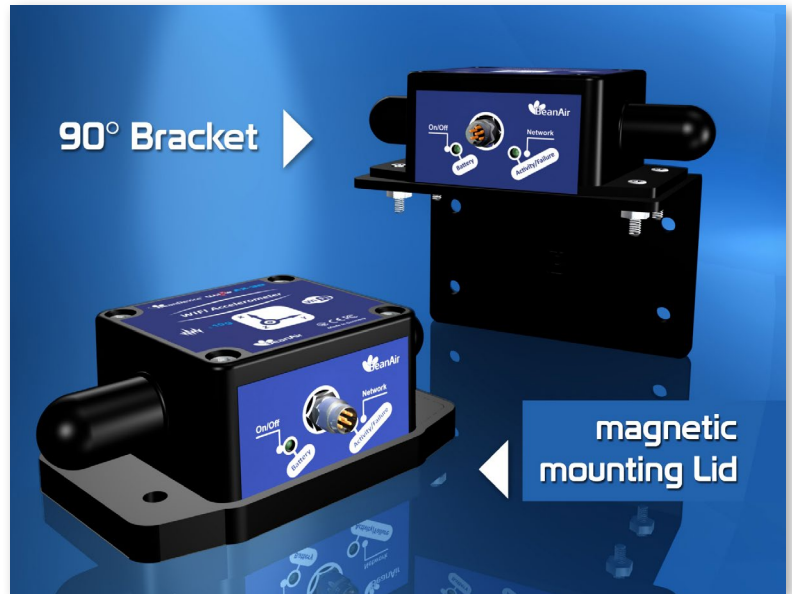
Mechanical Mounting Options

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

Visit our Websites

www.beanair.com

www.space-wireless.com

