

BeanDevice **WILOW<sup>®</sup>** HI-INC

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

PRODUCT VIDEO



USER GUIDE



QUICK START



MECHANICAL DRAWING



STEP FILE

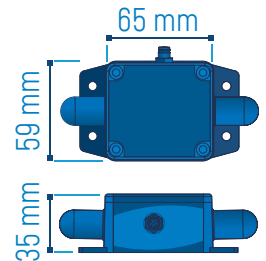
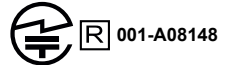


MQTT TOOLKIT FOR IOT  
SENSOR



2year  
Warranty

MADE IN GERMANY



MAIN FEATURES

- ULP (Ultra Low Power) Wifi technology
- Store & Forward+ : lossless data transmission with hard real-time
- Embedded data logger: up to 5 million data points (with events dating)
- Excellent radio link relying on the radio antenna diversity developed by Beanair<sup>®</sup>
- High accuracy bi-axis inclinometer  $\pm 15^\circ$  or  $\pm 30^\circ$
- IIOT Ready : Integrated MQTT data exchange, lightweight and open-source Internet of Things (IIOT) protocol
- Rugged aluminum enclosure, Waterproof IP67 | NEMA 6
- USB 2.0 link for device configuration (including firmware upgrade)
- Smart and flexible power supply:
  - Internal lithium-polymer rechargeable battery (780 mAh)
  - External power supply : USB 5VDC compatible with solar energy harvesting

BeanDevice<sup>®</sup> WILOW<sup>®</sup> HI-INC

APPLICATIONS



Structural Health Monitoring



Test and Measurement



Land Surveying



### 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 HI-INC** 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 ±15°

30B: bi-axis ±30°

**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 ±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°)

**TECHNICAL SPECIFICATIONS**
**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° (±0.02° on customer request)
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
Onboard temperature sensor	Range -40°C to +65°C , accuracy ±1°C

**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 AStreaming 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 <sup>®</sup>
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: <a href="#">WL-PC</a>
M8 to USB cable	1pcs M8-5pins to USB Cable, 2 meters length. Ref: <a href="#">WL-CBL-M8-USB-2M</a>
Magnet for power on/power off	1pcs Magnet. Ref: <a href="#">WL-MGN</a>
Wall mounting kit	4 pcs M5 screws+ Locknut. Ref: <a href="#">WL-SCMKIT</a>

**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: <a href="#">WL-CBL-M8-2M</a> - 5 meters. Ref: <a href="#">WL-CBL-M8-5M</a>
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: <a href="#">WL-AP-UBIQ-TIT-7DBI</a> for 7dBi Antenna Ref: <a href="#">WL-AP-UBIQ-TIT-9DBI</a> 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: <a href="#">WL-SLP-3W-2M</a> ) or 5 meters (Ref: <a href="#">WL-SLP-3W-5M</a> ) 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: <a href="#">WL-CERT-CAL</a> )

**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 • 5 VDC compatible with solar energy harvesting

BeanDevice® WILLOW® HI-INC

BEANDEVICE® WILLOW® FRONT VIEW



MECHANICAL MOUNTING OPTIONS

By default, the BeanDevice® Willow® 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



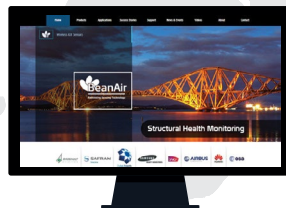
[www.industrial-wsn.com](http://www.industrial-wsn.com)



[www.facebook.com/BeanAir](http://www.facebook.com/BeanAir)



[www.beanair.com](http://www.beanair.com)



[www.youtube.com/user/BeanairSensors](http://www.youtube.com/user/BeanairSensors)



[www.twitter.com/beanair](http://www.twitter.com/beanair)



**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