Wireless Sensor Node

Manual

WW-5H20

WW-5H2B
(with Redundant Battery)

Wintec®
wireless electronics

NOTED

- AUX port cable outside diameter needs to be between 3~7 mm.
- When all cable gland fixing head are not wired, the inner cable gland sealing plug rod can be installed first to avoid dust and water infiltration.

WARNING

To reduce the risk associated with all applicable hazards:

- Read and follow all safety information contained in the installation instructions and Product Safety Guide Prior to installing, using or servicing the wall mount. Retain these instructions for future reference.

To reduce the risk associated with choking:

- Do not allow children access to small parts and / or packaging materials.
- Do not modify the physical aspects of the wall mount.
- Do not install on a mounting structure or surface that is prone to vibration, movement or chance of being impacted.
- Proper installation and servicing must be performed by experienced installers as outlined in the installation instructions.

To reduce the risk associated with impact:

- The EQUIPMENT is required hardware when installing the EQUIPMENT Mount onto concrete block walls and stud walls.
- Do not climb on, hang on or place any added weight other than the EQUIPMENT on the fixed or folding wall mount.

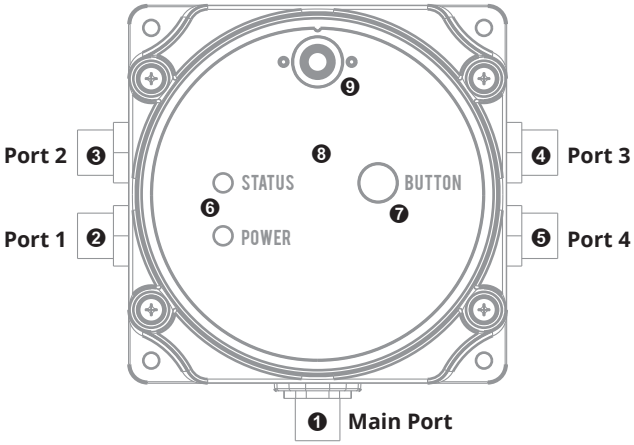
A symbol such as ISO 7000-0434 (2004-01) or a combination of this symbol and ISO 7000-1641 (2004-01) to refer to text in an accompanying document. These symbols may be combined.

Contents

Overview

Wintec launched the Sensor Node series for remote or mobile monitoring / data collection and control. WW-5H2X is the first product in the Sensor Node series.
The product can be connected to analog sensors / thermocouple thermometers / frequency counters / rain gauges / digital sensors / modbus sensors, and also provides analog / digital control contacts and GPS positioning functions.
It also provides sensor data collection and upload to cloud / server and sensor data logger functions. Regarding data confidentiality also adds AES encryption function.
WW-5H2X only provides the full version. It is suitable for purchasing when the initial requirements are not clear or when you want to quickly display your application ecology.
With the increasing popularity of the Internet of Things and simple functions, single purpose has become a trend. Field devices usually require only one function, and that function is almost never changed again. Many functions are not used, resulting in waste of resources and increased costs.
Therefore, in addition to providing a complete version of the product, it also provides a new product concept: product modularity.
Product modularity means that the WW-5H2X function list can be checked according to the needs. We will customize production according to the function list.
This document applies to the full version of WW-5H2X. If you confirm that you only need certain functions after using the full version, please feel free to contact us to order customized products.

Appearance



❶ Main Port
- Power Input
  - · Solar Panel
  - · DC Adapter
- RS-485
  - · Configuration
  - · Sensor
- External Battery Pack

❷❸❹ Port 1~3
- Analog Input
- Digital Input
- RTD PT-100
- Freqency Count
- Analog Output
- Digital Output
- Power Output

❺ Port 4
- Analog Input
- Digital Input
- RTD PT-100
- Freqency Count
- Analog Output
- Digital Output
- Pulse Count
- Power Output

❻ Indicator

❼ Wake Up

❽ GPS Receiver Inside

❾ Antenna Connector

Specification

Product Type	Outdoor
Cellular Protocol	NB-IoT (LTE Cat NB1 3GPP Release 13)
Internet Protocol	TCP / UDP / MQTT / MQTTS / Line Notify
Operating LTE Bands	Band 1 / Band 3 / Band 5 / Band 8 / Band 20 / Band 28
SIM Type	nano SIM, e-SIM (Optional)
Sensitivity	Maximum -116dBm
Transmit RF Power	Maximum 23 dBm (Class 3)
Antenna Connector Type	RP-SMA Jack
Cellular Data Rate	NB1 (26.15 kbit/s DL, 62.5 kbit/s UL)
Main Port Interface	RS-485
Port1~4 Interfaces	Analog or Digital Input / Analog (0~10V) or Digital Output / FFT (Frequency Count) / RTD (PT-100) / Pulse Count (Port4 only, special connector required)
Port1~4 Connector Type	M12 5PIN
Main Port Connector Type	M12 8PIN
RS-485 Support Protocol	Modbus RTU / Hex / ASCII / Transparent
RS-485 Baud Rate	1200bps / 2400bps / 4800bps / 9600bps / 19200bps / 38400bps / 57600bps / 115200bps / 230400bps
Analog Input	Analog Input Support 0~10 V / 0~20 mA / 4~20 mA / ADC (0~10V)
Digital Input	Digital Input Support High / Low Signal Judge
Analog Input	Source Voltage > 1V (Cannot be used in sleep mode)
Analog Input Spec	Analog Input Support 0~10 V (± 0.1%) / 0~20 mA / 4~20 mA / ADC (0~10 V, ± 0.1%)
FFT (Frequency Count) Spec	Resolution 12bit / Frequency Range: 1~3KHz / Input leave > 100mVp-p
RTD (PT-100) Spec	Tolerance 1mV / Temperature Range: -150℃ ~ +300℃ / 2-Wire or 3-Wire
Pulse Count Spec	Resolution 24bit / 2 or 3 or 4 Wire (Support rain gauge function)
Digital Output	Digital Output Support PWM / Latch Mode
Digital Output Spec	[PWM] Frequency: Max. 2KHz / [Latch] High: VCC (Infinite input impedance) / Low: GND (100 ohm) Maximum Current 80mA, Maxim Input 36V (Open drain)

Analog Output	Analog Output Support 1~10V (±3.0%), Recommended Current: < 10mA
Analog Output Spec	Resolution 12bit
Button	Wake Up
LED Status	Power Status / Wireless Status
GPS / GNSS	U-blox GPS Chipset
GNSS Receiver Type	72-Channel u-blox M8 Engine, GPS / QZSS L1 C / A, GLONASS L10F, BeiDou B1I Galileo E1B / C, SBAS L1 C / A: WAAS / EGNOS / MSAS / GAGAN
GNSS Sensitivity	Tracking & Navigation: -167 dBm, Reacquisition: -160 dBm, Hot Start: -157 dBm, Cold Start: -148 dBm
GNSS Antenna Type	Built in Patch Antenna
GNSS Protocol	NMEA0183
GNSS Accuracy	2.0m CEP (GPS / SBAS / QZSS+GLONASS)
GNSS Acquisition Time (Average)	Hot Start: 1 sec, Cold Start: 26 sec
Data Logger Storage	Micro SD Card (Support SDHC)
Encryption Function	AES 128 / 256, ECB / CBC / CTR
Encryption Method	SDCard. / Upload / Publish
Operating Temperature	-40°C ~ 85°C
Main Unit Dimensions	10 x 10 x 4.8 cm (Not include antenna and external connect)
Weight	260 g
Waterproof	IP 68
Redundant Battery	18650 / 3.7V / 5000mAh (1S2P)
Battery Protection	Temperature / OVP / OCP
NTC Specification (Required)	10k ohm (±1%)
Input Power Supply	7V ~ 36V DC / 1A (with over protect)
Solar Charger Voltage Range	7V ~ 36V DC
Solar Chager Current	20mA~1.4mA (±10mA)
Output Power Supply	Each Port (1~4): 10V DC / 30mA (Max.)
Output Power Monitor	Current Measurement
Power Consumption	12V 5.3~6.8mA @receive / 12V 250～300mA @transmit / 12V 50~400uA @sleep / 12V 1.4mA @charging
Special Specification	Flame Retardant

LED Indicate

Power

Red Light Stay On	Battery changing
Green Light Stay On	Power on
Yellow Light Flashing	Firmware upgrade
Red Light Flashing	Battery charging failed
Green + Yellow Flashing	No SD card or SD card error
Red Light Flashes Quickly	Battery is very low, please charge it now

Status

Red Light Stay On	System error
Green Light Stay On	When not connected to the Internet
Yellow / Green + Yellow Flashing	Firmware download Over The Air (FOTA)
Red Light Flashing	SIM card error
Green Light Flashing Once Per Second	SIM ready + Server is connected
Green Light Flashing Twice Per Second	SIM ready + Server is connected + GPS working
Yellow Light Flashing	Setup program connection (Schedule pause)
Red + Yellow Flashing	Upgrade failed

PIN Define

Port 1~4: M12 5P Definition

❶ Vout +
❷ Vout -
❸ A / D Input +
❹ A / D Input -
❺ Digital Output

Define	Wire Color	PIN Description
❶ Vout +	Blue	10V DC / 30mA
❷ Vout -	Black	DC Ground
❸ Analog / Digital Input+	Orange	Differential positive / Single-ended for Analog input / RTD PT-100 Freqency counter / Pulse count
❹ Analog / Digital Input-	Brown	Differential negative
❺ Analog / Digital Output	White	Analog 1~10V or Digital output

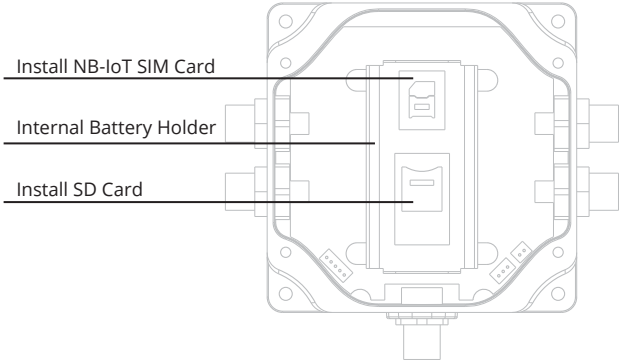
Main Port: M12 8P Definition

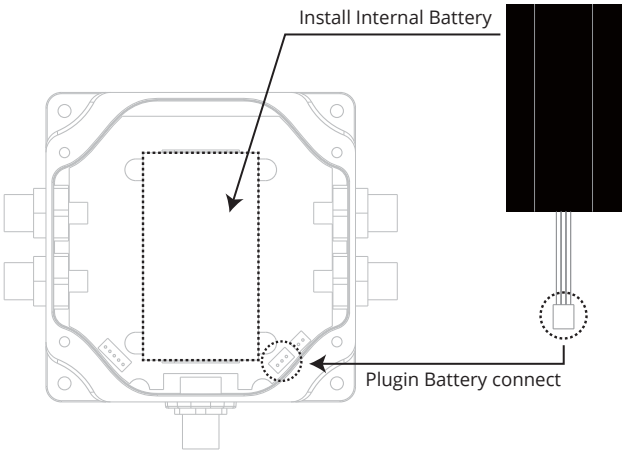
❶ Vin+
❷ Vin-
❸ Battery Input+
❹ Battery Input-
❺ RS-485 A
❻ RS-485 B
❼ Battery NTC
❽ RS-485 GND

Define	Wire Color	PIN Description
❶ Vin+	Brown	7~36V DC / 1A
❷ Vin-	White	Ground
❸ Battery Input+	Green	3.7~4.2V Single series and multiple parallel battery packs
❹ Battery Input-	Red	Battery packs ground pin
❺ RS-485 A	Yellow	Non-isolator differenal interface A
❻ RS-485 B	Gray	Non-isolator differenal interface B
❼ Battery NTC	Blue	battery packs NTC pin (Negative Temperature Coefficient)
❽ RS-485 GND	Pink	Signal ground

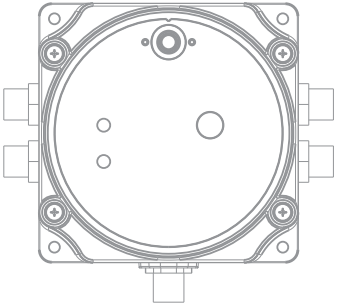
SIM / SD Card & Battery Installation (WW-5H2B)

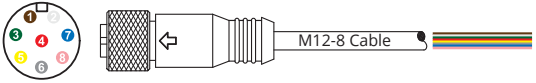
Open the top cover and put the 18650 Li-ion Recharging Battery provided in the box into the battery holder.





External Battery Installation (WW-5H20)

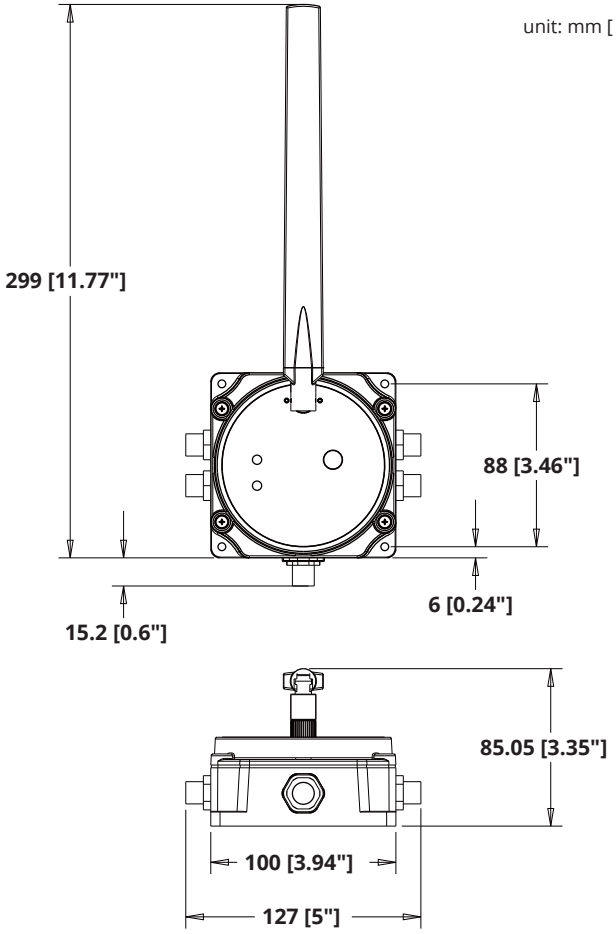


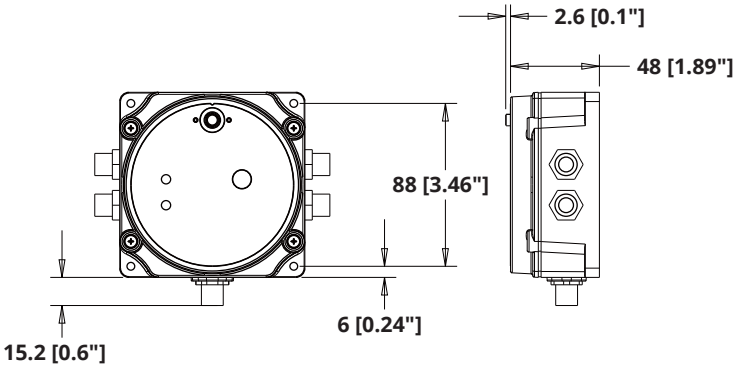


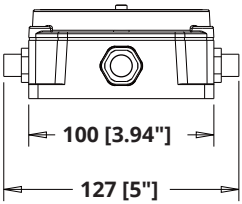
❸ Green: Battery Input+	Battery VCC
❹ Red: Battery Input-	Battery Ground
❼ Blue: Battery NTC	Battery NTC

3.7~42V
Battery Packs

Dimensions



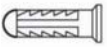
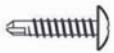




unit: mm [in]

Installation Guide

Screw List

Item		Description	Spec	Units
❶		Phillips Mechanical Stainless Steel Metal Screw	M4*20mm	4
❷		Spring Washer	M4	4
❸		Hex Nut	M4	4
❹		Phillips Self Tapping Stainless Steel Metal Screw	M4	4
❺		Nylon Hammer Drive Anchor	1/4*1	4
❻		Self-Drilling Screw	8#3/4	4

Installation Guide

To install the lock screw sequence, it is recommended to use the upper right → upper left → lower left → lower right mode to avoid falling.

The following parts can be used when installed on a device that has been drilled first.

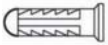
Item		Description	Spec	Units
❶		Phillips Mechanical Stainless Steel Metal Screw	M4*20mm	4
❷		Spring Washer	M4	4
❸		Hex Nut	M4	4

After piercing the screw, put on the spring washer and nut and lock it.

The following parts can be used when installed on a wooden wall.

	Item	Description	Spec	Units
❹		Phillips Self Tapping Stainless Steel Metal Screw	M4	4

The following parts can be used when installed on a concrete wall.

	Item	Description	Spec	Units
❹		Phillips Self Tapping Stainless Steel Metal Screw	M4	4
❺		Nylon Hammer Drive Anchor	1/4*1	4

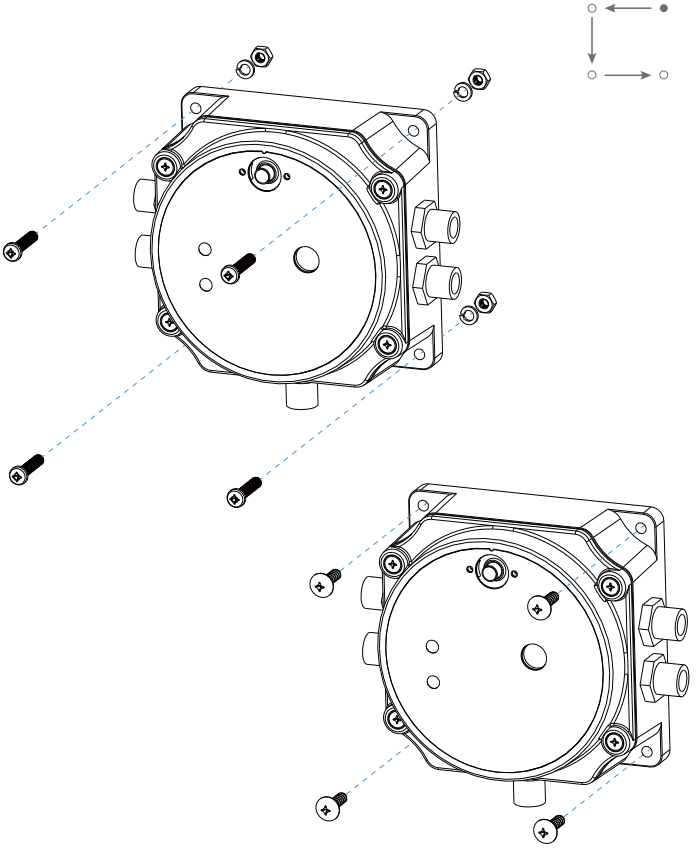
Please drill first (aperture 6mm depth 20mm), put it into the nylon hammer drive anchor, then lock the screw.

The following parts can be used when installed on a metal wall.

	Item	Description	Spec	Units
❻		Self-Drilling Screw	8#3/4	4

Assembling

To install the lock screw sequence, it is recommended to use the upper right → upper left → lower left → lower right mode to avoid falling.



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www.win-tec.com.tw | sales@win-tec.com.tw

* Regarding the connection method and software documents, please download from our website www.win-tec.com.tw