

NB-IOT WIRELESS SENSOR NODE



WTC4 / WTC4B is a rugged NB-IoT wireless sensor node designed for long-term outdoor data collection.

With 4 flexible sensor ports, RS-485 support, GNSS capability, data logging, and built-in solar and battery management, it provides a reliable and secure solution for remote monitoring in industrial and environmental applications.

- NB-IoT connectivity (LTE Cat NB1, 3GPP Release 13) for stable and low-power data transmission.
- Supports LTE Bands 1-5, 8, 12-14, 17-20, 25, 26, 28, 66, 70, and 85.
- Internet protocol: TCP / UDP / MQTT / MQTTS.
- 4 flexible sensor ports: analog or digital I/O, RTD (PT-100), frequency / pulse count.
- RS-485 interface with Modbus RTU, Hex, ASCII, and Transparent protocols.
- GNSS support (u-blox M8, GPS / GLONASS / BeiDou / Galileo, 2.0m accuracy).
- Built-in SD card slot for local data logging (SDHC supported).
- AES 128 / 256 encryption for secure data storage and transmission.
- Solar charging supported (7-36V, 20-1400mA) with internal 6000mAh Li-ion battery) WTC4B only*
- AUX power output: 10V / 30mA per port, supports current monitoring.
- IP68-rated, flame-retardant enclosure; operating temperature -40°C ~ 85°C.
- Compact size (10 x 10 x 4.8 cm), M12 connectors for industrial reliability.



SOFTWARE FUNCTION

Secure Communication

Supports AES encryption (128/256-bit) and secure protocols such as TLS and MQTTS, ensuring data security in transmission and storage.

Primary and Backup Server Support

Allows configuration of two server destinations to ensure continuous data upload in case of connection failure.

Multiple MQTT Topics

Supports 3 publish and 3 subscribe topics for flexible cloud integration and device management.

Scheduled Data Upload

Up to 60 programmable schedules for automated data reporting at defined intervals.

Flexible Upload Protocols

Sensor data can be forwarded via TCP, UDP, MQTT, or MQTTS over cellular networks.

Time-Based Operation

Supports both relative and absolute time settings for precise scheduling and control.

Remote Configuration

Device settings can be modified remotely via the control platform or cloud interface.

Remote I/O Control

Enables cloud-based control of digital outputs, such as relays or indicators.

Auto Resend on Reconnection

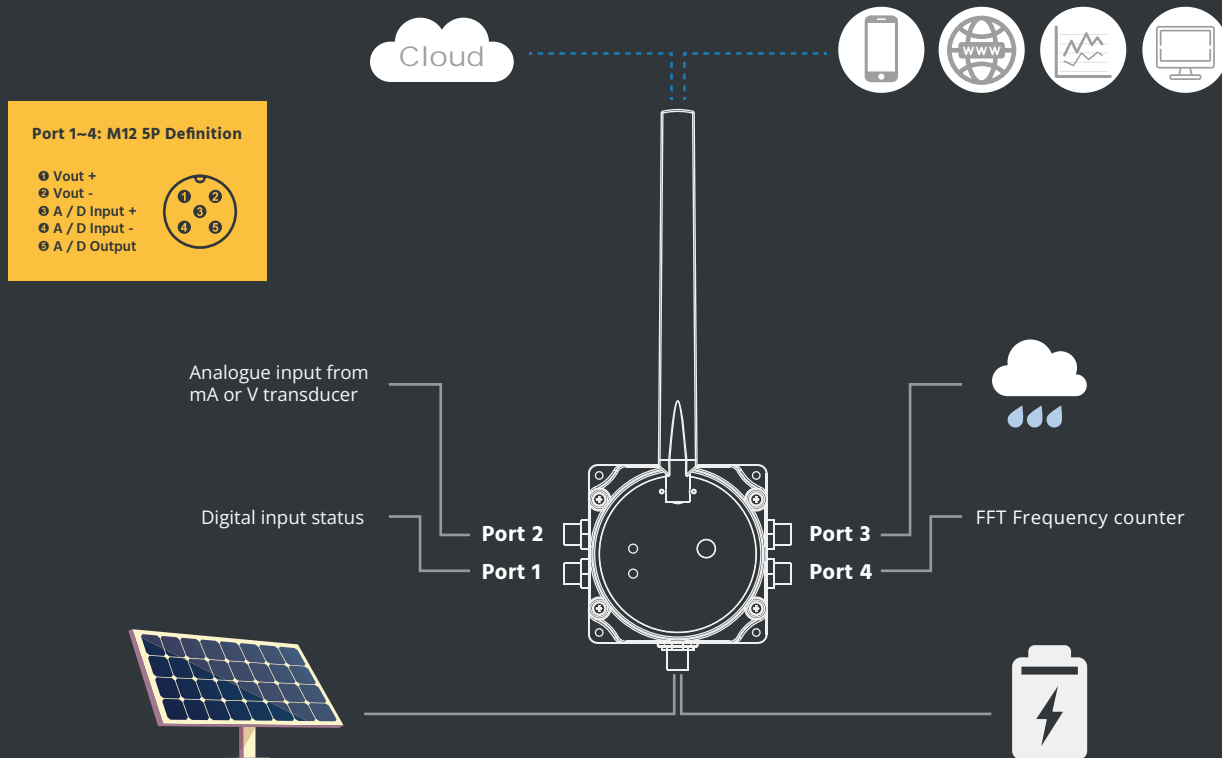
Automatically resends buffered data after reconnecting to the network, ensuring data integrity.

Power and Battery Monitoring

Monitors main power, battery level, and load status for system diagnostics and energy management.

ENDLESS APPLICATION SOLUTIONS

Analog Sensor with External Battery Pack



SPECIFICATION OVERVIEW

General

- Product Type: Outdoor
- Main Unit Dimensions: 10 x 10 x 4.8 cm
(Not include antenna and external connect)
- Weight: 260 g (Without battery)
- Waterproof: IP68
- Special Specification: Flame Retardant

Cellular & Network

- Cellular Protocol: NB-IoT (LTE Cat NB1 3GPP Release 13)
- Operating LTE Bands:
Band 1 / Band 2 / Band 3 / Band 4 / Band 5 / Band 8 /
Band 12 / Band 13 / Band 14 / Band 17 / Band 18 /
Band 19 / Band 20 / Band 25 / Band 26 / Band 28 /
Band 66 / Band 70 / Band 85
- SIM Type: nano SIM, e-SIM (Optional)
- Sensitivity: Maximum -116 dBm
- Transmit RF Power: Maximum 23 dBm (Class 3)
- Antenna Connector Type: RP-SMA Jack
- Cellular Data Rate: NB2 (Uplink: 159 kbps / Downlink: 127 kbps)

Internet Protocol

- Protocols: TCP/UDP/MQTT/MQTTs

Port Interface

- Main Port Interface: RS-485
- Port1~4 Interfaces:
Analog or Digital Input
Analog (1~10V) 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

- Supported Protocols: Modbus RTU/Hex/ASCII/Transparent
- Baud Rate:
1200bps/2400bps/4800bps/9600bps/19200bps/38400bps /
57600bps/115200bps (default)/230400bps / 460800bps

Sensor Interface

- Digital Input: High / Low Signal Judge
- Analog Input Spec:
0~±10 V (± 0.1%)
0~20 mA (± 0.2%)
4~20 mA (± 0.2%)
- FFT (Frequency Count):
Frequency Range: 1Hz~3KHz
Input Level > 100 mVp-p
- RTD (PT-100):
Recommend Temperature Range: -150°C ~ +300°C
2-Wire or 3-Wire
- Pulse Count: Support rain gauge function
- Digital Output:
Support PWM/Latch Mode
- Digital Output Spec:
PWM Frequency: Max. 2KHz
Latch: Max Input 36V (Open drain), Max Current 80mA
- Analog Output:
1~10V (±3.0%)
Recommended Current: <10mA

GNSS / GPS

- GNSS / GPS: U-blox GNSS Chipset
- Receiver Type: 72-Channel u-blox M8 Engine
- Supported Systems: GPS/QZSS, GLONASS, BeiDou, Galileo, SBAS (WAAS/EGNOS/MSAS/GAGAN)
- Default Setting: GPS/SBAS/QZSS + GLONASS
- Sensitivity:
Tracking & Navigation: -167 dBm
Reacquisition: -160 dBm
Hot Start: -157 dBm
Cold Start: -148 dBm
- Antenna Type: Built-in Patch Antenna
- Protocol: NMEA0183
- Accuracy: 2.0m CEP (GPS/SBAS/QZSS + GLONASS)
- Acquisition Time (Average):
Hot Start: 1 sec
Cold Start: 26 sec

Data Logger & Storage

- Data Logger Storage: Micro SD Card (Support SDHC)

Encryption

- Encryption Function: AES 128/256
- Encryption Method: ECB/CBC/CTR
- Applies To: SD Card/Upload/Publish

Power & Battery

- Input Power Supply: 7V ~ 36V DC (With OVP), 7V1A@charging
- Solar Charger Voltage Range: 7V ~ 36V DC
- Solar Charger Current: 20mA~1400mA (±10mA)
- Redundant Battery: 18650/3.7V/6000mAh (1S2P)
- Battery Protection: Temperature (OVP/OCV) @charging
- NTC Specification (Required): 10k ohm (±1%)
- Output Power Supply (Each Port 1~4): 10V DC/30mA (Max.), supports current monitor
- Output Power Monitor:
12V 6.8mA @receive
12V 300mA @transmit
50~400uA @sleep (battery only)
12V 1.4mA @charge off

Others

- Button: Wake Up
- LED Status: Power Status/Wireless Status

Note:

Specifications are subject to change without prior notice. Please refer to the actual product for the most accurate and up-to-date information.

