NBIoT Meter Interface Unit

1. Product Usage

Non-magnetic remote transmission module (AGIL WRPMIU 301) integrates multiple functions into one, including data collection, precise measurement, two-way communication, data calculation and storage, etc.

This module strictly follows 3GPP TS 36.101 and uses standardized NB-IoT base stations and integrated smart metering platforms for efficient and secure data interaction and centralized equipment control.

2. Working Principle

AGIL WRPMIU 301 can gather metering signals from water meters using non-magnetic coils and other sensors, storing the accumulated readings in an MCU. This module has the capability to report these cumulative readings either by magnetic induction triggering or by actively sending them at pre-set time intervals. Subsequently, these data are displayed on a comprehensive meter reading platform through a specific application communication protocol. Conversely, the integrated meter reading platform can also transmit specific commands to the module on the water meter.

3. Packaging information and precautions

3.1 packing list

Serial Number	Name	Quantity
1	Non-magnetic remote transmission module	1 piece
2	Battery compartment cover	1
3	Special tool for battery compartment cover	1
4	connecting nut	1
5	Sealing gasket	1
6	manual	1 serving
7	Infrared handheld machine	1
8	programmer	1

3.2 Storage and disposal after use

This device should be stored in an environment of 0~55℃ (avoid direct heating), otherwise it may affect the normal operation of the MCU inside the device;

This device contains batteries, after the product is scrapped, it must be handed over to the relevant electronic product processing agency for recycling and unified processing to prevent environmental impact.

4. Module Installation

4.1 Installation steps

1. Install AGIL WRPMIU 301 into the water meter buckle and align it with the fixing hole .

2. Tighten 1 stainless steel screw at the fixing hole .

4.2 Installation site signal judgment

The signal of the module installation position can be judged by the following two data:

1. CSQ: received signal strength; the larger the value, the better the signal. When the value is less than 10, it means that the MIU installation environment signal indicators are very poor, which will cause the MIU to frequently fail to upload data. (This data is used to judge on-site NB network performance) .
2. RSRP: Received signal energy; the larger the value, the better the signal. When the value is less than -105, it means the MIU installation environment signal index is very poor. (This data is used to judge on-site NB network performance) .

two. Signal parameter range reference:

1. CSQ: signal strength, range 0-31, the larger the value, the better.
2. SNR: Signal-to-noise ratio, above 0, the bigger the better.
3. RSRP: Signal receiving power, -60 ~ -130dBm, -60 ~ -100dBm good.
4. ECL: Coverage level 0-2, 0 is excellent, 1 is average, and 2 is poor.

5. On-site debugging

5.1 Instructions for parameter setting of new protocol for handheld console

Enter the main interface of the software and click the "Parameter Settings" option, enter the password (the initial password is: 12345), and click the "ID Parameters" option to set the unique number, user table number and base table number. Click the "Internal Parameters" option to set the base, communication method, etc.

5.2 Handheld protocol parameter reading instructions

Enter the main interface of the software and click the "Parameter Acquisition" option, and click the "Read Basic Data" option to obtain the device unique number, device number, firmware version and real-time data. Click the "Read Core Data" option to obtain device flow data and voltage values. You can use the left and right keys to turn pages up and down to determine the information you need.

6. Parameters and functions

6.1 Product parameters

No.	Item	Description
1	Network type	Cellular
2	Technology	NB-IoT, conforms to 3GPP TS 36.101.
3	Frequency band	Cat NB1/Cat NB2

4	Geographical coverage	Global (SEA, Middle East, Brazil, Europe, US)
5	Transmit power	24dBm (class 5) max.
6	Receiver sensitivity	CAT NB1/NB2: -114dBm
7	Data rate	Cat NB1/NB2: Max. 127 kbps (DL), Max. 158.5 kbps (UL)
8	Power class	Class 5
9	Antenna gain	<2dBi
10	Operating Temperature	-20°C to +55°C
11	Operating Humidity	<95% RH Non-Condensing
12	Ingress protection	IP68
13	Battery life	15 years (transmission interval, by default 1 time/day), 10 years (transmission interval is 3 times/day)
14	Power consumption	< 1A
15	Standby mode	<20uA
16	Transmission inrush current	<329mA
17	MIU power consumption during transmission	Data Sampling per times: ＜0.30uAh Data Report per times: <500 uAh
18	Battery nominal capacity	19Ah
19	Battery storage leakage	<1% per year @ +25°C

6. 2 Functional Characteristics

No.	Item	Description
1	Data reporting	There are two data reporting methods: ① Magnetic attraction trigger report: Use a magnet to approach the transceiver module for about two seconds, then remove the magnet and wait for about 30 seconds, the module will report the data (if there is an indicator light, you can see that when the module is successfully triggered by magnet, the indicator light will flash quickly. When the module is reporting the data, the indicator. light will be on for a few seconds). ②Regular active reporting: The module will automatically report data at a specific time (default 0:00) , and report data

		at intervals according to the set interval time.
2	Power management	The module will monitor and report the battery voltage value in real time at the time of data reporting, and judge whether to generate an alarm signal according to the set value.
3	Measurement	The module supports data acquisition methods such as non-magnetic coils.
4	Freeze data at intervals	The module can store water consumption at intervals according to the set value , up to 96 data per day, and Up to 31 days of frozen data can be saved.
5	Parameter settings	The module supports wireless short-range or remote parameter setting. The short-range parameter setting is realized through the wireless near-end maintenance device (mobile APP or PC software); the remote parameter setting is realized through the cloud platform.

7. Common troubleshooting

7.1 Incorrect or abnormal data

1. Whether the initial bottom level is set correctly;
2. Whether the sensor fixing screw is loose;
3. If there is data backflow, you can upgrade the device to the latest version and enable non-metering when using the device.
4. If there is a jump in the data or the bottom is cleared, upgrade to the latest program and reset the bottom to observe the situation.
5. Check whether the base meter is installed backwards . If the fault cannot be eliminated, replace the water meter sensor and then read the data.

7.2 No data on Far EasTone platform

1. Whether the table ID and IMEI number are consistent with the table end;
2. Whether the battery voltage is normal; whether the on-site NB signal is good.

7.3 Failed to set parameters of handheld device

1. If the sensor can be activated, please confirm whether the infrared port of the handheld device and the infrared port of the water meter sensor are aligned.
2. If parameters are not set for a long time, the device will automatically enter sleep mode to ensure power consumption. Check whether the indicator light is on.
3. If there is still no response when reading, replace the water meter sensor.

8. Precautions

1) Data reporting failure: Use wireless local maintenance equipment to confirm whether the module information is consistent with the platform registration information. If inconsistent, please reset the module parameters.

2) Parameter setting failed: During the data reporting process, the module cannot perform the parameter setting operation. Please wait for about 1 minute and try again.

3) If the above issue still cannot be resolved, please contact our technical support team for further assistance and troubleshooting.

4) If the magnet triggering operation fails: Use a magnet close to the wireless transceiver module and remove the magnet within about 2 seconds. The module will enter the activation state (the indicator light flashes quickly). At this time, important parameters are ready to be set. The duration is 25 seconds. Then the module automatically exits the activation mode (the indicator light flashes slowly), and after about 3 seconds, the module starts reporting data (the indicator light will light up for a few seconds). If parameter setting is unsuccessful, please repeat the above operation (wait 1 minute between each magnet triggering operation).

5) It is recommended that the remote water meter be checked once a year. If the mechanical reading does not match the electronic reading or the smart water meter fails, the mechanical reading shall prevail and the faulty water meter shall be repaired in a timely manner to avoid water volume disputes .

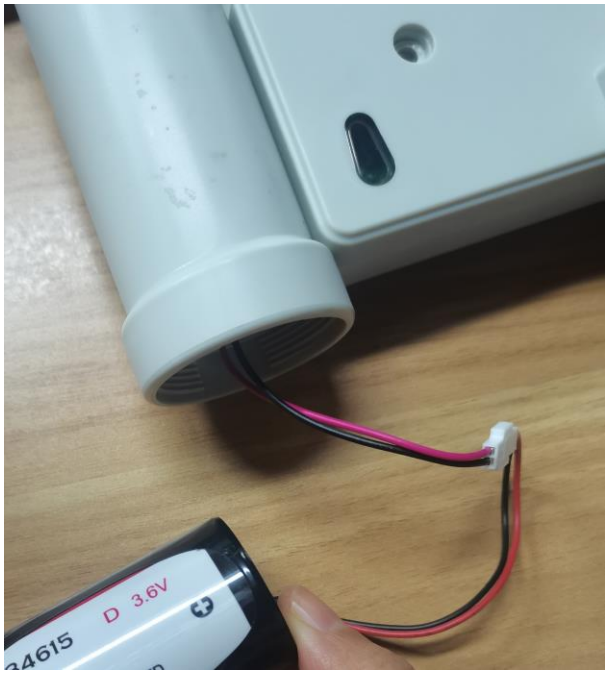
9. Equipment maintenance

9.1 battery replacement

1. Use a special screwdriver to remove the battery compartment cover

2. After cutting the old battery cable, connect the new battery power cable to the communication board power cable using terminal blocks.

3. the battery compartment to its original state (after connecting the wires, first put a blue ferrule on the outside of the battery, put the battery in, then put the yellow gasket, then cover the battery compartment cover and tighten it with a tool)



9.2 MIU replacement

1. Use a screwdriver to remove the fixing screw;
2. Pin the new module to the base table;
3. Make basic modifications to the new module and modify the base table correspondence.

This model of our company's FCC certified products: AGIL WRPMIU 301, make the following statement:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

FCC Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.