


FUWIT
FU-M6-IN1
IP68 Reader



FUWIT FU-M6-IN1 IP68 Reader User Manual

[Home](#) » [FUWIT](#) » FUWIT FU-M6-IN1 IP68 Reader User Manual 

Contents

- [1 FUWIT FU-M6-IN1 IP68 Reader](#)
- [2 Specifications](#)
- [3 Product Usage Instructions](#)
- [4 Product overview](#)
- [5 Product Specifications](#)
- [6 Dimension](#)
- [7 Equipment installation and inspection](#)
- [8 Product handling and use](#)
- [9 Daily Maintenance and Repair](#)
- [10 Product Accessories List](#)
- [11 Warranty Service Terms](#)
- [12 More Info](#)
- [13 Frequently Asked Questions](#)
- [14 Documents / Resources](#)
 - [14.1 References](#)

FUWIT

FUWIT FU-M6-IN1 IP68 Reader



Specifications

- Name: FU-M6-IN1 IP68 reader
- Manufacturer: Shenzhen Fuwit Technology Co., Ltd
- IP Rating: IP68
- RFID Protocol: UHF RFID
- Supports: Multiple RFID protocols, ISO 18000-6C/E1G2
- Features: System development documentation, multi-protocol automatic identification, wide voltage input, customizable interface

Product Usage Instructions

Installation

- Follow the steps below for proper installation:

Select the Installation Location

- Choose a suitable location for installing the device.

Connection of Various Devices

- Connect the necessary devices as per the provided guidelines.

Installation of Equipment

- Install the equipment securely, following the installation instructions provided.

Product Handling and Use

Preparation Before Test

- Before testing, ensure the following:
- Perform a hardware inspection to check for any damage.
- Download and install demo software for testing purposes.

Demo Connection and Testing

- Connect the device as per the network port instructions and conduct simple tests for frequency band, antenna, power, and card reading.

Device IP Change

- If required, change the device IP address following the provided guidelines.

Daily Maintenance and Repair

- Perform routine maintenance as described in the manual. In case of common faults, refer to the analysis and solutions section for troubleshooting.

Product Accessories List

- Refer to the provided list for information on product accessories and attachments.

Warranty Service Terms

Understand the warranty terms provided for the product.

Foreword

- Welcome to FUWIT products.
- This manual applies to the following product name:

FU-M6-IN1 IP68 read-write device

- This manual provides information on the product's installation, use, maintenance, repair, and other characteristics, and can be read and used by the product's installers, users, and maintenance personnel

Product overview

Characteristics

UHF RFID Protocol

- Multi-purpose UHF RFID device with system development documentation

UHF RFID Protocol

- Multiple RFID protocols and support for multi-protocol automatic identification and mode switching
- Meet the industrial wide voltage input mode
- Give full play to the advantages of the Thingmagic RFID module algorithm, its excellent label chip compatibility.
- Interface can be easily customized
- ISO 18000-6C/E1G2 support

Communication mode and peripheral interface

- Support RJ45 interface Ethernet communication
- Customizable support DB9 interface RS232 serial communication
- Peripheral 12v output universal interface
- Peripheral 1 GPI interface and 1 GPO interface

Power supply and energy consumption

- DC12v to 24v operating voltage range
- Supports POE power supply

Environmental conditions

- Operating environment temperature:-20°C to +55°C
- Working environment humidity: 5% to 95% (no condensation)
- Storage ambient temperature:-40°C to +85°
- Storage environment humidity: Certification
- ROHS&Reach
- FCC RF
- CE RF

Application

- Universal UHF RFID Tag Reader Writer
- Universal UHF RFID Data Logger
- Access Control Statistics Management System
- Health/Medical/Nursing Applications
- Industrial Automation
- warehousing logistics

ForewordTHE

- FU-M6-IN1 ZEUS UHF RFID station machine is an industrial UHF RFID integrated reader/writer with a small size, easy installation and deployment, anti-electromagnetic interference design, built-in integrated 6dbi circularly polarized antenna, die-cast aluminum and ABS shell, M12 waterproof connector, IP68 protection

grade, and specially designed for industrial and harsh environments. Embedded ThingMagic full function, stable M6e-Nano UHF RFID module integration, ZEUS RFID station reader provides command and control to computer or PLC system through its TCP/IP serial or RS232 interface. Modbus system (optional) support.

Description of type selection

- For equipment details and custom equipment, please contact us.
- Communication and control mode, by default, will give priority to network port communication. For serial communication function, please contact us.
- For more information on product size, refer to the product size section 6.1.

Product Specifications

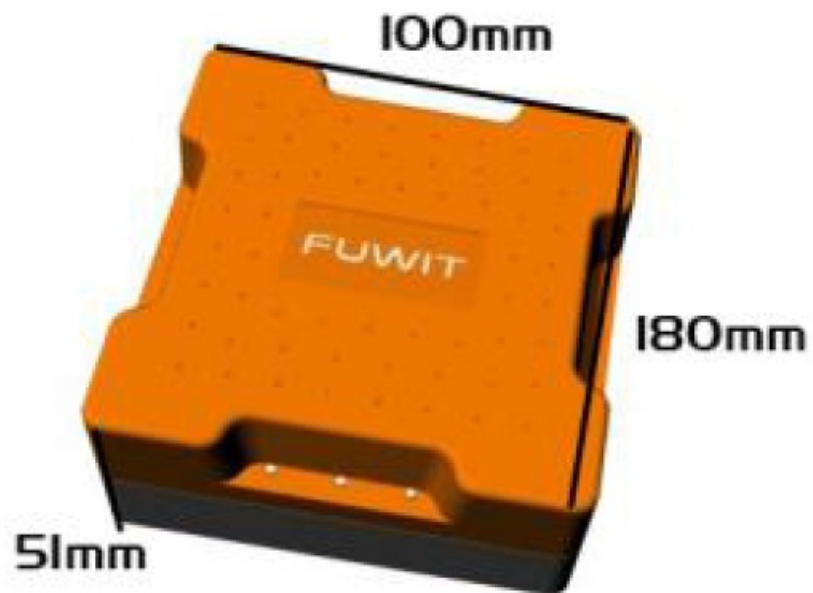
| Condition | Parameters | Description | Remarks |
|------------------------|----------------------------|---|-----------------------|
| Data Control Interface | Signal Definition | Power Supply * 1 & GPIO * 1 & TCP/IP * 1 | |
| | LED | Red Light * 3 | |
| | Reset | Power off restart/manual button restart | |
| Power | Adapter | Default 12v (wide DC12-24v) 20W | |
| | POE power supply | POE 12v/1A 13w | Customization |
| RF Function | Operating frequency | FCC(NA,SA)902-928MHz/ETSI(EU)865.6-867.6MHz/ TRAI(India)865-867MHz/KCC(Korea)917-920.8MHz/ ACMA(Australia)920-926MHz/SRRC-MII(PR.China)920-925MHz/MICapan)916.8-923.4MHzOpen'(Customizable channel plan;865-869902-928 MHz) | |
| | Support protocol standards | ISO18000-6C (EPC Class Gen2)/Gen 2v2 | |
| | RF Power | Read and write (transceiver) separation mode 0 ~ 27dBm(0.01dBm adjustable) | |
| | Antenna | Built-in 5.8db antenna | circular polarization |
| | | | |

| | | | |
|--------------------------------|--|--|--|
| | Max Tag Cache | >10M bits | |
| | Maximum reading rate | >250 tag/s | |
| | Maximum EPC ID | 512 bits | |
| Architecture | Network | TCP/IP or RS485 | |
| Development Interface | Support for dev elopment languages | Java, C,C ## | |
| Authentication and Security | Qualification C ertification | Thingmagic M6e-Nano module: FCC47 CFR CH.1Part15; Canada(IndustrieCanadaRSS-210);EU(ETSI EN 302 208 v3.1.1.RED 2014/53/EU) | |
| | Other | RQHS | |

Mechanical Characteristics

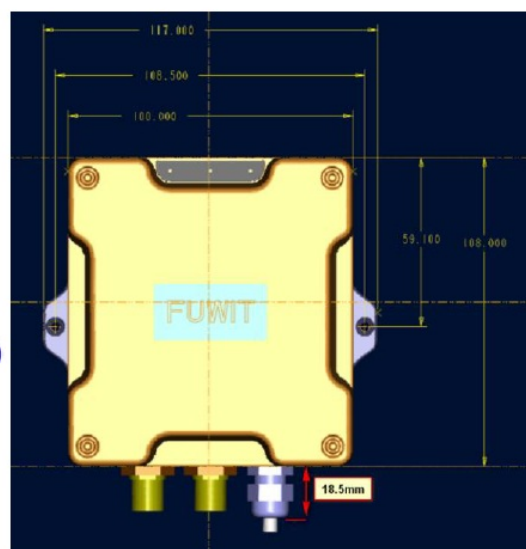
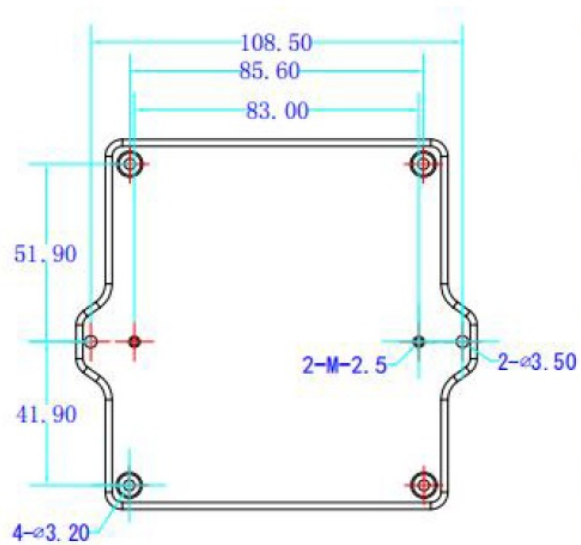
| Condition | Parameters | Description | Remarks |
|---------------------------|------------------------|-----------------------------|---------|
| Shape and struct ure | Dimensions | 108*108*51mm | |
| | Net weight | 0.7kg | |
| Use of the environment | Storage temperature | -40°C to +85°C | |
| | Working temperature | -20°C to +55°C | |
| | Humidity | 5% to 95% (no condensation) | |
| | Shock shock | 1 m drop safety | |

Dimension

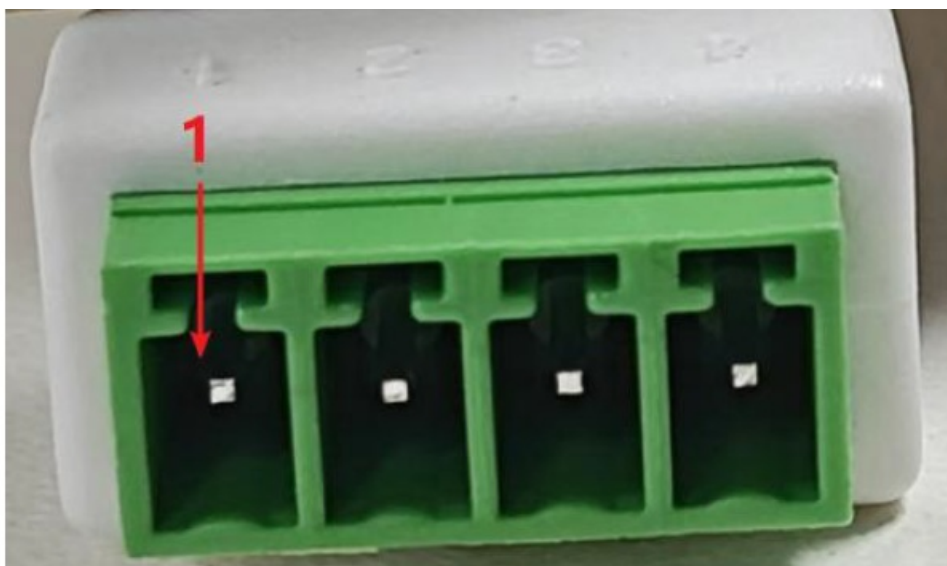


- **FU-M6-IN1** : 108(L)*108(W)*51mm(H)

Product structure



Interface definition



| Position number | Definition | Description |
|-----------------|------------|-----------------|
| 1 | DI1 + | Enter positive |
| 2 | DI1- | Input negative |
| 3 | DO1 + | Output positive |
| 4 | DO1- | Output negative |

Equipment installation and inspection

Installation Precautions

- In order to ensure your personal and property safety, the following preparations must be made before installing and using the product.
- Measure and estimate the connection distance between equipment and system (such as equipment and antenna, equipment and PC, equipment and power socket, etc.);
- Check whether the installation position and direction of the equipment and antenna will disturb the signal when the information is exchanged between the product and the electronic label;
- When installing multiple devices or identifying dense areas, pay attention to the antenna placement of multiple devices and the minimum distance between the antennas to avoid mutual interference.

Installation Conditions

- Before installing the equipment, please carefully check whether the product is in good condition, whether the accessories are complete, and meet the required standards for installation, and can be installed in the use environment.

Select the installation location

- Consider the minimum safe distance between the antenna and the human body.

Connection of various devices

- Connect the reader, antenna, and PC.
- The auxiliary parts shall be connected according to the specified equipment.
- When installing the connected antenna, pay special attention to the polarization matching between the antenna and the electronic tag, otherwise, it will seriously affect the reading/writing distance of the reader to the electronic tag.

Installation of equipment

- According to the field application, the reading and writing range of the reader and the connecting antenna is preliminarily determined. According to the on-site reading and writing test results of the FU-M6IN1 reader, adjust the tilt (rotation) angle of the reader antenna to make the reading distance reach the best state. Finally, the installation position and tilt (turn) angle of the equipment are fixed.

Installation FAQ

- This section describes in detail common problems during commissioning, in particular general problems due to incorrect installation, and explains how to correct them.

The main common problems of debugging are as follows:

No response from reader

- The power indicator light is on. → Check the relevant cable connection and check the corresponding items according to the status of the relevant indicator light;
- In the communication state of the network port → check whether the connected IP is correct; Check whether there is any conflict between IP addresses; check Whether the IP address and the upper computer are in the same network segment;
- Whether the antenna number is set correctly.

Read/write label error

Check whether the reader protocol is compatible with the label protocol;

Check whether the configuration of the reader is correct;

- Label placement, whether the label is in the effective reading and writing range of the reader
- Whether there is electromagnetic interference between readers or other equipment;
- Whether the access password is required for label reading/writing and whether the password is correct;
- Whether the label is damaged.

Read and write scope does not meet the requirements

Check the antenna installation and placement direction;

Check whether the polarization mode of the antenna and the label are consistent;

- Whether the antenna selection supports the requirements of reading and writing range;
- Whether there are interferences in the surrounding environment.

Product handling and use

- Demo software mainly carries out demonstration functions such as system control, parameter setting, parameter query, communication mode selection, reading and writing and display of RF tags.
- If you need secondary development, please contact Quan Shunhong to obtain development kits and technical support.

Preparation before test

Hardware inspection

1. Connect the computer adapter
 2. Connect the reader with one end of the network cable, and the other end is directly connected to the computer
 3. Set the ip address of the local network card of the computer to 192.168.0.80/24 network segment
- Note: The factory IP address of the reader is 192.168.0.80. Please do not set the IP address of the local network card of the computer to this IP to prevent IP address conflicts.

Demo software download and installation

- Win10 PC side: Universal Reader Assistant

Demo connection and testing

- Connection (network port)

1. Click on the software after the installation is complete



2. Click Skip to skip this interface.

Universal Reader Assistant - Connection Wizard

Universal Reader Assistant Connection Wizard

Select Reader Connection Settings Connect/Read

Please Select a Reader

Reader Type: ☒ Serial Reader ☐ Network Reader ☐ Custom Transport Reader

Reader Name: Prolific USB-to-Serial Comm Port (COM)

Refresh

Next Skip

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3. Select connection method

1. Serial: serial port connection mode
2. Network: automatic identification method (this method is only applicable to support DHCP reader)
3. Custom Transport: Custom transmission method (this device is connected in this way)

Connect

Reader Type: ☐ Serial ☐ Network ☒ Custom Transport

Reader Name: 192.168.0.80:8086

☐ Transport Logs

Connect

Baud Rate: Select

Region: Select

Load/Save Profile

Load Save

4. Select Custom Transport mode, fill in the reader factory IP address: port, default: 192.168.0.80:8086

- Click on the connect to connect the reader, after the connection is successful, the connect becomes Disconnect

Connect

Reader Type : ☐ Serial ☐ Network ☒ Custom Transport

Reader Name :

☐ Transport Logs

Baud Rate :

Region :

Load/Save Profile

Simple test (frequency band, antenna, power, card reading)

- Select Region, which can be selected according to requirements, and generally select NA2.

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Settings/Status

Connect

Reader Type : ☐ Serial ☐ Network ☒ Custom Transport

Reader Name :

☐ Transport Logs

Baud Rate :

Region :

Load/Save Profile

NA2

NA3

IN

JP

PRC

EU3

KR2

AU

NZ

MY

ID

PH

TW

MO

RU

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- Check the antenna

Read/Write Options

Antennas

Switching Method: ☐ Equal Time ☒ Dynamic

☐ Antenna Detection

☐ Antenna Multiplexing

GPIO Configuration

GPIO Pins: ☐ GPIO1 ☐ GPIO2 ☐ GPIO3 ☐ GPIO4

Read Behaviour

☒ Read Continuously ☐ Read Once ☐ Fast Search

RF On (ms):

RF Off (ms):

Protocols

☒ Gen2

Embedded ReadData

☐ Enable

Filter

☐ Apply Filter1

- Configure read and write power

Performance Tuning

Reader Power Settings

RF Power Settings: ☒ Global ☐ Per Port

Read Power: dBm

Write Power: dBm

Gen2 Performance Tuning

Tag population size

☒ Automatically adjust as population changes

☐ Optimize for estimated number of tags in field:

Tags

Read Distance vs. Read Rate

Maximize Tag read distance Maximize tag read rate

Tag Response Rate

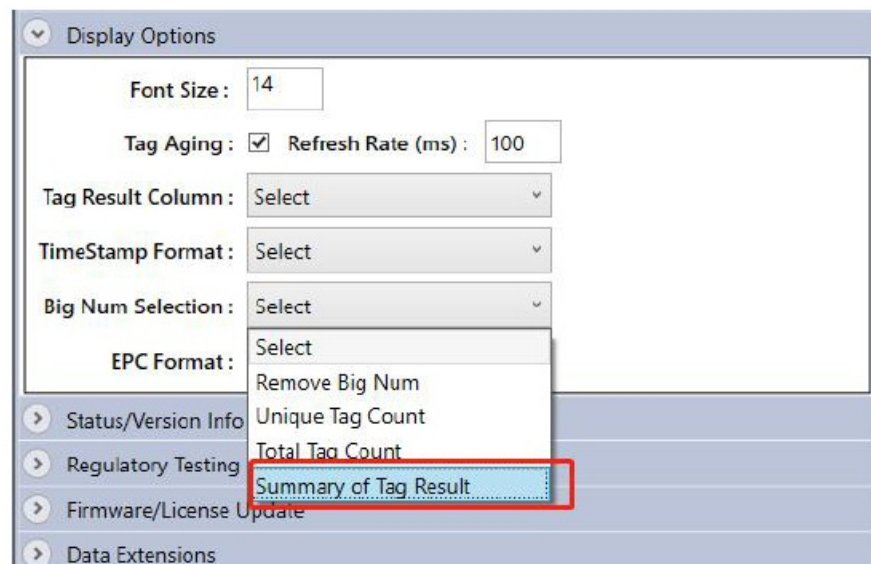
☐ Select best choice for population size

☒ Customize tag response rate

Tags respond less often Tags respond more often

☐ Configure Gen2 Settings

- Display Options



Unique Tag Count _____ Number of

0

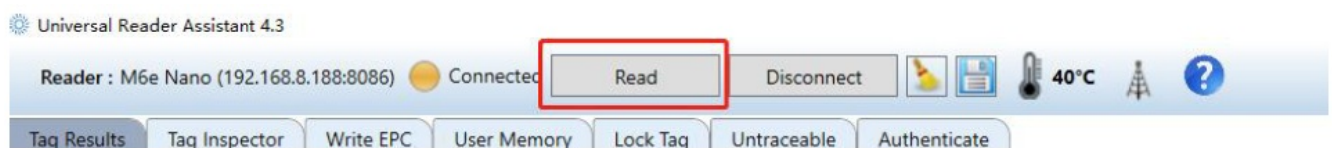
Total Tag Count _____ Total number of

0

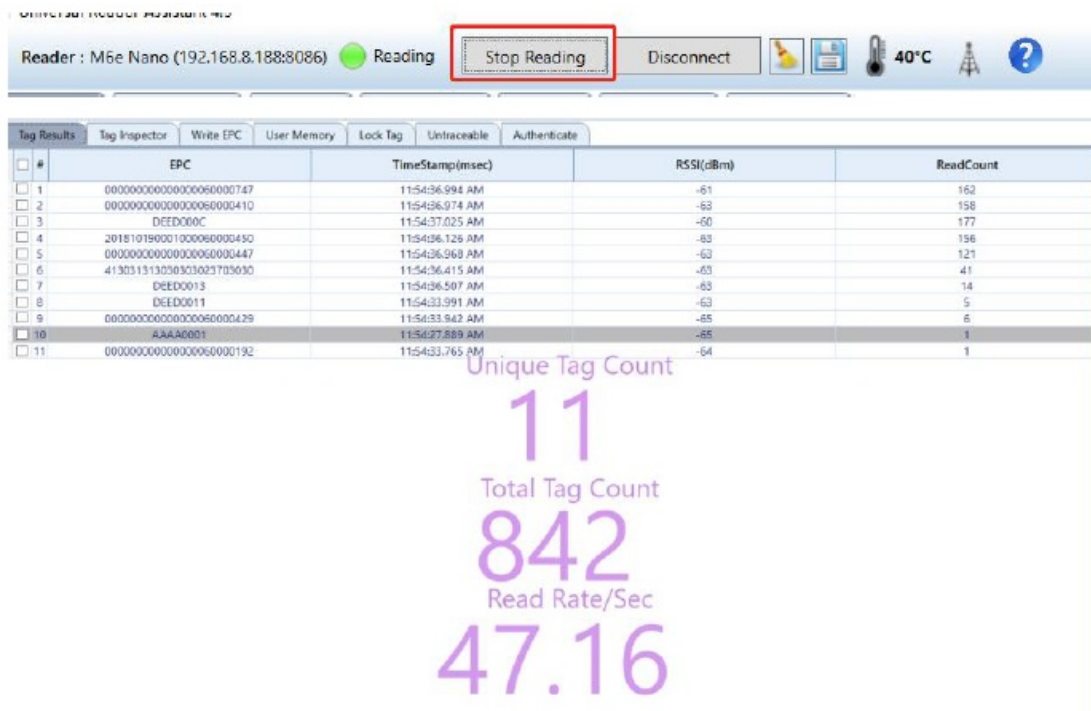
Read Rate/Sec _____ Read Rate

0

- Click Read to start tag reading.



- Click the Stop Reading to stop tag reading



Device IP Change

- Enter the address of the browser (192.168.0.80) and press Enter.

Note: If the IP address has been modified, you need to log in with the new IP address



- Login account: admin login password: 12345678

The screenshot shows a login form with the following elements:

- A header bar with the text '登录' (Login).
- A text input field containing the username 'admin'.
- A password input field containing the password '12345678' with a toggle icon on the right.
- A blue button with the text '登录' (Login).

- Go to the IP configuration page

- Modify the new IP address, click Save Settings, and restart the module to complete the modification

Daily Maintenance and Repair

Routine maintenance

- Store according to storage requirements.

Analysis and solution of common faults

- This paper mainly introduces the handling methods when the user encounters the abnormal phenomenon of the equipment in use.
- The power indicator does not light up after power-on
- Power supply system failure: check whether the power supply is normal;
- If other indicator lights are on, it may be an internal circuit failure. Please contact our company to discuss maintenance matters.
- The network port cannot be connected
- The default IP address set by the reader-writer when leaving the factory is 192.168.0.80.
- When connecting, ensure that the IP address of the upper computer and the IP address of the reader-writer are on the same network segment, such as "192.168.0.XXX," can be reliably connected with the reader-writer. If you forget the IP address of the reader, please consult our company for the method of resetting the IP.
- Cannot read card
- Whether the cable is connected correctly, the cable is not connected, or the connection is not firm will lead to the PC command not being issued to the reader;
- Please check whether the antenna connector is tightened and the label is damaged.

- Make sure the reader is properly configured.
- For problems that users cannot solve by themselves, please contact our company to discuss maintenance matters

Product Accessories List

- List of attachments

| Name | Quantity | Remarks |
|-----------------------|----------|---------|
| FU-M6-IN1 IP68 reader | 1 | |
| | | |

- Note: Items that do not belong to the equipment accompanying or subsequent optional items will not be recorded in the list. Please confirm with the sales for specific information

Warranty Service Terms

Warranty Service Scope

- Warranty Products:
To comply with the relevant laws and administrative regulations of the People's Republic of China, this warranty service is a limited warranty applicable only to products sold by Shenzhen Fuwit Technology Co., Ltd. (hereinafter referred to as "Fuwit") or its authorized distributors.

Warranty period:

- From the date of shipment, products that experience malfunctions under normal use within the specified period are eligible for warranty service. Customers requesting warranty services must provide a purchase contract, delivery receipt, the faulty device's SN number, and a description of the issue to prove that the product qualifies for a one-year warranty from the date of shipment.
- Exclusions from Warranty:
 - **a.** Failure to provide valid purchase contracts, delivery receipts, or proof of purchase (including altered purchase contracts or receipts or discrepancies between documents and actual products).
 - **b.** Surface damages such as scratches, dents, or depressions.
 - **c.** Consumable items like batteries, except in cases where defects result from material or manufacturing issues.
 - **d.** Damage caused by accidents, misuse, improper handling, fire, natural disasters, or improper maintenance (including external force damage).
 - **e.** Repairs, modifications, or alterations conducted by unauthorized personnel, which may lead to permanent product damage.

Description

- This warranty policy grants you specific legal rights, which may vary by country. Other statutory rights under

different national laws are not excluded, limited, or suspended by this policy. Some of the following limitations may not apply to you.

- To the extent permitted by law, this warranty policy is exclusive and supersedes all other express, implied, or statutory warranties, including but not limited to warranties of merchantability, fitness for a particular purpose, or any other condition under statutory laws. Furthermore, Fuwit shall not be liable for any incidental, special, indirect, or consequential damages arising from the use, misuse, inability to use, or defects of the product.
- Fuwit reserves the right to deny warranty claims for products or services obtained and/or used in violation of any national laws.
- Products purchased through auction websites or from non-authorized distributors of Fuwit are not covered under this warranty service.
- If the product is determined to fall outside the warranty scope after inspection, Fuwit will proceed with repairs only after obtaining customer approval and charging a quoted fee. Repaired components are covered by a 90-day warranty for the same functionality failure.
- Fuwit reserves the right to repair or replace the product or software. Repairs will be performed using original manufacturer parts following standard procedures. If the product cannot be repaired, it may be replaced with a module or an entire unit. If repair parts are out of stock or the product has been discontinued, Fuwit will provide an equivalent replacement product
- based on depreciation value during the warranty period or offer an upgrade option with an additional charge upon customer agreement. Products outside the warranty period will not be eligible for repair services. Any replaced defective parts will become the property of Fuwit.

Precautions

- Before requesting warranty service, customers should back up all personal and important data and provide only the faulty product for repair. During the repair process, all data stored in the device may be lost and cannot be recovered. Fuwit does not provide data backup services and does not guarantee that system settings will remain unchanged before and after repair.

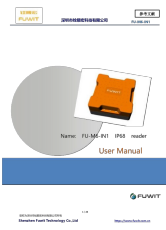
More Info

- <https://www.fuwit.com.cn>

Frequently Asked Questions

- **Q: What should I do if the device is not reading RFID cards?**
 - A: Check the antenna connection and power supply. Ensure the card is compatible with the device's supported protocols.
- **Q: How can I change the device's IP address?**
 - A: Refer to section 2.3 in the manual for instructions on changing the device's IP address.

Documents / Resources

| | |
|--|---|
|  | <p>FUWIT FU-M6-IN1 IP68 Reader [pdf] User Manual</p> <p>FUM6IN1, 2A9GZ-FUM6IN1, 2A9GZFUM6IN1, FU-M6-IN1 IP68 Reader, FU-M6-IN1, IP68 Reader, Reader</p> |
|--|---|

References

- [User Manual](#)

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