



HF Industrial Reader User Manual

- ◆ Before you use this product, please read this manual carefully and properly keep it for future reference.
- ◆ As our products continue improving, they may be changed without advanced notice.
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1. Product Overview

1.1. Introduction

AR14x1M is an HF low-power high-stability industrial-grade RFID reading device operating at 13.56MHz, supporting reading of tags conforming to ISO15693 international standard protocols such as NXP I-CODE 2 and I-CODE SLI. The device has built-in filtering and isolation modules, providing strong anti-interference capability for EMC, along with features like easy use, good sealing, excellent heat dissipation, high receiving sensitivity, stable performance, and high reliability. This product adopts the standard industrial Modbus RTU communication protocol, facilitating users to integrate it into PLC and other control systems, while also being compatible with the company's private protocol. The reader integrates the radio frequency communication protocol internally; users do not need to understand complex radio frequency communication protocols, but only need to operate the holding registers and input registers inside the reader through general Modbus commands to realize inventory UID, read memory area and write memory area.

AR14x1M is suitable for industrial fields such as production automation lines, automated sorting systems, and component assembly lines.

1.2. Product Features

- Support ISO 15693 standard
- Communication interface: RS485
- Built-in filter and isolation module, with strong anti-interference ability to EMC
- Integrated design, compact structure, convenient for distributed installation and deployment
- Protection class IP67, suitable for various harsh environments in the industrial field
-

1.3. Product Pictures



Figure 1 Product appearance(From left to right: AR1401, AR1411, AR1421, AR1431)

1.4. Main Parameter

The detailed technical parameters of this product are as follows:

Table 1 Description of main technical parameters of the product

Parameter	Description
Operating Frequency	13.56 MHz
Support Standard	ISO 15693 standard
Read And Write Distance	AR1401: 0~20mm (standard card) AR1411: 0~40mm (standard card) AR1421: 0~40mm (standard card) AR1431: 0~55mm (standard card)
Communication Interface	RS485 (Modbus RTU)
Communication Rate	9600~115200 bit/s
Supply Voltage	24VDC(10~30V)
Maximum current	<0.05A@24V DC
Indicator Light	1LED indicator
Dimensions	AR1401:φ18mm*75.5±0.5mm AR1411:φ18mm*82.5±0.5mm AR1421:φ30mm*76.5±0.5mm AR1431:φ30mm*87.5±0.5mm
Weight	AR1401:39g AR1411:42g AR1421:92g AR1431:100g

Fixed way	Threaded Screw-in or nut fixed
Shell Material	PC + ABS + brass nickel plating
Shell Color	Dark gray+silver
Operating Temperature	-30℃~+75℃
Operating Humidity	5%~95%RH
IP Rating	IP67

2. Hardware Interface Description

This product uses an industrial-grade plug (M12A, 4-pin male) as the power and communication port:

AR14x1M use RS485 communication interface, the default communication parameters are as follows:

- Baud rate: 19200
- Bit length: 8 bits
- Stop bit: 1 bit
- Parity bit: Even

The power supply adopts DC 24V (9~30V) power supply mode.

Table 2 Reader Power and Communication Port Pin Definition

Reader Port	Pin (4-pin male)	Connection (Power + Communication Port)
	1	24V DC
	2	A(485)
	3	0V, GND shared
	4	B(485)

3. Communication Connection

3.1. Connection Instructions

When a single AR14x1M reader is connected to the PLC, it only needs to be directly connected.

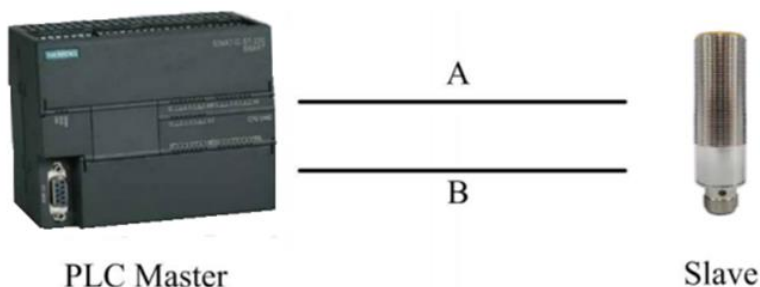


Figure 2 AR14x1M Single Machine Connected to PLC

RS485 bus supports multiple AR14x1M readers to be mounted on the same bus for multi-machine networking. When multiple readers are mounted on the bus, to improve communication reliability, 120Ω matching resistors should be connected externally at the front and rear ends of the bus.

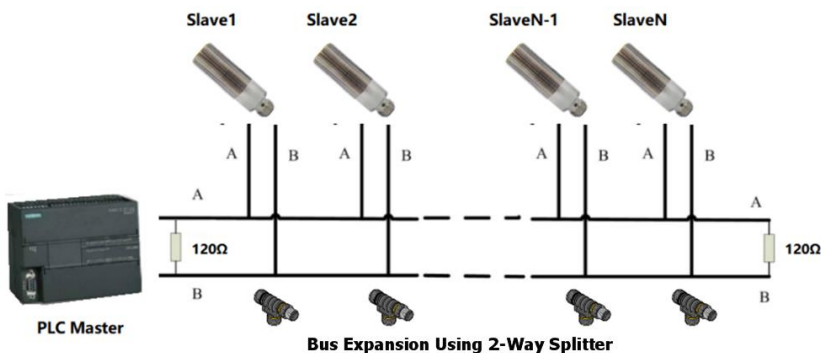


Figure 3 AR14x1M Multi-machine 485 Bus Connection

3.2. Connector Instructions

3.2.1. 2-way Splitter

Connection through 2-way splitter can expand power supply and RS485 communication bus:

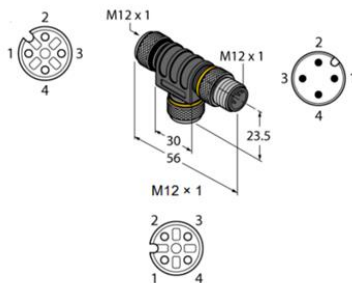


Figure 4 2-way splitter (optional accessory)

3.2.2. Power/Communication Cable

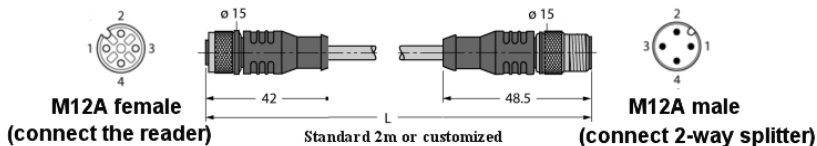


Figure 5 AR14x1M Power Supply and RS485 Cable (Standard Configuration)

This cable encapsulates 24V DC power supply and RS485 communication line in a 4-core industrial cable.

To improve communication reliability and system EMI performance, users can choose shielded twisted pair as communication cable or special serial communication cable. The communication distance is related to the quality of the communication cable and the communication baud rate.

Table 3 Baud Rate and Communication Distance Description

Baud rate (bits/s)	Maximum Communication Distance (m)
9600	800
19200	600
38400	500

4. Indicator Light Description



Figure 6 Reader Indicator Light

Table 4 Reader Indicator Light Description

LED	Status	Instructions
Green LED	Slow flicker	Command reading mode
	Fast flicker	Cyclic reading mode
	Always bright	Read RFID tags

5. Installation Instructions

5.1. Product Dimensions

The dimensions of this product are as follows (unit: mm):

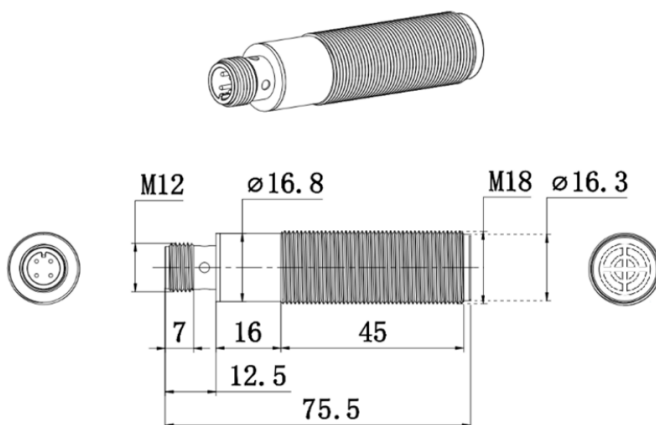


Figure 7 The dimensions of AR1401M (unit: mm)

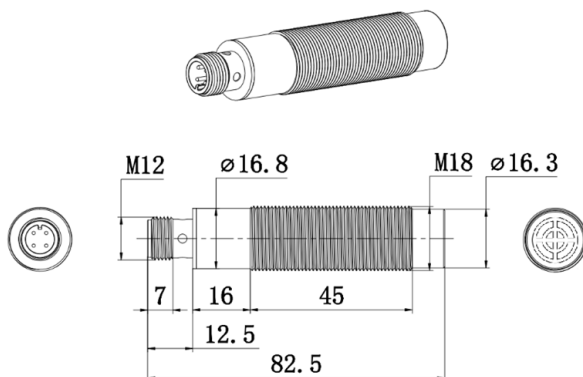


Figure 8 The dimensions of AR1411M (unit: mm)

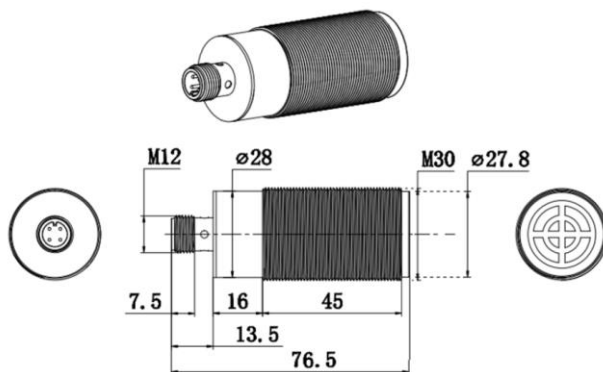


Figure 9 The dimensions of AR1421M (unit: mm)

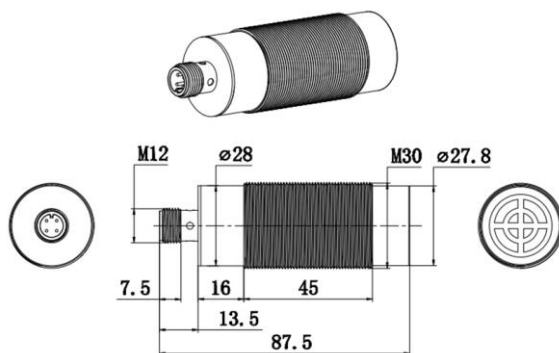


Figure 10 The dimensions of AR1431M/R(unit: mm)

5.2. Product Installation Methods

AR14x1M reader can be fixed to the using position with 2 nuts (see Figure 12); or directly screwed into the installation position (see Figure 13). If direct installation is not possible, various mounting brackets can be customized according to the customer's on-site installation environment to fix the reader.

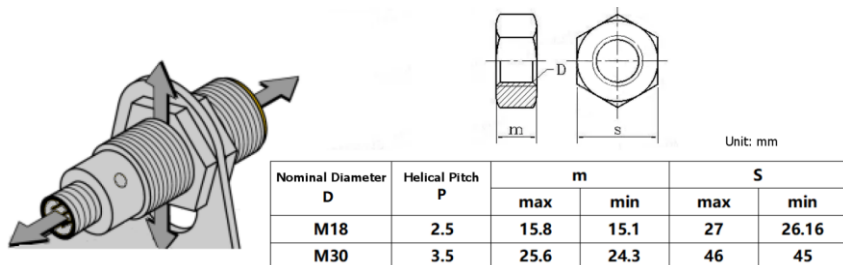


Figure 11 Schematic diagram of nut fixing and installation

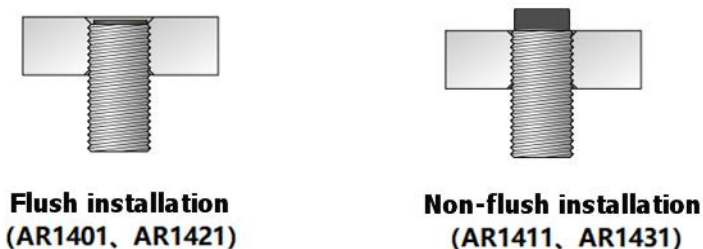


Figure 12 Schematic for screw-in installation

Since the radio frequency between the readers will interfere with each other, any two readers must be separated by a certain distance so as not to interfere with each other. Therefore, when the readers are installed sideways, the distance between them should be greater than 850mm; when they are installed oppositely, the distance between them should be greater than 600mm.

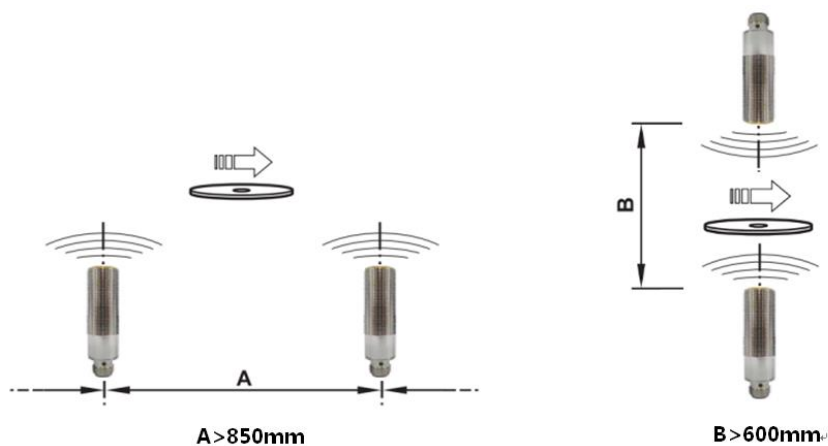


Figure 13 Product installation interval

6. Technical Support

- **Download link for development data and testing**
<http://www.gzandea.com/download.php>
- **Call for equipment debugging and technical support**
Mobile phone: 138 0251 4535

Caution: The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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: 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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



Guangzhou Andea Electronics Technology Co., Ltd.

Address: Room 1101, 1102, Building C2, No. 29, Bishan Street,
Huangpu District, Guangzhou.

Zip code:510705

Website: <http://www.gzandea.com>