



UHF Industrial Reader User Manual

Suitable for ARU5321M&x

- ◆ 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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Contents

1.	Product Overview	1
1.1.	Introduction	1
1.2.	Product Features	1
1.3.	Product Pictures	2
1.4.	Main Parameter	2
2.	Hardware Interface Description	3
3.	Communication Connection	5
3.1.	Ethernet Connection Instructions	5
3.2.	Serial Port Connection Instructions	5
3.3.	Connector Instructions	6
3.3.1.	Ethernet Cable	6
3.3.2.	DC Power Supply and Serial Communication Cable	7
3.3.3.	2-Way Splitter	7
4.	Indicator Light Description	8
5.	Installation Instructions	8
5.1.	Product Dimensions	8
5.2.	Product Installation Method	9
6.	Technical Support	10

1. Product Overview

1.1. Introduction

ARU5321M&x is a high-stability industrial-grade UHF RFID reader device, integrated based on the UHF RF chip E710. It operates in the frequency band of 865~930MHz (customizable, including US standard 902~928MHz, EU standard 865.6~867.6MHz, and national standard 920~925MHz), and supports reading tags that comply with the ISO18000-6C and EPC Class1 Gen2 international standard protocol formats.

The device has built-in filtering and isolation modules, providing strong anti-interference capabilities for EMC. It also features easy operation, excellent sealing and heat dissipation, high receiving sensitivity, stable performance, and high reliability. Equipped with RS485 and TCP communication interfaces, the RS485 interface supports the standard industrial communication protocol ModBus RTU, while the TCP interface has multiple standard Ethernet industrial communication protocol versions including ModBus TCP, PROFINET, EtherNet/IP, and CC-LINK IE FB, allowing users to easily integrate it into PLC and other control systems. The reader integrates the RF communication protocol internally, so users do not need to understand complex RF communication protocols. They can achieve inventory UID, read storage area, and write storage area by operating the holding registers and input registers inside the reader through ModBus, PROFINET, EtherNet/IP, and CC-LINK IE FB commands.

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

1.2. Product Features

- Support ISO18000-6C, EPC Class1 Gen2 standard
- Communication interface: Industrial Ethernet, RS485
- Supports standard industrial communication protocols ModBus, PROFINET, EtherNet/IP, CC-LINK IE FB, facilitating user integration into PLC and other control systems
- Built-in filtering and isolation modules with strong anti-interference capabilities

for EMC

- Integrated design with a compact structure, convenient for distributed installation and deployment
- IP67 protection rating, suitable for various harsh industrial environments

1.3. Product Pictures



Figure 1 Product appearance

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	865~930MHz (the range can be customized)
Support Standard	ISO18000-6C, EPC C1G2 standard
RF Power	1-30DBM (configurable)

Read And Write Distance	0~6000mm (The farthest reading distance is related to the tag)
Communication Interface	Industrial Ethernet, RS485
Communication Protocols	ARU5321M&T: Modbus RTU, Modbus TCP ARU5321M&P: Modbus RTU, PROFINET ARU5321M&E: Modbus RTU, EtherNet/IP ARU5321M&I: Modbus RTU, CC-LINK IE FB
Communication Rate	10/100M bps, 9600b/s~115200b/s
Power Supply Voltage	24V DC (10~30V), 48V POE (46-54V) (limited to ARU5321M&T)
Maximum Current	<0.38A@24V DC
Indicator Lights	6 types of LED indicator lights
Dimensions	135*135*42mm (top cover size 130*130mm)
Weight	580g±50g
Fixing Method	Fixed with nuts (4*M5) or with accessory brackets
Housing Material	ABS top cover + metal bottom case
Housing Color	Dark gray top cover, silver bottom case
Operating Temperature	-40°C~+60°C
Operating Humidity	5%~95%RH
IP Rating	IP67

2. Hardware Interface Description

This product has three communication ports:

- Port 1 is an industrial plug 8pin male (M12A): 6 I/O ports (8pin, 2 isolated inputs, 4 outputs).
- Port 2 is an industrial plug 5pin male (M12A): RS485 communication port + power supply.
 - Baud rate: 19200
 - Bit length: 8 bits
 - Stop bit: 1 bit
 - Parity: Even
- Port 3 is an industrial plug 4pin male (M12D): Ethernet communication port.

The default IP address of the reader is 10.168.1.222, and the default port is 502.

The ARU5321M&T product can be powered by DC 24V (10~30V) or 48V POE (46~54V, IEEE802.3af). The product supports both power supply methods, but only one method needs to be selected for actual use.

The ARU5321M&P, ARU5321M&E, and ARU5321M&I products are powered by DC 24V (10~30V).

Table 2 Pin Definition of Port 1

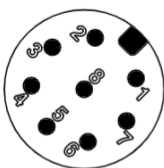
Port 1	Pin (8-pin male)	Digital Input/Output
 M12A male	1,2	Input 1-2
	3,4,5,6	Output 1-4
	7	COM
	8	GND

Table 3 Pin Definition of Port 2

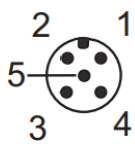
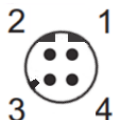
Port 2	Pin (5-pin male)	Connection (Communication Port + Power)
 M12	1	24V DC
	2	A(485)
	3	0V
	4	B(485)
	5	GND

Table 4 Pin Definition of Port 3

Port 3	Pin (4-pin male)	Connection (Ethernet Port)
 M12 D	1	TD+
	2	RD+
	3	TD-
	4	RD-

3. Communication Connection

3.1. Ethernet Connection Instructions

The ARU5321M&x reader and commonly used PLC can be networked through the Ethernet switch.

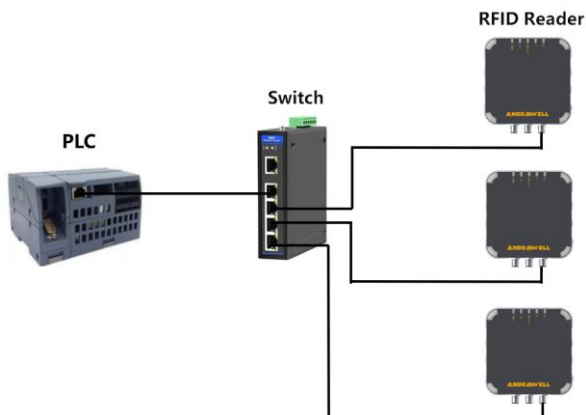


Figure 2 Product working network topology

3.2. Serial Port Connection Instructions

When a single ARU5321M&x reader is connected to a PLC via the RS485 serial port, direct connection is sufficient.

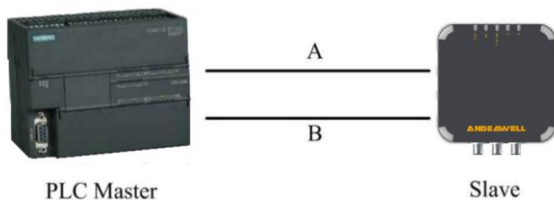


Figure 3 ARU5321M&x stand-alone connection to PLC(RS485)

The RS485 bus supports multiple ARU5321M&x readers to be mounted on the same bus for multi-machine networking. When multiple readers are mounted on the bus, 120Ω matching resistors should be connected to the front and rear ends of the bus to

improve communication reliability.

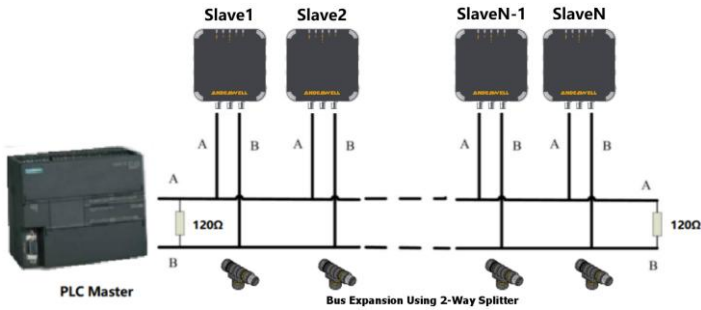
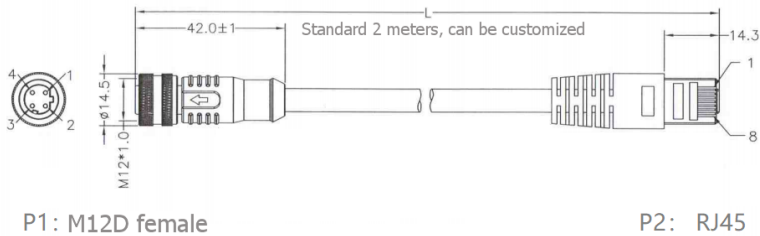


Figure 4 ARU5321M&x multi-machine 485 bus connection

3.3. Connector Instructions

3.3.1. Ethernet Cable



P1: M12D female

P2: RJ45

Figure 5 Industrial Ethernet cable

When the product uses POE power supply, the ARU5321M&T only needs one industrial Ethernet cable. To improve communication reliability and system EMI performance, it is recommended to use CAT5E standard industrial Ethernet cable as the communication cable. The theoretical communication distance is up to 100 meters, and it is recommended to use within 80 meters in actual applications.

Table 5 Port Connections

P1 (Reader)	P2 (Router)	Definition	Color
1	1	TD+	Orange-white
3	2	TD-	Orange
2	3	RD+	Green-white
4	6	RD-	Green

Metal shielding mesh	Metal shielding mesh	Signal shielding mesh	
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3.3.2. DC Power Supply and Serial Communication Cable

One end (M12A female connector) of the DC 24V power supply cable is connected to the reader, and the other end (M12A male connector) is directly connected to the power supply; or a 2-way splitter can be used to power multiple readers with one power supply. The 5-core cable contains 2 power wires (1, 3), 2 serial communication wires (2, 4), and 1 ground wire (5).

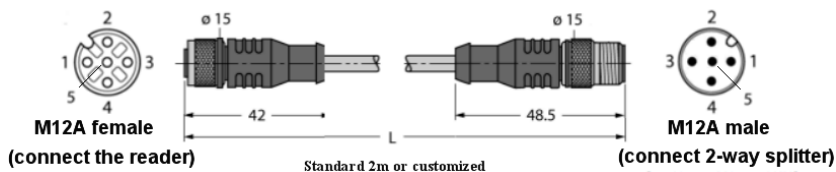


Figure 6 DC power supply, serial communication cable

3.3.3. 2-Way Splitter

The power supply and RS485 communication bus can be expanded by connecting through a 2-way splitter:

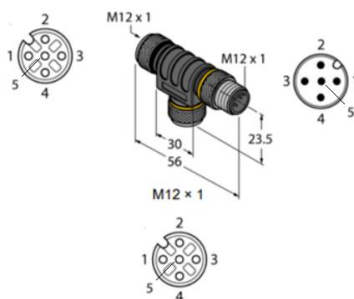


Figure 7 2-way splitter (optional)

4. Indicator Light Description



Figure 8 Reader Indicator Lights

Table 6 Reader indicator lights description

No.	LED	Color	State	Instructions
1	POWER	Blue	Always on	Reader power is on
2	LAN	Yellow-green	Blinking	Network communication with host computer
3	UART	Green	On	RS485 communication with host computer
4	DI	Green	On	Input level detected
5	DO	Green	On	Output circuit level output
6	Four-corner ambient light	White	Always on	Power-on standby state
			Blinking	RFID detected
			Always on	Device fault warning

5. Installation Instructions

5.1. Product Dimensions

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

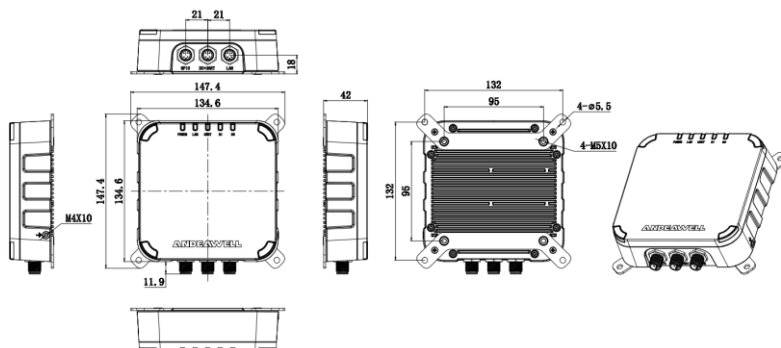


Figure 9 Device dimensions (Unit: mm)

5.2. Product Installation Method

This device can be fixed to the desired position with 4 M5 screws, and custom installation brackets can be provided according to the customer's on-site installation environment. If there is a metal plate on any side of the reader, the reader should be at least 50cm away from the metal plate, otherwise, the reader's RF signal will be affected, resulting in the reader's reading distance not reaching the expected distance or even being unable to read at all.

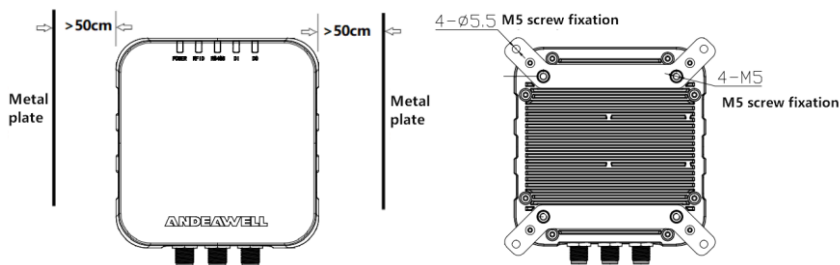


Figure 10 Product installation instructions

Since the RF signals between readers will interfere with each other, a certain distance must be maintained between any two readers to avoid mutual interference, whether installed sideways or facing each other.

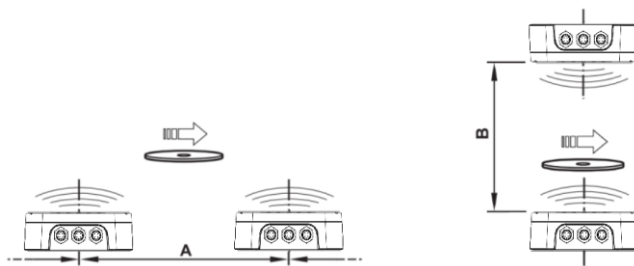


Figure 11 Product installation interval

Table 7 Installation distance between readers

RF Operating Mode	Side separation distance (A)	Forward separation distance (B)
100% RF output power (concurrent operation)	>6.5 m	>10.5 m
100% RF output power (alternating operation)	>0.35 m	>0.35 m

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.

(* The product should not be used in contact with the human body. The warning is as follows)

This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.



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