

DENSO

RFID table scanner

UR21-MR-01

UR21-MS-01

User's Manual

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Introduction

Thank you very much for using the RFID Table Scanner UR21 Series.

This manual describes how to handle, connect, operate, and clean the RFID Table Scanner.

To ensure correct and efficient use of this scanner, read this manual carefully beforehand. Be sure to keep this manual in an appropriate place for later use.

This scanner may malfunction if it is exposed to electrical noise. Do NOT use it in an environment where electrical noise may be generated.

■ DENSO WAVE INCORPORATED does not assume any product liability arising out of, or in connection with, the application or use of any product, circuit, or application described herein.

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Customer Registration and Inquiries

Customer Registration

To allow us to provide our customers with comprehensive service and support, we request that all customers complete a Member Registration Form. Registered members will be offered the following privileges.

- Latest upgrade information
- Free exhibition and event information for new products
- Free web-information service “QBdirect”

QBdirect Service Contents

Information search service (FAQ)	Offers detailed information on each product.
Download service	Offers downloads of the latest system, software update modules, and sample programs.
E-mail inquiries	Allows customers to send product-related queries by e-mail.

Please note that these privileges may be subject to change without prior notice.

How to Register

Access the URL below and follow the instructions provided.



<http://www.qbdirect.net>

Safety Precautions

Be sure to observe all these safety precautions.

- Please READ through these instructions carefully. They will enable you to use the scanner correctly.
- Always keep this manual nearby for speedy reference.

Strict observance of these warnings and cautions is a **MUST** for preventing accidents that could result in bodily injury and substantial property damage. Make sure you fully understand all definitions of these terms and symbols given below before you proceed to the text itself.

 WARNING	Alerts you to those conditions that could cause serious bodily injury or death if the instructions are not followed correctly.
 CAUTION	Alerts you to those conditions that could cause minor bodily injury or substantial property damage if the instructions are not followed correctly.

Meaning of Symbols



A triangle (▲) with a picture inside alerts you to a warning of danger. Here you see the warning for electrical shock.



A diagonal line through a circle (⊘) warns you of something you should not do; it may or may not have a picture inside. Here you see a screwdriver inside the circle, meaning that you should not disassemble.



A black circle (●) with a picture inside alerts you to something you **MUST** do. This example shows that you **MUST** unplug the power cord.



WARNING



To System Designers:

- When introducing the scanner in those systems that could affect human lives (e.g., medicines management system), develop applications carefully through redundancy and safety design which avoids the feasibility of affecting human lives even if a data error occurs.

Important: Regarding implantable medical devices



- This product is an RFID device reader/writer using radio waves. Therefore, it may affect the performance of the medical devices around it depending on its use and location. To reduce the effects of this product on the medical devices, please observe the precautions described below while it is in use.
Keep the RFID device's antenna at least 22 cm away from the part of the body of any user of an implantable medical device in which it is located. For details, visit the website of the Ministry of Internal Affairs and Communications.

Improper handling of the scanner may cause heat generation/fuming/device failure.
Keep the following precautions in mind when using:



- Never bring any metals into contact with the terminals in connectors.
Doing so could produce a large current through the scanner, resulting in heat or fire, as well as damage to the scanner.
- Keep the AC adapter away from water.
Failure to do so could cause fire or electrical shock.
- Never use the scanner on the line voltage other than the specified level.
Doing so could cause the scanner to break or burn.
- Do not use the scanner where any inflammable gases may be emitted.
Doing so could cause fire.
- Do not scratch, modify, bend, twist, pull, or heat the power cable of the AC adapter. Do not place heavy material on the cable or allow the cable to get pressed under heavy material.
Doing so could break the cable, resulting in a fire.





- If smoke, abnormal odors or noises come from the scanner, immediately switch off the host computer, disconnect the AC adapter and the interface cable, and contact your nearest dealer.
Failure to do so could cause fire or electrical shock.
- If foreign material or water gets into the scanner, immediately unplug the AC adapter and the interface cable, and contact your nearest dealer.
Failure to do so could cause fire or electrical shock.
- If you drop the scanner so as to affect the operation or damage its housing, switch off the host computer, unplug the AC adapter and the interface cable, and contact your nearest dealer.
Failure to do so could cause fire or electrical shock.



CAUTION



Improper handling of the scanner may cause heat generation/fuming/device failure.
Keep the following precautions in mind when using:

 <p>Never disassemble</p>	<ul style="list-style-type: none">• Never disassemble or modify the scanner; doing so could result in an accident such as break or fire. Doing so could result in a fire or electrical shock.
	<ul style="list-style-type: none">• Do not put the scanner on an unstable or inclined plane. The scanner may drop, creating injuries.• Never put the scanner in places where there are excessively high temperatures, such as inside closed-up automobiles, or in places exposed to direct sunlight. Doing so could affect the housing or parts, resulting in a fire.• Avoid using the scanner in extremely humid areas, or where there are drastic temperature changes. Moisture will get into the scanner, resulting in malfunction, fire or electrical shock.• Do not place the scanner anywhere where it may be subjected to oily smoke or steam, e.g., near a cooking range or humidifier. Doing so could result in a fire or electrical shock.• Never cover or wrap up the scanner or AC adapter in a cloth or blanket. Doing so could cause the unit to heat up inside, deforming its housing, resulting in a fire. Always use the scanner and AC adapter in a well-ventilated area.• Keep the power cable of the AC adapter away from any heating equipment. Failure to do so could melt the sheathing, resulting in a fire or electrical shock.• Do not scratch or modify the scanner or its interface cable. Do not bend, twist, pull, or heat the cable. Doing so could damage the scanner or its interface cable, creating a fire hazard.• Do not put heavy material on the scanner or its interface cable, or allow the cable to get pressed under heavy material.• Do not look into the light source from the scanning window or do not point the scanning window at other people's eyes. Eyesight may be damaged by direct exposure to this light.• Do not use the scanner if your hands are wet or damp. Doing so could result in an electrical shock.• Never use chemicals or organic solvents such as naphtha and thinner to clean the housing. Do not apply insecticide to the scanner. Doing so could result in a marred or cracked housing, electrical shock or fire.• Do not use the scanner with anti-slip gloves containing plasticizer. The scanner housing may be broken, creating injuries, electrical shock, or fire.



CAUTION

Improper handling of the scanner may cause heat generation/fuming, device failure. Keep the following precautions in mind when using:

	<ul style="list-style-type: none">• When disconnecting the AC adapter from the wall socket, hold the AC adapter body not the power cable. The power cable may be broken, resulting in a burnt AC adapter, electrical shock, or fire.• If the interface cable is damaged (e.g., exposed or broken lead wires), stop using it and contact your nearest dealer. Failure to do so could result in a fire or electrical shock.
	<ul style="list-style-type: none">• During electrical storm activity, always unplug the AC adapter from the wall socket. Exposure to power surges could result in a damaged scanner or fire.• When taking care of the scanner, unplug the AC adapter from the wall socket for safety. Failure to do so could result in an electrical shock.• Do not drop the scanner. The scanner housing may be broken, creating injuries. Using the scanner whose housing is broken could result in smoke or fire. Unplug the AC adapter from the wall socket and contact your nearest dealer.

Cleaning

■ Cleaning the scanner

Clean the scanner with a soft, dry cloth.

CAUTION

- (1) Do NOT use any cleaning agent such as naphtha or alcohol. The housing may be degraded or the sticker or coating could peel off.
- (2) If it is noticeably dusty or dirty, wipe it using a clean cloth soaked with water-diluted detergent (it should be slightly wet) and then wipe it with another dry cloth.

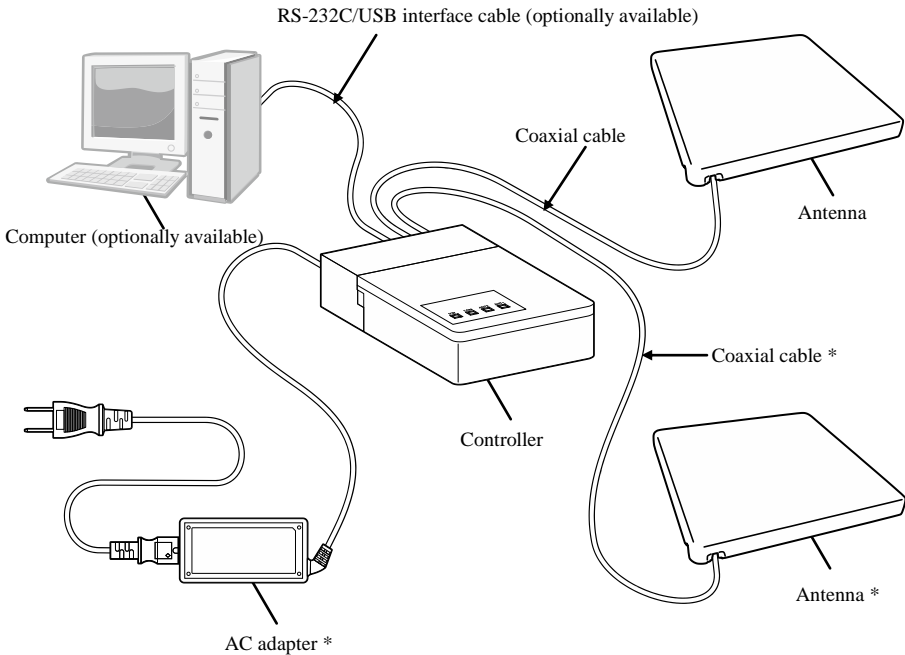
Chapter 1 System Configuration

This chapter describes the hardware required for the UHF RFID data collection system and the software for the RFID table scanner.

1.1 System Configuration

To use the UHF RFID data collection system using the RFID table scanner, the following hardware and software, as well as the the RFID table scanner, are required: Using the DLL supplied by us, application programs can easily be built in the computer in a general-purpose development environment (Visual Studio, etc.).

Some of the hardware requirements differ according to the communication system used.



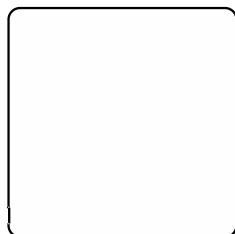
* option

CAUTION

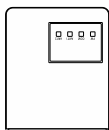
- (1) Computer and interface cable are not included in this package; they are available from suppliers.
- (2) Two antennas can be connected to the controller.

1.2 Items Included in the Package

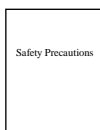
UR21-MR-01



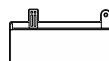
Antenna
(with insert nut)



Controller



Safety Precautions



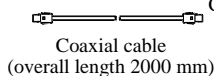
Cover



Cover locking screw



Antenna stay
Locking screw



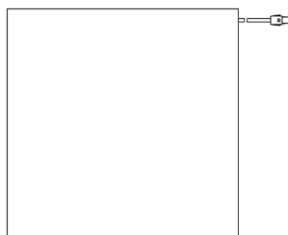
Coaxial cable

(overall length 2000 mm)

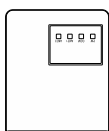
Items contained in the package UR21-MR-01 (interface: RS-232C/USB)

- Controller URCT-M21
- Antenna URAN-R2
- Cover
- Cover locking screw
- Coaxial cable (overall length 2000 mm)
- Antenna stay locking screw: 4 pcs.
- Safety Precautions

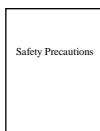
UR21-MS-01



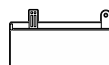
Antenna



Controller



Safety Precautions



Cover



Cover locking screw

Items contained in the package UR21-MS-01 (interface: RS-232C/USB)

- Controller URCT-M21
- Antenna URAN-S1
- Cover
- Cover locking screw
- Safety Precautions

1.3 Software

- RFID Table Scanner DLL

■ Related manuals

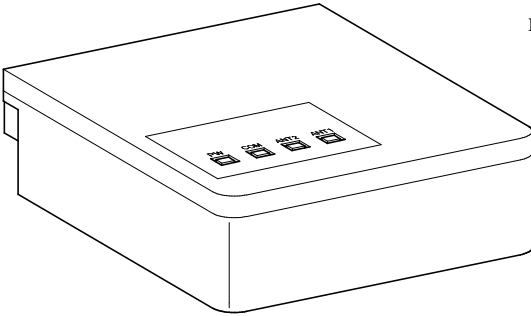
To develop RFID-based applications, the following manuals are required:

- UR20 Series DLL Reference Manual
- UR20 Series Command Manual

The DLL, DLL Reference Manual and Command Manual can be downloaded from “QBdirect”.

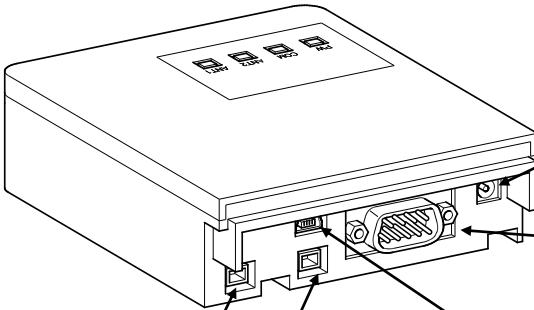
Chapter 2 Names and Functions of the Parts

Controller



Indicator LEDs

Indicate the operating status of the RFID table scanner.
☞ For details, see Chapter 6.



DC jack

Accepts the DC plug of the AC adapter.

RS-232C communication connector

Connects to a computer, etc. via the interface cable.

USB communication connector

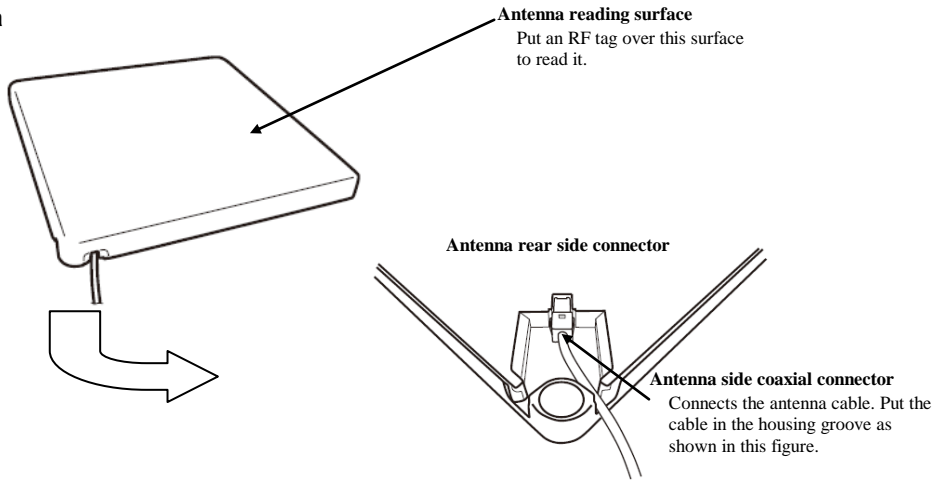
Connects to a computer, etc. via the interface cable.

Controller side coaxial connector ANT2

Controller side coaxial connector ANT1

Connects to the antenna with the coaxial cable.

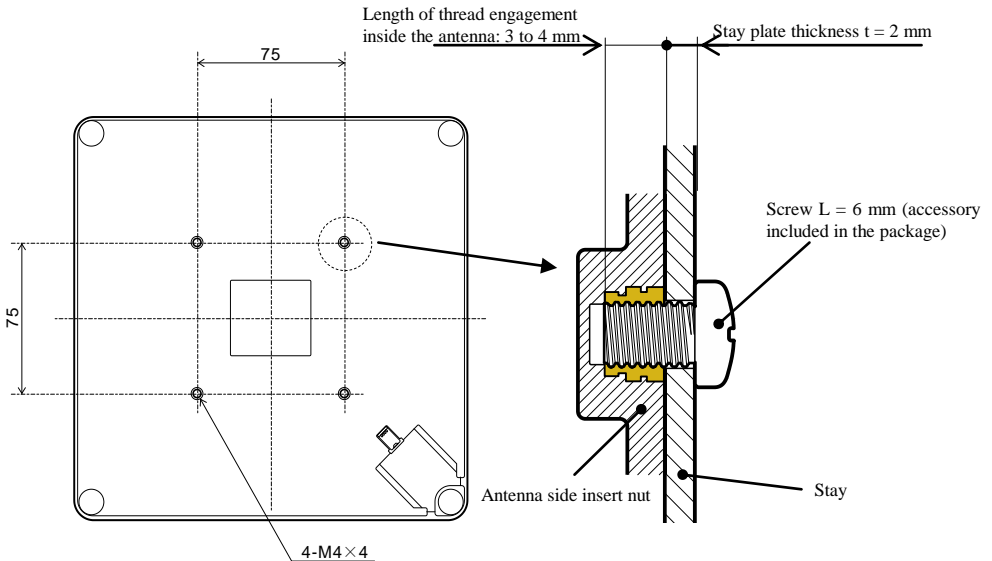
Antenna



CAUTION

- (1) If installing the antenna under the desk, use a dedicated stay (optionally available).
- (2) RF tags are read using radio waves. Reading performance may be lower if there are any metal objects (other than the dedicated stay) or equipment using radio waves (mobile phones, amateur radio stations, microwaves, etc.). Before installing the antenna, check for such problems.

Antenna rear side



Notes:

- (1) If the plate thickness of the antenna mounting stay is 2 mm ($t = 2$ mm), it can be secured with the screws $L = 6$ mm included in the package.
If the plate thickness of the antenna mounting stay is not 2 mm ($t \neq 2$ mm), use screws whose length of thread engagement is 3 to 4 mm inside the antenna.
- (2) If you fail to tighten them to recommended torque (0.53 to 0.95 N-m), they may be incompletely tightened.
- (3) The screws may gradually become loose depending the stay material/surface treatment and/or the surrounding environment. Check the installation of the scanner at regular intervals while in use.

Chapter 3 Preparations for Use of the Table Scanner

Before you can use the RFID table scanner, you need to connect the antenna, controller, and computer using the cables. It is also necessary to supply power to the controller using its AC adapter.

Make sure that the computer has at least one empty RS-232C/USB communication port.

The commutator needs software for controlling the communication of this product and reading RFID.

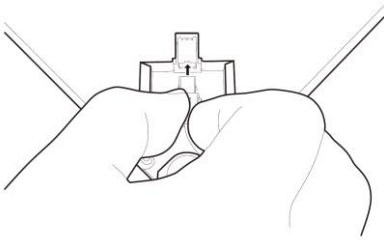
We offer DLL to support your software development.

For details on the DLL, see the related reference manuals.

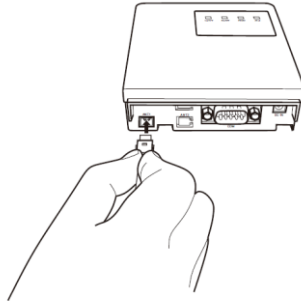
Connecting the antennas

- (1) Attach the antenna connector to the connector on one end of the coaxial cable. Push the connector firmly until it is locked.
- (2) Attach the other connector of the coaxial cable to the controller's antenna connector. Push the connector firmly until it is locked.

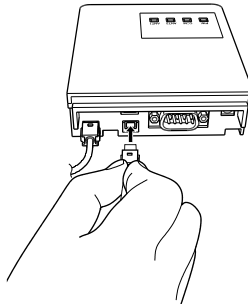
**Antenna side coaxial connector
(in the case of using UR21-MR-01)**



Controller side coaxial connector



- (3) If the UR21-MR-01 is used in combination with two antennas, attach the second antenna's coaxial cable connector to the controller's antenna connector ATN2. Push the connector firmly until it is locked.

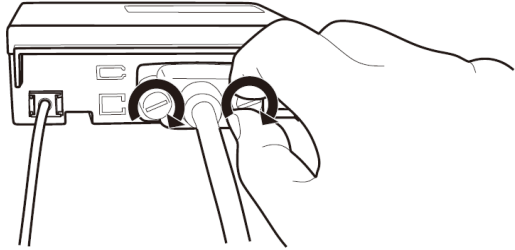
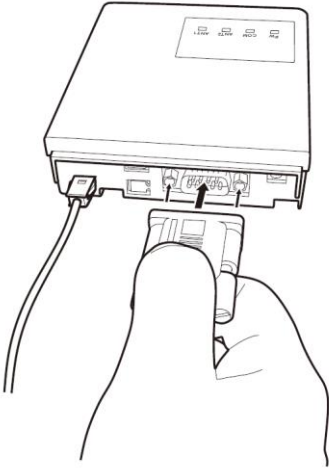


Notes:

- (1) Hold the coaxial cable connector housing and insert it as far as it will go.
- (2) When removing the coaxial cable, hold the both snaps on the connector.
- (3) Run the cable through the cover and then connect it.

Connecting the scanner to the computer (when RS-232C interface used)

(1) Connect the RS-232C interface cable to the controller's communication connector.

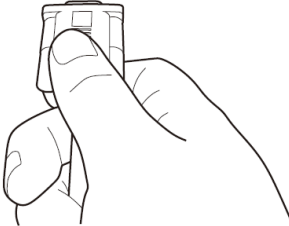
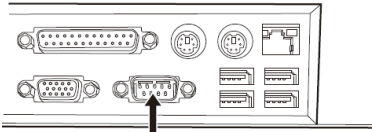


Secure the connectors with their screws.

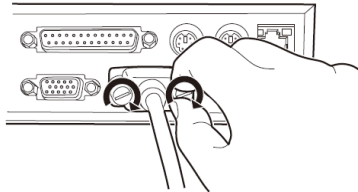
Note:

Run the cable through the cover in advance and then connect it.

(2) Connect the RS-232C interface cable to the computer,



Attach the connector.



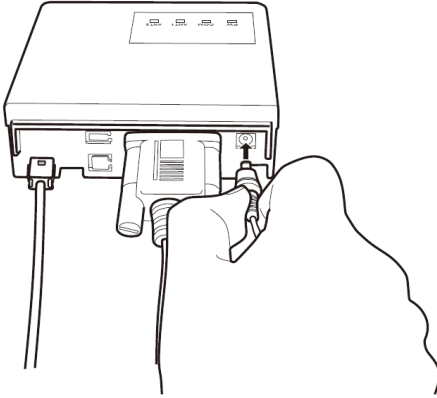
Lock the connector.

Note:

This figure shows an example of a computer. The RS-232C interface cable should be connected in accordance with the instruction manual for the computer used.

(3) Plug the AC adapter into the controller's power jack.

When the AC adapter is plugged into the outlet, its power is turned on.



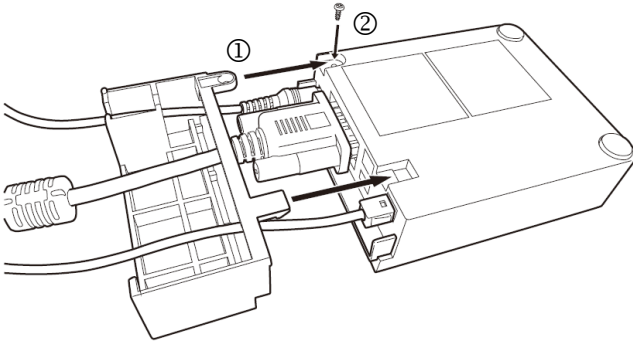
Note:

Run the cable through the cover in advance and then connect it.

(4) Attach the cover to the controller's connector.

① Align the protrusions on the cover with the screw holes in accordance with the mounting position of the controller.

② Fasten the cover to the controller using the screw included in the package.
(recommended torque: 0.25 to 0.50 N-m)

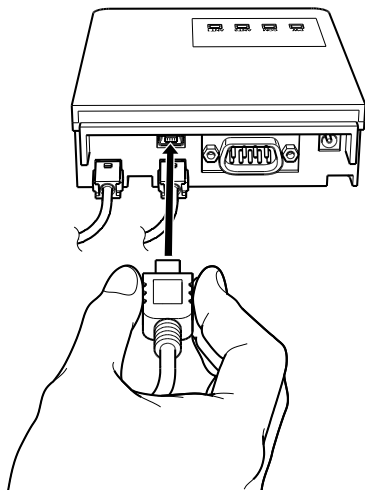


Note:

- (1) When removing the connector and DC plug, hold the connector. If you hold the cable when removing, this may cause a broken wire.
- (2) The connector should be attached/removed only when absolutely necessary. Doing so frequently may result in a loose connection.

Connecting the scanner to the computer (when USB interface used)

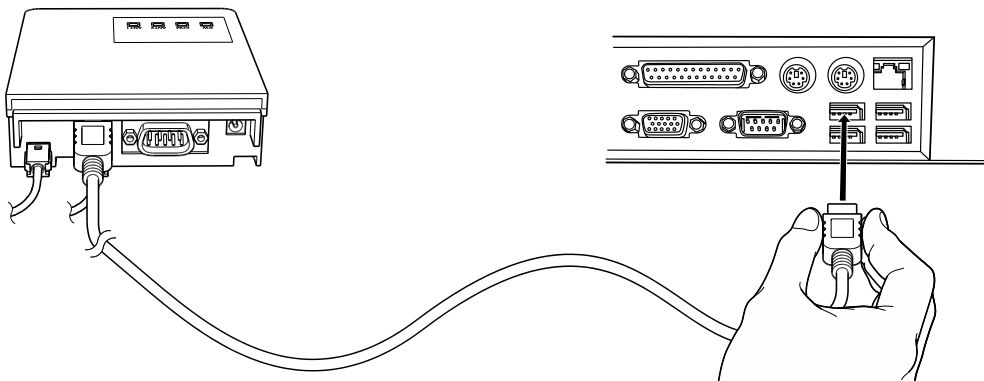
(1) Connect the USB cable plug to the controller's USB connector.



Note:

Run the cable through the cover in advance and then connect it.

(2) Connect the USB cable to the computer.

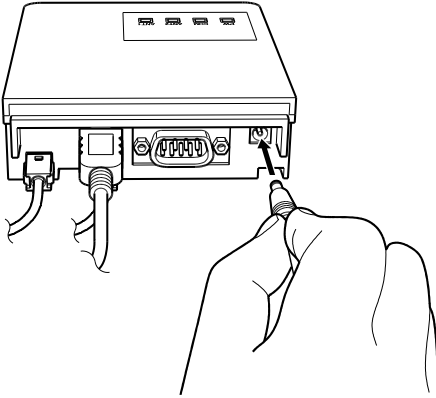


Note:

This figure shows an example of a computer. The RS-232C interface cable should be connected in accordance with the instruction manual for the computer used.

(3) Plug the AC adapter into the controller's power jack.

When the AC adapter is plugged into the outlet, its power is turned on.



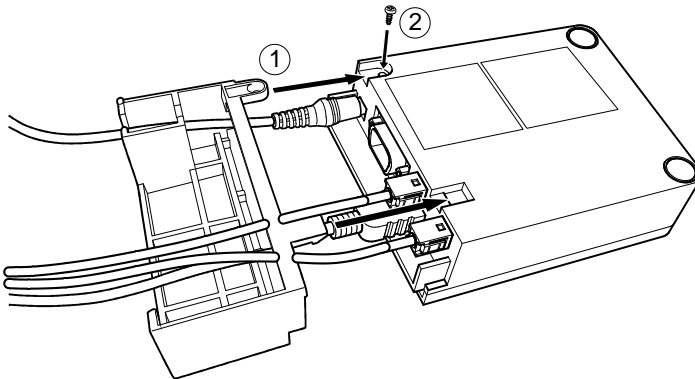
Note:

Run the cable through the cover in advance and then connect it.

(4) Attach the cover to the controller's connector.

① Align the protrusions on the cover with the screw holes in accordance with the mounting position of the controller.

② Fasten the cover to the controller using the screw included in the package.
(recommended torque: 0.25 to 0.50 N-m)



Note:

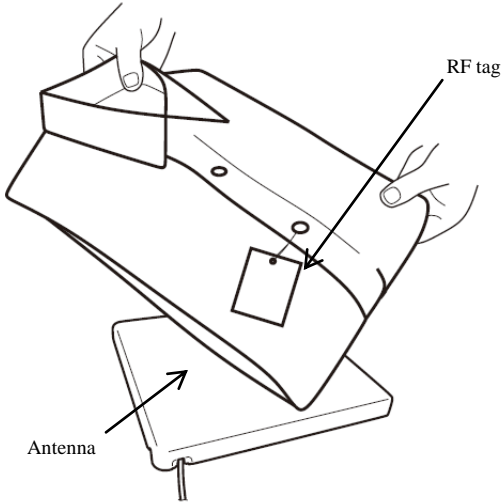
- (1) When removing the connector/DC plug, hold the connector. If you hold the cable when removing, this may cause a broken wire.
- (2) Do NOT violently pull the cable. It may be disconnected.
- (3) The connector should be attached/removed only when absolutely necessary. Doing so frequently may result in a loose connection.

Chapter 4 How to Read RF Tags

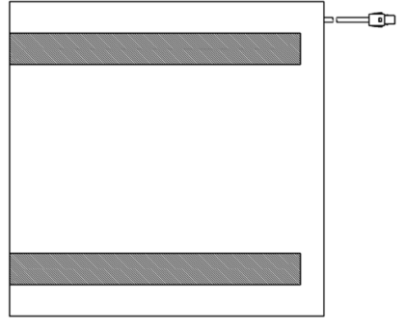
An example of reading an RF tag using the UR21-MR-01 and UR-21-MS-01 is given below.

POS processing at clothing shop

- (1) Put the RF tag close to the antenna to allow the scanner to read the information from the tag.



In the case of using UR21-MS-01



This side is the back side.
(installation surface)

For its reading range, see Appendix 1.

Check the operation of the scanner using actually used RF tags.

- (2) If the data has been read successfully, it will be sent to the computer.

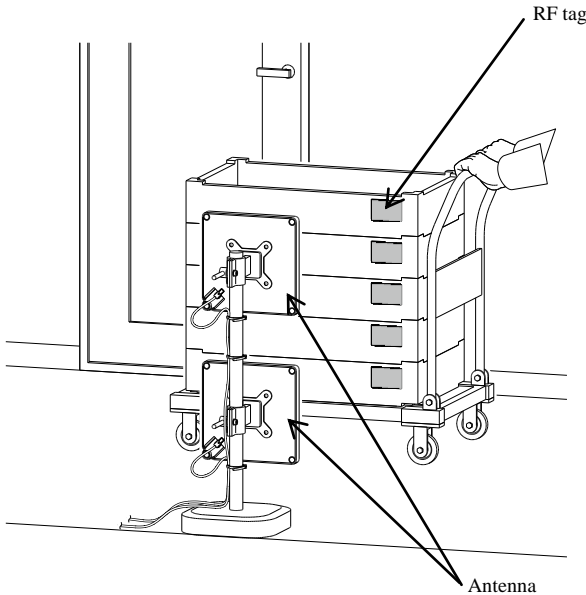
Note:

- (1) RF tags are read using radio waves. Reading performance may be lower if there are any metal objects (other than the dedicated stay) or equipment using radio waves (mobile phones, amateur radio stations, microwaves, etc.).
Keep it as far away from any metal objects or equipment using radio waves. Before installing the antenna, check for such problems.
- (2) The reading range is based on the center of the antenna.
- (3) If another RFID device is used nearby, RF tags may be difficult to read or they could be read at all.
- (4) While the scanner reads a RF tag, it should be kept parallel to the antenna where possible. If not, it may be read incorrectly or could not be read at all.
- (5) Some RF tags may be difficult to read due to the deviation of the resonance frequency depending on the material to which they are attached.
Select RF tags with a slight frequency deviation and check the operation of the scanner using such tags.
- (6) Do NOT put any heavy object on the antenna.

An example of reading an RF tag using the UR21-MR-01 is given below.

Entrance/exit gate control

- (1) Put the RF tag close to the antenna to allow the scanner to read the information from the tag.



For its reading range, see Appendix 1.

When continuously reading UII data (see page 12), the scanner reads tags by changing the antenna at intervals of approximately 200 ms; it may fail to read some of them. Check the operation of the scanner using actually used RF tags in an actual operation environment.

- (2) If the data has been read successfully, it will be sent to the computer.

Notes:

- (1) RF tags are read using radio waves. Reading performance may be lower if there are any metal objects (other than the dedicated stay) or equipment using radio waves (mobile phones, amateur radio stations, microwaves, etc.). Keep it as far away from any metal objects or equipment using radio waves. Before installing the antenna, check for such problems.
- (2) The reading range is based on the center of the antenna.
- (3) If another RFID device is used nearby, RF tags may be difficult to read or they could be read at all.
- (4) While the scanner reads a RF tag, it should be kept parallel to the antenna where possible. If not, it may be read incorrectly or could not be read at all.
- (5) Some RF tags may be difficult to read due to the deviation of the resonance frequency depending on the material to which they are attached.
Select RF tags with a slight frequency deviation and check the operation of the scanner using such tags.
- (6) Do NOT put any heavy object on the antenna.

Chapter 5 RFID Table Scanner Control and Parameter Settings

Perform RFID table scanner control and parameter settings by using commands from a control device such as a computer via the RS-232C/USB interface.

5.1 Read Control

The RFID table scanner can perform the following operations to RF tags: For details, see “DLL Reference Manual, Chapter 4, Function Specifications” or “Command Manual, Chapter 4, Command Specifications”.

Read UII	Obtain ID (UII) information from RF tags.
Continuously Read UII	Continuously obtain ID (UII) information from RF tags
Read from Memory	Read data from RF tag memory area.
Write to Memory (Note 1)	Write data to RF tag memory area.
Lock (Note 1)	Change the locked state of the RF tag.
Kill (Note 1)	Disable the RF tag.

(Note 1) The distance may be shorter in write processing (Write to Memory, Lock, or Kill) than in read processing.

5.2 Parameter Settings

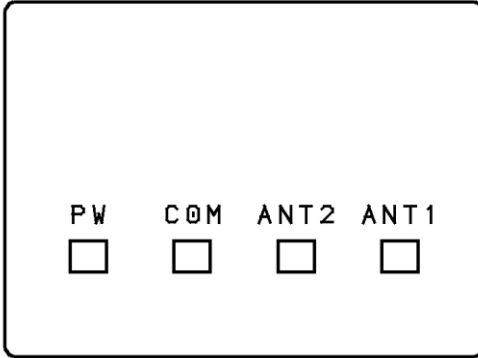
Antenna parameter settings can be made with the RFID table scanner.

For details, see “DLL Reference Manual” or “Command Manual”.

Carrier output intensity	The carrier output for communicating with RF tags can be adjusted.
Output enabled frequency	If in the region it is possible to select output frequency channels, it can be specified. For details, see “DLL Reference Manual” or “Command Manual”.
Antenna port	Antenna to be used can be selected.
Conditions for repeating each tag operation	It is possible to set conditions for repeating each tag operation involving communication with a tag, such the number of repeats, duration, and number of successfully read tags, etc. The tag operation process will come to an end if any of the termination conditions are met.
Re-read prevention	Enable or disable the Re-read prevention. It is possible to prevent the same tag being re-detected in UII read processing.

Chapter 6 Status Check

The operating status of the scanner is indicated by the four status indicator LEDs shown below.



Status indicators

Status	PW (green)	COM (red)	ANT2 (orange)	ANT1 (orange)
Power off	Unlit	Unlit	Unlit	Unlit
Power on, start-up process underway	Lit	Unlit	Unlit	Unlit
Start-up process completed	Lit	Unlit	Unlit	Lit
Open command executed Antenna port setting made Ready for receiving commands from upper-level device	Lit	Unlit	Lit (Note 1)	Lit (Note 1)
Transmitting RF carrier wave	Lit	Unlit	Blinking (Note 1)	Blinking (Note 1)
Communicating with upper-level device	Lit	Lit	Lit (Note 1)	Lit (Note 1)

(Note 1): The status indicator LED (ANT1/ANT2) corresponding to the port enabled by the antenna port setting is lit or blinking. The status indicator LED corresponding to the disabled antenna port is unlit.

Chapter 7 Upper-Level Communication

This scanner performs communication via a serial interface for connection to an upper-level device.

Item	Specification	
RS-232C	Signal level	: RS-232C
	Synchronization system	: Half-duplex start-stop synchronization
	Communication speed	: 9,600 bps (default)
	Start bit	: 1bit
	Word length	: 8bits
	Parity	: EVEN
	Stop bit	: 1bit
	Transmission order	: LSB-first
	Flow control	: Not available
USB (see Note 1)	Communication system	: USB 2.0 High-speed
	Communication speed	: 12 Mbps, 480 Mbps

(Note 1)

To use the USB-COM interface, it is necessary to install the Active USB-COM port driver, which is supplied by Denso Wave, on the computer. This driver is available for free from our QBdirect website. If you need a CD containing this driver, please contact us at the address described in "Introduction."

<http://www.qbdirect.net>

The downloaded file is compressed (zipped). It needs to be decompressed before use.

For the latest information, see the manual attached to the driver.

Precautions to be taken when installing and using the Active USB-COM port driver:

- You must have administrator rights to install the driver.
- This driver does not have a digital signature issued by Microsoft Corporation; use Driver Signing Options and Local Policies\Security Options to allow unsigned drivers to be installed.
- The USB device can be removed from the PC USB Port during communication (COM port open); the data transmitted with the device removed will be lost.
- The virtual serial port remains active even with the USB device removed. The COM port number is constantly occupied.
- It cannot be used together with any conventional USB-COM device driver. If a conventional USB-COM device driver already exists on the computer, you are requested to uninstall it before installing this driver.
- If you install multiple copies of this driver on a single computer, you can use the same number of units of this USB device. However, these copies of this driver cannot be uninstalled one-by-one. All of them can only be uninstalled at a time.
- For the installation procedure, see "the Active USB-COM Port Driver Install Guide attached to the downloaded driver".

Chapter 8 Troubleshooting

If data cannot be correctly read/written from/to an RF tag:

Check item	Corrective action
Is the RF tag located at the read/write position?	If not, move it. If the scanner is too close to or too far away from the RF tag, it may fail to read/write from/to the RF tag. The distance may be shorter in the write process than in the read process.
Is the RF tag inclined with respect to the antenna?	If so, make the RF tag surface parallel to the antenna surface. If not, it may be read incorrectly or could not be read at all.
Are there any metal objects or equipment using radio waves around the antenna?	If so, keep them as far away from the antenna as possible.
Are there any metal objects at/near the RF tag attached area?	If so, keep the tag at least 15 cm away from them.
Is the RF tag or the RF tag attached area is wet?	If so, dry and then retry reading.
Is the PW LED lit?	If not, make sure that the AC adapter, which is included in the package, is firmly connected.
Is the antenna port to be used selected?	Check the enabled port using the antenna port settings. Make sure that the antenna is connected to the enabled port.

If the problem cannot be solved by taking the measures described above, contact us.

Appendix 1 Specifications

Radio Wave Specifications (860MHz band)

Item		Specification
RF interface	Communication frequency for Europe	865.7 MHz to 867.5 MHz (at 600kHz intervals) (a total of 4 channels)
	Communication frequency for Russia	866.1 MHz to 867.5 MHz (at 200kHz intervals) (a total of 8 channels)
	Applicable standards	Conforms to ISO/IEC 18000-63 (GS1 EPC Gen2)
	Setting Output Power	3~200mW (5~23dBm) Variable
Antenna	Gain	-2 dBi or less
	Polarization	Circular polarization

Radio Wave Specifications (920MHz band)

Item		Specification
RF interface	Communication frequency for Australia	918.25 MHz to 925.75 MHz (at 500kHz intervals) (a total of 16 channels)
	Communication frequency for Hong Kong	920.25 MHz to 924.75 MHz (at 500kHz intervals) (a total of 10 channels)
	Communication frequency for Taiwan	922.25 MHz to 927.75 MHz (at 500kHz intervals) (a total of 12 channels)
	Communication frequency for Korea	917.3 MHz to 920.3 MHz (at 600kHz intervals) (a total of 6 channels)
	Communication frequency for China	920.625 MHz to 924.375 MHz (at 250kHz intervals) (a total of 16 channels)
	Communication frequency for US and Canada	915.25 MHz to 927.5 MHz (at 250kHz intervals) (a total of 50 channels)
	Applicable standards	Conforms to ISO/IEC 18000-63 (GS1 EPC Gen2)
	Setting Output Power	3~200mW (5~23dBm) Variable
Antenna	Gain	-2 dBi or less
	Polarization	Circular polarization

Communicable RF tag specifications

Item		Specification
Communication frequency		865 to 868 MHz and 915 to 928 MHz
Communication system		Half duplex
Reader/writer ↓ RF tag	Modulation system	PR-ASK 80 to 100%
	Encoding system	Pulse interval [PIE]
	Communication speed	40 kbps
RF tag ↓ Reader/writer	Modulation system	Backscatter ASK
	Encoding system	Mirror Subcarrier 200kHz
	Communication speed	50 kbps (M=4)

Precautions to be taken during RFID communication:

Even in the case of an RF tag conformable to the specifications described above, you may experience “unstable communication” or “communication failure”.

To avoid such problems, carefully check the operation of the scanner with RF tags intended for use in the actual operating environment.

Do NOT touch the antenna and its surrounding parts during reading by the scanner. This may result in poor reception.

You may experience poor communication performance in the presence of any metal object.

Other Specifications

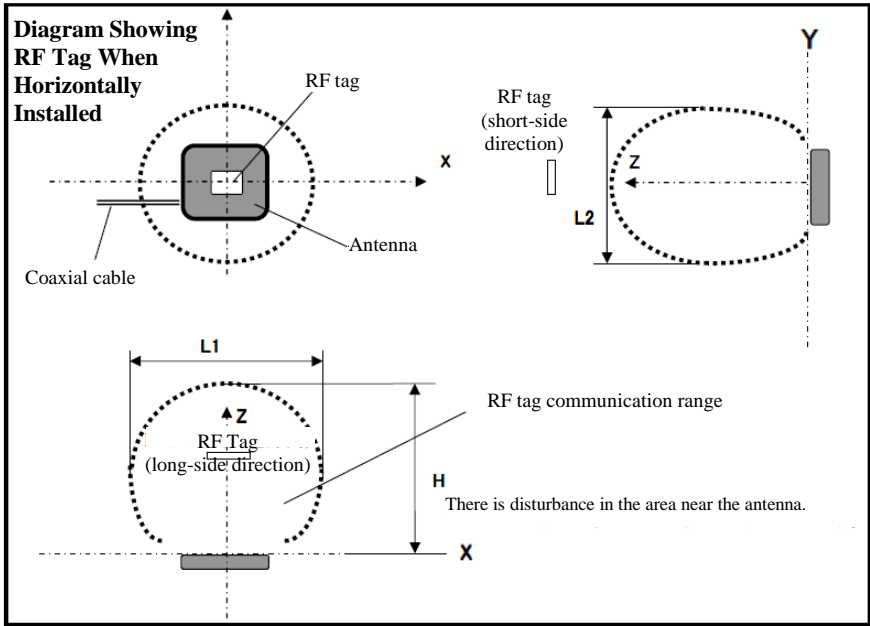
Item		Specification
Interface		RS-232C
Input power source	Operating supply voltage	DC input: 4.75 to 5.25 VDC Dedicated AC adapter used: (AC adapter input: 90 to 110 VAC, 50/60 Hz)
	Current consumption	1200 mA MAX (except for inrush current)
Environmental conditions	Operating temperature range	0 to 40 °C
	Operating humidity range	20 to 80%RH (see Note 1)
	Storage temperature range	-10 to 60°C
	Storage humidity range	20 to 80%RH (see Note 1)
External dimensions		Controller: 90 * 108.5 * 31 mm Antenna for UR21-MR-01 : 200 * 200 * 17.5 mm Antenna for UR21-MS-01: 200 * 200 * 5 mm Coaxial cable: Overall length 2000 mm
Weight		Controller: Approx. 130 g Antenna (coaxial cable not included): Approx. 360 g (UR21-MR-01) Approx. 250 g (UR21-MS-01) Cover: Approx. 15 g

(Note 1) There shall be no rapid temperature change or condensation/frost; wet-bulb temperature 30°C or lower.

Scanning Performance

The communication range based on our standard RF tag (Avery Dennison AD-229R6) is illustrated below.

- The reference values given below were measured with the scanner and RF tag in the absence of any object/substance that may affect radio waves around the scanner.
- The reading range varies according to RF tag type and surrounding environment. It should be checked with RF tags intended for use in the actual installation environment before use.



Scanning range (at normal temperature and humidity)

When RF tag placed in horizontal position

Setting Output Power	H (reading distance)	L1 (horizontal range)	L2 (vertical range)
23dBm	Approx. 0.8 m	Approx. 1.2 m	Approx. 1.2 m

The values described above are reference values related to the communication range using the Query command; they are not guaranteed values.

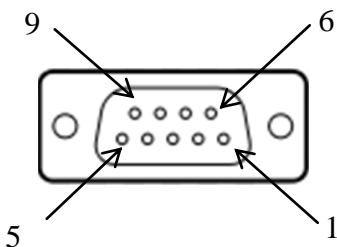
Writing performance

Tag memory writing requires more electric power than tag memory reading: If the same output level is set for reading and writing, the writing range may be smaller than the reading range. Therefore, even if an RF tag is read successfully, a write error may occur due to insufficient RF tag power. Check the operation of the scanner beforehand. If an RF tag is not successfully written, adjust its position or change the communication range (output) setting to enables the write operation.

Appendix 2 Interface Specifications

RS-232C Interface

D-Sub 9 pin plug type



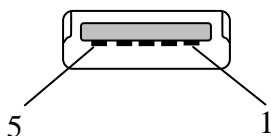
Pin No. (Note 1)	Symbol	Signal name	Input/Output (Note 2)
2	$\overline{\text{RXD}}$	Received data	Input
3	$\overline{\text{TXD}}$	Sent data	Output
5	SG	Signal Ground	—
7	RTS	Request to Send	Output
8	CTS	Clear to Send	Input

(Note 1) Any pin numbers other than those described above are not used (unconnected).

(Note 2) The inputs and outputs are on the scanner side.

USB interface

Communication connector: USB MINI-B Type



Pin No.	Symbol	Signal name	Input/Output (see Note 1)	Remarks
1	Vbus	VBUS	Input	
2	D-	D-	Input/Output	
3	D+	D+	Input/Output	
4	ID	ID	—	GND connection
5	GND	GND	—	

(Note 1) The inputs and outputs are on the scanner side.

RFID table scanner

UR21-MR-01

UR21-MS-01

User's Manual

Preliminary Edition. October. 2017

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