KW2D Series RFID Reader
User's Manual

Thank you for purchasing this IDEC product. Before using this product, please confirm that there are no mistakes with your order. Carefully read this manual and use this product correctly.

Safety Precautions

- Read the "KW2D Series User's Manual" to ensure correct operation before starting installation, wiring, operation, maintenance, and inspection of the KW2D Series.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- All KW2D Series modules are manufactured under IDEC's rigorous quality control system, but users must add a backup or failsafe provision to the control system when using the KW2D Series in applications where heavy damage or personal injury may be caused, in case the KW2D Series should fail.
- Implement security measures, such as those for unauthorized access to this product from external devices, on the network system side. IDEC Corporation bears no responsibility for losses, damages, and/or other expenses that occur directly or indirectly as a result of unauthorized access or other security failures.
- As a security measure, always use a firewall or another tool and block accessible IP addresses and ports.
- In this manual, safety precautions are categorized in order of importance:

Warning notices are used to emphasize that improper operation may cause severe personal injury or death.

Caution notices are used where inattention might cause personal injury or damage to equipment.

- This product is not designed for use in applications requiring a high degree of reliability and safety, such as applications for medical devices, nuclear power, railroads, aerospace, and automotive devices. The KW2D Series should not be used for such applications.
- Turn off power to the KW2D Series before installation, removal, wiring, maintenance, and inspection of the KW2D Series. Failure to turn power off may cause damage, electrical shocks or fire hazard. If such a circuit is configured inside the KW2D Series, Failure of the KW2D Series may cause disorder of the control system, damage, or accidents.
- Special expertise is required to install, wire, and operate the KW2D Series. People without such expertise must not use the KW2D Series.
- Install the KW2D Series according to the instructions described in the "KW2D Series User's Manual". Improper installation will result in falling, failure, or malfunction of the KW2D Series.

- Install the KW2D Series in environments described in the "KW2D Series User's Manual". If the KW2D Series is used in places where the KW2D Series is subjected to high-temperature, high-humidity, condensation, corrosive gases, excessive vibrations, or excessive shocks, then electrical shocks, fire hazard, or malfunction will result.
- Prevent the KW2D Series from falling while moving or transporting the KW2D Series, otherwise damage or malfunction of the KW2D Series will result.
- Wiring must use lead sizes that are appropriate for the applied voltage and current.
- Prevent metal fragments and pieces of wire from dropping inside the KW2D Series housing. Put a cover on the KW2D Series modules during installation and wiring. Ingress of such fragments and chips may cause fire hazard, damage, or malfunction.
- Use SELV power supply that is reinforced or double-insulated from MAINS without any risk of electric shock, and Limited Energy (LIM) Circuit.
- Do not disassemble, repair, or modify the KW2D Series modules. There is a risk of serious accident, such as electric shock, damage, fire, and malfunction.
  This device complies with part 15 of FCC Rules and Innovation, Science and Economic Development Canada's licence-exempt RSS(s). 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.
  Le présent appareil est conforme à la partie 15 des règles de la FCC et aux normes des CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
  FCC CAUTION
  Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- Electromagnetic waves are generated from the front unit, so—excluding when using tags—stay more than 5 cm away from the front unit.
- When disposing of the KW2D Series, do so in accordance with national and local regulations.

Note:

- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- Use a Category 5 or higher STP shielded cable for the LAN cable.

Introduction

This manual describes the functions, configuration methods, and safety precautions of the KW2D Series RFID Reader and the KW RFID Configurator configuration software.
Read this manual to ensure the correct understanding of the functions and performance of the KW2D Series RFID Reader and the KW RFID Configurator configuration software. Store this manual carefully so it can be read at any time.

IDEC Corporation makes the latest product manual PDFs available on our website at no additional cost. Please download the latest product manual PDFs from our website.

Publication History

July 2020 First Edition

Notes

- IDEC Corporation holds all rights related to this manual and the KW RFID Configurator. Unauthorized duplication, reprinting, sales, transfers, and leasing are prohibited.
- The contents of this manual and the KW RFID Configurator may change without prior notification.
- IDEC Corporation bears no responsibility for the results of using this manual or the KW RFID Configurator.
- We have taken all possible measures with the content of this product, but if you notice any portions that are unclear, or any mistakes, please contact the dealer where purchased, an IDEC sales office, or the customer service line.

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Microsoft and Windows are registered trademarks or trademarks of Microsoft Corporation in the United State and other countries.
FeliCa is a registered trademark of Sony Corporation.
Mifare is a registered trademark of NXP Semiconductors.
Other company names and product names used in this manual are the trademarks or registered trademarks of their respective companies.

Regarding Laws and Compatible Standards

This product adheres to the laws and compatible standards of all countries involved, as shown below.

European laws and standards

This product complies with the following EU directives.

- Low Voltage Directive
- EMC Directive
- RoHS Directive
- Radio Equipment Directive

To comply with these directives, this product has been designed and evaluated on the basis of the following international and European standard.

- IEC/EN 61131-2
- ISO/IEC 18000-3
- ISO/IEC 14443 Type A
- ISO/IEC 18092
- JIS X6319-4
- ISO/IEC 15693

North America laws and standards

This product complies with the following standards.

- UL61010-1

RFID communication standards

- ISO/IEC 14443 Type A
- ISO/IEC 18092
- JIS X6319-4
- ISO/IEC 15693

Radio law certification

This product has received certification for the following radio laws.

- MIC (Japan)
- FCC/ISED (USA/Canada)
- NCC (Taiwan)
- Radio Equipment Directive (EU)

For details on applicable standards and EU directives, please contact the dealer where purchased or check the IDEC website.

About the Warranty of the Products

1. Warranty Period

The Products are warranted for 3 years from the date of purchase, or from the date of delivery completion.

2. Extent of Warranty

IDEC CORPORATION is responsible for failures or defects of the Products during the above warranty period, either a replacement part will be provided or the defective parts of the Products will be repaired free of charge.
If such failure or defects should occur, please offer them to the distributor, dealer or IDEC CORPORATION with the materials in which the date of purchase is specified.

* The expenses for installation and construction at the time of repair will not be borne.

3. Start

July 1, 2020.

4. Indemnification

IDEC CORPORATION will not be liable under this Warranty and be indemnified and held harmless from any and all demands, suits, expenses, claims, damages and liabilities in the following event that:

1) The Products are used or operated beyond the conditions or environment range as described in catalog, specifications or instruction; or
2) The failure or defects of the Products arise from the cause other than the Products; or
3) The Products are improved, modified or altered by the party other than IDEC; or
4) The failure or defects and damages of the Products arise from the usage of the Product in the way that is not intended; or
5) The failure or defects and damages of the Products arise from the cause beyond IDEC's control including, but not limited to, fire, earthquake, flood, lightning, other natural disasters, and acts of God; or
6) The failure or defects and damages of the Products arise from the relocation, transportation or drop after you purchase the Products; or
7) The failure or defects and damages of the Products arise from improper installation; or
8) Maintenance and inspection are not carried out in accordance with instruction.

* The customer is responsible for checking the operation of programmable Products. IDEC CORPORATION bears no responsibility for the operation of programs created by the customer and for damages that occur as a result of those programs.

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5. Extent of Service

The price of the Products will not include the fee for any service such as sending technicians and engineers, IDEC CORPORATION will charge you the fee for the following:

1) Instruction for installment and visiting for test operation, including, but not limited to creating application software and operation tests; and
2) Maintenance and inspection, arrangement and repair; and
3) Technical assistance and technical education; and
4) Product test and inspection based on you request.

Abbreviations, Names, and Terms

Item	Description
KW2D Series RFID Reader	The general term for this product. KW2D-R100Q4E, KW2D-RH100Q4E
KW2D special tag	The general term for this product's special tags. KW9Z-T1**, KW9Z-T2**
RFID tag	The general term for RF tags and non-contact IC cards that support IC tag standards.
Non-contact IC card	The general term for card type RF tags that support IC tag standards.
IC tag standards	Standards for RFID tags.
KW RFID Configurator	The software for creating project data for the KW2D Series RFID Reader.
Project	The KW2D Series RFID Reader settings and tag list to which UIDs and authorities are registered.
Tag list	A list to which UIDs and authorities are registered.
UID	An abbreviation for unique identifier. A unique ID number stored in the RFID tag that cannot be overwritten. It is a data string with a maximum length of 10 bytes.
Tag information	The general term for the UID, authority, Name1, and Name2 to register for a tag.
Authority	One byte of information associated with the UID.
Verification result	The information obtained as the result of verifying UIDs. This information includes the UID, authority, and IC tag standard.
Host device	A device that supports Modbus TCP client.
Shared memory	Memory for Modbus TCP communications that the KW2D Series RFID Reader makes available.
Name1, Name2	Text strings that can be set as desired in the tag list.
Lock operation	The state in which the verification result is held in shared memory.

Symbols Used in the Manual

The following symbols are used in the manual to simplify the descriptions.

Notes

Symbol	Meaning
	Indicates information about items that carry the risk of death or serious injury if the product is used improperly.
	Indicates information about items that carry the risk of personal injury or physical damage if the product is used improperly.
	Indicates information about items that must be observed or that are easily mistaken when using the product.
	Indicates supplemental information about an item or helpful information that you should know.
	Reference to web manual with QR code.
	Ground the functional ground terminal to ensure stable operation fo the equipment.

Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance Information

Unique Identifier: KW2D-R100Q4E or KW2D-RH100Q4E

Responsible Party – U.S. Contact Information

IDEC Corporation
1175 Elko Drive, Sunnyvale, CA 94089-2209, USA
Tel: +1-408-747-0550 opencontact@idec.com

FCC Compliance Statement
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.

Contents

Chapter 1 Overview of the KW2D Series RFID Reader

This chapter describes an overview of the KW2D Series RFID Reader and its system configuration.

Introduction to the KW2D Series RFID Reader

The KW2D Series RFID Reader is an RFID reader equipped with a verification function. Both card type and coin type RFID tags are supported.
The KW2D Series RFID Reader can work with a host device using communication functions, such as maintenance communication server and Modbus TCP server. Use the KW RFID Configurator for the creation and management of RFID tags and projects that are used with the KW2D Series RFID Reader.

Type Numbers

This section gives the type numbers for the KW2D Series RFID Reader.

- **KW2D Series RFID Reader**

KW2D - R 1 00 Q4 E

- E: Communication type
  - E : Ethernet
- Q4: Power supply
  - Q4: 24V DC power type
- 1: Version
  - 1 : Version 1
- R: Holder
  - R : Without holder
  - RH: With holder

- **KW2D Special Tag**

KW9Z - T1 X1G

- X1G: Authority (KEYFOB color)
  - X1G: Authority 1 (green)
  - X2Y: Authority 2 (yellow)
  - X3R: Authority 3 (red)
  - X4S: Authority 4 (blue)
  - X5B: Authority 5 (black)
  - X0 : Authority 10
- T1: Tag type
  - T1 : KEYFOB
  - T2 : CARD*1

*1 The authority for the CARD type is "X0: Authority 10" only.

- **Cover**

KW9Z - CV

- CV: Type
  - CV : For KW2D-R
  - CVH: For KW2D-RH

Type Numbers and Functions List

KW2D Series RFID Reader Type Numbers and Functions

Type No.	Power Supply	Ethernet Port	Holder
KW2D-R100Q4E	24V DC	Yes	None
KW2D-RH100Q4E	24V DC	Yes	Yes

KW2D Special Tag Type Numbers and Functions

Type No.	Tag Type	Tag Color	Default Authority					
			1	2	3	4	5	10
KW9Z-T1X1G	KEYFOB	Green	Yes	-	-	-	-	-
KW9Z-T1X2Y		Yellow	-	Yes	-	-	-	-
KW9Z-T1X3R		Red	-	-	Yes	-	-	-
KW9Z-T1X4S		Blue	-	-	-	Yes	-	-
KW9Z-T1X5B		Black	-	-	-	-	Yes	-
KW9Z-T2X0	CARD	-	-	-	-	-	-	Yes

For details on product specifications, see "Chapter 2 Product Specifications" on page 2-1.

KW2D Series RFID Reader Features

This section describes the features of the KW2D Series RFID Reader.
The KW2D Series RFID Reader is a compact RFID reader equipped with an Ethernet port that can be mounted in a 22-mm diameter hole in a panel surface.

- **Panel Surface Mounted**
  This RFID reader can be mounted in a 22-mm diameter hole.

- **Communication Functions**
  The KW2D Series RFID Reader supports the following types of communication.
  • Maintenance communication server
  • Modbus TCP server
  • Find RFID readers

  The KW2D Series RFID Reader can be connected a computer on which the KW RFID Configurator has been installed, and it can be connected to devices such as operator interfaces and PLCs that support the Modbus TCP client.

- **Verification Function**
  The KW2D Series RFID Reader can verify UIDs in RFID tags against UIDs that were registered in advance.

KW2D Series RFID Reader Functions

This section describes the functions of the KW2D Series RFID Reader.

- **Read UID Function**

  This function reads the UID of KW2D special tags and general-purpose card type RFID tags.

- **UID Verification Function**

  The KW2D Series RFID Reader is equipped with an RFID antenna (13.56 MHz band) and can verify UIDs read from RFID cards against UIDs that were registered in advance. The following three types of IC tag standards are supported.

IC Tag Standard	Non-contact IC Card/Tag Name
ISO/IEC 14443 Type A	MIFARE (NXP)
ISO/IEC 18092	FeliCa (Sony)
ISO/IEC 15693	Tag-it (Texas Instruments), I-CODE (NXP)

- **Read Confirmation Function**

  The read status of the RFID tag can be confirmed with the buzzer.

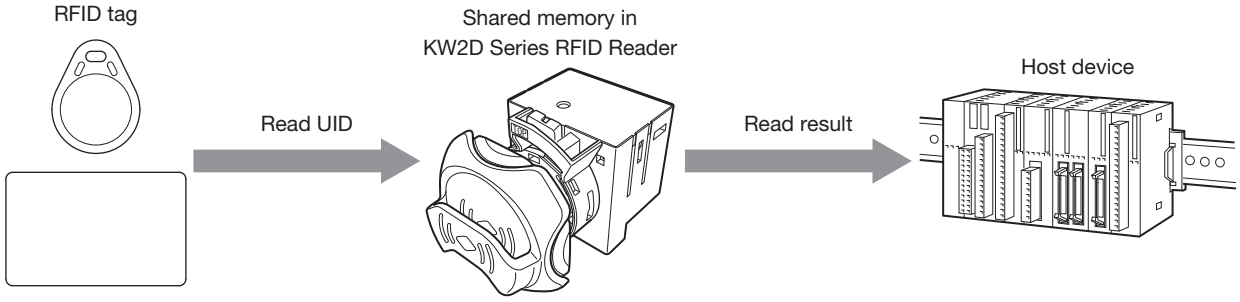
- **Status Confirmation Function**

  The operating status and error status of the KW2D Series RFID Reader can be checked with the three colors of LED indicators (white, green, and red) on the front of the KW2D Series RFID Reader.

The buzzer and LED indicators can be enabled or disabled. The buzzer and LED indicators can also be controlled from the host device. For more information on remote control of the buzzer and LED indicators, see "Chapter 5 Remote Control of Buzzer and LEDs" on page 5-11.

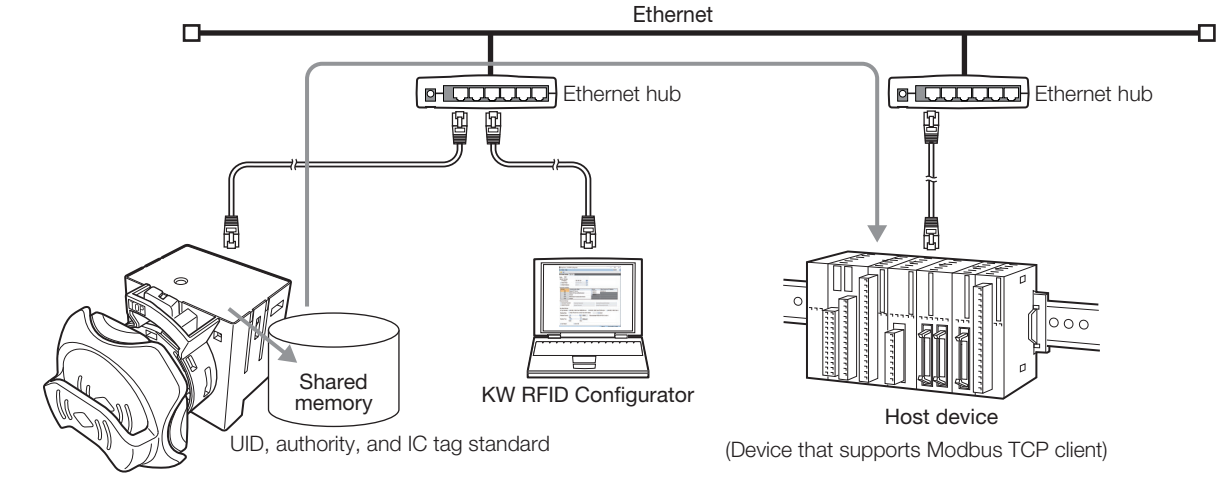
System Configuration

There are two system configurations for using theKW2D Series RFID Reader: the system configuration used for actual operation and the system configuration for creating a project for operation.
Use the KW RFID Configurator dedicated configuration software to create a project.



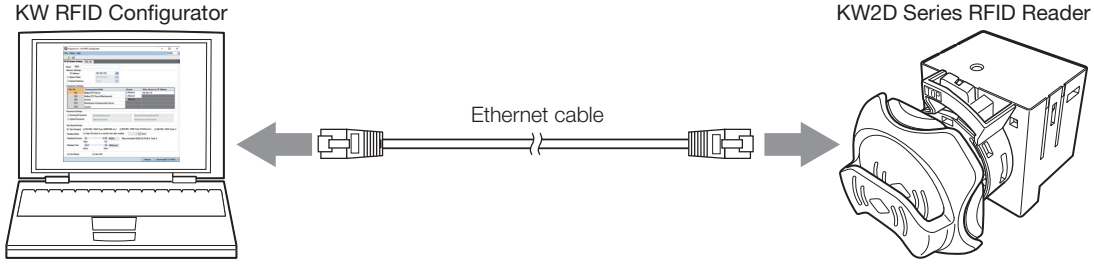
• System Configuration During Operation

The KW2D Series RFID Reader can be used in the following system configuration. The devices that can be connected depend on the model. For details, see "Chapter 2 Product Specifications" on page 2-1.



• System Configuration During Project Creation

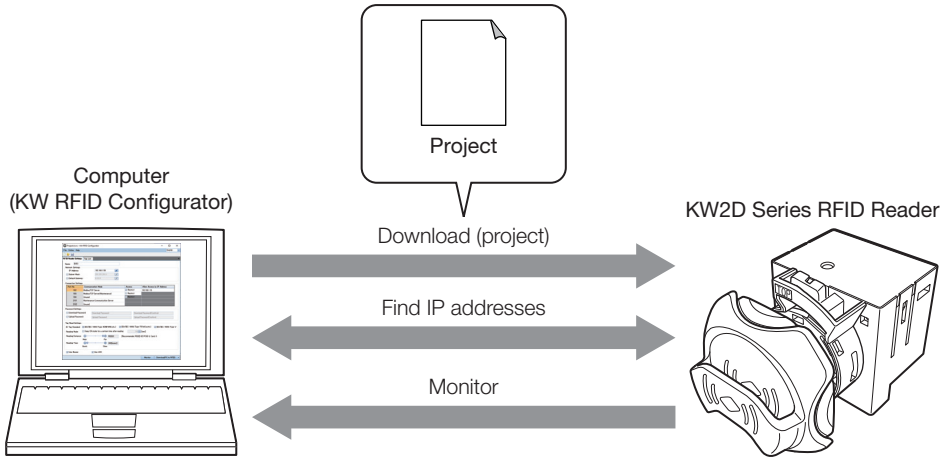
To use the KW2D Series RFID Reader, you must download a project to it.
Use the KW RFID Configurator to create the project. You can connect the KW2D Series RFID Reader to a computer and download the created project over Ethernet communication.



Introduction to the KW RFID Configurator

The KW RFID Configurator is dedicated software for the KW2D Series RFID Reader to monitor tag information read by the KW2D Series RFID Reader, configure the KW2D Series RFID Reader settings, and create tag lists. The collection of settings and created data is called a project.
Build the environment required for operation by using the KW RFID Configurator to create a project and downloading that project to the KW2D Series RFID Reader.
The KW RFID Configurator has the following functions.

- **Find RFID Readers**
  If you do not know the IP address of a KW2D Series RFID Reader, you can search for its IP address. The default IP address of the KW2D Series RFID Reader is 192.168.1.50.
- **Create Project**
  Create the tag list and configure the KW2D Series RFID Reader settings.
  If necessary, create the tag list while monitoring the KW2D Series RFID Reader.
- **RFID Reader Monitor**
  You can monitor the status of the KW2D Series RFID Reader and the UIDs.



Overview of Communication Functions

The Ethernet port is standard equipment on the KW2D Series RFID Reader to enable communication using Ethernet. There are a total of five connections that can be used for various communications: three Modbus TCP server connections and two maintenance communication server connections.

• Communication Functions

Modbus TCP Server	Modbus TCP server can be used to exchange data between the KW2D Series RFID Reader and a host device that supports the Modbus TCP client protocol. For details, see "Chapter 5 Modbus TCP Server" on page 5-17.
Maintenance Communication Server	Maintenance communication server can be used with a computer or PLC to upload and download projects and to monitor UIDs detected by the KW2D Series RFID Reader. For details, see "Chapter 5 Maintenance Communication Server" on page 5-21.
Find RFID Readers	If you forget the IP address of a KW2D Series RFID Reader, you can find the RFID readers connected to the network. For details, see "Chapter 4 [RFID Reader List] Dialog Box" on page 4-14.

• Communication Interface

Ethernet Port	The KW2D Series RFID Reader can communicate with Ethernet communication-compatible host devices such as computers using this port. Maintenance communication and Modbus TCP communication can be used.

Chapter 2 Product Specifications

This chapter describes the part names and specifications of the units that make up the KW2D Series RFID Reader.

Specifications

The specifications of this product are as follows.

Operating Environment Specifications

Ambient Operating Temperature	-25 to +55°C (no freezing)	
Ambient Storage Temperature	-40 to +80°C (no freezing)	
Relative Humidity	10 to 95% RH (no condensation)	
Storage Humidity	10 to 95% RH (no condensation)	
Pollution Degree	Front of panel	3 (IEC 60664-1)
	Inside panel	2 (IEC 60664-1)
Degree of Protection*1	Front unit*2	IP65 or IP67 (IEC 60529)
	Back unit	IP20 (IEC 60529)
Atmosphere	No corrosive gas	
Altitude or Air Pressure	During use	1013 to 795 hPa (0 to 2000 m)
	During transport	1013 to 701 hPa (0 to 3000 m)
Installation Location	Indoors	
Device Class	Open equipment	
Overvoltage Category	II	
Vibration Resistance	Durability	30 Hz, half amplitude 1.5 mm
	Malfunction	5 to 55 Hz, half amplitude 0.5 mm
Shock Resistance	Durability	1000 m/s^2
	Malfunction	100 m/s^2
EMC Immunity	IEC/EN 61131-2 Zone B, EN 301-489-3 compatibility	

*1 IP ratings are not applicable to UL certification.

*2 Front of panel only

Electrical Specifications

Rated Input Voltage	24V DC	
Power Supply Fluctuation Range	20.4 to 28.8V DC (including ripple)	
Current Draw	2.4 W maximum (24V DC)	
Allowable Time for Instantaneous Power Loss	1 ms or longer (when rated power supply voltage)	
Withstand Voltage	Between power and FE terminals	500V AC, 1 minute
	Between LAN port and internal circuit	500V AC, 1 minute
Insulation Resistance	Between power and FE terminals	100 MΩ or higher (500V DC insulation resistance tester)
	Between LAN port and internal circuit	100 MΩ or higher (500V DC insulation resistance tester)
Inrush Current	25 A or lower	
Isolation	Between LAN port and internal circuit	Transformer isolation
Ground	D-type ground (Class 3 ground)	
Functional Ground Wire	See "Chapter 3 Power Supply and Power Supply Wiring" on page 3-9.	
Power Supply Wire	See "Chapter 3 Power Supply and Power Supply Wiring" on page 3-9.	
Effect of Improper Power Supply Connection	Reverse polarity	Normal operation
	Improper voltage or frequency	Permanent damage may be caused
	Improper lead connection	Permanent damage may be caused
Weight (approx.)	70 g	

Mechanical Specifications

Power Supply Terminals	Terminal configuration	Push-in terminals
	Wire pull force	AWG24 ≥ 10 N, AWG22 ≥ 15 N, AWG20 ≥ 20 N, AWG18 ≥ 30 N, AWG16 ≥ 40 N
	Insertion/removal durability	25 times minimum
	Recommended operation force of Pusher	20 N (40 N maximum)
Tag Holder*1	Insertion force	10 to 15 N
	Retention force (Withdrawal force)	10 to 15 N
	Insertion/removal durability	12,000 times minimum
Indicators*2	Three colors of LEDs (red: 2, green: 2, white: 4)	
Buzzer*3	Single tone with fixed volume	
Case Materials	Front cover and back cover	PBT
	Front base, back base, and lens	PA66
	KEYFOB holder	PBT

*1 This holder is for mounting the KEYFOB type tag (KW9Z-T1X**).
*2 For details on illumination conditions, see "Chapter 5 Operation Variations" on page 5-1.
*3 For details on buzzer operation conditions, see "Chapter 5 Operation Variations" on page 5-1.

Ethernet Communication Specifications

Communication Type	IEEE 802.3 compliant	
Connector	Connector	RJ45
	Pull force	15 N
	Insertion/removal durability	100 times minimum
Isolation	Pulse transformer isolated	
Transmission Speed	10BASE-T and 100BASE-TX	
Communication Functions	Modbus TCP server and maintenance communication server	
Cable	Cat 5 STP, maximum cable length 100 m	

RFID Interface Specifications

Communication Standards	ISO/IEC 14443 (Type A), ISO/IEC 18092, JIS X6319-4, and ISO/IEC 15693	
Communication Speed	Felica	212 kbps
	ISO/IEC 14443A	106 kbps
	ISO 15693	26.5 kbps
Wireless Frequency	13.56 MHz (HF band)	
Supported Tags*1	Card type	ISO/IEC 14443 Type A, ISO/IEC 18092, JIS X6319-4, and ISO/IEC 15693
	KEYFOB type	ISO/IEC 14443 Type A
Tag Reading Distance*2	Card type	15 mm maximum
	KEYFOB type	5 mm maximum
Tag Reading Position	Center of tag stationary in center of front unit	
Tag Reading Time	Stationary for 1 sec maximum	

*1 Check compatibility with the main body that will be used.
*2 Distance from the top of the front unit to the tag when the center of the tag is stationary on the line segment extension in the center of the front unit. The reading distance decreases if the tag is off center. Multiple tags cannot be read.

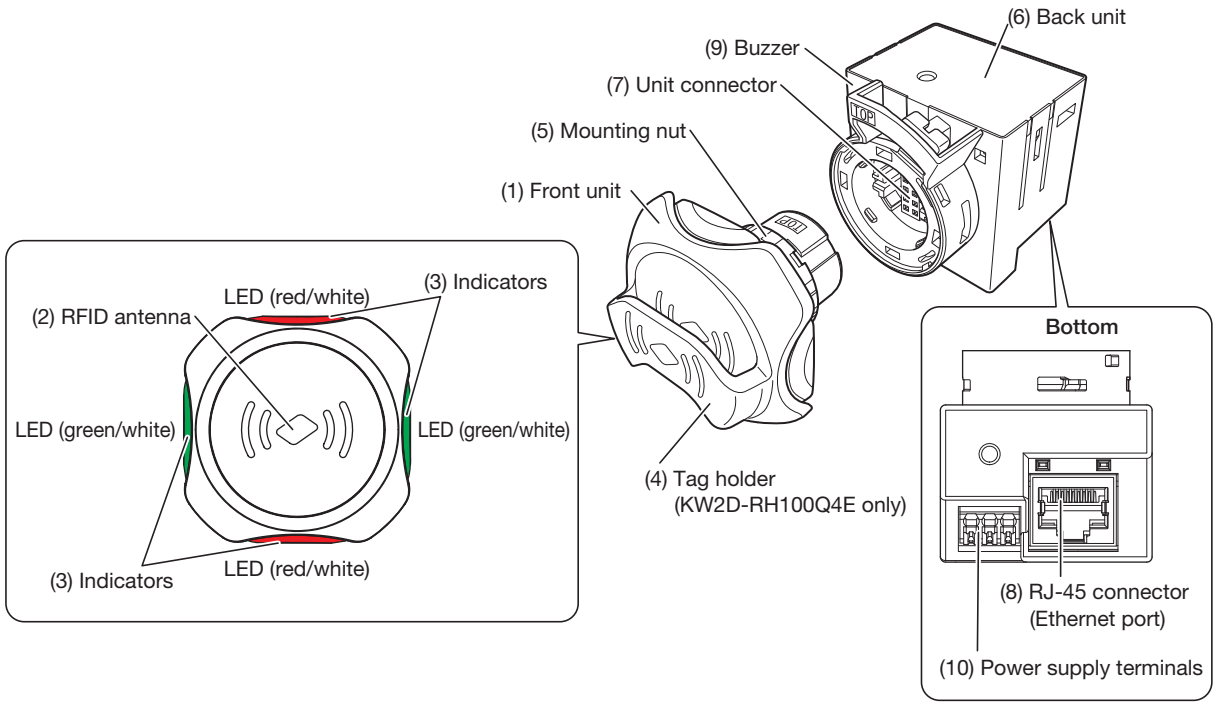
- The tag reading distance is the value using a standard IDEC tag placed near the center of the reader. The tag reading distance changes with the tag and operating environment.
- The listed value is that in an ideal environment that is not affected by radio waves and metals in the surrounding area. Carefully check the performance of this product in your environment.
- For installation, see "Chapter 3 Installation and Wiring Precautions" on page 3-1.

Names of LSIs in Tested Tags

NFC Type	Manufacturer Name	Tag Type	
		Card Type	KEYFOB Type
Type A	MIFARE CLASSIC 1K (NXP)	Yes	-
	MIFARE UL (NXP)	Yes	Yes
Type V	ICODE SLI (NXP)	Yes	-
	ICODE SLIX (NXP)	Yes	-
	Tag-it HF-I Plus (TI)	Yes	-
	Tag-it HF-I Pro (TI)	Yes	-
	my-d SRF55V10P (Infineon)	Yes	-
	my-d SRF55V02P (Infineon)	Yes	-
	MB89R118B (Fujitsu)	Yes	-
	MB89R118C (Fujitsu)	Yes	-
Type F	RC-S962 (Standard) (Sony)	Yes	-
	RC-S965 (Lite) (Sony)	Yes	-
	RC-S966 (Lite-S) (Sony)	Yes	-

Part Names and Functions

This section describes the configuration of the main body of the KW2D Series RFID Reader and the names of parts.
The main body is composed of the front unit (1) and the back unit (6).



(1) Front unit

This unit is mounted on the front surface of the panel. The RFID antenna (2) and indicators (3) are built into this unit.

(2) RFID antenna

The antenna used to communicate with RFID tags.

(3) Indicators

Built into the front unit. The indicators turn on and off when the KW2D Series RFID Reader is operating.
For details on LED illumination conditions, see "Chapter 5 Operation Variations" on page 5-1.

LED Indicator	Description
LED (red)	This LED turns on and flashes when there is an error in reading or verifying a UID and when not communicating with a Modbus TCP server.
LED (white)	This LED turns on and flashes when the KW2D Series RFID Reader is operating. It flashes slowly (interval of 1 sec) during operation and it flashes quickly (interval of 100 msec) when reading an RFID tag.
LED (green)	This LED turns on and flashes when reading and verifying a UID is normal and when communication with a Modbus TCP server is normal.

(4) Tag holder (KW2D-RH100Q4E only)

This holder is for mounting the KEYFOB type tag (KW9Z-T1X**).

(5) Mounting nut

Fixes the front unit to the mounting panel.

(6) Back unit

The unit stored inside the panel. The RFID reading circuit, Ethernet interface circuit, power supply interface circuit, buzzer, and other components are built into this unit.

(7) Unit connector

This connector is used to connect the front unit and back unit.

(8) RJ-45 connector (Ethernet port)

This port is used to connect a host device.

Connect a LAN cable and this port allows Ethernet communication with connected devices that are equipped with an Ethernet interface.

LED	Status
Steady yellow	When a device compatible with the network is connected to the RJ-45 connector
Flashing green	When the KW2D Series RFID Reader is sending or receiving data

(9) Buzzer

Notifies the user of the result of reading and verifying a UID. For details on buzzer operation conditions, see "Chapter 5 Operation Variations" on page 5-1.

(10) Power supply terminals

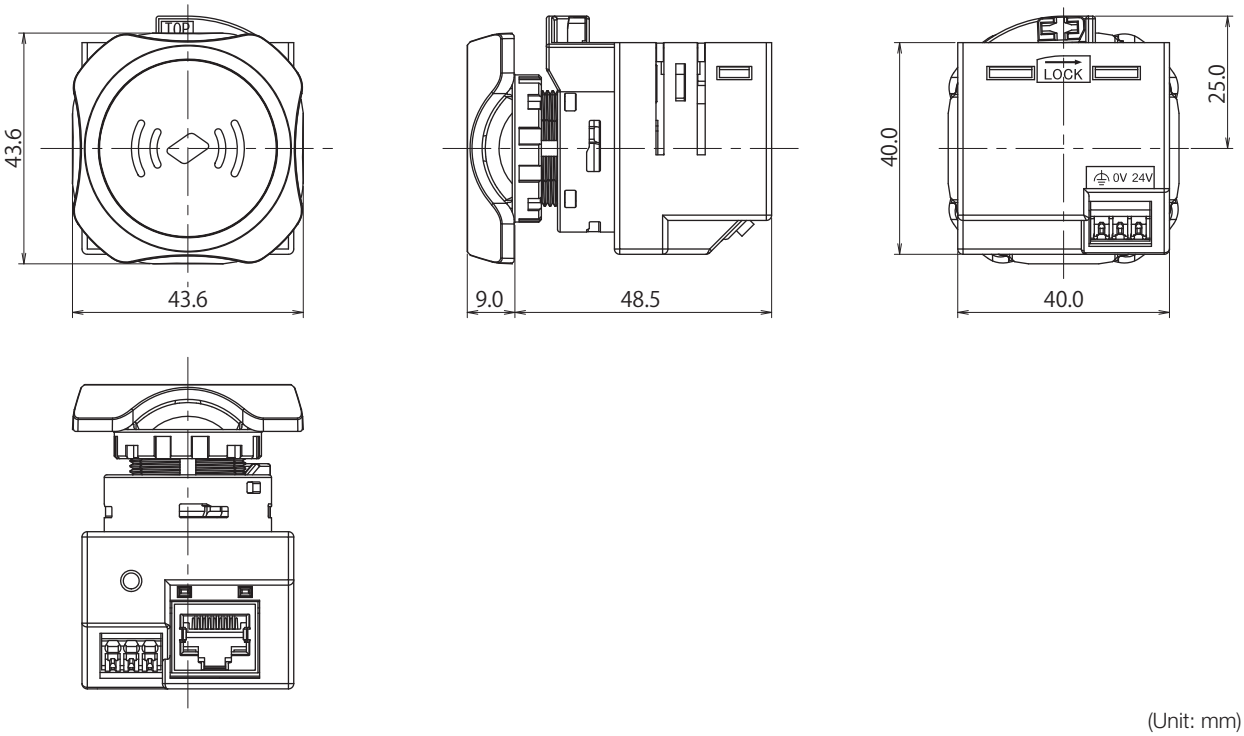
These terminals are used to supply DC power (24V DC) to the KW2D Series RFID Reader.

For details on KW2D Series RFID Reader installation, see "Chapter 3 Installation and Wiring" on page 3-1.

Dimensions

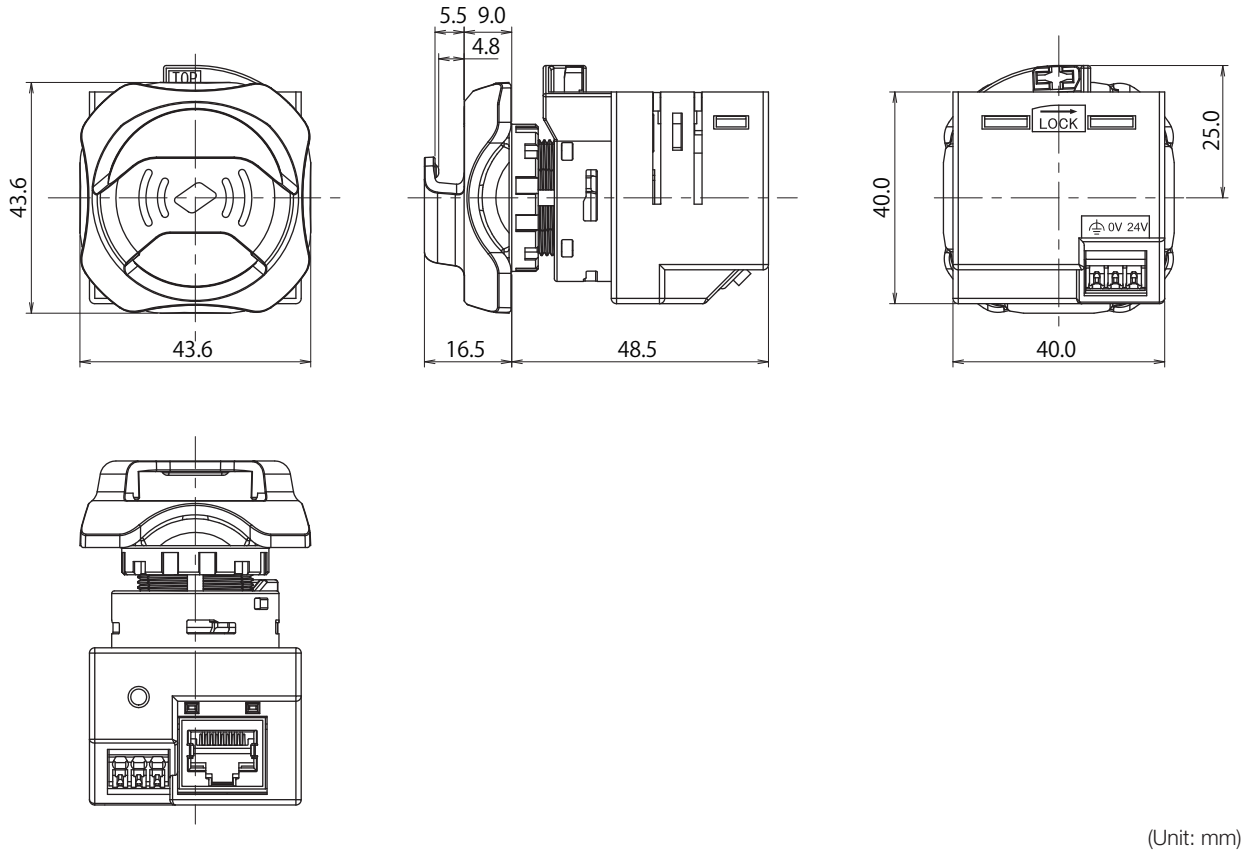
Main Body

Without holder: KW2D-R100Q4E



(Unit: mm)

With holder: KW2D-RH100Q4E

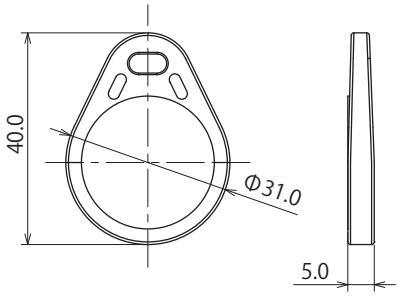


(Unit: mm)

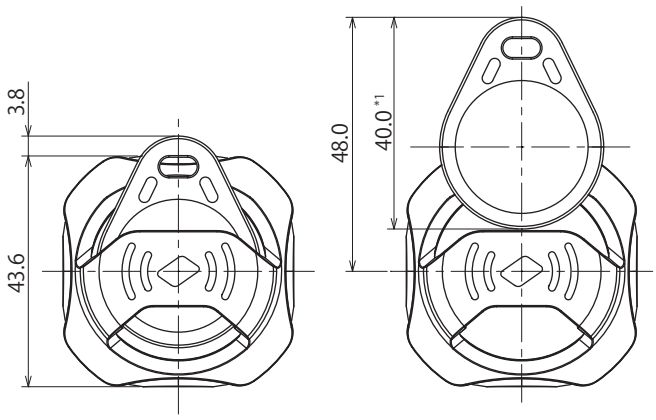
*1 The height is the length to the front of the mounting panel.

Tag

KEYFOB type: **KW9Z-T1X1G, KW9Z-T1X2Y, KW9Z-T1X3R, KW9Z-T1X4S, and KW9Z-T1X5W**



Dimensions when KEYFOB is inserted and when mounted

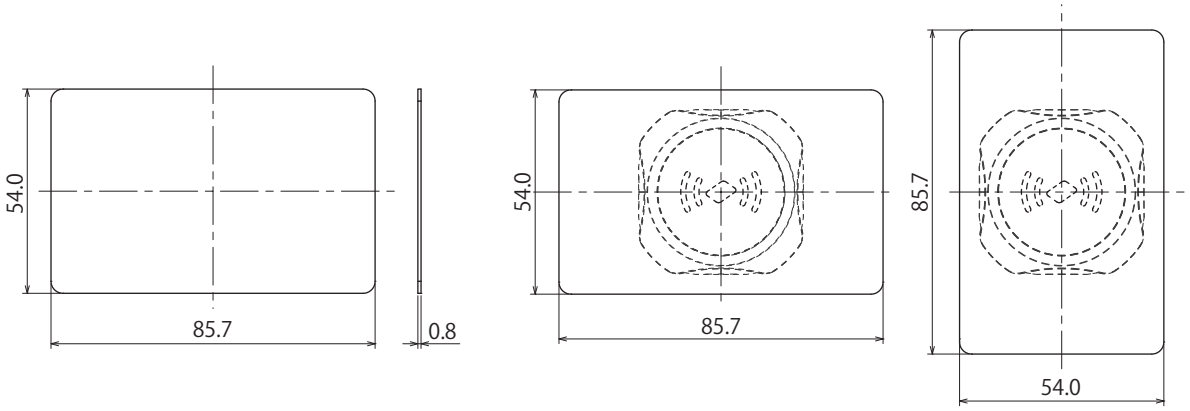


*1 Minimum dimension when KEYFOB is equipped

(Unit: mm)

Card type: **KW9Z-T2X0**

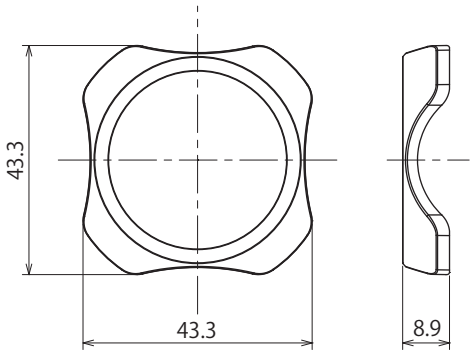
Dimensions when reading



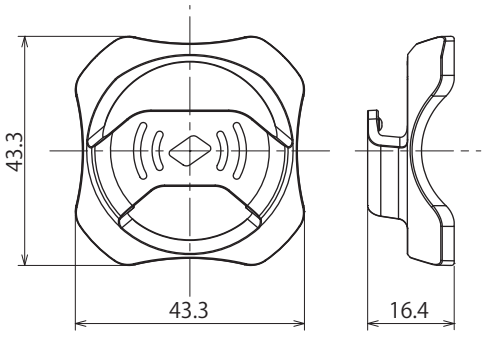
(Unit: mm)

Cover

KW9Z-CV



KW9Z-CVH



(Unit: mm)

Chapter 3 Installation and Wiring

This chapter describes how to install and wire the KW2D Series RFID Reader.
Carefully read and understand the content in this manual to correctly use the KW2D Series RFID Reader.

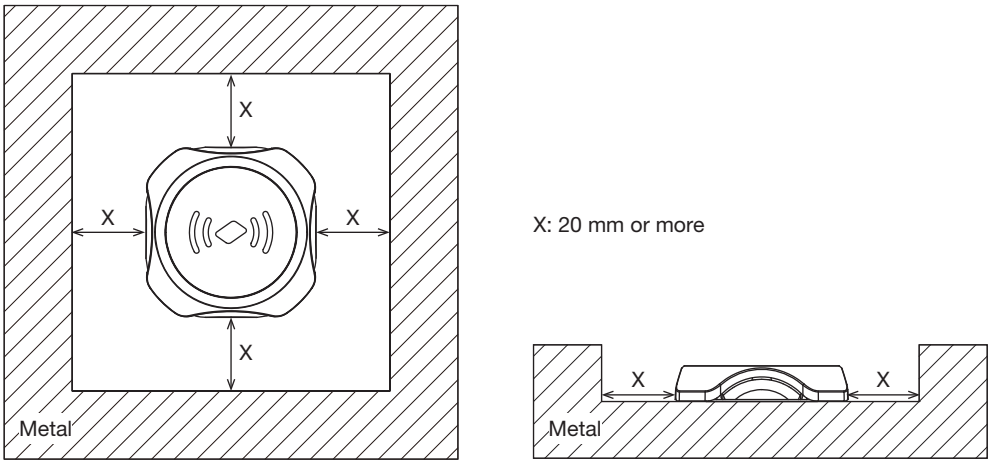
Installation and Wiring Precautions

This section describes the precautions when installing and wiring the KW2D Series RFID Reader.

Caution Always turn off the power before installation, removal, wiring, maintenance, and inspection. There is a risk of electric shock and fire. Intended to be mounted on a Flat surface of type 1 enclosure.

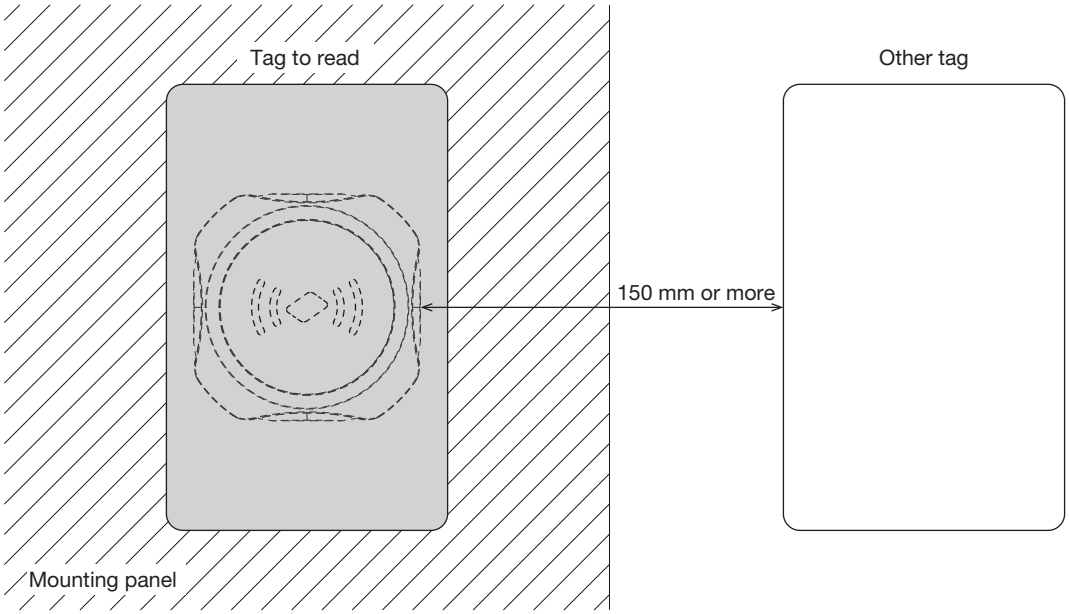
Installation Space

Metal around the front unit will affect the reading distance of RFID tags. If the front unit is surrounded with metal, separate the metal from the front unit by 20 mm or more.



When Multiple Tags Are in the Reading Area

The wrong tag may be detected. Keep tags that should not be read 150 mm or more from the area around the front unit.



Attachment Methods

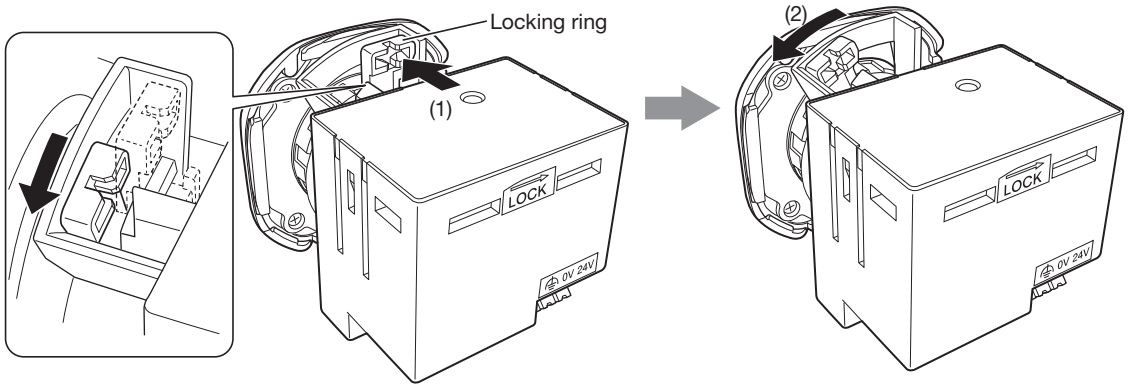
This section describes the attachment methods for the KW2D Series RFID Reader.

Back Unit Removal and Attachment Methods

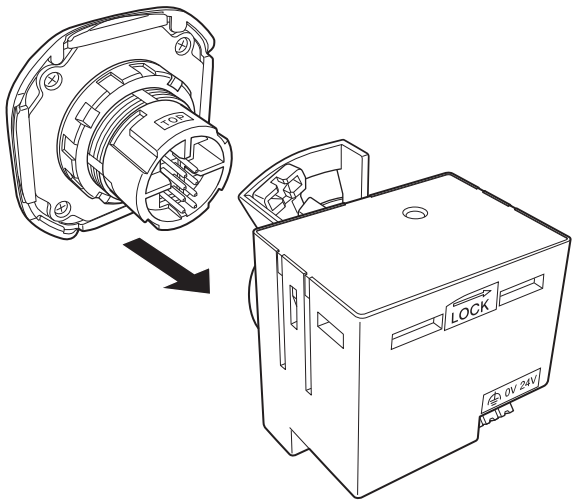
This section describes how to remove and attach the front unit and back unit.

• Removing the Back Unit

1. While pressing the locking ring (1) on the back unit, push it in the opposite direction indicated by "LOCK→" (2).



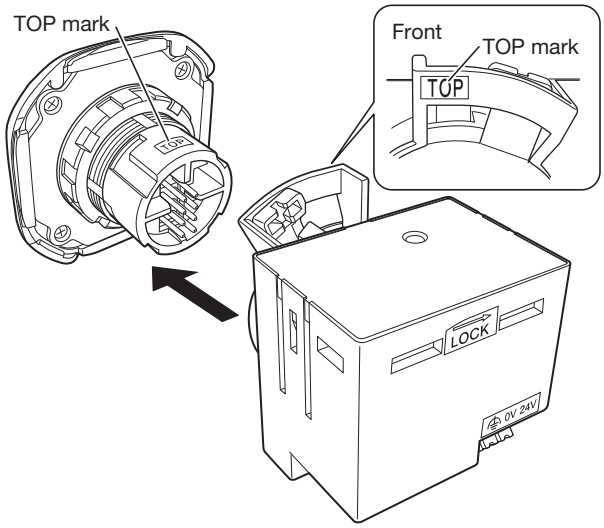
2. Remove the back unit from the front unit.



This completes separating the front unit and back unit.

• Attaching the Back Unit

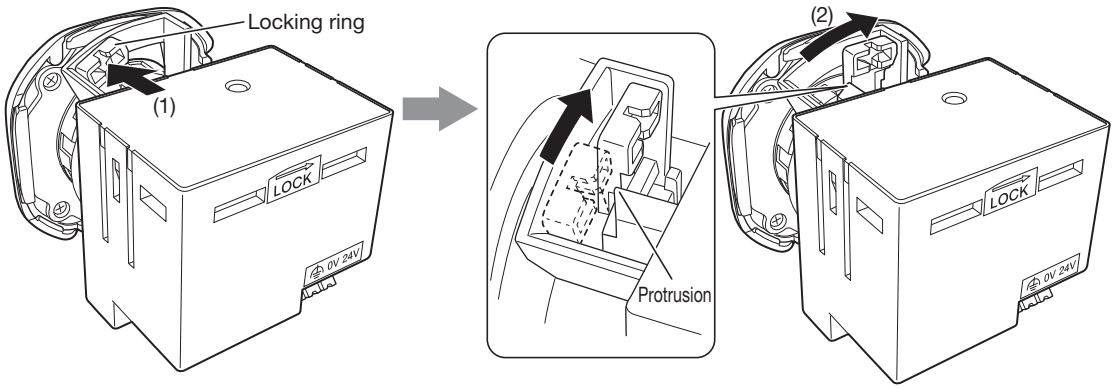
1. Align the TOP marks on the front unit and the back unit, and then insert the back unit into the front unit.



Caution You cannot insert the back unit into the front unit if the locking ring is in the locked position ("LOCK→"). Always confirm that the locking ring is in the unlocked position (opposite direction of "LOCK→").

2. Confirm that the back unit is inserted fully into the front unit, and then while pressing the locking ring (1) on the back unit, push it in the direction indicated by "LOCK→" (2).

Caution Confirm that the locking ring is on the other side of the protrusion. The lock is not fully engaged if the locking ring is not in the lock position on the other side of the protrusion.

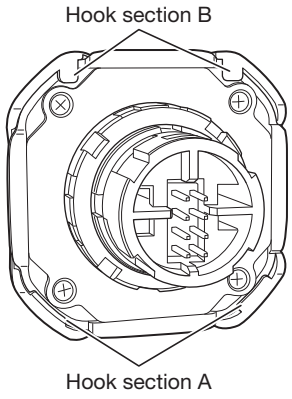


This completes attaching the front unit and back unit.

Front Cover Removal and Attachment Methods

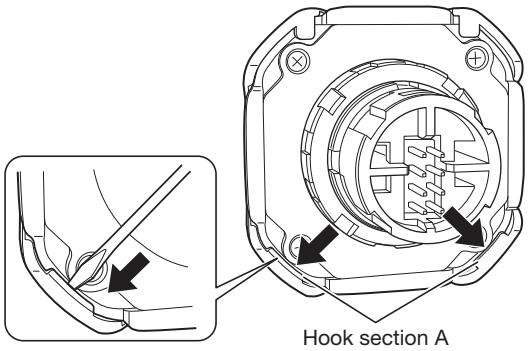
This section describes how to remove and attach the front unit and front cover.

The front cover has hook section A in two locations and hook section B in two locations on the backside of the front unit.

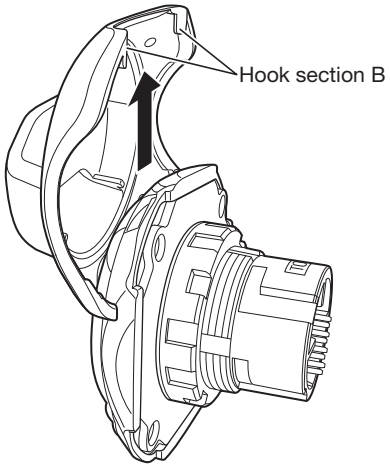


• Removing the Front Cover

1. Separate the front unit and back unit. (page 3-2)
2. Insert a flathead screwdriver with a thin tip into hook section A in two sections and remove the front cover (hook section A).



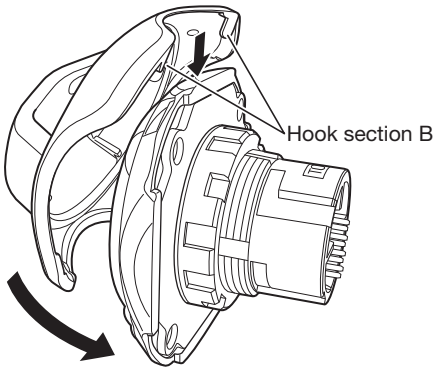
3. Remove the front cover by sliding hook section B up in the direction of the arrow.



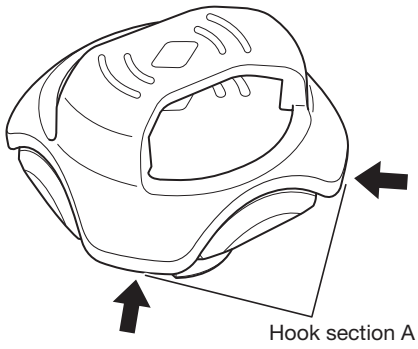
This completes separating the front cover and front unit.

- **Attaching the Front Cover**

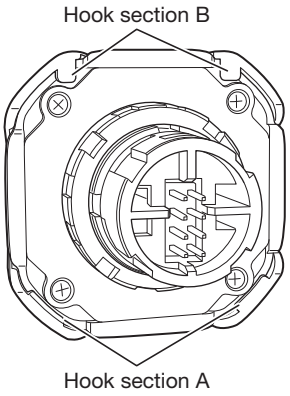
1. Attach hook section B of the front cover to the front unit.



2. Push hook section A onto the front unit.



This completes attaching the front cover and front unit.

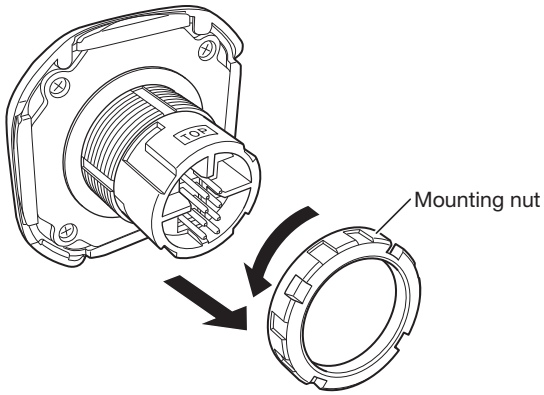


Caution Confirm that hook section A and hook section B are firmly attached to the front unit.

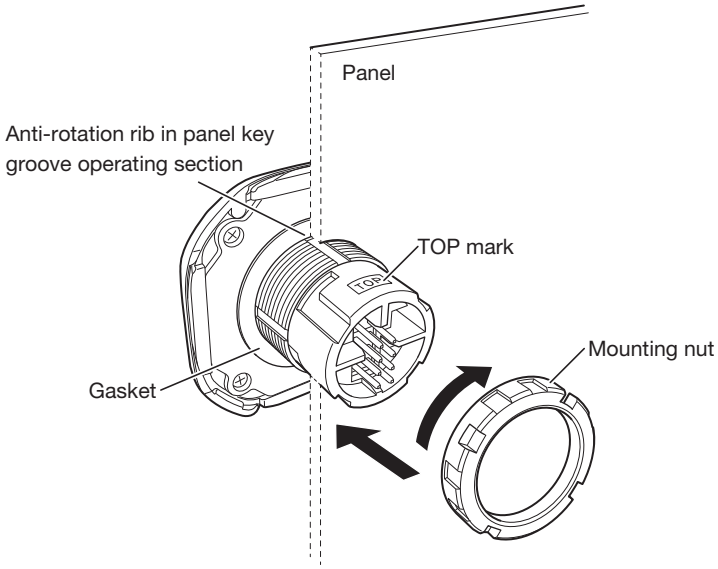
Panel Mounting Method

This section describes how to mount the KW2D Series RFID Reader to the panel.

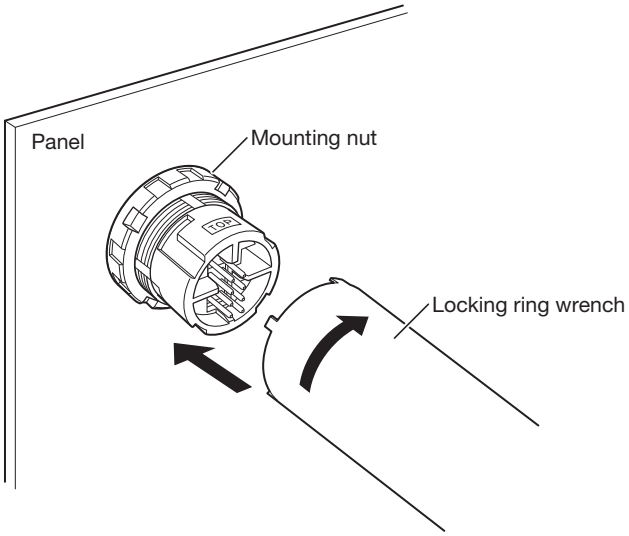
1. Separate the front unit and back unit. (page 3-2)
2. Remove the mounting nut from the front unit.



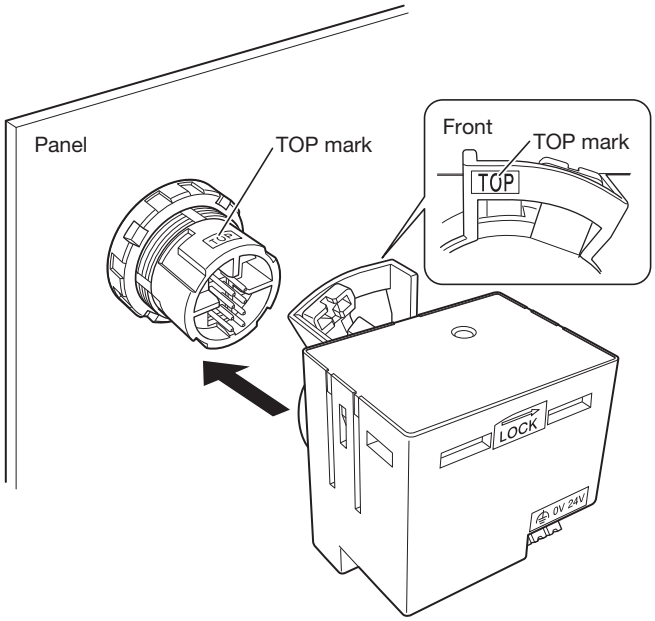
3. Insert the front unit into the mounting hole from the front of the panel, and then attach the mounting nut from the back of the panel.



4. Use the locking ring wrench to tighten the mounting nut to the specified tightening torque (2.0 N·m).



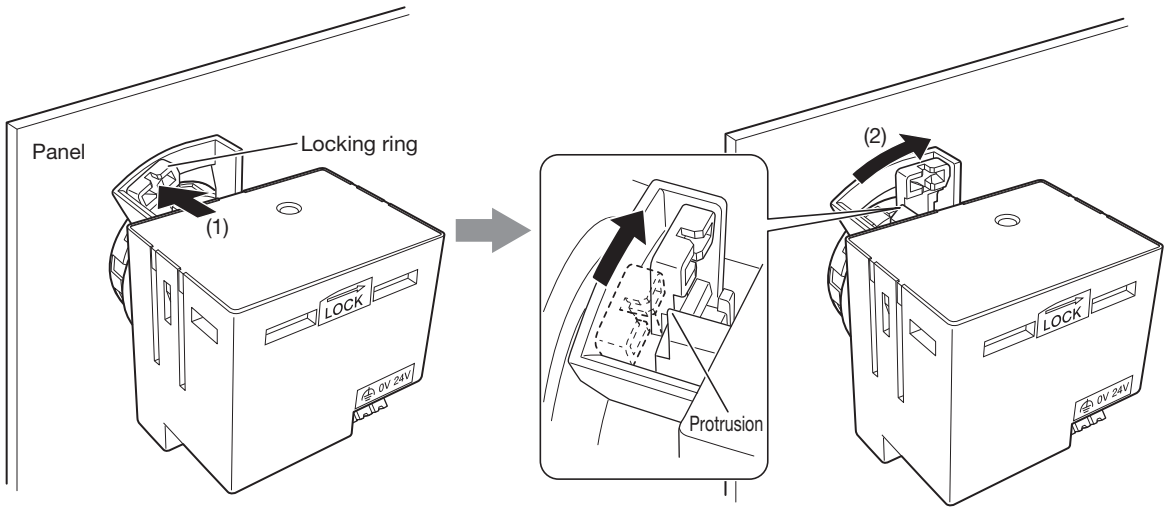
5. Align the TOP marks on the front unit and the back unit, and then insert the back unit into the front unit.



Caution You cannot insert the back unit into the front unit if the locking ring is in the locked position. Always confirm that the locking ring is in the unlocked position.

6. Confirm that the back unit is inserted fully into the front unit, and then while pressing the locking ring (1) on the back unit, push it in the direction indicated by "LOCK→" (2).

Caution Confirm that the locking ring is on the other side of the protrusion. The lock is not fully engaged if the locking ring is not in the lock position on the other side of the protrusion.



This completes mounting the KW2D Series RFID Reader to the panel.

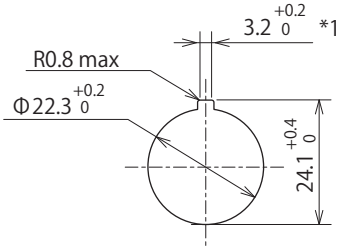
Caution
- When separating the front unit and back unit, switch the locking ring to the unlocked position (opposite direction of "LOCK→").
- Tighten the mounting nut to the specified tightening torque of 2.0 N·m.
- Use caution as the mounting nut may break if needle-nose pliers or another tool are used to tighten the mounting nut to more than the required torque.
  Locking ring wrench: IDEC type no. MW9Z-T1

The KW2D Series RFID Reader can be mounted to metal panels (such as steel and aluminum) and resin panels (such as plastic).

Drilling the Mounting Hole

Mounting Hole Layout

Drill a mounting hole with the dimensions shown in the following diagram in the panel.



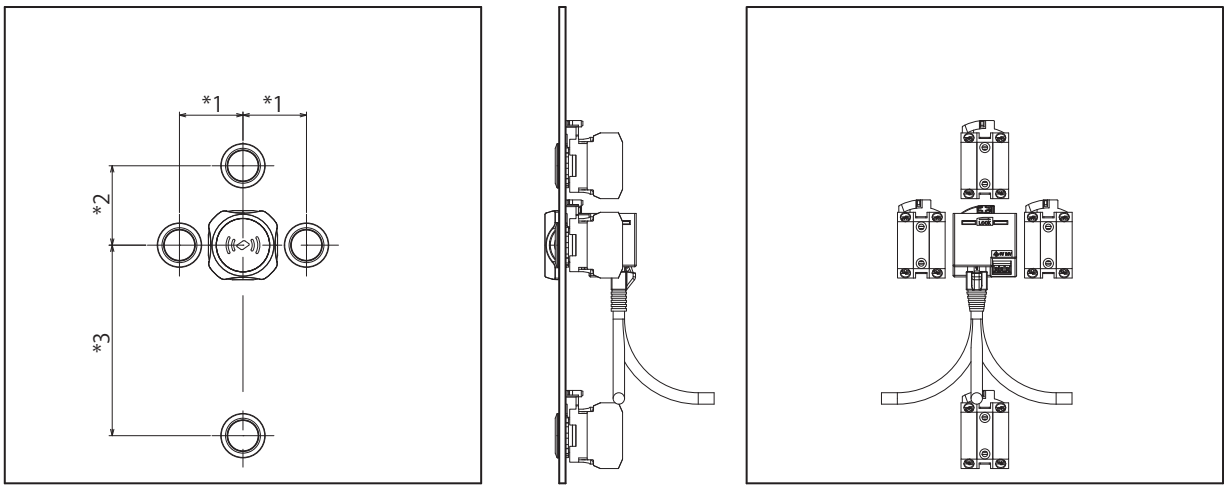
*1 To prevent rotation. Unnecessary when not using a nameplate or when not preventing rotation.

Mounting Centers Example

This example shows the centers when mounting the KW2D Series RFID Reader and IDEC switches on the same panel.

Caution

- The numeric values given in the following diagram are a guide for the restrictions on wiring in the panel. These numeric values will change depending on the cables that are used.
  Use centers that take into consideration the usability of tags (KEYFOB type/card type) and other obstructions.
- If multiple KW2D Series RFID Readers are installed close together, the radio waves will interfere and tags cannot be read.
- Ensure a space of 150 mm or more between the centers of neighboring front units.



	CW Series	LW Series	LBW Series
*1	40	38	36
*2	50	41	39
*3	120	115	115

(Unit: mm)

Power Supply and Power Supply Wiring

This section describes the power supply connections of the KW2D Series RFID Reader.

Power Supply

Caution

- Always turn off the power before wiring.
- Use SELV power supply that is reinforced or double-insulated from MAINS without any risk of electric shock, and Limited Energy (LIM) Circuit.
- Keep all wiring a sufficient distance away from high voltage and high current cables. Make wiring as short as possible.
- Carefully observe the precautions when wiring the product.
- Ground the functional ground terminal for stable operation of the product.

Power Supply Voltage

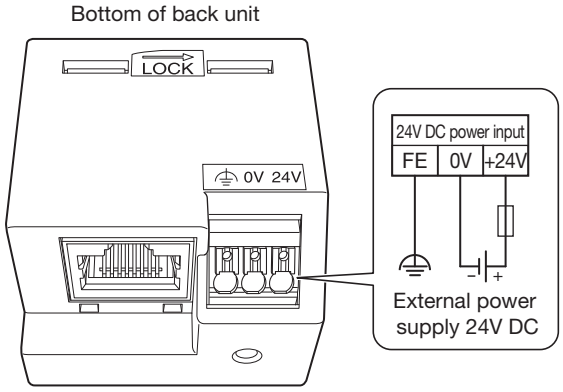
The power supply voltage that can be used with the KW2D Series RFID Reader is 20.4 to 28.8 V DC.

Warning

Do not use a power supply voltage outside this range.

Power Supply Wiring

- The KW2D Series RFID Reader has a push-in type terminal block.
- An inrush current of 25 A or lower (when input is +24 V) flows when the power is turned on. Use a power supply with sufficient capacity.
- Make the power line as short as possible.
- Run the power line as far away as possible from motor lines.
- The following table shows the signals that correspond to the signal codes. Be careful not to mistake the connections.



No.	Signal Wire
+	Power supply (+24 V)
-	Power supply (0 V)
⏚	Functional ground (FE)

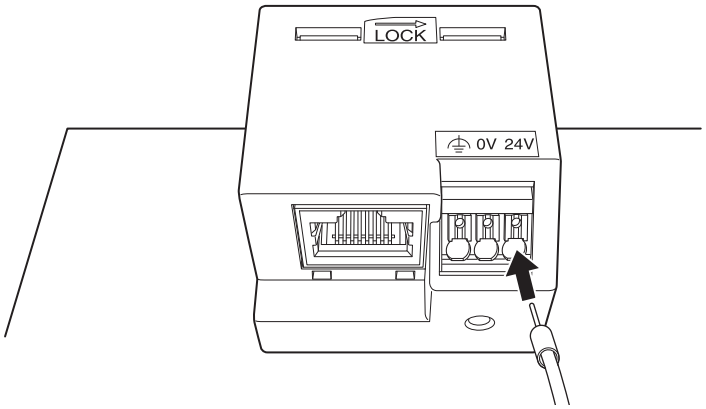
Power Supply Terminal Block Wiring Method

This section describes the removal and attachment methods for terminals in the power supply terminal block.

• Attachment Method

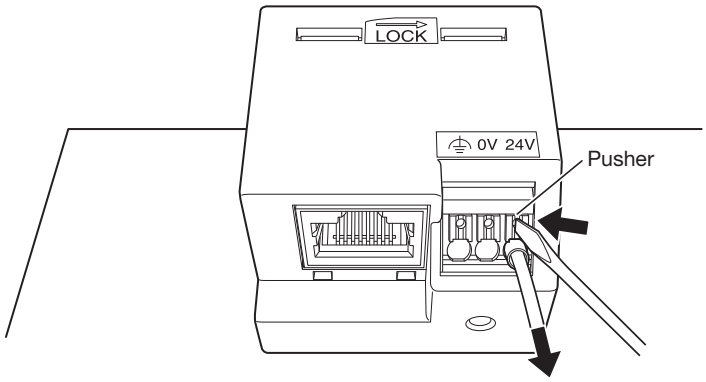
1. Push the terminal into the power supply terminal block.

Insert the terminal straight into the terminal block until it hits the back of the hole.



• Removal Method

1. Press the pusher with a flathead screwdriver and pull the wire straight out.



Caution

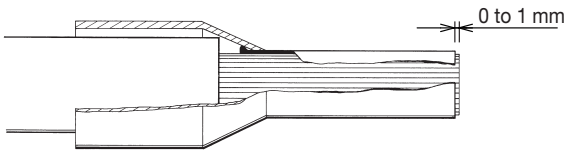
- Always turn off the power before working.
- Operate the pusher with about 20 N of force. The product may break and no longer function if you press with excessive force.
- The product may be damaged and no longer function if you pull out the wire without pressing the pusher or if you pull the wire at an angle.
- Take care with the insertion direction of the terminals.
- After connecting a terminal, tug lightly to make sure that the wire is properly connected.

Terminals

This section describes the type and usage method of terminals.

Terminals for the Terminal Block

- Choose an appropriate ferrule for the wire.
- For details, see "Applicable Wires and Recommended Ferrules" on page 3-12.
- Cut the wire carefully to get a flat end.
- Make sure that ferrule sleeve is completely filled by the conductor. Depending on the cross section, the conductor should protrude approx. 0 to 1 mm from the ferrule sleeve.

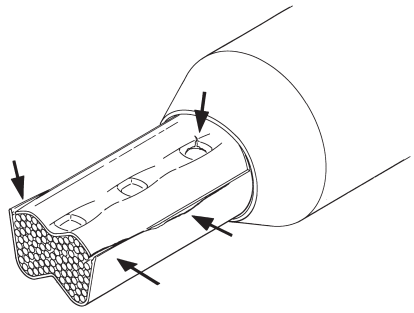


- When crimping, refer to the instructions of the crimping tool.

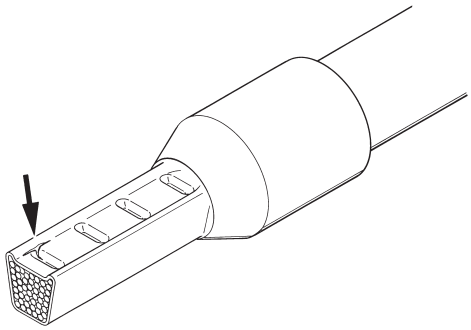
Faults Which Can Occur during Crimping

- Cracks along the sides and die impressions
- Splitting of the ferrules
- Asymmetrical crimping shape
- Extreme burrs formed along the sides
- Ferrule not filled by conductor
- Insulation cover damaged by the crimping jaw
- Conductor insulation not pushed into the insulated cover
- Ferrule bent longitudinally after crimping
- Single conductors pushed back by protruding from the insulated cover
- Single conductor squeezed off

Formation of cracks at the sides. Sides spilt open

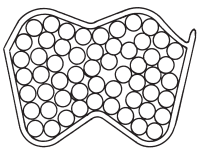


Formation of cracks at the impressions of the crimping jaw.

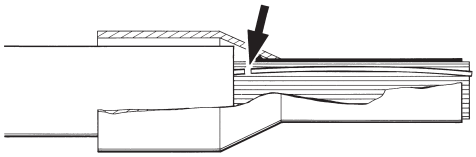


Asymmetrical crimping shape. Burr formation on one side.

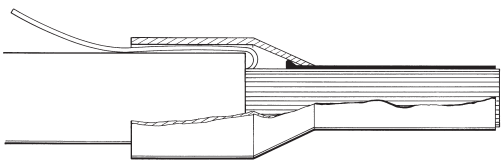
Asymmetrical crimping shape. Burr formation on one side.



Single conductor squeezed off.



Single conductor pushed back.



Applicable Wires and Recommended Ferrules

Use the recommended ferrules for the wires connected to each terminal. Use the recommended screwdriver when making connections to the terminal block. The recommended ferrules and screwdrivers are manufactured by Weidmüller.

Insulated Cover		With insulated cover	Without insulated cover	UL wire compatible with insulated cover
Wire Thickness		0.20 to 1.50 mm^2		
Wire Gauge	AWG24	H0,25/12 HBL (9025760000)	-	-
	AWG22	H0,34/12 TK (9025770000)	-	-
	AWG20	H0,5/14 OR (0690700000)	H0,5/10 (9004050000)	H0,5/14S OR (9004560000) H0,5/14S W (9004590000)
	AWG18	H0,75/14 W (0462900000)	H0,75/10 (0542500000)	-
	AWG17	H1,0/10 (0282800000)	-	-
	AWG16	H1,5/10 (0186800000)	-	-

Numbers in parentheses are order numbers for Weidmüller products.

Recommended Screwdrivers

Tool Name	Model Number (Order Number)
Screwdriver	Normal type: SDS 0.4×2.5×75 (9009030000) With insulated cover: SDIS 0.4×2.5×75 (9008370000)

Crimping Tool

The following crimping tool can be used. The recommended tool is manufactured by Weidmüller.

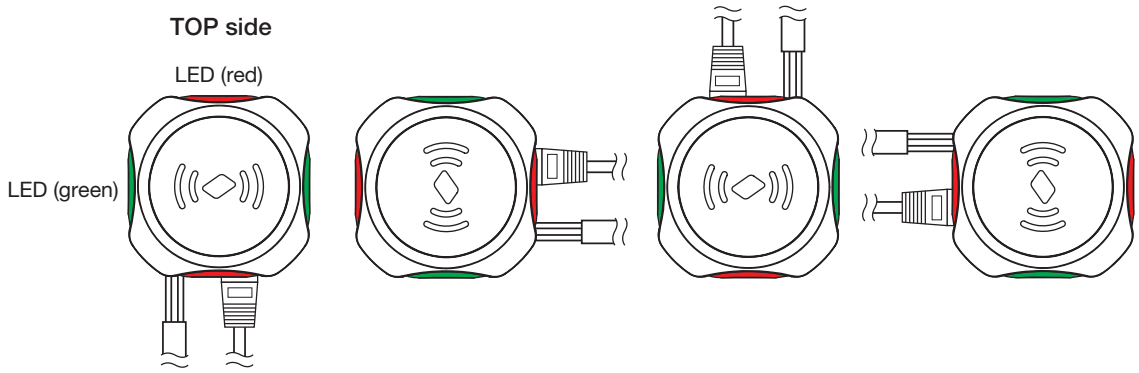
Tool Name	Model Number (Order Number)
Crimping tool	PZ6/5 (90011460000)

- Do not touch live terminals. There is a risk of electric shock.
- Do not touch the power supply terminals immediately after turning the power off. There is a risk of electric shock.
- When powered, the terminals that are connected to external devices may become hot. Do not touch the terminals immediately after turning the power off.
- Insert the wire all the way to the tip of the ferrule and crimp it.
- Only one wire can be inserted in one connector hole. Do not attach two or more wires to one connector hole.
- If you use a tool other than the recommended tools, the wire cannot be crimped into the appropriate shape. This may deform the clamp and spring inside the contact and cause the product to no longer function correctly.

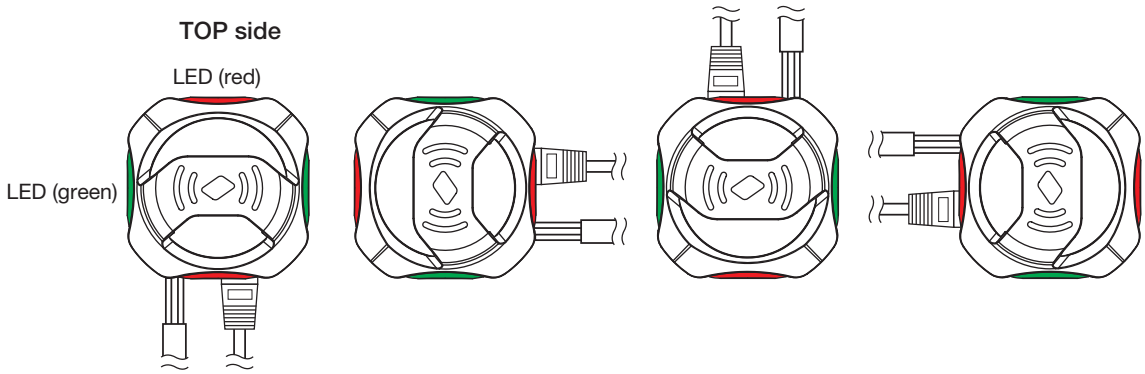
Wiring Directions and Panel Indicators

This section describes the wiring directions of the KW2D Series RFID Reader and the LED indicators on the front unit.
The position of the LED indicators (green and red) on the front unit changes according to the wiring direction.

■ KW2D-R



■ KW2D-RH



Chapter 4 KW RFID Configurator

This chapter describes the KW RFID Configurator.

Overview of the KW RFID Configurator

The KW RFID Configurator is software used to configure settings for KW2D Series RFID Reader and to check its operation.

Operating Environment

The operating environment of the KW RFID Configurator is as follows.

Item	Description
OS	Windows 10
CPU	1.0 GHz or faster
Memory	1 GB or more
Environment	Microsoft .NET Framework 4.0 or higher

Installing the Software

This section describes the procedure to install the KW RFID Configurator.

1. Download the KW RFID Configurator installer from the download site on the IDEC homepage.
2. Double-click the downloaded installer. The installer window is displayed. Install the software by following the on-screen instructions.
   This concludes installing the KW RFID Configurator.

Uninstalling the Software

This section describes the procedure to uninstall the KW RFID Configurator.

1. Right the [Start] button and click [Apps and Features].
   [Apps & features] is displayed.
2. Select "KW RFID Configurator" and click the [Uninstall] button.
   The setup program is started.
3. Click the [Yes] button on the uninstall confirmation message.
   The selected application is deleted.
   This concludes uninstalling the KW RFID Configurator.

Starting and Exiting the Software

- **Starting the KW RFID Configurator**

This section describes the procedure to start the KW RFID Configurator.

1. Click the [Start] button and then click [KW RFID Configurator].
   This starts the KW RFID Configurator.

- **Exiting the KW RFID Configurator**

This section describes the procedure to exit the KW RFID Configurator.

1. Click the [×] button at the top right of the window.
   This exits the KW RFID Configurator.

You can also start the KW RFID Configurator by double-clicking its icon on the desktop.

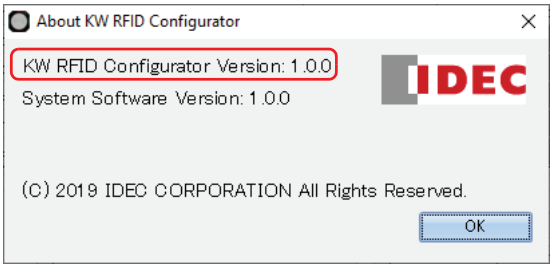
• Checking the KW RFID Configurator Version Number

This section describes the procedure to check the KW RFID Configurator version.

1. On the menu bar, click [Help] > [Version].

   The [About KW RFID Configurator] dialog box is displayed.

2. You can check the KW RFID Configurator version with this dialog box.

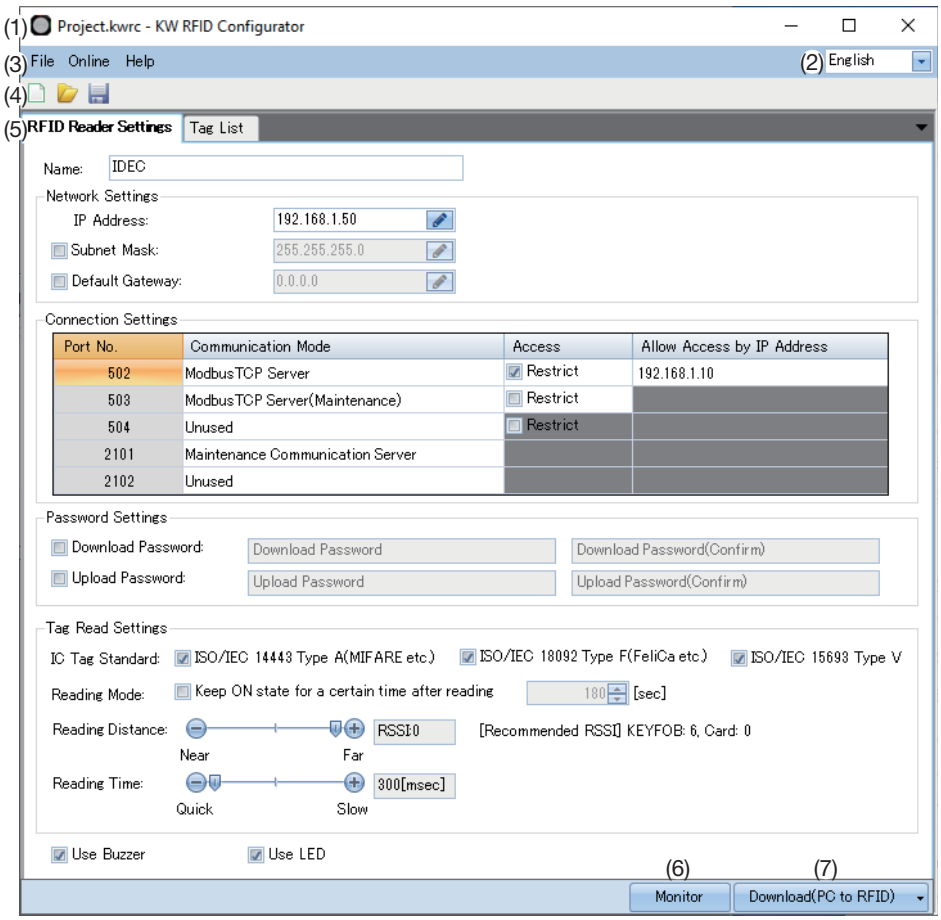


When finished, click [OK] button.
This concludes the procedure to check the KW RFID Configurator version.

Configuration and Functions

Configuration of the KW RFID Configurator

This chapter describes the names and functions of the elements that make up the KW RFID Configurator.



(1) Title bar

Displays the name of the project being edited and the name of the software "KW RFID Configurator".

(2) Language

Select the display language of the software from the following.
"Japanese", "English", or "Chinese"

(3) Menu bar

Displays commands to create a project and transfer the project to the KW2D Series RFID Reader.
For details, see "Menu Bar Commands" on page 4-4.

(4) Toolbar

Displays command buttons to create a new project, open a project, and save a project.
For details, see "Toolbar" on page 4-16.

(5) Settings tabs

Configures the basic settings of the KW2D Series RFID Reader and sets the authority of RFID tag UIDs.
For details, see "Settings Tabs" on page 4-17.

(6) Monitor

Monitors a KW2D Series RFID Reader. This is the same function as [Online] > [Monitor] on the menu bar. For details, see "Online" on "(3) Monitor" on page 4-7.

(7) Download

Downloads the project or tag list only to the KW2D Series RFID Reader. This is the same function as [Online] > [Download] on the menu bar. For details, see "Online" on "(1) Download(PC to RFID)" on page 4-7.

Menu Bar Commands

The commands that can be executed from the menu bar are as follows.

- File

Command	Description
New Project	Creates a new project.
Open Project	Opens a created project.
Save Project	Saves the project being edited.
Save Project As	Saves the project being edited with a new name.
Project Property	Configures the properties of the project.

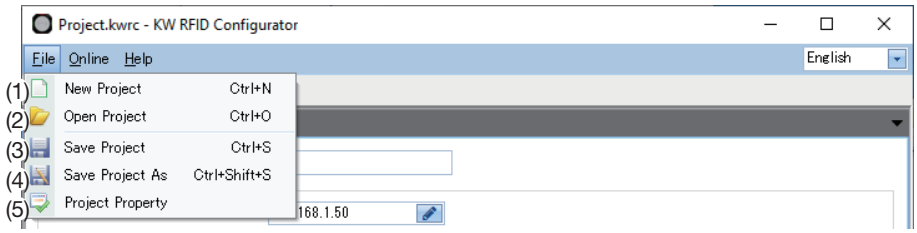
- Online

Command	Description
Download(PC to RFID)	Downloads the project or tag list only to the KW2D Series RFID Reader.
Upload(RFID to PC)	Uploads the project from the KW2D Series RFID Reader.
Monitor	Monitors a KW2D Series RFID Reader.
Communication Settings	Configures the details of maintenance communication.
Reset RFID Reader to factory settings	Resets a KW2D Series RFID Reader to the factory settings.

- Help

Command	Description
Manual	Displays the included manual (this PDF).
Version	Displays version information about the KW RFID Configurator.

File



(1) New Project

Creates a new project.

A confirmation message is displayed if the project being edited is not saved.

- To save the project, click the [Yes] button. A new project will be created after the project is saved.
- To discard the changes to the project, click the [No] button. A new project will be created without saving the project.
- Click the [Cancel] button to return to the KW RFID Configurator.

(2) Open Project

Opens a created project.

The [Open] dialog box is displayed. Select a project file (*.kwrc) and click the [Open] button.

- A confirmation message is displayed if the project being edited is not saved.
  - To save the project, click the [Yes] button. The [Open] dialog box is displayed after saving the project.
  - To discard the changes to the project, click the [No] button. The [Open] dialog box is displayed without saving the project.
  - Click the [Cancel] button to return to the KW RFID Configurator.
- If a project password was set, the [Confirm Password] dialog box is displayed. Enter the password and click the [OK] button. The project password is set on the [Project Property] dialog box. For details, see "[Project Property] Dialog Box" on page 4-6.
- A project created with a new version of the KW RFID Configurator cannot be opened with an old version of the software.

(3) Save Project

Saves the project being edited.

If a new project was created, the [Save Project As] dialog box is displayed. Enter the file name (*.kwrc) and click the [Save] button to save the project file.

(4) Save Project As

Saves the project being edited with a new name.

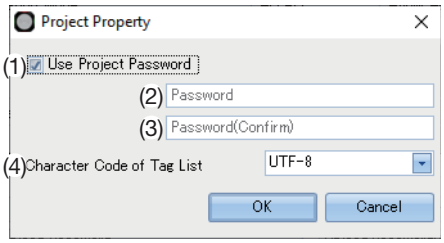
The [Save Project As] dialog box is displayed. Enter the file name (*.kwrc) and click the [Save] button to save the project file.

(5) Project Property

Configures the project password and character encoding for the tag list.

The [Project Property] dialog box is displayed. For details, see "[Project Property] Dialog Box" on page 4-6.

- **[Project Property] Dialog Box**



(1) Use Project Password

Select this check box to password protect access to the project file.
The [Confirm Password] dialog box is displayed when you open a created project from [File] > [Open Project] on the menu bar.

(2) Password

Enter the password. The entered characters are masked with * (asterisks).
The length of the password is 8 to 16 characters. Only single-byte alphanumeric characters and symbols can be used.
The password can be set only when the [Use Project Password] check box is selected.

Manage the password appropriately so that third parties do not know it. If you forget the password to a project, you can no longer open that project file.

(3) Password(Confirm)

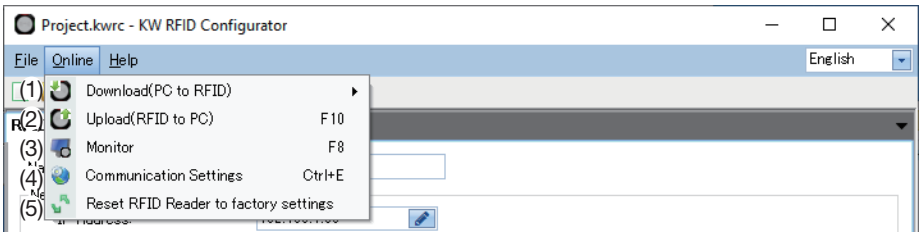
Enter the same password that you entered in [Password].

(4) Character Code of Tag List

Select the character encoding that is used in the tag list from the following.
"UTF-8", "ASCII", "Japanese (Shift-JIS)", "Chinese (GB2312)", or "European (ISO 8859-1)"

If there are characters in the tag list that cannot be converted using the selected character encoding, those characters are displayed as "?".

Online



(1) Download(PC to RFID)

Downloads the project to the KW2D Series RFID Reader.

All Settings : Downloads all settings in the project to the KW2D Series RFID Reader.
The [Download(PC to RFID)] dialog box is displayed. For details, see "[Download(PC to RFID)] Dialog Box" on page 4-8.

Tag List Only : Downloads only the tag list settings in the project to the KW2D Series RFID Reader. The tag list settings can be downloaded to multiple KW2D Series RFID Readers (50 maximum).
The [Tag List Download(PC to RFID)] dialog box is displayed. For details, see "[Tag List Download (PC to RFID)] Dialog Box" on page 4-9.

(2) Upload(RFID to PC)

Uploads the project from the KW2D Series RFID Reader.
The [Upload(RFID to PC)] dialog box is displayed. For details, see "[Upload(RFID to PC)] Dialog Box" on page 4-10.

(3) Monitor

Monitors a KW2D Series RFID Reader.
The [RFID Reader Monitor] dialog box is displayed. For details, see "[RFID Reader Monitor] Dialog Box" on page 4-11.

(4) Communication Settings

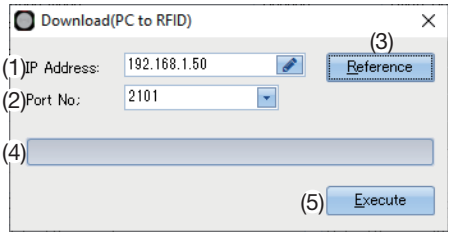
Configures the timeout used in maintenance communication and the network adapter in the computer that is used.
The [Communication Settings] dialog box is displayed. For details, see "[Communication Settings] Dialog Box" on page 4-12.

(5) Reset RFID Reader to factory settings

Resets a KW2D Series RFID Reader to the factory settings.
The [Reset RFID Reader to factory settings] dialog box is displayed. For details, see "[Reset RFID Reader to factory settings] Dialog Box" on page 4-13.

• [Download(PC to RFID)] Dialog Box

This dialog box is used to download all settings in the project to the KW2D Series RFID Reader.



(1) IP Address

Specifies the IP address of the target KW2D Series RFID Reader.

(2) Port No.

Select the port number of the target KW2D Series RFID Reader from "2101" or "2102".

(3) [Reference] button

The [RFID Reader List] dialog box is displayed. Specify the IP address of the target KW2D Series RFID Reader with the [RFID Reader List] dialog box. For details, see "[RFID Reader List] Dialog Box" on page 4-14.

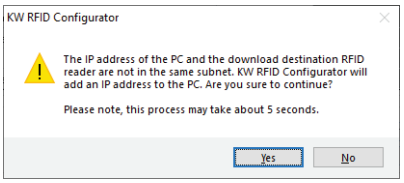
(4) Progress bar

Displays the progress of the download.

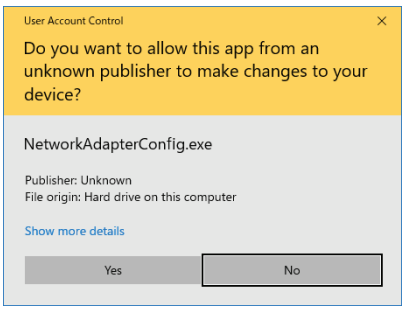
(5) [Execute] button

Executes the download of the project.

- A confirmation message is displayed if the firmware version of the KW2D Series RFID Reader differs from the version included with KW RFID Configurator.
  - To update the firmware of the KW RFID Configurator, click the [Yes] button. The firmware of the KW2D Series RFID Reader will be updated and the download will start.
  - To keep the firmware of the KW RFID Configurator, click the [No] button. The download will start without updating the firmware of the KW2D Series RFID Reader.
  - Click the [Cancel] button to return to the KW RFID Configurator.
- If a download password was set for the KW2D Series RFID Reader project, the [Confirm Password] dialog box is displayed. Enter the password and click the [OK] button. The download will start only if the password matches. For the download password, see "(4) Password Settings" on page 4-18.
- If the IP address of the KW2D Series RFID Reader connected by the Ethernet cable is not in the same subnet as the computer running KW RFID Configurator, you must set an IP address in the same subnet for the computer. The KW RFID Configurator has a function to add an IP address in the same subnet as the KW2D Series RFID Reader to the computer.
  Click the [Yes] button on Message 1. Message 2 is displayed. Click the [Yes] button on Message 2. The IP address is automatically added.
  This function is available in functions that connect to the RFID reader, such as downloading, uploading, and monitoring.
  - Message 1

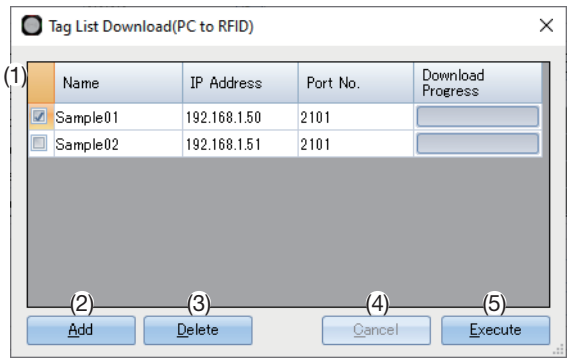


  - Message 2



• [Tag List Download (PC to RFID)] Dialog Box

This dialog box is used to download only the tag list settings in the project to the KW2D Series RFID Reader. The tag list settings can be batch downloaded to multiple KW2D Series RFID Readers (50 maximum).



(1) List of download targets

Displays the list of target KW2D Series RFID Readers.

(Download target check box) : Select this check box to download the tag list to the corresponding KW2D Series RFID Reader.

Name : Displays the name of the KW2D Series RFID Reader.

IP Address : Displays the IP address of the KW2D Series RFID Reader.

Port No. : Displays the port number of the KW2D Series RFID Reader.

Download Progress : Displays the progress of the download.
"Completed" is displayed when the download finishes normally. "Failed" is displayed when the download finishes with an error.

(2) [Add] button

Adds a KW2D Series RFID Reader to the list of download targets.
The [RFID Reader List] dialog box is displayed. Specify the IP address of the target KW2D Series RFID Reader with the [RFID Reader List] dialog box. For details, see "[RFID Reader List] Dialog Box" on page 4-14.

(3) [Delete] button

Deletes the selected KW2D Series RFID Reader from the list of download targets.

(4) [Cancel] button

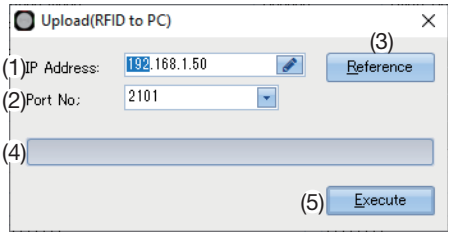
Cancels the download of the tag list and returns to the KW RFID Configurator.

(5) [Execute] button

Executes the download of the tag list.

- **[Upload(RFID to PC)] Dialog Box**

This dialog box is used to upload the project from the KW2D Series RFID Reader.



(1) IP Address

Specifies the IP address of the source KW2D Series RFID Reader.

(2) Port No.

Select the port number of the source KW2D Series RFID Reader from "2101" or "2102".

(3) [Reference] button

The [RFID Reader List] dialog box is displayed. Specify the IP address of the source KW2D Series RFID Reader with the [RFID Reader List] dialog box. For details, see "[RFID Reader List] Dialog Box" on page 4-14.

(4) Progress bar

Displays the progress of the upload.

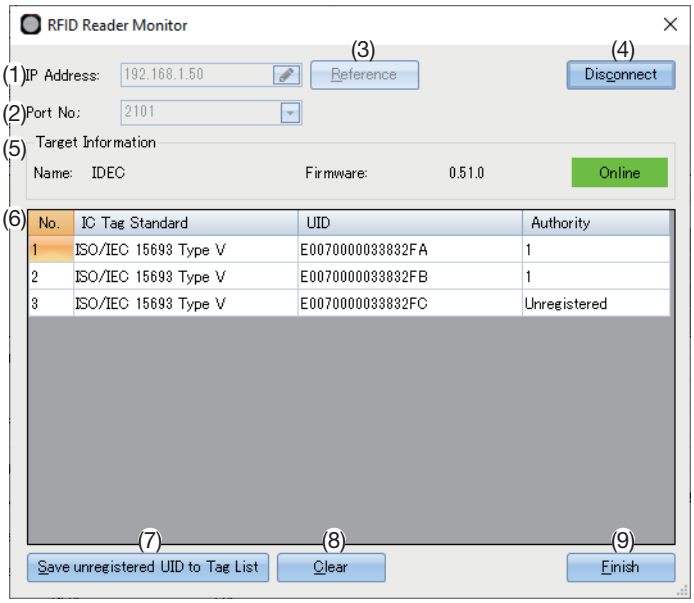
(5) [Execute] button

Executes the upload of the project.

If an upload password was set for the KW2D Series RFID Reader project, the [Confirm Password] dialog box is displayed. Enter the password and click the [OK] button. The upload will start only if the password matches. For the upload password, see "(4) Password Settings" on page 4-18.

• [RFID Reader Monitor] Dialog Box

This dialog box is used to monitor a KW2D Series RFID Reader.



(1) IP Address

Specifies the IP address of the KW2D Series RFID Reader to monitor.

(2) Port No.

Select the port number of the KW2D Series RFID Reader to monitor from "2101" or "2102".

(3) [Reference] button

The [RFID Reader List] dialog box is displayed. Specify the KW2D Series RFID Reader to monitor with the [RFID Reader List] dialog box. For details, see "[RFID Reader List] Dialog Box" on page 4-14.

(4) [Connect] button / [Disconnect] button

Connects or disconnects the KW2D Series RFID Reader to monitor.

The [IP Address], [Port No.], and [Reference] buttons are disabled while the KW2D Series RFID Reader is connected.

- When connecting to a KW2D Series RFID Reader, monitoring will start if the KW RFID Configurator tag list and the tag list in the KW2D Series RFID Reader are the same. If the KW RFID Configurator tag list and the tag list in the KW2D Series RFID Reader are different, a confirmation message will be displayed.
  - To upload the tag information from the tag list in the KW2D Series RFID Reader and then connect to the RFID reader, click the [Yes] button.
  - To connect to the KW2D Series RFID Reader without uploading the tag information from its internal tag list, click the [No] button. However, it is recommended to perform the upload before monitoring.
  - Click the [Cancel] button to return to the [RFID Reader Monitor] dialog box without starting monitoring.
- When connecting to a KW2D Series RFID Reader, if previously read tag information exists in the tag list, a confirmation message is displayed.
  - To discard the tag information and connect to the RFID reader, click the [Yes] button.
  - To keep the tag information and connect to the RFID reader, click the [No] button.
- A confirmation message is displayed if the project being edited is not saved.
  - To save the project, click the [Yes] button. Monitoring will start after the project is saved.
  - To discard the changes to the project, click the [No] button. Monitoring will start without saving the project.
  - Click the [Cancel] button to return to the [RFID Reader Monitor] dialog box without starting monitoring.

(5) Target Information

Displays information on the KW2D Series RFID Reader to monitor.

Name	: Displays the name of the KW2D Series RFID Reader.
Firmware	: Displays the firmware version of the KW2D Series RFID Reader.
Online/Offline	: Displays the connection status between the KW RFID Configurator and the KW2D Series RFID Reader.

(6) List of tag information

Displays the list of tag information read by the KW2D Series RFID Reader. A maximum of 50 items of tag information can be displayed. Tag information is not displayed for the 51st and subsequent items.

No.	: Displays the number (1 to 50) of the tag information that was read.
IC Tag Standard	: Displays the RFID tag standard of the tag information that was read.
UID	: Displays the UID of the tag information that was read.
Authority	: Displays the authority of the tag information that was read. "Unregistered" is displayed if the authority was not registered.

(7) [Save unregistered UID to Tag List] button

Registers UIDs with [Authority] set to [Unregistered] to the tag list of the project being edited.
A confirmation message is displayed. Click the [Yes] button. The KW2D Series RFID Reader is disconnected and the UIDs are registered to the tag list.
Click the [No] button to return to the [RFID Reader Monitor] dialog box without registering UIDs.

(8) [Clear] button

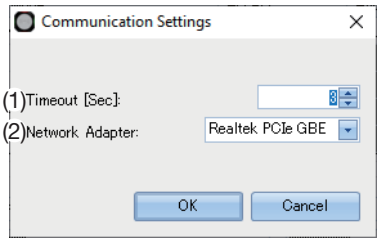
Deletes the tag information read from the KW2D Series RFID Reader from the list of tag information.
A confirmation message is displayed. Click the [Yes] button.
Click the [No] button to return to the [RFID Reader Monitor] dialog box without deleting the tag information.

(9) [Finish] button

Closes the [RFID Reader Monitor] dialog box and returns to the KW RFID Configurator.
A confirmation message is displayed when connected to a KW2D Series RFID Reader. Click the [Yes] button.
Click the [No] button to return to the [RFID Reader Monitor] dialog box.

• [Communication Settings] Dialog Box

This dialog box is used to configure the timeout used in maintenance communication and the network adapter in the computer that is used.



(1) Timeout

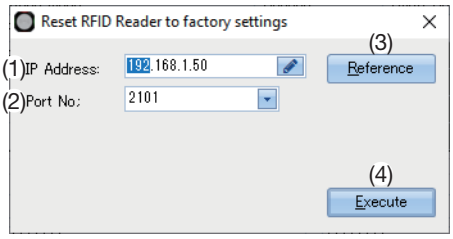
Sets the timeout used in maintenance communication (3 to 10 sec).

(2) Network Adapter

Select the network adapter in the computer that is used. Only enabled network adapters are displayed. Disabled network adapters, such as those not connected with an Ethernet cable, are not displayed.

• [Reset RFID Reader to factory settings] Dialog Box

This dialog box is used to reset a KW2D Series RFID Reader to the factory settings.



(1) IP Address

Specifies the IP address of the KW2D Series RFID Reader to reset to the factory settings.

(2) Port No.

Select the port number of the KW2D Series RFID Reader to reset to the factory settings from "2101" or "2102".

(3) [Reference] button

The [RFID Reader List] dialog box is displayed. Specify the KW2D Series RFID Reader to reset to the factory settings with the [RFID Reader List] dialog box. For details, see "[RFID Reader List] Dialog Box" on page 4-14.

(4) [Execute] button

Executes the reset of the KW2D Series RFID Reader.

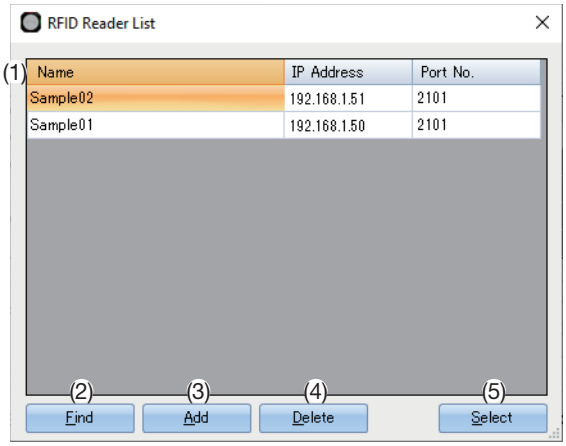
A confirmation message is displayed. Hold an RFID tag with factory reset authority up to the KW2D Series RFID Reader to reset within 30 seconds.

- If an RFID tag set with factory reset authority is recognized, a reset completed message is displayed. Click the [OK] button. You are returned to the [Reset RFID Reader to factory settings] dialog box.
- If an RFID tag set with factory reset authority is not recognized, a reset failed message is displayed. Click the [OK] button. You are returned to the [Reset RFID Reader to factory settings] dialog box without resetting the RFID reader.

  For details on factory reset authority, see "(5) Factory reset authority" on page 4-21.

- **[RFID Reader List] Dialog Box**

This dialog box is used to manage the KW2D Series RFID Readers that connect to the computer over maintenance communication.



(1) Target list

Displays the list of target KW2D Series RFID Readers.

Name	:	Displays the name of the KW2D Series RFID Reader. To change the name, double-click the cell when selected, and then enter the new name.
IP Address	:	Displays the IP address of the KW2D Series RFID Reader. To change the IP address, double-click the cell when selected, and then enter the new IP address.
Port No.	:	Displays the port number of the KW2D Series RFID Reader. To change the port number, click the cell when selected, and then select the port number from "2101" or "2102".

(2) [Find] button

Searches for KW2D Series RFID Reader on the same network that can be connected to the computer over maintenance communication.
Information on KW2D Series RFID Readers that were found is added to the target list. A maximum of 50 devices can be added.

(3) [Add] button

Adds a target KW2D Series RFID Reader to the target list.
A new row is added to the target list. Set the name, IP address, and port number. A maximum of 50 devices can be added.

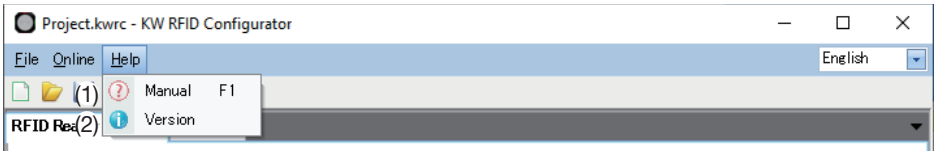
(4) [Delete] button

Deletes a target KW2D Series RFID Reader from the target list.

(5) [Select] button

Returns to the original dialog box and registers the KW2D Series RFID Reader selected in the target list.
If the KW2D Series RFID Reader with the IP address is already registered in the original dialog box, an error message is displayed.

Help



(1) Manual

Displays the included manual (PDF).

(2) Version

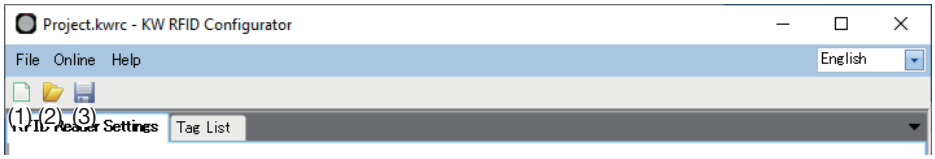
Displays version information about the KW RFID Configurator.

The [About KW RFID Configurator] dialog box is displayed. You can check the KW RFID Configurator version with this dialog box.

For details, see "Checking the KW RFID Configurator Version Number" on page 4-2.

Toolbar

Command buttons to create a new project, open a project, and save a project are located on the toolbar.



(1) New Project

Creates a new project. For details, see "(1) New Project" on page 4-5.

(2) Open Project

Displays a created project. For details, see "(2) Open Project" on page 4-5.

(3) Save Project

Saves the project being edited.

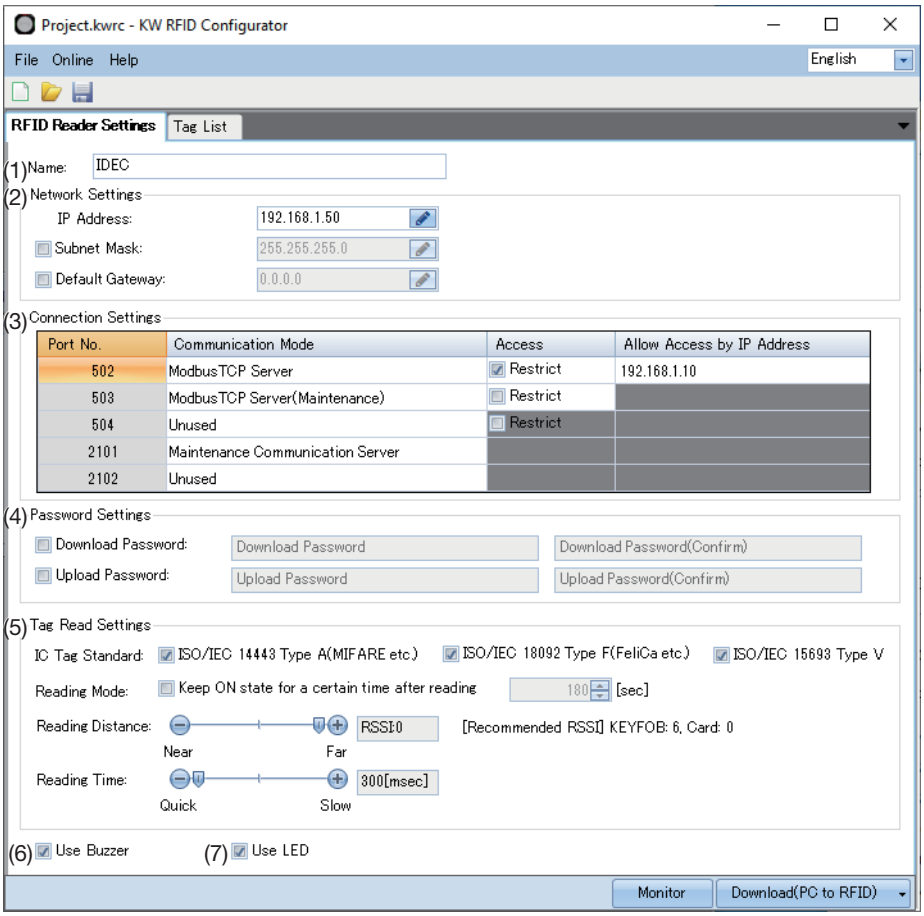
If a new project was created, the [Save Project As] dialog box is displayed. Enter the file name (*.kwrc) and click the [Save] button to save the project file.

Settings Tabs

These tabs are used to configure the basic settings of the KW2D Series RFID Reader and to set the authority of RFID tag UIDs.

- **[RFID Reader Settings] Tab**

  This tab is used to configure the basic settings of the KW2D Series RFID Reader.



(1) Name

Enter the name of the KW2D Series RFID Reader. Up to 16 bytes can be set as ASCII characters.

(2) Network Settings

Sets information for connecting the KW2D Series RFID Reader to a network.

IP Address : Specifies the IP address of the KW2D Series RFID Reader.
The input format is "xxx.xxx.xxx.xxx". "xxx" stands for a numeric value from 0 to 255.
Ensure that IP addresses are unique when connecting multiple devices to the same network.

Subnet Mask : To change the subnet mask of the KW2D Series RFID Reader, select this check box and specify the subnet mask.
The input format is "xxx.xxx.xxx.xxx". "xxx" stands for a numeric value from 0 to 255.
Set the same value on all devices. If this check box is cleared, the value is "255.255.255.0".

Default Gateway : To change the default gateway of the KW2D Series RFID Reader, select this check box and specify the default gateway.
The input format is "xxx.xxx.xxx.xxx". "xxx" stands for a numeric value from 0 to 255.
Set this value to use a router. Leave this value blank if not required.

(3) Connection Settings

Sets the connections to use for the KW2D Series RFID Reader. The port numbers used in Ethernet communication by the KW2D Series RFID Reader and the assigned communication modes are as follows.

502 : "ModbusTCP Server" is the assigned communication mode.
To restrict access to the KW2D Series RFID Reader, select the [Restrict] check box, and then enter the IP address from which access is allowed in the [Allow Access by IP Address] field.

503 : "ModbusTCP Server(Maintenance)" is the assigned communication mode.
To restrict access to the KW2D Series RFID Reader, select the [Restrict] check box, and then enter the IP address from which access is allowed in the [Allow Access by IP Address] field.

504 Select "Unused" or "ModbusTCP Server(Maintenance)" for the communication mode.
If "ModbusTCP Server(Maintenance)" is selected, access to the KW2D Series RFID Reader can be restricted. To restrict access to the KW2D Series RFID Reader, select the [Restrict] check box, and then enter the IP address from which access is allowed in the [Allow Access by IP Address] field.

2101 : "Maintenance Communication Server" is the assigned communication mode.

2102 : Select "Unused" or "Maintenance Communication Server" for the communication mode.

(4) Password Settings

Download Password : Select this check box to password protect downloading the project to the KW2D Series RFID Reader.

- Download Password : Enter the password. The entered characters are masked with * (asterisks).
  The length of the password is 8 to 16 characters. Only single-byte alphanumeric characters and symbols can be used.
  The password can be set only when the [Download Password] check box is selected.
- Download Password(Confirm) : Enter the same password that you entered in [Download Password].

Upload Password : Select this check box to password protect uploading the project from the KW2D Series RFID Reader.

- Upload Password : Enter the password. The entered characters are masked with * (asterisks).
  The length of the password is 8 to 16 characters. Only single-byte alphanumeric characters and symbols can be used.
  The password can be set only when the [Upload Password] check box is selected.
- Upload Password(Confirm) : Enter the same password that you entered in [Upload Password].

Manage the passwords appropriately so that third parties do not know them. If you forget the download password, use the [Reset RFID Reader to factory settings] function in the KW RFID Configurator to reset the RFID reader. The project saved in the KW2D Series RFID Reader will be deleted and the settings will be reset to the factory settings.
For details, see "[Reset RFID Reader to factory settings] Dialog Box" on page 4-13.

(5) Tag Read Settings

IC Tag Standard : Select the check boxes of the IC tag standards to read with the KW2D Series RFID Reader.
"ISO/IEC 14443 Type A(MIFARE etc.)", "ISO/IEC 18092 Type F(FeliCa etc.)", "ISO/IEC 15693 Type V"

Reading Mode : To keep the ON state for a certain amount of time after reading the RFID tag, select the [Keep ON state for a certain time after reading] check box and specify the amount of time to keep the ON state (1 to 28,800 sec).

Reading Distance : Specify the distance at which the KW2D Series RFID Reader can read RFID tags in 8 steps by sliding the slider or clicking ⊖/⊕.
The RSSI value (0 to 7) of each specified step is displayed to the right of the slider.
The RSSI value indicates the received signal strength, which is the signal strength when the KW2D Series RFID Reader reads the RFID tag. An RSSI value of 7 (near) means the strongest signal strength and a value of 0 (far) means the weakest signal strength. The signal strength becomes smaller the further the distance between the KW2D Series RFID Reader and RFID tag. For this reason, the KW2D Series RFID Reader controls the distance between the RFID reader and RFID tag by judging the detection of the RFID tag only when the RSSI value is greater than or equal to the set RSSI value.
For example, when the RSSI value is 7 (received signal strength: maximum), reading signal strengths lower than 7 is abandoned.

Reading Time : Specify the response time to read the RFID tag in 10 steps by sliding the slider or clicking ⊖/⊕.
The time (300 to 3000 msec in increments of 300 msec) of each specified step is displayed to the right of the slider.

(6) Use Buzzer

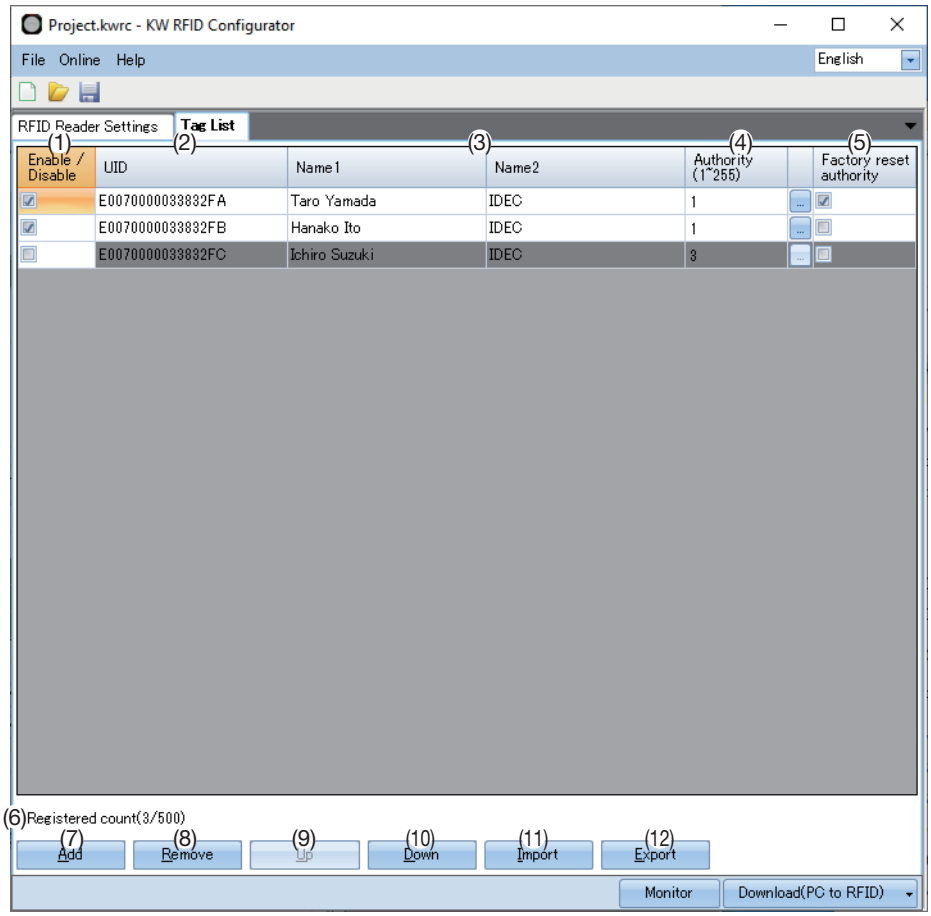
Select this check box to sound the buzzer according to the operation of the KW2D Series RFID Reader.

(7) Use LED

Select this check box to turn on or flash the LEDs according to the operation of the KW2D Series RFID Reader.

- **[Tag List] Tab**

This tab is used to batch manage the tags used with the KW2D Series RFID Reader on the tag list.



(1) Enable / Disable

Select this check box to enable the RFID tag.

All RFID tag settings are downloaded to the KW2D Series RFID Reader regardless of check box selections.

(2) UID

Enter the UID of the RFID tag. The UID can be entered up to 20 digits only with characters that can be used as hexadecimal digits. If the number of digits is odd, "0" is added to the end of the UID to make the number of digits even.

Be careful not to enter duplicate UIDs. If you enter a UID that is already registered, an error message is displayed and that UID cannot be registered.

(3) Name1, Name2

Enter any name freely. The maximum length is 18 bytes.

The character encoding set for [Character Code of Tag List] on the [Project Property] dialog box is used. If there are characters that cannot be converted, those characters are displayed as "?". For details, see "[Project Property] Dialog Box" on page 4-6.

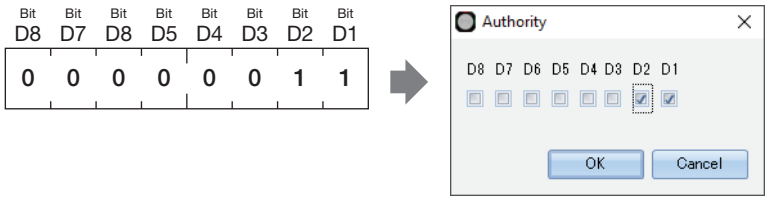
(4) Authority

Specifies the authority (1 to 255) for the UID.

Click [...] to display the [Authority] dialog box.

Select the check boxes to turn the bits on and off. The set authority is displayed in bit format. Assigning the devices to control to each bit makes the authority easier to use.

For example, when the authority is 3, the value is "00000011" in binary. Select the D1 and D2 check boxes.



Change the check boxes on the [Authority] dialog box and click the [OK] button. The authority is updated when the dialog box is closed.

(5) Factory reset authority

An RFID tag set with factory reset authority is used when resetting the KW2D Series RFID Reader in situations such as when the download password is forgotten. Select this check box to set the authority to allow the KW2D Series RFID Reader to be reset. The RFID tag can be used to reset the KW2D Series RFID Reader in situations such as when the download password is forgotten.

Always select the [Factory reset authority] check box for one or more RFID tags. An error will occur when downloading the project to the KW2D Series RFID Reader if the [Factory reset authority] check box is cleared for all RFID tags.

(6) Registered count

Displays the number of registered RFID tags.

(7) [Add] button

Adds an RFID tag to the list. A maximum of 500 RFID tags can be added.

(8) [Remove] button

Deletes the selected RFID tag from the list.

(9) [Up] button

Moves the selected RFID tag up in the list.

(10) [Down] button

Moves the selected RFID tag down in the list.

(11) [Import] button

The [Open] dialog box is displayed.

Select a tag list that was exported to a CSV file (.csv) or a Unicode text file (.txt) and click the [Open] button. The selected tag list is imported into the tag list.

The tag list being edited is also overwritten.

(12) [Export] button

The [Save Project As] dialog box is displayed.

Select the location to save the file, enter a file name, and then click the [Save] button. The tag list being edited is saved as a CSV file (.csv) or a Unicode text file (.txt).

The saved tag list can be imported with the [Import] button.

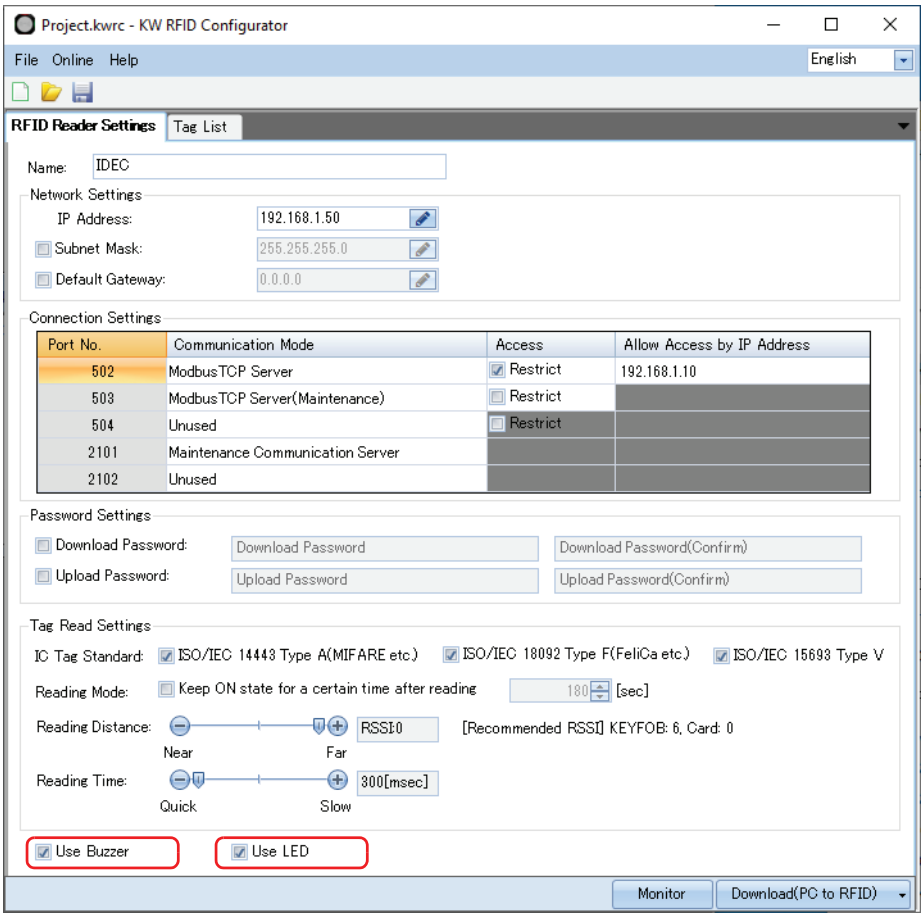
Chapter 5 Functions and Settings

This chapter describes the basic operations and functions of the KW2D Series RFID Reader.

Operation Variations

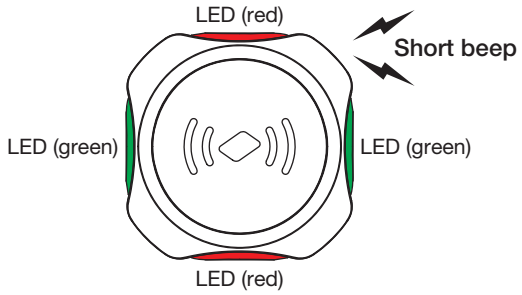
Basic Operations Using the Buzzer and LEDs

You can check the status of the KW2D Series RFID Reader with the buzzer and LEDs. To use the buzzer and LEDs, select the [Use Buzzer] and [Use LED] check boxes on the [RFID Reader Settings] tab in the KW RFID Configurator.



• When Starting and Resetting the RFID Reader

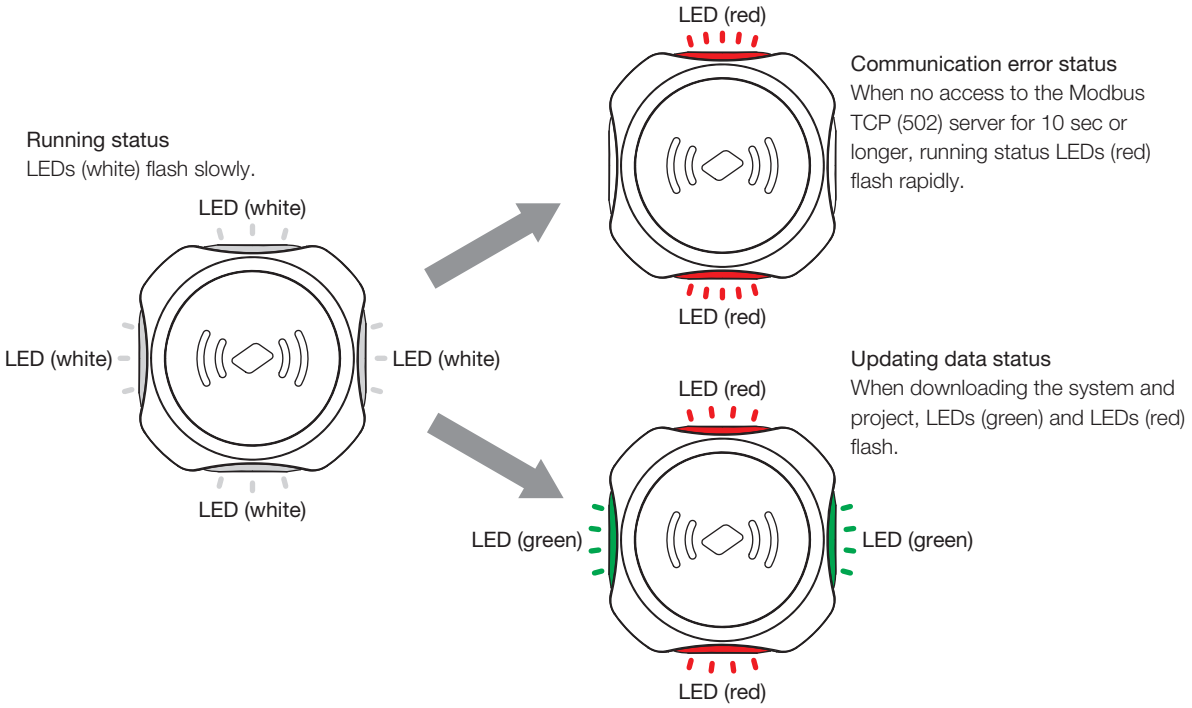
The LEDs (green) and LEDs (red) turn on for 2 sec. This indicates the KW2D Series RFID Reader is performing initialization processing.



Status	LED Indicator	Buzzer Sound	Description
When starting	LEDs (green) on LEDs (red) on	One short beep	KW2D Series RFID Reader is performing initialization processing

• Running

The LEDs indicate the status in which RFID tags can be read.
RFID tags are read periodically according to [IC Tag Standard] specified on the [RFID Reader Settings] tab in the KW RFID Configurator.
If the IC tag standards are not specified, all supported IC tag standards are read.



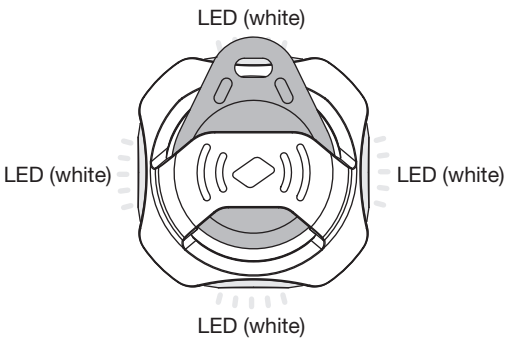
Status	LED Indicator	Buzzer Sound	Description
Running	LEDs (white) slow flashing	None	RFID tags can be read
Communication error	LEDs (red) rapid flashing	None	Access to Modbus TCP (502) server was lost for 10 sec or longer
Updating data	LEDs (green) flashing LEDs (red) flashing	None	System downloading or project downloading

- RFID tags are not detected while updating data.
- The RFID reader is reset and restarted after the system or program is downloaded.

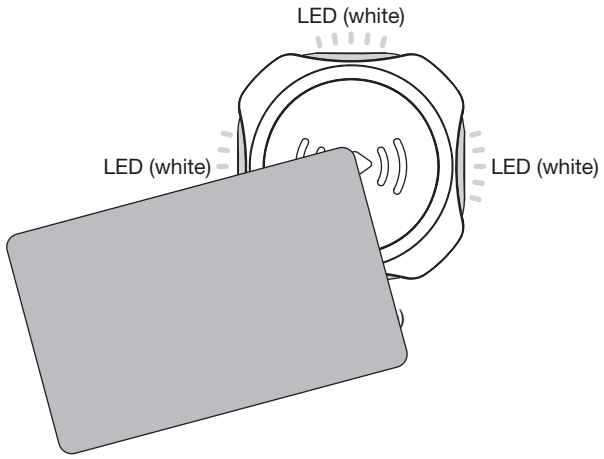
• RFID Tag Detection

When an RFID tag is detected, the LEDs (white) flash rapidly. After detection, the RFID reader waits for verification and host device reading.

KEYFOB type



Card type

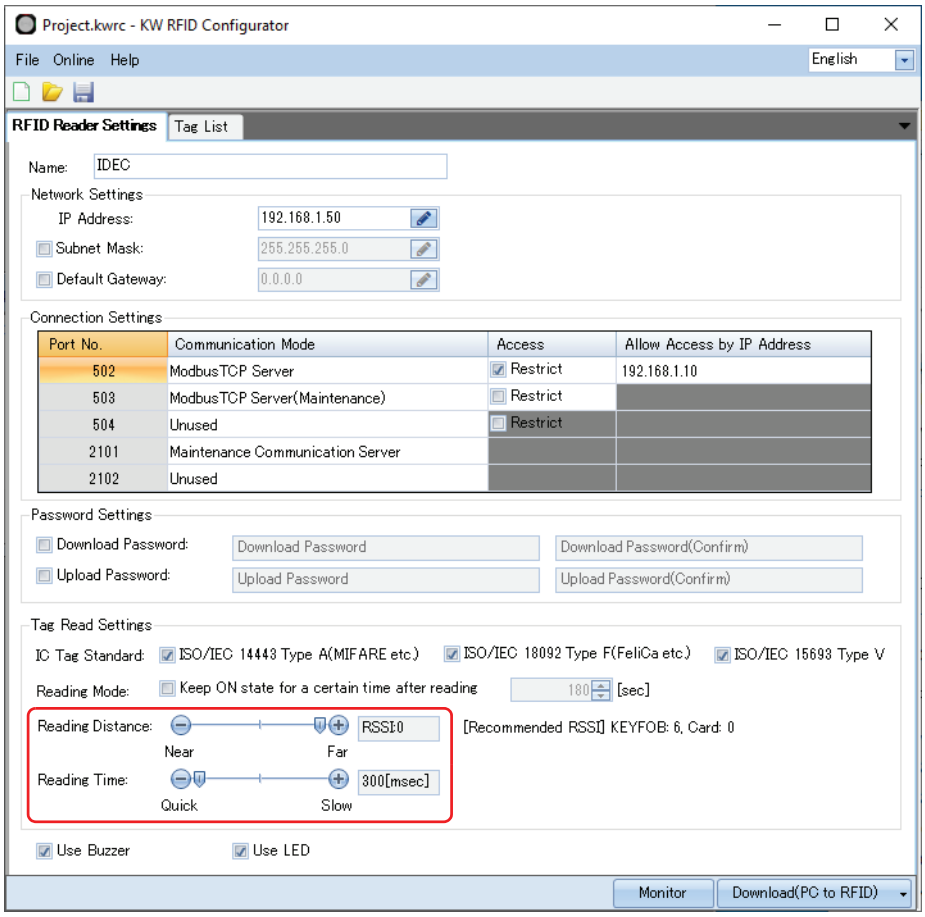


Status	LED Indicator	Buzzer Sound	Condition
Detecting	LEDs (white) rapid flashing	None	Detecting RFID card (tag)

- A transition may be made to the result immediately depending on the communication status.
- RFID tags are not detected if two or more tags are held up to the RFID reader.
- The illustration of the card type above is an example of the LED indicators when the RFID tag is detected. This illustration does not provide any guarantees as to the detection position of the RFID tag.

RFID Tag Detection

On the [RFID Reader Settings] tab in KW RFID Configurator, you can change [Reading Distance] and [Reading Time] for RFID tags.



- For [Reading Distance], specify the distance from the RFID tag to the KW2D Series RFID Reader as a value between 7 (near) and 0 (far). This distance is shown as the RSSI (received signal strength) value in eight steps.
- For [Reading Time], specify the response time from when the RFID tag is held up to the KW2D Series RFID Reader as a value between 300 msec (quick) and 3000 msec (slow). The value can be set in 10 steps in increments of 300 msec.
  The response time has a margin of error of -300 msec. This means the response time is detected between 300 to 600 msec when 600 msec is specified.
  Increase the response time to prevent detection of RFID tags when they mistakenly touch the KW2D Series RFID Reader.

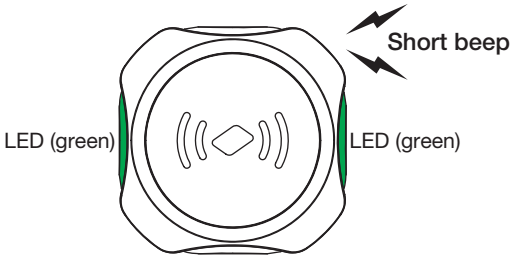
When using a KW2D Series RFID Reader with a tag holder, the tag may be detected before the tag is placed in the holder. Set the reading distance to RSSI value: 7 (near) to prevent detection of the tag before it is placed in the holder.

• Detection Result

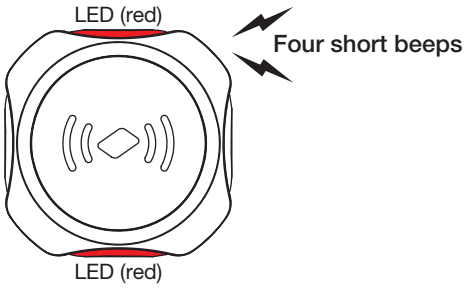
One of the following statuses is shown depending on the verification result and communication status with the Modbus TCP server (502).

Status	LED Indicator	Buzzer Sound	Description
Normal	LEDs (green) on	One short beep	Verification match and normal communication with host device
Verification error	LEDs (red) on	Four short beeps	Verification mismatch
Host communication error	LEDs (red) rapid flashing	Three long beeps	Verification match and communication error with host device

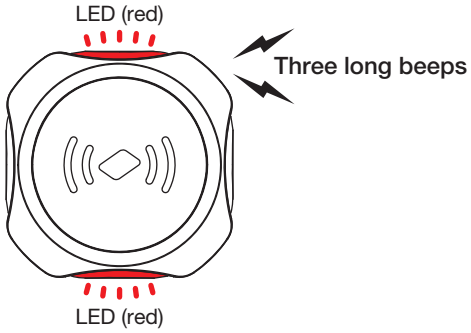
Normal (verification OK and communication OK)



Verification error (verification failure)



Host communication error (verification OK and communication failure)



If the tag list was not registered, the OK/failure judgment is performed by turning on the OK command or failure command from the host device. The OK command or failure command is given by turning the following coil relay on and off.

Status	LED Indicator	Buzzer Sound	Description
OK command	LEDs (green) on	One short beep	OK command from host device
Failure command	LEDs (red) on	Four short beeps	Failure command from host device
No command	LEDs (red) rapid flashing	Three long beeps	No command from host device

Coil Relays

Use the following coil relay to give the OK command or failure command.

Coil Relay (00****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0007	OK command*1	ON: Turn on OK command, OFF: No command	R/W	0
0008	Failure command*1	ON: Turn on failure command, OFF: No command	R/W	0

*1 The failure command has priority when both commands are turned on at the same time.

• Verification Result References

The verification result can be checked with the following input relays and input registers. The verification result is held for a maximum of 3 sec after the RFID tag is detected.
If the RFID reader does not transition to the lock operation, the verification result is set to the initial value and the RFID reader transitions to running.

Input Relays

Input Relay (10****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0001	Verification result OK	This input relay is turned on if the RFID tag verification result is OK.	R	0
0002	Verification result failure	This input relay is turned on if the RFID tag verification result is failure.	R	0
0009 to 0016	Authority	Authority of the detected RFID tag, 1 to 255: Authority	R	0

Input Registers

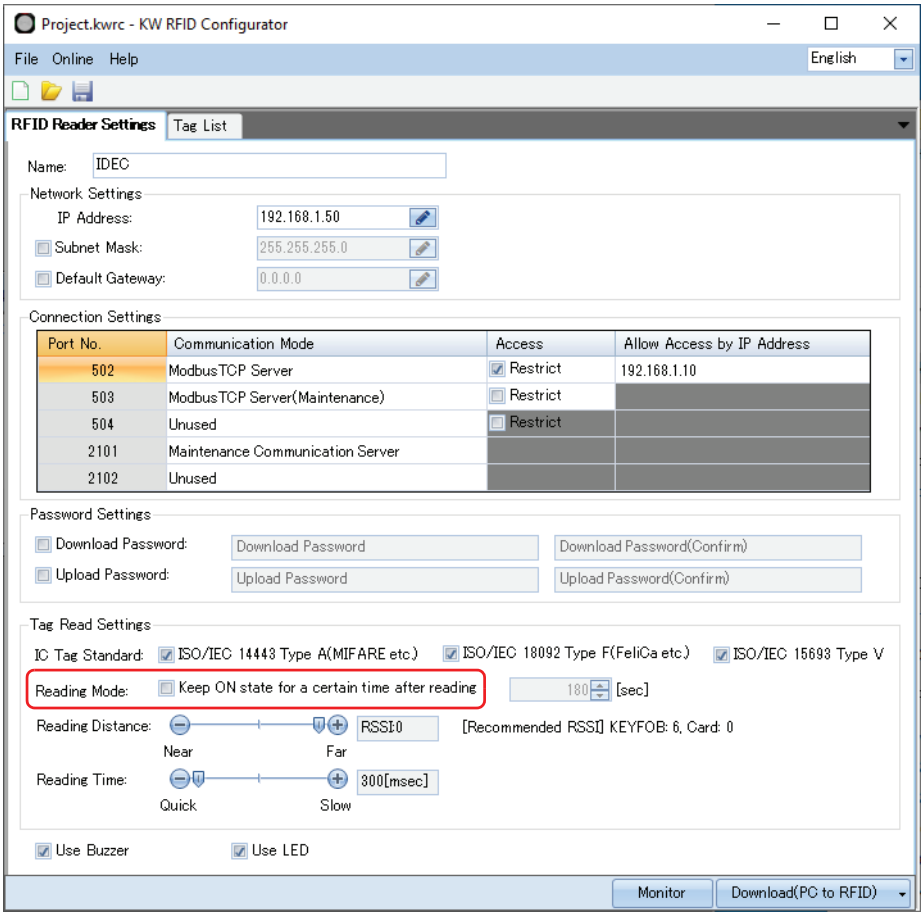
Input Register (30****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0002	Authority (judgment result)	0: Mismatch, 1 to 255: Authority, FFFFh: Reading	R	FFFFh
0003	Number of UID bytes	Number of bytes (1 to 10, 0 is UID not stored)	R	0
0004	UID	Stored in order of upper byte (1st byte) and lower byte (2nd byte)	R	0
0005	UID	Stored in order of upper byte (3rd byte) and lower byte (4th byte)	R	0
0006	UID	Stored in order of upper byte (5th byte) and lower byte (6th byte)	R	0
0007	UID	Stored in order of upper byte (7th byte) and lower byte (8th byte)	R	0
0008	UID	Stored in order of upper byte (9th byte) and lower byte (10th byte)	R	0
0009 to 0011	Reserved	0 (fixed)	R	0
0012	Name1	Stored in order of upper byte (1st character) and lower byte (2nd character)	R	0
0013	Name1	Stored in order of upper byte (3rd character) and lower byte (4th character)	R	0
0014	Name1	Stored in order of upper byte (5th character) and lower byte (6th character)	R	0
0015	Name1	Stored in order of upper byte (7th character) and lower byte (8th character)	R	0
0016	Name1	Stored in order of upper byte (9th character) and lower byte (10th character)	R	0
0017	Name1	Stored in order of upper byte (11th character) and lower byte (12th character)	R	0
0018	Name1	Stored in order of upper byte (13th character) and lower byte (14th character)	R	0
0019	Name1	Stored in order of upper byte (15th character) and lower byte (16th character)	R	0
0020	Name1	Stored in order of upper byte (17th character) and lower byte (18th character)	R	0
0021	Reserved	0 (fixed)	R	0
0022	Name2	Stored in order of upper byte (1st character) and lower byte (2nd character)	R	0
0023	Name2	Stored in order of upper byte (3rd character) and lower byte (4th character)	R	0
0024	Name2	Stored in order of upper byte (5th character) and lower byte (6th character)	R	0
0025	Name2	Stored in order of upper byte (7th character) and lower byte (8th character)	R	0
0026	Name2	Stored in order of upper byte (9th character) and lower byte (10th character)	R	0
0027	Name2	Stored in order of upper byte (11th character) and lower byte (12th character)	R	0
0028	Name2	Stored in order of upper byte (13th character) and lower byte (14th character)	R	0
0029	Name2	Stored in order of upper byte (15th character) and lower byte (16th character)	R	0
0030	Name2	Stored in order of upper byte (17th character) and lower byte (18th character)	R	0

The used character encoding is the character encoding set in KW RFID Configurator.
For the character encoding, see "(4) Character Code of Tag List" on page 4-6.

Lock Operation

If the detection result is normal, the KW2D Series RFID Reader can transition to the lock operation.

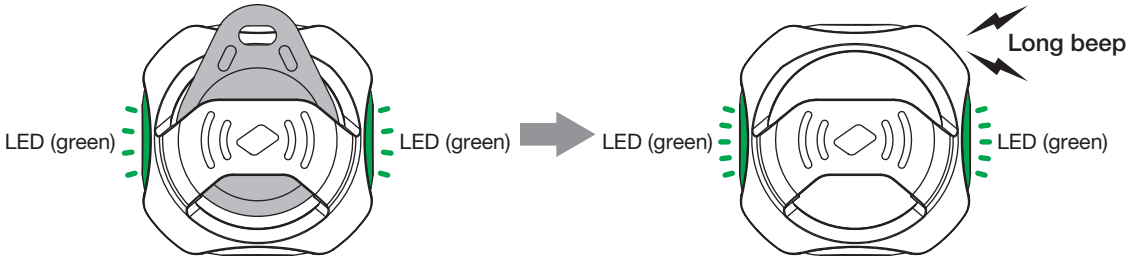
The behavior of the lock operation depends on whether the [Keep ON state for a certain time after reading] check box is selected under [Reading Mode] on the [RFID Reader Settings] tab in the KW RFID Configurator.



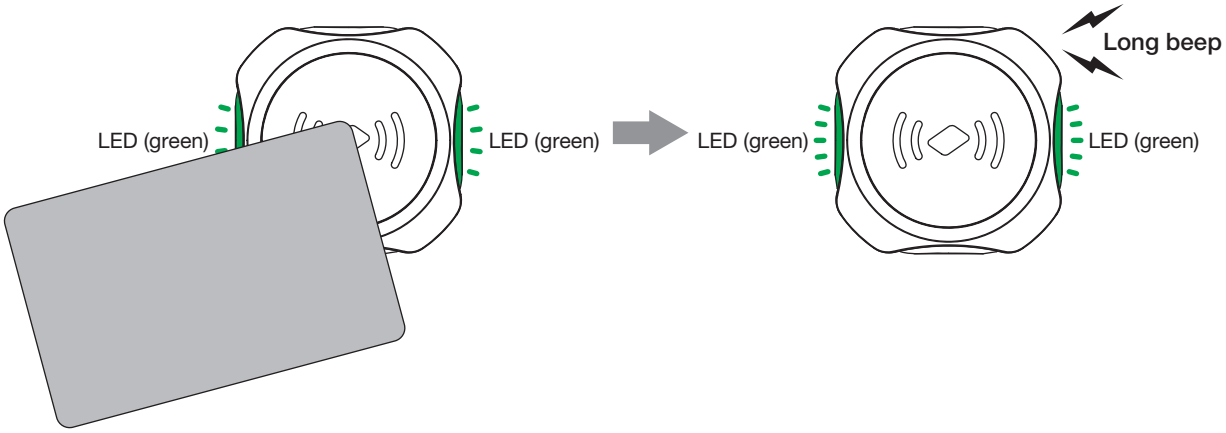
When the [Keep ON state for a certain time after reading] Check Box Is Cleared

The verification result is held (locked) while the RFID tag is set in the tag holder or the RFID tag is held up to the RFID reader. When the RFID tag is removed, the verification result is cleared (unlocked), and the RFID reader resumes running.

• When an RFID tag is set in the tag holder



• When an RFID tag is held up to the KW2D Series RFID Reader



Status	LED Indicator	Buzzer Sound	Description
Lock operation	LEDs (green) flashing	None	During lock operation No other RFID tags are accepted during lock operation.
Canceling lock operation	LEDs (green) rapid flashing	One long beep	Canceling lock operation

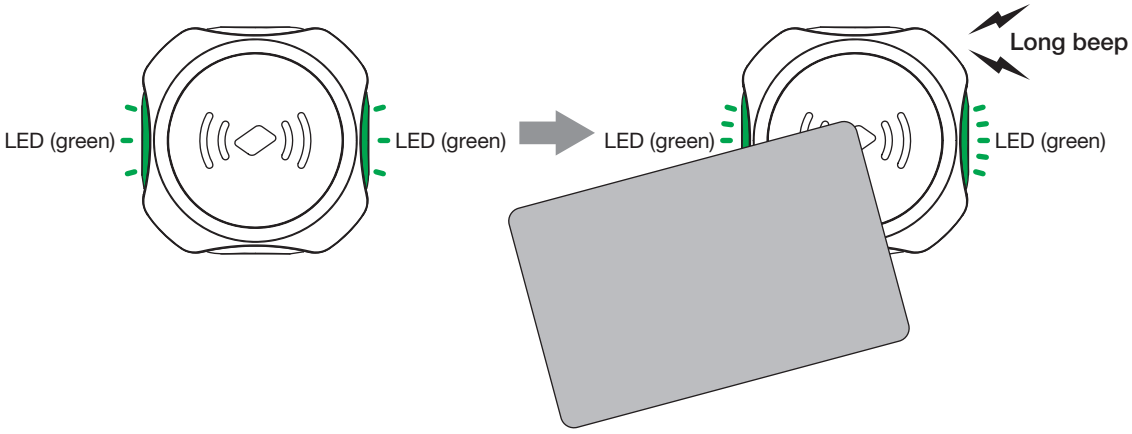
- When an RFID tag is held up to the RFID reader and locked, if another RFID tag is held up to the RFID reader, the RFID tags can longer be detected and the lock is cleared.
  Do not hold two or more RFID tags up to the RFID reader.
- The illustration of the card type above is an example of the LED indicators when the RFID tag is detected. This illustration does not provide any guarantees as to the detection position of the RFID tag.

When the [Keep ON state for a certain time after reading] Check Box Is Selected

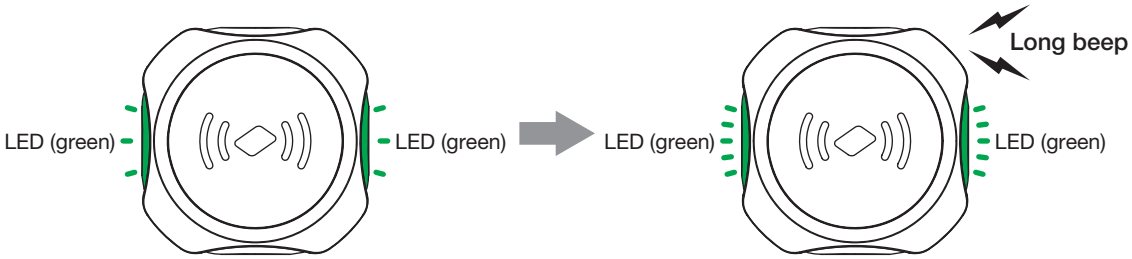
When an RFID tag is held up to the RFID tag reader, the verification result is held. When the same RFID tag is held up again, the lock is cleared, the verification result is cleared, and the RFID reader resumes running. In order to prevent the lock from becoming stuck in the locked state, the lock is automatically cleared after the lock time elapses, the verification result is cleared, and the RFID reader resumes running.

The lock time can be set between 1 and 28800 sec in increments of 1 sec.

• When the RFID tag is held up again and the lock is forcibly cleared



• When the lock is cleared due to exceeding the lock time (when the lock time is set to 7 sec or longer)



Status	LED Indicator	Buzzer Sound	Description
Canceling lock operation (Forced cancellation)	LEDs (green) rapid flashing	One long beep	Lock is forcibly cleared due to holding up RFID tag, etc.
Canceling lock operation (Time exceeded)	LEDs (green) rapid flashing	One long beep	Lock is cleared due to exceeding time

- While locked during the lock time, the RFID reader will not respond even when other RFID tags are held up to it. The RFID reader will remain locked.
- The illustration of the card type above is an example of the LED indicators when the RFID tag is detected. This illustration does not provide any guarantees as to the detection position of the RFID tag.

Pausing the Lock Operation and Canceling the Lock

The lock operation can be changed from the host device using coil relays.
You can forcibly cancel the lock by turning on coil relay 0002. To stop the lock time and continue the lock, you can pause the timer for the lock time by turning on coil relay 0003.
You can check the lock time with input register 0032 while the timer is running.

Coil Relays

Coil Relay (00****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0002	Forcibly cancel lock command	Cancels the lock operation 0: No cancel lock operation command, 1: Turn on cancel lock operation command	R/W	0
0003	Forcibly stop timer for lock time command	Stops the timer for the lock time 0: No command, 1: Turn on stop timer for lock time command	R/W	0

Input Register

Input Register (30****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0032	Lock time	Lock time (counts down)	R	0

Stopping the KW2D Series RFID Reader

The KW2D Series RFID Reader can be stopped from the host device using the coil relay. When the KW2D Series RFID Reader is stopped, all LEDs turn off and RFID tag detection processing is stopped.
The operation status of the KW2D Series RFID Reader can be checked with input relay 0008.

Coil Relay

Coil Relay (00****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0001	Stop RFID command	Stops KW2D Series RFID Reader detection processing of RFID tags. Restores original operation when canceled. 0: Cancel stop command, 1: Stop command	R/W	0

Input Relay

Input Relay (10****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0008	RFID operation status	KW2D Series RFID Reader operation status 0: Running, 1: Stopped	R	0

Remote Control of Buzzer and LEDs

The buzzer and LED indicators can be controlled from the host device using coil relays. Even when using the buzzer and LEDs in the standard IDEC specifications by selecting the [Use Buzzer] and [Use LED] check boxes on the [RFID Reader Settings] tab in the KW RFID Configurator, the buzzer and LEDs can also be controlled by enabling the manual controls.

Coil Relays

Coil Relay (00****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0009	Enable manual control of buzzer	Controls the buzzer. 0: Follow setting, 1: Enable manual control of buzzer	R/W	0
0010	Control buzzer	Turns the buzzer on/off. 0: Turn off buzzer, 1: Turn on buzzer	R/W	0
0011	Enable manual control of LEDs (red)	Controls the LEDs (red). 0: Follow setting, 1: Enable manual control of LEDs (red)	R/W	0
0012	Control LEDs (red)	Turns the LEDs (red) on/off. 0: Turn off LEDs (red), 1: Turn on LEDs (red)	R/W	0
0013	Enable manual control of LEDs (white)	Controls the LEDs (white). 0: Follow setting, 1: Enable manual control of LEDs (white)	R/W	0
0014	Control LEDs (white)	Turns the LEDs (white) on/off. 0: Turn off LEDs (white), 1: Turn on LEDs (white)	R/W	0
0015	Enable manual control of LEDs (green)	Controls the LEDs (green). 0: Follow setting, 1: Enable manual control of LEDs (green)	R/W	0
0016	Control LEDs (green)	Turns the LEDs (green) on/off. 0: Turn off LEDs (green), 1: Turn on LEDs (green)	R/W	0

KW2D Series RFID Reader Functions

Read UID Function

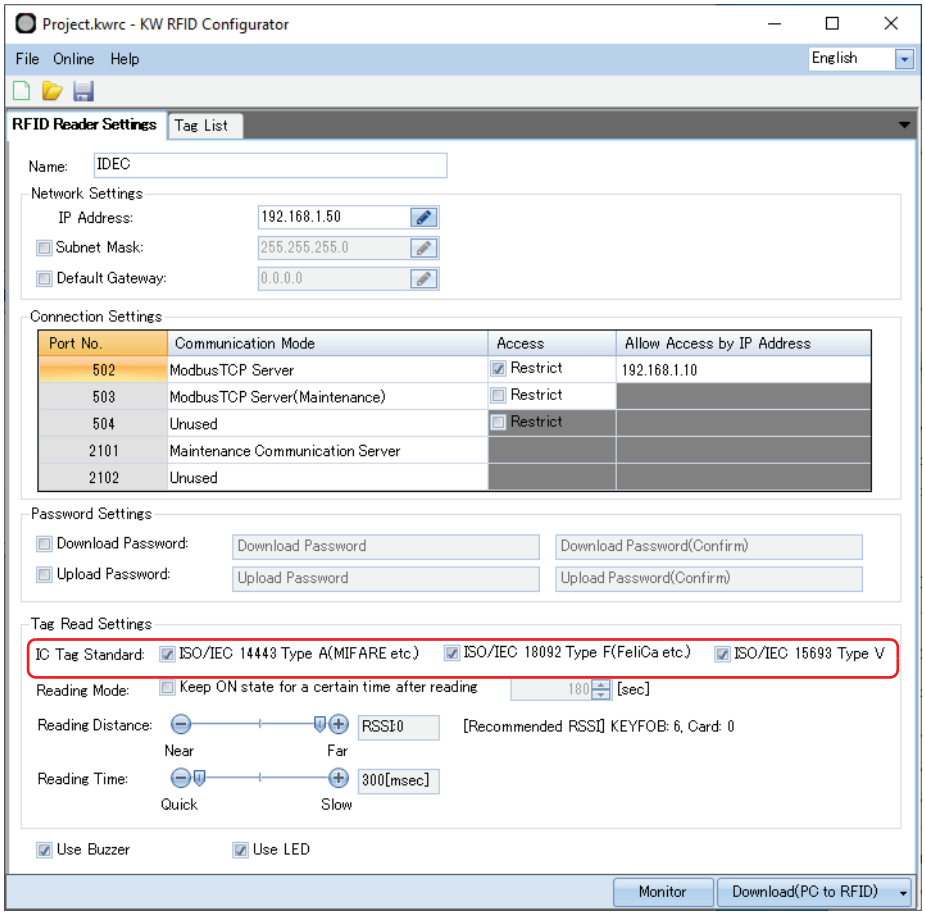
The KW2D Series RFID Reader is equipped with an antenna (13.56 MHz band) to read the UIDs of RFID tags. The following three types of IC tag standards are supported.

ISO/IEC 1443A (TYPE-A)

ISO/IEC 18092 (TYPE-F)

ISO/IEC 15693 (TYPE-V)

With the factory settings, the RFID reader detects RFID tags that support the three types of IC tag standards. On the [RFID Reader Settings] tab, you can change the IC tag standards that are detected.



UID Verification Function

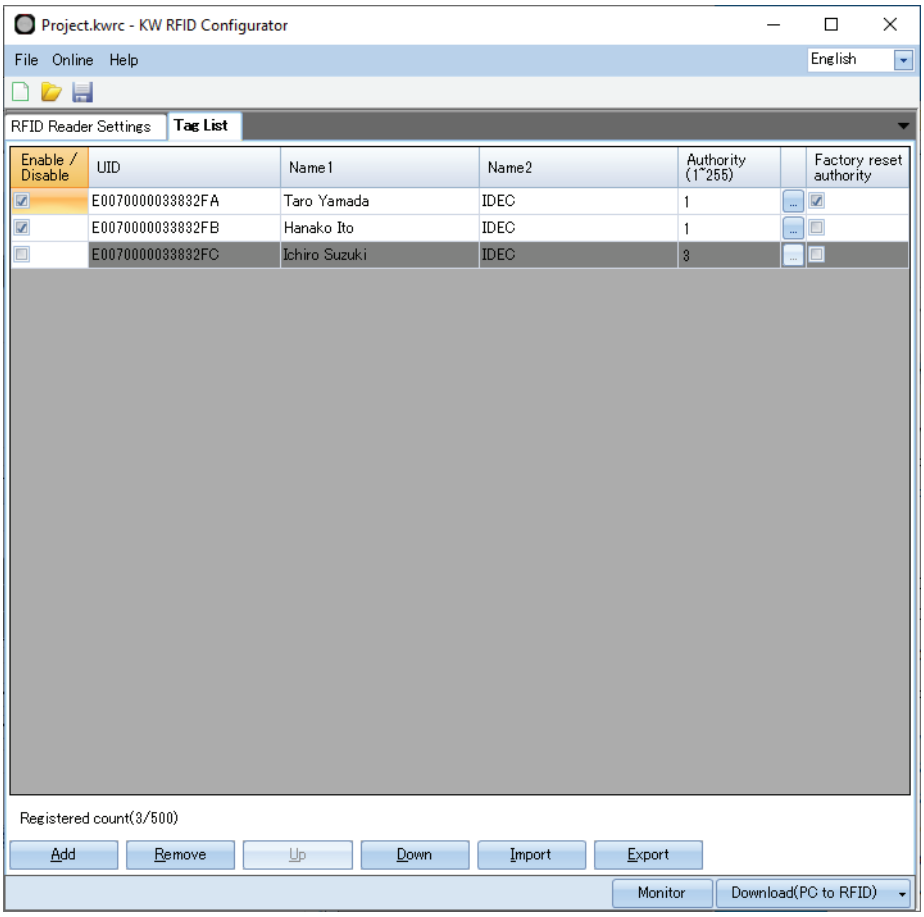
This function verifies the UID in the RFID tag against UIDs that were registered in advance. UIDs are registered on the [Tag List] tab in KW RFID Configurator. For the UIDs that are registered, a 1-byte authority (1 to 255) can be specified for each UID, which allows 255 authorities to be divided by UID differences. A maximum of 500 items of tag information can be registered.
In this manual, tag information includes the UID, authority, Name1, and Name2.
The tag information obtained in verification can be read by the host device and used to restrict the operation of equipment and to manage a usage history.
When creating the tag list, you can monitor the UIDs read with the KW2D Series RFID Reader and register those to the tag list.

Tag Information Contents

Tag Information	Description	Explanation
UID	Maximum 10 bytes of data	In verification, any match other than a complete match of the UID is a failure.
Name1	Maximum 18 bytes	Used to explain the UID. This information is not used by the KW2D Series RFID Reader.
Name2	Maximum 18 bytes	
Authority	1 byte (1 to 255)	If an unregistered UID is read, the authority is read as 0.

[Tag List] Tab

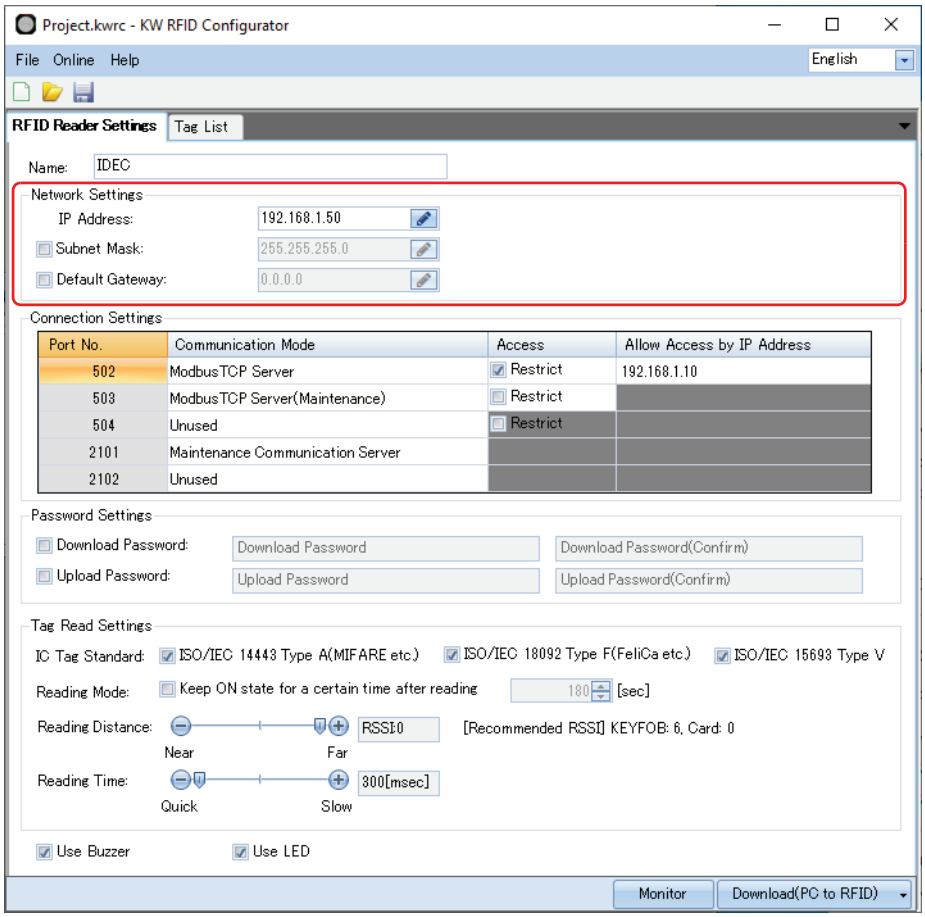
For details, see "Chapter 4 [Tag List] Tab" on page 4-20.



Ethernet Communication Function

- **Network Settings**

The KW2D Series RFID Reader is equipped with one Ethernet port and can communicate with Ethernet communication-compatible host devices such as computers and PLCs. The factory setting of the IP address for the KW2D Series RFID Reader Ethernet port is 192.168.1.50. This setting can be changed on the [RFID Reader Settings] tab in the KW RFID Configurator.



Caution

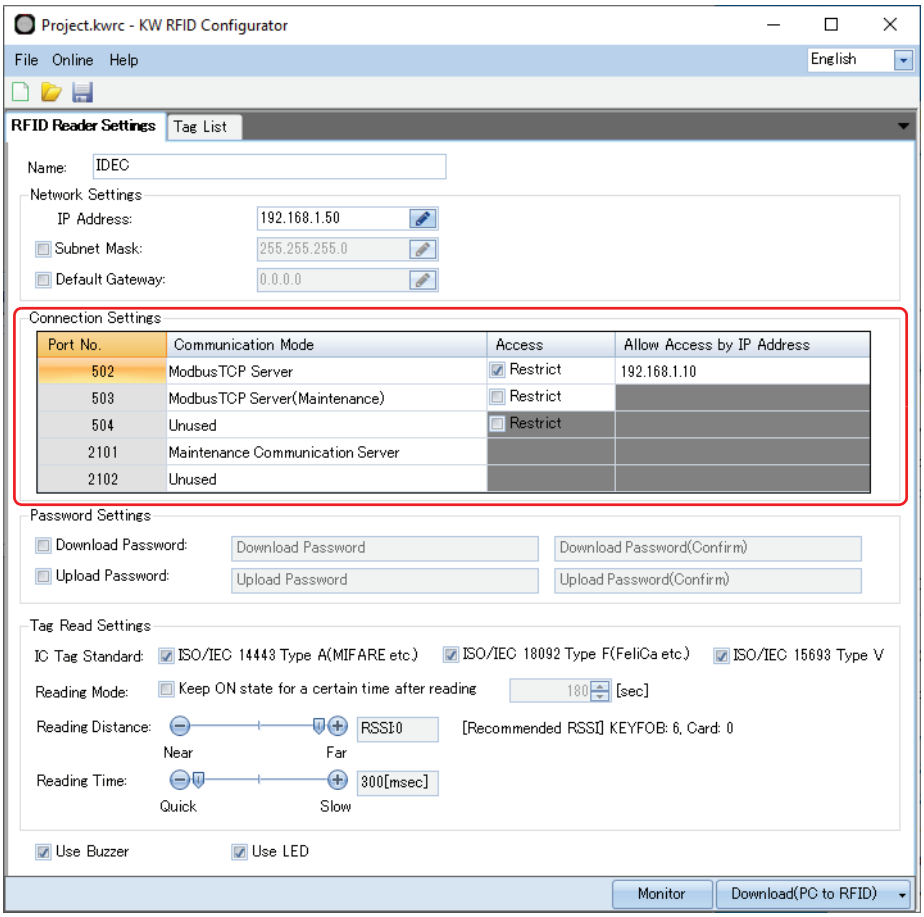
- When the KW2D Series RFID Reader is connected to the internet, adequate security measures for the network are required, such as those to prevent invalid access. Always consult with your network administrator and internet service provider. IDEC Corporation bears no responsibility for damages and problems in security that occur in communication over the internet.
- As a security measure, always use a firewall or another tool and block accessible IP addresses and ports.

• Connection Settings

A maximum of three Modbus TCP server connections and a maximum of two maintenance communication server connections are supported for communication modes.

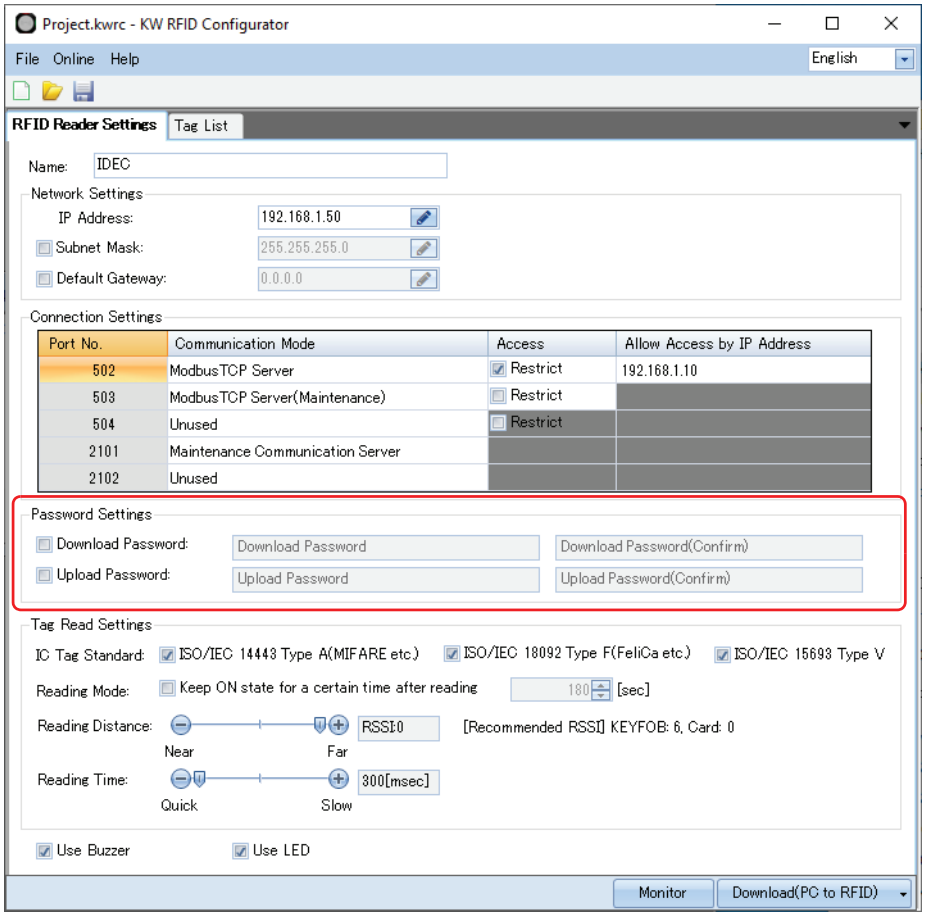
- Modbus TCP server (port number: 502, 503, and 504)
- Maintenance communication server (port number: 2101 and 2102)

Modbus TCP server (port number: 502) is the communication mode for reading the verification result of RFID tags. If communication is lost for 10 seconds or longer, the red LEDs on the KW2D Series RFID Reader flash.
To monitor the status of the KW2D Series RFID Reader with another device, you can use Modbus TCP server (port number: 503 and 504). If Modbus TCP server (port number: 504) will not be used, select "Unused".
The client that accesses the Modbus TCP server port can be restricted by selecting the [Restrict] check box in the [Access] column.
Maintenance communication server (port number: 2101 and 2102) is the communication mode for a connection to the KW RFID Configurator.



Projects

Use KW RFID Configurator to configure KW2D Series RFID Reader settings and create a tag list. A project is the general term for the created KW2D Series RFID Reader settings and tag list to which UIDs and authorities are registered. You can password protect the project when downloading the project to the KW2D Series RFID Reader and when uploading the project from the KW2D Series RFID Reader by setting the following passwords in the project.



Modbus TCP Server

Communication Specifications

Item	Specifications
Supported protocol	Modbus TCP server
Maximum number of simultaneous clients	1 client per port
Port No.	502, 503, and 504 (fixed) You can select to use or not use port 504.
Access control	One IP address can be specified per port. (Set in KW RFID Configurator)
Supported function codes	01: Read coil status (000001 to 000016) 02: Read input relay status (100001 to 100032) 03: Read holding register status (400001 to 400032) 04: Read input register status (300001 to 300032) 05: Change one coil status (000001 to 000016) 06: Write one holding register (400001 to 400032) 15: Change N coil statuses (000001 to 000016) 16: Write N holding registers (400001 to 400032)
Function	• Read tag information • Read status information • Control LEDs and buzzer

Shared Memory

Shared memory is memory accessed from a Modbus TCP client.

Input Relays (100001 to 100032)

Input relays can be read in bit units.

02: Read input relay status (100001 to 100032)

Input Relay (10****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0001*1	Verification result OK	Turns on if the RFID tag verification result is OK.	R	0
0002*1	Verification result failure	Turns on if the RFID tag verification result is failure.	R	0
0003	Port 502 communication status	Indicates the communication status of the Modbus TCP server (port 502). 0: Communicating, 1: Not communicating	R	0
0004	RFID reader settings status	Indicates whether the KW2D Series RFID Reader has basic settings (project). 0: Has settings, 1: No settings	R	0
0005	Tag list status	Indicates whether the KW2D Series RFID Reader has a tag list. 0: Has a tag list, 1: No tag list	R	0
0006 to 0007	Reserved		R	-
0008	RFID operation status	Indicates the operation status of the KW2D Series RFID Reader. 0: Running, 1: Stopped	R	0
0009*1, *2	Authority D1	Indicates the authority of the detected RFID tag. 1 to 255: Authority	R	0
0010*1, *2	Authority D2			
0011*1, *2	Authority D3			
0012*1, *2	Authority D4			
0013*1, *2	Authority D5			
0014*1, *2	Authority D6			
0015*1, *2	Authority D7			
0016*1, *2	Authority D8			
0017*1	KW2D Series special tag detection	0: KW2D Series special tag not detected, 1: KW2D Series special tag detected	R	0
0018 to 0032	Reserved		R	-

*1 The verification result is held for a maximum of 3 sec after the RFID tag is detected. Then it is set with the initial value.

*2 Authority

When a tag list is registered : The UID is verified against the tag list. If OK, the authority registered in the tag list is read. For a KW2D special tag, if authority 1 to 254 is specified in the tag list, the authority registered in the tag list is read. If 255 is specified in the tag list, the authority added to the tag is read.

When a tag list is not registered : For a KW2D special tag, the authority held in the tag is read. For other tags, 255 is read.

Coil Relays (000001 to 000016)

Coil relays can be read and written in bit units.

01: Read coil status (000001 to 000016)

05: Change one coil status (000001 to 000016)

15: Change N coil statuses (000001 to 000016)

Coil Relay (00****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0001	Stop RFID command	Stops KW2D Series RFID Reader detection processing of RFID tags. Restores original operation when canceled. 0: Cancel stop command, 1: Stop command	R/W	0
0002	Forcibly cancel lock command	Cancels the lock operation. 0: No cancel lock operation command, 1: Turn on cancel lock operation command	R/W	0
0003	Forcibly stop timer for lock time command	Stops the timer for the lock time. 0: No command, 1: Turn on stop timer for lock time command	R/W	0
0004 to 0006	Reserved		R/W	-
0007	OK command	ON: Turn on OK command, OFF: No command	R/W	0
0008	Failure command	ON: Turn on failure command, OFF: No command	R/W	0
0009	Enable manual control of buzzer	Controls the buzzer. 0: Follow setting, 1: Enable manual control of buzzer	R/W	0
0010	Control buzzer	Turns the buzzer on/off. 0: Turn off buzzer, 1: Turn on buzzer	R/W	0
0011	Enable manual control of LEDs (red)	Controls the LEDs (red). 0: Follow setting, 1: Enable manual control of LEDs (red)	R/W	0
0012	Control LEDs (red)	Turns the LEDs (red) on/off. 0: Turn off LEDs (red), 1: Turn on LEDs (red)	R/W	0
0013	Enable manual control of LEDs (white)	Controls the LEDs (white). 0: Follow setting, 1: Enable manual control of LEDs (white)	R/W	0
0014	Control LEDs (white)	Turns the LEDs (white) on/off. 0: Turn off LEDs (white), 1: Turn on LEDs (white)	R/W	0
0015	Enable manual control of LEDs (green)	Controls the LEDs (green). 0: Follow setting, 1: Enable manual control of LEDs (green)	R/W	0
0016	Control LEDs (green)	Turns the LEDs (green) on/off. 0: Turn off LEDs (green), 1: Turn on LEDs (green)	R/W	0

Input Registers (300001 to 300032)

Input registers can be read in word units.

04: Read input register status (300001 to 300032)

Input Register (30****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0001	Reserved		R	-
0002*1, *2	Authority (judgment result)	0: Mismatch, 1 to 255: Authority, FFFFh: Reading	R	FFFFh
0003*1	Number of UID bytes	Number of bytes (1 to 10, 0 is UID not stored)	R	0
0004*1	UID	Stored in order of upper byte (1st byte) and lower byte (2nd byte)	R	0
0005*1	UID	Stored in order of upper byte (3rd byte) and lower byte (4th byte)	R	0
0006*1	UID	Stored in order of upper byte (5th byte) and lower byte (6th byte)	R	0
0007*1	UID	Stored in order of upper byte (7th byte) and lower byte (8th byte)	R	0
0008*1	UID	Stored in order of upper byte (9th byte) and lower byte (10th byte)	R	0
0009 to 0011*1	Reserved		R	-
0012*1	Name1	Stored in order of upper byte (1st character) and lower byte (2nd character)	R	0
0013*1	Name1	Stored in order of upper byte (3rd character) and lower byte (4th character)	R	0
0014*1	Name1	Stored in order of upper byte (5th character) and lower byte (6th character)	R	0
0015*1	Name1	Stored in order of upper byte (7th character) and lower byte (8th character)	R	0
0016*1	Name1	Stored in order of upper byte (9th character) and lower byte (10th character)	R	0
0017*1	Name1	Stored in order of upper byte (11th character) and lower byte (12th character)	R	0
0018*1	Name1	Stored in order of upper byte (13th character) and lower byte (14th character)	R	0
0019*1	Name1	Stored in order of upper byte (15th character) and lower byte (16th character)	R	0
0020*1	Name1	Stored in order of upper byte (17th character) and lower byte (18th character)	R	0
0021*1	Reserved		R	-
0022*1	Name2	Stored in order of upper byte (1st character) and lower byte (2nd character)	R	0
0023*1	Name2	Stored in order of upper byte (3rd character) and lower byte (4th character)	R	0
0024*1	Name2	Stored in order of upper byte (5th character) and lower byte (6th character)	R	0
0025*1	Name2	Stored in order of upper byte (7th character) and lower byte (8th character)	R	0
0026*1	Name2	Stored in order of upper byte (9th character) and lower byte (10th character)	R	0
0027*1	Name2	Stored in order of upper byte (11th character) and lower byte (12th character)	R	0
0028*1	Name2	Stored in order of upper byte (13th character) and lower byte (14th character)	R	0
0029*1	Name2	Stored in order of upper byte (15th character) and lower byte (16th character)	R	0
0030*1	Name2	Stored in order of upper byte (17th character) and lower byte (18th character)	R	0
0031	Reserved		R	-
0032	Lock time	Lock time (counts down)	R	0

*1 The verification result is held for a maximum of 3 sec after the RFID tag is detected. Then it is set with the initial value.

*2 Authority

When a tag list is registered : The UID is verified against the tag list. If OK, the authority registered in the tag list is read. For a KW2D special tag, if authority 1 to 254 is specified in the tag list, the authority registered in the tag list is read. If 255 is specified in the tag list, the authority added to the tag is read.

When a tag list is not registered : For a KW2D special tag, the authority held in the tag is read. For other tags, 255 is read.

Holding Registers (400001 to 400032)

Holding registers can be read and written in word units.

03: Read holding register status (400001 to 400032)

06: Write one holding register (400001 to 400032)

16: Write N holding registers (400001 to 400032)

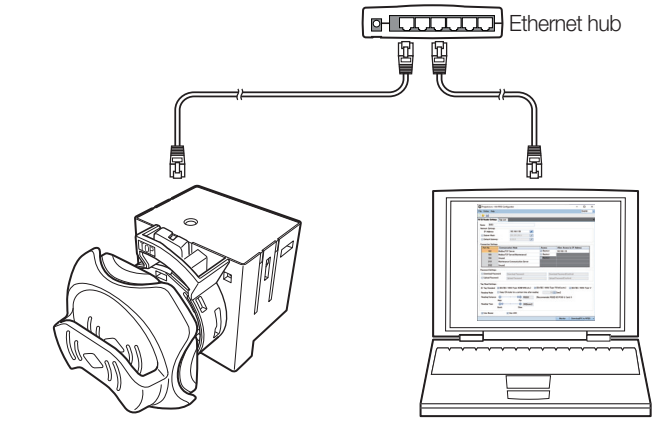
Holding Register (40****)	Description	Explanation	R/W	Initial Value (Hexadecimal)
0001 to 0032	Reserved		R/W	-

Maintenance Communication Server

Maintenance communication server is the communication mode for communication with the KW RFID Configurator. A maximum of two maintenance communication server ports can be used.
The following functions can be executed using a KW2D Series RFID Reader.

- Read/write KW2D Series RFID Reader settings and tag list
- Read UIDs detected by the KW2D Series RFID Reader and monitor status
- Find KW2D Series RFID Readers
- Update KW2D Series RFID Reader firmware

System Configuration Image



Communication Specifications

Item	Specifications
Supported protocol	Maintenance communication server
Maximum number of simultaneous clients	1 client per port
Port No.	2101 and 2102 (fixed) * You can select to use or not use port 2102.
Allow access by IP address	None
Function	• Read/write RFID reader settings and tag list • Monitor UIDs detected by the KW2D Series RFID Reader • Find KW2D Series RFID Readers • Update KW2D Series RFID Reader firmware

Functions

Read/Write RFID Reader Settings and Tag List

You can access a KW2D Series RFID Reader and read/write the KW2D Series RFID Reader communication settings and tag list that contains the tag information for RFID tags to verify. You can also protect KW2D Series RFID Reader settings and tag list with the download password and upload password. See the following sections.

Settings

- Configure the KW2D Series RFID Reader settings : Page 4-17
- Create tag list : Page 4-20

Download

- Write KW2D Series RFID Reader settings and tag list : Page 4-8
- Write tag list : Page 4-9

Upload

- Read KW2D Series RFID Reader settings and tag list : Page 4-10

Monitor UID Information Detected by KW2D Series RFID Reader

You can monitor the tag information detected by a KW2D Series RFID Reader. You can also add the monitored UID information to the tag list.

For how to monitor UID information, see "Chapter 4 [RFID Reader Monitor] Dialog Box" on page 4-11.

Find KW2D Series RFID Readers

If you do not know the IP address of a KW2D Series RFID Reader, you can search for its IP address with the search function.

For how to search for KW2D Series RFID Readers, see "Chapter 4 [RFID Reader List] Dialog Box" on page 4-14.

Update KW2D Series RFID Reader Firmware

You can update the firmware on a KW2D Series RFID Reader. Always using the KW2D Series RFID Reader with the latest firmware is recommended. For how to update the firmware, see "Chapter 4 [Download(PC to RFID)] Dialog Box" on page 4-8.

Chapter 6 Troubleshooting

This chapter describes how to investigate and resolve errors and problems that occur on the KW2D Series RFID Reader.

Errors

Errors on the KW2D Series RFID Reader can be checked with the LEDs (red) and input relays.

Checking Errors with the LED Indicator Colors

The error status can be checked with the LEDs (red). The status of the other LEDs in relation to the LEDs (red) and the status of the KW2D Series RFID Reader is as follows.

LED (red)	LED (white)	LED (green)	Description
Off	Off	Off	Stopped
	Flashing (1 sec)	Off	Running
	Flashing (100 msec)	Off	RFID tag detection
	Off	On	Result OK
	Off	Flashing (250 msec)	During UID hold operation
	Off	Flashing (100 msec)	Canceling UID hold
On	Off	On	Initializing
	Off	Off	Result failure (verification error)
Flashing (100 msec)	Off	Off	Modbus TCP server (port 502) communication error If communication is lost for 10 seconds or longer
Flashing (500 msec)	Off	Flashing (500 msec)	Downloading project

Checking Errors with the Input Relays

Input Relay	Description	Explanation
0001	Verification result OK	Turns on if the RFID tag verification result is OK.
0002	Verification result failure	Turns on if the RFID tag verification result is failure.
0003	Port 502 communication status	Indicates the communication status of the Modbus TCP server (port 502). 0: Communicating, 1: Not communicating
0004	RFID reader settings status	Indicates whether the KW2D Series RFID Reader has basic settings (project). 0: Has settings, 1: No settings
0005	Tag list status	Indicates whether the KW2D Series RFID Reader has a tag list. 0: Has a tag list, 1: No tag list

Troubleshooting

This section describes how to investigate and resolve problems that occur when using the KW2D Series RFID Reader.

Problem	Cause	Action
The LEDs do not turn on or flash.	The [Use LED] check box on [RFID Reader Settings] tab is cleared.	If the [Use LED] check box on [RFID Reader Settings] tab is cleared, select the check box.
		If the [Use LED] check box on [RFID Reader Settings] tab is selected, but the LEDs do not turn on or flash, check the following. Turn on coil relays 0011 to 0016 (enable manual control of LEDs) over Modbus TCP server communication. If the LEDs turn on, there is no problem with the LEDs.
The buzzer does not operate.	The [Use Buzzer] check box on [RFID Reader Settings] tab is cleared.	If the [Use Buzzer] check box on [RFID Reader Settings] tab is cleared, select the check box.
		If the [Use Buzzer] check box on [RFID Reader Settings] tab is selected, but the buzzer does not operate, check the following. Turn on coil relays 0009 and 0010 (enable manual control of buzzer) over Modbus TCP server communication. If the buzzer operates, there is no problem with the buzzer.
Cannot communicate with KW RFID Configurator.	The IP address you are trying to access from the computer does not match the IP address of the KW2D Series RFID Reader.	Directly connect the computer and KW2D Series RFID Reader with an Ethernet cable. Use the search function in KW RFID Configurator to find the KW2D Series RFID Reader. Finally, communicate with the RFID reader using the IP address that was detected.
The IP address of the RFID reader was forgotten.	-	Directly connect the computer and KW2D Series RFID Reader with an Ethernet cable. Use the search function in KW RFID Configurator to find the KW2D Series RFID Reader. Finally, communicate with the RFID reader using the IP address that was detected.
Cannot communicate over Modbus TCP.	[Communication Mode] is set to "Unused" for the port number you are trying to access under [Connection Settings] on the [RFID Reader Settings] tab.	Select "ModbusTCP Server(Maintenance)" and check communication.
	The [Restrict] check box is selected for the port number you are trying to access under [Connection Settings] on the [RFID Reader Settings] tab.	Clear the [Restrict] check box under [Access] and check communication.
The LEDs (red) are flashing.	Communication over Modbus TCP server (port 502) was lost for 10 sec or longer.	Check if a communication error occurred on the Modbus TCP client side.
The upload password set on the RFID reader was forgotten.	-	No method to learn the upload password of the KW2D Series RFID Reader is provided.
The download password set on the RFID reader was forgotten.	-	No method to learn the download password of the KW2D Series RFID Reader is provided. The KW2D Series RFID Reader can be reset to the factory settings, but the project saved in the KW2D Series RFID Reader will be deleted. For details, see "Chapter 4 [Reset RFID Reader to factory settings] Dialog Box" on page 4-13.
RFID tags cannot be detected.	The IC tag standard of the RFID tag is not supported.	RFID tags with unsupported IC tag standards cannot be used.
	IC tag standards are restricted.	Check if the [IC Tag Standard] check boxes to read with the KW2D Series RFID Reader are cleared under [Tag Read Settings] on the [RFID Reader Settings] tab.
	The RFID tag signal strength is weak.	Click ⊕ for [Reading Distance] under [Tag Read Settings] on the [RFID Reader Settings] tab and set the RSSI value to 0 (far). Also make adjustments to [Reading Time]. For details, see "Chapter 4 (5) Tag Read Settings" on page 4-19.
	RFID tags are overlapping or multiple tags are near the front unit.	Keep tags that should not be read 15 cm or more from the front unit.
	There is a device nearby causing electromagnetic interference.	Do not install the KW2D Series RFID Reader near devices that cause electromagnetic interference (examples include electric motors, magnetic valves, and solenoids).
	Metal or a metallic film sticker is applied to RFID tag.	Check if foreign objects are attached to the RFID tag.

Problem	Cause	Action
An error occurs in RFID tag verification.	The RFID tag is not registered.	Connect to the KW2D Series RFID Reader with the monitor function and check the authority of the RFID tag. For details, see "Chapter 4 (7) [Save unregistered UID to Tag List] button" on page 4-12.
Input relay address 0004 is on.	Basic settings (project) were not written to the KW2D Series RFID Reader.	Download the basic settings (project) to the KW2D Series RFID Reader. For details, see "Chapter 4 [Download(PC to RFID)] Dialog Box" on page 4-8.
Input relay address 0005 is on.	A tag list was not written to the KW2D Series RFID Reader.	Download a tag list when performing verification with the KW2D Series RFID Reader. For details, see "Chapter 4 [Tag List Download (PC to RFID)] Dialog Box" on page 4-9.
The password for the project file created in KW RFID Configurator was forgotten.		No method to learn the password set for the project file is provided. Manage the password appropriately so that third parties do not know it.
KW RFID Configurator does not start.	The computer does not satisfy the specifications for the operating environment.	KW RFID Configurator can be used on Windows 10.
The characters in the tag list of a CSV file (.csv) imported with KW RFID Configurator are garbled.	The character encoding of the imported tag list is different from the character encoding of the operating system.	A tag list exported with KW RFID Configurator is encoded using the character encoding of the version of Windows that is used. To import the file, use a computer with the same language settings as the computer that exported the file. To export and import tag lists between operating systems with different languages, select Unicode text (.txt) when exporting the tag list.

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