

RFID System

V680S Series

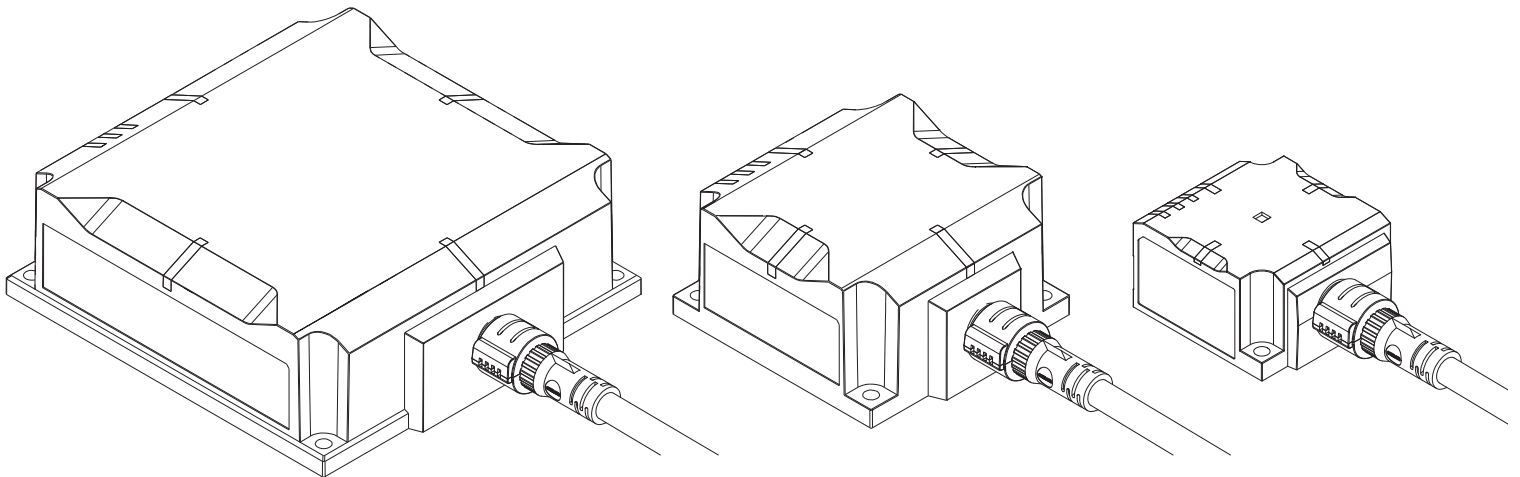
User's Manual
(PROFINET)

Reader/Writer

V680S-HMD63-PNT

V680S-HMD64-PNT

V680S-HMD66-PNT



Introduction

Thank you for purchasing a V680S-series RFID System. This manual describes the functions, performance, and application methods needed for optimum use of the V680S-series RFID System.

Please observe the following items when using the V680S-series RFID System.

- Allow the V680S-series RFID System to be installed and operated only by qualified specialists with a sufficient knowledge of electrical systems.
- Read and understand this manual before attempting to use the RFID System and use the RFID System correctly.
- Keep this manual in a safe and accessible location so that it is available for reference when required.

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RFID System

V680S-HMD63-PNT
V680S-HMD64-PNT
V680S-HMD66-PNT

Reader/Writer
Reader/Writer
Reader/Writer

User's Manual

Terms and Conditions Agreement

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Safety Precautions

■ Definition of Precautionary Information

The following notation and alert symbols are used in this User's Manual to provide precautions required to ensure safe usage of the V680S-HMD63-PNT/V680S-HMD64-PNT/V680S-HMD66-PNT Reader/Writer.

The safety precautions that are provided are extremely important to safety. Always read and heed the information provided in all safety precautions.

The following notation is used.

| | |
|--|---|
|  <b style="font-size: 24px; margin-left: 10px;">WARNING | <p>Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.</p> |
|--|---|

■ Alert Symbols



The filled circle symbol indicates operations that you must do.

The specific operation is shown in the circle and explained in text.

This example on the left shows a general precaution for something that you must do.

■ Warnings

WARNING

Anti-virus protection

Install the latest commercial-quality antivirus software on the computer connected to the control system and maintain to keep the software up-to-date.



Security measures to prevent unauthorized access

Take the following measures to prevent unauthorized access to our products.

- Install physical controls so that only authorized personnel can access control systems and equipment.
- Reduce connections to control systems and equipment via networks to prevent access from untrusted devices.
- Install firewalls to shut down unused communications ports and limit communications hosts and isolate control systems and equipment from the IT network.
- Use a virtual private network (VPN) for remote access to control systems and equipment.
- Adopt multifactor authentication to devices with remote access to control systems and equipment.
- Set strong passwords and change them frequently.
- Scan virus to ensure safety of USB drives or other external storages before connecting them to control systems and equipment.



Data input and output protection

Validate backups and ranges to cope with unintentional modification of input/output data to control systems and equipment.

- Checking the scope of data
- Checking validity of backups and preparing data for restore in case of falsification and abnormalities
- Safety design, such as emergency shutdown and fail-soft operation in case of data tampering and abnormalities

**Data recovery**

Backup data and keep the data up-to-date periodically to prepare for data loss.



When using an intranet environment through a global address, connecting to a SCADA or an unauthorized terminal such as an HMI or to an unauthorized server may result in network security issues such as spoofing and tampering. You must take sufficient measures such as restricting access to the terminal, using a terminal equipped with a secure function, and locking the installation area by yourself.



When constructing an intranet, communication failure may occur due to cable disconnection or the influence of unauthorized network equipment. Take adequate measures, such as restricting physical access to network devices, by means such as locking the installation area.



When using a device equipped with the SD Memory Card function, there is a security risk that a third party may acquire, alter, or replace the files and data in the removable media by removing the removable media or unmounting the removable media. Please take sufficient measures, such as restricting physical access to the Controller or taking appropriate management measures for removable media, by means of locking the installation area, entrance management, etc., by yourself.



Precautions for Safe Use

Observe the following precautions to ensure safe use of the Product.

1. Installation and Storage Environment

- Do not install the Product near any equipment that generates a large amount of heat (such as heaters, transformers, and large-capacity resistors).
- If multiple Reader/Writers are installed near each other, communications performance may decrease due to mutual interference. Refer to *Mutual Interference of Reader/Writers* in *RF Tag Installation Precautions* in *Section 11 Appendices* and check to make sure there is no mutual interference between Reader/Writers.

2. Installation and Removal

- Never use an AC power supply. Doing so may result in rupture.
- Wire the Product correctly. Incorrect wiring may result in rupture or burning.
- Connect the Ethernet Cable to a host device (e.g., Switching Hub or PLC) that supports STP and ground the host device to 100 Ω or less.
- The communications range is adversely affected if there is any metal material around the RF Tag.
- Transmission will not be possible if the front and back panels are mistakenly reversed and the Unit is mounted to a metallic surface.
V680-D1KP66MT
V680S-D2KF67M/-D8KF67M
V680S-D2KF68M/-D8KF68M
- The transmission distance will be reduced when the Unit is not mounted to a metallic surface.
V680-D1KP66MT
V680S-D2KF67M/-D8KF67M
V680S-D2KF68M/-D8KF68M
- The maximum communications range can be obtained when the Antenna faces the RF tag directly. When the RF tag is installed at a tilt, the communications range is reduced. Consider the effect of the RF tag at tilt when installing the RF Tag.
- Provide the mounting distances between plural RF tags to prevent them from malfunctions due to mutual interference.
- if the central axis of an antenna and RF tag shifts, a communications range will fall.
- Do not touch the product immediately after usage at high temperatures, Doing so may occasionally result in burning.

3. Application Methods

- Do not bend the Cable to a bending radius of 40 mm or less. Doing so may break the wires.
- If an error is detected in the Product, immediately stop operation and turn OFF the power supply. Consult with an OMRON representative.

4. Cleaning

- Do not clean the Product with paint thinner, benzene, acetone, or kerosene.

5. Disposal

- Dispose of the Product as industrial waste.

Precautions for Correct Use

Always observe the following precautions to prevent operation failures, malfunctions, and adverse effects on performance and equipment.

1. Installation and Storage Environment

Do not use or store the Product in the following locations.

- Locations subject to combustible gases, explosive gases, corrosive gases, dust, dirt, metal powder, or salt
- Locations where the specified ambient temperature range or ambient humidity range is exceeded
- Locations subject to extreme temperature changes that may result in condensation
- Locations subject to direct vibration or shock outside the specified ranges

2. Installation

- This Product uses a frequency band of 13.56 MHz to communicate with RF Tags. Some transceivers, motors, inverters, switch-mode power supplies, and other devices generate electrical noise that will affect these communications. If any of these devices are located in the vicinity of the Product, they may affect communications with RF Tags, and may possibly damage the RF Tags. Prior to using the Product in the vicinity of any of these devices, perform a test to determine whether the Product can be used under the resulting influence.
- Connect the control signal to the positive and negative sides of the power supply. The control signal is used to change the operation mode of the Reader/Writer.

Refer to *Connector* in *Section 3 Component Names* for the connection methods.



- Do not exceed the rated voltage range. Doing so may result in Product destruction or burning.
- Tighten the mounting screws to a torque of 1.2 N·m.
- Tighten the Cable connector to a torque of 0.39 to 0.49 N·m.
- Mount the two-way Branch Cable with an M4 screw.

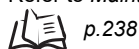
3. Application Methods

- Do not drop the Product.
- Do not pull on the Cables with excessive force.
- Do not attempt to disassemble, repair, or modify the Product.
- If you use the products in an environment that will subject them to oil, confirm that the oil that is used will not adversely affect the resins used in the products.

4. Maintenance

- Perform inspections both daily and periodically.

Refer to *Maintenance and Inspection* in *Section 10 Maintenance and Inspection* for the items to inspect.



Meanings of Symbols



CHECK!

Indicates particularly important points related to a function, including precautions and application advice.



Indicates page numbers containing relevant information.



Indicates reference to helpful information and explanations for difficult terminology.

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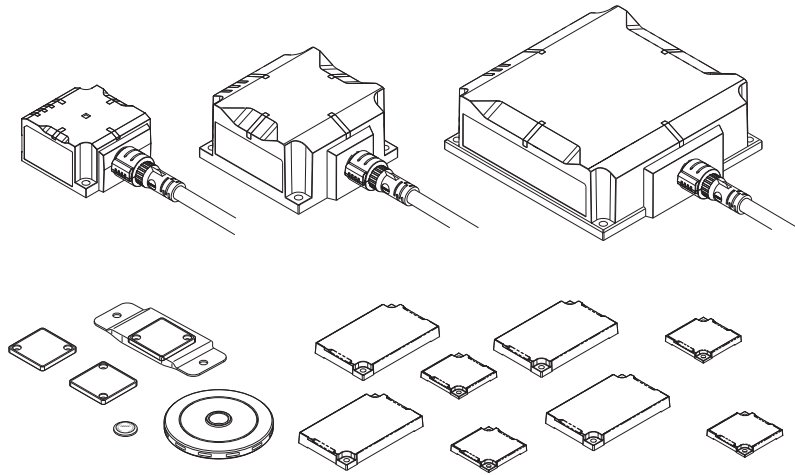
Section 1

Product Overview

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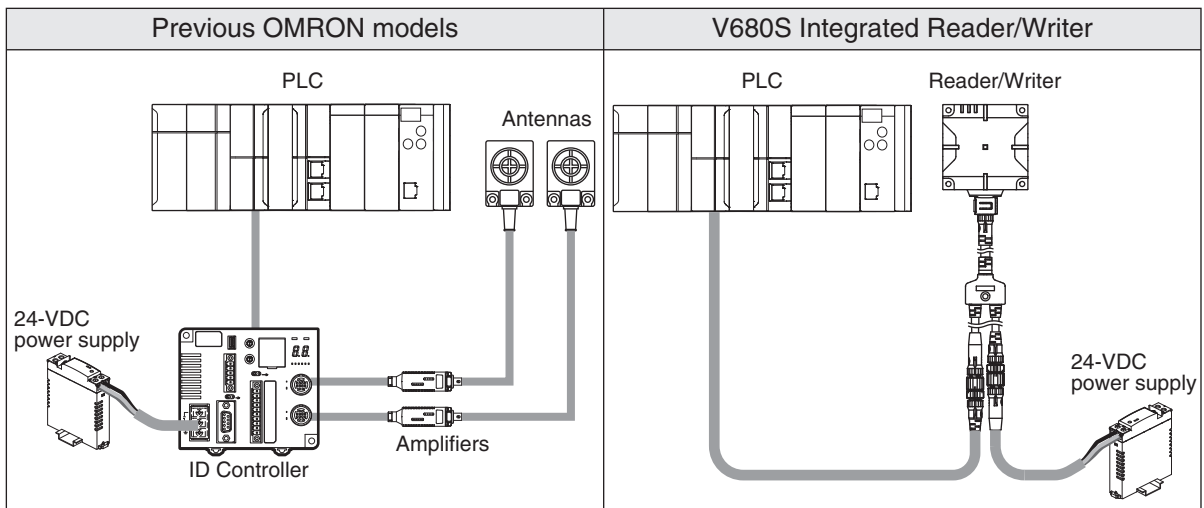
Features

The integrated V680S-series Reader/Writers (V680S-HMD6□-PNT) perform communications with RF Tags according to commands from a host device.



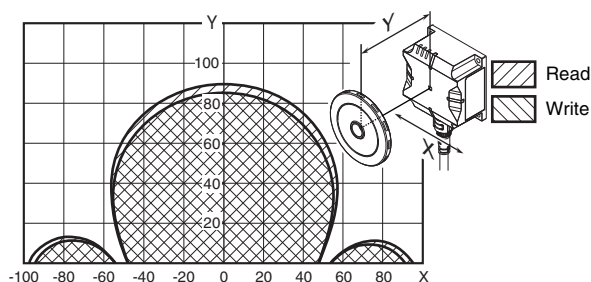
■ Integrated Structure

The controller, amplifier, and antenna are integrated into the Reader/Writer for a simple structure.



■ Simple Installation


The Reader/Writer is automatically set to the best parameters according to the RF Tags to achieve stable communications with more consistent communications and less omissions of RF Tags in the communications field.



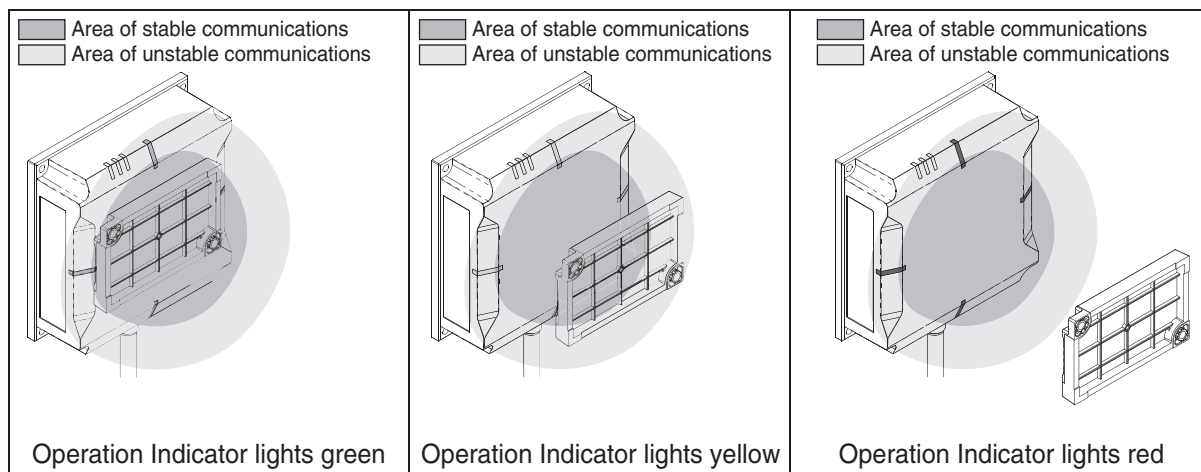
■ Stable Operation

When the Reader/Writer communicates with an RF Tag, it diagnoses the communications leeway and reports the result. You can check the communications leeway to appropriately install the Reader/Writer and RF Tags to achieve stable operation of your OMRON RFID System.

For details, refer to *Using Communication Diagnostic and the RF Analyzer* in *Section 6 Functions*.

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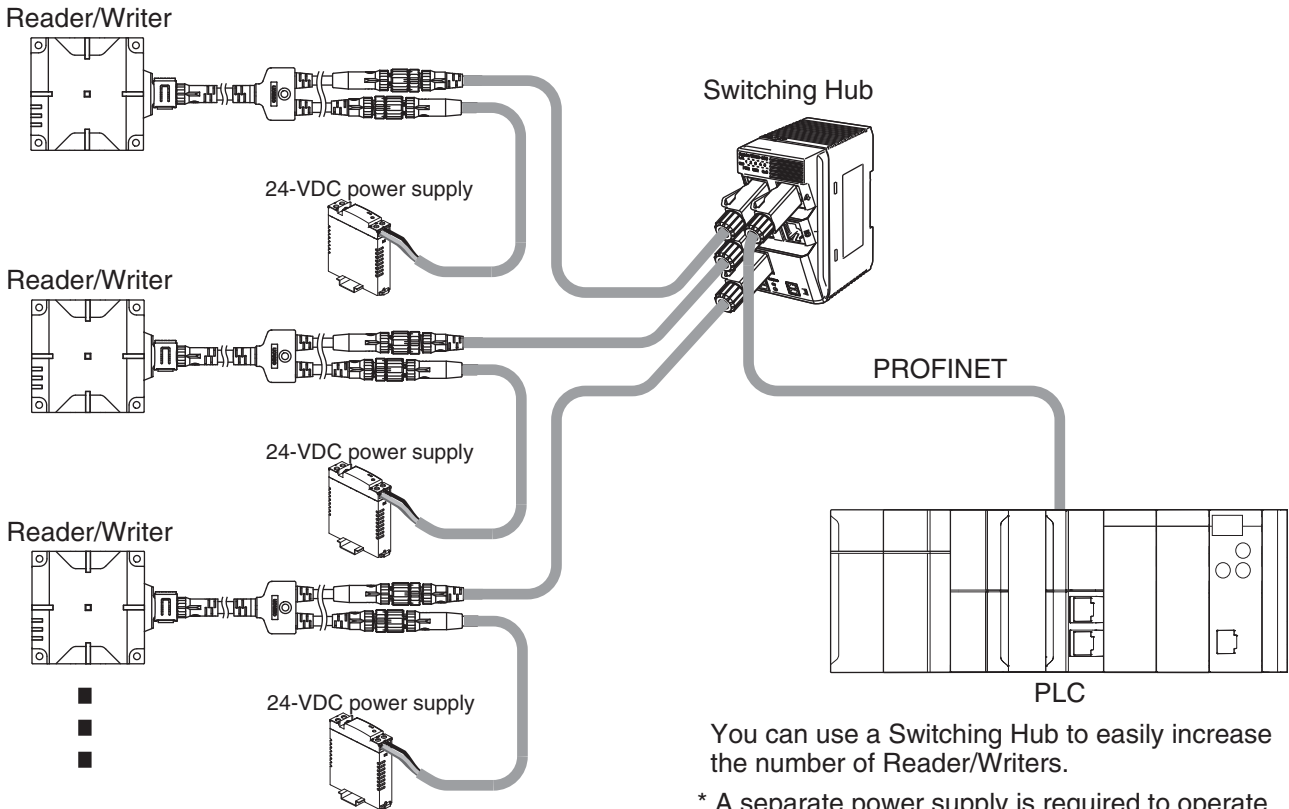
If you use the RFID System under installation conditions that provide a high communications leeway, you can reduce communications troubles during system operation and achieve stable line operation.



Simple Connection with PROFINET

The Reader/Writer communicates with the host device through PROFINET. PROFINET is an industrial network that uses the PROFIBUS DP protocol on industrial Ethernet (100 Mbps, full duplex). The specifications are open standards managed by PI (PROFIBUS & PROFINET International). PROFINET is used by a wide range of industrial devices.

Because PROFINET uses standard Ethernet technology, various general-purpose Ethernet devices can be used in the network. You can easily increase the number of Reader/Writers by using a Switching Hub.



You can use a Switching Hub to easily increase the number of Reader/Writers.

* A separate power supply is required to operate the Reader/Writers.



To connect more than one Reader/Writer, all devices must be set to a unique IP address.

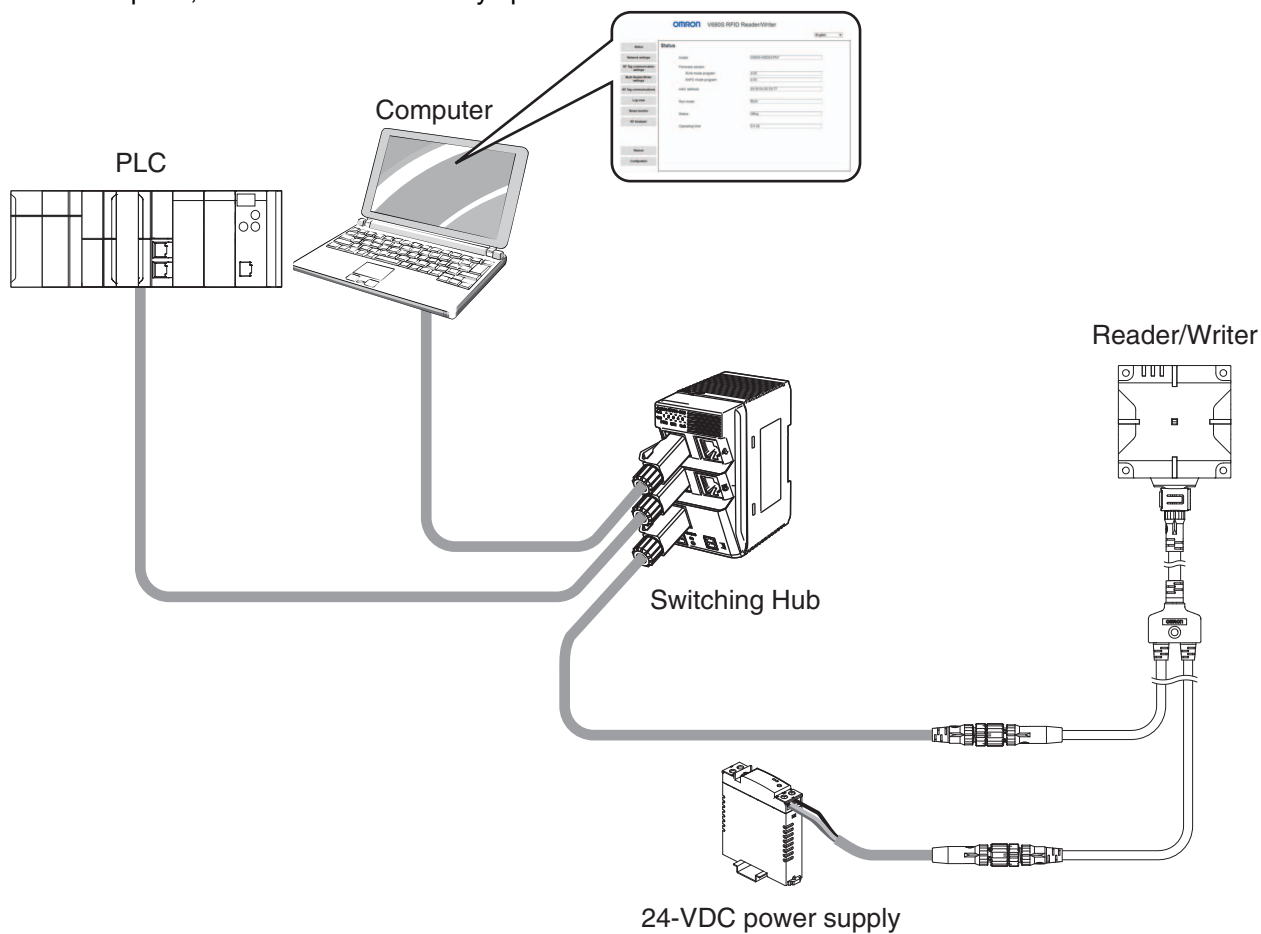
There are two PROFINET standards: PROFINET IO and PROFINET CBA. The Reader/Writers are applicable to a PROFINET IO network because communications for I/O data is performed between a controller and devices. The Reader/Writers use RT (realtime) communications for cyclic data communications with PROFINET IO. Conformance class A is supported along with the basic functions of RT communications.

The functions below are defined in Class A.

| Function | Overview |
|--|--|
| Cyclic data exchange | Real-time data communication between the I/O controller and I/O devices at determined cycles. Set by I/O data CR. |
| Acyclic parameter data / device identification | Used for parameter settings, I/O device configuration, and reading of device information. Set by record data CR. |
| Device/network diagnosis | Communication for the purpose of sending alarms and statuses from I/O devices to the I/O controller. Set by Alarm CR. |

■ Easy Operation

A Web server is provided so that you can easily perform setup and status monitoring by connecting to a computer, without the need for any special software.



You can connect a computer to the Switching Hub to easily set up the Reader/Writers and check the status of the Reader/Writers.

Application Flowchart

A simple application flowchart is described below. For correct application methods and details, refer to the reference page or section given for each step.

Preparations

Checking the Installation Environment

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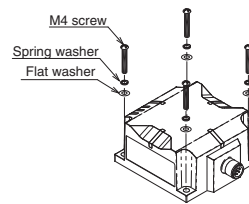


Refer to Reader/Writer Installation Precautions in Section 11 Appendices to confirm the conditions under which the RFID System will not be influenced by surrounding metal on the Reader/Writer or mutual interference between Reader/Writers.

Installation

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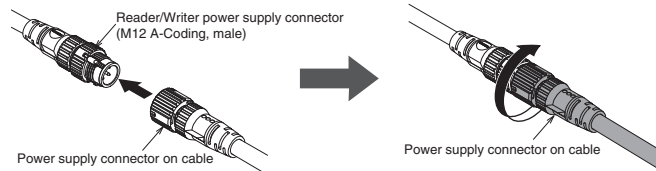
Install the Reader/Writer with four M4 screws.
V680S-HMD63-PNT: Use two screws.
V680S-HMD64-PNT/-HMD66-PNT: Use four screws.



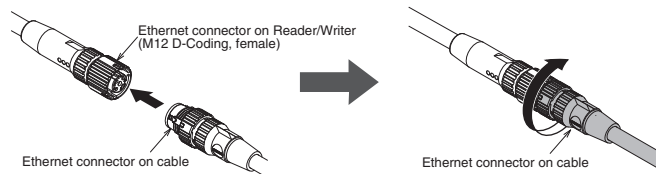
Connections and Wiring

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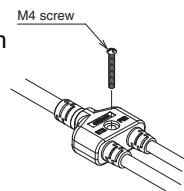
Insert the Power Cable into the power supply connector on the Reader/Writer (M12 A-Coding, female) and turn the cable connector on the Reader/Writer end clockwise to lock it in place.



Insert the Ethernet Cable into the Ethernet connector on the Reader/Writer (M12 D-Coding, male) and turn the cable connector on the Reader/Writer end clockwise to lock it in place.



Mount the Branch Cable with one M4 screw.
Recommended tightening torque: 0.39 to 0.49 N·m



Connect the Power Cable to a 24-VDC power supply.
Connect the Ethernet Cable to the host device (PLC) or Switching Hub.

Setting Reader/Writer Communications Conditions

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The default network settings for the Reader/Writer are listed in the following table.

| | |
|-----------------------------|--------------------------------|
| IP address | 192.168.1.200 (fixed settings) |
| Subnet mask | 255.255.255.0 |
| Default gateway | 192.168.1.254 |
| Port number for Web browser | 7090 |

Change the network settings of the host device to match those of the Reader/Writer.

Host Device Setting Example

IP address: 192.168.1.100

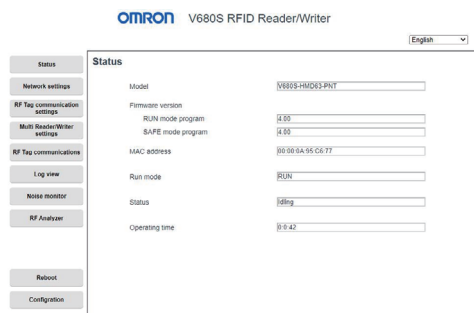
Subnet mask: 255.255.255.0



Communications Test with Host Device

 p.190

Start a Web browser (e.g., Internet Explorer, Microsoft Edge, Google Chrome) on the host computer, enter <http://192.168.1.200/> in the address box, and press the Enter Key. Communications will be possible if the following view appears.

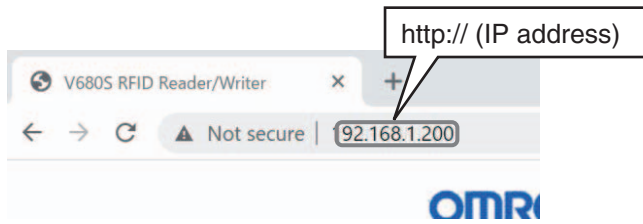


Using Communication Diagnostic to Check Communications Leeway

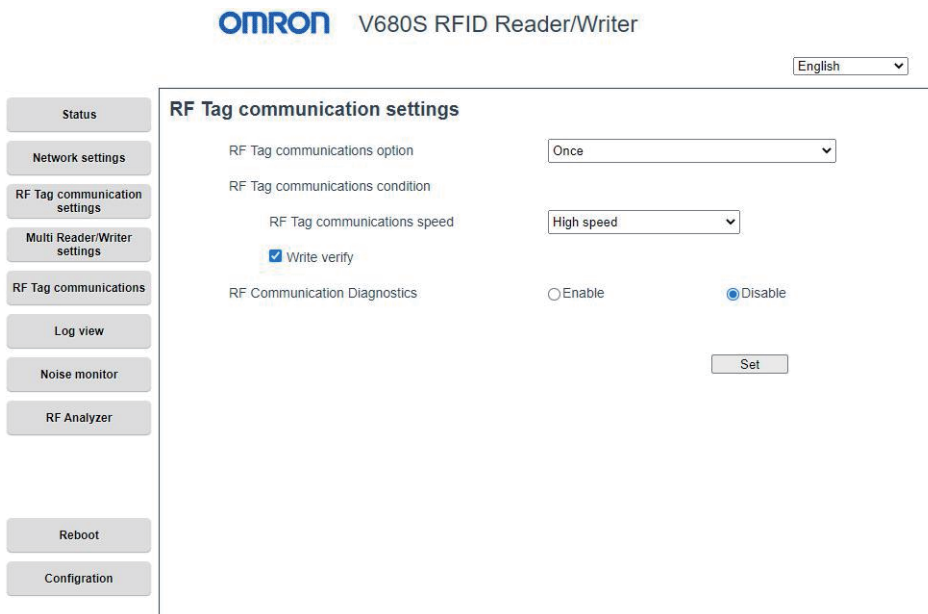
 p.121

1. Connect the Ethernet cable, turn ON the power supply to the Reader/Writer, and then start a Web browser on a computer.

2. Specify the IP address of the Reader/Writer in the address field of the Web browser.
Enter **http://192.168.1.200/** if you are using the default IP address.



3. The Communications Setting View will be displayed.



Using the RF Analyzer to Check the Results of Communication Diagnostic

p.125

1. Display the RF Analyzer View.

Trial Operation

OMRON V680S RFID Reader/Writer

English

Status

Network settings

RF Tag communication settings

Multi Reader/Writer settings

RF Tag communications

Log view

Noise monitor

RF Analyzer

Reboot

Configuration

RF Analyzer

Total : 82 Warning : 15 Error : 10

| No | Time | Command | Result | UID |
|----|------------|---------|---------|------------------|
| 4 | 0000:09:11 | Read ID | Stable | D5782372500108E0 |
| 5 | 0000:09:12 | Read ID | Warning | D5782372500108E0 |
| 6 | 0000:09:23 | Read ID | Error | 0000000000000000 |
| 7 | 0000:09:23 | Read ID | Error | 0000000000000000 |
| 8 | 0000:09:24 | Read ID | Error | 0000000000000000 |

No: 5

Command: Read ID

Diagnostic description: 0001 : The Signal Level is low.

Signal Level: 8 Noise: 0

The Signal Level is low. Push the "Display" button on the right, and follow the instruction.

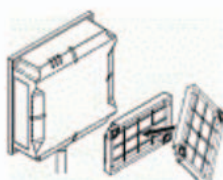
Assumed

2. Click the **Display** Button in the Details column and follow the guidance to check the assumed causes and corrections.

The Signal Level is low.

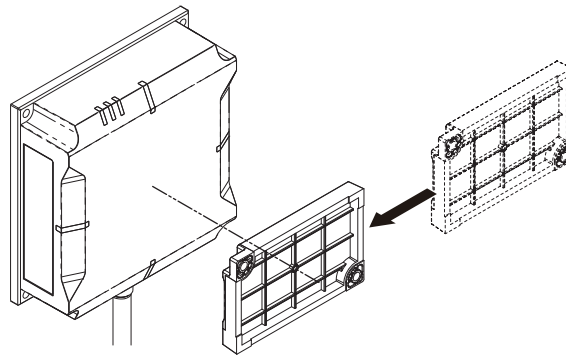
Follow the instruction in below.

There is a possibility the positioning and posture of the Reader/Writer and the RF tag is not proper.
 Make a position so that the Reader/Writer and the RF tag surface in face to face, then execute the RF communication diagnostics.
 The inclination of the RF tag surface to the Reader/Writer may cause the deterioration of RF communication.

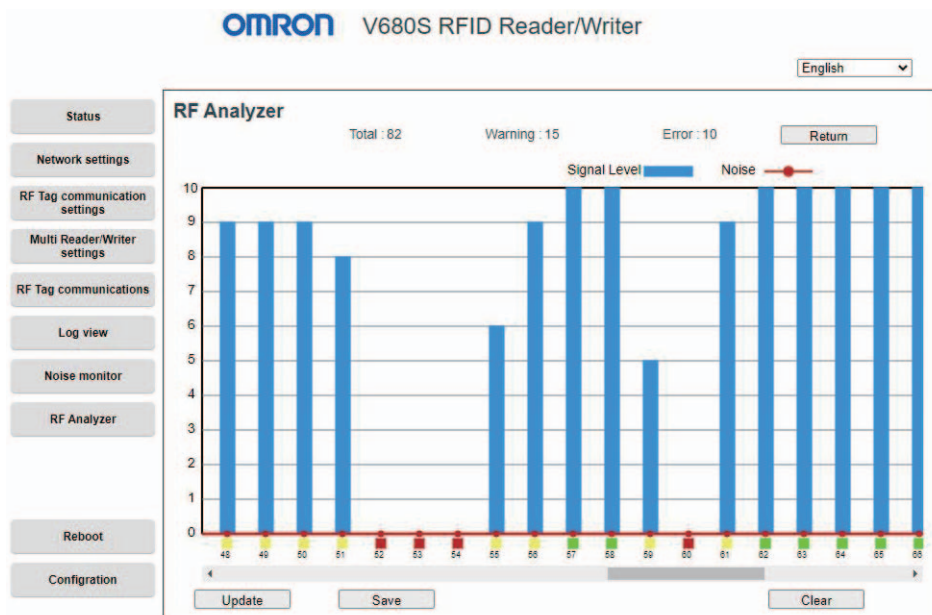


Section 1
Application Flowchart


3. In this example, the position of the Tag is corrected according to the guidance.



4. You can check the graph display to check quantitative information on the degree of instability.




When you are finished, perform the step to communicate with the RF Tag again and check to see if stable communications have been achieved.


 Communications with RF Tags for Commands from the Host Device Using Cyclic Data Exchanges p.155


The Reader/Writer can perform various types of communications with RF Tags.


| Communications command name | Description | Page |
|--------------------------------|--|-------|
| READ DATA | Reads data from an RF Tag in the communications field. | p.159 |
| WRITE DATA | Writes data to an RF Tag in the communications field. | p.160 |
| READ ID | Reads the ID code from an RF Tag in the communications field. | p.158 |
| COPY DATA | Uses two Reader/Writers to copy data from the memory of an RF Tag in the communications field of one Reader/Writer (A) to the memory of the RF Tag in the communications field of another Reader/Writer (B). | p.165 |
| DATA FILL | Writes the specified data to the specified number of words beginning from the specified start address. The specifications are made in the command. | p.162 |
| LOCK | This command locks the specified memory in the RF Tag. It will no longer be possible to write data to the locked memory. The lock cannot be released. | p.161 |
| RF TAG OVERWRITE COUNT CONTROL | Used to manage the number of times data is written to an RF Tag. You can use this command for RF Tags with EEPROM memory. | p.163 |
| RESTORE DATA | This command reads the restore information from the Reader/Writer. | p.164 |

If you Encounter a Problem...

 Troubleshooting

 p.155 Error Codes

 p.64 Operation Indicators

 p.224 Troubleshooting Flowcharts

Product Specifications

Reader/Writer

General Specifications

| Item | Model | V680S-HMD63-PNT | V680S-HMD64-PNT | V680S-HMD66-PNT |
|-------------------------------------|-------|--|---|--|
| Compliance standards | | ISO/IEC 18000-3 (15693) | | |
| Frequency | | 13.56 MHz | | |
| Dimensions | | 50 × 50 × 30 mm (W × H × D, excluding protruding parts and cables) | 75 × 75 × 40 mm (W × H × D, excluding protruding parts and cables) | 120 × 120 × 40 mm (W × H × D, excluding protruding parts and cables) |
| Power supply voltage | | 24 VDC (-15% to +10%) | | |
| Consumption current | | 0.2A max. | | |
| Ambient operating temperature | | -10 to 55°C (with no icing) | | |
| Ambient operating humidity | | 25% to 85% (with no condensation) | | |
| Ambient storage temperature | | -25 to 70°C (with no icing) | | |
| Ambient storage humidity | | 25% to 85% (with no condensation) | | |
| Insulation resistance | | 20 MΩ min. (at 500 VDC) between cable terminals and case | | |
| Dielectric strength | | 1,000 VAC, 50/60 Hz for 1 min between cable terminals and case | | |
| Vibration resistance | | No abnormality after application of 10 to 500 Hz, 1.5-mm double amplitude, acceleration: 100 m/s ² , 10 sweeps in each of 3 axis directions (up/down, left/right, and forward/backward) for 11 minutes each | | |
| Shock resistance | | No abnormality after application of 500 m/s ² , 3 times each in 6 directions (Total: 18 times) | | |
| Degree of protection | | IP67 (IEC 60529:2001) Oil resistance equivalent to IP67F (JIS C 0920:2003, Appendix 1) <small>See Note 1</small> | | |
| Materials | | Case: PBT resin, Filled resin: Urethane resin | | |
| Mass | | Approx. 240 g | Approx. 390 g | Approx. 760 g |
| Installation method | | Reader/Writer body: Two M4 screws <small>See Note 2</small> Cable branching section: One M4 screw | Reader/Writer body: Four M4 screws <small>See Note 2</small> Cable branching section: One M4 screw | |
| Host communications interface | | Ethernet 10BASE-T/100BASE-TX | | |
| Host device communications protocol | | PROFINET | | |
| Accessories | | Instruction Sheet Copy of EC Self Declaration IP address label | | |

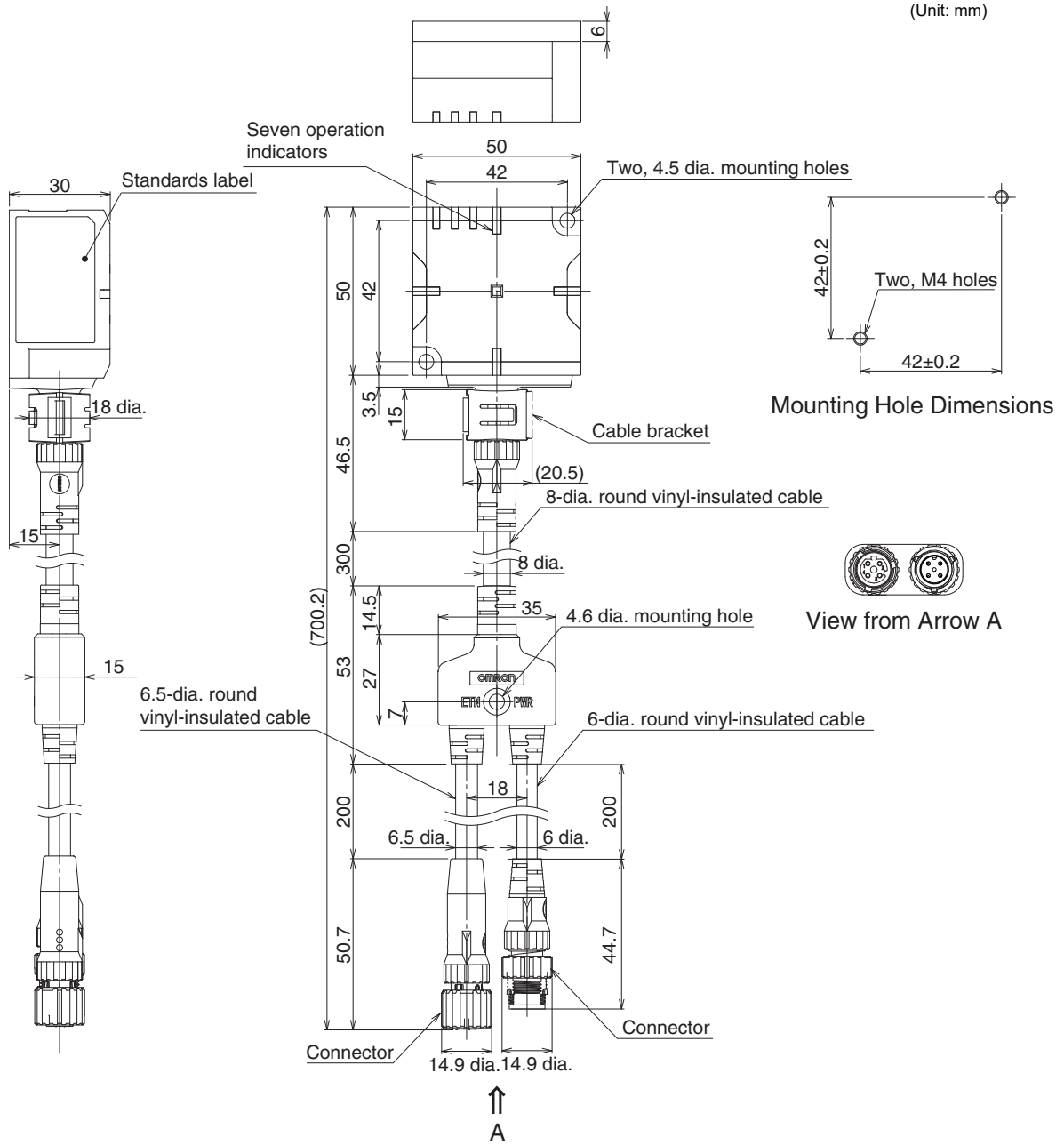
Note 1. Oil resistance has been tested using a specific oil as defined in the OMRON test method.

Note 2. Use a screw of 12 mm or more in length.

■ Dimensions

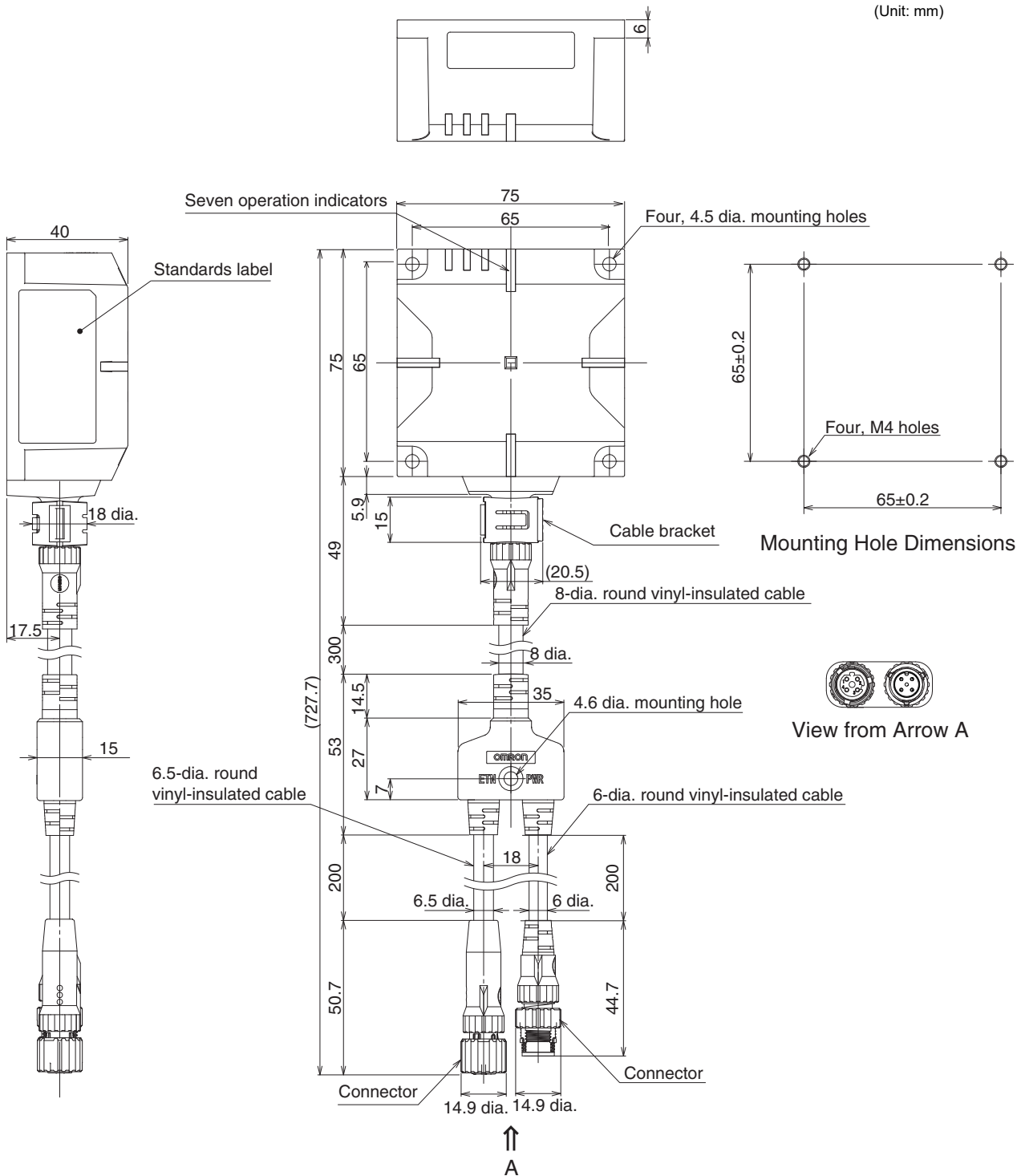
■ V680S-HMD63-PNT

(Unit: mm)



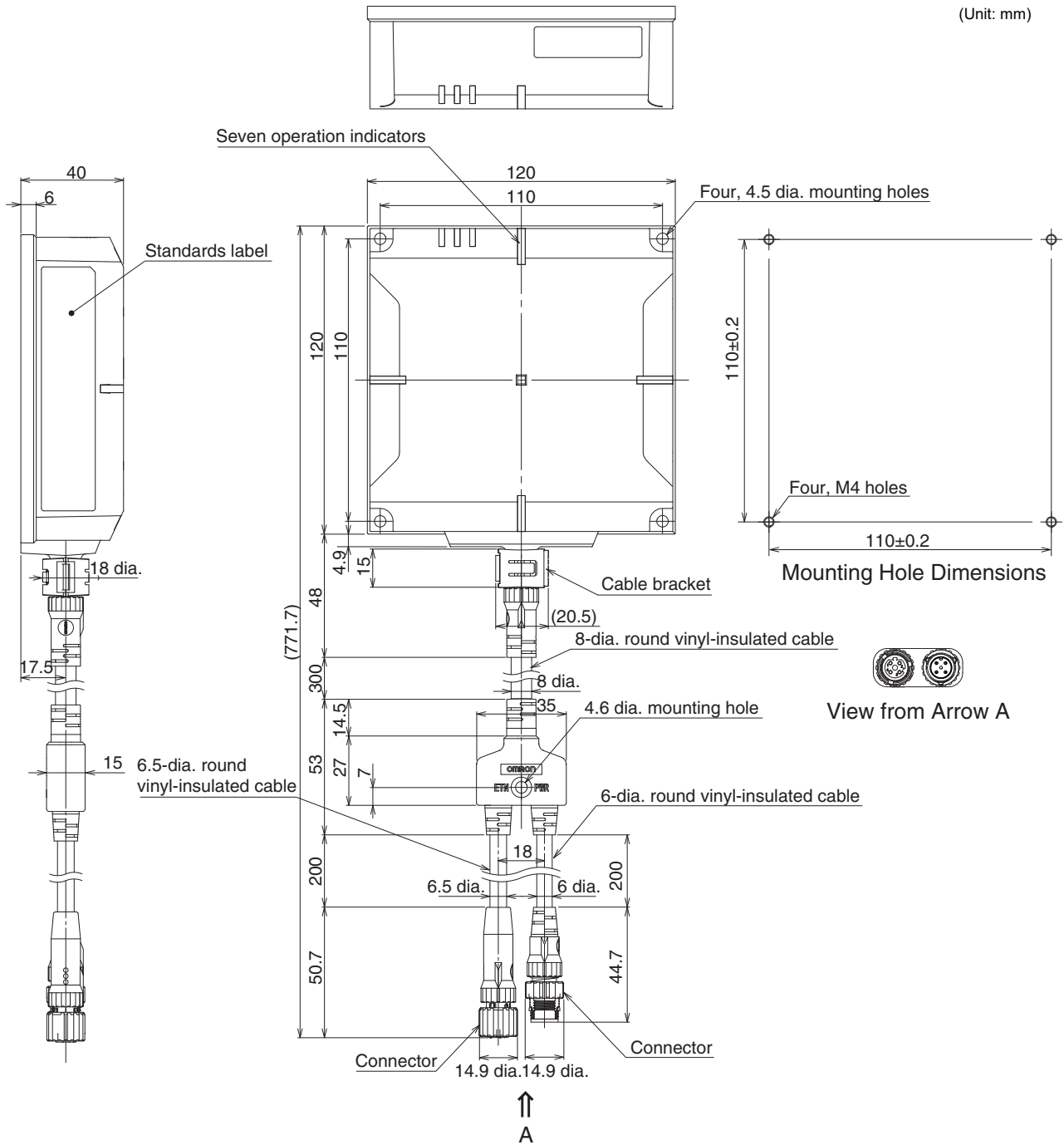
▪ V680S-HMD64-PNT

(Unit: mm)



▪ V680S-HMD66-PNT

(Unit: mm)



Connector Cover (Slim Type)

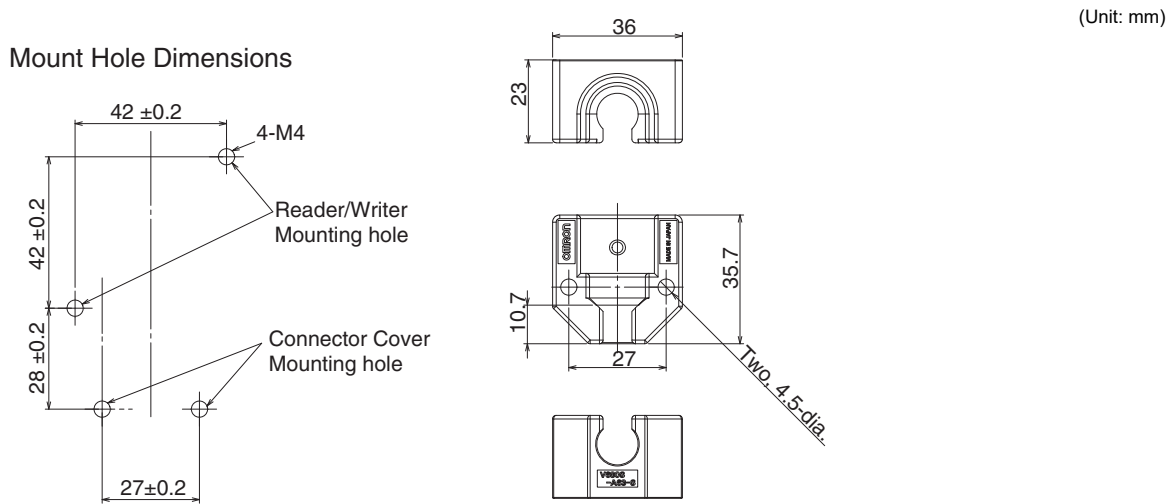
General Specifications

| Item | Model | V680S-A63-S | V680S-A64-S |
|-------------------------------|-------|-----------------------------------|-------------|
| Ambient operating temperature | | -10 to 55°C (with no icing) | |
| Ambient operating humidity | | 25% to 85% (with no condensation) | |
| Ambient storage temperature | | -25 to 70°C (with no icing) | |
| Ambient storage humidity | | 25% to 85% (with no condensation) | |
| Materials | | PBT resin | |
| Installation method | | Fixing screws in two locations*1 | |

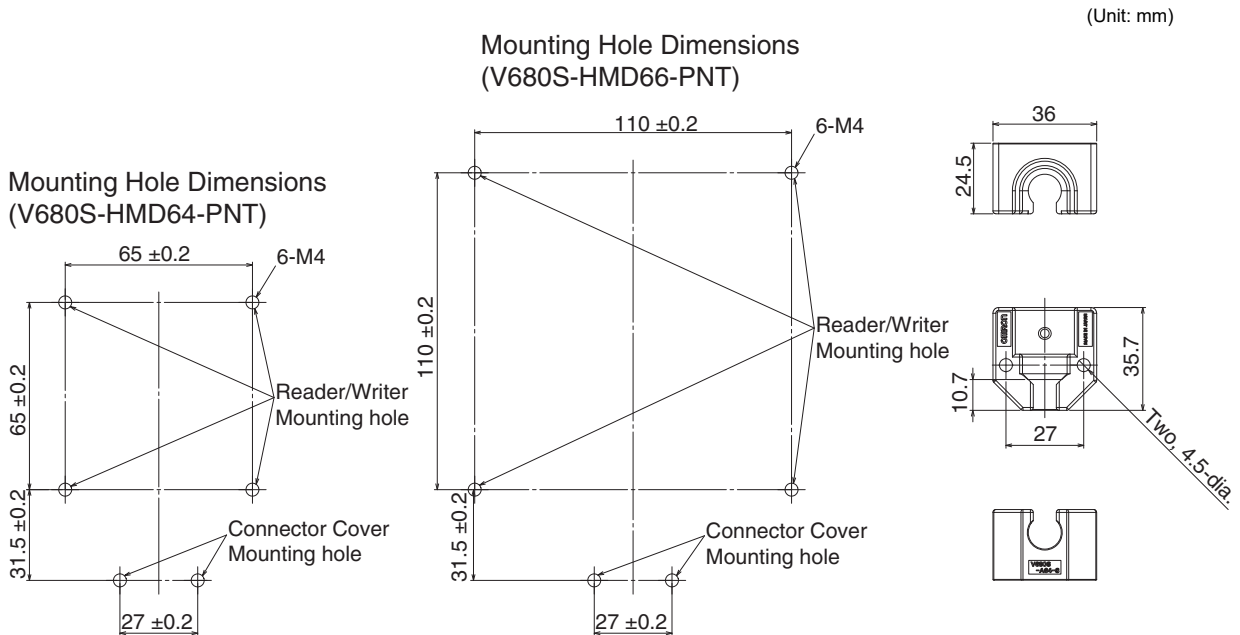
*1. In addition to the reader/writer mounting holes, two mounting holes are required for the connector cover.

Dimensions

V680S-A63-S



V680S-A64



RF Tag

■ V680-D1KP54T

■ General Specifications

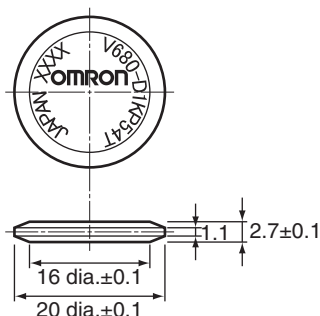
| Item | Model | V680-D1KP54T |
|-------------------------------|-------|--|
| Compliance standards | | ISO/IEC 18000-3 (15693) |
| Memory capacity | | 1,000 bytes (user area) |
| Memory type | | EEPROM |
| Data retention | | 10 years after writing (85°C or less), 0.5 years after writing (85 to 125°C) Total data retention at high temperatures exceeding 125°C is 10 hours <small>See Note 1.</small> |
| Write endurance | | 100,000 writes for each block (25°C) |
| Ambient operating temperature | | -25 to 85°C (with no icing) |
| Ambient operating humidity | | 35% to 95% |
| Ambient storage temperature | | -40 to 125°C (with no icing) |
| Ambient storage humidity | | 35% to 95% |
| Degree of protection | | IP67 (IEC 60529:2001) Oil resistance equivalent to IP67G (JIS C 0920:2003, Appendix 1) <small>See Note 2.</small> |
| Vibration resistance | | No abnormality after application of 10 to 2,000 Hz, 1.5-mm double amplitude, acceleration: 150 m/s ² , 10 sweeps each in X, Y, and Z directions for 15 minutes each |
| Shock resistance | | No abnormality after application of 500 m/s ² , 3 times each in X, Y, and Z directions (Total: 18 times) |
| Dimensions | | 20 dia. × 2.7 mm |
| Materials | | PPS resin |
| Weight | | Approx. 2 g |
| Metal countermeasures | | None |

Note 1. After storing RF Tags at high temperatures, rewrite the data even if changes are not required. High temperatures are those between 125 and 180°C.

2. Oil resistance has been tested using a specific oil as defined in the OMRON test method.

■ Dimensions

(Unit: mm)



| | |
|---------------|-----------|
| Case material | PPS resin |
|---------------|-----------|



The V680-D1KP54T RF Tag can be placed in the Attachment in either direction. The direction does not affect operation.

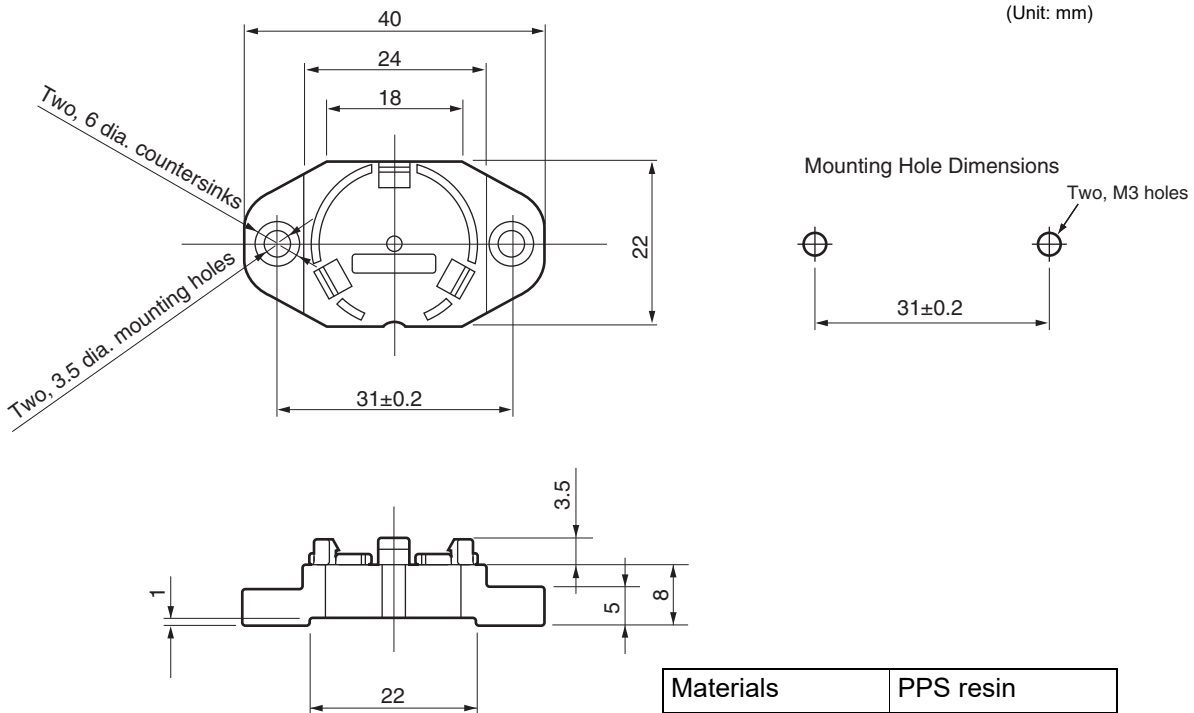


The ID code is written in the memory of the RF Tag and may be affected by data retention characteristics at high temperatures. Take suitable precautions when using the READ ID command for RF Tags operating at high temperatures.



You cannot use FIFO Repeat communications.

V700-A80 Attachment



▪ RF Tag Heat Resistance

“ Storing RF Tags under high temperatures or under heat cycles will adversely affect the performance of the internal parts and the service life of the RF Tags.

An LTPD of 10% was used for evaluation of RF Tags that reached the end of their service life after testing under the following test conditions.

Heat cycle: 1,000 cycles of 30 minutes each between -10 and 150°C. No failures occurred in 22 samples.

200 cycles of 30 minutes each between -10 and 180°C. No failures occurred in 22 samples.

High-temperature storage: 1,000 hours at 150°C. No failures occurred in 22 samples.

200 hours at 180°C. No failures occurred in 22 samples.



LTPD: Lot Tolerance Percent Defective

Lower limit of the malfunction rate for lots to be considered unacceptable during reliability testing.

CHECK!

■ V680-D1KP66T/-D1KP66MT

■ General Specifications

| Item | Model | V680-D1KP66T | V680-D1KP66MT |
|-------------------------------|-------|--|---------------|
| Compliance standards | | ISO/IEC 18000-3 (15693) | |
| Memory capacity | | 1,000 bytes (user area) | |
| Memory type | | EEPROM | |
| Data retention | | 10 years after writing (85°C or less), 0.5 years after writing (85 to 125°C) Total data retention at high temperatures exceeding 125°C is 10 hours <small>See Note 1.</small> | |
| Write endurance | | 100,000 writes for each block (25°C) | |
| Ambient operating temperature | | -25 to 85°C (with no icing) | |
| Ambient operating humidity | | 35% to 95% | |
| Ambient storage temperature | | -40 to 125°C (with no icing) | |
| Ambient storage humidity | | 35% to 95% | |
| Degree of protection | | IP68 (IEC 60529:2001) Oil resistance equivalent to IP67G (JIS C 0920:2003, Appendix 1) <small>See Note 2.</small> | |
| Vibration resistance | | No abnormality after application of 10 to 2,000 Hz, 1.5-mm double amplitude, acceleration: 150 m/s ² , 10 sweeps each in X, Y, and Z directions for 15 minutes each | |
| Shock resistance | | No abnormality after application of 500 m/s ² , 3 times each in X, Y, and Z directions (Total: 18 times) | |
| Dimensions | | 34 × 34 × 3.5 mm (W × H × D) | |
| Materials | | PPS resin | |
| Weight | | Approx. 6 g | Approx. 7.5 g |
| Metal countermeasures | | None | Provided |

Note 1. After storing RF Tags at high temperatures, rewrite the data even if changes are not required. High temperatures are those between 125 and 180°C.

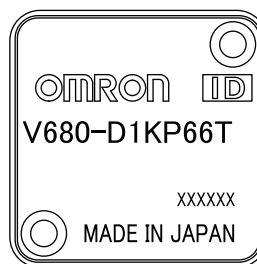
2. Oil resistance has been tested using a specific oil as defined in the OMRON test method.

The V680-D1KP66MT must be mounted on a metallic surface. The markings on the V680-D1KP66T and V680-D1KP66MT are shown below.

● V680-D1KP66MT



● V680-D1KP66T



CHECK!

The marked surface is the communications surface. When mounting the RF Tag, face the marked surface toward the Reader/Writer.



CHECK!

The ID code is written in the memory of the RF Tag and may be affected by data retention characteristics at high temperatures. Take suitable precautions when using the READ ID command for RF Tags operating at high temperatures.

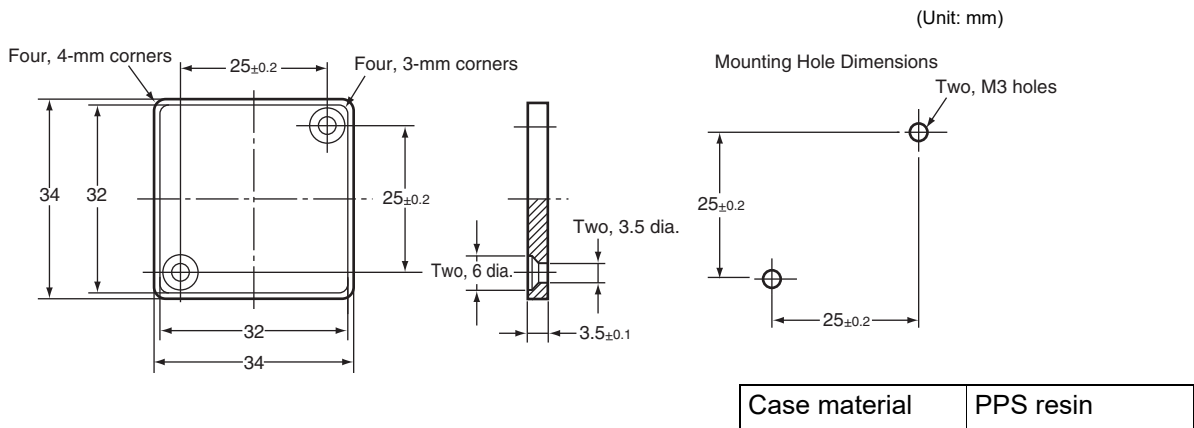


CHECK!

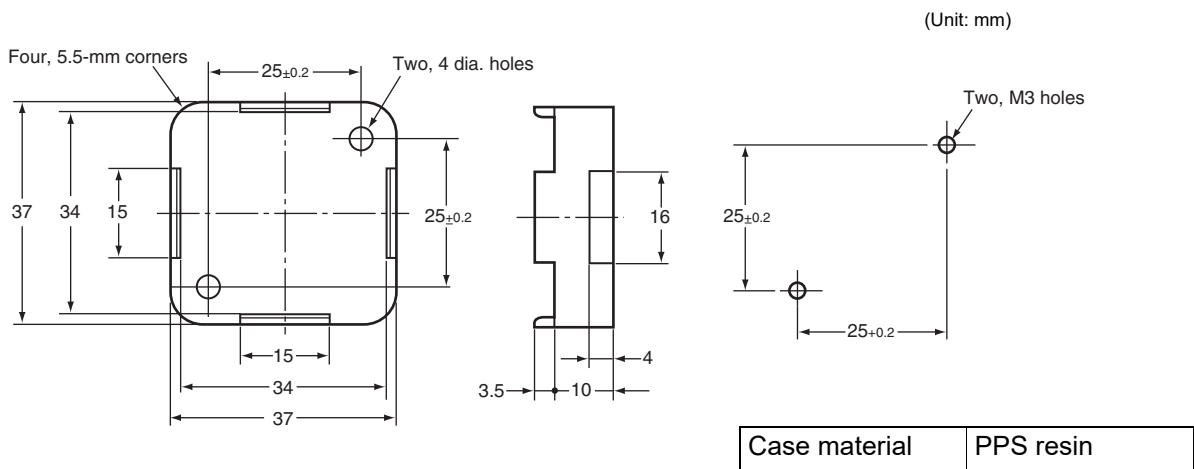
You cannot use FIFO Repeat communications.

▪ **Dimensions**

V680-D1KP66T/-D1KP66MT



V600-A86 Attachment



▪ **RF Tag Heat Resistance**

” Storing RF Tags under high temperatures or under heat cycles will adversely affect the performance of the internal parts and the service life of the RF Tags.

An LTPD of 10% was used for evaluation of RF Tags that reached the end of their service life after testing under the following test conditions.

- Heat cycle:
 - 1,000 cycles of 30 minutes each between -10 and 150°C. No failures occurred in 22 samples.
 - 200 cycles of 30 minutes each between -10 and 180°C. No failures occurred in 22 samples.
- High-temperature storage:
 - 1,000 hours at 150°C. No failures occurred in 22 samples.
 - 200 hours at 180°C. No failures occurred in 22 samples.



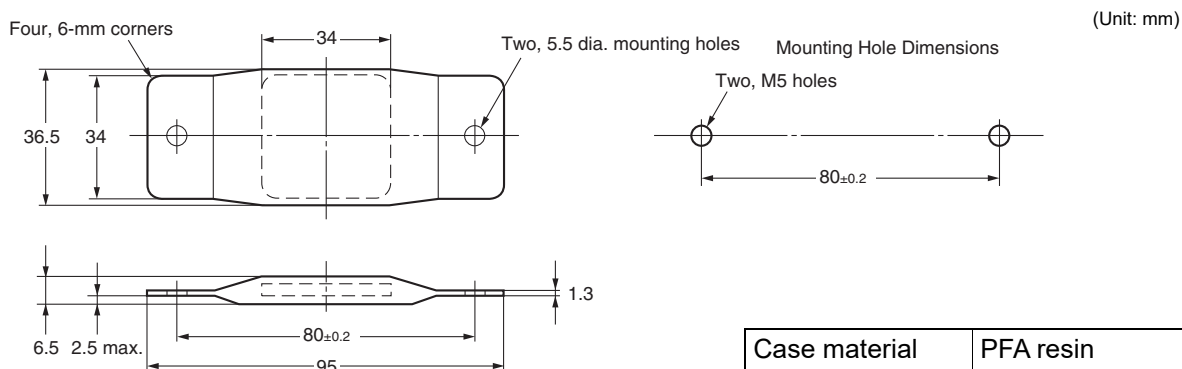
LTPD: Lot Tolerance Percent Defective
Upper limit of the malfunction rate for lots to be considered unacceptable during reliability testing.

■ V680-D1KP66T-SP

■ General Specifications

| Item | Specification |
|-------------------------------|--|
| Compliance standards | ISO/IEC 18000-3 (15693) |
| Memory capacity | 1,000 bytes |
| Memory type | EEPROM |
| Data retention | 10 years (85°C or less) |
| Write endurance | 100,000 writes for each block (25°C) |
| Ambient operating temperature | -25 to 70°C (with no icing) |
| Ambient operating humidity | 35% to 95% (with no condensation) |
| Ambient storage temperature | -40 to 110°C (with no icing) |
| Ambient storage humidity | 35% to 95% (with no condensation) |
| Vibration resistance | 10 to 2,000 Hz, 1.5-mm double amplitude, acceleration: 150 m/s ² , 10 sweeps each in 3 directions for 15 minutes each |
| Shock resistance | No abnormality after application of 500 m/s ² , 3 times each in X, Y, and Z directions (Total: 18 times) |
| Dimensions | 95 × 36.5 × 6.5 mm (W × H × D, excluding protruding parts) |
| Degree of protection | IP67 |
| Materials | Exterior: PFA fluororesin RF Tag filling: PPS resin |
| Weight | Approx. 20 g |
| Installation method | Two M5 screws |
| Metal countermeasures | None |

■ Dimensions



The marked surface is the communications surface. When mounting the RF Tag, face the marked surface toward the Reader/Writer.



You cannot use FIFO Repeat communications.

■ V680-D1KP58HTN

■ General Specifications

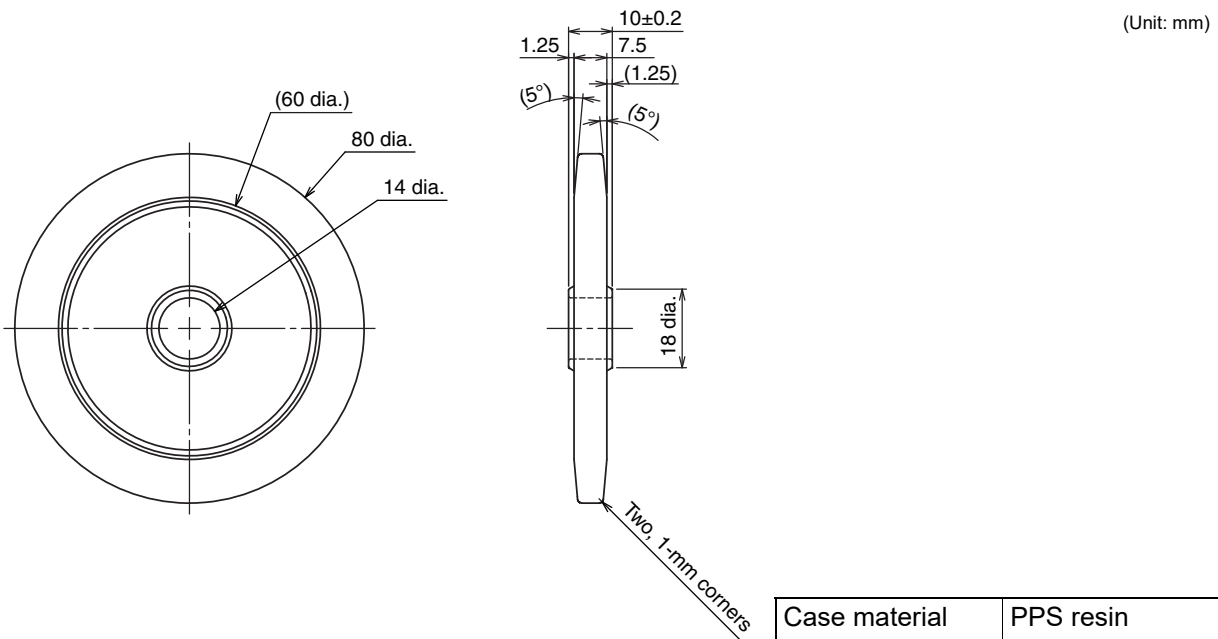
| Item | Model | V680-D1KP58HTN |
|-------------------------------|-------|--|
| Compliance standards | | ISO/IEC 18000-3 (15693) |
| Memory capacity | | 1,000 bytes (user area) |
| Memory type | | EEPROM |
| Data retention | | 10 years after writing (85°C or less), 0.5 years after writing (85 to 125°C) Total data retention at high temperatures exceeding 125°C is 10 hours ^{See Note.1} |
| Write endurance | | 100,000 writes for each block (25°C) |
| Ambient operating temperature | | -25 to 85°C (with no icing) |
| Ambient operating humidity | | No restrictions. |
| Ambient storage temperature | | -40 to 250°C (with no icing) (Data retention: -40 to 125°C) |
| Ambient storage humidity | | No restrictions. |
| Degree of protection | | IP67 (IEC 60529:2001) Oil resistance equivalent to IP67G (JIS C 0920:2003, Appendix 1) ^{See Note.2} |
| Vibration resistance | | No abnormality after application of 10 to 2,000 Hz, 1.5-mm double amplitude, acceleration: 150 m/s ² , 10 sweeps each in X, Y, and Z directions for 15 minutes each |
| Shock resistance | | No abnormality after application of 500 m/s ² , 3 times each in X, Y, and Z directions (Total: 18 times) |
| Dimensions | | 80 dia. × 10 mm |
| Materials | | PPS resin |
| Weight | | Approx. 70 g |

Note1. After storing RF Tags at high temperatures, rewrite the data even if changes are not required. High temperatures are those between 125 and 250°C.

2. Oil resistance has been tested using a specific oil as defined in the OMRON test method.

■ Dimensions

V680-D1KP58HTN

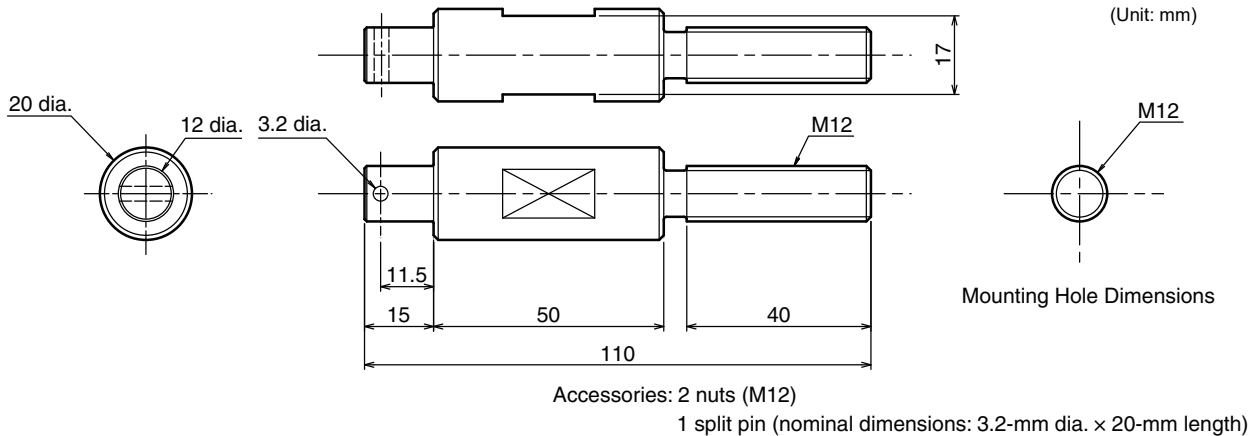


The RF Tag can be placed in the Attachment in either direction. The direction does not affect operation.

V680-A80 Attachment

This Attachment is used to hold V680-D1KP58HTN ID Tags.

Applicable model: V680-D1KP58HTN



▪ **High-temperature Applications (V680-D1KP58HTN)**

▪ **Data Retention**

- ” Due to the characteristics of EEPROM, any data that is written to an RF Tag may be lost if it is used in a high-temperature environment that exceeds 125°C for a total of more than 10 hours. Always reset the data holding time before a total of 10 hours is reached.
- ” Communications between the Reader/Writer and RF Tags may fail in high-temperature environments of 85°C or higher. Do not perform communications between the Reader/Writer and RF Tag in a high-temperature environment of 85°C or higher.
- ” Due to the characteristics of EEPROM, the UID (RF Tag ID code) may be lost if an RF Tag is used in a high-temperature environment that exceeds 125°C. Do not use commands that use the UID in high-temperature environments that exceed 125°C.
- ” Do not use the ID READ command.
- ” You cannot use FIFO Repeat communications.

← **Total Usage Time**

This section gives the total time that an RF Tag can be placed at high temperatures.

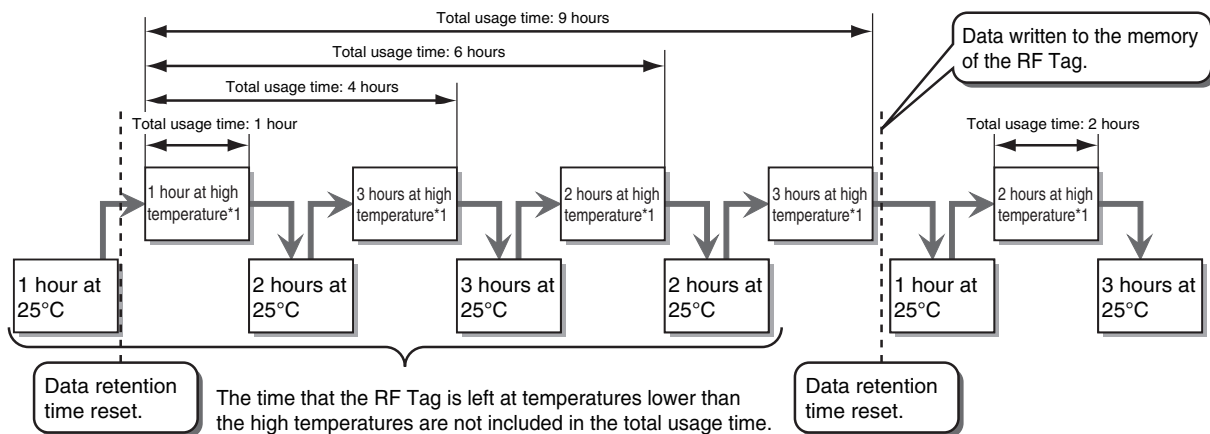


Fig. Conceptual Diagram of Resetting the Data Retention Time

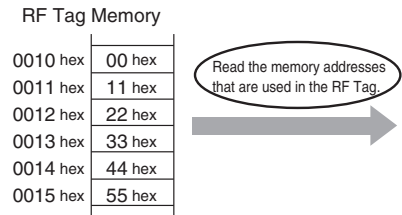
*1 A “high temperature” is one between 125°C and 250°C.

▪ **Data Retention Time Reset Procedure**

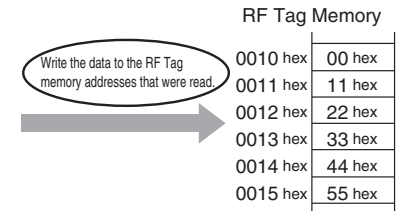
Always use the following procedure to reset the data holding time before a total of 10 hours is reached.


When Using RF Tag Memory Addresses 0010 to 0015 hex

1. Read the data from RF Tag addresses 0010 to 0015 hex.



2. Write the read data to RF Tag memory addresses 0010 to 0015 hex.



 The data retention time is reset only for the RF Tag memory addresses that are written. At the data retention time, write the same data to all of the memory addresses that are used in the RF Tag.

CHECK!

▪ **Heat Resistance**

Storing RF Tags under high temperatures or under heat cycles will adversely affect the performance of the internal parts and the service life of the RF Tags.

The RF Tag were placed in the following high temperatures and then evaluated in-house. It was confirmed that no problems occurred.

- 1) 2,000 cycles of 30 minutes each between room temperature and 200°C
- 2) 500 hours at 250°C

■ V680S-D2KF67/-D2KF67M/-D8KF67/-D8KF67M

■ General Specifications

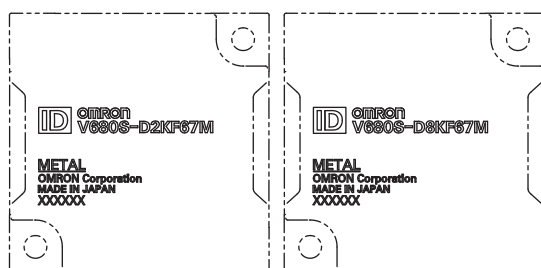
| Item | Model | V680S-D2KF67 | V680S-D2KF67M | V680S-D8KF67 | V680S-D8KF67M |
|-------------------------------|-------|--|---------------|-------------------------|---------------|
| Compliance standards | | ISO/IEC 18000-3 (15693) | | | |
| Memory capacity | | 2,000 bytes (user area) | | 8,192 bytes (user area) | |
| Memory type | | FRAM | | | |
| Data retention | | 10 years after writing (85°C or less) | | | |
| Write Endurance | | One trillion times per block (85°C or less), Access frequency ^{See Note 1.} One trillion times | | | |
| Ambient operating temperature | | -20 to 85°C (with no icing) | | | |
| Ambient operating humidity | | 35% to 85% | | | |
| Ambient storage temperature | | -40 to 125°C (with no icing) | | | |
| Ambient storage humidity | | 35% to 85% | | | |
| Degree of protection | | IP68 (IEC 60529:2001), Oil resistance equivalent to IP67G (JIS C 0920:2003, Appendix 1) ^{See Note 2.} IPX9K (DIN 40 050) | | | |
| Vibration resistance | | No abnormality after application of 10 to 2,000 Hz, 1.5-mm double amplitude, acceleration: 150 m/s ² , 10 sweeps each in X, Y, and Z directions for 15 minutes each | | | |
| Shock resistance | | No abnormality after application of 500 m/s ² , 3 times each in X, Y, and Z directions (Total: 18 times) | | | |
| Dimensions | | 40 × 40 × 5 mm (W × H × D) | | | |
| Materials | | PPS resin | | | |
| Weight | | Approx. 11.5 g | Approx. 12 g | Approx. 11.5 g | Approx. 12 g |
| Metal countermeasures | | None | Provided | None | Provided |

Note 1. The number of accesses is the total number of reads and writes.

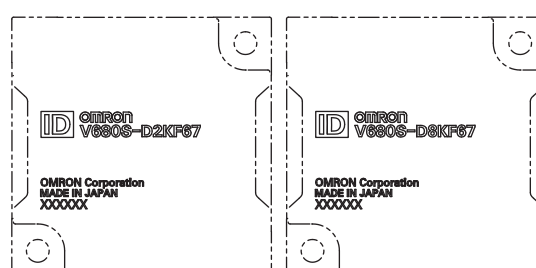
2. Oil resistance has been tested using a specific oil as defined in the OMRON test method.

The V680S-D2KF67M/-D8KF67M must be mounted on a metallic surface. The markings on the V680-D2KF67/-D8KF67 and V680-D2KF67M/-D8KF67M are shown below.

● V680S-D2KF67M/-D8KF67M



● V680S-D2KF67/-D8KF67



The marked surface is the communications surface. When mounting the RF Tag, face the marked surface toward the Reader/Writer.

CHECK!



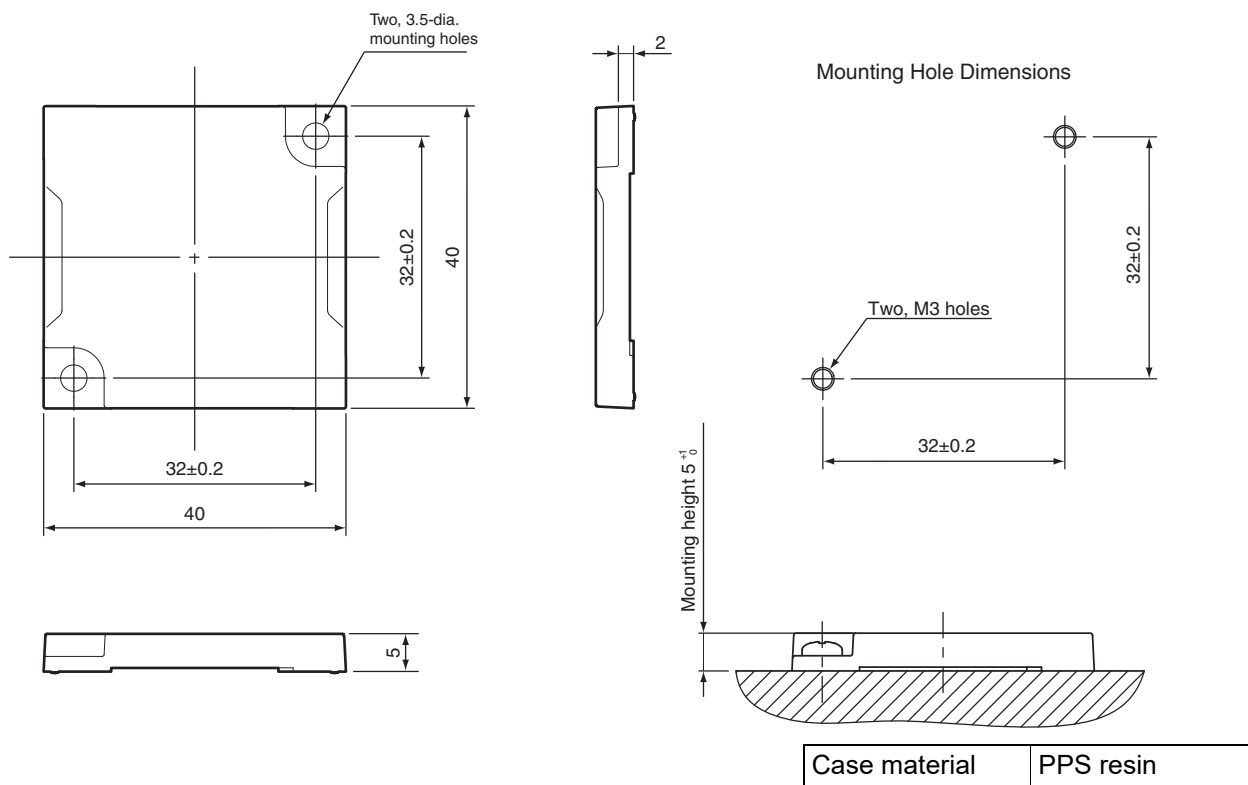
You can use the V680S-D8KF67□ with Reader/Writers with firmware version 2.00 or higher.

CHECK!

▪ Dimensions

V680S-D2KF67/-D2KF67M/-D8KF67/-D8KF67M

(Unit: mm)



■ V680S-D2KF68/-D2KF68M/-D8KF68/-D8KF68M

■ General Specifications

| Item | Model | V680S-D2KF68 | V680S-D2KF68M | V680S-D8KF68 | V680S-D8KF68M |
|-------------------------------|-------|--|---------------|-------------------------|---------------|
| Compliance standards | | ISO/IEC 18000-3 (15693) | | | |
| Memory capacity | | 2,000 bytes (user area) | | 8,192 bytes (user area) | |
| Memory type | | FRAM | | | |
| Data retention | | 10 years after writing (85°C or less) | | | |
| Write Endurance | | One trillion times per block (85°C or less), Access frequency ^{See Note 1} : One trillion times | | | |
| Ambient operating temperature | | -20 to 85°C (with no icing) | | | |
| Ambient operating humidity | | 35% to 85% | | | |
| Ambient storage temperature | | -40 to 125°C (with no icing) | | | |
| Ambient storage humidity | | 35% to 85% | | | |
| Degree of protection | | IP68 (IEC 60529), Oil resistance equivalent to IP67G (JIS C 0920:2003, Appendix 1) ^{See Note 2} . IPX9K (DIN 40 050) | | | |
| Vibration resistance | | No abnormality after application of 10 to 500 Hz, 1.5-mm double amplitude, acceleration: 100 m/s ² , 10 sweeps each in X, Y, and Z directions for 11 minutes each | | | |
| Shock resistance | | No abnormality after application of 500 m/s ² , 3 times each in X, Y, and Z directions (Total: 18 times) | | | |
| Dimensions | | 86 × 54 × 10 mm (W × H × D) | | | |
| Materials | | PPS resin | | | |
| Weight | | Approx. 44 g | Approx. 46 g | Approx. 44 g | Approx. 46 g |
| Metal countermeasures | | None | Provided | None | Provided |

Note 1. The number of accesses is the total number of reads and writes.

2. Oil resistance has been tested using a specific oil as defined in the OMRON test method.

The V680S-D2KF68M/-D8KF68M must be mounted on a metallic surface. The markings on the V680-D2KF68/-D8KF68 and V680-D2KF68M/-D8KF68M are shown below.

● V680S-D2KF68M/-D8KF68M



● V680S-D2KF68/-D8KF68



The marked surface is the communications surface. When mounting the RF Tag, face the marked surface toward the Reader/Writer.

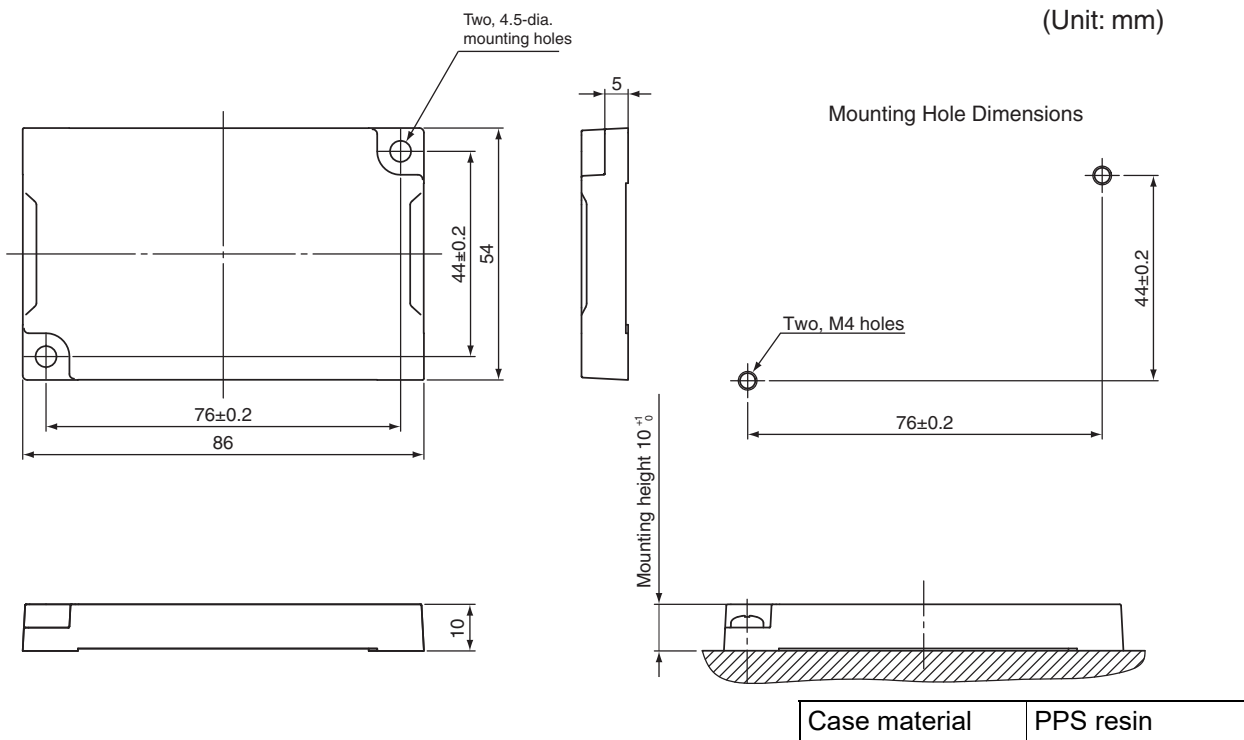


You can use the V680S-D8KF68□ with Reader/Writers with firmware version 2.00 or higher.

▪ Dimensions

V680S-D2KF68/-D2KF68M/-D8KF68/-D8KF68M

(Unit: mm)



Data Characteristics

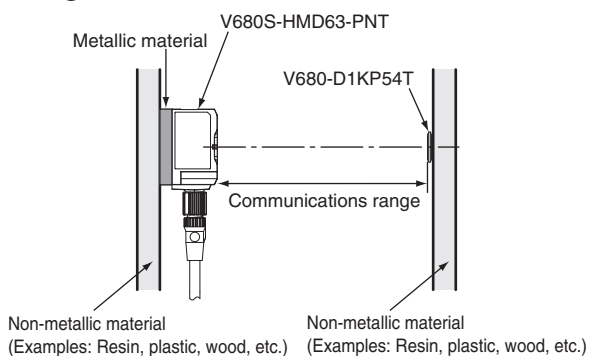
Communications Range Specifications

■ V680S-HMD63-PNT

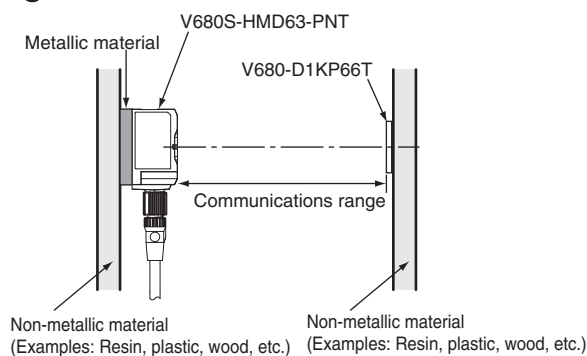
| Reader/Writer | RF Tag | Communications range specification | |
|---|---|--------------------------------------|--------------------------------------|
| V680S-HMD63-PNT (mounted to metallic material) | V680-D1KP54T (mounted to non-metallic material) | Read | 0.0 to 24.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 20.0 mm (axis offset: ±10 mm) |
| | V680-D1KP66T (mounted to non-metallic material) | Read | 0.0 to 30.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 25.0 mm (axis offset: ±10 mm) |
| | V680-D1KP66MT (mounted to metallic material) | Read | 0.0 to 25.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 20.0 mm (axis offset: ±10 mm) |
| | V680-D1KP66T-SP (mounted to non-metallic material) | Read | 0.0 to 25.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 20.0 mm (axis offset: ±10 mm) |
| | V680S-D2KF67 (mounted to non-metallic material) | Read | 7.0 to 40.0 mm (axis offset: ±10 mm) |
| | | Write | 7.0 to 40.0 mm (axis offset: ±10 mm) |
| | V680S-D2KF67M (mounted to metallic material) | Read | 6.0 to 30.0 mm (axis offset: ±10 mm) |
| | | Write | 6.0 to 30.0 mm (axis offset: ±10 mm) |
| | V680S-D8KF67 (mounted to non-metallic material) | Read | 7.0 to 40.0 mm (axis offset: ±10 mm) |
| | | Write | 7.0 to 40.0 mm (axis offset: ±10 mm) |
| V680S-D8KF67M (mounted to metallic material) | Read | 6.0 to 30.0 mm (axis offset: ±10 mm) | |
| | Write | 6.0 to 30.0 mm (axis offset: ±10 mm) | |

Installation Conditions

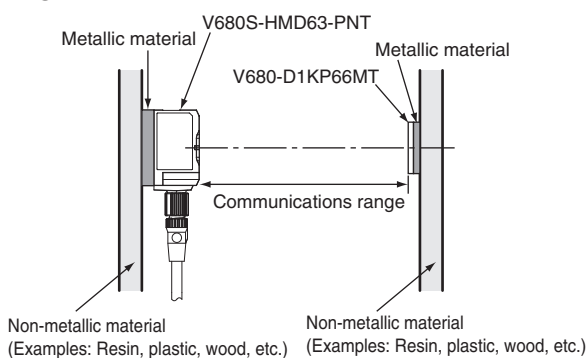
● V680-D1KP54T



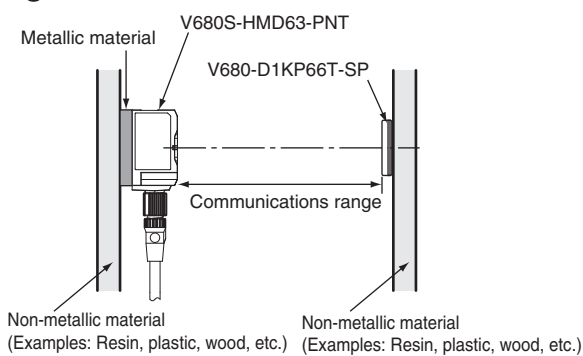
● V680-D1KP66T



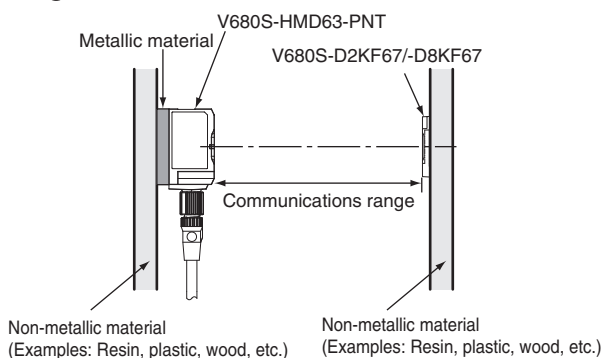
● V680-D1KP66MT



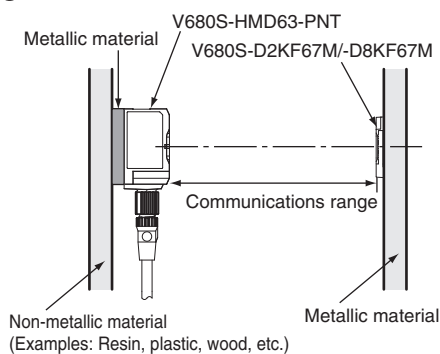
● V680-D1KP66T-SP



● V680S-D2KF67/-D8KF67



● V680S-D2KF67M/-D8KF67M

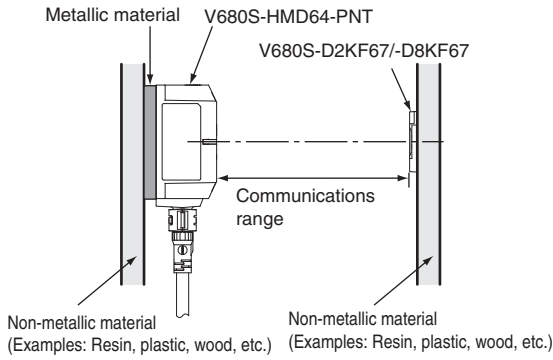


■ V680S-HMD64-PNT

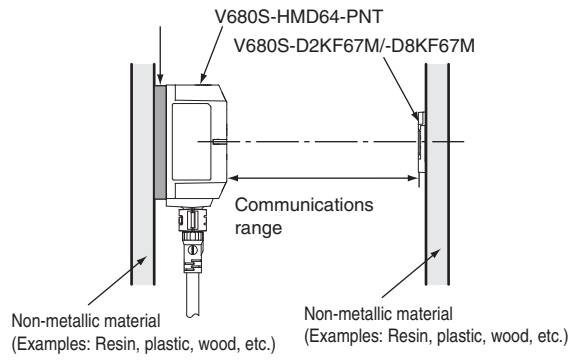
| Reader/Writer | RF Tag | Communications Range Specification | |
|--|---|--------------------------------------|--------------------------------------|
| V680S-HMD64-PNT (mounted to metallic material) | V680-D1KP54T (mounted to non-metallic material) | Read | 0.0 to 33.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 28.0 mm (axis offset: ±10 mm) |
| | V680-D1KP66T (mounted to non-metallic material) | Read | 0.0 to 47.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 42.0 mm (axis offset: ±10 mm) |
| | V680-D1KP66MT (mounted to metallic material) | Read | 0.0 to 35.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 30.0 mm (axis offset: ±10 mm) |
| | V680-D1KP66T-SP (mounted to non-metallic material) | Read | 0.0 to 42.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 37.0 mm (axis offset: ±10 mm) |
| | V680-D1KP58HTN | Read | 7.5 to 75.0 mm (axis offset: ±10 mm) |
| | | Write | 7.5 to 75.0 mm (axis offset: ±10 mm) |
| | V680S-D2KF67 (mounted to non-metallic material) | Read | 5.0 to 65.0 mm (axis offset: ±10 mm) |
| | | Write | 5.0 to 65.0 mm (axis offset: ±10 mm) |
| | V680S-D2KF67M (mounted to metallic material) | Read | 3.0 to 40.0 mm (axis offset: ±10 mm) |
| | | Write | 3.0 to 40.0 mm (axis offset: ±10 mm) |
| | V680S-D8KF67 (mounted to non-metallic material) | Read | 5.0 to 65.0 mm (axis offset: ±10 mm) |
| | | Write | 5.0 to 65.0 mm (axis offset: ±10 mm) |
| | V680S-D8KF67M (mounted to metallic material) | Read | 3.0 to 40.0 mm (axis offset: ±10 mm) |
| | | Write | 3.0 to 40.0 mm (axis offset: ±10 mm) |
| | V680S-D2KF68 (mounted to non-metallic material) | Read | 7.5 to 75.0 mm (axis offset: ±10 mm) |
| | | Write | 7.5 to 75.0 mm (axis offset: ±10 mm) |
| V680S-D2KF68M (mounted to metallic material) | Read | 5.5 to 55.0 mm (axis offset: ±10 mm) | |
| | Write | 5.5 to 55.0 mm (axis offset: ±10 mm) | |
| V680S-D8KF68 (mounted to non-metallic material) | Read | 7.5 to 75.0 mm (axis offset: ±10 mm) | |
| | Write | 7.5 to 75.0 mm (axis offset: ±10 mm) | |
| V680S-D8KF68M (mounted to metallic material) | Read | 5.5 to 55.0 mm (axis offset: ±10 mm) | |
| | Write | 5.5 to 55.0 mm (axis offset: ±10 mm) | |

■ Installation Conditions

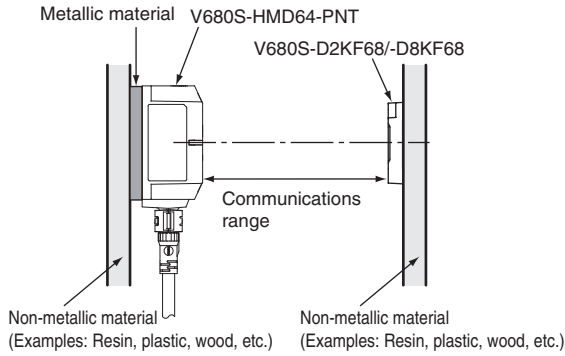
● V680S-D2KF67/-D8KF67



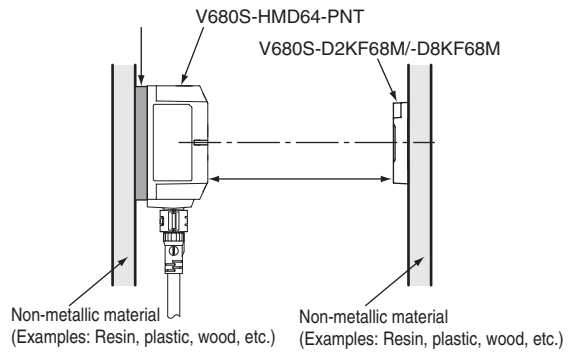
● V680S-D2KF67/-D8KF67M



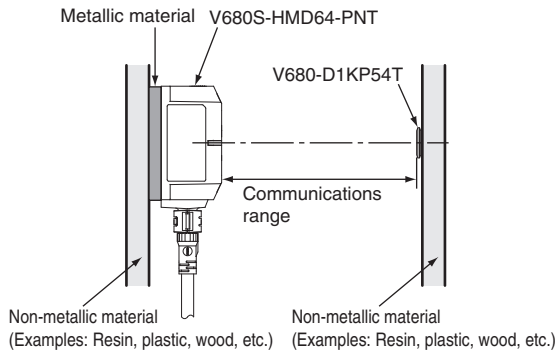
● V680S-D2KF68/-D8KF68



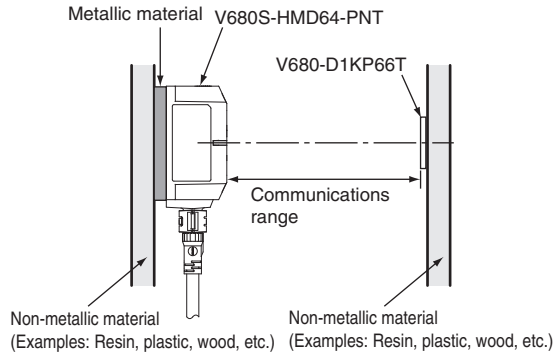
● V680S-D2KF68/-D8KF68M



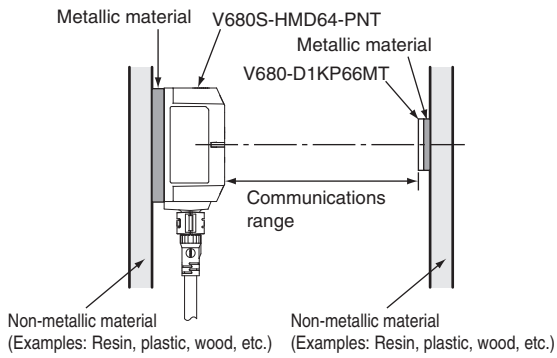
● **V680-D1KP54T**



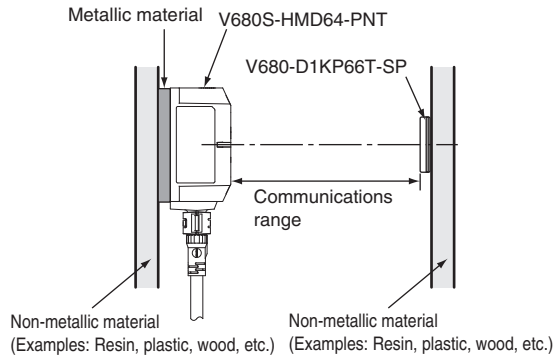
● **V680-D1KP66T**



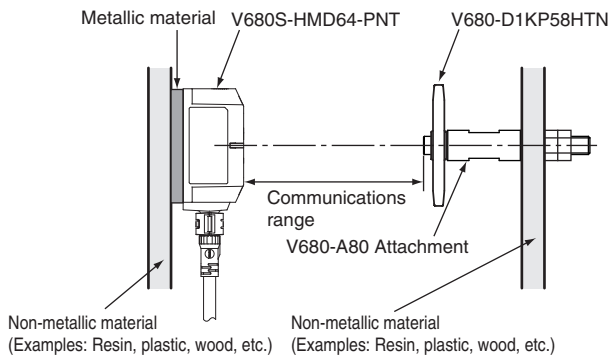
● **V680-D1KP66MT**



● **V680-D1KP66T-SP**



● **V680-D1KP58HTN**



■ V680S-HMD66-PNT

| Reader/Writer | RF Tag | Communications Range Specification | |
|--|---|--|--|
| V680S-HMD66-PNT (mounted to metallic material) | V680-D1KP54T (mounted to non-metallic material) | Read | 7.5 to 75.0 mm (axis offset: ±10 mm) |
| | | Write | 7.5 to 75.0 mm (axis offset: ±10 mm) |
| | V680-D1KP66T (mounted to non-metallic material) | Read | 0.0 to 45.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 38.0 mm (axis offset: ±10 mm) |
| | V680-D1KP66MT (mounted to metallic material) | Read | 0.0 to 37.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 30.0 mm (axis offset: ±10 mm) |
| | V680-D1KP66T-SP (mounted to non-metallic material) | Read | 0.0 to 59.0 mm (axis offset: ±10 mm) |
| | | Write | 0.0 to 52.0 mm (axis offset: ±10 mm) |
| | V680-D1KP58HTN | Read | 10.0 to 90.0 mm (axis offset: ±10 mm) |
| | | Write | 10.0 to 800.0 mm (axis offset: ±10 mm) |
| | V680S-D2KF67 (mounted to non-metallic material) | Read | 7.0 to 70.0 mm (axis offset: ±10 mm) |
| | | Write | 7.0 to 70.0 mm (axis offset: ±10 mm) |
| | V680S-D2KF67M (mounted to metallic material) | Read | 4.0 to 45.0 mm (axis offset: ±10 mm) |
| | | Write | 4.0 to 45.0 mm (axis offset: ±10 mm) |
| | V680S-D8KF67 (mounted to non-metallic material) | Read | 7.0 to 70.0 mm (axis offset: ±10 mm) |
| | | Write | 7.0 to 70.0 mm (axis offset: ±10 mm) |
| | V680S-D8KF67M (mounted to metallic material) | Read | 4.0 to 45.0 mm (axis offset: ±10 mm) |
| | | Write | 4.0 to 45.0 mm (axis offset: ±10 mm) |
| | V680S-D2KF68 (mounted to non-metallic material) | Read | 10.0 to 100.0 mm (axis offset: ±10 mm) |
| | | Write | 10.0 to 100.0 mm (axis offset: ±10 mm) |
| V680S-D2KF68M (mounted to metallic material) | Read | 7.5 to 75.0 mm (axis offset: ±10 mm) | |
| | Write | 7.5 to 75.0 mm (axis offset: ±10 mm) | |
| V680S-D8KF68 (mounted to non-metallic material) | Read | 10.0 to 100.0 mm (axis offset: ±10 mm) | |
| | Write | 10.0 to 100.0 mm (axis offset: ±10 mm) | |
| V680S-D8KF68M (mounted to metallic material) | Read | 7.5 to 75.0 mm (axis offset: ±10 mm) | |
| | Write | 7.5 to 75.0 mm (axis offset: ±10 mm) | |

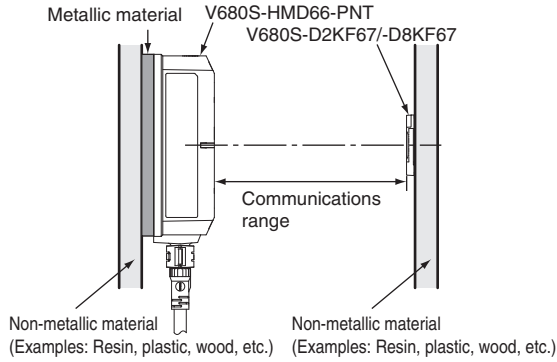


You can use the V680S-D8KF6□ with Reader/Writers with firmware version 2.00 or higher.

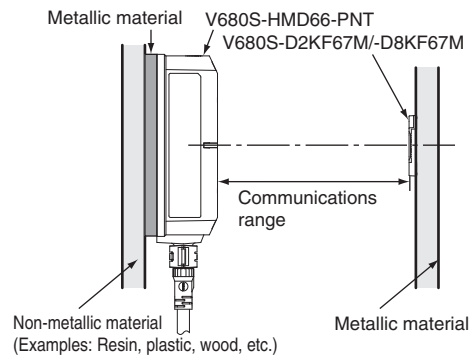
CHECK!

Installation Conditions

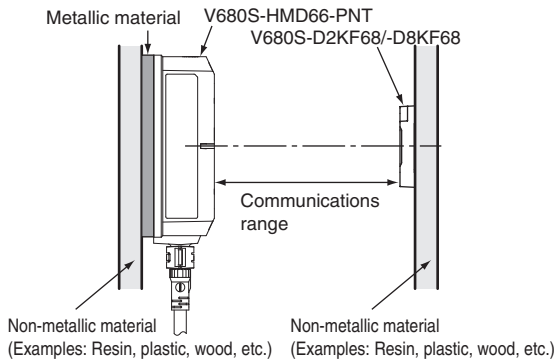
● V680S-D2KF67/-D8KF67



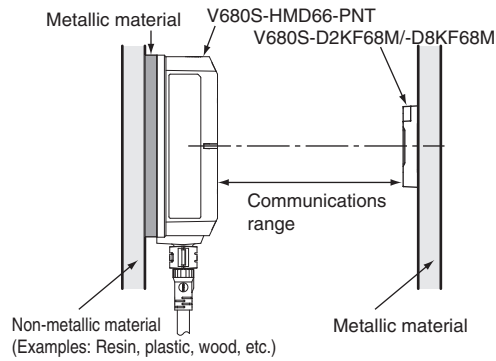
● V680S-D2KF67M/-D8KF67M



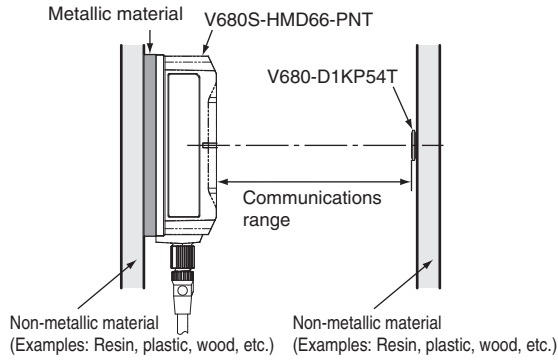
● V680S-D2KF68/-D8KF68



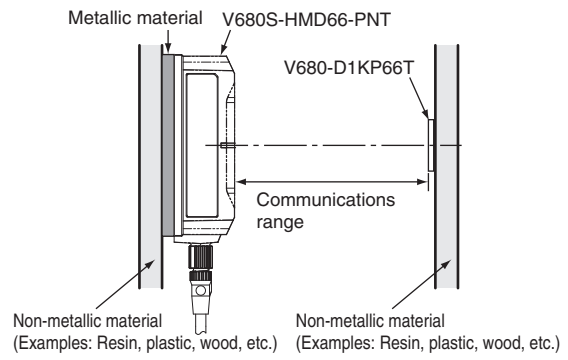
● V680S-D2KF68M/-D8KF68M



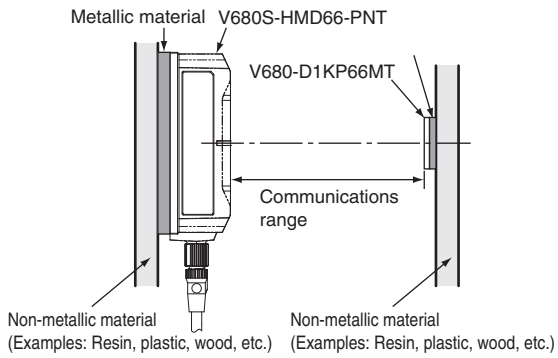
● V680-D1KP54T



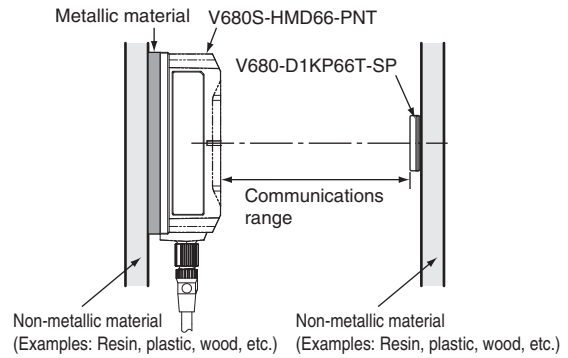
● V680-D1KP66T



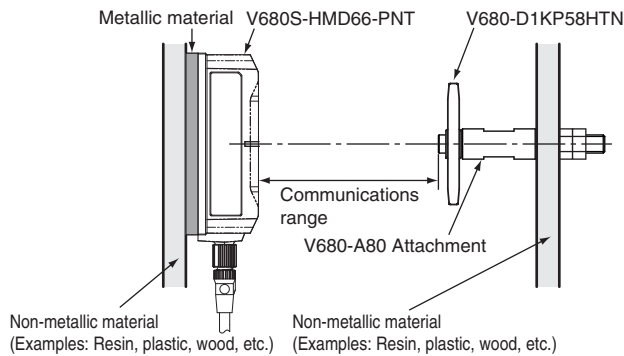
● V680-D1KP66MT



● V680-D1KP66T-SP



● V680-D1KP58HTN



MEMO

Section 2

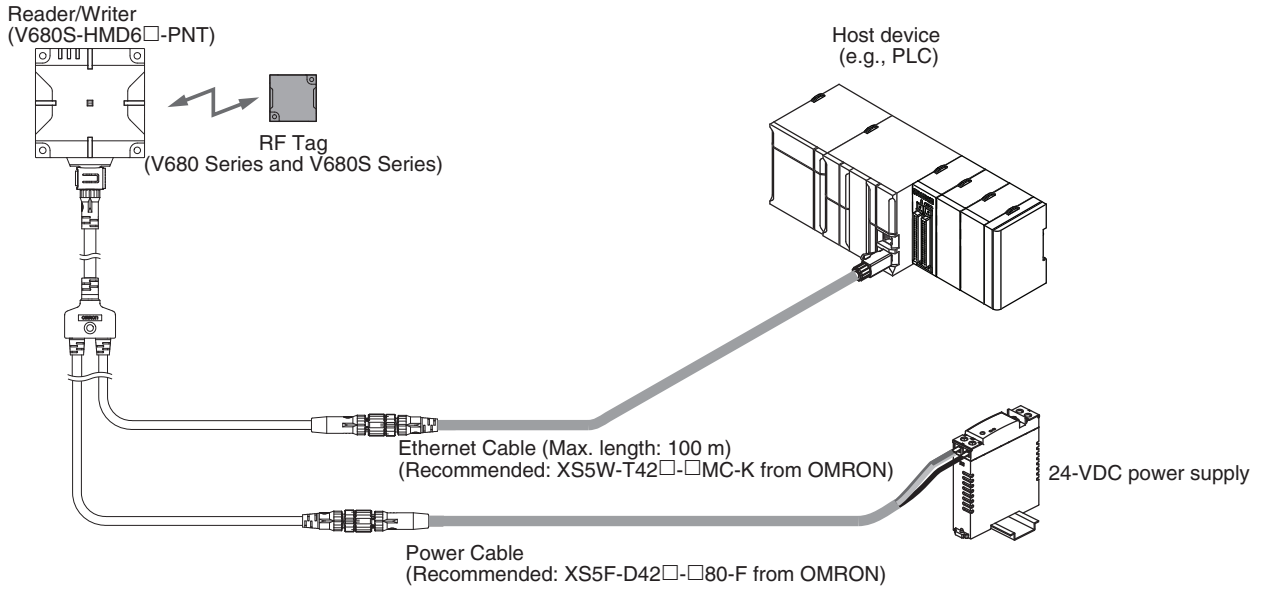
System Configuration

 System Configuration

56

System Configuration

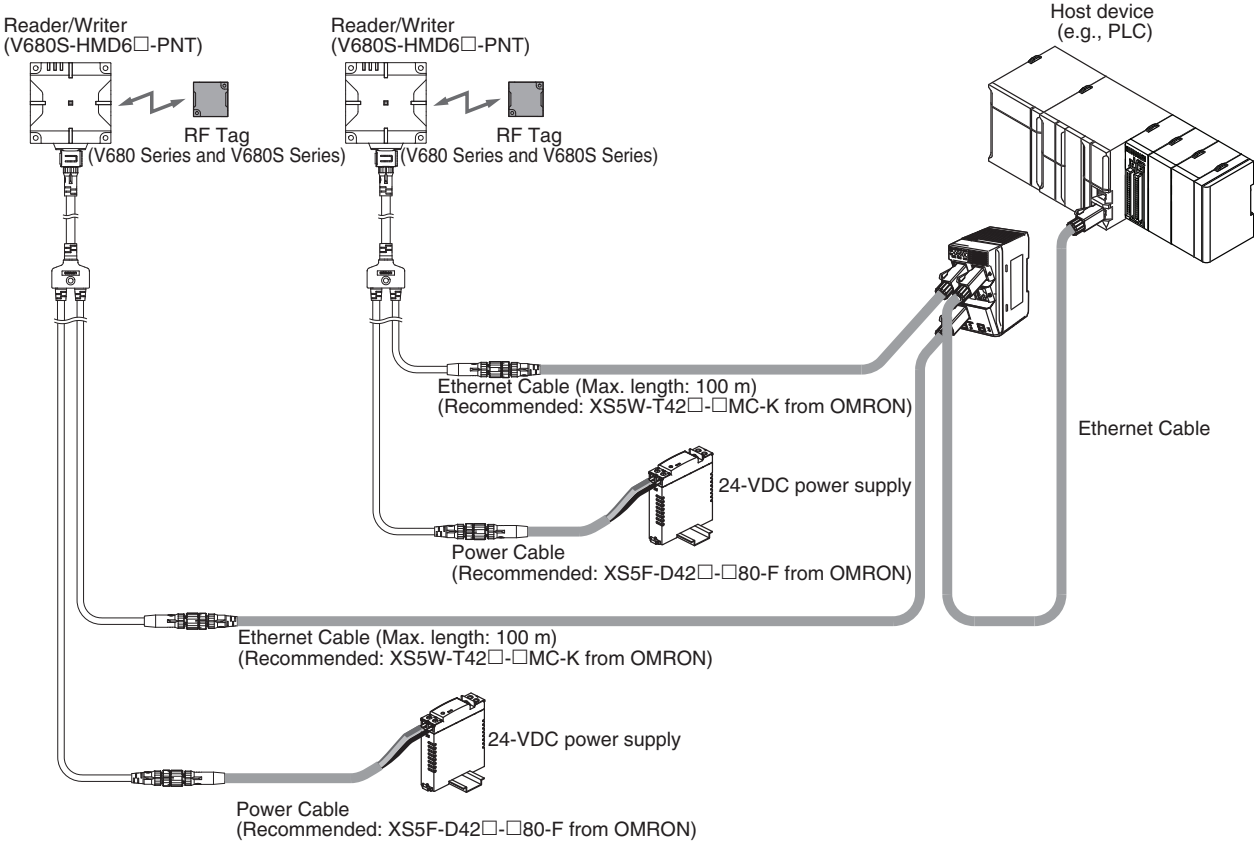
■ One Reader/Writer is connected to the Host device (e.g., PLC)



Connect the Ethernet Cable to a host device (e.g., Switching Hub or PLC) that supports STP and ground the host device to 100 Ω or less.

CHECK!

■ The plural Reader/Writer's are connected to the Host device (e.g., PLC)



Connect the Ethernet Cable to a host device (e.g., Switching Hub or PLC) that supports STP and ground the host device to 100 Ω or less.

CHECK!




Always use a Switching Hub on any network where cyclic data exchanges are used.

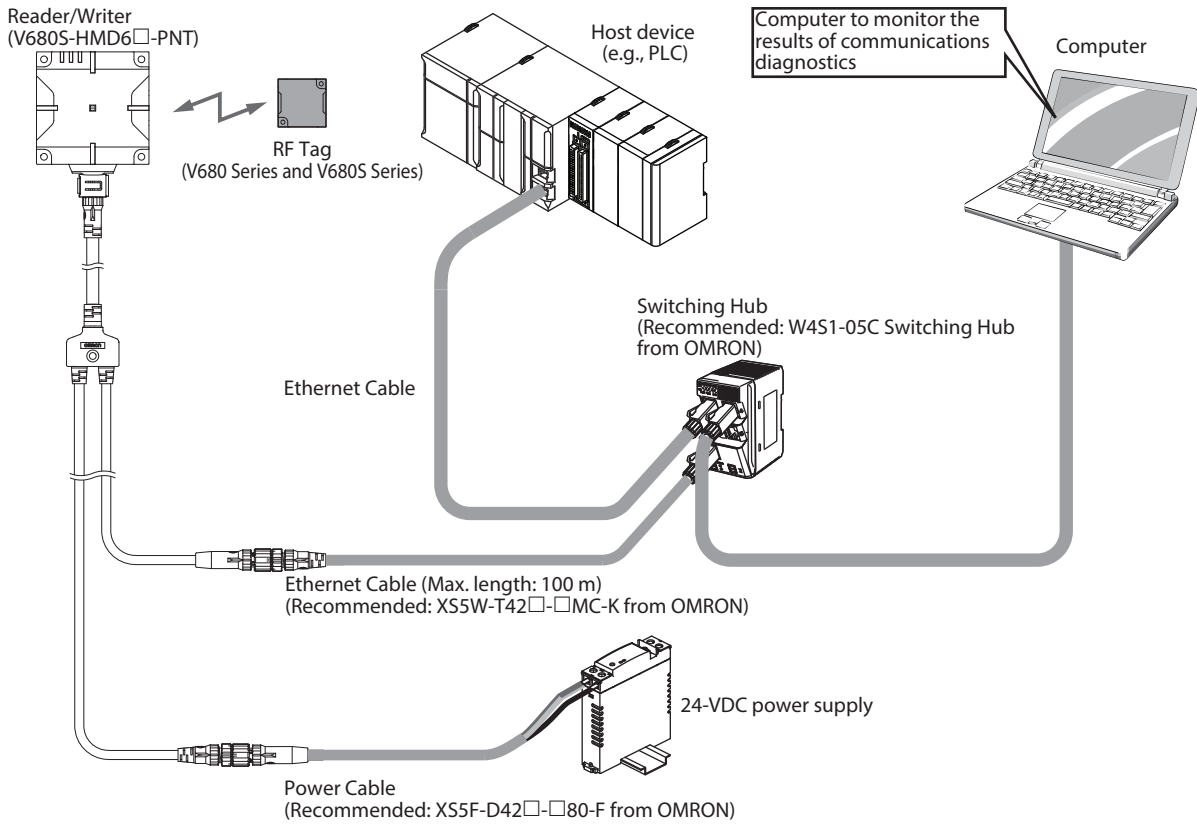
CHECK!

■ The computer is connected to monitor the results of communications diagnostics

The system requires the combination of OS and browser to use the Web browser.

For details, refer to Section 8 Web Browser Interface.

 p.189, p.191



Connect the Ethernet Cable to a host device (e.g., Switching Hub or PLC) that supports STP and ground the host device to 100 Ω or less.

CHECK!



Always use a Switching Hub on any network where cyclic data exchanges are used.

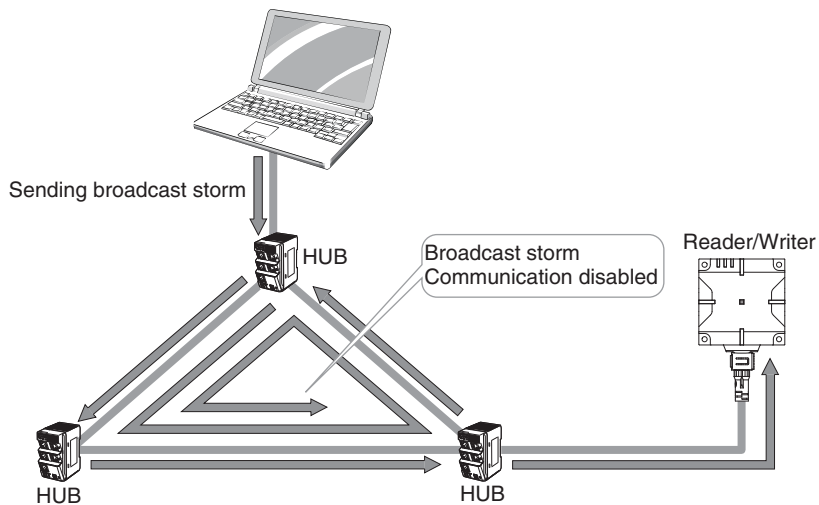
CHECK!

■ About the Ethernet communication abnormality



If an Ethernet network is configured into a loop as shown below, broadcast packets are accumulated in the band, and the communication is disabled. Therefore, do not configure the Ethernet network into a loop.

CHECK!




When a large amount of broadcast packets or multicast packets flow into the Ethernet network, Reader/Writers may stop its operation. Please do not send a large amount of packet. Please separate the Reader/Writers from the network segment that broadcast or multicast packets flow.

CHECK!

MEMO

Section 3

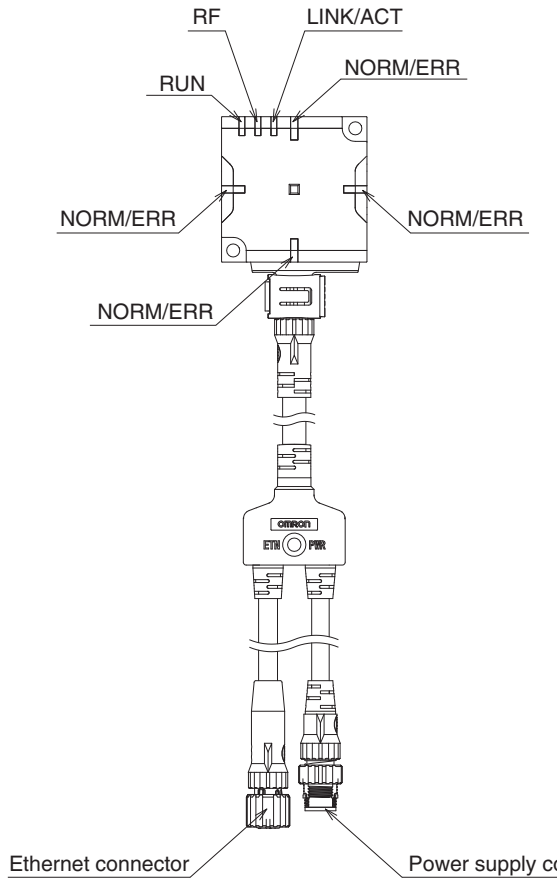
Component Names

| | |
|---|----|
|  Component Names | 62 |
| Reader/Writer | 62 |
| RF Tag | 66 |

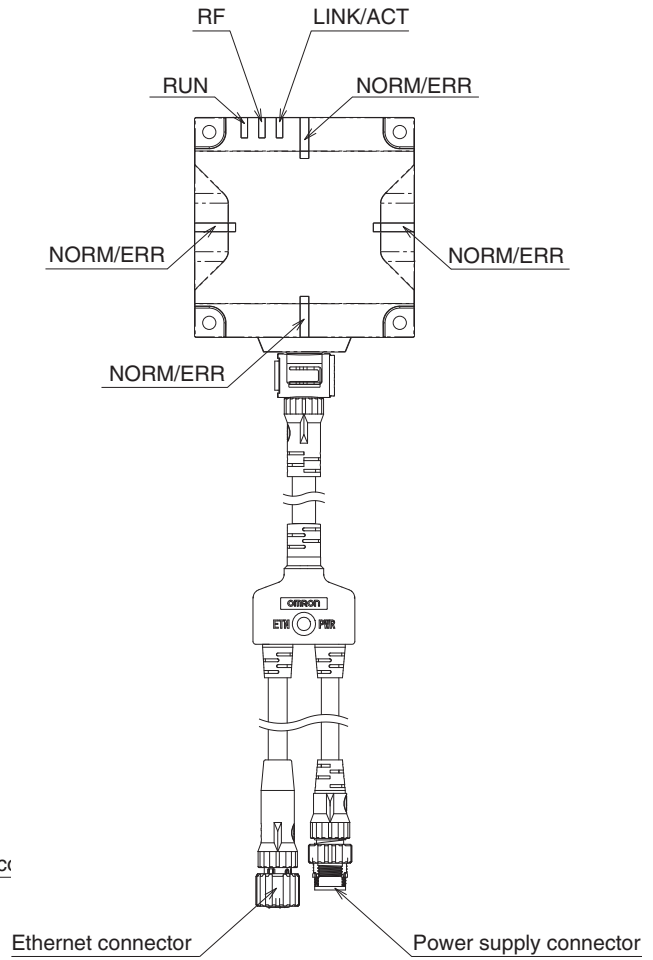
Component Names

Reader/Writer

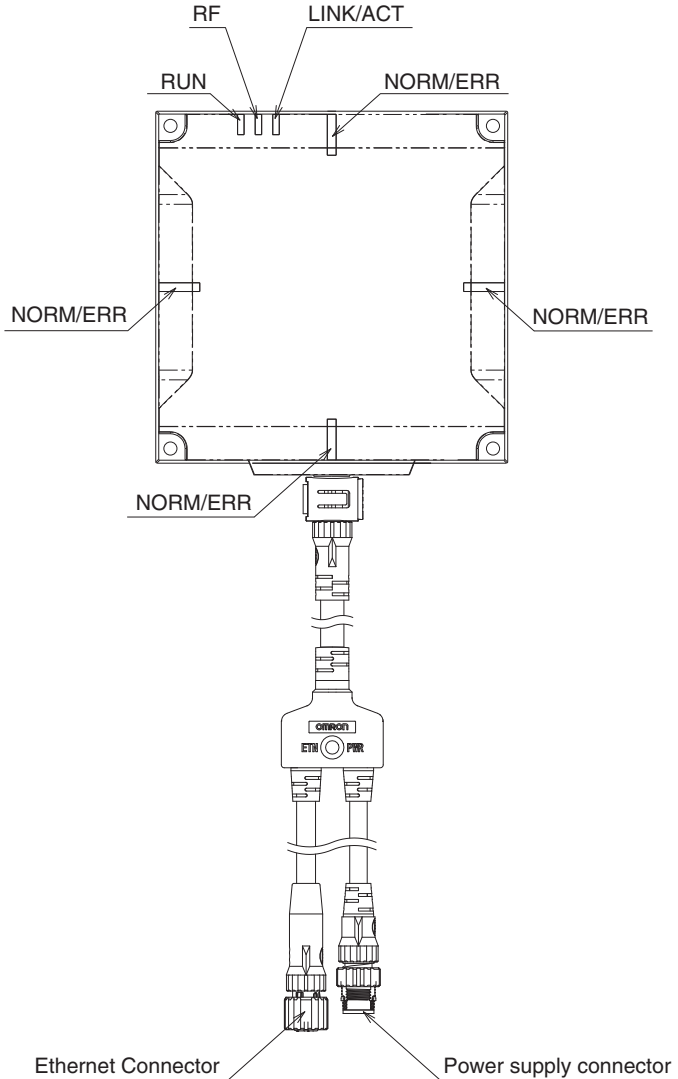
V680S-HMD63-PNT



V680S-HMD64-PNT



V680S-HMD66-PNT



■ Operation Indicators

■ RUN

| Status | Meaning |
|-------------------------|---|
| Lit green | Lighting while the Reader/Writer is in Run Mode and cyclic data exchanges connection are established. |
| Flashing green | Flashes during operation in Safe Mode. (Flashes at 1-s intervals.) |
| Flashing green quickly | The indicator will flash quickly in the following cases. (Flashes at 200-ms intervals.) <ul style="list-style-type: none"> • During Reader/Writer initialization • While the Reader/Writer is in Run Mode and is waiting to establish a connection for cyclic data exchanges from the IO controller |
| Lit yellow | Lights yellow while the Reader/Writer is operating in Slave Mode. |
| Flashing yellow quickly | Flashes quickly while the Reader/Writer is in Slave Mode and is waiting to establish a connection for cyclic data exchanges from the IO controller. |
| Not lit | Turn off when power is not supplied. |

■ RF

| Status | Meaning |
|------------|---|
| Lit yellow | Lighting during communication for RF Tag. |
| Not lit | Turn off when not in communication with no error. |

■ NORM/ERR

The NORM/ERR indicator shows the result of communications with an RF Tag.

| Status | Meaning |
|--------------------------|---|
| Lit green | Lights once when processing a communications command or another command from the host device is completed normally. When communication diagnostic is enabled, this indicator will flash once each time a stable communication is detected. |
| Lit yellow | When communication diagnostic is enabled, this indicator will flash once each time an unstable communication is detected. |
| Flashing yellow quickly | Flashes quickly when a timeout is detected during cyclic data exchanges. (A timeout occurs when I/O data from the IO controller is not received within the time specified for the timeout value.) |
| Lit red | Lights once when processing a communications command or another command from the host device ends in an error. It continues to light if a system error occurred. |
| Flashing red | Flash when recoverable error occurs. (Configuration memory error, or Control signal wiring mistake, etc.) |
| Flashing red irregularly | The indicator will flash irregularly in the following cases. (It will repeatedly flash twice for 100 ms at 1-s intervals.) <ul style="list-style-type: none"> • When the same IP address is detected for two different devices on the network at startup |
| Not lit | Turn off when the standby state. |

■ LINK/ACT

| Status | Meaning |
|----------------|--|
| Lit green | Lighting during linking normally. |
| Flashing green | Flash during detects a carrier. |
| Not lit | Turn off when the Ethernet cable is not connected. |

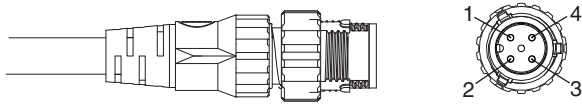
Refer to *Errors and Indicator Status* in *Section 9 Troubleshooting* for information of Error content of the operation indicator

 p.216

■ Connector

■ Power Supply Connector (M12 A-Coding)

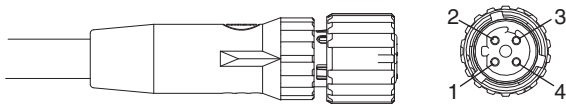
Power Supply Connector (M12 A-Coding, male)



| Pin No. | Name | Description | I/O |
|---------|------|---|-----|
| 1 | 24P | +24 V | --- |
| 2 | CONT | Control signal (operating mode signal) * Run Mode: Connect to +24 V and then start the Reader/Writer. Safe Mode: Connect to 0 V and then start the Reader/Writer. | IN |
| 3 | 24N | 0 V | --- |
| 4 | - | - | --- |

■ Ethernet Connector (M12 D-Coding)

Ethernet Connector (M12 D-Coding, female)

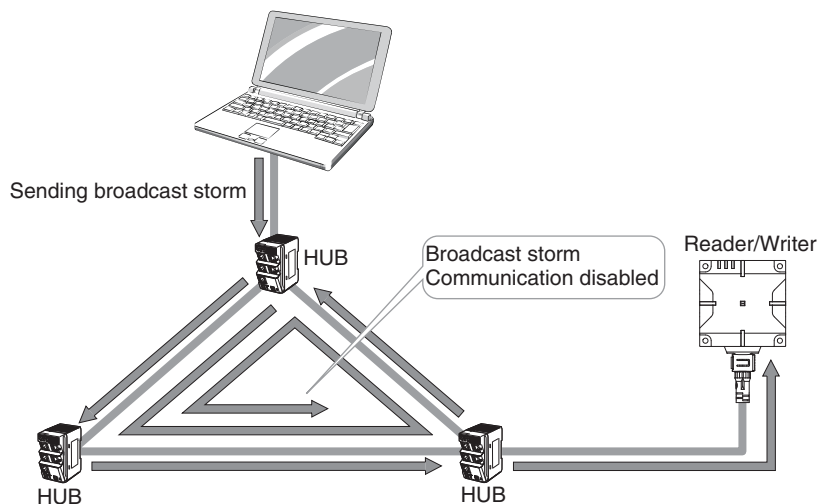


| Pin No. | Name | Description | I/O |
|---------|------|---------------------------|-----|
| 1 | TD+ | Ethernet send signal + | OUT |
| 2 | RD+ | Ethernet receive signal + | IN |
| 3 | TD- | Ethernet send signal - | OUT |
| 4 | RD- | Ethernet receive signal - | IN |
| Housing | FG | Frame ground | --- |



CHECK!

If an Ethernet network is configured into a loop as shown below, broadcast packets are accumulated in the band, and the communication is disabled. Therefore, do not configure the Ethernet network into a loop.



CHECK!

When a large amount of broadcast packets or multicast packets flow into the Ethernet network, Reader/Writers may stop its operation. Please do not send a large amount of packet. Please separate the Reader/Writers from the network segment that broadcast or multicast packets flow.

RF Tag

The model numbers of the RF Tags that can communicate with the Reader/Writer are given in this section. For the communications range specifications, refer to *Communications Range Specifications* in *Section 1 Product Overview*.

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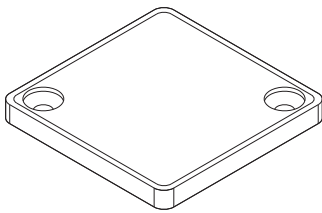
(Unit: mm)

■ V680-D1KP54T



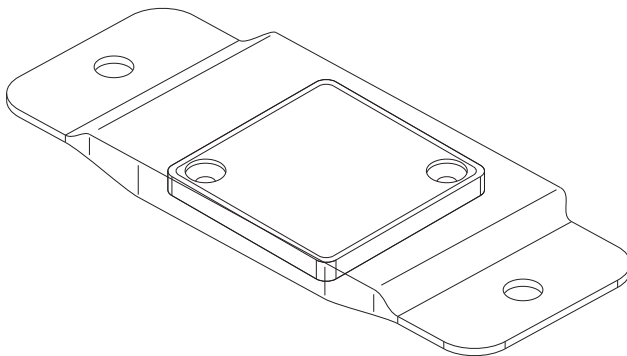
Shape: 20 dia. × 2.7

■ V680-D1KP66T/-D1KP66MT



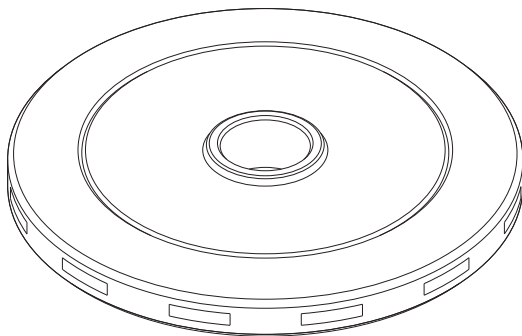
Shape: 34 × 34 × 3.5 (W × H × D)

■ V680-D1KP66T-SP



Shape: 95 × 36.5 × 6.5 (W × H × D)
(excluding protruding parts)

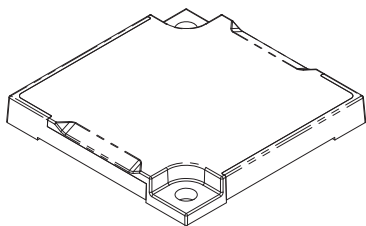
■ V680-D1KP58HTN



Shape: 80 dia. × 10

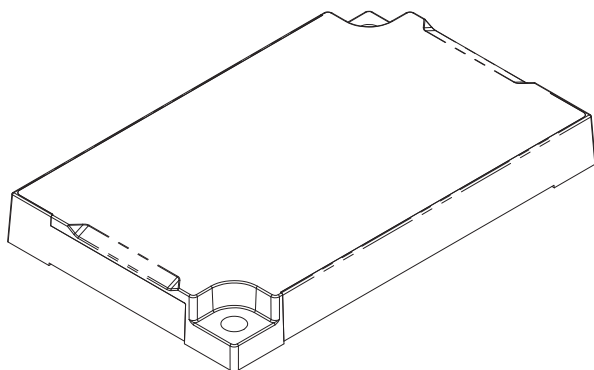
(Unit: mm)

■ V680S-D2KF67/-D2KF67M/-D8KF67/-D8KF67M



Shape: 40 × 40 × 5 (W × H × D)

■ V680S-D2KF68/-D2KF68M/-D8KF68/-D8KF68M



Shape: 86 × 54 × 10 (W × H × D)



CHECK!

You can use the V680S-D8KF6□ with Reader/Writers with firmware version 2.00 or higher.

MEMO

Section 4

Installation and Connections

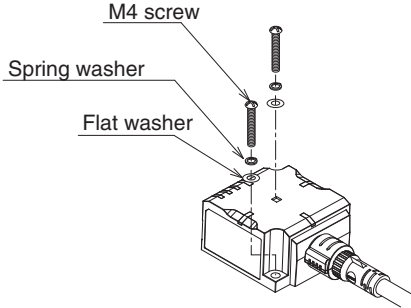
| | |
|---|----|
| ☒ Installation | 70 |
| Reader/Writer | 70 |
| Connector Cover | 73 |
| RF Tag | 75 |
| ☒ Connections and Wiring | 82 |
| Connecting and Removing the Reader/Writer Power Cable and Ethernet Cable | 82 |

Installation

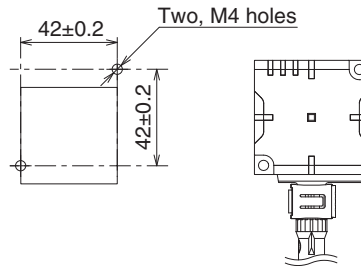
Reader/Writer

■ V680S-HMD63-PNT

Install the Reader/Writer with two M4 screws. Use both spring washers and flat washer.



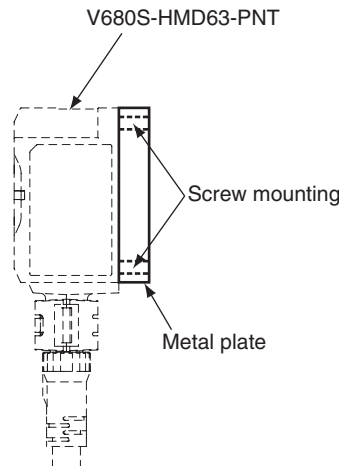
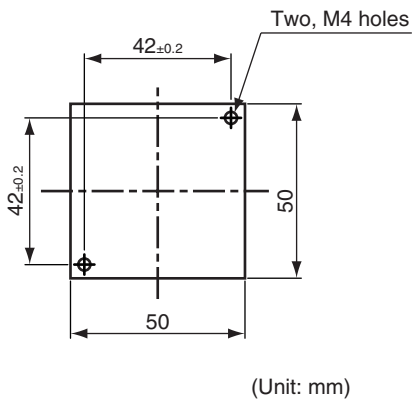
Mounting Hole Dimensions



(Unit: mm)

When you install the Reader/Writer, prepare the metal plate shown in the following figure. When the metal plates size is larger than the below illustration, communication range will change.

Material: Steel



Although it is possible to use SUS, aluminum or brass in addition to steel as the metal plate, communications range is influenced by the material. Do not use resin as the metal plate.



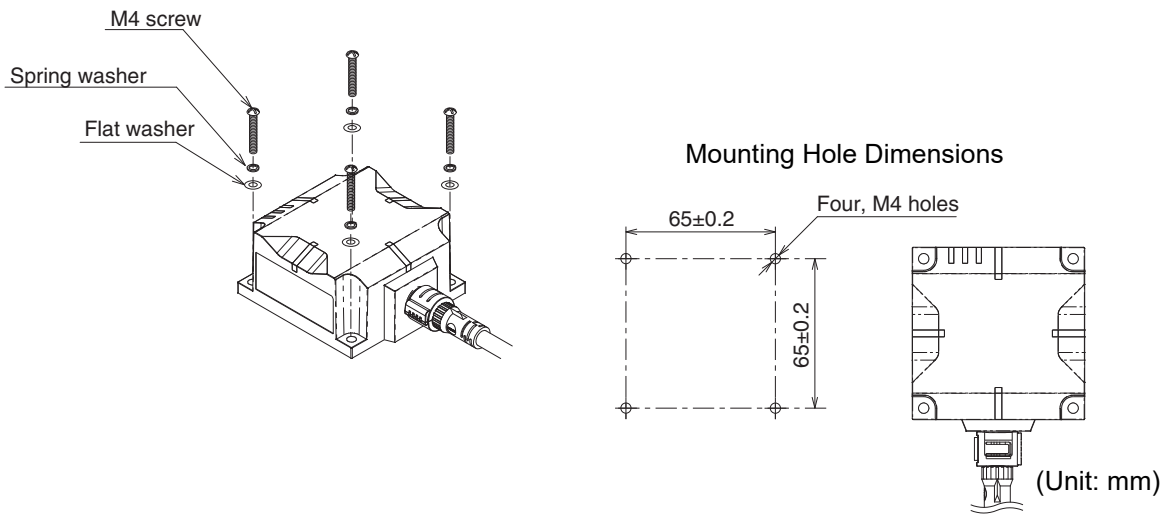
The recommended tightening torque for M4 screws is 1.2 N·m.

Refer to *Reader/Writer Installation Precautions* in *Section 11 Appendices* for information of surrounding metal and Mutual Interference of Reader/Writers.

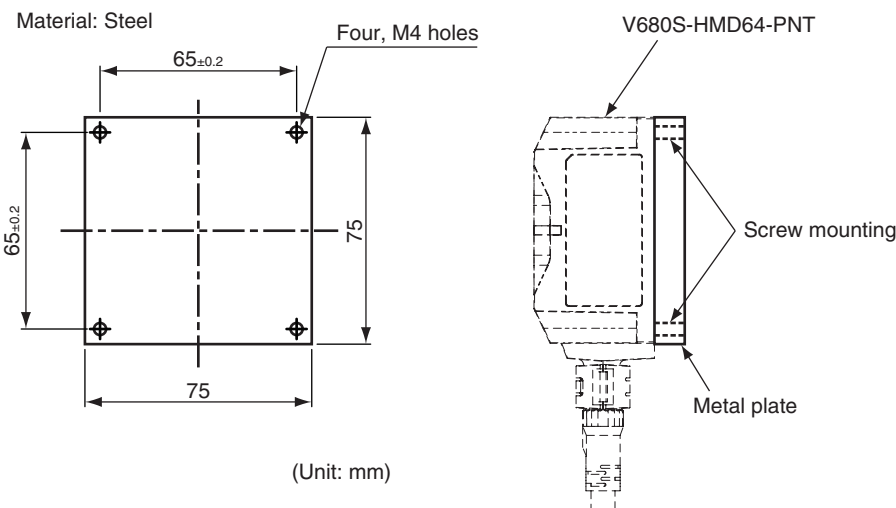
p.252


■ V680S-HMD64-PNT

Install the Reader/Writer with four M4 screws. Use both spring washers and flat washers.




When you install the Reader/Writer, prepare the metal plate shown in the following figure. When the metal plates size is larger than the below illustration, communication range will change.



 Although it is possible to use SUS, aluminum or brass in addition to steel as the metal plate, communications range is influenced by the material. Do not use resin as the metal plate.

CHECK!

 The recommended tightening torque for M4 screws is 1.2 N·m.

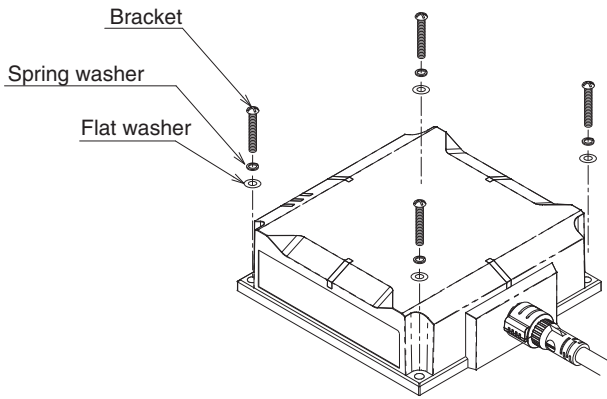
CHECK!

Refer to *Reader/Writer Installation Precautions* in *Section 11 Appendices* for information of surrounding metal and Mutual Interference of Reader/Writers.

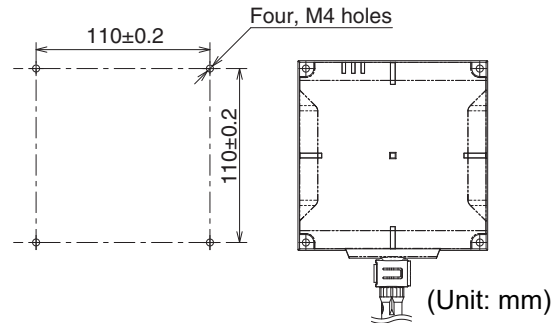
 p.252

■ V680S-HMD66-PNT

Install the Reader/Writer with four M4 screws. Use both spring washers and flat washers.

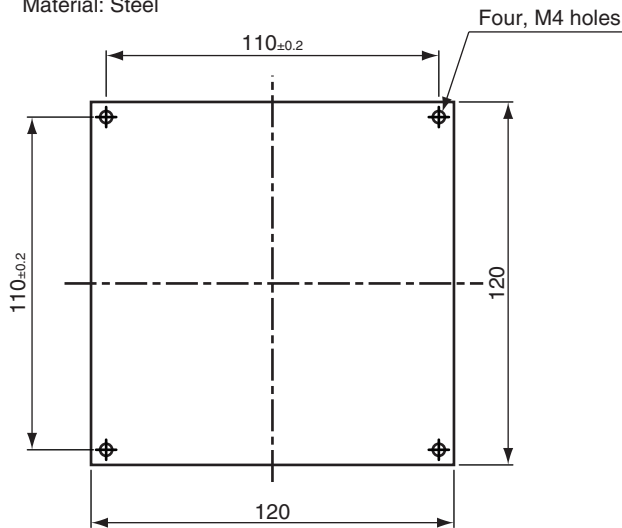


Mounting Hole Dimensions

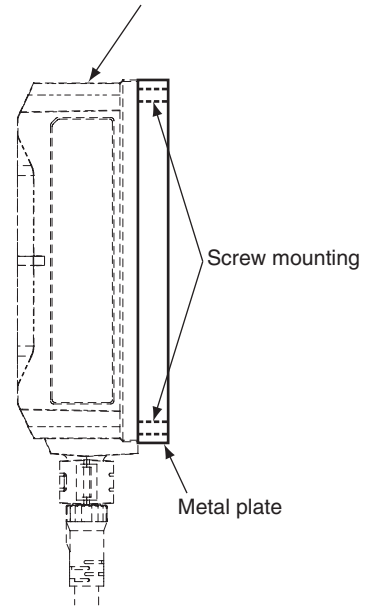


When you install the Reader/Writer, prepare the metal plate as shown in the following figure. When the metal plates size is larger than the below illustration, communication range will change.

Material: Steel



V680S-HMD66-PNT



Although it is possible to use SUS, aluminum or brass in addition to steel as the metal plate, communications range is influenced by the material. Do not use resin as the metal plate.

CHECK!



The recommended tightening torque for M4 screws is 1.2 N·m.

CHECK!

Refer to *Reader/Writer Installation Precautions* in *Section 11 Appendices* for information of surrounding metal and Mutual Interference of Reader/Writers.

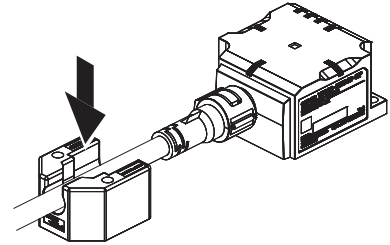
p.252

Connector Cover

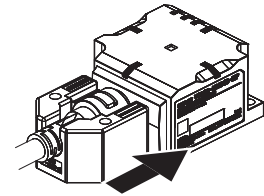
■ V680S-A63-S

Either use the V680S-A63-S Attachment to mount the Connector Cover with screws or permanently attach the RF Tags with adhesive.

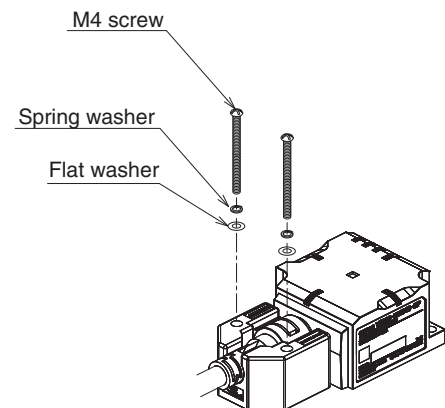
1. Through a cord into a connector cover.



2. Press a connector cover up until it clicks.



3. Install the connector cover with two M4 screws.
Tightening torque: 1.2 N·m



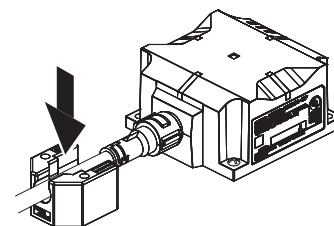
When removing a connector, please remove the screw on which a connector cover is being fixed and shift a connector cover.

CHECK! (1),(2),(3) above-mentioned is reverse.

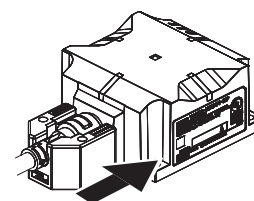
■ V680S-A64-S

Either use the V680S-A64-S Attachment to mount the Connector Cover with screws or permanently attach the RF Tags with adhesive.

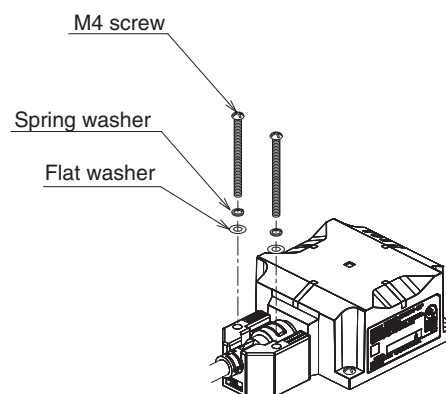
1. Through a cord into a connector cover.



2. Press a connector cover up until it clicks.



3. Install the connector cover with two M4 screws.
Tightening torque: 1.2 N·m



When removing a connector, please remove the screw on which a connector cover is being fixed and shift a connector cover.

CHECK! (1),(2),(3) above-mentioned is reverse.

RF Tag

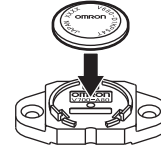
■ V680-D1KP54T

Either use the V700-A80 Attachment to mount the RF Tags with screws or permanently attach the RF Tags with adhesive.

Installation with the V700-A80 Attachment

1. Place the V680-D1KP54T RF Tag in the Attachment.

The V680-D1KP54T RF Tag can be placed in the Attachment in either direction.
The direction does not affect operation.



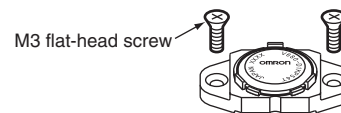
CHECK!

Do not repeatedly place the RF Tag in the Attachment and remove it from the Attachment. If you do so, the RF Tag will become loose or the Attachment will be damaged.

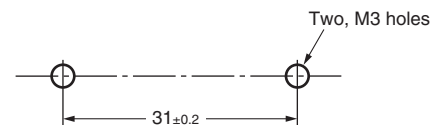
If you must remove an RF Tag from the Attachment, insert a flat-blade screwdriver in the gap under the RF Tag. Do not try to remove it with your bare hands. Doing so may result in injury.

2. Mount the Attachment with M3 screws.

Tighten the screws to a suitable torque.
Tightening torque: 0.3 to 0.5 N·m



Mounting Hole Dimensions



■ Installation with Adhesive

Select an adhesive that is suitable for the materials. Use the correct application method and amount. Always confirm that the RF Tag is securely attached before you use it.

The RF Tags are made from PPS resin. We recommend epoxy adhesives to mount them on metal or hard plastic.

The epoxy adhesives that are listed in the following table are recommended for the given temperature ranges.

| Ambient operating temperature | Product name | Manufacturer |
|-------------------------------|--|---------------------|
| -40 to 70°C | Two-part Epoxy Adhesive: TB2001 (main agent)/TB2105C (curing agent) | ThreeBond Co., Ltd. |
| | One-part Moisture-curing Elastic Adhesive: TB1530 | ThreeBond Co., Ltd. |
| -40 to 110°C | Two-part Epoxy Adhesive: EP001 | Cemedine Co. Ltd. |
| -40 to 150°C | One-part Epoxy Adhesive: TB2285 | ThreeBond Co., Ltd. |
| | Two-part Epoxy Adhesive: TB2087 | ThreeBond Co., Ltd. |



CHECK!

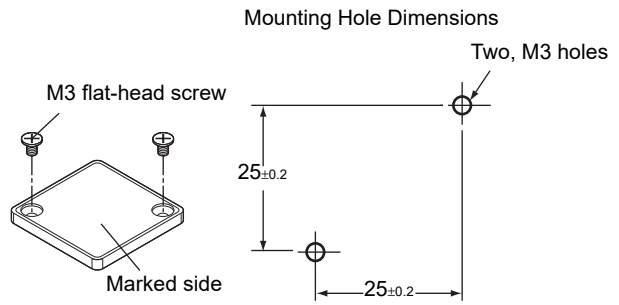
The above adhesives may not provide sufficient strength when attaching RF Tags to polyethylene, polypropylene, fluororesins, or silicon-based resins. Check applicability carefully in advance. Consult with the manufacturer for detailed information on adhesives.

■ V680-D1KP66T

■ Mounting on Non-metallic Material

Mount the RF Tag using M3 flat-head screws from the marked side.

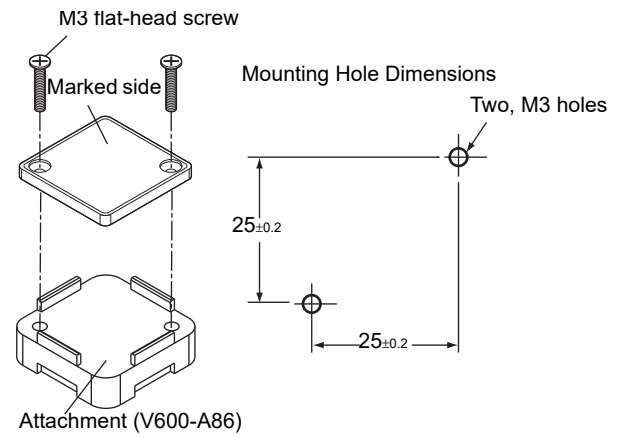
Tighten the screws to a torque of 0.3 to 0.5 N·m.



■ Mounting on Metallic Material

The communications range will decrease if there is metal at the back of the V680-D1KP66T RF Tag.

If the RF Tag is mounted on metallic material, use the V600-A86 Attachment (sold separately) or a non-metallic spacer (e.g., plastic or resin).



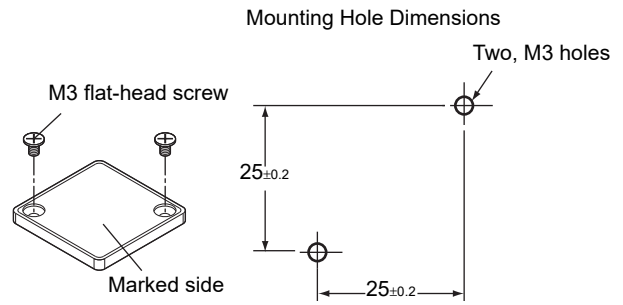
Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of metal at the back surface, Mutual Interference of RF Tags and Influence of Inclination of the V680-D1KP66T.

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■ V680-D1KP66MT

Mount the RF Tag using M3 flat-head screws from the marked side.

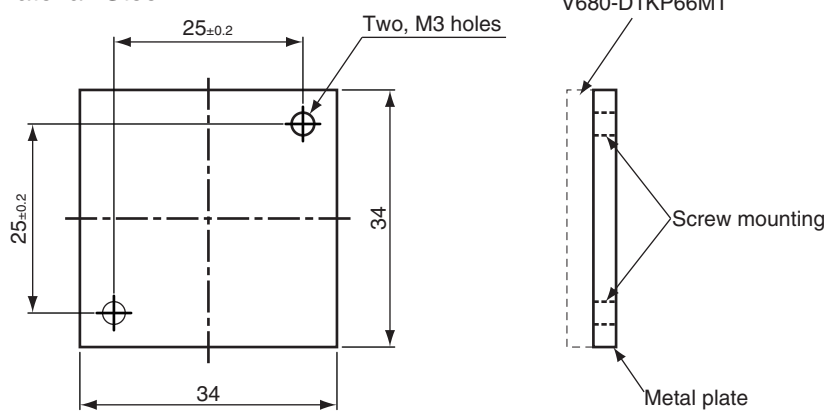
Tighten the screws to a torque of 0.3 to 0.5 N·m.



When you install the RF tag, prepare the metal plate as shown in the figure below.

When the metal plates size is larger than the below illustration, communication range will change. Please confirm the influence well.

Material: Steel



(Unit: mm)



Although it is possible to use SUS, aluminum or brass in addition to steel as the metal plate, communications range is influenced by the material. Do not use resin as the metal plate.

CHECK!

Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of surrounding metal, Mutual Interference of RF Tags and Influence of Inclination on the V680-D1KP66MT.

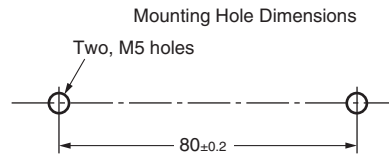
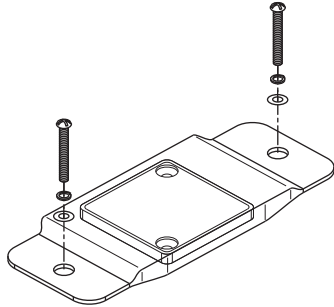


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■ V680-D1KP66T-SP

Mount the RF Tag using M5 screws and washers. The tightening torque is 1.2 N·m.

There are no restrictions on the mounting direction for the RF Tag or the direction of RF Tag travel in respect to the Reader/Writer.



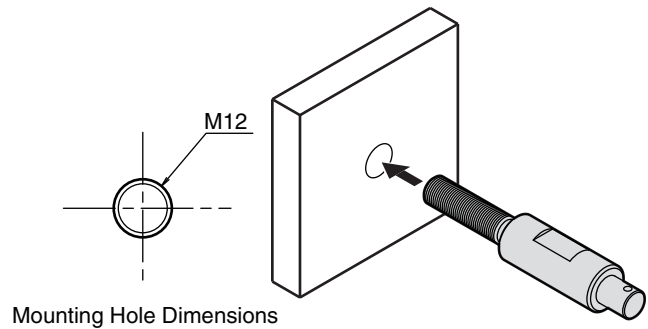
Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of metal at the back surface, Mutual Interference of RF Tags and Influence of Inclination of the V680-D1KP66T-SP.

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■ **V680-D1KP58HTN**

Use the following procedure to install an RF Tag with the V680-A80 Attachment.

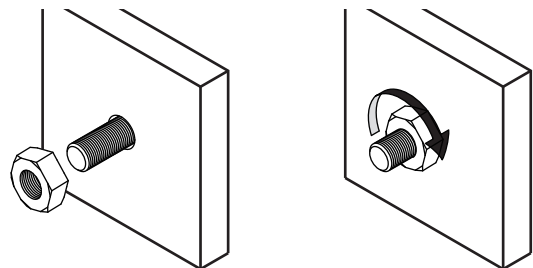
- 1.** Attach the Attachment to the workpiece.



- 2.** Tighten the lock nut.



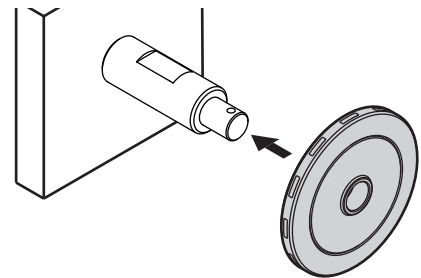
Use a tightening torque of 21 to 42 N·m.



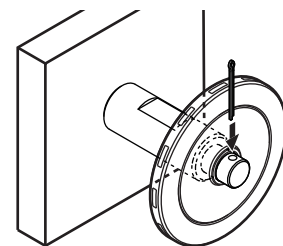
- 3.** Place the RF Tag in the Attachment.



The RF Tag can be attached in either direction. The direction does not affect operation.



- 4.** Insert the split pin into the 3.2-diameter hole and spread open the end of the pin to prevent it from coming out.



Two nuts and one split pin are provided with the V680-A80 Attachment. You must provide any replacement split pins.

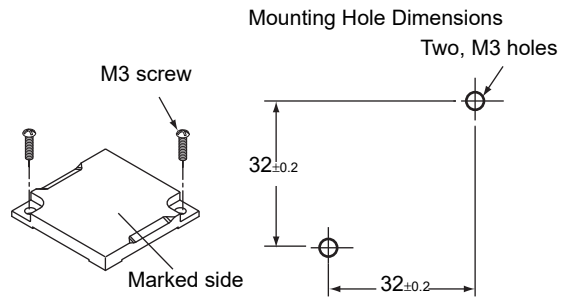
| | |
|-----------|--|
| Split pin | Nominal dimensions: 3.2-mm dia. × 20-mm length |
|-----------|--|

Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of metal at the back surface, Mutual Interference of RF Tags and Influence of Inclination of the V680-D1KP58HTN.

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■ V680S-D2KF67/-D8KF67

Mount the RF Tag with M3 screws.
Tighten the screws to a torque of 0.6 N·m.



Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of metal at the back surface, Mutual Interference of RF Tags and Influence of Inclination of the V680S-D2KF67.

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Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of metal at the back surface, Mutual Interference of RF Tags and Influence of Inclination of the V680S-D8KF67.

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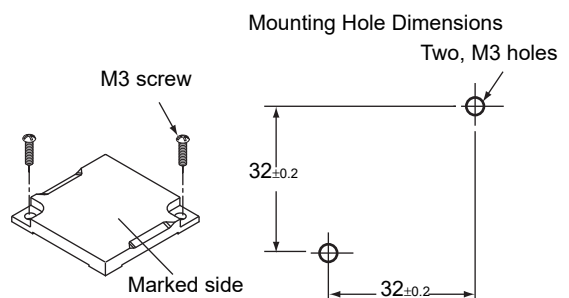


CHECK!

You can use the V680S-D8KF67 with Reader/Writers with firmware version 2.00 or higher.

■ V680S-D2KF67M/-D8KF67M

Mount the V680-D8KF67M to a metal surface.
Mount the RF Tag with M3 screws.
Tighten the screws to a torque of 0.6 N·m.



Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of surrounding metal, Mutual Interference of RF Tags and Influence of Inclination on the V680S-D2KF67M.

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Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of surrounding metal, Mutual Interference of RF Tags and Influence of Inclination on the V680S-D8KF67M.

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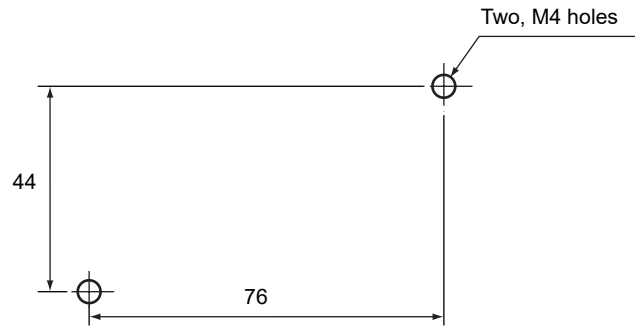
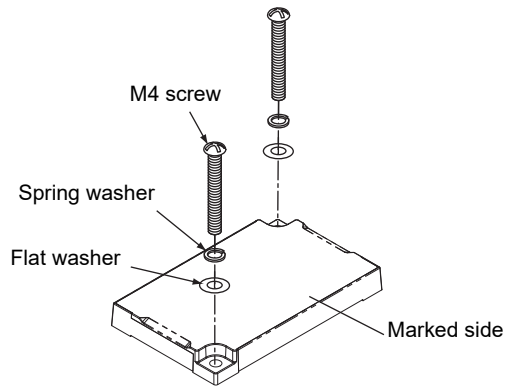


CHECK!

You can use the V680S-D8KF67M with Reader/Writers with firmware version 2.00 or higher.

■ V680S-D2KF68/-D8KF68

Mount the RF Tag with M4 screws. Tighten the screws to a torque of 0.7 to 1.2 N·m.



(Unit: mm)

Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of metal at the back surface, Mutual Interference of RF Tags and Influence of Inclination of the V680S-D2KF68.



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Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of metal at the back surface, Mutual Interference of RF Tags and Influence of Inclination of the V680S-D8KF68.



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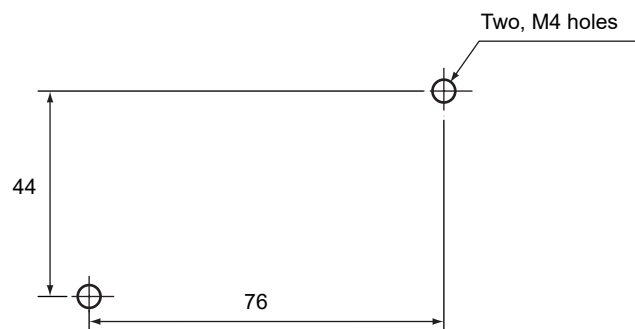
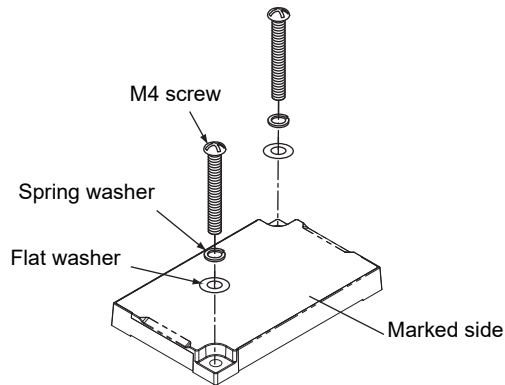


CHECK!

You can use the V680S-D8KF68 with Reader/Writers with firmware version 2.00 or higher.

■ V680S-D2KF68M/-D8KF68M

Mount the RF Tag with M4 screws. Tighten the screws to a torque of 0.7 to 1.2 N·m.



(Unit: mm)

Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of surrounding metal, Mutual Interference of RF Tags and Influence of Inclination on the V680S-D2KF68M.



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Refer to *RF Tag Installation Precautions* in *Section 11 Appendices* for information on the effect of surrounding metal, Mutual Interference of RF Tags and Influence of Inclination on the V680S-D8KF68M.



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CHECK!

You can use the V680S-D8KF68M with Reader/Writers with firmware version 2.00 or higher.

Connections and Wiring

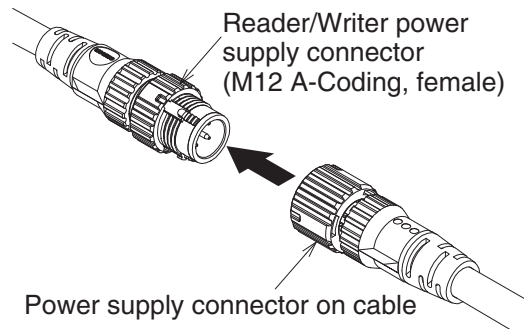
Connecting and Removing the Reader/Writer Power Cable and Ethernet Cable

■ Connecting Method

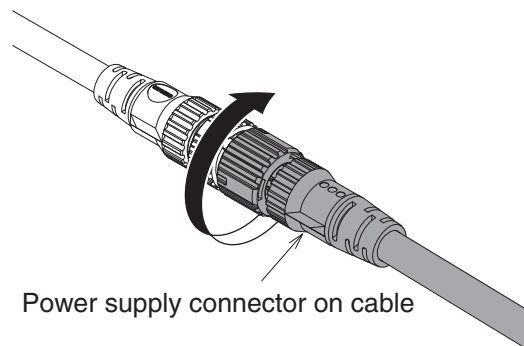
1. Hold onto the connector on the Power Cable and insert it into the power connector on the Reader/Writer.



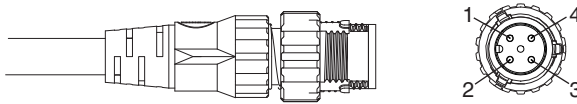
Do not apply more than 30 N of force to the connector on the Reader/Writer.



2. Turn the connector on the Power Cable clockwise to lock it in place.
Recommended tightening torque: 0.39 to 0.49 N·m



■ Contact arrangement of the Reader/Writer's power connector



| Pin No. | Name | Description | I/O |
|---------|------|---|-----|
| 1 | 24P | +24 V | --- |
| 2 | CONT | Control signal (operating mode signal) * Run Mode: Connect to +24 V and then start the Reader/Writer. Safe Mode: Connect to 0 V and then start the Reader/Writer. | IN |
| 3 | 24N | 0 V | --- |
| 4 | - | - | --- |
| Pin No. | Name | Description | I/O |

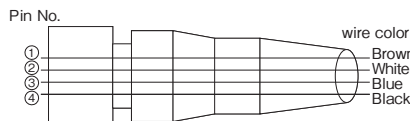
Refer to *Operation Mode* in *Section 6 Functions* for information on the RUN mode, and Safe mode.



■ Contact arrangement and wiring diagram of the recommended cable (Model XS5F-D42□-□80-F)

Contact arrangement

Wiring cable (Four-core type)



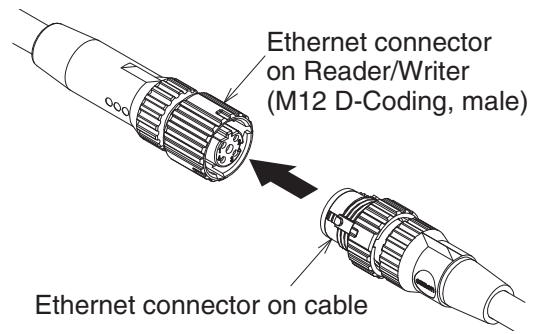
Read and understand the power cable manual before attempting to connect the power cable.

3. Hold onto the connector on the Ethernet Cable and insert it into the Ethernet connector on the Reader/Writer.



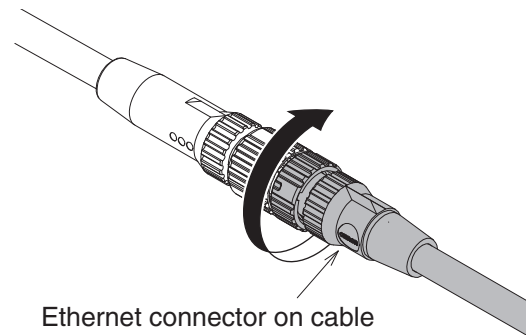
Do not apply more than 30 N of force to the connector on the Reader/Writer.

CHECK!

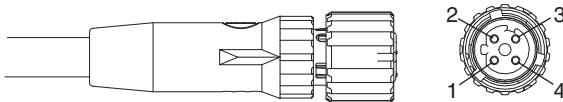


4. Turn the connector on the Ethernet Cable clockwise to lock it in place.

Recommended tightening torque: 0.39 to 0.49 N·m



▪ Contact arrangement of the Reader/Writer's Ethernet connector



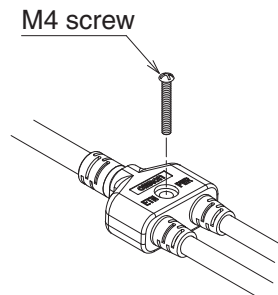
| Pin No. | Name | Description | I/O |
|---------|------|---------------------------|-----|
| 1 | TD+ | Ethernet send signal + | OUT |
| 2 | RD+ | Ethernet receive signal + | IN |
| 3 | TD- | Ethernet send signal - | OUT |
| 4 | RD- | Ethernet receive signal - | IN |
| Housing | FG | Frame ground | --- |

5. Mount the Branch Cable with one M4 screw.



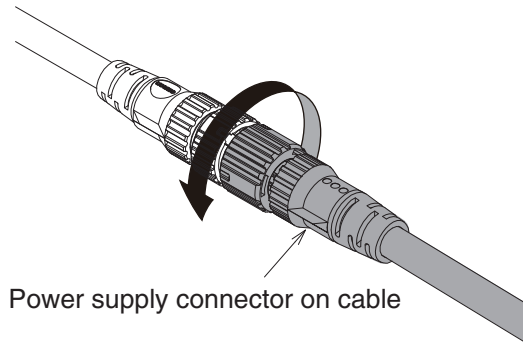
Recommended tightening torque: 0.39 to 0.49 N·m

CHECK!



■ Removal Method

1. Turn the connector on the Power Cable counterclockwise to unlock it.

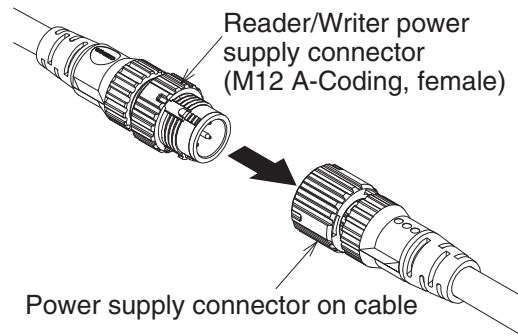


2. Hold onto the connector on the Power Cable and pull it straight out to remove it.

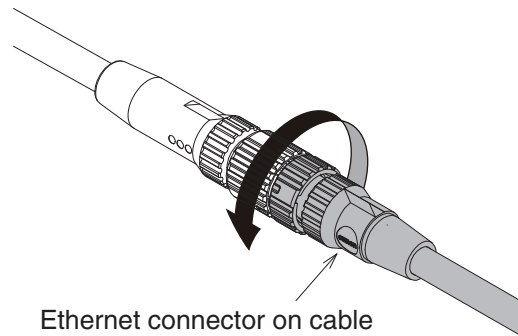


CHECK!

If the connector is difficult to remove, press on the Reader/Writer and pull on the connector. Never pull on the Cable with excessive force. Doing so may break the wires and cause malfunction.



3. Turn the connector on the Ethernet Cable counterclockwise to unlock it.

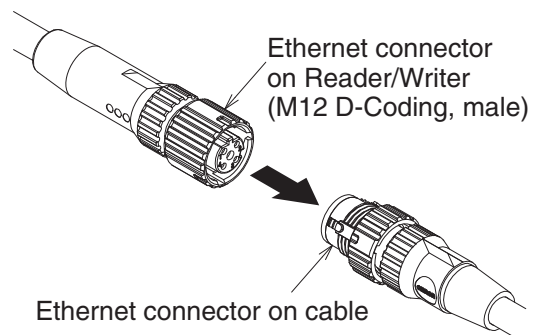


4. Hold onto the connector on the Ethernet Cable and pull it straight out to remove it.



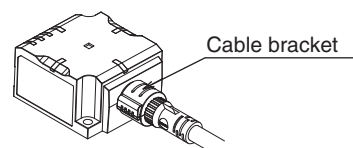
CHECK!

Never pull on the Cable with excessive force. Doing so may break the wires and cause malfunction.



CHECK!

Do not remove the cable bracket from the Reader/Writer.



Section 5

Preparations for Communications

| | |
|--|----|
| ▣ Starting the Reader/Writer | 86 |
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Starting the Reader/Writer

Reader/Writer Starting Procedure

1. Connect the Cable to the Reader/Writer.

Refer to *Connecting and Removing the Reader/Writer Power Cable and Ethernet Cable* in *Section 4 Installation and Connections* for the connector method.



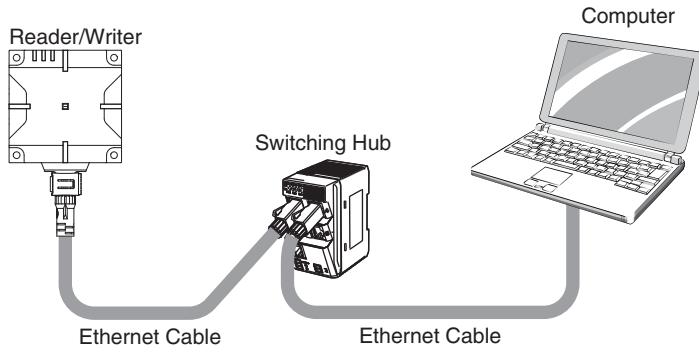
2. Connect the power supply lines and the operation mode signal line in the Cable to the power source and connect the RJ45 connector to an Ethernet port on the host device.
3. Turn ON the power supply to start the Reader/Writer.
If the Reader/Writer starts normally, the RUN indicator will fast flashing green.

Setting Communications Conditions

Preparations for Work

1. Network Configuration

The network configuration that is described in this manual is shown in the following figure. Connect the Reader/Writer and the computer with an Ethernet Cable.



2. Set the IP address on the computer.

Set the IP addresses on the computer. The default IP addresses of the Reader/Writer are given in the following table. Use these addresses to set the IP address on the computer. This example changes the last part of the IP address to a value other than 200 (i.e., to 1 to 199 or 201 to 254). Values of 0 and 255 cannot be used.

▪ Default IP Addresses of the Reader/Writer

| Setting | Default setting |
|-----------------|--------------------------------|
| IP address | 192.168.1.200 (fixed setting) |
| Subnet mask | 255.255.255.0 (fixed setting) |
| Default gateway | 192.168.1.254 (fixed settings) |

■ Setting the IP Address on the Computer with Windows 7 or Windows 10

1. Open the Control Panel, and select Network and Internet and then Network and Sharing Center.
2. Select Change adapter settings and then right-click Local Area Connection.
3. Right-click Local Area Connection and select Properties.
4. Select Internet Protocol Version 4 (TCP/IPv4) and then click the Properties Button.
5. Select the Use the following IP address Option, make the following settings, and then click the OK Button.

- Host Device Setting Example

IP address : 192.168.1.100
Subnet mask : 255.255.255.0



CHECK!

This example changes the last part of the IP address of the host device to a value other than 200 (i.e., 1 to 199 or 201 to 254). Values of 0 and 255 cannot be used.

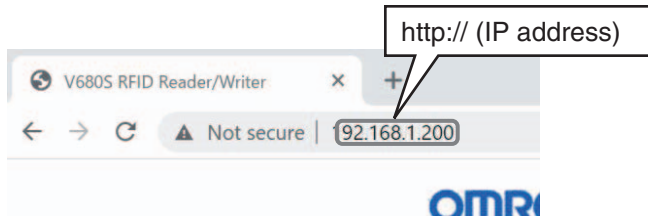
6. Click the OK Button to close the Internet Protocol Version 4 (TCP/IPv4) Properties Dialog Box.

Setting the IP Address of the Reader/Writer from a Web Browser

1. Start the Web browser.

Enter the IP address of the Reader/Writer in the address field of the Web browser to display the Web Browser Operation Window.

Enter `http://192.168.1.200` if you are using the default IP address.



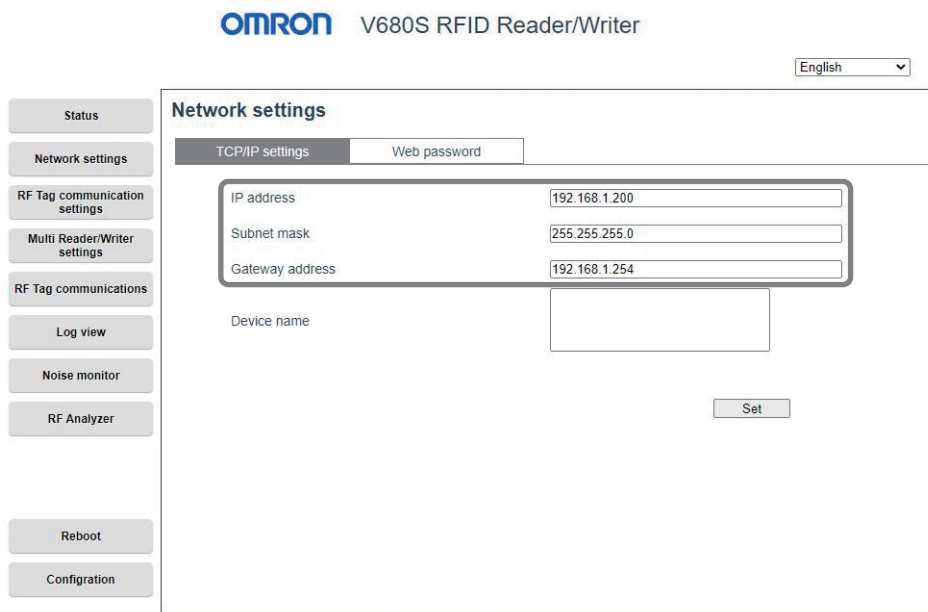
2. Set the IP address of the Reader/Writer.

Click the **Network settings** Button at the upper left of the Web Browser Operation Window.

Enter the IP address, subnet mask, and gateway address, and then click the **Set** Button.

▪ Setting a Fixed IP Address

On the Network Settings View, select the *Fixed settings* Option, enter the IP address, subnet mask, and gateway address, and then click the **Set** Button.



Setting the IP Address of the Reader/Writer on the Engineering Tool

You can also use the Engineering Tool to set the IP address for the Reader/Writer. Refer to the manual for your Engineering Tool for the specific procedure to set the IP address with the Engineering Tool.



CHECK!

If you assign the IP addresses of the Reader/Writer from the IO controller, the IP addresses that are specified for the following Reader/Writer functions will change dynamically and may result in unexpected operation. Confirm that no problems will occur before you assign the IP addresses from the IO controller.

- IP address of the copy destination Reader/Writer for the data copy function
- IP addresses of the Slave Reader/Writers for multi-Reader/Writer operation

Setting Cyclic Data Exchanges

Refer to *Section 7 Setting Up Cyclic Data Exchanges*.

 p.152

MEMO

Section 6

Functions

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Operation Mode

The Reader/Writer has two operation modes: Run Mode, and Safe Mode.

You can use the control signal to the Reader/Writer connector to change between these modes.

Run Mode

When you connect the control signal to the 24-VDC side of the power supply and turn ON the power supply, the Reader/Writer will start in Run Mode.

Operation is performed in the modes specified in the commands from the host device and the results are returned to the host device as responses.

Safe Mode

When you connect the control signal to the 0-VDC side of the power supply and turn ON the power supply, the Reader/Writer will start in Safe Mode. The Safe Mode is used when you do not remember the IP address that is set in the Reader/Writer. In Safe Mode, the Reader/Writer will start with the following IP settings.

IP address: 192.168.1.200

Subnet mask: 255.255.255.0

RF Tag Communications

Communications Options

Communications with the RF Tag are performed according to one of the communications options that are listed in the following table.

The setting of the communications option is effective immediately after it is changed. It is saved in internal memory in the Reader/Writer even after the power supply is turned OFF.

| Name | Description |
|-------------|--|
| Once | When the Reader/Writer receives a command, it communicates with an RF Tag and returns a response. |
| Auto | After the Reader/Writer receives a command, the Reader/Writer automatically detects an RF Tag that enters the communications field and communicates with it. Communication can be carried out without confirming the existence of an RF tag by a sensor or the like. |
| Repeat | When the Reader/Writer receives a command, it repeatedly communicates with RF Tags and returns a response when communicating with an RF Tag was possible. Until the Reader/Writer communicates with another RF tag, the Reader/Writer cannot communicate with the RF tag once communicated. |
| FIFO Repeat | When the Reader/Writer receives a command, it repeatedly communicates with RF Tags and returns a response when communicating with an RF Tag was possible. The Reader/Writer can communicate with the another RF tag when the new RF tag comes in the communication area, because the Reader/Writer stops the operation of the RF tag once communicated. The Reader/Writer does not communicate with the RF tag once communicated until the following conditions are satisfied. <ul style="list-style-type: none"> •The RF tag goes out of the communication area. •The Reader/Writer communicates with another RF tag. <p>FIFO Repeat has the following two setting modes.</p> <ul style="list-style-type: none"> •Without ID code check Repeat communication with RF tags without ID code check. Compared “With ID code check”, communication time becomes shorter. However, if the next tag enters the communication area during communication processing with the RF tag, there is a possibility of reading the data of the next RF tag. It is the same communication function as the FIFO repeat of the Reader/Writer of firmware version “3.01 or earlier”. •With ID code check Repeat Communication with RF tag is processed with ID code check. Even if the next tag enters the communication area during communication processing with the RF tag, it will not read the data of the next RF tag. RF tags can be installed at narrow pitch. However, compared with “Without ID code check”, communication time will be longer. Therefore, in order to ensure reliable communication with the RF tag you want to communicate, we recommend “With ID code check”. It can be used with a Reader/Writer with firmware version “3.02 or later”. |



CHECK!

“ID code” is a unique ID previously stored in each RF tag. By performing ID code check, even if an RF tag with another ID code enters the communication area during communication processing, it does not communicate with that RF tag.

Refer to *RF Tag Communications Time (for Reference Only)* in *Section 11 Appendices* for details of Communications Time.



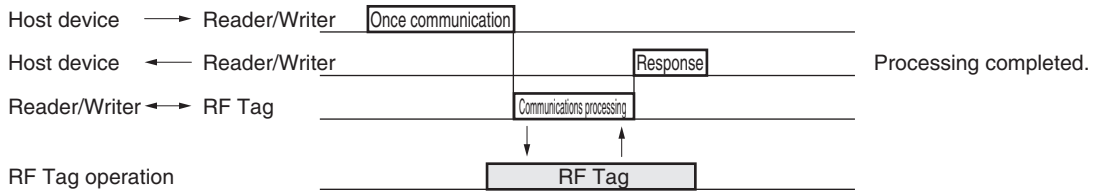
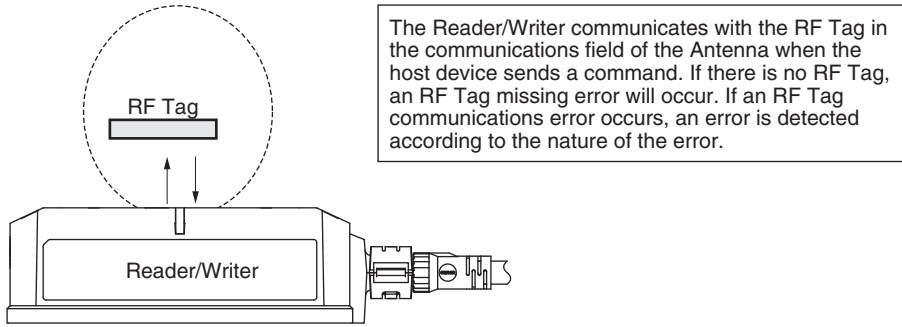
p.248

■ **Once**

The Reader/Writer communicates with RF Tags for command execution requests from the host device.

When the Reader/Writer is finished communicating with an RF Tag, it returns the communications results to the host device and waits for another command.

If there is no RF Tag in the communications field when the Reader/Writer receives the command from the host device, an RF Tag missing error will occur. It is therefore necessary to use a sensor or other device to detect the presence of an RF Tag before you request command execution.

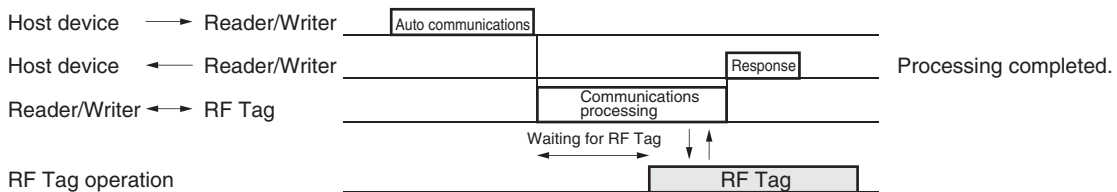
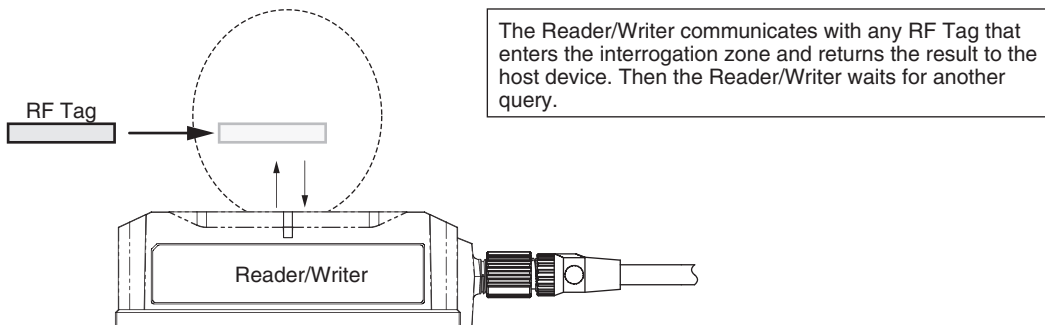


Refer to *Time Charts in Section 7 Host Communications Specifications* for details of Time charts of each communications options.
 p.184

■ **Auto**

The Reader/Writer automatically detects an RF Tag and communicates with it.

After the host device sends the command, the Reader/Writer automatically detects an RF Tag that enters the communications field and communicates with it.



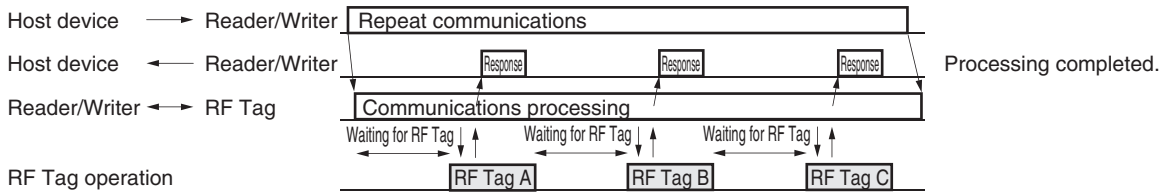
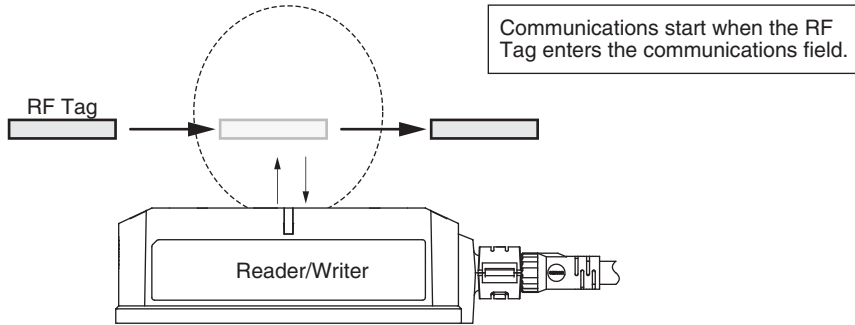
Refer to *Time Charts in Section 7 Host Communications Specifications* for details of Time charts of each communications options.
 p.185

Repeat

When the Reader/Writer receives a command execution request from the host device, it automatically detects RF Tags in the communications field and communicates with them. This process is repeated until the execution request is cleared.

Communications are not performed for RF Tags that have returned communications results to the host device until the Reader/Writer has to communicate with another RF Tags.

You can use this specification to perform communications with RF Tags in order as they move past the Reader/Writer. However, if there is more than one RF Tag in the communications field of the Antenna at the same time, normal communications will not be possible. Make sure that there is never more than one RF Tag in the communications field of the Antenna at the same time.



When the communications option is "Repeat", no notice (error response) is sent to the host device even if an RF Tag missing error communications error or occurs.

CHECK!

Refer to *Time Charts* in *Section 7 Host Communications Specifications* for details of Time charts of each communications options.



p.186

■ FIFO Repeat

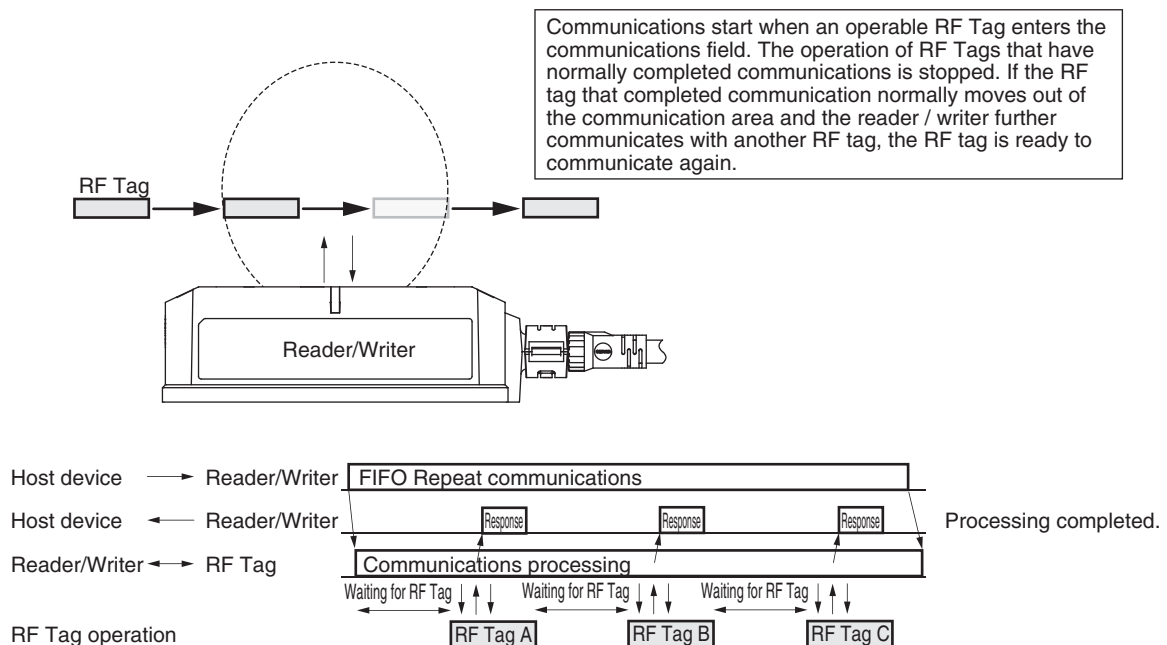
When the Reader/Writer receives a command execution request from the host device, it automatically detects RF Tags in the communications field and communicates with them. After successfully communicating with an RF Tag once, operation for that RF Tag is stopped. This process is repeated until the execution request is cleared.

The Reader/Writer does not communicate with the RF tag that has completed communication until the RF tag is out of the communication area.

The Reader/Writer does not communicate with the RF tag once communicated until the following conditions are satisfied.


- The RF tag goes out of the communication area.
- The Reader/Writer communicates with another RF tag.

You can use the FIFO Repeat communications option to perform communications with RF Tags in order as they move past the Reader/Writer even when there is limited space between the RF Tags. If there is more than one RF Tag for which operation is possible in the communications field of the Antenna at the same time, normal communications will not be possible. Make sure that there is never more than one RF Tag for which operation is possible in the communications field of the Antenna at the same time.




 FIFO Repeat communications cannot be used for communicating with V680-D1KP□□ RF Tags.

CHECK!

 When the communications option is "FIFO Repeat", no notice (error response) is sent to the host device even if an RF Tag missing error or communications error occurs.

CHECK!

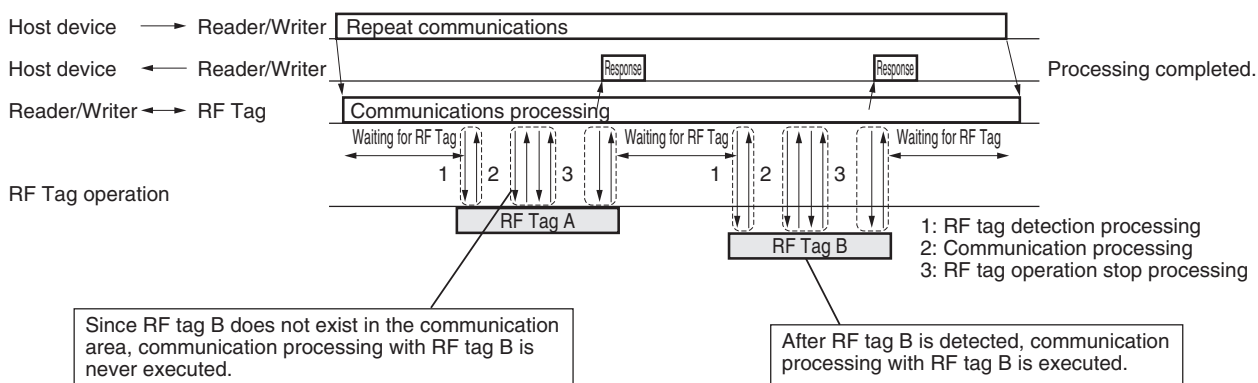
Refer to *Time Charts* in *Section 7 Host Communications Specifications* for details of Time charts of each communications options.

 p.186

The FIFO Repeat detects the RF tag in the sequence of “1. RF tag detection processing” and executes read/write with the RF tag detected in the sequence of “2. communication processing”.

<Without ID code check>

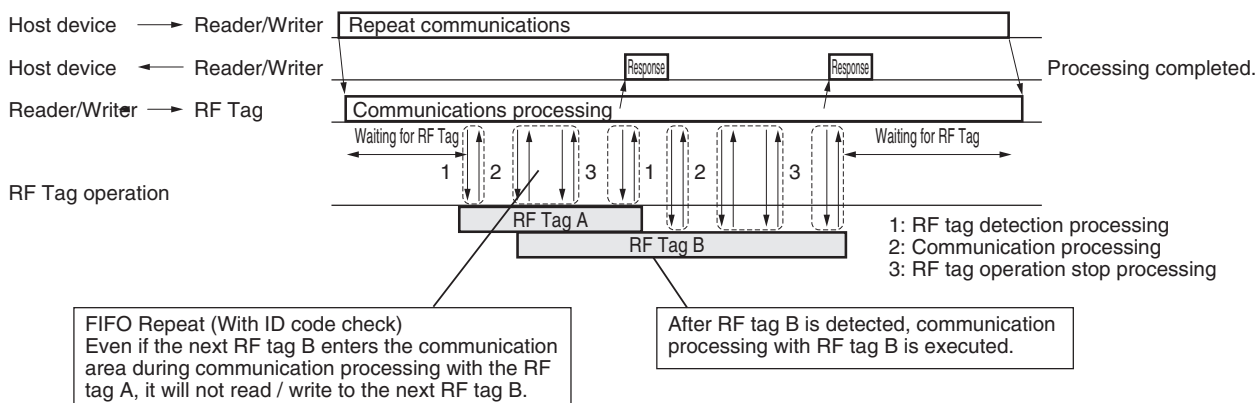
When using FIFO Repeat (Without ID code check), please do not put the next RF tag B in the communication area until communication with the detected RF tag is completed. (See the figure below) *




* When using FIFO Repeat (Without ID code check), the ID code of the RF tag is not checked. Therefore communication time will be shorter than FIFO Repeat (With ID code check). However, if the next RF tag enters the communication area during “2. communication processing” with the detected RF tag, there is a possibility of reading / writing the next RF tag.

<With ID code check>


When FIFO Repeat (With ID code check) is used, even if the next RF tag enters the communication area before communication with the detected RF tag is completed, it can read / write without any problem I will. *



* When using FIFO Repeat (With ID code check), the ID code of the RF tag is checked. Even if the next RF tag enters the communication area during “2. communication processing” with the detected RF tag, there is no possibility of reading / writing the next RF tag. However, compared with “Without ID code check”, communication time will be longer.

 “ID code” is a unique ID previously stored in each RF tag. By performing ID code check, even if an RF tag with another ID code enters the communication area during communication processing, it does not communicate with that RF tag.
CHECK!

Refer to *RF Tag Communications Time (for Reference Only)* in *Section 11 Appendices* for details of Communications Time.

 p.248

Normal RF Tag Communications

The commands in the following table perform communications with RF Tags.

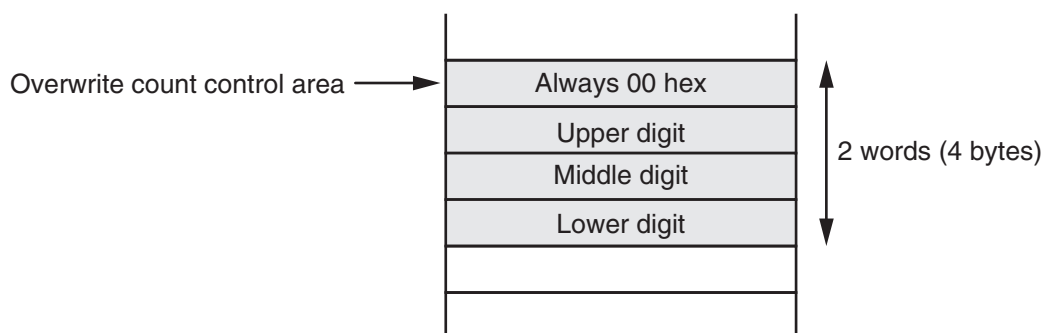
| Name | Description | Page |
|------------|---|-------|
| READ DATA | Reads data from an RF Tag. | p.159 |
| WRITE DATA | Writes data to the memory of the RF Tag. | p.160 |
| READ ID | Reads the RF Tag's ID code. | p.158 |
| DATA FILL | Writes the specified data to the specified number of words beginning from the specified start address. The specifications are made in the command. | p.162 |
| LOCK | Locks the specified memory block in the RF Tag. It will no longer be possible to write data to the locked memory block. The lock cannot be released. | p.161 |
| COPY DATA | Reads data from the memory of an RF Tag using one Reader/Writer (A) and writes it to the memory of the RF Tag in the communications field of another Reader/Writer (B). | p.165 |

Tag Memory Management

RF TAG OVERWRITE COUNT CONTROL Command

The RF TAG OVERWRITE COUNT CONTROL command is used to determine whether the RF Tag overwrite limit has been exceeded.

- With the RF TAG OVERWRITE COUNT CONTROL command with a subtraction specification, the overwrite count is subtracted from the data in the user-specified overwrite count control area to determine whether the number of overwrites has been exceeded.
- With the RF TAG OVERWRITE COUNT CONTROL command with an addition specification, the overwrite count is added to the data in the user-specified overwrite count control area to determine whether the number of overwrites has exceeded 100,000. The RF TAG OVERWRITE COUNT CONTROL command with an addition specification is used only for RF Tags with a overwrite life of 100,000 writes.



RF TAG OVERWRITE COUNT CONTROL Command with a Subtraction Specification

The overwrite count control area consists of 4 bytes from the specified start address. The decrement value is subtracted from the overwrite count and then written to this area. When the value reaches 0 (i.e., 00 hex), a warning code is returned. Therefore, to enable control of the number of overwrites, the maximum number of overwrites must be written to the overwrite count control area beforehand. You can set any number of overwrites up to 16,700,000.

You can read the overwrite count control area with a read command. If the control area data is already 0, the control area value will not be refreshed, and a warning code will be returned as a response. When the refresh count is set to 0000 hex, the count will not be updated, and only an overwrite count check will be performed.

RF TAG OVERWRITE COUNT CONTROL Command with a Addition Specification

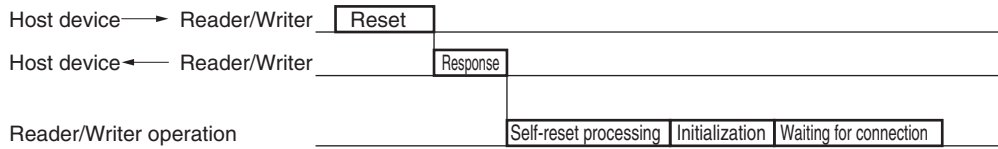
The overwrite count control area consists of 4 bytes from the specified start address. The increment value is added to the overwrite count and then written to this area. When the value reaches 100,000 (i.e., 0186A0 hex), a warning code is returned. You can read the overwrite count control area with a read command. If the control area data is already 100,000, the control area value will not be refreshed, and a warning code will be returned as a response. When the refresh count is set to 0000 hex, the count will not be updated, and only an overwrite count check will be performed.

Reader/Writer Controls

RESET

You can restart the Reader/Writer.

You can restart the Reader/Writer by using a RESET command or by performing a reset with the DCP protocol from a Web browser. The Reader/Writer will return the execution results and reset itself.



CHECK!

If you reset the Reader/Writer during cyclic data exchanges, the connection will be broken and must be re-established from the IO controller.



CHECK!

If the Reader/Writer is reset with the DCP protocol, it will be restored to the default settings.

All of the network settings will be restored to zeros, including the IP address, subnetwork, and default gateway. Use the IP address settings with the DCP protocol to reset the IP address as required.

Maintenance

Reading Device Information

You can read the device information given in the following table from the Reader/Writer.

You can send a command from the host device or access the information from a Web browser to read the device information.

| Device information | Description |
|--------------------------------|---|
| Model | Gives the model number of the Reader/Writer. |
| Firmware version | Gives the firmware version in the Reader/Writer. |
| MAC address | Gives the MAC address that is assigned to the Reader/Writer. * Not supported for the command. |
| Reader/Writer operating status | Gives the operating status of the Reader/Writer. The operating status include idle (waiting for a command), communicating, other processing, etc. * Not supported for the command. |
| Operating time | Gives the elapsed time in milliseconds since the Reader/Writer was started. * 0 to 4,294,967,295 (FFFF FFFF hex) |

Noise Measurement

Communication performance will be reduced when the RF tag or the Reader/Writer are influenced by ambient noise. The Reader/Writer responds the ambient noise level by using noise monitor function. The response data includes the following parameters. By checking the noise level, you can check the influence on the performance of communication with the RF tag in advance. You can also check the noise level when the trouble occurs.

| | |
|-----------------------|--|
| Noise level (Average) | This represents the average value of the measured noise level. 00 to 99 |
| Noise level (Maximum) | This represents the Maximum value of the measured noise level. 00 to 99 |
| Noise level (Minimum) | This represents the minimum value of the measured noise level. 00 to 99 |

The noise monitor can be performed by means of the following two.

Measuring Noise with a Command from the Host Device

You can send the MEASURE NOISE command to the Reader/Writer to obtain the numerical ambient noise level around the Reader/Writer.

Refer to *MEASURE NOISE* in *V680S Commands* in *Section 7 Host Communications Specifications* for details on the MEASURE NOISE command.

 p.177

Noise measurement using Web browser.

You can check the transition graph of the noise level using Web browser.


By selecting the type of the RF tag, you are also able to visually confirm the stability of communication.

Refer to *Noise Monitor View* in *Section 8 Web Browser Interface* for more information.

 p.200

If the noise level that was confirmed by Web browser screen may affect the performance of communication, do the following actions.

- If the other Reader/Writers are operating close to the Reader/Writer, ensure the distance between the Reader/Writers.

 p.252, p.253, p.255

- If the equipment close to the Reader/Writer, become a source of noise transceivers, motors, inverters, and switching power supply is running, ensure the distance until the amount of noise is sufficiently reduced. Take action, such as enclosing the noise source by metal object.

Setting Functions

You can use a setting command or a Web browser to set the operating conditions of the Reader/Writer according to the application environment.

You can save the settings so that they are stored in internal memory in the Reader/Writer even after the power supply is turned OFF.

Only the settings that are made with the SET TAG COMMUNICATIONS CONDITIONS command are effective immediately after they are changed. For any changes to all other settings, you must first save them and then reset the Reader/Writer to enable using them.

Refer to *SET MULTI-READER/WRITE OPERATION* in *V680S Commands* in *Section 7 Host Communications Specifications* for details on the setting command.



p.170

Refer to *RF Tag Communications View* in *Network Settings View* in *Section 8 Web Browser Interface* for the setting procedure for the Web browser interface.



p.194, p.198

Initialization

Initialization returns all of the set values in the Reader/Writer to their default values.

Setting Communications Conditions

This command sets parameters that are related to the operation of communications with RF Tags. Any changes to the settings that are made with this command are effective immediately. (There is no need to reset the Reader/Writer to save the settings.)

■ Communications Option Setting

You can set the communications option of the Reader/Writer to Once, Repeat, or FIFO Repeat.

| Name | Description |
|-------------|--|
| Once | When the Reader/Writer receives a command, it communicates with an RF Tag and returns a response. |
| Auto | After the Reader/Writer receives a command, the Reader/Writer automatically detects an RF Tag that enters the communications field and communicates with it. Communication can be carried out without confirming the existence of an RF tag by a sensor or the like. |
| Repeat | When the Reader/Writer receives a command, it repeatedly communicates with RF Tags and returns a response when communicating with an RF Tag was possible. Until the Reader/Writer communicates with another RF tag, the Reader/Writer cannot communicate with the RF tag once communicated. |
| FIFO Repeat | <p>When the Reader/Writer receives a command, it repeatedly communicates with RF Tags and returns a response when communicating with an RF Tag was possible.</p> <p>The Reader/Writer can communicate with the another RF tag when the new RF tag comes in the communication area, because the Reader/Writer stops the operation of the RF tag once communicated.</p> <p>The Reader/Writer does not communicate with the RF tag once communicated until the following conditions are satisfied.</p> <ul style="list-style-type: none"> •The RF tag goes out of the communication area. •The Reader/Writer communicates with another RF tag. <p>FIFO Repeat has the following two setting modes.</p> <ul style="list-style-type: none"> •Without ID code check Repeat communication with RF tags without ID code check. Compared "With ID code check", communication time becomes shorter. However, if the next tag enters the communication area during communication processing with the RF tag, there is a possibility of reading the data of the next RF tag. It is the same communication function as the FIFO repeat of the Reader/Writer of firmware version "3.01 or earlier". •With ID code check Repeat Communication with RF tag is processed with ID code check. Even if the next tag enters the communication area during communication processing with the RF tag, it will not read the data of the next RF tag. RF tags can be installed at narrow pitch. However, compared with "Without ID code check", communication time will be longer. Therefore, in order to ensure reliable communication with the RF tag you want to communicate, we recommend "With ID code check". It can be used with a Reader/Writer with firmware version "3.02 or later". |



"ID code" is a unique ID previously stored in each RF tag. By performing ID code check, even if an RF tag with another ID code enters the communication area during communication processing, it does not communicate with that RF tag.

CHECK!

Refer to *RF Tag Communications Time (for Reference Only)* in *Section 11 Appendices* for details of Communications Time.



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■ RF Tag Communications Speed Setting

You can set the speed for communications between the Reader/Writer and RF Tags.

| | |
|----------------------|---|
| High speed (default) | This setting reduces the communications time by reading more than one block at the same time with an air interface. However, if errors are detected during communications due to ambient noise or other factors, processing is redone from the beginning, which can actually increase the communications time. |
| Normal speed | This setting provides more stable communications quality by reading one block at a time, in the same way as for the earlier V680. Although the normal communications time is longer, processing can be continued during communications if errors are detected due to ambient noise or other factors, which can actually reduce the communications time. |

■ Write Verification

You can set whether to verify write processing.

| | |
|-------------------|---|
| Enabled (default) | After processing a write operation, the memory area that was written in the RF Tag is read and verified to confirm that the write operation was performed normally. |
| Disabled | Write processing is not verified. |

■ Communications Diagnostic

You can set whether to the communications diagnostic of the Reader/Writer.

| | |
|-------------------|--|
| Disable (default) | The Reader/Writer does not perform communications diagnostic. |
| Enable | This function diagnoses the communications leeway whenever the Reader/Writer communicates with an RF Tag, displays the results on an operation indicator, and reports the results to the host device. It will help you achieve a more stable Reader/Writer and RF Tag installation and enable monitoring the status of operations. |

Network Settings

You can set the parameters for communications between the Reader/Writer and the host device. If you change the settings, you must reset the Reader/Writer to enable the new settings.

■ IP Address, Subnet Mask, and Default Gateway

You can use any of the following methods to set the IP address, subnet mask, and default gateway for the Reader/Writer.

■ Fixed IP Address Setting

Default setting: 192.168.1.200

■ Subnet Mask Setting

Default setting: 255.255.255.0

■ Gateway Address Setting

Default setting: 192.168.1.254

■ Setting the Web Password

You can set a password for logging in from a Web interface. The password can be up to 15 ASCII characters. No password is set by default.

If a Web password is set, a dialog box requesting entry of the password will be displayed when the initial Web server interface is displayed. If the correct password is entered, the normal Web interface can be used.

Error Logs

The Reader/Writer manages errors that occur during operation in logs. The error logs are saved until the power supply to the Reader/Writer is turned OFF. You can read the error logs by sending commands from the host device or by using a Web browser.

The following logs are saved.

| Category | Description |
|-------------------|---|
| System error log | This log contains up to eight fatal errors that were detected by the Reader/Writer. They are given in chronological order. If more than eight system errors occur, the oldest records are deleted in order. |
| Command error log | This log contains up to 16 errors detected for command execution for cyclic data exchanges. They are given in chronological order. If more than 16 errors occur, the oldest errors are deleted in order. |

System Error Log

Each record in the system error log consists of 16 bytes in the format that is shown in the following table. Up to eight records are recorded. To read the system error log, either send a GET SYSTEM ERROR LOG command or read it from a Web browser.

| Field | Size | Description |
|------------------------|---------|---|
| Operating time | 4 bytes | This is the operating time of the Reader/Writer when the error occurred. * The operating time is the elapsed time in milliseconds from when the Reader/Writer was started. |
| Error code | 4 bytes | This code is used to identify the error. |
| Attached information 1 | 4 bytes | These codes provide additional information on the error. |
| Attached information 2 | 4 bytes | |

Refer to *Error Codes* in *Section 7 Host Communications Specifications* for detailed information on error codes, attached information 1, and attached information 2.



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Command Error Log

Each record consists of 16 bytes in the format that is shown in the following table. Up to 16 records are recorded. To read the command error log, either send a GET COMMAND ERROR LOG command or read it from a Web browser.

| Field | Size | Description |
|--|---------|---|
| Operating time | 4 bytes | Gives the operating time of the Reader/Writer when the error occurred. * The operating time is the elapsed time in milliseconds from when the Reader/Writer was started. |
| IP address of device that sent the command | 4 bytes | Gives the IP address of the host device that sent the command. |
| Command code | 2 bytes | Gives the command code of the command received by the Reader/Writer. |
| Error code | 2 bytes | Gives the error code from the response returned by the Reader/Writer. |
| Response information 1 | 2 bytes | Gives response information 1 from the response returned by the Reader/Writer. |
| Response information 2 | 2 bytes | Gives response information 2 from the response returned by the Reader/Writer. |



CHECK!

Errors that occur during RF Tag communications from a Web browser are not recorded in the command error log. Only errors that occur in command execution for cyclic data exchanges are recorded.

Refer to *Error Codes*, *Device Information*, and *Communications Diagnostics Results* in *Section 7 Host Communications Specifications* for detailed information on error codes, response information 1, and response information 2.



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Web Server

The following functions are provided in the Web server interface.

Status Monitoring, Setting, and Confirmation

■ Status Monitoring

You can monitor the status of the Reader/Writer. The Reader/Writer status includes the firmware versions, MAC address, network settings, operating status, and other status information.

■ Setting

You can set any of the settable parameters from the Web server interface. This includes the network settings, RF Tag communications settings, etc.

■ Importing and Exporting Settings

You can import and export the Reader/Writer setting information. You can store or view the configuration file on a computer. You can use importing to simplify setting up more than one Reader/Writer and you can use exporting to store and restore settings information as a countermeasure for problems.

Convenient Functions

■ Simple Operation Test

You can send commands from the Web server interface to operate the Reader/Writer without any special software.

■ Utilities

You can display the results of noise measurements or error log information.

RFID System Maintenance

Communications performance can be affected by environmental factors around the RFID System (including metal objects, the positional relationship between the Reader/Writer and RF Tags, and noise). You can use the RFID System maintenance functions to check the leeway in communications and achieve more stable device operation.

Refer to *GET FIRMWARE VERSION* in *Section 7 Host Communications Specifications* for the procedure to check the firmware version.

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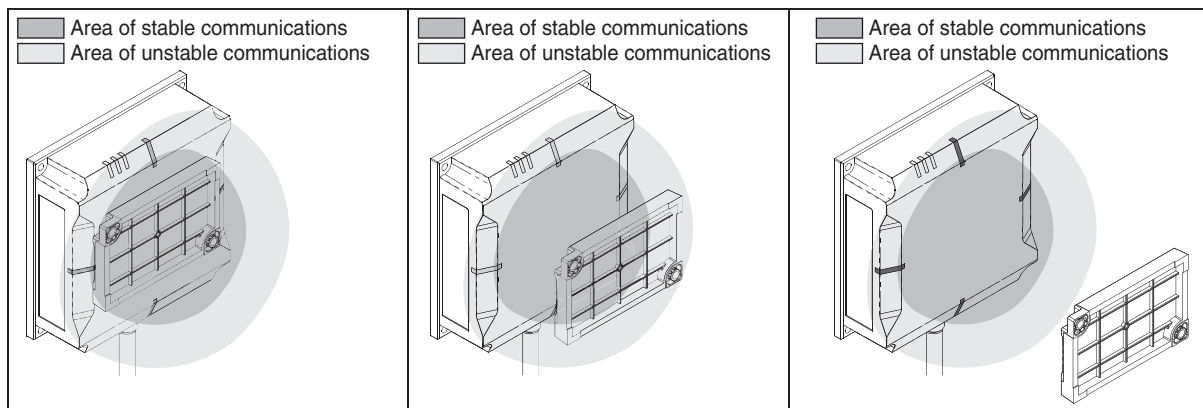
You cannot use the maintenance functions if you are using the FIFO Repeat communications option.

CHECK!

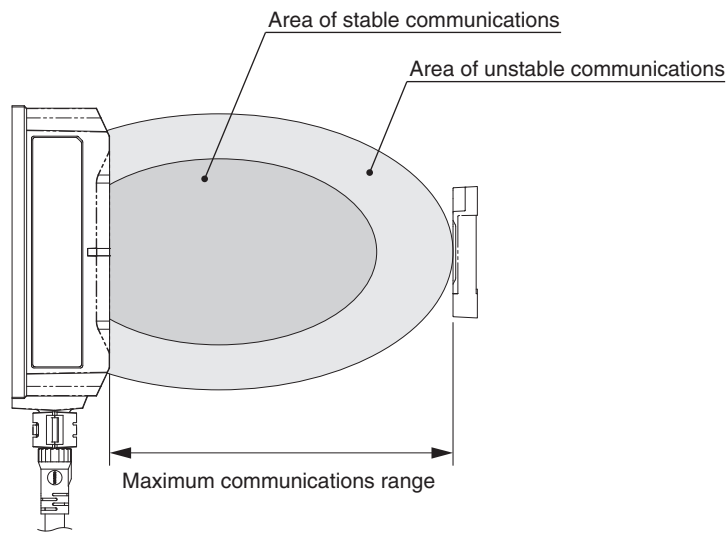
Communication Diagnostic

This function diagnoses the communications leeway whenever the Reader/Writer communicates with an RF Tag, displays the results on an operation indicator, and reports the results to the host device. It will help you achieve a more stable Reader/Writer and RF Tag installation and enable monitoring the status of operations.

The operation indicator lights green for a stable communication, yellow for an unstable communication, and red for a communications error.



Yellow, which indicates an unstable communication, means that there is only 10% to 30% leeway in relation to the maximum communications range.





CHECK!

Communication diagnostic is disabled in the default settings. To use communication diagnostic, you must enable it in advance.

Refer to *RF Tag Communications View* in *Section 8 Web Browser Interface* for the setting procedure for communication diagnostic.

 p.198



CHECK!

Use the results of communication diagnostic as a guideline.

An indication of a stable communication (green) does not necessarily mean that communications are normal.



CHECK!

Yellow, which indicates an unstable communication, does not necessarily mean that communications are not possible. It merely means that there is little leeway in communications.

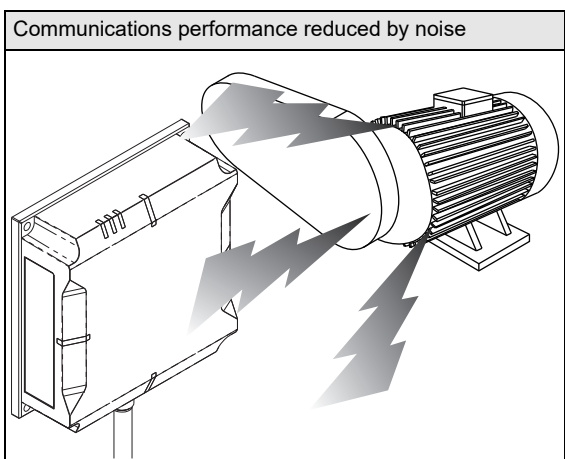
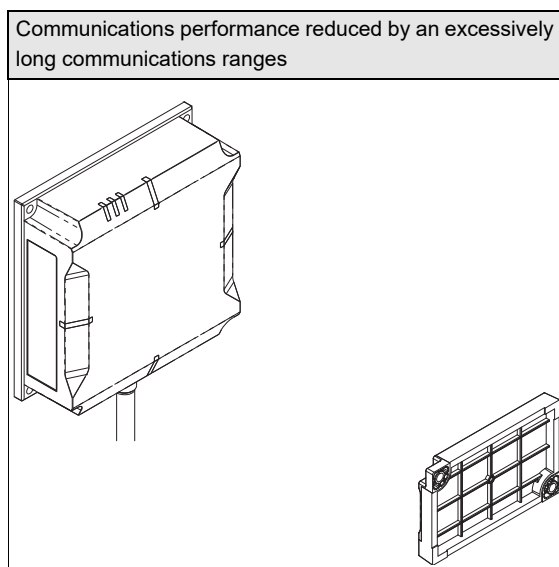
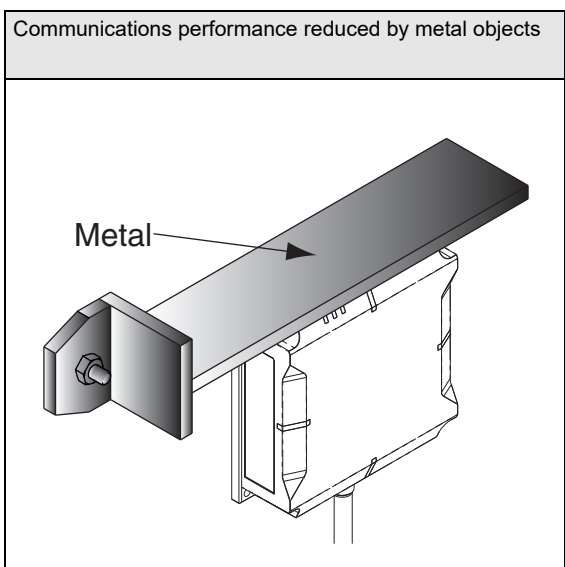
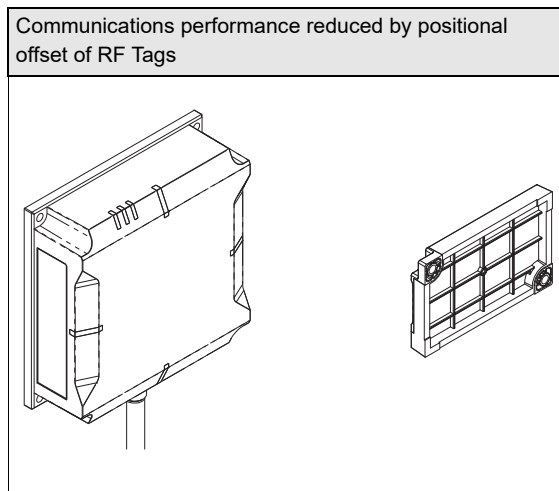
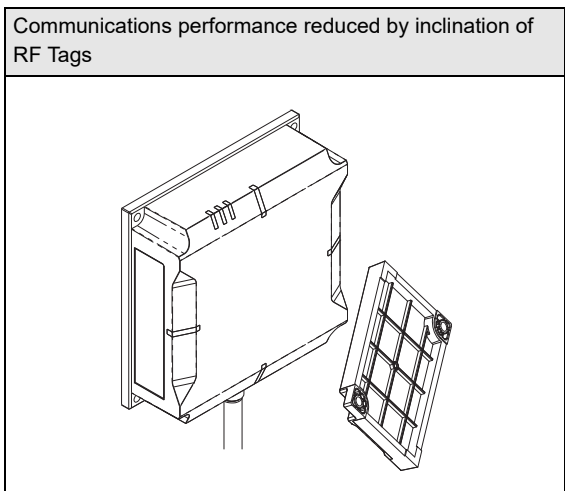
If you want to ensure more stable communications, we recommend that you use the Reader/Writer so that stable communications (green) are indicated.



CHECK!

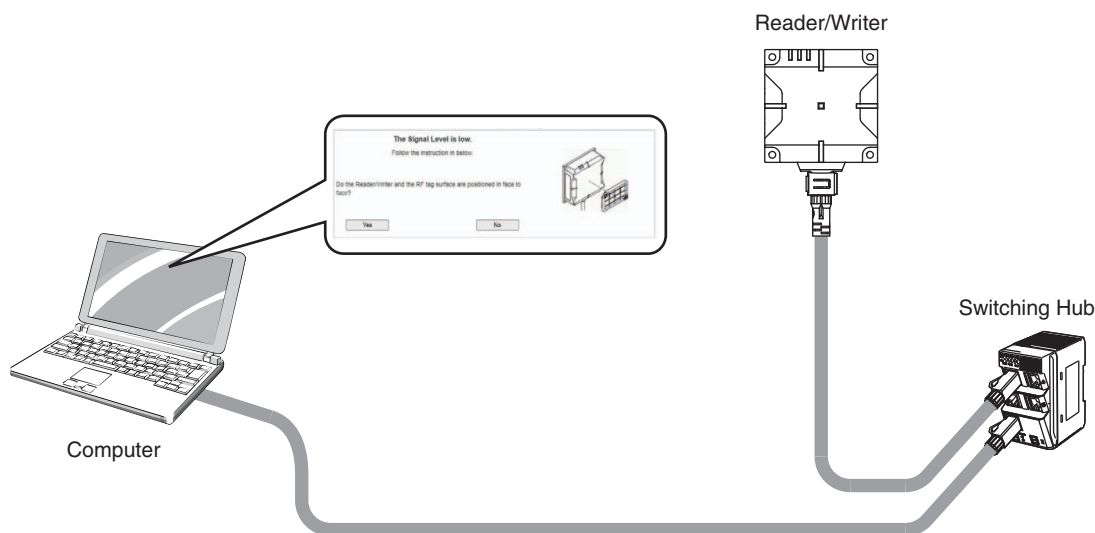
The communication time is approximately 200 ms longer when enabling Communication Diagnostic function.

You can use communication diagnostic to detect and diagnoses deterioration of performance for the following conditions.



RF Analyzer

The RF Analyzer displays detailed information from communication diagnostic on a Web browser. You can easily check to see how stable communications are and troubleshoot problems. You can browse a list of diagnostic information and periodically confirm the leeway quantitatively on graphs. You can download a log file that contains the diagnostic information stored in the Reader/Writer to a computer for your usage.



Diagnostic Information Table

You can display a table of the diagnostic information from communications between the Reader/Writer and RF Tags. (The table contains up to 2,048 records.) You can check the following items in the table.

| | |
|------------------------|---|
| Time | The Reader/Writer operating time when it communicated with the RF Tag |
| Command | The name of the command used to communicate with the RF Tag |
| Result | The diagnostic result (stable, unstable, or error) |
| Diagnostic information | The cause when a communication was unstable |

Whenever a communication was unstable, a button to display details is displayed in the list. If you click this button, you can troubleshoot the cause with guidance displayed on the Web browser to help stabilize communications.

Diagnostic Information Graphs

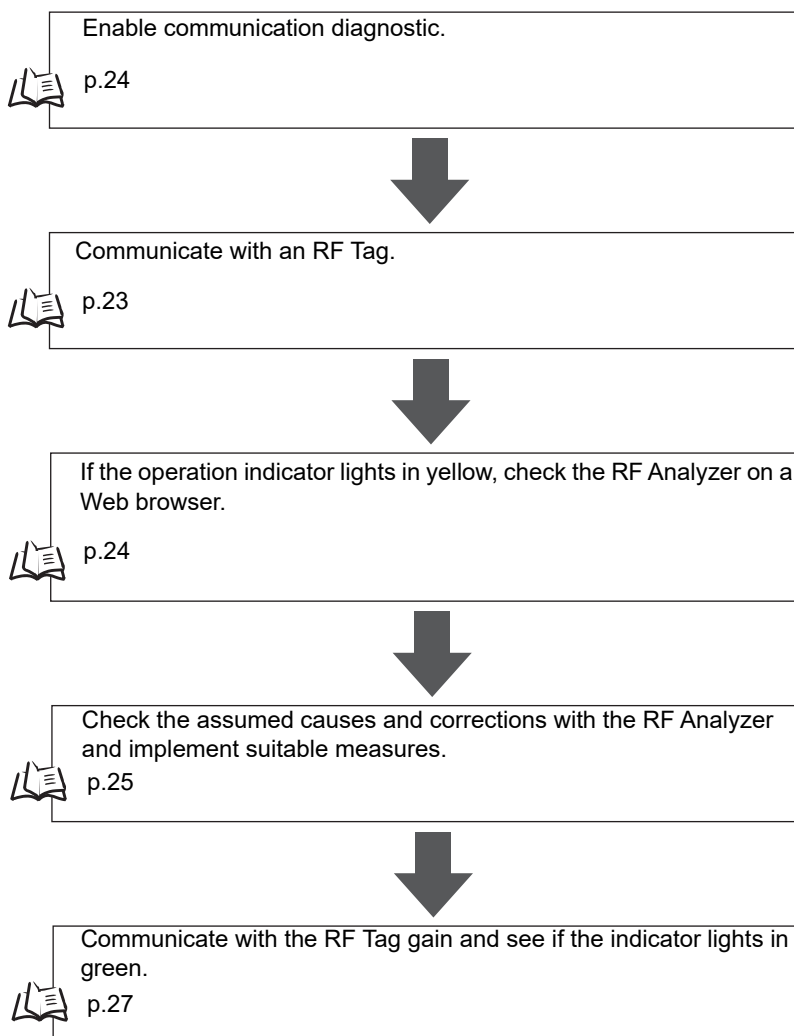
You can display the diagnostic information quantitatively on a graph. You can check the following information on the graph.

| | |
|--------------|--|
| Signal level | The communications signal level between the Reader/Writer and RF Tag is displayed in 10 levels on a vertical bar graph. The higher the value, the more stable the communications. A value of 10 means that communications are stable, and the bar is displayed in blue. A value of 1 to 9 means that communications are unstable, and the bar is displayed in yellow. A value of 0 indicates a communications error. Adjust the installation conditions to get the values as close to 10 as possible. |
| Noise level | The ambient noise level around the Reader/Writer that was detected in communications with RF Tags is displayed in 10 levels on a broken-line graph. The higher the value, the less stable the communications. |

Refer to *RF Analyzer* in *Section 8 Web Browser Interface* for the operating procedures of the RF Analyzer.

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An application example of the RFID System maintenance functions is given below.

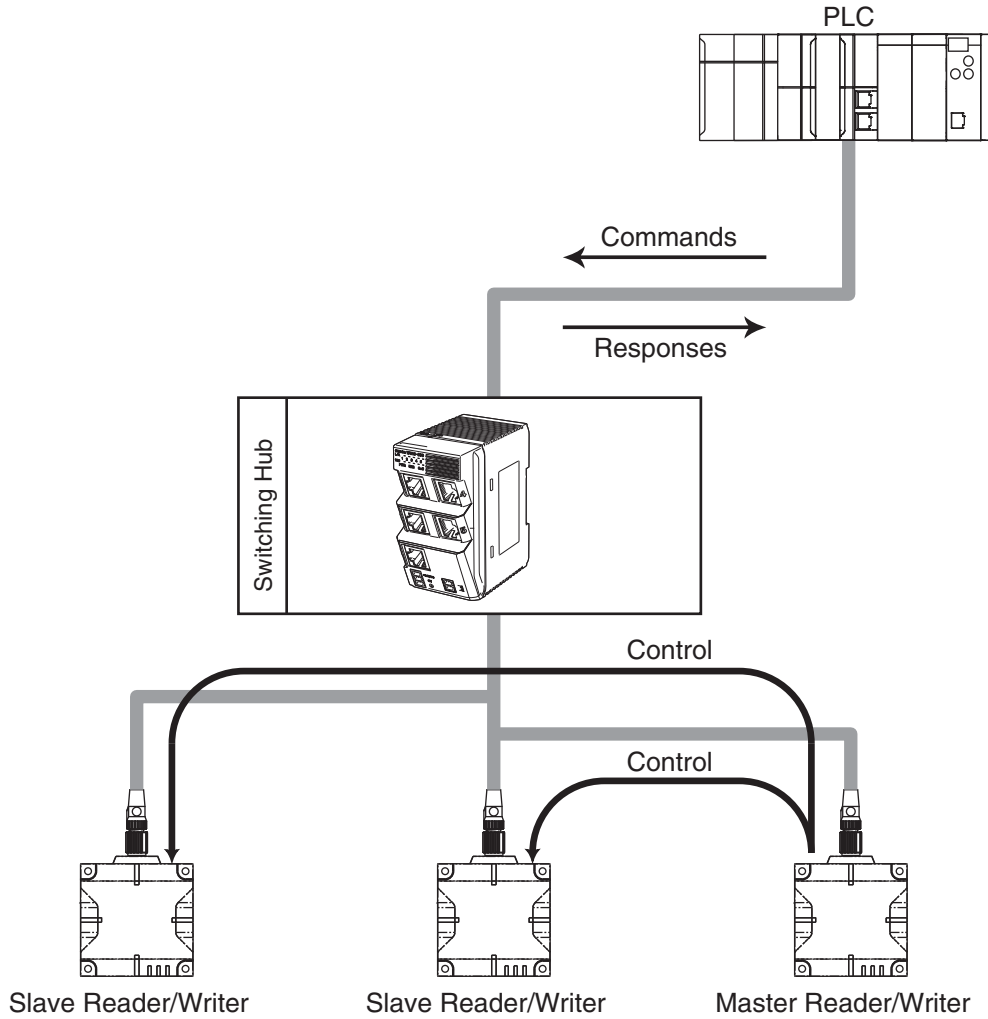


Multi-Reader/Writer Operation

There are two modes that you can use for multi-Reader/Writer operation: Field Extension Mode and High-speed Traveling Mode.

You can link up to eight Reader/Writers to perform communications operations with RF Tags. One of the Reader/Writers operates as the master and the other Reader/Writers operate as slaves.

The host device just has to control one Reader/Writer, the master, to easily achieve complex control operations for all of the linked Reader/Writers.



The RF Tag communications commands that you can use during multi-Reader/Writer operation (Field Extension Mode or High-speed Traveling Mode) are shown in the following table. If you use unsupported RF Tag communications commands when multi-Reader/Writer operation is enabled, an execution status error will be indicated in the response.

| | Field Extension Mode | High-speed Traveling Mode |
|-----------------------------------|----------------------|---------------------------|
| READ DATA | Supported | Supported |
| WRITE DATA | Supported | Not supported |
| DATA FILL | Not supported | Not supported |
| RF TAG OVERWRITE COUNT CONTROL | Not supported | Not supported |
| READ ID | Supported | Not supported |
| COPY | Not supported | Not supported |
| LOCK | Not supported | Not supported |

The commands that can be acknowledged by a Slave Reader/Writer are shown in the following table. If an unsupported command is received by a Slave Reader/Writer, a multi-Reader/Writer execution error will occur.

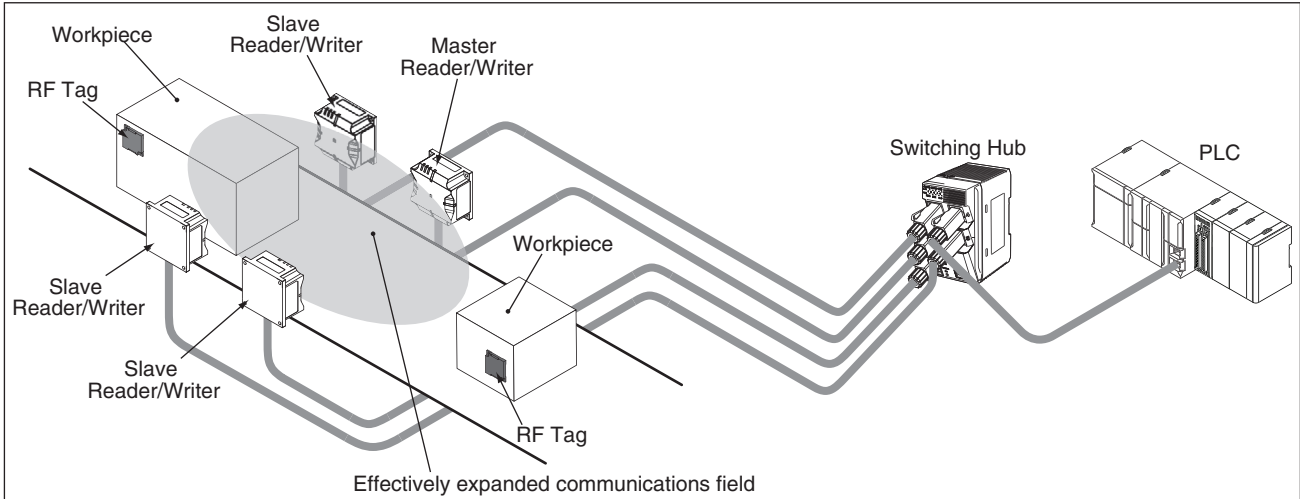
| | Name | Supported |
|------------------------|--------------------------------------|-----------|
| RF Tag communications | READ DATA | No |
| | WRITE DATA | No |
| | READ ID | No |
| | COPY DATA | No |
| | DATA FILL | No |
| | LOCK | No |
| | RF TAG OVERWRITE COUNT CONTROL | No |
| | RESTORE DATA | No |
| Reader/Writer settings | SET TAG COMMUNICATIONS OPTION | No |
| | GET TAG COMMUNICATIONS OPTION | Yes |
| | SET TAG COMMUNICATIONS CONDITIONS | No |
| | GET TAG COMMUNICATIONS CONDITIONS | Yes |
| | SET TCP/IP COMMUNICATIONS CONDITIONS | No |
| | GET TCP/IP COMMUNICATIONS CONDITIONS | Yes |
| | SET DEVICE NAME | No |
| | GET DEVICE NAME | Yes |
| | SET WEB COMMUNICATIONS CONDITIONS | No |
| | GET WEB COMMUNICATIONS CONDITIONS | Yes |
| | SET WEB PASSWORD | No |
| | GET WEB PASSWORD | Yes |
| | INITIALIZE | No |

| | Name | Supported |
|------------------------------------|--|-----------|
| Checking Reader/Writer information | MEASURE NOISE | No |
| | GET MODEL INFORMATION | Yes |
| | GET FIRMWARE VERSION | Yes |
| | GET MAC ADDRESS | Yes |
| | GET READER/WRITER OPERATING STATUS | Yes |
| | GET OPERATING TIME | Yes |
| | GET RECENT ERROR COMMAND INFORMATION | Yes |
| | GET COMMUNICATIONS ERROR LOG | Yes |
| | GET SYSTEM ERROR LOG | Yes |
| | GET RESTORE INFORMATION | Yes |
| Reader/Writer operation control | STOP | No |
| | RESET | No |
| RFID maintenance | SET COMMUNICATIONS DIAGNOSIS | No |
| | GET COMMUNICATIONS DIAGNOSIS SETTING | Yes |
| Multi-Reader/Writer operation | SET MULTI-READER/WRITER OPERATION | No |
| | GET MULTI-READER/WRITER SETTINGS | Yes |
| | GET MULTI-READER/WRITER OPERATION STATUS | Yes |

Field Extension Mode

You can use this mode to link Reader/Writers in order to extend the effective communications field. Even if the workpieces are not all the same height or not oriented in the same direction, the placement of more than one Reader/Writer enables communicating with the RF Tags without worrying about the positions or orientation of the RF Tags.

This enables communications over a wide communications field and is therefore recommended for applications in which the locations or orientation of the RF Tags is not consistent.



Communicating with RF Tags is possible without being affected by the orientation of the workpieces (i.e., the locations where the RF Tags are attached).

If you use Field Extension Mode, you can use only three RF Tag communications commands: READ DATA, WRITE DATA, and READ ID. Also, you can specify only the Once, Auto or Repeat communications option. If you use the FIFO Repeat communications option in Field Extension Mode, an execution status error will be indicated in the response.

Applicable RF Tag Communications Commands

| | Supported |
|--------------------------------|-----------|
| READ DATA | Yes |
| WRITE DATA | Yes |
| DATA FILL | No |
| RF TAG OVERWRITE COUNT CONTROL | No |
| READ ID | Yes |
| COPY | No |
| LOCK | No |

Applicable Communications Options

| | Supported |
|-------------|-----------|
| Once | Yes |
| Auto | Yes |
| Repeat | Yes |
| FIFO Repeat | No |



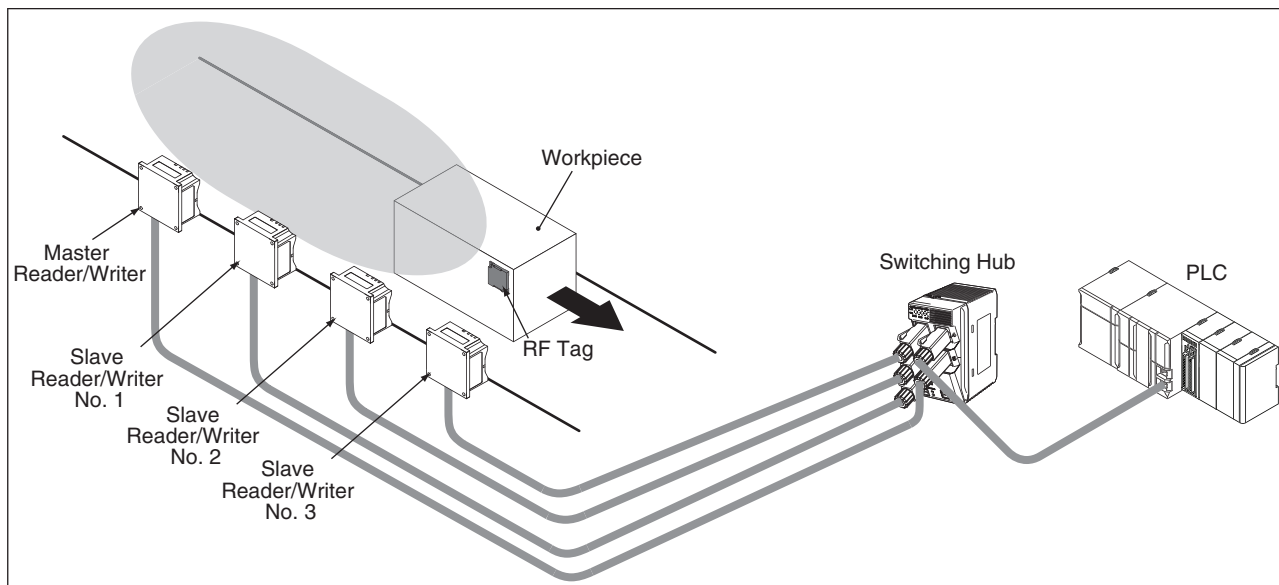
CHECK!

In Field Extension Mode, the Reader/Writers do not simultaneously perform communications. The Reader/Writers individually perform communications on a time sharing basis.

Traveling Mode

You can read large data sizes from RF Tags because the data is split up and read by more than one Reader/Writer on a time-sharing basis while the workpiece is moving.

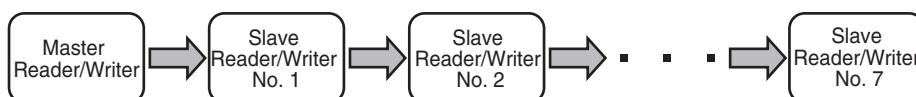
We recommend that you use this mode when reading data from RF Tags that are moving on a production line.



For example, if you link four Reader/Writers and each Reader/Writer can read only 25 words, you can read 100 words of data with the four linked Reader/Writers.

To use the High-speed Traveling Mode, the Master Reader/Writer and Slave Reader/Writers must be set according to their positions.

Read processing is executed in the following order.



CHECK!

Always set the first Reader/Writer to read data as the Master Reader/Writer. Then set the other Reader/Writers to read data in order from Slave No. 1, Slave No.2, etc.



CHECK!

Refer to *RF Tag Communications Range (for Reference Only)* in Section 11 Appendices and install the Reader/Writers so that the communications fields do not overlap. If the Reader/Writers are installed too close to each other, the reading speed will decrease.



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CHECK!

Refer to *Travel Speed Calculations* in Section 11 Appendices and set the workpiece travel speed.



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For details, refer to *Using High-speed Traveling Mode* in this section.



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CHECK!

In High-speed Traveling Mode, the Master Reader/Writer must be located first.

In High-speed Traveling Mode, you can use only the READ DATA RF Tag communications command. Also, you can specify only the Auto or Repeat communications option. If you use any communications option other than Repeat in the High-speed Traveling Mode, an execution status error will be indicated in the response.

Applicable RF Tag Communications Commands

| | Supported |
|--------------------------------|-----------|
| READ DATA | Yes |
| WRITE DATA | No |
| DATA FILL | No |
| RF TAG OVERWRITE COUNT CONTROL | No |
| READ ID | No |
| COPY | No |
| LOCK | No |

Applicable Communications Options

| | Supported |
|-------------|-----------|
| Once | No |
| Auto | Yes |
| Repeat | Yes |
| FIFO Repeat | No |



CHECK!

In High-speed Traveling Mode, the Reader/Writers do not simultaneously perform communications. The Reader/Writers individually perform communications on a time sharing basis.

Using Communication Diagnostic and the RF Analyzer

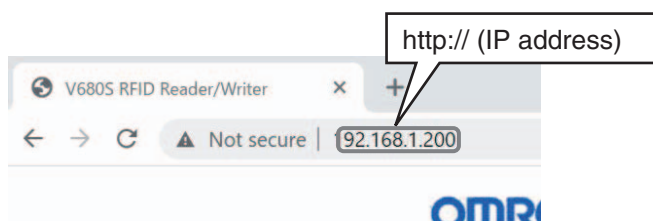
You can use communications diagnostics from a Web server. Use either of the following procedures. Use the Web server to use the RF Analyzer.

Using the Web Server

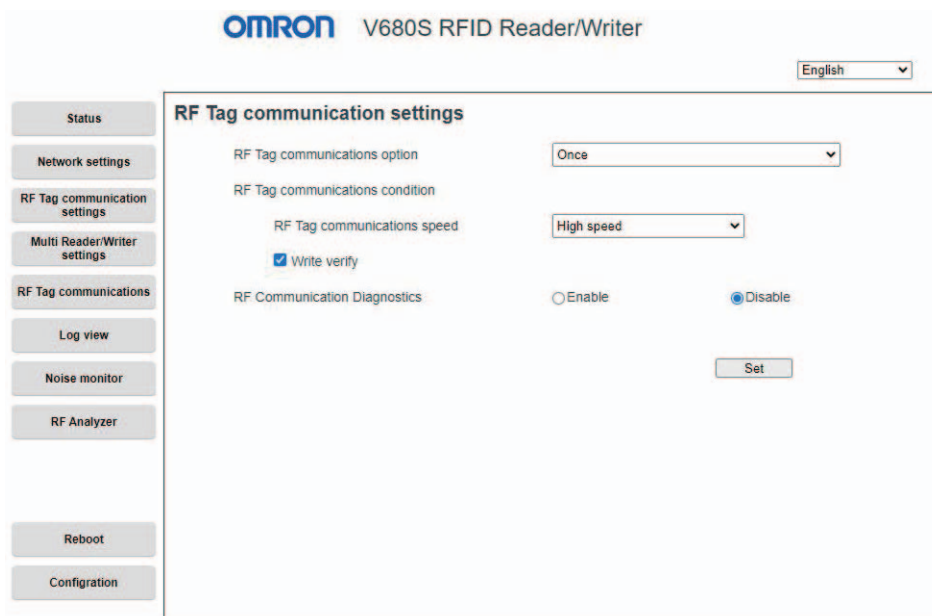
■ Enabling Communication Diagnostic

1. Connect the Ethernet cable, turn ON the power supply to the Reader/Writer, and then start a Web browser on a computer.

2. Specify the IP address of the Reader/Writer in the address field of the Web browser. Enter **http://192.168.1.200/** if you are using the default IP address.




3. The Communications Setting View will be displayed.



4. Select the *Enable* Option for *Communication Diagnostics* and click the **Set** Button.



Refer to *Communications Settings View* in *Section 8 Web Browser Interface* for the setting procedure for the Web browser interface.

 p.196



When you enable communication diagnostic, the setting will be retained after the Reader/Writer is restarted and communication diagnostic will remain enabled.

CHECK!



You cannot use the communications diagnostics if you are using the FIFO Repeat communications option. Use the Once, Auto or Repeat communications option.

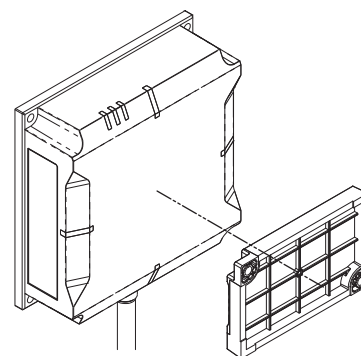
CHECK!

■ Communicating with an RF Tag

1. The RF Tag Communications View will be displayed.



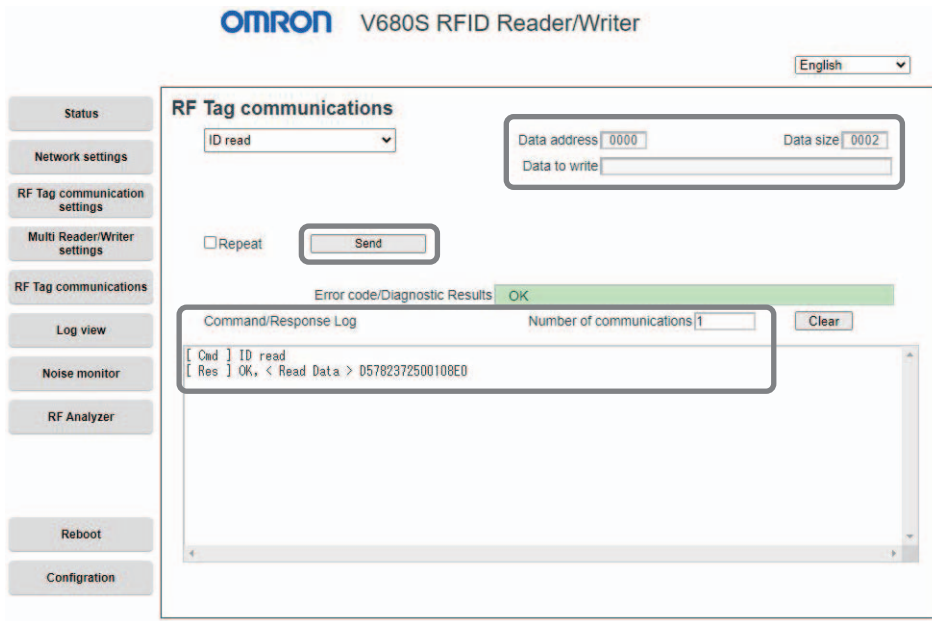
2. Place a RF Tag in front of the Reader/Writer.



CHECK!

To increase the accuracy of communication diagnostic, we recommend installation in an environment that is as close as possible to the actual application environment.

3. Set the communications parameters (data address, data size, etc.), click the **Send** Button, and check the diagnostic results.



■ Checking with the RF Analyzer and Implementing Corrections

1. Display the RF Analyzer View.

OMRON V680S RFID Reader/Writer

English

Status

Network settings

RF Tag communication settings

Multi Reader/Writer settings

RF Tag communications

Log view

Noise monitor

RF Analyzer

Reboot

Configuration

RF Analyzer

Total : 82 Warning : 15 Error : 10 Graph

| No | Time | Command | Result | UID |
|----|------------|---------|---------|------------------|
| 4 | 0000:09:11 | Read ID | Stable | D5782372500108E0 |
| 5 | 0000:09:12 | Read ID | Warning | D5782372500108E0 |
| 6 | 0000:09:23 | Read ID | Error | 0000000000000000 |
| 7 | 0000:09:23 | Read ID | Error | 0000000000000000 |
| 8 | 0000:09:24 | Read ID | Error | 0000000000000000 |

No 5

Command Read ID

Diagnostic description 0001 : The Signal Level is low.

Signal Level 8 Noise 0

The Signal Level is low. Push the "Display" button on the right, and follow the instruction. Display

Update Save Clear



CHECK!

You cannot use the RF Tag Analyzer if you are using the FIFO Repeat communications option. Use the Once, Auto or Repeat communications option.

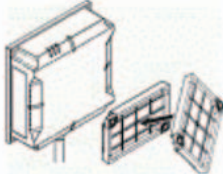
2. Click the **Display** Button in the *Details* column and follow the guidance to check the assumed causes and corrections.

The Signal Level is low.

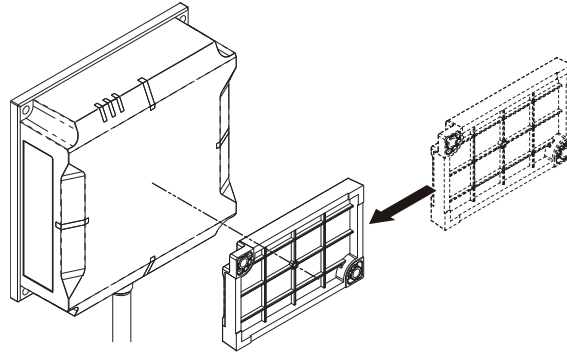
Follow the instruction in below.

There is a possibility the positioning and posture of the Reader/Writer and the RF tag is not proper.
Make a position so that the Reader/Writer and the RF tag surface in face to face, then execute the RF communication diagnostics.
The inclination of the RF tag surface to the Reader/Writer may cause the deterioration of RF communication .

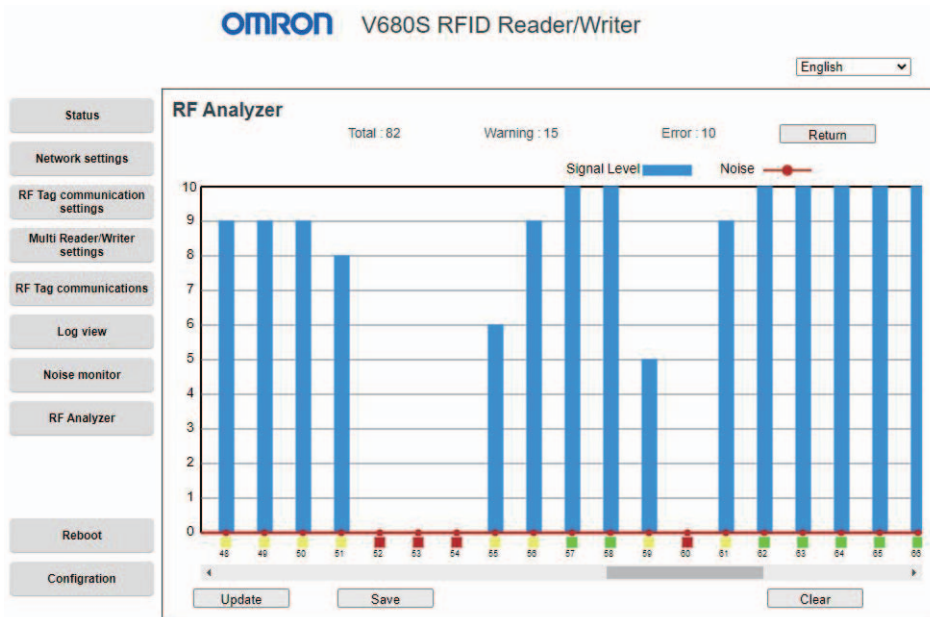
Return



3. In this example, the position of the Tag is corrected according to the guidance.



4. You can check the graph display to check quantitative information on the degree of instability.

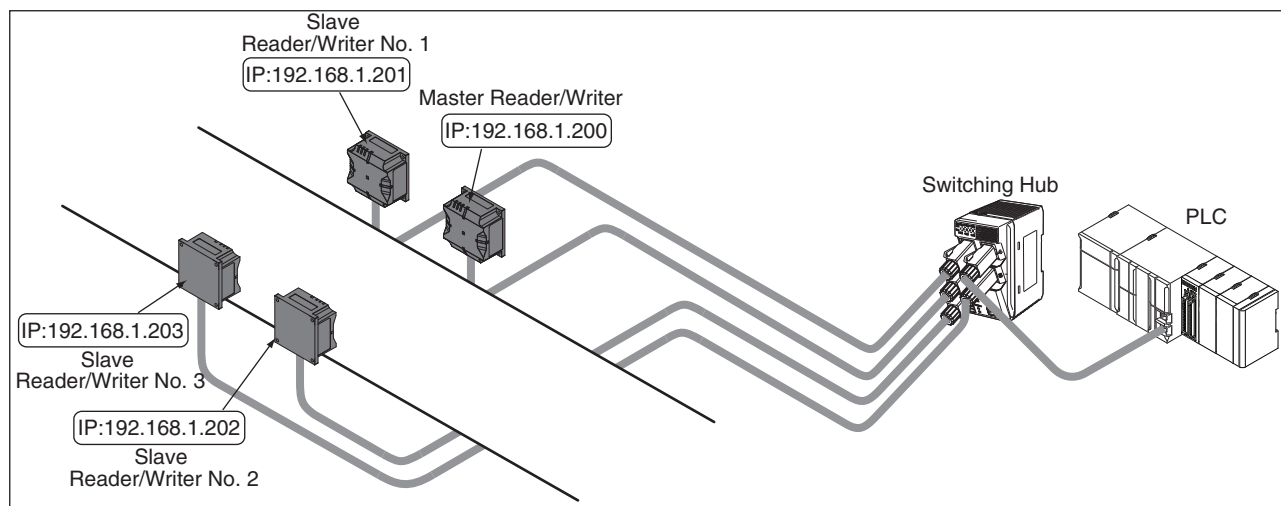


When you are finished, perform the step to communicate with the RF Tag again and check to see if stable communications have been achieved.

Using Multi-Reader/Writer Operation

Using Field Extension Mode

Use the following procedure for operation in Field Extension Mode. The following figure shows an example in which four Reader/Writers are installed.



■ Enabling Field Extension Mode

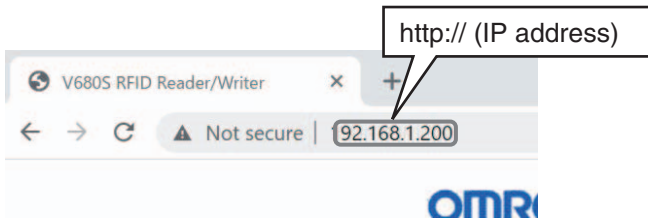
1. Connect all of the Reader/Writers with Ethernet Cables and turn ON the power supplies.



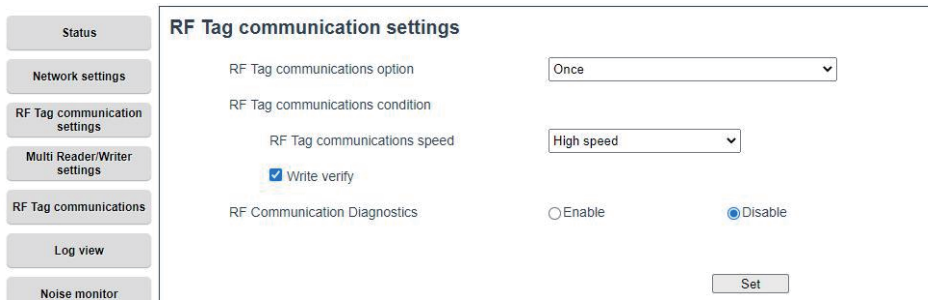
CHECK!

Set a unique IP address for each Reader/Writer in advance.
Refer to *Section 5 Preparations for Communications*.

2. Start a Web browser on your computer.
3. In the address field on the Web browser operation window, enter the IP address of the master Reader/Writer (here, 192.168.1.200).



4. Display the RF Tag Communications Settings View, set the RF Tag communications option to Once, Auto or Repeat, and then click the **Set** Button.



CHECK!

If you specify the FIFO Repeat communications option, multi-Reader/Writer operation will be enabled and a multi-Reader/Writer execution error will occur when you restart.

5. Display the Multi-Reader/Writer Settings View.

OMRON V680S RFID Reader/Writer

English

Status

Network settings

RF Tag communication settings

Multi Reader/Writer settings

RF Tag communications

Log view

Noise monitor

RF Analyzer

Reboot

Configuration

Multi Reader/Writer settings

Multi Reader/Writer mode Disable Field extension mode High-speed travelling mode

| Group setting | IP address | Status |
|--------------------------|------------|--------|
| Slave Reader/Writer No.1 | | ■ |
| Slave Reader/Writer No.2 | | ■ |
| Slave Reader/Writer No.3 | | ■ |
| Slave Reader/Writer No.4 | | ■ |
| Slave Reader/Writer No.5 | | ■ |
| Slave Reader/Writer No.6 | | ■ |
| Slave Reader/Writer No.7 | | ■ |

Set

6. Select the *Field Extension Mode* Check Box.

English

Status

Network settings

Multi Reader/Writer settings

Multi Reader/Writer mode Disable Field extension mode High-speed travelling mode

7. Set the IP addresses of the three slave Reader/Writers and click the **Set** Button.

English

RF Tag communication settings

Multi Reader/Writer settings

RF Tag communications

Log view

Noise monitor

RF Analyzer

Multi Reader/Writer settings

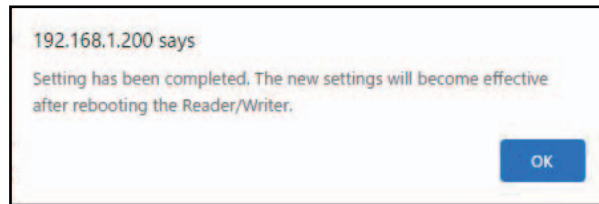
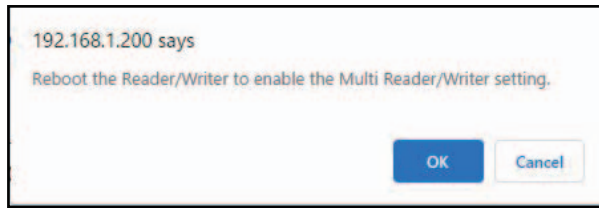
Multi Reader/Writer mode Disable Field extension mode High-speed travelling mode

| Group setting | IP address | Status |
|--------------------------|---------------|--------|
| Slave Reader/Writer No.1 | 192.168.1.201 | ■ |
| Slave Reader/Writer No.2 | 192.168.1.202 | ■ |
| Slave Reader/Writer No.3 | 192.168.1.203 | ■ |
| Slave Reader/Writer No.4 | | ■ |
| Slave Reader/Writer No.5 | | ■ |
| Slave Reader/Writer No.6 | | ■ |
| Slave Reader/Writer No.7 | | ■ |



If you assign the IP addresses of the Reader/Writer from the IO controller, the IP addresses of the slave Reader/Writer will change dynamically and may result in unexpected operation. Confirm that no problems will occur before you assign the IP addresses from the IO controller.

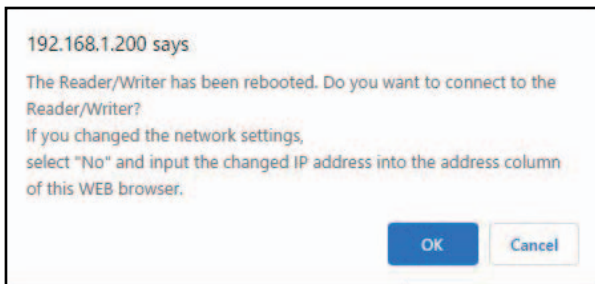
8. A confirmation message will be displayed. Click the **OK** Button.



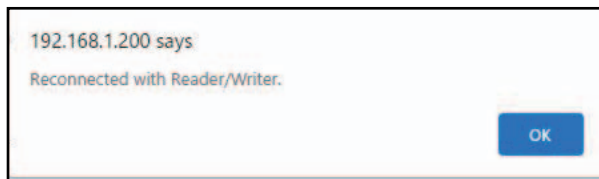
9. Click the **Reboot** Button. A Confirm Reboot Dialog Box will be displayed. Click the **OK** Button.



10. The following dialog box is displayed after the Reader/Writer has finished rebooting. Click the **OK** Button to connect to the Reader/Writer.



11. The following dialog box is displayed after reconnecting to the Reader/Writer. Click the **OK** Button.



When re-connection goes wrong and an error message is displayed, check connection with the Reader/Writer and reboot a Web browser.

CHECK!



After re-connection, displays the "Status" window.

CHECK!

12. When the Master Reader/Writer is restarted, group registration processing is automatically performed for the registered Slave Reader/Writers.



If the Master Reader/Writer cannot establish communications with a registered Slave Reader/Writer (e.g., due to an incorrect IP address or because the Slave Reader/Writer is not started), the ERROR indicator (red) on the Master Reader/Writer will flash at 1-s intervals.

CHECK!

13. You can confirm when communications have been established with all of the slave Reader/Writer from the Multi-Reader/Writer Setting View of the Web browser operation window.

| Group setting | IP address | Status |
|--------------------------|--|--------------------------------------|
| Slave Reader/Writer No.1 | <input type="text" value="192.168.1.201"/> | ■ |
| Slave Reader/Writer No.2 | <input type="text" value="192.168.1.202"/> | ■ |
| Slave Reader/Writer No.3 | <input type="text" value="192.168.1.203"/> | ■ |
| Slave Reader/Writer No.4 | <input type="text"/> | ■ |

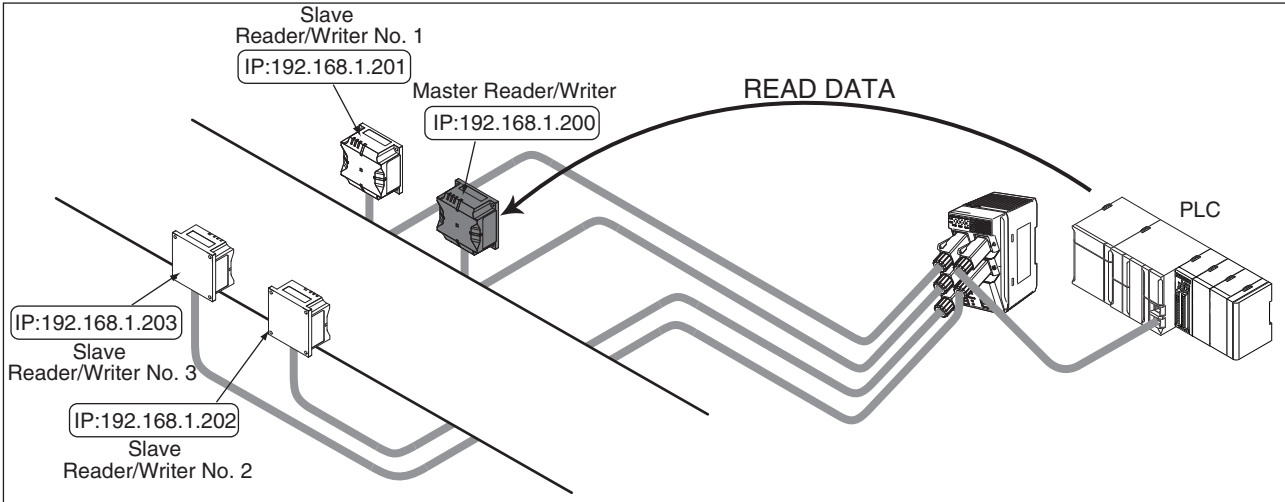
14. The RUN indicator will light yellow on Reader/Writers that are operating as slave Reader/Writers. The indicator on the master Reader/Writer will remain lit green.

15. This concludes the procedure to set Field Extension Mode. You can now use READ DATA or WRITE DATA commands from the host controller for the Master Reader/Writer to perform linked operation of multiple Reader/Writers.

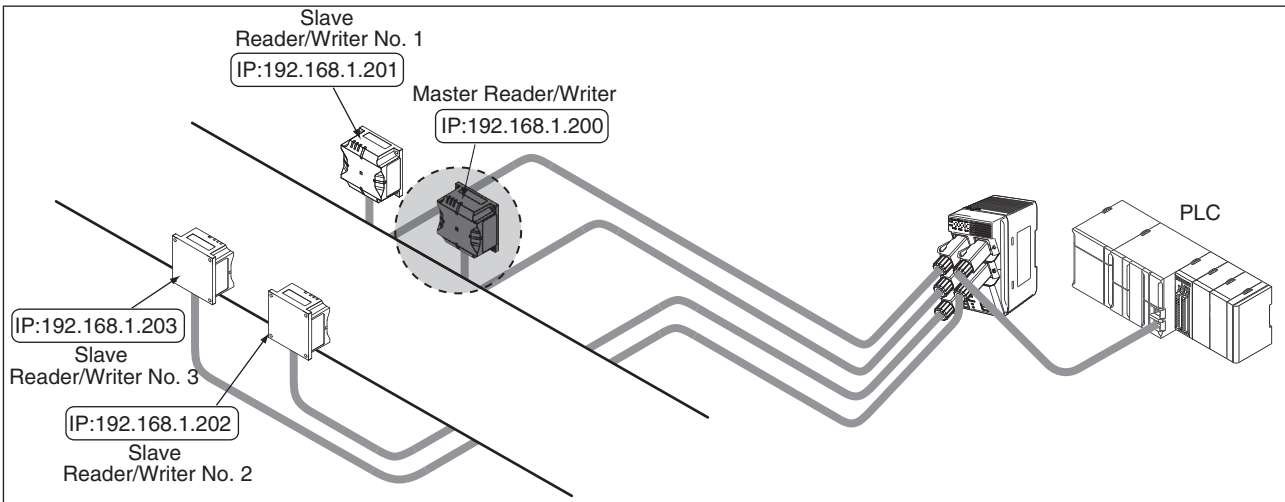
■ Executing a READ DATA Command in Field Extension Mode.

- When the RF Tag Communications Option of the Master Reader/Writer Is Set to Once

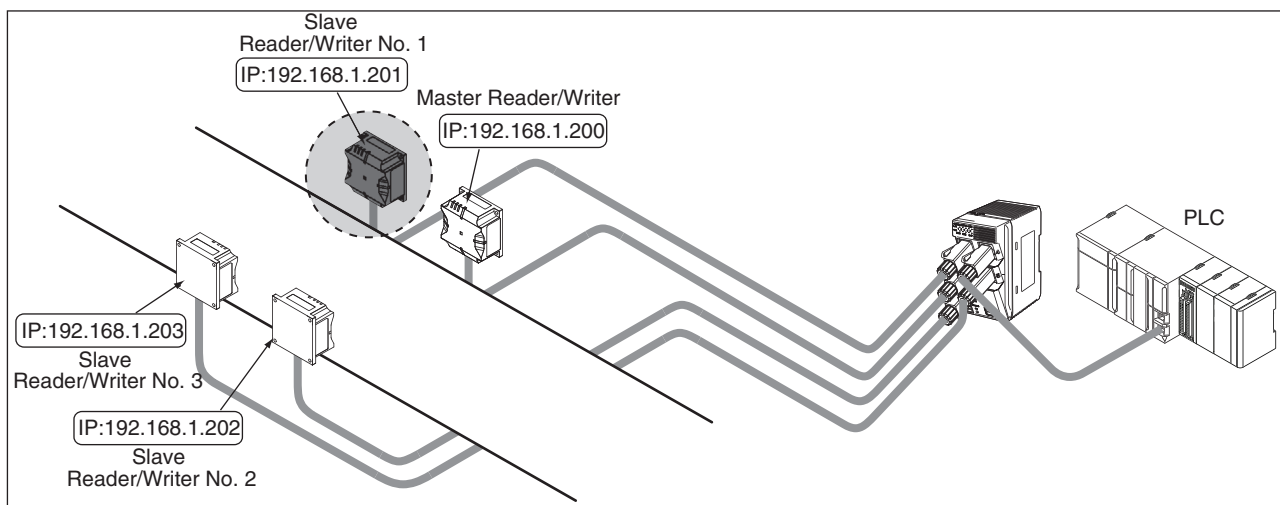
1. Send a READ DATA command from the host device to the Master Reader/Writer.



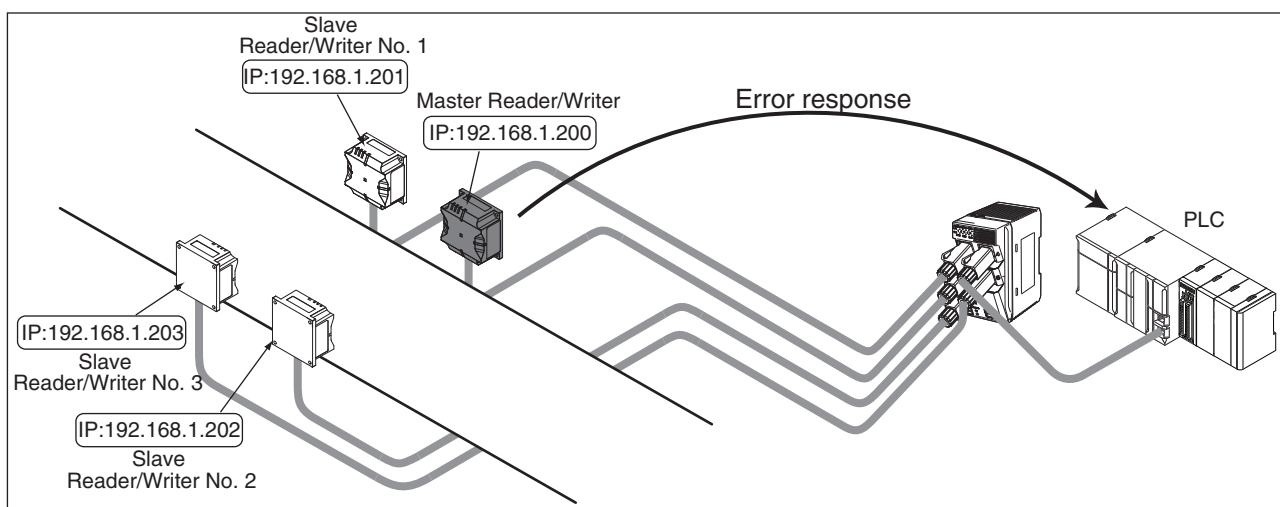
2. The Master Reader/Writer will communicate with the RF Tag using the Once communications option. Here, communications will end normally or an RF Tag communications error will occur, the Reader/Writer will return a response to the host device, and processing will end. If an RF Tag missing error is detected, processing proceeds to step 3.



- Slave Reader/Writer No. 1 will communicate with the RF Tag using the Once communications option. Here, communications will end normally or an RF Tag communications error will occur, the Reader/Writer will return a response to the host device, and processing will end. If an RF Tag tag missing error is detected, processing will be continued in order by Slave No. 2 and then by Slave No. 3.

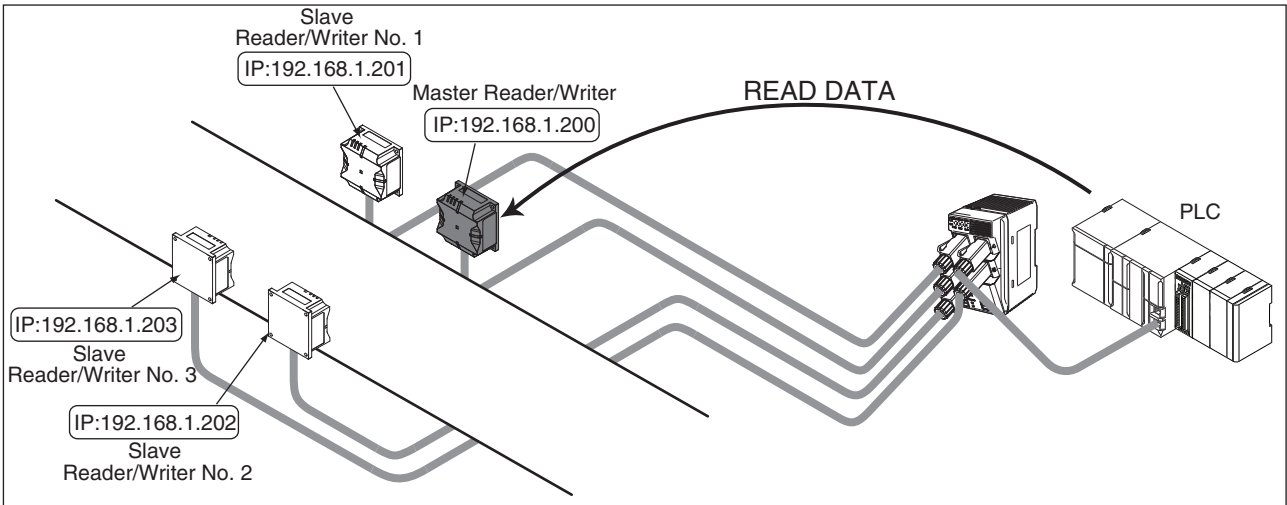


- If an RF Tag missing error is detected for Slave No. 3, the error is returned to the host device and processing ends.

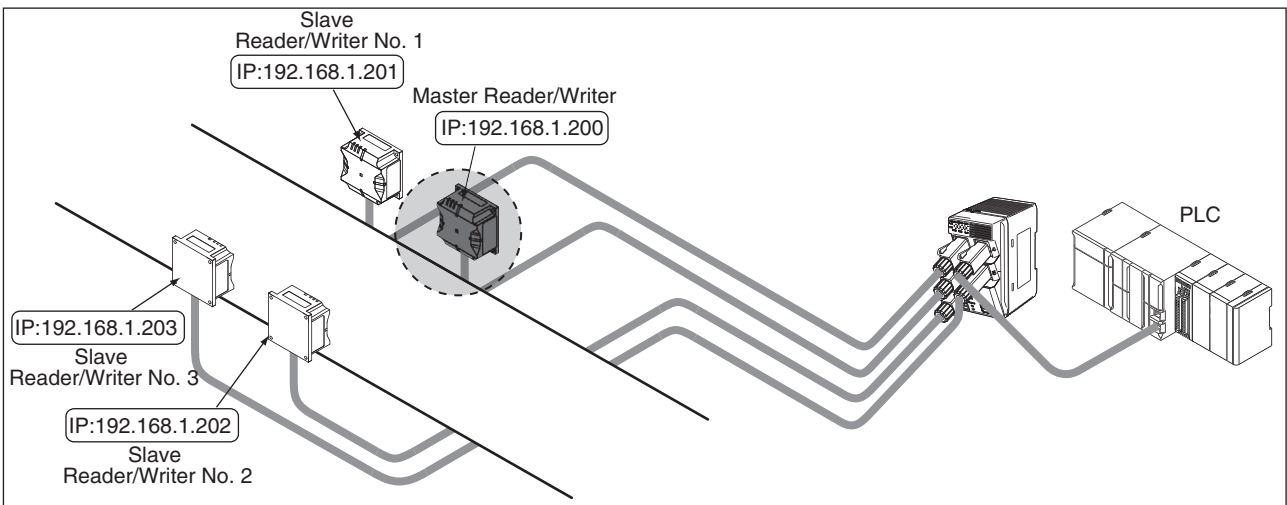


▪ When the RF Tag Communications Option of the Master Reader/Writer Is Set to Auto

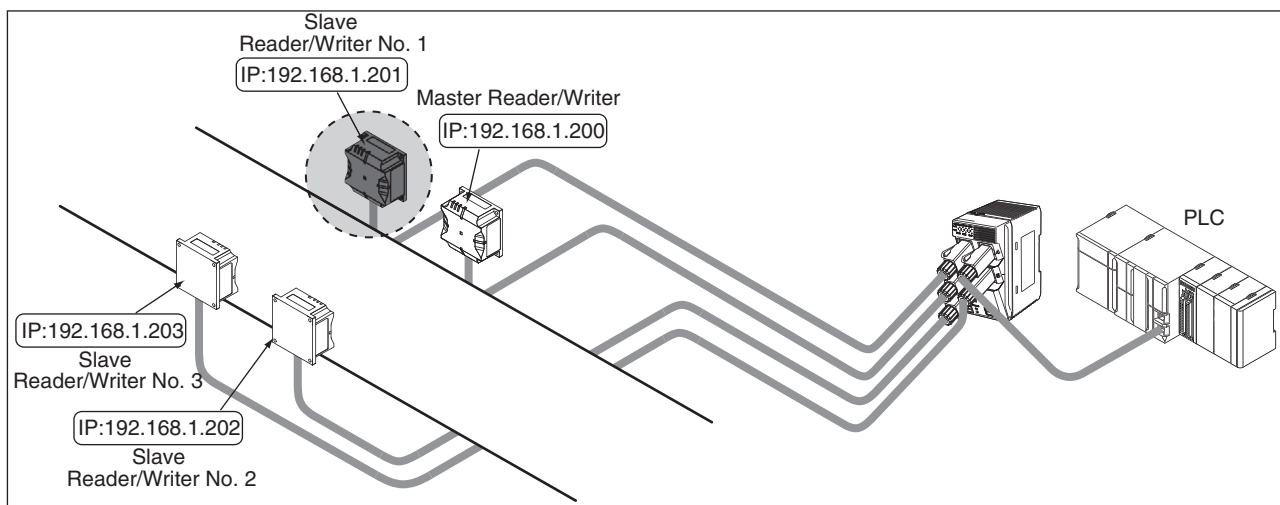
1. Send a READ DATA command from the host device to the Master Reader/Writer.



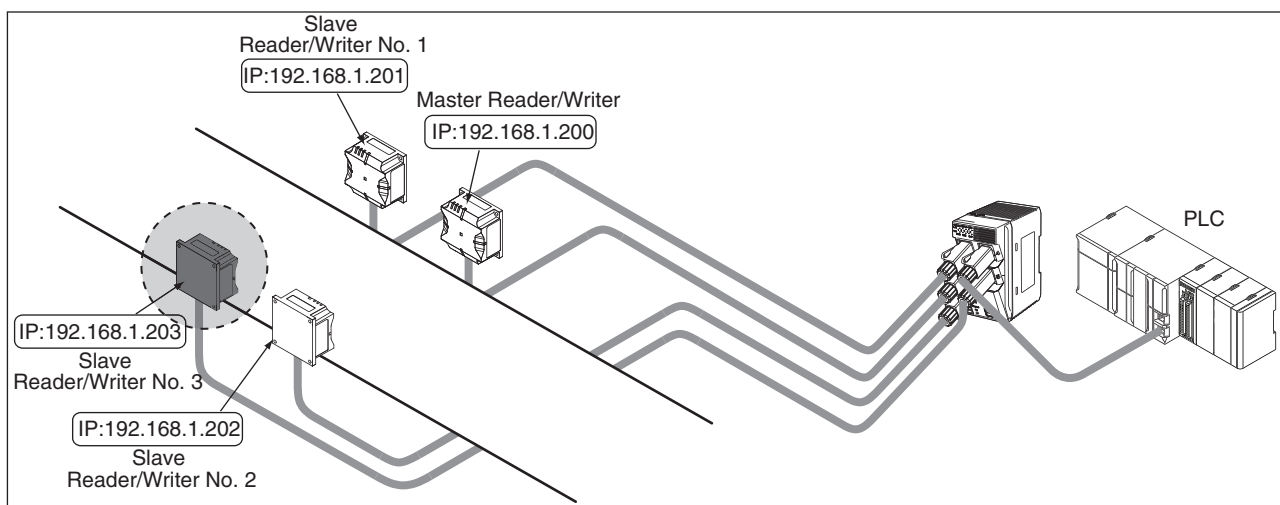
2. The Master Reader/Writer will communicate with the RF Tag using the Once communications option. Here, communications will end normally or an RF Tag communications error will occur, the Reader/Writer will return a response to the host device, and processing will end. If an RF Tag missing error is detected, processing proceeds to step 3.



- Slave Reader/Writer No. 1 will communicate with the RF Tag using the Once communications option. Here, communications will end normally or an RF Tag communications error will occur, the Reader/Writer will return a response to the host device, and processing will end. If an RF Tag tag missing error is detected, processing will be continued in order by Slave No. 2 and then by Slave No. 3.



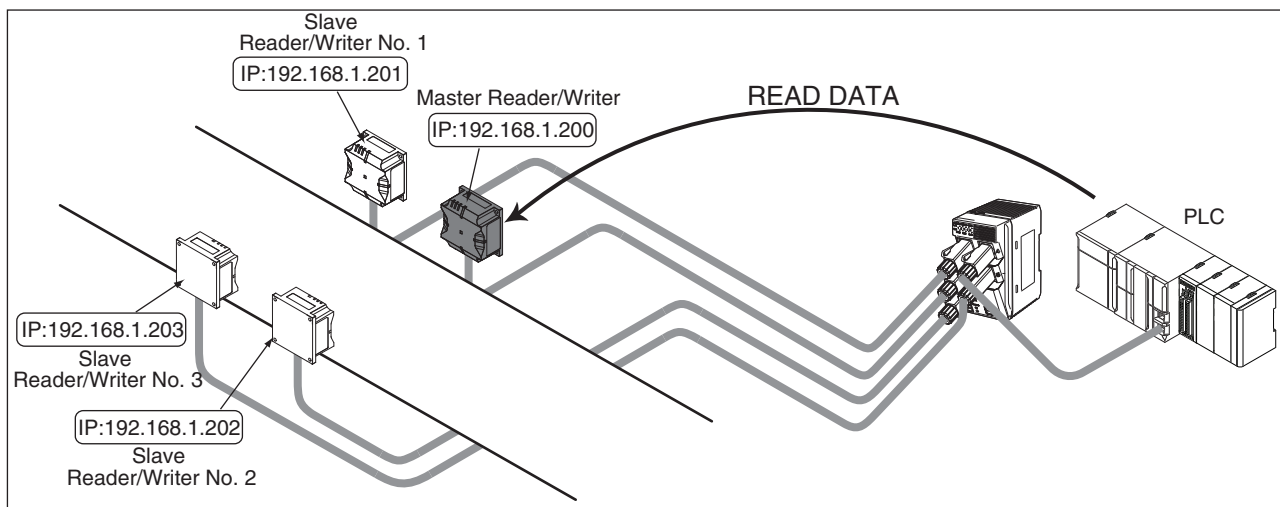
- If an RF Tag missing error is detected for Slave No.3, communications processing is returned to the Master Reader/Writer and the operation is repeated from step 2.



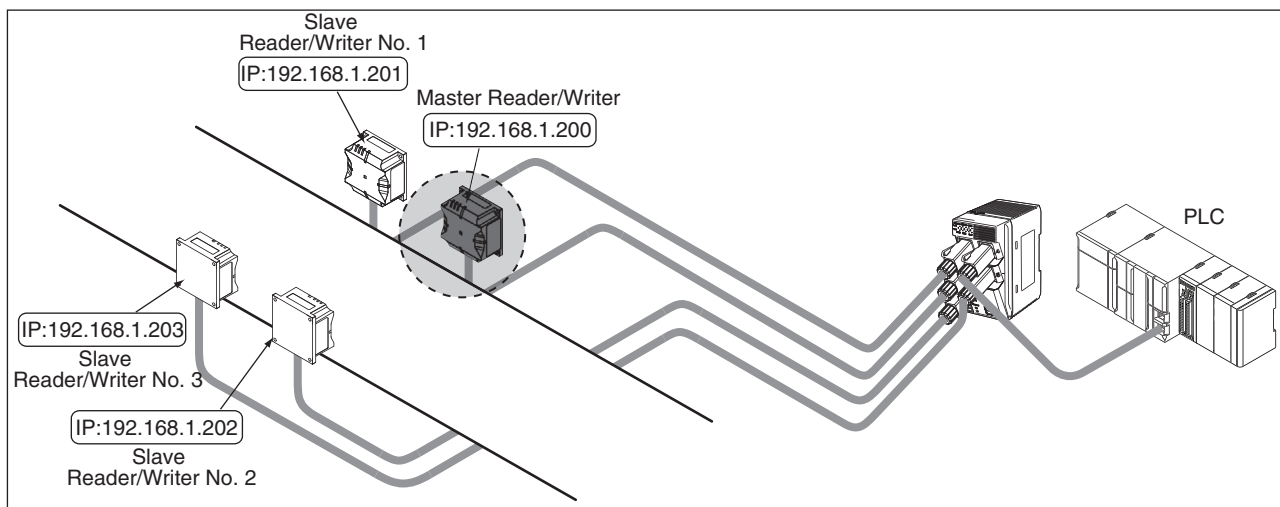
In Field Extension Mode, the Reader/Writers do not simultaneously perform communications. The Reader/Writers individually perform communications on a time sharing basis.

▪ When the RF Tag Communications Option of the Master Reader/Writer Is Set to Repeat

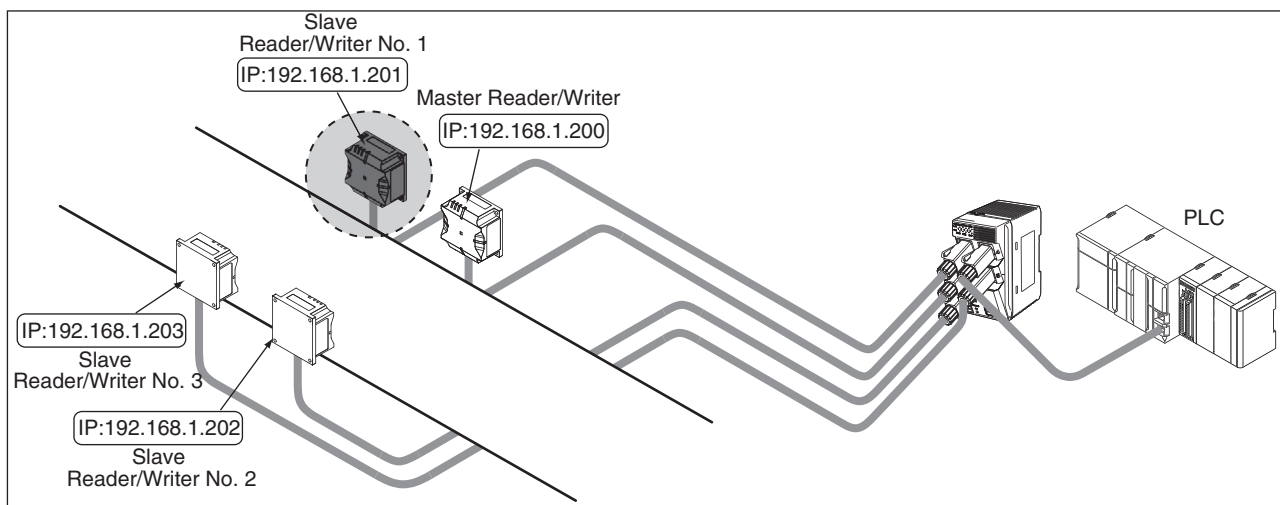
1. Send a READ DATA command from the host device to the Master Reader/Writer.



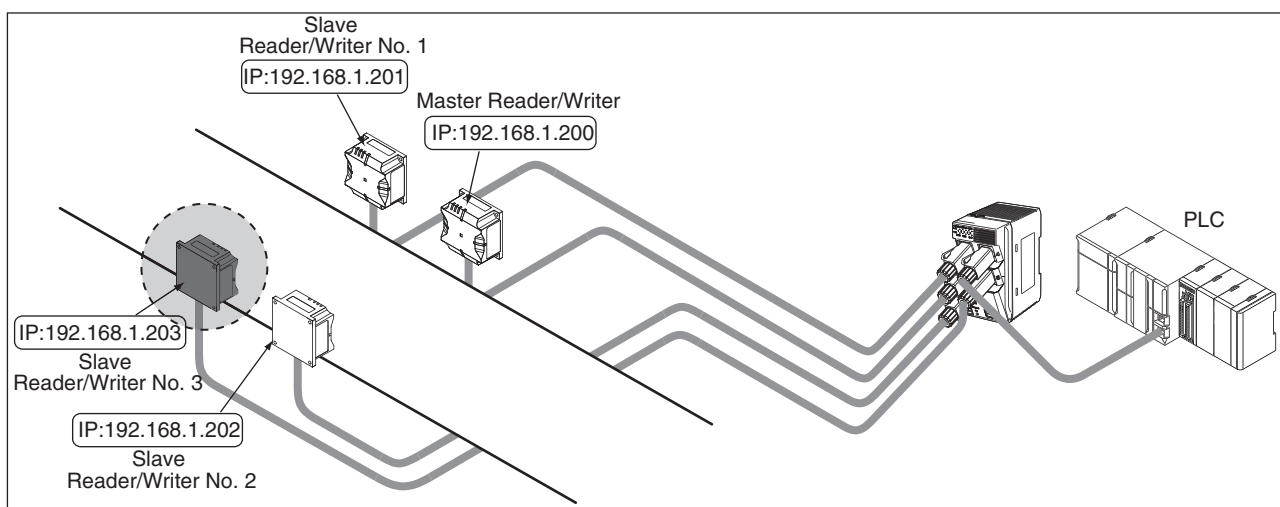
2. The Master Reader/Writer will communicate with the RF Tag using the Once communications option. Here, if RF Tag communications end normally, the Reader/Writer will return a response to the host device and processing is repeated from step 2. If an RF Tag missing error is detected, processing proceeds to step 3.



- Slave Reader/Writer No. 1 will communicate with the RF Tag using the Once communications option. Here, if RF Tag communications end normally, the Reader/Writer will return a response to the host device and processing is repeated from step 2. If an RF Tag tag missing error is detected, processing will be continued in order by Slave No. 2 and then by Slave No. 3.



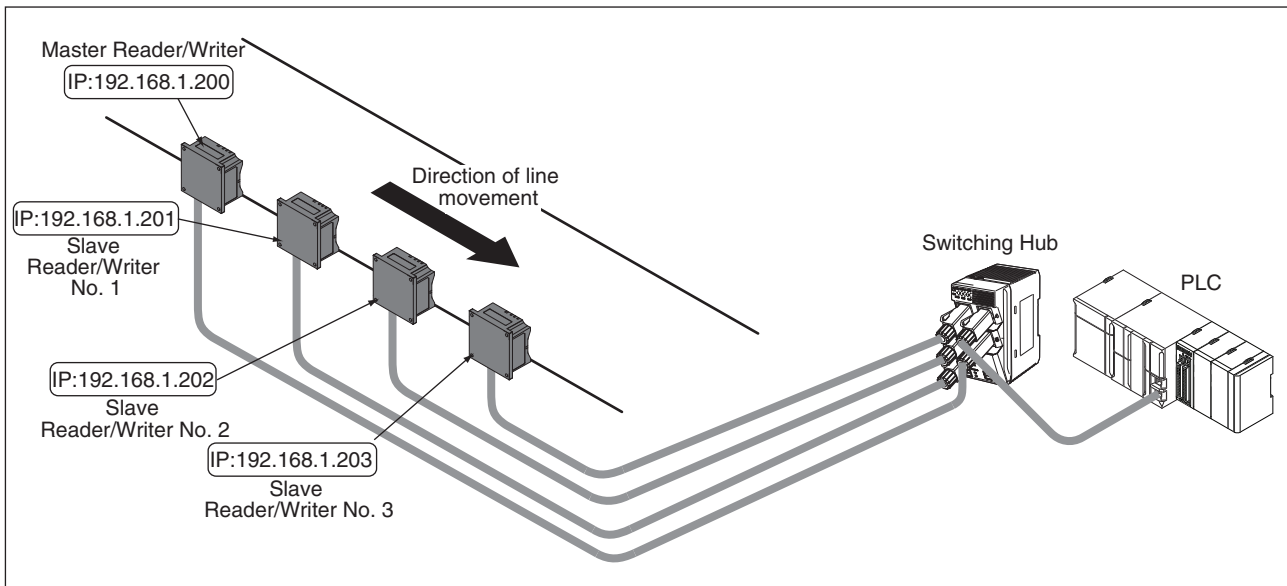
- When communications have been completed for all of the Slave Reader/Writers, the operation is repeated from step 2.



In Field Extension Mode, the Reader/Writers do not simultaneously perform communications. The Reader/Writers individually perform communications on a time sharing basis.

Using High-speed Traveling Mode

Use the following procedure for operation in High-speed Traveling Mode. The following figure shows an example in which four Reader/Writers are installed.



■ Enabling High-speed Traveling Mode

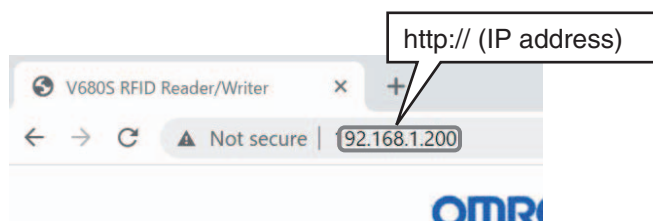
1. Connect all of the Reader/Writers with Ethernet Cable and turn ON the power supplies.



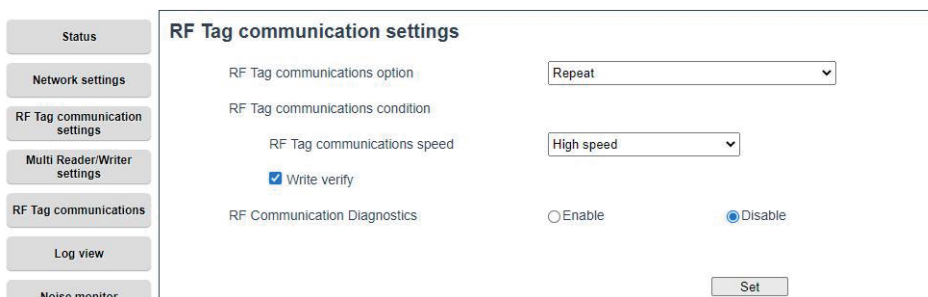
Set a unique IP address for each Reader/Writer in advance.
Refer to *Section 5 Preparations for Communications*.

CHECK!

2. Start a Web browser on your computer.
3. In the address field on the Web browser operation window, enter the IP address of the master Reader/Writer (here, 192.168.1.200).



4. Display the RF Tag Communications Settings View, set the RF Tag communications option to Repeat, and then click the **Set** Button.



If you specify the Once or FIFO Repeat communications option, multi-Reader/Writer operation will be enabled and a multi-Reader/Writer execution error will occur when you restart.

CHECK!

5. Display the Multi-Reader/Writer Settings View.

| Group setting | IP address | Status |
|--------------------------|------------|--------|
| Slave Reader/Writer No.1 | | ■ |
| Slave Reader/Writer No.2 | | ■ |
| Slave Reader/Writer No.3 | | ■ |
| Slave Reader/Writer No.4 | | ■ |
| Slave Reader/Writer No.5 | | ■ |
| Slave Reader/Writer No.6 | | ■ |
| Slave Reader/Writer No.7 | | ■ |

6. Select the *High-speed travelling mode* Check Box.

Multi Reader/Writer mode: Disable Field extension mode High-speed travelling mode

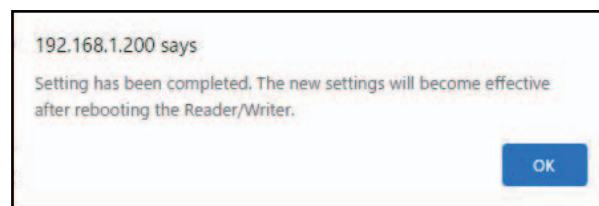
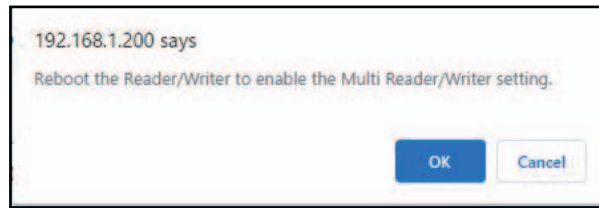
7. Set the IP addresses of the three slave Reader/Writers and click the **Set** Button.

| Group setting | IP address | Status |
|--------------------------|---------------|--------|
| Slave Reader/Writer No.1 | 192.168.1.201 | ■ |
| Slave Reader/Writer No.2 | 192.168.1.202 | ■ |
| Slave Reader/Writer No.3 | 192.168.1.203 | ■ |
| Slave Reader/Writer No.4 | | ■ |
| Slave Reader/Writer No.5 | | ■ |
| Slave Reader/Writer No.6 | | ■ |
| Slave Reader/Writer No.7 | | ■ |



If you assign the IP addresses of the Reader/Writer from the IO controller, the IP addresses of the slave Reader/Writer will change dynamically and may result in unexpected operation. Confirm that no problems will occur before you assign the IP addresses from the IO controller.

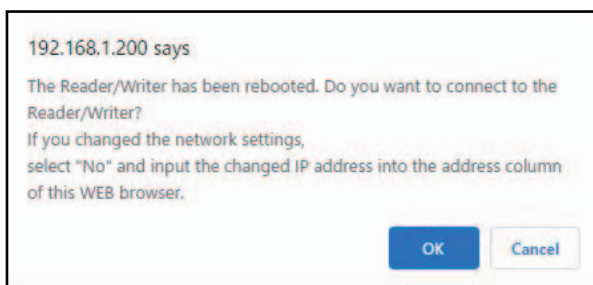
8. A confirmation message will be displayed. Click the **OK** Button.



9. Click the **Reboot** Button. A Confirm Reboot Dialog Box will be displayed. Click the **OK** Button.



10. The following dialog box is displayed after the Reader/Writer has finished rebooting. Click the **OK** Button to connect to the Reader/Writer.



11. The following dialog box is displayed after reconnecting to the Reader/Writer. Click the **OK** Button.



When re-connection goes wrong and an error message is displayed, check connection with the Reader/Writer and reboot a Web browser.

CHECK!



After re-connection, display the "Status" window.

CHECK!

12. When the Master Reader/Writer is restarted, group registration processing is automatically performed for the registered Slave Reader/Writers.



If the Master Reader/Writer cannot establish communications with a registered Slave Reader/Writer (e.g., due to an incorrect IP address or because the Slave Reader/Writer is not started), the ERROR indicator (red) on the Master Reader/Writer will flash at 1-s intervals.

CHECK!

13. You can confirm when communications have been established with all of the slave Reader/Writer from the Multi-Reader/Writer Setting View of the Web browser operation window.

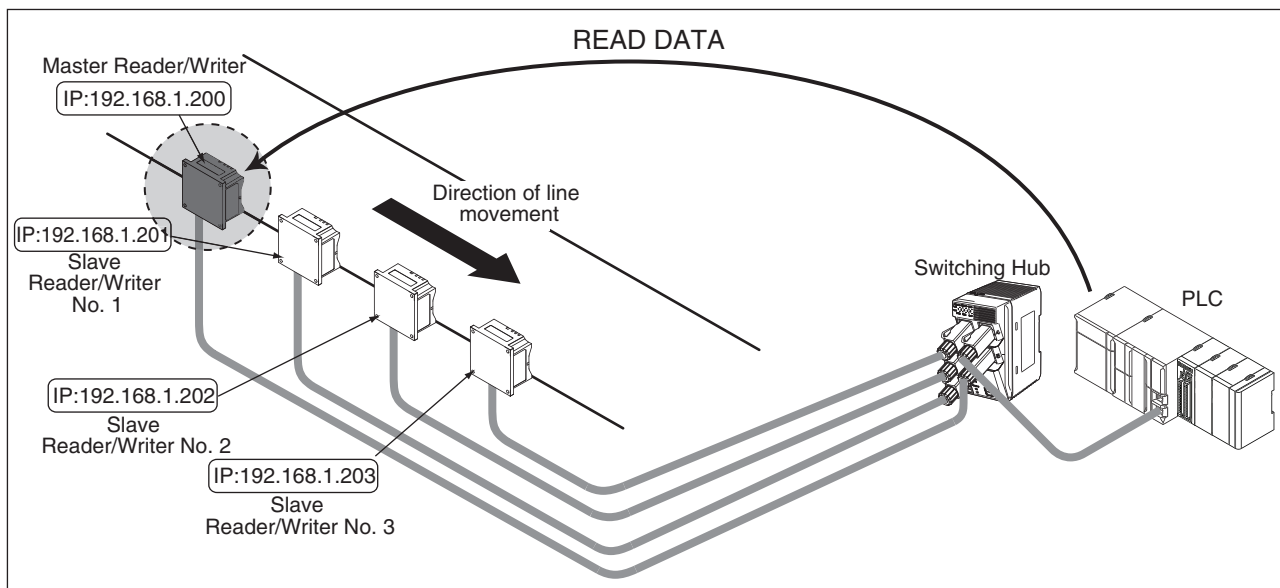
| Group setting | IP address | Status |
|--------------------------|--|--------------------------------------|
| Slave Reader/Writer No.1 | <input type="text" value="192.168.1.201"/> | ■ |
| Slave Reader/Writer No.2 | <input type="text" value="192.168.1.202"/> | ■ |
| Slave Reader/Writer No.3 | <input type="text" value="192.168.1.203"/> | ■ |
| Slave Reader/Writer No.4 | <input type="text"/> | ■ |

14. The RUN indicator will light yellow on Reader/Writers that are operating as slave Reader/Writers. The indicator on the master Reader/Writer will remain lit green.

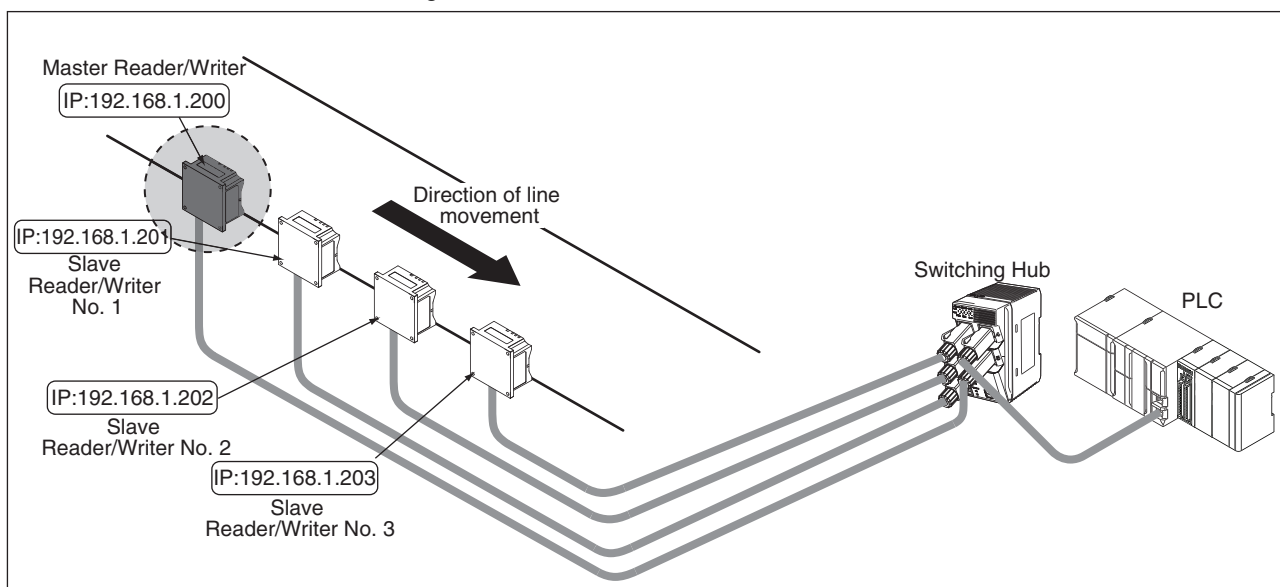
15. This concludes the procedure to set Field Extension Mode. You can now use READ DATA or WRITE DATA commands from the host controller for the Master Reader/Writer to perform linked operation of multiple Reader/Writers.

■ Executing a READ DATA Command in High-speed Traveling Mode.

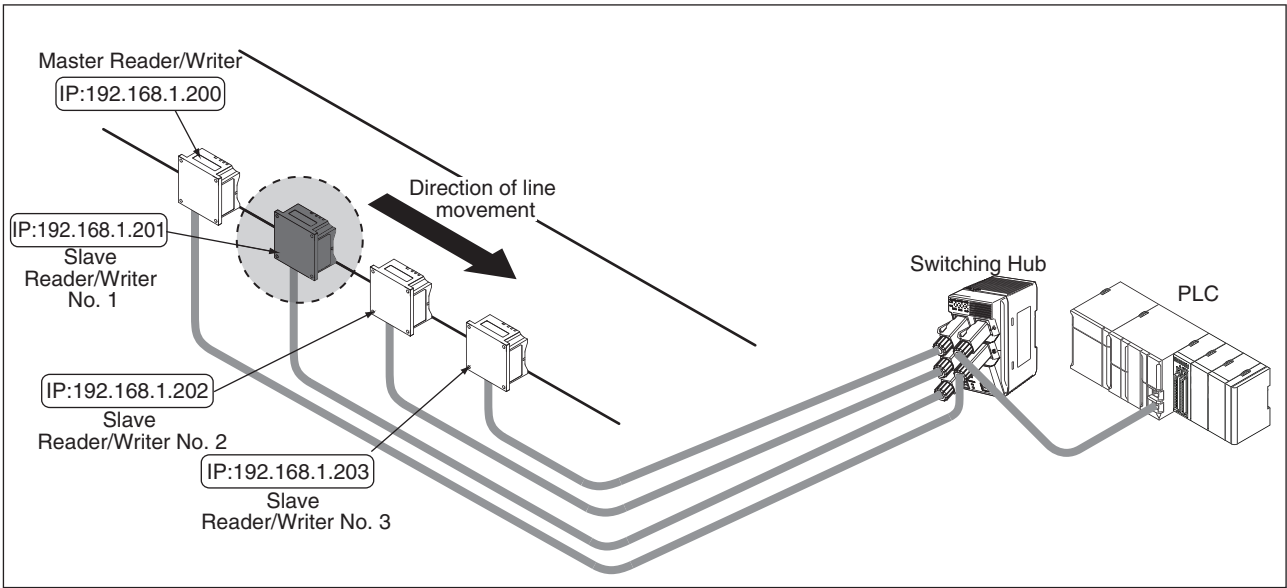
1. Send a READ DATA command from the host device to the Master Reader/Writer.



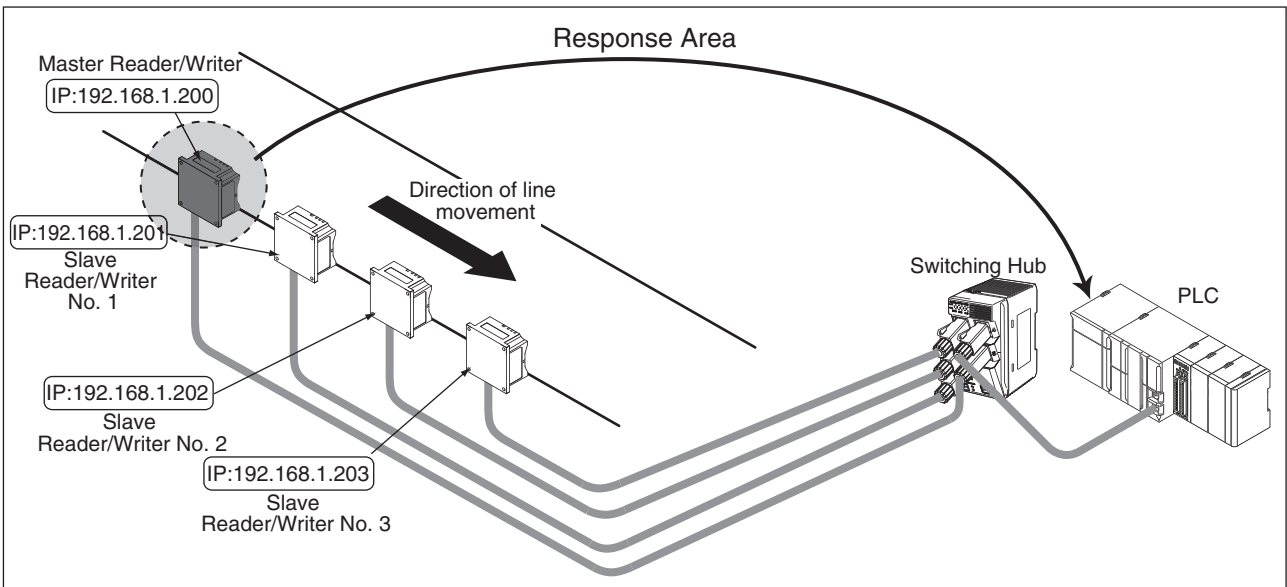
2. The Master Reader/Writer will wait for an RF Tag to enter the communications field and then communicate with the RF Tag.



- Slave No. 1 will wait for an RF Tag to enter the communications field and then communicate with the RF Tag. If communicating with the RF Tag ends normally, processing will be continued in order by Slave No. 2 and then by Slave No. 3.



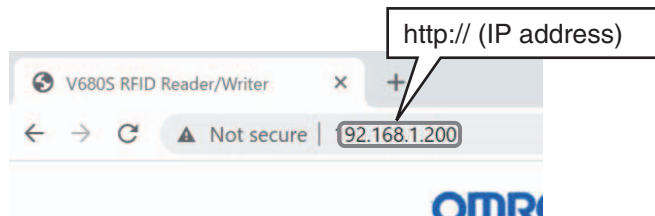
- If all communications with the RF Tag end normally, the read data is returned to the host device and processing returns to step 2.



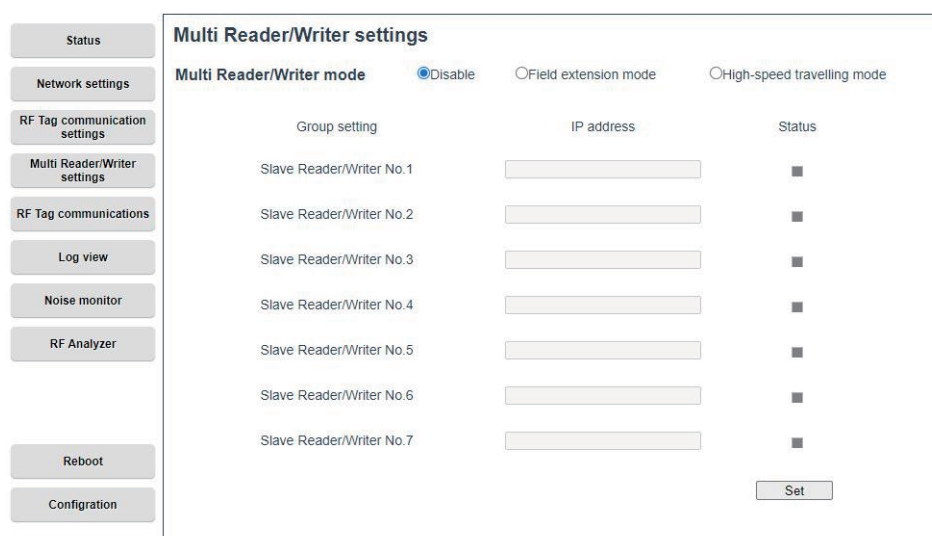
■ Disabling Multi-Reader/Writer Operation

The following example procedure shows how to disable the multi-Reader/Writer operation. You can use the same procedure from either Field Extension Mode or High-speed Traveling Mode.

1. Start the Web browser on your computer and enter the IP address of the master Reader/Writer (here, 192.168.1.200) in the address field.



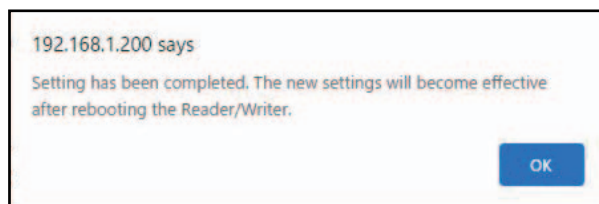
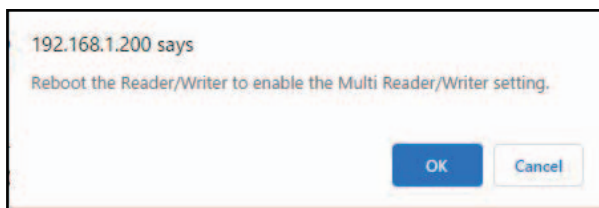
2. Display the Multi-Reader/Writer Settings View.



3. Select the *Disable* Check Box for Multi-Reader/Writer Mode and click the **Set** Button.



4. A confirmation message will be displayed. Click the **OK** Button.

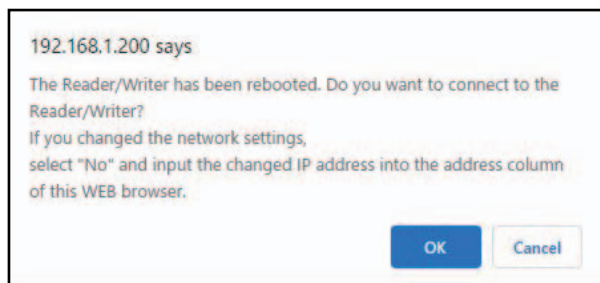


5. Click the **Reboot** Button. A Confirm Reboot Dialog Box will be displayed. Click the **OK** Button.

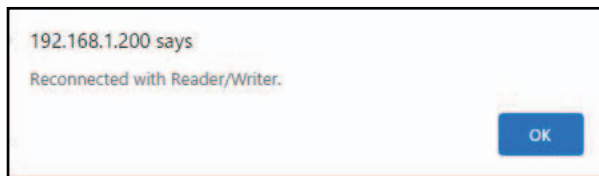


If you turn OFF the power supplies to the Slave Reader/Writers or if a communications error occurs for a Slave Reader/Writer (e.g., Ethernet Cable disconnection) before you restart the Reader/Writers, an execution status error will occur and the Reader/Writers will not restart normally. If that occurs, turn OFF the power supplies to all of the Reader/Writers and then turn them back ON.

6. The following dialog box is displayed after the Reader/Writer has finished rebooting. Click the **OK** Button to connect to the Reader/Writer.



7. The following dialog box is displayed after reconnecting to the Reader/Writer. Click the **OK** Button.



CHECK!

When re-connection goes wrong and an error message is displayed, check connection with the Reader/Writer and reboot a Web browser.



CHECK!

After re-connection, display the "Status" window.

8. The Slave Reader/Writers will also be restarted automatically. This concludes the procedure to disable multi-Reader/Writer operation.



CHECK!

When the Field Extension Mode is disabled, the RUN indicators on the Slave Reader/Writers will fast flashing green.

Section 7

Host Communications Specifications

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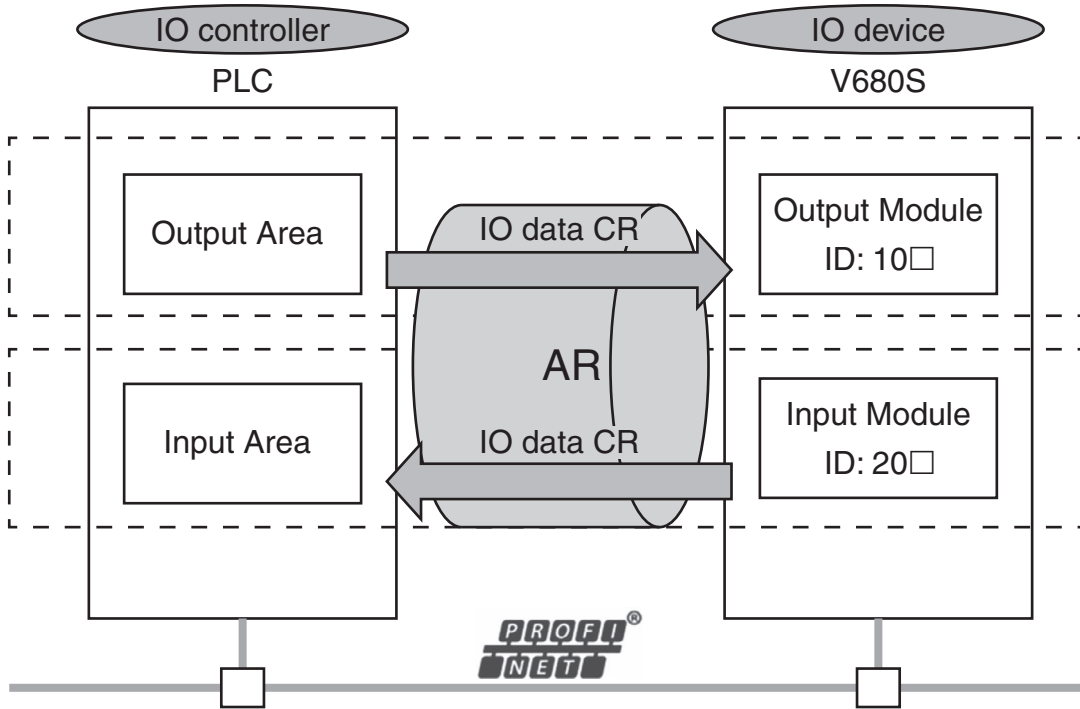
PROFINET IO Communications Protocol

Data Exchange with PROFINET IO

The host device (PLC) and Reader/Writer function as the IO controller and IO device.

You must establish a connection called an AR (application relation) between the two devices to perform communications between an IO controller and IO device.

When an AR connection is established the CRs (communications relations) that define the contents of data communications are used to perform data communications between the IO controller and IO device.



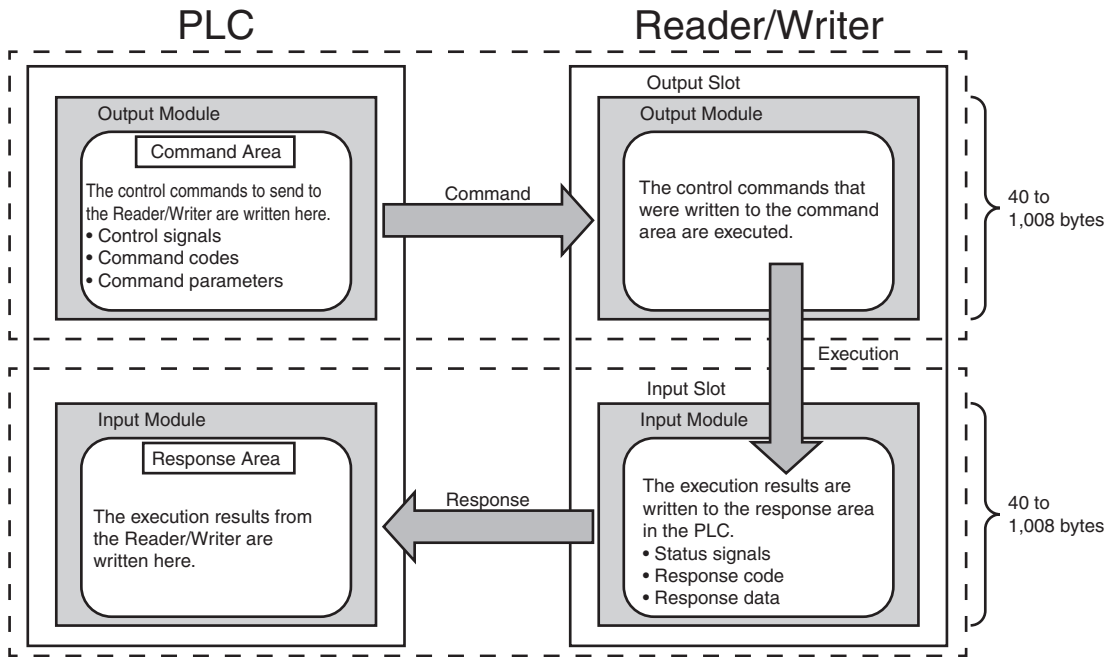
The CRs include the IO data CRs, record data CR, and alarm CR.

The IO data CRs are used to perform data communications every refreshing task period. The other CRs perform communication between the cyclic data communications.

PROFINET IO Communications with the Reader/Writer

For cyclic data exchanges between the host device (PLC) and a Reader/Writer, you can use the IO data CRs to control RF Tag communications from the PLC with command/response communications. The following communications areas are prepared in the PLC to perform communications.

| Area name | Description |
|---------------|--|
| Command Area | This is the area to which you (PLC) write commands for the Reader/Writer to execute. |
| Response Area | This is the area to which the Reader/Writer writes the results of commands executed from the command area. |



Setting Up Cyclic Data Exchanges

This section describes how to set up cyclic data exchanges with PROFINET IO.

The Reader/Writer's IO data CRs provide slot 1 for output data and slot 2 for input data. An Output Module and Input Module with different data sizes are specified for these slots.

■ I/O Data CR Settings

| Setting item | Setting | |
|----------------|----------------------------------|----------------------------------|
| | Command area | Response area |
| Slot number | 0001 hex | 0002 hex |
| Subslot number | 0000 hex | 0000 hex |
| Module name | Output data (V680S Command Data) | Input data (V680S Response Data) |
| Module ID | 0100/0101/0102/0103 hex | 0200/00201/0202/0203 hex |
| Data size | 40, 264, 520, or 1,008 bytes*1 | 40, 264, 520, or 1,008 bytes*1 |

*1 Select one of the following values for the data size according to the data size required to write or read an RF Tag in one operation.

| Data size | Data size that can be read or written for an RF Tag in one operation |
|-------------|--|
| 40 bytes | 32 bytes |
| 264 bytes | 256 bytes |
| 520 bytes | 512 bytes |
| 1,008 bytes | 1,000 bytes |

To connect to the host device (PLC) and perform PROFINET communications, set up the IO data CR from the Engineering Tool.

Refer to the manual for your Engineering Tool for the specific procedure to set up the IO data CR with the Engineering Tool.



To connect to an IO controller manufactured by OMRON, use the CX-Configurator FDT Engineering Tool to set up the IO data CR.

CHECK!



To set up cyclic data exchanges, a GSDML file that defines the V680S IO data CR is required. Download the GSDML file from your OMRON website.

CHECK!

Memory Assignments

This section describes the command area (output area) for the input CR to the Reader/Writer and the response area (input area) for the output CR to the PLC.

Memory alignment is given in units of 8 bits. The byte order in all fields is big endian.

Command Area PLC (IO Controller) ↔ Reader/Writer (IO Device)

| Offset | Bit | | | | | | | |
|--------|--|------|------|------|------|------|------|------|
| | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| +0 | Resv | Resv | Resv | Resv | Resv | Resv | Resv | EXE |
| +1 | Resv | Resv | Resv | Resv | Resv | Resv | Resv | Resv |
| +2 | Command Code | | | | | | | |
| +3 | | | | | | | | |
| +4 | Command Parameter 1 | | | | | | | |
| +5 | | | | | | | | |
| +6 | Command Parameter 2 | | | | | | | |
| +7 | | | | | | | | |
| +8 | Command Data (The format depends on the command.) | | | | | | | |
| : | | | | | | | | |
| +N | | | | | | | | |

* Reserved (resv) bits are for future expansion. Do not turn them ON and OFF.

| Signal/data | Name | Data type | Size | Description |
|-------------|---------------------------|-----------|---------|---|
| EXE | Command Execution Request | BOOL | 1 bit | <ul style="list-style-type: none"> Turn ON this bit to send a request to the Reader/Writer to execute a command. Set the command code and parameters before you turn ON this bit. You can turn OFF this bit during execution of a communications command with RF Tags to cancel communications processing by the Reader/Writer. |
| CmdCode | Command Code | WORD | 16 bits | This word stores the command code. |
| CmdParam1 | Command Parameter 1 | WORD | 16 bits | These words store the command parameters. Refer to the sections for individual commands for details. |
| CmdParam2 | Command Parameter 2 | WORD | 16 bits | |
| CmdData | Command Data | --- | --- | These words store the command data. Refer to the sections for individual commands for details. |

▪ **Response Area** **Reader/Writer (IO Device) ↔ PLC (IO Controller)**

| Offset | Bit | | | | | | | |
|--------|---|--------|---------|------|------|------|------|--------|
| | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| +0 | SYS_ERR | RF_ERR | CMD_ERR | FRIC | ERR | NORM | BUSY | READY |
| +1 | Resv | Resv | Resv | Resv | Resv | Resv | Resv | RF_WAR |
| +2 | Error Code | | | | | | | |
| +3 | | | | | | | | |
| +4 | Response Information 1 | | | | | | | |
| +5 | | | | | | | | |
| +6 | Response Information 2 | | | | | | | |
| +7 | | | | | | | | |
| +8 | Response Data (The format depends on the command.) | | | | | | | |
| : | | | | | | | | |
| +N | | | | | | | | |

* Reserved (resv) bits are for future expansion. They always output 0.

| Signal/data | Name | Data type | Size | Description |
|-------------|------------------------------|-----------|---------|--|
| READY | Ready | BOOL | 1 bit | This bit turns ON when the Reader/Writer completes preparations and is ready to receive a command. It turns OFF while cyclic data exchanges are disconnected and the reconnecting Reader/Writer is executing a command. |
| BUSY | Command Execution Active | BOOL | 1 bit | This bit is ON while the Reader/Writer is executing a command. It is OFF when a command is not being executed. |
| NORM | Command Completion | BOOL | 1 bit | This bit turns ON when the Reader/Writer completes command execution normally (i.e., for a normal end). It turns OFF when the EXE signal is turned OFF. |
| ERR | Error | BOOL | 1 bit | This bit turns ON when the Reader/Writer returns an error response. It turns OFF when the EXE signal is turned OFF. |
| FRIC | Flicker | BOOL | 1 bit | This bit toggles (turns ON or turns OFF) when the communications result changes while the Reader/Writer is executing an RF Tag communications command with a Repeat communications option. |
| CMD_ERR | Command Error | BOOL | 1 bit | This bit turns ON when the Reader/Writer returns a command error response. It turns ON and OFF in sync with the ERR signal. |
| RF_ERR | RF Tag Communications Errors | BOOL | 1bit | This bit turns ON when the Reader/Writer returns an RF Tag communications error response. It turns ON and OFF in sync with the ERR signal. |
| SYS_ERR | Fatal Error | BOOL | 1 bit | This bit turns ON when the Reader/Writer returns a fatal error response. It turns ON and OFF in sync with the ERR signal. |
| RF_WAR | Unstable Communications | BOOL | 1 bit | This bit turns ON when the diagnostics result in the response for execution of an RF Tag communications command by the Reader/Writer indicates that communications are unstable. It turns ON and OFF in sync with the NORM signal. |
| ErrCode | Error Code | WORD | 2 bytes | This word contains the error code. |
| RespInfo1 | Response Information 1 | WORD | 2 bytes | This word contains device information. |
| RespInfo2 | Response Information 2 | WORD | 2 bytes | This word contains communications diagnostic results. |
| RespData | Response Data | --- | --- | This word contains the response data. Refer to the sections for individual commands for details. |

V680S Commands

■ Command Codes

The following table lists the command codes that you can specify for execution by the Reader/Writer. Set these codes in the Command Code field in the command area.

| Classification | Command code | Command name | Reference |
|---------------------------------------|--------------|------------------------------------|-----------|
| RF Tag communications | 0001 hex | READ ID | p.158 |
| | 0002 hex | READ DATA | p.159 |
| | 0003 hex | WRITE DATA | p.160 |
| | 0004 hex | LOCK | p.161 |
| | 0005 hex | DATA FILL | p.162 |
| | 0006 hex | RF TAG OVERWRITE COUNT CONTROL | p.163 |
| | 0007 hex | RESTORE DATA | p.164 |
| | 0008 hex | COPY DATA | p.165 |
| Reader/Writer settings | 1000 hex | INITIALIZE | p.167 |
| | 1001 hex | SET RF TAG COMMUNICATIONS | p.168 |
| | 1002 hex | GET RF TAG COMMUNICATIONS SETTINGS | p.169 |
| | 1003 hex | SET MULTI-READER/WRITER OPERATION | p.170 |
| | 1004 hex | GET MULTI-READER/WRITER SETTINGS | p.172 |
| Reader/Writer information acquisition | 2000 hex | GET MODEL INFORMATION | p.174 |
| | 2001 hex | GET FIRMWARE VERSION | p.175 |
| | 2002 hex | GET OPERATING TIME | p.176 |
| | 2003 hex | MEASURE NOISE | p.177 |
| | 2004 hex | GET COMMAND ERROR LOG | p.178 |
| | 2005 hex | GET RESTORE INFORMATION | p.180 |
| | 2006 hex | GET MULTI-READER/WRITER STATUS | p.182 |
| Reader/Writer operation control | 3000 hex | RESET | p.183 |

■ Error Codes

The following tables list the error codes that indicate the response results from the Reader/Writer. These codes are set in the Error Code field in the response area.

If an error response is returned (i.e., an error code other than 0000 hex), a record is stored in the command error log in the Reader/Writer. Records are not stored for errors for which responses are not returned to the host device. Reader/Writer operating errors and system errors are recorded in the system error log in the Reader/Writer.

■ Normal Code

| Error code name | Error code | Description |
|-----------------|------------|----------------------------|
| Normal end | 0000 hex | Processing ended normally. |

■ Interrupted Processing

| Error code name | Error code | Description |
|-------------------------|------------|---|
| Communications canceled | 0001 hex | Processing was canceled when an OFF EXE signal was received before an RF Tag was detected. (The contents of the RF Tag was not changed, even for a WRITE DATA command.) |
| Communications aborted | 0002 hex | Processing was canceled when an OFF EXE signal was received during communications with an RF Tag. (For a WRITE DATA command, the contents of the RF Tag may have been changed.) |

▪ **Command Errors**

| Error code name | Error code | Description |
|-------------------------|------------|--|
| Unknown command error | 1003 hex | A command that is not supported by the Reader/Writer was received. |
| Command parameter error | 1005 hex | There was an error in the parameters in the received command data. |
| Execution status error | 1006 hex | The Reader/Writer could not execute the command that was received. |

▪ **RF Tag Communications Errors**

| Error code name | Error code | Description |
|--|------------|--|
| RF Tag missing error | 2001 hex | There is no RF Tag in the communications field. |
| RF Tag communications error | 2002 hex | Communications with the RF Tag did not end normally. |
| UID mismatch error | 2003 hex | An RF Tag with the specified ID was not in the communications field. |
| RF Tag address error | 2004 hex | The access address for the RF Tag is outside of the area supported by the target RF Tag. |
| RF Tag lock error | 2005 hex | An attempt was made to write data to a locked area. |
| Verification error | 2006 hex | Processing to write data to the RF Tag did not end normally. |
| RF Tag data lost error | 2007 hex | Processing to write data to the RF Tag did not end normally. (Data may have been lost and must be restored.) |
| RF Tag system error | 2008 hex | The RF Tag returned an error response. |
| RF Tag overwriting error | 2009 hex | The overwrite limit was exceeded for overwrite count control processing. |
| Reader/Writer connection error | 200A hex | When executing the COPY DATA command, communications could not be established with the copy destination Reader/Writer. |
| Communications connection error between Reader/Writers | 200B hex | When executing multi-Reader/Writer functions, communications could not be established with a Slave Reader/Writer. |

▪ **Reader/Writer Operation Errors**

| Error code name | Error code | Description |
|-------------------------------------|------------|--|
| Unfixed operation mode error | 8001 hex | The control signal was not stable when the Reader/Writer was started. A record is stored only in the system error log. |
| User setting error | 8002 hex | An error was detected in user configuration memory when the Reader/Writer was started. A record is stored only in the system error log. The classification of the setting is given in attached information 1. 0000 0001 hex: Network setting 0000 0002 hex: RF Tag communications setting 0000 0003 hex: Multi-Reader/Writer setting |
| Multi-Reader/Writer execution error | 8003 hex | A set value was detected when the Reader/Writer was started that prevents execution of multi-Reader/Writer operation. The reason for the error is given in attached information 1. 0000 0001 hex: The combination of the Multi-Reader/Writer Mode and the communications option prevented execution. 0000 0002 hex: This Reader/Writer has the same IP address as the Slave Reader/Writer. |

■ System Errors

| Error code name | Error code | Description |
|----------------------------|------------|---|
| System startup errors | | |
| System memory error | F001 hex | An error was detected in system memory. A record is stored only in the system error log. |
| Profile error | F002 hex | An error was detected in the profile data. A record is stored only in the system error log. |
| Hardware faults | | |
| IC error | F011 hex | An error was detected in an IC in the Reader/Writer. |
| Configuration memory error | F012 hex | An error was detected when accessing configuration memory. |

■ Device Information

The following table lists the device information that indicates the Reader/Writer in which the error occurred.

These codes are set in the Response Information 1 field in the response area.

| Device information | Description |
|--------------------|--|
| 0000 hex | An error occurred in the local Reader/Writer. |
| 0100 hex | <ul style="list-style-type: none"> • An error occurred in the destination Reader/Writer when copying data. • An error occurred in Slave Reader/Writer No. 1 for multi-Reader/Writer operation. |
| 0200 hex | An error occurred in Slave Reader/Writer No. 2 for multi-Reader/Writer operation. |
| 0300 hex | An error occurred in Slave Reader/Writer No. 3 for multi-Reader/Writer operation. |
| 0400 hex | An error occurred in Slave Reader/Writer No. 4 for multi-Reader/Writer operation. |
| 0500 hex | An error occurred in Slave Reader/Writer No. 5 for multi-Reader/Writer operation. |
| 0600 hex | An error occurred in Slave Reader/Writer No. 6 for multi-Reader/Writer operation. |
| 0700 hex | An error occurred in Slave Reader/Writer No. 7 for multi-Reader/Writer operation. |

■ Communications Diagnostics Results

The following table lists the communications diagnostic results that are obtained when the Reader/Writer communicates with an RF Tag.

If communications diagnostics are enabled, these codes are provided to indicate the cause when diagnostics indicate that communications are unstable.

This information is set in the Response Information 2 field in the response area. When this information is set, the RF_WAR (communications unstable) signal turns ON.

| Communications diagnostics result | Description |
|-----------------------------------|------------------------------------|
| 0000 hex | Normal |
| 0001 hex | Insufficient power to send |
| 0002 hex | Insufficient power to receive |
| 0003 hex | Too much noise |
| 0004 hex | Insufficient signal-to-noise ratio |

V680S Command Details



READ ID

This command reads the ID code of the RF Tag in the communications field.

Command Area

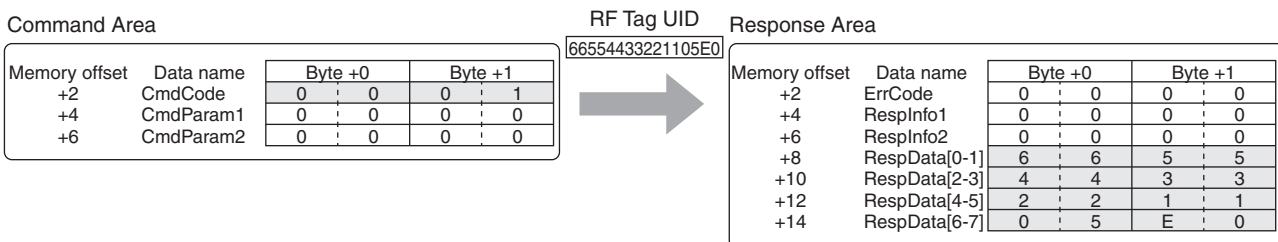
| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 0001 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|--------------------|---------|---|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | Device information |
| RespInfo2/Response Information 2 | WORD | 2 bytes | Communications diagnostics result |
| RespData/Response Data | STRUCT | --- | --- |
| ID Data | ARRAY[] OF BYTE | 8 bytes | ID data read from the RF Tag (always 8 bytes) |

Execution Example

Reading the ID Data from the RF Tag



READ DATA

This command reads data from the RF Tag in the communications field.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|--|
| CmdCode/Command Code | WORD | 2 bytes | 0002 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | First word address of the data read from the RF Tag 0000 to FFFF hex |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | Data size to read from the RF Tag (in words) 0000 to 0200 hex * The maximum size that you can specify depends on the cyclic data exchange settings. |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|--------------------|---------------------|-----------------------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | Device information |
| RespInfo2/Response Information 2 | WORD | 2 bytes | Communications diagnostics result |
| RespData/Response Data | | | |
| Read Data | ARRAY[] OF BYTE | 1,000 bytes max. | Data read from the RF Tag |

Execution Example

Reading Four Words of Data Starting from Word Address 1234 Hex in the RF Tag

Command Area

| Memory offset | Data name | Byte +0 | | Byte +1 | |
|---------------|-----------|---------|---|---------|---|
| +2 | CmdCode | 0 | 0 | 0 | 2 |
| +4 | CmdParam1 | 1 | 2 | 3 | 4 |
| +6 | CmdParam2 | 0 | 0 | 0 | 4 |

RF Tag Memory

| User address | bit15-12 | bit11-8 | bit7-4 | bit3-0 |
|--------------|----------|---------|--------|--------|
| 1234 hex | 1 | 1 | 1 | 1 |
| 1235 hex | 2 | 2 | 2 | 2 |
| 1236 hex | 3 | 3 | 3 | 3 |
| 1235 hex | 4 | 4 | 4 | 4 |



Response Area

| Memory offset | Data name | Byte +0 | | Byte +1 | |
|---------------|---------------|---------|---|---------|---|
| +2 | ErrCode | 0 | 0 | 0 | 0 |
| +4 | RespInfo1 | 0 | 0 | 0 | 0 |
| +6 | RespInfo2 | 0 | 0 | 0 | 0 |
| +8 | RespData[0-1] | 1 | 1 | 1 | 1 |
| +10 | RespData[2-3] | 2 | 2 | 2 | 2 |
| +12 | RespData[4-5] | 3 | 3 | 3 | 3 |
| +14 | RespData[6-7] | 4 | 4 | 4 | 4 |

WRITE DATA

This command writes data to the RF Tag in the communications field.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|--------------------|---------------------|--|
| CmdCode/Command Code | WORD | 16 bits | WRITE DATA (0003 hex) |
| CmdParam1/Command Parameter 1 | WORD | 16 bits | First word address of the data to write to the RF Tag 0000 to FFFF hex |
| CmdParam2/Command Parameter 2 | WORD | 16 bits | Number of words in the RF Tag to write 0000 to 0200 hex * The maximum size that you can specify depends on the cyclic data exchange settings. |
| CmdData/Command Data | | | |
| Data to write | ARRAY[] OF BYTE | 1,000 bytes max. | Data to write to RF Tag |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|-----------------------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| Resplnfo1/Response Information 1 | WORD | 2 bytes | Error device information |
| Resplnfo2/Response Information 2 | WORD | 2 bytes | Communications diagnostics result |

Execution Example

Writing 1111222233334444 to Four Words Starting from Word Address 1234 Hex in the RF Tag

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|--------------|---------|---------|
| +2 | CmdCode | 0 : 0 | 0 : 3 |
| +4 | CmdParam1 | 1 : 2 | 3 : 4 |
| +6 | CmdParam2 | 0 : 0 | 0 : 4 |
| +8 | CmdData[0-1] | 1 : 1 | 1 : 1 |
| +10 | CmdData[2-3] | 2 : 2 | 2 : 2 |
| +12 | CmdData[4-5] | 3 : 3 | 3 : 3 |
| +14 | CmdData[6-7] | 4 : 4 | 4 : 4 |

Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | ErrCode | 0 : 0 | 0 : 0 |
| +4 | Resplnfo1 | 0 : 0 | 0 : 0 |
| +6 | Resplnfo2 | 0 : 0 | 0 : 0 |

RF Tag Memory

| User address | bit15-12 | bit11-8 | bit7-4 | bit3-0 |
|--------------|----------|---------|--------|--------|
| 1234 hex | 1 | 1 | 1 | 1 |
| 1235 hex | 2 | 2 | 2 | 2 |
| 1236 hex | 3 | 3 | 3 | 3 |
| 1235 hex | 4 | 4 | 4 | 4 |

LOCK

This command locks the memory of the RF Tag in the communications field. Memory cannot be written again after it is locked. There is also no way to unlock memory.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|--|
| CmdCode/Command Code | WORD | 2 bytes | 0004 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | First block or sector number to lock in the RF Tag 0000 to FFFF hex |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | Number of blocks or sectors to lock in the RF Tag 0001 to FFFF hex |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|-----------------------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| Resplnfo1/Response Information 1 | WORD | 2 bytes | Device information |
| Resplnfo2/Response Information 2 | WORD | 2 bytes | Communications diagnostics result |

Execution Example

Locking Four Blocks/Sectors Starting from Block/Sector 12 in the RF Tag

Command Area

| Memory offset | Data name | Byte +0 | | Byte +1 | |
|---------------|-----------|---------|---|---------|---|
| +2 | CmdCode | 0 | 0 | 0 | 4 |
| +4 | CmdParam1 | 0 | 0 | 0 | C |
| +6 | CmdParam2 | 0 | 0 | 0 | 4 |



Response Area

| Memory offset | Data name | Byte +0 | | Byte +1 | |
|---------------|-----------|---------|---|---------|---|
| +2 | ErrCode | 0 | 0 | 0 | 0 |
| +4 | Resplnfo1 | 0 | 0 | 0 | 0 |
| +6 | Resplnfo2 | 0 | 0 | 0 | 0 |



CHECK!

The unit for locking memory depends on the RF Tag. Refer to *RF Tag Memory Map* in Section 11 Appendices for details.

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DATA FILL

This command fills the specified number of words in the RF Tag in the communications field with the specified data.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|--------------------|---------|--|
| CmdCode/Command Code | WORD | 2 bytes | 0005 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | First word address of the data to write to the RF Tag 0000 to FFFF hex |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | Number of words in the RF Tag to write 0000 hex: Specifies the entire area. 0001 to FFFF hex: Specified size |
| CmdData/Command Data | | | |
| Fill Data | ARRAY[] OF BYTE | 2 bytes | Fill data to write to the RF Tag (always one word) |

Response Area

| Signal/data | Data type | Size | Function |
|-----------------------------------|-----------|---------|-----------------------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| ResplInfo1/Response Information 1 | WORD | 2 bytes | Device information |
| ResplInfo2/Response Information 2 | WORD | 2 bytes | Communications diagnostics result |

Execution Example

Writing 5A5A Hex to Four Words Starting from Word Address 1234 Hex in the RF Tag

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|--------------|---------|---------|
| +2 | CmdCode | 0 : 0 | 0 : 5 |
| +4 | CmdParam1 | 1 : 2 | 3 : 4 |
| +6 | CmdParam2 | 0 : 0 | 0 : 4 |
| +8 | CmdData[0-1] | 5 : A | 5 : A |

Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|------------|---------|---------|
| +2 | ErrCode | 0 : 0 | 0 : 0 |
| +4 | ResplInfo1 | 0 : 0 | 0 : 0 |
| +6 | ResplInfo2 | 0 : 0 | 0 : 0 |

RF Tag Memory

| User address | bit15-12 | bit11-8 | bit7-4 | bit3-0 |
|--------------|----------|---------|--------|--------|
| 1234 hex | 5 | A | 5 | A |
| 1235 hex | 5 | A | 5 | A |
| 1236 hex | 5 | A | 5 | A |
| 1235 hex | 5 | A | 5 | A |

RF TAG OVERWRITE COUNT CONTROL

This command is used to control the number of times RF Tags are overwritten.
You can use it for RF Tags that have EEPROM.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|---|
| CmdCode/Command Code | WORD | 2 bytes | 0006 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | Overwrite count control operation 0000 hex: Initialization 0001 hex: Subtraction 0002 hex: Addition |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | First word address of the overwrite count area to maintain in the RF Tag 0000 to FFFF hex |
| CmdData/Command Data | | | |
| Count | UDINT | 4 bytes | Initialize: The overwrite count to set in the RF Tag Addition/Subtraction: The count to add to or subtract from the current value maintained in the RF Tag 0000 to FFFF hex |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|-----------------------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | Device information |
| RespInfo2/Response Information 2 | WORD | 2 bytes | Communications diagnostics result |

Execution Example

Initializing Word Address 1234 Hex in the RF Tag to a Count of 5,000 (1388 Hex) as the Overwrite Count Area

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|--------------|---------|---------|
| +2 | CmdCode | 0 : 0 | 0 : 6 |
| +4 | CmdParam1 | 0 : 0 | 0 : 0 |
| +6 | CmdParam2 | 1 : 2 | 3 : 4 |
| +8 | CmdData[0-1] | 0 : 0 | 0 : 0 |
| +10 | CmdData[2-3] | 1 : 3 | 8 : 8 |



Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | ErrCode | 0 : 0 | 0 : 0 |
| +4 | RespInfo1 | 0 : 0 | 0 : 0 |
| +6 | RespInfo2 | 0 : 0 | 0 : 0 |

RF Tag Memory

| User address | bit15-12 | bit11-8 | bit7-4 | bit3-0 |
|--------------|----------|---------|--------|--------|
| 1234 hex | 0 | 0 | 0 | 0 |
| 1235 hex | 1 | 3 | 8 | 8 |

RESTORE DATA

This command restores the RF Tag data that is held in the Reader/Writer. You can use it for RF Tags that have EEPROM.

You can restore RF Tag data only when the RF Tag in the communications field matches the held RF Tag ID.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 0007 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|-----------------------------------|-----------|---------|-----------------------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| ResplInfo1/Response Information 1 | WORD | 2 bytes | Device information |
| ResplInfo2/Response Information 2 | WORD | 2 bytes | Communications diagnostics result |

Execution Example

Restoring Data When Writing to an RF Tag Fails and an RF Tag Data Lost Error Occurs

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | CmdCode | 0 : 0 | 0 : 7 |
| +4 | CmdParam1 | 0 : 0 | 0 : 0 |
| +6 | CmdParam2 | 0 : 0 | 0 : 0 |

Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|------------|---------|---------|
| +2 | ErrCode | 0 : 0 | 0 : 0 |
| +4 | ResplInfo1 | 0 : 0 | 0 : 0 |
| +6 | ResplInfo2 | 0 : 0 | 0 : 0 |

Information to Restore

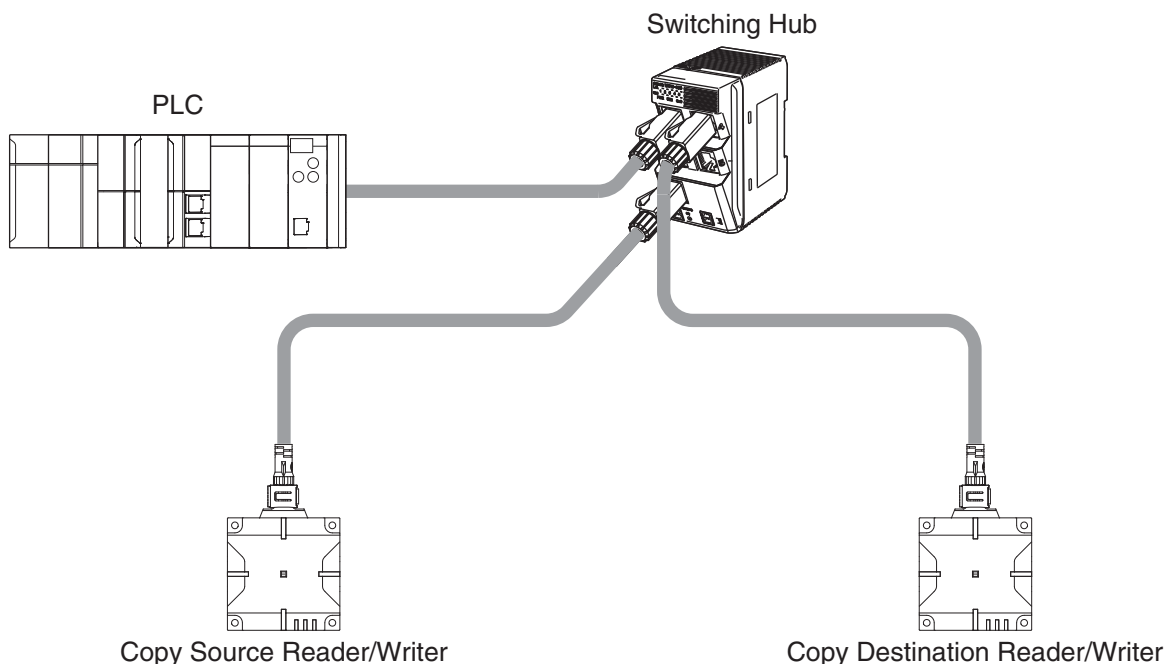
| | | |
|--------------|------|----|
| User address | 1234 | |
| Data size | 0004 | |
| Data | 11 | 22 |
| | 33 | 44 |
| | 55 | 66 |
| | 77 | 88 |

RF Tag Memory

| User address | bit15-12 | bit11-8 | bit7-4 | bit3-0 |
|--------------|----------|---------|--------|--------|
| 1234 hex | 1 | 1 | 2 | 2 |
| 1235 hex | 3 | 3 | 4 | 4 |
| 1236 hex | 5 | 5 | 6 | 6 |
| 1235 hex | 7 | 7 | 8 | 8 |

COPY DATA

This command uses two Reader/Writers to copy data from an RF Tag in the communications field of one Reader/Writer (A) to the RF Tag in the communications field of another Reader/Writer (B).



Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|--|
| CmdCode/Command Code | WORD | 2 bytes | 0008 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | First word address of the data to copy from the RF Tag 0000 to FFFF hex |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | Number of words in the RF Tag to copy 0001 to 01F4 hex |
| CmdData/Command Data | | | |
| IP Address | DWORD | 4 bytes | IP address of Reader/Writer at the copy destination 0000 0000 to FFFF FFFF hex Example: C0A801C8 hex (192.168.1.200) |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|-----------------------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | Device information |
| RespInfo2/Response Information 2 | WORD | 2 bytes | Communications diagnostics result |

▪ **Execution Example**

Copying Four Words of Data Starting from Word Address 1234 Hex in the RF Tag to an RF Tag in the Communications Field of the Reader/Writer with IP Address 192.168.1.201 (C0A801C9 Hex)

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|--------------|---------|---------|
| +2 | CmdCode | 0 : 0 | 0 : 8 |
| +4 | CmdParam1 | 1 : 2 | 3 : 4 |
| +6 | CmdParam2 | 0 : 0 | 0 : 4 |
| +8 | CmdData[0-1] | C : 0 | A : 8 |
| +10 | CmdData[2-3] | 0 : 1 | C : 9 |

Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|------------|---------|---------|
| +2 | ErrCode | 0 : 0 | 0 : 0 |
| +4 | ResplInfo1 | 0 : 0 | 0 : 0 |
| +6 | ResplInfo2 | 0 : 0 | 0 : 0 |

RF Tag Memory in the Copy Source Reader/Writer

| User address | bit15-12 | bit11-8 | bit7-4 | bit3-0 |
|--------------|----------|---------|--------|--------|
| 1234 hex | 1 | 1 | 2 | 2 |
| 1235 hex | 3 | 3 | 4 | 4 |
| 1236 hex | 5 | 5 | 6 | 6 |
| 1235 hex | 7 | 7 | 8 | 8 |

RF Tag Memory in the Copy Destination Reader/Writer

| User address | bit15-12 | bit11-8 | bit7-4 | bit3-0 |
|--------------|----------|---------|--------|--------|
| 1234 hex | 1 | 1 | 2 | 2 |
| 1235 hex | 3 | 3 | 4 | 4 |
| 1236 hex | 5 | 5 | 6 | 6 |
| 1235 hex | 7 | 7 | 8 | 8 |

The operation indicator on the copy source Reader/Writer will change as shown in the following table.

| | | Copy destination | | |
|-------------|--|--|--|---|
| | | Communications normal (stable communications): Indicator lights green. | Communications normal (unstable communications): Indicator lights yellow. | Communications failed: Indicator lights red. |
| Copy source | Communications normal (stable communications): Indicator lights green. | Communications normal (stable communications): Indicator lights green. | Communications normal (unstable communications): Indicator lights yellow. | Communications failed: Indicator lights red. |
| | Communications normal (unstable communications): Indicator lights yellow. | Communications normal (unstable communications): Indicator lights yellow. | Communications normal (unstable communications): Indicator lights yellow. | Communications failed: Indicator lights red. |
| | Communications failed: Indicator lights red. | Communications failed: Indicator lights red. | Communications failed: Indicator lights red. | Communications failed: Indicator lights red. |



To check the communications diagnostics result of the copy destination Reader/Writer, use the Web server function to check the copy destination Reader/Writer separately.

CHECK!

Refer to *Web Server* in *Section 6 Functions* for detailed information on Web server function.



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INITIALIZE

This command restores the Reader/Writer settings to their default values.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 1000 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|----------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error Code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Execution Example

Initializing All Settings

Command Area

| Memory offset | Data name | Byte +0 | | Byte +1 | |
|---------------|-----------|---------|---|---------|---|
| +2 | CmdCode | 1 | 0 | 0 | 0 |
| +4 | CmdParam1 | 0 | 0 | 0 | 0 |
| +6 | CmdParam2 | 0 | 0 | 0 | 0 |



Response Area

| Memory offset | Data name | Byte +0 | | Byte +1 | |
|---------------|-----------|---------|---|---------|---|
| +2 | ErrCode | 0 | 0 | 0 | 0 |
| +4 | RespInfo1 | 0 | 0 | 0 | 0 |
| +6 | RespInfo2 | 0 | 0 | 0 | 0 |

SET RF TAG COMMUNICATIONS

This command sets the RF Tag communications conditions in the Reader/Writer (communications option, communications speed, and write verification).

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|---|
| CmdCode/Command Code | WORD | 2 bytes | 1001 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdData/Command Data | | | |
| Communications Option | WORD | 2 bytes | 0000 hex: Once 0001 hex: Repeat 0002 hex: FIFO Repeat (Without ID code check) 0003 hex: Auto 0012 hex: FIFO Repeat (With ID code check) |
| Communications Speed | WORD | 2 bytes | 0000 hex: High speed 0001 hex: Normal speed |
| Write Verification | WORD | 2 bytes | 0000 hex: Do not verify. 0001 hex: Verify |
| Communications Diagnostics | WORD | 2 bytes | 0000 hex: Disable 0001 hex: Enable |

Response Area

| Signal/data | Data type | Size | Function |
|-----------------------------------|-----------|---------|----------------------|
| ErrCode/Error Code | WORD | 16 bits | Error Code |
| ResplInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| ResplInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Execution Example

Setting the Communications Option to Repeat, Setting the Communications Speed to Standard, Disabling Write Verification, and Enabling Communications Diagnostics

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|--------------|---------|---------|
| +2 | CmdCode | 1 : 0 | 0 : 1 |
| +4 | CmdParam1 | 0 : 0 | 0 : 0 |
| +6 | CmdParam2 | 0 : 0 | 0 : 0 |
| +8 | CmdData[0-1] | 0 : 0 | 0 : 1 |
| +10 | CmdData[2-3] | 0 : 0 | 0 : 1 |
| +12 | CmdData[4-5] | 0 : 0 | 0 : 0 |
| +14 | CmdData[6-7] | 0 : 0 | 0 : 1 |



Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|------------|---------|---------|
| +2 | ErrCode | 0 : 0 | 0 : 0 |
| +4 | ResplInfo1 | 0 : 0 | 0 : 0 |
| +6 | ResplInfo2 | 0 : 0 | 0 : 0 |

GET RF TAG COMMUNICATIONS SETTINGS

This command reads the RF Tags communications conditions from the Reader/Writer (communications option, communications speed, and write verification).

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 1002 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|---|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespData/Response Data | | | |
| Communications Option | WORD | 2 bytes | 0000 hex: Once 0001 hex: Repeat 0002 hex: FIFO Repeat (Without ID code check) 0003 hex: Auto 0012 hex: FIFO Repeat (With ID code check) |
| Communications Speed | WORD | 2 bytes | 0000 hex: High speed 0001 hex: Normal speed |
| Write Verification | WORD | 2 bytes | 0000 hex: Do not verify. 0001 hex: Verify |
| Communications Diagnostics | WORD | 2 bytes | 0000 hex: Disable 0001 hex: Enable |

Execution Example

Reading the Communications Settings When the Communications Option Is Set to Repeat, the Communications Speed Is Set to Standard, Write Verification Is Disabled, and Communications Diagnostics Are Enabled

Command Area

| Memory offset | Data name | Byte +0 | | Byte +1 | |
|---------------|-----------|---------|---|---------|---|
| +2 | CmdCode | 1 | 0 | 0 | 2 |
| +4 | CmdParam1 | 0 | 0 | 0 | 0 |
| +6 | CmdParam2 | 0 | 0 | 0 | 0 |



Response Area

| Memory offset | Data name | Byte +0 | | Byte +1 | |
|---------------|---------------|---------|---|---------|---|
| +2 | ErrCode | 0 | 0 | 0 | 0 |
| +4 | RespInfo1 | 0 | 0 | 0 | 0 |
| +6 | RespInfo2 | 0 | 0 | 0 | 0 |
| +8 | RespData[0-1] | 0 | 0 | 0 | 1 |
| +10 | RespData[2-3] | 0 | 0 | 0 | 1 |
| +12 | RespData[4-5] | 0 | 0 | 0 | 0 |
| +14 | RespData[6-7] | 0 | 0 | 0 | 1 |

SET MULTI-READER/WRITER OPERATION

This command sets multi-Reader/Writer operation.

Command Area

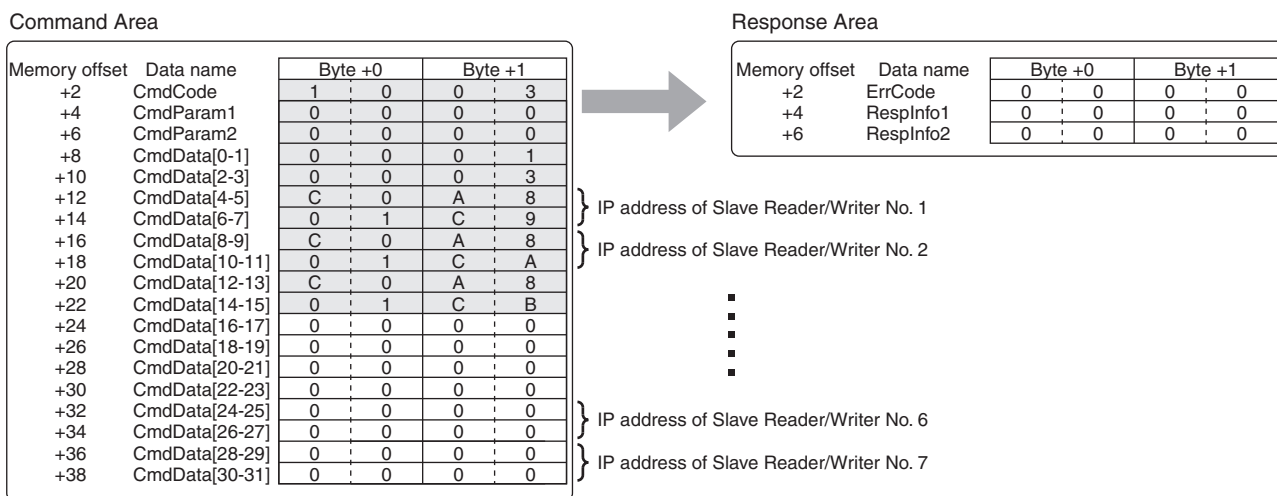
| Signal/data | Data type | Size | Function |
|---|-----------|---------|---|
| CmdCode/Command Code | WORD | 2 bytes | 1003 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdData/Command Data | | | |
| Multi-Reader/Writer Mode | WORD | 2 bytes | 0000 hex: Disable 0001 hex: Enable Field Extension Mode 0002 hex: Enable High-speed Traveling Mode |
| Number of Slave Reader/Writers | WORD | 2 bytes | Number of Reader/Writers linked with multi-Reader/Writer operation 0000 to 0007 hex * Specify 0000 hex if multi-Reader/Writer operation is disabled. |
| IP Address of Slave Reader/Writer No. 1 | DWORD | 4 bytes | IP addresses of Slave Reader/Writers 0000 0000 to FFFF FFFF hex Example: C0A801C8 hex (192.168.1.200) * Specify 0000 0000 hex if multi-Reader/Writer operation is disabled or the Slave Reader/Writer is not used. |
| IP Address of Slave Reader/Writer No. 2 | DWORD | 4 bytes | |
| IP Address of Slave Reader/Writer No. 3 | DWORD | 4 bytes | |
| IP Address of Slave Reader/Writer No. 4 | DWORD | 4 bytes | |
| IP Address of Slave Reader/Writer No. 5 | DWORD | 4 bytes | |
| IP Address of Slave Reader/Writer No. 6 | DWORD | 4 bytes | |
| IP Address of Slave Reader/Writer No. 7 | DWORD | 4 bytes | |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|----------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) |

▪ **Execution Example**

Setting the Multi-Reader/Writer Mode to Field Extension Mode, the Number of Slave Reader/Writers to 3, and the IP Addresses of Slaves No. 1, No. 2, and No. 3 to 192.168.1.201, 192.168.1.202, and 192.168.1.203, Respectively



GET MULTI-READER/WRITER SETTINGS

You can use this command to check the multi-Reader/Writer settings in a Reader/Writer.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 1004 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|---|-----------|---------|---|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespData/Response Data | | | |
| Multi-Reader/Writer Mode | WORD | 2 bytes | 0000 hex: Disable 0001 hex: Enable Field Extension Mode 0002 hex: Enable High-speed Traveling Mode |
| Number of Slave Reader/Writers | WORD | 2 bytes | Number of Reader/Writers linked with multi-Reader/Writer operation 0000 to 0007 hex |
| IP Address of Slave Reader/Writer No. 1 | DWORD | 4 bytes | IP addresses of Slave Reader/Writers 0000 0000 to FFFF FFFF hex Example: C0A801C8 hex (192.168.1.200) |
| IP Address of Slave Reader/Writer No. 2 | DWORD | 4 bytes | |
| IP Address of Slave Reader/Writer No. 3 | DWORD | 4 bytes | |
| IP Address of Slave Reader/Writer No. 4 | DWORD | 4 bytes | |
| IP Address of Slave Reader/Writer No. 5 | DWORD | 4 bytes | |
| IP Address of Slave Reader/Writer No. 6 | DWORD | 4 bytes | |
| IP Address of Slave Reader/Writer No. 7 | DWORD | 4 bytes | |

▪ Execution Example

Reading the Multi-Read/Writer Settings When the Multi-Reader/Writer Mode Is Set to Field Extension Mode, the Number of Slave Reader/Writers Is Set to 3, and the IP Addresses of Slaves No. 1, No. 2, and No. 3 Are Set to 192.168.1.201, 192.168.1.202, and 192.168.1.203, Respectively

Command Area

| Memory offset | Data name | Byte +0 | | Byte +1 | |
|---------------|-----------|---------|---|---------|---|
| +2 | CmdCode | 1 | 0 | 0 | 4 |
| +4 | CmdParam1 | 0 | 0 | 0 | 0 |
| +6 | CmdParam2 | 0 | 0 | 0 | 0 |



Response Area

| Memory offset | Data name | Byte +0 | | Byte +1 | | |
|---------------|-----------------|---------|---|---------|---|---|
| +2 | ErrCode | 0 | 0 | 0 | 0 | |
| +4 | RespInfo1 | 0 | 0 | 0 | 0 | |
| +6 | RespInfo2 | 0 | 0 | 0 | 0 | |
| +8 | RespData[0-1] | 0 | 0 | 0 | 1 | |
| +10 | RespData[2-3] | 0 | 0 | 0 | 3 | |
| +12 | RespData[4-5] | C | 0 | A | 8 | } IP address of Slave Reader/Writer No. 1 |
| +14 | RespData[6-7] | 0 | 1 | C | 9 | |
| +16 | RespData[8-9] | C | 0 | A | 8 | } IP address of Slave Reader/Writer No. 2 |
| +18 | RespData[10-11] | 0 | 1 | C | A | |
| +20 | RespData[12-13] | C | 0 | A | 8 | } IP address of Slave Reader/Writer No. 2 |
| +22 | RespData[14-15] | 0 | 1 | C | B | |
| +24 | RespData[16-17] | 0 | 0 | 0 | 0 | |
| +26 | RespData[18-19] | 0 | 0 | 0 | 0 | |
| +28 | RespData[20-21] | 0 | 0 | 0 | 0 | |
| +30 | RespData[22-23] | 0 | 0 | 0 | 0 | |
| +32 | RespData[24-25] | 0 | 0 | 0 | 0 | |
| +34 | RespData[26-27] | 0 | 0 | 0 | 0 | |
| +36 | RespData[28-29] | 0 | 0 | 0 | 0 | |
| +38 | RespData[30-31] | 0 | 0 | 0 | 0 | |

GET MODEL INFORMATION

This command reads the model of the Reader/Writer.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 2000 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|--------------------|----------|--|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespData/Response Data | | | |
| Model Number Information | ARRAY[] OF BYTE | 32 bytes | 32 bytes of ASCII text max. (end code: 0000 hex) |

Execution Example

Reading the Model When a V680S-HMD63-PNT Reader/Writer Is Being Used

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | CmdCode | 2 | 0 |
| +4 | CmdParam1 | 0 | 0 |
| +6 | CmdParam2 | 0 | 0 |



Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------------|---------|---------|
| +2 | ErrCode | 0 | 0 |
| +4 | RespInfo1 | 0 | 0 |
| +6 | RespInfo2 | 0 | 0 |
| +8 | RespData[0-1] | 5 | 6 |
| +10 | RespData[2-3] | 3 | 8 |
| +12 | RespData[4-5] | 5 | 3 |
| +14 | RespData[6-7] | 4 | 8 |
| +16 | RespData[8-9] | 4 | 4 |
| +18 | RespData[10-11] | 3 | 3 |
| +20 | RespData[12-13] | 4 | 5 |
| +22 | RespData[14-15] | 5 | 0 |
| +24 | RespData[16-17] | 0 | 0 |
| +26 | RespData[18-19] | 0 | 0 |
| +28 | RespData[20-21] | 0 | 0 |
| +30 | RespData[22-23] | 0 | 0 |
| +32 | RespData[24-25] | 0 | 0 |
| +34 | RespData[26-27] | 0 | 0 |
| +36 | RespData[28-29] | 0 | 0 |
| +38 | RespData[30-31] | 0 | 0 |

Model number information obtained from Reader/Writer

GET FIRMWARE VERSION

This command reads the firmware version of the Reader/Writer.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 2001 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|------------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespData/Response Data | | | |
| Run Mode Program Major Version | WORD | 2 bytes | 0000 to 0099 hex (BCD) |
| Run Mode Program Minor Version | WORD | 2 bytes | 0000 to 0099 hex (BCD) |
| Run Mode Program Revision | WORD | 2 bytes | 0000 to 9999 hex (BCD) |
| Safe Mode Program Major Version | WORD | 2 bytes | 0000 to 0099 hex (BCD) |
| Safe Mode Program Minor Version | WORD | 2 bytes | 0000 to 0099 hex (BCD) |
| Safe Mode Program Revision | WORD | 2 bytes | 0000 to 9999 hex (BCD) |

Execution Example

Reading the Firmware Version When the Run Mode Program Version is Version 1.2.3 and the Safe Mode Program Version is Version 1.2.2

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | CmdCode | 2 | 0 |
| +4 | CmdParam1 | 0 | 0 |
| +6 | CmdParam2 | 0 | 0 |



Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------------|---------|---------|
| +2 | ErrCode | 0 | 0 |
| +4 | RespInfo1 | 0 | 0 |
| +6 | RespInfo2 | 0 | 0 |
| +8 | RespData[0-1] | 0 | 0 |
| +10 | RespData[2-3] | 0 | 2 |
| +12 | RespData[4-5] | 0 | 3 |
| +14 | RespData[6-7] | 0 | 1 |
| +16 | RespData[8-9] | 0 | 2 |
| +18 | RespData[10-11] | 0 | 2 |

} Run Mode program version information (addresses +8 to +12)

} Safe Mode program version information (addresses +14 to +18)

GET OPERATING TIME

This command reads the operating time since the Reader/Writer was started.
The operating time is reset when the Reader/Writer is reset.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 2002 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|--|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespData/Response Data | | | |
| Operating time | UDINT | 4 bytes | Running time since the Reader/Writer was started (in milliseconds) 0000 0000 to FFFF FFFF hex |

Execution Example

Reading the Operating Time When It Is 1,234,567,890 (4996 02D2 hex)

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | CmdCode | 2 : 0 | 0 : 2 |
| +4 | CmdParam1 | 0 : 0 | 0 : 0 |
| +6 | CmdParam2 | 0 : 0 | 0 : 0 |



Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|---------------|---------|---------|
| +2 | ErrCode | 0 : 0 | 0 : 0 |
| +4 | RespInfo1 | 0 : 0 | 0 : 0 |
| +6 | RespInfo2 | 0 : 0 | 0 : 0 |
| +8 | RespData[0-1] | 4 : 9 | 9 : 6 |
| +10 | RespData[2-3] | 0 : 2 | D : 2 |

MEASURE NOISE

This command measures the noise level around the Reader/Writer.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 2003 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|----------------------------------|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespData/Response Data | | | |
| Average Noise Level | UINT | 2 bytes | 0000 to 0063 hex (level 0 to 99) |
| Maximum Noise Level | UINT | 2 bytes | 0000 to 0063 hex (level 0 to 99) |
| Minimum Noise Level | UINT | 2 bytes | 0000 to 0063 hex (level 0 to 99) |

Execution Example

Measuring the Noise Level When the Average Level Is 51 (0033 Hex), the Maximum Level Is 62 (003E ex), and the Minimum Level Is 41 (0029 Hex)

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | CmdCode | 2 : 0 | 0 : 3 |
| +4 | CmdParam1 | 0 : 0 | 0 : 0 |
| +6 | CmdParam2 | 0 : 0 | 0 : 0 |



Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|---------------|---------|---------|
| +2 | ErrCode | 0 : 0 | 0 : 0 |
| +4 | RespInfo1 | 0 : 0 | 0 : 0 |
| +6 | RespInfo2 | 0 : 0 | 0 : 0 |
| +8 | RespData[0-1] | 0 : 0 | 3 : 3 |
| +10 | RespData[2-3] | 0 : 0 | 3 : E |
| +12 | RespData[4-5] | 0 : 0 | 2 : 9 |

GET COMMAND ERROR LOG

This command reads the log of command errors that have occurred in the Reader/Writer. The command error log is reset when the Reader/Writer is restarted.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|---|
| CmdCode/Command Code | WORD | 2 bytes | 2004 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | Number of first record to read 0000 to 000F hex (0 to 15) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | Number of records to read 0001 to 0010 hex (1 to 16) * The maximum number of records that you can specify depends on the cyclic data exchange settings. |

Response Area

| Signal/data | Data type | Size | Function | |
|----------------------------------|---------------------------------|----------------|----------------------|---|
| ErrCode/Error Code | WORD | 2 bytes | Error code | |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) | |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) | |
| RespData/Response Data | | | | |
| Number of Records | | UINT | 2 bytes | Number of valid records in the command error log 0000 to 0010 hex (1 to 16) |
| Newest Record | Operating Time | UDINT | 4 bytes | Operating time when the error occurred (unit: ms) 0000 0000 to FFFF FFFF hex |
| | IP Address of the Remote Device | DWORD | 4 bytes | IP address of host device that generated the error 0000 0000 to FFFF FFFF hex Example: C0A801C8 (192.168.1.200) |
| | Command Code | WORD | 2 bytes | Command code for which an error occurred |
| | Error Code | WORD | 2 bytes | Error code of the error that occurred |
| | Response Information 1 | WORD | 2 bytes | Response information 1 for the error that occurred |
| | Response Information 2 | WORD | 2 bytes | Response information 2 for the error that occurred |
| Newest Record - 1 | Same as above. | Same as above. | Same as above. | Same as above. |
| : | : | : | : | : |
| Newest Record - 15 | Same as above. | Same as above. | Same as above. | Same as above. |

*The maximum size of the response data depends on the tag and tag set settings. Therefore, the number of command error log records that can be read with one operation will vary. A parameter error will occur if the setting exceeds the response data size.

▪ Execution Example

Reading the Two Newest Records from the Command Error Log When Command Errors Occur

* This example assumes that there are the following two valid records in the command error log.

- Error code 2001 hex occurred for command code 0001 hex at the host device (IP address 192.168.1.10) at an operating time of 11,223,344 (00AB 4130 hex).
- Error code 2002 hex occurred for command code 0002 hex at the host device (IP address 192.168.1.10) at an operating time of 11,223,345 (00AB 4131 hex).

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | CmdCode | 2 | 0 |
| +4 | CmdParam1 | 0 | 0 |
| +6 | CmdParam2 | 0 | 2 |



Response Area

| Memory offset | Data name | Byte +0 | Byte +1 | | |
|---------------|-------------------|---------|---------|------------------------|---|
| +2 | ErrCode | 0 | 0 | | |
| +4 | RespInfo1 | 0 | 0 | | |
| +6 | RespInfo2 | 0 | 0 | | |
| +8 | RespData[0-1] | 0 | 0 | Number of records | |
| +10 | RespData[2-3] | 0 | 0 | Operating time | |
| +12 | RespData[4-5] | 4 | 1 | | |
| +14 | RespData[6-7] | C | 0 | IP address | Newest record in the command error log |
| +16 | RespData[8-9] | 0 | 1 | Command code | |
| +18 | RespData[10-11] | 0 | 0 | Error code | |
| +20 | RespData[12-13] | 2 | 0 | Response information 1 | |
| +22 | RespData[14-15] | 0 | 0 | Response information 2 | |
| +24 | RespData[16-17] | 0 | 0 | | |
| +26 | RespData[18-19] | 0 | 0 | Operating time | |
| +28 | RespData[20-21] | 4 | 1 | | |
| +30 | RespData[22-23] | C | 0 | IP address | Newest record - 1 in the command error log |
| +32 | RespData[24-25] | 0 | 1 | Command code | |
| +34 | RespData[26-27] | 0 | 0 | Error code | |
| +36 | RespData[28-29] | 2 | 0 | Response information 1 | |
| +38 | RespData[30-31] | 0 | 0 | Response information 2 | |
| +40 | RespData[32-33] | 0 | 0 | | |
| ⋮ | ⋮ | ⋮ | ⋮ | | |
| +250 | RespData[242-243] | 0 | 0 | Operating time | Newest record - 15 in the command error log |
| +252 | RespData[244-245] | 0 | 0 | IP address | |
| +254 | RespData[246-247] | 0 | 0 | Command code | |
| +256 | RespData[248-249] | 0 | 0 | Error code | |
| +258 | RespData[250-251] | 0 | 0 | Response information 1 | |
| +260 | RespData[252-253] | 0 | 0 | Response information 2 | |
| +262 | RespData[254-255] | 0 | 0 | | |
| +264 | RespData[256-257] | 0 | 0 | | |

GET RESTORE INFORMATION

This command reads the restore information from memory in the Reader/Writer.
The restore information is reset when the Reader/Writer is reset.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|---|
| CmdCode/Command Code | WORD | 2 bytes | 2005 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | Number of first record to read 0000 to 0007 hex (0 to 7) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | Number of records to read 0001 to 008 hex (1 to 8) * The maximum number of records that you can specify depends on the cyclic data exchange settings. |

Response Area

| Signal/data | Data type | Size | Function | |
|----------------------------------|----------------|-----------------|----------------------|---|
| ErrCode/Error Code | WORD | 2 bytes | Error code | |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) | |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) | |
| RespData/Response Data | | | | |
| Number of Records | | UINT | 2 bytes | Number of valid records in the restore information 0000 to 0008 hex (1 to 8) |
| Newest Record | Operating Time | UDINT | 4 bytes | Operating time in milliseconds when RF Tag data lost error occurred 0000 0000 to FFFF FFFF hex |
| | RF Tag ID | ARRAY[] OF BYTE | 8 bytes | UID of the RF Tag when the RF Tag data lost error occurred |
| | User Address | WORD | 2 bytes | First write address when an RF Tag data lost error occurred |
| | Data Size | WORD | 2 bytes | Write size when an RF Tag data lost error occurred |
| | Data | BYTE[] OF BYTE | 8 bytes | Data in the RF Tag before the write operation when the RF Tag data lost error occurred |
| Newest Record - 1 | Same as above. | Same as above. | Same as above. | Same as above. |
| : | : | : | : | : |
| Newest Record - 7 | Same as above. | Same as above. | Same as above. | Same as above. |

*The maximum size of the response data depends on the tag and tag set settings. Therefore, the number of records of restore information that can be read with one operation will vary. A parameter error will occur if the setting exceeds the response data size.

▪ Execution Example

Reading the Newest Restore Information Record When Writing to an RF Tag Fails and an RF Tag Data Lost Error Occurs

* This example assumes that there is the following one valid record of restore information.

- Operating time: 1,234,567,890 (4996 02D2 hex)
- RF Tag ID: 6655 4433 2211 05E0
- User address: 1234 hex
- Data size: 0004 hex
- Data: 1122 3344 5566 7788 hex

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | CmdCode | 2 : 0 | 0 : 5 |
| +4 | CmdParam1 | 0 : 0 | 0 : 0 |
| +6 | CmdParam2 | 0 : 0 | 0 : 1 |



Response Area

| Memory offset | Data name | Byte +0 | Byte +1 | | |
|---------------|-------------------|---------|---------|---------------------|--|
| +2 | ErrCode | 0 : 0 | 0 : 0 | | |
| +4 | RespInfo1 | 0 : 0 | 0 : 0 | | |
| +6 | RespInfo2 | 0 : 0 | 0 : 0 | | |
| +8 | RespData[0-1] | 0 : 0 | 0 : 1 | } Number of records | } Newest record in restore information |
| +10 | RespData[2-3] | 4 : 9 | 9 : 6 | | |
| +12 | RespData[4-5] | 0 : 2 | D : 2 | } Operating time | |
| +14 | RespData[6-7] | 6 : 6 | 5 : 5 | | |
| +16 | RespData[8-9] | 4 : 4 | 3 : 3 | } RF Tag UID | |
| +18 | RespData[10-11] | 2 : 2 | 1 : 1 | | |
| +20 | RespData[12-13] | 0 : 5 | E : 0 | } User address | |
| +22 | RespData[14-15] | 1 : 2 | 3 : 4 | | |
| +24 | RespData[16-17] | 0 : 0 | 0 : 4 | } Data size | |
| +26 | RespData[18-19] | 1 : 1 | 2 : 2 | | |
| +28 | RespData[20-21] | 3 : 3 | 4 : 4 | } Data | |
| +30 | RespData[22-23] | 5 : 5 | 6 : 6 | | |
| +32 | RespData[24-25] | 7 : 7 | 8 : 8 | | |
| ⋮ | ⋮ | ⋮ | ⋮ | | |
| +256 | RespData[248-249] | 0 : 0 | 0 : 0 | } Operating time | } Newest record - 7 in restore information |
| +258 | RespData[250-251] | 0 : 0 | 0 : 0 | | |
| +260 | RespData[252-253] | 0 : 0 | 0 : 0 | } RF Tag UID | |
| +262 | RespData[254-255] | 0 : 0 | 0 : 0 | | |
| +264 | RespData[256-257] | 0 : 0 | 0 : 0 | } User address | |
| +266 | RespData[258-259] | 0 : 0 | 0 : 0 | | |
| +268 | RespData[260-262] | 0 : 0 | 0 : 0 | } Data sizes | |
| +270 | RespData[263-264] | 0 : 0 | 0 : 0 | | |
| +272 | RespData[265-266] | 0 : 0 | 0 : 0 | } Data | |
| +274 | RespData[267-268] | 0 : 0 | 0 : 0 | | |
| +276 | RespData[269-270] | 0 : 0 | 0 : 0 | | |
| +278 | RespData[271-272] | 0 : 0 | 0 : 0 | | |

GET MULTI-READER/WRITER STATUS

This command reads the Master Reader/Writer and Slave Reader/Writer status when multi-Reader/Writer operation is being used.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 2006 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|---|
| ErrCode/Error Code | WORD | 2 bytes | Error code |
| RespInfo1/Response Information 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespInfo2/Response Information 2 | WORD | 2 bytes | 0000 hex (Not used.) |
| RespData/Response Data | | | |
| Master Status | WORD | 2 bytes | Multi-Reader/Writer status of Master Reader/Writer 0000 hex: Disable 1000 hex: Preparing for Field Extension Mode (Detecting Groups) 1001 hex: Ready for Field Extension Mode (Group Detection Completed) 2000 hex: Preparing for High-speed Traveling Mode (Detecting Groups) 2001 hex: Ready for High-speed Traveling Mode (Group Detection Completed) |
| Slave No. 1 Status | WORD | 2 bytes | Connection status of Slave Reader/Writers No. 1 to 7 0000 hex: Not connected. 0001 hex: Connection successful 0002 hex: Connection failed |
| : | : | : | |
| Slave No. 7 Status | UINT | 2 bytes | |

Execution Example

Reading the Multi-Reader/Writer Status When the Reader/Writer Is in Field Extension Mode, the Group Is Being Detected, Connection of Slave Reader/Writer No. 2 Failed, and Slave Reader/Writers No. 3 to 7 Are Not Connected

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | CmdCode | 2 : 0 | 0 : 6 |
| +4 | CmdParam1 | 0 : 0 | 0 : 0 |
| +6 | CmdParam2 | 0 : 0 | 0 : 0 |



Response Area

| Memory offset | Data name | Byte +0 | Byte +1 | |
|---------------|-----------------|---------|---------|-----------------------------|
| +2 | ErrCode | 0 : 0 | 0 : 0 | |
| +4 | RespInfo1 | 0 : 0 | 0 : 0 | |
| +6 | RespInfo2 | 0 : 0 | 0 : 0 | |
| +8 | RespData[0-1] | 1 : 0 | 0 : 0 | } Master Reader/Writer |
| +10 | RespData[2-3] | 0 : 0 | 0 : 1 | } Slave Reader/Writer No. 1 |
| +12 | RespData[4-5] | 0 : 0 | 0 : 2 | } Slave Reader/Writer No. 2 |
| +14 | RespData[6-7] | 0 : 0 | 0 : 0 | } Slave Reader/Writer No. 3 |
| +16 | RespData[8-9] | 0 : 0 | 0 : 0 | } Slave Reader/Writer No. 4 |
| +18 | RespData[10-11] | 0 : 0 | 0 : 0 | } Slave Reader/Writer No. 5 |
| +20 | RespData[12-13] | 0 : 0 | 0 : 0 | } Slave Reader/Writer No. 6 |
| +22 | RespData[14-15] | 0 : 0 | 0 : 0 | } Slave Reader/Writer No. 7 |

RESET

This command resets the Reader/Writer.

Command Area

| Signal/data | Data type | Size | Function |
|-------------------------------|-----------|---------|----------------------|
| CmdCode/Command Code | WORD | 2 bytes | 3000 hex |
| CmdParam1/Command Parameter 1 | WORD | 2 bytes | 0000 hex (Not used.) |
| CmdParam2/Command Parameter 2 | WORD | 2 bytes | 0000 hex (Not used.) |

Response Area

| Signal/data | Data type | Size | Function |
|----------------------------------|-----------|---------|----------------------|
| ErrCode/Error Code | WORD | 16 bits | Error code |
| RespInfo1/Response Information 1 | WORD | 16 bits | 0000 hex (Not used.) |
| RespInfo2/Response Information 2 | WORD | 16 bits | 0000 hex (Not used.) |

Execution Example

Resetting the Reader/Writer

Command Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | CmdCode | 3 : 0 | 0 : 0 |
| +4 | CmdParam1 | 0 : 0 | 0 : 0 |
| +6 | CmdParam2 | 0 : 0 | 0 : 0 |



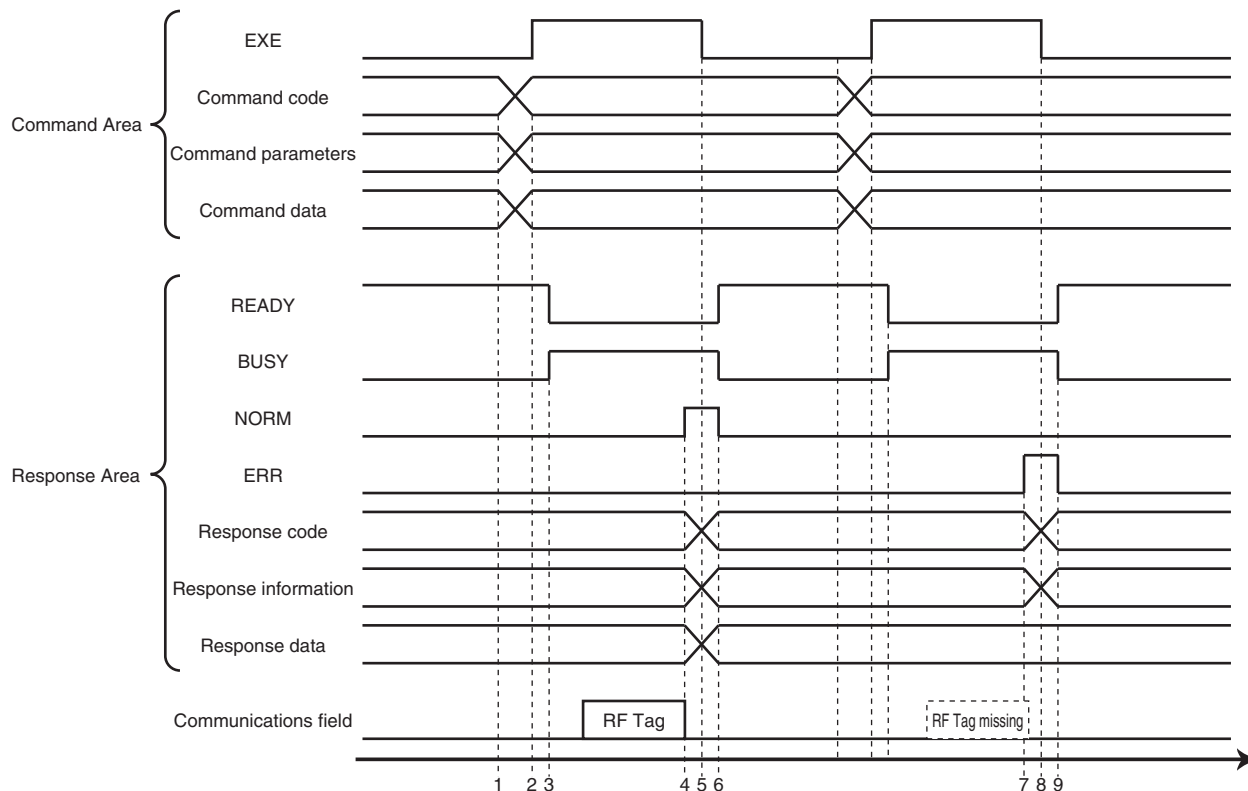
Response Area

| Memory offset | Data name | Byte +0 | Byte +1 |
|---------------|-----------|---------|---------|
| +2 | ErrCode | 0 : 0 | 0 : 0 |
| +4 | RespInfo1 | 0 : 0 | 0 : 0 |
| +6 | RespInfo2 | 0 : 0 | 0 : 0 |

Time Charts

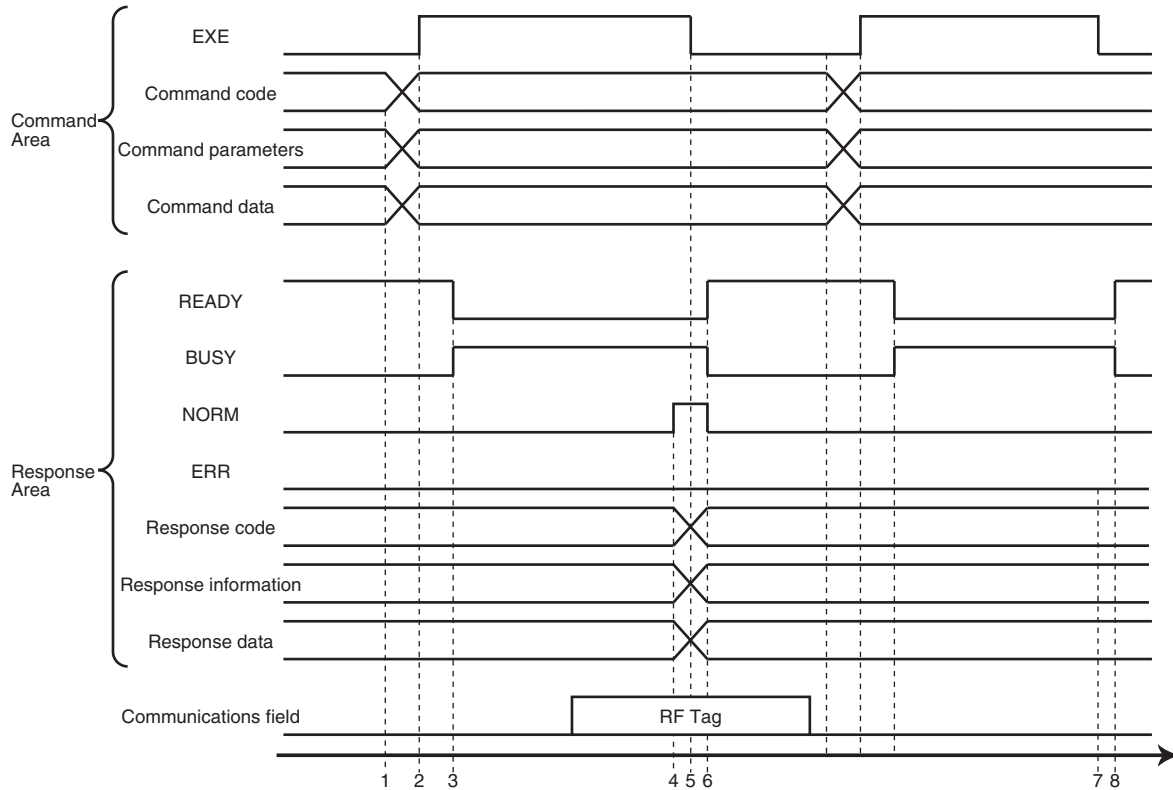
Time Charts

- Executing RF Tag Communications Commands
 - Using the Once Communications Option



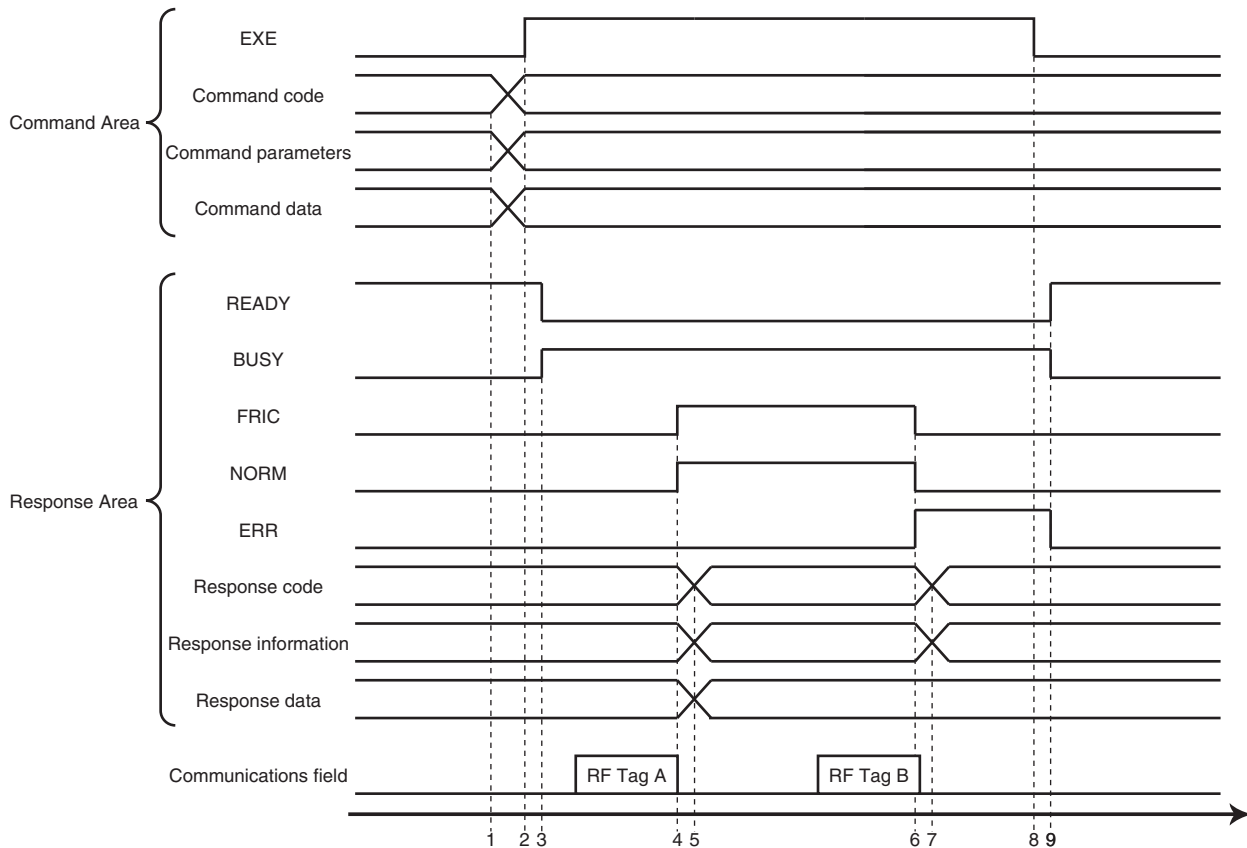
1. The command code, command parameters, and command data are set from the PLC while the READY signal is ON.
2. The user (PLC) turns ON the EXE signal. This tells the Reader/Writer to start execution.
3. When the Reader/Writer receives the instruction to start execution, it turns OFF the READY signal and turns ON the BUSY signal.
4. The Reader/Writer detects an RF Tag and when communications end normally, it sets the response code, response information, and response data and turns ON the NORM signal.
5. The user (PLC) detects that the NORM signal has turned ON and reads the response data. After reading the data, the user (PLC) turns OFF the EXE signal. This tells the Reader/Writer to stop execution.
6. When the Reader/Writer receives the instruction to stop execution, it turns ON the READY signal and turns OFF the BUSY signal and the NORM signal.
7. When command execution ends in an error (e.g., the Reader/Writer does not detect an RF Tag or communications fail), it sets the response code and response information and turns ON the ERR signal.
8. The user (PLC) detects that the ERR signal has turned ON, reads the response code and response information, and checks the error. After checking the error, the user (PLC) turns OFF the EXE signal. This tells the Reader/Writer to stop execution.
9. When the Reader/Writer receives the instruction to stop execution, it turns ON the READY signal and turns OFF the BUSY signal and the ERR signal.

▪ Using the Auto Communications Option



1. The command code, command parameters, and command data are set from the PLC while the READY signal is ON.
2. The user (PLC) turns ON the EXE signal. This tells the Reader/Writer to start execution.
3. When the Reader/Writer receives the instruction to start execution, it turns OFF the READY signal and turns ON the BUSY signal. From this timing, the reader / writer keeps waiting for the RF tag to enter the communication area.
4. The Reader/Writer detects an RF Tag and when communications end normally, it sets the response code, response information, and response data and turns ON the NORM signal. At this time, the NORM LED (green) lights up once.
5. The user (PLC) detects that the NORM signal has turned ON and reads the response data. After reading the data, the user (PLC) turns OFF the EXE signal. This tells the Reader/Writer to stop execution.
6. When the Reader/Writer receives the instruction to stop execution, it turns ON the READY signal and turns OFF the BUSY signal and the NORM signal.
7. If the BUSY signal is ON and the user (PLC) wants to cancel Auto communications, the user (PLC) turns OFF the EXE signal. This tells the Reader/Writer to stop execution.
8. When the Reader/Writer receives the instruction to stop execution, it turns ON the READY signal and turns OFF the BUSY signal and the ERR signal.

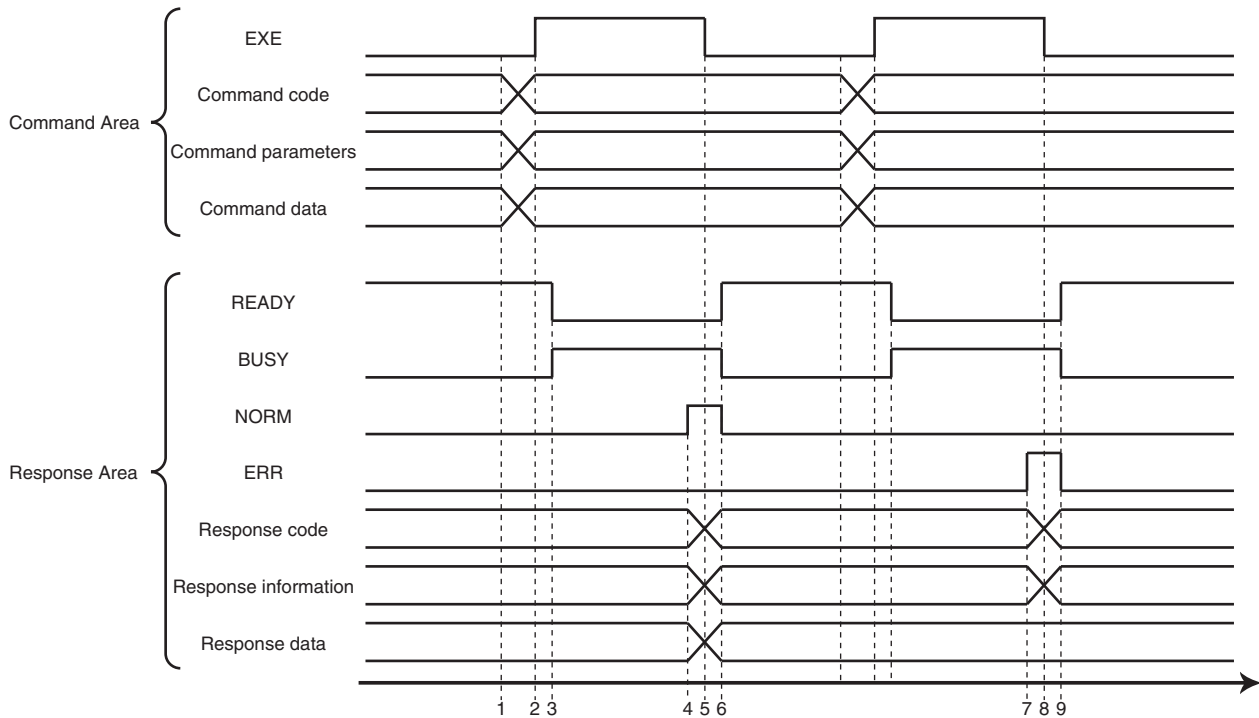
▪ Using the Repeat or FIFO Repeat Communications Option



1. The command code, command parameters, and command data are set from the PLC while the READY signal is ON.
2. The user (PLC) turns ON the EXE signal. This tells the Reader/Writer to start execution.
3. When the Reader/Writer receives the instruction to start execution, it turns OFF the READY signal and turns ON the BUSY signal.
4. The Reader/Writer detects the first RF Tag (RF Tag A) and when communications end normally, it sets the response code, response information, and response data, toggles the FRIC signal (turns it ON), and turns ON the NORM signal.
5. The user (PLC) detects that the FRIC signal has changed and that the NORM signal has turned ON and reads the response data.
6. The Reader/Writer detects the second RF Tag (RF Tag B) and when communications end in an error, it sets the response code and response information, toggles the FRIC signal (turns it OFF), and turns ON the ERR signal.
7. The user (PLC) detects that the FRIC signal has changed and that the ERR signal has turned ON, reads the response code and response information, and checks the error.
8. If the BUSY signal is ON and the user (PLC) wants to cancel Repeat or FIFO Repeat communications, the user (PLC) turns OFF the EXE signal. This tells the Reader/Writer to stop execution.
9. When the Reader/Writer receives the instruction to stop execution, it turns ON the READY signal and turns OFF the BUSY, FRIC, NORM, and ERROR signals.

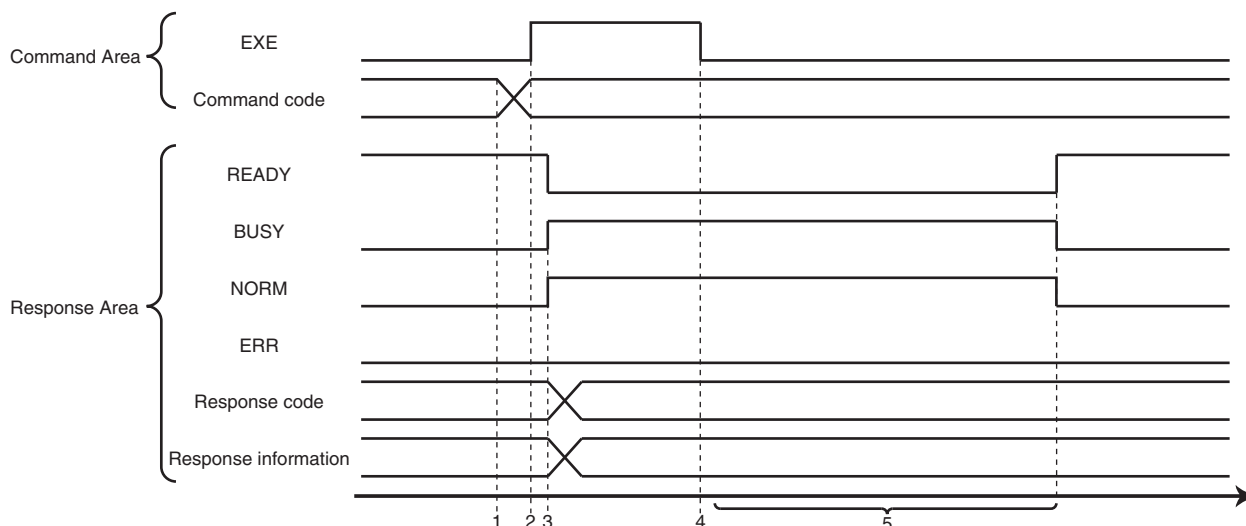
■ Executing Other Commands

■ Executing Reader/Writer Setting, Reader/Writer Information Acquisition, or Reader/Writer Operation Control Commands



1. The command code, command parameters, and command data are set from the PLC while the READY signal is ON.
2. The user (PLC) turns ON the EXE signal. This tells the Reader/Writer to start execution.
3. When the Reader/Writer receives the instruction to start execution, it turns OFF the READY signal and turns ON the BUSY signal.
4. When communications end normally, the Reader/Writer sets the response code and response data and turns ON the NORM signal.
5. The user (PLC) detects that the NORM signal has turned ON and reads the response data. After reading the data, the user (PLC) turns OFF the EXE signal. This tells the Reader/Writer to stop execution.
6. When the Reader/Writer receives the instruction to stop execution, it turns ON the READY signal and turns OFF the BUSY signal and the ERR signal.
7. When communications end in an error, the Reader/Writer sets the response code and response information and turns ON the ERR signal.
8. The user (PLC) detects that the ERR signal has turned ON, reads the response code and response information. After reading the data, the user (PLC) turns OFF the EXE signal. This tells the Reader/Writer to stop execution.
9. When the Reader/Writer receives the instruction to stop execution, it turns ON the READY signal and turns OFF the BUSY signal and the ERR signal.

▪ **Executing the RESET Command**



1. Set the command code of the RESET command in the PLC while the READY signal is ON.
2. The user (PLC) turns ON the EXE signal. This tells the Reader/Writer to start execution.
3. When the Reader/Writer receives the instruction to start execution, it turns OFF the READY signal and turns ON the BUSY signal. If the Reader/Writer can be reset, it sets the response code and turns ON the NORM signal.
4. When the PLC detects that the NORM signal is ON, it turns OFF the EXE signal. This tells the Reader/Writer to stop execution.
5. When the Reader/Writer receives the instruction to stop execution, it resets itself. After the Reader/Writer restarts and the cyclic data exchanges connections are established again, the Reader/Writer turns ON the READY signal and turns OFF the BUSY signal and NORM signal.

Section 8

Web Browser Interface

| | |
|-----------------------------------|-----|
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| ❏ Operation Interface | 192 |
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| Log View | 199 |
| Noise Monitor View | 200 |
| RF Analyzer | 201 |
| Reboot | 205 |
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Web Browser Operation Window

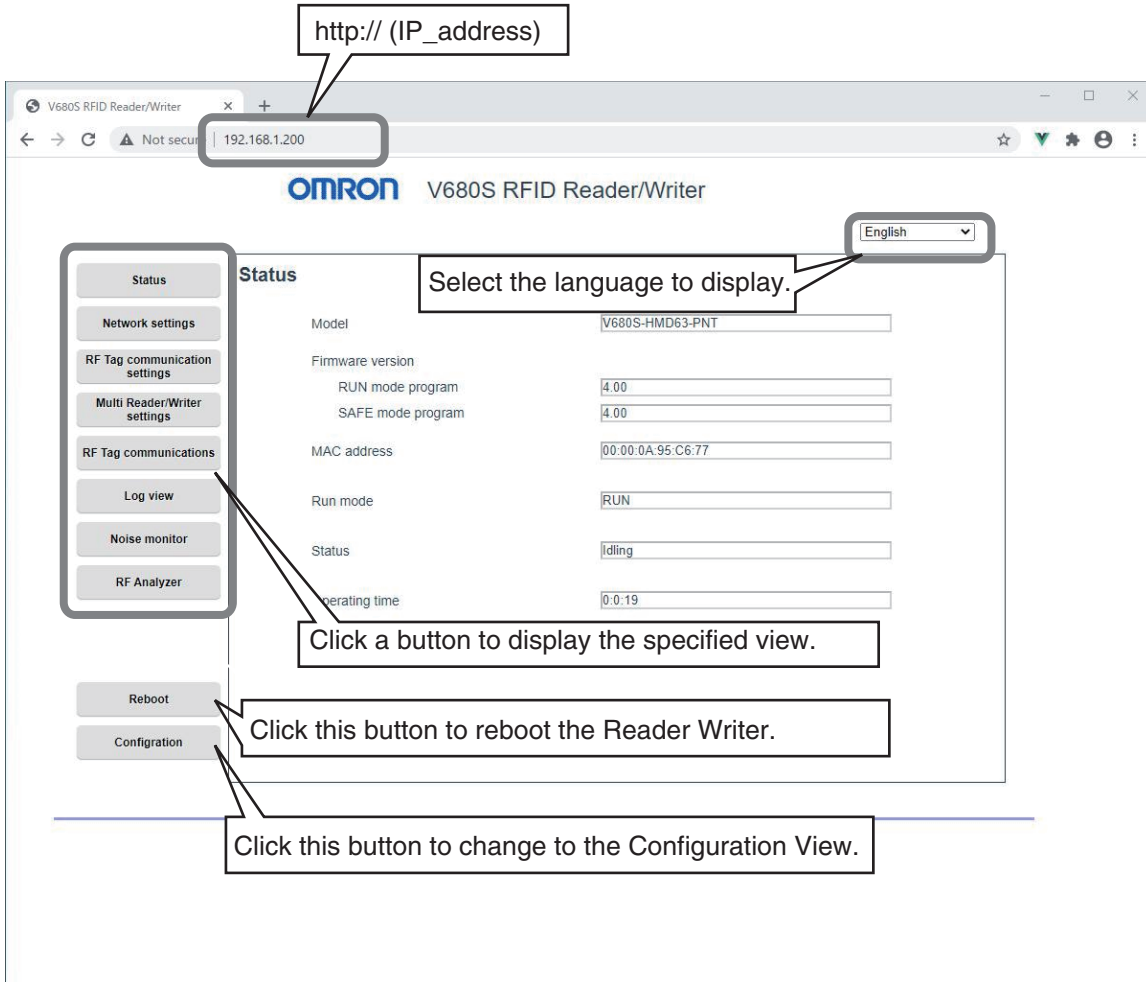
Connect the Ethernet cable and start a Web browser on the computer.




Enter the IP address of the Reader/Writer in the address field of the Web browser to display the Web browser operation window.

Enter http://192.168.1.200 if you are using the default IP address.

If a Web password is not set in the Reader/Writer, the Status View will be displayed first.

To display another view, click the specified menu button.



-  **CHECK!** Do not connect multiple Web browsers to one reader / writer.
If you operate with multiple Web browsers at the same time, it may not be displayed correctly or you may not be able to perform the correct operation.
-  **CHECK!** If the characters on the Web browser screen are difficult to see, use the zoom function provided by the Web browser.
-  **CHECK!** The operating indicator (Green) may flash because the Web browser communicates with the Reader/Writer at fixed interval.

The Web browser interface can be used in the following operating environments.

- OS: Windows 8.1/Windows 10/Windows 11
- Web Browser: Internet Explorer 11

Microsoft Edge

Google Chrome

| OS | Web Browser | Propriety of use |
|-------------|-------------|------------------|
| Windows XP | IE7 to IE8 | Not available |
| Windows 7 | IE8 to IE10 | Not available |
| Windows 8.1 | IE11 | Available |
| Windows 10 | IE11 | Available |
| Windows 10 | Edge | Available |
| Windows 10 | Chrome | Available |
| Windows 11 | Edge | Available |
| Windows 11 | Chrome | Available |

No Java plug-in is required to use the Web browser interface.



Depending on the combination of OS and Web browser, you may not be able to use the Web browser.

Please refer to the above figure and use the Web browser suitable for your OS.

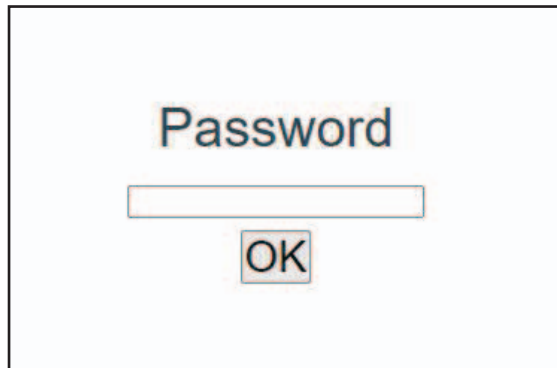
CHECK!

If you want to use it in the conventional PC operating environment, please contact our sales staff.

Operation Interface

Password Entry View

If a Web password is set in the Reader/Writer, the Password Entry View will be displayed first.



| Item name | Description |
|-----------|--|
| Password | If a Web password is set in the Reader/Writer, enter the password. |



If an error message appears after pressing the **OK** button, confirm the password.

CHECK!



If the Reader/Writer is running in Safe mode, the password entry screen does not appear even if you set the password.

CHECK!

Status View

OMRON V680S RFID Reader/Writer

English

| | |
|-------------------------------|--------------------------------|
| Status | Status |
| Network settings | Model: V680S-HMD63-PNT |
| RF Tag communication settings | Firmware version |
| Multi Reader/Writer settings | RUN mode program: 4.00 |
| RF Tag communications | SAFE mode program: 4.00 |
| Log view | MAC address: 00:00:0A:95:C6:77 |
| Noise monitor | Run mode: RUN |
| RF Analyzer | Status: Idling |
| Reboot | Operating time: 0:0:42 |
| Configuration | |

| Item name | | Description |
|------------------|-------------------|---|
| Device type | | Displays the product model number. |
| Firmware version | Run mode program | Displays the Run Mode program versions. Displays only "Major version" and "Minor version". |
| | Safe mode program | Displays the Safe Mode program versions. Displays only "Major version" and "Minor version". |
| MAC address | | Displays the MAC address from the Reader/Writer. |
| Operation mode | | Displays the mode of the Reader/Writer. Run/Safe Mode |
| Status | | Displays the status of the Reader/Writer. Idling/RF Tag communications in progress and Changing settings/Error |
| Operating time | | Displays the time since the Reader/Writer was started. Example: 0:12:34 |

Network Settings View

■ TCP/IP Setting

English ▼

OMRON V680S RFID Reader/Writer

Status

Network settings

RF Tag communication settings

Multi Reader/Writer settings

RF Tag communications

Log view

Noise monitor

RF Analyzer

Reboot

Configuration

Network settings

TCP/IP settings

Web password

IP address

Subnet mask

Gateway address

Device name

Click this button to set the displayed values.

| Item name | Description | Setting range | Default |
|-----------------|---------------------------|--|---------------|
| IP address | IP address | --- | 192.168.1.200 |
| Subnet mask | Subnet mask address | --- | 255.255.255.0 |
| Gateway address | Gateway address | --- | 192.168.1.254 |
| Device name | 239 ASCII characters max. | According to the naming rules of the PROFINET standards.*1 | None |

*1 The naming rules for PROFINET devices are as follows:

- Devices name must consist of one or more labels. Labels are separated by periods.
- A period cannot be used as the first or last character in a name.
- Labels must consist of up to 63 of the following characters: a to z, 0 to 9, and -
- A dash (-) cannot be used as the first or last character in a label.
- The text string at the beginning of a name must not be "port-<n>" where n is 0 to 9.
- Text strings in the format of IP addresses cannot be used for names. (Example: 192.168.1.200)



CHECK!

If you change the network settings, restart the Reader/Writer. The new settings will be effective after a restart of the Reader/Writer.



CHECK!

When you restart the Reader/Writer after you change the IP address, Web browser can not reconnect to the Reader/Writer. If you re-specified the new IP address in the address field of the Web browser, the screen will be appeared.



CHECK!

The error message is displayed if you change the configuration during the Reader/Writer is executing RF tag communication or Noise measurement.

■ Web Password

English ▾

Status

Network settings

RF Tag communication settings

Multi Reader/Writer settings

RF Tag communications

Log view

Noise monitor

RF Analyzer

Reboot

Configuration

Network settings

TCP/IP settings

Web password

Web password

Web password (confirmation)

| Item name | Description | Setting range | Default |
|-----------------------------|--------------------------|--------------------------|---------|
| Web password | 15 ASCII characters max. | 15 ASCII characters max. | None |
| Web password (confirmation) | 15 ASCII characters max. | 15 ASCII characters max. | None |

Communications Settings View

OMRON V680S RFID Reader/Writer

English

| Item name | Description | Setting range | Default |
|------------------------------|---|---|------------|
| RF Tag Communications option | Select the RF Tag communications option. | Once, Auto, Repeat, FIFO Repeat (Without ID code check) or FIFO Repeat (With ID code check) | Once |
| RF Tag Communications Speed | Specify the speed of communications with the RF Tags. | High speed or Normal speed | High speed |
| Write Verify | Select this check box to enable write verification. | Enabled/disabled | Enabled |
| Use diagnostics | Select to enabled or disabled. | Enabled/disabled | Enabled |

Refer to *Communications Options* in *Section 6 Functions* for information of RF Tag Communications option.



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Refer to *Setting Communications Conditions* in *Section 6 Functions* for information of RF Tag Communications option.



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The settings are immediately reflected when you click the “Set” button.

CHECK!

Refer to *RFID System Maintenance* in *Section 6 Functions* for communication diagnostic.



p.111



The error message is displayed if you change the configuration during the Reader/Writer is executing RF tag communication or Noise measurement.

CHECK!

SET MULTI-READER/WRITER OPERATION

OMRON V680S RFID Reader/Writer

English ▾

Status

Network settings

RF Tag communication settings

Multi Reader/Writer settings

RF Tag communications

Log view

Noise monitor

RF Analyzer

Reboot

Configuration

Multi Reader/Writer settings

Multi Reader/Writer mode Disable Field extension mode High-speed travelling mode

| Group setting | IP address | Status |
|--------------------------|----------------------|--------|
| Slave Reader/Writer No.1 | <input type="text"/> | ■ |
| Slave Reader/Writer No.2 | <input type="text"/> | ■ |
| Slave Reader/Writer No.3 | <input type="text"/> | ■ |
| Slave Reader/Writer No.4 | <input type="text"/> | ■ |
| Slave Reader/Writer No.5 | <input type="text"/> | ■ |
| Slave Reader/Writer No.6 | <input type="text"/> | ■ |
| Slave Reader/Writer No.7 | <input type="text"/> | ■ |

Click this button to set the displayed values.

| Item name | Description | Setting range | Default setting |
|--------------------------|---|--|-----------------|
| Multi Reader/Writer mode | Sets the Multi-Reader/Writer Mode. | Disable, Field extension mode, or High-speed traveling mode | Disable |
| Group setting | You can check the IP address of Reader/Writers registered as Slave Reader/Writers and the connection status of all of the Slave Reader/Writers. | - | - |
| IP address | You can set or check the IP addresses of Slave Reader/Writers No. 1 to 7. | - | - |
| Status | You can check the connection status of Slave Reader/Writers No. 1 to 7 with the displayed colors. | Not registered: Gray Connection failed: Red Connection successful: Green | - |



If you change any of the multi-Reader/Writer settings, restart the Reader/Writer. The new settings will be enabled after the Reader/Writer is restarted.

CHECK!



You can register IP addresses for up to seven Slave Reader/Writers on this view. If you set the Multi-Reader/Writer Mode to anything other than Disable and set the IP address for a Slave Reader/Writer, the Slave Reader/Writer will become a Master Reader/Writer.

CHECK!



There can be only one Master Reader/Writer in any one group.

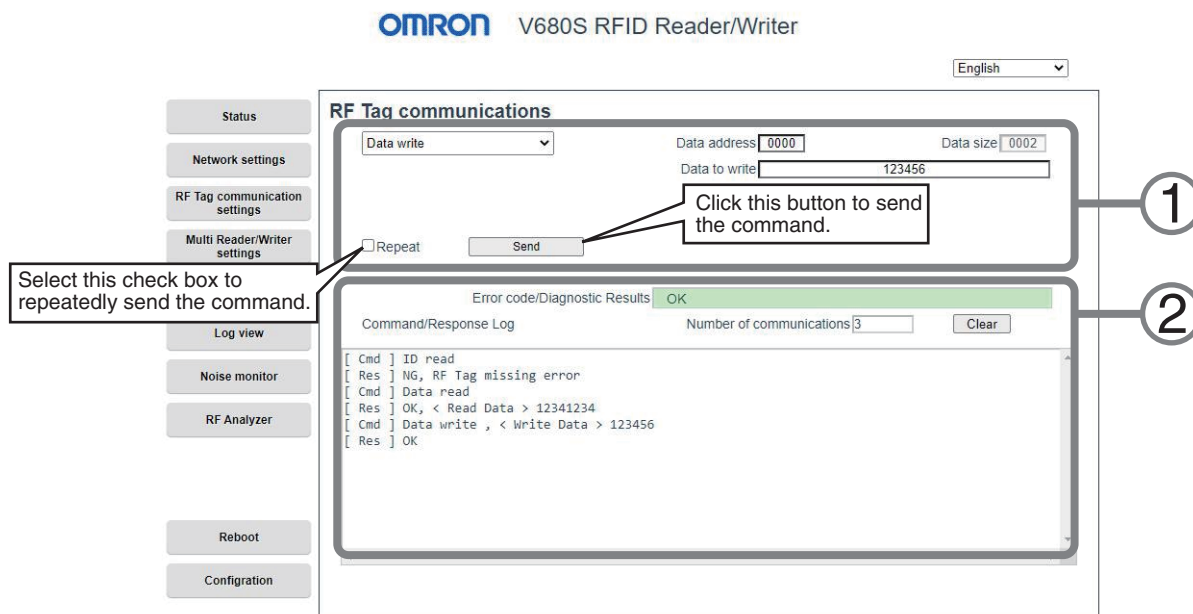
CHECK!



If you assign the IP addresses of the Reader/Writer from the IO controller, the IP addresses of the slave Reader/Writer will change dynamically and may result in unexpected operation. Confirm that no problems will occur before you assign the IP addresses from the IO controller.

CHECK!

RF Tag Communications View



1. Command Area

| Item name | Description | Setting range |
|----------------|--|----------------------------------|
| Command select | Select the command to send. | ID READ / DATA READ / DATA WRITE |
| Data address | Specify in 4-digit hexadecimal the first address to read or write from the RF Tag. | 0000 to 0999 hex |
| Data size | Specify in 4-digit hexadecimal the number of words of data to read from the RF Tag. | 0001 to 007D hex |
| Write data | Specify the data to write to RF Tag. | 1 to 113 words |
| Repeat | Select this check box to repeatedly and consecutively send the command. Clear the selection of this check box if the RF Tag communications option of the Reader/Writer is set to Auto, Repeat or FIFO Repeat. If a command is sent repeatedly and consecutively with the Auto, Repeat or FIFO Repeat option, an error dialog will occur. | |

2. Response Area

| Item name | Description |
|--------------------------------|--|
| Error code/Diagnostics results | The background will be green when the response returned by the Reader/Writer indicates a normal end. If the response indicates an error end, the background will be red and the error code will be displayed. If communications diagnostics are enabled and communications with the RF Tag are determined to be unstable, the background will be yellow and the diagnostics result is displayed. |
| Number of communications | The total number of commands that have been sent to the Reader/Writer is displayed. |
| Command/Response Log | Displays the sent command and write data, read data and the result. [Cmd] : The send command is displayed. If the command is a data write, it is followed by <Write Data>. [Res] : Result of the response is displayed. If the response result is NG, the error details will be displayed. If the ID read and data read are successful, <Read Data> follows the response result. <Write Data> : The data to be written to the tag is displayed. <Read Data> : The read data of the tag is displayed. |
| Clear | This button clears the number of sent commands and command/response log. |

Refer to *RFID System Maintenance* in *Section 6 Functions* for details on communications diagnostics.



p.111



CHECK!

If RF Tag communications are attempted when the Reader/Writer is performing RF Tag communications, noise measurement, or other processing, an error will occur. Perform operations when the Reader/Writer is not busy with another operation.

Log View

Command error log

OMRON V680S RFID Reader/Writer

English

Log view

Command error log System error log

Command error log

| Time | Error name | IP address | Command code |
|------------|----------------------|--------------|--------------|
| 0000:06:29 | RF Tag missing error | 192.168.1.90 | 0003 |
| 0000:06:20 | RF Tag missing error | 192.168.1.90 | 0002 |
| 0000:06:18 | RF Tag missing error | 192.168.1.90 | 0001 |
| 0000:06:17 | RF Tag missing error | 192.168.1.90 | 0001 |

Update

Click this button to refresh the display.

| Item name | Description |
|-------------------|---|
| Command error log | Displays the following command error log information. Operating time, error name, IP address, command code, error code, response information 1, and response information 2 |

Refer to *Command Error Log* in *Section 6 Functions* for details on the command error log.

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System error log

OMRON V680S RFID Reader/Writer

English

Log view

Command error log System error log

System error log

| Time | Error name | Error code | Int |
|------|------------|------------|-----|
| | | | |
| | | | |
| | | | |

Update

Click this button to refresh the display.

| Item name | Description |
|------------------|---|
| System error log | Displays the following information from the system error log: Operating time, error name, error code, attached information 1, and attached information 2 |

Refer to *System Error Log* in *Section 6 Functions* for details on the system error log.

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Noise Monitor View

You can check the graphed noise level (one second intervals) around the Reader/Writer.

Select from the screen, the type of the RF tag you want to use, because the communication performance will be changed by the combination of the type of the RF tag to be used.

The “Normal area”, “Precaution area” and “Warning area” will be appeared on the screen according to the type of the RF tag to be used.

| | |
|-----------------|---|
| Normal area | Means the noise level that communications range can be reduced to about less than 20% |
| Precaution area | Means the noise level that communications range can be reduced to about 20% to 50%. |
| Warning area | Means the noise level that communications range can be reduced to about 50% or more. |



When the Reader/Writer is running in safe mode, this screen can not be operated. Run the Reader/Writer in RUN mode.

CHECK!

About the relationship between the Reader/Writer communication performance and the noise level, refer to *Noise Measurement* in *Section 6 Functions*.



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Because there is variation in the result of the noise measurement, consider the result as a guideline.

CHECK!

OMRON V680S RFID Reader/Writer

Displays the maximum noise level since noise monitoring was started.

Peak : 77

V680-D1KP66T

Select the type of the RF tag you want to use.

Warning area shown in white.

Caution area shown in light blue.

Normal area shown in blue.

Click this button to start or stop monitoring noise.

Start

| Item name | Description |
|---------------|--|
| Noise monitor | The display is updated every second. The maximum, average, and minimum noise levels since noise monitoring was started are displayed. |



The error message is displayed if you change the configuration during the Reader/Writer is executing RF tag communication or Noise measurement.

CHECK!

RF Analyzer

You can use the RF Analyzer to check the diagnostic information from communication diagnostic. You can easily see whether communications are stable, unstable (warning), or in error when communication diagnostic is used.

If communications are unstable (warning), you can display assumed causes and display guidance that provides detailed cause confirmation and corrections.

If an error occurs, the error name and corrections are displayed.



When the Reader/Writer is running in safe mode, this screen can not be operated. Run the Reader/Writer in RUN mode.

CHECK!



The diagnostic log is not displayed while communication diagnostic is disabled. Enable communication diagnostic on the Communications Setting View.

CHECK!



If the number of records in the diagnostic log exceeds 2,048, the oldest records are overwritten.

CHECK!

The screenshot shows the RF Analyzer interface with the following callouts:

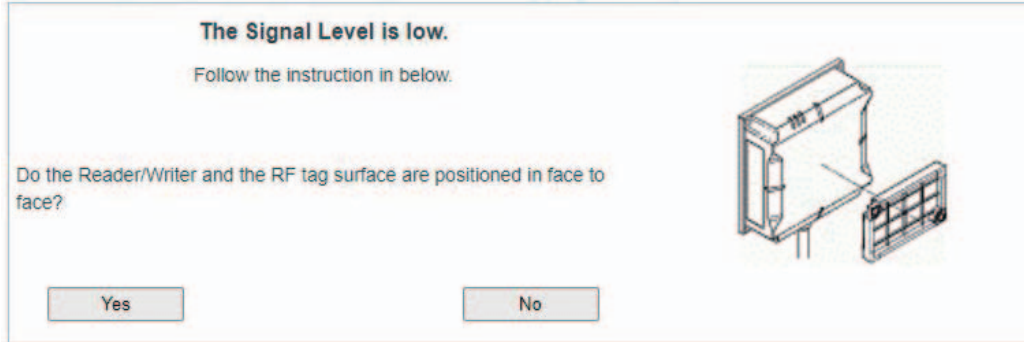
- Total number of records in diagnostic log (2,048 max.), Number of unstable communications, Number of errors:** Points to the summary statistics at the top of the table.
- Reader/Writer:** Points to the status indicator at the top.
- English:** Points to the language selection dropdown.
- You can check the diagnostic log on a graph:** Points to the 'Graph' button.
- This button is displayed when diagnostic results show warning communications. Click the button to display guidance in a separate window so that you can check assumed causes and corrections.** Points to the 'Display' button in the diagnostic details section.
- You can save the diagnostic log in a CSV file on the computer.** Points to the 'Save' button.
- Click this button to refresh the display.** Points to the 'Update' button.
- Click this button to clear the diagnostic log.** Points to the 'Clear' button.

| Item name | Description |
|------------------------|---|
| No. | Numbers are assigned from 1 to 2,048. The larger the number, the more recent the information. |
| Time | The Reader/Writer operating time when the diagnostic information was registered. |
| Command | The command that was executed when the diagnostics information was registered. |
| Result | One of the following: Stable, Unstable (warning), or Error |
| UID | Displays the UID of the RF Tags that were detected in communications diagnostics. |
| Diagnostic description | Displays the details of the communication diagnosis history. No. : Numbers are assigned from 1 to 2,048. The larger the number, the more recent the information. Command : The command type that was executed when the diagnostic information was registered. Diagnostic description : The error code and assumed cause are displayed. Signal Level : Displays the signal level when communicating with the RF tag. Noise : Displays the noise level around the reader / writer during communication with the RF tag. Assumed cause/Correction: The assumed cause and corrections are displayed for unstable (warning) communications and communications errors. A button is displayed for unstable communications. Click the button and follow the displayed guidance to display assumed causes and corrections. |

■ Guidance display

Click the **Display** Button in the *Details* column on the RF Analyzer View to display guidance. Respond yes or no to the questions to display advice on the assumed causes and corrections.

If you follow the advice to make corrections, you can increase the communications leeway and achieve more stable RFID System operation.



RF Analyzer Graphs

You can display time-based graphs of diagnostic log information.

This allows you to visually understand the data from communication diagnostic and quantitatively confirm the degree of leeway in communications.

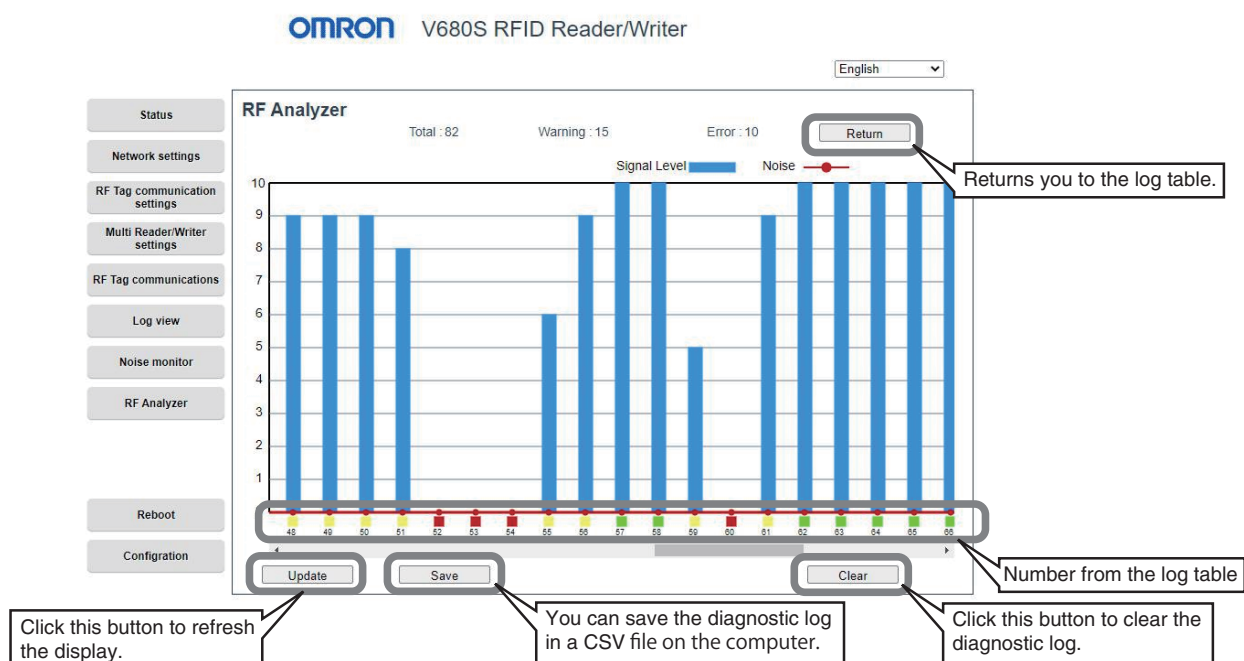
Two parameters are displayed for the graph.

1. Signal Level

To communicate with RF Tags, the Signal levels of the Reader/Writer and RF Tags must be sufficiently high. You can display the Signal levels in 10 levels from 0 to 10 on a bar graph. The higher the value, the more leeway there is in communications. If there is sufficient communications leeway, the level is 10. If a communication fails (i.e., if an error occurs), the level will be 0 and no bar will be displayed. A value of 1 to 9 means that the communications leeway is low (i.e., that communications are unstable), and the bar will be displayed in yellow. In this case, we recommend that you follow the guidance described above and adjust the installation conditions to increase the communications leeway as close as possible to a level of 10.

2. Noise Level

The ambient noise level around the Reader/Writer during communications with the RF Tag is displayed in red on a broken-line graph. The lower the noise level, the better the conditions. A noise level of 5 or higher means that the communications leeway is low (i.e., that communications are unstable), and the bar will be displayed in yellow.



■ RF Analyzer Diagnostic Log File

You can click the **Export** Button on the RF Analyzer View to download the diagnostic log stored in the Reader/Writer to a computer and save it as a CSV file. The following information is included in the diagnostic log file. You can use it to check more detailed information than you can on the Web browser displays.

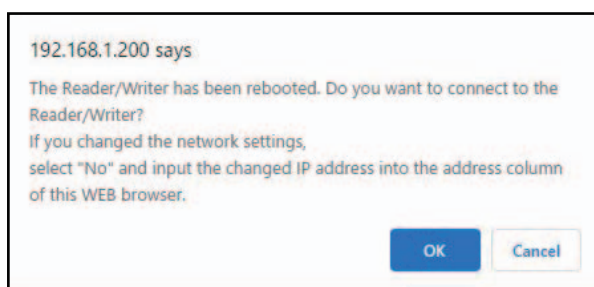
| Item name | Description |
|-------------------|--|
| No | Numbers are assigned from 1 to 2,048. The larger the number, the more recent the information. |
| Time Stamp | The Reader/Writer operating time when the diagnostic information was registered. |
| Command | The command type that was executed when the diagnostic information was registered. |
| Response Result | The communications result is displayed. "Warning" is displayed if the communications diagnostic result shows an unstable communication. <ul style="list-style-type: none"> • Normal: Normal • Warning: Unstable • Other: Error type name |
| Diagnostic Result | The communications diagnostic result is displayed. <ul style="list-style-type: none"> • Good: Stable • Output level low: Low send power • Receiving level low: Low receive power • Noise level high: Excessive ambient noise level • Signal-Noise ratio low: Low signal-to-noise ratio • N/A: Communications error |
| Output Level | The send power level to the RF Tag is given between 0 and 10. The higher the value, the better the conditions. (If the level is 9 or lower, the Reader/Writer will determine that the communication was warning.) |
| Receiving Level | The receive power level from the RF Tag to the Reader/Writer is given between 0 and 10. The higher the value, the better the conditions. (If the level is 9 or lower, the Reader/Writer will determine that the communication was warning.) |
| Noise Level | The ambient noise level around the Reader/Writer is given between 0 and 10. The lower the value, the better the conditions. (If the level is 5 or higher, the Reader/Writer will determine that the communication was warning.) |
| Signal Level | The overall level combining Output Level and Receiving Level is given between 0 and 10. The higher the value, the better the conditions. |
| Tag ID | The Tag ID of the RF Tag for which communication diagnostic was performed is given. |

Reboot

If you click the **Reboot** Button on any of the operation views, a Confirm Reboot Dialog Box is displayed.



The following dialog box is displayed after the Reader/Writer has finished rebooting. Click the **OK** Button to connect to the Reader/Writer.



The following dialog box is displayed after reconnecting to the Reader/Writer. Click the **OK** Button.



When re-connection goes wrong and an error message is displayed, Check the connection with the Reader/Writer and reboot a Web browser.

CHECK!



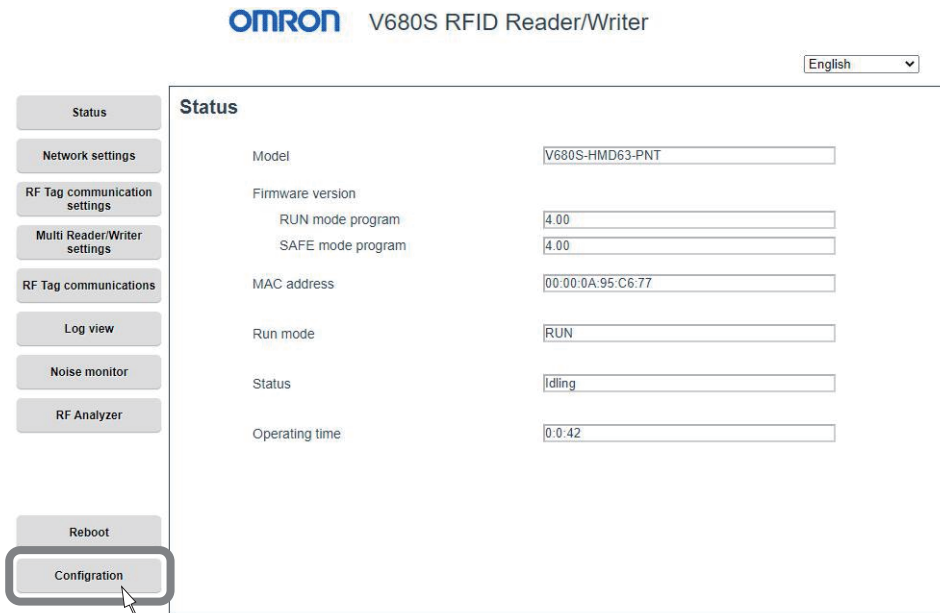
After re-connection, displays the "Status" window.

CHECK!

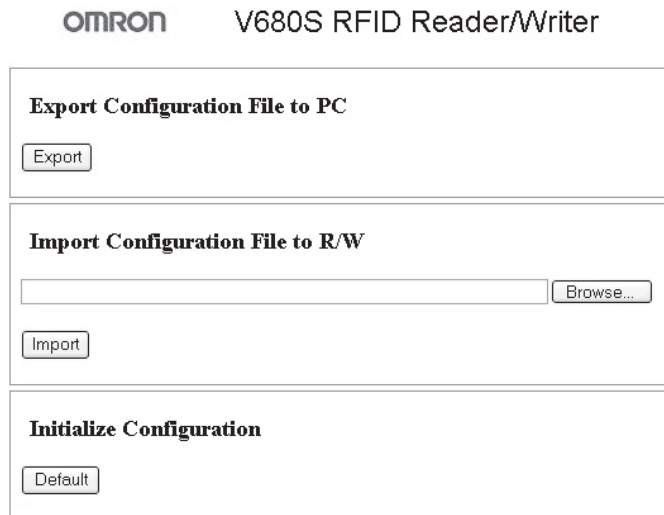
Configuration

You can save a configuration file (INI file) that contains the configuration information from the Reader/Writer in the computer. You can also send a configuration file to the Reader/Writer to change all of the configuration information in the Reader/Writer. Or, you can click the **Default** Button to return all of the configuration information in the Reader/Writer to the default settings.

To display the Configuration View, click the **Configuration** Button at the bottom of the Web browser operation window.



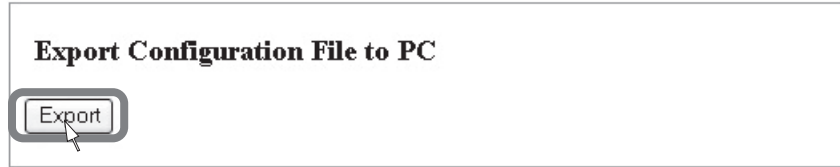
Click the **Configuration** Button at the bottom of the Web browser operation window to display the Configuration View.



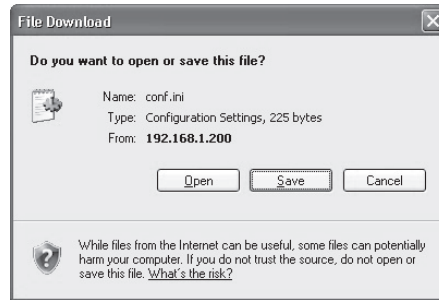
| Item name | Description |
|----------------------------------|--|
| Export Configuration File to PC | Saves a configuration file that contains the Reader/Writer settings on the computer. |
| Import Configuration File to R/W | Updates the settings in the Reader/Writer with the settings in a configuration file that you select on the computer. |
| Initialize Configuration | Returns all of the settings in the Reader/Writer to the default settings. |

■ Saving a Configuration File on the Computer

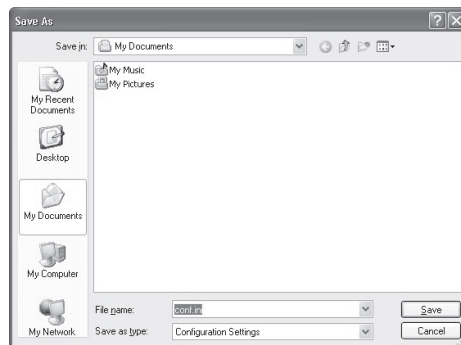
You can click the **Export** Button in the *Export Configuration File to PC* Area to save a configuration file (file name: conf.ini) that contains the configuration information from the Reader/Writer on the computer. The configuration file uses a normal INI file format.



Click the **Export** Button. The following dialog box will be displayed. Click the **Save** Button.



Specify where to save the file and click the **Save** Button. The configuration information from the Reader/Writer will be saved in the configuration file.

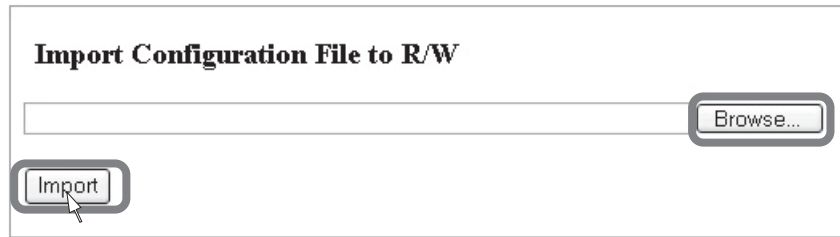


Example of a Configuration File

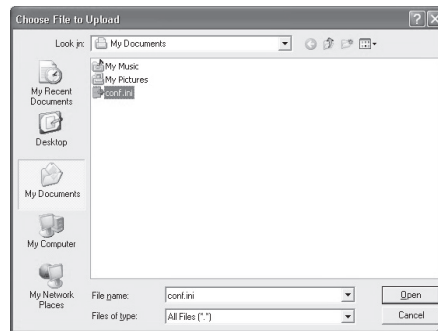
```
[NetworkSetting]
IPAddress=192.168.1.200
SubnetMask=255.255.255.0
GatewayAddress=192.168.1.254
DeviceName=
WebPassword=
WebPortNo=7090
[RFTagCommunicationSetting]
CommunicationSpeed=0
WriteVerify=1
CommunicationOption=0
CommunicationDiagnostics=0
[MultiReaderWriterSetting]
MultiReaderWriterMode=0
SlaveNum=0
SlaveNo1IPAddress=0.0.0.0
SlaveNo2IPAddress=0.0.0.0
SlaveNo3IPAddress=0.0.0.0
SlaveNo4IPAddress=0.0.0.0
SlaveNo5IPAddress=0.0.0.0
SlaveNo6IPAddress=0.0.0.0
SlaveNo7IPAddress=0.0.0.0
```

■ Sending a Configuration File to the Reader/Writer

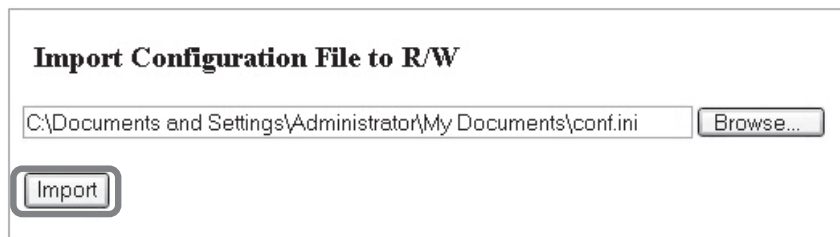
You can change all of the configuration information in the Reader/Writer with the following procedure: Click the **Browse** Button in the *Import Configuration File to R/W* Area, select the configuration file to use to set up the Reader/Writer, and then click the **Import** Button.



Click the **Browse** Button. A dialog box to select the configuration file will be displayed. Select the configuration file and then click the **Open** Button.



Click the **Import** Button. All of the configuration information in the Reader/Writer will be changed.



The following information is displayed after setting is completed.

OMRON V680S RFID Reader/Writer**V680S - Change Configuration****[NetworkSetting]**

IPAddress = 192.168.1.200 **Check OK**
SubnetMask = 255.255.255.0 **Check OK**
GatewayAddress = 192.168.1.254 **Check OK**
DeviceName = **Check OK**
WebPassword = **Check OK**
WebPortNo = 7090 **Check OK**

[RF TagCommunicationSetting]

CommunicationSpeed = 0 **Check OK**
WriteVerify = 1 **Check OK**
CommunicationOption = 0 **Check OK**
CommunicationDiagnostics = 0 **Check OK**

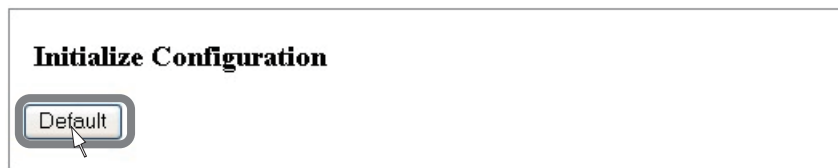
[MultiReaderWriterSetting]

MultiReaderWriterMode = 0 **Check OK**
SlaveNum = 0 **Check OK**
SlaveNo1IPAddress = 0.0.0.0 **Check OK**
SlaveNo2IPAddress = 0.0.0.0 **Check OK**
SlaveNo3IPAddress = 0.0.0.0 **Check OK**
SlaveNo4IPAddress = 0.0.0.0 **Check OK**
SlaveNo5IPAddress = 0.0.0.0 **Check OK**
SlaveNo6IPAddress = 0.0.0.0 **Check OK**
SlaveNo7IPAddress = 0.0.0.0 **Check OK**

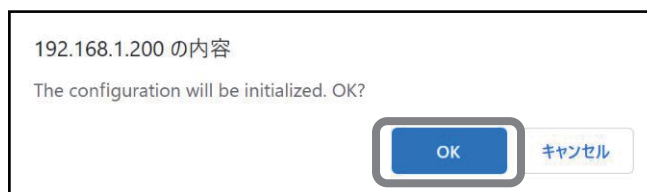
Configuration-Update Completed !!

■ Initializing the Settings

Click the **Default** Button in the *Initialize Configuration* Area to return all of the settings in the Reader/Writer to the default settings. After you initialize the settings, cycle the power supply to the Reader/Writer to enable the new settings.



Click the **Default** Button in the *Initialize Configuration* Area. The following dialog box will be displayed. Click the **OK** Button.



The following information is displayed after setting is completed. The network settings (NetworkSetting) are applied when the Reader/Writer is restarted. The RF Tag communications settings (RFTagCommunicationSetting) are applied immediately.

OMRON V680S RFID Reader/Writer

V680S - Change Configuration

```

[NetworkSetting]
  IPAddress = 192.168.1.200  Check OK
  SubnetMask = 255.255.255.0  Check OK
  GatewayAddress = 192.168.1.254  Check OK
  DeviceName =  Check OK
  WebPassword =  Check OK
  WebPortNo = 7090  Check OK
[RFTagCommunicationSetting]
  CommunicationSpeed = 0  Check OK
  WriteVerify = 1  Check OK
  CommunicationOption = 0  Check OK
  CommunicationDiagnostics = 0  Check OK
[MultiReaderWriterSetting]
  MultiReaderWriterMode = 0  Check OK
  SlaveNum = 0  Check OK
  SlaveNo1IPAddress = 0.0.0.0  Check OK
  SlaveNo2IPAddress = 0.0.0.0  Check OK
  SlaveNo3IPAddress = 0.0.0.0  Check OK
  SlaveNo4IPAddress = 0.0.0.0  Check OK
  SlaveNo5IPAddress = 0.0.0.0  Check OK
  SlaveNo6IPAddress = 0.0.0.0  Check OK
  SlaveNo7IPAddress = 0.0.0.0  Check OK

Configuration-Update Completed !!

```

Configuration File

This section describes the format of the configuration file. The configuration file uses a normal INI file format.

- Any line that starts with a semicolon (;) is treated as a comment.
- Any line that starts with an opening bracket ([) is treated as a section declaration row. The row must also end in a closing bracket (]).
- Any row that does not start with either of the above two characters is an entry row.

Section and Entry Table

| Section name | Entry name | Description | Default |
|---------------------------|---------------------|---|---------------|
| NetworkSetting | IPAddress | Gives the setting of the IP address of the Reader/Writer. Specify four decimal numbers separated by periods. | 192.168.1.200 |
| | SubnetMask | Gives the setting of the subnet mask of the Reader/Writer. Specify four decimal numbers separated by periods. | 255.255.255.0 |
| | GatewayAddress | Gives the setting of the default gateway of the Reader/Writer. Specify four decimal numbers separated by periods. | 192.168.1.254 |
| | DeviceName | Gives the name of the Reader/Writer. Specify up to 63 ASCII characters. | |
| | WebPassword | Gives the login password for the Web browser interface. Specify up to 15 ASCII characters. Specify "" (blank) for no password. | |
| | WebPortNo | Gives the Ethernet communications port number for the Web browser interface. Specify 1024 to 65535 decimal. | 7090 |
| RFTagCommunicationSetting | CommunicationSpeed | Gives the communications speed between the Reader/Writer and RF Tags. Set a decimal number. 0: High speed 1: Normal speed | 0 |
| | WriteVerify | Gives the setting for write verification for write communications. Set a decimal number. 0: No verification 1: Verification | 1 |
| | CommunicationOption | Gives the setting of the RF Tag communications option. Set a decimal number. 0: Once 1: Repeat 2: FIFO Repeat (Without ID code check) 3: Auto 18: FIFO Repeat (With ID code check) | 0 |

| Section name | Entry name | Description | Default |
|--------------------------|-----------------------|--|---------|
| MultiReaderWriterSetting | MultiReaderWriterMode | Gives the Reader/Writer Extended Mode settings. Specify a decimal value. 0: Disabled 1: Field Extension Mode 2: High-speed Traveling Mode | 0 |
| | SlaveNum | Gives the number of slaves in Field Extension Mode. Set a value between 0 and 7. | 0 |
| | SlaveNo1IPAddress | Give the IP Addresses in Reader/Writer Extended Mode. Specify four decimal numbers separated by periods. | 0.0.0.0 |
| | SlaveNo7IPAddress | | |

Section 9

Troubleshooting

| | |
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Error Descriptions

Information on up to eight errors that occur are recorded until the power supply to the Reader/Writer is turned OFF. You can access this information from the host device or the Web server.

Fatal Errors

■ Reader/Writer Operation Errors

The NORM/ERR indicator in the operation indicators flashes red if the control signal is not stable or if an error occurs in user configuration memory. If the Reader/Writer detects a user configuration memory error during startup, it will start in Safe Mode and the RUN indicator will flash green.

Check the connection of the control signal or correct the user settings, and then cycle the power supply to the Reader/Writer to return to normal operation.

■ System Errors

The NORM/ERR indicator in the operation indicators lights red if there is a CPU error, system memory error, or hardware fault. If the Reader/Writer detects a system memory error during startup, it will start in Safe Mode and the RUN indicator will flash green.

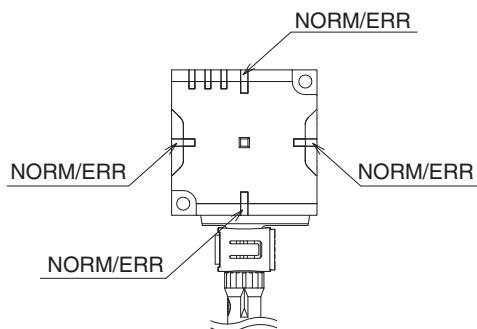
■ IP Address Duplication Error

If an IP address duplication error is detected at startup, the NORM/ERR indicator in the operation indicators flashes red irregularly. Turn OFF the power supply to the Reader/Writer, remove the Reader/Writer from the network, correct the IP addresses, add the Reader/Writer to the network, and turn the power supply back ON.

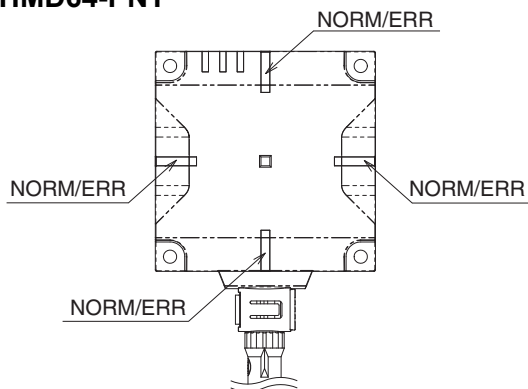
Nonfatal Errors

The NORM/ERR indicator in the operation indicators flashes red once if an error occurs in communications between the Reader/Writer and host device or in communications with an RF Tag.

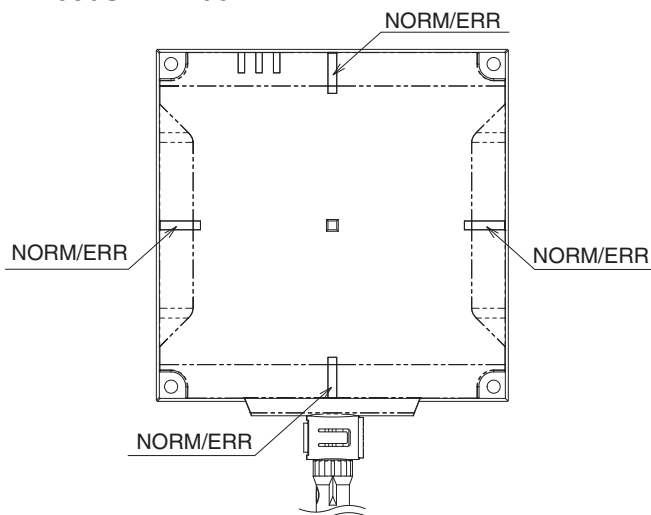
V680S-HMD63-PNT



V680S-HMD64-PNT



V680S-HMD66-PNT






Errors and Indicator Status




Fatal Errors

Reader/Writer Operation Errors




User Configuration Memory Error

| RUN | NORM/ERR | Processing when error occurs |
|---|---|---|
|  |  | There is an error in user configuration memory. <ul style="list-style-type: none"> Initialize the settings to restore normal operation. Refer to <i>User Configuration Memory Error</i> in this Section for information for Initialize the setting. |
| Lit green or fast flashing green | Flashing red |  p.219 |



Unstable Control Signal or User Configuration Memory (Host Device Communications Conditions Settings) Error

| RUN | NORM/ERR | Processing when error occurs |
|---|---|--|
|  |  | The value of the control signal is not stable. <ul style="list-style-type: none"> See if the control signal line in the V680S Cable is connected correctly to 24 VDC. See if there is a source of strong noise near the Reader/Writer or Cable. There is an error in user configuration memory (host device communications conditions settings). <ul style="list-style-type: none"> Initialize the settings to restore normal operation. Refer to <i>User Configuration Memory Error</i> in this Section for information for Initialize the setting. |
| Flashing green | Flashing red |  p.219 * The Reader/Writer automatically starts in Safe Mode when it detects an error. |

Multi-Reader/Writer Execution Error




| RUN | NORM/ERR | Processing when error occurs |
|---|---|--|
|  |  | The multi-Reader/Writer functions cannot be executed. <ul style="list-style-type: none"> Check the combination of the RF Tag communications option setting and multi-Reader/Writer function operating mode in the Master Reader/Writer. Correct the IP address settings so that the Slave Reader/Writer does not use the same IP address as the Master Reader/Writer. For details, refer <i>Section 6 Multi-Reader/Writer Operation</i> . |
| Flashing green or fast flashing green | Lit red |  p.116 |

IP Address Duplication Error (Indicator Flashes Red Irregularly)




| RUN | NORM/ERR | Processing when error occurs |
|---|---|--|
|  |  | Devices with the same IP address were detected during Reader/Writer startup. <ul style="list-style-type: none"> Correct the IP address settings of the Reader/Writers. |
| Fast flashing green | Flashing red irregularly | |

■ **System Errors**

■ **CPU Error or Hardware Fault**



| RUN | NORM/ERR | Processing when error occurs |
|---|---|--|
|  |  | Take the appropriate action referring <i>System Errors</i> in this Section Replace the Reader/Writer if the condition does not change.  p.220 |
| Lit green or fast flashing green | Lit red | |

■ **System Memory Error**



| RUN | NORM/ERR | Processing when error occurs |
|---|---|--|
|  |  | Take the appropriate action referring <i>System Errors</i> in this Section Replace the Reader/Writer if the condition does not change.  p.220 * If the Reader/Writer detects a fault, the Reader/Writer will start in the "Safe mode" automatically. |
| Flashing green | Lit red | |

Nonfatal Errors

The NORM/ERR indicator flashes once if an error occurs in communications between the Reader/Writer and host device or in communications with an RF Tag.

| RUN | NORM/ERR |
|---|---|
|  |  |
| Lit green or fast flashing green | Flashes red once |

Cyclic Data Exchanges Error

| RUN | NORM/ERR |
|---|---|
|  |  |
| Lit green | Flashing yellow |



CHECK!

If you use more than one Reader/Writer for multi-Reader/Writer operation, the ERROR indicator will light red once on any Reader/Writer for which an error is detected during communications with an RF Tag. The NORM indicator will light green once on any Reader/Writer that completes communications with an RF Tag normally. When the Master Reader/Writer returns a response to the host device, the NORM or ERROR indicator will light depending on whether the results given in the response is for a normal or error completion.

Errors and Countermeasures

Reader/Writer Operation Errors

■ User Configuration Memory Error

Initialize the settings to restore normal operation. There are the following two ways to initialize the Reader/Writer.

■ Initializing with a Command Message from the Host Device

You can send the INITIALIZE SETTINGS command to the Reader/Writer to return the settings to the default values.

■ Initializing through the Web Server

You can connect a computer to the network, start a Web browser, and return the settings to the default values from the Web browser window.

Refer to *Initializing the Settings in Configuration in Section 8 Web Browser Interface* for the procedure to Initializing through the Web Server.



■ Unfixed Operation Mode Error or User Configuration Memory (Host Device Communications Conditions Settings) Error

Identify the error on the Error Log View in the Web browser and restore operation with the countermeasure.

Refer to *Log View in Section 8 Web Browser Interface* for the procedure to check the error log contents from the Web browser window.



■ Unfixed Operation Mode Error

See if the control signal line is connected correctly to the 24 VDC terminal on the power source. Check for sources of noise around the Cable.

■ User Configuration Memory Error (Host Device Communications Conditions Settings)

Initialize the settings to restore normal operation. You can connect a computer to the network, start a Web browser, and return the settings to the default values from the Web browser window.

Refer to *Initializing the Settings in Configuration in Section 8 Web Browser Interface* for the procedure to Initializing through the Web Server.



■ Multi-Reader/Writer Execution Error

Check the combination of the Multi-Reader/Writer Mode and the communications option.

IP Address Duplication Error

Turn OFF the power supply to the Reader/Writer, remove the Reader/Writer from the network, correct the IP addresses, add the Reader/Writer to the network, and turn the power supply back ON.

System Errors

Turn OFF the power supply, check the wiring, and then turn ON the power supply. If the problem does not change, recovery is not possible for the error. Replace the Reader/Writer.

■ Multi-Reader/Writer Execution Error

Check the combination of the Multi-Reader/Writer Mode and the RF Tag communications option.

Or, check the IP address settings to see if the Slave Reader/Writer is using the same IP address as the Master Reader/Writer.

The RF Tag communications commands that you can use during multi-Reader/Writer operation (Field Extension Mode or High-speed Traveling Mode) are shown in the following table.

If you use any RF Tag communications command that cannot be used for the Master Reader/Writer, an execution status error will be indicated in the response.

■ Commands That Can Be Addressed to a Master Reader/Writer

| RF Tag communications command | Multi-Reader/Writer Mode | |
|-----------------------------------|--------------------------|---------------------------|
| | Field Extension Mode | High-speed Traveling Mode |
| READ DATA | Supported | Supported |
| WRITE DATA | Supported | Not supported |
| DATA FILL | Not supported | Not supported |
| RF TAG OVERWRITE COUNT CONTROL | Not supported | Not supported |
| READ ID | Supported | Not supported |
| COPY DATA | Not supported | Not supported |
| LOCK | Not supported | Not supported |

■ **Commands That Can Be Acknowledged by a Slave Reader/Writer**

The following table shows the commands that a Reader/Writer that is operating as a slave can acknowledge.

If an unsupported command is received by a Slave Reader/Writer, an execution status error will be indicated in the response.

| Command type | Name | Supported |
|------------------------|--------------------------------------|-----------|
| RF Tag communications | READ DATA | No |
| | WRITE DATA | No |
| | READ ID | No |
| | COPY DATA | No |
| | DATA FILL | No |
| | LOCK | No |
| | RF TAG OVERWRITE COUNT CONTROL | No |
| | RESTORE DATA | No |
| Reader/Writer settings | SET TAG COMMUNICATIONS OPTION | No |
| | GET TAG COMMUNICATIONS OPTION | Yes |
| | SET TAG COMMUNICATIONS CONDITIONS | No |
| | GET TAG COMMUNICATIONS CONDITIONS | Yes |
| | SET TCP/IP COMMUNICATIONS CONDITIONS | No |
| | GET TCP/IP COMMUNICATIONS CONDITIONS | Yes |
| | SET DEVICE NAME | No |
| | GET DEVICE NAME | Yes |
| | SET TCP/IP COMMUNICATIONS CONDITIONS | No |
| | GET TCP/IP COMMUNICATIONS CONDITIONS | Yes |
| | SET WEB PASSWORD | No |
| | GET WEB PASSWORD | Yes |
| | INITIALIZE | No |

| Command type | Name | Supported |
|------------------------------------|--|-----------|
| Checking Reader/Writer information | MEASURE NOISE | No |
| | GET MODEL INFORMATION | Yes |
| | GET FIRMWARE VERSION | Yes |
| | GET MAC ADDRESS | Yes |
| | GET READER/WRITER OPERATING STATUS | Yes |
| | GET OPERATING TIME | Yes |
| | GET RECENT ERROR COMMAND INFORMATION | Yes |
| | GET COMMUNICATIONS ERROR LOG | Yes |
| | GET SYSTEM ERROR LOG | Yes |
| | GET RESTORE INFORMATION | Yes |
| Reader/Writer operation control | STOP | No |
| | RESET | No |
| RFID maintenance | SET COMMUNICATIONS DIAGNOSTICS SETTINGS | No |
| | GET COMMUNICATIONS DIAGNOSTICS SETTINGS | Yes |
| Multi-Reader/Writer operation | SET MULTI-READER/WRITER OPERATION | No |
| | GET MULTI-READER/WRITER OPERATION SETTINGS | Yes |
| | GET MULTI-READER/WRITER OPERATION STATUS | Yes |



You can use the maintenance functions with Reader/Writers with firmware version 3.00 or higher.



All linked Reader/Writers must have firmware version 3.00 or higher.

V680S Command Errors

You can check errors detected by the Reader/Writer in the Response Area where the Reader/Writer returns the response after command execution.





You can also check error information by sending the GET COMMAND ERROR LOG command to the Reader/Writer or by using the Error Log View on a Web browser. The following table provides detailed error information and countermeasures.

| Error name | Error code | Countermeasure |
|-------------------------|------------|---|
| Command parameter error | 1005 hex | Check the contents of the command and send the correct contents. Make sure the command parameter values are correct. |
| Execution status error | 1006 hex | Send the command again. Execution is not possible because the Reader/Writer is performing other processing. |

RF Tag Communications Errors

You can check errors detected by the Reader/Writer in the Response Area where the Reader/Writer returns the response after command execution.

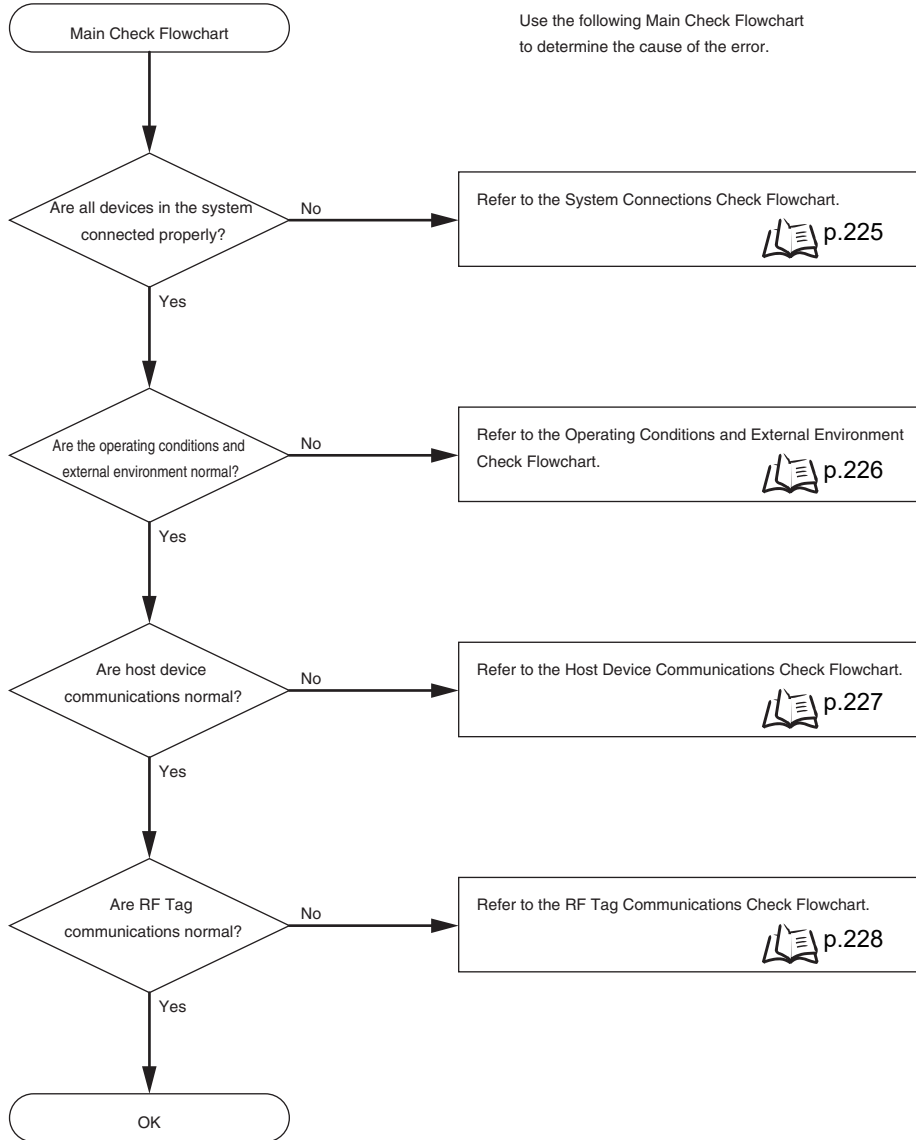
You can also check error information by sending the GET COMMAND ERROR LOG command to the Reader/Writer or by using the Error Log View on a Web browser. The following table provides detailed error information and countermeasures.

| Error name | Error code | Countermeasure |
|--|------------|---|
| RF Tag missing error | 2001 hex | Change the control timing so that communications start when there is an RF Tag in the communications field of the Reader/Writer. Measure the noise and implement noise countermeasures.  p.104 Check the influence of surrounding metal and make sure there is sufficient communications range. |
| RF Tag communications error | 2002 hex | Change the control timing so that communications start when there is an RF Tag in the communications field of the Reader/Writer. Measure the noise and implement noise countermeasures.  p.104 Check the influence of surrounding metal and make sure there is sufficient communications range. |
| UID mismatch error | 2003 hex | Perform communications when the RF Tag for which data is to be restored is in the communications field of the Reader/Writer. |
| RF Tag address error | 2004 hex | Adjust the processing area (addresses) for communications with the RF Tag to match the memory area of the RF Tag. |
| RF Tag lock error | 2005 hex | The RF Tag memory region that contains the communications processing area (addresses) is locked. Check the communications processing area (addresses) and perform the process again or replace the RF Tag. |
| RF Tag verification error | 2006 hex | Repeat the processing while the RF Tag is in the communications field of the Reader/Writer. Measure the noise and implement noise countermeasures.  p.104 Check the influence of surrounding metal and make sure there is sufficient communications range. |
| RF Tag data lost error | 2007 hex | Repeat the processing while the RF Tag is in the communications field of the Reader/Writer. Measure the noise and implement noise countermeasures.  p.104 Check the influence of surrounding metal and make sure there is sufficient communications range. |
| RF Tag system error | 2008 hex | Change to an RF Tag that is supported by the Reader/Writer. |
| RF Tag overwriting error | 2009 hex | Replace the RF Tag. |
| Reader/Writer connection error | 200A hex | Make sure that the copy destination Reader/Writer is operating normally. Make sure that the copy destination Reader/Writer is normally connected to the network and that there are no mistakes in the settings. |
| Communications connection error between Reader/Writers | 200B hex | Make sure that the Slave Reader/Writers have started normally before you execute multi-Reader/Writer functions. Make sure that the Slave Reader/Writers are normally connected to the network and that there are no mistakes in the settings. |

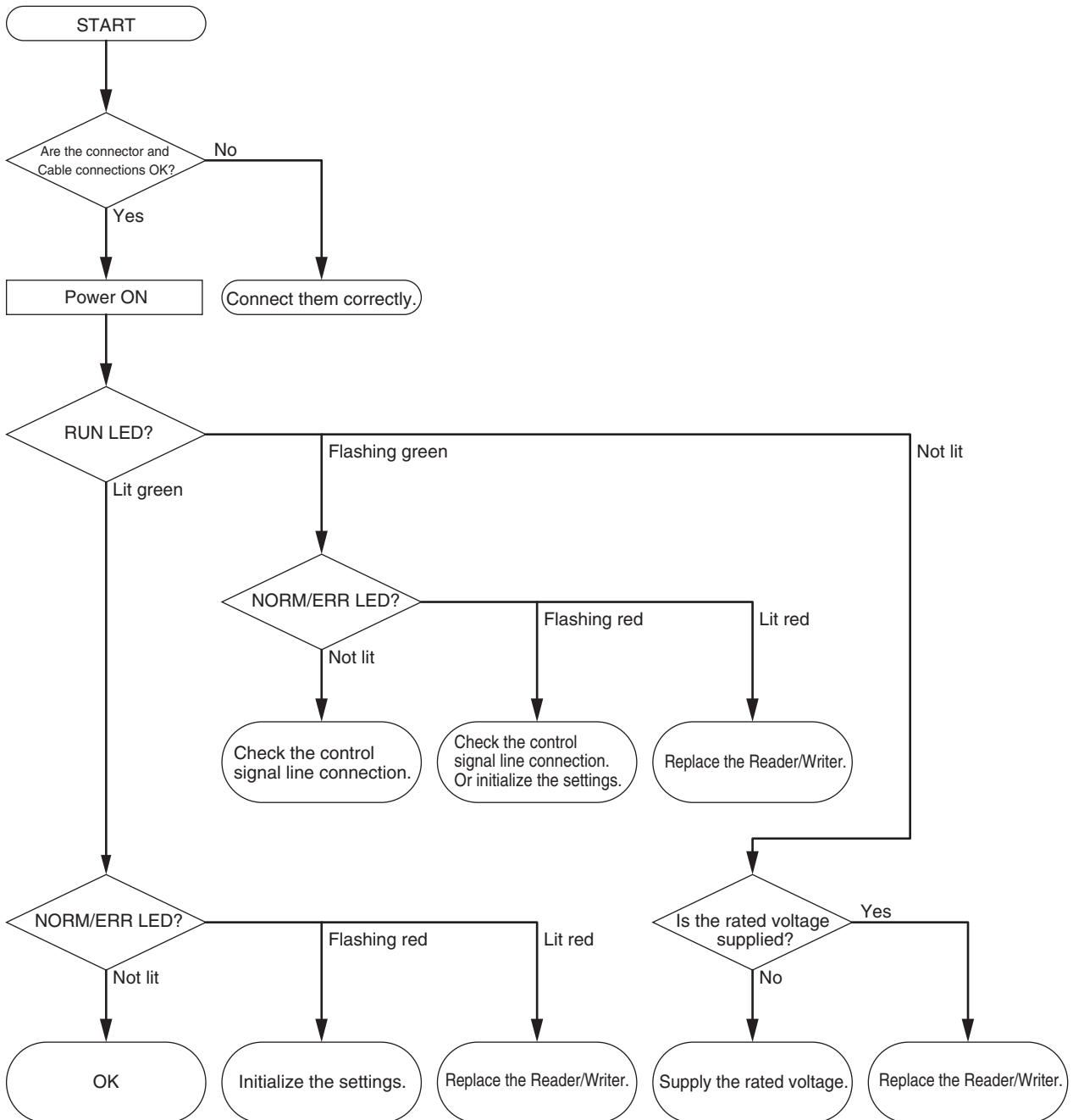
Troubleshooting Flowcharts

If an error occurs, fully check the whole situation, determine the relationship between the system and any other devices, and refer to the following flowcharts for the troubleshooting procedures.

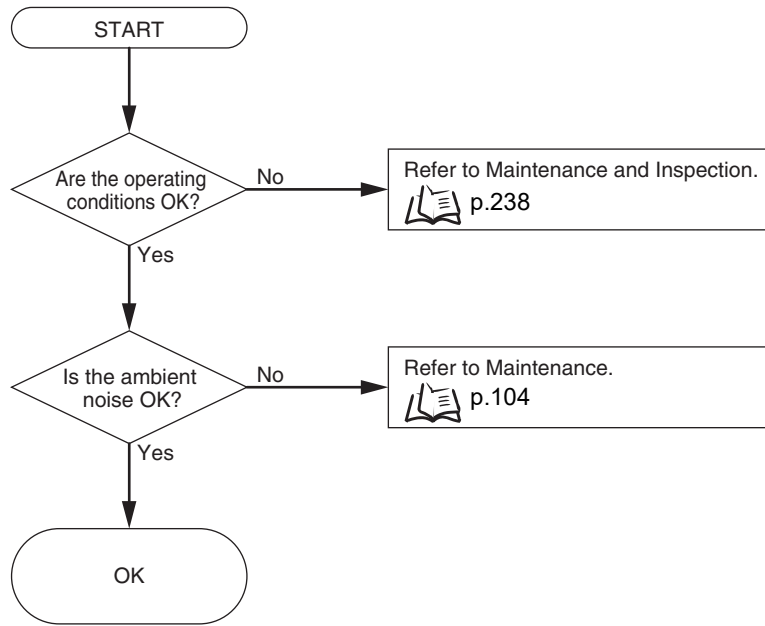
Main Check Flowchart



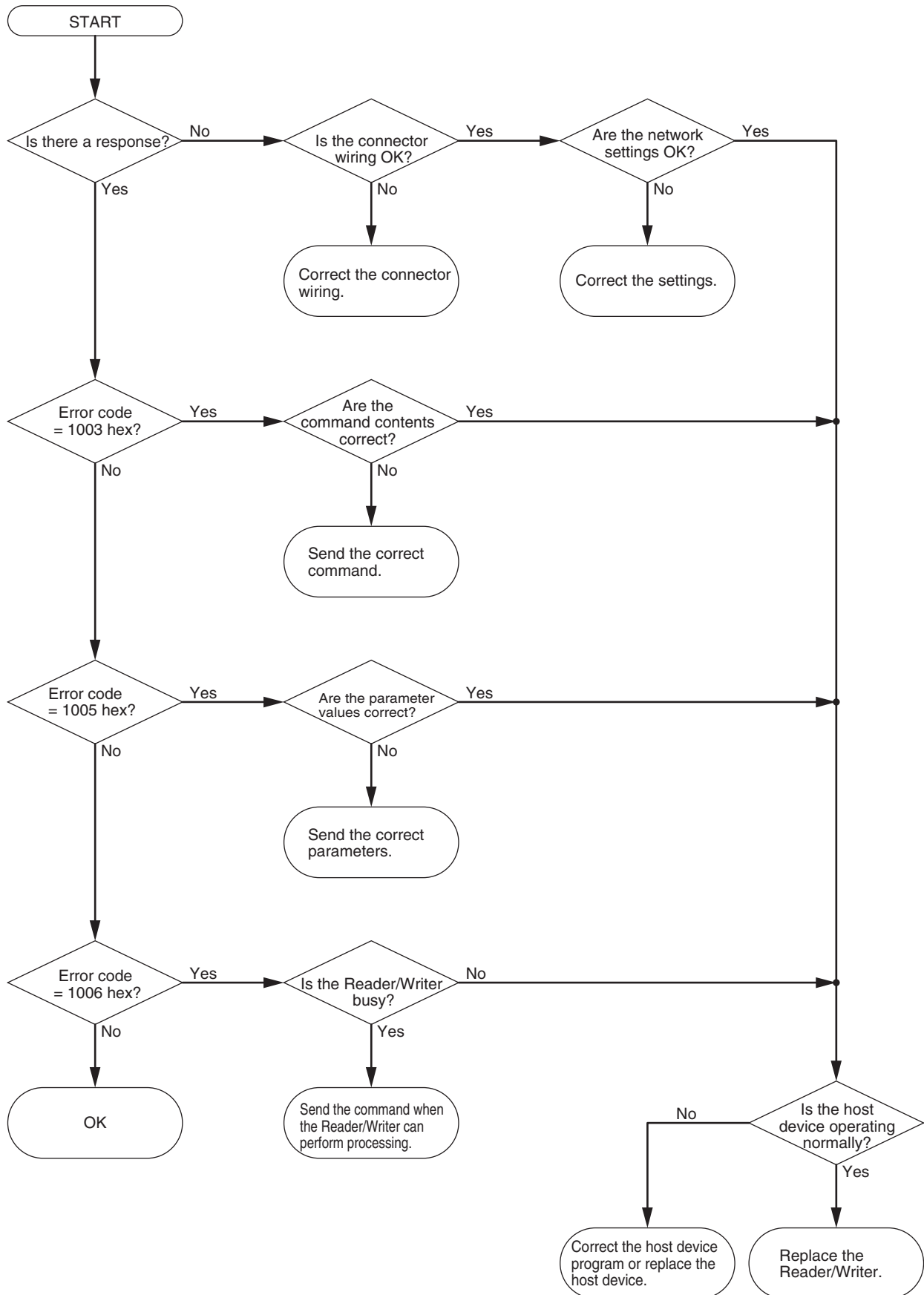
System Connections Check Flowchart



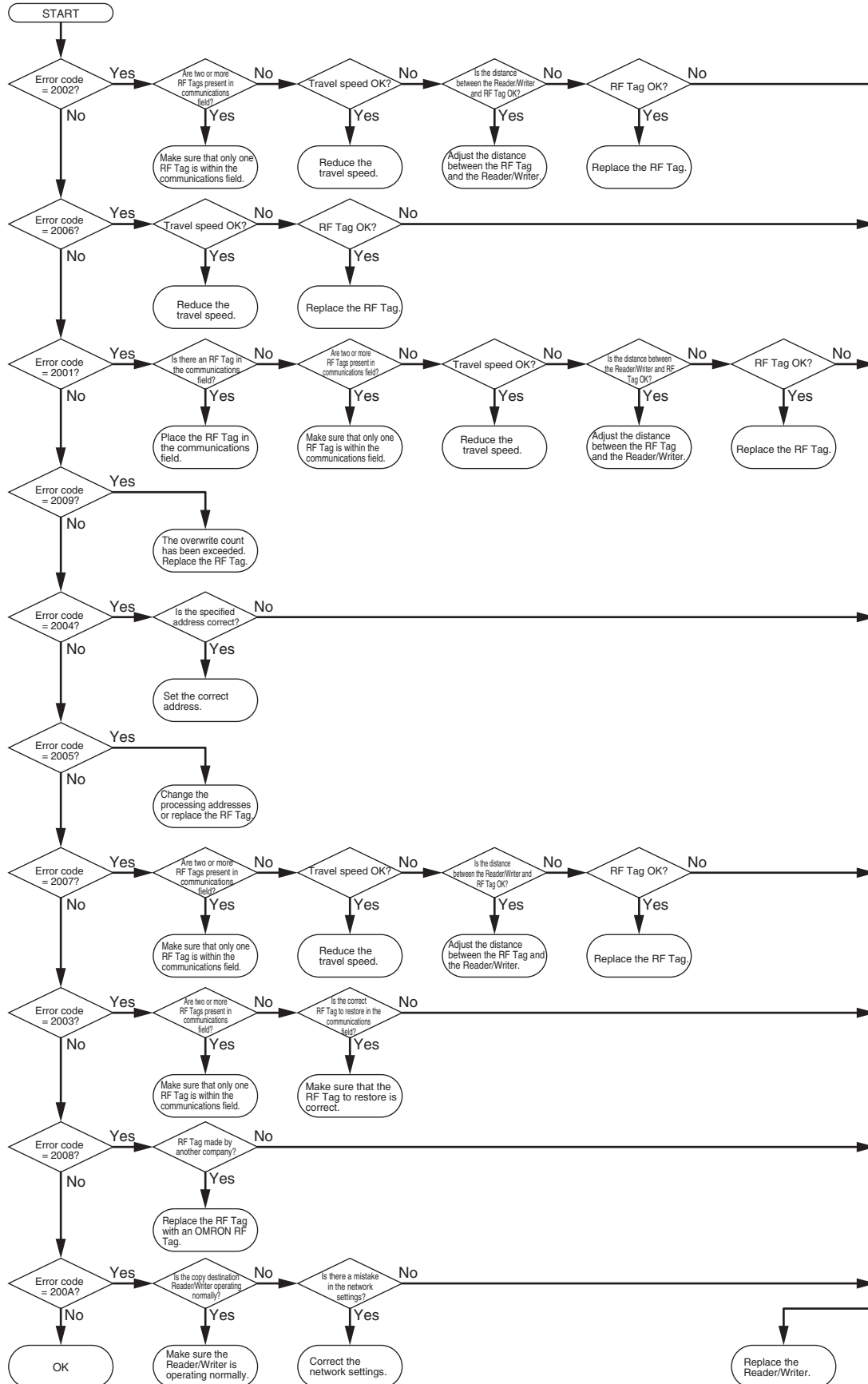
Operating Conditions and External Environment Check Flowchart



Host Device Communications Check Flowchart



RF Tag Communications Check Flow



Refer to *RFID System Maintenance* in *Section 6 Functions*, when Communication Diagnosis is enabled and the diagnostic result is "Warning"

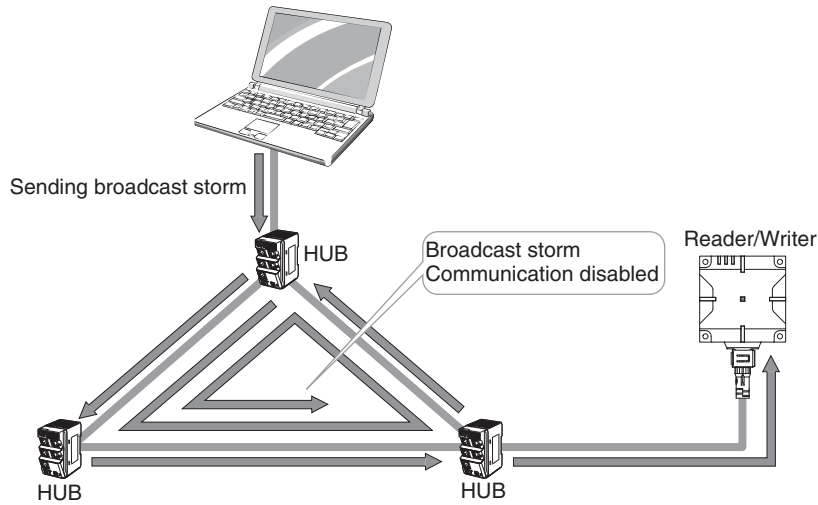
p.111

About The Ethernet Communication Abnormality



If an Ethernet network is configured into a loop as shown below, broadcast packets are accumulated in the band, and the communication is disabled. Therefore, do not configure the Ethernet network into a loop.

CHECK!



When a large amount of broadcast packets or multicast packets flow into the Ethernet network, Reader/Writers may stop its operation. Please do not send a large amount of packet. Please separate the Reader/Writers from the network segment that broadcast or multicast packets flow.

CHECK!

How to deal with browser interface problems

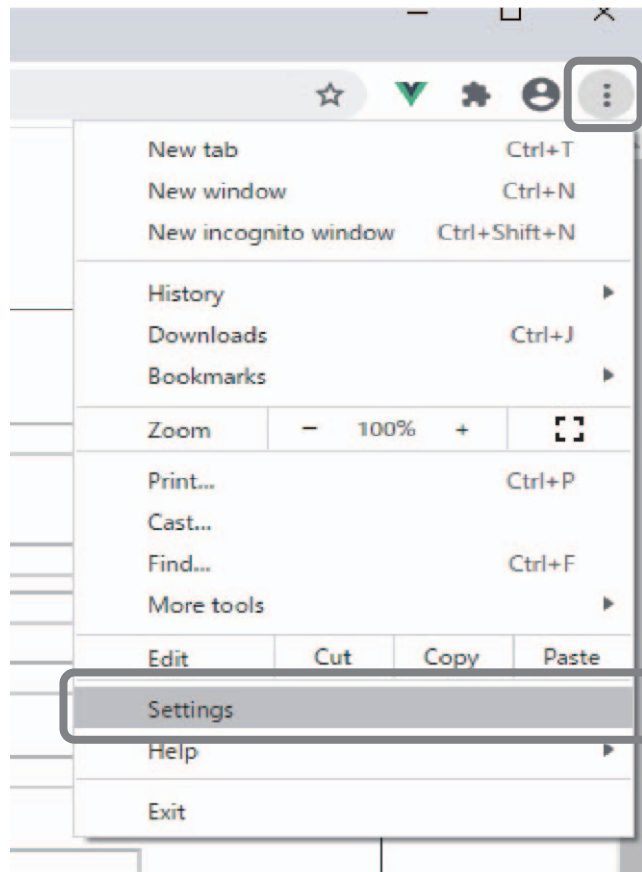
When the Web browser screen is not displayed or the screen layout is strange

When the Web browser screen is not displayed or the screen layout is strange.

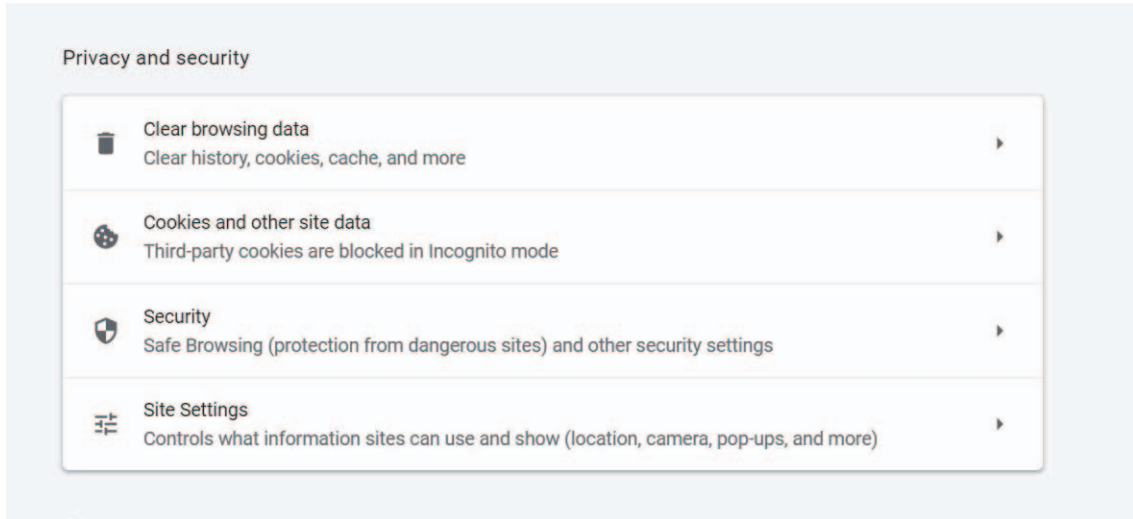
Please reload. If the problem persists even after reloading, follow the procedure below to delete the temporary Internet file and then display it again.

■ Google Chrome

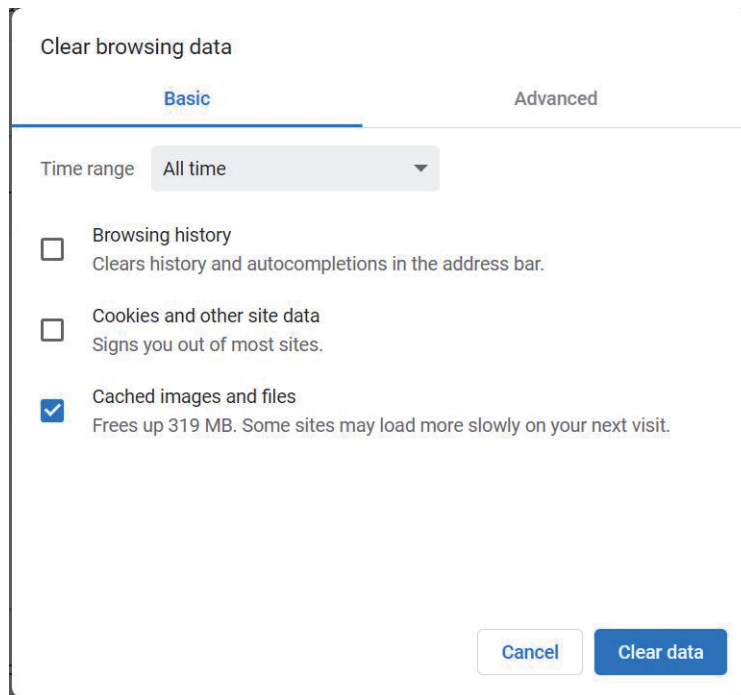
(1) Open the settings from “Google chrome settings” at the top right of the screen.



(2) Select Clear browsing data in the privacy and security section.



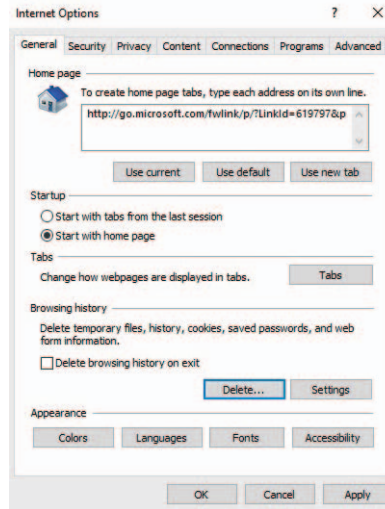
(3) Time range selects all time. Check cached images and files and select clear data.



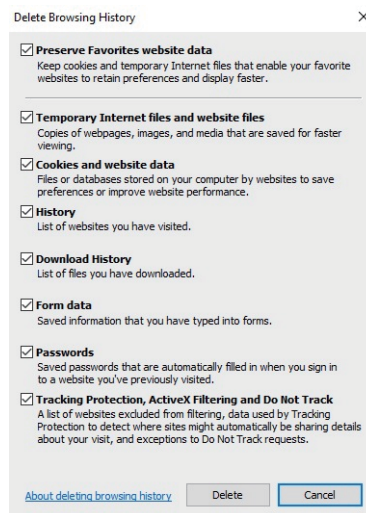
■ Internet explorer11

(1)Click the Tools menu and select Internet Options.

Click the delete... button in the Browsing History section of the General tab.

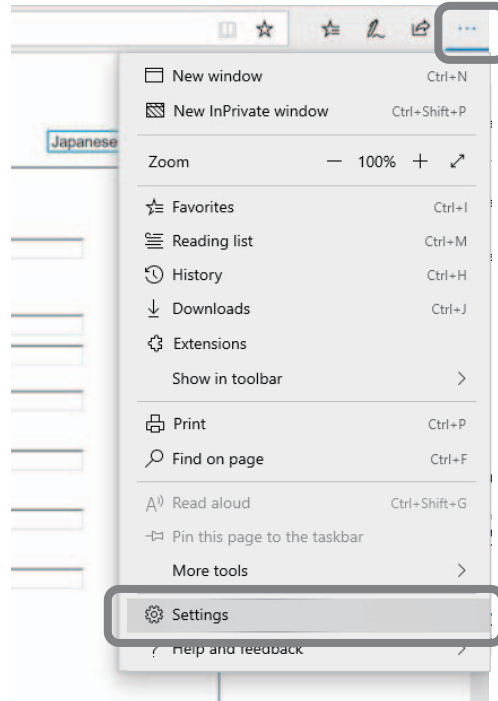


(2)Check "Temporary Internet files and website files" and click Delete.

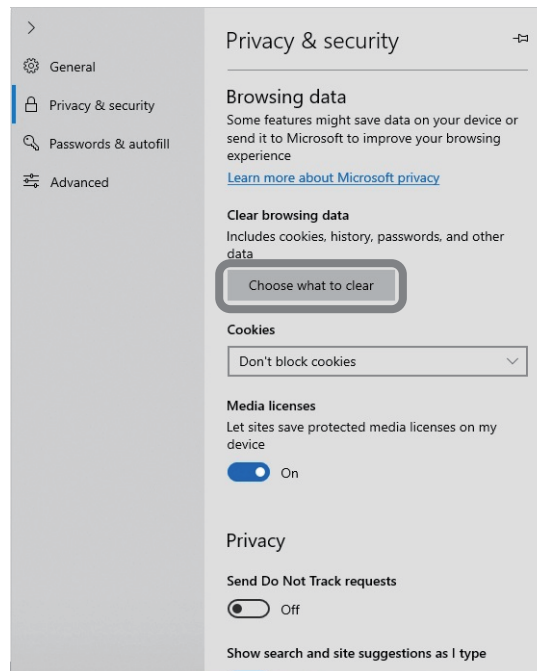


■ Microsoft Edge

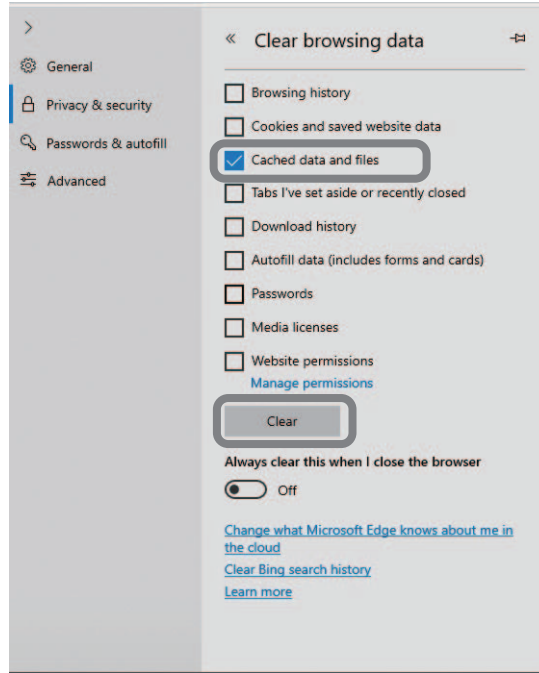
(1) Click the three points in the upper right and click “Settings”.



(2) Click “choose what to clear” in the “Privacy & Security” tab.



(3) Check “Cached data and files” and click Clear.



Safe Mode

In addition to the Run Mode that is used for normal operation, the Reader/Writer supports a Safe Mode operation mode. The Safe Mode is used when you do not remember the IP address that is set in the Reader/Writer.

If the Reader/Writer starts in Safe Mode, the following settings are always used. This allows you to access the Reader/Writer even if you forget the IP address so that you can set the IP address again.

| | |
|-------------|---------------|
| IP address | 192.168.1.200 |
| Subnet mask | 255.255.255.0 |



CHECK!

When the Reader/Writer is running in safe mode, some functions can not be used (Ex. RF tag communication and noise measurement function, etc). When you use the Reader/Writer normally, please start the Reader/Writer in RUN mode.

Starting in Safe Mode

- (1) Connect the control signal line from the Cable to 0 V on the DC power supply. Connect the other two lines (24P and 24N) to the DC power supply terminals.
- (2) Turn ON the power supply to the Reader/Writer.
- (3) The RUN indicator on the Reader/Writer will flash green

After the Reader/Writer starts in Safe Mode, reset or initialize the IP address from the Web browser or host device.



CHECK!




p.214

If an error occurs in the Reader/Writer, the Reader/Writer may automatically start in Safe Mode. Refer to *Error Descriptions* in this Section for more information.

MEMO

Section 10

Maintenance and Inspection

 Maintenance and Inspection

238

Maintenance and Inspection

The Reader/Writer must be inspected on a daily or periodic basis so that the functions remain in good condition. The Reader/Writer consists of semiconductors that last almost indefinitely. The following malfunctions, however, may result due to the operating environment and conditions.

- (1) Element deterioration due to overvoltage or overcurrent.
- (2) Element deterioration due to continuous stress caused by high ambient temperature.
- (3) Connector contact faults or insulation deterioration due to humidity and dust.
- (4) Connector contact faults or element corrosion due to corrosive gas.

■ Inspection Items

| No. | Inspection item | Details | Criteria | Remarks |
|-----|---|---|--|---|
| 1 | Power supply voltage fluctuation | (1) Make sure that the supply voltage fluctuation at the power supply terminal block is within the permissible range. | Within supply voltage specified range | Multimeter |
| | | (2) Make sure that there are no frequent instantaneous power failures or radical voltage fluctuations. | Within permissible voltage fluctuation range | Power supply analyzer |
| 2 | Ambient environment | | | Maximum and minimum thermometer Hygrometer |
| | (a) Temperature | (a) Within the specified range | (a) -10 to 55°C | |
| | (b) Humidity | (b) Within the specified range | (b) 25% to 85% | |
| | (c) Vibration and shock | (c) Influence of vibration or shock from machines | (c) Within the specified range | |
| | (d) Dust | (d) Make sure that the Reader/Writer is free of accumulated dust and foreign particles. | (d) Must not be present. | |
| | (e) Corrosive gas | (e) Make sure that no metal parts are discolored or corroded. | (e) Must not be present. | |
| 3 | Panel condition | | | --- |
| | (a) Ventilation | (a) Make sure that the system is ventilated properly with natural ventilation, forced ventilation, or cooling air. | (a) The interior temperature must be between -10 and 55°C with proper ventilation. | |
| | (b) Damage to packing for any enclosing structure | (b) Make sure that the panel packing is properly attached with no damage. | (b) The packing must have no damage. | |
| 4 | Mounting conditions | (1) Make sure that the Reader/Writer is securely mounted. | No loose screws | --- |
| | | (2) Make sure that each connector is fully inserted. | Each connector must be locked or securely tightened with screws. | --- |
| | | (3) Make sure that no wire is broken or nearly broken. | Must be no wire that is broken or nearly broken. | --- |
| | | (4) Make sure that the distance between the RF Tags and Reader/Writer is within the specified range. | Within the specified range | --- |
| 5 | RF Tag life | Manage the number of times data is written to each RF Tag. | The maximum number of overwrites must not be exceeded | --- |

Section 11

Appendices

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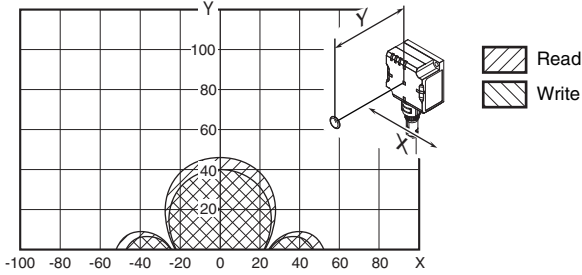
Data Characteristics

RF Tag Communications Range (for Reference Only)

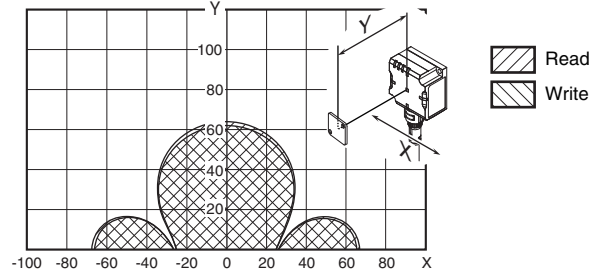
■ V680S-HMD63-PNT

(Unit: mm)

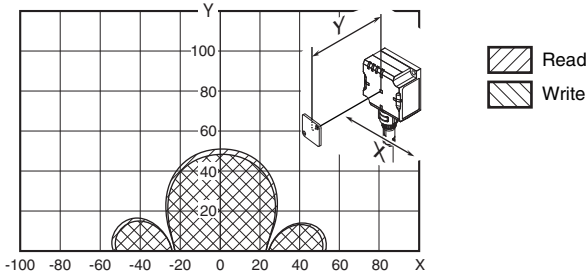
- V680S-HMD63-PNT and V680-D1KP54MT
(Back Surface: Metal)



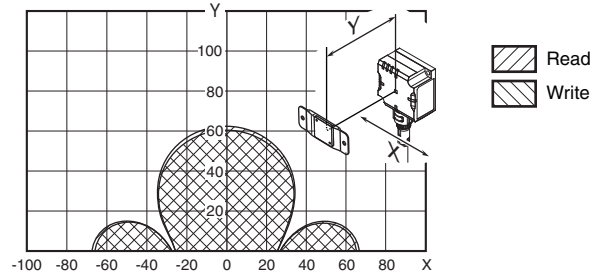
- V680S-HMD63-PNT and V680-D1KP66T
(Back Surface: Metal)



- V680S-HMD63-PNT and V680-D1KP66MT
(Back Surface: Metal) (Back Surface: Metal)

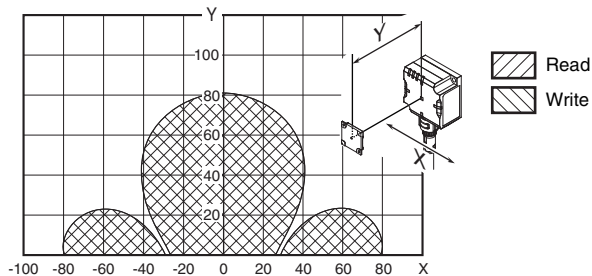


- V680S-HMD63-PNT and V680-D1KP66T-SP
(Back Surface: Metal)

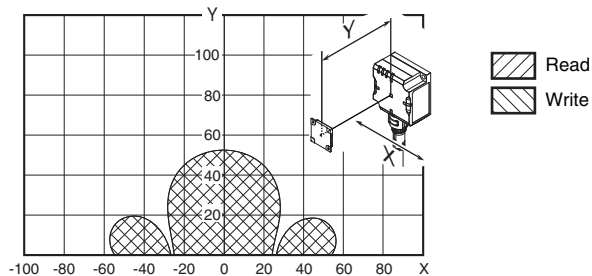


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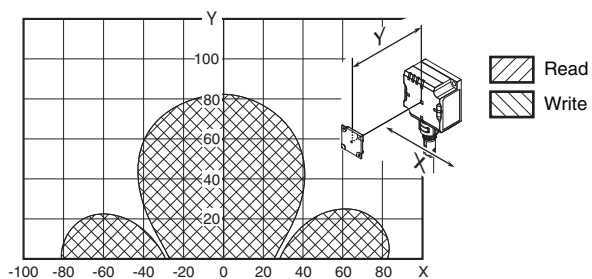
- V680S-HMD63-PNT and V680S-D2KF67
(Back Surface: Metal)



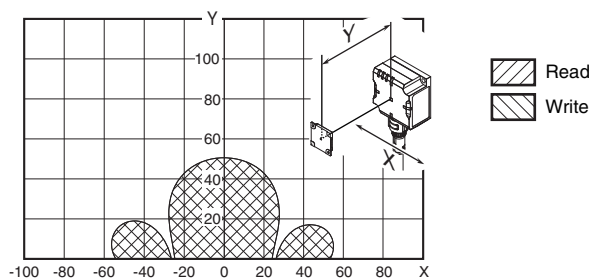
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(Back Surface: Metal)



- V680S-HMD63-PNT and V680S-D8KF67
(Back Surface: Metal)

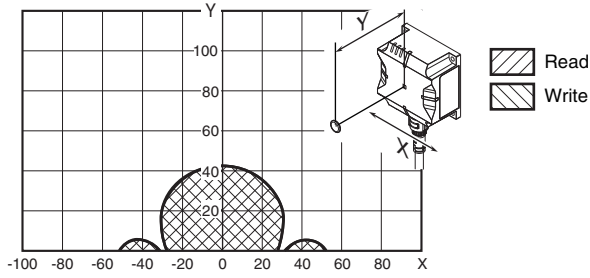


- V680S-HMD63-PNT and V680S-D8KF67M
(Back Surface: Metal) (Back Surface: Metal)

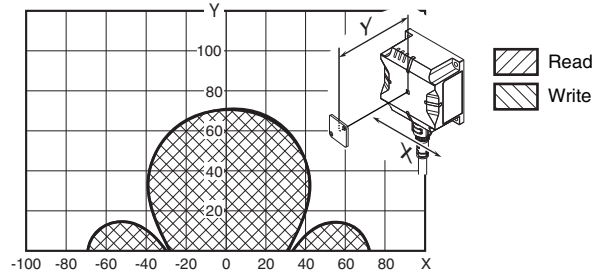


■ V680S-HMD64-PNT

- V680S-HMD64-PNT and V680-D1KP54T
(Back Surface: Metal)

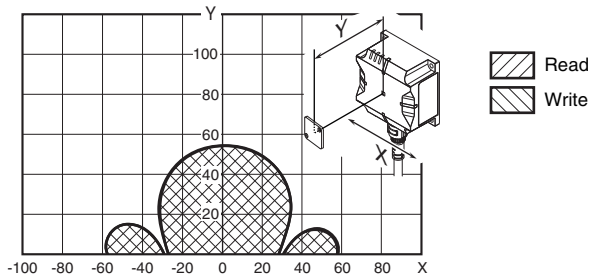


- V680S-HMD64-PNT and V680-D1KP66T
(Back Surface: Metal)

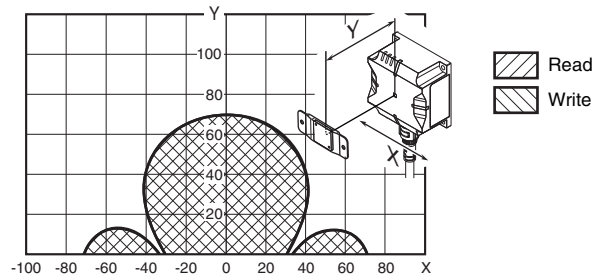


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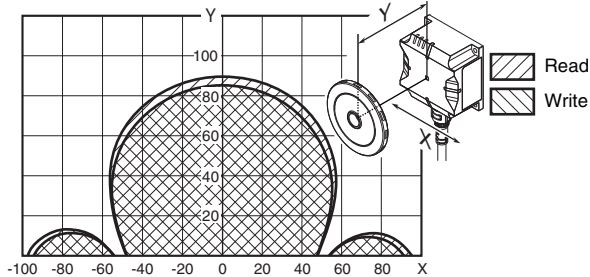
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(Back Surface: Metal) (Back Surface: Metal)



- V680S-HMD64-PNT and V680-D1KP66T-SP
(Back Surface: Metal)

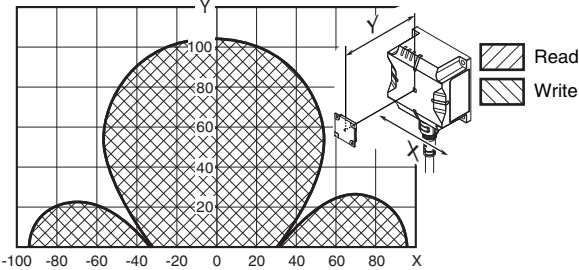


- V680S-HMD64-PNT and V680-D1KP58HTN
(Back Surface: Metal) (with Attachment, V680-A80)

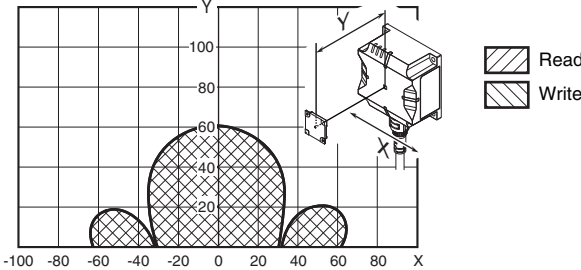


(Unit: mm)

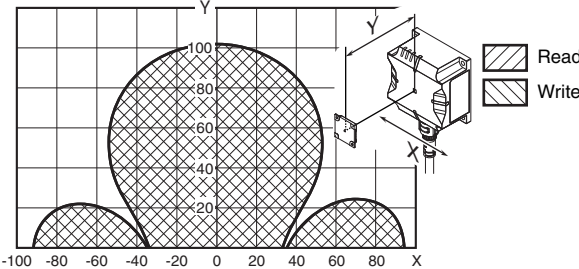
● V680S-HMD64-PNT and V680S-D2KF67
(Back Surface: Metal)



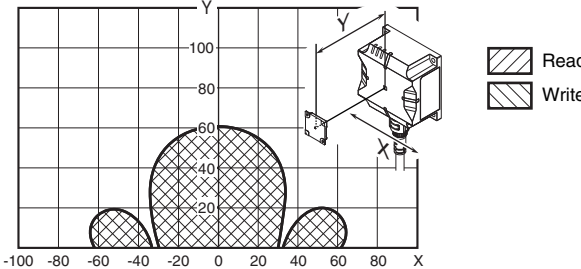
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(Back Surface: Metal) (Back Surface: Metal)



● V680S-HMD64-PNT and V680S-D8KF67
(Back Surface: Metal)

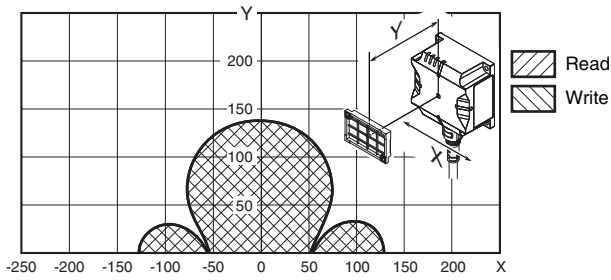


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(Back Surface: Metal) (Back Surface: Metal)

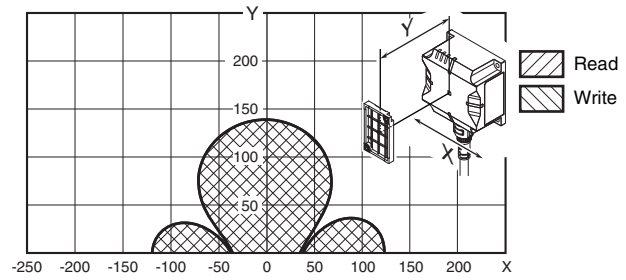


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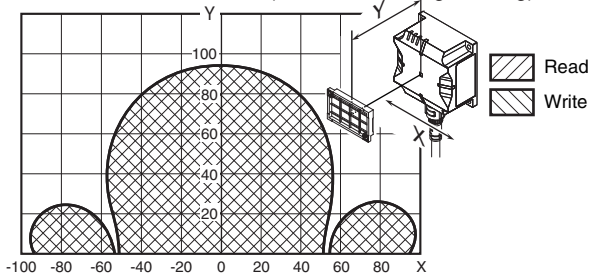
● V680S-HMD64-PNT and V680S-D2KF68
(Back Surface: Metal) (Horizontal-facing RF Tag)



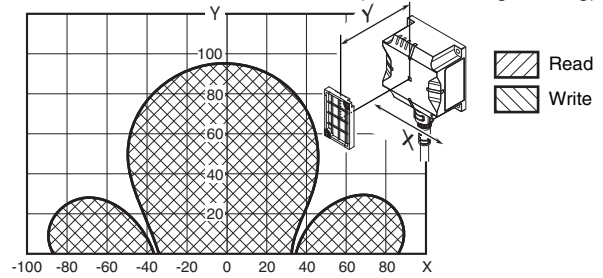
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(Back Surface: Metal) (Vertical-facing RF Tag)



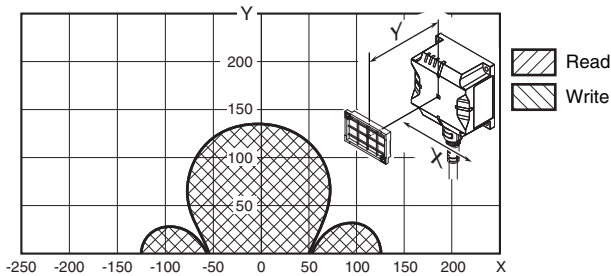
● V680S-HMD64-PNT and V680S-D2KF68M
(Back Surface: Metal) (Back Surface: Metal)
(Horizontal-facing RF Tag)



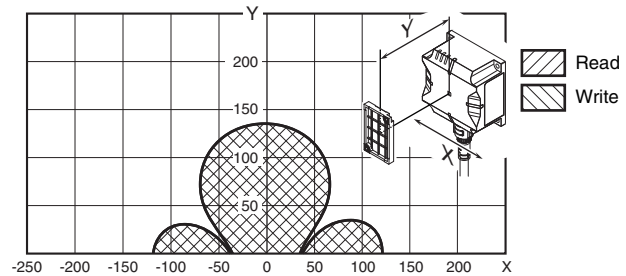
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(Back Surface: Metal) (Back Surface: Metal)
(Vertical-facing RF Tag)



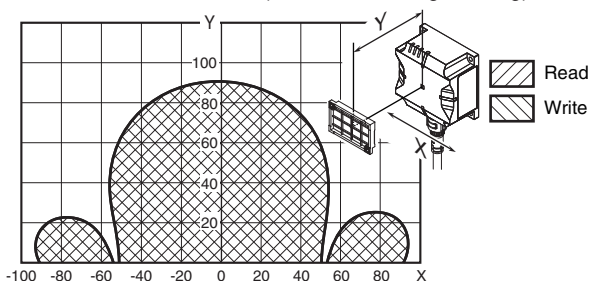
● V680S-HMD64-PNT and V680S-D8KF68
(Back Surface: Metal) (Horizontal-facing RF Tag)



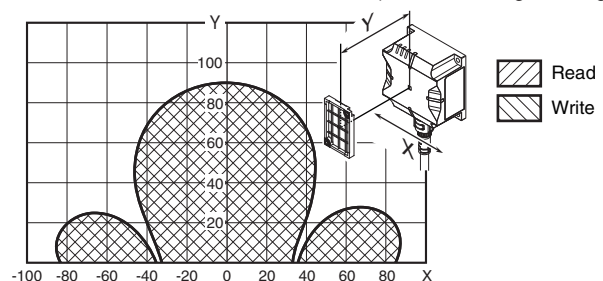
● V680S-HMD64-PNT and V680S-D8KF68
(Back Surface: Metal) (Vertical-facing RF Tag)



● V680S-HMD64-PNT and V680S-D8KF68M
(Back Surface: Metal) (Back Surface: Metal)
(Horizontal-facing RF Tag)



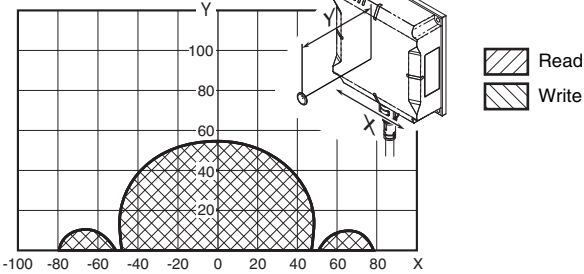
● V680S-HMD64-PNT and V680S-D8KF68M
(Back Surface: Metal) (Back Surface: Metal)
(Vertical-facing RF Tag)



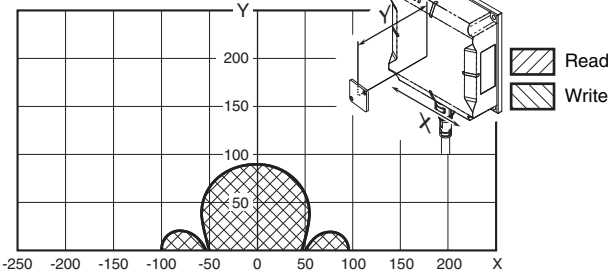
■ V680S-HMD66-PNT

(Unit: mm)

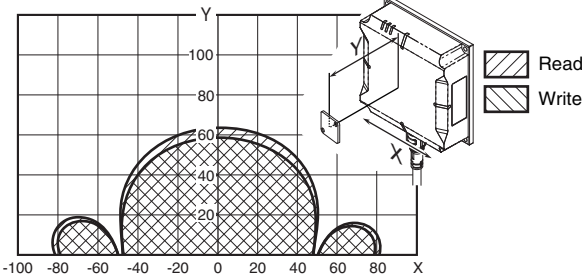
● V680S-HMD66-PNT and V680-D1KP54T
(Back Surface: Metal)



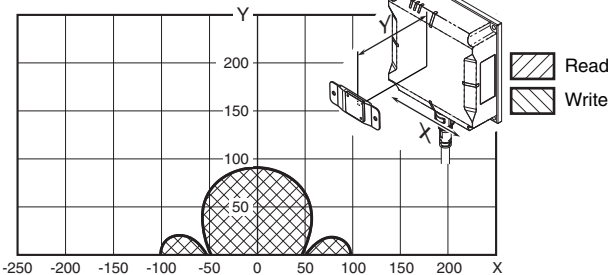
● V680S-HMD66-PNT and V680-D1KP66T
(Back Surface: Metal)



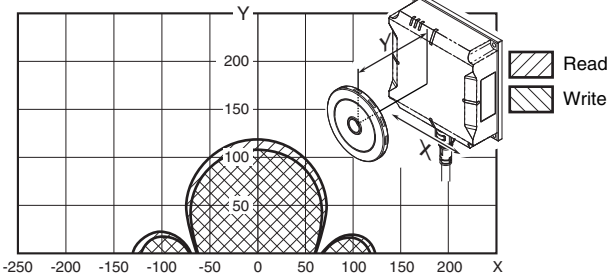
● V680S-HMD66-PNT and V680-D1KP66MT
(Back Surface: Metal) (Back Surface: Metal)



● V680S-HMD66-PNT and V680-D1KP66T-SP
(Back Surface: Metal)

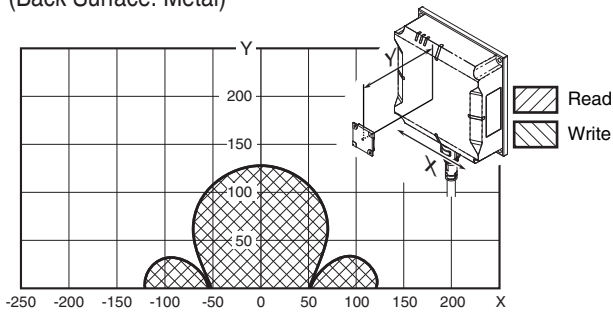


V680S-HMD66-PNT and V680-D1KP58HTN
(Back Surface: Metal) (with Attachment, V680-A80)

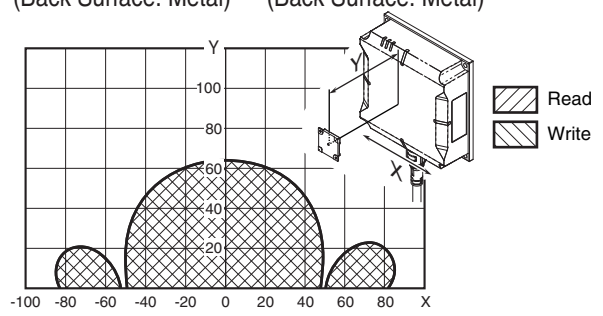


(Unit: mm)

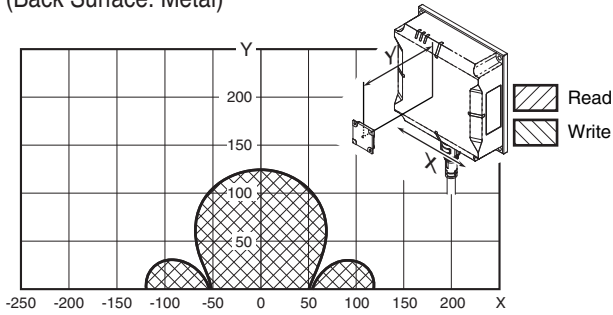
● V680S-HMD66-PNT and V680S-D2KF67
(Back Surface: Metal)



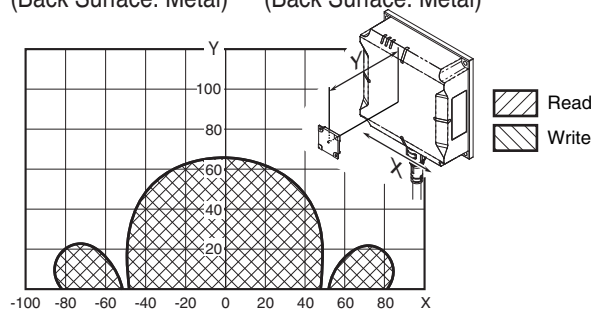
● V680S-HMD66-PNT and V680S-D2KF67M
(Back Surface: Metal) (Back Surface: Metal)



● V680S-HMD66-PNT and V680S-D8KF67
(Back Surface: Metal)

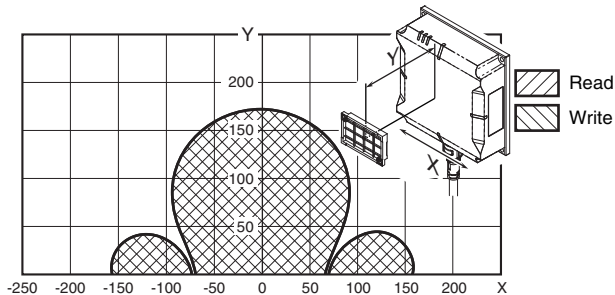


● V680S-HMD66-PNT and V680S-D8KF67M
(Back Surface: Metal) (Back Surface: Metal)

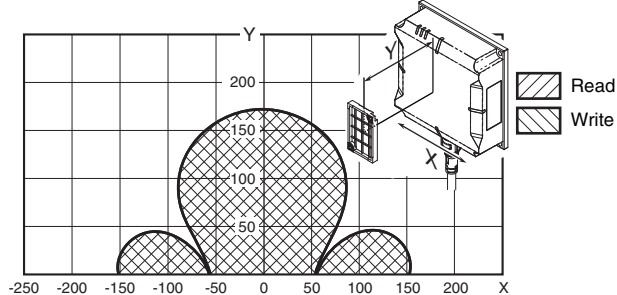


(Unit: mm)

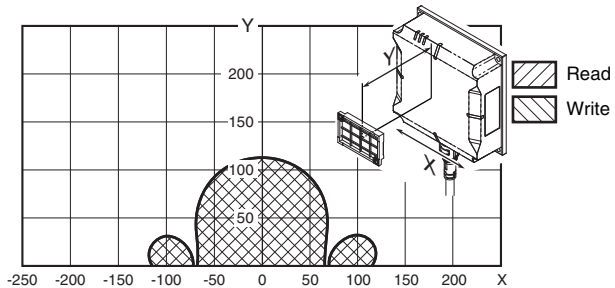
● V680S-HMD66-PNT and V680S-D2KF68
(Back Surface: Metal) (Horizontal-facing RF Tag)



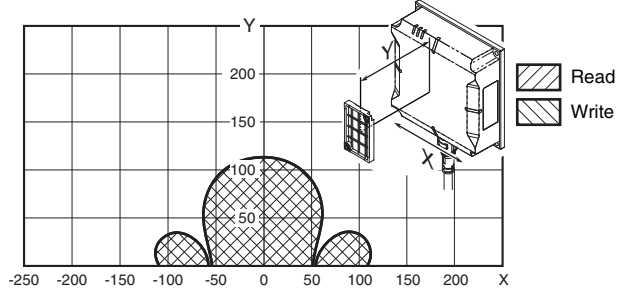
● V680S-HMD66-PNT and V680S-D2KF68
(Back Surface: Metal) (Vertical-facing RF Tag)



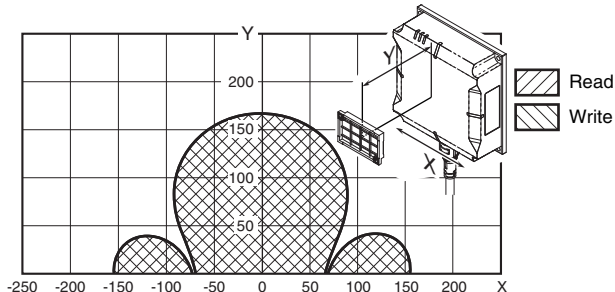
● V680S-HMD66-PNT and V680S-D2KF68M
(Back Surface: Metal) (Back Surface: Metal)
(Horizontal-facing RF Tag)



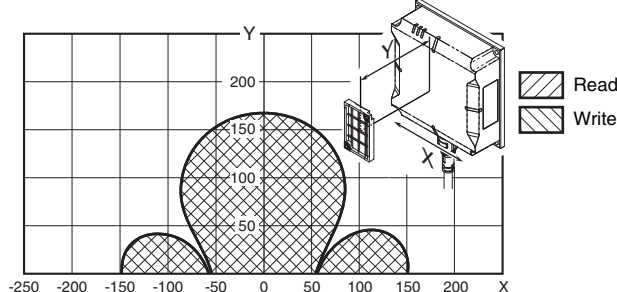
● V680S-HMD66-PNT and V680S-D2KF68M
(Back Surface: Metal) (Back Surface: Metal)
(Vertical-facing RF Tag)



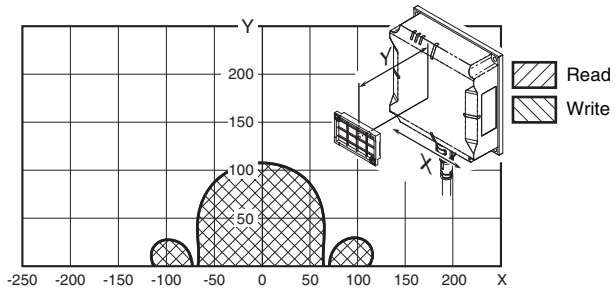
● V680S-HMD66-PNT and V680S-D8KF68
(Back Surface: Metal) (Horizontal-facing RF Tag)



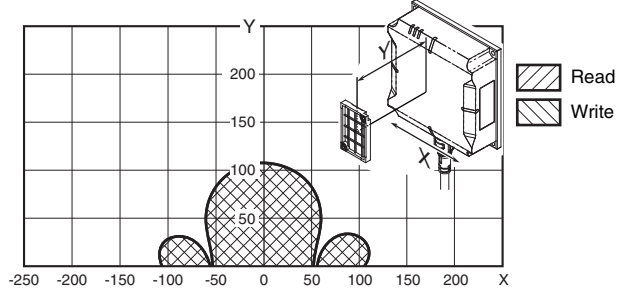
● V680S-HMD66-PNT and V680S-D8KF68
(Back Surface: Metal) (Vertical-facing RF Tag)



● V680S-HMD66-PNT and V680S-D8KF68M
(Back Surface: Metal) (Back Surface: Metal)
(Horizontal-facing RF Tag)



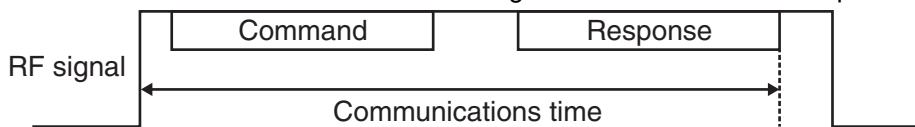
● V680S-HMD66-PNT and V680S-D8KF68M
(Back Surface: Metal) (Back Surface: Metal)
(Vertical-facing RF Tag)



RF Tag Communications Time (for Reference Only)

■ Communications Time

Communications time is from the rise of the RF signal to the last bit of the response from the RF tag.



RF signal : The radio wave that the Reader/Writer turns ON the RF Tag.
The Reader/Writer turns ON this RF signal and then sends the command to start communications with the RF tag.
When the communications end, the Reader/Writer turns OFF the RF signal

Command : The command that the Reader/Writer sends to the RF Tag.

Response : The response that the RF Tag returns to the Reader/Writer.



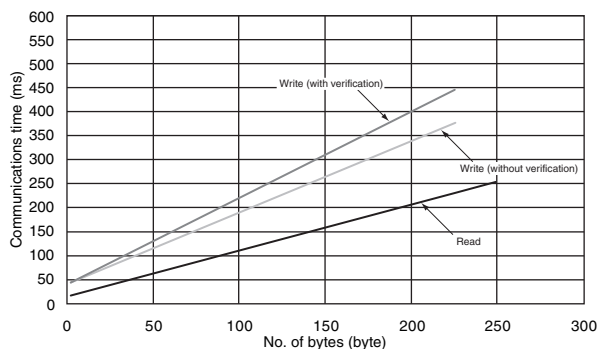
The communication time is approximately 200ms longer when enabling Communications Diagnosis function.

CHECK!

V680S-HMD6□-PNT and V680-D1KP□□

There are no differences between Communication speed: "normal" and "high".

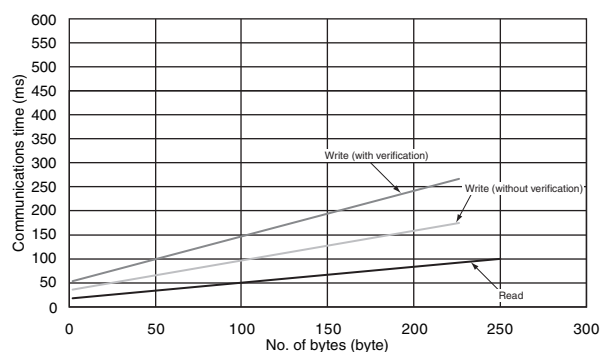
| Command | Communications time (ms) N: No. of bytes processed |
|------------------------------|---|
| Read | $T = 1.0N + 20.1$ |
| Write (with verification) | $T = 1.8N + 45.2$ |
| Write (without verification) | $T = 1.5N + 41.4$ |



V680S-HMD6□-PNT and V680S-D2KF6□ (Communications speed setting: High speed)

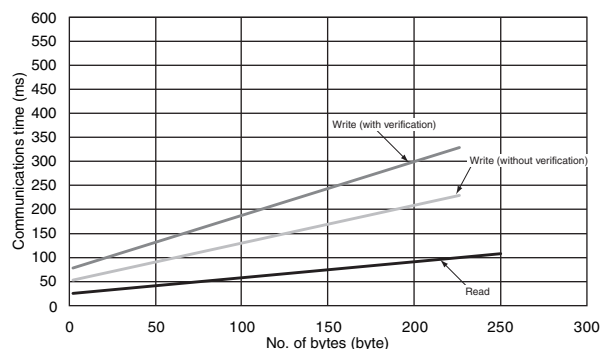
- Communication Option: Other than FIFO Repeat (With ID code check)

| Command | Communications time (ms) N: No. of bytes processed |
|------------------------------|---|
| Read | $T = 0.4N + 17.4$ |
| Write (with verification) | $T = 1.0N + 51.9$ |
| Write (without verification) | $T = 0.7N + 35.2$ |



- Communication Option: FIFO Repeat (With ID code check)

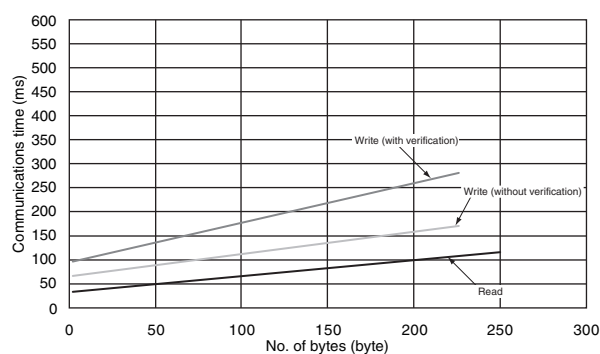
| Command | Communications time (ms) N: No. of bytes processed |
|------------------------------|---|
| Read | $T = 0.4N + 24.8$ |
| Write (with verification) | $T = 1.2N + 76.1$ |
| Write (without verification) | $T = 0.8N + 51.6$ |



V680S-HMD6□-PNT and V680S-D8KF6□ (Communications speed setting: High speed)

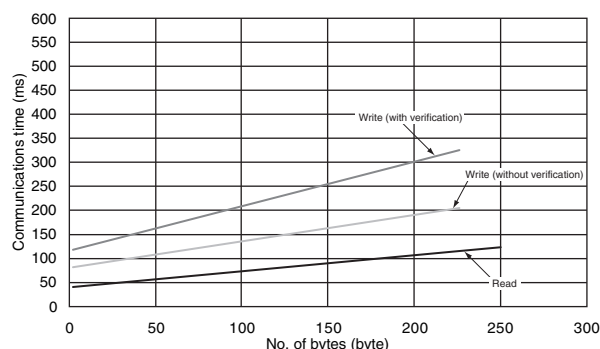
- Communication Option: Other than FIFO Repeat (With ID code check)

| Command | Communications time (ms) N: No. of bytes processed |
|------------------------------|---|
| Read | $T = 0.4N + 33.0$ |
| Write (with verification) | $T = 0.9N + 95.1$ |
| Write (without verification) | $T = 0.5N + 65.8$ |



- Communication Option: FIFO Repeat (With ID code check)

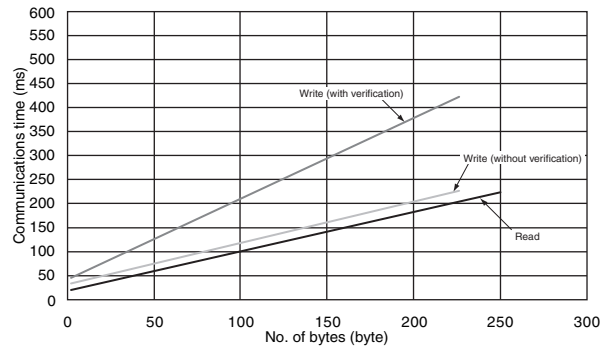
| Command | Communications time (ms) N: No. of bytes processed |
|------------------------------|---|
| Read | $T = 0.4N + 40.4$ |
| Write (with verification) | $T = 1.0N + 116.5$ |
| Write (without verification) | $T = 0.6N + 45.8$ |



V680S-HMD6□-PNT and V680S-D2KF6□ (Communications speed setting: Normal speed)

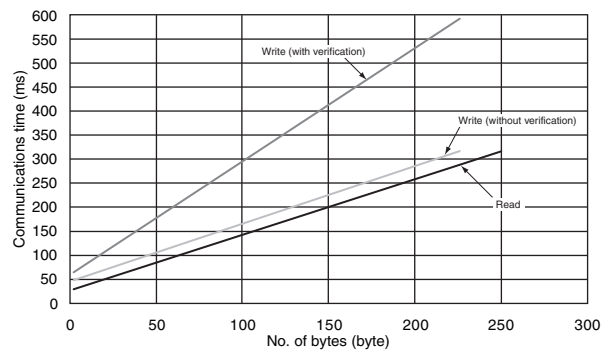
- Communication Option: Other than FIFO Repeat (With ID code check)

| Command | Communications time (ms) N: No. of bytes processed |
|------------------------------|---|
| Read | $T = 0.9N + 18.7$ |
| Write (with verification) | $T = 1.7N + 42.1$ |
| Write (without verification) | $T = 0.9N + 32.0$ |



- Communication Option: FIFO Repeat (With ID code check)

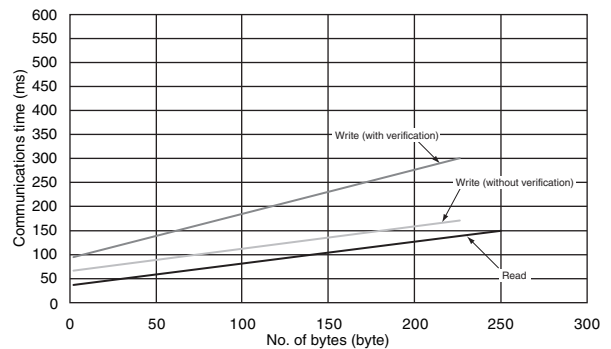
| Command | Communications time (ms) N: No. of bytes processed |
|------------------------------|---|
| Read | $T = 1.2N + 27.3$ |
| Write (with verification) | $T = 2.4N + 60.2$ |
| Write (without verification) | $T = 1.2N + 46.4$ |



V680S-HMD6□-PNT and V680S-D8KF6□ (Communications speed setting: Normal speed)

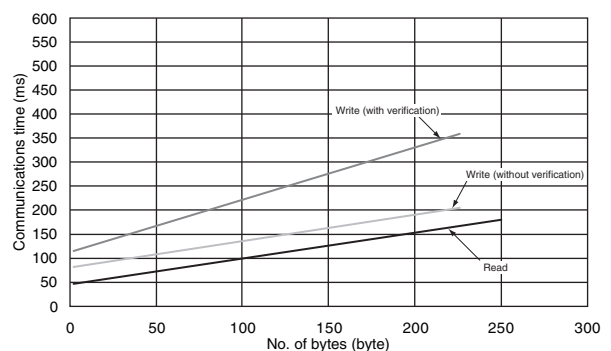
- Communication Option: Other than FIFO Repeat (With ID code check)

| Command | Communications time (ms) N: No. of bytes processed |
|------------------------------|---|
| Read | $T = 0.5N + 36.1$ |
| Write (with verification) | $T = 1.0N + 93.0$ |
| Write (without verification) | $T = 0.5N + 65.8$ |



- Communication Option: FIFO Repeat (With ID code check)

| Command | Communications time (ms) N: No. of bytes processed |
|------------------------------|---|
| Read | $T = 0.6N + 45.8$ |
| Write (with verification) | $T = 1.1N + 113.1$ |
| Write (without verification) | $T = 0.6N + 80.8$ |



Travel Speed Calculations

Set the communications option to Repeat to communicate with a moving RF Tag.

The maximum speed for communicating with the RF Tag can be calculated simply using the following formula.

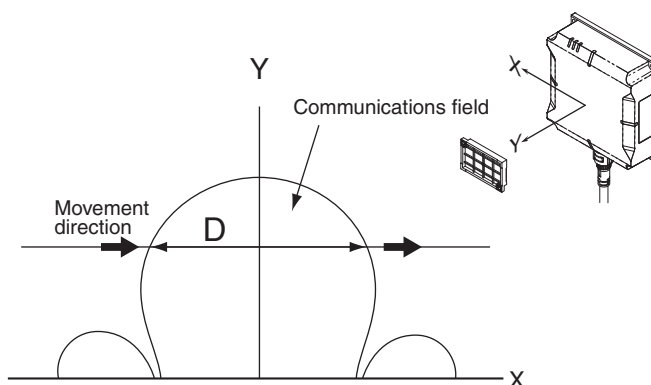
$$\text{Maximum speed} = \frac{D \text{ (Distance traveled in communications field)}}{T \text{ (Communications time)}}$$

D (Distance traveled in communications field) is calculated from the actual measurement or the communications field between the Reader/Writer and RF Tag.



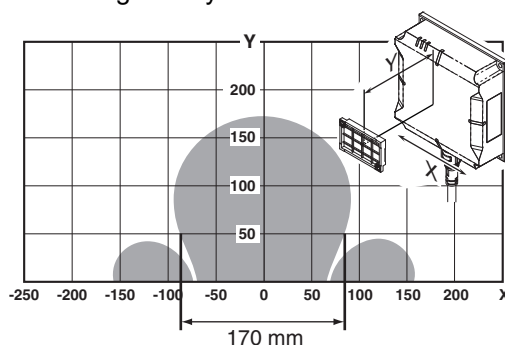
CHECK!

In order to ensure a margin, it is preferable that the communication time is calculated at twice.



Calculation Example

The following example is for reading 128 bytes with the V680S-D2KF68 and V680S-HMD66-PNT.



From the above chart,

Distance traveled in communications field = 170 mm when Y (communications range) is 50 mm

Communications time $T = 267.8$ ms (calculated from the communications time, i.e., $2 \text{ times} \times (0.9 \times 128 \text{ bytes} + 18.7)$)

Therefore, the maximum speed of the Tag is as follows:

$$\begin{aligned} \text{Maximum speed} &= \frac{D \text{ (Distance traveled in communications field)}}{T \text{ (Communications time)}} = \frac{170(\text{mm})}{267.8(\text{ms})} \\ &= 38.1 \text{ m/min} \end{aligned}$$

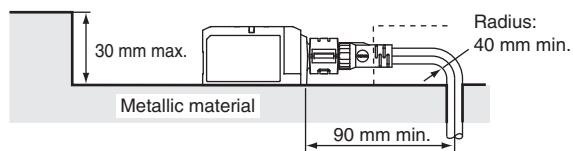
Reader/Writer Installation Precautions

V680S-HMD63-PNT

■ Influence of Surrounding Metal on Reader/Writer

The Reader/Writer can be surface-mounted or it can be embedded in metal to protect it from collisions. If you embed the Reader/Writer in metal, separate it at least 80 mm from any metallic surface to prevent malfunctions. If the distance between surrounding metal and the Reader/Writer is less than 80 mm, the Reader/Writer communications range will be greatly reduced.

Do not allow the height of the metal to exceed the height of the Reader/Writer.



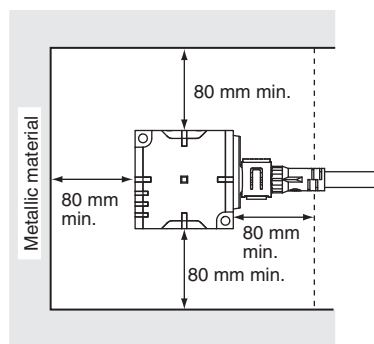
CHECK!

Provide a Cable bending radius of 40 mm or more.



CHECK!

The communications range will be reduced significantly if the Reader/Writer is installed closer than 80 mm to metal surfaces.



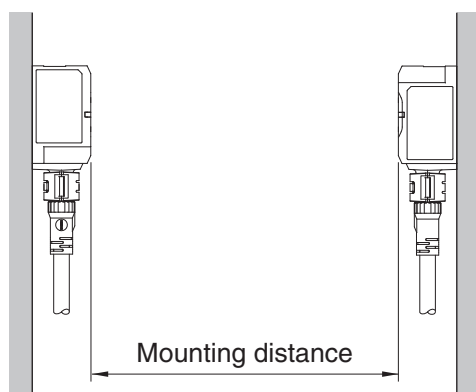
■ Mutual Interference of Reader/Writers

To prevent malfunctioning due to mutual interference when using more than one Reader/Writer, leave sufficient space between them as given in the following table.

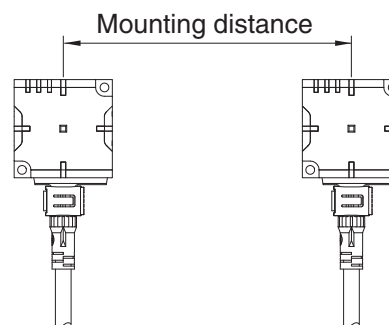
If the distance between the Reader/Writers is too short, the read/write distances will be reduced.

| RF Tag model | Mounting distance | |
|-----------------|---|---|
| | Installing the Reader/Writers facing each other | Installing the Reader/Writers in parallel |
| V680-D1KP54T | 230 mm | 110 mm |
| V680-D1KP66T | 300 mm | 100 mm |
| V680-D1KP66MT | 220 mm | 100 mm |
| V680-D1KP66T-SP | 300 mm | 100 mm |
| V680S-D2KF67 | 370 mm | 120 mm |
| V680S-D2KF67M | 220 mm | 100 mm |
| V680S-D8KF67 | 290 mm | 120 mm |
| V680S-D8KF67M | 240 mm | 100 mm |

- Installing the Reader/Writers Facing Each Other



- Installing the Reader/Writers in Parallel

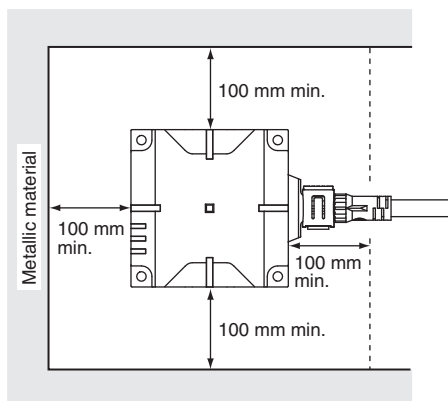
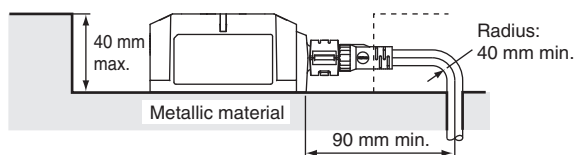


V680S-HMD64-PNT

■ Influence of Surrounding Metal on Reader/Writer

The Reader/Writer can be surface-mounted or it can be embedded in metal to protect it from collisions. If you embed the Reader/Writer in metal, separate it at least 100 mm from any metallic surface to prevent malfunctions. If the distance between surrounding metal and the Reader/Writer is less than 100 mm, the Reader/Writer communications range will be greatly reduced.

Do not allow the height of the metal to exceed the height of the Reader/Writer.



Provide a Cable bending radius of 40 mm or more.

The communications range will be reduced significantly if the Reader/Writer is installed closer than 100 mm to metal surfaces.

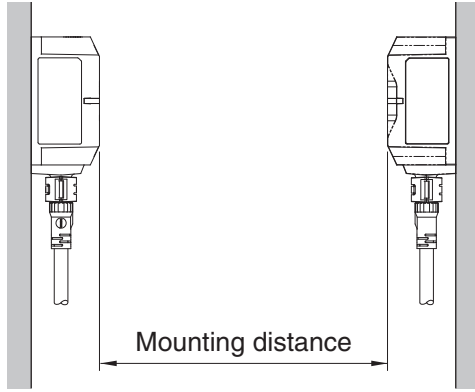
■ Mutual Interference of Reader/Writers

To prevent malfunctioning due to mutual interference when using more than one Reader/Writer, leave sufficient space between them as shown in the following diagrams.

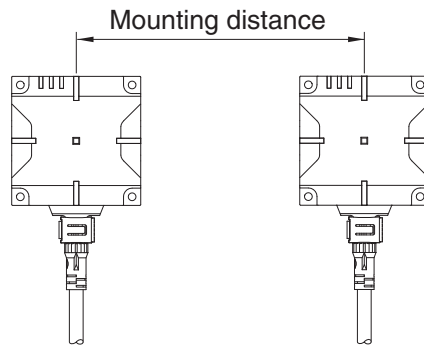
If the distance between the Reader/Writers is too short, read / write distance will be reduced.

| RF Tag model | Mounting distance | |
|-----------------|--|--|
| | Installing the Reader/Writer facing each other | Installing the Reader/Writer in parallel |
| V680-D1KP54T | 250 mm | 125 mm |
| V680-D1KP66T | 350 mm | 150 mm |
| V680-D1KP66MT | 250 mm | 150 mm |
| V680-D1KP66T-SP | 350 mm | 150 mm |
| V680-D1KP58HTN | 450 mm | 125 mm |
| V680S-D2KF67 | 460 mm | 170 mm |
| V680S-D2KF67M | 220 mm | 160 mm |
| V680S-D8KF67 | 400 mm | 170 mm |
| V680S-D8KF67M | 180 mm | 160 mm |
| V680S-D2KF68 | 600 mm | 180 mm |
| V680S-D2KF68M | 380 mm | 160 mm |
| V680S-D8KF68 | 600 mm | 180 mm |
| V680S-D8KF68M | 260 mm | 160 mm |

- Installing the Reader/Writer Facing Each Other



- Installing the Reader/Writer in Parallel

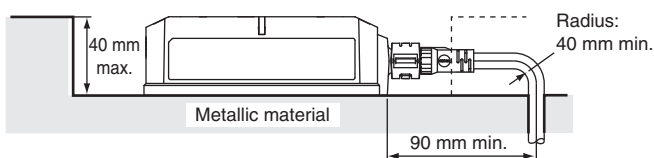


V680S-HMD66-PNT

■ Influence of Surrounding Metal on Reader/Writer

The Reader/Writer can be surface-mounted or it can be embedded in metal to protect it from collisions. If you embed the Reader/Writer in metal, separate it at least 160 mm from any metallic surface to prevent malfunctions. If the distance between surrounding metal and the Reader/Writer is less than 160 mm, the Reader/Writer communications range will be greatly reduced.

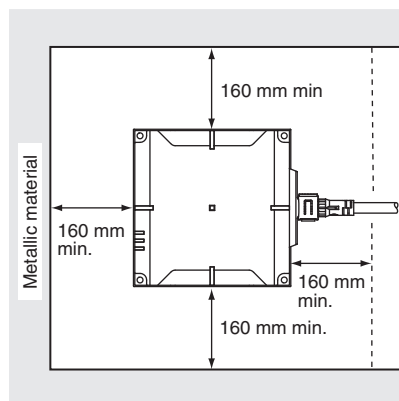
Do not allow the height of the metal to exceed the height of the Reader/Writer.



Provide a Cable bending radius of 40 mm or more.



The communications range will be reduced significantly if the Reader/Writer is installed closer than 160 mm to metal surfaces.



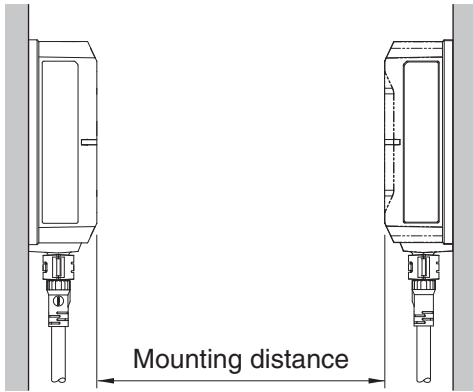
■ Mutual Interference of Reader/Writers

To prevent malfunctioning due to mutual interference when using more than one Reader/Writer, leave sufficient space between them as shown in the following diagrams.

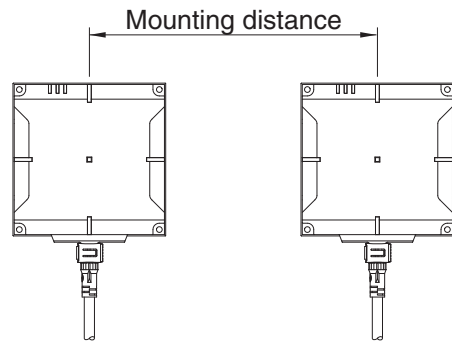
If the distance between the Reader/Writers is too short, read / write distance will be reduced.

| RF Tag model | Mounting distance | |
|-----------------|--|--|
| | Installing the Reader/Writer facing each other | Installing the Reader/Writer in parallel |
| V680-D1KP54T | 340 mm | 190 mm |
| V680-D1KP66T | 410 mm | 190 mm |
| V680-D1KP66MT | 300 mm | 180 mm |
| V680-D1KP66T-SP | 410 mm | 190 mm |
| V680-D1KP58HTN | 500 mm | 170 mm |
| V680S-D2KF67 | 460 mm | 230 mm |
| V680S-D2KF67M | 300 mm | 230 mm |
| V680S-D8KF67 | 580 mm | 250 mm |
| V680S-D8KF67M | 280 mm | 220 mm |
| V680S-D2KF68 | 750 mm | 220 mm |
| V680S-D2KF68M | 420 mm | 220 mm |
| V680S-D8KF68 | 600 mm | 240 mm |
| V680S-D8KF68M | 360 mm | 220 mm |

•Reader/Writers Installed Facing Each Other



•Reader/Writers Installed in Parallel



RF Tag Installation Precautions

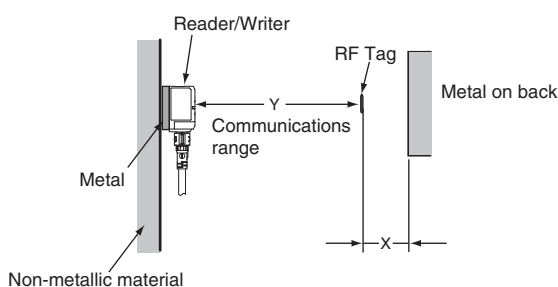
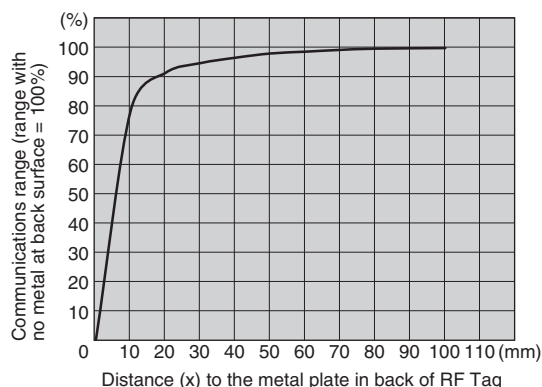
V680-D1KP54T

Effect of Metal behind RF Tags

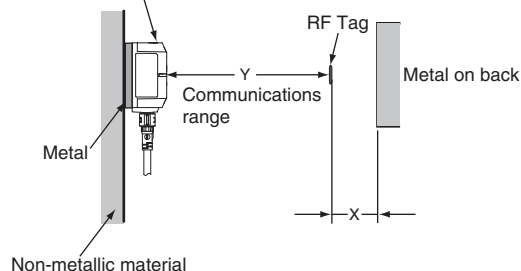
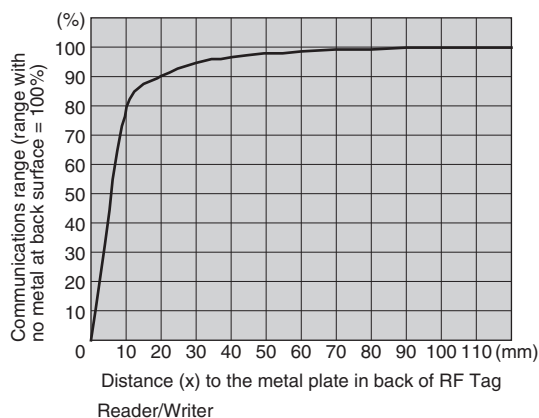
The communications range will decrease if there is metal at the back of the V680-D1KP54T RF Tag. The V700-A80 Attachment is 8 mm thick. If the RF Tag is mounted on metallic material, use a non-metallic spacer (e.g., plastic or resin). The following graphs show the relationship between the distance from the RF Tag to the metallic surface and the communications range.

The V700-A80 Attachment is 8 mm thick.

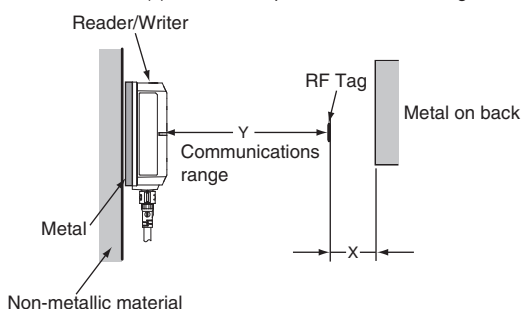
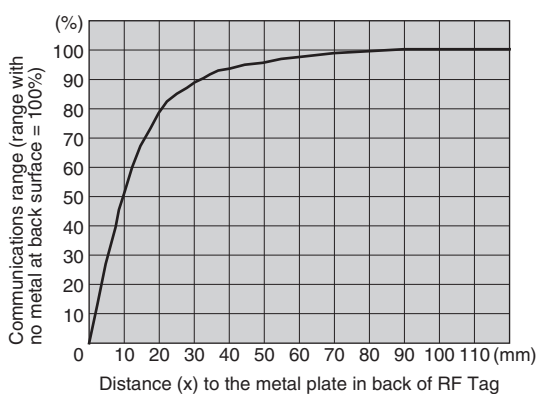
● V680S-HMD63-PNT and V680-D1KP54T



● V680S-HMD64-PNT and V680-D1KP54T



● V680S-HMD66-PNT and V680-D1KP54T

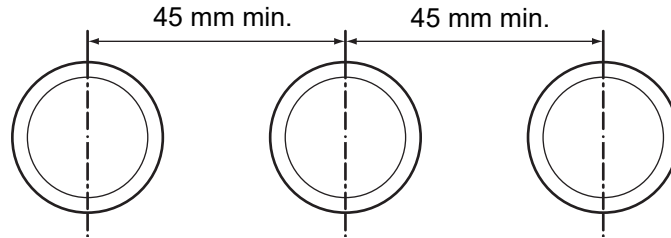


■ Mutual Interference of RF Tags

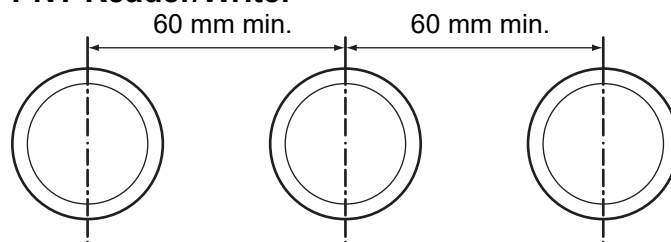
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

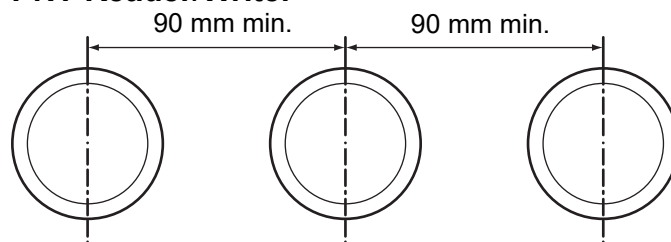
■ V680S-HMD63-PNT Reader/Writer



■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

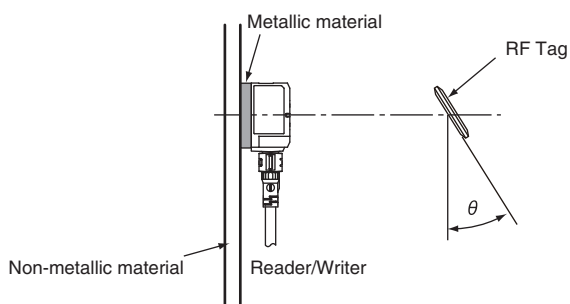
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680-D1KP54T

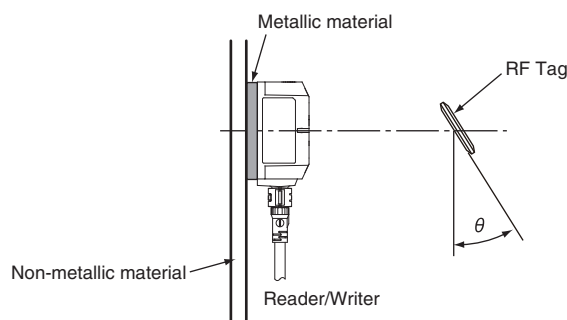
| | RF Tag inclination (θ°) | | | | | | | | | |
|----------------------------------|---------------------------------------|-----|-----|-----|------|------|------|------|------|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD63-PNT and V680-D1KP66T | 0% | 0% | -2% | -5% | -9% | -14% | -21% | -32% | -49% | --- |
| V680S-HMD64-PNT and V680-D1KP54T | 0% | -1% | -3% | -6% | -12% | -19% | -29% | -43% | -70 | --- |
| V680S-HMD66-PNT and V680-D1KP54T | 0% | -1% | -3% | -6% | -11% | -18% | -27% | -42% | -67 | --- |

■ Measurement Conditions

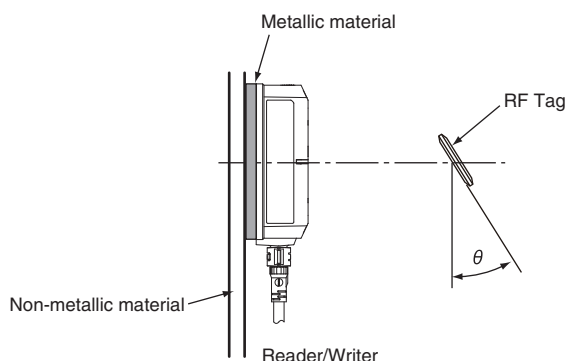
- V680S-HMD63-PNT and V680-D1KP54T



- V680S-HMD64-PNT and V680-D1KP54T



- V680S-HMD66-PNT and V680-D1KP54T



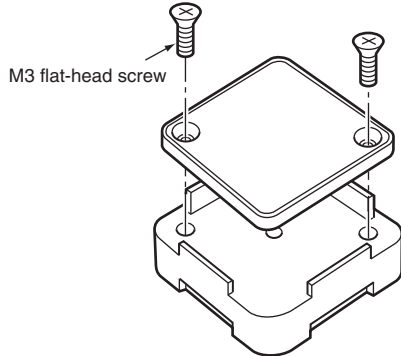
V680-D1KP66T

■ Influence of Metal at Back Surface

The communications range will decrease if there is metal at the back of the V680-D1KP66T RF Tag. If the RF Tag is mounted on metallic material, use the V600-A86 Attachment (sold separately) or insert a non-metallic spacer (e.g., plastic or resin). The following graphs show the relationship between the distance from the RF Tag to the metallic surface and the communications range.

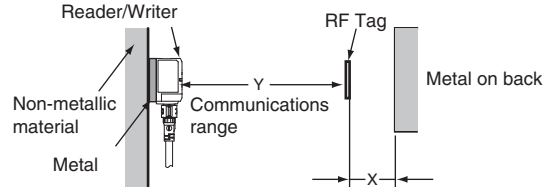
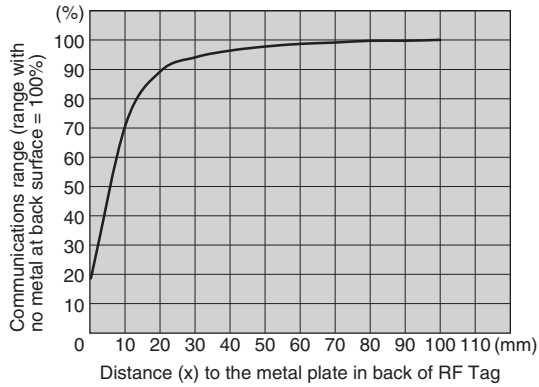
You can also use more than one Attachment (10 mm).

Installation with the V600-A86 Attachment

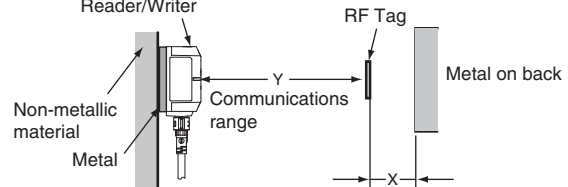
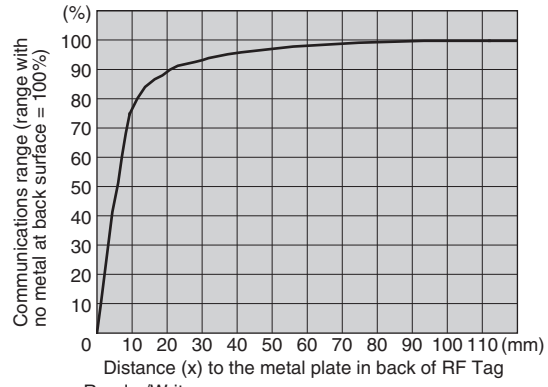


Note: Orient the RF Tag so that the mounting holes are aligned.

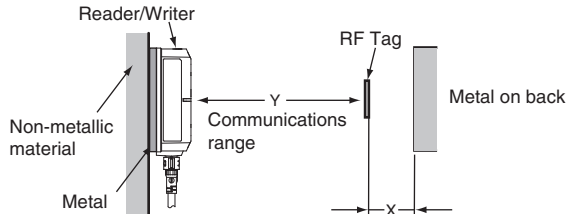
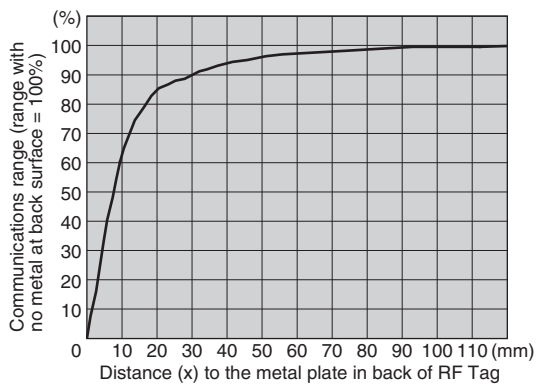
● V680S-HMD63-PNT and V680-D1KP66T



● V680S-HMD64-PNT and V680-D1KP66T



● V680S-HMD66-PNT and V680-D1KP66T

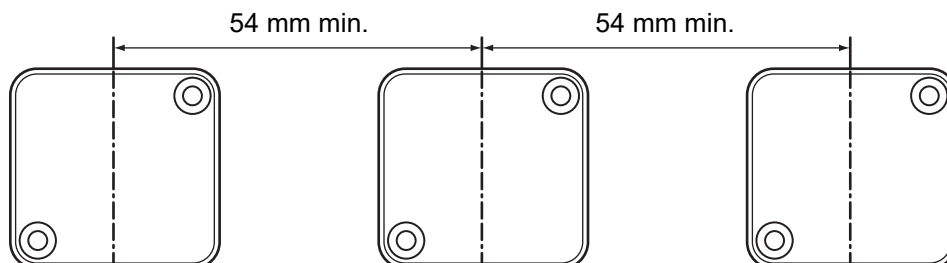


■ Mutual Interference of RF Tags

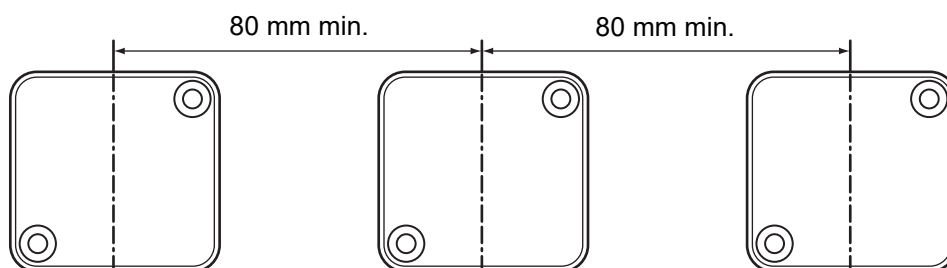
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

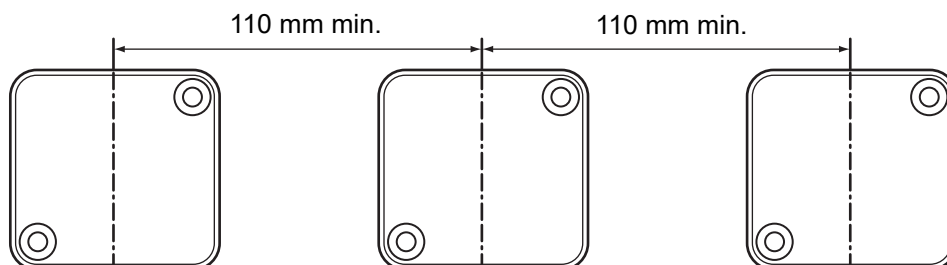
■ V680S-HMD63-PNT Reader/Writer



■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

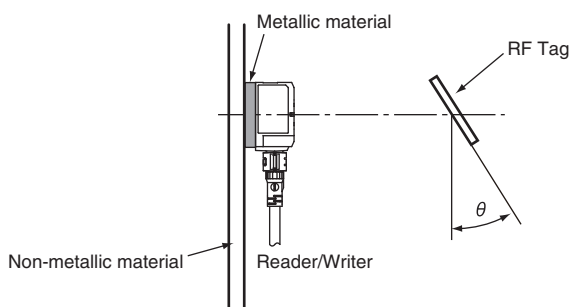
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680-D1KP66T

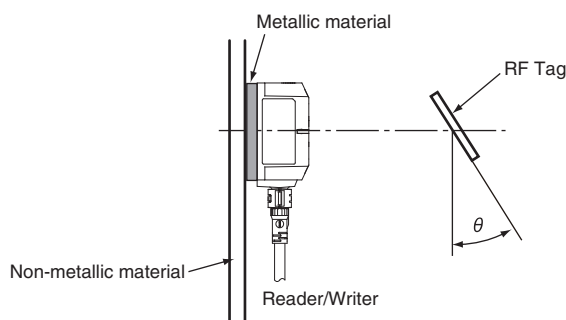
| | RF Tag inclination (θ°) | | | | | | | | | |
|-------------------------------------|---------------------------------------|-----|-----|-----|------|------|------|------|------|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD63-PNT and V680-D1KP66T-SP | 0% | -1% | -2% | -4% | -8% | -13% | -19% | -29% | -44% | --- |
| V680S-HMD64-PNT and V680-D1KP66T | 0% | -1% | -3% | -5% | -9% | -14% | -21% | -32% | -48% | --- |
| V680S-HMD66-PNT and V680-D1KP66T | 0% | -1% | -3% | -6% | -10% | -17% | -27% | -41% | -62% | --- |

■ Measurement Conditions

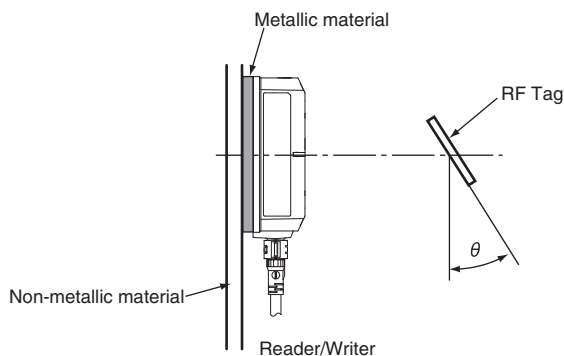
- V680S-HMD63-PNT and V680-D1KP66T



- V680S-HMD64-PNT and V680-D1KP66T



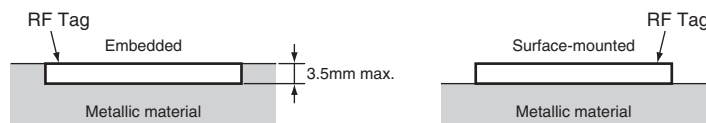
- V680S-HMD66-PNT and V680-D1KP66T



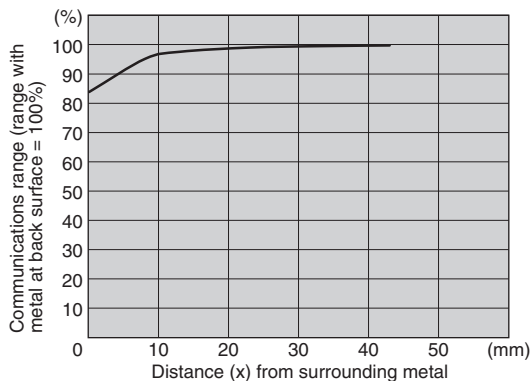
V680-D1KP66MT

■ Influence of Surrounding Metal

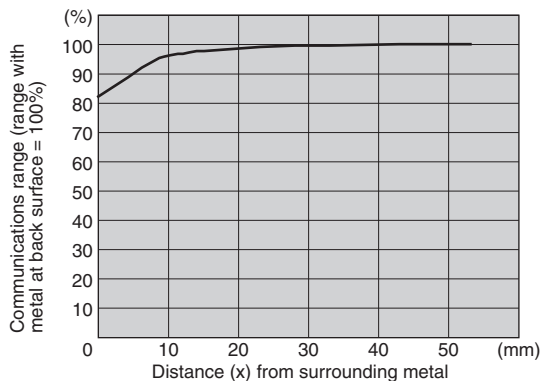
The V680-D1KP66MT can be surface-mounted or it can be embedded in metal. However, do not allow the height of the metal to exceed the height of the V680-D1KP66MT.



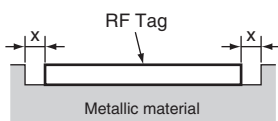
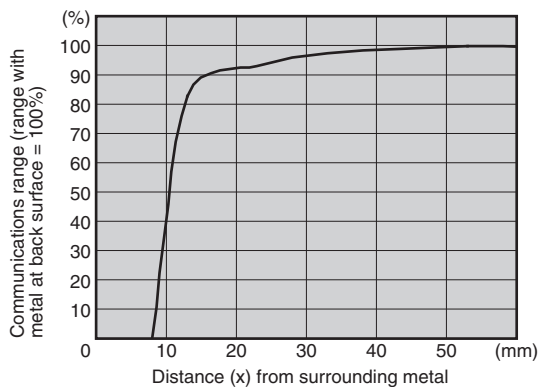
● V680S-HMD63-PNT and V680-D1KP66MT



● V680S-HMD64-PNT and V680-D1KP66MT



● V680S-HMD66-PNT and V680-D1KP66MT

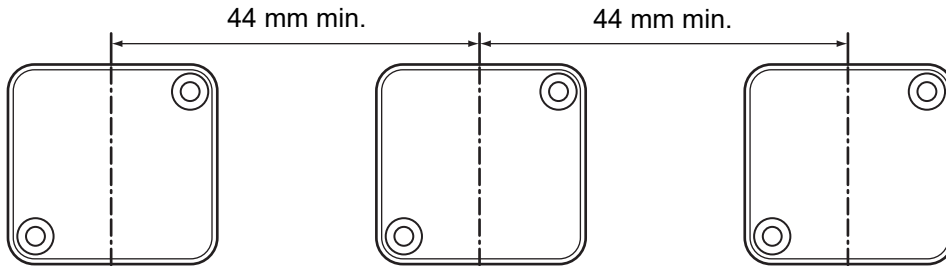


■ Mutual Interference of RF Tags

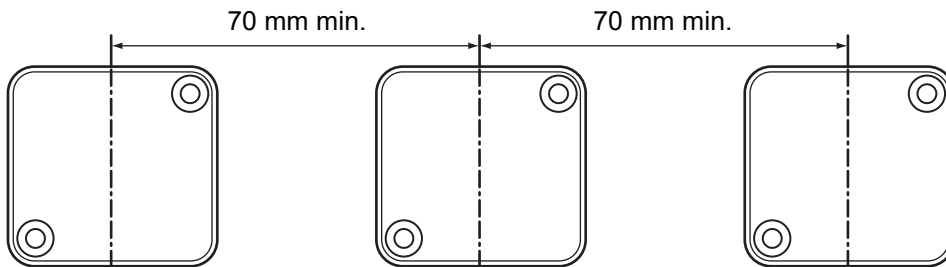
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

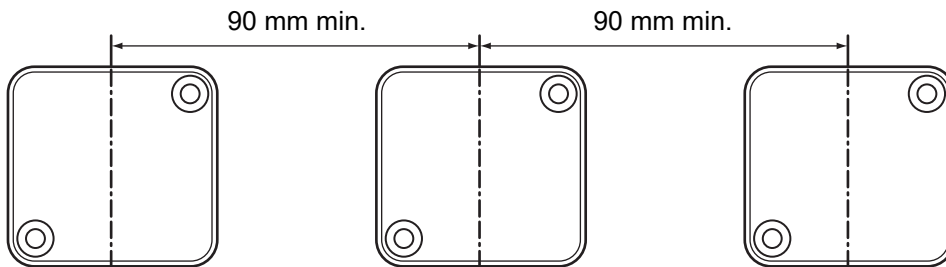
■ V680S-HMD63-PNT Reader/Writer



■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

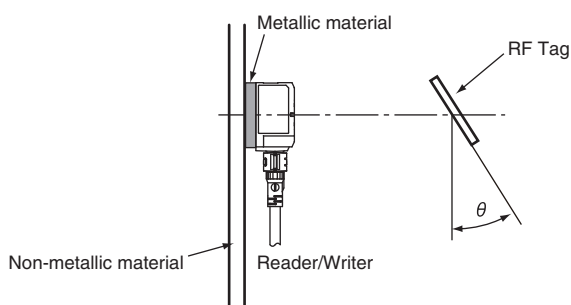
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680-D1KP66MT

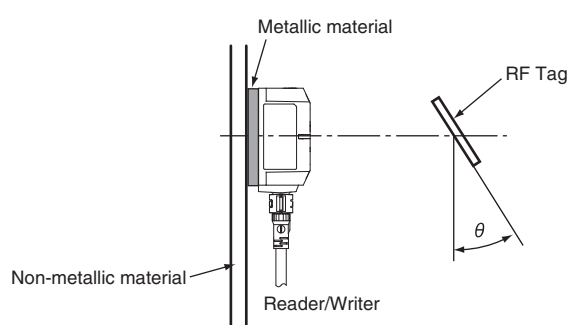
| | RF Tag inclination (θ°) | | | | | | | | | |
|---|---------------------------------------|-----|-----|-----|------|------|------|------|-----|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD63-PNT and V680-D1KP66MT (Metal at back surface: Steel) | 0% | -1% | -6% | -9% | -15% | -23% | -36% | -67% | --- | --- |
| V680S-HMD64-PNT and V680-D1KP66MT (Metal at back surface: Steel) | 0% | 0% | -2% | -5% | -10% | -18% | -31% | -59% | --- | --- |
| V680S-HMD66-PNT and V680-D1KP66MT (Metal at back surface: Steel) | 0% | 0% | -3% | -7% | -16% | -28% | -49% | --- | --- | --- |

■ Measurement Conditions

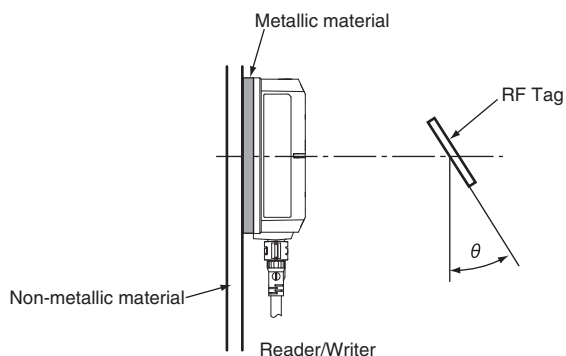
- V680S-HMD63-PNT and V680-D1KP66MT
(Metal at Back Surface: Steel)



- V680S-HMD64-PNT and V680-D1KP66MT
(Metal at Back Surface: Steel)



- V680S-HMD66-PNT and V680-D1KP66MT
(Metal at Back Surface: Steel)

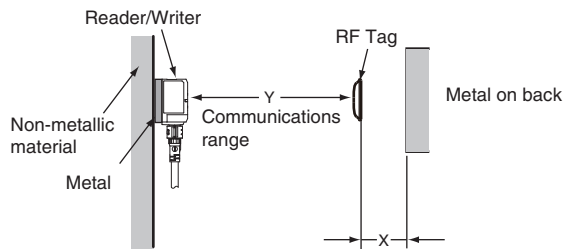
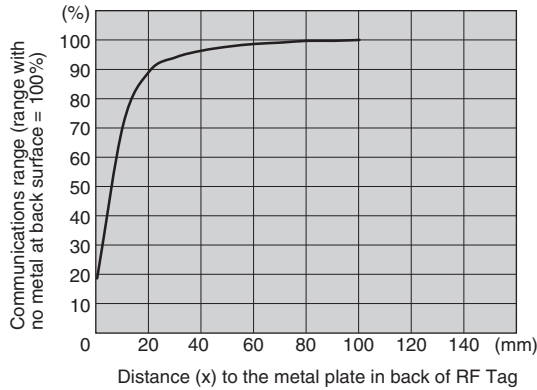


V680-D1KP66T-SP

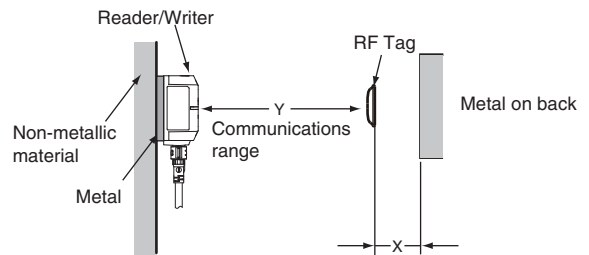
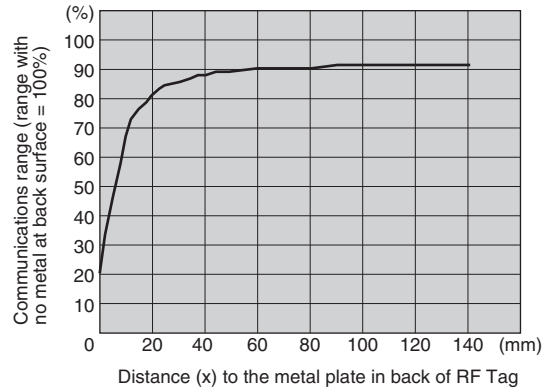
■ Influence of Metal at Back Surface

The communications range will decrease if there is metal at the back of the V680-D1KP66T-SP RF Tag. If the RF Tag is mounted on metallic material, use a non-metallic spacer (e.g., plastic or resin). The following graphs show the relationship between the distance from the RF Tag to the metallic surface and the communications range.

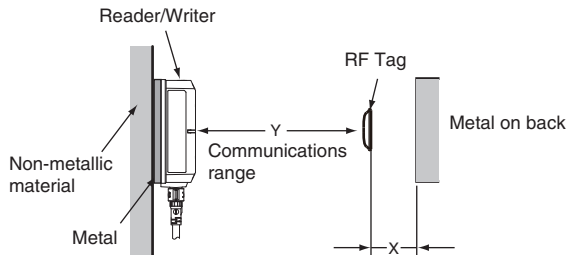
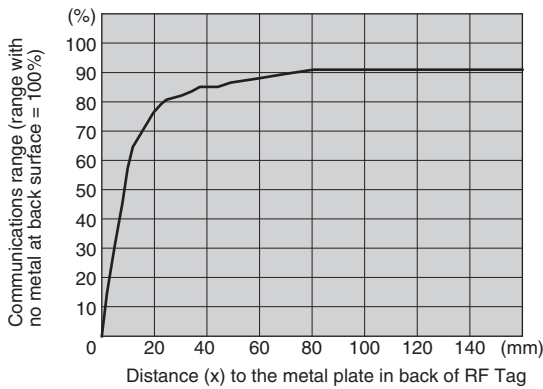
● V680S-HMD63-PNT and V680-D1KP66T-SP



● V680S-HMD64-PNT and V680-D1KP66T-SP



● V680S-HMD66-PNT and V680-D1KP66T-SP

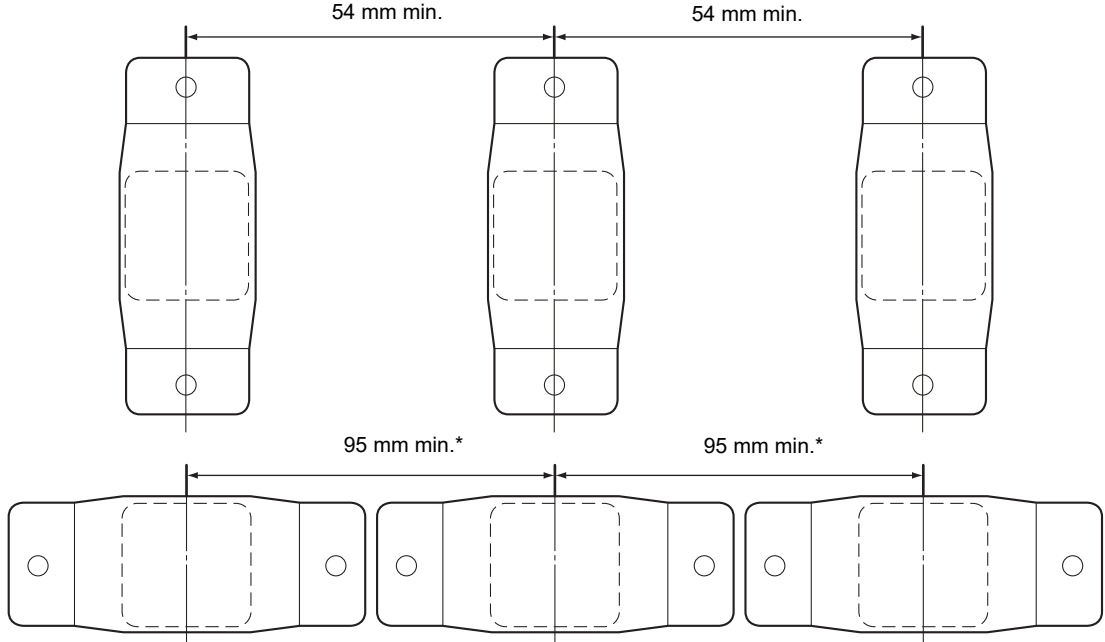


■ Mutual Interference of RF Tags

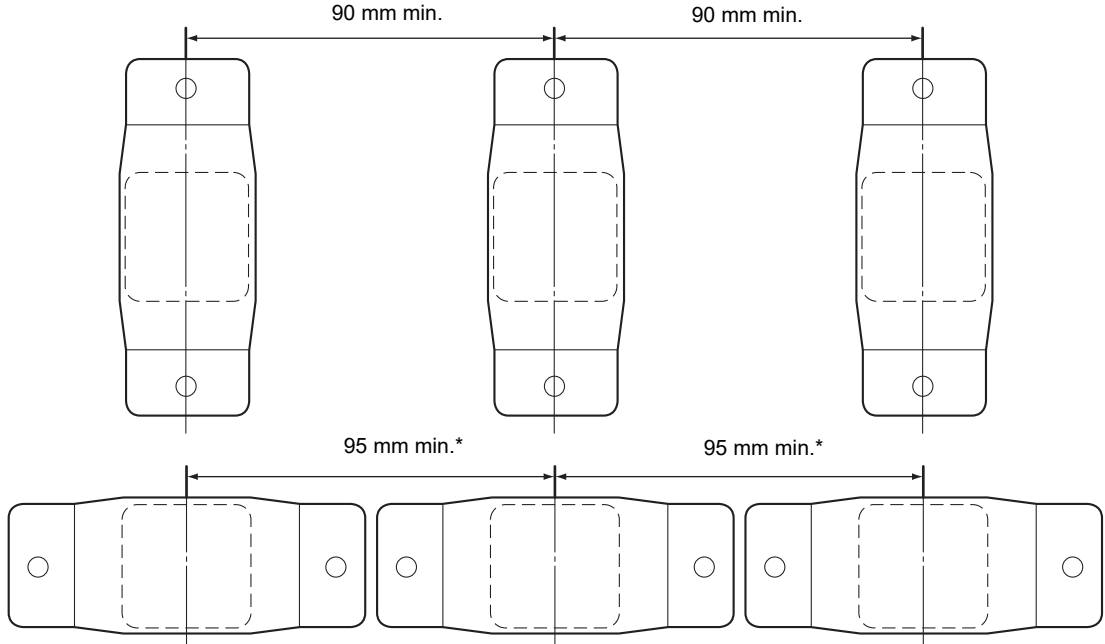
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

■ V680S-HMD63-PNT Reader/Writer

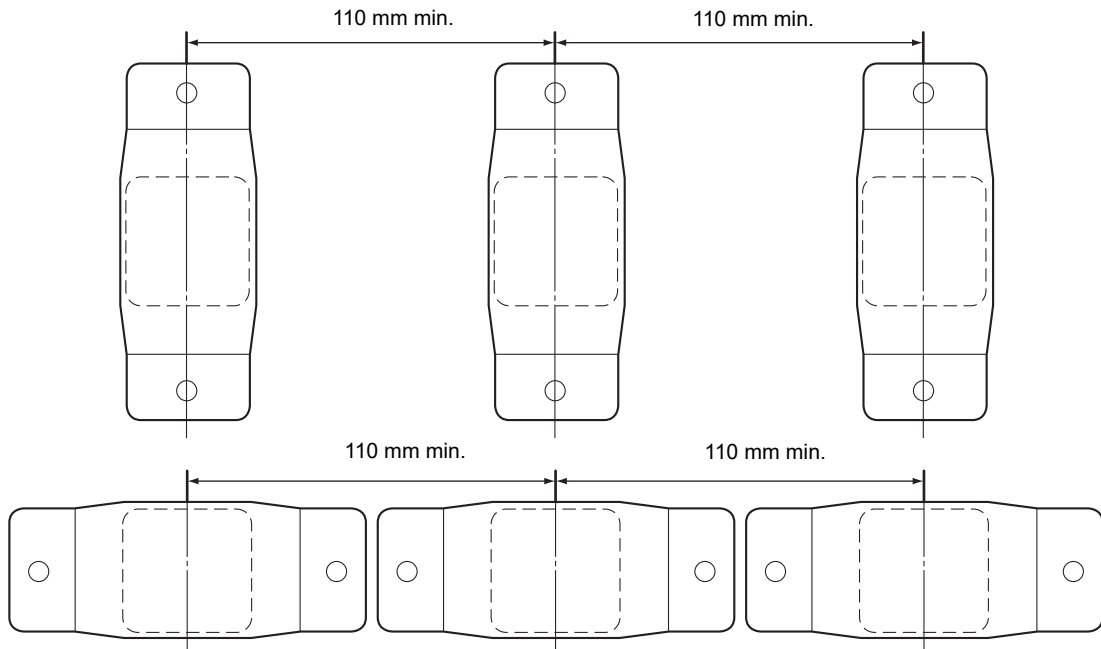


■ V680S-HMD64-PNT Reader/Writer



* This is required for the V680-D1KP66T-SP exterior dimension (Length: 95 mm).

V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

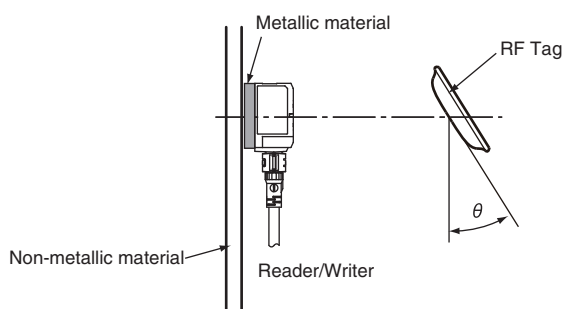
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680-D1KP66T-SP

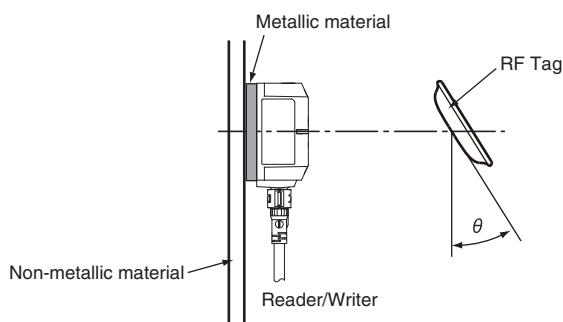
| | RF Tag inclination (θ°) | | | | | | | | | |
|-------------------------------------|---------------------------------------|-----|-----|-----|------|------|------|------|------|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD63-PNT and V680-D1KP66T-SP | 0% | -1% | -2% | -4% | -8% | -13% | -19% | -29% | -44% | --- |
| V680S-HMD64-PNT and V680-D1KP66T-SP | 0% | -1% | -3% | -5% | -9% | -14% | -21% | -32% | -48% | --- |
| V680S-HMD66-PNT and V680-D1KP66T-SP | 0% | -1% | -3% | -6% | -10% | -17% | -27% | -41% | -62% | --- |

■ Measurement Conditions

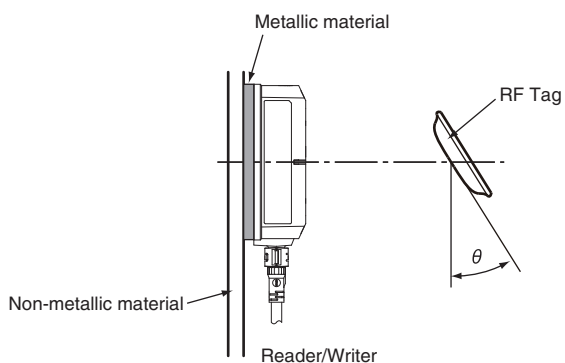
- V680S-HMD63-PNT and V680-D1KP66T-SP



- V680S-HMD64-PNT and V680-D1KP66T-SP



- V680S-HMD66-PNT and V680-D1KP66T-SP



V680-D1KP58HTN

■ Influence of Metal at Back Surface

You must consider the influence of the mounting location when mounting RF Tags.

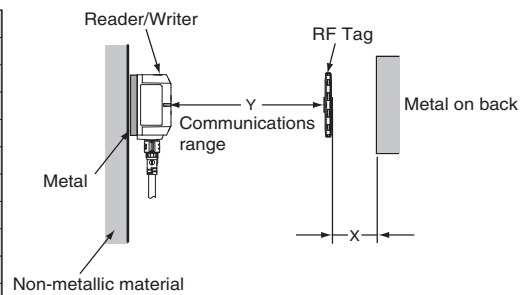
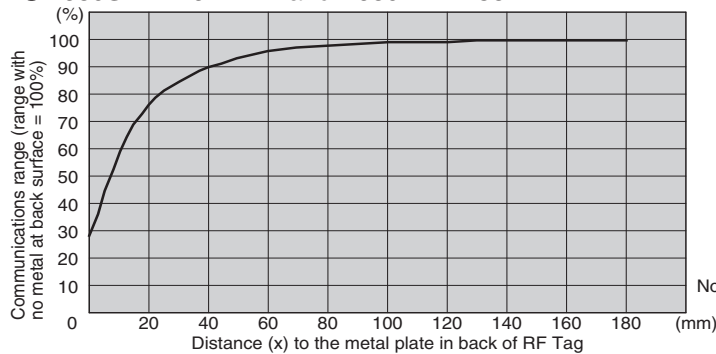
The communications range of an RF Tag may be reduced by the influence of the surrounding objects. The amount that the communications range decreases will depend on the materials and shapes of the surrounding objects. As reference data, this section shows the influence of metal at the back surface of an RF Tag.

■ Influence of Metal Objects

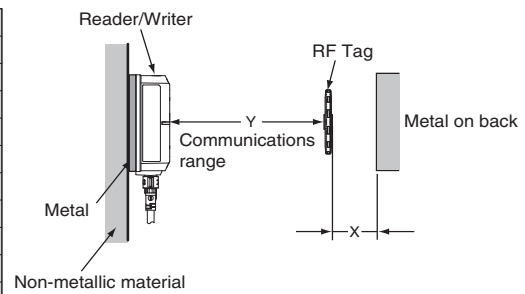
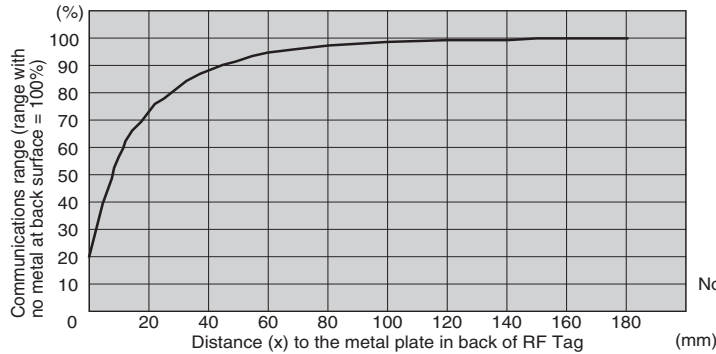
The following figure shows the percentage of decrease in the communications range when there is a metal object at the back surface of an RF Tag.

The X axis gives the distance between the RF Tag and a metal plate. The Y axis shows the relative communications range taking the communications range with no metal plate as 100% (i.e., it shows the percentage of decrease in the communications range).

● V680S-HMD64-PNT and V680-D1KP58HTN



● V680S-HMD66-PNT and V680-D1KP58HTN



Material: Steel (thickness: 1.5 mm)

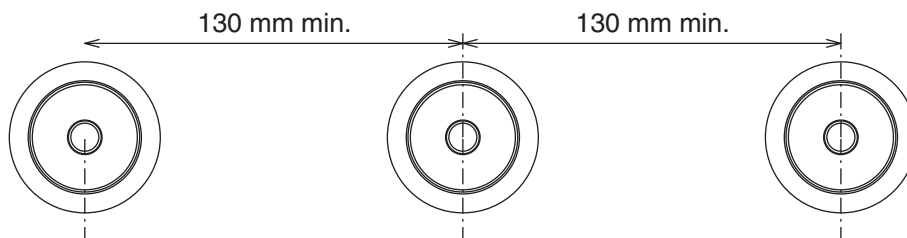
Shape: 295 × 295 mm

■ Mutual Interference of RF Tags

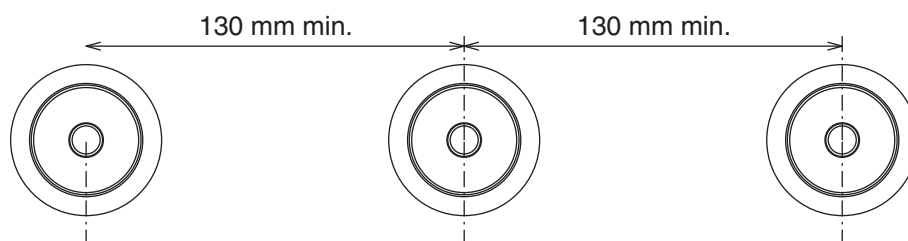
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

The maximum communications range is achieved when the RF Tags are mounted so that the surfaces of the RF Tags are parallel with the surface of the Reader/Writer. If the RF Tags are mounted at an angle, the communications range will decrease. You must consider the influence of the inclination of the RF Tags when mounting RF Tags.

As reference data, this section shows the decrease in the communications range due to RF Tag inclination.

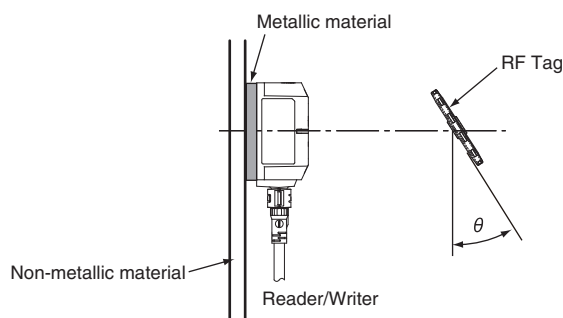
The X axis gives the angle with 0° which indicates that the RF Tag and Reader/Writer surfaces are parallel to each other. The Y axis shows the relative communications range taking the communications range at 0° as 100% (i.e., it shows the percentage of decrease in the communications range).

■ Rates of Change in Communications Range for Inclination of V680-D1KP58HTN

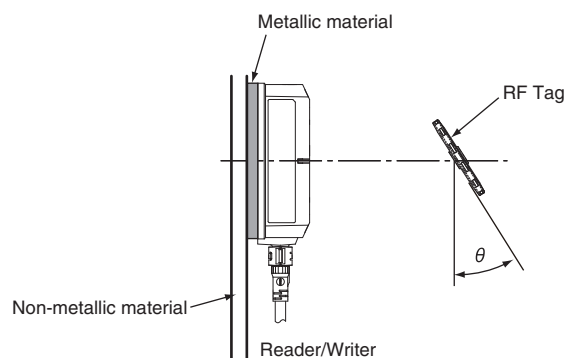
| | RF Tag inclination (θ°) | | | | | | | | | |
|------------------------------------|---------------------------------------|-----|-----|-----|-----|------|------|------|------|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD64-PNT and V680-D1KP58HTN | 0% | -1% | -3% | -5% | -8% | -14% | -22% | -32% | -35% | --- |
| V680S-HMD66-PNT and V680-D1KP58HTN | 0% | -1% | -2% | -4% | -7% | -11% | -17% | -27% | -44% | --- |

■ Measurement Conditions

- V680S-HMD64-PNT and V680-D1KP58HTN



- V680S-HMD66-PNT and V680-D1KP58HTN

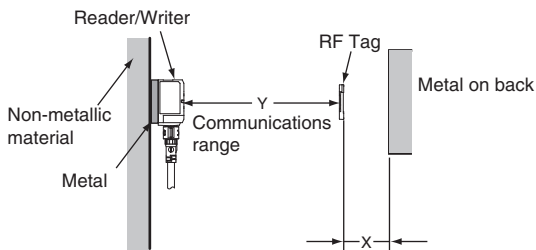
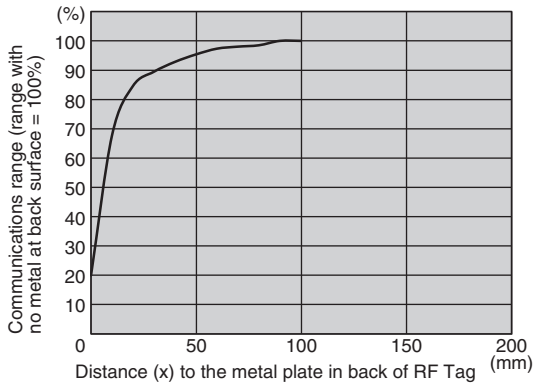


V680S-D2KF67

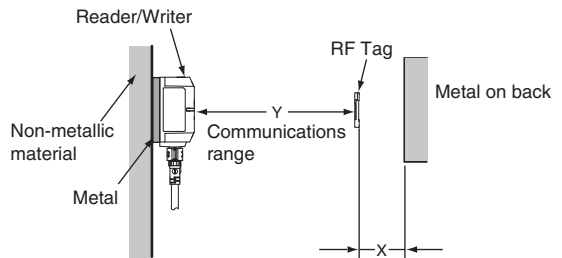
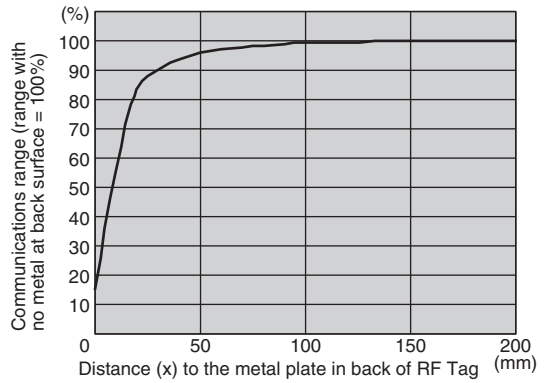
■ Influence of Metal at Back Surface of RF Tags

The communications range will decrease if there is metal at the back of the V680S-D2KF67 RF Tag. If the RF Tag is mounted on metallic material, use a non-metallic spacer (e.g., plastic or resin). The following graphs show the relationship between the distance from the RF Tag to the metallic surface and the communications range.

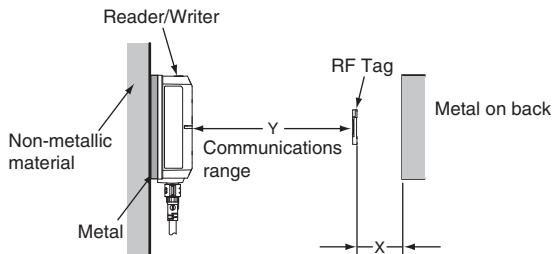
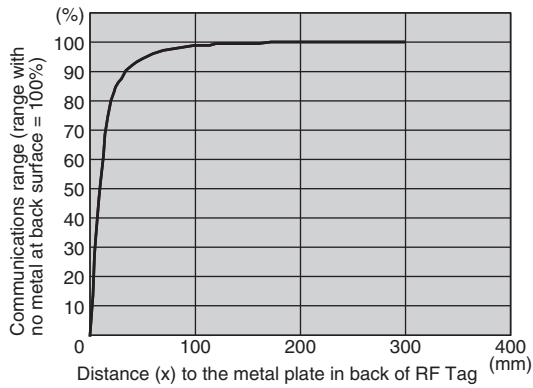
● V680S-HMD63-PNT and V680S-D2KF67



● V680S-HMD64-PNT and V680S-D2KF67



● V680S-HMD66-PNT and V680S-D2KF67

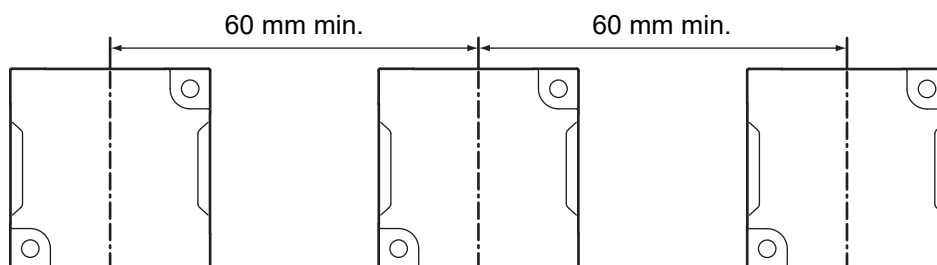


■ Mutual Interference of RF Tags

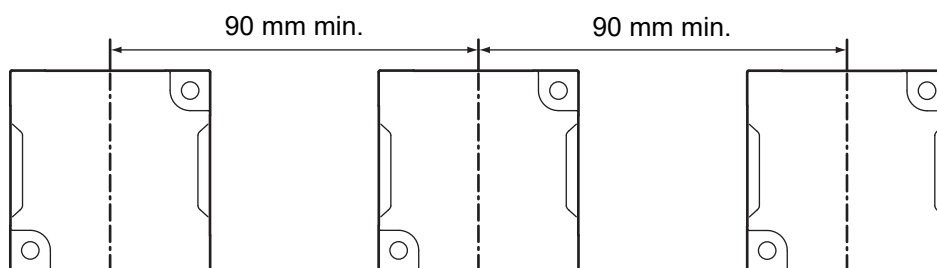
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

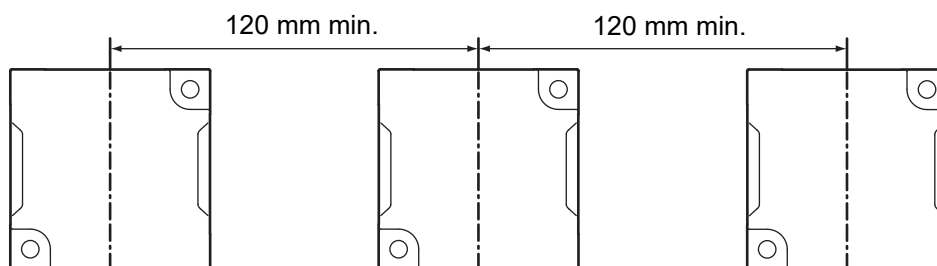
■ V680S-HMD63-PNT Reader/Writer



■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

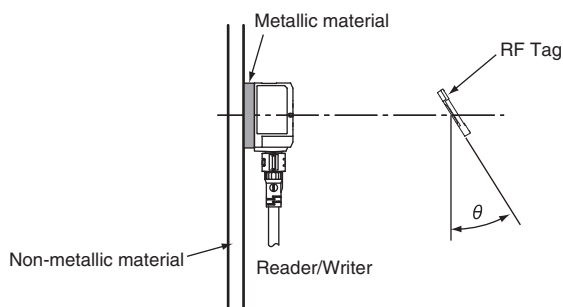
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680S-D2KF67

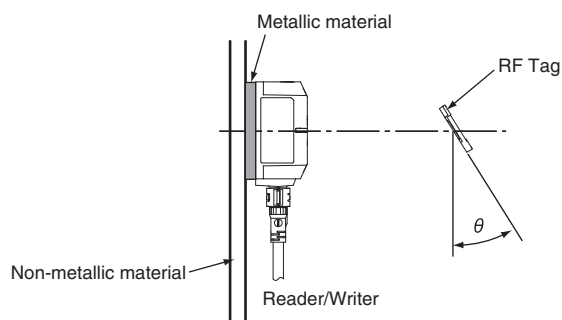
| | RF Tag inclination (θ°) | | | | | | | | | |
|----------------------------------|---------------------------------------|-----|-----|-----|-----|------|------|------|------|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD63-PNT and V680S-D2KF67 | 0% | -1% | -2% | -4% | -8% | -13% | -20% | -29% | -44% | --- |
| V680S-HMD64-PNT and V680S-D2KF67 | 0% | -1% | -3% | -5% | -8% | -13% | -19% | -27% | -38% | --- |
| V680S-HMD66-PNT and V680S-D2KF67 | 0% | -1% | -2% | -4% | -8% | -13% | -19% | -29% | -43% | --- |

■ Measurement Conditions

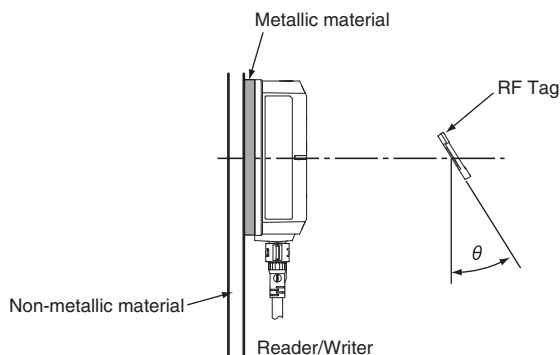
- V680S-HMD63-PNT and V680S-D2KF67



- V680S-HMD64-PNT and V680S-D2KF67



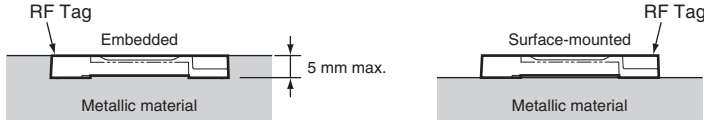
- V680S-HMD66-PNT and V680S-D2KF67



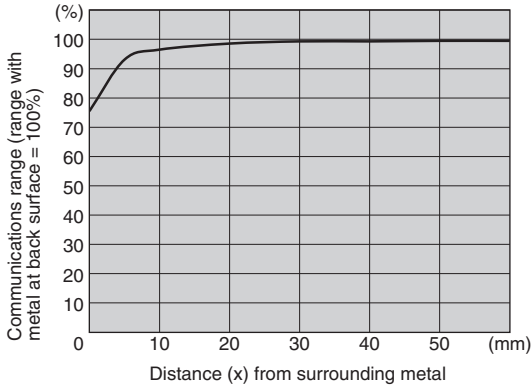
V680S-D2KF67M

■ Influence of Surrounding Metal

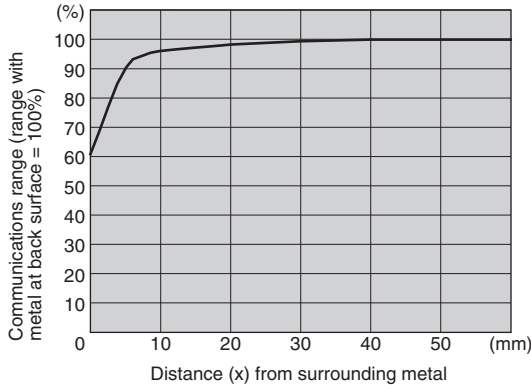
The V680S-D2KF67M can be surface-mounted or it can be embedded in metal. However, do not allow the height of the metal to exceed the height of the V680S-D2KF67M.



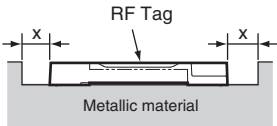
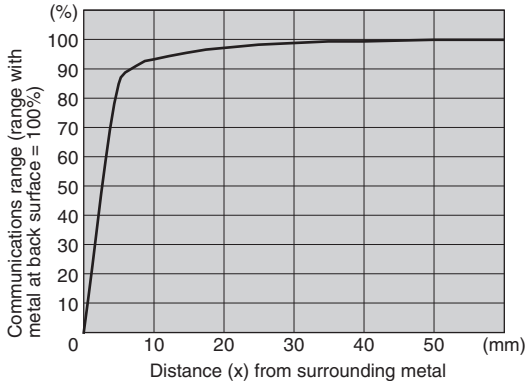
● V680S-HMD63-PNT and V680S-D2KF67M



● V680S-HMD64-PNT and V680S-D2KF67M



● V680S-HMD66-PNT and V680S-D2KF67M

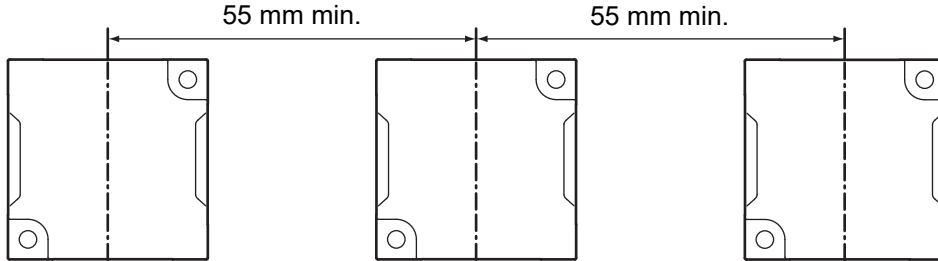


■ Mutual Interference of RF Tags

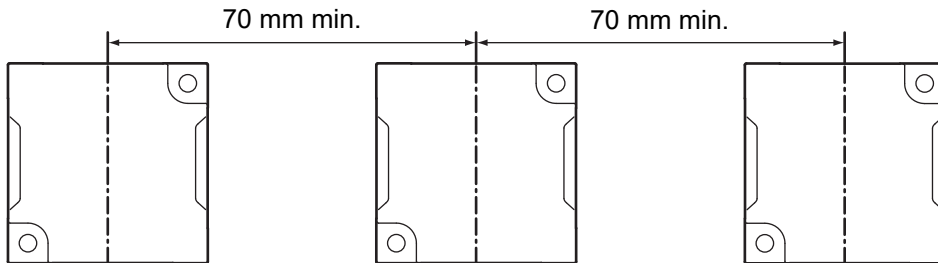
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

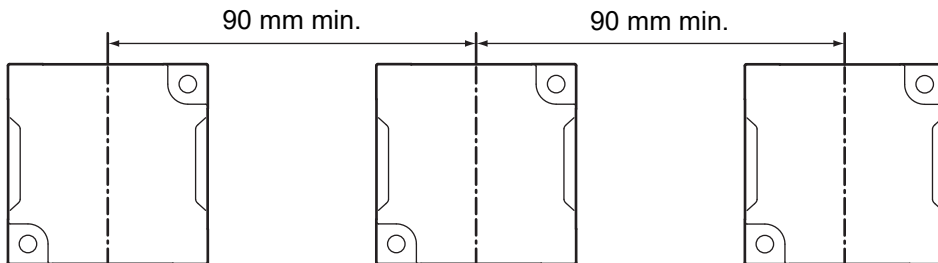
■ V680S-HMD63-PNT Reader/Writer



■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

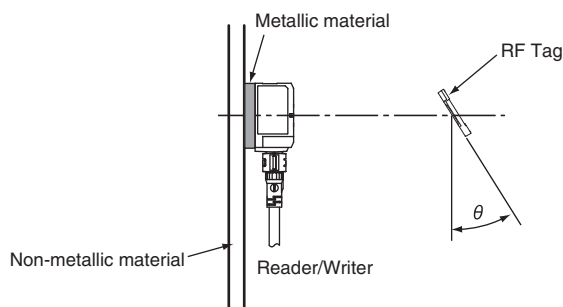
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680S-D2KF67M

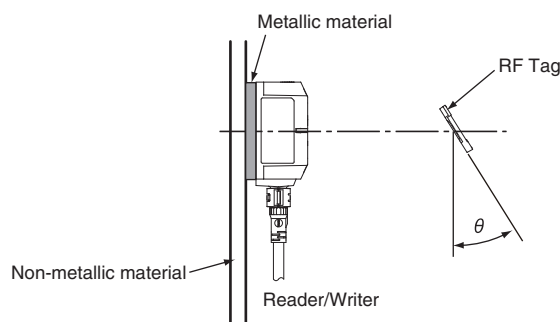
| | RF Tag inclination (θ°) | | | | | | | | | |
|---|---------------------------------------|-----|-----|-----|------|------|------|-----|-----|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD63-PNT and V680S-D2KF67M (Metal at back surface: Steel) | 0% | -1% | -4% | -8% | -15% | -25% | -50% | --- | --- | --- |
| V680S-HMD64-PNT and V680S-D2KF67M (Metal at back surface: Steel) | 0% | -1% | -3% | -7% | -12% | -21% | -37% | --- | --- | --- |
| V680S-HMD66-PNT and V680S-D2KF67M (Metal at back surface: Steel) | 0% | -1% | -4% | -9% | -18% | -33% | --- | --- | --- | --- |

■ Measurement Conditions

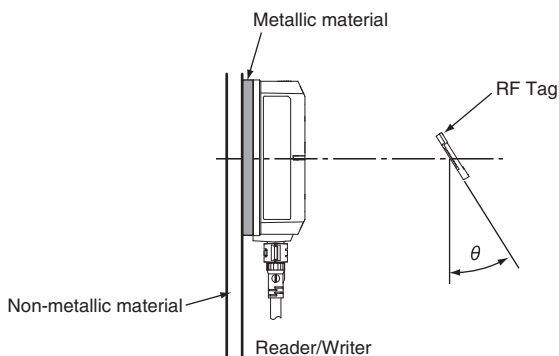
- V680S-HMD63-PNT and V680S-D2KF67M
(Metal at Back Surface: Steel)



- V680S-HMD64-PNT and V680S-D2KF67M
(Metal at Back Surface: Steel)



- V680S-HMD66-PNT and V680S-D2KF67M
(Metal at Back Surface: Steel)

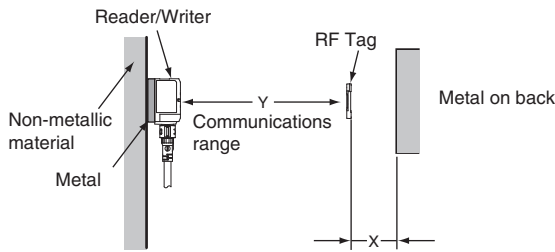
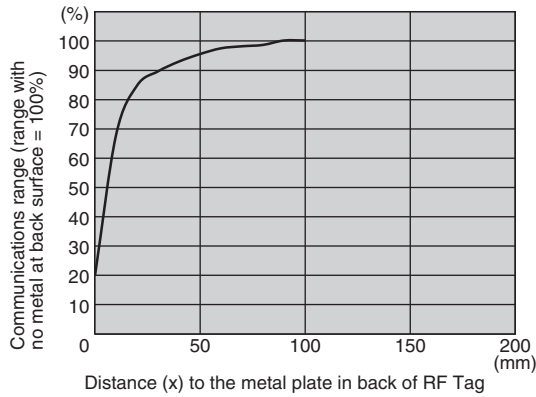


V680S-D8KF67

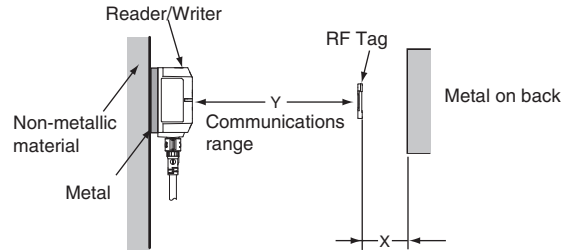
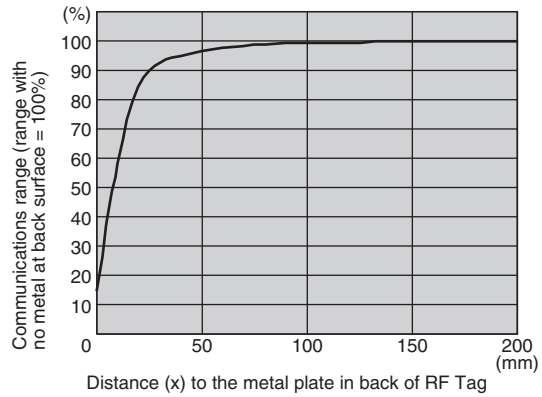
■ Influence of Metal at Back Surface of RF Tags

The communications range will decrease if there is metal at the back of the V680S-D8KF67 RF Tag. If the RF Tag is mounted on metallic material, use a non-metallic spacer (e.g., plastic or resin). The following graphs show the relationship between the distance from the RF Tag to the metallic surface and the communications range.

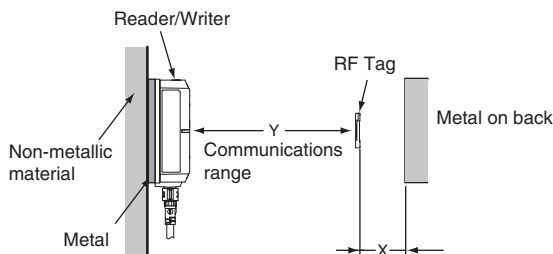
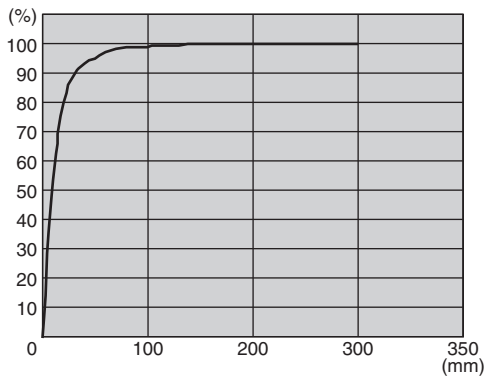
● V680S-HMD63-PNT and V680S-D8KF67



● V680S-HMD64-PNT and V680S-D8KF67



● V680S-HMD66-PNT and V680S-D8KF67

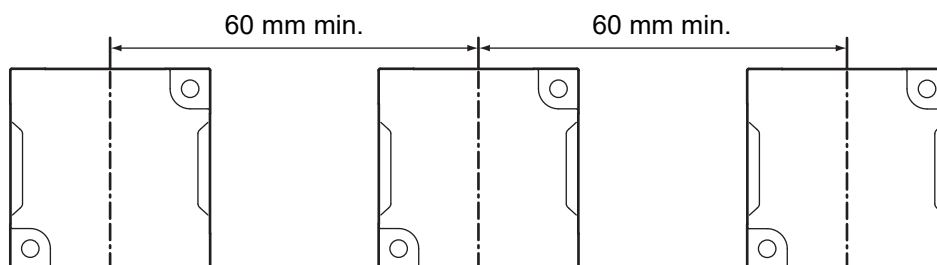


■ Mutual Interference of RF Tags

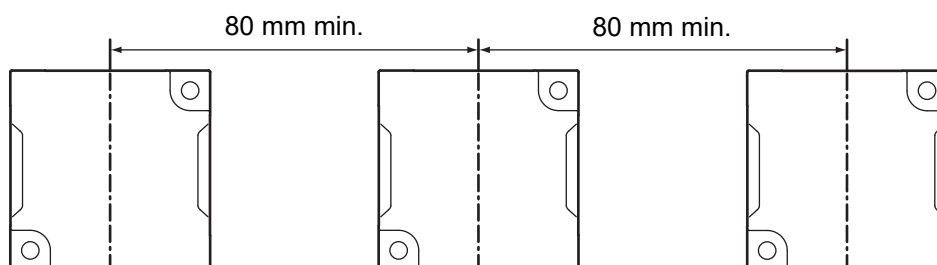
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

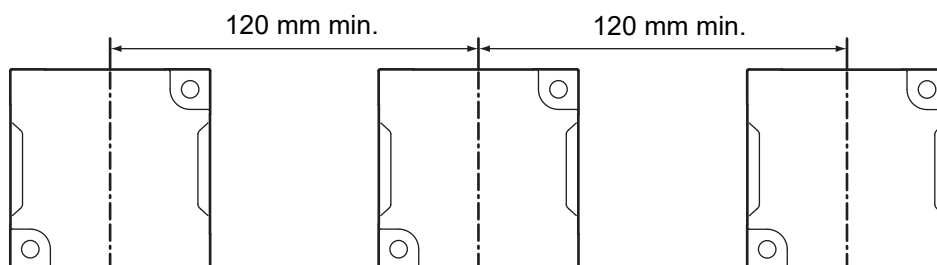
■ V680S-HMD63-PNT Reader/Writer



■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

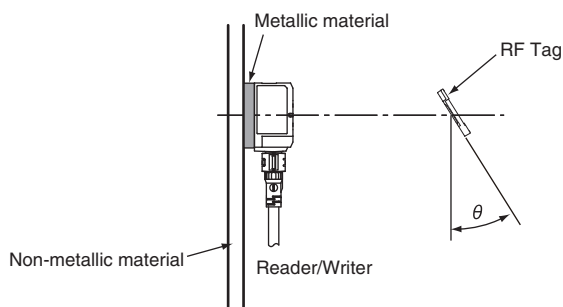
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680S-D2KF67

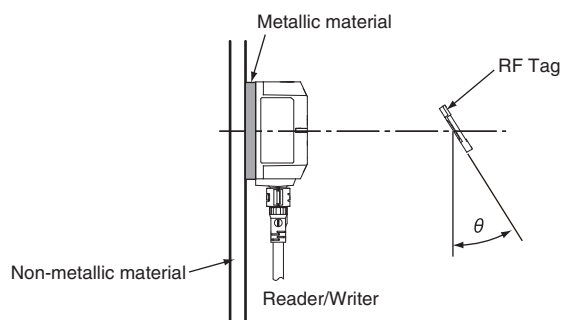
| | RF Tag inclination (θ°) | | | | | | | | | |
|----------------------------------|---------------------------------------|-----|-----|-----|-----|------|------|------|------|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD63-PNT and V680S-D8KF67 | 0% | -1% | -2% | -5% | -8% | -13% | -20% | -30% | -45% | --- |
| V680S-HMD64-PNT and V680S-D8KF67 | 0% | -1% | -2% | -4% | -6% | -10% | -17% | -24% | -36% | --- |
| V680S-HMD66-PNT and V680S-D8KF67 | 0% | -1% | -2% | -4% | -7% | -12% | -19% | -28% | -42% | --- |

■ Measurement Conditions

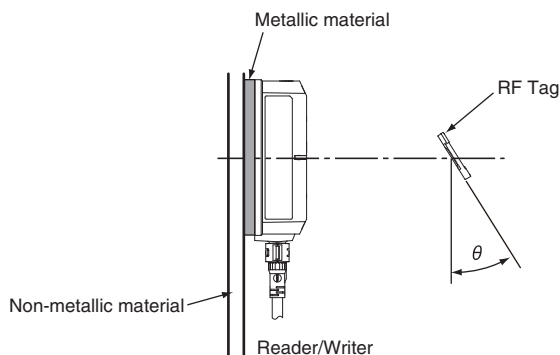
- V680S-HMD63-PNT and V680S-D8KF67



- V680S-HMD64-PNT and V680S-D8KF67



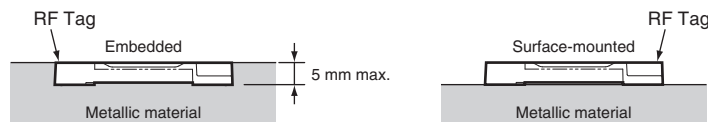
- V680S-HMD66-PNT and V680S-D8KF67



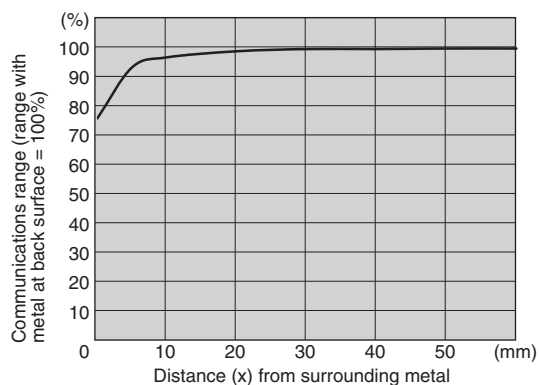
V680S-D8KF67M

■ Influence of Surrounding Metal

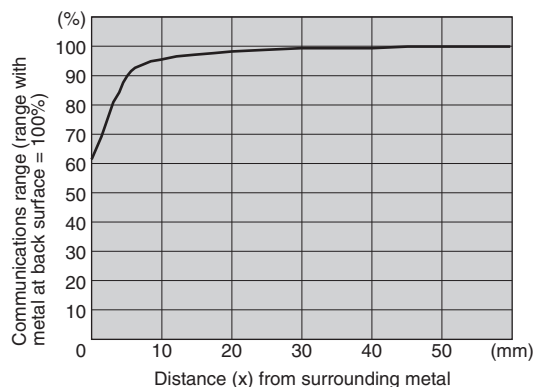
The V680S-D8KF67M can be surface-mounted or it can be embedded in metal. However, do not allow the height of the metal to exceed the height of the V680S-D8KF67M.



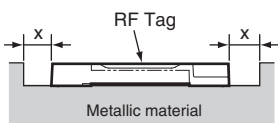
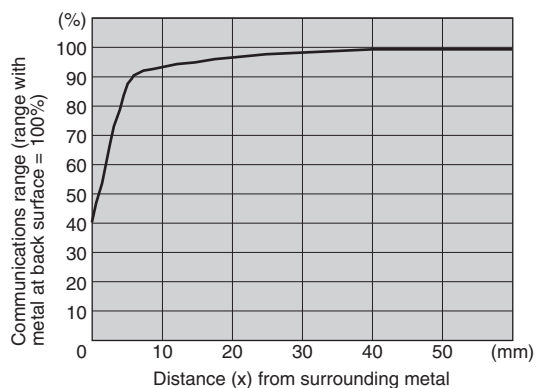
● V680S-HMD63-PNT and V680S-D8KF67M



● V680S-HMD64-PNT and V680S-D8KF67M



● V680S-HMD66-PNT and V680S-D8KF67M

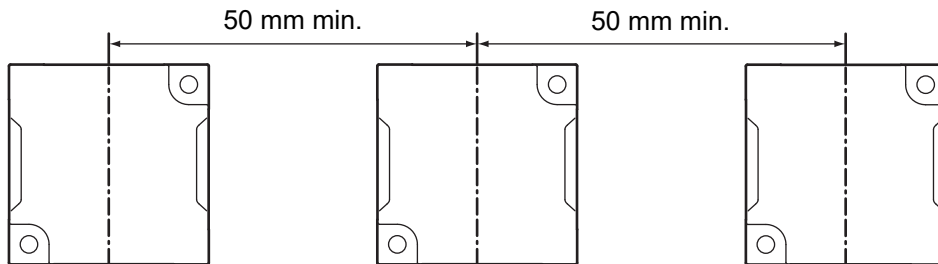


■ Mutual Interference of RF Tags

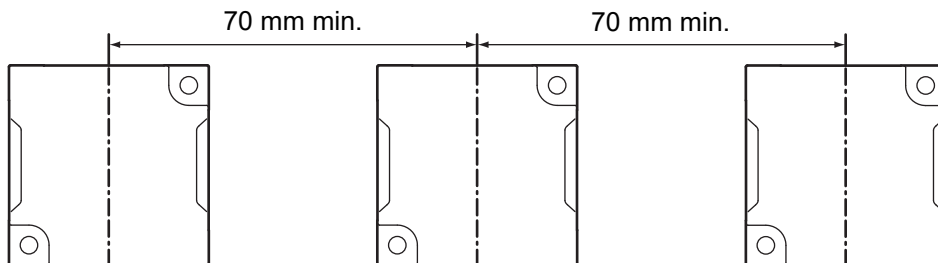
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

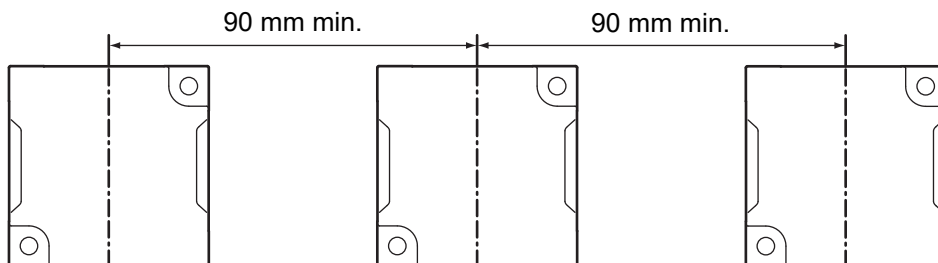
■ V680S-HMD63-PNT Reader/Writer



■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

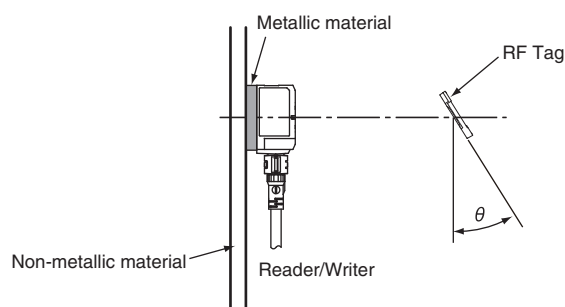
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680S-D8KF67M

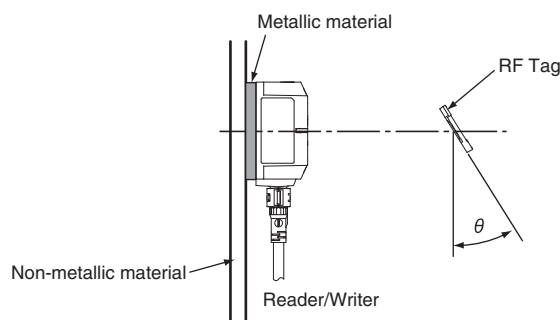
| | RF Tag inclination (θ°) | | | | | | | | | |
|---|---------------------------------------|-----|-----|------|------|------|------|-----|-----|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD63-PNT and V680S-D8KF67M (Metal at back surface: Steel) | 0% | -1% | -3% | -7% | -13% | -24% | -47% | --- | --- | --- |
| V680S-HMD64-PNT and V680S-D8KF67M (Metal at back surface: Steel) | 0% | -1% | -3% | -7% | -13% | -22% | -38% | --- | --- | --- |
| V680S-HMD66-PNT and V680S-D8KF67M (Metal at back surface: Steel) | 0% | -1% | -4% | -10% | -20% | -39% | --- | --- | --- | --- |

■ Measurement Conditions

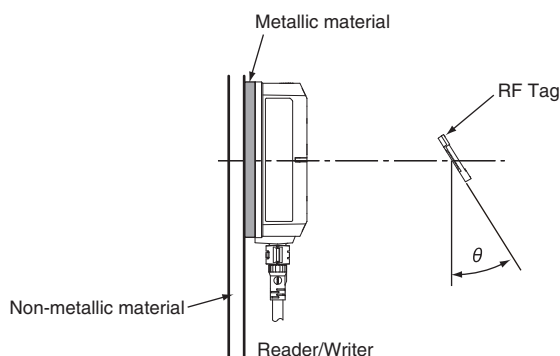
- V680S-HMD63-PNT and V680S-D8KF67M
(Metal at Back Surface: Steel)



- V680S-HMD64-PNT and V680S-D8KF67M
(Metal at Back Surface: Steel)



- V680S-HMD66-PNT and V680S-D8KF67M
(Metal at Back Surface: Steel)

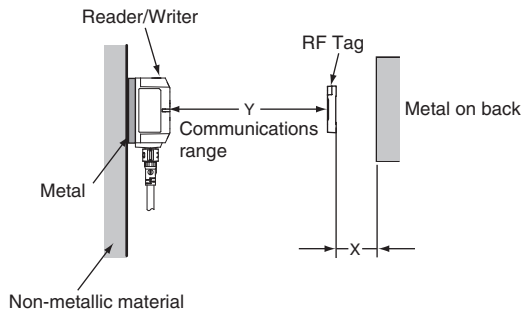
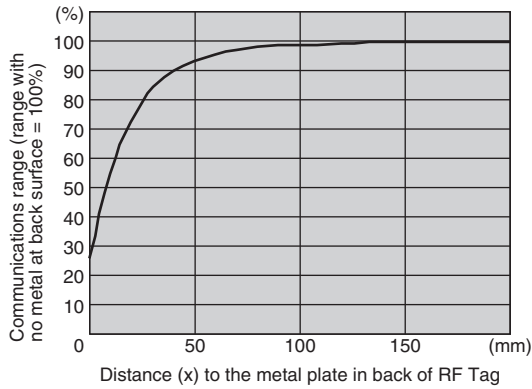


V680S-D2KF68

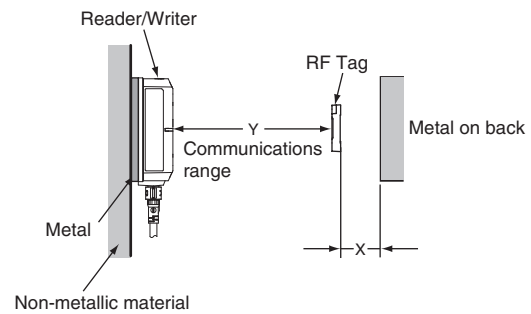
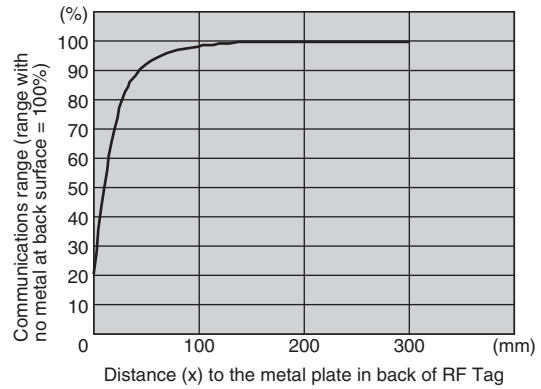
■ Influence of Metal at Back Surface of RF Tags

The communications range will decrease if there is metal at the back of the V680S-D2KF68 RF Tag. If the RF Tag is mounted on metallic material, use a non-metallic spacer (e.g., plastic or resin). The following graphs show the relationship between the distance from the RF Tag to the metallic surface and the communications range.

● V680S-HMD64-PNT and V680S-D2KF68



● V680S-HMD66-PNT and V680S-D2KF68

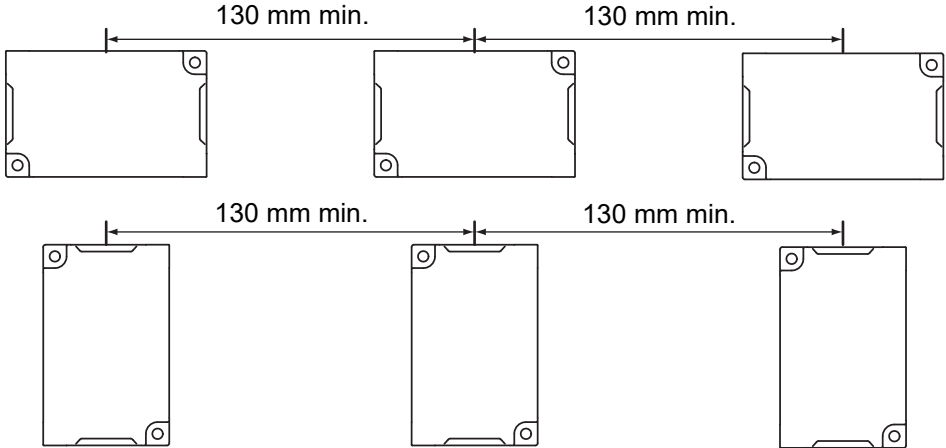


■ **Mutual Interference of RF Tags**

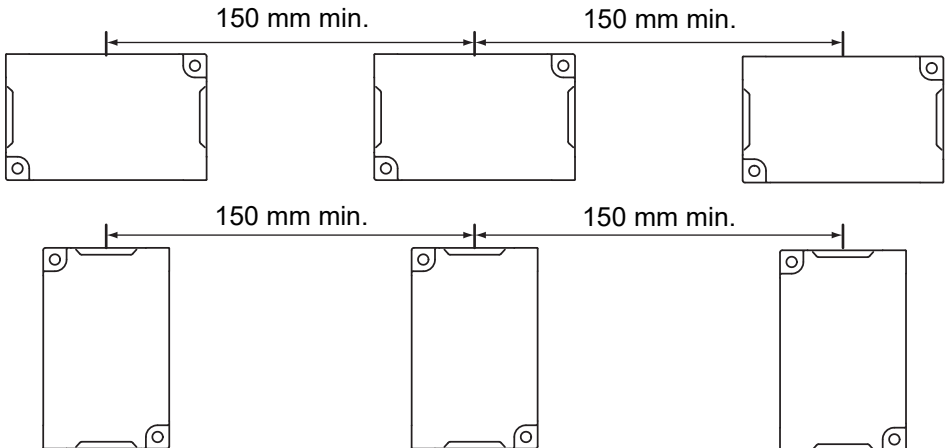
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

■ **V680S-HMD64-PNT Reader/Writer**



■ **V680S-HMD66-PNT Reader/Writer**



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

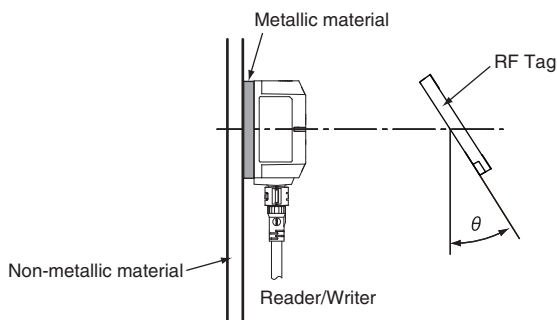
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680S-D2KF68

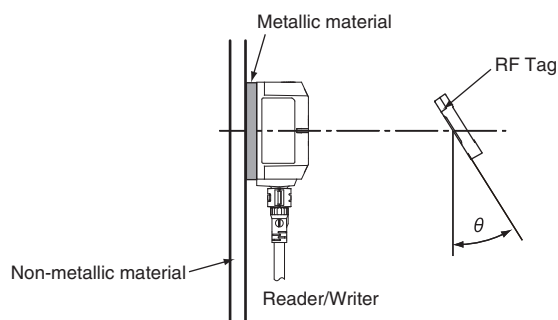
| | RF Tag inclination (θ°) | | | | | | | | | |
|---|---------------------------------------|-----|-----|-----|-----|------|------|------|------|------|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD64-PNT and V680S-D2KF68 horizontally | -0% | -1% | -2% | -3% | -6% | -9% | -14% | -21% | -33% | -59% |
| V680S-HMD64-PNT and V680S-D2KF68 vertically | -0% | -1% | -3% | -5% | -8% | -13% | -20% | -28% | -41% | -66% |
| V680S-HMD66-PNT and V680S-D2KF68 horizontally | -0% | -1% | -2% | -3% | -6% | -11% | -16% | -25% | -39% | -65% |
| V680S-HMD66-PNT and V680S-D2KF68 vertically | -0% | -1% | -2% | -5% | -8% | -13% | -20% | -29% | -42% | -68% |

■ Measurement Conditions

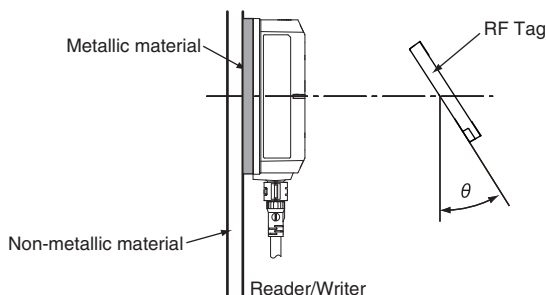
- V680S-HMD64-PNT and V680S-D2KF68 Horizontally



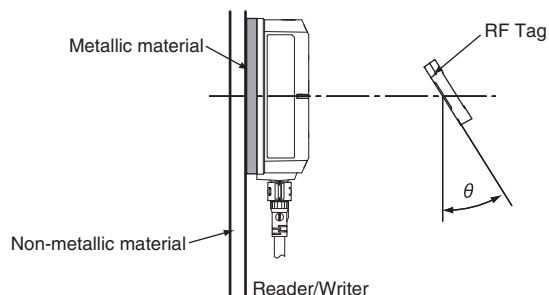
- V680S-HMD64-PNT and V680S-D2KF68 Vertically



- V680S-HMD66-PNT and V680S-D2KF68 Horizontally



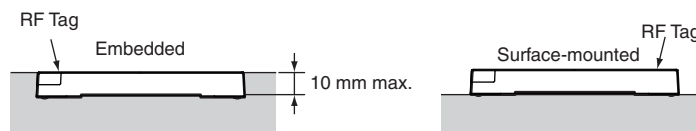
- V680S-HMD66-PNT and V680S-D2KF68 Vertically



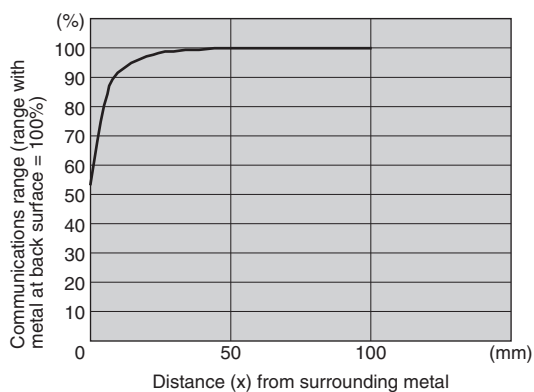
V680S-D2KF68M

■ Influence of Surrounding Metal

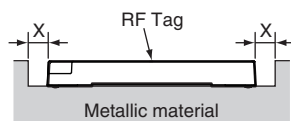
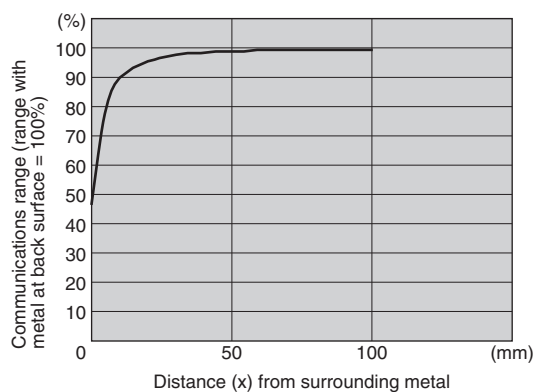
The V680S-D2KF68M can be surface-mounted or it can be embedded in metal. However, do not allow the height of the metal to exceed the height of the V680S-D2KF68M.



● V680S-HMD64-PNT and V680S-D2KF68M



● V680S-HMD66-PNT and V680S-D2KF68M

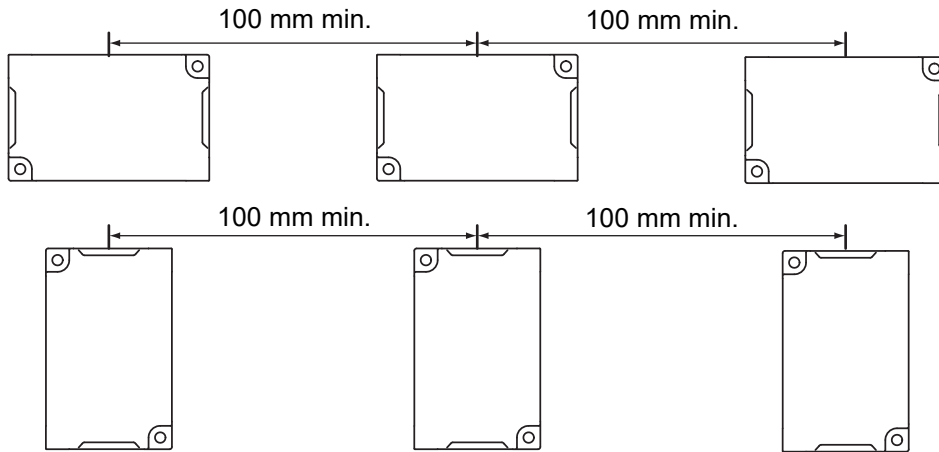


■ Mutual Interference of RF Tags

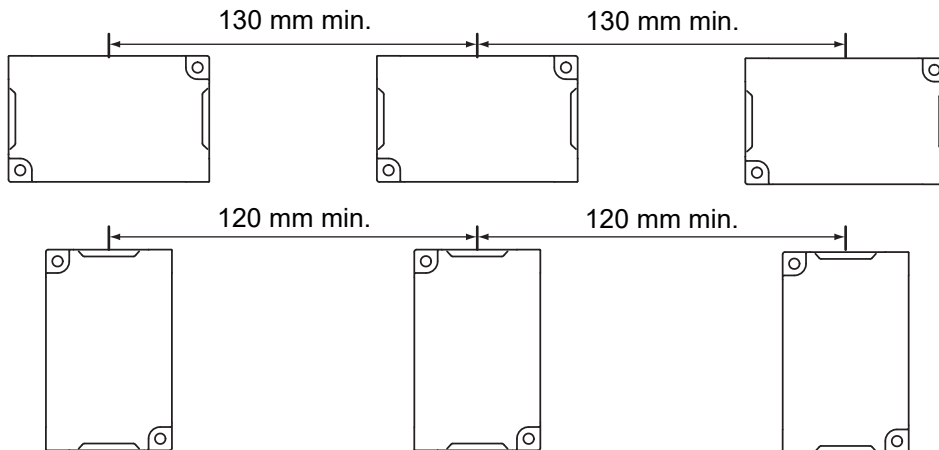
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

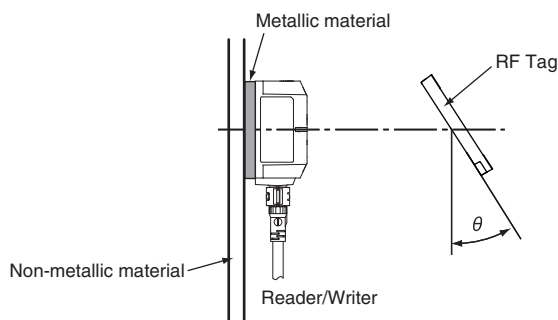
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680S-D2KF68M

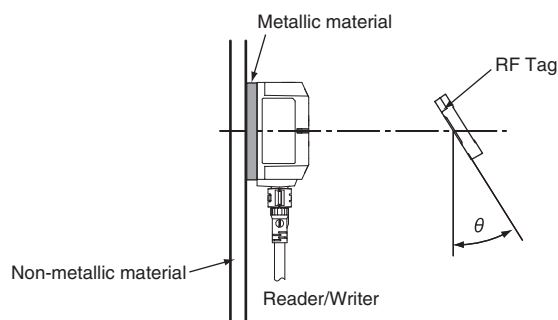
| | RF Tag inclination (θ°) | | | | | | | | | |
|--|---------------------------------------|-----|-----|-----|------|------|------|------|-----|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD64-PNT and V680S-D2KF68M horizontally | 0% | 0% | -1% | -3% | -5% | -9% | -17% | -32% | --- | --- |
| V680S-HMD64-PNT and V680S-D2KF68M vertically | 0% | -2% | -4% | -7% | -12% | -19% | -31% | -51% | --- | --- |
| V680S-HMD66-PNT and V680S-D2KF68M horizontally | 0% | -1% | -2% | -4% | -8% | -13% | -23% | -43% | --- | --- |
| V680S-HMD66-PNT and V680S-D2KF68M vertically | 0% | -1% | -4% | -7% | -12% | -21% | -33% | -58% | --- | --- |

■ Measurement Conditions

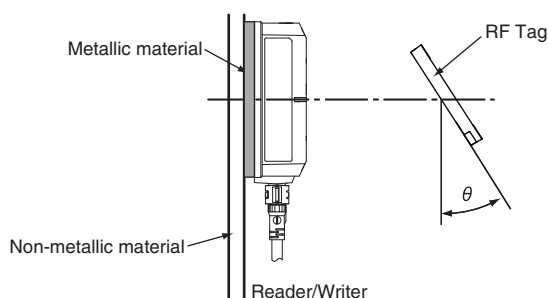
- V680S-HMD64-PNT and V680S-D2KF68M Horizontally



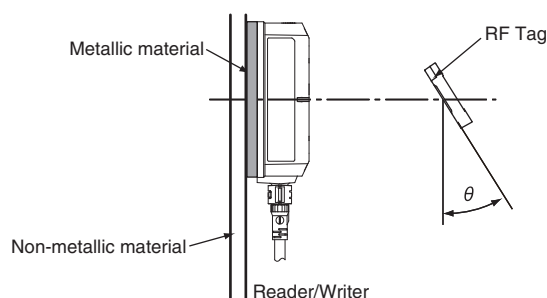
- V680S-HMD64-PNT and V680S-D2KF68M Vertically



- V680S-HMD66-PNT and V680S-D2KF68M Horizontally



- V680S-HMD66-PNT and V680S-D2KF68M Vertically

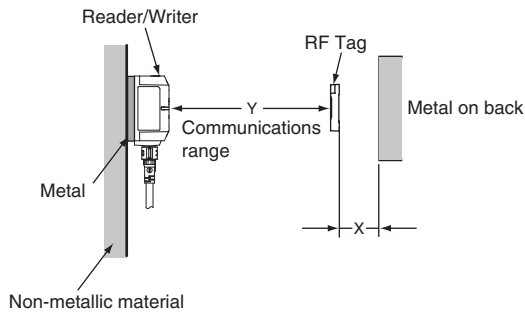
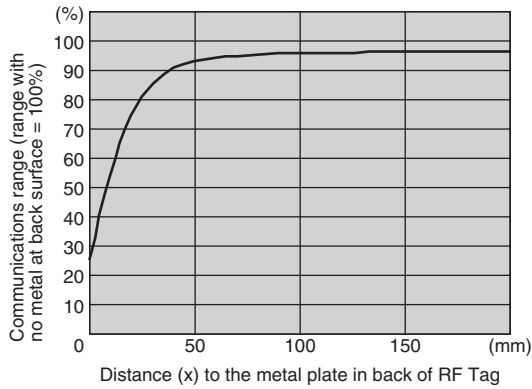


V680S-D8KF68

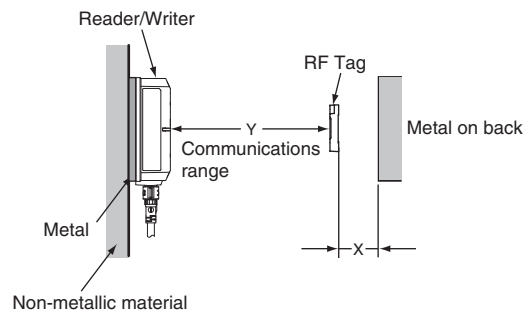
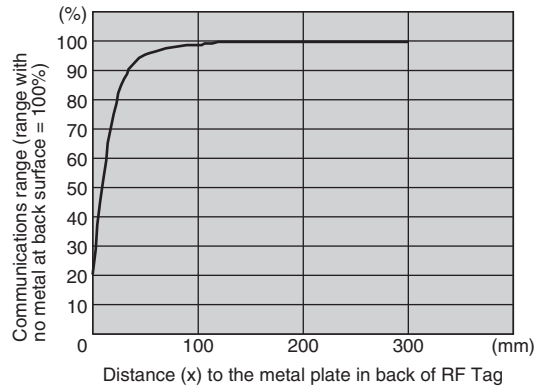
■ Influence of Metal at Back Surface of RF Tags

The communications range will decrease if there is metal at the back of the V680S-D8KF68 RF Tag. If the RF Tag is mounted on metallic material, use a non-metallic spacer (e.g., plastic or resin). The following graphs show the relationship between the distance from the RF Tag to the metallic surface and the communications range.

● V680S-HMD64-PNT and V680S-D8KF68



● V680S-HMD66-PNT and V680S-D8KF68

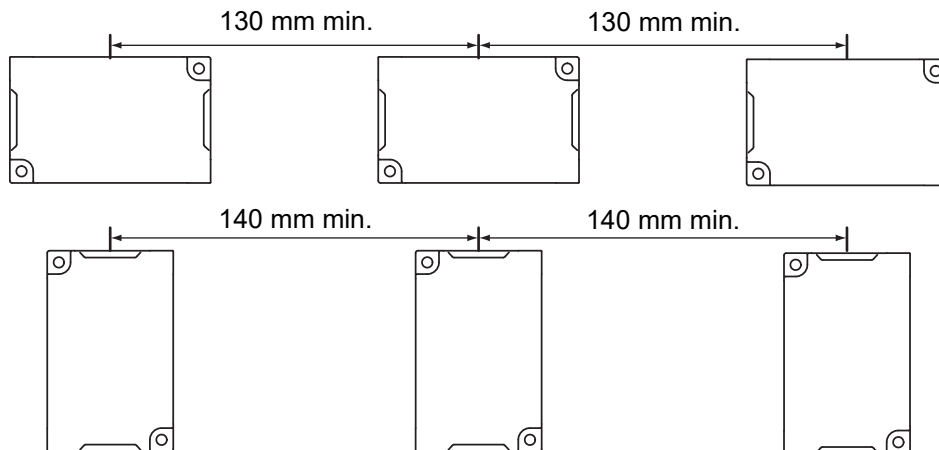


■ Mutual Interference of RF Tags

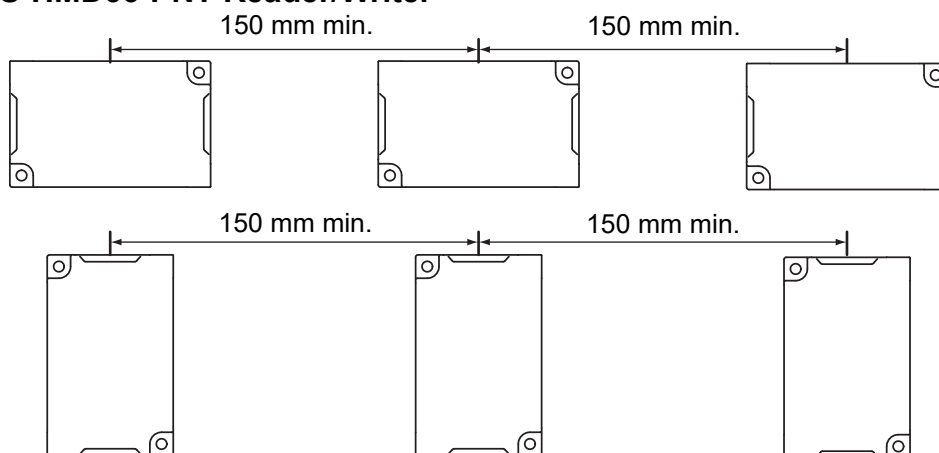
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

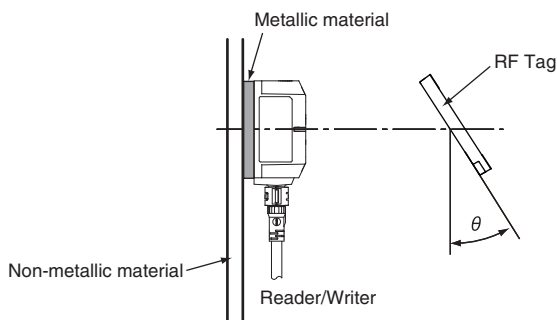
■ Rates of Change in Communications Range for Inclination of V680S-D8KF68

| | RF Tag inclination (θ°) | | | | | | | | | |
|---|---------------------------------------|-----|-----|-----|-----|------|------|------|------|------|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD64-PNT and V680S-D8KF68 horizontally | 0% | -1% | -2% | -3% | -5% | -9% | -14% | -21% | -32% | -58% |
| V680S-HMD64-PNT and V680S-D8KF68 vertically | 0% | -1% | -3% | -5% | -8% | -13% | -19% | -28% | -41% | -65% |
| V680S-HMD66-PNT and V680S-D8KF68 horizontally | 0% | -1% | -2% | -3% | -6% | -11% | -16% | -25% | -39% | --- |
| V680S-HMD66-PNT and V680S-D8KF68 vertically | 0% | -1% | -2% | -5% | -8% | -14% | -20% | -29% | -43% | -69% |

■ Measurement Conditions

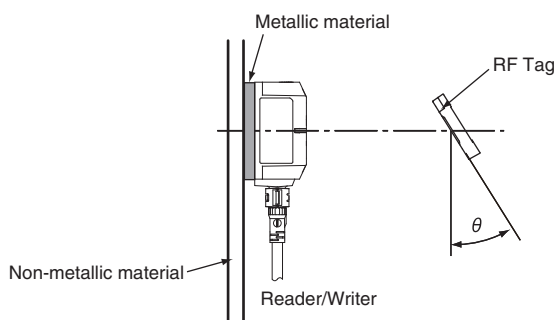
- V680S-HMD64-PNT and V680S-D8KF68

Horizontally



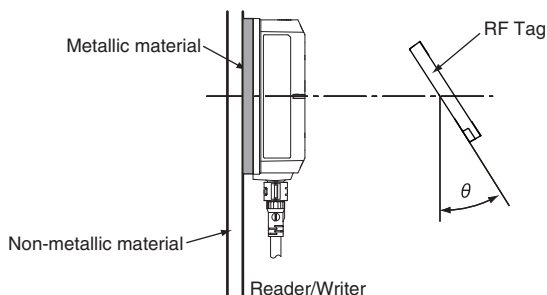
- V680S-HMD64-PNT and V680S-D8KF68

Vertically



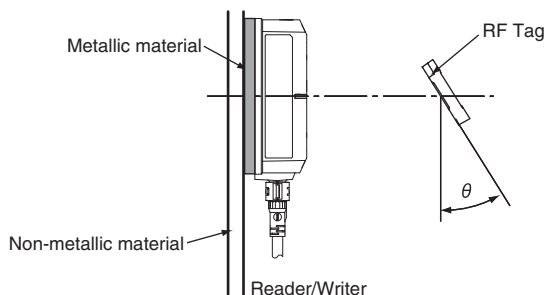
- V680S-HMD66-PNT and V680S-D8KF68

Horizontally



- V680S-HMD66-PNT and V680S-D8KF68

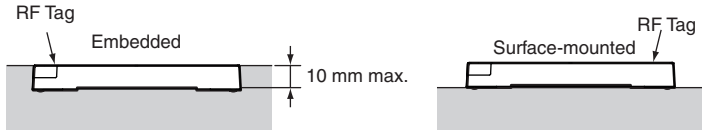
Vertically



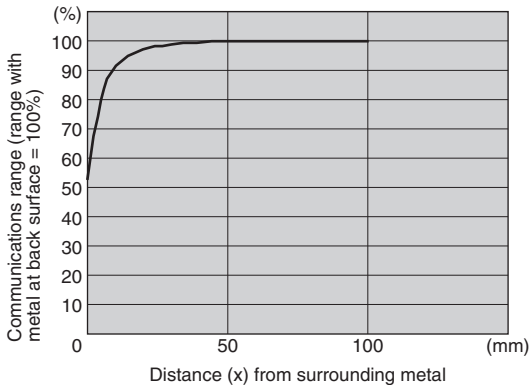
V680S-D8KF68M

■ Influence of Surrounding Metal

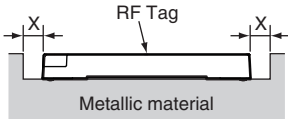
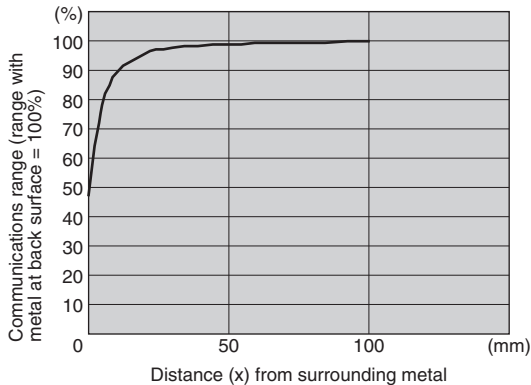
The V680S-D8KF68M can be surface-mounted or it can be embedded in metal. However, do not allow the height of the metal to exceed the height of the V680S-D8KF68M.



● V680S-HMD64-PNT and V680S-D8KF68M



● V680S-HMD66-PNT and V680S-D8KF68M

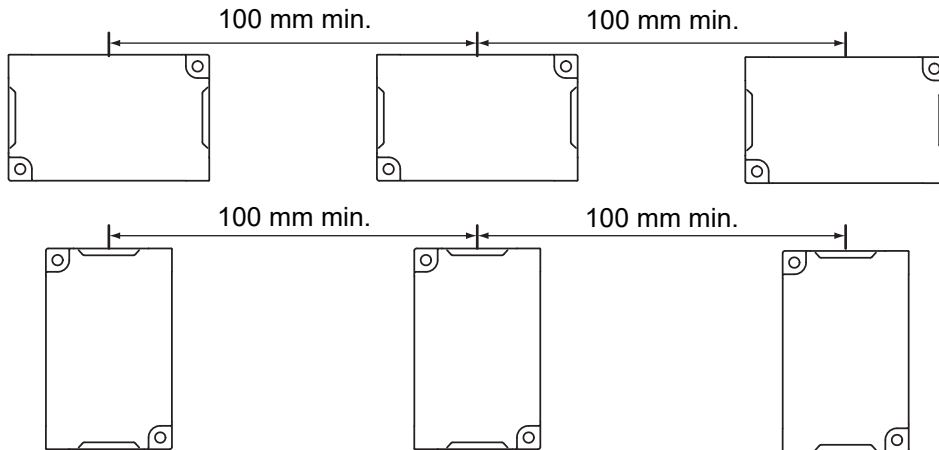


■ Mutual Interference of RF Tags

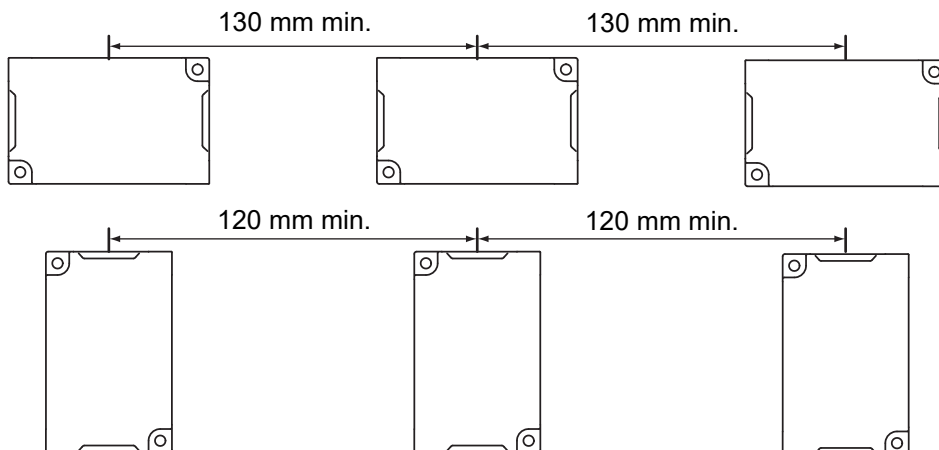
If you use more than one RF Tag, separate them by at least the interval shown below to prevent malfunctions due to mutual interference.

If the distance between the RF tags is too short, read / write distance will be reduced.

■ V680S-HMD64-PNT Reader/Writer



■ V680S-HMD66-PNT Reader/Writer



■ Influence of Inclination

Install the Reader/Writer and RF Tags so that the Reader/Writer and RF Tags are as parallel to each other as possible.

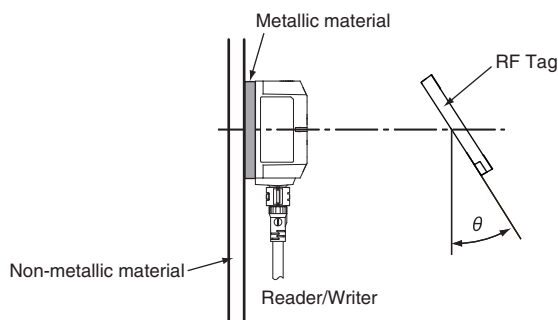
Communications will be possible even if the Reader/Writer and RF Tags are not parallel to each other; however, the communications range is affected by the inclination between them as shown in the following graphs.

■ Rates of Change in Communications Range for Inclination of V680S-D8KF68M

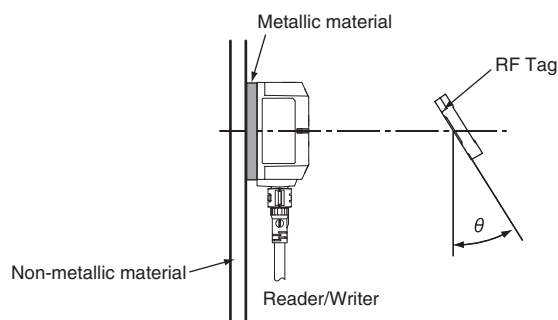
| | RF Tag inclination (θ°) | | | | | | | | | |
|--|---------------------------------------|-----|-----|-----|------|------|------|------|------|-----|
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| V680S-HMD64-PNT and V680S-D8KF68M horizontally | 0% | -1% | -1% | -3% | -5% | -9% | -16% | -29% | --- | --- |
| V680S-HMD64-PNT and V680S-D8KF68M vertically | 0% | -1% | -3% | -7% | -12% | -19% | -30% | -52% | -56% | --- |
| V680S-HMD66-PNT and V680S-D8KF68M horizontally | 0% | -1% | -2% | -4% | -8% | -13% | -24% | -50% | --- | --- |
| V680S-HMD66-PNT and V680S-D8KF68M vertically | 0% | -1% | -4% | -8% | -13% | -22% | -35% | -67% | --- | --- |

Measurement Conditions

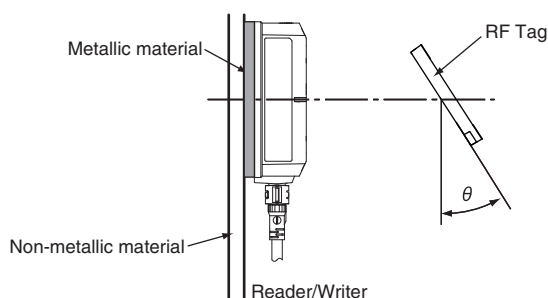
- V680S-HMD64-PNT and V680S-D8KF68M Horizontally



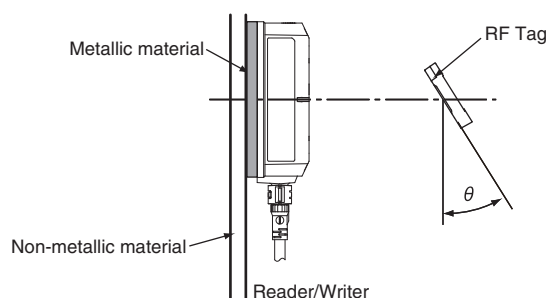
- V680S-HMD64-PNT and V680S-D8KF68M Vertically



- V680S-HMD66-PNT and V680S-D8KF68M Horizontally



- V680S-HMD66-PNT and V680S-D8KF68M Vertically



RF Tag Memory Capacities and Memory Types

(As of July 2019)

| Model | Memory capacity (user memory) | Memory type | Life expectancy |
|--|-------------------------------|-------------|---|
| V680-D1KP54T V680-D1KP66T V680-D1KP66MT V680-D1KP66T-SP | 1,000 bytes | EEPROM | <ul style="list-style-type: none"> • Write endurance: 100,000 times per block (25°C) • Data retention: 10 years after writing (85°C or less) |
| V680-D1KP58HTN | | | <ul style="list-style-type: none"> • Write endurance: 100,000 times per block (25°C) • Data retention: 10 years after writing (85°C or less) * Total data retention at high temperatures exceeding 125°C is 10 hours |
| V680S-D2KF67 V680S-D2KF67M V680S-D2KF68 V680S-D2KF68M | 2,000 bytes | FRAM | <ul style="list-style-type: none"> • Access frequency: One trillion times • Data retention: 10 years after writing (85°C or less) |
| V680S-D8KF67 V680S-D8KF67M V680S-D8KF68 V680S-D8KF68M | 8,192 bytes | | |

RF Tag Memory Map

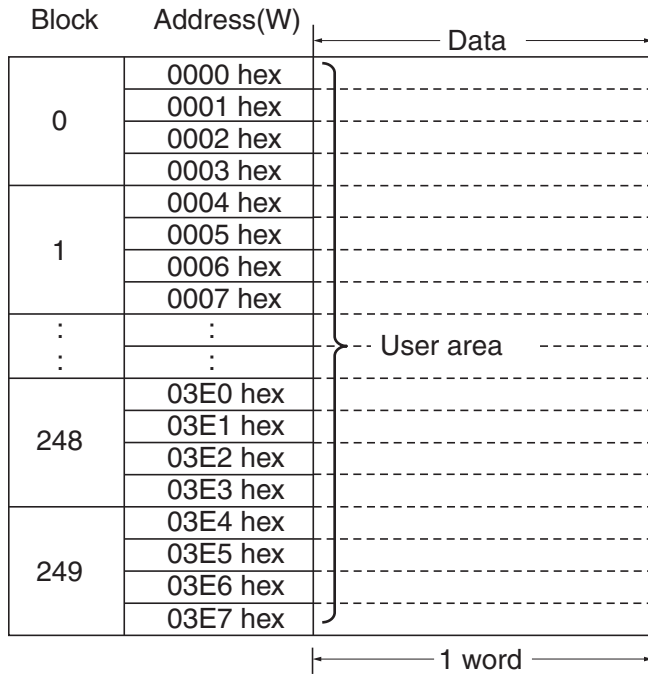
V680-D1KP□□ RF Tags

| Block | Address(W) | Data | |
|-------|------------|-------------|--|
| 0 | 0000 hex | } User area | |
| | 0001 hex | | |
| | 0002 hex | | |
| | 0003 hex | | |
| 1 | 0004 hex | | |
| | 0005 hex | | |
| | 0006 hex | | |
| | 0007 hex | | |
| ⋮ | ⋮ | | |
| ⋮ | ⋮ | | |
| 123 | 01EC hex | | |
| | 01ED hex | | |
| | 01EE hex | | |
| | 01EF hex | | |
| 124 | 01F0 hex | | |
| | 01F1 hex | | |
| | 01F2 hex | | |
| | 01F3 hex | | |

← 1 word →

EEPROM is used as the memory in the RF Tag.
The user-accessible capacity is 1,000 bytes.

V680S-D2KF6 RF Tags



FRAM is used as the memory in the RF Tag.
 The user-accessible capacity is 2,000 bytes.

V680S-D8KF6 RF Tags

| Block | Address(W) | Data |
|----------|------------|-------------|
| 0 | 0000 hex | ----- |
| | 0001 hex | |
| | 0002 hex | |
| | 0003 hex | |
| | : | |
| | : | |
| | 000C hex | |
| | 000D hex | |
| | 000E hex | |
| 1 | 0010 hex | ----- |
| | 0011 hex | |
| | 0012 hex | |
| | 0013 hex | |
| | : | |
| | : | |
| | 001C hex | |
| | 001D hex | |
| | 001E hex | |
| 001F hex | | |
| : | : | } User area |
| : | : | |
| 254 | 0FE0 hex | ----- |
| | 0FE1 hex | |
| | 0FE2 hex | |
| | 0FE3 hex | |
| | : | |
| | : | |
| | 0FEC hex | |
| | 0FED hex | |
| | 0FEE hex | |
| 0FEF hex | | |
| 255 | 0FF0 hex | ----- |
| | 0FF1 hex | |
| | 0FF2 hex | |
| | 0FF3 hex | |
| | : | |
| | : | |
| | 0FFC hex | |
| | 0FFD hex | |
| | 0FFE hex | |
| 0FFF hex | | |

FRAM is used as the memory in the RF Tag.

1 word

Chemical Resistance of the Reader/Writers and RF Tags

Chemical Resistance of the Reader/Writers

■ Applicable Models

V680S-HMD63-PNT/-HMD64-PNT/-HMD66-PNT

The chemicals that affect the Reader/Writer are listed below.

PBT (polybutylene terephthalate) is used as the case material and a urethane resin is used as the filling. Refer to the following lists and do not use chemicals that affect PBT and urethane resins.

Reader/Writers cannot be used in applications with explosion-proof specifications.

■ Chemicals That Cause Deformations, Cracks, Etc.

| Chemical name |
|--|
| Acetone, trichloroethylene, ethylene dichloride, sodium hydroxide, and other alkaline substances, hydrochloric acid (35% or more), nitric acid (70% or more) |

■ Chemicals That May Cause Discoloration, Swelling, Etc.

| Chemical name |
|---|
| Hydrochloric acid (10% RT), acetic acid (5% RT), benzene, nitric acid (20% or more) |



CHECK!

The above results are from tests conducted at room temperature (23°C). Even if the chemicals do not affect the PPS or epoxy resins at room temperature, they may affect the resins at higher or lower temperatures. Check the chemicals carefully in advance.

Chemical Resistance of RF Tags

■ Applicable Models

V680-D1KP54T/-D1KP66T/-D1KP66MT/-D1KP58HTN/V680S-D□KF6□

PPS resin is used for case material. Refer to the following lists and do not use chemicals that affect PPS and epoxy resin.

RF Tags cannot be used in applications with explosion-proof specifications.

| Chemical | | At room temperature | At 90°C |
|----------------------------|-----|---------------------|---------|
| Hydrochloric acid | 37% | A | A |
| | 10% | A | A |
| Sulfuric acid | 98% | A | B |
| | 50% | A | A |
| | 30% | A | A |
| | 3% | A | A |
| | 60% | B | C |
| | 40% | A | B |
| | 10% | A | A |
| Hydrogen fluoride solution | 40% | B | B |
| Chromic acid | 40% | A | A |
| Hydrogen peroxide solution | 28% | A | B |
| | 3% | A | A |
| Sodium hydroxide solution | 60% | A | A |
| | 10% | A | A |
| | 1% | A | A |
| Ammonia solution | 28% | A | B |
| | 10% | A | B |
| Sodium chloride | 10% | A | A |
| Sodium carbonate | 20% | A | A |
| | 2% | A | A |

| Chemical | | At room temperature | At 90°C |
|---------------------------|-----|---------------------|---------|
| Sodium hypochlorite | | A | A |
| Phenol solution | 5% | A | A |
| Glacial acetic acid | | A | A |
| Acetic acid | | A | A |
| Oleic acid | | A | A |
| Methyl alcohol | 95% | A | A |
| Ethyl alcohol | 95% | A | A |
| Ethyl acetate | | A | A |
| Sebacic acid diethylhexyl | | A | A |
| Acetone | | A | A |
| Diethyl ether | | A | A |
| n-heptane | | A | A |
| 2-2-4 trimethylpentane | | A | A |
| Benzene | | A | A |
| Toluene | | A | A |
| Aniline | | A | A |
| Mineral oil | | A | A |
| Gasoline | | A | A |
| Insulating oil | | A | A |
| Dichloroethylene | | A | A |
| Carbon tetrachloride | | A | A |

A: Has no adverse effect, B: May cause discoloration, swelling, etc., C: Causes deformation, cracks, etc.



CHECK!

The above table shows the extent of changes in PPS resin exposed to each chemical at room temperature and at 90°C. If actual chemicals, concentrations, and temperatures are different from those shown in the tables, always conduct tests under the actual conditions in which the RF Tags are to be used.

■ Applicable Models

V680-D1KP66T-SP

PFA resin is used for exterior case material. Refer to the following lists and do not use chemicals that affect PFA resin.

RF Tags cannot be used in applications with explosion-proof specifications.

■ Chemical Resistance of Fluoroplastic PFA (Reference)

PFA: Tetrafluorethylene-Perfluoroalkylvinylether Copolymer

Fluoroplastic PFA does not react with most chemicals except molten alkali metal, hot pressurized fluorine (F₂), and some halogen derivatives. The following tables show the results of tests in which PFA was soaked in or exposed to commonly used organic and inorganic chemicals. In these tests, a compression-molded test piece (1.3 mm thick) was soaked in the chemical at a specified temperature for a week (168 hours) and taken out of the chemical, then the weight change, tensile strength, and elongation of the test piece were immediately measured. If the change in the tensile strength is 15 % or less, the change in the elongation is 10 % or less, and the increase in the weight is less than 0.5 %, the results of the test can be considered normal.

If PFA is exposed to trichloroacetic acid, tri-n-butyl phosphate, perchloroethylene, carbon tetrachloride, and other liquids (which easily make resin surfaces wet) at a high temperature, it tends to increase its weight due to absorption and reduce its tensile strength. Even when PFA absorbs chemicals and solvents, its molecular structure will not change. If, however, PFA is subject to temperature or pressure changes or mechanical damage when it has absorbed chemicals, the chemicals will repeatedly expand and contract inside pfa, causing mechanical problems such as cracks and bulging. In fact, this problem occurs with any kind of plastic.

■ Inorganic Chemicals

| Chemical name | Test temperature (°C) | Resulting characteristics (%) | | Weight increase rate (%) |
|----------------------------------|-----------------------|-------------------------------|------------|--------------------------|
| | | Tensile strength | Elongation | |
| Concentrated hydrochloric acid | 120 | 98 | 100 | 0.0 |
| Concentrated sulfuric acid | 120 | 95 | 98 | 0.0 |
| Hydrofluoric acid (60%) | 23 | 99 | 99 | 0.0 |
| Fuming sulfuric acid | 23 | 95 | 96 | 0.0 |
| Aqua regia | 120 | 99 | 100 | 0.0 |
| Chromic acid (50%) | 120 | 93 | 97 | 0.0 |
| Concentrated nitric acid | 120 | 95 | 98 | 0.0 |
| Fuming nitric acid | 23 | 99 | 99 | 0.0 |
| Concentrated ammonia solution | 66 | 98 | 100 | 0.0 |
| Caustic soda (50%) | 120 | 93 | 99 | 0.4 |
| Hydrogen peroxide solution (30%) | 23 | 93 | 95 | 0.0 |
| Bromine | 23 | 99 | 100 | 0.5 |
| Chlorine | 120 | 92 | 100 | 0.5 |
| Ferrous chloride (25%) | 100 | 93 | 98 | 0.0 |
| Zinc chloride (25%) | 100 | 96 | 100 | 2.7 |
| Chlorosulfonic acid | 151 | 91 | 100 | 2.7 |
| Concentrated phosphoric acid | 100 | 93 | 100 | 0.0 |

▪ Organic Chemicals

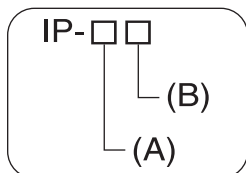
| Chemical name | Test temperature (°C) | Resulting characteristics (%) | | Weight increase rate (%) |
|-----------------------|-----------------------|-------------------------------|------------|--------------------------|
| | | Tensile strength | Elongation | |
| Glacial acetic acid | 118 | 95 | 100 | 0.4 |
| Acetic anhydride | 139 | 91 | 99 | 0.3 |
| Trichloroacetic acid | 196 | 90 | 100 | 2.2 |
| Isooctane | 99 | 94 | 100 | 0.7 |
| Naphtha | 100 | 91 | 100 | 0.5 |
| Mineral oil | 180 | 87 | 95 | 0.0 |
| Toluene | 110 | 88 | 100 | 0.7 |
| o-creosol | 191 | 92 | 96 | 0.2 |
| Nitrobenzene | 210 | 90 | 100 | 0.3 |
| Benzyl alcohol | 205 | 93 | 99 | 0.3 |
| Aniline | 185 | 94 | 100 | 0.3 |
| n-butylamine | 78 | 86 | 97 | 0.4 |
| Ethylenediamine | 117 | 96 | 100 | 0.1 |
| Tetrahydrofuran | 66 | 88 | 100 | 0.1 |
| Benzaldehyde | 179 | 90 | 99 | 0.5 |
| Cyclohexane | 156 | 92 | 100 | 0.4 |
| Methyl ethyl ketone | 80 | 90 | 100 | 0.4 |
| Acetophenone | 202 | 90 | 100 | 0.6 |
| Dimethylphtalate | 200 | 98 | 100 | 0.3 |
| n-butyl acetate | 125 | 93 | 100 | 0.5 |
| Tri-n-butyl phosphate | 200 | 91 | 100 | 2.0 |
| Methylene chloride | 40 | 94 | 100 | 0.8 |
| Perchloroethylene | 121 | 86 | 100 | 2.0 |
| Carbon tetrachloride | 77 | 87 | 100 | 2.3 |
| Dimethyl formamide | 154 | 96 | 100 | 0.2 |
| Dimethyl sulfoxide | 189 | 95 | 100 | 0.1 |
| Dioxane | 101 | 92 | 100 | 0.6 |

Reference: *Fluoroplastics Handbook*, The Nikkan Kogyo Shimbun Ltd. (Takaomi Satogawa)

Degree of Protection

Ingress protection degrees (IP-□□) are determined by the following tests. Be sure to check the sealing capability under the actual operating environment and conditions before actual use.

■ IEC (International Electrotechnical Commission) IEC 60529:2001


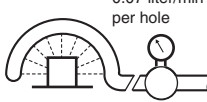

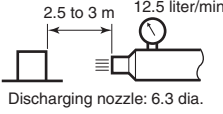

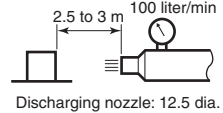

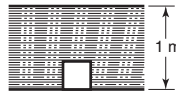



(A) First Digit: Degree of Protection from Solid Materials

| Degree | Protection | |
|--------|------------|---|
| 0 | | No protection |
| 1 | | Protects against penetration of any solid object such as a hand that is 50 mm or more in diameter. |
| 2 | | Protects against penetration of any solid object, that is 12.5 mm or more in diameter. Even if finger or other object 12 mm in diameter penetrates, it will not reach a hazardous part. |
| 3 | | Protects against penetration of any solid object, such as a wire, that is 2.5 mm or more in diameter. |
| 4 | | Protects against penetration of any solid object, such as a wire, that is 1 mm or more in diameter. |
| 5 | | Protects against penetration of dust of a quantity that may cause malfunction or obstruct the safe operation of the product. |
| 6 | | Protects against penetration of all dust. |

(B) Second Digit: Degree of Protection Against Water

| Degree | Protection | | Test method (with pure water) |
|--------|--|--|--|
| 0 | No protection | Not protected against water. | No test |
| 1 | Protection against water drops | Protects against vertical drops of water towards the product. | Water is dropped vertically towards the product from the test machine for 10 min. |
| 2 | Protection against water drop | Protects against drops of water approaching at a maximum angle of 15° to the left, right, back, and front from vertical towards the product. | Water is dropped for 25 min each (i.e., 10 min in total) towards the product inclined 15° to the left, right, back, and front from the test machine. |
| 3 | Protection against sprinkled water | Protects against sprinkled water approaching at a maximum angle of 60° from vertical towards the product. | Water is sprinkled for 10 min at a maximum angle of 60° to the left and right from vertical from the test machine. |

| Degree | Protection | | Test method (with pure water) |
|------------------|---|--|--|
| 4 | Protection against water spray  | Protects against water spray approaching at any angle towards the product. | Water is sprayed at any angle towards the product for 10 min from the test machine.  |
| 5 | Protection against water jet spray  | Protects against water jet spray approaching at any angle towards the product. | Water is jet sprayed at any angle towards the product for 1 min per square meter for at least 3 min in total from the test machine.  |
| 6 | Protection against high pressure water jet spray  | Protects against high-pressure water jet spray approaching at any angle towards the product. | Water is jet sprayed at any angle towards the product for 1 min per square meter for at least 3 min in total from the test machine.  |
| 7 | Protection against limited immersion in water  | Resists the penetration of water when the product is placed underwater at specified pressure for a specified time. | The product is placed 1 m deep in water (if the product is 850 mm max. in height) for 30 min.  |
| 8 (See note.) | Protection against long-term immersion in water  | Can be used continuously underwater. | The test method is determined by the manufacturer and user. |

Note: OMRON Test Method

Usage condition: 10 m or less under water in natural conditions

1. No water ingress after 1 hour under water at 2 atmospheres of pressure.
2. Sensing distance and insulation resistance specifications must be met after 100 repetitions of half hour in 5°C water and half hour in 85°C water.

About IPX9K

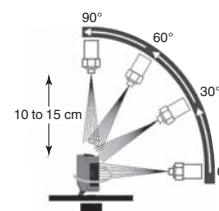
IPX9K is a protection standard regarding high temperature and high-pressure water which is defined by the German standard (DIN 40050 PART9).

Water is sprayed on 80 °C hot water with the water pressure of 80 to 100BAR from a nozzle to the test piece.

Amount of water is 14 to 16 liters/minute.

The distance between the test piece and a nozzle is 10 to 15 cm, and the directions of water-drainage are 0 degrees, 30 degrees, 60 degrees, and 90 degrees horizontally.

They are evaluated with the test piece is rotating on a horizontal plane by 30 seconds in each direction.



Oil Resistance (OMRON in-house standard)

| Protection | |
|---------------|--|
| Oil-resistant | No adverse affect from oil drops or oil spray approaching from any direction. |
| Oil-proof | Protects against penetration of oil drops or oil spray approaching from any direction. |

Note. Oil resistance has been tested using a specific oil as defined in the OMRON test method. (JIS C 0920:2003, Appendix 1)

Differences in Address and Size Specifications between V680 and V680S Reader/Writers

RF Tag access for V680S-series Reader/Writers is performed in words (1 word = 2 bytes). RF Tag access for V680-series Controllers is performed in bytes. Be sure to access data in the correct units.

The word and byte addresses for the memory map of a V680-D1KP□□ RF Tag are given below as a concrete example.

| Word address | Byte address | Data |
|--------------|--------------|------------|
| 0000 hex | 0000 hex | ----- |
| | 0001 hex | |
| 0001 hex | 0002 hex | ----- |
| | 0003 hex | |
| 0002 hex | 0004 hex | ----- |
| | 0005 hex | |
| 0003 hex | 0006 hex | ----- |
| | 0007 hex | |
| ⋮ | ⋮ | ----- |
| | ⋮ | |
| 01F2 hex | 03E4 hex | ----- |
| | 03E5 hex | |
| 01F3 hex | 03E6 hex | ----- |
| | 03E7 hex | |
| | | ← 1 byte → |

Because you cannot access data in bytes for a V680S-series Reader/Writer, you cannot, for example, read six bytes of data starting from address (byte address) 0001 hex. In this case, you would have to read four words from address (word address) 0000 hex and discard the first and last bytes at the host device.



Data is accessed in words for a V680S-series Reader/Writer. The smallest accessible unit is therefore one word (two bytes).

CHECK!

For customers using Reader/Writer earlier than firmware Ver.4.00.

Operating environment when using a web browser.

The WEB browser interface can be used in the following operating environments.

- Windows 7, Windows 8.1, or Windows 10 with Internet Explorer 8 or higher
- The combination of the firmware version and the JRE version

| Reader/Writers firmware version | JRE version | | Java 8 | | |
|------------------------------------|---------------|-----------|----------------|--------------------------|-------------------------|
| | Java 6 | Java 7 | Up to Update73 | Update74 to Update201 | Update211 or later*1 |
| Ver1.01 | Available | Available | Not available | Not available | Not available |
| Ver2.00 | Available | Available | Not available | Not available | Not available |
| Ver3.00 | Not available | Available | Available | Not available*2 | Not available*2 |
| Ver3.01/Ver.3.02 | Not available | Available | Available | Available | Available |

*1: Commercial license is required for Java 8 Update 211(April 16, 2019).

*2: Java 8 Update74(February 5, 2016) or later can not be connected.



CHECK!

There is case where WEB browser can not be used in a combination of the firmware version of Reader/Writer and the JRE version. Refer to the table above, please use the JRE version that was appropriate for your Reader/Writer.

* Java software can be downloaded from the following.

URL: <https://www.oracle.com/technetwork/java/archive-139210.html>

(*URL is as of April 2019 and may change in the future.)

Cannot Display the Web Browser Operation Window

This section describes countermeasures when you cannot access the Reader/Writer Web browser interface (i.e., when you cannot display the operation window).

Only countermeasures that have been confirmed by OMRON are provided. They may not solve all possible problems. Contact your OMRON representative if you have problems that cannot be solved.



The problems described in this section have been solved for firmware version 3.00 or higher.

CHECK!

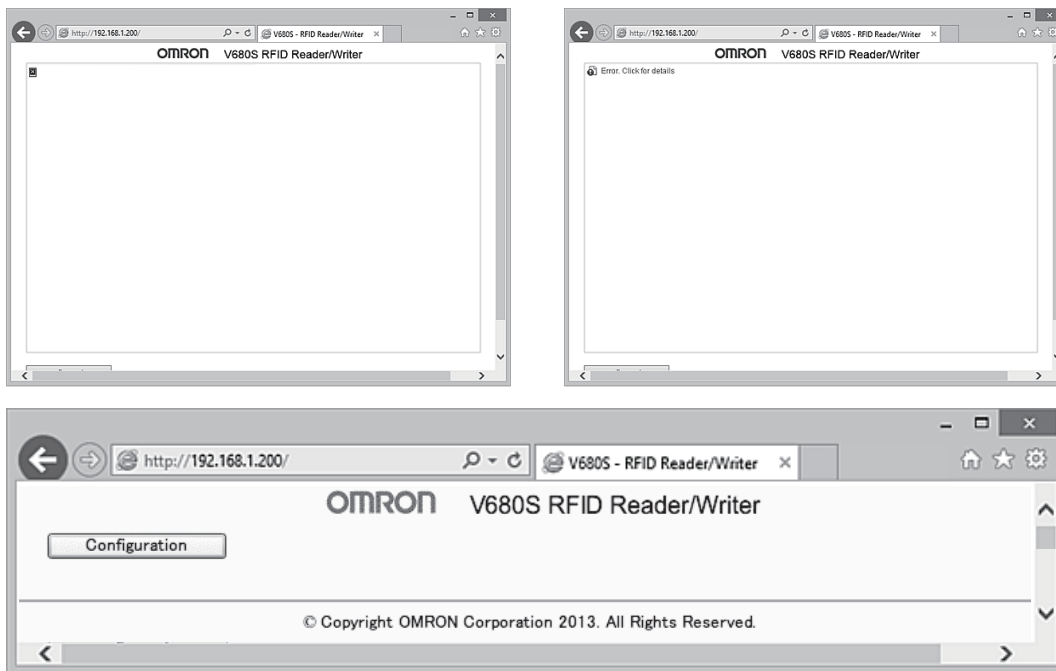


The screen layout may be broken if you configure display magnification to other than 100%.

CHECK!

■ Problem

When the Web browser Reader/Writer interface is used to display the Web operation window, the OMRON logo is displayed and an error message is displayed instead of the operation menu.



■ Solution

Check the message that appears when you try to start the Web browser interface, and then perform the corresponding procedure.

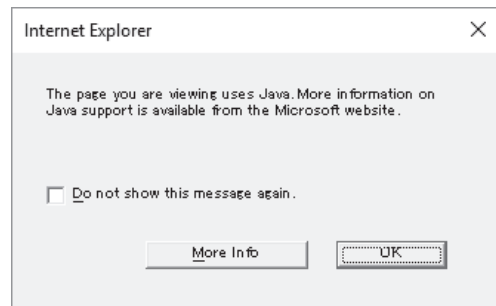
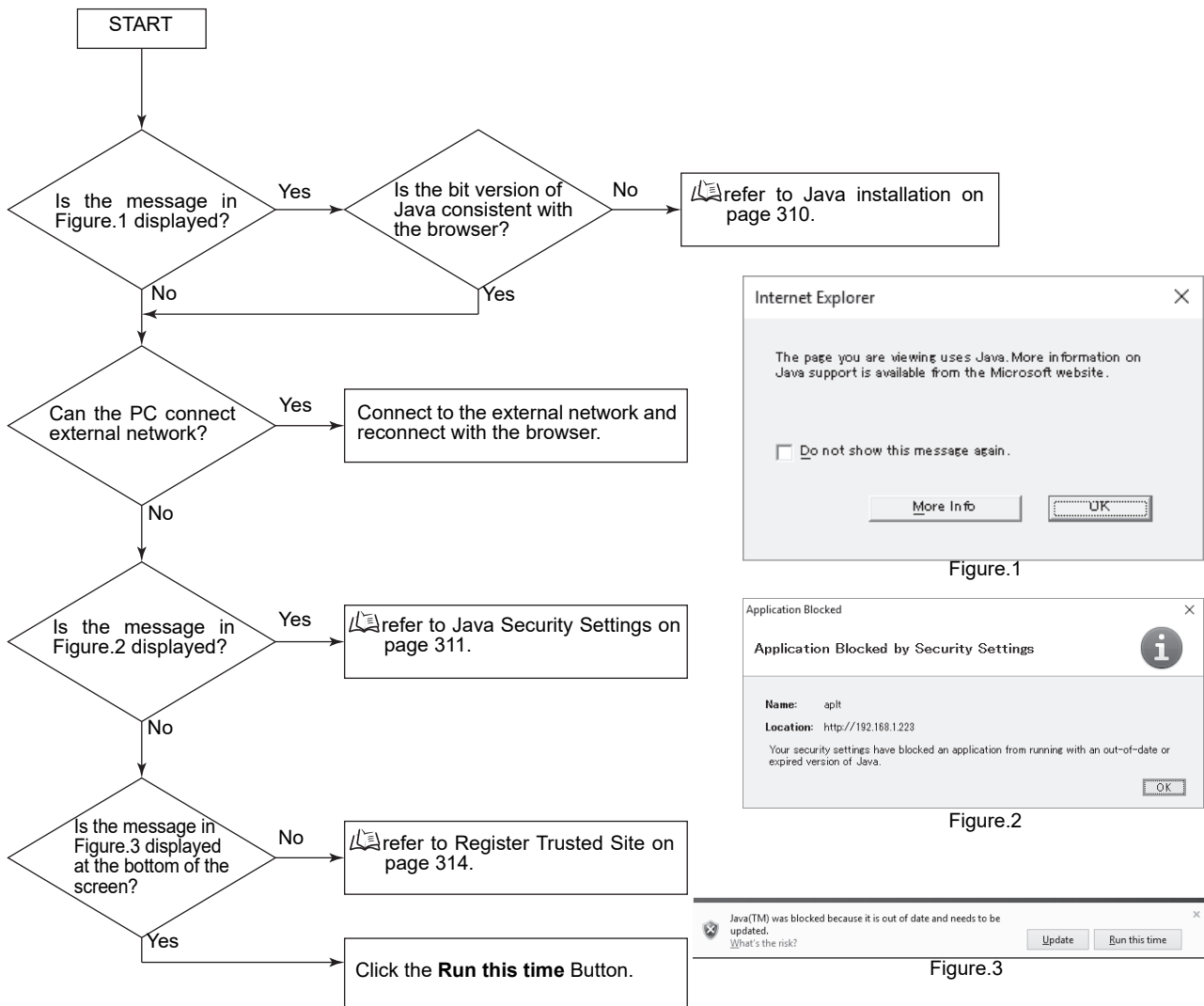


Figure.1

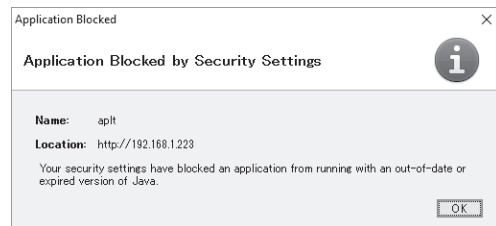


Figure.2

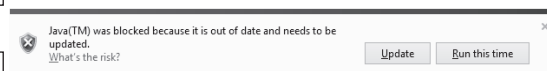
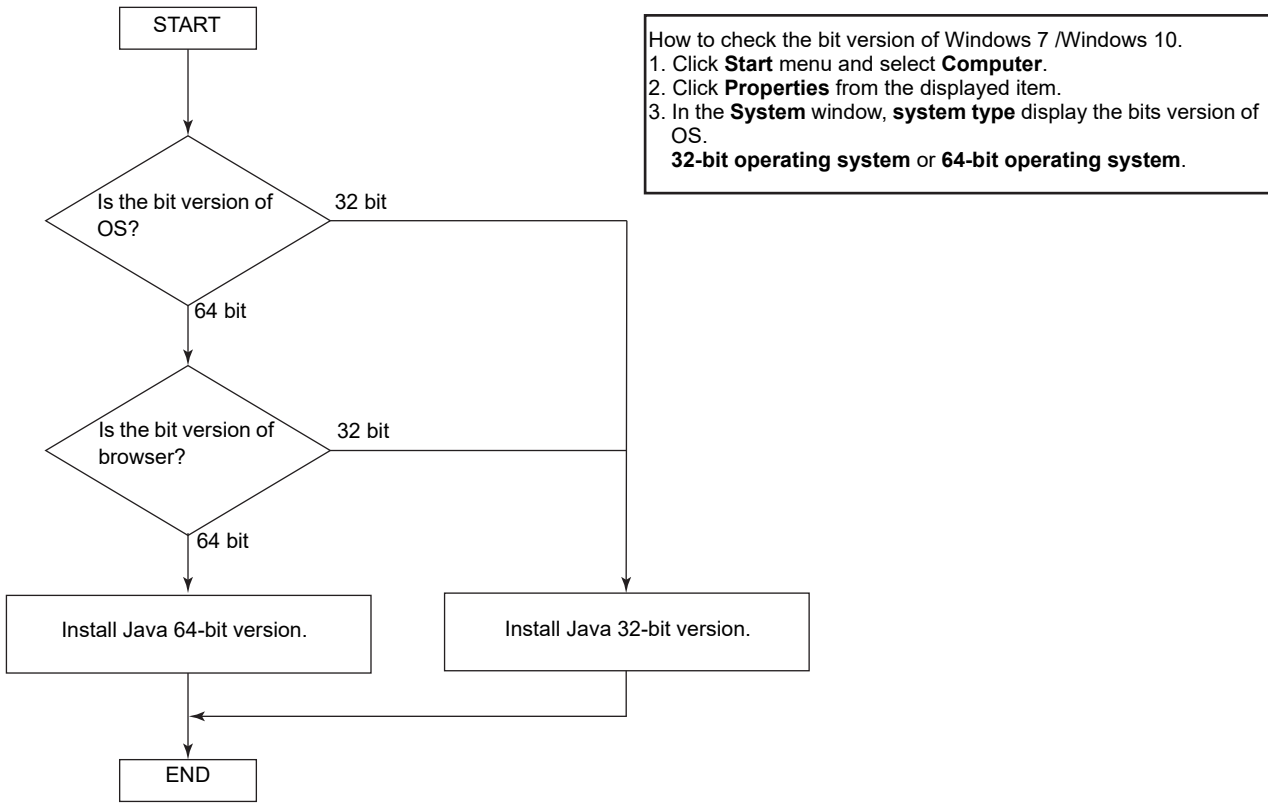


Figure.3

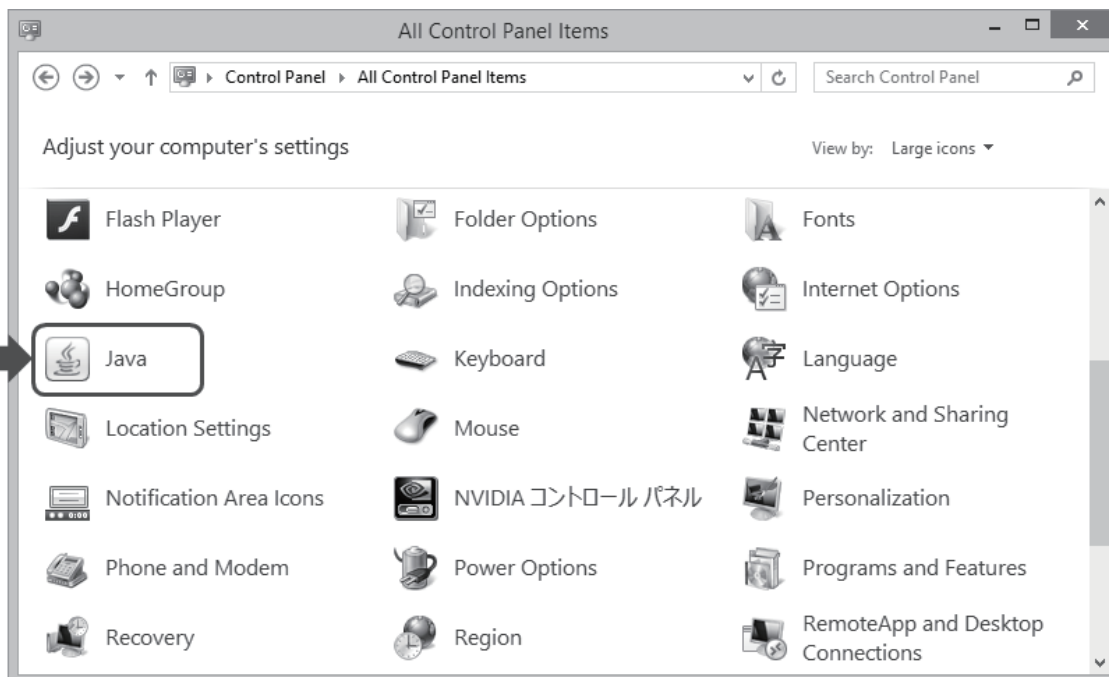
■ Java installation

Install Java bit version (64-bit or 32-bit) decided by the following flow.



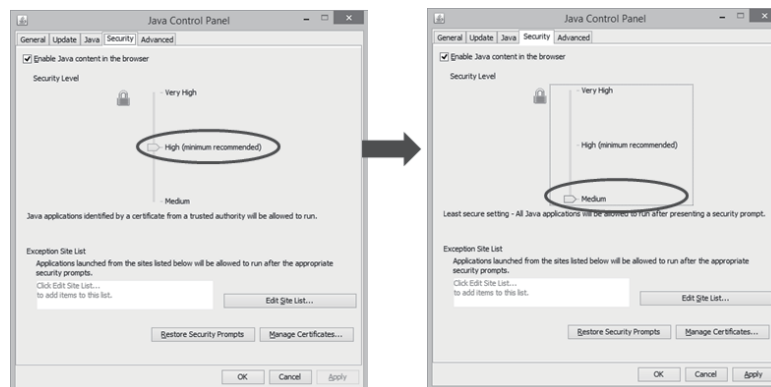
■ Java Security Settings

(1) Open the Control Panel and click the **Java** icon.



(2) Click the **Security** Tab and change the security level from high to medium.

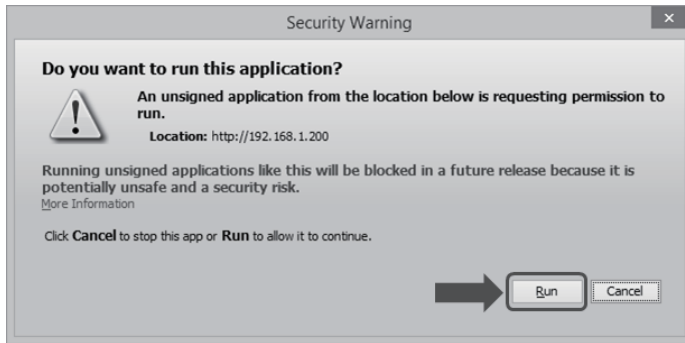
* If the security settings are not displayed, refer to *Java Security Settings Are Not Displayed*.



This procedure will reduce the security verification performed for execution of Java applications and therefore it may affect the execution of other Java applications.

(3) Restart the Web browser and access the IP address of the Reader/Writer again.

* The first time you access the IP address, the following message will be displayed. Click the **Execute** Button to display the window.



■ Java Security Settings Are Not Displayed

This section describes the countermeasure when the exception site list is not displayed and operation is not possible.

If the tab page to change Java security settings does not appear and you cannot change the settings when you select the **Security** Tab in step 2 of the procedure in *Countermeasure for Security Settings*, use the following procedure.

- (1) Open the Control Panel and uninstall all Java programs.
- (2) After you uninstall all of the programs, go to the following website and install Java.
<https://www.oracle.com/technetwork/java/archive-139210.html>
(*URL is as of April 2019 and may change in the future.)

Refer to *Operating environment when using a web browser*. for Java versions that can be used.



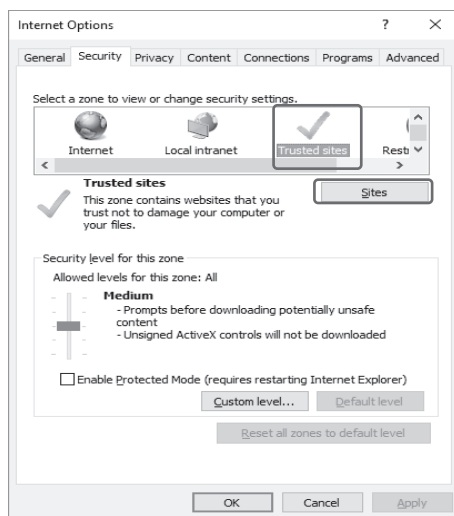
CHECK!

Java security features have been improved for the most recent version of Java, so the same problem may occur.

■ Register Trusted Site

(1) Open the Web browser, click the **Tools** menu and select **Internet Options**.

(2) Click the **Security** Tab, select Trusted sites and click **Sites** button.

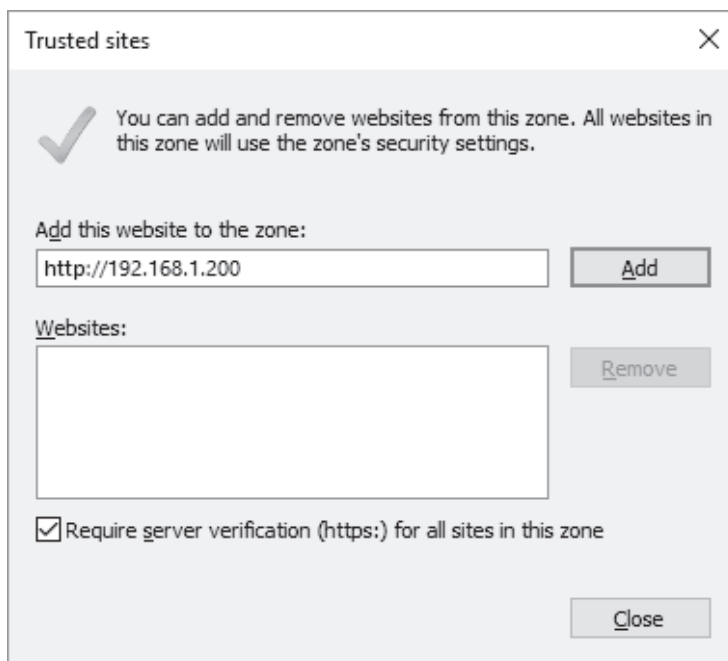


Java security features have been improved for the most recent version of Java, so the same problem may occur.

(3) In the **Add this Web site to the zone** box, enter the IP address of the target Reader/Writer, and then click **Add** button.

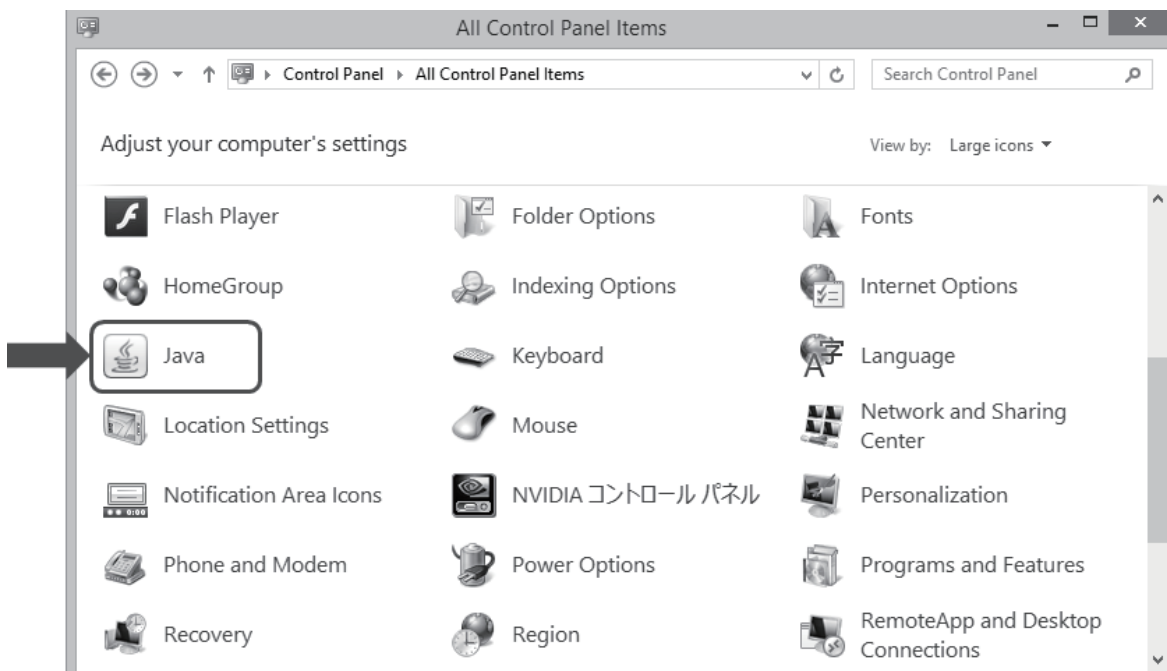
http://"IP address of target device"

ex) <http://192.168.1.200/>

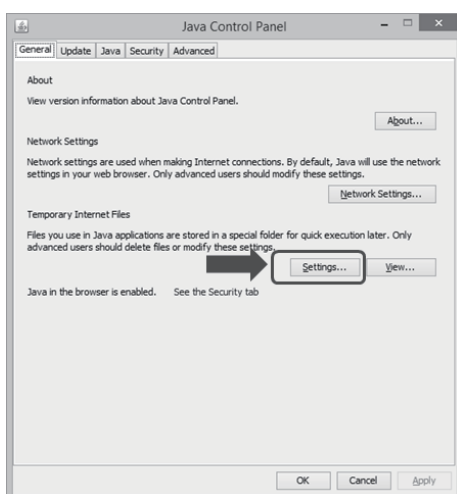


■ Countermeasures for Other Problems

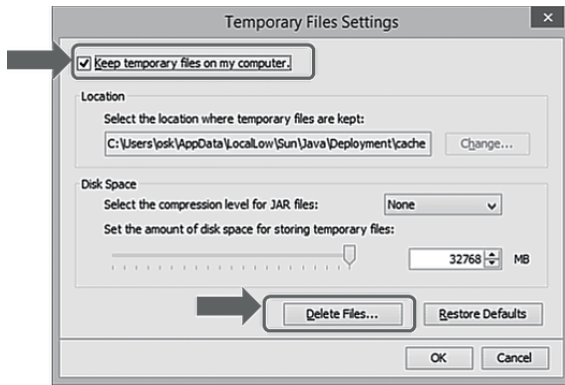
(1) Open the Control Panel and click the **Java** icon.



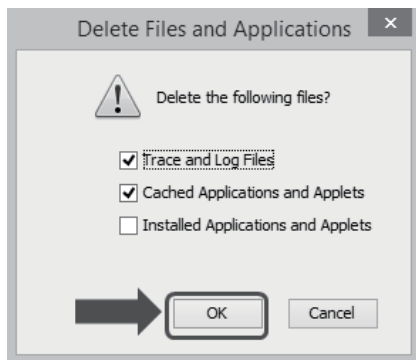
(2) Click the **Settings** Button in the *Temporary Internet Files* Area on the General Tab Page.



(3) Select the *Keep temporary files on my computer* Check Box and click the **Delete Files** Button.



(4) Click the **OK** Button.



(5) When the files have been deleted, click the **OK** Button and close all windows. Then, restart the Web browser and connect to the Reader/Writer again.

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Revision History

A manual revision code appears as a suffix to the catalog number at the bottom of the front and rear pages.

Man. No.: Z354-E1-14

↑
Revision code

| Revision code | Date | Revised contents |
|---------------|----------------|---|
| 01 | February 2015 | Original production |
| 02 | August 2015 | Changed model numbers of the recommended cable for Ethernet cable and Power cable, and changed the information for RF Tag Communications Time. and made other minor corrections. |
| 03 | September 2015 | Added information on RF Tag Communications Time. Made other minor changes. |
| 04 | April 2016 | Added information on Compliance standards and Frequency to the General Specifications of the Reader/Writer's. Added information on Compliance standards, Ambient operating temperature, Ambient storage humidity, and Dimensions to the General Specifications of the RF Tags. Added the information to the system configuration Changed the information on the mounting bracket of Reader/Writer, V680-D1KP66MT, and V680-D8KF67M. Added information on the delaying and the stopping of the Ethernet packet. Made other minor changes. |
| 05 | July 2016 | Changed the configuration of the section. |
| 06 | October 2016 | Change the description of the operating environment of the Web browser. Added the information for "Firmware Version Update History". Changed the information for "Mutual Interference of Reader/Writers (for Reference Only)" of the V680S-HMD63-PNT and V680S-HMD64-PNT. |
| 07 | February 2017 | Changed the information for "FIFO Repeat". |
| 08 | April 2017 | Addition of description of communication function "Auto", "FIFO Repeat (Without ID code check)" and "FIFO Repeat (With ID code check)" The layout change of Web browser. |
| 09 | July 2019 | Changed the description of Java version. Added items for the V680S-A63-S, and V680-A64-S. Deleted items for V680-D8KF67, V680-D8KF67M, and V680-D8KF68A RF Tags, |
| 10 | December 2019 | Changed the configuration for setting communication conditions (Addition of setting procedure for IP address of the personal computer) Made other minor changes. |
| 11 | December 2020 | Change of recommended operating environment of Web browser Changes in the appearance and layout of the Web browser interface |
| 12 | March 2021 | Added information of Java version earlier than firmware Ver.4.00. |
| 13 | June 2022 | Added information of Windows11. |
| 14 | September 2022 | Added description of Safety Precautions and added information about Security Measures. |

Firmware Version Update History

V680S Reader/Writers: The following table gives an update history of the firmware version of the V680S-HMD6□-PNT Series.

| Firmware version | Revised contents |
|------------------|---|
| 3.00 | Original production |
| 3.01 | Web browser interface can be used in the Java8 update74 or later. |
| 3.02 | Addition of communication option "Auto" and "FIFO Repeat (With ID code check)" The layout change of Web browser. |
| 4.00 | Change of recommended operating environment of Web browser Changes in the appearance and layout of the Web browser interface |

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