

PRELIMINARY

OMRON

V750-series UHF RFID System

Operation Manual

Reader/Writer
Antenna

V750-BA50C04-US (Mono-static Reader/Writer)
V740-HS01CA (Circular Antenna)
V740-HS01LA (Liner Antenna)

OMRON Corporation

Cat. No. SRFM – 012 – A

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Application Precautions, Change in Specifications

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Declarations

Regulatory Compliance

EMC 47 CFR, Part 15
.....RSS210
Safety UL 60950
..... Can/CSA C22.2 No 60950

FCC WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC COMPLIANCE: This equipment complies with Part 15 of the FCC rules for intentional radiators and Class A digital devices when installed and used in accordance with the operation manual. Following these rules provides reasonable protection against harmful interference from equipment operated in a commercial area. This equipment should not be installed in a residential area as it can radiate radio frequency energy that could interfere with radio communications, a situation the user would have to fix at their own expense.

EQUIPMENT MODIFICATION CAUTION: Equipment changes or modifications not expressly approved by OMRON Corporation, the party responsible for FCC compliance, could void the user's authority to operate the equipment and could create a hazardous condition.

IMPORTANT USER INFORMATION: This equipment complies with FCC radiation exposure limits set forth for uncontrolled equipment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment should be installed and operated with at least 23cm (9.1in) and more between the radiator and person's body (excluding extremities: hands, wrists, feet and legs).

This device complies with RSS-Gen of IC Rules. Operation is subject to the following two conditions:

(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.



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Safety Precautions

This chapter provides important information for the safe use of this product.
Ensure to read the information carefully before use.

IN THE SAFETY PRECAUTIONS BELOW, SEVERITY IS CATEGORIZED AS EITHER "WARNING" OR "CAUTION".

 WARNING	<p>Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.</p>
 CAUTION	<p>Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage. Property damage refers to extended damage caused to house/household goods or livestock/pets.</p>

•Description of Symbols



Prohibition

Indicates an action or activity not permitted.



Observe strictly

Indicates the need to ensure the safe use of the product.



Ensure to establish a solid grounding

A label indicating that a device with a grounding terminal should always be grounded.



Electric shock hazard

A notification that alerts the possibility of electric shock under certain conditions.



Do not disassemble

A notification that prohibits disassembly when injuries caused by electric shocks may result.

Please ensure that all cautions and prohibitions are adhered to, since non-compliance may lead to serious injury or damage, in certain circumstances.

 **WARNING**


Never disassemble, repair, or modify the main unit and cables.

- Do not disassemble, repair, or modify this product. Doing so may result in electric shock, fire, or personal injury.



Do not handle the device with wet hands. Do not touch the terminals while the device is connected to the power supply.

- Electric shock hazard.



Do not allow the cables to be in contact with heaters.

- The cable sheaths may melt and the exposed wire may cause electric shock or fire.



Be sure to connect to a grounded main outlet for AC adapter power cord.

- Electric shock hazard.



Do not use the power cords and power adapters not supplied with the products.

- Failure to do so may result in electric shock, fire, or personal injury.



Connect and disconnect cables as described in the following procedures when installing, moving, on this product or attached devices.

To connect:

1. Attached all cables to devices.
2. Attached power cords to outlet.

To disconnect:

1. Remove power cords from outlet.
2. Remove all cables from devices.

Failure to do so may result In spark or deform or damage the device.



Always turn OFF the power supply to the PC before attempting any of the following. Not turning OFF the power supply may result in malfunction or electric shock.

- Assembling the Units.
- Connecting or disconnecting the Expansion I/O Units or Expansion Units.
- Connecting or wiring the cables.
- Connecting or disconnecting the connectors.

 CAUTION
**Do not drop the device you may receive major shocks.**

- Doing so may result in personal injury or device damage.

**Do not apply strong force to, or place heavy items on the device or cables.**

- Doing so may deform or damage the device, resulting in electric shock or fire.

**Use and store the product in an environment that is specified in the catalog or operation manual.**

- Failure to do so may cause failure of the device, electric shock, or fire. Do not use or store the devices (Reader/Write ,antenna ,antenna cable) in the following locations:
 - Locations that do not satisfy the specified operating conditions (0 to +40 , 35%RH to 85%RH,non-condensing).
 - Locations that do not satisfy the specified storage conditions (-25 to +65 , 35%RH to 85%RH,non-condensing).
 - Locations where the Reader/Writer is exposed to direct sunlight.
 - Locations where the Reader/Writer is exposed to dust, corrosive gas, saline, or flammable gas.
 - Locations where the Reader/Writer is exposed to direct heat.
 - Locations subject to condensation due to high humidity.
 - Locations subject to vibration or impact that exceed the limits outlined in the specifications.
 - Locations where the device may be exposed to water, oil, or chemical agents. (This applies to the models other than waterproof types.)
 - Outdoor

**Be sure to tighten the devices screws securely.**

- Failure to do so may result in personal injury or device damage.

**Cables with screw attachments must be secured before use.**

- Failure to do so may damage the device.

**To avoid interferences with other systems, adhere to the following items and check them before using the product.**

- The product uses a publicly available ISM frequency band of 902-928MHz to communicate with Tags. Some transceivers, motors, monitoring devices, power supplies (power supply ICs), and other similar RFID systems may generate noise, which cause radio interference and may affect communication with Tags. If the product is required in the vicinity of these items, check for any interferences prior to use.
- On the contrary, the system itself may affect radio station transmissions or medical devices. Be cautious when using the system in the environments where such effects might occur.
- To minimize noise effects, adhere to the following:
 - Establish a Class D grounding (former Class 3 grounding) for metal objects placed in the vicinity of the system.
 - Keep cables away from those with high voltages or heavy currents.

	<p>Do not allow the device or cables to be exposed to water.</p> <ul style="list-style-type: none"> ● Doing so may result in electric shock, fire or failure of non-waterproof devices or cables.
	<p>If the device fails or is exposed to water (non-waterproof devices or parts), or an unusual smell, smoke, or sparks are detected, immediately refrain from using the device and contact OMRON or a sales representative for service and repair.</p> <ul style="list-style-type: none"> ● Continued use of the failed device may result in electric shock or fire.
	<p>Do not use damaged cables.</p> <ul style="list-style-type: none"> ● Continued use of the damaged cables may result in electric shock or fire.
	<p>Fail-safe measures must be taken by the customer to ensure safety in the event of incorrect, missing, or abnormal signals caused by broken signal lines, momentary power interruptions, or other causes.</p>
	<p>Be sure that all the mounting screws, terminal screws, and cable connector screws are tightened to the torque specified in the relevant manuals. Incorrect tightening torque may result in malfunction.</p>
	<p>Be sure that terminal blocks and connectors are connected in the specified direction with the correct polarity. Not doing so may result in malfunction. If the power supply for the I/O circuits is turned ON with the input and output connectors reversed, the fuse of output transistor may be blown.</p>
	<p>Do not apply voltages to the input terminals in excess of the rated input voltage. Excess voltages may result in burning.</p>
	<p>Do not apply voltages or connect loads to the output terminals in excess of the maximum switching capacity. Excess voltage or loads may result in burning.</p>
	<p>When transporting the Units, use special packing boxes. Be careful not to apply excessive vibration or shock, or not to expose to water during transportation and not to drop the product.</p>
	<p>Do not install or keep the V750-BA50C04-US in the following locations:</p> <ul style="list-style-type: none"> -Locations subject to shock or vibration. -Locations subject to condensation as the result of severe changes in temperature. -Where the device may be exposed to water, oil, chemicals or organic solvents.
	<p>Do not use the system in an environment subject to flammable, explosive, or corrosive gases.</p>
	<p>Provide an enough space around the device for ventilation</p>
	<p>Keep cables away from those with high voltages or heavy current.</p>






	<p>To avoid interferences with other systems, adhere to the following items and check them before using the product:</p> <p>-The product uses a publicly available ISM frequency band of 902-928MHz to communicate with Tags. Some transceivers, motors, monitoring devices, power supplies, and other similar RFID systems may generate noise, which cause radio interference and may affect communication with Tags. If the product is required in the vicinity of these items, check for any interferences prior to use.</p>
	<p>In order to comply with FCC requirements for RF exposure safety, a separation distance of at least 23cm(9.1in) needs to be maintained between the radiating elements of the antenna and the bodies of nearby persons.</p>
	<p>To avoid interferences with other systems, adhere to the following items and check them before using the product:</p> <p>-On the contrary, the system itself may affect radio station transmissions or medical devices. Be cautions when using the system in the environments where such effects might occur.</p>
	<p>Keep cables away from those with high voltages or heavy current.</p>
	<p>Properly shielded a grounded cables and connectors must be used for connection to host computer and / or peripherals in order to meet FCC emission limits.</p>

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Feature of V750 series RFID system

V750 Series RFID Reader / Writer, Antenna

Operation Manual



V750-BA50C04-US Mono-static
Reader/Writer(4ports)



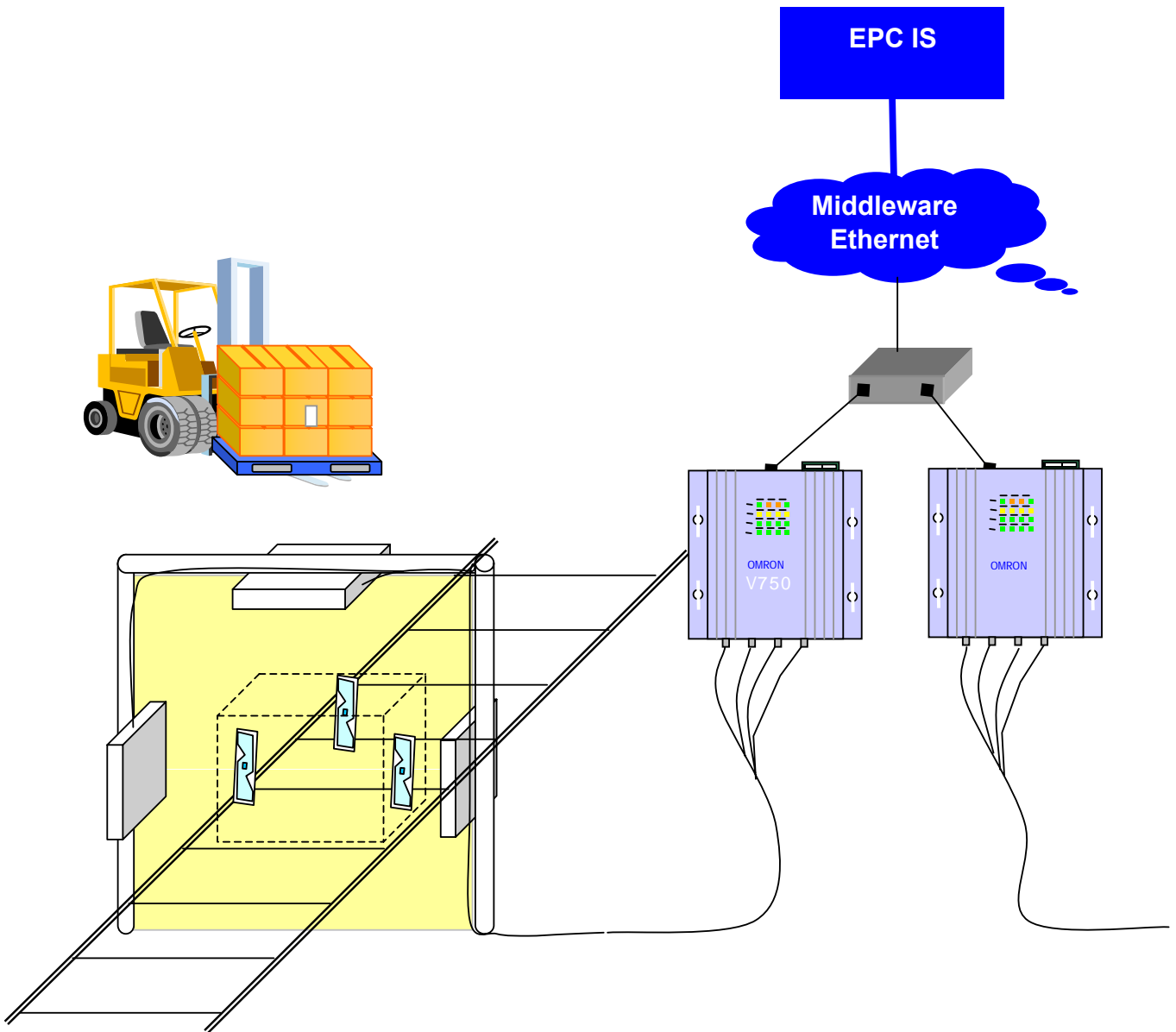
V740-HS01CA Mono-static
Antenna (Circular)
V740-HS01LA Mono-static
Antenna (Liner)

The OMRON V750 RFID Reader (herein after denoted as the V750 Reader) uses RFID (radio frequency identification) technology to read data stored on RFID tags.

The reader supports UHF (ultra high frequency) antennas, which are available separately. The reader supports multiple configurations of UHF antenna ports and transfers data to a remote computer over a network connection.

V750-series Radio wave propatative RFID system is ideal for long range communication and for the system construction used in the production process or distribution control.

It is designed to increase “basic performance of communication with tag” and “Quick and simple operability” most as a unique feature.



Main Features 英語内容確認

(1) Various communication performances and functions for various customers' applications.

1) Selective communication modes to meet various applications.

Multi-access: optimizes a sequence automatically according to the number of tags existing in the read field.

Single-access: reads a tag in high speed if there is a single tag in the read field.

2) Wide-choice communication condition setting.

Multiple communication conditions can be combined for suitable usage..

3) Self-operation function that can build system at low cost.

Using two function; command register function and programmable function, the Reader/Writer can implement simple judgment or processing without instruction from the host.

Command setting function

Can set the commands so that the command starts when power is on or input terminal signal is ON.

Programmable output terminals

4 outputs can be used for output terminals to show reader status or communication test results judgment.

When the output terminal is used for communication test results judgment, the judgment conditions can be changed by choosing criteria objective such as data value or tag numbers.

(2) Various Maintenance Functions and On-site Verification Functions.

1) Monitoring and Setting via Web browser.

Via Web browser, you can set functions to display an operation state or setting conditions or to set the operation parameters easily by using PC.

2) Communication monitoring function that reduces the time to verify the system.

A tag communication test (Query), an on-site environmental monitoring function (a noise check, Channel, radio wave monitor), and error logging function are equipped. This function shows the status of radio waves and enables you to verify performance of tag-reader or analyze phenomenon that may change depending on on-site RF environment.

3) Multiple LED operation displays

The multiple LED lamps show the reader operation state clearly and simply so that you can understand the reader's status and handle an error quickly if the error occurs.

4) Automatic antenna detection.

This function enables you to check the connection status of antennas and the R/W when a command is executed. It helps to detect an error or problem of antenna(s) or wiring.

(3) Extensibility applicable to broad usage

1) Firmware upgradeable.

Via an Ethernet port, you can upgrade its software. It means that countermeasures can be taken easily against an error and future functions are expandable. In addition to this, Safe Mode is also equipped so that the reader/writer can recover from the upgrade error.

FCC WARNING

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Properly shielded a grounded cables and connectors must be used for connection to host computer and / or peripherals in order to meet FCC emission limits.

(AC adaptor) with ferrite core must be used for RF interference suppression.

1. Installation and Usage Guide

About this Guide

This installation and usage guide explains how to install the V750 Reader, how to use the browser-based interface, and how to control the reader remotely.

1.1 Before You Begin

1.1.1 Installation Requirements

- The reader is shipped with a power source with a cable length of 4.2m (13ft9in).
- Use only authorized antennas and cables to maintain FCC approval .
- In order to comply with FCC requirements for RF exposure safety, a separation distance of at least 23 cm (9.1 in) needs to be maintained between the radiating elements of the antenna and the bodies of nearby persons.
- Provide strain relief for all reader connections.
- The minimum screw size for mounting the reader is M4. Use suitable wall anchors when mounting to drywall or masonry whose thickness is 16mm or more.(Refer to 1.3.1 Install the Reader)
- A Shielded Ethernet cable must be used to communicate with other devices.
- Multiple readers and antennas can be used in combination to enhance detection at specific locations provided the software application is able to synchronize antenna operation.

1.1.2 Performance Considerations

Reader performance may be affected by external factors including tag variables and environment.

Performance tests conducted under typical operating conditions at your site are recommended to help you optimize system performance.

Tag Variables

There are several variables associated with tags that can affect reader performance:

- Application surface — Some materials interfere with tag performance including metal and moisture. Tags applied to items made from or containing these materials may not perform as expected.
- Tag orientation — Reader performance is affected by the orientation of the tag in the antenna field.
- Tag model — many tag models are available. Each model has its own performance characteristics (refer to [Chapter 3](#)).

Environment

Reader performance may be affected by the following:

- Metal surfaces such as desks, filing cabinets, bookshelves, and wastebaskets may enhance or degrade reader performance.

Mount antennas as far as possible from metal surfaces that are adversely affecting system performance.

- Devices that operate at 900 MHz, such as cordless phones and wireless LANs, can interfere with reader performance.
These devices may degrade performance of the reader. The reader may also adversely affect performance of 900 MHz devices.
- Antennas operating in close proximity may interfere with one another, thus degrading reader performance.
- Interference from other antennas may be eliminated or reduced by using either one or both of the following strategies:
 - Affected antennas may be synchronized by a separate user application using a time-multiplexing strategy.
 - Antenna power can be reduced by reconfiguring the RF Transmit Power setting for the reader.

1.2 Authorized Antennas

The antenna authorized by the FCC for use with the V750 Reader is described below.

IMPORTANT: No other antennas may be used with the V750 Reader without violating FCC regulations. It is the responsibility of the user to comply with this requirement.

1.2.1 Antennas

Mono-static Circular Antenna (Options)

Model: V740-HS01CA
 Polarization: Circular
 Gain: 6dBi max.
 Connector: N-Female
 Cable length: 0.3m (0.98')

Mono-static Liner Antenna (Options)

Model: V740-HS01LA
 Polarization: Liner
 Gain: 6dBi max.
 Connector: N-Female
 Cable length: 0.3m (0.98')

1.2.2 Antenna Cables

The only cables authorized by the FCC for use with the V750 Reader are listed below:

Short cable (Options)

Model: V740-A01-3.0M
 Length: 3.0m (9.8')
 Insertion Loss: 1.5 dB min.
 Cable Type: 3D-2V
 Connector: Reverse TNC to Type N
 Cable Diameter: 5.5mm (0.22")

Long cable (Options)

Model: V740-A01-10M
 Length: 10m (32.8')
 Insertion Loss: 1.5 dB min.
 Cable Type: 5D-SFA
 Connector: Reverse TNC to Type N
 Cable Diameter: 7.6mm (0.30")

1.2.3 Setting the Reader RF Power

During initial installation, the reader must be properly configured to use the correct RF power to comply with FCC regulations. DO NOT increase the power beyond the recommended power setting as calculated below.

The maximum RF power is determined from antenna gain and antenna cable loss using the formula:

$$P_{max} = 36 \text{ dBm} - \text{Antenna Gain} + \text{Cable Loss}$$

For example, if the antenna has a maximum gain of 6 dBi, and the cable has a minimum loss of 1.5 dB, the maximum RF power that may be set is $(36 - 6 + 1.5) = 31.5 \text{ dBm}$.

The Reader RF Power is set through the [Settings Page as described on Page18](#).

Note that in no case may the power be set higher than 32.0 dBm.

Recommended Power Settings

Antenna Type	Short Cable/Long Cable
V740-HS01CA V740-HS01LA	31.5 dBm

1.3 Reader Installation

The following parts are provided with the reader:

Part	Quantity	Part Number
V750-Reader/Writer	1	V750-BA50C04-US
Power Supply	1	-
I/O Port Connector	1	-

IMPORTANT: Be sure the user reads the section on *Declarations* to maintain compliance with FCC regulations. The Reader and the antennas are to be installed only by professionals at specific locations For human safety maintain a 23 cm (9.1 in) distance from the antennas.

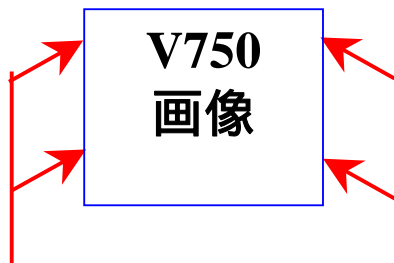
IMPORTANT: This product is intended to be supplied by a Listed AC Adapter (Switching Power Adapter) marked LPS and rated 12 Vdc, 4 A

1.3.1 Install the Reader

You can place the reader on a shelf or mount it to a wall. Mounting shelf and wall should be flat to fix the reader securely.

To mount the reader on a wall:

1. Hold the reader in its four mounting location and mark the position of the mounting screws



Mounting holes

2. Drill holes for the screws and install wall anchors if required. Be sure anchors must have enough strength to fixed the reader against vibration.
3. Hold the reader at the position on the mark and insert the M4x16 screws with spring washers and flat washers, and tighten until almost flush with the wall. Two persons (one for hold the reader and the other for tighten the screws) are required for this installation for the safety.
4. Tighten the screws securely.
5. Place the AC adaptor where it is not obstructed and Fix it so that not to move by vibration and tense DC plug cables. Do not bundle the adaptor cable with other signal or power lines.

IMPORTANT: Be sure to remain within the rated voltage and current of the power cord and outlet.

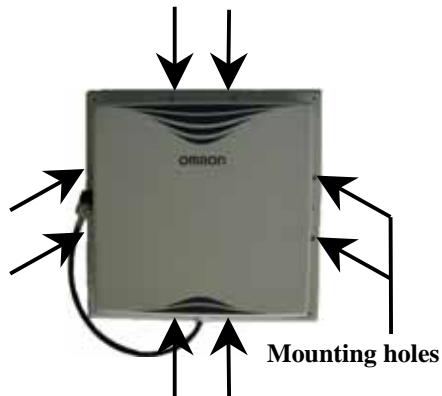
Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

1.3.2 Install the Antennas

The antennas can be mounted directly to a variety of surfaces. Mounting surfaces should be flat to fix the antenna securely.

To mount the reader on a wall :

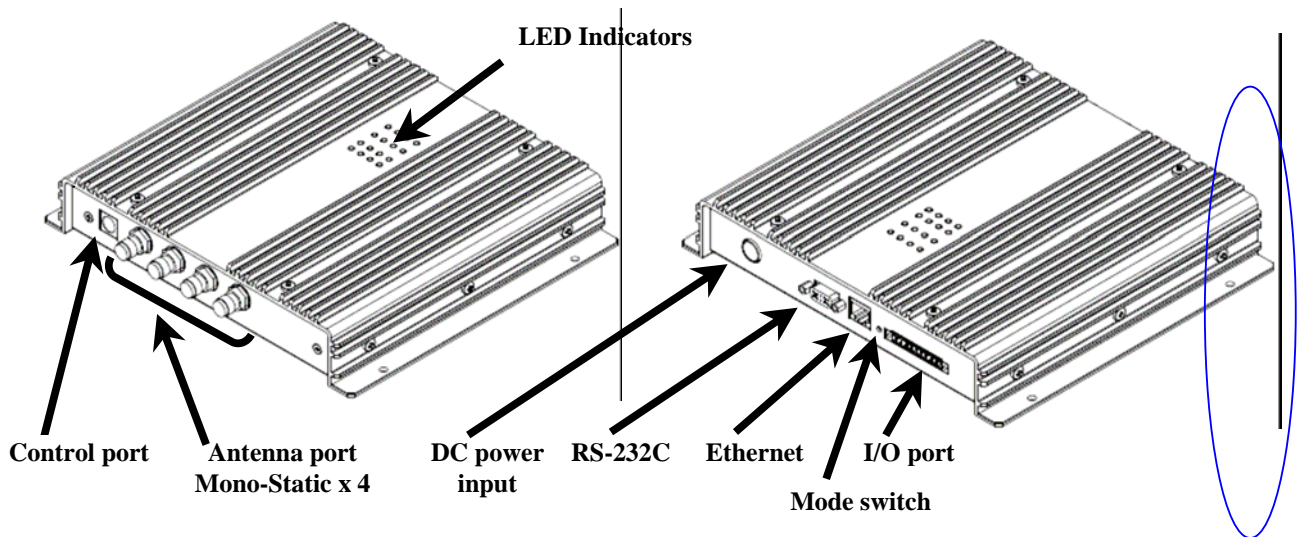
1. Hold the antenna in its mounting location and mark the position of the mounting screws with minimum (4) points. The antenna has several mounting holes for each side. Choose 4 of those with diagonal position according to the mounting location.



2. Drill holes for the screws and install wall anchors if required.
3. Insert the M4x20 screws with spring washers and flat washers and tighten until almost flush with the wall.
4. Tighten the screws securely.

Note: For best performance, mount the antenna in the horizontal orientation as pictured above.

1.3.3 Connect the Reader



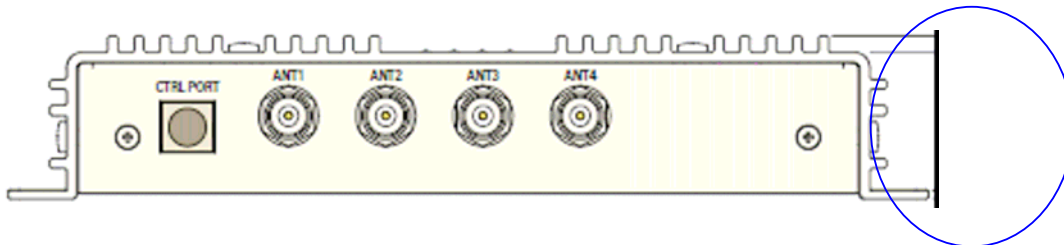
Interface name and function

Name	Function	Connector specifications
Antenna port ANT1- ANT4	Connects with UHF mono-static type antenna specified by OMRON with attachment cables. Max 4 cables can be connected to.	Reverse TNC
Ethernet port ETHERNET	Connects with the host by a commercially available 10/100Base-T cable.	RJ-45 LED Left: Link, Right: Act
RS-232C port RS-232C	Connects with the host by a commercially available cable for DOS/V RS-232C.	D-SUB 9pin (male) Inch screw (#4-40)
Input/Output port IN 1,2,3,4,C OUT 1,2,3,4,C	4 Inputs: connects with the sensor that works as a trigger signal for communication start. 4 Output: connects with the light or actuator that is driven by output signal.	MC1.5/10-SFT-3.81 (produced by PHOENIX CONTACT GmbH & Co.KG).
DC Power input POWER DC12V	Connects with the attachment AC adaptor to receive +12V electric power. * Extension of AC adaptor cable is not allowable.	Exclusive connector
Control port CTRL PORT	For future expansion.	Exclusive connector
Mode switch (Not indicated)	Pushing this button for 1 second or more makes the system rebooting with default setting, which will be useful in case of system error or setting unknown.	-

Note: MAC Address is displayed on the lower part of RJ-45 Ethernet port.

1.3.4 Antenna Port

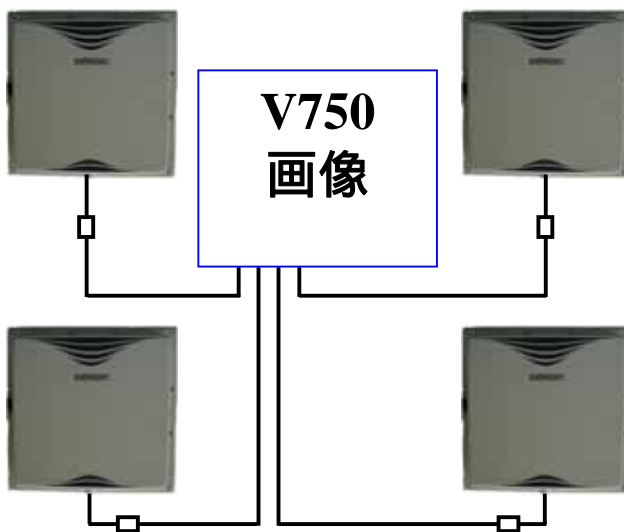
One to four OMRON Mono-static antennas (V740-HS01CA, V740-HS01LA) can be connected to the reader, depending on the application requirements.



1. Connect required UHF antennas to the antenna ports on the reader .

IMPORTANT: Connect antennas to the antenna ports before applying power to the reader. Any antenna port not having an antenna connected to it will be disabled when the reader is powered on.

Antenna Connection: V750-BA50C04-US



Antenna x 4
(V740-HS01CA or V740-HS01LA)

Antenna Cable x 4
(V740-A01-3.0M or V740-A01-10M)

Note: With the two antenna configuration, there is a possibility that a tag may be read by an inactive antenna if the tag is located with in approximately 20 cm of the inactive antenna.

2. Verify that all antennas are securely connected.
3. Connect the reader to the network by plugging a Shielded Ethernet cable into the Ethernet port.

or

Connect the reader to a PC (personal computer) by plugging a crossover Shielded Ethernet cable into the Ethernet port.

Note: If DHCP is to be used, then the network and server must be connected **before** powering up the reader. If a DHCP server is not found, the reader will fall back to the IP address:

"192.168.1.200"

4. Plug the power adapter provided with the reader into the DC power input connector. Then connect the AC power cord to a power outlet.

While the reader is powering up, 'PWR' LED will turn on. After the reader finishes its power-on self-test, approximately 5 seconds, 'RUN' LED will turn on. The reader is now ready for operation.

Connector: Reverse TNC

Name	Function
SG	Signal output
GND	Ground

* Prior to connect antenna(s) to the R/W, make sure the power is off. If antenna is connected during power-on, the R/W can not detect the antenna.

1.3.5 LED Indicators



LED Indicators

Indication	Name	Color	Description	
PWR	Power	Green	ON	Normally energized.
RUN	Running	Green	ON	Normally running.
			Flashing(1)	Boot processing (Flashing short interval).
			Flashing(2)	Safe Mode running (Flashing long interval).
ERR	Reader error -RUN light off Unrecoverable error -RUN light on Recoverable error if error cause removed.	Red	ON	システム異常 機能を実行できない障害が発生している状態 (ex. H/W異常) Stopped abnormally. The error has occurred and it stopped the system operation. (ex. H/W error or setting unreadable.)
			Flashing(1)	設定異常 設定データが異常のため正常に動作できない状態 (ex. 設定コマンド実行中の電断、通信設定異常、DHCPサーバー接続不可) Error occurred and requires handling. System can be running when error appears. (ex. Setting data error.)
			Flashing(2)	動作可能状態待ち Error occurred but requires no handling. System is waiting until the some processes have been completed. (ex. A command is being registered into the host via Ethernet.)
NORM/ERC	Communication result	Green	ON	Command executed or communication with tag completed normally. (Turns off after 50ms ON or upon ERR LED turns on.)
		Red	ON	Command executed or communication with tag completed abnormally. (Turn off after 50ms ON or upon NORM LED turns on.)
Antenna port	ANT1	Yellow	ON	Connecting with an antenna via ANT1 is detected. (Lighting for 50ms after power on.) Means communication process is running via ANT1.

	ANT2	ANT2 port connecting	Yellow	ON	Connecting with an antenna via ANT2 is detected. (Lighting for 50ms after power on.) Means communication process is running via ANT2.
	ANT3	ANT3 port connecting	Yellow	ON	Connecting with an antenna via ANT3 is detected. (Lighting for 50ms after power on.) Means communication process is running via ANT3.
	ANT4	ANT4 port connecting	Yellow	ON	Connecting with an antenna via ANT4 is detected. (Lighting for 50ms after power on.) Means communication process is running via ANT4.
Input/Output port	IN1	Input1	Green	ON	Signal of Input1 is ON.
	IN2	Input2	Green	ON	Signal of Input2 is ON.
	IN3	Input3	Green	ON	Signal of Input3 is ON.
	IN4	Input4	Green	ON	Signal of Input4 is ON.
	OUT1	Output1	Green	ON	Signal of Output1 is ON.
	OUT2	Output2	Green	ON	Signal of Output2 is ON.
	OUT3	Output3	Green	ON	Signal of Output3 is ON.
	OUT4	Output4	Green	ON	Signal of Output4 is ON.

(Flashing 1) short interval::250ms ON ⇔ 250ms OFF 具体的な数値は削除予定

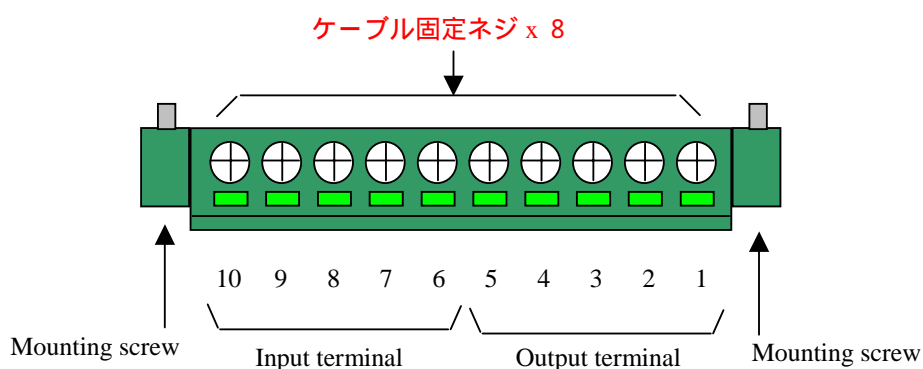
(Flashing 2) long interval: 500ms ON ⇔ 500ms OFF

IMPORTANT: DO NOT disconnect power during startup. Disconnecting power while booting the V750 reader may result in improper startup.

1.3.6 I/O Interface

As an input/ output port, the R/W contains a terminal block of which male connector is removable and attachable with screws.

Terminal block connector: MC1.5/10-SFT-3.81 (PHOENIX CONTACT GmbH & Co.KG)



Pin assignment

Pin No	Name	I/O	Description
1	OUT 1	OUT	Output 1
2	OUT 2	OUT	Output 2
3	OUT 3	OUT	Output 3
4	OUT 4	OUT	Output 4
5	OUT C	-	Output common
6	IN 1	IN	Input 1
7	IN 2	IN	Input 2
8	IN 3	IN	Input 3
9	IN 4	IN	Input 4
10	IN C	-	Input common

[配線手順]

ケーブルをコネクタに結線

・ケーブル固定ネジを緩めて（左回し）、ケーブルを奥まで挿入する。

・ケーブル固定ネジを閉めて（右回し）

コネクタをリーダーライタ本体に取付け

取り付けネジ 2 本で固定

(必要工具)

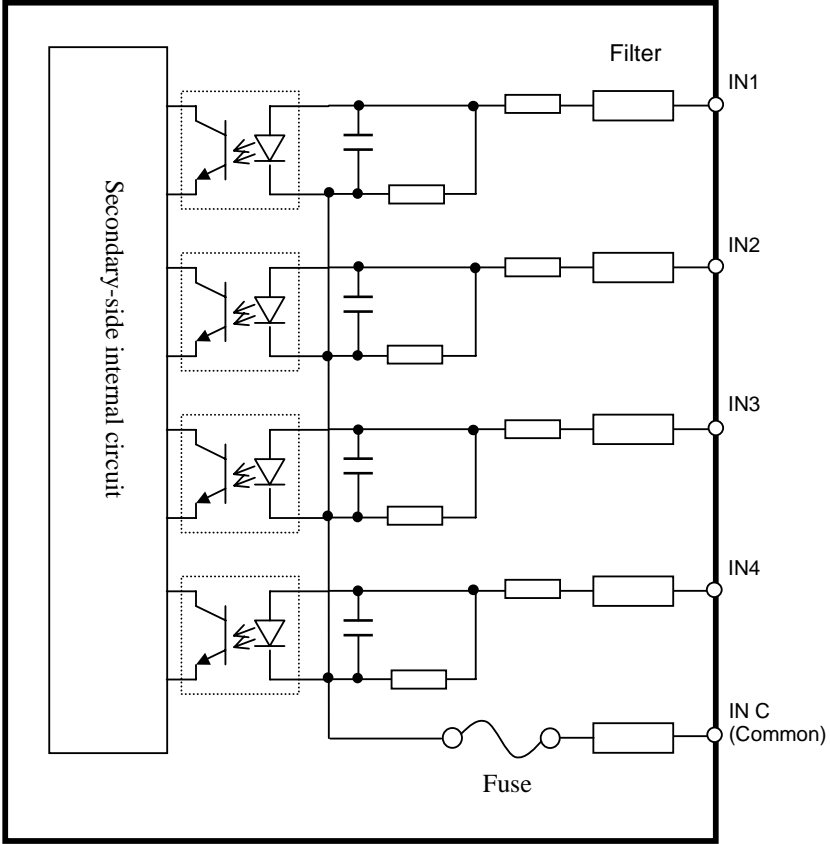
マイナスドライバ

ケーブルを奥まで挿入する。

マイナスドライバ

ケーブルのコネクタへの結線は、必ずコネクタの本体取付け前に行ってください。

Input specifications

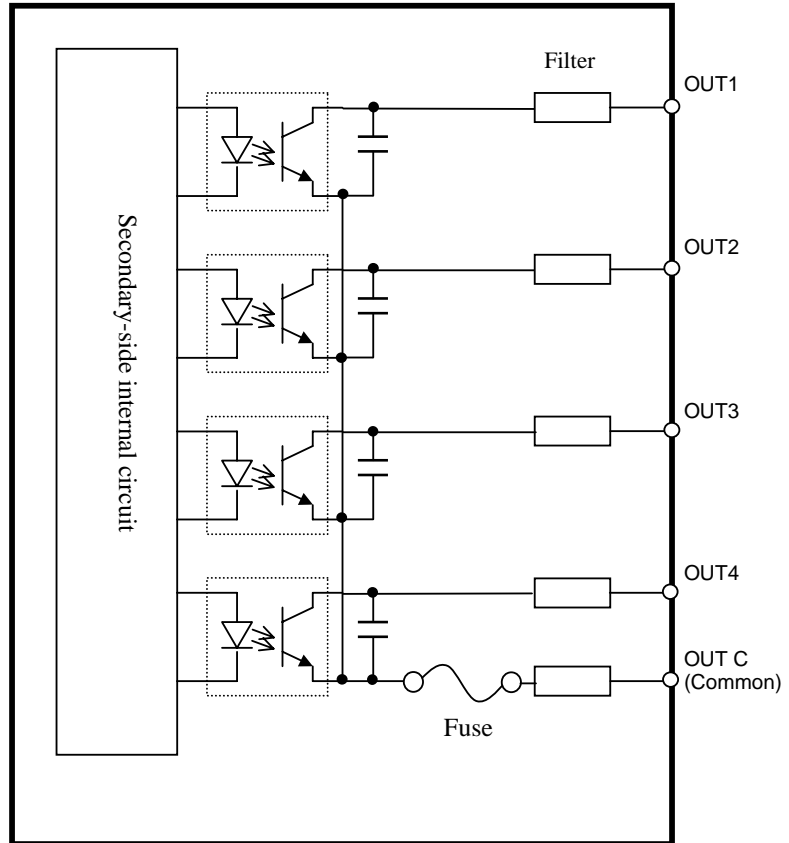
Item	Specifications
Number of input	4 inputs, 1 common input
Input method	Photo coupler
Input voltage	DC12 ~ 24V
Input impedance	2.35k TYP.
Input current	12V: 4.5mA, 24V: 9.8mA TYP.
Wiring	<p data-bbox="496 577 850 609">Wiring with input equipment</p>  <p>The diagram illustrates the internal secondary-side input circuit. It features four parallel input channels, each corresponding to an input terminal: IN1, IN2, IN3, and IN4. A fifth terminal, labeled IN C (Common), is connected to a shared fuse. Each input channel consists of a photo-coupler (represented by a triangle and a diode symbol) connected to the internal circuit. The input lines are protected by fuses and include filters. The internal circuit also includes pull-up resistors and bypass capacitors for each input channel.</p>

Output specifications

Item	Specifications
Number of output	4 outputs 1 common output
Output method	Open collector output (Sync type: NPN)
Output voltage	24V max
Output current	20mA

Wiring

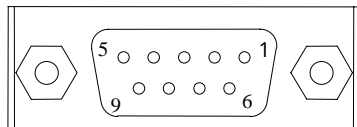
Wiring with output equipment



1.3.7 RS232C Interface

This port is used to connect the R/W to the host containing RS-232C I/F such as PC or PLC. If you use DOS/V computer as a host, prepare a cross cable to connect the PC to the port.

Connector: D-SUB9 pin (male), inch screw (#4-40)

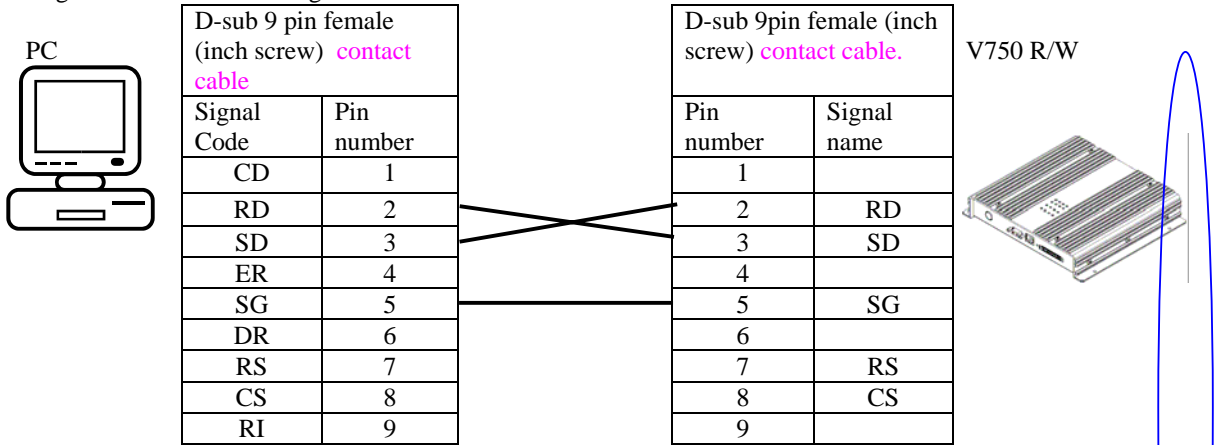


Pin assignment

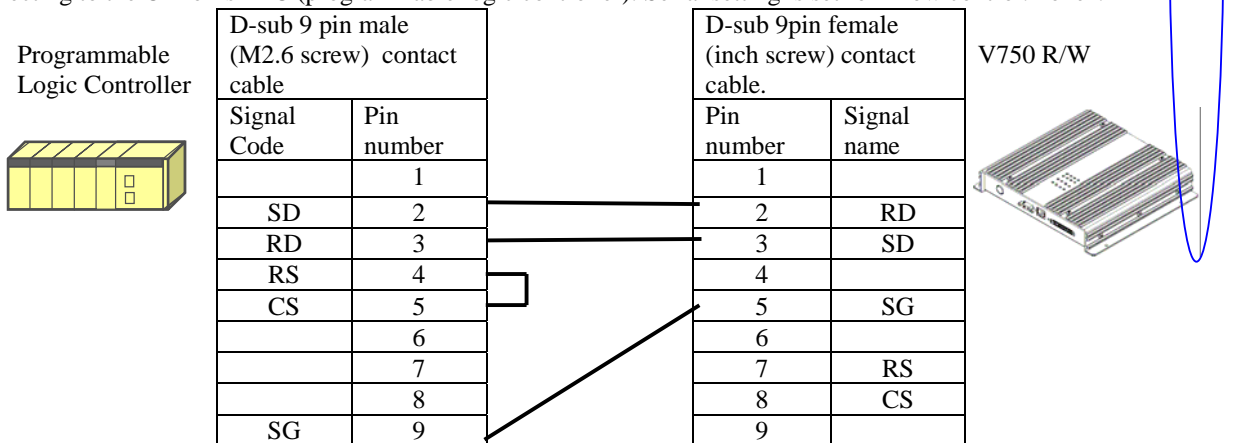
Pin No	Name	Description	I/O
1	-	-	-
2	RD	Receive Data	IN
3	SD	Send Data	OUT
4	-	-	-
5	SG	Signal Ground	-
6	-	-	-
7	RS	Request to Send	OUT
8	CS	Clear to Send	IN
9	-	-	-

【Sample of connection】

Connecting to the PC: Serial setting is set for “flow control: none”.



Connecting to the Omron's PLC (programmable logic controller): Serial setting is set for “flow control: none”.



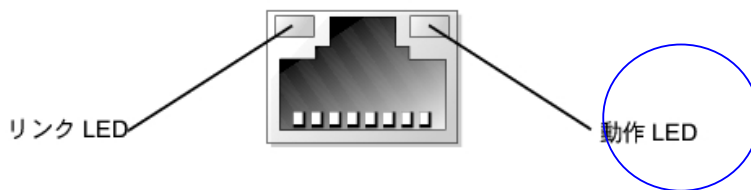
1.3.8 Ethernet Interface

This port is used to connect the host to the R/W via Ethernet. To connect them, use the commercial cable 10/10Base-T.

Connector: RJ-45 (10Pin) LED: LINK(green)/ACT(yellow)

LINK --- lights while linking normally.

ACT --- lights when detects a carrier.



Pin No	Name	Description	I/O
1	Reserved	- (Do not use)	-
2	TXD (+)	Transmit Data + (positive)	OUT
3	TXD (-)	Transmit Data - (negative)	OUT
4	RXD (+)	Receive Data + (positive)	IN
5	Reserved/Do not use	- (Do not use)	-
6	Reserved/Do not use	- (Do not use)	-
7	RXD (-)	Receive Data - (negative)	IN
8	Reserved/Do not use	- (Do not use)	-
9	Reserved/Do not use	- (Do not use)	-
10	Reserved/Do not Use	- (Do not use)	-

1.4 Specifications

Electrical

Reader

UHF operating frequency	902.75–927.25MHz
Input voltage	12Vdc, 2.3A
RF connector type	Reverse-TNC

Separate Power Supply

Input voltage	Nominal 100–240Vac, 50/60Hz
AC line current.....	Nominal 0.5A at 120V
Output voltage	Nominal 12Vdc, 2.5A peak

Antenna

Operating frequency	902–928MHz
V.S.W.R.....	< 1.5 :1
Polarization.....	Circular / Liner
Impedance.....	50ohm
Cable length	30cm(11.8')
RF connector type	N-Female

Environmental

Reader

Operating temperature:	-10° to 55°C (14° to 122°F)
Storage temperature:	-25° to 65°C (-13° to 149°F)
Relative humidity:	25 to 85%RH non-condensing

Antenna

Operating temperature:	-10° to 55°C (14° to 122°F)
Storage temperature:	-25° to 65°C (-13° to 149°F)
Relative humidity:	25 to 85%RH non-condensing

Mechanical

Reader

Dimension	246 x 215 x 43.5mm (9.7 x 8.5 x 1.7 in)
Weight	1.4kg (3.1 lbs)
Protection	IP50

Antenna

Dimension	256 x 256 x 57mm (10.1 x 10.1 x 2.3 in)
Weight	1.0kg (2.3 lbs)
Protection	IP50

PRELIMINARY



Supported Tag Protocols

915 MHz EPC GEN2

2. Functions and Control

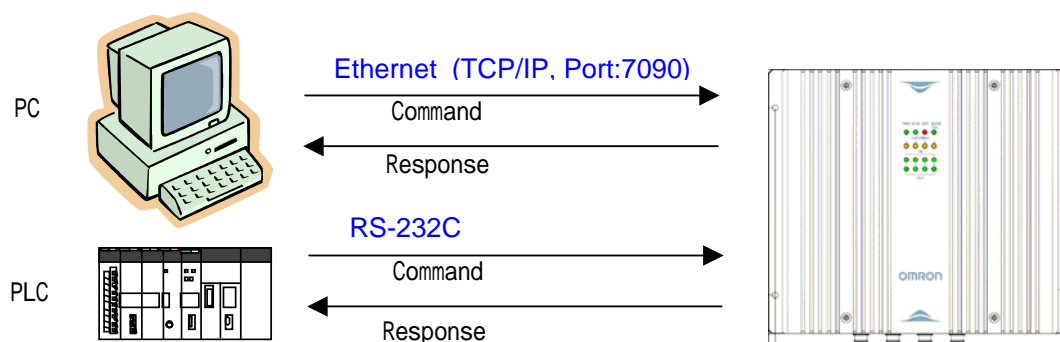
Reference Guide

This chapter lays the groundwork for the communication protocol between client software running on a remote computer and the V750 reader.

2.1 System Interface

2.1.1 Command I/F function

Via 10/100BaseT Ethernet or RS-232C, the host issues a command to control the R/W. As the control method, V750 employs original procedures. Same commands are used for Ethernet and or RS-232C.



(1) Ethernet

Ethernet is connected with the host such as server computer with TCP/IP protocol.

IP address corresponds to variable IP address assigned by DHCP server. You can choose between static IP (Default 192.168.1.200) and variable IP. Default setting is static IP. 使用する Port 番号は 7090。IP アドレスと Port 番号は、設定コマンドまたは Web 画面から変更可能。If the reader can't detect DHCP server under various IP address setting, it will indicate error occurrence and start up with changing various IP address setting into the static IP. Under Safe Mode, IP address shall be always set static IP (192.168.1.200).

(2) RS-232C

The reader conforms to the RS-232C standard. It can connect with the host such as PLC. You can choose following communication conditions.

Optional communication conditions

Item	Setting value	Factory-default/ (for Safe Mode)
Baud rate	9.6 / 19.2 / 38.4 / 57.6 kbps	57.6 kbps
Data length	7 / 8 bit	7 bit
Parity Bit	Even / Odd / None	Even

PRELIMINARY

OMRON

Stop Bit	1 / 2bit	2 bit
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【コマンド動作一覧】

コマンド種類	経路 / 返信先	レスポンス経路	備考
上位機器からの コマンド	EtherNet	EtherNet (Port:7090)	*Connection 確立時 にシステム起動状 態になる。
	RS-232C	RS-232C	
登録コマンド -電源 ON コマンド -入力起動コマンド	なし	なし(出力制御のみ)	
	RS-232C	RS-232C	
	EtherNet	Ethernet (Port:7090) *	

Operating Mode

Operating Mode contains two modes, Operation Mode and Safe Mode.

Operation Mode: The R/W works as R/W normally.

Safe Mode: The R/W is being under recovering or being maintained after error.

The R/W will start up under Safe Mode if you push the Mode Switch for 1 second or more and release the switch while the system is running, or if the R/W detects an error (ex. Hardware error or a failure of firmware update) and it can not start up normally due to this error. Under Safe Mode, you can check the Status via Web browser, initialize the setting, and write firmware.

2.1.2 Ethernet Protocol

In the current implementation, TCP/IP is used as the transport protocol. TCP is a connection-oriented protocol that provides a reliable, in-order data transport layer with end-to-end checksums and flow control.

2.1.2.1 TCP Connection Setup and Teardown

A session between client software and the reader consists of connection setup, data transactions, and connection teardown.

At present, all connections are initiated only by the client software. If, for example, the reader is configured to automatically forward events and/or data to the client software but the client software has not established a connection, then no attempt is made by the reader to contact the client software to establish a connection. Furthermore, if an extant connection terminates unexpectedly, the reader will not attempt to contact the client software to re-establish a connection. All responsibility for opening, maintaining, and closing the connection during a session rests with client software.

The client software sets up a TCP socket connection on reader port 7090. After connecting successfully, communication between the client software and the reader can proceed as described below. Once the client software has determined that communication has concluded, the connection must be terminated at the TCP level. In order to prevent synchronization issues, each reader will support only one TCP connection.

Other transport protocols may be used to communicate between the client software and its subjugate readers. The application-level protocol discussed below is neutral with respect to the transport layer.

2.1.2.2 Reader Configuration

In some cases, the application software may provide support for reader configuration. If so, follow the instructions provided with the application.

The following procedure describes how to configure the reader directly from a network PC using the browser-based interface.

The reader is with a static IP address which is default setting '192.168.1.200'. At first you can connect to the reader using the default IP address and change IP address to adjust it to your network environment.

Default network setting:

IP Address:	192.168.1.200
Subnet Mask:	255.255.255.0
Gateway:	192.168.1.254

If you are not using DHCP, you must know the IP address and subnet mask settings for the network environment in which the reader will be running. If you are using DHCP, you must have a means of finding the reader, typically by having a DHCP server update a DNS server.

How to change network settings is as the following:

1. Exit any reader applications that are running on the network.

IMPORTANT: Running another reader application while using the browser-based interface may cause a reader error. If this happens, reboot the reader or restart the system using the browser-based interface.

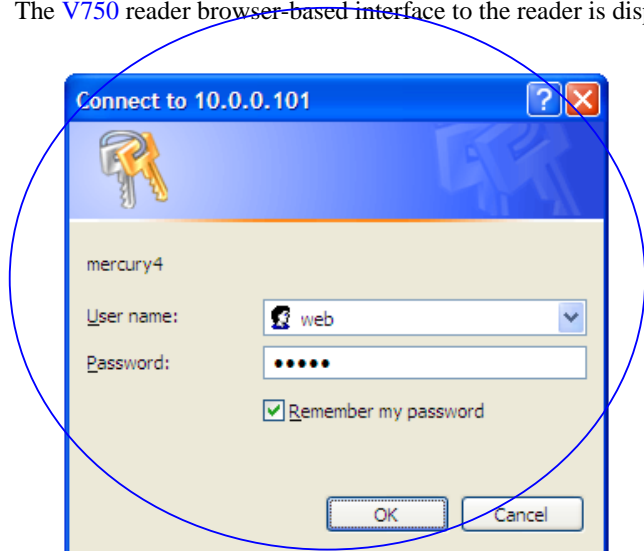
2. Verify that the reader is operational. All LED's should be out except for the green power LED which should be pulsing.
3. Start a Java-enabled web browser from any network-enabled PC. This PC must be configured with an IP address and subnet mask compatible with the reader's settings. For example:

IP address 192.168.1.100
Subnet mask 255.255.255.0

4. Browse to...

http://192.168.1.200 or
http://v740 (dhcp name)

The V750 reader browser-based interface to the reader is displayed.



5. Click the **Set Reader** link in the navigation menu. The Modify Settings page appears.
6. If you wish to use DHCP, modify the "Use DHCP?" setting by selecting the "Yes" radio button; otherwise, enter the required network settings in the IP Address, Subnet Mask, and Gateway fields. The fields will turn red if the gateway is not on the same subnet as the IP address. Then, click the **Save Changes** button.

IMPORTANT: Do not disconnect power until the save process is completed.

7. Set the reader RF power per instructions on page to correspond to antenna and cable types.
8. Verify that the settings shown are correct. Then, restart the reader by disconnecting the power cable and then reconnecting it.

It may take about 60 seconds for the reader to restart. If the reader IP address was changed, you must type the new address into the PC browser address field to communicate with the reader.

IMPORTANT: Do not disconnect and connect power cable at the DC cord. Always disconnect and connect power cable at the AC cord.

9. Once the system restarts, click **Settings**. You are taken to the **Modify Settings** page. Your changes will be saved and then applied. After the reader reconfigures its network interfaces, it will automatically redirect you to its status page. There is no need to restart the reader.

IMPORTANT: Do not disconnect power while the reader is saving its new configuration.

The reader is now ready to receive commands from the network.

10. Use the **Query** page of the browser-based interface to verify the reader and antenna operation by reading tags.
11. Close the browser window. Start an application to control the reader on the network.

2.1.3 Web browser function

Via Web browser, you can set following functions, which can perform various works such as indicating an operation state or setting condition, or setting an operation parameter.

Item	Specification
Web browser (Normal)	Communication via Web browser.
1.Status	Indicates current setting and operation state (current executed command).
2.Query	Simple operation window for Tag refresh (Read/Write)
3.Set Reader	Specifies operation conditions of the R/W.
4.Set Communication	Specifies a parameter for communication with tag.
5.Set Operation	Registers a command and specifies programmable output conditions.
6.Utility	HMI for the function to monitor an on-site environment. - Noise check
7.Firmware Update	Uploads or resets firmware data.
8.Help	Explains the functions.
Web browser (Safe Mode)	This mode provides required functions to recover from the error related with R/W. Consistent static IP: 192.168.1.200
1.Status	Indicates current setting and operation state (current executed command).
2.Setting Initialize	Initializes following setting into factory-default setting; Set Reader, Set Communication, and Set Operation. \emptyset
3.Firmware Update	Uploads or resets firmware data.
4.Help	Explains the functions.

2.2 Functions

2.2.1 Command execution

Receiving a command from the host via Ethernet or RS-232C, the R/W starts the command execution. You can use following three commands.

- (1) Reader control command
It reads or changes operation control or setting of the R/W.
- (2) Communication command
It triggers to communicate with tag.
It executes communication with tag according to the command option or the R/W setting conditions.
- (3) Maintenance command
The command is used to evaluate on-site circumstances implementing a test such as noise check.

2.2.2 Self-operation

This function enables the R/W to start some works, judge, and output the results without instruction of host by combining followings; registering command, setting reader status output, and setting communication result judgment.

- (1) Command registry
Commands can be registered in Start Up and 4 digital inputs respectively.
- (2) R/W status output
Data is output depending on the R/W status.
Available conditions

Function	Output timing	Note
RUN	Running Normally	Same action as RUN LED (except for blink).
ERR	Abnormally stopped	Same action as ERR LED(except for blink).
COM	Communication status	Same action as OR of AT1-4 LED.
ATn(n=1-4)	Antenna"n" is specified.	Same action as LED of AT1, AT2, AT3, and AT4.

- (3) Communication result judgment
Upon the response for communication process is returned, the R/W sends judgment signal depending on the specified conditions to the corresponding Digital output port (1-4).

2.2.3 Digital Input / Output

(1) Digital input

Following two functions can be assigned to 4 digital inputs respectively. To assign the function, set via Set Operation window of command or Web.

User Input: reads ON/OFF state by receiving the command from the host.

Command registry: executes registered command series at the rising edge of input signal.

(2) Digital output “Programmable output”

Following three functions can be assigned to 4 digital outputs respectively. To assign the function, set via Set Operation window of command or Web.

User output: outputs ON/OFF state according to the command from the host.

Reader state output: outputs operation status of the R/W.

Communication results output: output ON/OFF signal depending on the specified judgment after communication process.

2.2.4 Firmware Upgrade

You can update the firmware by specifying update files via Web browser. Updated data shall be effective upon subsequent power-ups.

2.3 Communication

2.3.1 Communication Process

Combining following process options, suitable communication procedures can be specified for your application.

Process list

Item	Specifications	Note
Process contents (Command)	ID read	Reads tag's ID data.
	ID write	Writes ID data into the tag.
	Data read	Reads tad data (including password).
	Data write	Writes data (including) into tag.
	Lock	Enables lock function in the tag.
	Kill	Disables tag permanently.
Communication sequence (Option)	Single Once	Executes a fixed count or specified period.
	Single Repeat	Repeat transaction until termination has been instructed.
	Multi Once	Executes a fixed count or specified period.
	Multi Repeat	Repeat transaction until termination has been instructed.
Antenna specification (Option)	Antenna Sequence1-4	Sets maximum 9 antennas.
Communication parameter (Setting)	(GEN2)Session specified (Once or Repeat)	S0/S1/S2/S3
	UHF Power (Port1,2,3,4)	Set each port separately.
	Communication mode	Normal/(MRM)/DRM
	Reads only selected tags suitable for pre-specified data conditions.	Objective tags are the tags that meet the conditions specified with Select Command prior to communication sequence.
	1. Prevention of response duplication. 2. Prevention of reread. 3. Omission of no tag response.	
Filtering	Filtering function	
Smoothing	Smoothing function	

2.3.2 Communication Sequence

As a way to communication to the tag(s), you can choose a sequence among the following four sequences by specifying with the commands.

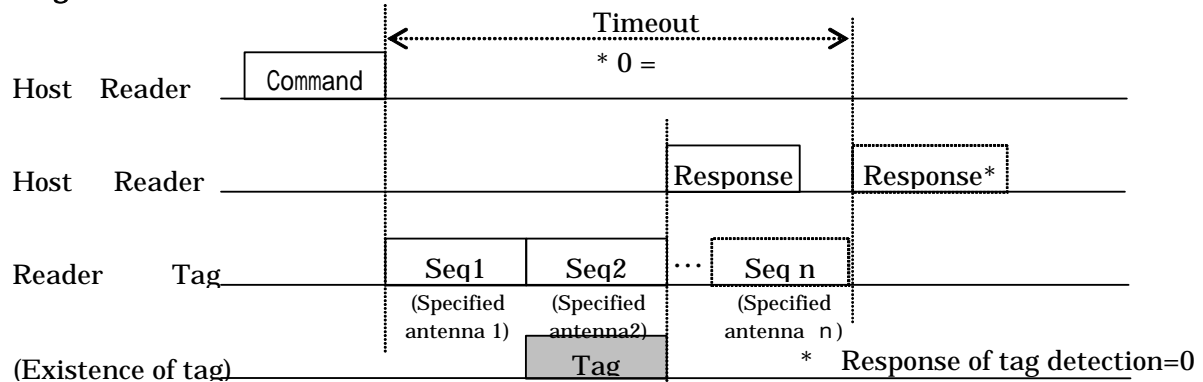
Name	Code	Description
1. Single access		This method is used for communicating with a single tag in the read field. It can reduce communication process time more than the time under the Multi access mode. This is suitable for the place where the reader reads a single tag at a time and the place which requires speed and prompt control such as production process line.
Single Once	“SOC”	This is used for communicating with single tag in the read field. Just after the communication transaction, the result is returned promptly.
Single Repeat	“SRP”	This is used for communicating with the single tag existing in the read field repeatedly.
2. Multi access		This method is used for communicating with one or more tag(s) in the read field. It is suitable for the place where the reader reads various numbers of tags existing in the read field such as logistics distribution area.
Multi Once	“MOC”	This is used for communicating with multiple tags existing in the read field. Just after the communication transaction, the result is returned promptly.
Multi Repeat	“MRP”	This is used for communicating with multiple tags existing in the read field repeatedly.

< Operation timing of communication sequence >

(1) Single Once

The reader communicates with a single tag at a time (1:1 communication). When an antenna detects first tag, the reader returns response and terminates transaction (1 response/ 1 transaction). If the reader does not detect any tag, it repeats the transaction until timeout. In this case, the response indicates "0" as the tag number. If the timeout is specified as "0", the transaction will repeat until the termination command has been sent.

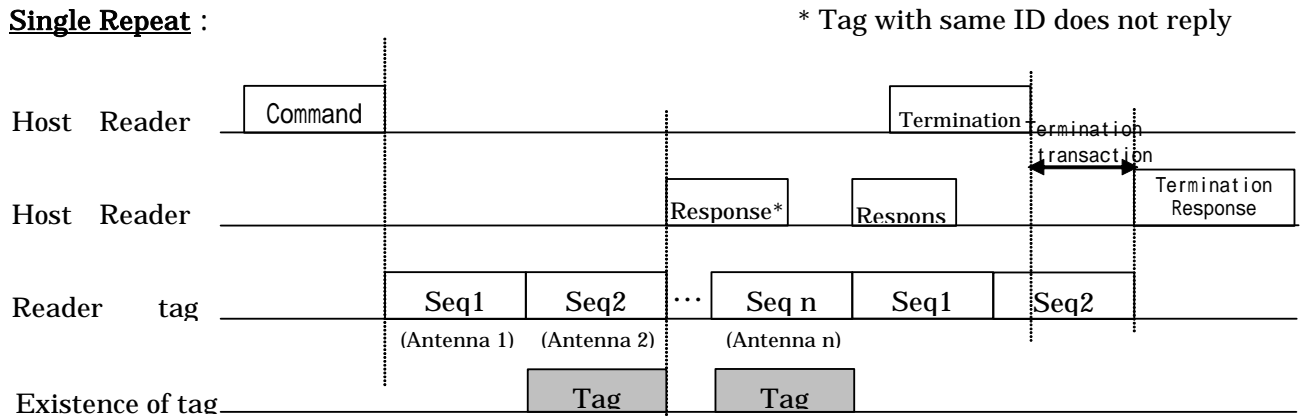
Single Once :



2) Single Repeat

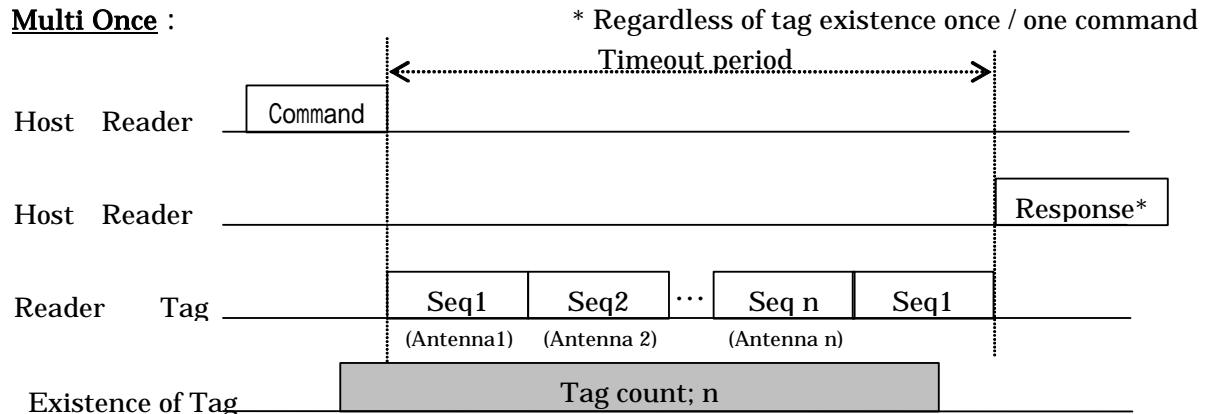
The reader communicates with a single tag at a time (1:1) and repeats the communication transaction. When the reader detects first tag, it returns response to the host and still repeats its transaction. Whenever it detects unread tag, it returns read results to the host. It repeats the sequence until the termination command has been sent.

Single Repeat :



3) Multi Once

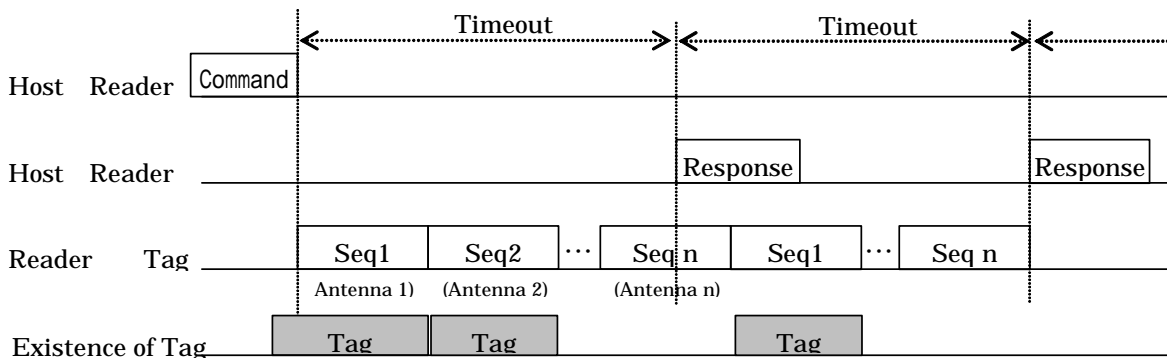
The reader reads multiple tags repeating the read transaction until timeout. Upon timeout, it returns all results of communication with tags to the host and finishes the transaction. If the reader does not detect any tag during the reading time, it returns response meaning the number of tag = 0.



4) Multi Repeat

The reader reads multiple tags repeating the reading transaction until timeout. Upon timeout, it returns results of communication with tags to the host and it starts another time period to repeat the transaction until termination command has been sent. At each timeout, the reader returns all read tag's results to the host. If it does not read any tag during each time period, it returns response meaning the number of tag = 0.

Multi Repeat :



2.3.3 Session Setting

Following table shows 4 flags as a session flag for communication command. S0 is set as factory default setting for Once command, and S2 is set for Repeat command.

Communication option	Flag	Description
Once • Single Once • Multi Once	S0	Factory default setting. In this setting, the reader communicates with all tags existing in the read field whenever a command is executed.
	S1/S2/S3	In this setting, the reader communicates with un-read tags (it ignores once-read tags.) If S1 is set, tag refreshes its S1 flag when a specified time has passed after flag setting (after communication transaction) regardless of whether tag energized or not. It means that the tags are read repeatedly in a certain interval. If S2 or S3 is set, tag refreshes its S2 or S3 flag when a specified time has passed after tag energizing stopped. It means that the tag is not re-read unless the tag stays out of the read field for the specified time.
Repeat • Single Repeat • Multi Repeat	S2	Factory default setting. In this setting, the reader communicates with new-detected tags existing in the read field during the command execution.
	S0	When there is a tag the reader can not read because of flag conflict with other readers, this setting enables the reader to read the tag.
	S1/S3	If another reader set in the near process line uses S2 flag, the reader same flag may encounter the flag conflict. S1 and S3 flags are used to avoid this conflict. Setting S3 provides same operation as S2 setting. If S1 is set, tag refreshes its S1 flag when a specified time has passed after flag setting (after communication transaction) regardless of whether tag energized or not. It means that the tags are read repeatedly in a certain interval.

(Reference) Function/ effect of each Session flag

Flag	Tag persistence time after tag energizing is stopped
S0	None
S1	500ms to 5s (Same when tag is energized)
S2/S3	2s or more
SL	2s or more

2.3.4 Communication Data Control

(1) Filtering function

Filtering function enables the reader to communicate with selected tags that are suitable for pre-specified conditions.

【Application examples】

- To read pallet tags selectively when item tags and pallet tags are existing together (EPC data).
- To read only the selected vender's tag if there are various kind of venders' tags (EPC data).
- To read the tags that has exclusive data format (the number of PC+EPC bit, NSI).
- To selectively read the specified tags that have certain supplier's IC (Mask-designer identifier of TID).

(2) Smoothing function

Smoothing function consists of following three types. Using this function, the reader can reduce the quantity of data transferred between the host and the reader.

1) Prevention of response duplication.

Under this function setting, the reader can prevent duplicated responses of same tag ID in a single response frame.

2) Prevention of reread.

Under this function setting, the tag that has been already read does not reply in the transaction period during the communication sequence (Single Repeat, Multi Repeat) which repeats its transaction,

3) Omission of No tag Response

This function enables the reader to omit the responses if it does not read any tag in the communication sequence (Single Repeat, Multi Repeat) which repeats its transaction.

2.4 Tag Fundamentals

Tag Memory Structure

Protocols and the tag memory structures supported by the V750 reader are described below. For additional information regarding tag operation, refer to each tag specification.

GEN2 Tags

GEN2 tags have four memory banks.

Kill Password and Access Password are stored in bank 00 (Reserved Area), EPC code is in bank 01 (EPC Area), Tag Identification Memory data that is read only is in bank 10 (TID Area). User data is in bank 11 (User Area). For the detailed information refer each tag's specification.

Bank	block number	Bit	Contents
00 (Reserved Area)	0	00-0F	Kill Password [31:16]
	1	10-1F	Kill Password [15:0]
	2	20-2F	Access Password [31:16]
	3	30-3F	Access Password [15:0]

01 (EPC Area)	0	00-0F	CRC-16
	1	10-1F	Protocol-Control Bits (PC)
	2	20-2F	EPC[95:80]
	3	30-3F	EPC[79:64]
	4	40-4F	EPC[63:48]
	5	50-5F	EPC[47:32]
	6	60-6F	EPC[31:16]
	7	70-7F	EPC[15:0]
...	
10 (TID Area)	0	00-0F	Tag Identification Memory data (read only)
	1	10-1F	

11 (User Area)	0	00-0F	User data
	1	10-1F	
	2	20-2F	

3. Command Line Interface

About this Guide

This chapter lays the groundwork for the communication protocol between client software running on a remote computer and the V750 reader.

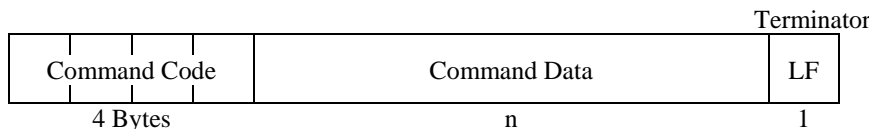
3.1 Command Interface

3.1.1 Command / Response Frame Structure

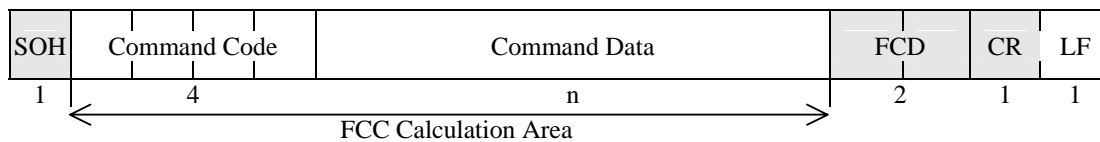
Ethernet and RS-232C has almost same command structure for command line I/F. Command frame has a Command Code area to control the R/W and Command Data area that is used with Command Code. Terminator that indicates the end of the frame is [LF].

RS-232C requires a start code [SOH], check data, and [CR]. The start code shall be at the beginning of the frame, and the check data and the [CR] shall be immediately before terminator ([LF]).

Command frame for Ethernet



Command frame for RS-232C

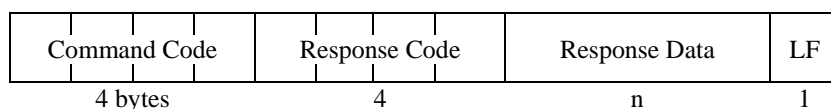


Contents in command frame

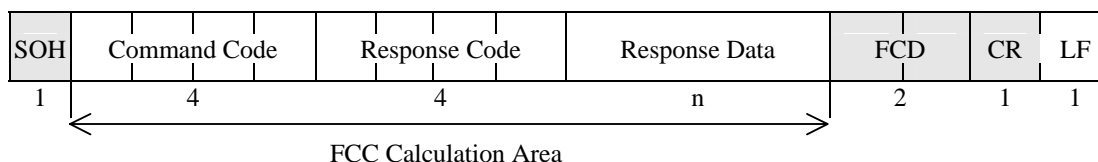
Contents	Description	Ethernet required?	RS-232C required?
Start code [SOH,0x01]	Indicates the beginning of the frame with SOH,0x01.	No	Yes
Command code	Specifies the command the Reader executes.	Yes	Yes
Command data	Specifies the data for use with Command Code	Yes	Yes
FCD	Stands for Frame Check Data (hereinafter referred to as "FCD". The code is to detect a data error.) The result of the horizontal parity calculation from after SOH through immediately before FCD is expressed by two characters of ASCII code.	No	Yes

Terminator [CR,0x0d]	Indicates the end of the frame with CR,0x0d.	No	Yes
Terminator [LF,0x0a]	Indicates the end of the frame with LF,0x0a.	Yes	Yes

Response frame for Ethernet



Response frame for RS-232C



Contents in command frame

Contents	Description	Ethernet required?	RS-232C required?
Start code [SOH,0x01]	Indicates the beginning of the frame with SOH,0x01.	No	Yes
Command code	Specifies the command the Reader executes.	Yes	Yes
Response data	Indicates the results of command execution.	Yes	Yes
FCD	Stands for Frame Check Data	No	Yes
Terminator [CR,0x0d]	Indicates the end of the frame with CR,0x0d.	No	Yes
Terminator [LF,0x0a]	Indicates the end of the frame with LF,0x0a.	Yes	Yes

How to calculate FCC in frame for RS-232C.

Calculate XOR (Exclusive OR) of figures included in the range of FCD calculation and put the result as a ASCII code at the end of the command.

An example of FCD calculation:

Command code and Command data: RDID -seq MOC -ant 1 -tmo 500

FCD value: 19

Command frame: [SOH]RDID -seq MOC -ant 1 -tmo 50019[CR][LF]

Calculation

Character	ASCII Code (Hex)	Binary
R	52	01010010
D	44	01000100
I	49	01001001
D	44	01000100
(Space)	20	00100000
-	2C	00101100
s	73	01110011
e	65	01100101
q	71	01110001
(Space)	20	00100000
M	4C	01001100
O	4F	01001111
C	43	01000011
(Space)	20	00100000
-	2C	00101100
a	61	01100001
n	6E	01101110
t	74	01110100
(Space)	20	00100000
l	31	00110001
(Space)	20	00100000
-	2C	00101100
t	74	01110100
m	6C	01101100
o	6F	01101111
(Space)	20	00100000
5	35	00110101
0	30	00110000
0	30	00110000
XOR	19	00011001

3.1.2 Command Code List

Following is a list of the supported command codes. Each command is represented with four characters.

Command Code List

Command Code	Command name	Description	Executable in communication?
(1) Communication Command (to communicate with tags)			
RDID	<u>R</u> ead <u>I</u> D	Reads ID data from the tag memory.	No
WTID	<u>W</u> rite <u>I</u> D	Writes ID data into the tag memory.	No
RDDT	<u>R</u> ead <u>D</u> ata	Reads data from the tag memory. (including the password)	No
WTDT	<u>W</u> rite <u>D</u> ata	Writes data to the tag memory. (including the password)	No
LOCK	<u>L</u> ock	Sets Lock function in the tag.	No
KILL	<u>K</u> ill	Disables the tag permanently.	No
(2) Setting Command (to set a condition).			
SETR	<u>S</u> et <u>R</u> eader	Sets the function condition in the R/W.	No
GETR	<u>G</u> et <u>R</u> eader	Reads the function conditions from the R/W.	No
SETO	<u>S</u> et <u>R</u> eader <u>O</u> peration	Sets the operation condition in the R/W.	No
GETO	<u>G</u> et <u>R</u> eader <u>O</u> peration	Reads the operation conditions from R/W.	No
SETC	<u>S</u> et <u>C</u> ommunication	Sets the communication condition in the R/W. (temporary setting).	No
GETC	<u>G</u> et <u>C</u> ommunication	Reads the communication condition from the R/W.	No
SAVE	<u>S</u> ave communication settings	Save the communication condition into the nonvolatile memories in the R/W. (permanent setting)	No
(3) Control command (to control the action)			
INIT	<u>I</u> nitialization	Initializes all settings in the R/W.	No
STOP	<u>S</u> top	Stops the communication with the tags.	Yes
EXIO	<u>E</u> xternal <u>I</u> nput <u>O</u> utput control	Reads input port status. Sets condition of output port.	Yes
REST	<u>R</u> eset	Restarts the R/W.	Yes
GBYE	<u>G</u> ood <u>B</u> ye	Disconnects the Ethernet connection.	No
RRES	<u>R</u> equest <u>R</u> esend	Requests to resend the last response data.	Yes
TEST	<u>T</u> est	Tests the communication between host and the R/W.	Yes

NOIS	<u>Nois</u> measurement	Measures noise level of the specified antenna.	No
(4) Undefined command (in the response frame only)			
ICMD	<u>l</u> legal <u>C</u> ommand	Command code to be used in the response frame if the R/W receives undefined command.	-

3.1.3 Response Code List

Response code consisting of four digit figures represents the result of the command execution. Response code helps you speculate a cause of the occurred error.

Response Code List

Category	Response Code		Response Name	Description
	Main	Sub		
Normal end	00	00	Normal end	The received command ended normally with no error.
Command error	10	00	Parity error	A parity error has occurred in one of the characters of the command frame (For only RS-232C).
	11	00	Framing error	A framing error has occurred in one of the characters of the command frame (For only RS-232C).
	12	00	Overrun error	An overrun error has occurred in one of the characters of the command frame (For only RS-232C).
	13	00	FCD error	The command frame has an incorrect FCD (Only for RS-232C).
	14	0x	Command code error	Incorrect command has been received. The response code is ICMD.
			Command parameter error	Command parameter is incorrect.
			Command option error	Command option is incorrect.
15	0x	Process error	Specified command can not be executed. Ex1. Caused by executing a communication command when the last command is being executed Ex2. Caused by incorrect setting of filtering condition.	
18	00	Frame length error	A command received from the host exceeds the receive buffer (256 Bytes).	
Tag communication error	70	1x	Communication error	During the transaction after tag detection, communication error or process time out has occurred, and consequently the transaction can not be completed normally. Specified password does not match to the password of the target tag.
		2x	Communication error	During the transaction after tag detection, communication error or process time out has occurred, and consequently the transaction can not be completed normally. * In the case of ID write / Data write, a part of data in the tag may have been written.

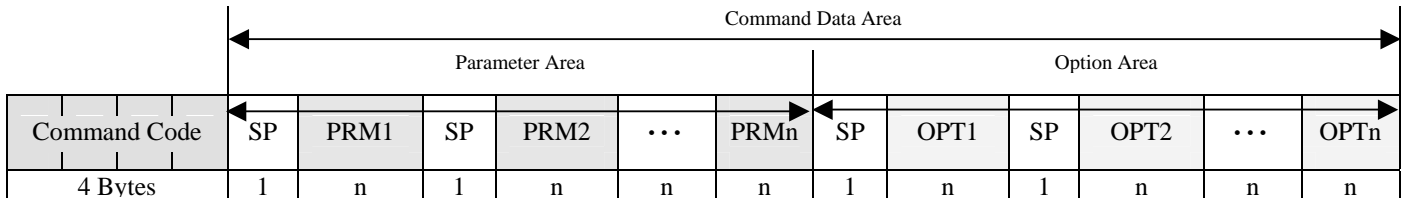
	7A	00	Address specification error	Specifying Bank/Address in the tag memory is incorrect and command can not be executed.
	7B	00	Data write error	During the data write into the detected tag, sufficient power is not supplied to the tag.
	7C	1x	Antenna detection error	At the R/W starts up, an appropriate antenna has not been connected to the specified antenna port.
		2x	Antenna error	Error occurred with the antenna connected to the specified antenna port (even though the antenna is detected normally when start up).
	7E	00	Lock error	When data write or read command is sent for the locked area. It depends on the tag's chip specifications. (For Monza chip, when these command are sent for Lock Bit of User Memory because this area does not exist.)
	7F	xx	Tag error	The tag has been rejected the command process.
System error	9A	xx	Hardware error	An error that blocks command execution has been detected in the hardware (such as malfunction of inner circuit or temporally execution error caused by noise).

Response Code の x は、0~9,A-F のいずれかの文字が入ることを示しています。

3.1.4 Command / Response Format

Following shows a grammar of commands.

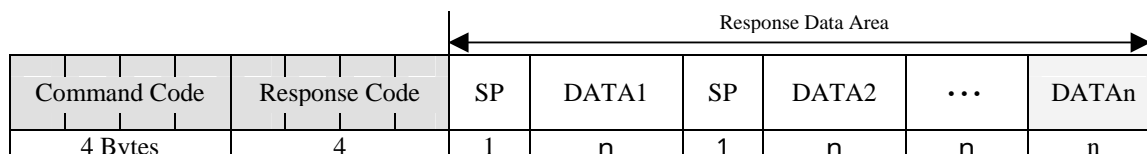
Command Code and Command Data format in Command Frame



Command Code	Consists of four characters in ACSII format. This specifies one of the commands described in the Command Code List of 3.1.2.
Space (SP)	Between the elements (Parameters and Options), “ ” (space) has to be entered for one or more character. Even if a two or more characters of “ ” (space) are put in, they work same way as one-character “ ” (space).
Parameter (PRMx x:1 to n)	Mandatory for each command. If there are multiple parameters in a single command, they must be separated with some spaces and specified in the specified order. Applicable parameter for each command is shown in the table in 3.1.5.1.
Option (OPTx x:1 to n)	Optional for each command. If there are multiple options in a single command, they must be separated with some spaces. If it is not specified, default value will be employed. If multiple option items are specified, they shall be described continuously. Any order is acceptable.

* Commands are acceptable regardless the character is big or little. Any command works regardless the size combination of characters such as big letters, little letters, or mixed one.

Command Code, Response Code and Response Data format in Response Frame



Command Code	Set same characters specified as a command sent from the host.
Response Code	Indicates four-digit hexadecimal numbers.
Response Data	Returns the some data executed by R/W. Example1: No. of tags for communication commands Example2: The tag ID(s) (or data) read by R/W with Hex code. If R/W reads multiple tags' IDs (or data), it indicates them in line with space(s) between each ID (or data). Data in hexadecimal numbers does not need [0x].

* All hexadecimal numbers as commands and data in the read tags are indicated with capitals (A to F).

3.1.5 Command Specification

3.1.5.1 Communication Command

A communication command consists of parameter(s) mandated for command execution and option specified if necessary. Following table shows parameters as an argument of each command and available options.

Parameters and Options for Communication Commands

Command Data		Parameter (mandatory)					Option					
		Memory bank	Data pointer	Data length	Write data	Lock code	-seq	-ant	-tmo	-tif	-pwd	-ptc
Command Code												
Read ID	RDID						Yes	Yes	Yes	Yes		Yes
Write ID	WTID				Yes		Yes	Yes	Yes	Yes	Yes	Yes
Read Data	RDDT	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes
Write Data	WTDT	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
Lock	LOCK					Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kill	KILL						Yes	Yes	Yes	Yes	Yes	Yes

- All options can be omitted. If option(s) is omitted, the default value is applied depending on the option item.

- Kill command requires the option item “-pwd” (if the “-pwd” is not used in command, 7Fxx error will occur.)

To set parameters, items in the following list shall be chosen and be described in to the command one’s way down the list.

Parameter Details

Parameter	Setting value
Memory bank	Memory bank of a GEN2 tag for “Read Data” or “Write Data” shall be specified with the following number in decimal or hexadecimal (begins with 0x) format. <ul style="list-style-type: none"> • 0 or 0x00: Reserved Area • 1 or 0x01: EPC Area • 2 or 0x02: TID Area • 3 or 0x03: User Area
Data pointer	Memory address in the memory bank of the GEN2 tag for “Read Data” or “Write Data” shall be specified with number(s) in the following range in decimal or hexadecimal (begins with 0x) format. <ul style="list-style-type: none"> • Min: 0 or 0x00 • Max: 255 or 0xFF
Data length	Memory size to be accessed for “Read Data” shall be specified with the number(s) in the following range in decimal or hexadecimal (begins with 0x) format. <ul style="list-style-type: none"> • Min: 0 or 0x00 • Max: 32 or 0x20
Write data	To write data into a tag with “Write ID” or “Write Data” command, the data

	shall be specified in 32-bit hexadecimal format as below. (0x not required) • Format: XXXXXXXX ... XXXXXXXX 32bit 単位との内容を追記！ X: 0 to 9 , A to F																																	
Lock code	When Lock command is executed, this code shall be specified depending on the type of lock. For GEN2 system, 10-digit Lock value shall be specified with 0, 1, * (0 and 1 mean Action and * means MASK) for following five areas; Kill pwd, Access pwd, EPC memory, TID memory, and User memory. • Format: XXXXXXXXXX X: 0 or 1 or * (0:Off , 1:On , *:do-nothing)																																	
	<table border="1"> <thead> <tr> <th>chr.</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> </tr> </thead> <tbody> <tr> <td></td> <td colspan="2">Kill pwd</td> <td colspan="2">Access pwd</td> <td colspan="2">EPC memory</td> <td colspan="2">TID memory</td> <td colspan="2">User memory</td> </tr> <tr> <td>Action Fields</td> <td>pwd read/write</td> <td>perma lock</td> <td>pwd read/write</td> <td>perma lock</td> <td>pwd write</td> <td>perma lock</td> <td>pwd write</td> <td>perma lock</td> <td>pwd write</td> <td>perma lock</td> </tr> </tbody> </table>	chr.	1	2	3	4	5	6	7	8	9	10		Kill pwd		Access pwd		EPC memory		TID memory		User memory		Action Fields	pwd read/write	perma lock	pwd read/write	perma lock	pwd write	perma lock	pwd write	perma lock	pwd write	perma lock
chr.	1	2	3	4	5	6	7	8	9	10																								
	Kill pwd		Access pwd		EPC memory		TID memory		User memory																									
Action Fields	pwd read/write	perma lock	pwd read/write	perma lock	pwd write	perma lock	pwd write	perma lock	pwd write	perma lock																								

Option shall be specified with values following the code that indicates option type.

Option Details

Code	Item	Specified Value	Default Value
-seq	Communication <u>sequence</u>	Specifies the communication sequence according to the operating conditions. For “Read ID” command, all parameters can be specified. For other commands, only SOC can be specified. • SOC: Single Once • SRP: Single Repeat • MOC: Multi Once • MRP: Multi Repeat	-seq SOC
-ant	<u>Antenna number</u>	Can specify the order of antenna to operate from first to 9thwith figure of 1, 2, 3, and 4. The figure 1 to 4 means antenna’s identical number. If an antenna is specified multiply, the antenna executes sequence multiply depend on the order. • Format: X ... XXXXXXXX (Max 9 characters) X: 1 to 4	-ant 1
-tmo	<u>Timeout</u>	Specifies time parameter for communication process with 0 to 2550 in decimal number. The numbers after rounding down to the 10 is added ms as a specified value (the least significant digit is always “0”). If the communication sequence is SOC/MOC, the specified value is the communication time. If the value is specified 0 (zero), communication process will continue until STOP command is executed. If the communication sequence is SRP/MRP, the specified value is maximum time between response (0 can’t be specified for SRP/MOC/MRP). • 0, 10...2550 (ms)	-tmo 250

-tif	<u>Tag Information</u>	<p>Specifies one or more following items as additional information of tag communication results that are output in the response. Specified item(s) shall be returned according to the specified order with commas.</p> <ul style="list-style-type: none"> • ANT: An antenna number which reads the tag first. • CNT: The count of tag read. • EPC: EPC code only. • PEP: PC bit and EPC code • PER: PC bit, EPC code, and CRC <p>For ID read, EPC/PRP/PER determines the EPC data type to be returned. For ID write or Data write, if EPC/PEP/PER is specified, EPC data before rewriting shall be returned. (If EPC data length is 0, it will be “*”.)</p>	-tif EPC
-pwd	<u>Password</u>	<p>Specifies the password data with 32-bit 8 digit numbers in hexadecimal format for access of ID Write command, Data Write command, and Lock command, and Kill password for Kill command. (0x not required)</p> <p style="margin-left: 40px;">➤ XXXXXXXX</p> <p>For ID Write, Data Write, or Lock, if this option is omitted or specified “00000000”, Access password shall not be used. (If Access password of the Tag is 0x00000000, the tag can be processed. For Kill command, the Access password shall not be 0x00000000. If so, 7Error occurs.)</p>	-pwd 00000000
-ptc	<u>Tag protocol</u>	<p>Specifies the number(s) that indicates the protocol type. Multiple numbers can be specified.</p> <ul style="list-style-type: none"> • 2: Class1 Generation2 	-ptc 2

[Note]

For setting a timeout value, 100ms or less shall not be specified under the repeat mode (SRP/ MRP). If so, the Reader/Writer may freeze (setting error may occur) depending on the communication performance of the Ethernet or RS-232C. If Ethernet's traffic is large or the communication speed setting for RS-232C is low, the value shall be set longer.

(2) Write ID (WTID)

Command	WTID (S) <i>dat</i> (S) [Options] ...<LF> dat : Data to be written
Response	WTID[RC] (S) [CNT] (S) [ITM1]<LF> [RC] Response Code [CNT] Tag Count [ITM1] Items indicated by TIF option. Items are delimited by a comma. ● If EPC/PEP/PER are specified for TIF, EPC data shall be the data before rewrite. If Data length is zero during EPC specification, data shall become "".

* (S) Space character

Example 1) When all set values are default values and ID 1234567890ABCDEF12345678 is specified, the command is executed and write process has been completed successfully:

[Tx] WTID 1234567890ABCDEF12345678<LF>
[Rx] WTID0000 001<LF>

Example 2) When ANT and 1234567890ABCDEF12345678 are specified for Tag InFormation, Write data and the command is executed and then R/W has succeeded to write data with Antenna 1.

[Tx] WTID 1234567890ABCDEF12345678 -tif EPC,ant<LF>
[Rx] WTID0000 001*, 1<LF>
If tif is specified for EPC code, tag's EPC data before rewritten is returned. If the tag has no EPC data, [*] is returned.

Example 3) When FFFFFFFFFFFFFFFFFFFFFFFFFF, 2, and 300 are specified for ID, antenna, and TimeOut and the command is executed but no tag is found:

[Tx] WTID FFFFFFFFFFFFFFFFFFFFFFFFFF -ant 2 -tmo 300<LF>
[Rx] WTID0000 000<LF>

Example 4) When an error has occurred during communication process:

[Tx] WTID 1234567890ABCDEF12345678<LF>
[Rx] WTID7F00<LF>
* The error code is added to the response code.

(3) Read Data (RDDT)

Command	RDDT(S) <i>mbk</i> (S) <i>dpt</i> (S) <i>dln</i> (S)[options...]<LF> mbk: Memory Bank dpt: Data Pointer dln; Data Length
Response	RDDT[RC] (S) [CNT] (S) [Data1 with ITM1] <LF> [RC] Response Code [CNT] Tag Count [Data with ITM] Data with Items indicated by TIF option. Items are delimited by a comma.

* (S) Space Character

Example 1) When [Memory bank; 2, start address; 16, word count to be read; 4] is specified, other settings are default value and then read process has completed successfully:

```
[Tx] RDDT 2 16 4<LF>
[Rx] RDDT0000 001 1111222233334444<LF>
```

Example 2) When [Memory bank; 0x01, start address; 0x02, word count to be read; 0x03, Antenna; 1-3] is specified and read process has succeeded:

```
[Tx] RDDT 0x01 0x02 0x03 -ant 123 -tif EPC,ANT<LF>
[Rx] RDDT0000 001 111122223333, 1234567890ABCDEF12345678,2<LF>
(In this case, the read data is [111122223333], the tag EPC code is [1234567890ABCDEF12345678], and the read antenna ID is [2].)
```

Example 3) When an incorrect address is specified:

```
[Tx] RDDT 0 0x100 0x1 -ant 123<LF>
[Rx] RDDT1412<LF>
(The command data error [Code:1412] is returned.)
```

Example 4) When an error has occurred during communication process:

```
[Tx] RDDT 0 0 1 -ant 123<LF>
[Rx] RDDT7000<LF>
```

- The error code is returned.

(4) WriTe DaTa (WTDT)

Command	WTDT (S) <i>mbk</i> (S) <i>dpt</i> (S) <i>dln</i> (S) [options...]<LF> mbk: Memory Bank dpt: Data Pointer dln; Data Length
Response	WTDT[RC] (S) [CNT] (S) [ITM1] <LF> [RC] Response Code [CNT] Tag Count [ITM1] Items indicated by TIF option. Items are delimited by a comma. ● If EPC/PEP/PER are specified for TIF, EPC data shall be the data before rewrite. If Data length is zero during EPC specification, data shall become "***".

* (S) Space Character

Example 1) When [Memory bank; 0, Start address; 0, Data; 0x12345678] is specified, other setting are default and then the write process has been succeeded:

[Tx] WTDT 0 0 12345678<LF>
[Rx] WTDT0000 001<LF>

Example 2) When [Memory bank;1, Start address; 32, word count to be written ;6, Data; 0x1234567890ABCDEF12345678 , ANT: 2-3, Time Out: 200] is specified:

[Tx] WTDT 1 32 1234567890ABCDEF12345678 -ant 23 -tmo 200 -tif ANT<LF>
[Rx] WTDT0000 001 2<LF>

* In this case, write command is processed with Antenna 2.

Example 3) When [Memory bank; 0x00, Start address; 0x00, Data; 0x00 ABCDEFGH] is specified and a format error has occurred.

[Tx] WTDT 0x00 0x00 ABCDEFGH<LF>
[Rx] WTDT1412<LF>
* The error code [1412] is returned.

Example 4) When an error occurred during communication process.

[Tx] WTDT 1 32 1234567890ABCDEF12345678 -ant 23 <LF>
[Rx] WTDT7011<LF>
* The error code [7011] is returned.

(5) LOCK (LOCK)

Command	LOCK (S) <i>lkc</i> (S) [options...]<LF> lkc: Lock Code (10 characters 0/1/*)
Response	LOCK[RC] (S) [CNT] (S) [ITM1]<LF> [RC] Response Code [CNT] Tag Count [ITM1] Items indicated by TIF option. Items are delimited by a comma.

* (S) Space Character

Example 1) When [Password; 0x12341234, EPC memory; locked temporarily] is set:

```
[Tx] LOCK ****10**** -pwd 12341234<LF>
[Rx] LOCK0000 001<LF>
```

Example 2) When [Password; 0xFFFFFFFF, all memory are locked permanently, and antenna; 2] is set:

```
[Tx] LOCK 111111111 -pwd FFFFFFFF -ant 2 -tif EPC<LF>
[Rx] LOCK0000 001 1234567890ABCDEF12345678<LF>
*The EPC code of the tag is [1234567890ABCDEF12345678].
```

Example 3) When [Password; 0x12341234 and all memories are permanently locked] is specified incorrectly:

```
[Tx] LOCK 111111111 -pwd 12341234<LF>
[Rx] LOCK7011<LF>
* The communication error [7011] is returned.
```

Example 4) When [Password; 0xFFFFFFFF] is specified and specified lock code is incorrect:

```
[Tx] LOCK 222222222 -pwd FFFFFFFF -ant 2<LF>
[Rx] LOCK1411<LF>
* The error code [1411] is returned.
```

(6) Kill (KILL)

Command	KILL (S) [options...]<LF> Option "pwd" is mandatory.
Response	KILL[RC] (S) [CNT] (S) [ITM1] <LF> [RC] Response Code [CNT] Tag Count [ITM1] Items indicated by TIF option. Items are delimited by a comma.

* (S) Space Character

Example 1) When [Password; 0x22222222] is specified and then KILL command is completed normally:

```
[Tx] KILL -pwd 22222222<LF>
[Rx] KILL0000 001<LF>
```

Example 2) When [Antenna; 3, Password; 0xAAAABBBB, items; PER and ANT] is specified and KILL command has completed normally:

```
[Tx] KILL -pwd AAAABBBB -ant 3 -tif PER,ANT<LF>
[Rx] KILL0000 001 30001234567890ABCDEF12345678ABCD,3<LF>
* The PC code of the tag is [3000], EPC code is [1234567890ABCDEF12345678], CRC is [ABCD], and command executed Antenna ID is [3].
```

Example 3) When [Password; 0x12345678] is specified and password has turned out incorrect:

```
[Tx] KILL -pwd 12345678<LF>
[Rx] KILL7012<LF>
* The error code [7012] is returned.
```

Example 4) When [Password; 0x12] is specified and password has turned out incorrect:

```
[Tx] KILL -pwd 12<LF>
[Rx] KILL1421<LF>
* The error code [1421] is returned.
```

3.1.5.2 Information of the Reader , Status of the Reader function

To setting type of the Reader information and conditions of the Reader function, following items shall be specified in the SET Reader command (SETR) and GET Reader command (GETR). Specifying following option makes setting or read the Reader/Writer function. Information of the Reader is available only for reading data.

Reader Basic information (GETR)

Code	Content	Fixed Value (=Factory Settings)
MFT	ManuFacTurer	OMRON Corporation
TYP	TYPe of the Reader	V750-BC50C04-US
FWV	FirmWare Version	xxxx-xxxx-xxxx-x
SER	SERrial number	xxxx xxxx xxxx xxxx
MAC	MAC address	00:00:0A:89:x3:xx

Reader Status (GETR)

Code	Content	Reader Status
ATS	AnTenna Status Connected Antenna	????????
TTK	Transition Time from Kick	hhh:mm:ss -Min: 0000:00:00 -Max: 9999:59:59

Reader Basic information (GETR/SETR)

Code	Content	User Setting Value	Factory Settings
RNM	Reader NaMe	-Min: 63characters , ASCII -Max: 63characters , ASCII	(None)
RRL	Reader's RoLe	-Min: 63characters , ASCII -Max: 63characters , ASCII	(None)

Reader Network Settings (GETR/SETR)

Code	Content	User setting value		Factory Settings
		Input	Select	
PRT	Ethernet PoRT 2 ports are used; specified port (command control) and specified port +1(Web function).	-Min: ???? -Max: ????		7090
LHN	LAN Host Name Sent to DHCP server when IP is acquired.	-Min: 0character -Max: ?characters		V750-BC50C04-US
LDN	LAN Domain Name Sent to DHCP server when IP is acquired.			(None)
DHE	DHCP Enable		0:Disable 1:Enable	0:Disable
LIP	LAN IP Address IP address when using static IP address	xxx.xxx.xxx.xxx		192.168.1.200
LNМ	LAN Net Mask Net Mask when using static IP address	xxx.xxx.xxx.xxx		255.255.255.0
LGW	Default Gateway IP Address for the Gateway	xxx.xxx.xxx.xxx		192.168/254

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RBR	RS-232C Baud rate		9.6 (kbps) 19.2 38.4 57.6	57.6 (kbps)
RDT	RS-232C Data length		7 (bit) 8	7 (bit)
RPB	RS-232C Parity bit		N:none O:odd E:even	E: even
RSB	RS-232C Stop bit		1 (bit) 2	2 (bit)

(1) SET Reader function (S E T R)

This command writes the functional conditions of the command in process into the nonvolatile memory in the Reader/ Writer. The setting shall be enabled at the upcoming startup.

Command	SETR (S) param1=value1 (S)...param n=value n<LF> <ul style="list-style-type: none"> ● It specifies a parameter connecting a setting item to a setting value with equal. (The setting item does not have to be prepended with '-'.) ● No space shall be put in from the beginning of the setting item to the end of the setting value. If the setting value includes any space, the space shall be enclosed with double quotation. ● In a single command, multiple setting items can be specified by separating with space. A 2 or more character space is acceptable for indicating separation.
Response	SETR0000<LF>

* (S) Space Character

Example 1) When DHCP Enabled is set "ON":

[Tx] SETR dhe=1<LF>
[Rx] SETR0000<LF>

Example 2) When [Host name; V750-BA50C04, IP; 192.168.1.1, and Net Mask; 255.255.255.0] is set:

[Tx] SETR lhn="V750 BA50C04" lip=192.168.1.1 lnm=255.255.255.0<LF>
[Rx] SETR0000<LF>

Example 3) When [RS-232C Baud rate; 19200bps, Data length; 7bit, Parity; Even, and Stop; 1bit] is set:

[Tx] SETR rbr=19200 rdt=7 rpb=E rsb=1<LF>
[Rx] SETR0000<LF>

Example 4) When the setting item is incorrect:

[Tx] SETR xxx=111<LF>
[Rx] SETR1407<LF>

(2) GET Reader (GETR)

This command allows the Reader/Writer to read the current functional conditions. Even after SET Reader command (SETR) is executed, the old information shall be read out unless the reboot is completed.

Command	<p>GETR (S) param1 (S) param2...<LF></p> <ul style="list-style-type: none"> It specifies a parameter connecting a setting item to a setting value. ('The setting item does not have to be prepended with ' - ' .) <p>In a single command multiple setting items can be specified by separating with space. A 2 or more character space is acceptable for indicating separation.</p>
Response	<p>GETR (S) param1=value1 (S) ...param n = value n<LF></p> <ul style="list-style-type: none"> If multiple items are specified, the Reader/Writer shall return response with connecting specified items to the setting values with equal in the specified order. Alphabetical characters included in the item name in the response shall be small characters. If the setting value includes any space, the space shall be enclosed with double quotation.

* (S) Space Character

Example 1) When [Firmware version;100-100-100-0] is read:

```
[Tx] GETR fvw<LF>
[Rx] GETR0000 fvw=100-100-100-0<LF>
```

Example 2) When [Host name; V750-BA50C04, IP; 192.168.1.1, and Net Mask; 255.255.255.0] is read:

```
[Tx] GETR lhn lip lnm<LF>
[Rx] GETR0000 lhn=V750-BA50C04 lip=192.168.1.1 lnm=255.255.255.0 <LF>
```

Example 3) When [RS-232C Baud rate; 19200bps, Data length; 7 bit, Parity; even, and Stop; 1bit] is read:

```
[Tx] GETR rbr rdt rpb rsb<LF>
[Rx] GETR0000 rbr=19200 rdt=7 rpb=E rsb=1<LF>

[Tx] GETR rbr rdt rpb rsb<LF>
[Rx] GETR0000 rbr=19200 rdt=7 rpb=E rsb=1<LF>
```

3.1.5.3 Reader/Writer operation conditions

Specifying following option in the operation setting command (SETO) or operation read command (GETO) enables to set or read the Reader's operation conditions.

Reader Network Settings (GETR/SETR)

Code	Content	User setting value	Factory Settings
CLI	Receiver of response after command execution.	0:None 1:Ethernet 2:RS-232C	1:Ethernet
IEC	Initial Executed Command. Executed command at startup.	Executed command sequence(実行されるコマンド) Example RDID -seq SOC -tmo 500	(None)
IN1	Input port #1 function setting	Function 0:None 1:Command execution Timing 0:Startup Command Example 1 0 "RDID -seq SOC -tmo 500"	(None)
IN2	Input port #2 function setting	Same as IN1	(None)
IN3	Input port #3 function setting	Same as IN1	(None)
IN4	Input port #4 function setting	Same as IN1	(None)
OT1	Output port #1 function setting	Timing 00:None 11:RUN output 12:ERR output 20:COM output 2n:ATn: Current antenna(s) (n=1~4) 31:NML (evaluated normal completion) 32:ERR (evaluated completion with error occurring) Output time 10 ~ 2550 (ms) 0:Status kept until upcoming evaluation. -Output time is effective only for NML/ ERR setting Evaluation condition * Refer to the following list.	(None) ng
OT2	Output port #2 function setting	Same as OT1	(None)

OT3	Output port #3 function setting	Same as OT1	(None)
OT4	Output port #4 function setting	Same as OT1	(None)

If the NML mode is specified in output function setting, you can set conditions by using the following format.

Condition(A) Condition(B)	Dynamic comparison data	"DAT": data (リードしたタグデータ) "TCT": tag count (リードしたタグ枚数)
	Comparison operators	"==" : Data match "!=" : Data unmatched ">=" : data value or more "<=" : data or less When comparison data is "TCT", the code is able to be specified.
	Static comparison data	00 ~ [Hex] *mark is a wild card (effective only for Data matched or Data unmatched)
Logical operator		"&": AND operator Format: condition A & condition B " ": OR operator Format: condition A condition B

* If there is no condition to be set or condition (A) is set, condition (B) shall not be included in the setting.

Ex.) When the characters from 5th to 8th in read data or when the number of tags is 8 or more,
 "DAT==XXXX0000 | TCT>=8"

In the case that ERR mode is specified for output function setting, you can set conditions with the following format.

Conditions	Error code specifying. Error code: Specified error has occurred (Max 6 code can be specified.) ex. "7071"•••
------------	--

* If there is no condition to be set, any condition shall not be specified.

Ex.) When communication error or verify error has been occurred,
 "dat==7071"

(1) Set Operation of Reader (SETO: ST Operation)

This command is to write operation conditions into the nonvolatile memories in the Reader/Writer. The new setting shall be enabled at the upcoming startup.

Command	SETO (S) param1=value1<LF> <ul style="list-style-type: none"> ● Putting equal between a single setting item and a setting value specifies the value (no need to put '-' before setting item). * Multiple setting items can not be applicable.
Response	SETO0000<LF>

* (S) Space Character

Example 1) When the receiver of response after command execution is set RS-232,

```
[Tx] SETO cli=2<LF>
[Rx] SETO0000<LF>
```

Example 2) When the executed command at the start up is set as [rdid -ant 122322 -tmo 100] ,

```
[Tx] SETO iec="rdid -ant 122322 -tmo 100"<LF>
[Rx] SETO0000<LF>
```

Example 3) When Input 1 function setting is set as [Command execution, start up edge," rdid -ant 122322 -tmo 100"] ,

```
[Tx] SETO in1=1 0 "rdid -ant 122322 -tmo 100"<LF>
[Rx] SETO0000<LF>
```

Example 4) When output 2 function setting is set [output time;500ms when ERR],

```
[Tx] SETO ot2=01 500
[Rx] SETO0000<LF>
```

Example 5) **When output 2 function setting is set as; if data read from memory bank1 and address 2 is XXXX0000 after data read completes normally, output status shall be kept until upcoming evaluation, 出力 3 機能設定を、正常読取り完了時、メモリバンク 1、アドレス 2 から読み出したデータが XXXX0000 のときに次回の判定まで出力状態を保持する場合**

```
[Tx] SETO ot3=31 0 1 2 dat=XXXX0000
[Rx] SETO0000<LF>
```

(2) Get operation of reader (GETO: GET Operation)

This command allows the Reader/Writer to read the current operation conditions. Even after setting operation command (SETO) is executed, the old information shall be read out unless the reboot is completed.

Command	GETO (S) param1 (S) ... param n<LF> <ul style="list-style-type: none"> ● Specifies a single setting item. (not required '-' before the item) * Multiple setting items cannot not be specified.
Response	GETO (S) param1=value1 (S)<LF>

* (S) Space Character

Example 1) When executed command is read at startup,

```
[Tx] GETO iec<LF>
[Rx] GETO0000 iec=" rdid -ant 122322 -tmo 100"<LF>
```

Example 2) When Input 1 function setting is read,

```
[Tx] GETO in1<LF>
[Rx] GETO0000 in1=1 0 "rdid -ant 122322 -tmo 100"<LF>
```

Example 3) When Output 1 function setting is read,

```
[Tx] GETO ot1<LF>
[Rx] GETO0000 ot2="31 0 mbk 1 dpt 2 dat=XXXX0000"<LF>
```

3.1.5.4 Setting for Communication Conditions

To setting the conditions to communicate with tags, following items shall be specified in the SET Communication command (SETC) and GET Communication command (GETC). Specifying following option allows the Reader/Writer to set or read the communication condition. To write the setting data into the nonvolatile memories in the Reader/Writer, SAVE communication setting command (SAVE) shall be executed.

Smoothing Function (GETC/SETC)

Code	Content	User setting value		Factory Settings
		Value setting	Value selecting	
SBF	Prevents repeat read (Smoothing Buffer)	-Min: 0 -Max: 999 -Step: 1		0:Disable
ONR	Omit No Tag Response		0:Disable 1:Enable	0:Disable

Filtering Function (GETC/SETC)

Code	Content	User setting value		Factory Settings
		Value setting	Value selecting	
FTE	Filtering Enable		0:None 1:Filter1 2:Filter2 1&2:Filter1 and Filter2 1 2: Filter1 or Filter2	0:None
FT1	Filtering condition 1	Filter type:0 MemBank:0-3 Pointer:0x00...0xFF(bit) Length:0x00...0xFF(bit) Value:0x0...(Hex)		(None)
FT2	Filtering condition 2	Same as FT1		(None)

RF Control Conditions (GETC/SETC)

Code	Content	User setting value		Factory Settings
		Value setting	Value selecting	
SS1	Gen2 Session value In case of Once Mode reading		0 1 2 3	0
SS2	Gen2 Session value In case of Repeat Mode reading		0 1 2 3	2
PW1	UHF Power Level (Port1)	-Min: 10.0 -Max: 32.0 -Step: 0.5		31.5 (dBm)
PW2	UHF Power Level (Port2)	Same as PW1		31.5 (dBm)
PW3	UHF Power Level (Port3)	Same as PW1		31.5 (dBm)
PW4	UHF Power Level (Port4)	Same as PW1		31.5 (dBm)
CMD	Communication mode		0:Normal mode 1:Dense reader mode (DRM)	0:Normal mode

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(1) SET Communication (SETC)

While the command is being executed, setting conditions in the Reader/ Writer are changed.

This setting is enabled when another communication command is executed. To write the setting data into the nonvolatile memories in the Reader/Writer, SAVE communication setting command (SAVE) shall be executed. The new setting shall be enabled at the upcoming startup.

Command	<p>SETC (S) param1=value1 (S)... param n=value n<LF></p> <ul style="list-style-type: none"> ● It specifies a parameter connecting a setting item to a setting value. ('The setting item does not have to be prepended with ' - ' .) ● No space shall be put in from the beginning of the setting item to the end of the setting value unless setting item is ft1 or ft2. ● If the setting item is ft1 and/or ft2, the five items shall be specified with space separation between each item. Instead of space, enclosing double quotations is not allowable. ● In a single command, multiple setting items can be specified by separating with space. A 2 or more character space is acceptable for indicating separation.
Response	SETC0000<LF>

* (S) Space Character

Example 1) When [Port 1 power; 10, Session; S1] is specified:

```
[Tx] SETC cp1=10 ss1=1<LF>
[Rx] SETC0000<LF>
```

Example 2) When [Filter; 1 or 2, Filter1; Bank 1, Address; 20, Dat; 0x**11, Filter2; Bank 1, Data Pointer; 20, Dat; 0x1211] is specified:

```
[Tx] SETC ft1=0 1 20 XX11<LF>
[Rx] SETC0000<LF>
[Tx] SETC ft2=0 1 20 1211<LF>
[Rx] SETC0000<LF>
[Tx] SETC fte=1 | 2 <LF>
[Rx] SETC0000<LF>
```

(2) GET Communication (GETC)

This command allows the Reader/ Writer to read the current communication conditions. Just after SET Communication command (SETC) is executed, new information shall be read out.

Command	<p>GETC (S) param1 (S) param n<LF></p> <ul style="list-style-type: none"> ● It specifies a parameter connecting a setting item to a setting value. ('The setting item does not have to be prepended with '-' .) ● In a single command, multiple setting items can be specified by separating with space. (A 2 or more character space is acceptable for indicating separation.)
Response	<p>GETC0000 (S) param1=value1 (S) ... param n=value n<LF></p> <ul style="list-style-type: none"> ● If multiple items are specified, the Reader/Writer shall return response with connecting specified items to the setting values with equal in the specified order. Alphabetical characters included in the item name in the response shall be small characters. ● If the setting item is ft1 and/or ft2, the five items shall be returned with space separation between each item. Double quotations shall not be used for enclosing.

* (S) Space Character

Example 1) When [UHF power, Session] is read out:

[Tx] GETC cpw ss1<LF>
 [Rx] GETC0000 cpw=10 ss1=1<LF>

Example 2) When [Filter setting, Filter condition 1, Filter condition 2] is read out:

[Tx] GETC fte fl1 fl2<LF>
 [Rx] GETC0000 fte=1&2 ft1=0 1 20 XX11 ft2=0 1 20 1211<LF>

(3) SAVE communication setting (SAVE)

This command allows the Reader/Writer to write communication setting into the nonvolatile memories in the Reader/Writer. If SET Communication command (SETC) is executed and then the Reader/Writer is started up without executing this command(SAVE), new setting will be abandoned.

Command	SAVE<LF> ● No arguments. * In the future, the function will be extended so that the Reader/Writer can write data into a certain area with specifying the area. ex. SAVE 0(<= specified area number)
Response	SAVE0000<LF>

Example 1) When communication setting is saved (New setting is written into the nonvolatile memory):

[Tx] SAVE
[Rx] SAVE0000

3.1.5.5 Control Command

(1) INITialize setting (INIT)

This command initializes all setting of reader so that all setting will return to factory default setting. All setting shall be written into the inner nonvolatile memories. After executing this INIT command, the Reader/Writer requires reboot.

Command	INIT<LF> ● No argument ex. INIT 1(Initalized range)
Response	INIT0000<LF>

Example 1) All setting of reader is initialized to the factory default setting.

```
[Tx] INIT  
[Rx] INIT0000
```


(1) External Input Output control (EXIO)

This command allows the Reader /Writer to output ON/OFF to the output terminal and read an input terminal status. If output setting value is omitted, the Reader/Write shall read the input status only.

Command	EXIO <LF> (For only input status read) EXIO (S) <i>outd</i> <LF> (For output specifying) outd: For OUT1-4, values are set with four characters (left to the right; 1-4) (“0”-OFF / “1”-ON / “*”-Don’t care)
Response	EXIO0000 (S) <i>inpd</i> (S) <i>outd</i> <LF> inpd: For IN1-4, values 2-4 are set with four characters (left to the right). (“0”-OFF / “1”-ON)

* (S) Space Character

Example 1) When [Output 1; High, Output 2; Low, Output 3; High, Output 4; Low] is specified:

[Tx] EXIO 1010
[Rx] EXIO0000 1111 1010

Example 2) When [Getting I/O status] is specified:

[Tx] EXIO<LF>
[Rx] EXIO0000 1011 1001<LF> (From the left side, the following status is shown;
IN1...IN4, OUT1...OUT4)

(2) RESeT (RSET)

This command reboots the Reader/Writer after the Reader/ Writer returns the response indicating command receipt.

Command	RESET<LF> ● No arguments. * In the future, the function will be extended so that it can specify reset level. ex. RESET 1 (<= Reset level)
Response	REST0000<LF>

Example 1) When all the settings of the Reader/Writer are initialized to factory default setting.:

```
[Tx] REST<LF>
[Rx] REST0000<LF>
```

(3) STOP the operation (STOP)

This command instructs the Reader/Writer to stop the operation in process.

Command	STOP<LF> ● No arguments
Response	STOP0000<LF>

Example 1) When the Reader/Writer stops multi-repeat communication:

```
[Tx] RDID -seq MRP -ant 12 ---- ReaD ID command starts multi-repeat.

[Tx] STOP<LF>
[Rx] STOP0000<LF>
```

(4) Good BYE (GBYE) - Connection shut down

This command enables to shut down connection with Ethernet. This command is valid only when Connection Method is Passive. (Error occurs if the mode is Active.) The communication of response that indicates command receipt is **shut down (disconnected?)** after sending.

Command	GBYE<LF> ● No argument
Response	GBYE0000<LF>

Example 1) All setting of the reader shall be initialized to factory default setting.

[Tx] GBYE<LF>
[Rx] REST0000<LF>

(6) RERESponse (RERES)

This command instructs the Reader/Writer to re-send the latest response data that has been sent. This command shall not be accepted when the other command such as **Repeat mode** is being processed.

REPEAT 系

Command	RRES<LF> ● No argument
Response	(The latest response)

Example 1) When the host requests to resend the response for the External Input Output control command (EXIO) that has been executed most lately.

[Tx] RRES<LF>

[Rx] EXIO0000 1011 1001<LF>

(4) TEST (TEST)

This command instructs the Reader/ Writer to return the exact data message just after receiving it from the host. It is to test a communication line.

Command	TEST (S) <i>TestData</i> <LF>
Response	TEST0000 (S) <i>TestData</i> <LF>

* (S) Space Character

Example 1) When test data "123456789" is entered to check a communication status between the host and the Reader/Writer:

[Tx] TEST 1234567890

[Rx] TEST0000 1234567890

(8) Noise level check (NOIS)

This command is to check the noise level of specified antenna.

Command	NOIS (S) <i>antenna</i> <LF> antenna: the port number of antenna (1-4) that is to check the noise level.
Response	NOIS0000 (S) <i>ch1</i> (S) <i>ch2</i> (S) <i>ch3</i> ··· (S) <i>chn</i> <LF> ch1-n: Noise level of each communication channel. (S:n=50,EU:n=10,JP:n=9) * Absolute value (not db unit) For the graph via Web site, the level will be plotted with log.

* (S) Space Character

Example 1) Noise level check for the antenna port 1(US version).

[Tx] NOIS 1<LF>

[Rx] NOIS0000 1111 2222 3333 4444 ···· nnnn<LF>

Note:**Q**

A parameter that an Interrogator uses to regulate the probability of Tag response. An Interrogator commands Tags in an inventory round to load a Q-bit random (or pseudo-random) number into their slot counter; the Interrogator may also command Tags to decrement their slot counter. Tags reply when the value in their slot counter (i.e. their slot . see below) is zero. Q is an integer in the range (0,15); the corresponding Tag response probabilities range from $2^0 = 1$ to $2^{15} = 0.000031$.

Session

An inventory process comprising an Interrogator and an associated Tag population. An Interrogator chooses one of four sessions and inventories Tags within that session. The Interrogator and associated Tag population operate in one and only one session for the duration of an inventory round (defined above). For each session, Tags maintain a corresponding inventoried flag. Sessions allow Tags to keep track of their inventoried status separately for each of four possible time-interleaved inventory processes, using an independent inventoried flag for each process.

3.2 Examples

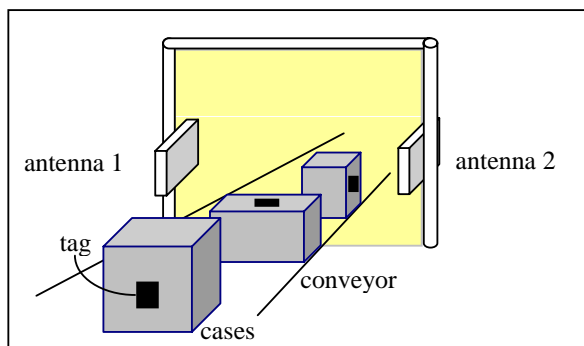
Examples given in this chapter are provided as a guide for the user in determining suitability and does not constitute a warranty. Users must verify operation in their specific environment and application.

3.2.1 Example 1

To read tags attached to cases passed through a gate on a conveyor, the client software finds tags using 2 antennas. For the example pictured below, the command is as follows:

```
SELECT id, antenna_id FROM tag_id WHERE (antenna_id=1 OR antenna_id=2) AND  
protocol_id='GEN2' AND read_count>1 SET time_out=500;
```

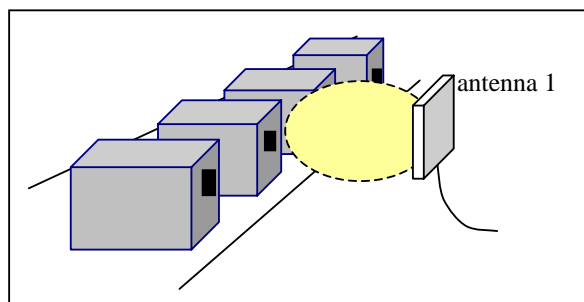
Then the reader continues to read tags through the gate.



3.2.2 Example 2

To read tags and send a response repeatedly every 1 second using one antenna. For the example pictured below, the command is as follows:

```
DECLARE query1 CURSOR FOR SELECT id FROM tag_id WHERE antenna_id=1 AND  
protocol_id='EPC1' SET time_out=500;  
SET AUTO query1=ON, repeat=1000;
```



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3.2.3 Example 3

To synchronize two readers see the following instructions.

On Reader 1:

```
DECLARE cursor_one CURSOR FOR SELECT id FROM tag_id WHERE protocol_id='EPC1' SET
time_out=300;
SET auto_time cursor_one = '2005-02-01T13:00:00Z', repeat=1000;
```

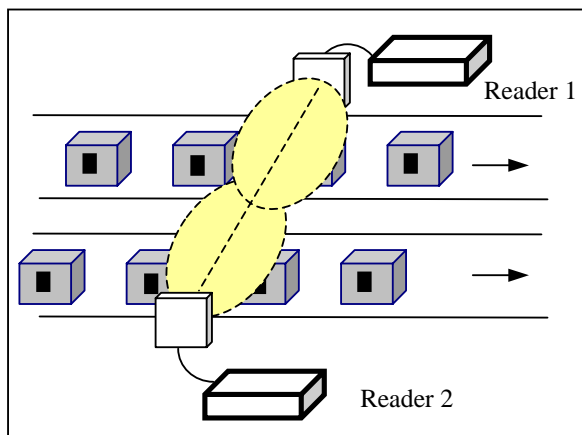
The first reader will start reading for no less than 300 ms at just 13 o'clock, and it will repeat the command 1000ms.

On Reader 2:

```
DECLARE cursor_two CURSOR FOR SELECT id FROM tag_id WHERE protocol_id='GEN2' AND
read_count>1 SET time_out=300;
SET auto_time cursor_two = '2005-02-01T13:00:00.5Z', repeat = 1000;
```

The second reader will start reading for no less than 300ms starting at time 0.5 second after 13 o'clock, and it will repeat the command every 1000ms.

The effect will be that each reader will have a almost 50% duty cycle with each one only active when the other one is off.



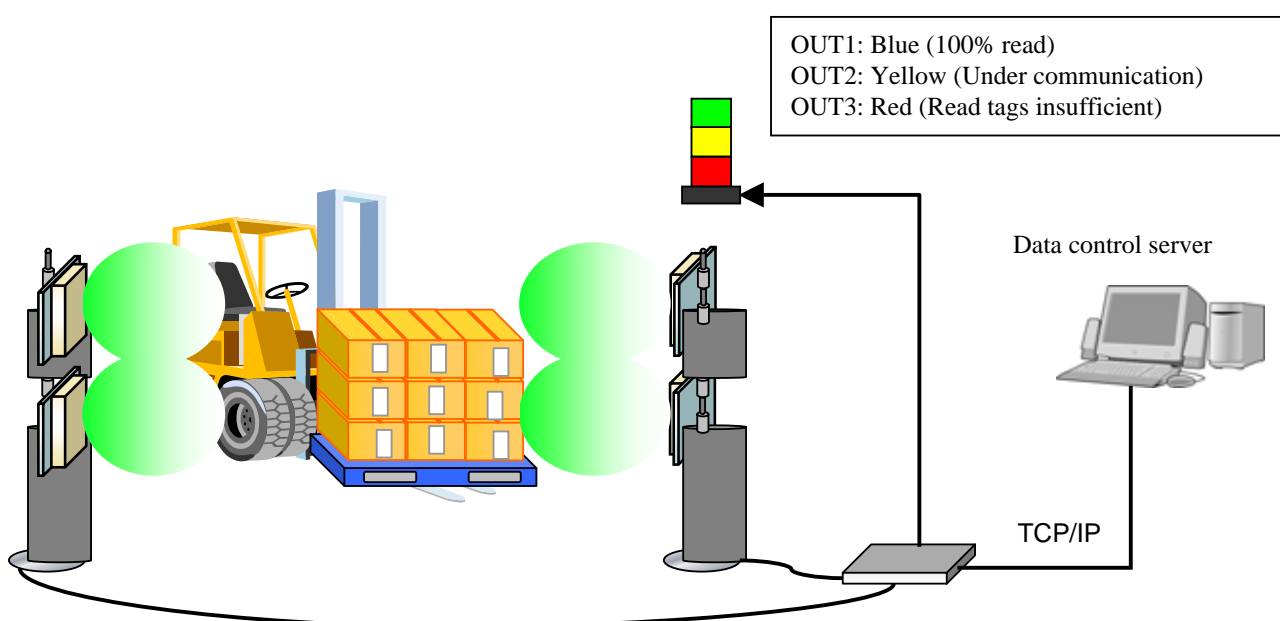
3.2.4 Example 4

【System example of self-operation】

Simplified setting operation provides low-cost system.

[1] Automated pass check at a portal gate.

When products with tags pass through the portal, the R/W can check whether it reads specified quantity of tags or not. Then the R/W reports the judgment; passing OK or not, to the operator.



Operating conditions

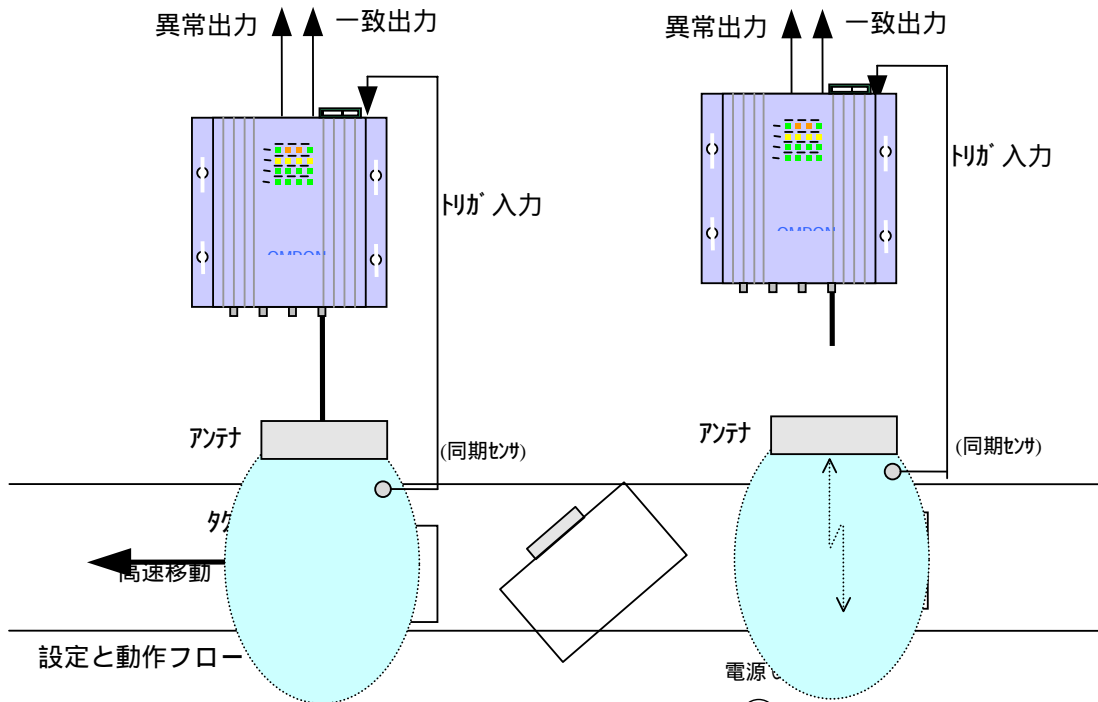
Item	Registered contents
Start Up	ID read, Multi Repeat
OUT1	Outputs tms when read tag count is 9.
OUT2	Communication status output
OUT3	Output tms when read tag count is other than 9.

3.2.5 Example 5

[2] コンペアの自動仕分け

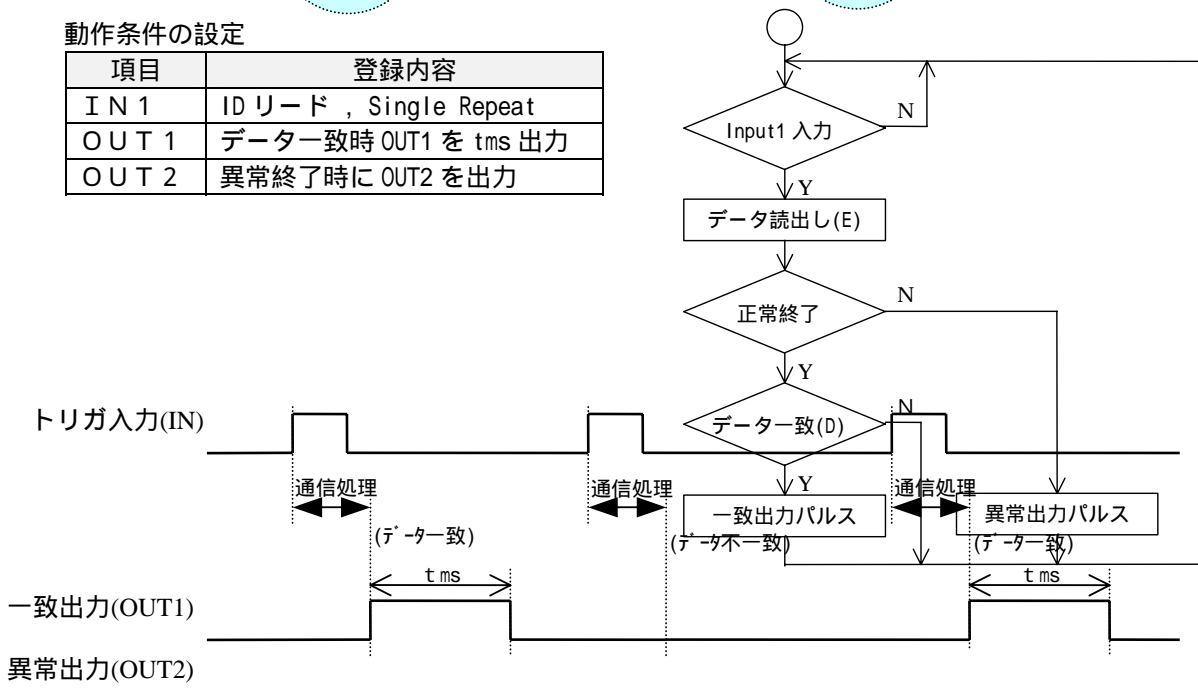
行先情報が書き込まれたタグを読み出し、該当する行先のものだけを検出してパルスを出力する場合。何らかの異常で読み出しができなかった場合には、異常パルスを出力する。

システム構成



動作条件の設定

項目	登録内容
IN 1	ID リード , Single Repeat
OUT 1	データ一致時 OUT1 を tms 出力
OUT 2	異常終了時に OUT2 を出力



4. Browser-Based Interface

About this Guide

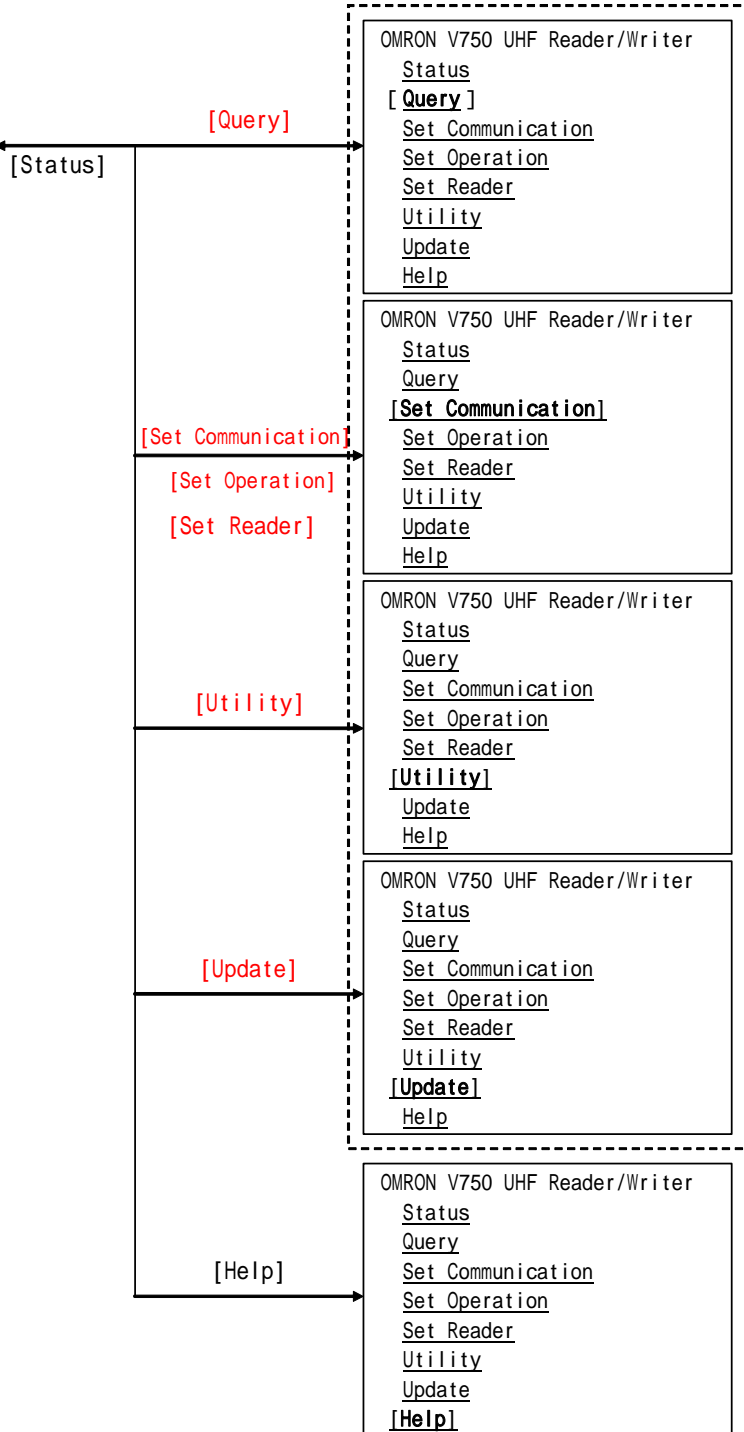
This installation and usage guide explains how to install the V750 Reader, how to use the browser-based interface, and how to control the reader remotely.

4.1 Using the Browser-Based Interface 詳細仕様作成中！

7.1 機能構成

Web ブラウザで接続した後の最初の画面は常に Status 画面となる。各々の画面の最上部と最下部には全ページへのリンクメニューを表示し、1 クリックで任意の画面に移動することができる。Status や Help 画面から他の画面（オフライン機能）に移動する際には、Ethernet/RS-232C からのコマンドが受け付けられなくなる旨の Warning Message を出し、OK の場合のみに移行する。オフライン機能は同時に 1 接続のみで使用可能。

オフライン機能



< Safe Mode 時 >

OMRON V740 UHF Reader/Writer
< Safe Mode >
[Status]
Set Reader
Update
Help

4.2 Web Operation

(1) Status 画面

ブラウザでリーダにアクセスした場合、最初に表示される。

[Static Status (静的情報)]

リーダ起動後に変更されない状態情報を表示する。

- ・リーダ形式 : V740-BC50C04-US
- ・バージョン : XXXX-XXXX-XXXX-X (SHソフト - MBソフト - ロジック - H/Wレベル)
- ・製造番号 : 出荷時に書き込んだ製造管理番号
- ・MACアドレス : リーダのMACアドレス
- ・[EPCコード] : リーダ自身のEPCコード(コード取得時に対応)
- ・アンテナ接続状態 : 起動時に接続を認識したアンテナ

[Dynamic Status (動的情報)]

刻々と変化するリーダの状態情報をリアルタイムで表示する。

- ・Ethernet状態 : コマンド I/F Port の Connection Method / Connection 有無
- ・実行中のコマンド : 起動元、実行コマンド、状態 / 結果
- ・[時刻] : 現在時刻 hh:mm:ss [NTP サーバー対応時]
- ・起動後経過時間 : 起動後経過時間 hh:mm:ss

Static Status

Static Status	
EPC Code	12 3456 78
Manufacturer	OMRON
Reader Type	V750-BA50C04-US
Available Antennas	1, 2, 3, 4
Firmware Version	2.0.1 (Hayabusa)
Hardware Version	1.0.1
MAC Address	00 00 0A 89 03 AA
Boot Time	2006-05-01 12:34:56

Dynamic Status

Dynamic Status	
Reader Status	Ready / Communicating / Error
Host Connection	Connected / Disconnected
Active Connection	Ethernet / RS-232C / None
Current Command	READ - PRET GENE - ANT 1
Current Time	2006-04-01 12:34:56 UTC
Time Taken	01:23:45

(2) Query 画面

実際にコマンドを発信し、実行結果を表示することができる。

実行するコマンドの主なオプションは、すべて画面クリックで選択することができ、コマンド体系を熟知しないユーザでも簡単に操作することができる。また、コマンドラインを編集することを可能にし、熟達したユーザが自由にコマンドを実行することもできる。



(3) Set Reader 画面

リーダの機能情報を表示、設定変更する。

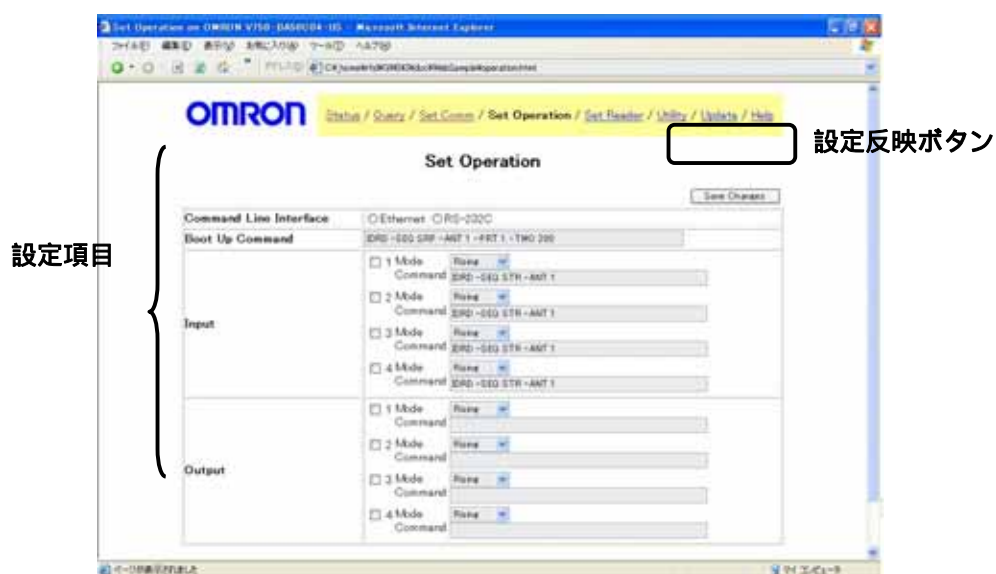
- ・リーダ定義 : ユーザー定義のリーダ名称 / リーダ役割 (設置位置など)
- ・LAN 設定 : [機能] (機能拡張時に対応)、Host、Domain、DHCP、IP Address、Net Mask、Gateway、[DNS Server]、[Connection Method]、[Default Host/Port]、[NTP Server]、[SNMP Server]
- ・RS-232C 設定 : [機能] (機能拡張時に対応)、ボーレート、データ構成、[RS/CS 制御有無] (機能拡張時に対応)
RS-232C 接続の拡張 I/O 対応など、システム I/F 以外に使用する場合
- ・[制御ポート] : 機能 [スキャン接続、アンテナ切替機、など] (機能拡張時に対応)



(4) Set Operation 画面

リーダの動作条件の情報を表示、設定変更する。

- ・コマンド実行後返信先 : 登録コマンド実行後の返信先 - NON/Ethernet/RS-232C
- ・電源 ON 動作 : 実行コマンド列
- ・入力 1 ~ 4 動作 : 機能 - なし(ユザ) / コマンド登録、[起動] (機能拡張時に対応)、実行コマンド列
信号立上り時に以外の起動条件に対応した場合
- ・出力 1 ~ 4 動作 : 機能 - なし(ユザ) / 状態出力 / 送信結果判断出力、出力時間、条件 (出力時間と条件は機能を送信結果判断出力時に有効)



(5) Set Communication 画面

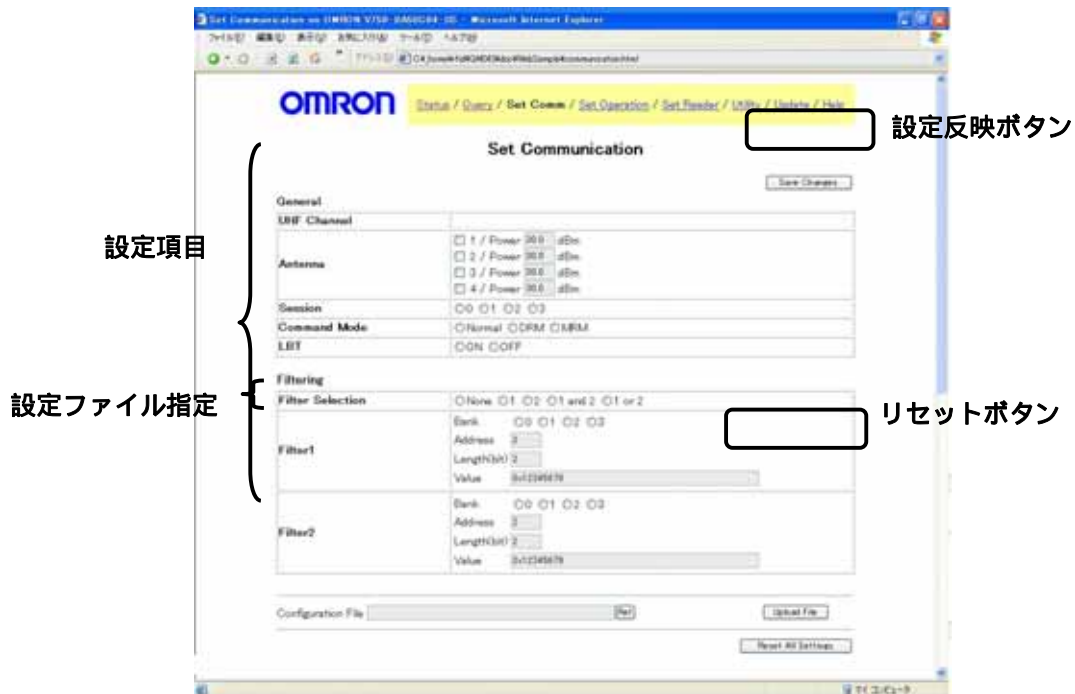
タグとの通信設定条件を表示、設定変更する。

- Smoothing 機能 : 2 度読み防止機能、不在レスポンス省略
- Filtering 機能 : 有効 / 無効、Filtering 条件 1 - [タグ種類] / パラメータ (MemBank、Pointer、Length、Data)
Gen2 以外のタグの Filtering 機能に対応する場合
- RF 制御条件 : 使用 Session、アンテナ出力レベル、通信実行モード、[LBT 使用]、[ライトベリファイ有無]

一斉に設定変更する場合は、所定のフォーマットで項目とその値を記述したファイルをアップロードすることで、反映させることができる。

各項目の値を記入し、[設定反映ボタン] を押すと、設定が変更される。

[リセットボタン] を押すと、設定値がすべてデフォルト状態に戻される。



(6) Utility 画面

リーダを操作する上で、補助となる以下の2つの機能を提供する。

Channel RF Monitor

各チャンネルでの電波の出力状態をモニタリング表示する。

チャンネル状態



機能切り替え

Log Data 表示

起動後に発生したエラーの履歴を最新エラーログと統計エラーログの種類の形式で表示する。リセットにより履歴情報はクリアされる。

最新エラーログでは、直前に発生した最大 32 件のエラーを、実行したコマンドコードとエラーコード (4 桁) で表示する。

統計エラーログでは、各エラーコード (上 2 桁) 毎に発生した回数を表示する。回数の最大は 65535 回である。これ以上に発生した場合にはカウントアップされない。(下記の画面イメージ)

表示データ選択

ログデータ表示



(7) Update 画面

ファームウェアのアップグレード時に、ファームウェアファイルを指定して [更新指示] ボタンを押すことによりファームウェアを更新する。

ファームウェアファイル指定
更新指示 {

(8) Help 画面
各画面の操作方

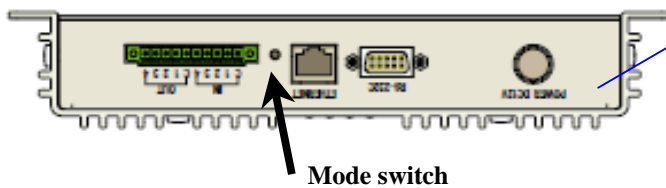
4.3 Safe Mode

Use the recessed Safe Mode button on the reader connector panel to recover from errors which prevent the reader from operating in normal mode. In Safe Mode the reader is configured with a static IP address of 192.168.1.200. Safe mode operation restores factory default settings as follows:

IP Address: 192.168.1.200
Host Name: Mercury4

Although the browser-based interface pages are displayed in red when operating in safe mode, the reader is still functional, although it cannot read or write tags. In most cases, the reader will need to be reconfigured for operation with the reader application after starting in Safe Mode.

- 1. With the reader running, hold down the recessed Mode Switch button for 1 seconds, using a non-conductive object.



最終版では、180度回転した画像を使用する。

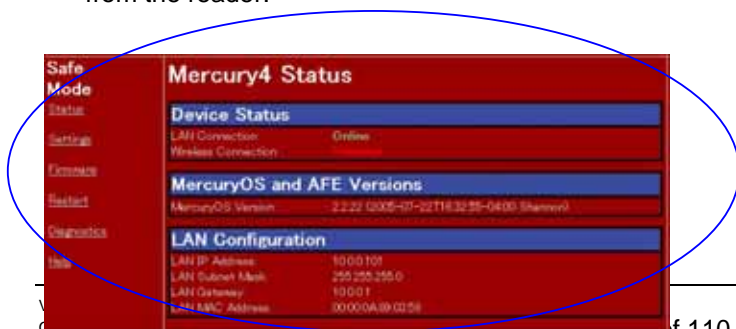
- 2. Release the button
- 3. The green LED should turn solid as soon as the button is released, indicating the reader is rebooting. It should take approximately 30 seconds to boot into Safe Mode. The web server, telnet server and SSH server run in Safe Mode, however none of the RFID features are activated. To communicate with the reader in Safe Mode, a PC must have an IP address and subnet mask that are compatible with the reader settings, for example:

IP address 192.168.1.200
netmask 255.255.255.0

There are two main reasons to enter Safe Mode. One is to perform a firmware update to repair a corrupted file system. The second is to change settings that are preventing the reader from operating normally.

Both of these tasks can be performed via the web interface.

- 4. Once the maintenance has been performed, restart the reader to activate the changes. Disconnect power from the reader.



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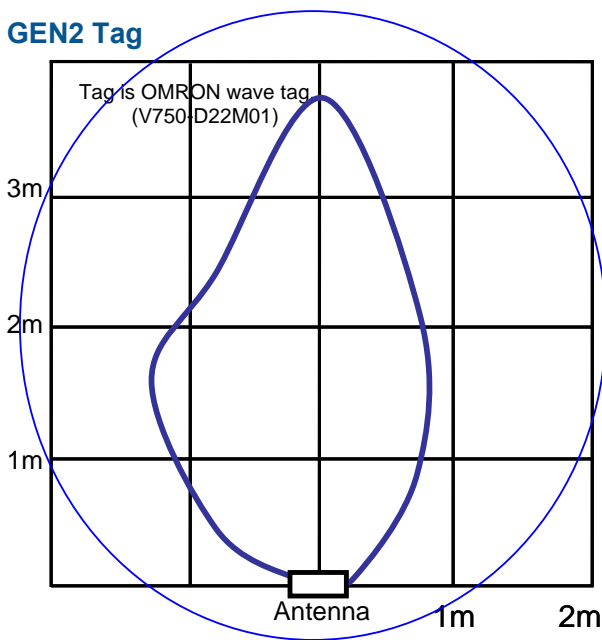
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5 Characteristics(Reference)

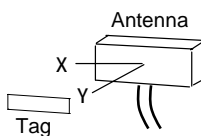
Characteristics data given in this chapter is provided as a guide for the user in determining suitability and does not constitute a warranty. Actual performance may vary based on actual user conditions.

5.1 Communications Range

GEN2 Tag



<Measurement Set-up>



- *. There are no RF reflection objects around the Antenna and Tag in the measurement environment.
- *. There are some areas where communication is possible outside the communications range shown in the graph by the effect of reflection off of the ground.
For example, radio anechoic chamber.
- *. **Class1b:3dB attenuator is attached at the time of measurement with a Antenna.**
- *. **GEN2:DRM off mode**

5.2 Communications Time

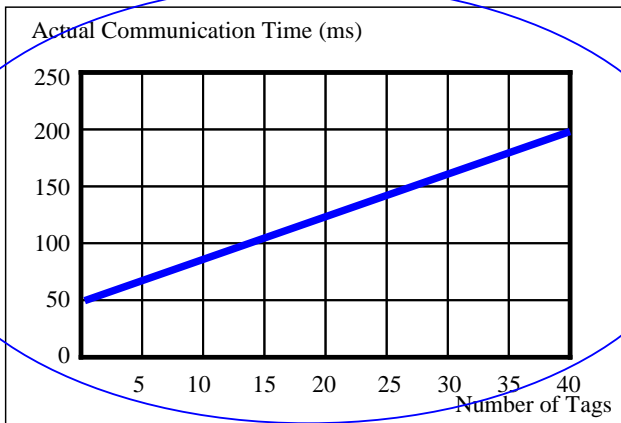
The following charts show communication time on each protocol. It is influenced on practical matters, for example radio noise, distance between tags, materials tags are on and other environmental matters.

These charts are generated by plotting and linking average of actual communication time on every 5 tags. Communication time is measured in shielded room with one reader, so that no reflection and no interference are considered.

You can refer these charts on determining time out value of RQL command. But you must keep in mind actual communication time on your environment may not correspond to these charts because of the reasons already described.

Timeout 値を決定する為のグラフであるにもかかわらず実フィールドで使用するための値としていない。

GEN2 Tags



Number of Tags:0 ~ 200
DRM ON/OFF

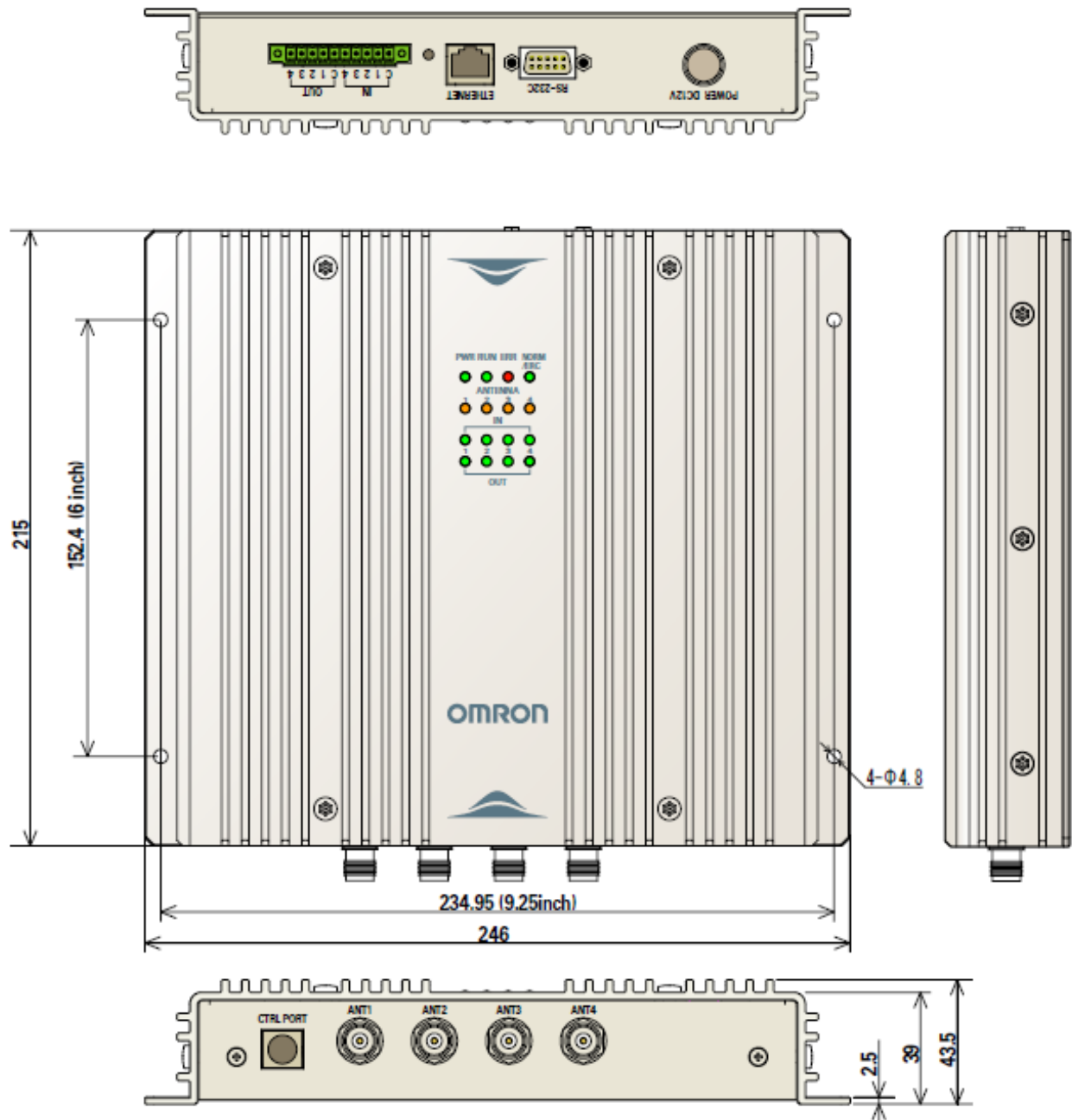
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APPENDIX: OUTLINE DRAWINGS

Reader / Writer: (V750-BA50C04-US)

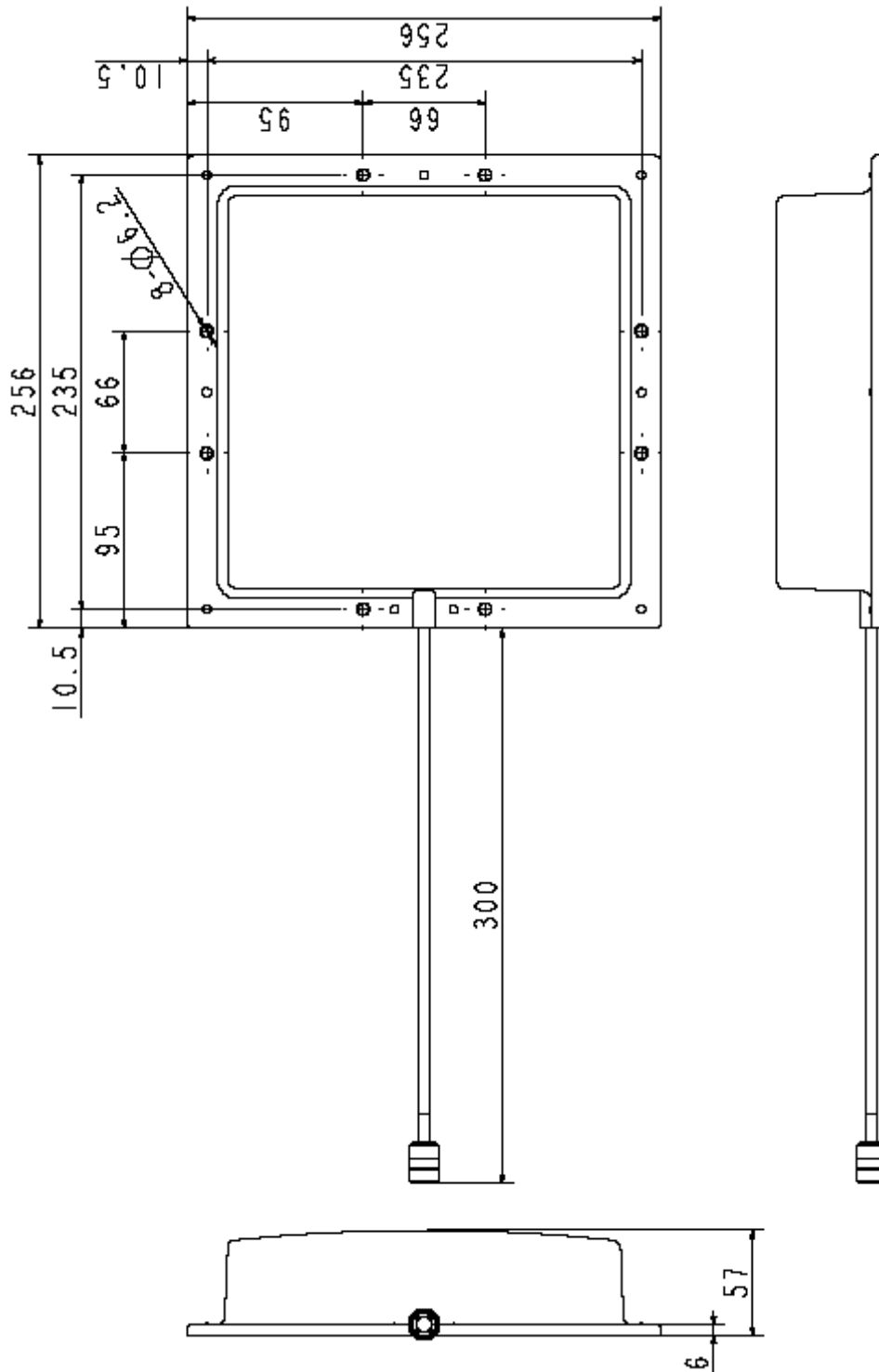
Material : Aluminium



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Antenna: (V740-HS01LA, V740-HS01CA)



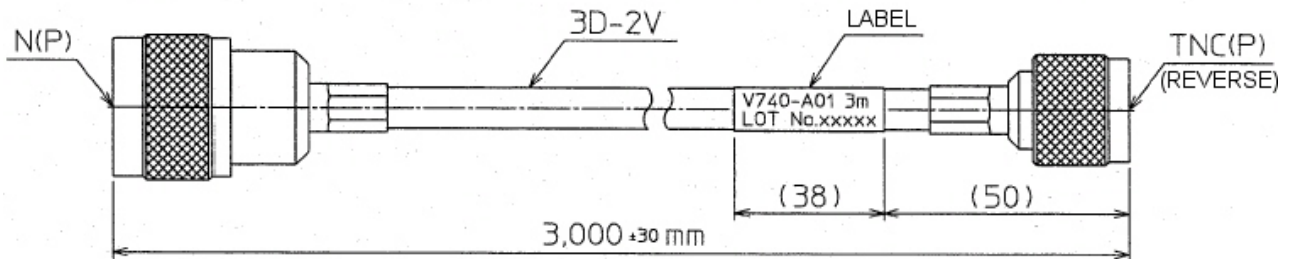
Material: Case PVC, Base plate Aluminum

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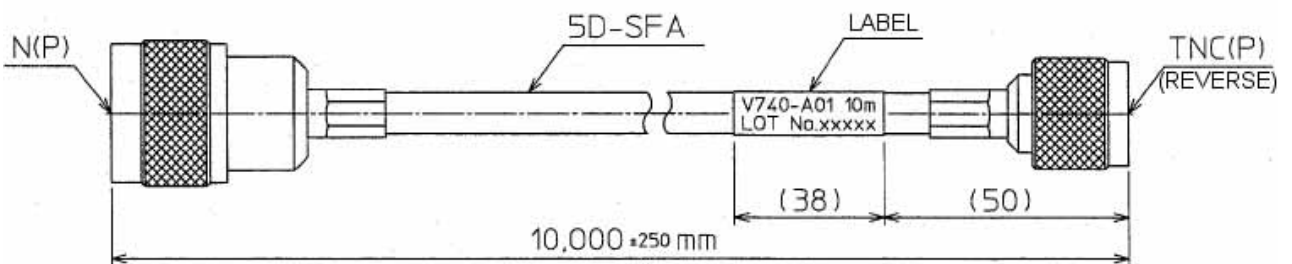
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Antenna Cable: (V740-A01-3.0M, V740-A01-10M)

Short cable (V740-A01-3.0M)



Long cable (V740-A01-10M)



Revision History

Catalog No. SRFM – 012 – A

Revision Code

Revision Code	Date	Reason for revision/revised page
A	2006/10	First edition

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<http://www.omronrfid.com/>