KEYENCE

300GB

Fixed Mount 2D Code Reader
SR-750 Series
Ultra-compact Code Reader
SR-700 Series
User's Manual Rev8.0

Read this manual before use.
Keep this manual in a safe place for future reference.

■ Symbols

This user's manual uses the following symbols that alert you to important messages. Be sure to read these messages carefully.

DANGER	**It indicates a hazardous situation which, if not avoided, will result in death or serious injury.**
WARNING	**It indicates a hazardous situation which, if not avoided, could result in death or serious injury.**
CAUTION	**It indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**
NOTICE	**It indicates a situation which, if not avoided, could result in product damage as well as property damage.**

Important **Cautions as to operation that is always performed are shown.**

Point **Cautions as to operation that can be easily performed incorrectly are shown.**

Reference Matters that will help the user improve understanding of the text and useful information are shown.

The items and pages to be referred to in this document are shown.

Introduction

This manual explains the connections, wiring, settings, and precautions for the SR-750 Series fixed type 2D code reader and the SR-700 Series ultra-compact fixed type code reader. Please read this manual before use to fully understand the characteristics of the SR-750/SR-700 Series. Store this manual carefully for possible future reference.

Series symbols

In this manual, items corresponding to each series are marked with the following symbols.

SR-750 SR-750 Series symbol

SR-700 SR-700 Series symbol

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General Precautions

DANGER	• **Do not use this product for the purpose to protect a human body or a part of human body.** • **This product is not intended for use as explosion-proof product. Do not use this product in a hazardous location and/or potentially explosive atmosphere.**
CAUTION	• **Be sure to check that the SR-750 Series performs properly before starting the work or operation.** • **If the SR-750 Series malfunctions, take adequate safety precautions to prevent various types of damage.** • **Do not use the SR-750 Series in a manner not specified herein. It may result in fire, electric shock or malfunction.**
NOTICE	• **It should be noted that functions and performances will not be guaranteed if the SR-750 Series is used in any way not specified or described in the product specifications or it is modified.** • **When the SR-750 Series is used in combination with other devices, functions and performance may be degraded, depending on the operating conditions and environment.**

Safety Information for SR-750 Series

Safety precautions on Laser product

In both the SR-750 Series fixed type 2D code reader and SR-700 Series ultra-compact fixed type code reader, a visible light semi-conductor laser (wavelength 660 nm) is used as the reading position adjustment target pointer.

■ SR-750 Series laser pointer specifications

Wavelength	660nm
Output	60μW
Pulse duration	200μs
Laser class	Class 1 Laser Product (IEC60825-1, FDA(CDRH) Part 1040.10*)

* The classification is based on IEC60825-1 standard following the Laser Notice No. 50 from FDA (CDRH).

■ SR-700 Series laser pointer specifications

Wavelength	660nm
Output	60μW
Pulse duration	200μs
Laser class	Class 1 Laser Product (IEC60825-1, FDA(CDRH) Part 1040.10*)

* The classification is based on IEC60825-1 standard following the Laser Notice No. 50 from FDA (CDRH).

WARNING	• **Control and adjustment with procedures other than those specified here may lead to exposure to harmful laser radiation.** • **Do not disassemble this product. The laser radiation emission from this product is not automatically stopped when it is disassembled.** **Precautions on Class 1 Laser Product** • **Do not stare into the direct or specularly reflected beam.**

Precautions on Proper Use

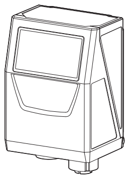
NOTICE	• **Do not use a voltage other than that described in the specifications with the SR-750/SR-700 Series. Doing so may cause damage to the unit.** • **The SR-750 Series employs 2 power connection methods, which are 24 V DC supply and supply from PoE power supply devices. When connecting the SR-750 Series to the power source, be sure to use one of these methods. Using both power sources simultaneously may cause damage to the units.** • **Be sure to turn off the power to devices attached to the SR-750/SR-700 Series when you plug in or unplug the cables. Failure to do so may cause damage to the SR-750/SR-700 Series.** • **Do not disassemble or modify the SR-750/SR-700 Series. Doing so may cause damage to the unit.** • **Place cables as far away as possible from high-voltage lines and power lines. Otherwise, electrical noise can be generated that may cause product failure or malfunction.** • **The SR-750/SR-700 Series is a precision instrument. Do not impact or drop the instrument. Pay particular attention when transporting or installing the unit.** • **Do not hold the unit by its cable when carrying. The units may become damaged if the cables are disconnected or the units strike each other.** • **Do not allow water, oil, dust, or other foreign substances to stick to the scanner. This may cause read errors. Use a soft, dry cloth to wipe any substance from the scanner. (Do not use a cloth dipped in alcohol or other cleaning substance.)**

1-1 Checking the Package Contents for the SR-750 Series

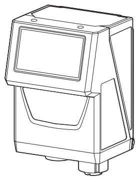
The package of the SR-750 Series main unit contains the following components.

■ SR-750 Series (Fixed mount 2D code reader)

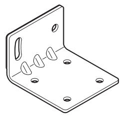
Main unit
SR-750/751/750HA



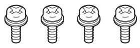
SR-752



Mounting bracket x 1

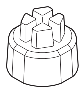


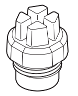
Mounting screw (M4) x 4



Insulating spacer x 2

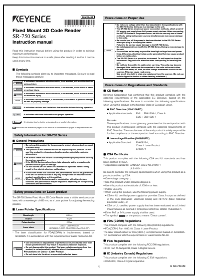
Port cover (Power supply and control port, Ethernet connection port) x 1 each





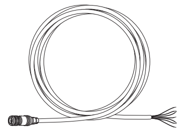
Washer x 2

Instruction Manual



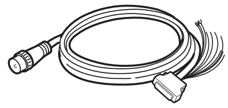
Optional accessories

■ Cable and connector

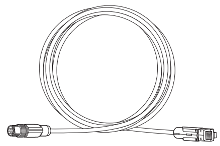


Control cable (Power supply, I/O, RS-232C)
- OP-87224 (2 m cable)
- OP-87225 (5 m cable)
- OP-87226 (10 m cable)

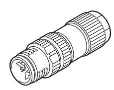
NFPA79 compliant Control cable
- OP-87353 (2 m cable)
- OP-87354 (5 m cable)
- OP-87355 (10 m cable)



Control cable (NFPA79-compliant) with D-Sub9 pin (Power supply, I/O, RS-232C)
- OP-87527 (2 m cable)
- OP-87528 (5 m cable)
- OP-87529 (10 m cable)

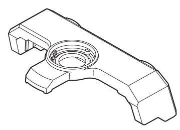


NFPA79 compliant Ethernet cable
- OP-87359 (2 m cable)
- OP-87360 (5 m cable)
- OP-87361 (10 m cable)



Ethernet assembly plug
- OP-87362

■ Long distance lens



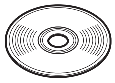
400 mm lens
- SR-75L4

600 mm lens
- SR-75L6

Configuration software

■ SR-H4W

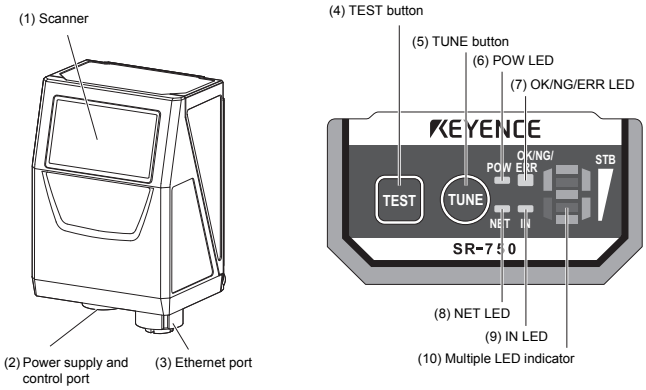
AutoID Network Navigator



1-2 SR-750 Series Part Names and Functions

SR-750 Series

This section describes the part names and functions of the SR-750 Series.

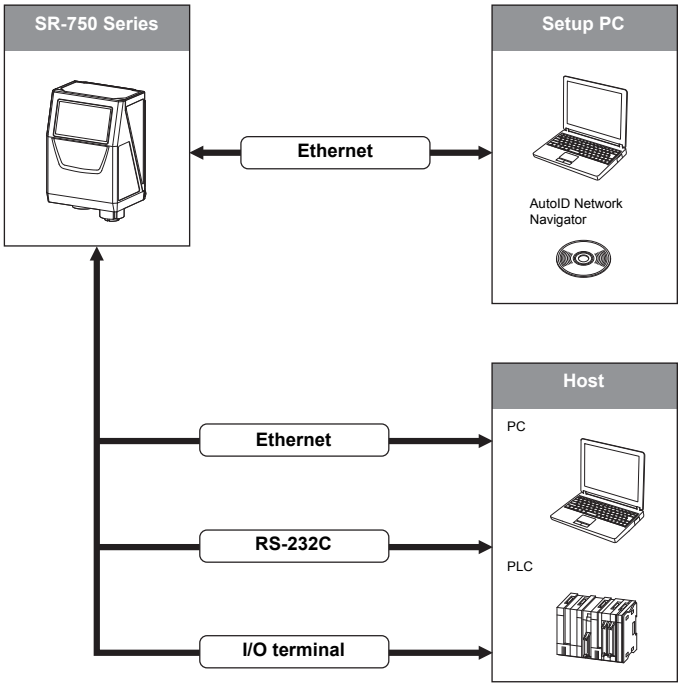


Number	Name	Function
(1)	Scanner	Reads 2D codes and bar codes.
(2)	Power supply and control port	Connect the control cable.
(3)	Ethernet port	Connect the Ethernet cable.
(4)	TEST button	Use this button to perform the following operations: • Run 1 reading operation. • Start and stop test mode. • Run the multi-reading mode. • Fix the communication settings of RS-232C to the default values. • Reset PLC link error.
(5)	TUNE button	Use this button to perform the following operations: • Turn on the laser pointer for reading position adjustment. • Start parameter tuning. • Display the number of parameter banks of which the alternate function is effective. • Read the quick setup code. • Reset errors. • Start Ethernet communication BootP mode connection.
(6)	POW LED	When the power is turned ON, the "green" light turns on.
(7)	OK/NG/ERR LED	• When OK output is ON, the "green" light turns on. • When NG output is ON, the "orange" light turns on. • When ERR output is ON, the "red" light turns on.
(8)	NET LED	• When connected to Ethernet, the "green" light turns on. • When the Ethernet data is sent/received, the "green" light turns on.
(9)	IN LED	When an input terminal is on, this lights up.
(10)	Multiple LED indicator	This displays the operation status including the bank number upon successful reading, reading stability and operation mode.

1-3 SR-750 Series System Configuration and Setup Flow

System configuration

The SR-750 Series has the following configuration.



Setup Flow

This section describes the flow of the setup procedure required for starting the operation of the SR-750 Series.

1 After unpacking the package, first check the package contents.

2 Connect the SR-750 Series to a communication unit or a PC.

3 Use the AutoID Network Navigator to configure and send settings to the SR-750 Series.

4 Install the SR-750 Series according to the location.

5 Adjust the reading conditions and make the operation settings of the SR-750 Series.

Start operation.

1-4 Connecting the SR-750 Series Power Source

This section describes how to connect the SR-750 Series and the power source.

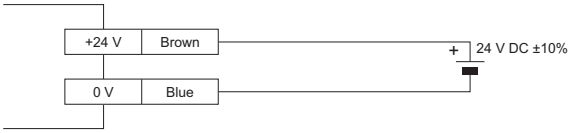
Power supply to the SR-750 Series

There are 2 methods employed for connecting power source to the SR-750 Series.
- Connect the power supply wire of the control cable to a 24 V DC power supply device.
- Connect to a PoE (Power over Ethernet) power supply device using the Ethernet port.

Use only one of the above methods to connect to the power source according to the usage.

NOTICE	**Make sure to use either one of the connection methods for power supply.** **If power is supplied both from the control cable and PoE power supply device at the same time, the unit may be damaged.**

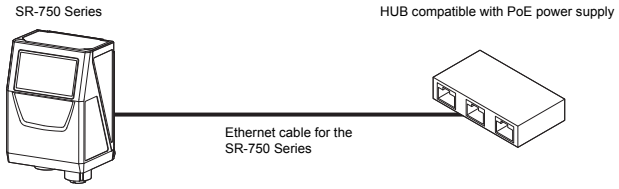
Wiring when supplying 24 V to the control cable



NOTICE	• **Use a steady power supply voltage of 24 V DC ±10%.** • **Do not use a power supply other than 24 V DC. Otherwise, it may cause failure.** • **Before connecting or disconnecting cables, make sure to turn off power to the equipment connected to the SR-750 Series. Otherwise, it may cause the failure of the SR-750 Series.**

Connection when supplying power from a PoE device

Use the Ethernet cable for the SR-750 Series for connection. Connect the RJ-45 connector of the Ethernet cable to a device (switching hub, etc.) compatible with the PoE power supply feature.



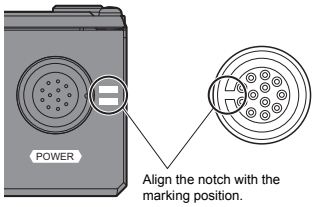
NOTICE	**Be sure to connect with a PoE power supply device compliant with IEEE802.3af.**

1-5 Connecting the SR-750 Series Control Cable and Wiring

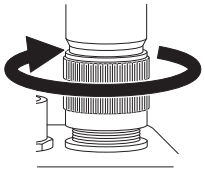
Connect the control cable to the SR-750 Series.

Control cable connection method

1 Align the dent of the cable connector with the marking position next to the control port.



2 Tighten the connector screw by turning clockwise. Set the screw tightening torque to 1.5 - 2.0 N•m.



NOTICE	**When connecting the connector, insert it not to lean toward one side and securely tighten it. Under-tightening can lead to loose connector due to vibrations, resulting in poor contact. Insufficient tightening may not meet the requirements of the protective structure.** *** To get a rough idea, after tightening it by hand, retighten it approximately 90° - 120° using a tool such as pliers.** **Do not repeatedly bend the root of the connector of control cable. Loose connection may result.**

Control cable color and the meaning of signal

The following different color lead wires are drawn out of the control cable. Solder the lead wire to the connector using the wire attached to the device to be connected.

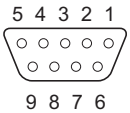
Wire color	Symbol	Description	Signal direction	AWG size
Brown	24 V	+24 V power supply	Input	26
Blue	0 V	Power supply GND	–	26
Orange	RXD	RS-232C Receive	Input	28
Yellow	TXD	RS-232C Send	Output	28
Purple	SGND	RS-232C GND	–	28
Green	IN1	IN1 Input	Input	26
Gray	IN2	IN2 Input	Input	28
White and blue	INCOM	Input common mode voltage	–	28
Pink	OUT1	OUT1 Output	Output	28
Aqua blue	OUT2	OUT2 Output	Output	28
White	OUT3	OUT3 Output	Output	28
Black	OUTCOM	Output common mode voltage	–	28
Black tube	FG	FG	–	–

NOTICE	**Make sure to turn the power off when attaching or removing the control cable.**

■ Control cable (NFPA79-compliant) with D-Sub9 pin

● RS-232C wire

The tip of the RS-232C wire is a D-sub9-pin.

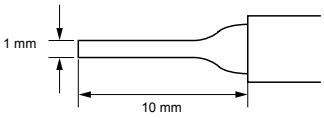


D-sub9 pin (Female)
DTE specifications (Terminal definition)
#4-40 screw

Pin No.	Symbol	Description	Signal direction
2	TXD	Data Send	Output
3	RXD	Data Receive	Input
5	SGND	Signal GND	-

● Control wire (Input/Output signal wire)

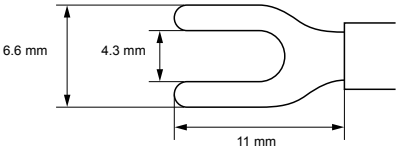
The tip of the control wire is a rod terminal.



Wire color	Symbol	Description
Green	IN1	IN1 Input
Gray	IN2	IN2 Input
White and blue	INCOM	Input common
Pink	OUT1	OUT1 Output
Aqua blue	OUT2	OUT2 Output
White	OUT3	OUT3 Output
Black	OUTCOM	Output common

● Power wire

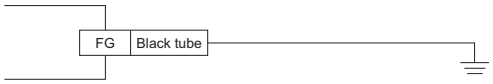
The tip of the power wire is a Y-shape terminal.



Wire color	Symbol	Description
Brown	24 V	+24 V Power supply
Blue	0 V	Power supply GND
Black tube	FG	FG

Connecting the FG wire

Be sure to provide Class D ground for the FG wire.

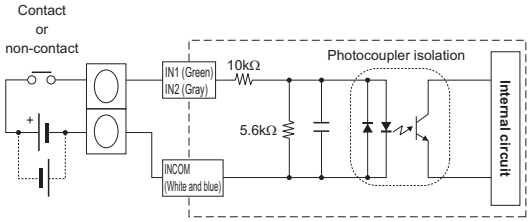


NOTICE	**The shield and FG wire of the control cable and the shield of the Ethernet cable are electrically connected via the main unit case. Provide them with a common ground.**

IN1/IN2 wire connection

- The IN1 (timing) input means the input that causes the SR-750 Series to start reading.
- The IN2 (preset) input means the input that causes the SR-750 Series to register preset data.

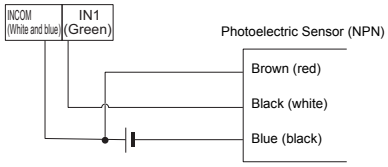
IN1/IN2 inputs operate by voltage inputs.



- Input rating : 15 - 26.4 V DC
- Repetitive peak off-state current : 0.2 mA

■ Connecting a photoelectric sensor manufactured by KEYENCE

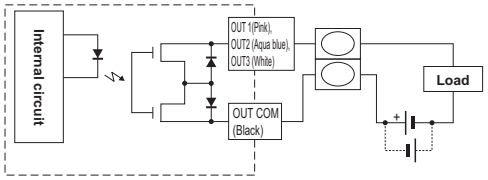
Connection example when the IN1 terminal is used as the trigger input terminal.



Connecting the OUT1/OUT2/OUT3 wires

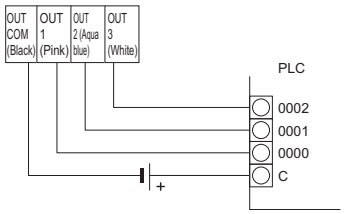
- The OUT1 (OK) output is used as an output for successful reading and verification of OK as a result of checking against the preset data.
- The OUT2 (NG/ERROR) output is used as an output for reading failure and verification of NG reading as a result of checking against the preset data.
- OUT3 (BUSY) is output any time the trigger input cannot be accepted. For example, a busy signal will be output at initial start-up, during the key operation, reading operation, etc.

The output form of each signal is photo MOS relay.



- Maximum rated load : 30 V DC (1 output maximum 50 mA, 3 outputs total 100 mA or less)
- Leakage current when OFF : 0.1 mA or less
- Residual voltage when ON : 1 V or less

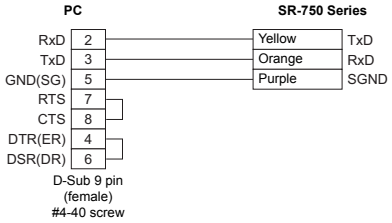
■ Connection with KEYENCE PLC (Programmable controller)



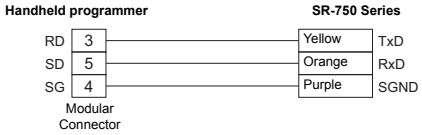
Wiring the RS-232C signal line

Connect to host devices (PC, PLC, etc.) as illustrated below:

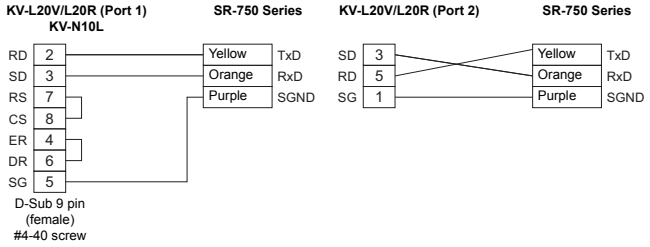
■ Connection to a PC



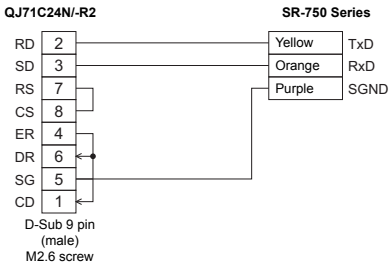
■ Connection to the handheld programmer for the KEYENCE KV Series



■ Connection to the KV-L21V/L20V/L20R/N10L

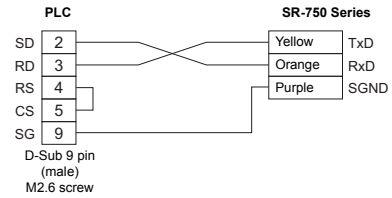


■ Connection to the QJ71C24N/-R2



■ Connection to the SYSMAC Series PLC

CJ1W-SCU□□(-V1)
CS1W-SCU□□-V1
CS1W-SCB□□-V1
CP1W-CIF01

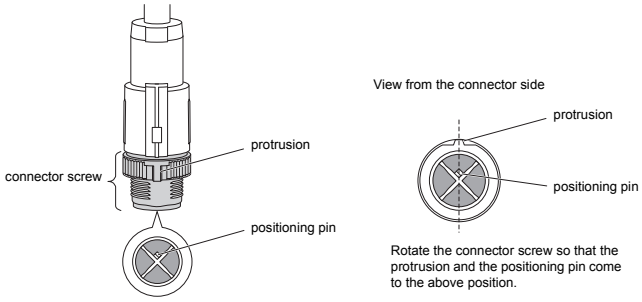


1-6 Connecting the SR-750 Series Ethernet Cable

Connect the Ethernet cable to the SR-750 Series in the following procedure.

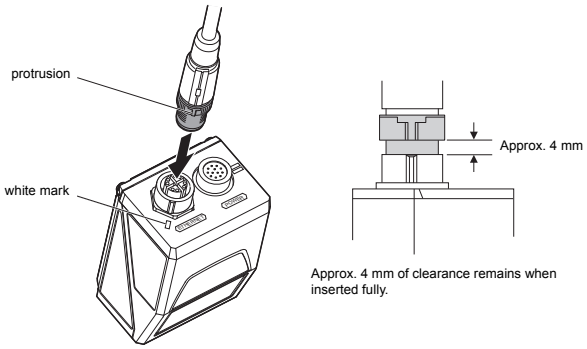
1 Preparation of Ethernet cable

First, rotate the connector screw and align the protrusion position with the positioning pin position in the connector.



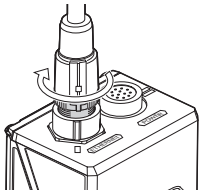
2 Connect to the SR-750 main unit

Align the protrusion position of the connector screw with the white mark position of the SR-750 Series Ethernet port. Then, insert straight to avoid tilting the connector.



3 Tighten the connector

Rotate the connector screw in the arrow direction until it stops (approx. 180 degrees) and tighten it.



NOTICE	• **When connecting the connector, insert it straight so it does not tilt. Otherwise, the connector pin may be damaged.** • **Tighten the connector screw correctly. If it is not tightened properly, the connector may become loose due to vibration, etc. and connection failure may occur.** • **Do not repeatedly bend the root of the connector of Ethernet cable. Loose connection may result.**

2-1 Checking the Package Contents for the SR-700 Series

The package of the SR-700 Series main unit contains the following components. Check that you have all the package contents before use.

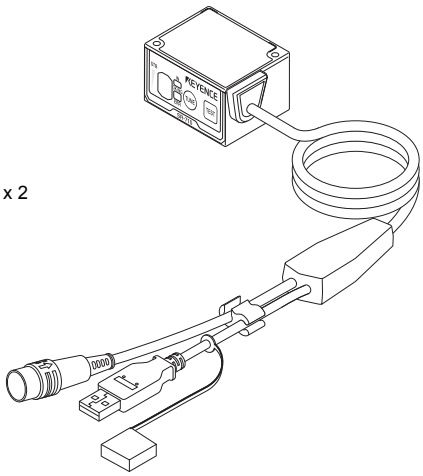
■ SR-700 Series (Ultra-compact fixed type code reader)

Insulating spacer x 2

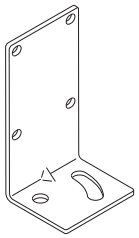
Washer x 2

Mounting screw (M3) x 2

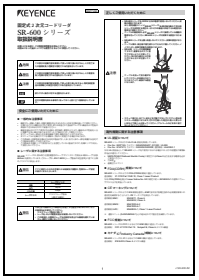
Main unit
SR-700HA/SR-700/SR-710



Mounting bracket x 1



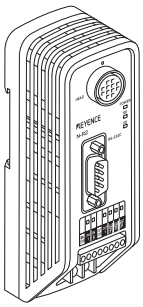
Instruction Manual



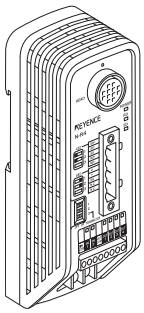
Optional accessories

■ Dedicated communication unit N-R2/R4/UB/L1

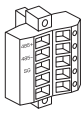
N-R2



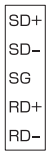
N-R4



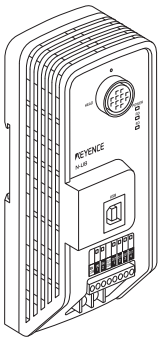
RS-422A/485 connector



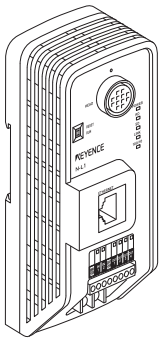
RS-422A terminal seal



N-UB



N-L1



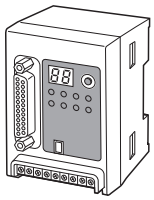
Instruction manual
(supplied for each unit)

Model	Supply voltage	Communication interface
N-R2	DC24V	RS-232C
N-R4		RS-422A/485 (Selectable with DIP switches)
N-UB		USB connection
N-L1		Ethernet connection

■ Other peripheral devices

N-410: RS-485 master unit

Used as a master unit when RS-485 communication is used.

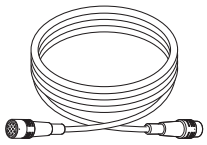


Extension cable

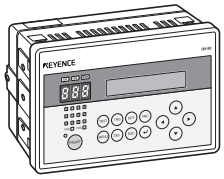
NX-C03R : 3 m extension cable

NX-C05R: 5 m extension cable

Used for cable extension between the SR-700 Series and special units.

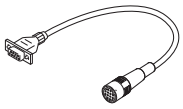


DV-90 Series: AutoID data controller



OP-80616: Conversion cable

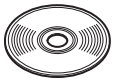
Used when connecting the SR-700 Series and DV-90 Series.
(Cable length: 0.2 m)



Configuration software

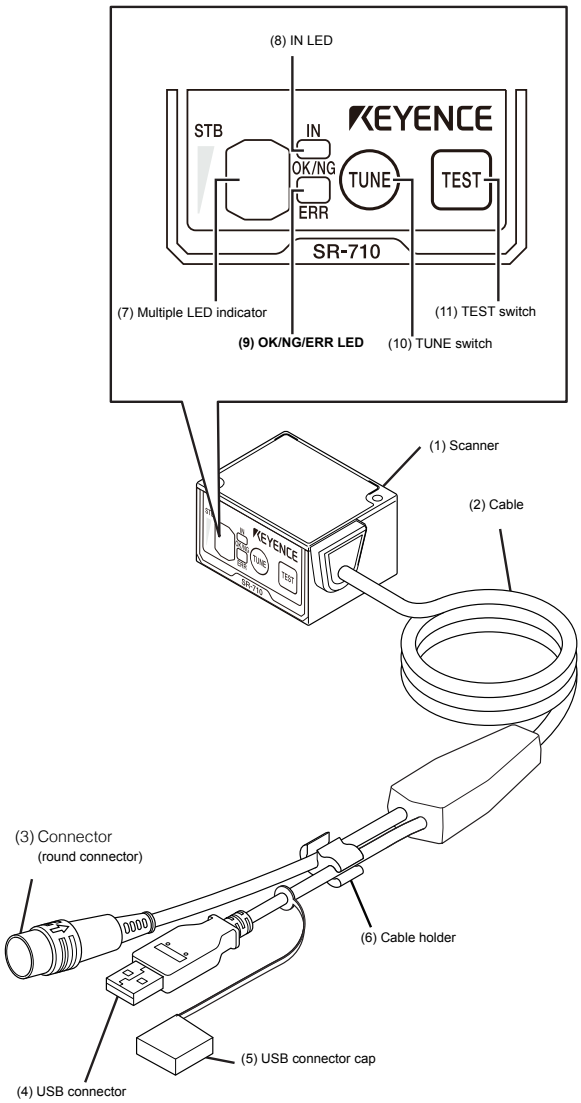
■ SR-H4W

AutoID Network Navigator



2-2 SR-700 Series Part Names and Functions

SR-700 Series

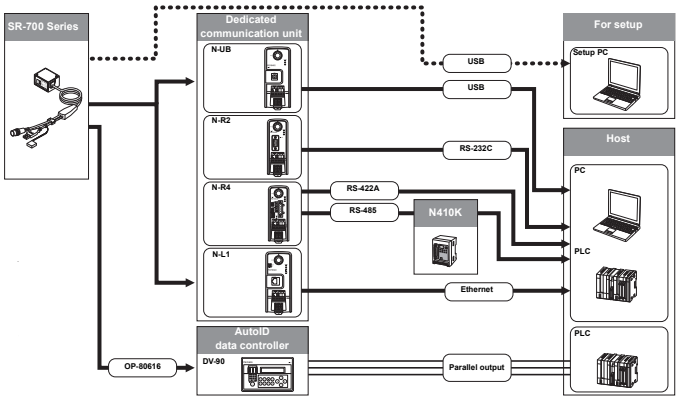


Number	Name	Function
(1)	Scanner	Reads 2D codes and barcodes.
(2)	Cable	Cable length is 1.8 m.
(3)	Connector (Round connector)	Connects to the power supply and communication unit (N-R2/UB/R4/L1). The connector can be used for serial communications with external devices.
(4)	USB Connector	Connects to a PC to change settings with AutoID Network Navigator. The connector is type A. Cable length is 130 mm from the section where the cable splits.
(5)	USB connector cap	When the USB connector is not in use, place the cap on the connector to prevent the entry of dust and contact with surrounding metal objects.
(6)	Cable holder	When the USB connector is not in use, place the USB cable in the cable holder so that it does not move around.
(7)	Multiple LED indicator	Displays the operation status including the bank number upon successful decoding, reading stability and operation mode.
(8)	IN LED	Lights up when an input terminal is on. (Default settings: Displays the Input terminal 1 state)
(9)	OK/NG/ERR LED	• Lights green when a OK signal is output. • Lights orange when an NG signal is output. • Lights red when an ERROR signal is output.
(10)	TUNE switch	Use this switch to perform the following operations. • Turn on the laser pointer for reading position adjustment • Display registered parameter banks (Up to 10 banks can be registered.) • Start parameter tuning • Read all of the program codes • Reset errors
(11)	TEST switch	Use this switch to perform the following operations. • Start and stop test mode • Run 1 reading operation • Fix the communication settings to the default values when sending and receiving the settings

2-3 SR-700 Series System Configuration and Setup Flow

System configuration

The SR-700 Series has the following configuration.



Setup Flow

This section describes the flow of the setup procedure required for starting the operation of the SR-700 Series.

1 After unpacking the package, first check the package contents.

↓

2 Connect the SR-700 Series to a communication unit or a PC.

↓

3 Use the AutoID Network Navigator to configure and send settings to the SR-700 Series.

↓

4 Install the SR-700 Series according to the location.

↓

5 Adjust the reading conditions and make the operation settings of the SR-700 Series.

↓

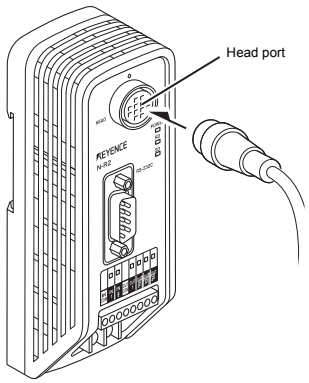
Start operation.

2-4 Connecting the SR-700 Series to the Dedicated Communication Unit

Connect the SR-700 Series to the head port of the dedicated communication unit (N-R2/R4/UB/L1).

Connection illustration

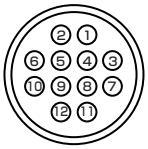
The SR-700 Series and dedicated communication unit are connected in the following way:



* Although the figure shows the model "N-R2", the head port is located in the same position for all models.

Pin layout of the head port

12-pin round jack



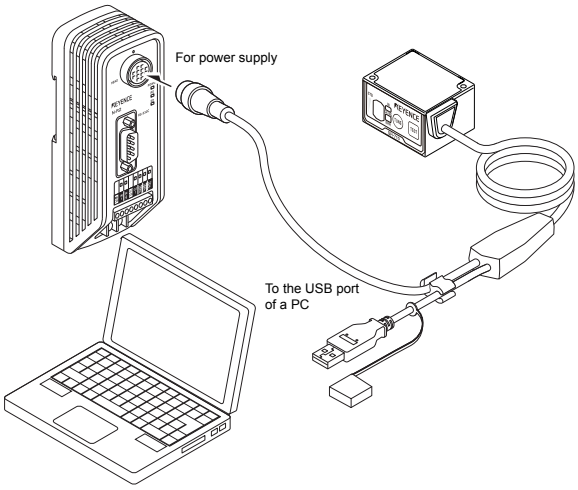
Pin no.	Name	Signal name	Signal direction
1	OUT1	For OUT1 input	Input
2	OUT2	For OUT2 input	Input
3	RXD	RS-232C transmission	Input
4	RTS	RS-232C transmission permitted	Output
5	OUT4	For OUT4 input	Input
6	IN2	For IN2 output	Output
7	TXD	RS-232C send	Output
8	CTS	RS-232C send permitted	Input
9	OUT3	For OUT3 input	Input
10	IN1	For IN1 input	Output
11	+5V	+5V power	Output
12	GND (SG)	Common GND	-

NOTICE **Install and remove connection cables with the power OFF.**

Reference **To extend the cable between the SR-700 Series and dedicated communication unit, use the optional extension cable NX-C03R (cable length: 3 m) or NX-C05R (cable length: 5 m).**

2-5 Connecting the SR-700 Series to a PC

Connect the USB connector of the SR-700 Series to a PC (personal computer).



Point
- **Power is not supplied to the SR-700 Series through the USB connection. Make sure to supply power through the round connector.**
- **You cannot connect multiple SR-700s to a single PC through USB connections at the same time.**

Installing the USB Driver

To use the SR-700 Series by connecting it to a PC, you need to install the USB driver.
The USB driver is installed with the AutoID Network Navigator.

■ Precautions to consider when installing drivers:

- Applicable operating systems (OS) are Windows 8/7/Vista.
- When you install the USB driver for the SR-700 Series for the first time, start up the PC first and then connect the SR-700 Series to the USB port of the PC. If you start up the PC after connecting the SR-700 Series to the USB port, the installation will not proceed properly.

■ Precautions to consider when connecting to a PC:

- It may take several seconds before the PC recognizes or ends the connection of a USB device. Consequently, wait at least 10 seconds before connecting/disconnecting the USB device.
- Do not connect/disconnect the USB connector while the PC is in standby mode (suspended).
- Do not connect/disconnect other USB devices while the PC is processing the connection of the SR-700.
- If you disconnect the USB cable while the SR-700 is communicating with the PC, not only may data be lost, but damage to the system may also occur. Do not disconnect the USB cable during communication.

NOTICE **Only one SR-700 Series can be connected to a PC.**

2-6 Wiring the SR-700 Series Dedicated Communication Unit

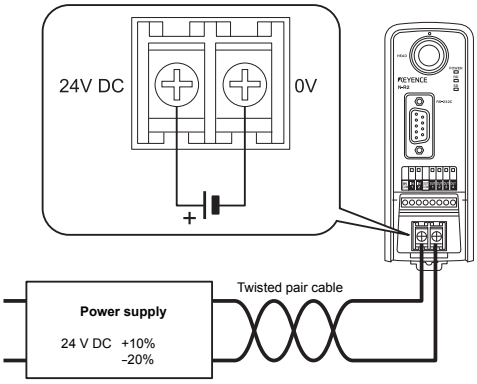
This section describes the wiring of the N-R2/R4/UB/L1 dedicated communication unit.

Connecting the DC Power Supply

This section describes how to connect the power supply.

Connecting the power supply terminal

Connect the 24 V DC power supply to the power supply terminal block as shown in the figure.



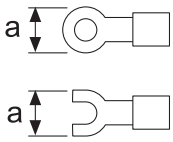
* Although the figure shows the model "N-R2", the power supply terminals are located in the same position for all models.

NOTICE	**Do not use a power supply other than 24 V DC. Doing so may damage to the unit.**

■ Applicable terminals for power supply connection

The dimensions of crimp contacts used for wiring should be as follows:

Terminal	Dimensions
Round terminal	a : 6.0 mm max.
Y terminal	a : 6.0 mm max.

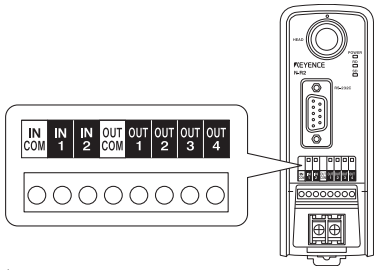


Item	Description
Wire size	AWG 14 to 22
Tightening torque	0.49 N·m (4.34 lbf·in)
Wire material	Copper
Wire type	Stranded wire
Electric wire temperature rating	+60°C

I/O Terminal Layout and Wiring

I/O terminal layout

These terminals are used to connect I/O devices such as a PLC.



* Although the figure shows the model "N-R2", the I/O terminals are located in the same position for all models.

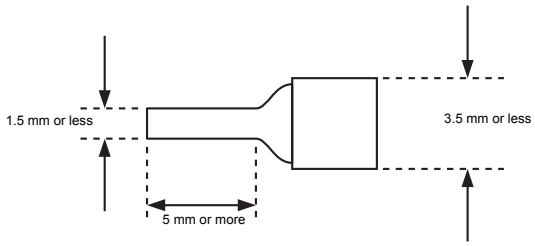
Symbol name	Explanation	Signal direction
INCOM	Common for IN terminal	-
IN1	Used as an input terminal to the code reader.	Input
IN2		
OUTCOM	Common for OUT terminal	-
OUT1	Used as an output terminal from the code reader.	Output
OUT2		
OUT3		
OUT4		

NOTICE	• **For connection, use stranded copper wire with a gauge of AWG16 to 26.** • **Limit the tightening torque for the terminal block screws to 0.19 N·m (1.7 Lbf·in) or less.**

Reference
- The power supply terminal block and the I/O terminal block are insulated from each other.
- The INCOM and OUTCOM terminals are insulated from each other.

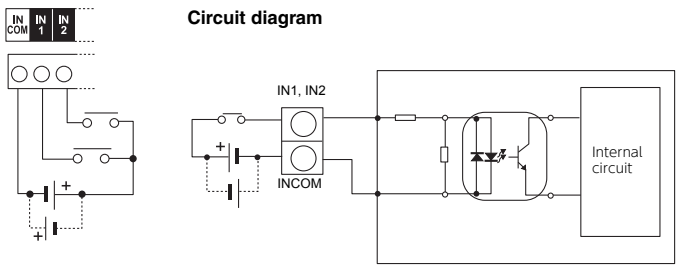
■ Applicable crimp terminal

Use a bar terminal with the following dimensions for the connection:



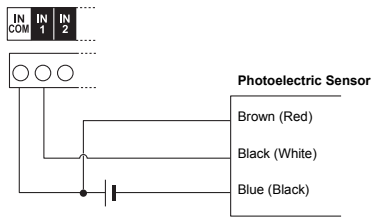
Wiring the IN1 and IN2 terminals

The IN1 and IN2 terminals are used to input trigger signals, preset registration data, or to conduct quick tuning for the SR-700.
The inputs are energized when 15 to 26.4 V DC is connected between the corresponding input terminals.



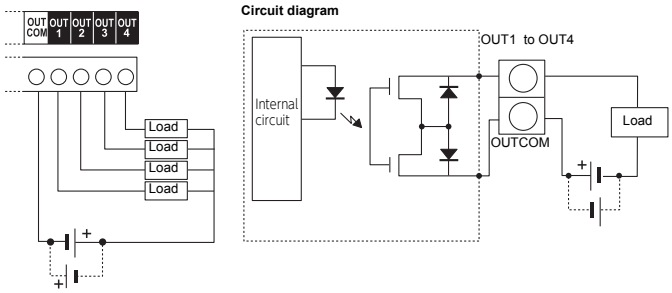
■ Connecting a photoelectric sensor manufactured by KEYENCE

For this connection, the IN1 terminal is used as the trigger input terminal.

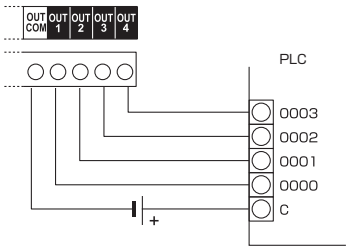


Wiring the OUT1 through OUT4 terminals

The OUT terminals can be used to verify OK/NG readings and other status outputs from the SR-700 Series.
The output form is photo MOS relay.



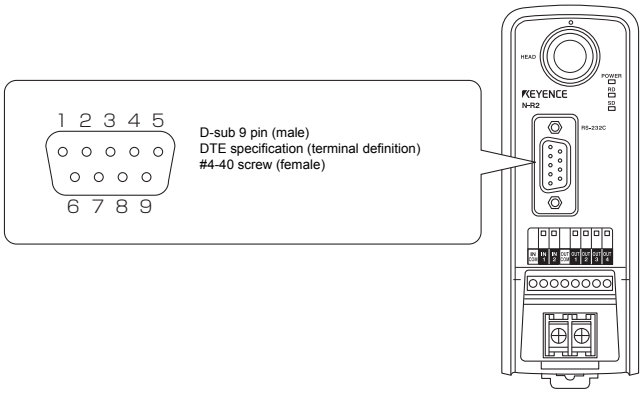
■ Connection to a PLC (programmable logic controller) manufactured by KEYENCE



Wiring an RS-232C Port Device (N-R2)

Pin layout of the RS-232C port

The pin layout of the RS-232C port of the N-R2 is as follows:

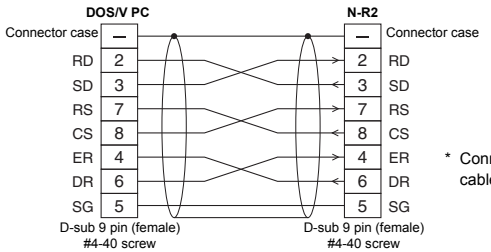


Pin no.	Symbol name	Explanation	Signal direction
2	RD (RXD)	Data reception	Input
3	SD (TXD)	Data transmission	Output
4	ER (DTR)	Connected to Pin 6 internally	Output
5	SG	Signal ground	-
6	DR (DSR)	Connected to Pin 4 internally	Input
7	RS (RTS)	Transmission request (always ON)	Output
8	CS (CTS)	Transmission permitted	Input

Wiring the RS-232C cable

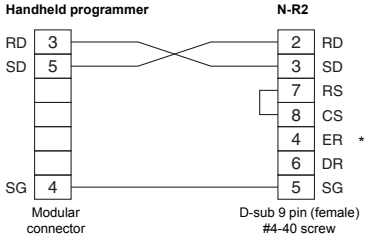
Connect the N-R2 to a host device (PC, PLC, etc.) according to the following wiring diagram:

■ Connection to a PC



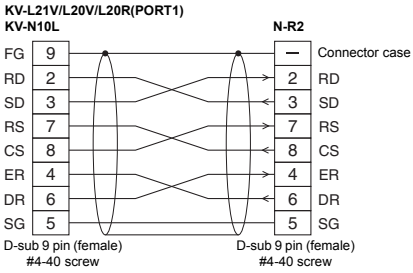
* Connect using our optional cable: OP-27937 (2 m).

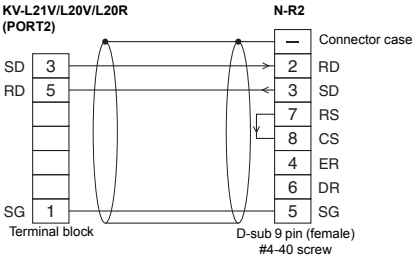
■ Connection to the handheld programmer for the KEYENCE, KV Series



* Connect using our optional cables: OP-26487 (2.5 m) and OP-26486.

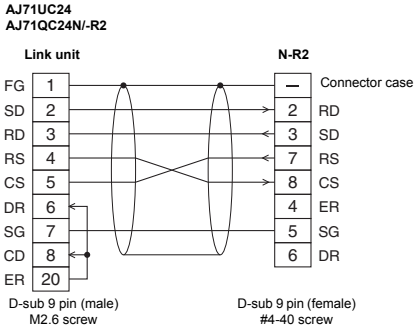
■ Connection to the KV-L21V/L20V/L20R/N10L

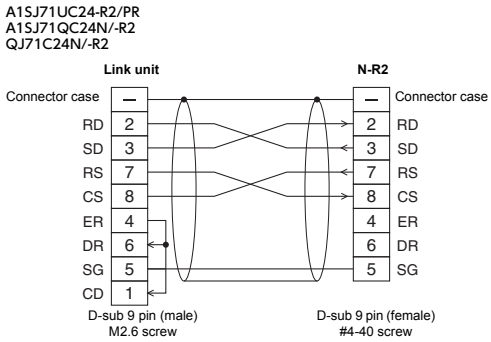




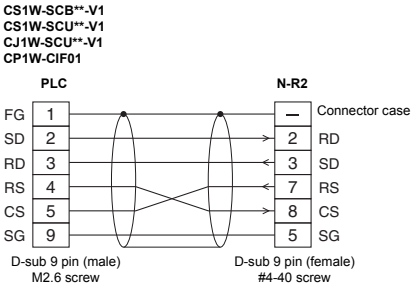
* Connect using our optional cable: OP-27937 (2 m).

■ Connection to a MELSEC Series PLC



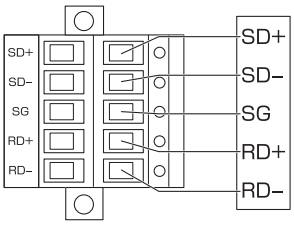


■ Connection to a SYSMAC Series PLC



Wiring to an RS-422A/485 Port Device (N-R4)

Terminal layout of the RS-422A connector



Symbol name	Explanation	Signal direction
SD+	Data transmission + side	Output
SD–	Data transmission – side	Output
SG	Signal ground	-
RD+	Data reception + side	Input
RD–	Data reception – side	Input

* The connector is labeled with the RS-485 terminal layout. To use RS-422A, attach the label showing the RS-422A terminal layout.

Point

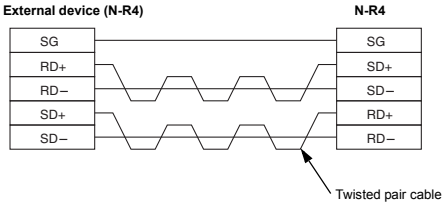
- **The extended distance of the cable must not exceed 1.2 km.**
- **Set the terminating resistance switch/termination resistor (100Ω) of both the N-R4 and external device to ON.**

Wiring the RS-422A cable

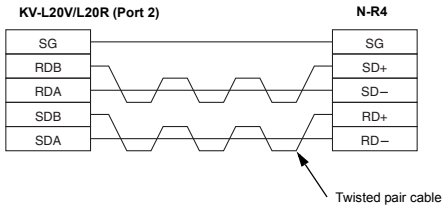
Use a twisted pair cable to establish an RS-422A connection.
Recommended RS-422A cable (with shield)

Manufacturer:	NIHON ELECTRIC WIRE & CABLE Co., LTD.
Product name:	Instrumentation cable
Model	KNPEV-SB 0.75 mm^2 x 2P

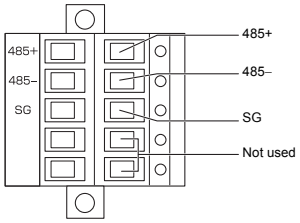
■ Wiring a general RS-422A device



■ KV-L20V/L20R (RS-422A)



Terminal layout of the RS-485 connector



Symbol name	Explanation	Signal direction
485+	RS-485 + side	I/O
485–	RS-485 – side	I/O
SG	Signal ground	–

Point

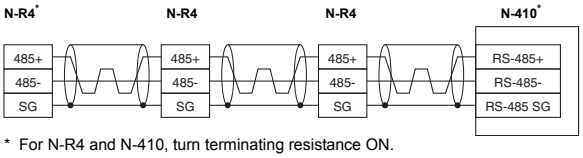
- **The extended distance of the cable must not exceed 1.2 km.**
- **Set the terminating resistance switch (100Ω) of the N-R4 located at the end of the RS-485 trunk line to ON.**
- **To use the multi-drop connection, the N-410 master unit must be used.**

Wiring the RS-485

Use a twisted pair cable for RS-485 connection.
Recommended RS-485 cable

Manufacturer:	THE FURUKAWA ELECTRIC CO., LTD.
Product name:	Instrumentation cable
Model	KPEV-SB (1P) 0.75 mm^2

■ N-410 (Multi-drop communication)

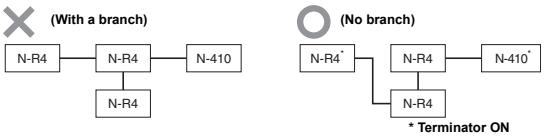


* For N-R4 and N-410, turn terminating resistance ON.

- Up to 31 N-R4 units can be connected to a single N-410.
- Limit the total extension of the RS-485 cables to 1.2 km.

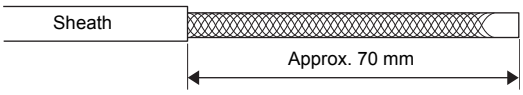
Point

- **Do not supply power to the N-R4 from the 24 V DC OUT terminal of the N-410.**
- **Never use a terminal block connection at a midpoint of the connection.**
- **Avoid branching of the RS-485 connection as shown in the figure below:**

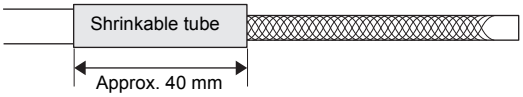


Preparing the communication cable

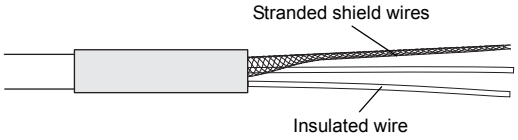
1 Remove about 70 mm of the cable's sheath.



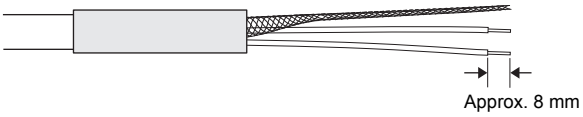
2 Cover the bare shield wires and the sheath portion with a shrinkable tube about 40 mm in length.



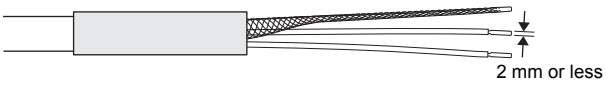
3 Strand together the shield mesh wires as illustrated in the example below and then prepare the insulated wires. (5 wires are required for RS-422A and 3 wires are required for RS-485)



4 Remove about 8 mm of insulation from each wire.

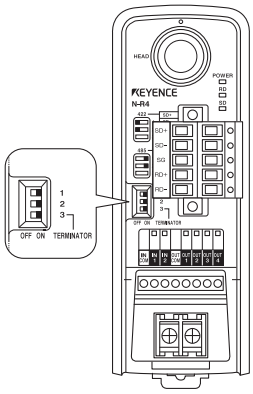


5 Perform preliminary soldering on each wire about 6 mm from the tip. The external diameter of the soldered wire must not exceed 2 mm.



RS-422A/RS-485 selection switch and terminating resistance switch

Before using the N-R4, select either RS-422A or RS-485 communication using the switch on the unit.
Moreover, when the N-R4 is located at the end of the communication line, set the terminating resistance switch (100Ω) to ON.
Set the switches according to the table below:



Number	RS-422A communication mode	RS-485 communication mode	Terminating resistance ON
(1)	Left	Right	-
(2)	Left	Right	-
(3)	-	-	Right

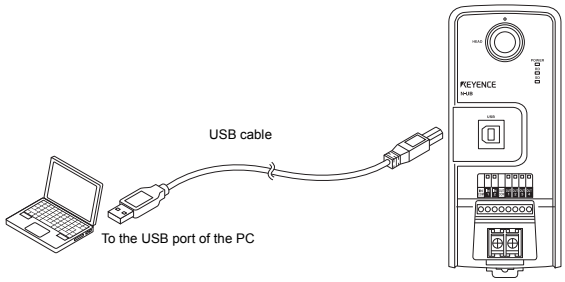
* The factory setting is RS-485 communication mode and terminating resistance OFF.

Wiring a USB Device (N-UB)

The USB port of the N-UB can only be connected to a computer (PC).
Connect the type B side of the USB cable to the N-UB.

Important

When using the N-UB to connect to a PC, be sure to set the RTS/CTS protocol setting of the SR-700 Series to < Enable >.



Point

- **The length of the USB cable must be 5 m or less.**
- **Constant vibration may result in a loose USB connection or a communication error.**
  In such cases, take appropriate measures to insulate the N-UB from vibration or to better secure the USB cable.

Installing the USB driver

To connect the N-UB to a PC, you need to install the USB driver.
The USB driver is installed with the AutoID Network Navigator.

■ Precautions to consider when installing the drivers:

- Applicable operating systems (OS) are Windows 8/7/Vista.
- Do not turn on the PC with the N-UB connected to the PC's USB port before installing the USB driver of the N-UB. This may cause the installation of the USB driver to start during the booting process of Windows, resulting in improper installation.

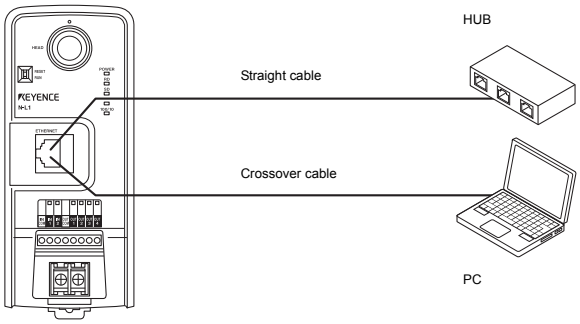
■ Precautions to consider when connecting to a PC:

- It may take several seconds before the PC recognizes or ends the connection of a USB device. Consequently, wait at least 10 seconds before connecting/disconnecting the USB device.
- Do not connect/disconnect the N-UB device while the PC is in standby mode (suspended).
- Do not connect/disconnect other USB devices while the PC is processing the connection of the N-UB.
- If you disconnect the USB cable while the N-UB is communicating with the PC, not only may data be lost, but damage to the system may also occur. Do not disconnect the USB cable during communication.

NOTICE	• **Only one N-UB can be connected to a PC.** • **Even if several N-UBs are connected, only one COM port No. is occupied.**

Wiring a LAN Port Device (N-L1)

Use a "straight cable" when connecting an N-L1 to a hub; use a "crossover cable" when connecting it to a computer (PC) directly.



- Use a cable that is category 5 or higher. (Both STP and UTP can be used)
- The extended length must not exceed 100 m.

NOTICE	**The N-L1 does not support PoE (Power over Ethernet). Be sure to supply 24 V DC power to the power terminal.**

* Use AutoID Navigator to configure the N-L1 settings.

Important **When using the N-L1, be sure to set the RTS/CTS protocol setting of the SR-700 Series to < Enable >.**

2-7 Connection when not using a SR-700 Series Communication Unit

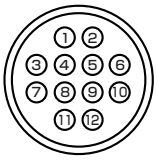
This section describes the connection and wiring when no communication unit is used.

Pin Layout and Connection of SR-700 Series Connector

Pin layout

The connector of the SR-700 Series has the following pin layout:

SR-700 pin position



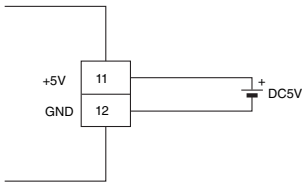
RP17-13PA-12 PC plug male

Manufactured by
Hirose Electric Co., Ltd.

Pin no.	Wire color	Symbol name	Explanation	Signal direction
1	White	OUT1	Output pin 1 (default: OK output)	Output
2	Gray	OUT2	Output pin 2 (default: NG/ERROR output)	Output
3	Purple	TXD	RS-232C send	Output
4	Blue	CTS	RS-232C send OK	Input
5	Light blue	OUT4	Output pin 4 (default: BUSY output)	Output
6	Green	IN2	Input pin 2 (default: PRESET input)	Input
7	Brown	RXD	RS-232C transmission	Input
8	Pink	RTS	RS-232C transmission permitted	Output
9	Orange	OUT3	Output pin 3 (default: ERROR output)	Output
10	Yellow	IN1	Input pin 1 (default: TIMING input)	Input
11	Red	5V	+5V power	Input
12	Black	GND (SG)	Common GND	-

* The shield line is directly connected to the common GND.

Connecting the power source

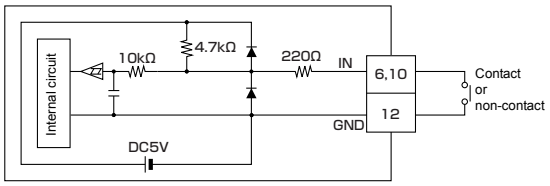


Point

- **Reverse connection of the power supply is strictly prohibited. Doing so may cause damage to the unit.**
- **Use a stable power supply of 5 V DC ±5%. Using a power supply outside this range may cause product failure.**
- **Following UL standards, use a power supply of NEC Class 2.**

Input terminal 1 and Input terminal 2 wiring

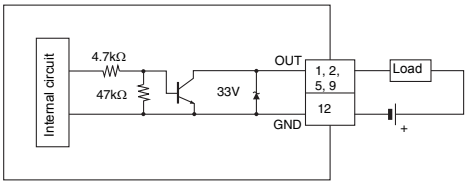
These are non-voltage inputs. Connect relay contacts or NPN open collector outputs.



- TIMING (Input terminal 1) is input to initiate the 2D code and bar code reading.
- PRESET (Input terminal 2) is input to preset (register) the 2D code and bar code data on the SR-700 Series.

Output terminal 1, Output terminal 2, Output terminal 3 and Output terminal 4 wiring

These are NPN open collector outputs.

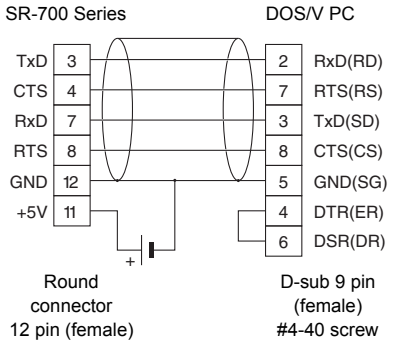


* Rated load: 24 V DC (30 mA) or less

- OUT 1 (OK) output is used to indicate that reading has been successfully completed and that the comparison and matching with preset data is judged OK.
- OUT 2 (NG/ERROR) output is used to indicate that reading has failed and that the comparison and matching with preset data is judged as NG.
- OUT 3 (ERROR) output is used to indicate that reading has failed.
- OUT 4 (BUSY) is output any time the trigger input can not be accepted due to internal processing.
- When BUSY is output, TIMING (Input terminal 1) cannot be input.

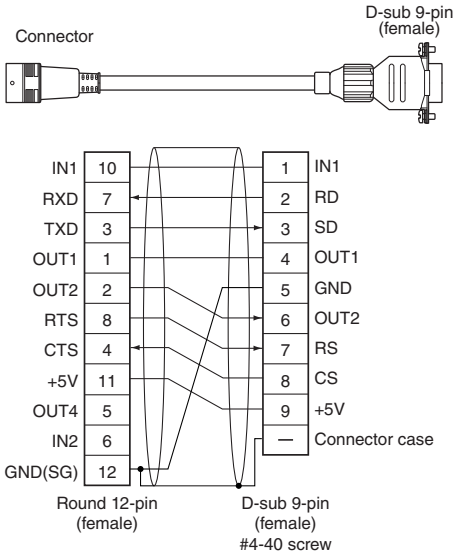
RS-232C wiring

When connecting the SR-700 Series to the PC, connect as shown below:



OP-80616 wiring diagram

The following wiring diagram shows the conversion cable OP-80616.
Cable is 200 mm long.



Reference

Round 12-pin connector	RP-17-13JA-12SC(71) Made by Hirose Electric Co., Ltd.
D-Sub 9-pin connector	JEZ-9S-3
Connector case	J-SC9A J-SC9B Made by J.S.T. Connector

3-1 Using the SR-750/700 Series

SR-750 SR-700

This section describes basic uses for performing reading operation using the SR-750/SR-700 Series.

Basic steps

Before using the SR-750/SR-700 Series, register codes and conduct read test by performing the following steps:

Preparations

(1) Read condition setting

Perform quick calibration on the SR-750/SR-700 Series.
- 3-2 Quick Calibration
- 5-4 Details of Settings View

(2) Read test

Once the quick tuning is complete, confirm that reading is stable. Using the test mode of the SR-750/SR-700 Series, confirm the reading stability and the read processing time.
- 3-1 Using the SR-750/700 Series (TEST Button Operation Procedure).
- 3-4 Test Mode
- 5-8 Terminal

(3) Determination of operation

Let's consider the usage of the SR-750/SR-700 Series.
The SR-750/SR-700 Series has functions that lead to stable operation or reduction in control man-hours.

■ **Function leading to stable read**
- 3-3 Alternate Function
- 4-1 Reading Operations

■ **Function leading to reduction in control man-hours**
- 3-5 Preset/Verification Function
- 3-6 Multi-I/O Function
- 3-8 Silent Mode
- Edit data function and edit image file name function
- Duplicate reading prevention interval reset
- Master/Slave function

■ **Connection method with a control device**
- Connection and Wiring
- SR-750 Series Communication Specifications

Start of Operation

(4) Start of Operation

Once the operation procedure and installation conditions have been determined, you can start the operation.
The SR-750/SR-700 Series has functions that are useful for analyzing read errors, etc. that occur during operation.
- Matching function
- 3-12 Code quality verification function
- 3-7 Image Saving Function
- 7-2 Data Communication Format
- 7-6 FTP Communication

SR-750 Main Unit Buttons

The SR-750/SR-700 Series main unit has 2 buttons for registering and adjusting the reading operation.
- TUNE button : used for turning on the laser-aimer, starting quick calibration and reading the quick setup code
- TEST button : used for starting the test mode and changing the RS-232C communication settings to the default condition.

According to the operating status of each button, the status is also displayed on the multiple LED.

This section describes the operation procedure of the 2 buttons.

TUNE Button Operation Procedure

Operation	Multiple LED indicator	Lighting	Action	SR-750	SR-700
Press once quickly (less than 1 s)		-	The laser pointer emits a laser beam. (Reading is disabled while the laser pointer is on.)	SR-750	SR-700
Press for 2 seconds		Illuminates 1 time	Activates the quick calibration function. "3-2 Quick Calibration (Page 19)"	SR-750	SR-700
Press for 3 seconds		Illuminates 2 times	The number of parameter banks (0 to 10) for which the alternate function can be used is shown on the multiple LED indicator. When the number of registered parameter banks is 10, "0" and "1" are displayed alternately. "3-3 Alternate Function (Page 21)"	SR-750	SR-700
Press for 4 seconds		Illuminates 3 times	Activates the batch setting reading mode. "3-10 Batch Setting Code (Page 30)"	SR-750	SR-700
Press for 5 seconds		Illuminates 3 times	Activates the temporary IP address setting mode. * Only in this mode, the operation does not finish even if the TUNE button is briefly pressed once. Assign the temporary IP address or turn the power on again.	SR-750	-

* To quit an action/mode, press the TUNE button once briefly.
To quit the quick calibration, hold down the TUNE button for at least 2 seconds.

TEST Button Operation Procedure

Operation	Multiple LED indicator	Lighting	Action	SR-750	SR-700
Press once quickly (less than 1 s)		Illuminates	One reading operation is performed.	SR-750	SR-700
Press for 2 seconds		Illuminates 1 time	Activates the reading rate test mode. "Reading rate test mode" (Page 22)	SR-750	SR-700
Press for 3 seconds		Illuminates 2 times	Activates the tact measurement test mode. "Read time test mode (Page 22)"	SR-750	-
Press for 4 seconds		Illuminates 3 times	Activates the bar code position test mode. "Code position measurement test mode" (Page 23)	SR-750	-
Press for 5 seconds		Illuminates 4 times	Runs the multi 1 read mode. "4-4 Read Mode (Page 43)"	SR-750	-
SR-750: Press for 6 seconds SR-700: Press for 3 seconds		Illuminates 5 times	Sets the communication settings of RS-232C to the default state temporarily.	SR-750	SR-700

* To quit an operation, press the TEST button once briefly.
* The default state of the RS-232C communication settings is as follows.
- The default settings for the RS-232C communication

Baud rate	: 115200 bps	Header	: None
Data bits	: 8 bit	Terminator	: CR
Parity	: Even	Stop bit length	: 1 bit

Displays on the Multiple LED indicator

■ Run mode

In Run mode, the multiple LED displays a number, letter, or other symbol.

Multiple LED indicator	Display content	Operation	Meaning	SR-750	SR-700
	0 to 10	When reading successful	The parameter bank number is displayed (1 to 10). When the parameter bank is 10, the first digit value and "1" are displayed alternately. "3-3 Alternate Function (Page 21)"	SR-750	SR-700
	P	Preset	Preset successful "3-5 Preset/Verification Function (Page 23)"	SR-750	SR-700
	2 points light up	Laser pointer emission	The laser pointer is turned on when the TUNE button is pressed quickly.	SR-750	SR-700
	2 points flashing	Set the communication parameters of the RS-232C to the default state.	Blinks when RS-232C communication status has returned to default settings.	SR-750	SR-700
	2 points flashing	Temporary IP address setting mode	Press the TUNE button for at least 5 seconds. The LED flashes in the temporary IP address setting mode.	SR-750	-
	L	TUNE button lock	The TUNE button is locked according to the settings. The laser pointer cannot be turned on and quick calibration cannot be performed.	SR-750	SR-700
	NG	Saving the read error image	The LED lights up while the read error image is being written into the ROM. * SR-750 Series "3-7 Image Saving Function (Page 26)"	SR-750	-
	E←→ Error code	Error occurred.	This shows that an error such as buffer overflow has occurred. E and error code (number) lights up alternately.	SR-750	SR-700
	All LEDs light up	At power-on	All LEDs light up for 500 ms when the power is turned on.	SR-750	SR-700
	PC	Connected to configuration software	Blinks when connected to AutoID Navigator.	-	SR-700

■ Quick setup code reading mode

In Quick setup code reading mode, the multiple LED displays a number, alphabet, etc.

Multiple LED indicator	Display content	Meaning
	C←→Numeric value	C: Starts reading the quick setup code. Numeric value: The number "C" of quick setup codes being read and the numeric value are displayed alternately.
	d	Reading successful or program successful
	F	Reading failed or program failed

■ Test Mode

In Test mode, the multiple LED displays measurement results.

Multiple LED status	Reading rate measurement (%)	Processing time (ms)	Position	OK/NG/ ERRLED
5 bars lit	90 to 100	Up to 99	LEVEL 5	Green
4 bars lit	70 to 80	100 to 199	LEVEL 4	Green
3 bars lit	50 to 60	200 to 299	LEVEL 3	Green
2 bars lit	30 to 40	300 to 399	LEVEL 2	Green
1 bar lit	10 to 20	400 or more	LEVEL 1	Green
0 bars lit	Reading error			Red

* Processing time display and code position measurement is for SR-750 only.

■ Other operations

In the quick calibration operation, the multiple LED displays bars, a number, or a letter.

Action	Multiple LED indicator	Display content	Meaning
Quick calibration		Bar LEDs light up in series.	This shows the progress of the quick calibration.
		Bar LEDs and upper 2 points light up.	The quick calibration is complete and the test mode is running. Changing the position of the code fluctuates the bar LEDs.
		F	Quick calibration failed (Data for successful quick calibration was not provided.)
		H	Quick calibration failed (Data for successful quick calibration was provided.)
		d	Saving complete

Error indications on the multiple LED indicator

Display content	Description	SR-750	SR-700
E0, E1	Main device system error * Possible abnormality with main device, please contact your nearest sales office.	SR-750	SR-700
E2	Settings file reader error, image storage error * If main device cannot be restored after initialization, there may be an abnormality with the main device, so please contact your nearest sales office.	SR-750	SR-700
E3	PROFINET error	SR-750	-
E4	Transmission buffer overflow	SR-750	SR-700
E5	IP address duplication error	SR-750	-
E6	Main unit system firmware update error	SR-750	SR-700
E7	PLC link error	SR-750	SR-700
E8	Script error	SR-750	SR-700

Operation of I/O terminals

The default settings of the I/O terminals of the SR-750 Series are as follows:

Terminal		Function
Input terminal	IN1	Trigger input
	IN2	Preset input
Output terminal	OUT1	OK
	OUT2	NG/ERROR
	OUT3	TRG BUSY LOCK BUSY MODE BUSY ERR BUSY

The default settings of the I/O terminals of the SR-700 Series are as follows:

Terminal		Function
Input terminal	IN1	Trigger input
	IN2	Preset input
Output terminal	OUT1	OK
	OUT2	NG/ERROR
	OUT3	ERROR
	OUT4	TRG BUSY LOCK BUSY MODE BUSY ERR BUSY CONFIG BUSY

* Functions of each terminal can be changed according to the settings.
"3-6 Multi-I/O Function (Page 24)"

3-2 Quick Calibration

SR-750 SR-700

This section describes the Quick Calibration function.

Quick Calibration

The SR-750/SR-700 Series automatically adjusts parameters for reading the target codes through the main unit button operation or AutoID Network Navigator and stores the settings in its internal memory.
This function is called "Quick Calibration".
Set the calibration condition by using AutoID Network Navigator or sending the setting commands.

■ Setting items of calibration conditions

- Camera settings
  Set the brightness adjustment mode, exposure on high speed mode, offset and dynamic range.
- Tuning options
  Set the tuning method, multi read and inverse read.

Quick Calibration Function Operation

The following are the quick calibration methods.
- Using the main unit buttons
- Using the input terminal
- Using AutoID Network Navigator

Each operation method is described.

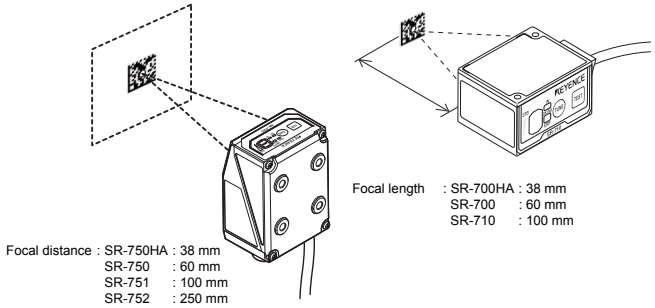
Activation using the button on the panel

Use the button on the panel of the SR-750/SR-700 Series to activate the quick calibration.
When the TUNE button is held down for 2 seconds in Quick Calibration mode, the quick calibration is canceled and the SR-750 Series returns to Run mode.

1 Set up the SR-750/SR-700 Series and prepare the code that is going to be read.

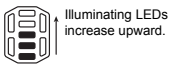
2 Press the TUNE button quickly to start the laser pointer emission and adjust the reading position.

After the adjustment, press the TUNE button quickly to turn off the laser pointer.
* When mounting SR-75L4 or SR-75L6 onto SR-752, laser pointer emission is not visible.



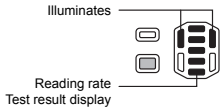
3 Press and hold the TUNE button for two seconds to perform quick calibration.

During the quick calibration, the multiple LED indicator illuminates as shown on the right.



4 After the calibration, the reading rate measurement is performed automatically.

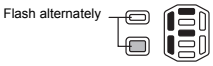
Once the calibration finishes successfully, the SR-750 Series starts the reading rate measurement.
Check the level of reading stability on the multiple LED indicator.



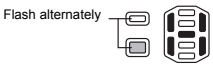
If the reading failure continues for a certain period of time, the quick calibration is performed again.

If the calibration fails, "F" or "H" is displayed
By pressing the TUNE button, you can perform the quick calibration again.

- F: Displayed when the quick calibration failed.

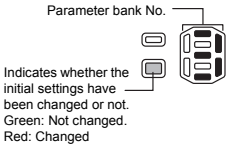


- H: Displayed when the quick calibration was completed successfully but the reading failed and another quick calibration was attempted but failed.
  By pressing the TEST button, you can register the result of the successful calibration.



5 Press the TEST button and select the parameter bank in which to register the parameters.

Every time the TEST button is pressed, the parameter bank number changes by one.
When the initial settings have been changed for the parameter bank being displayed, the OK/NG/ERROR LED illuminates in red.
When the parameter bank number is 10, "0" and "1" are displayed alternately.



6 When the parameter bank in which to register the parameters is determined, press the TUNE button to register the parameters.

When the parameters are registered successfully, the multiple LED indicator shows "d".

Activation using the input terminal

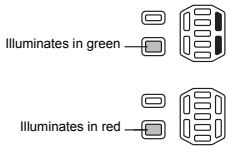
By assigning "Quick Calibration Operation" to an input terminal, you can use that terminal to activate the quick calibration.

1 Turn on the input terminal to which the function has been assigned.

The quick calibration starts.

2 "1" is displayed.

Parameter bank 1 is overwritten with the calibration result and the TUNING OK output turns on.
When the calibration fails, the OK/NG/ERROR LED illuminates in red, the ERROR signal is output, and the calibration operation ends.
* For the SR-700 Series only OK/NG/ERROR illuminates. "1" is not displayed.



Point

When the input terminal is used to activate the quick calibration, the calibration result is automatically written to parameter bank No. 1.

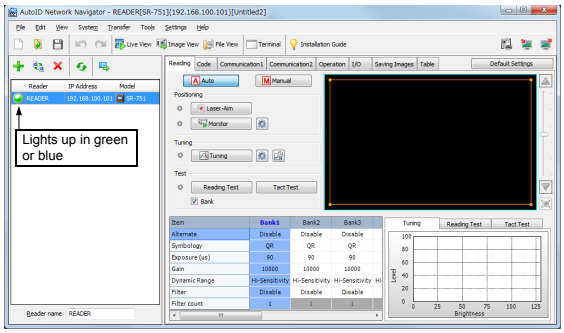
3 Turn off the input terminal.

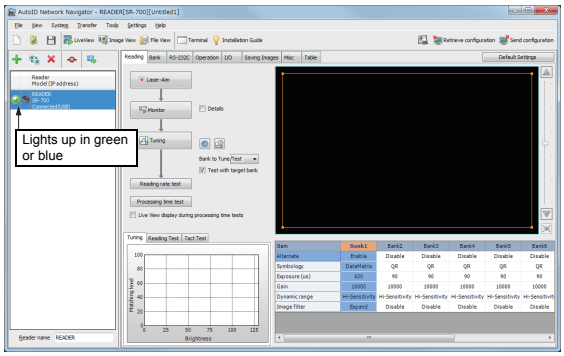
Activation using AutoID Network Navigator

Quick calibration is performed using AutoID Network Navigator.
Confirming the actual scanned image, you can operate calibration.
The following screen is a representative screen of the SR-750.

1 Connects the SR-750/SR-700 Series to the AutoID Network Navigator.

The following screen will appear when the SR-750/SR-700 Series is detected. Confirm that the indicator displayed on the left of the reader name lights up in green or blue.



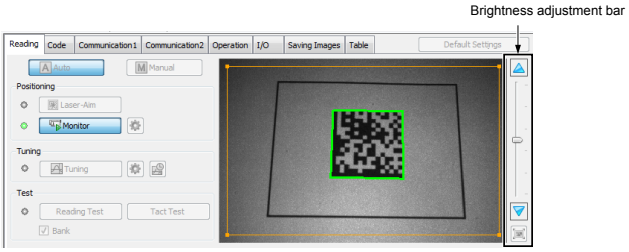


2 Click the [Pointer] button.

The laser pointer on the SR-750/SR-700 Series lights up. Align the center of the code with the position emitting light on the pointer.

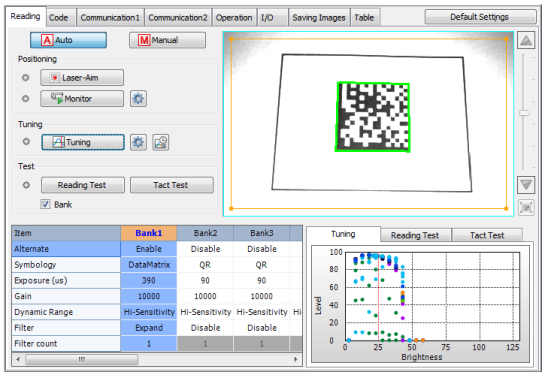
3 Click the [Monitor] button.

Looking at real-time scanned images, you can confirm the code positions. Adjust the brightness using the "Brightness adjustment bar" on the right. After the code position is determined, press the "Monitor" button to finish the setting.



4 Click [Calibration] button.

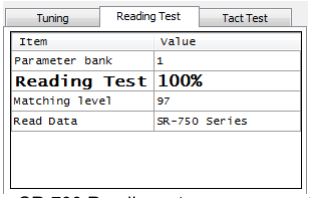
The most appropriate scan condition is automatically set according to the code. Settings are registered with bank, and the operation finishes.



5 Perform the reading test.

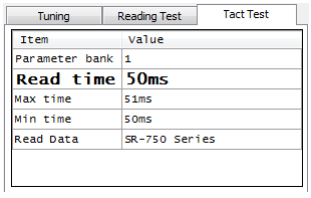
Perform the reading rate test and processing time test, and confirm the reading stability of the calibration result.

- SR-750 Reading rate measurement test display screen



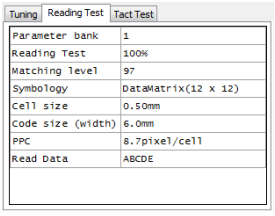
Item	Value
Parameter bank	1
Reading Test	100%
Matching level	97
Read Data	SR-750 Series

- SR-750 Tact measurement test display screen



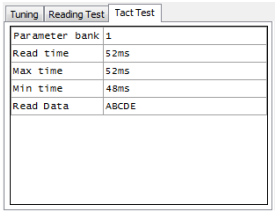
Item	Value
Parameter bank	1
Read time	50ms
Max time	51ms
Min time	50ms
Read Data	SR-750 Series

- SR-700 Reading rate measurement test display screen



Parameter bank	1
Reading Test	100%
Matching level	97
Symbology	DataMatrix(12 x 12)
Cell size	0.50mm
Code size (width)	6.0mm
PPC	8.7pixel/cell
Read Data	ABCDE

- SR-700 Tact measurement test display screen



Parameter bank	1
Read time	52ms
Max time	52ms
Min time	48ms
Read Data	ABCDE

3-3 Alternate Function

SR-750 SR-700

This section describes the alternate function.

Alternate Function

The SR-750/SR-700 Series can perform the reading operation while switching between multiple parameter banks that are registered for the code being read.
The function that performs reading operation with the most appropriate parameter while automatically switching the parameter bank - this is called "Alternate Function".
Even when there are fluctuations in printing conditions or reading distance, since it operates by switching between multiple parameter banks during a single read operation, a stable read operation is provided.

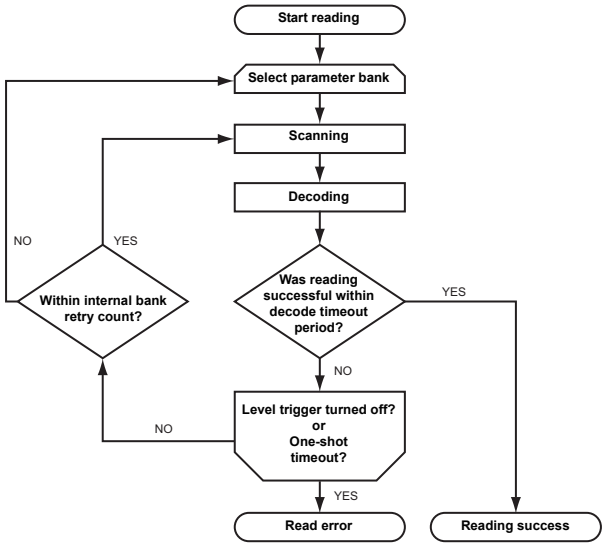
Parameter banks

The SR-750/SR-700 Series sets parameters necessary for code recognition such as scan conditions and filter conditions.
Location where this setting is stored is called a "Parameter Bank".
The SR-750/SR-700 Series has 10 parameter banks. Multiple optimal parameters can be registered according to work conditions and printing conditions.

The following settings are stored in the parameter bank.
- Code type..... Set the version of the code to be read, the number of codes, and the output length limitation function.
- Internal light/External light... Set whether or not to use internal lighting and external lighting.
- Scan conditions..... Set exposure time, gain, and dynamic range.
- Filter ..... Set the filter condition to be used.
- Others ..... Set the alternate, decoding area, algorithm, etc.

Alternate Function Operations

The following flow chart illustrates operations that occur during the alternate function:



* Reading starts from the bank set as the "Alternate start bank".

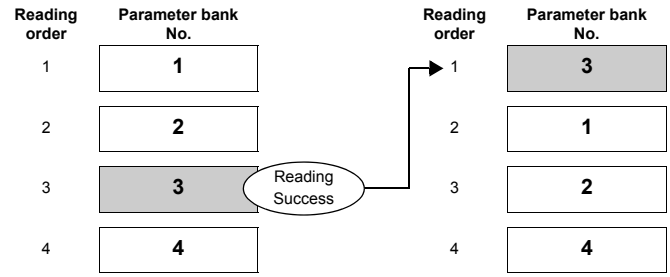
Important

Since the alternate function cycles through the parameter banks one at a to determine the optimal settings, overall processing time may increase. (The processing time depends on the decode timeout period setting.)
The alternate function is turned off by default. The function is enabled automatically after the Tuning operation has been performed on any of the parameter banks.
The alternate function is disabled in the following cases:
- **When using the read mode in the burst mode * SR-750 Series**
- **When the alternate function is turned off for all parameter banks**
- **When the bank specify trigger input command (LON01 to 10) is sent to directly specify the parameter bank for reading.**

■ Bank prioritizing function

When the alternate setting order is set to "Begin with successful bank", the next reading starts from the parameter bank of the most recent successful reading. When codes with similar conditions are read in sequence, prioritizing according to the last successful bank may result in a shorter reading processing time.

Operation of the bank prioritizing function when parameter banks 1 to 4 are used
The reading order is changed to start reading from the parameter bank of the previous successful reading.



Point

The bank prioritizing function is effective only in Operation mode. The reading order is reset to the default setting when one of the following operations is performed:
- **Stopping the power supply**
- **Entering the test mode**
- **Entering Setting mode or Test mode**
- **Changing the alternate setting**

3-4 Test Mode

SR-750 SR-700

This section describes the test mode of the SR-750/SR-700 Series.

Test mode summary

Function		Description
Reading rate test mode	Offline	Scans codes 10 times and measures the reading rate according to the number of times that the code was read correctly.
	Online	This test mode checks the number of successful decodes against the number of decodes attempted while the trigger input is turned ON.
Read time test mode	Offline	This test mode measures the amount of decode time that it takes to read a code and outputs the result every 10 decodings are performed.
	Online	This test mode measures the amount of time that it takes to read a code and outputs the result when the trigger input turns OFF.
Code position measurement test mode * SR-750 Series	Offline	In this test mode, the level that indicates how far the code shifts from the center of the field of view is measured.

For more information about the TEST button operations of the SR-750/SR-700 Series, or the multiple LED status display, refer to "3-1 Using the SR-750/700 Series (Page 17)".

Reference

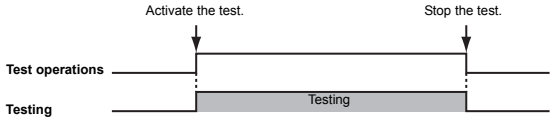
- It is also possible to perform the test mode by specifying a parameter bank.
  "8-2 Operation Commands (Page 95)"
- If no parameter banks have setting values, the test mode is performed for the parameter bank 0 (bank for read quick setup code).

Online and offline modes

SR-750 SR-700

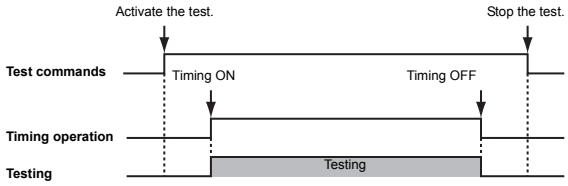
■ Offline mode

Offline mode is useful for fine-tuning the installation position, distance or angle during initial setup of the SR-750/SR-700 Series.
Data is continuously output as long as the test is active.
The test result data is output in real time.



■ Online mode

After SR-750/SR-700 Series installation, the online mode is used to check for problems with installation position and distance, reading execution time etc., and is used for troubleshooting during actual operational state.
When performing a test, after transition to online test mode using command input, results obtained between timing input (or operating command) ON and OFF are displayed.
To begin the test, turn the timing input on. To end the test and output results, turn the timing input off.



Test Mode Measurement Status

The measurement status of the test mode can be checked on the multiple LED indicator.
The multiple LED displays the following symbols during test mode.

Multiple LED status	Reading rate (%)	Processing time (ms)	Code position measurement	OK/NG/ ERROR LED
5 bars lit	90 to 100	Up to 99	LEVEL5	Green
4 bars lit	70 to 80	100 to 199	LEVEL4	Green
3 bars lit	50 to 60	200 to 299	LEVEL3	Green
2 bars lit	30 to 40	300 to 399	LEVEL2	Green
1 bar lit	10 to 20	400 or more	LEVEL1	Green
0 bars lit	Reading error			Red

Test Mode Details

This section describes the advanced details of each test mode.

Reading rate test mode

SR-750 SR-700

This test mode scans codes and measures the number of successful reads.
The offline mode scans 10 times and outputs the number of successful reads.
The offline test mode outputs the reading rate which is obtained from the number of decodes against the number of decodes attempted while the trigger input is ON.

The parameter bank switches while scanning, just as when reading with the alternate function. When reading is successful, the parameter bank used for reading is fixed and the reading rate is calculated.
When a read error occurs, the test mode switches to another parameter bank and continues the measurement.

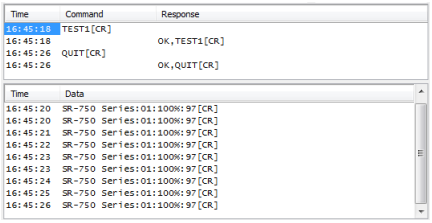
■ Starting reading rate test mode

The following procedures can be used to start and stop the reading rate test mode:
- Start: Hold the (TEST) button for 2 seconds.
  Stop: Tap the button once briefly.
- Start: Send the TEST1 (#TEST1) command from the control host.
  Stop: Send the QUIT command (#QUIT) from the control host.
- Using AutoID Network Navigator or direct serial commands, assign "TEST" and "Reading rate test mode" to one of the IN terminals.
  Start: Turn the input on
  Stop: Turn the input off

■ Reading rate test mode output data

Offline mode
The offline mode outputs data in the following format every 10 reading operations.

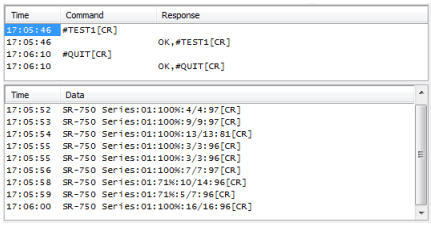
Read data	:	a	:	b	%	:	d



a = Parameter bank numbers (01 to 10)
b = Reading rate (1 to 100)
d = Average brightness value in code region (0 to 255)

Online mode
The online mode outputs data in the following format when the trigger input is turned off.

Read data	:	a	:	b	%	:	c	:	d



a = Parameter bank numbers (01 to 10)
b = Reading rate (1 to 100)
c = Number of decoding successes/ Number of decoding operations
d = Average brightness value in code region (0 to 255)

Reference
- When starting test mode, the data addition function is inactive.
- When TEST1nn (#TEST1nn) (nn: Parameter bank No.) is sent, the reading rate test mode is run for the bank with the specified parameter bank number.

Read time test mode

SR-750 SR-700

This test mode measures the amount of time that it takes to read a code and outputs the result.
The parameter bank switches while scanning, just as when reading with the alternate function. If reading is successful, the amount of time required from the start of reading until the completion of reading is measured and output. If the decoding fails, the read time becomes 0 ms.

■ Starting read time test mode

The following procedures can be used to start and stop read time test mode:
- Start: Hold the (TEST) button for 3 seconds. * SR-750 Series
  Stop: Tap the button once briefly to finish.
- Start: Send the TEST2 (#TEST2) command from the control host.
  Stop: Send the QUIT command (#QUIT) from the control host to finish.
- Assign "TEST" and "Reading rate test" to one of the IN terminals.
  Start: Turn on the input
  Stop: Turn off the input

■ Read time test mode output data

Offline mode
The offline mode outputs data in the following format every 10 successful decodings or every time the decoding fails.
Online mode
The online mode outputs data in the following format when the trigger input is turned off.

(The format is the same for offline and online modes.)

Read data	:	a	:	now = b ms	:	max = c ms	:	min = d ms

Time	Command	Response
16:46:55	TEST2[CR]	
16:46:55		OK,TEST2[CR]
16:47:03	QUIT[CR]	
16:47:03		OK,QUIT[CR]

Time	Data
16:46:57	SR-750 Series:01:now=50ms:max=51ms:min=50ms[CR]
16:46:58	SR-750 Series:01:now=50ms:max=51ms:min=50ms[CR]
16:46:58	SR-750 Series:01:now=50ms:max=51ms:min=50ms[CR]
16:46:59	SR-750 Series:01:now=50ms:max=51ms:min=50ms[CR]
16:47:00	SR-750 Series:01:now=50ms:max=51ms:min=50ms[CR]
16:47:01	SR-750 Series:01:now=50ms:max=51ms:min=50ms[CR]
16:47:01	SR-750 Series:01:now=50ms:max=51ms:min=50ms[CR]
16:47:02	SR-750 Series:01:now=50ms:max=51ms:min=50ms[CR]
16:47:03	SR-750 Series:01:now=50ms:max=51ms:min=50ms[CR]

a = Parameter bank No. (00 to 10)
b = Latest reading time
c = Maximum read time (Maximum value of the read operation from starting the read time test mode to outputting data)
d = Minimum read time (Maximum value of the read operation from starting the read time test mode to outputting data)
* The values for b, c, and d will be zero suppressed.

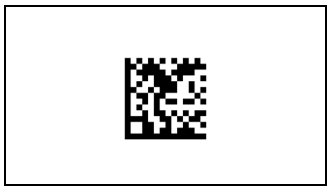
Reference
- When starting test mode, the data addition function is inactive.
- When TEST2nn (#TEST2nn) (nn: Parameter bank No.) is sent, the read time test mode is run for the bank with the specified parameter bank number.
- When the TEST2nn (#TEST2nn) command is sent or when there is only 1 parameter bank for reading, the specified decode timeout period is ignored and read operation is performed with a decode timeout period of 2550 ms. If it has been determined that the image cannot be decoded, measurement of the image is stopped without waiting for the decode timeout period expiration.

Code position measurement test mode

SR-750

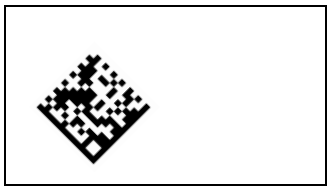
This test mode measures how far the code shifts from the center of the field of view.
This test mode can be used to perceive the amount of displacement and adjust both the code position and the SR-750 Series installation location.

Ideal position (LEVEL5)



The center of the code should coincide with the center of the field of view.

Shifted position (LEVEL1)



The code is displaced from the center of the field of view.

■ Starting code position measurement test mode

The following procedures can be used to start and stop code position measurement mode:
- Start: Hold the (TEST) button for 4 seconds.
  Stop: Tap once briefly to finish.
- Start: Send the TEST3 command from the control host.
  Stop: Send the QUIT command from the control host.
- Assign "TEST" and "Positioning Test" to one of the IN terminals.
  Start: Turn the input on
  Stop: Turn the input off

■ Code position measurement test mode output data

During code position measurement test mode, data of the average of 10 scans (the fractional portion is dropped) is sent to the computer in the following format after scanning 10 times:

Read data	:	a	:	level = b

Time	Command	Response
16:59:25	TEST3[CR]	
16:59:25		OK,TEST3[CR]
16:59:32	QUIT[CR]	
16:59:32		OK,QUIT[CR]

Time	Data
16:59:26	SR-750 Series:01:level=5[CR]
16:59:26	SR-750 Series:01:level=2[CR]
16:59:27	SR-750 Series:01:level=3[CR]
16:59:28	SR-750 Series:01:level=2[CR]
16:59:29	SR-750 Series:01:level=4[CR]
16:59:29	SR-750 Series:01:level=3[CR]
16:59:30	SR-750 Series:01:level=3[CR]
16:59:31	SR-750 Series:01:level=5[CR]
16:59:32	SR-750 Series:01:level=3[CR]

a = Parameter bank No. (00 to 10)
b = Position level (0 to 5)

Reference
- When starting test mode, the data addition function is inactive.
- The code position measurement test mode does not run in online mode.
- When TEST3nn (nn: Parameter bank No.) is sent, the code position test mode is run for the bank with the specified parameter bank number.

3-5 Preset/Verification Function

SR-750 SR-700

This section describes the preset/verification function.

Preset/Verification Function

This function allows the SR-750 Series to verify the read code data against the registered code data (preset data), and output an OK/NG signal to indicate whether or not they match. This allows the SR-750/SR-700 Series to perform simple detection of different codes without a sensor or other devices.
One set of preset data can be stored in the SR-750/SR-700 Series (maximum 494 digits). The starting digit (starting position) and range (number of digits) for the verification can be set in the preset data, so even codes with more than 494 digits can be verified.
* If the multi 2 read mode or multiple read mode is set, the preset verification function cannot be used.

NOTICE	**The verification starts at the specified starting position on the preset data and continues for the specified number of digits. Data cannot be verified at multiple points.**

Registering preset data

Use one of the following procedures to register preset data with the SR-750/SR-700 Series:
- Read a target code by turning on the external input terminal.
  * You need to assign the preset data input function to the external input terminal in advance.
  "3-6 Multi-I/O Function (Page 24)"
- Set with the AutoID Network Navigator "5-4 Details of Settings View (Page 51)"
- Set with a setup command "8-3 Details of Configuration Commands (Page 100)"

■ Output data format for the preset registration result

The following output data format is used when the preset data is registered.

PR	nn	:	Result data

nn = Preset registration result (00 to 05)

nn	Description	Result data
00	Preset registration success	Read data
01	Preset read failure	Read error data
02	The preset effective digit is specified as 0.	[null]
03	The number of digits of read data is less than the number of digits for preset start.	
04	The preset registration is not possible because the operation mode is set to multi 2 or multiple read.	
05	Two or more "!" exist in preset data.	

Output terminal operation

The output terminals perform the following operation:
- Reading successful and matches preset data ..... OK is output
- Reading successful but does not match preset data ... NG (NG verification) is output.
- Read error ..... ERROR is output
- Preset data is registered successfully..... PRESET OK is output

NOTICE	**In factory settings, PRESET OK output is not assigned to OUT1 to OUT3 terminals for SR-750 or OUT1 to OUT4 for SR-700. To connect the PRESET OK output to an external device, assign the PRESET OK output to an appropriate OUT terminal.**

Functions of "!" and "?" in the preset data (wild cards)

Registering "!" or "?" with the preset data increases the flexibility when comparing and verifying the code data against the preset data.
"!" .....This character represents an unlimited number of digits and can be used when any character for any number of digits is OK. If the preset data is "A B C!", all codes that begin with "ABC" are verified as a match. If the preset data is "!ABC", all codes that end with "ABC" are verified as a match. A maximum of 1 "!" can be registered with the preset data.
"?" .....This character represents 1 digit and can be used when any one character is OK. If the preset data is "A B??5 6", any 2 characters positioned in ?? are verified as a match. If the preset data has not been registered, "!" is registered instead. Consequently, OK is output when a barcode is read successfully and ERROR is output when reading fails, regardless of the data of the bar code.

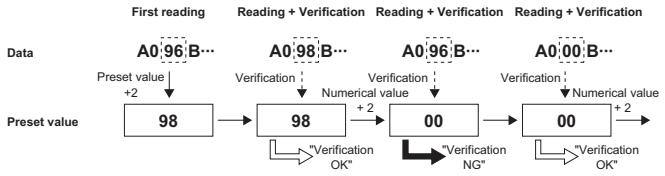
Reference By default, the PRESET output is not assigned to any of the OUT1 to OUT4 terminals. To connect the PRESET OK output to an external device, you need to assign the PRESET OK output to an appropriate OUT terminal.

Sequence Verification Function

This function allows verification of codes including numerical values which change in series, such as workpiece serial numbers.
When the verification is OK, a value is added to/subtracted from the preset value.
When the verification is NG, neither addition nor subtraction is performed.
When the sequence verification is set, the first data read after the setup or power-on is used as the preset data, and the numerical data for the number of digits set is verified.
When the PRESET input terminal is turned on during the automatic increment verification, the current preset value is cleared, and the data to be loaded next is used as the first load data.

The sequence verification requires the following settings:
- Verification method ..... Select "Sequential".
- Starting digit ..... Set the number of digits where the value verification starts.
- No. of digits ("Length") .... For the numerical verification, the acceptable number of digits is 1 to 9 digits.
- Increment ..... Enter a value used to add to or subtract from the read code value. (-9999 to 9999)

The following is the operation example when the starting digit is the third one, two digits are referenced and an increment of +2 is specified:



NOTICE	**The following restrictions are placed on the sequence verification function:** **• The verification results in NG when a value other than a numerical value is read.** **• The preset data cannot be registered through communication.**

3-6 Multi-I/O Function

SR-750 SR-700

You can assign various operating conditions to the I/O terminals of the SR-750/SR-700 Series. This section describes operations available with the Multi-I/O function.

Function and Operation of the Input Terminals

Functions assigned to the input terminals

Only 1 of the following functions can be assigned to each of the input terminals IN1 and IN2:
- Trigger input: Use as the input terminal to start/stop reading codes.
- Preset data input: Use as the input terminal to register preset data.
- Start test mode: Use as an input terminal to activate the specified test mode. (This function cannot be used to start the online test mode.)
- Capture: Use as an input terminal to capture 1 image with the specified parameter bank number. (SR-700 only)
- Clear PLC link error: Use as the terminal to clear the PLC link error.
- Trigger lock: Use as an input terminal to forcefully stop all read and scan operations. (SR-700 only)
- Read the quick setup code: Use as an input terminal to read the quick setup code created by the AutoID Network Navigator. (SR-700 only)
- Tuning operation: Use the terminal to activate the quick calibration function.
- None: Select this option when the terminal is not used as an input terminal.

Use AutoID Network Navigator or setup command to change the setting or assign the desired function.

* By default, the functions are assigned as follows:
IN1: Trigger input
IN2: Preset input

Input terminal status and operation

The table below shows the relationship between the status of the input terminal and the operation of the assigned function.

Function assigned to the input terminal	ON	OFF
Trigger input	Start reading	Stop reading (at the time of level trigger)
Preset input	Start preset data input	Finish preset data input (at the time of level trigger)
Start test mode	Activate the test mode	Quit the test mode
Capture	Start capturing images	—
Stop PLC error	Stop error	—
Trigger lock	Forced trigger lock	Release forced trigger
Read the quick setup code	Start the quick setup code reading	Quit the quick setup code reading.

■ Synchronous IN LED

Users can set the SR-750 Series to illuminate its IN LED when the IN1 or IN2 terminal turns on. When both IN1 and IN2 terminals synchronize with the IN LED, the LED illuminates based on the OR condition of the terminal status.
(By default, only the IN1 terminal synchronizes with the LED.)

■ Input polarity setting

The polarity of the input terminal can be selected from "N.O. (normally open) contact" or "N.C. (normally closed) contact".
(By default, "N.O. contact" is selected.)
The same input polarity is set for IN1 and IN2.

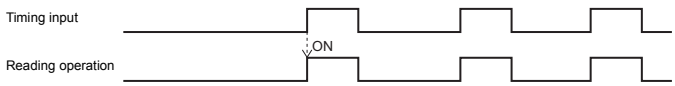
■ Power-on trigger setting

Normally, the input terminal recognizes the change in the input signal (ON/OFF) after the SR-750/SR-700 Series is turned on and its operation stabilizes.
The input terminal does not operate if the input signal turns on before the operation stabilizes (approximately 3 seconds after power on).
If "Power-on trigger" is enabled, the SR-750 Series recognizes the input ON status during the start-up period, and after the operation stabilizes, it performs the operation specified for the input signal.
(By default, "Power-on trigger" is disabled.)

Operation of Norm. open and Norm. closed

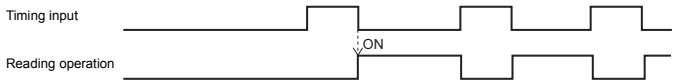
■ Norm. open (Normally open)

- **Normal**

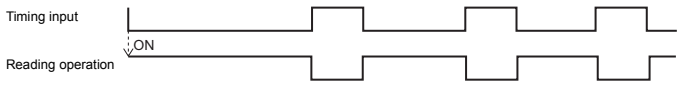


■ Norm. closed (Normally closed)

- **Normal**



- **Power-on trigger setting**



■ Required input duration setting

Users can set the "Required input duration", which is the period required for the ON status of the input terminal to be recognized. The function assigned to the input terminal is activated after the input stays on for specified time or longer.
(Required input duration setting range: Selectable from 1 ms, 2 ms or 10 ms; default setting is 1 ms.)

Function and Operation of the Output Terminals

Functions assigned to the output terminals

The following functions can be assigned to the output terminals (SR-750: OUT1 to 3, SR-700: OUT1 to 4). You can assign one or more functions to each output terminal.

■ Result output

This function outputs judgment results according to the SR-750/SR-700 Series operation.

- OK.....This signal is output when a bar code is read successfully or when the comparison/verification against preset data matches.
- NG (NG verification)....This signal is output when the comparison/verification against the preset data does not match.
- ERROR.....This signal is output when a read error occurs.
- STABLE .....This signal is output when reading is stable ("Matching level assessment function" or "Code quality verification function" is enabled and the matching level or Code quality verification result exceeds the set threshold).
- UNSTABLE .....This signal is output when reading is unstable ("Matching level assessment function" or "Code quality verification function" is enabled and the matching level or Code quality verification result falls below the set threshold).
- PRESET OK .....This signal is output when the preset data is registered successfully.
- TUNING OK.....This signal is output when the calibration is complete.
- SCRIPT CONTROL ....OUT terminal is used when control is done using script. (SR-700 only)

■ Operation output

This output function notifies that the SR-750/SR-700 Series is currently running

- TRG BUSY..... During start-up, timing input, preset registration, when sending image FTP, tuning, during bank number display (SR-750), test mode, when sending live view data, monitor running, laser pointer lit (SR-750), when saving image ROM, batch setting code reading, scripting
- LOCK BUSY ..... When force trigger is locked, laser pointer is lit (SR-700), trigger/lock is switched on (SR-700), during bank number display (SR-700)
- MODE BUSY ..... During batch setting code reading (SR-750), test mode (SR-750), online test (SR-700), ROM saving (SR-700)
- ERR BUSY..... Error occurred (buffer full, setting save error)
- CONFIG BUSY ... When controlled by AutoID Network Navigator (SR-700 only)

■ External light control output

- EXT. LIGHT..... This signal is output to control external illumination.

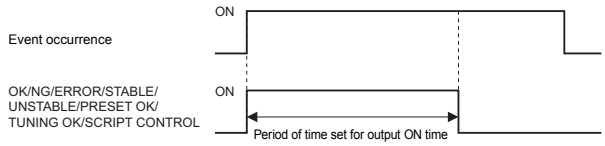
NOTICE	• **The result outputs (OK, NG, ERROR, STABLE, UNSTABLE, PRESET OK, TUNING OK, SCRIPT CONTROL) and the outputs in operation (TRG BUSY, LOCK BUSY, MODE BUSY, ERR BUSY, CONFIG BUSY) and EXT.LIGHT cannot be set for the same terminal.** • **EXT.LIGHT can only be set with OUT3 (SR-750) or OUT4 (SR-700). Also, other output functions cannot be set for OUT3 (SR-750) and OUT4 (SR-700) terminals with EXT.LIGHT.**

Output terminal operation

The output terminals operate differently depending on the assigned function. There are three types of operations as shown below:

■ OK, NG, ERROR, STABLE, UNSTABLE, PRESET OK, TUNING OK, SCRIPT CONTROL output

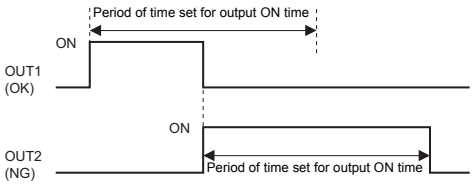
The above signals turn on the output for the specified output ON time when the respective event occurs.



* For the above output functions, a higher priority is assigned to the output of the function which occurred last.

Consequently, when the next operation occurs during the output ON time of the previous operation, the signal is switched to output the signal of the higher priority function.

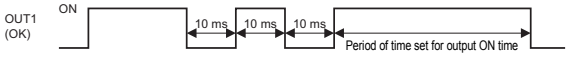
Timing diagram (When OUT1 outputs an OK signal and then OUT2 outputs a NG signal)



Point

If the same operation occurs again within the period of the output ON time, the output turns off for 10 ms and then turns on again to output the signal of the next operation. (If the same operation occurs continuously at short intervals, the output turns on for at least 10 ms before it turns off and then turns on again.)

Timing diagram (When OUT1 outputs signals continuously)

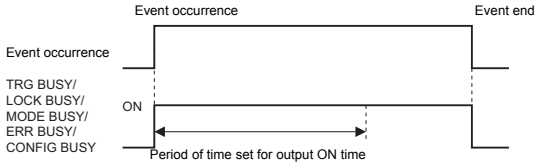


Other than the example described above, the signal is switched when any of the following events occurs:

- **Change to Test mode/Read quick setup mode**
- **Laser pointer is turned on**
- **Error**
- **Buffer full**

■ TRG BUSY, LOCK BUSY, MODE BUSY, ERR BUSY, CONFIG BUSY output

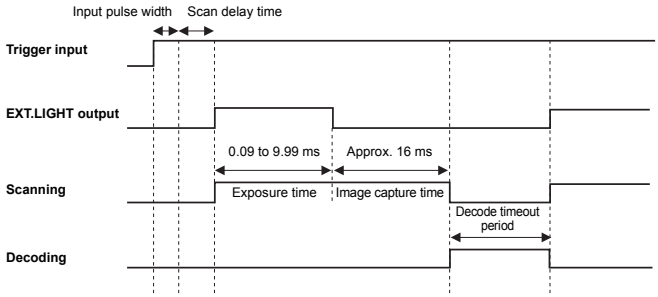
The above signals are retained until the corresponding event ends.
(The period is not affected by the period of time set for the output ON time.)



* If multiple BUSY outputs are assigned to one output terminal, the output signal is turned off when all events finish.

■ EXT.LIGHT (external illumination) output

The above signal is output in synchronization with the scan timing.
The output polarity can be selected from "N.O. (normally open) contact" or "N.C. (normally closed) contact".
The timing diagram shows the operation for the N.O. contact:



Point

- **EXT.LIGHT can only be set with OUT3 (SR-750) or OUT4 (SR-700).**
- **If EXT.LIGHT is set to OUT3 (SR-750) or OUT4 (SR-700), other outputs cannot be set to OUT3 (SR-750) or OUT4 (SR-700).**

3-7 Image Saving Function

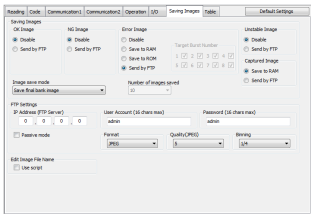
SR-750 SR-700

This section describes the image saving function of the SR-750/SR-700 Series.

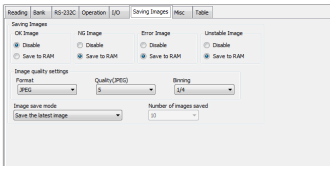
Image Saving Function

The save image function, based on save image mode settings, allows sending of captured image to PCs using RAM save/ROM save/Send FTP with SR-750, and RAM save with SR-700.
Saved images can be used for analyzing causes of read error, etc.
- AutoID Network Navigator setting screen

For the SR-750 Series



For the SR-700 Series



Type of images to be saved

■ Latest image

The SR-750 Series stores a scanned image to RAM temporarily and performs decoding process for the image data.
The image before decoding process is called the "Latest image".
- The "Latest image" saves up to 10 images to RAM in one time reading operation.
- The type of image of the "Latest image" is set to "L" for the file name.
  * SR-750 Series
- To confirm the "Latest image", use the image view function and file view function of the AutoID Network Navigator.

Refer to 📖 "5-10 ImageView (Page 73)", "5-11 FileView (Page 74)"

■ Judged image

The SR-750/SR-700 Series performs the decoding process, and the read and judged images are called "Judged images".
The "Judged images" on the SR-750 Series can be set for each judged result.
- Read OK, Verification NG, Unstable image : Not save or FTP transmission
- Read error : Not save, RAM save, ROM save or FTP transmission

The determined image in the SR-700 Series can be set up as follows.
- Reading successful, NG verification, Reading error, Reading unstable: : Do not save, or RAM save

The "Judged image" is saved according to the following rules.
- The number of judged images to be saved varies according to the reading operation and image saving mode. (Max. 10)
- The type of image for the file name of the "Judged image" is set as follows according to the judged result.
  Reading success : S
  Reading error : E
  Verification NG : N
  Unstable image : W
  Decoding process not performed : X..... The image was scanned in the burst read mode, but the decoding process was not performed.
- To confirm the "Judged image" saved into RAM/ROM, use the image view function and file view function of the AutoID Network Navigator.

Refer to 📖 "5-10 ImageView (Page 73)""5-11 FileView (Page 74)"

■ Capture image

For the SR-750/SR-700 Series, this is an image taken with the capture function.
1 image is saved with every 1 capture operation.
For the SR-750 Series, save the captured image to RAM or select Send FTP.
- Capture operation can be performed using the image view function or operation command.
- The type of image is set to "C" for the file name of the "Capture image".
- To confirm the "Capture image" saved into RAM, use the image view function and file view function of the AutoID Network Navigator.

Refer to 📖 "5-10 ImageView (Page 73)""5-11 FileView (Page 74)"

Image file name * SR-750 Series

An image file name is set in the following format.

(1)	_	(2)	_	(3)	_	(4)	.	(5)

(1) Image count value (3 bytes)	IMG	: When saved in ROM/RAM
	000 to 999	: When sent via FTP • The number is counted from 000 at startup. • The counter value is incremented each time one image is sent. • When the counter value of 999 is incremented, the value returns to 000.
(2) Image type (1 byte)	S	: OK image
	L	: Latest
	E	: Error image
	W	: Unstable image
	N	: Comparison NG
	C	: Captured image
	X	: No decoding process
(3) Operation number (2 bytes)	00	: Latest
	01 to 10	: From timing ON/OFF to specified number
	#1 to #8	: Burst number
(4) Bank number (2 bytes)	01 to 10	
(5) Image file extension	ROM/RAM	: bmp
	FTP	: bmp or jpg

■ When the edit image file name function is enabled

When sending images via FTP transmission with [Edit image file name] – [Use script] set to Enable, image file names can be freely changed.
For the edit image file name function, refer to 📖 "3-14 Edit data function/Edit image file name function (Page 38)".

Image file name * SR-700 Series

The image file name is set in the following format:

Saved file number	_	Image type Identification character	_	Bank No.	.bmp

- Saved file number: 3-digit image file serial number
- Image type identification character : Character that indicates the image type
  S .....Images successfully read
  N .....Image NG
  E .....Read error images
  W ....Unstable images
  C .....Instant Capture
- Bank No: Bank number used to obtain the image.

Example) Successfully read file name with the bank No. 1
001_S_01.bmp

Image save mode

The following 3 image save modes are available:
- Save final bank image
- Save images after timing input ON
- Save images of the specified number before trigger input OFF

This section describes each mode.

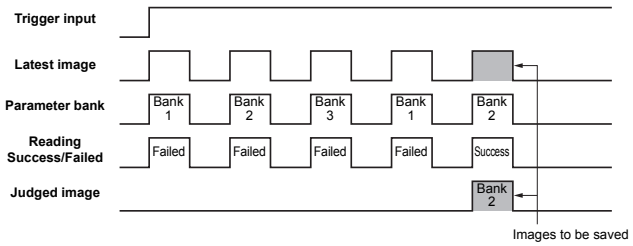
Save the latest bank image

In this mode, the SR-750/SR-700 Series performs the reading operation and saves the images at the timing when the read result is judged.
Depending on the reading modes of the SR-750/SR-700 Series, saved images and the determination timing for images to be saved are as follows

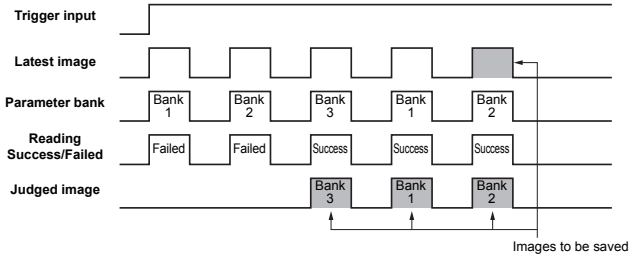
Refer to 📖 "4-4 Read Mode (Page 43)"

■ Read OK/Comparison NG (When the preset/comparison function is used)/Unstable image

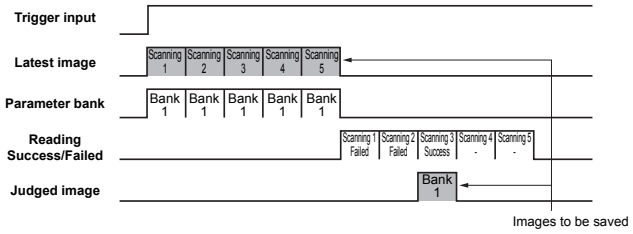
(1) When the reading mode is the single read mode or multi 1 read mode (SR-700 only)
Only successfully read images of both the latest images and judged images are saved.
(This is the example of when the parameter banks 1 to 3 are used.)



(2) When the reading mode is the multi 2 read mode
Judged images and parameter bank images successfully read are all saved.
For the latest images, only the image obtained last is saved.
(This is the example of when the parameter banks 1 to 3 are used.)

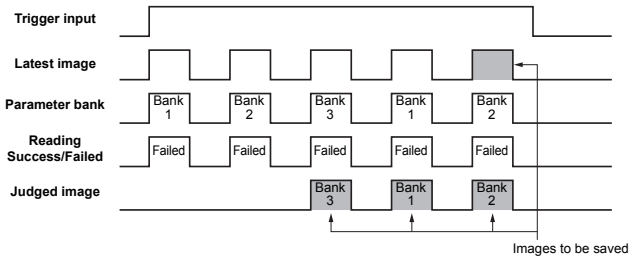


(3) When the reading mode is the burst read mode
For the latest images, all burst scanned images are saved.
For the judged images, only the images that can be decoded are saved.
(This is the example of when the burst execution bank is 1 and the number of burst scans is 5.)

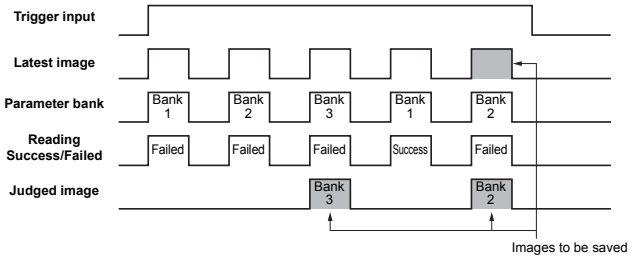


■ Read error

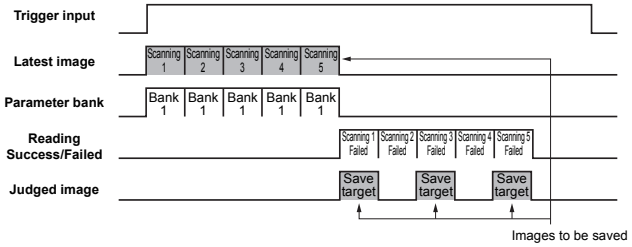
(1) When the reading mode is the single read mode or multi 1 read mode
When a reading error occurs, all parameter bank images used for reading operation are saved one by one as judged images.
For the latest images, only the image obtained last is saved.



(2) When the reading mode is the multi 2 read mode
In the multi 2 read mode, if reading judgments (Success or Failed) differ among parameter banks, the judged images of parameter banks that were judged as reading error are saved.
For the latest images, the image obtained last is saved.

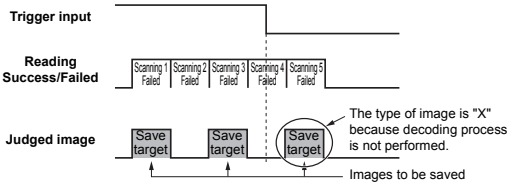


(3) When the reading mode is the burst read mode
If a read error occurs in the burst read mode, the judged images for the save target burst numbers are only saved.
For the latest images, all burst scanned images are saved.



NOTICE

If the trigger input turns off before the decoding process for scanned images are not complete, the judged images as save targets are saved with the type of image "X" (Decoding process not performed).

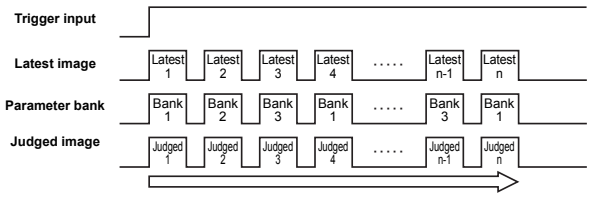


Save images of the specified number after trigger input ON

When the read result is judged, the SR-750/SR-700 Series saves the specified number of images after the reading operation began.

■ Image saving timing

The timing when images to be saved are determined is the same as the timing when Read OK/Verification NG/Read error is judged.
The number of images to be saved can be specified by using AutoID Network Navigator or setting commands for both the latest images and judged images. (Max. 10 for each)



The SR-750 Series saves images of the specified number (n) after the trigger input turns ON.

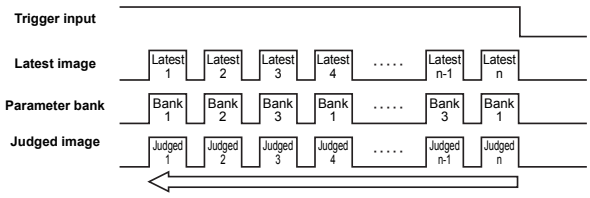
NOTICE	• **When the reading mode is the multi 1 read mode, image saving is impossible with this operation.** • **When the reading result can be judged before reaching the specified number, the images until that point are saved.** • **When the reading mode is the burst read mode, up to 8 images are saved. In the burst read mode, the SR-750 Series saves images of the specified number (burst scan count) for both the latest images and judged images.**

Save images of the specified number before trigger input OFF

When the read result is judged or the trigger input turns OFF, the SR-750/SR-700 Series saves the specified number of images before then.

■ Image saving timing

The timing when images to be saved are determined is the same as the timing when Read OK/Verification NG is determined, or the trigger input turns OFF and Read error is determined.
The number of images to be saved can be specified by using AutoID Network Navigator or setting commands for both the latest images and judged images. (Max. 10 for each)



The SR-750 Series saves images of the specified number going back from the image with the read result judged or the image when the trigger input turns OFF.

- Image number is counted in the obtained order as 1, 2, 3···.

NOTICE	• **When the reading mode is the multi 1 read mode, image saving is impossible with this operation.** • **When the reading result can be judged before reaching the specified number, the images until that point are saved.** • **When the reading mode is the burst read mode, up to 8 images are saved. In the burst read mode, the SR-750 Series saves images of the specified number (burst scan count) for both the latest images and judged images.**

3-8 Silent Mode

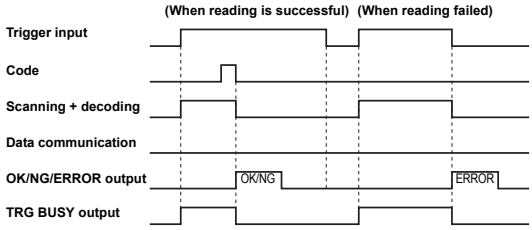
SR-750 SR-700

This section describes the silent mode of the SR-750/SR-700 Series.

Silent mode

A typical code reader outputs data of the result when the code is read or the read error code when it is not read.
The SR-750/SR-700 Series can be configured to restrain data communication and not to output the result data to the host computer.
This function is called "Silent mode".
For example, if the application only uses the OK, NG or Read Error terminal outputs, this information can be suppressed.
By configuring the SR-750 Series not to send all data, it eliminates the time required for data transmission to/from the host computer. As a result, overall reading time can be reduced.

■ Timing diagram (when OK/NG/ERROR data is restrained)



Only data is not sent as shown above, but the OUT output terminal performs normal operation.
* Even with the silent mode set, images can be saved with the condition set using the image save function.
Refer to 📖 "3-7 Image Saving Function (Page 26)"

Silent mode setting procedure

The following 2 procedures for setting silent mode are available:
- Setting using the AutoID Network Navigator
- Setting with a command

Data subject to data communication restraint

By configuring the SR-750/SR-700 Series, the following data communication can be restrained.

■ Setting items and setting details using the AutoID Network Navigator

Setting item	Data subject to output restraint
Read (Comparison) OK	Read data Read data judged as Comparison OK as a result of preset verification.
Comparison NG	Preset Comparison NG data Read data judged as Comparison NG as a result of preset verification.
Read ERROR	Read error data
Stable Reading (OK/NG)	Stable reading data Read data whose matching level or Code quality verification result is judged as more than the threshold
Unstable Reading (OK/NG)	Unstable reading data Read data whose matching level or Code quality verification result is judged as less than the threshold
Preset Result	Preset registration result data
Test Mode	Measured data in test mode

3-9 SR-600 Compatible Output Mode

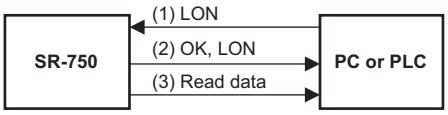
SR-750

This section describes the SR-600 compatible output mode of the SR-750 Series.

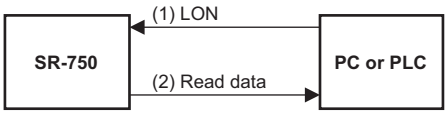
SR-600 compatible output mode

The SR-750 Series supports the Ethernet communication, so the operation command format and response code format have been changed from the previous SR-600 Series. When using the SR-750 Series in the SR-600 Series operation process or using the control program for the SR-600 Series, setting the SR-600 compatible output mode to Enable results in reduction in man-hours for program change.

- **Standard mode**



- **SR-600 compatible output mode**



SR-600 compatible output mode functions

Commands and responses set to Enable in the SR-600 compatible output mode are as follows.

■ Operation commands

Command name	Command	SR-750 Series normal output		SR-600 Compatible output	
		Response	Error code	Response	Error code
Trigger input ON	LON	OK, LON	ER, LON, ee	(N/A)	(N/A)
Trigger input ON (Bank settings)	LONbb				
	LON, bb				
Trigger input OFF	LOFF	OK, LOFF	ER, LOFF, ee	(N/A)	(N/A)
Start preset data registration	PRON	OK, PRON	ER, PRON, ee	(N/A)	(N/A)
End preset data registration	PROFF	OK, PROFF	ER, PROFF, ee	(N/A)	(N/A)
Start reading the quick setup code	RCON	OK, RCON	ER, RCON, ee	OK	ERRee
End reading the quick setup code	RCOFF	OK, RCOFF	ER, RCOFF, ee	OK	ERRee
Check the quick setup code reading status	RCCHK	OK, RCCHK, Obtained value	ER, RCCHK, ee	Obtained value	ERRee
Check the input terminal status	INCHK, m	OK, INCHK, Obtained value	ER, INCHK, ee	Obtained value	ERRee
	INmCHK	OK, INmCHK, Obtained value	ER, INmCHK, ee		
Output terminal ON control (individual control)	OUTON, m	OK, OUTON	ER, OUTON, ee	Obtained value	ERRee
	OUTmON	OK, OUTmON	ER, OUTmON, ee		
Output terminal OFF control (individual control)	OUTOFF, m	OK, OUTOFF	ER, OUTOFF, ee	Obtained value	ERRee
	OUTmOFF	OK, OUTmOFF	ER, OUTmOFF, ee		
Output terminal ON control (batch control)	ALLON	OK, ALLON	ER, ALLON, ee	OK	ERRee
Output terminal OFF control (batch control)	ALLOFF	OK, ALLOFF	ER, ALLOFF, ee	OK	ERRee
Soft reset	RESET	OK, RESET	(N/A)	OK	(N/A)
Clearing the send buffer	BCLR	OK, BCLR	(N/A)	OK	(N/A)
Check reading history	NUM	OK, NUM, Obtained value	ER, NUM, ee	Obtained value	ERRee
Capture	SHOTbb	OK, SHOT, File name	ER, SHOT, ee	OK	ERRee
	SHOT, bb				
Start tuning	TUNE, bb	OK, TUNE	ER, TUNE, ee	OK	ERRee
	TUNEbb				
Cancel tuning	TQUIT	OK, TQUIT	ER, TQUIT, ee	OK	ERRee
Obtain the alternate order	BANKORDER	OK, BANKORDER, Obtained value	ER, BANKORDER, ee	Obtained value	ERRee
Initialize the parameter bank	BANKCLR, bb	OK, BANKCLR	ER, BANKCLR, ee	OK	ERRee
	BANKCLRbb				
Save setting	SAVE	OK, SAVE	ER, SAVE, ee	OK	ERRee
Initialize the settings	DFLT	OK, DFLT	ER, DFLT, ee	OK	ERRee
Obtain the command status	CMDSTAT	OK, CMDSTAT, Obtained value	(N/A)	Obtained value	(N/A)
Obtain the error status	ERRSTAT	OK, ERRSTAT, Obtained value	(N/A)	Obtained value	(N/A)
Erase error images	ICLR, bb	OK, ICLR	ER, ICLR, ee	OK	ERRee
	ICLRbb				

■ Test mode commands

Command name	Command	SR-750 Series normal output		SR-600 Compatible output	
		Response	Error code	Response	Error code
Start reading rate test mode (offline)	TEST1	OK, TEST1	ER, TEST1, ee	OK	ERRee
	TEST1, bb				
	TEST1bb				
Start reading rate test mode (online)	#TEST1	OK, #TEST1	ER, #TEST1, ee	OK	ERRee
	#TEST1, bb				
	#TEST1bb				
Start processing time test mode (offline)	TEST2	OK, TEST2	ER, TEST2, ee	OK	ERRee
	TEST2, bb				
	TEST2bb				
Start processing time test mode (online)	#TEST2	OK, #TEST2	ER, #TEST2, ee	OK	ERRee
	#TEST2, bb				
	#TEST2bb				
Start position test mode (offline)	#TEST3	OK, TEST3	ER, TEST3, ee	OK	ERRee
	#TEST3, bb				
	#TEST3bb				
End test mode (offline)	QUIT	OK, QUIT	ER, QUIT, ee	OK	ERRee
End test mode (online)	#QUIT	OK, #QUIT	ER, #QUIT, ee	OK	ERRee

* bb : Parameter bank No.
ee : Error code
m : Pin No.
Obtained value : Value obtained after command operation

How to set the SR-600 Series compatible output mode

Change the setting according to the following methods to set the SR-600 Series compatible output mode to Enable.

- Change the setting using AutoID Network Navigator.
  On the AutoID Network Navigator, select [Table] tab - [Others] - [Trigger command response] - [Specify response character], and then specify SR-600 compatible. (Page 69)
- Send the setting command to set

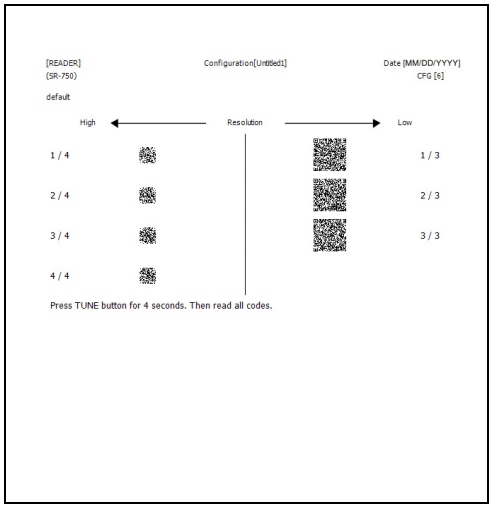
3-10 Batch Setting Code SR-750 SR-700

This section describes the quick setup code.

Quick Setup Code

Users can print the settings specified with AutoID Network Navigator as 2D codes and read the codes with the SR-750/SR-700 Series to change all the settings at once. When printing the quick setup code, use the AutoID Network Navigator quick setup code printing function.
Since the settings of the SR-750/SR-700 Series can be changed by reading the quick setup code, you can easily change the settings even in a location where a computer cannot be used.

■ Print image



Point

When reading the quick setup code with the high-resolution type unit (SR-750HA, SR-700HA), you must use a printer with high print quality. When a printer with low print quality is used, the cells in the 2D code may bleed and become unreadable.

How to read quick setup codes

Use one of the following methods to read the quick setup code

■ Reading the quick setup code using the TUNE button

Use the TUNE switch on the body of the SR-750/SR-700 Series to batch read setting codes.

1 On the body of the SR-750/SR-700 Series, press and hold down the TUNE switch for 4 seconds.

When batch setting code reading begins, the multi-LED on the SR-750/SR-700 Series displays "C" and "0" alternately.

2 Read the batch setting code.

The value displayed on the multi-LED on the body of the SR-750/SR-700 Series changes according to the code reading status.

3 When all setting codes are read, the multi-LED on the SR-750/SR-700 Series displays "d".

4 Press the TUNE button once briefly to finish the quick setup code reading operation.

- To cancel the quick setup code reading operation, press the TUNE button once briefly.
  When "F" is displayed on the multiple LED display, press the TUNE button once briefly again.

■ Sending the quick setup code reading commands

Send the quick setup code reading command (RCON) to the SR-750/SR-700 Series to read the quick setup code.

1 Send the "RCON" command from the control device.

When the SR-750/SR-700 Series receives the command normally, it returns "OK, RCON", and "C" and "0" are displayed alternately on the multiple LED indicator of the SR-750/SR-700 Series main unit.

2 Read the quick setup code.

According to the code reading status, values displayed on the multiple LED indicator of the SR-750/SR-700 Series main unit change.

3 When all quick setup codes are read, "d" is displayed on the multiple LED indicator of the SR-750/SR-700 Series main unit.

4 Send the "RCOFF" command from the control device.

When the SR-750/SR-700 Series receives the command normally, it returns "OK, RCOFF", and the quick setup code reading operation finishes. (After the setting is reflected, "d" on the multiple LED goes off.)

- To cancel the quick setup code reading operation, send the "RCOFF" command.

3-11 Matching level OK/NG Judgment Function SR-750 SR-700

This section describes the matching function of the SR-750/SR-700 Series.

Matching level

Matching level is a reference value for determining how easy it is for the SR-750/SR-700 Series to read the code for successful image reading when the SR-750/SR-700 Series reads the code successfully.
It can be used to check the reading allowance or it can also be used as correlation index of a parameter bank when calibrating.

Point

Since the QR code and DataMatrix have the error correcting symbol, data can be restored even if the code is partially corrupted. Therefore, the reading rate may become 100%. However, because the matching level is a value that represents ease of code reading, the matching level varies depending on code marking, corruption condition, and difference in read conditions even if the reading rate is 100%.
By checking the matching level, the function can be used as an index for determining optimum marking conditions for reading when specifications of code marking conditions are considered.

Matching level OK/NG judgment function

Matching level OK/NG judgment function notifies about changes in code marking conditions and changes in read conditions by determining whether the matching level is high or low against the set threshold. Before a serious problem occurs due to reduced stability of reading, this function can be used as information to take an appropriate action.

Criteria for judging matching level

Criteria for judging the matching level is as follows:
High: Matching level >= Threshold
Low: Matching level < Threshold

Functions that use the matching level OK/NG judgment function

The following 4 types of functions can be used by enabling the matching level OK/NG judgment function.

■ STABLE terminal output, UNSTABLE terminal output

STABLE terminal output.....Output when the matching level exceeds the threshold.
UNSTABLE terminal output ....Output when the matching level falls below the threshold.
(📖 "Page 25 Function and Operation of the Output Terminals")

■ Saving unstably read images

When the matching level is lower than the threshold, save it in accordance with the scan image settings (when set to FTP transmission, send to the destination).
(📖 "Page 26 Image Saving Function")

■ Silent Mode

When the matching level is higher or lower than the threshold, data communication can be restrained using silent mode.
(📖 "Page 28 Silent mode")

■ Function to append matching level

Matching level can be appended to read data.
(📖 "Page 87 Details of Appended Data")

Procedures for setting the matching level OK/NG judgment function

The following 2 procedures for setting the matching level OK/NG judgment function are available:
- Setting using the AutoID Network Navigator (📖 "Code quality verification" (Page 61))
- Setting with a setup command (📖 "Operation mode settings" (Page 106))

Point

When the matching level OK/NG judgment function is enabled, the decode time becomes longer than when it is disabled.
Perform calibration after enabling the matching level OK/NG judgment function or set the decode timeout period required for reading.
Check if it presents any problem to read time for operation using the read time test mode.
(📖 "3-4 Test Mode" (Page 21))

3-12 Code quality verification function SR-750 SR-700

This section describes the Code quality verification function.

Code quality verification function for the SR-750/SR-700 Series

The Code quality verification function evaluates the level (High/Low) of total grade based on the verification result output and the set threshold by verifying the 2D code scanned with the SR-750/SR-700 Series according to the marking quality evaluation specified by a third-party institution.
The SR-750/SR-700 Series provides the following 2D code verifications according to the Code quality verification standards..

Standards	Description
ISO/IEC15415	This is the 2D code marking quality evaluation standard established by International Organization for Standardization. This is mainly used to evaluate 2D codes printed on labels.
ISO/IEC TR 29158 (AIM DPM-1-2006)	This is the DPM (Direct Part Marking) 2D code marking quality evaluation standard established by Automatic Identification Manufacturers. This is based on ISO/IEC15415. This was also standardized by International Organization for Standardization in 2011.
SAE AS9132	This is the DataMatrix code marking quality evaluation standard established by SAE (Society of Automotive Engineers) and used by the aerospace industry.
SEMI T10-0701	This is the DataMatrix code marking quality evaluation standard established by SEMI (Semiconductor Equipment and Materials International) and printed on semiconductor-related materials.
Japanese Pharmaceutical Code quality verification	Function for evaluating the print quality of codes on pharmaceuticals, recommended by the Safety Division of Pharmaceutical and Food Safety Bureau and the Economic Affairs Division of Health Policy Bureau under the Ministry of Health, Labour and Welfare. It makes reference to ISO/IEC15415 and ISO/ IEC15416.
ISO/IEC16022	Function to evaluate print quality of DataMatrix code. See ISO/IEC16022:2000.

Important

Note that this Code quality verification function is designed to evaluate marking quality of the standards-compliant 2D codes of the images scanned with the SR-750/SR-700 Series, but cannot be used as an official 2D code verification device.

Reference

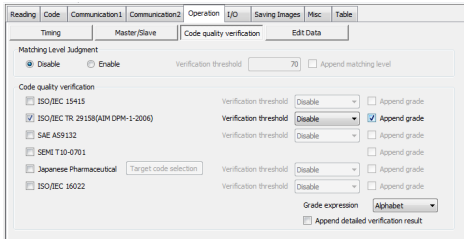
If ISO/IEC15415 is selected, PDF417 and MicroPDF unit print verification is possible.

Code quality verification function settings

This section describes the setting method of the Code quality verification function and the setting items.

Setting method for the Code quality verification function

To use the Code quality verification function, you need to enable the verification settings you wish to use.
(1) Setting using the AutoID Network Navigator.
Press the "Code quality verification" button on the "Operation" tab in the Settings view, and then check the desired verification standard.



(2) Setting using the setup commands
Send commands that enable the verification functions you wish to use.
📖 "8-3 Details of Configuration Commands - Reading operation setting (Page 102)"

Point

When the Code quality verification function is enabled, the decode time becomes longer than when it is disabled.
Perform calibration after enabling the Code quality verification function or set the decode timeout period required for reading.
Use the tact measurement test mode to confirm there is no problem with reading time for operation.
(📖 "3-4 Test Mode" (Page 21))

Append Code quality verification result data

To append the Code quality verification result data, the additional data setting and data format setting are required.

■ Additional data setting

Select "Operation" - "Additional data" on the "Table" tab in the Settings view, and then set verification results you wish to append as data to "Enable".

"5-4 Details of Settings View - [Table] tab (Page 63 or later)"
"3-12 Code quality verification function - Verification items description (Page 32 or later)"

■ Data format setting

Make the setting relating to the data format.
Set the following three items.

- Select expression of grades : Set the grade indication of the verification result to either Alphabet or Numeric. (SAE AS9132 and SEMI T10-0701 are excluded)
- Append detailed verification result : Set whether to append verification items of each standard to the total grade. (SEMI T10-0701 is excluded)
- Append values : Set whether to append evaluation values of each verification item used for verification result evaluation. (SEMI T10-0701 is excluded)

"7-2 Data Communication Format (Page 86)"

Code quality verification function Evaluation standard

Evaluation by the Code quality verification function is made for the total evaluation grade. Evaluation standards are as follows.

■ ISO/IEC15415, ISO/IEC TR 29158 (AIM DPM-1-2006), Japan Medical Pharmaceuticals, ISO/IEC 16022

High: Verification result >= Threshold value
Low: Verification result < Threshold value

■ SAE AS9132

High: Verification result = Pass
Low: Verification result = Fail

Important

SEMI T10-0701 does not offer total evaluation grade and cannot make evaluations.
This means that functions that can be used after evaluation cannot be used with SEMI T10-0701.

Functions that can use evaluation results of the Code quality verification function

■ STABLE terminal output, UNSTABLE terminal output

STABLE terminal output..... This is output when the total evaluation grade is the threshold value or more.
UNSTABLE terminal output ... This is output when the total evaluation grade is less than the threshold value.

("3-6 Multi-I/O Function (Page 24)")

■ Saving images of unstable reading

When the total evaluation grade is less than the threshold value, scanned images are saved according to the setting (If the FTP transmission is set, images are sent to the connection destination.).

("3-7 Image Saving Function (Page 26)")

■ Silent mode

When the total evaluation grade is more or less than the threshold value, data communication can be restrained using the silent mode.

("3-8 Silent Mode (Page 28)")

Point

When multiple verifications are in process, these functions operate in priority to the result which is less than the threshold value.

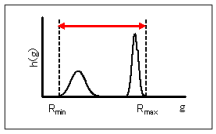
Note when using the Code quality verification function

- Code quality verification results may change according to the setting of the parameter bank for scanning. If the color or contrast of the 2D code and background change, consider preparing the parameter bank setting used as standard and performing the Code quality verification using the setting.
- Ensure that there are five or more pixels per cell.

Verification items description

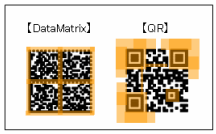
ISO/IEC 15415

Decode success/failure		DEC (Decode)
Description	Evaluates whether decoding is possible or not.	—
Calculation formula	—	
Criterion	—	

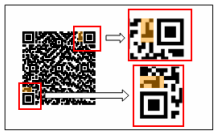
Symbol contrast		SC (Symbol Contrast)
Description	Evaluates the difference between the maximum brightness value (Rmax) and minimum brightness value (Rmin) in the code area.	
Calculation formula	SC = (Rmax-Rmin)/255 Rmax : Maximum brightness value Rmin : Minimum brightness value	
Criterion	A : more than 0.70 B : 0.55 to 0.70 C : 0.40 to 0.55 D : 0.20 to 0.40 F : less than 0.20	

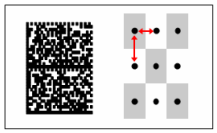
Modulation		MOD (Modulation)
Description	Evaluates the variation degree in cell brightness	—
Calculation formula	Each cell's MOD = 2 ∗ (abs (R-GT)/SC) R : Brightness value GT : Binarization threshold value SC : Symbol contrast	
Criterion	—	

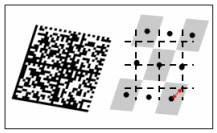
Reflectance margin		RM (Reflectance Margin)
Description	Evaluates the variation degree in cell brightness with black and white of the correct cell considered.	—
Calculation formula	[White cell] R >= GT → MARGIN = 2 ∗ (R-GT)/SC R < GT → MARGIN = 0 [Black cell] R < GT → MARGIN = 2 ∗ (GT-R)/SC R >= → MARGIN = 0 MARGIN : Margin of each cell R : Brightness value GT : Binarization threshold value SC : Symbol contrast	
Criterion	—	

Fixed pattern damage		FPD (Fixed Pattern Damage)
Description	Evaluates the degree of the fixed pattern damage (area on the right) dependent on the code type.	
Calculation formula	—	
Criterion	—	

Format information damage		FID (Format Information Damage)
Description	Evaluates the format information damage degree of QR code.	
Calculation formula	—	
Criterion	—	

Version information damage		VID (Version Information Damage)
Description	Evaluates the version information damage degree of QR code (Model 2, version 7 and later versions).	
Calculation formula	—	
Criterion	—	

Axial nonuniformity		AN (Axial Nonuniformity)
Description	Evaluates the distortion degree in vertical and horizontal size of the code.	
Calculation formula	AN = abs (Xavg = Yavg)/((Xavg = Yavg)/2) Xavg : Average cell size in horizontal direction Yavg : Vertical cell size in horizontal direction	
Criterion	A : less than 0.06 B : 0.06 to 0.08 C : 0.08 to 0.10 D : 0.10 to 0.12 F : more than 0.12	

Grid nonuniformity		GN (Grid Nonuniformity)
Description	Evaluates the maximum position slip of each cell	
Calculation formula	GN = Hmax/X Hmax : Maximum position slip amount X : Cell size	
Criterion	A : less than 0.38 B : 0.38 to 0.50 C : 0.50 to 0.63 D : 0.63 to 0.75 F : more than 0.75	

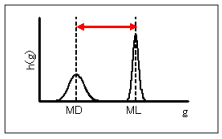
Unused error correction		UEC (Unused Error Correction)
Description	Evaluates the ratio of error correction unused at the time of decoding.	—
Calculation formula	UEC = 1.0 - ((e + 2t)/(d - p)) e : Number of code words that cannot be read t : Number of error code words d : Number of error corrected code words p : Number of error detected code words	
Criterion	A : more than 0.62 B : 0.50 to 0.62 C : 0.37 to 0.50 D : 0.25 to 0.37 F : less than 0.25	

Print growth (horizontal)		PGH (Print Growth Horizontal)
Description	Evaluates the mark cell growth in the horizontal direction. This item is not included in the total evaluation.	
Calculation formula	(D - 0.5)/0.15 D : On the horizontal clock pattern Ratio of the number of pixels of mark cell	
Criterion	A : -0.50 to 0.50 B : -0.70 to -0.50 or 0.50 to 0.70 C : -0.85 to -0.70 or 0.70 to 0.85 D : -1.00 to -0.85 or 0.85 to 1.00 F : less than -1.00 or more than 1.00	

Print growth (vertical)		PGV (Print Growth Vertical)
Description	Evaluates the mark cell growth in the vertical direction. This item is not included in the total evaluation.	
Calculation formula	(D - 0.5)/0.15 D : On the vertical clock pattern Ratio of the number of pixels of mark cell	
Criterion	A : -0.50 to 0.50 B : -0.70 to -0.50 or 0.50 to 0.70 C : -0.85 to -0.70 or 0.70 to 0.85 D : -1.00 to -0.85 or 0.85 to 1.00 F : less than -1.00 or more than 1.00	

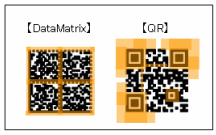
ISO/IEC TR 29158 (AIM DPM-1-2006)

Decode success/failure		DEC (Decode)
Description	Evaluates whether decoding is possible or not.	—
Calculation formula	—	
Criterion	—	

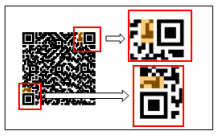
Cell contrast		CC (Cell Contrast)
Description	Evaluates the difference between the average brightness value of bright cell (ML) and average brightness value of dark cell (MD).	
Calculation formula	CC = (ML - MD)/ML ML : Average brightness value of bright cell MD : Average brightness value of dark cell	
Criterion	A : more than 0.30 B : 0.25 to 0.30 C : 0.20 to 0.25 D : 0.15 to 0.20 F : less than 0.15	

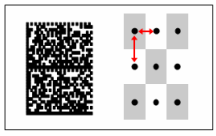
Cell modulation		CM (Cell Modulation)
Description	Evaluates the variation degree in cell brightness	—
Calculation formula	[White cell] CM = (R - GT)/(ML - GT) (When R ≥ GT) [Black cell] CM = (GT- R)/(GT- MD) (When R < GT) R : Brightness value GT : Binarization threshold value ML : Average brightness value of bright cell MD : Average brightness value of dark cell	
Criterion	—	

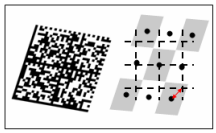
Reflectance margin		RM (Reflectance Margin)
Description	Evaluates the variation degree in cell brightness with black and white of the correct cell considered.	—
Calculation formula	[White cell] R >= MARGIN = (R-GT)/(ML-GT) R < GT → MARGIN = 0 [Black cell] R < GT→MARGIN = (GT-R)/(GT-MD) R >= → MARGIN = 0 MARGIN : Margin of each cell R : Brightness value GT : Binarization threshold value CC : Cell contrast	
Criterion	—	

Fixed pattern damage		FPD (Fixed Pattern Damage)
Description	Evaluates the degree of the fixed pattern damage (area on the right) dependent on the code type.	
Calculation formula	—	
Criterion	—	

Format information damage		FID (Format Information Damage)
Description	Evaluates the format information damage degree of QR code.	
Calculation formula	—	
Criterion	—	

Version information damage		VID (Version Information Damage)
Description	Evaluates the version information damage degree of QR code (Model 2, version 2 and later versions).	
Calculation formula	—	
Criterion	—	

Axial nonuniformity		AN (Axial Nonuniformity)
Description	Evaluates the distortion degree in vertical and horizontal size of the code.	
Calculation formula	AN = abs (Xavg - Yavg)/((Xavg + Yavg)/2) Xavg : Average cell size in horizontal direction Yavg : Vertical cell size in horizontal direction	
Criterion	A : less than 0.06 B : 0.06 to 0.08 C : 0.08 to 0.10 D : 0.10 to 0.12 F : more than 0.12	

Grid nonuniformity		GN (Grid Nonuniformity)
Description	Evaluates the maximum position slip of each cell	
Calculation formula	GN = Hmax/X Hmax : Maximum position slip amount X : Cell size	
Criterion	A : less than 0.38 B : 0.38 to 0.50 C : 0.50 to 0.63 D : 0.63 to 0.75 F : more than 0.75	

Unused error correction		UEC (Unused Error Correction)
Description	Evaluates the ratio of error correction unused at the time of decoding.	—
Calculation formula	UEC = 1.0 - ((e + 2t)/(d - p)) e : Number of code words that cannot be read t : Number of error code words d : Number of error corrected code words p : Number of error detected code words	
Criterion	A : more than 0.62 B : 0.50 to 0.62 C : 0.37 to 0.50 D : 0.25 to 0.37 F : less than 0.25	

Print growth (horizontal)		PGH (Print Growth Horizontal)
Description	Evaluates the mark cell growth in the horizontal direction. This item is not included in the total evaluation.	
Calculation formula	(D - 0.5)/0.15 D : On the horizontal clock pattern Ratio of the number of pixels of mark cell	
Criterion	A : -0.50 to 0.50 B : -0.70 to -0.50 or 0.50 to 0.70 C : -0.85 to -0.70 or 0.70 to 0.85 D : -1.00 to -0.85 or 0.85 to 1.00 F : less than -1.00 or more than 1.00	

Print growth (vertical)		PGV (Print Growth Vertical)
Description	Evaluates the mark cell growth in the vertical direction. This item is not included in the total evaluation.	
Calculation formula	(D - 0.5)/0.15 D : On the vertical clock pattern Ratio of the number of pixels of mark cell	
Criterion	A : -0.50 to 0.50 B : -0.70 to -0.50 or 0.50 to 0.70 C : -0.85 to -0.70 or 0.70 to 0.85 D : -1.00 to -0.85 or 0.85 to 1.00 F : less than -1.00 or more than 1.00	

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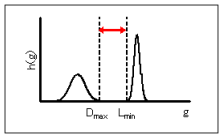
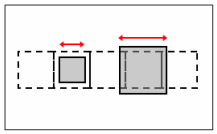
Quiet zone		QZ (Quiet Zone)
Description	Evaluates if multiple cells of quiet zone exist around the code.	
Calculation formula	—	
Criterion	—	

Symbol contrast		SC (Symbol Contrast)
Description	Evaluates the difference between the maximum brightness value of dark cell (Dmax) and minimum brightness value of bright cell (Lmin) in the code area.	
Calculation formula	(Lmin - Dmax)/255 Lmin : Minimum brightness value of bright cell Dmax : Maximum brightness value of dark cell	
Criterion	Pass : more than 0.20 Fail : less than 0.20	

Angular distortion		AD (Angular Distortion)
Description	Evaluates the distortion degree from 90 degrees of the angle formed by the straight line at L part.	
Calculation formula	—	
Criterion	Pass : -7 to 7 Fail : less than -7 or more than 7	

Module fill		MF (Module Fill)
Description	Evaluates the distortion from the correct size of the cell size.	
Calculation formula	Length of the side of cell/Module size	
Criterion	Pass : 0.60 to 1.05 Fail : less than 0.60 or more than 1.05	

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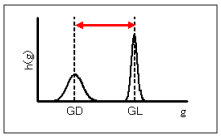
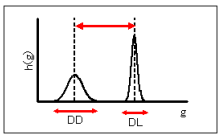
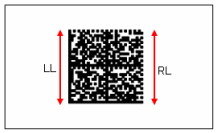
Symbol contrast		SC (Symbol Contrast)
Description	Evaluates the difference between the average brightness value of background (GL) and average brightness value of foreground (GD).	
Calculation formula	(GL - GD)/255 GL : Average brightness value of background GD : Average brightness value of foreground	
Criterion	1 is the best.	

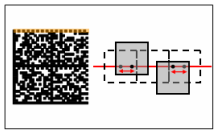
Signal to noise ratio		SNR (Signal to Noise Ratio)
Description	Evaluates the symbol contrast size against brightness variation.	
Calculation formula	(GL - GD)/Max (DL, DD) GL : Average brightness value of background GD : Average brightness value of foreground DL : Dispersion of background brightness value DD : Dispersion of foreground brightness value Max() : Maximum value	
Criterion	The greater, the better.	

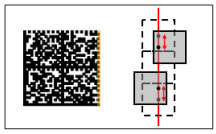
Horizontal mark growth		HMG (Horizontal Mark Growth)
Description	Evaluates the expansion and contraction degree of mark cell width of the timing pattern on the upper part.	
Calculation formula	Med (MCW)/(Med (MCW) + Med (SCW)) MCW : Mark cell width SCW : Space cell width Med () : Median value	
Criterion	0.5 is the best. Small→Thin Large→Thick	

Vertical mark growth		VMG (Vertical Mark Growth)
Description	Evaluates the expansion and contraction degree of mark cell height of the timing pattern on the right.	
Calculation formula	Med (MCH)/(Med (MCH) + Med (SCH)) MCH : Mark cell height SCH : Space cell height Med () : Median value	
Criterion	0.5 is the best. Small→Thin Large→Thick	

Average cell width		DMCW (DataMatrix Cell Width)
Description	Evaluates the average cell width.	
Calculation formula	(UL + BL)/(2 ∗ N) UL : Length of upper side BL : Length of bottom side N : Number of horizontal cells	
Criterion	—	

Average cell height		DMCH (DataMatrix Cell Height)
Description	Evaluates the average cell height.	
Calculation formula	(RL + LL)/(2 ∗ M) RL : Length of right side LL : Length of left side M : Number of vertical cells	
Criterion	—	

Horizontal misplacement		HMM (Horizontal Mark Misplacement)
Description	Evaluates the misplacement of the mark cell center position of the timing pattern on the upper part.	
Calculation formula	∑MHi/(N ∗ DMCW) MHi : Amount of the horizontal misplacement of each cell on upper TP N : Number of horizontal cells DMCW : Average cell width	
Criterion	0 is the best. (1 means the 1-cell misplacement.)	

Vertical misplacement		VMM (Vertical Mark Misplacement)
Description	Evaluates the misplacement of the mark cell center position of the timing pattern on the right.	
Calculation formula	∑MVi/(M ∗ DMCH) MVi : Amount of the vertical misplacement of each cell on the right TP M : Number of vertical cells DMCH : Average cell width	
Criterion	0 is the best. (1 means the 1-cell misplacement.)	

Cell defects		CD (Cell Defects)
Description	Evaluates the number of pixels for which white and black judgment was wrong.	—
Calculation formula	Number of wrong pixels/All pixels	
Criterion	0 is the best.	

Finder pattern defects		FPD (Finder Pattern Defects)
Description	Evaluates the number of pixels for which white and black judgment was wrong at the L part.	
Calculation formula	Number of wrong pixels at the L part/All pixels at the L part	
Criterion	0 is the best.	

Unused error correction		UEC (Unused Error Correction)
Description	Evaluates the ratio of error correction unused at the time of decoding.	—
Calculation formula	UEC = 1.0 - ((e + 2t)/(d - p)) e : Number of code words that cannot be read t : Number of error code words d : Number of error corrected code words p : Number of error detected code words	
Criterion	1.00 : Error correction is not used at all. 0.00 : Decoding failed or error correction has been used up.	

Japanese Pharmaceutical Code quality verification (GS1 DataBar Limited, GS1 DataBar Stacked, GS1-128)

Decode success/failure		DEC (Decode)
Description	Evaluates whether decoding is possible or not.	-
Calculation formula	-	
Criterion	A : Success F : Failure	

Number of edges		EDGE (EdgeDetermination)
Description	Determines whether the read number of edges is equal to the assumed number of edges.	-
Calculation formula	-	
Criterion	A : Match F : Mismatch	

Symbol contrast		SC (Symbol Contrast)
Description	Evaluates the difference between the maximum brightness value (Rmax) and minimum brightness value (Rmin) in the code area.	-
Calculation formula	SC = Rmax – Rmin	
Criterion	A : SC ≥ 70 % B : SC ≥ 55 % C : SC ≥ 40 % D : SC ≥ 20 % F : SC < 20 %	

Minimum Reflectance		MINR (Minimum Reflectance)
Description	Minimum reflectance among scanned waveforms	-
Calculation formula	-	
Criterion	A : Rmin ≤ 0.5 Rmax F : Rmin > 0.5 Rmax	

Minimum edge contrast		MINE (Minimum Edge Contrast)
Description	Minimum value of reflectance gap between space (including the quiet zone) and an adjacent bar	-
Calculation formula	EC = Rs - Rb ECmin = Min(EC) Rs : Reflectance of space Rb : Reflectance of space	
Criterion	A : ECmin ≥ 15% F : ECmin < 15%	

Modulation		MOD (Modulation)
Description	Ratio between the minimum edge contrast and the symbol contrast	-
Calculation formula	MOD = ECmin / SC	
Criterion	A : MOD ≥ 0.70 B : MOD ≥ 0.60 C : MOD ≥ 0.50 D : MOD ≥ 0.40 F : MOD < 0.40	

Minimum quiet zone		QZ (Quiet Zone)
Description	Evaluates whether the quiet zone width conforms to the standards.	-
Calculation formula	-	
Criterion	A : Satisfied F : Not satisfied	

* The evaluation of GS1 DataBar Limited (including CC-A/CC-B) is dependent on the main unit setting.

Decodability		DCD (Decodability)
Description	Decode margin is dependent on the code type Evaluates the level of error between the ideal line width pattern and the actual line width pattern.	-
Calculation formula	-	
Criterion	-	

Defects		DEF (Defects)
Description	Evaluates color unevenness in an element.	-
Calculation formula	Defects = ERNmax / SC ERN = (Gap between the maximum and minimum values of reflectance in an element), ERNmax = Max (ERN)	
Criterion	A : Defects ≤ 0.15 B : Defects ≤ 0.20 C : Defects ≤ 0.25 D : Defects ≤ 0.30 F : Defects > 0.30	

Japanese Pharmaceutical Code quality verification (PDF417, MicroPDF)

Decode success/failure		DEC(Decode)
Description	Evaluates whether decoding is possible or not.	-
Calculation formula	-	
Criterion	A : Success F : Failure	

Number of edges		EDGE (EdgeDetermination)
Description	Determines whether the read number of edges is equal to the assumed number of edges.	-
Calculation formula	-	
Criterion	A : Match F : Mismatch	

Symbol contrast		SC (Symbol Contrast)
Description	Evaluates the difference between the maximum brightness value (Rmax) and minimum brightness value (Rmin) in the code area.	-
Calculation formula	SC = Rmax – Rmin	
Criterion	A : SC ≥ 70 % B : SC ≥ 55 % C : SC ≥ 40 % D : SC ≥ 20 % F : SC < 20 %	

Minimum reflectance		MINR (Minimum Reflectance)
Description	Minimum reflectance among scanned waveforms	-
Calculation formula	-	
Criterion	A : Rmin ≤ 0.5 Rmax F : Rmin > 0.5 Rmax	

Minimum edge contrast		MINE (Minimum Edge Contrast)
Description	Minimum value of reflectance gap between space (including the quiet zone) and an adjacent bar	-
Calculation formula	EC = Rs – Rb ECmin = Min(EC) Rs : Reflectance of space Rb : Reflectance of space	
Criterion	A : ECmin ≥ 15% F : ECmin < 15%	

Modulation		MOD (Modulation)
Description	Ratio between the minimum edge contrast and the symbol contrast	-
Calculation formula	MOD = ECmin / SC	
Criterion	A : MOD ≥ 0.70 B : MOD ≥ 0.60 C : MOD ≥ 0.50 D : MOD ≥ 0.40 F : MOD < 0.40	

Minimum quiet zone		QZ (Quiet Zone)
Description	Evaluates whether the quiet zone width satisfies the standards.	-
Calculation formula	-	
Criterion	A : Satisfied F : Not satisfied	

Decodability		DCD (Decodability)
Description	Decode margin dependent on the code type Evaluates the level of error between the ideal line width pattern and the actual line width pattern.	-
Calculation formula	-	
Criterion	-	

Defects		DEF(Defects)
Description	Evaluates color unevenness in an element.	-
Calculation formula	Defects = ERNmax / SC ERN = (Gap between the maximum and minimum values of reflectance in an element), ERNmax = Max (ERN)	
Criterion	A : Defects ≤ 0.15 B : Defects ≤ 0.20 C : Defects ≤ 0.25 D : Defects ≤ 0.30 F : Defects > 0.30	

Effective codeword ratio		CY(Codeword Yield)
Description	Ratio of successfully read codewords	-
Calculation formula	-	
Criterion	A : CY ≥ 71% B : CY ≥ 64% C : CY ≥ 57% D : CY ≥ 50% F : CY < 50%	

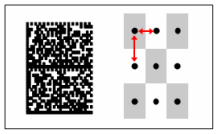
Codeword print quality		CPQ (Codeword Print Quality)
Description	Evaluates the print quality of codewords.	-
Calculation formula	-	
Criterion	-	

Unused error correction		UEC (Unused Error Correction)
Description	Evaluates the ratio of error correction unused at the time of decoding.	-
Calculation formula	UEC = 1.0 – ((e + 2t) / (d – p)) e : Number of codewords that cannot be read t : Number of error codewords d : Number of error corrected codewords p : Number of error detected codewords	
Criterion	A : UEC ≥ 0.62 B : UEC ≥ 0.50 C : UEC ≥ 0.37 D : UEC ≥ 0.25 F : UEC < 0.25	

ISO/IEC16022 Verification

Decode		DEC (Decode)
Description	Evaluates whether decoding is possible or not.	-
Calculation formula	-	
Criterion	A : Approved F : Failed	

Symbol Contrast		SC (Symbol Contrast)
Description	Evaluates the difference between the code region brightness top 10% average (RL) and bottom 10% average (RD).	-
Calculation formula	SC = RL – RD / 255	
Criterion	A : SC ≥ 70 % B : SC ≥ 55 % C : SC ≥ 40 % D : SC ≥ 20 % F : SC ≤ 20 %	

Axial Nonuniformity		AN (Axial Nonuniformity)
Description	Evaluate degree of distortion in the vertical and horizontal size of the code.	
Calculation formula	AN = abs (Xavg – Yavg) / (Xavg + Xavg) / 2) Xavg: Average cell size in horizontal direction Yavg: Average cell size in vertical direction	
Criterion	A : less than 0.06 B : 0.06 to 0.08 C : 0.08 to 0.10 D : 0.10 to 0.12 F : more than 0.12	

Unused Error Correction		UEC (Unused Error Correction)
Description	Evaluates percentage of error correction not used during decoding.	-
Calculation formula	UEC = 1.0 – ((e + 2t) / (d - p)) e : Number of code words not read t : Number of error code words d : Number of corrected code words p : Number of code words where error detected	
Criterion	A : more than 0.62 B : 0.50 to 0.62 C : 0.37 to 0.50 D : 0.25 to 0.37 F : less than 0.25	

Print Growth (Horizontal)		PGH (Print Growth Horizontal)
Description	Evaluates the growth in horizontal direction marked cell.	
Calculation formula	(D – 0.5) / 0.15 D : Proportion of number of pixels in marked cells on horizontal clock pattern	
Criterion	A : –0.50 to 0.50 B : –0.70 to –0.50 or 0.50 to 0.70 C : –0.85 to –0.70 or 0.70 to 0.85 D : –1.00 to –0.85 or 0.85 to 1.00 F : less than –1.00 or more than 1.00	

Print Growth Vertical		PGV (Print Growth Vertical)
Description	Evaluates the growth in vertical direction marked cell.	
Calculation formula	(D – 0.5) / 0.15 D : Proportion of number of pixels in marked cell on vertical clock pattern	
Criterion	A : –0.50 to 0.50 B : –0.70 to –0.50 or 0.50 to 0.70 C : –0.85 to –0.70 or 0.70 to 0.85 D : –1.00 to –0.85 or 0.85 to 1.00 F : less than –1.00 or more than 1.00	

3-13 Duplicate reading prevention interval reset

SR-750 SR-700

The duplicate read prevention function is equipped with the Multi1 reading mode not to read codes again that have been read once. The working time of this duplicate reading prevention function is set by the duplicate reading prevention interval. Two types of the duplicate reading prevention interval reset operation have been prepared with the SR-750 Series.

Types of the duplicate reading prevention interval reset

Two types of the duplicate reading prevention interval reset
- Reset when a code is read.
- Do not reset during duplicate reading prevention interval.

* The SR-700 Series is always "Do not reset during duplicate reading prevention interval.".

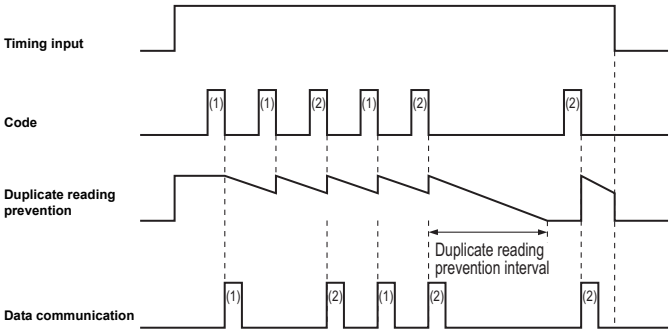
This section describes each operation.

Reset when a code is read.

SR-750

The duplicate reading prevention function works for one data most recently read. If different codes are read, the duplicate reading prevention interval is reset and the duplicate reading prevention function works for the newly read code data. The duplicate reading prevention interval count starts at the timing when the last code is read.

■ Timing chart



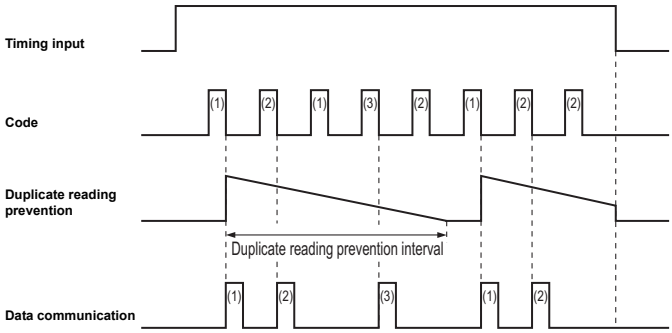
- When reading is successful, reading continues using the successful bank until a reading error occurs.
- If codes with the same contents are read in series, adjust the passing time longer than the time set with the duplicate reading prevention interval (setting range: 100 to 25500 ms). Codes with different contents can be read in series.
- The timing to start measuring the duplicate reading prevention interval is when the code that was read is outside the field of vision.

Do not reset during duplicate reading prevention interval.

SR-750 SR-700

The duplicate reading prevention function works for all codes read within the set duplicate reading prevention interval from when the timing input was done and the first code is read. The duplicate reading prevention function works again when the next code is read after the duplicate reading prevention interval finishes.

■ Timing chart



- Regardless of reading success or reading error, codes are read alternating parameter banks.
- Data amount during duplicate reading prevention interval for SR-750 is max. 160 codes, for SR-700 max. 128 codes, total 10K bytes.

Important

If multiple codes in the same type are seen in the field of view at the same time, take one of the following methods.
- **Prepare multiple parameter banks with the read length restricted, and make the setting so the parameter banks are switched for each code.**
- **Prepare multiple parameter banks with the decoding area restricted, and make the setting so the parameter banks are switched for each code.**

*** When Multi read (setting within 1 parameter bank) is set to Enable, if the code data that was read once matches with any of the multiple read code data in 1 scan, not all code data read in the scan are not output.**

3-14 Edit data function/Edit image file name function

SR-750 SR-700

With the edit data function, read data can be edited into a desired data format.
With the edit image file name function, when sending image files to upper ranks via FTP, the image file names can be edited into desired file names.

The edit data function and edit image file name function can do the following.

■ Edit data (Basic)

- Four arithmetic operations (add, subtract, multiply and divide)
- Conditional branching
- Adding arbitrary characters
- Extracting and combining arbitrary digits

■ Edit data (Advanced)

Various types of data can be built using four arithmetic operations, conditional branching, etc. from appended data information, etc.
[Example]
- Code rotation angle (Calculated from top coordinates)
- OUT signal output control (SR-700 Series only)

■ Edit image file name

- Time stamp*
- Append read data

Important

- **The edit image file name function is available only for images sent via FTP.**
  This does not function for images saved in RAM and ROM.
- **This does not support quick setup codes.**

*** When using the time stamp, enable the SNTP function of SR-750 and connect to the SNTP server.**
(For SNTP setting items, refer to Page 69.)

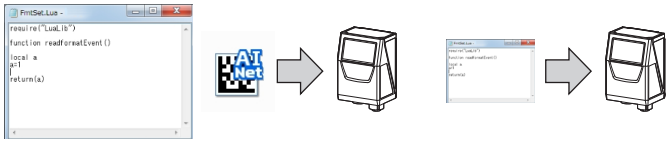
- **The SR-700 Series only supports the edit data function.**

Procedure for setting the edit data function and edit image file name function

The edit data function and the edit image file name function can be used by sending the file which contains the program of Script to SR-750/SR-700 Series and enabling the "Use script file" setting.

Setting procedure

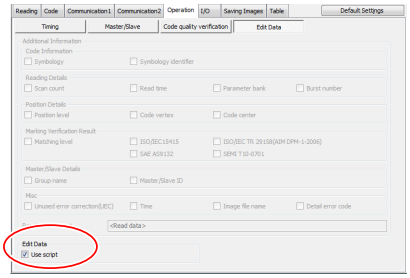
[1] Creating the script file → [2] Changing the script execution setting → [3] Transferring the script file



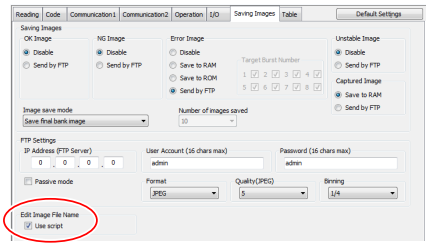
[1] Creating the script file
Create the script file (FmtSet.lua) and write the program using a text editor such as notepad.exe.
* For programming method, refer to "SR-D100/750 Series Script Reference".

[2] Changing the script execution setting
Using the AutoID Network Navigator, set the script execution setting of the SR-750/SR-700 Series to "Enable".
This must be set for the edit data function and the edit image file name function respectively.

[Edit data function - Script execution setting item]



[Edit image file name function - Script execution setting item]



[3] Transferring the script file
Transfer the script file (FmtSet.lua) to the SR-750/SR-700 Series.
Following are the transfer methods.
- Sending configuration of AutoID Network Navigator
- Transferring only the script file from the AutoID Network Navigator terminal
- Transferring using the Fileview software
- Transferring using the FTP

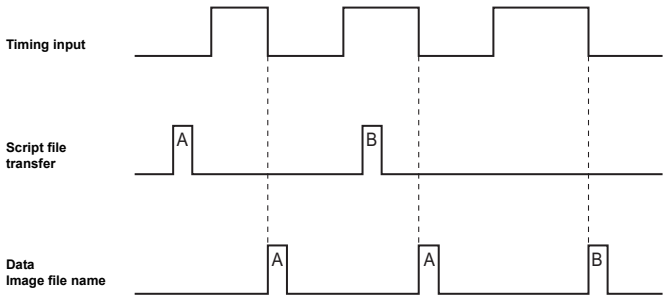
Important

When transferring the script file using the Fileview software or the FTP, set the file name to "FmtSet.Lua".

Script file reflection timing

Even if the script file is in operation, transfer is possible each time by using the FTP. In this case, the reflection timing of the script program is from the timing ON after file transfer.

■ Timing chart



Handing of the script file when settings are changed, etc.

This section describes how to handles the script file when restoring to the default settings or using the changeover function.

Operation contents		FmtSet.lua
AutoID Network Navigator "Retrieve Configuration"		Receives with the configuration file at the same time.
AutoID Network Navigator "Send Configuration"		Sends with the configuration file at the same time.
AutoID Network Navigator "Default Settings"		Remains.
Send or delete by FileView		Transmission and deletion possible from PC.
Reading quick setup codes		Remains.
Send command	SAVE	Remains.
	LOAD	Remains.
	DFLT	Remains.

When executing the script file - status confirmation command

■ Obtaining the script processing time

Send command SCPTIME
Response OK, SCPTIME, now=AAus, max=BBus, min=CCus
AA: Returns the most recent script processing time.
BB: Returns the maximum value of the processing time.
CC: Returns the minimum value of the processing time.

- Returns the processing time of script executed after power ON.

■ Script debug setting

Send command SCPDBG, n
Response OK, SCPDBG
n= 0: Script debug OFF
n=1: Script debug ON

- This sets whether to output debug from the script file to the command port or not.
- Setting the debug ON executes print(str) and outputs data.

■ Obtaining the script error results

Send command SCPERR
Response OK, SCPERR, mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm
mm… : Script error character string

- This returns the details of script error.

■ Obtaining the script version

Send command SCPVER
Response OK, SCPVER, mmmm, nnnn
mm...: Script library version
nn… : FmtSet.lua version
(Only when FmtSet.lua exists and the version is defined)

- FmtSet.Lua version is the value stored in variable name "SCPVERSION" within the FmtSet.Lua file.
- This returns the script library version and the FmtSet.lua version.
- If the script library does not exist, the error code 12 is returned.

* The script library is a library file to use the edit data function and the edit image file name function.

3-15 Changeover function

SR-700

Changeover function

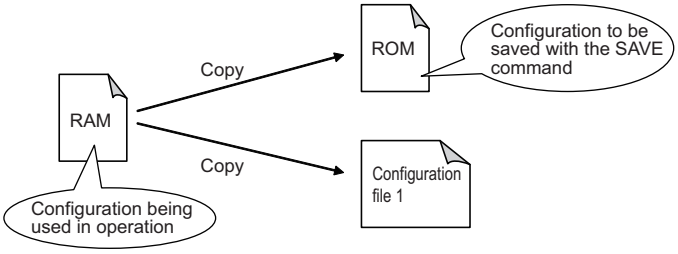
When reading 2D codes of workpieces proceeding on a line, the type of proceeding workpiece may change. In this case, you may want to make the parameter bank settings dedicated to the target workpiece.
For example, there are 4 types of codes and each code type needs 3 parameter banks. In this case, total of 12 banks must be prepared. It will take time to reach the target bank when the code type changes.
Another example. You may want to read multiple codes at once. Workpiece A has 2 codes and workpiece B has 3 codes. In this case, the number of output data cannot be changed with only one setting.

With SR-700, up to 8 configuration files and script files can be retained. Switching the settings with commands enables switching (changeover) of parameter bank setting.
Thus, the unit can be operated with the setting dedicated to the reading target workpiece. Codes can be read only with necessary banks and the data format can be adjusted to the workpiece.

Creating the changeover configuration file, and the reading command

■ Command to create the configuration file and the script file

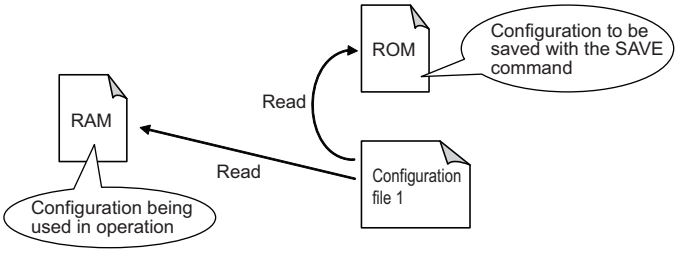
This is the command to create the configuration file and the script file to be retained.
This saves the settings in RAM to ROM and the configuration file to be retained.



Send command	BSAVE, m
Response	OK, BSAVE
m = 1 to 8	ROM configuration file number at copy destination (config1.ptc, config2.ptc …)
	ROM script file number at copy destination (FmtSet1.Lua, FmtSet2.Lua …)

■ Command to read the configuration file and the script file

This is the command to read the contents of the retained configuration file to RAM and ROM.
Use this command to switch the setting.



Send command	BLOAD, m
Response	OK, BLOAD
m = 1 to 8	Configuration file number to read (config1.ptc, config2.ptc …)
	Script file number to read (FmtSet1.Lua, FmtSet2.Lua …)

*The setting will be reflected after loading is complete.

Setting procedure

1 Send the first setting to SR-700 using AutoID Network Navigator.

2 Send "BSAVE,1" using the terminal.
→ config1.ptc, FmtSet1.Lua (first configuration file) will be created.

3 Send the second setting to SR-700 using AutoID Network Navigator.

4 Send "BSAVE,2" using the terminal.
→ config2.ptc, FmtSet2.Lua (second configuration file) will be created.

5 Necessary configuration files are created in the same procedure.

6 In operation, send "BLOAD,m" and operate with the setting according to the purpose.

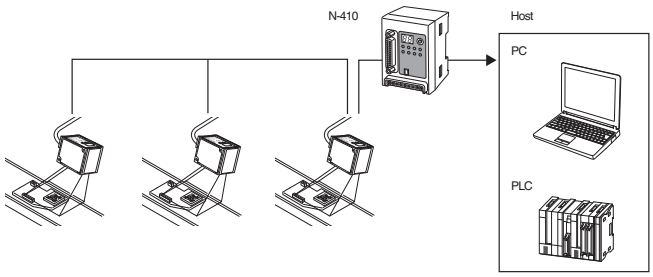
3-16 Multi-drop link communication

SR-700

The SR-700 Series can be connected to the RS-485 Master Unit N-410 and the multi-drop link configuration can be used.
N-410 is equipped with the following 2 modes. For details on N-410, please see the "RS-482 Master Unit N-410 Manual".

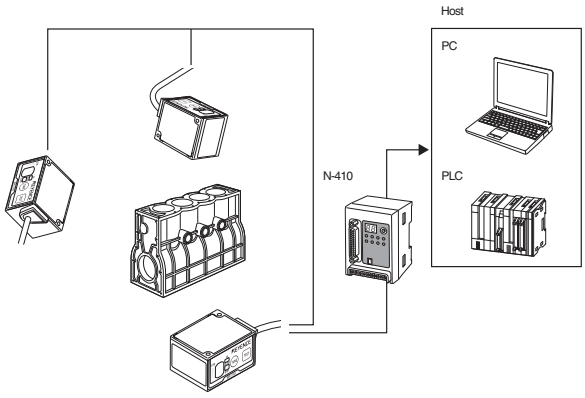
Multi-drop link mode

Multiple units operating with different purposes (max 31 units), and data read by SR-700 units, collected by N-410 and sent to the host. When multiple unit communication control is no longer necessary, the program can be switched to a concise system.

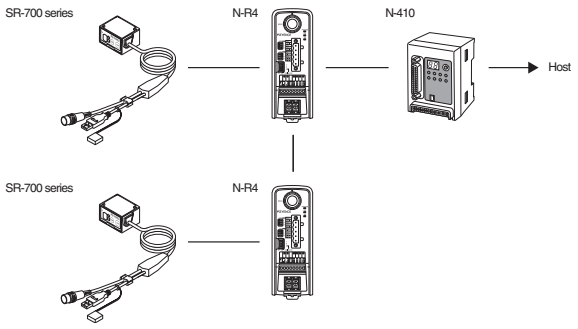


Multi-head mode

Multiple SR-700 series units (max 31 units) are treated as a single device, so the host does not need to consider multiple devices, enabling a simplified system in the program.

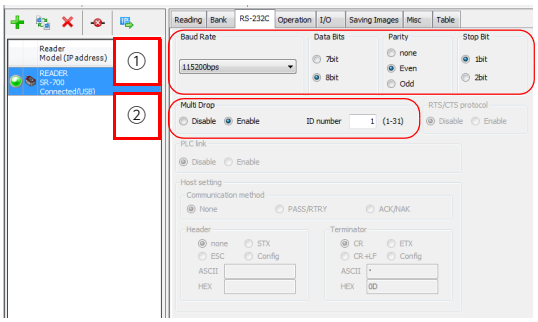


Device configuration



Setting method

SR-700 Series settings (Set-up software: AutoID Network Navigator)



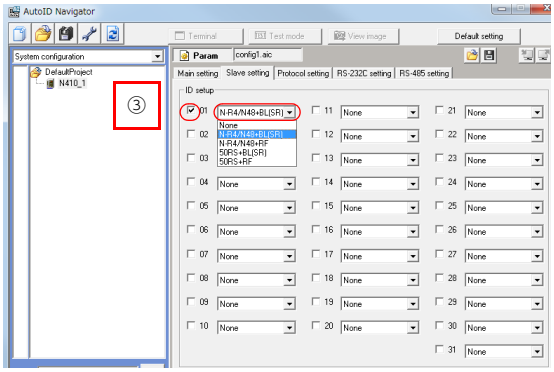
1 Set up RS-232C.

Set up so the settings in (1) are identical to the N-410 RS-485 settings.

2 Activate multi-drop.

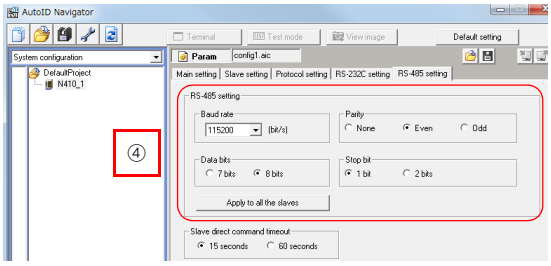
When setting (2), any ID number can be set. However, make sure that the same ID number is not used for multiple devices.

N-410 settings (Set-up software: AutoID Navigator)



3 Set up a slave unit.

Here the ID set for the SR-700 is registered.
Select "N-R4/N-48+BL(SR)" from the list box for the corresponding ID number.
If using auto-polling, put a check in the check box to the left of the ID number.
If using manual polling, a check is not necessary.



4 Set-up RS-485.

For (4), match settings with the RS-232C settings for the connecting slave unit (SR-700).

4-1 Reading Operations SR-750 SR-700

This section describes the reading conditions of the SR-750/SR-700 Series.

Steps of Read Operation

The SR-750/SR-700 Series follows the read sequence below:

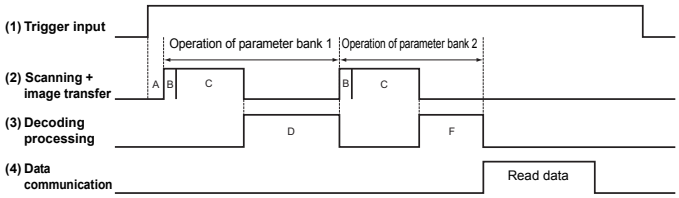
(1) Trigger input processing : Trigger input is verified and light is controlled.
(2) Scanning + image transfer : The image is scanned within the specified exposure time and the image is transferred.
(3) Decoding processing : The captured image is filtered and the code is processed (decoded).
(4) Data communication processing : The decoded results are output as data.

Since (2) and (3) above are based on the settings registered with the parameter banks, operation is repeated using alternate banks until a code is read or the trigger input is turned off.

Specify the following operations for the above processing:
- Timing Mode Specify from level trigger or one-shot trigger.
- Data Transmission Select "Send after read" or "Send after timing OFF".
- Read mode Specify from Single, Multi1, Multi 2 or burst.
  * Multi 2 is for SR-750 Series only

Timing Chart

This section describes the steps of basic operations of the SR-750/SR-700 Series.
Operating conditions are as follows:
- Timing Mode : Level trigger
- Timing to send data : Send after read
- Read mode : Single
- Parameter bank : Set 2 banks, alternate mode

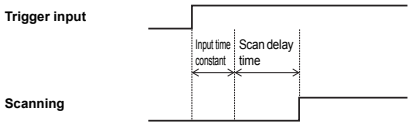


A: Input time constant + Scan delay time
B: Exposure time set for each parameter bank (max. 9.99 ms)
C: Image transfer time (approx. 16 ms)
D: Decode time out period set for each parameter bank (Max. 2550 ms)
F: Decoding time when reading is successful

- The above is the image when reading is successful. For read error, B, C and D are repeated continuously and read error data is output when the trigger input is turned off.

Scan delay time

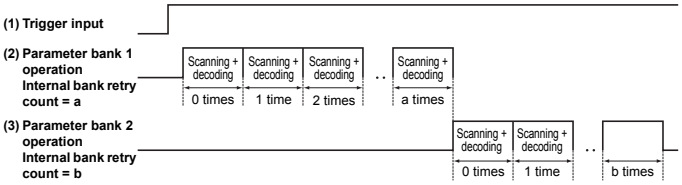
When the entry timing of the target to be conveyed is shifted from the input timing of the timing sensor, set the "scan delay time".
This makes it possible to start scanning under optimum read conditions by setting the delay for the timing at which emission of light of the SR-750/SR-700 Series begins.
- The time can be set between 0 and 255 ms (for SR-750) and 0 and 2550 ms (for SR-700) in increments of 1 ms (Default: 0 ms).
- Set the scan delay period for the parameter bank.



Internal bank retry count

When the internal bank retry count is set, 1 parameter bank is repeated. When decoding cannot be complete within the specified internal bank retry count, operation to switch to the next parameter bank is possible.
If reading operation becomes unstable due to vibration of the workpiece, setting the internal bank retry count enables stable reading.

■ Timing Chart



- The internal bank retry count can be set within the range from 0 to 32. (Factory setting: 0)
- If a large number is set for the internal bank retry count and multiple parameter banks are registered, reading time per time will become longer. Secure sufficient reading time so that reading can be stable.

4-2 Timing Mode

SR-750 SR-700

This section describes the timing mode of the SR-750/SR-700 Series.

Type of timing mode

The SR-750/SR-700 Series provides the following 2 types of timing mode.
- Level trigger
- One-shot trigger

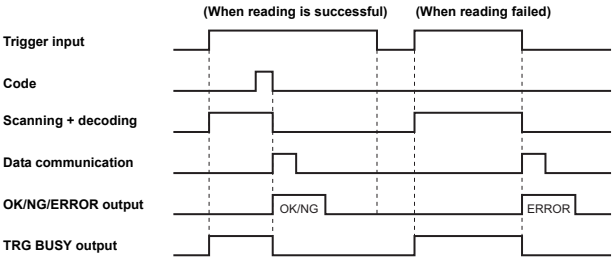
For the remainder of this section, assume the following settings are used:
- SR Series : SR-750
- Read mode : Single
- Data Transmission : Send after read
- Output terminal settings OUT1 = OK
  OUT2 = NG + ERROR
  OUT3 = TRG BUSY

* Output terminal settings "3-6 Multi-I/O Function (Page 24)"
* For convenience sake, the timing chart does not indicate the input pulse width + scan delay time.

Level trigger

When the trigger input turns on, the SR-750 Series turns on the illumination to start scanning.
When a code is read successfully, it stops illumination and sends the data.
If the SR-750 Series fails to read a code, it stops illumination when the trigger input turns off and sends a reading error.

■ Timing Chart



- Set the trigger input so it stays ON from the reading start time until reading end time.
- The light of the SR-750 Series turns on after the trigger input has been activated for the specified input time constant.
- The input time constant for the trigger input can be changed to 1 ms, 2 ms, or 10 ms.
- The RS-232C data communication time can be obtained using the following equation:

$$\text{Data communication time} = \frac{\text{Data length + (1: When parity is used) + Start/stop bits}}{\text{Baud rate}} \times \text{(Number of digits of data to be sent + Number of characters of header and terminator)}$$

- The ON time for the OK/NG/ERROR output can be set within the range of 10 to 2550 ms (Default: 500 ms).

Point

When a code is read at an interval shorter than the specified output ON time, the OK/NG/ERROR output turns off even if the output ON time of the previous output signal has not elapsed, and a new output signal turns on for the specified output ON time. If output terminal operations of the same type occur successively (such as OK→OK), the previous output signal turns off for 10 ms, and then the new output signal turns on.
Refer to "Page 25 Function and Operation of the Output Terminals".

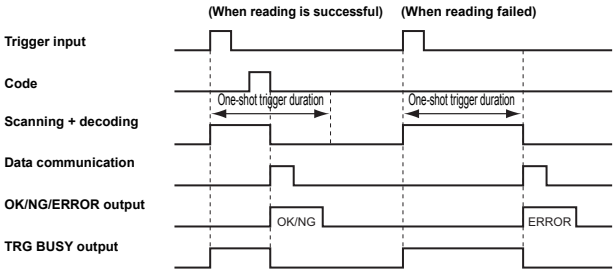
Reference

The TRG BUSY output turns on from the time the trigger input turns on to the time the code reading is complete or the trigger input is turned off.

One-shot trigger

When the SR-750 Series detects that the trigger input is on, it turns on the lighting for the specified one-shot trigger duration to scan a code.
When a code is read successfully, it stops illumination and sends the data. Other operations are the same as those for the level trigger.
Use the one-shot trigger if the ON time of the trigger input is extremely short or if you want to fix the read time.

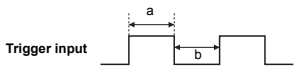
■ Timing Chart



- When the trigger input stays on for the specified input time constant, the illumination of the SR-750/SR-700 Series turns on and the scanning begins. When the reading is complete, the illumination stops.
- The input time constant for the trigger input can be changed to 1 ms, 2 ms, or 10 ms.
- The one-shot trigger duration can be changed within the range of 100 to 25500 ms (for SR-750) and 30 to 25500 ms (for SR-700).
- If the SR-750 Series fails to read a code within the one-shot trigger duration, it stops illumination and outputs a reading error.
- Other operations and precautions are the same as those for the level trigger.

Point

The ON state of the trigger input is recognized after the input stays on for at least the specified input time constant.
The OFF state of the trigger input is recognized after the input stays off for at least the specified input time constant.
Consequently, when the line speed is fast and fast pulse signals are used as trigger input signals, be careful to make the ON/OFF time of the pulse signals longer than the specified input time constant.



Trigger input time constant = when a, if a becomes larger than b, the OFF state of the trigger input is not recognized.
When a ≤ b, the ON/OFF state of the timing signal can be recognized.

4-3 Data Transmission Timing

SR-750 SR-700

This section describes the data transmission timing of the SR-750/SR-700 Series.

Type of data transmission timing

The SR-750/SR-700 Series offers the following 2 options for outputting the read data and OK/NG/ERROR signals:
- Send after reading
- Send after timing OFF

Select the appropriate type for your application.
* For the sake of simplicity, Input time constant + Scan delay time is not shown in the timing chart.

Send after reading

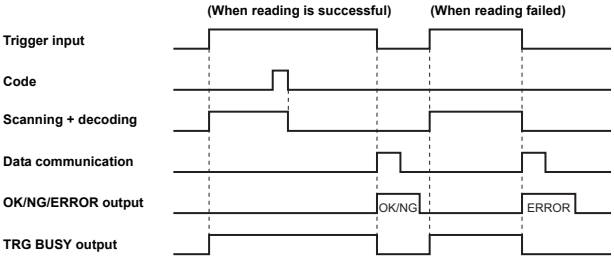
The SR-750/SR-700 Series outputs read data and an OK/NG signal as soon as code reading is complete. If the SR-750 Series fails to read a code, it outputs a read error code and an ERROR signal at the point when the timing signal turns off. The timing charts are the same as those shown in "Timing Mode".
"4-2 Timing Mode (Page 42)"

Send after timing OFF

When "Send after timing OFF" is selected, the SR-750 Series outputs read data and an OK/NG/ERROR signal at the next timing point for the specified trigger type. Use this type to output data and output signals with the same timing.

■ Timing Chart for the level trigger

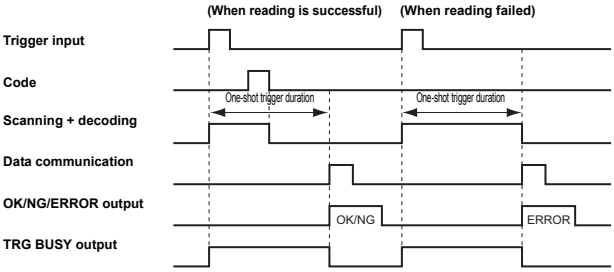
When the trigger input turns off, read data and OK/NG/ERROR signal are output.



- When a code is read successfully, the read operation stops.
- The TRG BUSY output continues until the trigger input turns off.

■ Timing Chart for the one-shot trigger

When the specified one-shot trigger duration elapses, the read data and OK/NG/ERROR signal are output.



- When a code is read successfully, the read operation stops.
- The TRG BUSY output continues until the one-shot trigger duration elapses.

4-4 Read Mode

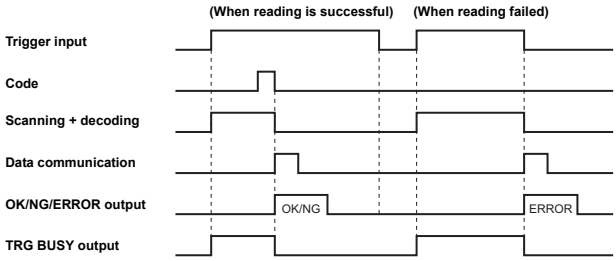
SR-750 SR-700

The SR-750/SR-700 Series offers 4 types of read modes. Select the appropriate type for your application. For most applications, use "Single read mode".
* For the sake of simplicity, Input time constant + Scan delay time is not shown in the timing chart.
* Multi 2 read mode is available on the SR-750 Series only.

Single read mode

In this mode, the SR-750 Series reads a single code while the trigger input is turned on once, and then outputs data.
Scanning will not begin again until the timing input is first turned off, then back on again.

■ Timing Chart



* The above timing chart shows the case where "Level trigger" and "Send after reading" are selected.
- In single read mode, the data transmission timing can be selected from "Send after reading" or "Send after timing off".
- The timing mode can be selected from "Level trigger" or "One-shot trigger".
- Scan interval is automatically set so that decoding processing can be implemented efficiently.
  "4-1 Reading Operations (Page 41)"

Multiple Code Reading in Single Read Mode * SR-750 Series

Normally, the single read mode is used to read 1 code from 1 timing input signal. When the following read setting conditions are specified, multiple codes within the field of view can be read with 1 timing input signal.

■ Setting "Multi read" in the code detail settings

When "Multi read" is selected in the code detail settings, multiple codes can be read in 1 reading operation.
- Use the AutoID Network Navigator or setting command to set.
- The number of codes for multiple readings can be set between 2 and 16
- When "Allow reduced detection count" is selected, the reading is considered successful if at least 1 code is read successfully.

Point
- **In this setting, multiple codes of different types cannot be read in 1 read action.**
- **Codes are output in order starting from the code coordinates above the upper scan screen (if the height is the same, from the left).**

- The output data format is as follows:

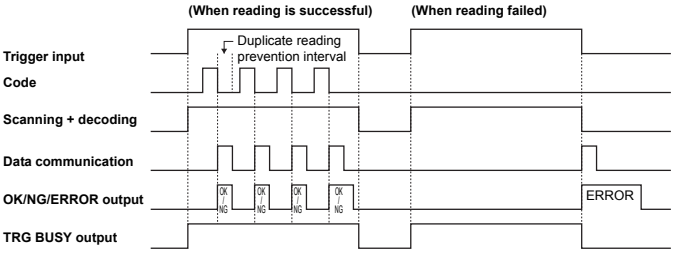
Header	The 1st data	,	The 2nd data	,	···	Terminator

,= Inter delimiter: Can be changed with setting (Default = "," (0x2C))

Multi 1 Read Mode

In this mode, the SR-750 Series reads multiple codes in succession while the trigger input is turned on once.
In Multi 1 read mode, the SR-750 Series sends out data and outputs an OK signal every time it reads 1 code (or an OK/NG signal when preset data is registered).
The SR-750 continues to scan while the trigger input is on even if no code is present. ERROR will only be output if no code is read after the trigger signal is turned off.

■ Timing Chart



- The SR-750/SR-700 Series reads codes in succession for the following duration:
  Level trigger : While the trigger input is turned on
  One-shot trigger : During the specified one-shot trigger duration
- The duplicate reading prevention operation changes according to the setting of the duplicate reading prevention interval reset. * SR-750 Series
  "3-13 Duplicate reading prevention interval reset" (Page 37)
- The duplicate reading reset function on the SR-700 Series works with the "Do not reset during duplicate reading prevention interval" setting.
- When codes with the same contents are read in succession, adjust the moving speed so that the codes pass at intervals longer than the specified duplicate reading prevention interval (Setting range: 0 to 25500 ms). Codes with different contents can be read at shorter intervals.
- Each time scanning is performed in Multi 1 operation, the laser pointer lights up. The lighting period for the laser pointer is set on "Laser-aimer blinking duration (0 to 990 ms)" and the scanning is not performed during this period. * SR-750 Series
- The data transmission timing for Multi 1 is "Send after read" only.
- In Multi 1 operation, the availability of the image save function is as follows.
  Saving images
  - Read OK/NG...Cannot be used
  - Error image .....Can be used

Point

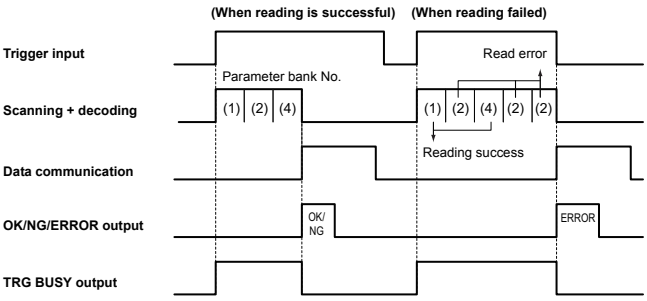
When Multi 1 read mode is selected using the AutoID Network Navigator, the decode timeout is set to 500 ms. To shorten the decode timeout period, change the decode timeout setting of each parameter bank manually.

Multi 2 Read Mode * SR-750 Series

Multi 2 read mode is used to read the codes in the parameter banks with registered settings in order while the trigger input is turned on once.
After reading all codes (max. 10 types) registered with the parameter bank, this function sends the read data in the order of parameter number and outputs OK/NG signals.
If no code is read while the trigger input is turned on or if even one code set for a parameter bank is not read, the SR-750 Series sends a reading error and outputs an ERROR signal for the unread code in the parameter bank after the trigger input turns off.

■ Timing Chart

Timing charts when registered with the parameter banks 1, 2 and 4 are as follows:



- The SR-750 Series reads codes in succession for the following duration:
  Level trigger : While the trigger input is turned on
  One-shot trigger : During the specified one-shot trigger duration
- An OK signal is output when all of the codes of the set parameter banks are read.
- An ERROR signal is output when even 1 specified code could not be read.
- Even when there are multiple codes within the reading range, all codes can be read simultaneously.
- Each time scanning is performed in Multi 2 operation, the laser pointer lights up. The lighting period for the laser pointer is set on "Laser-Aim pulse duration (0 to 990 ms)" and the scanning is not performed during this period.

Point

When Multi 1 read mode is selected using the AutoID Network Navigator, the decode timeout is set to 500 ms. To shorten the decode timeout period, change the decode timeout setting of each parameter bank manually.

■ Output data format

The following output data format is used for the read data.

Header	Read data in parameter bank No. 1	,	Read data in parameter bank No. 2	,	...	,	Read data in parameter bank No. 10	Terminator

- Each read data is separated with "," (0x2C: Intermediate delimiter).
- The data for the read bar codes is saved in the send buffer of the SR-750 Series once and then is output when all configured banks have been read or the timing input is turned off. The size of the send buffer of the SR-750 Series is 10 KB.
- If reading fails for any of parameter banks 1 to 10 or if the specified code is not found, ERROR is sent as the read data of the corresponding parameter bank number.

Burst Reading Mode

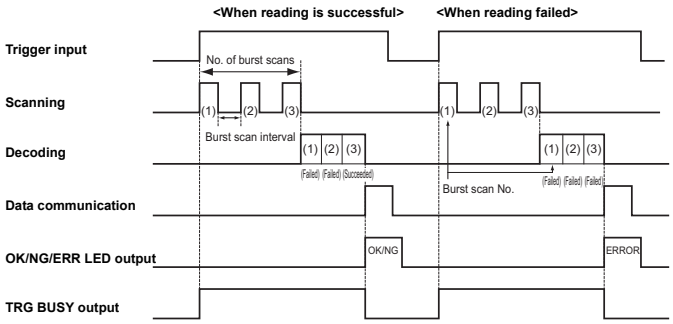
Burst reading mode repeat scans up to a maximum of 8 times (SR-750) or 10 times (SR-700) in succession, and performs decoding in order after scanning is complete.
When, for example, the line speed is fast and accurate positioning is difficult, this function ensures scanning without missing codes by repeating scans only for the period during which the target is expected to pass.

Point

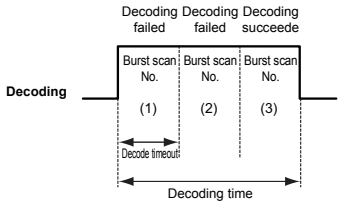
- **The alternate function cannot be used in Burst reading mode. Decoding is performed with the specified parameter number. * SR-750 Series**
- **In Burst reading mode, the No. of repeat read attempts setting is ignored. * SR-750 Series**

■ Timing Chart

The following is the timing chart when the Burst reading mode is used. (Burst scan count: 3)



- In Burst reading mode, the scanned data is decoded in the order in which it was obtained.
  If decoding fails after the decode timeout period elapses, the decoding is shifted to the next scanned data.
- The data communication is output when the decoding is successful or decoding of all scan data is failed.
  The decoding time when decoding succeeds for the third scanned data is as follows:



- If the trigger input turns off with the decoding processing unfinished, reading error occurs. Secure longer time for the trigger input ON than the time calculated by (scan + burst scan interval + decoding timeout time) x burst scan count.
- The data transmission timing for the Burst reading mode is "Send after read" only.

Reading multiple codes * SR-700 Series

This section explains how to read multiple codes with the SR-700 Series.

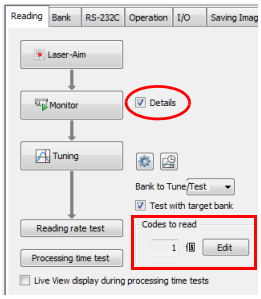
When the device is set to read multiple codes, the following conditions apply.

- Reading mode : single or burst
- Maximum number of readable codes : 128
  * A maximum of 16 codes can be read in one scan.
  When reading more than 17 codes, prepare multiple parameter data banks and set each so that the bank decode scope is restricted.
- Duplicate reading prevention function : Normally activated during Timing ON
  Codes within the same scan are excluded
- Reading same code type and same content data : Reading only codes in the same scan after the same content has already been read is not possible
- When code types are different : A parameter bank is needed for each code type.

Setting method

1 Check "Detailed Settings" on the "Reading" tab.

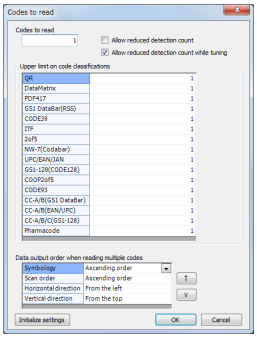
2 Press the "Change" button for the number of codes read.



3 Change the "Codes to read".

- Maximum number of codes by type
  Set the maximum number of codes read by code type.
- Data output order when reading multiple codes
  Set the priority in which data should be output.
  Code type... The "Maximum number of code types" appear in ascending order
  Scan order... The scans appear in ascending order with first scan appearing first
  Horizontal direction... See the center coordinates of the code
  Vertical direction..... See the center coordinates of the code

4 If codes cannot be read even if they are within the field of view, increase the decode time parameter in the parameter bank.



5-1 Installing, Starting, and Shutting Down

SR-750 SR-700

This section describes how to install AutoID Network Navigator as well as how to start and shut down the application.

PC Requirements

Before starting installation, confirm that your PC meets the following requirements:

■ Supported OSs

- Windows Vista (Business/Ultimate, SP2 or higher) 32-bit version
- Windows 7 (Professional or higher) 32-bit version/64-bit version
- Windows 8 (Windows RT excluded)

* NET Framework 3.5 SP1 or later must be installed in advance.
* When installing .NET3.5 on Windows 8, the Internet environment is necessary.
* When installing .NET3.5 on Windows 8, operate from the control panel.

■ Hardware

	32-bit	64-bit
Processor	2.0 GHz	
System Memory	1 GB	2 GB
DVD-ROM Drive	Required for installation	
Communication Port	Ethernet port	
Screen Resolution	1024 x 768 or higher	

■ Precautions

- To install AutoID Network Navigator, log on as a user with rights to change the system configuration, such as Administrator or Computer Administrator.
- Quit all active applications before starting the installation. The installation may take longer if antivirus software or other applications are active on the computer.

■ Trademark

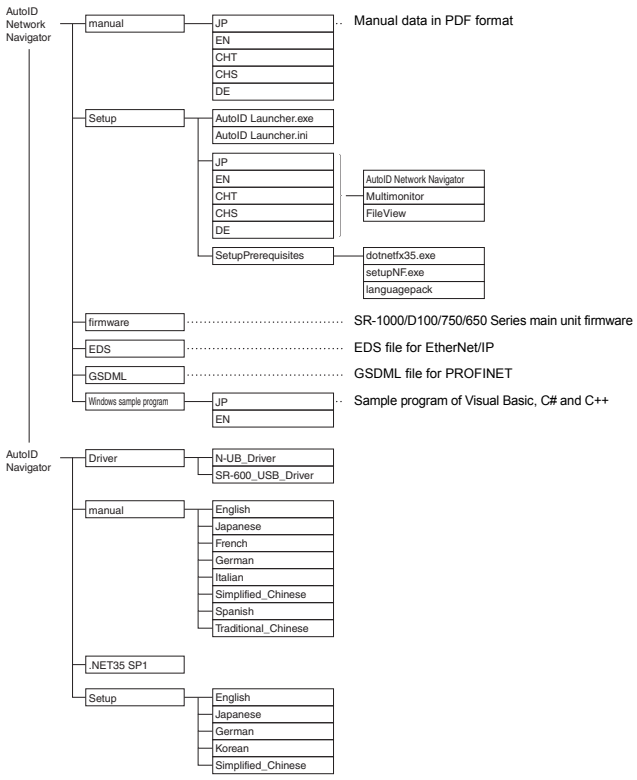
Windows 8/Windows 7/Vista is a registered trademark of Microsoft Corporation in the United States.

Install Method

This section explains installation using the following drive configuration under Windows 7 as an example:
Drive C: Hard disk drive
Drive E: DVD-ROM drive

■ Folder Structure

The folder structure on the master disc is as follows.



■ Installation Flow

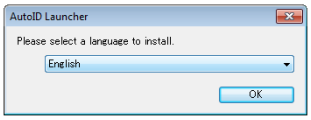
1 Turn ON the PC and start Windows.

Important
- **To install AutoID Network Navigator, log on as a user with rights to change the system configuration, such as Administrator or Computer Administrator.**
- **Quit all active applications before starting the installation. The installation may take longer if antivirus software or other applications are active on the computer.**

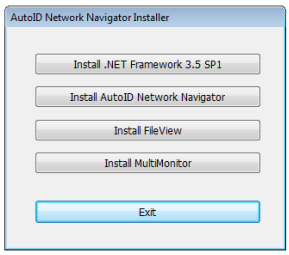
2 Insert the "AutoID Network Navigator Master Disc" into the DVD-ROM drive of the PC.

3 Normally, the AutoRun function of the computer will display the following screen.
To start the installer directly, use Windows Explorer or another method to open the DVD-ROM drive, and double-click "AutoID Launcher.exe" in the Setup folder.

AutoID Launcher will start and select the language of the installer software.



4 The AutoID Network Navigator installer will start.

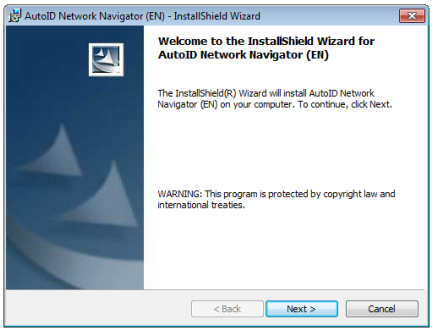


5 Click "Install .NET Framework 3.5 SP1".

If .NET Framework 3.5 SP1 is already installed in the computer to be used, then the install will automatically exit.
- If .NET Framework 3.5 SP1 is not installed, follow the on-screen instructions to continue with the installation.

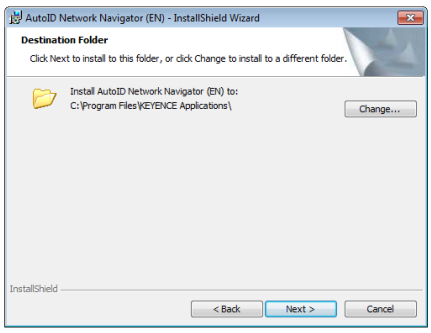
6 Click "Install AutoID Network Navigator".

7 Click "Next".

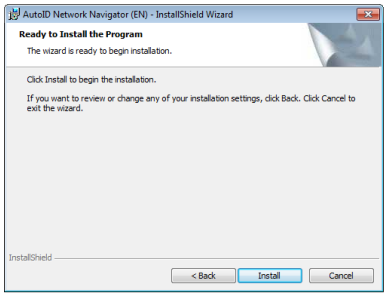


8 Click "Next".

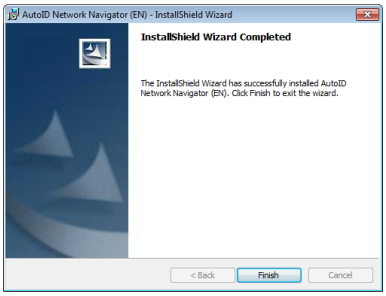
Click on the [Change] button to change to the folder in which the application will be installed.



9 **Click [Install].**

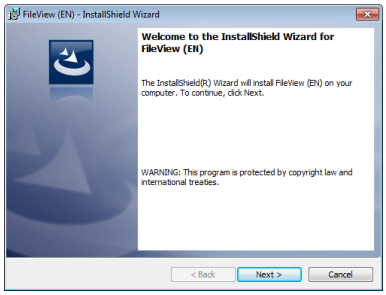


10 **Click [Finish].**

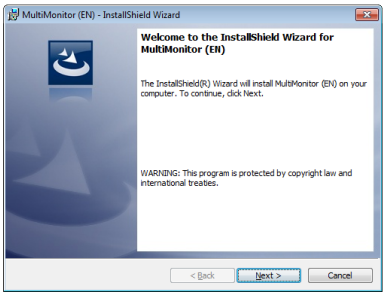


11 **Follow the same steps to "Install FileView" and "Install MultiMonitor".**

FileView install screen

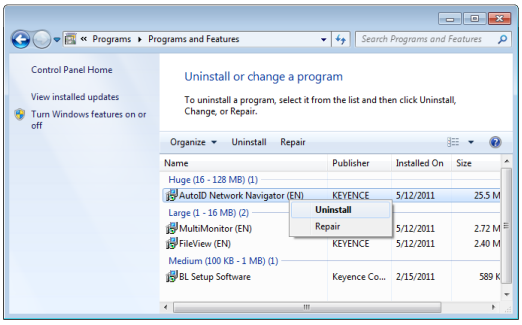


MultiMonitor install screen



■ Uninstall Method

From the Start menu, select [Control panel] -> [Programs] -> [Programs and Features] -> [Uninstall or change a program], select the program to uninstall from the list, and click [Uninstall].



Startup Procedure

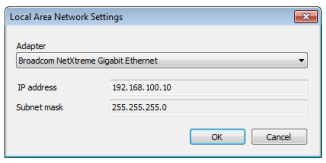
Starting AutoID Network Navigator

From the Start menu, select [Programs] → [KEYENCE Applications] → [AutoID] → [AutoID Network Navigator (EN)].

Or, double-click on the desktop.

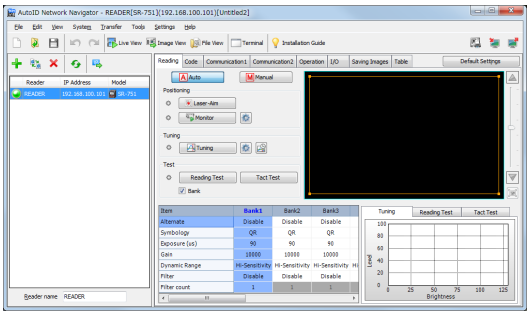
AutoID Network Navigator will start up.

Select the network card to use first.



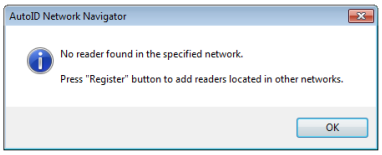
■ When automatically detected

If the SR-750 Series is in the same network, or the SR-700 is connected with a USB cable, it is automatically detected and the following window is displayed.



■ When not automatically detected

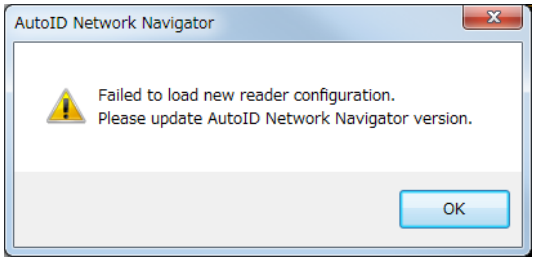
If the SR-750/SR-700 Series unit is not automatically detected, then the following message will be displayed.



When the SR-750 Series with the additional functions enabled is connected to the AutoID Network Navigator Ver 3.10 or lower

When the SR-750 Series with the additional functions enabled is connected to the AutoID Network Navigator Ver 3.10 or lower, the following message appears and the system cannot be configured.

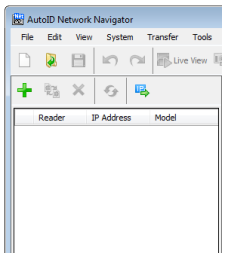
The AutoID Network Navigator requires a version upgrade.



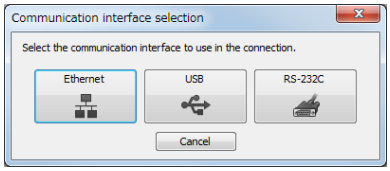
Adding Reader with Register Button

If the SR-750 Series is on the different network, or it is placed on the network after starting AutoID Network Navigator up, add the reader by clicking the Register button. Also, if the SR-700 Series is connected through the RS-232C interface, click the Register button to connect to the SR-700 Series.

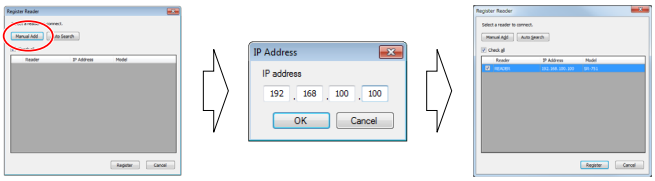
1 Click the Register button .



2 Select a communication interface.
If you select RS-232C, connect to the device according to the details shown when you click [Settings] - [RS-232C Settings].

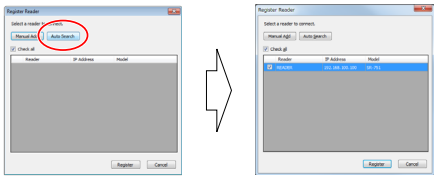


3 If the SR-750 Series is on a different network, click the Add button and enter the IP address of the SR-750 Series to add.



Important **To add the SR-750 Series on the different network, default gateway must have been preconfigured to the SR-750 Series.**

4 To have a SR-750 Series unit participate on the network after starting AutoID Network Navigator, click the [Auto Search] button and add the SR-750 Series unit.



To add all searched readers, check "Check all".
To add only a certain reader, uncheck "Check all" and check the reader to add.

5 Click the [Register] button.

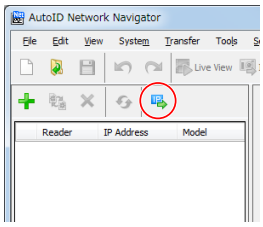
The SR-750 Series unit will be registered in the reader view, and will be usable by AutoID Network Navigator.

Important
- **Only version 1.10 and later of the SR-700 can establish connections through the RS-232C interface.**
- **You cannot connect to the SR-700 through a DV-90 or N-L1.**
- **o When the interface is RS-232C, no images are displayed on the monitor.**

Adding Reader with Temporary IP Address Settings * SR-750 Series

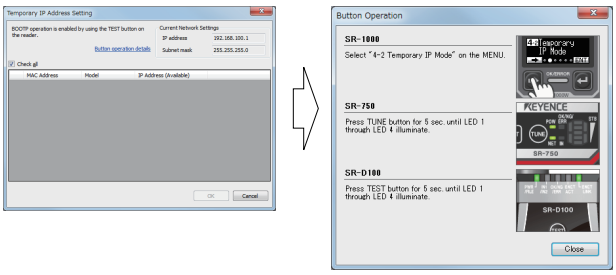
Temporary IP address is used if the IP address for the SR-750 Series is unknown or the IP address of the SR-750 Series to register is conflicting within the network.

1 Click the Apply temporary IP address button.

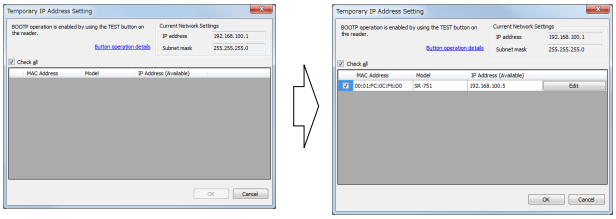


2 Press the TUNE button of the SR-750 Series for 5 seconds until 4 multiple LEDs light up.

For button operation details, click here to display the button operation description window.



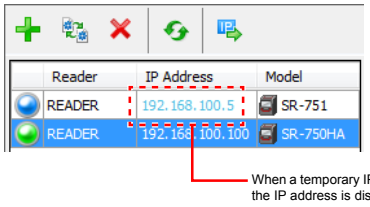
3 When the address is detected, the reader information is displayed as follows:



If the IP address shown is correct, click the OK button.
To change the IP address, click the Change button to change the IP address.

To add all readers detected, check "Check all".
To add only a certain reader, uncheck "Check all" and check the reader to add.

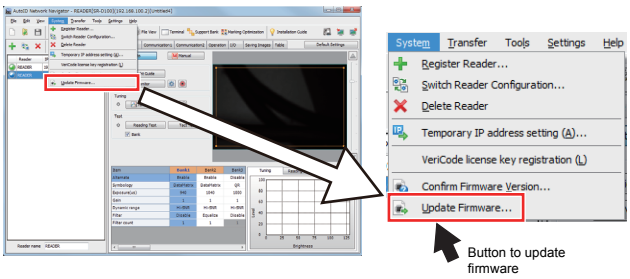
Important
- **To set a temporary IP address, the SR-750 Series must be on the same network.**
  Temporary IP address cannot set for a SR-750 Series on the different network.
- **Temporary IP address setting is a function to communicate with AutoID Network Navigator.**
  IP address and subnet mask etc. for the SR-750 Series must be set according to the network to use.
- **The IP address set using the Temporary IP Address Settings is canceled when the main unit is reset. When the unit is being connected temporarily due to maintenance, etc., turn the power on again after the setting is complete, or perform the main unit reset by sending the RESET command.**



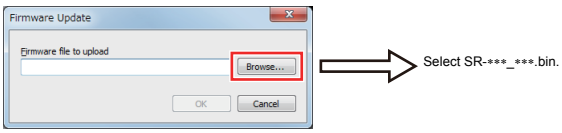
Firmware update of the main unit system

This describes how to update the firmware of the SR-750/SR-700 Series main unit system.

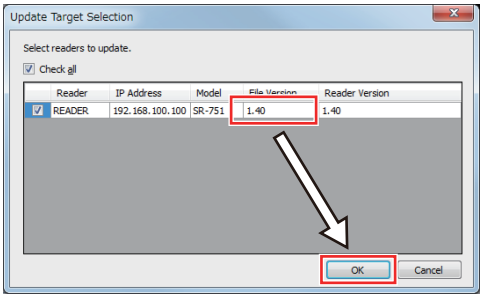
(1) Press Update Firmware.



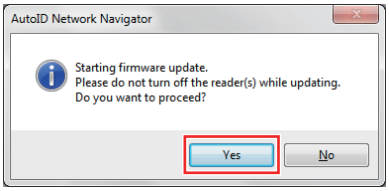
(2) The following window is displayed. Press the Browse button and select "SR-***_***.bin" file.



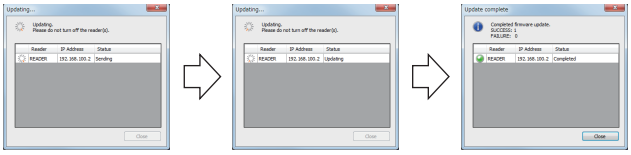
(3) When the file is selected, the following window is displayed. Confirm the version is correct and press the OK button.



(4) Press "Yes".



(5) Windows appear in the following order. When the green indicator lights up, the update is complete.



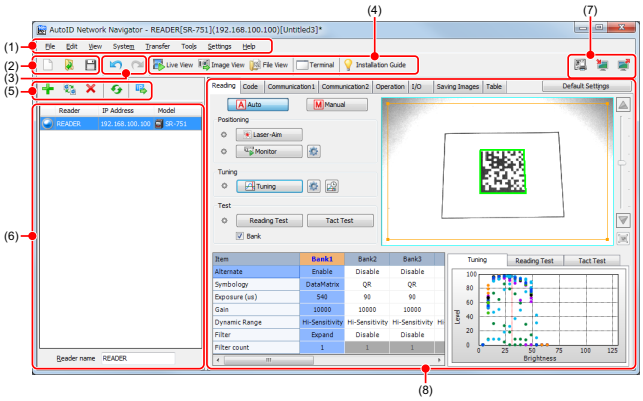
5-2 Screen Layout

SR-750 SR-700

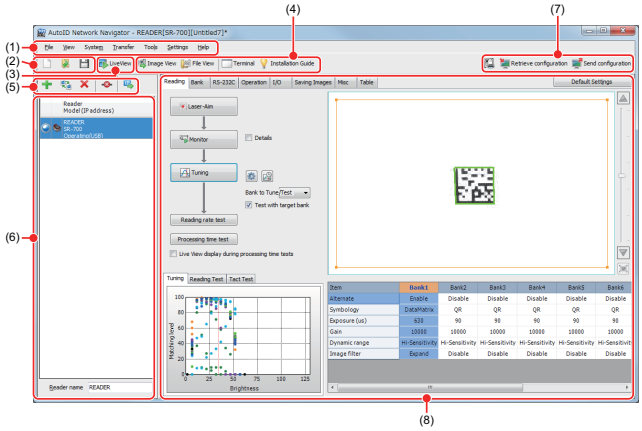
This section describes the icons for AutoID Network Navigator.

Screen

SR-750 Series



SR-700 Series



(1) : Menu Bar
Some operations of the AutoID Network Navigator functions or software version can be checked.

(2) : File Icon
…Creates a new file.
…Opens a file.
…Saves on an existing file.

(3) : Edit Icon
Undo the current work or redo.

(4) : Tool Icon
Starts each tool of AutoID Network Navigator.
(For details of each tool, refer to Page 72 or later.)

(5) : System icons
Register items on AutoID Network Navigator, remove items, or change settings.
… Register button. Register the SR-750 Series unit in AutoID Network Navigator.
… Change settings button. Open a configuration file.
… Delete button. Delete a SR-750 Series unit from AutoID Network Navigator.
… Update button. Update the connection with the SR-750 Series unit to the latest status.
… Disconnect button. Stop communication with the AutoID Network Navigator.
… Connect button. Reopen communication with the AutoID Network Navigator.
… Allot a temporary IP address to the reader.

(6) : Reader list
Displays search results or reader information for the detected readers or an open file.
Registration of a new reader or deletion of a displayed reader can also be performed.

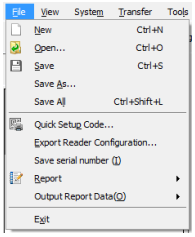
(7) : Transmission and reception settings icon
Prints quick setup codes or sends/receives a configuration.

(8) : Configuration View
While confirming SR-750 Series unit read images, carry out quick calibration or configure transmission settings or operations modes.
(For details of the Configuration View operation, refer to Page 53.)

Default settings
… Click to reset the configuration to default.

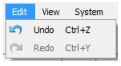
Menu Bar

■ File



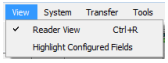
- New : Creates a new configuration file.
- Open : Opens a configuration file.
- Save : Saves the selected file.
- Save As : Saves the selected file with a new name.
- Save All : Saves all opened files.
- Quick Setup Code : Prints the settings of the selected file with the quick setup code function. For details, refer to 📖 Page 71.
- Export Reader Configuration : Outputs the selected file list to a tab separated text file. For details, refer to 📖 Page 75.
- Save serial number : Not used with the SR-750 Series.
- Report Generator : Uses the report generator function. For details, refer to 📖 "5-14 Report Generator Function (Page 76)".
- Data output for reportsr: Outputs report data used in the report generation function.

■ Edit * SR-750 Series



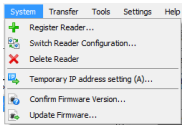
- Undo : Goes back to a previous state.
- Redo : Performs an operation again.

■ View



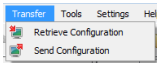
- Reader View : If the checkmark is removed, then the reader list will close.
- Highlight Configured Fields : Highlights the parts changed from the factory configuration.

■ System



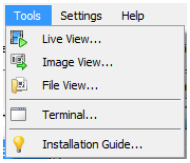
- Register : Registers a reader. For details, refer to 📖 Page 48.
- Switch reader configuration : Switches to the other configuration file.
- Delete Reader : Deletes a registered reader from a list.
- Temporary IP Address Setting : Assigns a temporary IP address.
- Confirm Firmware Version : Display the IP address, unit system version, and MAC address of the selected reader.
- Update Firmware : Updates the system firmware.

■ Transfer



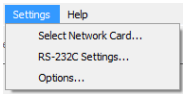
- Retrieve Configuration : Receives a configuration.
- Send Configuration : Sends a configuration.

■ Tool



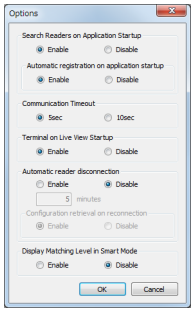
- Live View : Starts the LiveView function. For details, refer to 📖 Page 72.
- Image View : Starts the ImageView function. For details, refer to 📖 Page 73.
- FileView : Starts the FileView function. For details, refer to 📖 Page 74.
- Terminal : Starts the Terminal function. For details, refer to 📖 Page 71.
- Installation Guide : Starts the Installation Guide. For details, refer to 📖 Page 74.

■ Configuration



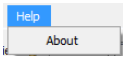
- Select Network Card : Selects a network card for the PC to use with AutoID Network Navigator.
- RS-232C Settings : Set the communication conditions used to connect to the SR-700 through the RS-232C interface.
- Options : Click to open the Option window.

- Option window



- Search Readers on Application Startup : Sets whether to search automatically an SR-750 Series at the AutoID Network Navigator startup.
- Automatic registration on application startup : Set whether to automatically register an SR-750 Series unit when AutoID Network Navigator starts.
- Communication Timeout : Sets the communication timeout for AutoID Network Navigator to either 5 or 10 seconds.
- Terminal on Live View Startup : Select to display the terminal together when Live View is started.
- Automatic reader disconnection : Set whether to disconnect from the reader when the length of time that AutoID Network Navigator operations are not performed exceeds the set time.
- Configuration retrieva on reconnection : Set whether to receive the settings when a connection is reestablished to a reader that was automatically disconnected.
- Display Matching Level in Smart Mode : Not used with the SR-750Series.

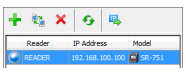
■ Help



- About : Displays the version information of AutoID Network Navigator.

The Reader List

AutoID Network Navigator communicates with the connected SR-750/SR-700 Series unit at specified intervals.
The indicator displayed to the left shows the status of communications.

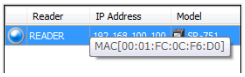


Lamp status		Description
	Green	SR-750/SR-700 is registered in AutoID Network Navigator.
	Blue	SR-750/SR-700 is operating in AutoID Network Navigator. * During operation, this will halt the command port connection and data port connection with other communication devices.
	Gray	AutoID Network Navigator and SR-750/SR-700 are not communicating.
	Red	An SR-750/SR-700 formerly in communication can not be recognized. Check that the IP address has not changed, or that the Ethernet cable has not been removed. When communication is possible, the indicator will automatically change to green.

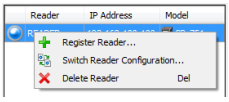
■ Operations that can be carried out on the reader list

The following operations can be carried out on the reader list.

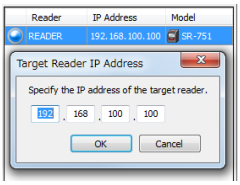
- Click the indicator to change the status of communications between AutoID Network Navigator and the SR-750 Series unit.
- When the mouse pointer is placed on any of the reader name, IP address, or model, then the MAC address of that SR-750 Series unit will be displayed.



- Right-clicking on any of the reader name, IP address, or model will enable selection of registration, deletion, or changing of configuration of the reader.
- These details can be selected from System in the menu bar.



- Double-click the IP address to specify the IP address of the connected reader.
- Used to change the SR-750 communicating with AutoID Network Navigator.



5-3 AutoID Network Navigator Operation Flow

SR-750 SR-700

The basic operation flow of AutoID Network Navigator is as follows:

1 Select a reader to configure from the automatically searched readers. Or register the reader to configure.

↓

2 Configure the operation of the SR-750/SR-700 Series
Page 51

↓

3 Send the configuration to the SR-750 Series
Page 70

↓

4 Perform a reading test
Page 51

↓

5 Save/print the configuration as necessary
Page 70, 75

↓

6 Shut down AutoID Network Navigator

5-4 Details of Settings View

SR-750 SR-700

This section describes details and operating methods in settings view for AutoID Network Navigator.

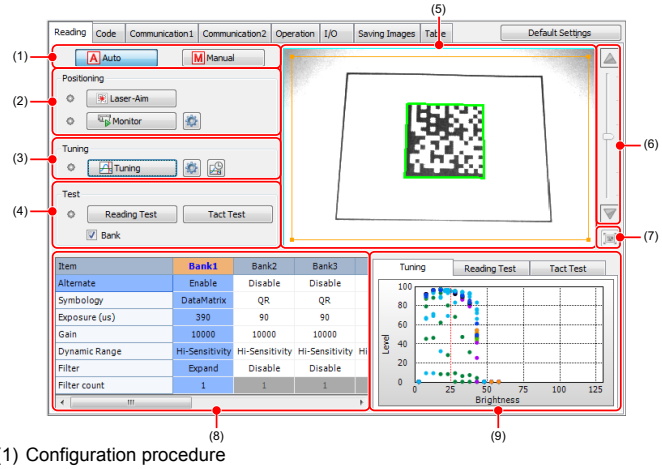
[Camera] tab * SR-750 Series

The [Camera] tab has [Auto] and [Manual] methods for registering with the parameter bank.

- Auto : Mode for carrying out quick calibration of the SR-750 Series unit. Click Positioning → Tuning → Test to automatically configure the optimum settings.
- Manual : Enables quick configuration of details of reading settings that cannot be configured in quick tuning.

This section explains details of this screen.

The [Auto] screen



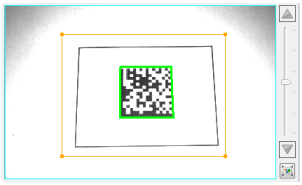
(1) Configuration procedure
Buttons to switch between [Auto] and [Manual] modes.

(2) Positioning
Laser-Aim … Activate the laser-Aim of the SR-750 Series.
Monitor … Displays the image output by the SR-750 Series. Automatically measures reading rate at the same time.
Monitor Settings…Sets the display during monitor operation.

(3) Tuning
Tuning…Performs a calibration.
Tuning option … Sets the calibration method.
Tuning History… Displays the history of calibrations.

(4) Test
Reading test…Starts the reading rate test mode.
Tact test … Starts the read time test mode.
Bank … Check to start the test mode using a bank selected at (8). If not checked, the test mode is started with the Alternate function activated.

(5) Monitor screen
Displays the image output by the SR-750 Series.
Dragging on the screen or operating the orange guide can restrict the tuning range. The position of the restricted tuning range can be changes by further dragging.



* Clicking the (7) "Full area" button can reset the restricted tuning range.

(6) Brightness adjustment bar
Adjust the brightness of the monitor screen.

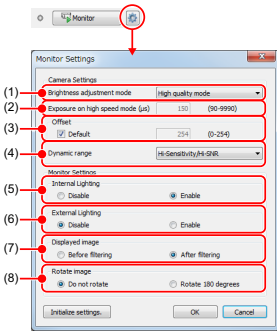
(7) [Full area] button
Resets the decoding area restricted on the monitor, and returns the decoding area to the full field of view.

(8) Parameter bank display window
Displays the current parameter bank settings.

(9) Camera status display window
Displays quick tuning status and test mode result values.

Monitor Settings

■ Camera settings



(1) : Brightness adjustment mode
High quality mode…Adjusts the monitor screen brightness with easiness to view codes prioritized.
High speed mode…Adjusts the monitor screen brightness with the (2) setting prioritized.

(2) : Exposure on high speed mode
Upper limit of exposure when capturing images

(3) : Offset
Sets the offset value (brightness base value).
Do not change normally.

(4) : Dynamic range
Sets the dynamic range when capturing images.
Setting range: Hi-Sensitivity/Hi-SNR, Hi-DR

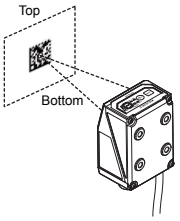
■ Monitor Settings

(5) : Internal Lighting
Selects whether to use lighting of the SR-750 Series main unit.

(6) : External Lighting
Selects when using the external lighting. To interlock operation of the SR-750 Series with emission of external lighting, assign "EXT.LIGHT" to the output terminal.

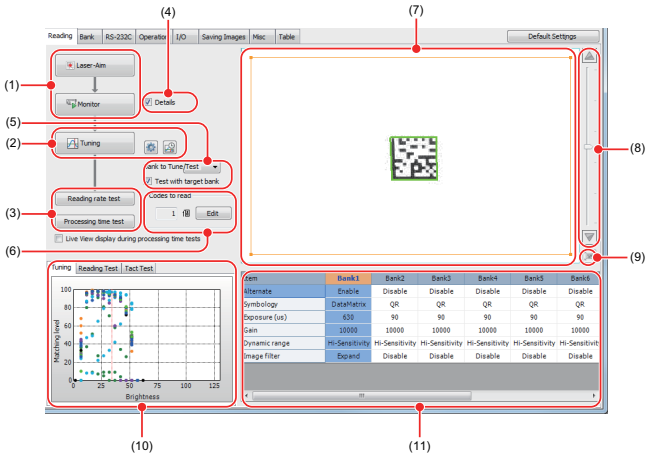
(7) : Displayed image
Selects the displayed image from images before filter-processed or images after filter-processed.

(8) : Rotate image
Images output from the SR-750 Series can be rotated 180 degrees.
The direction for easy adjustment can be selected according to the mounting condition of the SR-750 Series.



In the standard condition, the switch side of the SR-750 Series faces to the top.

[Reading] tab * SR-700 Series



(1) Positioning
Laser-Aim … Activate the laser-aim of the SR-700 Series.
Monitor … Displays the image output by the SR-700 Series. Automatically measures reading rate at the same time.

(2) Tuning
Tuning … Performs a calibration.
Tuning option … Sets the calibration method.
Tuning History … Displays the history of calibrations.

(3) Test
Reading test … Starts the reading rate test mode.
Tact test … Starts the read time test mode.

(4) Reading method
Detailed settings … Check when setting multiple reading codes.

(5) Bank
Use number settings specified in the bank, and run the test.
When "Test specified bank" is not checked, all registered banks are tested.

(6) Number of codes to be read
When reading multiple codes, press the change button and set the number of codes to read.
For the setting method, refer to "Reading multiple codes * SR-700 Series" (Page 45).

(7) Monitor screen
Displays the image output by the SR-700 Series.
Dragging on the screen or operating the orange guide to restrict the tuning range. The position of the restricted tuning range can be changed by further dragging.

(8) Brightness adjustment bar
Adjust the brightness of the monitor screen.

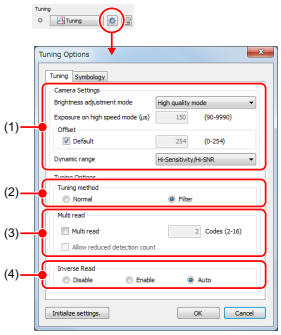
(9) [Full area] button
Resets the decoding area restricted on the monitor, and returns the decoding area to the full field of view.

(10) Camera status display window
Displays the current parameter bank settings.

(11) Parameter bank display window
Displays quick tuning status and test mode result values.

[Tuning] tab * SR-750 Series

■ Camera settings



(1) : Camera settings
Same as for the monitor settings

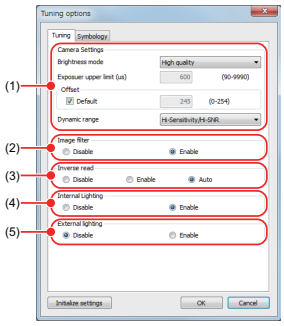
■ Tuning Options

(2) : Tuning method
Normal..... Performs tuning without image process filter.
Filter ..... Performs tuning with image process filter.

(3) : Multi read
The multi read mode reads multiple codes of the same type with one parameter bank.
Multi read ... Check to enable multi read.
Set the number of codes to be read from 2 to 16.
Allow reduced detection count…
Check this to approve reading success even if the number of codes read is less than the set number.

(4) : Rotate image
Disable ..... Searches black codes with white background.
Able ..... Searches white codes with black background.
Auto..... Searches automatically detecting the color (black/white) of code and background.

[Tuning] tab * SR-700 Series



(1) : Camera settings
- Brightness adjustment mode
  High quality...Adjusts the monitor screen brightness to priorities making the codes easy to see.
  High speed...Adjusts the monitor screen brightness to priorities the upper limit of exposure settings.
- Upper exposure limit
  Upper limit of exposure when capturing images
- Offset
  Sets the offset value (brightness base value).
  Do not change normally.
- Dynamic range
  Sets the dynamic range when capturing images.
  Setting range: Hi-Sensitivity/Hi-SNR, Hi-DR

(2) : Process filter
Disable ..... Performs tuning without image process filter.
Enable ..... Performs tuning with image process filter.

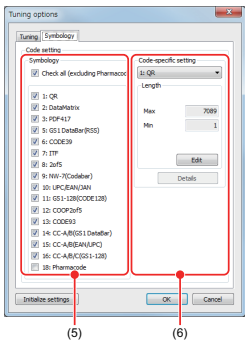
(3) : Invert black and white
Disable ..... Searches black codes with white background.
Enable ..... Searches white codes with black background.
Auto..... Searches automatically detecting the color (black/white) of code and background.

(4) : Internal Lighting
Selects whether to use lighting of the SR-750 Series main unit.

(5) : External Lighting
Select when using external lighting. To interlock operation of the SR-750 Series with emission of external lighting, assign "EXT.LIGHT" to the output terminal.

[Symbology] tab

■ Code setting



(5) : Symbology
Specify the code type for tuning.

(6) : Code-specific setting
Set the read length and detailed conditions of each code.
For read length and detailed conditions, refer to [Code] tab * SR-750 Series (Page 55).

■ Parameter Bank Display Window

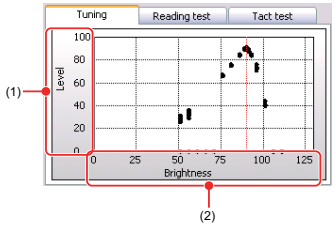
Item	Bank1	Bank2	Bank3
Alternate	Enable	Disable	Disable
Symbology	DataMatrix	QR	QR
Exposure (us)	390	90	90
Gain	10000	10000	10000
Dynamic Range	Hi-Sensitivity	Hi-Sensitivity	Hi-Sensitivity
Filter	Disable	Disable	Disable
Filter count	1	1	1

- Alternate … Displays whether to use the alternate function.
  When Alternate is set to "Disable", the corresponding parameter bank will not be used.
- Code type … Code type to perform reading. 1 code type for each bank is displayed.
- Exposure (µs) … Sets the exposure time to scan an image.
- Gain … Amplifies the brightness of the scanned data.
- Dynamic range … Displays the dynamic range for scanning.
- Filter … Displays the filter type for scanning.
- Filter count … Displays the number of filtering times.

■ Reading State Window (During Calibration)

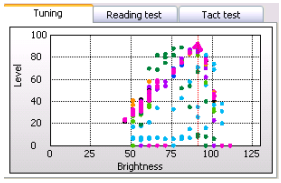
(1) : Level
Displays the matching level.

(2) : Brightness
Divided in 128 comprehensive image brightness phases according to the factors such as dynamic range, gain and exposure.



- Plot colors, when filtering function is activated

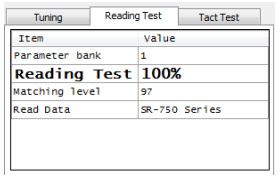
Color	Filter name	Color code (RGB)
●: Black	Disable	0,0,0
●: Yellow-green	Equalize	68,192,0
●: Green	Expand	0,130,58
●: Light blue	Shrink	0,183,238
●: Blue	Open	0,67,238
●: Purple	Close	171,0,242
●: Orange	Unsharp Mask	255,138,0



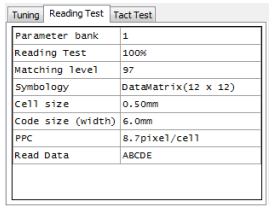
■ Reading State Window (Reading Rate)

- Parameter bank … Displays the bank number used for reading.
- Reading test … Displays a reading rate.
- Matching level … Displays a matching level.
- Code type … Displays read code types. (SR-700 only)
- Cell size … Displays cell size during focal length. (SR-700 only)
- Code size (width)… Displays code size during focal length. (SR-700 only)
- PPC … Displays the number of pixels for each cell. (SR-700 only)"
- Read Data … Displays data when the reading was successful.

For SR-750

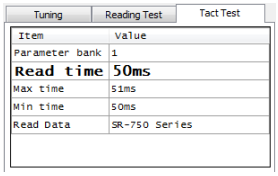


For SR-700



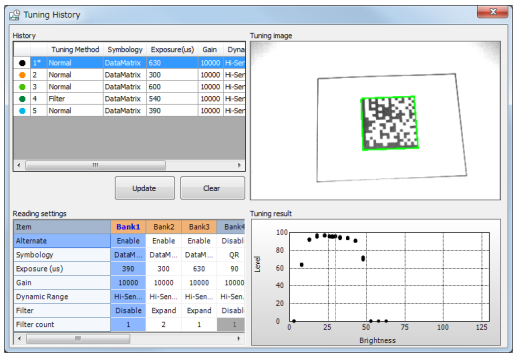
■ Reading State Window (Tact Test)

- Bank number … Displays the bank number used for reading.
- Read time … Displays the latest read time.
- Max time … Displays the maximum read time.
- Min time … Displays the minimum read time.
- Read Data … Displays data when the reading was successful.

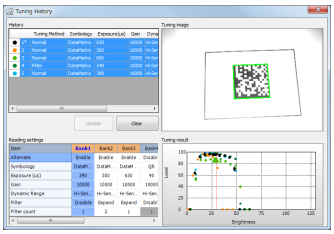


Details of the Tuning History screen

Click button to display the following screen.
It is possible to select what is considered the optimal calibration results when carrying out multiple calibrations for the same code, and register these in the parameter bank.



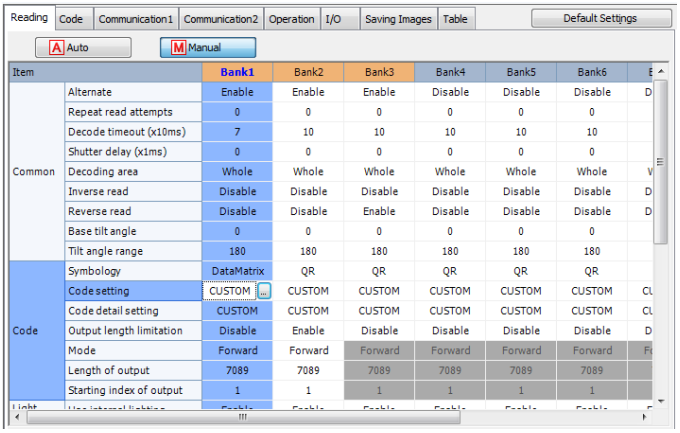
- **History**
  Displays a maximum of 8 results of calibration.
  The latest calibration results are displayed at the top in position (1).
  Multiple history data results can be combined and displayed on a calibration results chart.



- **Update**
  A button to reflect the calibration results selected in the history in the parameter bank selected in the reading settings.
- **Clear**
  Deletes all collected calibration history.
- **Reading settings**
  Use the bank update button to select the parameter bank No. to update.
  You can also confirm detailed values for updated calibration results.
- **Tuning image**
  Displays image obtained at calibration, when selected in the history.
- **Tuning result**
  Displays graphs from calibration, when selected in the history.

The [Manual] screen * Bank tab (for SR-700)

Click the [Manual] button to list items that can be configured in the SR-750 Series parameter bank. (For the SR-700 Series, click the bank tab.)
Use this to check result values obtained in the [Auto] screen, and to manually change parameters.



■ Common

- **Alternate**
  Enable: read the selected parameter bank, and use for reading operations.
  Disable: do not use the selected parameter bank.
- **Repeat read attempts**
  Set the number of repeat reads for the selected parameter bank within the range of 0 to 32.
  * This specifies the number of retries, therefore if "02" is set, then after a single read, 2 retries will be carried out.
- **Decode timeout (×10 ms)**
  The timeout value set in auto calibration.
  Set values can be specified manually from 10 ms to 10000 ms (Unit: 10 ms).
- **Shutter delay**
  Set the delay between the recognition of a trigger input and the scanning start.
  Default : 0 ms
  Setting range : 0 to 255 ms
- **Decode range**
  Set the range of scanning and decoding.
- **Inverse read**
  Inverse read settings during calibration.
- **Reverse read**
  Reverse read (reverse surface) settings during calibration.
- **Base tilt angle**
  Sets the base angle for a tilt angle range to limit reading.
  When DataMatrix is set, the finder pattern rotates until it appears as an "L". When the QR code is set, the corner without a finder pattern will become the bottom right corner and 0 degrees. The angle rotates in the clockwise direction (anticlockwise for Reverse read).
  Default : 0 degrees
  Setting range : 0 to 359 degrees
- **Tilt angle range**
  Sets a tilt angle range to limit reading. Specify with ±* degree to the base tilt angle.
  Default : 180 degree
  Setting range : 0 to 180 degree

■ Code

- **Code type**
  Code type set in the parameter bank.
- **Code setting**
  Maximum and minimum values for read digits in the parameter bank.
- **Code detail setting**
  Confirm and change detailed settings for each code item set in the parameter bank.
  Additionally, multiple read conditions can be set here.
- **Output length limitation**
  Set the output length limitation function.
  Default: if enabled, then set the following items.
- **Mode**
  Set the direction of the range of the output length limitation function.
  Forward : set the effective digits and start digits for restrictions from the front of the code data.
  Backward : set the effective digits and start digits for restrictions from the end of the code data.
- **Start of output**
  Set the number of digits for output length limitation.
- **Starting index of output**
  Set the number of digits for the start of output limiting within the code data.

* This item can also be set from the [Code] tab.

■ Light

- **Use internal lighting**
  Set whether or not to use internal lighting.
  Default: Enable
- **Use external lighting**
  Set whether or not to use external lighting.
  Default: Disable

■ Scan

- **Exposure**
  The exposure set in auto calibration.
  This can also be set manually from the drop-down menu.
- **Gain**
  The digital magnification ratio for brightness of the scan data set in auto calibration.
  Default: 10000
  This can also be set manually from the drop-down menu.
- **Offset**
  The offset value for the scan data set in auto calibration.
  Gain processing is performed based upon the value set as the offset.
  Do not change the setting value under normal conditions.
- **Dynamic range**
  The dynamic range set in auto calibration.
  Default : High sensitive
  Setting contents : Hi-Sensitive, Hi-SNR, Hi-DR
- **Sensitivity**
  The analog magnification ratio for brightness of the scan data set in auto calibration.
  Default: 10000
  This can also be set manually from the drop-down menu.

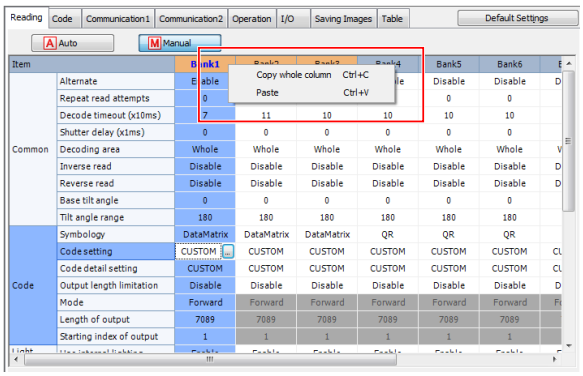
■ Filter

- **First manual filter**
  Sets the filter to perform for the scanned data.
  Default : Disable
  Setting range : Disable, Equalize, Expand, Shrink, Open, Close, Median, or Unsharp Mask
- **First manual filter count**
  Sets the repeat times to perform the first filtering operation specified.
  Default : 1
  Setting range : 1 to 7
- **Second to Fourth manual filters…Same as First manual filter.**
- **Second to Fourth manual filter counts…Same as First manual filter count.**

■ Algorithm

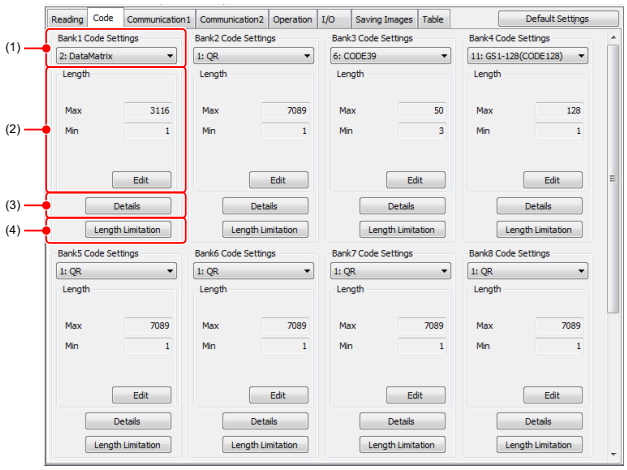
- **Grid correction**
  Sets to either Enable or Disable for the grid correction.
  Default : Disable
  Setting range : Enable or Disable

Reference To copy or paste a parameter bank, right click on the bank number and then perform copy or paste operation for the target parameter.
Screen image



[Code] tab * SR-750 Series

In the [Code] tab, set read digits for symbology registered in each parameter bank, as well as detailed items and output length restrictions for each code.
Furthermore, settings items in the [Code] tab set the same items as those in the [Camera] tab, Manual section.
Change settings in one of these.



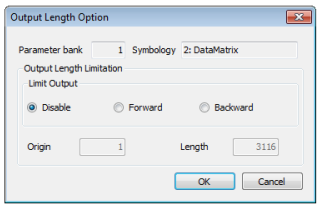
(1) Bank bb Coded Settings
Symbology set in the parameter bank number (1 to 10). Displays the symbology set in auto calibration.
Additionally, for each symbology set here, maximum values for read digits are changed, as well as detailed items using the [Details] button.

(2) Number of digits read
Set maximum and minimum values for digits read. Click the [Edit] button to change the maximum and minimum values.
The maximum and minimum values can be set to the same values, and the number of read digits restricted.

Reference Depending on the marking conditions or operation environment, cancellation of significant digits of ITF codes or NW-7 (Codabar) codes may occur or the code may be mistakenly read. It is recommended to restrict the read length.

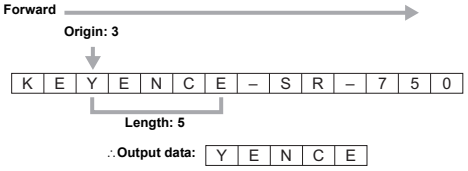
(3) Details
Click the [Details] button and set particular conditions for each code.
Additionally, set multiple read conditions.

(4) Output length option
Perform output length limitation settings.

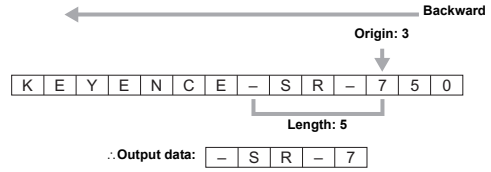


- **Length limitation settings method**
  The following are example settings when output is restricted in "KEYENCE-SR-750" data.

(1) Limit Output: Forward, Origin: 3, Length: 5



(2) Limit Output: Backward, Origin: 3, Length: 5



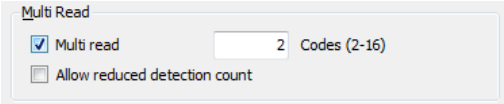
* If output is set to "Backward", then because this only designates the count direction of the star digit, the digits before and after the output data is not changed.

Detailed settings

Items that can be set using the details button differ depending on the code. This section explains detailed setting items for each symbology.

■ Multi read settings * SR-750 Series

Applying multi read settings enables reading of multiple codes within the same decoding area using one scan.



- Set the number of codes that can be read in one read In multi read from 2 to 16.
- By selecting "Allow reduced detection count", to output an OK signal even if a single read is successful.
- Output formats for multi read data are as follows.

Header	1st data item	,	2nd data item	,	…	,	nth data item	Terminator

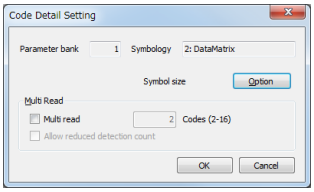
, : Intermediate delimiter. This can be changed to within 5 characters (Default =, (0x2Ch))

- The order of output data is from the code with center coordinates closest to the top of the scan screen (if the same height, then from the right).

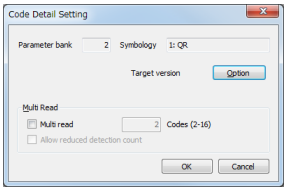
■ 2D code detail settings

Screens and setting items differ for each code.

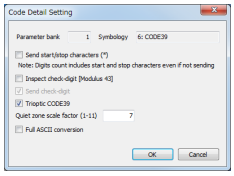
DataMatrix



QR



■ Detailed setting for CODE39



Send start/stop characters (*) .....Check this to send read data, including the start/stop character (*), to the host computer.

Inspect check-digit [Modulus 43] .....When this option is checked, [Send check-digit] is enabled.

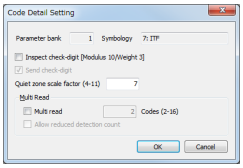
Send check-digit.....Check this to send read data, including the check digit, to the host computer.

Read Trioptic CODE39.....When checked, Trioptic CODE39 can be read.

Quiet zone scale factor (4-11)....Set the quiet zone scale factor.

Full ASCII conversion.....Recognizes CODE39 as "CODE39 FullAscii" and output.

■ Detailed setting for ITF

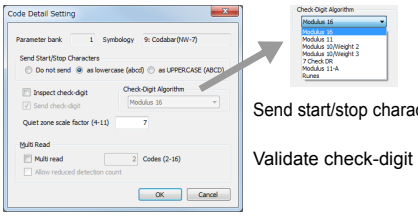


Modulus 10/Weight 3 ..... When this option is checked, [Send check-digit] is enabled.

Send check-digit ..... Check this to send read data, including the check digit, to the host computer.

Quiet zone scale factor (4-11) ... Set the quiet zone scale factor.

■ Detailed setting for NW-7 (Codabar)



Send start/stop characters...Select the Start/Stop Characters.

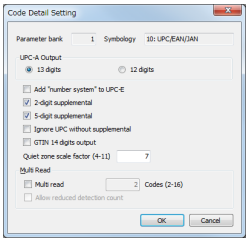
Validate check-digit .....When this option is checked, [Check-digit algorithm] and [Send check-digit] are enabled.

Check-digit algorithm.....Select the method used for the check digit calculation.

Send check-digit.....Check this to send read data, including the check digit, to the host computer.

Quiet zone scale factor (4-11)....Set the quiet zone scale factor.

■ Detailed setting for JAN/EAN/UPC



EAN/JAN-13.....Check this to allow reading of EAN/JAN 13 digits.
EAN/JAN-8.....Check this to allow reading of EAN/JAN 8 digits.
UPC-E.....Check this to allow reading of UPC-E.

UPC-A output.....When reading UPC-A, select whether to output the data as 12 or 13 digits.

Add '0' as system code UPC-E.....Check this to append a "0" to the head of read data.

2-digit supplemental.....Check this to read 2-digit supplemental characters.

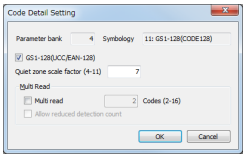
5-digit supplemental.....Check this to read 5-digit supplemental characters.

Ignore UPC without supplemental .....Check this to allow reading of the UPC code with supplemental characters only.

GTIN 14 digits output .....Add a "0" to the head of the data and output as 14 digits.

Quiet zone scale factor (4-11)....Set the quiet zone scale factor.

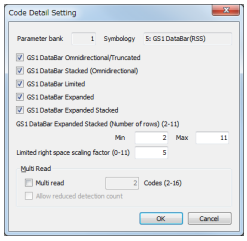
■ Detailed setting for CODE128



GS1-128 (UCC/EAN-128)...Check this to support GS1-128 (UCC/EAN-128). The SR-750 Series outputs "FNC1," which displays the variable length separator via [GS] (0x1D).

Quiet zone scale factor (4-11)....Set the quiet zone scale factor.

■ Detailed setting for GS1 DataBar



GS1 DataBar Truncated ... Check this to allow reading of GS1 DataBar Omnidirectional/GS1 DataBar Truncated.

GS1 DataBar Stacked (Omnidirectional) ..... Check this to allow reading of GS1 DataBar Stacked/GS1 DataBar Stacked Omnidirectional.

GS1 DataBar Limited ..... Check this to allow reading of GS1 DataBar Limited.

GS1 DataBar Expanded ... Check this to allow reading of GS1 DataBar Expanded.

GS1 DataBar Expanded Stacked ..... Check this to allow reading of GS1 DataBar Expanded Stacked.

GS1 DataBar Expanded Stacked (Number of rows) (2-11) ..... Set the GS1 DataBar Expanded Stacked (Number of rows).

Limited right space scaling factor (0-11) ..... Set the quiet zone scale factor.

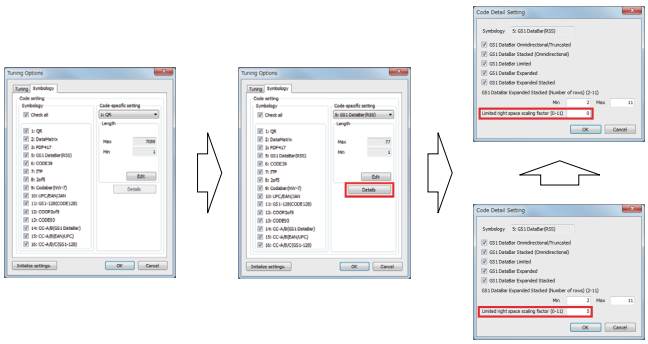
GS1 DataBar Limited and CC-A/B(GS1 DataBar Limited)

GS1 DataBar Limited (including GS1 DataBar Limited as a part of CC-A/B) is characterized by being closely similar to some portion of other barcodes in terms of the bar structure.
Accordingly, the standard regarding GS1 DataBar Limited was amended in 2011.

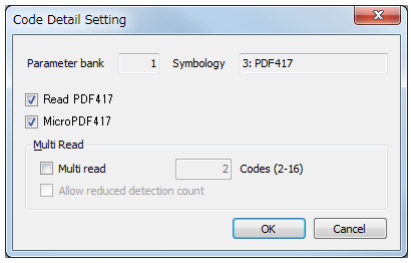
The amended standard requires that a trailing space five times the width of the narrow bar is maintained to the right of GS1 DataBar Limited.

For materials with a blackish surface, if the space portion is printed with a laser marker, the marker may not comply with the new standard. In this case, the SR-750 Series cannot be tuned with the factory setting.

If tuning is not possible with these printed codes, set the Limited right space scaling factor as 0 and retry tuning.

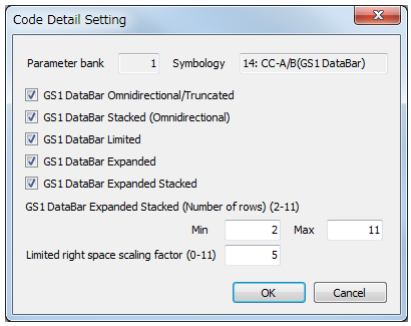


■ PDF417, MicroPDF



PDF417 ..... Check this to allow reading of PDF417.
MicroPDF ..... Check this to allow reading of MicroPDF.
* Be sure to check either one.

■ CC-A/B(GS1 DataBar)



GS1 DataBar Truncated ..... Check this to allow reading of GS1 DataBar Omnidirectional/GS1 DataBar Truncated.

GS1 DataBar Stacked (Omnidirectional) ..... Check this to allow reading of GS1 DataBar Stacked/GS1 DataBar Stacked Omnidirectional.

GS1 DataBar Limited ..... Check this to allow reading of GS1 DataBar Limited.

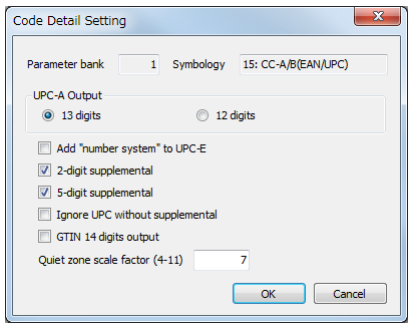
GS1 DataBar Expanded ..... Check this to allow reading of GS1 DataBar Expanded.

GS1 DataBar Expanded Stacked ..... Check this to allow reading of GS1 DataBar Expanded Stacked.

GS1 DataBar Expanded Stacked (Number of rows) (2-11) ..... Set the GS1 DataBar Expanded Stacked (Number of rows).

Limited right space scaling factor (0-11) ..... Set the quiet zone scale factor.

■ CC-A/B(EAN/UPC)



UPC-A output ..... When reading UPC-A, select whether to output the data as 12 or 13 digits.

Add '0' as system code UPC-E ..... Check this to append a "0" to the head of read data.

2-digit supplemental ..... Check this to read 2-digit supplemental characters.

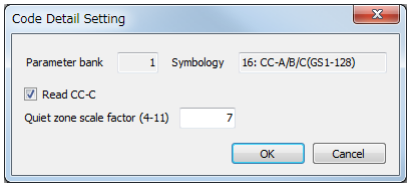
5-digit supplemental ..... Check this to read 5-digit supplemental characters.

Ignore UPC without supplemental ..... Check this to allow reading of the UPC code with supplemental characters only.

GTIN 14 digits output ..... Add a "0" to the head of the data and output as 14 digits.

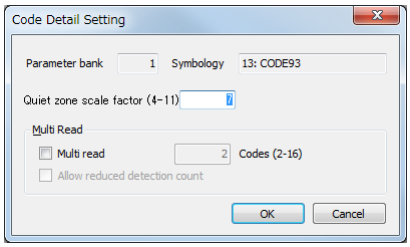
Quiet zone scale factor (4-11) ..... Set the quiet zone scale factor.

■ CC-A/B/C(GS1-128)



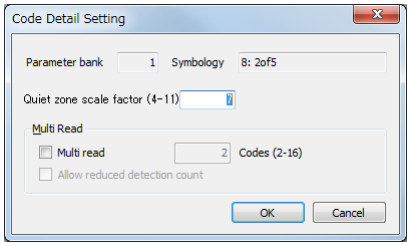
CC-C code .....Check this to allow reading of CC-C.
Quiet zone scale factor (4-11).....Set the quiet zone scale factor.

■ CODE93



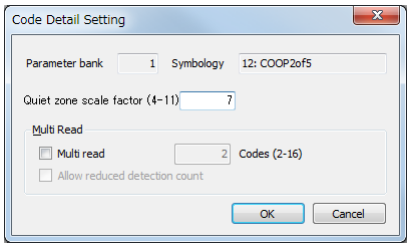
Quiet zone scale factor (4-11).....Set the quiet zone scale factor.

■ 2of5 (Industrial 2of5)



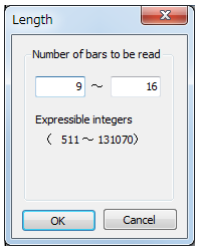
Quiet zone scale factor (4-11).....Set the quiet zone scale factor.

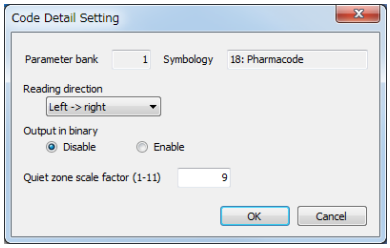
■ COOP2of5



Quiet zone scale factor (4-11).....Set the quiet zone scale factor.

■ Pharmacode *SR-700 only





[Communication1] tab * SR-750 Series

This section explains how to set the communication configuration for the SR-750 Series. Same configuration can be set in the Table tab.

(1) : RS-232C communication condition settings
Set these according to the external device to connect.

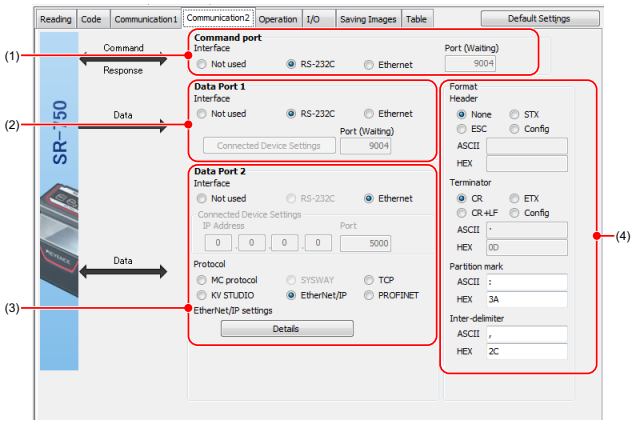
- **Baud Rate**
  Select 9600, 19200, 38400, 57600, or 115200 bps.
  Default: 115200 bps
- **Data Bits**
  Select the data length of either 7 or 8 bits.
  Default: 8 bits
- **Parity**
  Select None, Even, or Odd.
  Default: Even
- **Stop Bit**
  Select 1 or 2 bits.
  Default: 1 bit
- **Protocol**
  Select None, PASS/RTRY, or ACK/NAK for the communication protocol.
  Default: None

(2) : Ethernet communication condition settings
Set these according to the network to connect.

- **IP address**
  Set the IP address for the SR-750 Series.
  Default: 192.168.100.100
- **Subnet Mask**
  Set the subnet mask for the SR-750 Series.
  Default: 255.255.255.0
- **Default Gateway**
  Set the default gateway for the SR-750 Series.
  Default: 0.0.0.0

[Communication2] tab * SR-750 Series

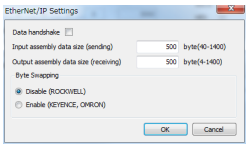
Set communications in line with the control host that connects the SR-750 Series unit. These can be set or changedin the [Table] tab.



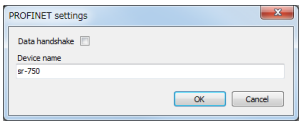
(1) : **Command port**
Select the interface to perform command communication. Commands indicate operation and configuration commands.
Default : RS-232C
Setting range : Not used, RS-232C or Ethernet
* If the Data port 2 interface is RS-232C, RS-232C cannot be selected for the command communication.
* When Ethernet is selected, set the port number to receive the SR-750 Series commands.
Port default: 9004

(2) : **Data port 1**
Select the interface to output the read data.
Default : RS-232C
Setting range : Not used, RS-232C or Ethernet
* If the Data port 2 interface is RS-232C, RS-232C cannot be selected for Data port 1.
* When Ethernet is selected, set the port number to receive the SR-750 Series commands.
Port default: 9004
* When Ethernet is selected and the SR-750 is set as a client, click the "Connected device settings" button to enter the IP address and port number of the destination to send the read data.

(3) : **Data port 2**
Select the interface and protocol to output the read data to a PLC.
- **Interface**
  Default : Not used
  Setting range : Not used, RS-232C or Ethernet
  * When Ethernet is selected, enter the IP address and port number of the destination to send the read data.
- **Protocol**
  Default : MC protocol
  Setting range : MC protocol, SYSWAY (only when RS-232C is selected), KV STUDIO, Ethernet/IP (only when Ethernet is selected), PROFINET (only when Ethernet is selected) or All-purpose (No procedure/TCP)
- **Memory layout**
  When the protocol is MC protocol, SYSWAY, or KV STUDIO, set the memory layout.
  - DM front address
    Default : 0
    Setting range : Page 110
  - Control region address
    Default : 0
    Setting range : Page 110
  - Response region address
    Default : 0
    Setting range : Page 110
- Ethernet/IP settings
  Set Ethernet/IP.

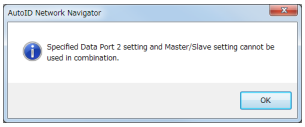


- PROFINET settings: Details
  Set PROFINET.



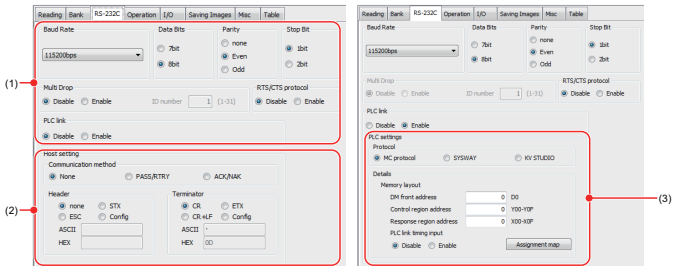
▶ Important

EtherNet/IP and PROFINET communication cannot be used in combination with the Master/Slave (multi-drop link) function. If the Master/Slave (multi-drop link) function has already been selected, the following message will appear. When setting EtherNet/IP and PROFINET communication, set the Master/Slave (multi-drop link) function to "Not used".



(4) : **Format**
- **Header/Terminator**
  Sets the header and terminator of the read data.
  - Header
    Default : None
    Setting range : Select None, STX, ESC, or Config.
    When Config is selected, enter the header using 5 or less ASCII or hexadecimal characters as desired.
  - Terminator
    Default : CR
    Setting range : CR, CR+LF, ETX, or Config.
    When Config is selected, enter the header using 5 or less ASCII or hexadecimal characters as desired.
- **Partition mark**
  The selected character is used as a separator in send data. Select any single ASCII or hexadecimal character.
  Default : ":" (3Ah)
- **Inter delimiter**
  The selected character is used as a separator for appended data. Select any single ASCII or hexadecimal character.
  Default : "," (2Ch)

[RS-232C] tab * SR-700 Series



(1) **RS-232C communication condition settings**

- **Baud Rate**
  Select 9600, 19200, 38400, 57600, or 115200 bps.
  Default : 115200 bps
- **Data Bits**
  Select the data length of either 7 or 8 bits.
  Default : 8 bits
- **Parity**
  Select None, Even, or Odd.
  Default : Even
- **Stop Bit**
  Select 1 or 2 bits.
  Default : 1 bit
- **RTS/CTS Protocol**
  Select Enable or Disable.
  Default : Disable
- **Multi Drop**
  Set the Multi drop link setting of Enable or Disable.
  Default : Disable
- **PLC Link**
  Select Enable or Disable.
  Default : Disable

(2) **Communication Method/Format Settings**

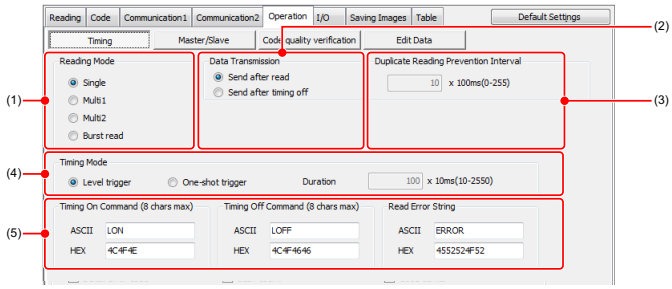
- **Communication Method**
  Select Non-procedure, PASS/RTRY or ACK/NAK.
  Default : Non-procedure
- **Header**
  Default : None
  Setting range: Select None, STX, ESC, or Config.
  When Config is selected, enter the header using 5 or less ASCII or hexadecimal characters as desired.
- **Terminator**
  Default : CR
  Setting range: Select CR, CR+LF, ETX, or Config.
  When Config is selected, enter the header using 5 or less ASCII or hexadecimal characters as desired.

(3) **PLC Link Settings**

- **Protocol**
  Default : MC Protocol
  Setting range : MC Protocol, SYSWAY or KV STUDIO
- **DM front address**
  Default : 0
  Setting range : Page 110
- **Control region address**
  Default : 0
  Setting range : Page 110
- **Response region address**
  Default : 0
  Setting range : Page 110
- **PLC link timing input**
  Sets whether timing is input by turning the PLC memory flag ON/OFF. Select Enable or Disable.
  Default : Disable

[Operation] tab

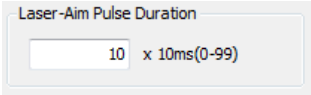
Configures SR-750/SR-700 Series operation. These can be set or changed in the [Table] tab.



(1) **Reading Mode**
Select one of the following four choices.

- **Single** ..... single label read mode
- **Multi1** ..... multi-label read mode 1
- **Multi2** ..... multi-label read mode 2 * SR-750 Series
- **Burst read** .... burst reading mode

When Multi1 or Multi2 is selected, the following window is displayed. Set Laser-Aim Pulse Duration. * SR-750 Series



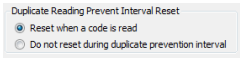
(2) **Data Transmission**
When specifying single label read mode or multi-label read mode 2, select from the following 2 options.

- **Send after read**
- **Send after timing off**

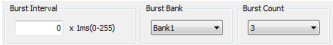
(3) **Duplicate Reading Prevention Interval**
Set when multi-label read mode 1 is specified.
Default : 1000 ms
Setting range : 0 to 25500 ms (Specify in units of 100 ms)

Important

When Multi1 is selected, the following window is displayed. Set Duplicate Reading Prevent Interval Reset. * SR-750 Series
"3-13 Duplicate reading prevention interval reset (Page 37)"



Burst read settings
Specify burst read mode and the follow screen will be displayed.



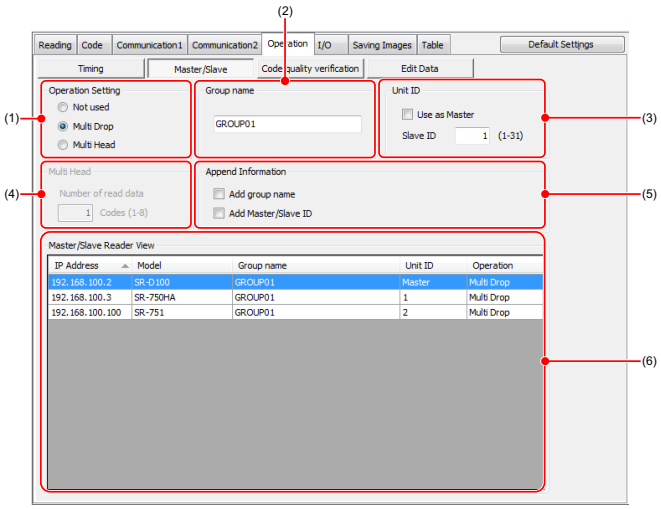
- **Burst Interval**
  Default : 0 ms
  Setting range : 0 to 255 ms (Specify in units of 1 ms)
- **Burst Bank * SR-750 Series**
  Default : Bank1
  Setting range : Bank1 to Bank10
- **Burst Count**
  Default : 3
  Setting range : 1 to 8

(4) **Timing Mode**
Select one of the following two choices.

- **Level trigger**
- **One-shot trigger**
  If one-shot trigger is selected, then set the one-shot duration.
  Default : 1000 ms
  Setting range : SR-750: 100 to 25500ms
  SR-700: 30 to 25500ms
  (Specify in units of 10 ms)

(5) **Timing On Command, Timing Off Command, Read Error String**
Specify up to 8 (for SR-750) or 32 (for SR-700) ASCII or hexadecimal characters.
Timing On Command default : LON (4C4F4E)
Timing Off Command default : LOFF (4C4F4646)
Read Error String default : ERROR (4552524F52)

Master/Slave * SR-750 Series



(1) : **Operation setting**
Sets the Master/Slave function operation.
- Default : Not used
- Setting range : Not used, Multi Drop, Multi Head

(2) : **Group name**
Determines the group name to use the Master/Slave function.
- Default : GROUP01
- Setting range : Up to 16 characters
  Set with ASCII.

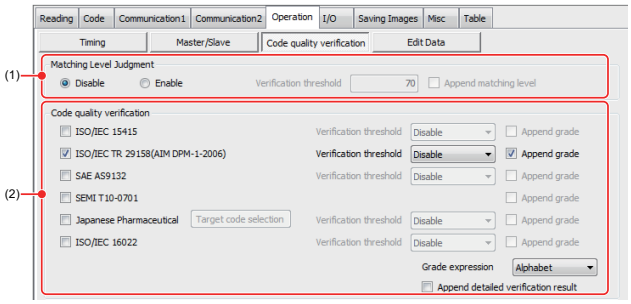
(3) : **Unit ID**
Sets ID as Master unit or Slave unit.
- Default : Check "Use as Master"
- Setting range : "Use as Master" or Slave ID "1 to 31"

(4) : **Multi Head**
Sets the number of read data when using the Multi Head.
- Default : 1
- Setting range : 1 to 8

(5) : **Append Information**
Sets to append group names or Master/Slave ID when using the Master/Slave function.
- Default : None

(6) : **Master/Slave Reader View**
Displays the information of the reader that uses the Master/Slave function among readers that have been registered to AutoID Network Navigator.

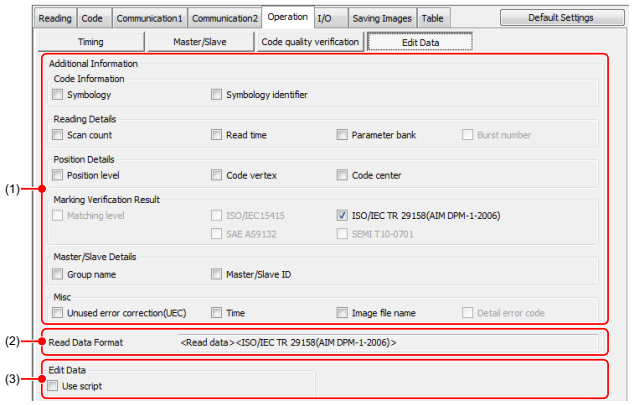
Code quality verification



(1) **Matching Level Judgment**
Sets the Matching Level Judgment function.
Default : Disable
Changing the setting to "Enable" will enable the setting items for threshold or appending matching level.

(2) **Code quality verification**
Sets the Code quality verification function. Check the code quality verification standard.
With the checked standard, set the threshold for the verified result or additional data of grade.
Additional data setting for detailed items of verified results can also be made.

Edit data



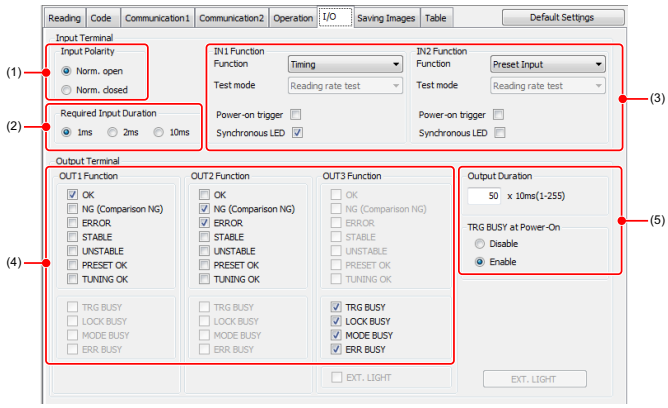
(1) **Additional Information**
Checking the checkbox of data to add can set the Additional Information.
Default : None for all items

(2) **Read Data Format**
Displays the position of added data when the Additional Information is set.

(3) **Edit Data**
Check "Use script" when using the edit data function.

[I/O] tab

Set operations for input/output terminals. These can be set or changed in the [Table] tab.



■ Input Terminal

Set the operation of the input terminals (IN1 and IN2).

(1) **Input Polarity**
Specify the polarity of the input terminal.
Default : Norm. open
Setting range : Norm. open (normally open) or Norm. close (normally closed)

(2) **Required Input Duration**
Set the time delay before the input terminal turns on.
Default : 1 ms
Setting range : 1 ms, 2 ms, 10 ms

(3) **IN1, IN2 Function**
- **Function**
  IN1 default : TIMING
  IN2 default : PRESET
  Settings range : TIMING, Preset Input, TEST, Clear PLC link error, TUNING, Disable, capture image (SR-700 only), trigger lock (SR-700 only), batch setting code reading (SR-700 only)
- **Test mode**
  When you select "TEST", specify the test mode desired.
  Settings range : reading rate test, processing time test, position test (SR-750 only)
- **Power-ON trigger**
  Select this to activate IN1 and IN2 specified at power-on.

■ Output terminal

Set the functions of the output terminals (OUT1, OUT2, OUT3).

(4) **OUT1, OUT2, OUT3 terminal functions**

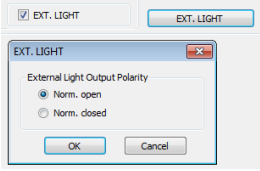
- **Terminal function**

  * For SR-750
  OUT1 default : OK
  OUT2 default : NG+ERROR
  OUT3 default : TRG BUSY, LOCK BUSY, MODE BUSY, ERR BUSY
  * For SR-700
  OUT1 default : OK
  OUT2 default : NG+ERROR
  OUT3 default : ERROR
  OUT4 default : TRG BUSY, LOCK BUSY, MODE BUSY, ERR BUSY
  Setting range : OK, NG, ERROR, STABLE, UNSTABLE, PRESET OK, TUNING OK, TRG BUSY, LOCK BUSY, MODE BUSY, ERR BUSY
  EXT. LIGHT

NOTICE	**You cannot set the result outputs (OK, NG, ERROR, PRESET OK, TUNING OK), and the operation outputs (TRG BUSY, LOCK BUSY, MODE BUSY, ERR BUSY) to the same output terminal.**

- **EXT. LIGHT**

  Select to use external lighting.
  Select this to make the [EXT. LIGHT] button active.



- External lighting output polarity
  Default : Norm. open
  Setting range : Norm. open (normally open) or Norm. close (normally closed)

(5) • **Output Duration**

  Specify the polarity of the output terminal. (Common between terminals)
  Default : 500 ms
  Setting range : 0 to 2550 ms (Specify in units of 10 ms)

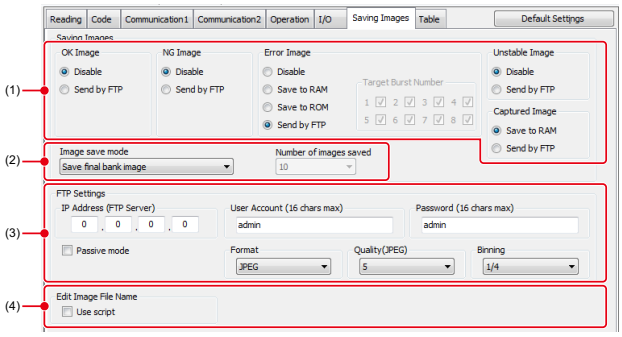
- **TRG BUSY at Power-On**

  Specify start-up options when TRG BUSY is set.
  Default : Disable
  Setting range : Disable, Enable

Refer to 📖 "3-6 Multi-I/O Function (Page 24)"

[Saving Images] tab

Set functions for saving images. These can be set or changed in the [Table] tab.



■ Image saving function settings

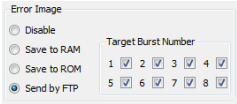
Set image saving functions and modes.

(1) **Saving images operations**

Default
- OK Image : Disable (SR-750), RAM (SR-700)
- NG Image : Disable (SR-750), RAM (SR-700)
- Error Image : Save to RAM
- Unstable image : Disable (SR-750), RAM (SR-700)
- Captured Image : Save to RAM (SR-750 only)

Setting range
- OK Image/NG Image/Unstable image : Disable, Send by FTP (SR-750), save to RAM (SR-700)
- Error Image : Disable, Save to RAM, Save to ROM (SR-750 only), Send by FTP (SR-750 only)
- Captured Image : Save to RAM, Send by FTP

If burst read mode is set as the operating mode, specify the burst number for the target images.



(2) • **Image save mode**

  Default : Save final bank image
  Setting range : Save final bank image, save specified number of images from timing ON, save specified number of images before timing OFF

- **Number of images saved**

  If the number of images to save has been specified from timing ON/OFF, then specify this number.
  Default : 10
  Setting range : 1 to 10

■ FTP Settings

Set if Send by FTP is selected in saving images, and the SR-750 Series device is operating as a client.

(3) • **IP Address**

  Set the IP address of the connection destination FTP server.
  Default : 0.0.0.0
  Setting range : 0.0.0.0 to 255.255.255.255

- **User Account/Password**

  Set the user account name and password of the destination FTP server.
  Default : User Account: admin
  Password: admin
  Setting range : Specify up to 16 ASCII or hexadecimal characters

- **Passive mode**

  Default : Disabled (no check mark)
  Setting range : Disable, Enable

- **Format (For SR-700, settable as an image quality setting)**

  Default : JPEG
  Setting range : Bitmap, JPEG

- **Quality (JPEG) (For SR-700, settable as an image quality setting)**

  Set this when JPEG is selected as the format setting.
  Default : 5
  Setting range : 1 to 10

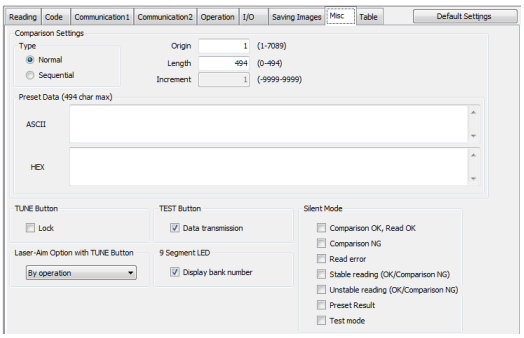
- **Binning (For SR-700, settable as an image quality setting)**

  Default : 1/4 skipping
  Setting range : No binning, 1/4 skipping, 1/16 skipping, 1/64 skipping

(4) **Edit image file name**

  When setting the edit image file name function, check "Use script".
  * Valid only in FTP transmission

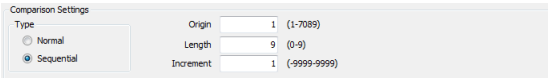
Addition of other tabs



(1) **Comparison/preset setting**
Sets the comparison/preset function.

- **Comparison method**
  Default : Normal
  Setting range : Normal or Sequential
- **Origin**
  Default : 1
  Setting range : 1 to 7089
- **Length**
  Default : 494
  Setting range : 0 to 494

When the comparison method is Sequential, set the increment.



- **Length**
  Default : 9
  Setting range : 0 to 9
- **Increment**
  Default : 1
  Setting range : -9999 to 9999

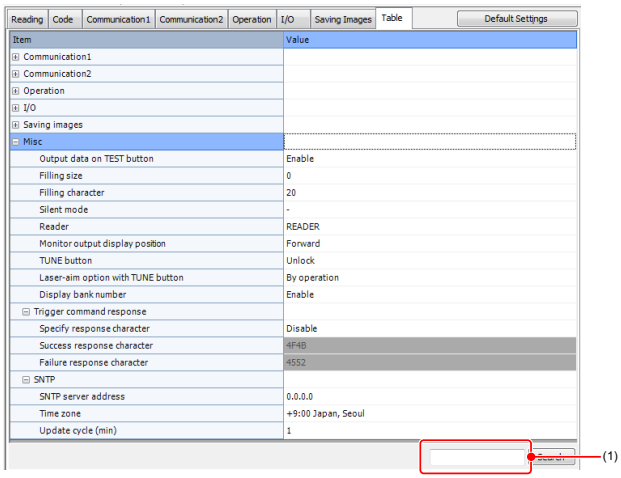
(2) **Operation configuration of the switches, laser pointer, and the multiple LED indicator**

- **TUNE button**
  Check this to enable/disable the operation of the TUNE button.
  Set this to deactivate the TUNE button during operation.
- **TEST button**
  Uncheck this to inhibit the test mode result data started with the TEST button.
- **Laser pointer lighting with the TUNE button * SR-750 Series**
  Sets the pointer lighting condition by TUNE button operation.
  Default : By operation
  Setting range : Lock.....The laser pointer does not light up by TUNE button operation or each operation mode.
  Test mode only ....Only in the test mode, the pointer lights up by the TUNE button.
  Run mode only ....Only in the run mode, the pointer lights up by the TUNE button.
  By operation.....Regardless of the test mode or the run mode, the pointer lights up by the TUNE button.
- **Laser-aim light *SR-700 only**
  Sets the conditions for the laser-aim light.
  Default : Manual lighting
  Setting range : Manual lighting ....Only lights when instructed by pressing TUNE button and giving command.
  Automatic lighting...Normally lit
  Automatic lighting during scanning only.....Lit only during scanning (with Timing ON)
- **LED indicator**
  Uncheck this to stop the parameter bank number display of reading success for the multiple LED indicator.

(3) **Silent mode setting**
Restrains data output of checked items.
Default : All disabled
Setting range : Read OK/Comparison OK
Comparison NG
Read ERROR
Stable Reading (OK/Comparison NG)
Unstable Reading (OK/Comparison NG)
Preset Result
Tuning (SR-700 only)
Test mode

[Table] tab

On the list of this tab, you can set items that can be set in [Communication1 (SR-750)], [Communication2 (SR-750)], [RS-232C(SR-700)], [Operation], [I/O] and [Saving images] tabs.
Defaults and settings ranges are the same as those in each respective tabs.



Some functions can only be configured on the [Table] tab.
(1) Search box
Search whether the input words are present in the Table.

Communication1 * SR-750 Series

■ RS-232C

- **Baud rate**
  Sets the baud rate.
  Default : 115200 bps
  Setting range : 9600, 19200, 38400, 57600, or 115200 bps
- **Data length**
  Sets the data bit length.
  Default : 8 bits
  Setting range : 7 or 8 bits
- **Parity**
  Sets the parity.
  Default : Even
  Setting range : None, Even, or Odd
- **Stop bit**
  Sets the stop bit length.
  Default : 1 bit
  Setting range : 1 or 2 bits
- **Protocol**
  Sets the output protocol for RS-232C read data.
  Default : None
  Setting range : None, PASS/RTRY, or ACK/NAK

■ Ethernet

- **IP address**
  Sets the IP address.
  Default : 192.168.100.100
- **Subnet Mask**
  Sets the subnet mask.
  Default : 24 (255.255.255.0)
  Setting range : 8 to 30 (255.0.0.0 to 255.255.255.252)
- **Default Gateway**
  Sets the default gateway.
  Default : 0.0.0.0

Communication2 * SR-750 Series

■ Command port

- **Interface**
  Select the interface to perform command communication.
  Default : RS-232C
  Setting range : Not used, RS-232C, Ethernet
- **Port (Waiting)**
  Sets the port number to perform command communication. *Only when the interface is set to Ethernet
  Default : 9004
  Setting range : 1024 to 65535
  * 9013, 9014, 9015, 9016, 5900, 5910, and 44818 cannot be used as they are reserved for the main unit system.
- **Keep Alive**
  Sets the keep-alive function for command communication. *Only when the interface is set to Ethernet
  Default : Enable
  Setting range : Enable or Disable

■ Data port 1

- **Interface**
  Sets the interface to perform PC host output.
  Default : RS-232C
  Setting range : Not used, RS-232C, Ethernet
- **Remote IP address**
  Sets the IP address of the PC host. *Only when the interface is set to Ethernet
  Default : 0.0.0.0 * When 0.0.0.0 is set, the SR-750 performs server operations only.
  Setting range : 0.0.0.0 to 255.255.255.255
- **Remote port**
  Sets the port number of the PC host. *Only when the interface is set to Ethernet
  Default : 9004
  Setting range : 1024 to 65535
- **Connection request**
  Sets whether the reader sends connection requests for PC host output. *Only when the interface is set to Ethernet
  Default : Disabled
  Setting range : Disable or Enable
- **Port (Waiting)**
  Sets the port number for PC host output of the SR-750 Series. *Only when the interface is set to Ethernet
  Default : 9004
  Setting range : 1024 to 655355
  * 9013, 9014, 9015, 9016, 5900, 5910, and 44818 cannot be used as they are reserved for the main unit system.
- **Keep Alive**
  Sets the keep-alive function of PC host output. *Only when the interface is set to Ethernet
  Default : Enable
  Setting range : Enable or Disable

■ Data port 2

- **Interface**
  Sets the interface to perform PLC communication.
  Default : Not used
  Setting range : Not used, RS-232C, Ethernet
- **Remote IP address**
  Sets the IP address of the remote PLC. *Only when the interface is set to Ethernet
  Default : 0.0.0.0
  Setting range : 0.0.0.0 to 255.255.255.25
- **Remote port**
  Sets the port number of the remote PLC. *Only when the interface is set to Ethernet
  Default : 5000
  Setting range : 1024 to 65535

■ PLC link

- **Protocol**
  Sets the PLC communication protocol.
  Default : MC protocol
  Setting range : MC protocol, SYSWAY (*RS-232C only), KV STUDIO, None (*RS-232C only), TCP (*Ethernet only), EtherNet/IP (*Ethernet only) or PROFINET (only when Ethernet is selected)
- **DM front address**
  Sets the DM front address when a PLC link is used.
  Default : 0
  Setting range : MC protocol …0 to 32767
  SYSWAY …0 to 9999
  KV STUDIO …0 to 65534
- **Control region address**
  Sets the control region address when a PLC link is used.
  Default : 0
  Setting range : MC protocol …0 to 7F
  SYSWAY …0 to 6143
  KV STUDIO …1 to 599
- **Response region address**
  Sets the response region address when a PLC link is used.
  Default : 0
  Setting range : MC protocol …0 to 7F
  SYSWAY …0 to 6143
  KV STUDIO …1 to 599
- **PLC link timing input**
  Sets to enable timing input by PLC link.
  Default : Disabled
  Setting range : Disable or Enable
- **Output length**
  Sets the data write length by PLC link.
  Default : 64 digits
  Setting range : 1 to 100 digits
- **Timing/Data wait (x 100 ms)**
  Sets the communication interval of reading or writing to a PLC via PLC link.
  Default : 100 ms
  Setting range : 0 to 9900 ms (in units of 100 ms)
- **Retry duration**
  Sets the interval to reconnect when PLC link communication is disabled.
  Default : 5 seconds
  Setting range : 1 to 30 seconds

■ EtherNet/IP

- **Data handshake**
  Sets EtherNet/IP data handshake
  Default : Disable
  Setting range : Disable or Enable
- **Input assembly data size (send)**
  Sets EtherNet/IP Input assembly (send) size within the range from 40 to 1400.
  Default : 500
  Setting range : 40 to 1400
- **Output assembly data size (receive)**
  Sets EtherNet/IP Output assembly (receive) size within the range from 4 to 1400.
  Default : 500
  Setting range : 4 to 1400
- **Byte swapping**
  Sets EtherNet/IP Byte swap for the data area
  Default : Disable
  Setting range : Disable or Enable

■ PROFINET

- **Device name**
  Sets the device name used for PROFINET.
  Default: sr-750

> ▶ Important
> **Device name rule**
> 1. **PROFINET device name length: 1 to 240 characters**
> 2. **1 label length: 1 to 63 characters**
> 3. **Only [a to z] (alphabet lower case), [0 to 9] (numbers), [-] (hyphen), [.] (period) can be used for a device name.**
> 4. **[-] (hyphen) cannot be used at the beginning of the label.**
> 5. **[-] (hyphen) cannot be used at the end of the label.**
> 6. **port-xyz, port-xyz-abcde cannot be the name of the first label. a, b, c, d, e, x, y, z means [0 to 9] (numbers).**
> 7. **Device names cannot be made in the IP address format (n.n.n.n n=0,…,999).**
> 8. **Labels cannot start with xn-.**
> 9. **The first character of labels cannot be a number.**

- **Data handshake**
  Sets the data handshake.
  Default : Disable
  Setting range : Disable or Enable

■ Format

- **Header**
  Sets the header.
  Default : Not selected
  Setting range : Enter the header using 5 or less ASCII or hexadecimal characters as desired.
- **Terminator**
  Sets the terminator.
  Default : 0D (hexadecimal display, ASCII characters [CR])
  Setting range : Enter the header using 5 or less ASCII or hexadecimal characters as desired.
- **Partition mark**
  Sets the partition mark.
  Default : 3A (hexadecimal display, ASCII characters ":")
  Setting range : Enter any single ASCII or hexadecimal character.
- **Inter delimiter**
  Sets the inter delimiter.
  Default : 2C (hexadecimal display, ASCII characters ",")
  Setting range : Enter any single ASCII or hexadecimal characters.
- **Append data size**
  Set this option to append data size.
  Default : Disabled
  Setting range : Disable or Enable
- **Append checksum**
  Set this option to append checksum function.
  Default : Disabled
  Setting range : Disable or Enable

RS-232C * SR-700 Series

■ RS-232C

- **Baud Rate**
  Select 9600, 19200, 38400, 57600, or 115200 bps.
  Default : 115200 bps
- **Data Bits**
  Select the data length of either 7 or 8 bits.
  Default : 8 bits
- **Parity**
  Select None, Even, or Odd.
  Default : Even
- **Stop Bit**
  Select 1 or 2 bits.
  Default : 1 bit
- **Communication Method**
  Select Non-procedure, PASS/RTRY or ACK/NAK.
  Default : Non-procedure
- **RTS/CTS Protocol**
  Select Enable or Disable.
  Default : Disable
- **Multi Drop**
  Set the Multi drop link setting of Enable or Disable.
  Default : Disable

■ Field Network/PLC Link

- **PLC Link**
  Select Enable or Disable.
  Default : Disable
- **PLC Protocol**
  Default : MC Protocol
  Setting range: MC Protocol, SYSWAY or KV STUDIO
- **DM front address**
  Default : 0
  Setting range : 📖 Page 110
- **Control region address**
  Default : 0
  Setting range : 📖 Page 110
- **Response region address**
  Default : 0
  Setting range : 📖 Page 110
- **PLC link timing input**
  Sets whether timing is input by turning the PLC memory flag ON/OFF. Select Enable or Disable.
  Default : Disable
- **Output length**
  Sets the data write length by PLC link.
  Default : 64 digits
  Setting range : 1 to 100 digits
- **Timing/Data wait (x 10 ms)**
  Sets the communication interval of reading or writing to a PLC via PLC link.
  Default : 100 ms
  Setting range : 0 to 990 ms (in units of 10 ms)
- **Retry duration**
  Sets the interval to reconnect when PLC link communication is disabled.
  Default : 5 seconds
  Setting range : 1 to 10 seconds

■ Format

- **Header**
  Default : None
  Setting range : Select None, STX, ESC, or Config.
  When Config is selected, enter the header using 5 or less ASCII or hexadecimal characters as desired.
- **Terminator**
  Default : CR
  Setting range : Select CR, CR+LF, ETX, or Config.
  When Config is selected, enter the header using 5 or less ASCII or hexadecimal characters as desired.
- **Partition mark**
  Sets the partition mark.
  Default : 3A (hexadecimal display, ASCII characters ":")
  Setting range : Enter any single ASCII or hexadecimal character.
- **Composite symbol delimiter**
  Sets the delimiter for composite symbol (CC-A/B/C) 1D code data and 2D code data.
  Default : Not set
  Setting range : Up to 5 characters
- **Inter delimiter**
  Sets the inter delimiter.
  Default : 2C (hexadecimal display, ASCII characters ":")
  Setting range : Enter any single ASCII or hexadecimal character.
- **Append data size**
  Set this option to append data size.
  Default : Disabled
  Setting range : Disable or Enable
- **Append checksum**
  Set this option to append checksum function.
  Default : Disabled
  Setting range: Disable or Enable

■ TIMING

- **Timing Mode**
  Sets the method of measuring timing.
  Default : Level trigger
  Setting range : Level trigger or One-shot trigger
- **One-shot trigger duration**
  Sets the measuring duration of one-shot trigger.
  Default : 1000 ms
  Setting range : SR-750: 100 to 25500 ms (in units of 100 ms)
  SR-700: 30 to 25500 ms (in units of 10 ms)
- **Timing ON command**
  Sets the timing ON command characters.
  Default : 4C4F4E (hexadecimal display, ASCII characters "LON")
  Setting range : Enter a string using 8 or less ASCII or hexadecimal characters as desired.
- **Timing OFF command**
  Sets the timing OFF command characters.
  Default : 4C4F4646 (hexadecimal display, ASCII characters "LOFF")
  Setting range : Enter a string using 8 or less ASCII or hexadecimal characters as desired.
- **One-character timing recognition**
  Set to enable one-character timing recognition.
  Default : Disable
  Setting range : Disable or Enable

Important

■ SR-750

The following strings can recognize a timing ON/OFF command as one-character:

SOH (0x01)	SO (0x0e)	EM (0x19)
STX (0x02)	SI (0x0f)	SUB (0x1a)
ETX (0x03)	DLE (0x10)	FS (0x1c)
EOT (0x04)	DC1 (0x11)	GS (0x1d)
ENQ (0x05)	DC2 (0x12)	RS (0x1e)
BEL (0x07)	DC3 (0x13)	US (0x1f)
BS (0x08)	DC4 (0x14)	* If STX (0x02) or ETX (0x03) is set for either the timing ON or OFF command, the command is not recognized in the "<STX> command <ETX>" format.
HT (0x09)	SYN (0x16)	
VT (0x0b)	ETB (0x17)	
FF (0x0c)	CAN (0x18)	

■ SR-700

* When activated, the characters below can be specified in the timing ON/OFF command

	0	1	2	3	4	5	6	7
0	NUL	DLE	SP	0	@	'	'	p
1	SOH	DC1	!	1			a	q
2	STX	DC2	"	2			b	r
3	ETX	DC3		3			c	s
4	EOT	DC4	$	4			d	t
5	ENQ			5			e	u
6		SYN	&	6			f	v
7	BEL	ETB		7			g	w
8	BS	CAN	(	8			h	x
9	HT	EM	)	9			i	y
A		SUB	*	:			j	z
B	VT		+	;		[	k	{
C	CL	FS	,	<		\	l	¦
D		GS	-	=		]	m	}
E	SO	RS	.	>		^	n	~
F	SI	US	/	?			o	del

If specifying STX or ETX, command cannot be recognized in the format <STX> command <ETX> .

■ Reading Behavior

- **Reading Mode**
  Sets the reading mode.
  Default : Single
  Setting range : Single, Multi1, Multi2 (SR-750), or Burst read
- **Data Transmission**
  Sets the timing to send data.
  Default : Send after read
  Setting range : Send after read or Send after timing off
- **Duplicate reading prevention interval (x100 ms)**
  Sets the time to prevent reading the same code twice in the Multi1 Reading mode.
  Default : 1000 ms
  Setting range : 100 to 25500 ms (in units of 100 ms)
- **Duplicate reading prevention interval reset * SR-750 Series**
  Sets the duplicate reading prevention interval reset.
  Default : Reset when a code is read
  Setting range : Reset when a code is read or Do not reset during duplicate prevention interval
- **Laser-Aim Pulse Duration. * SR-750 Series**
  Sets when Multi1 read mode or Multi2 read mode is specified.
  Default : 100 ms
  Setting range : 0 to 990 ms (Specify by the 10 ms)
- **Read error string**
  Sets the reading error code.
  Default : 4552524F52 (hexadecimal display, ASCII characters "ERROR")
  Setting range : Enter a string using 8 or less ASCII or hexadecimal characters as desired.
- **Bank shift shortening operation**
  If it has been determined that the scanned image cannot be decoded within the specified decode timeout period, set this option to select either performing the next scanning immediately or waiting for the decode timeout period expiration.
  Default : Enable
  Setting range : Enable or Disable
- **Burst interval (x1 ms)**
  Sets the burst interval.
  Default : 0 ms
  Setting range : 0 to 255 ms
- **Burst count**
  Sets the number of scans in the burst read mode.
  Default : 3
  Setting range : 1 to 8
- **Burst bank**
  Sets the bank used in the burst read mode.
  Default : Bank 1
  Setting range : Bank 1 to Bank 10

■ Master/Slave * SR-750 Series

- **Operation setting**
  Sets the Master/Slave function operation.
  Default : Not used
  Setting range : Not used, Multi Drop or Multi Head
- **Group name**
  Sets group name.
  Default : GROUP01
  Setting range : Input up to 16 arbitrary characters using the ASCII character.
- **Unit ID**
  Sets ID of SR-750.
  Default : 0
  Setting range : 0 to 31
- **Read data number for Multi Head mode**
  Sets the number of read data during multi head operation.
  Default : 1
  Setting range : 1 to 8

■ Alternate

- **Priority bank * SR-750 Series**
  Sets the parameter bank to start reading when the Alternate function is used.
  Default : 1
  Setting range : 1 to 10
- **Order**
  Sets the alternate order changing method. When "Begin with successful bank" is set, the alternate comes from the parameter bank that was last read successfully.
  Default : Begin with successfully read bank
  Setting range : Sequential or Begin with successfully read bank

■ Matching Function

- **Matching level OK/NG judgment**
  Sets to judge the matching level when a reading was successful.
  Default : Disable
  Setting range : Disable or Enable
- **Matching level threshold**
  Sets the threshold for matching level OK/NG judgment.
  Default : 70
  Setting range : 0 to 99

■ Code quality verification

- **ISO/IEC15415 verification**
  Sets ISO/IEC15415 verification function.
  Default : Disable
  Setting range : Disable or Enable
- **ISO/IEC15415 verification threshold**
  Sets the threshold of ISO/IEC15415 evaluation result.
  Default : Disable
  Setting range : Disable, D, C, B or A
- **ISO/IEC TR 29158 (AIM DPM-1-2006) verification**
  Sets ISO/IEC TR 29158 (AIM DPM-1-2006) verification function.
  Default : Disable
  Setting range : Disable or Enable
- **ISO/IEC TR 29158 (AIM DPM-1-2006) verification threshold**
  Sets the threshold of ISO/IEC TR 29158 (AIM DPM-1-2006) evaluation result.
  Default : Disable
  Setting range : Disable, D, C, B or A
- **SAE AS9132 verification**
  Sets SAE AS9132 verification function.
  Default : Disable
  Setting range : Disable or Enable
- **SAE AS9132 verification threshold**
  Sets the threshold of SAE AS9132 evaluation result.
  Default : Disable
  Setting range : Disable or Enable
- **SEMI T10-0701 verification**
  Sets SEMI T10-0701 verification function.
  Default : Disable
  Setting range : Disable or Enable
- **Select code for Japan Pharmaceutical Verification**
  Sets the code for Japan Pharmaceutical Verification.
  Default : None
  Setting range : GS1-128, GS1 DataBar Limited, GS1 DataBar Stacked, CC-A (GS1 DataBar Limited) or CC-A(GS1 DataBar Stacked)
- **Evaluation result threshold value for Japan Pharmaceutical Verification**
  Sets the evaluation result threshold value for Japan Pharmaceutical Verification.
  Default : Disable
  Setting range : Disable, D, C, B or A
- **ISO/IEC16022 verification**
  Sets the ISO/IEC16022 verification function.
  Default : Disable
  Setting range : Disable or Enable
- **ISO/IEC16022 threshold value**
  Sets the ISO/IEC16022 evaluation result threshold value.
  Default : Disable
  Setting range : Disable, D, C, B or A
- **Select expression of grades**
  Set this option to select expression of quality grades.
  Default : Alphabet
  Setting range : Alphabet or Numeric
- **Append detailed verification result**
  Sets the detailed verification result addition function when the verification result is appended.
  Default : Disable
  Setting range : Disable or Enable
- **Append values**
  Sets the evaluation value addition function when the verification result is appended.
  Default : Disable
  Setting range : Disable or Enable

■ Edit Data

- **Data edit by script**
  Sets the edit data function.
  Default : Disable
  Setting range : Disable or Enable

■ Additional Data

- **Time**
  Set this option to append time.
  Default : Disabled
  Setting range : Disable or Enable
- **Detail error code**
  Set the additional function for detailed read code.
  Default : Disable
  Setting range : Disable or Enable
- **Code type**
  Set this option to append code type.
  Default : Disabled
  Setting range : Disable or Enable
- **Symbol ID**
  Set this option to append symbol ID.
  Default : Disabled
  Setting range : Disable or Enable
- **Parameter bank**
  Set this option to append bank number.
  Default : Disabled
  Setting range : Disable or Enable
- **Burst number**
  Sets the additional function for burst number.
  Default : Disable
  Setting range : Disable or Enable
- **Read count**
  Set this option to append scan count.
  Default : Disabled
  Setting range : Disable or Enable
- **Position level * SR-750 Series**
  Set this option to append position measurement level.
  Default : Disabled
  Setting range : Disable or Enable
- **Code vertex**
  Set this option to append corner coordinates of codes.
  Default : Disabled
  Setting range : Disable or Enable
- **Code center**
  Set this option to append center coordinates of codes.
  Default : Disabled
  Setting range : Disable or Enable
- **ECC level (UEC)**
  Set this option to append unused ECC ratio.
  Default : Disabled
  Setting range : Disable or Enable
- **Matching level**
  Set this option to append matching level.
  Default : Disabled
  Setting range : Disable or Enable
- **ISO/IEC15415 verification result**
  Set threshold of ISO/IEC15415 verification result.
  Default : Disable
  Setting range : Disable or Enable
- **ISO/IEC TR 29158 (AIM DPM-1-2006) verification result**
  Sets ISO/IEC TR 29158 (AIM DPM-1-2006) verification result addition function.
  Default : Disable
  Setting range : Disable or Enable
- **SAE AS9132 verification result**
  Sets SAE AS9132 verification result addition function.
  Default : Disable
  Setting range : Disable or Enable
- **SEMI T10-0701 verification result**
  Default : Disable
  Setting range : Disable or Enable
- **Japan Pharmaceutical Verification results**
  Sets the Japan Pharmaceutical Verification Additional Function.
  Default : Disable
  Setting range : Disable or Enable
- **ISO/IEC16022 verification result**
  Sets the ISO/IEC16022 verification result additional function.
  Default : Disable
  Setting range : Disable or Enable
- **Image file name**
  Set this option to append image name.
  Default : Disabled
  Setting range : Disable or Enable
- **Read time**
  Sets the read time function.
  Default : Disabled
  Setting range : Disable or Enable
- **Group name * SR-750 Series**
  Sets the additional function for the group name used in the Master/Slave function.
  Default : Disable
  Setting range : Disable or Enable
- **Master/Slave ID * SR-750 Series**
  Sets the additional function for Master/Slave ID.
  Default : Disable
  Setting range : Disable or Enable

■ Comparison

- **Comparison method**
  Sets the comparison method.
  Default : Normal
  Setting range : Normal or Sequential
- **Origin**
  Sets the origin of comparison or preset.
  Default : 1
  Setting range : 1 to 7089
- **Length**
  Sets the length for comparison or preset.
  Default : 494
  Setting range : Normal …0 to 494
  Sequential …0 to 9
- **Increment**
  When the comparison method is Sequential, set the increment.
  Default : 1
  Setting range : - 9999 to 9999
- **Preset data**
  Registers the preset data.
  Default : Not selected
  Setting range : Enter up to 494 ASCII or hexadecimal characters.

I/O

■ Input Terminal Common

- **Input polarity**
  Sets the input polarity of the IN terminal.
  Default : Norm. open
  Setting range : Norm. open or Norm. close
- **Required input duration**
  Sets the required input duration for the IN terminal.
  Default : 2 ms
  Setting range : 1 ms, 2 ms, or 10 ms

■ IN1/2 Terminal

- **Function**
  Sets the function for the IN1/2 terminal.
  Default : IN1 terminal…Timing input
  IN2 terminal…Preset input
  Setting range : Disable, TIMING, Preset Input, TEST, Clear PLC link error, TUNING
- **Test mode**
  When "TEST" is selected, specify the test mode to start.
  Default : Reading rate test
  Setting range : Reading rate test, Read time test, or Positioning test (SR-750 only)
- **Startup state**
  Sets whether to activate the input function specified for the IN1 and IN2 terminals at power-on.
  Default : Disable
  Setting range : Disable or Enable
- **IN LED synchronization**
  Set whether to synchronize with IN LED.
  Default : IN1…Enable
  IN2…Disabled
  Setting range : Disable or Enable

■ Output Terminal

- **TRG BUSY Output at Power On**
  Set this option to enable TRG BUSY output upon reader startup.
  Default : Enable
  Setting range : Disable or Enable
- **Output duration**
  Sets the output ON duration for the OUT terminal.
  Default : 500 ms
  Setting range : 10 to 2550 ms
- **OUT1/2/3/4(SR-700) function**
  Sets the function for the OUT1/2/3 terminal.
  Default OUT1…OK
  OUT2…NG (Comparison NG), ERROR
  OUT3 (SR-750)…TRG, LOCK, MODE, ERR BUSY
  OUT3 (SR-700)…ERROR
  OUT4 (SR-700)…TRG, LOCK, MODE, ERR BUSY
  Setting range : OK, NG (comparison NG), ERROR, STABLE, UNSTABLE, PRESET OK, TUNING OK, SCRIPT CONTROL (SR-700 only), TRG BUSY, LOCK BUSY, MODE BUSY, ERR BUSY, FILE BUSY, CONFIG BUSY (SR-700), EXT.LIGHT
- **External light output polarity**
  Sets the output polarity of the EXT.LIGHT signal.
  Default : Norm. open
  Setting range : Norm. open, Norm. closed

Saving Images

- **OK image**
  Sets the saving option for images successfully read.
  Default : Disabled
  Setting range : Disabled or Send by FTP (SR-750), save to RAM (SR-700)
- **Comparison NG**
  Set save destination for comparison NG image.
  Default : Disable (SR-750), save to RAM (SR-700)
  Setting range : Disabled or Send by FTP (SR-750), save to RAM (SR-700)
- **Error image**
  Sets the save destination for read error images.
  Default : Save to RAM
  Setting range : Disabled, Save to RAM, Save to ROM (SR-750), or Send by FTP (SR-750)
- **Unstable image**
  Sets the save destination for unstable images.
  Default : Disable (SR-750), save to RAM (SR-700)
  Setting range : Disabled or Send by FTP
- **Target burst number**
  Default : All banks
- **Captured image * SR-750 Series**
  Sets the saving option for captured images.
  Default : Save to RAM
  Setting range : Save to RAM or Send by FTP
- **Image Save Mode**
  Sets the image saving mode.
  Default : Save final bank image
  Setting range : Save final bank image, Save specified number of images after timing ON, or Save specified number of images after timing OFF
- **Number of images to save**
  Sets the number of images to save after the timing ON/OFF.
  Default : 10 images
  Setting range : 1 to 10 images
- **Edit image file name by script (FTP transmission only) * SR-750 Series**
  Sets the edit image file name function.
  Default : Disable
  Setting range : Disable or Enable

■ FTP Settings

- **IP address * SR-750 Series**
  Sets the IP address of the remote FTP server.
  Default : 0.0.0.0
  Setting range : 0.0.0.0 to 255.255.255.255
- **User/Password * SR-750 Series**
  Sets the user name/password of the destination required for FTP client operations.
  Default : User…admin
  Password…admin
  Setting range : Up to 16 characters
  Set in ASCII characters.
- **Passive mode * SR-750 Series**
  Set this option to send passive commands to the remote FTP server.
  Default : Disable
  Setting range : Enable or Disable
- **Change directory * SR-750 Series**
  Set this option to change FTP remote directory.
  Default : Disabled
  Setting range : Disable or Enable
- **Format**
  Sets the image format sent via FTP.
  Default : JPEG
  Setting range: JPEG, Bitmap
- **JPEG quality**
  Default : 5
  Setting range : 1 to 10
- **Binning**
  Default : 1/4
  Setting range: Full, 1/4, 1/16, 1/64
- **Directory name * SR-750 Series**
  Sets the remote directory.
  Default : image
  Setting range : 1 to 32 characters

- **Keep connected * SR-750 Series**
  Check this option to let reader send connection requests whenever the connection is closed.
  Default : Disabled
  Setting range : Disable or Enable
- **Send NOOP command * SR-750 Series**
  Sets whether to send NOOP commands periodically.
  Default : Enable
  Setting range : Disable or Enable
- **NOOP command interval (minutes) * SR-750 Series**
  Sets the sending interval for NOOP commands.
  Default : 1 minute
  Setting range : 1 to 10 (minutes)

Misc

- **Output data on TEST button**
  Sets the data output when the TEST button is pressed.
  Default : Enable
  Setting range : Disable or Enable
- **Filling size**
  Sets the data filling size. This fills the missing digits with the specified data filling characters when the read data is less than the set size.
  Default : 0
  Setting range : 0 to 999
- **Filling character**
  Sets the data filling characters.
  Default : 20 (hexadecimal display, ASCII characters "(SP)")
  Setting range : Enter any single ASCII or hexadecimal characters.
- **Silent Mode**
  Set this option to enable silent mode.
  Default : Not selected
  Setting range : Comparison OK and Read OK, Comparison NG, Read ERROR, Stable Reading (OK/Comparison NG), Unstable Reading (OK/Comparison NG), Preset Result, Test mode, or Tuning (SR-700 only)
- **Data output for each bank**
  Sets whether to output the data from each registered bank.
  Default : Disable
  Setting range : Disable or Enable
- **Reader**
  Sets the reader name.
  Default : READER
  Setting range : Up to 8 characters
- **Monitor output data priority display position**
  Sets the monitor output data priority display position.
  Default : Forward
  Setting range : Forward or Backward
- **TUNE button**
  Sets Enable/Disable of the TUNE button.
  Default : Unlock
  Setting range : Unlock or Lock
- **Laser-aim option with TUNE button * SR-750 Series**
  Sets the pointer lighting condition by TUNE button operation.
  Default : By operation
  Setting range : Lock ..... The laser pointer does not light up by TUNE button operation or each operation mode.
  Test mode only ..... Only in the test mode, the pointer lights up by the TUNE button.
  Run mode only ..... Only in the run mode, the pointer lights up by the TUNE button.
  By operation ..... Regardless of the test mode or the run mode, the pointer lights up by the TUNE button.
- **Display bank number**
  Sets the parameter bank number display of reading success for the multiple LED indicator.
  Default : Enable
  Setting range : Enable or Disable
- **Laser-aim light * SR-700 Series**
  Sets the conditions for the laser-aim light.
  Default : Manual lighting
  Setting range : Manual lighting ..... Only lights when instructed by pressing TUNE button and giving command.
  Automatic lighting ..... Normally lit
  Automatic lighting during scanning only ... Lit only during scanning (with Timing ON)

■ Trigger command response

- **Specify response character**
  Sets the LON and LOFF trigger command response.
  Default (SR-750) : Disable
  Setting range (SR-750) : Disable, SR-600 compatible or User setting
  Default (SR-700) : Not specified
  Setting range (SR-700) : Not specified, detailed reply, user-specified or Echo back
  - SR-600 compatible (SR-750)
    Set this option to enable the SR-600 compatible mode. For details, refer to "3-9 SR-600 Compatible Output Mode (Page 29)".
  - Detailed settings
    For all reply commands, reply with the format below.
    OK, [reply command]
  - User setting
    Sets the response for the following commands to Success response character or Failure response character.
    - LON
    - LONmm
    - LOFF
    - PRON
    - PROFF
    - RESET
    - BCLR
- **Success response character**
  Sets the response character string when LON and LOFF is normally processed.
  Default : OK (0x4F4B)
  Setting range : Up to 8 characters
  Set with ASCII or HEX.
- **Failure response character**
  Sets the response character string when the process (e.g. LON is sent during LON. LOFF is sent during reading standby.) fails.
  Default : ER (0x4552)
  Setting range : Up to 8 characters
  Set with ASCII or HEX.

■ SNTP * SR-750 Series

- **SNTP server address**
  Sets the SNTP server address.
- **Time zone**
  Sets the time zone of the country where SR-750 is used.
  Default : +9:00 Japan, Seoul
- **Update cycle (min)**
  Sets the time update cycle.
  Default : 1
  Setting range : 1 to 99

■ Monitor * SR-700 Series

- **Displayed image**
  Default : after image process filter
  Setting range : after image process filter or before image process filter

■ Tuning

- **Code search**
  Set whether to restrict the code size and cell size during tuning.
  Default : Restrict
  Setting range : Restrict or Do not restrict

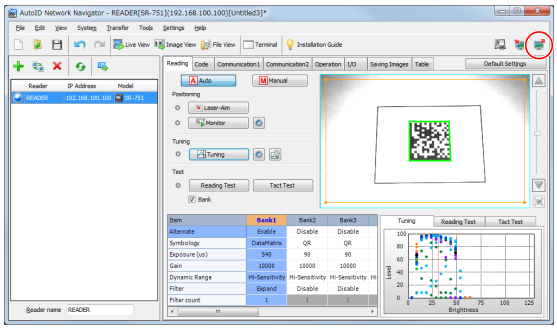
5-5 Sending/Receiving Configuration

SR-750 SR-700

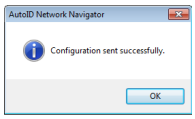
This section explains the transmission of a configuration between AutoID Network Navigator and the SR-750/SR-700 Series.

Sending Configuration to the SR-750 Series

1 Select the SR-750/SR-700 Series unit registered in the reader list, and click the button.

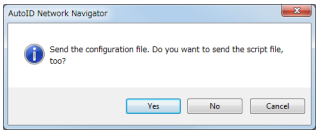


2 When the transmission finishes with the message "Configuration sent successfully.", the settings specified on the individual tabs have been written to the SR-750/SR-700 Series.



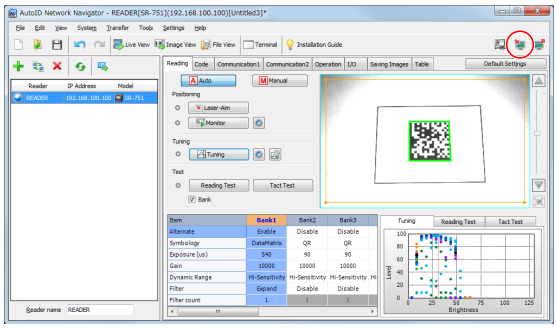
Important

As the edit data function or the edit image file name function is used, if "Use script" is enabled, the following window appears.

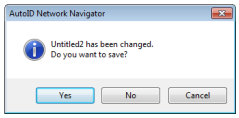


Receiving Configuration from the SR-750 Series

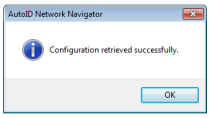
1 Select the SR-750/SR-700 Series unit registered in the reader list, and click the button.



2 When the settings are received for the configuration file currently being edited, the following message is displayed:
Click "Yes" to save the configuration file currently being edited, click "No" to not save, or "Cancel" to cancel receiving the configuration.



3 When the reception finishes with the message "Configuration retrieved successfully.", the configuration of the SR-750/SR-700 Series has been reflected on the tabs of AutoID Network Navigator.



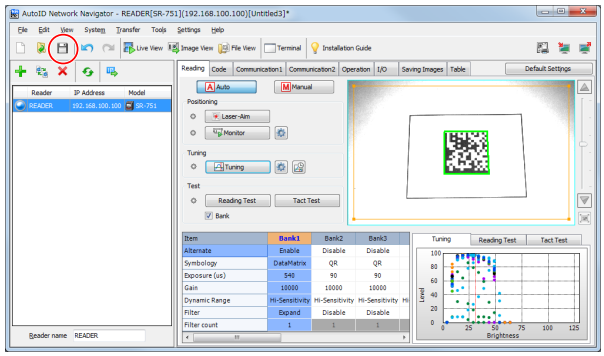
5-6 Saving/Reading a Configuration File

SR-750 SR-700

The specified settings can be saved as a configuration file or read from a configuration file.

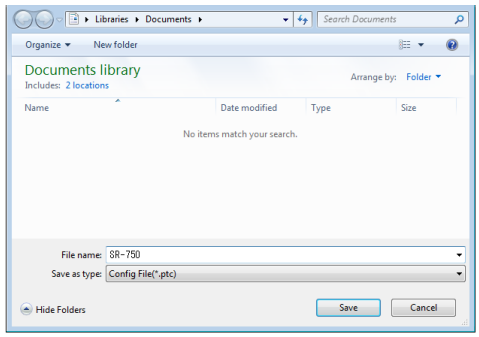
Saving a Configuration File

1 Select the SR-750/SR-700 Series unit registered in the reader list, and click the button.



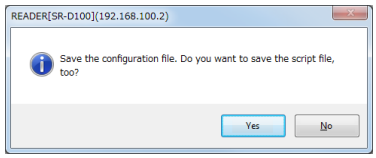
You can also save a configuration file from the "File", "Save", "Save As ", or "Save All" commands in the menu bar.

2 When the "Save As" dialog box is displayed, enter the file name.



The file is saved with the "ptc" extension.

When the setting to use the edit data function or the edit image file name function has been made, the message box to save the script file appears. Press "Yes" to save the script file.

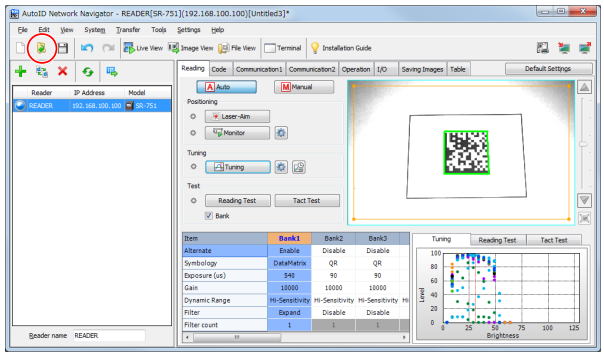


3 Click the "Save" button.

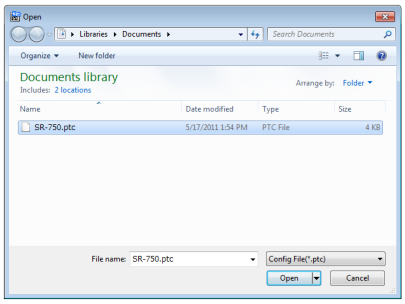
The configuration will be saved in the specified file.

Reading Configuration Files

1 Click the button.



2 **Select a file from the "Open" dialog box.**



3 **Click the "Open" button.**

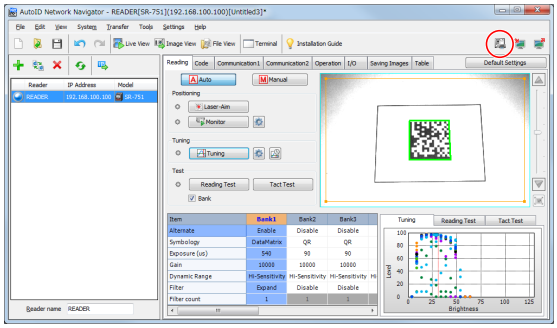
The settings saved in that file will be displayed.

5-7 Quick Setup Code

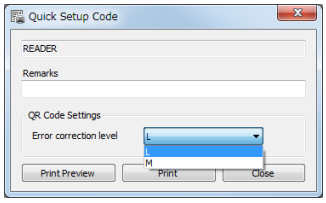
Create a quick setup code based upon details set in AutoID Network Navigator.
You can read a printed quick setup code into the SR-750/SR-700 Series unit, and change settings.
Refer to "3-10 Batch Setting Code (Page 30)"

Printing Quick Setup Codes

1 **Select the SR-750/SR-700 Series unit registered in the reader list, and click the button.**



2 **Enter any comments, or change the Error Correction Level value in the QR code section as necessary.**



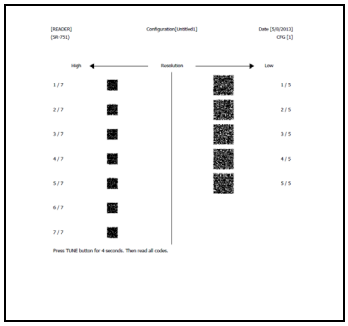
- Comment : Any comments that have been entered will be printed.
- Error correction level : Quick setup codes are printed with the Error Correction Level specified.

3 **Click the "Print" button.**

Important

When reading a quick setup code with the high-resolution type model (SR-750HA and SR-700HA), make sure to use a printer with high print quality. When a printer with low print quality is used, the cells in the 2D code may bleed and become unreadable. Be sure to use a printer with 300 dpi or more for printing.

[Printout sample]



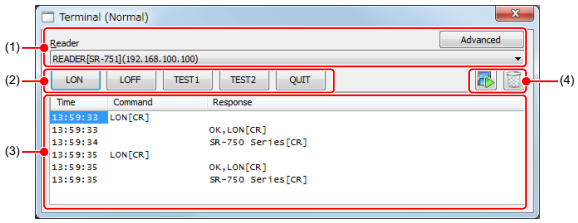
5-8 Terminal

Click the [Terminal] icon, and the terminal screen will be displayed.
The terminal can be used to confirm code data read by the SR-750/SR-700 Series unit, or send commands to the SR-750/SR-700 Series unit.
Additionally, the terminal screen can be used to start the Live View window, and confirm in real time read images.

Terminal Screen

The terminal screen has 2 types of display mode.

[Normal] view



(1) Reader list
If multiple SR-750/SR-700 Series units are registered in AutoID Network Navigator, specify in the terminal the SR-750/SR-700 Series unit to confirm.
The reader name, model and IP address are displayed.
[Advanced] button
Changes the terminal screen to [Advanced] view.

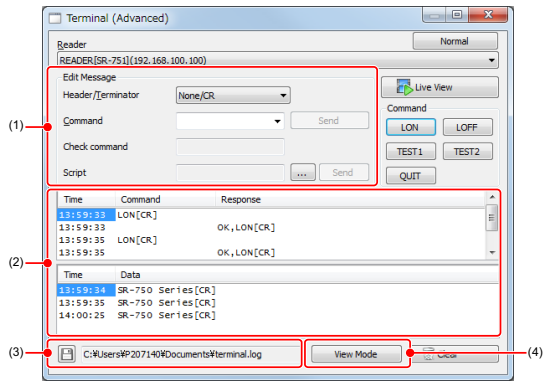
(2) Command button
Button to operate the SR-750/SR-700 Series unit.
"LON" .....Same operation as the Timing ON command.
"LOFF" .....Same operation as the Timing OFF command.
"TEST1" ....Activates the reading rate test mode.
"TEST2" ....Activates the tact measurement test mode.
"QUIT" .....Quits the test mode in operation.

(3) Display area
Displays data from the SR-750/SR-700 Series, commands sent using the command button, and response histories.

(4) [Live View] button
Click to start Live View.
[Clear] button
Delete history data from the display area.

[Advanced] view

By switching to [Advanced] view, you can save action commands for the SR-750/SR-700 Series, sent control commands, and acquired history log file log data.
(Click the [Normal] button to switch to the [Normal] mode display.)



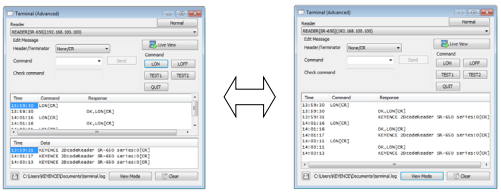
(1) Edit Message

Area in which to input commands to send to the SR-750/SR-700 Series.

- Header/Terminator
  Specify headers and terminators for commands to send to the SR-750/SR-700 Series.
  Default : None/CR
  Setting range : None/CR, STX/ETX
- Command
  Input commands to send to the SR-750/SR-700 Series.
  Use the ▼ button to display the sent commands history.
- Check command
  You can confirm message format comprising selected headers/terminators as well as input commands.
- [Send] button
  Click this to send the input command to the SR-750/SR-700 Series unit.
- Script
  Script files can be sent from the terminal to SR-750/SR-700. Press the " ... " button, select the applicable file, and then press the "Send" button to set.

(2) Display area

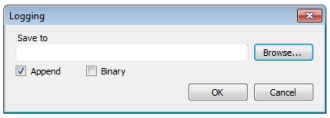
Displays data from the SR-750/SR-700 Series, commands sent using the command button, and response histories.
You can click the (4) [View Mode] button to switch between the command/response screen and the output data display methods.



(3) [Save log] button

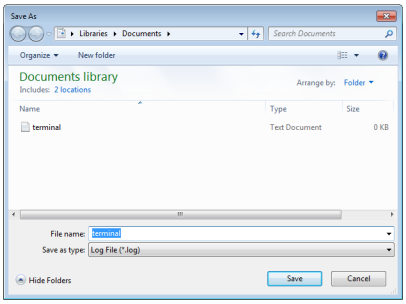
You can save the history data from the display area as a log file.

1 Click the [Save log] button. The "Logging" window will be displayed.
When specifying the save location, click the [Browse…] button.
If not changing the save location, click the [OK] button without making any changes.



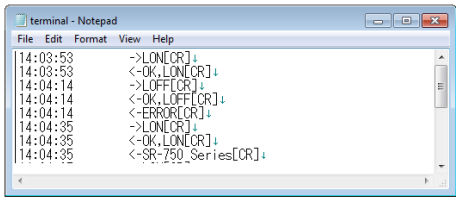
- Append : select this to add new data if there is already saved log information.
- Binary : select this to save as binary format data.

2 When the [Save As] is displayed, specify a file name. (The default setting is terminal.log)



3 Click the [Save] button to save the log data.

4 When saving of the log is complete, click the [Save log] button again.
[Example log file]

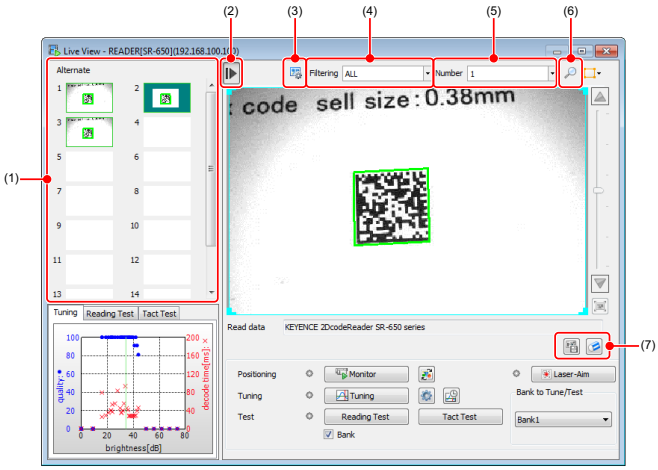


5-9 LiveView

Click the [Live View] icon to display the Live View screen. The Live View screen enables real-time display of scanned image data.
Additionally, the Live View screen enables tuning operations and starting of test mode as with in the [Read] tab.

* Displaying the Live View screen also starts the terminal screen. This section only explains the Live View screen.
* In SR-700 Series, only the scan screen is displayed. Tuning result graph and monitor tuning buttons are not displayed.

Details of the Live View screen



(1) Parameter bank display window

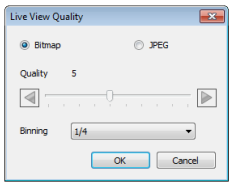
Displays the latest images read by of all parameter banks.
Images can be enlarged by double-clicking.
When the border of each image is green, this indicates a successful read, whereas a red border indicates a failed read.

(2) [Bank display/hide switch] button

Click this to switch between display/hide for the parameter bank display window and the camera status display window.

(3) [Live View screen] button

Click to change the Live View screen quality.



- File type
  Setting range : Bitmap, JPEG
  Default Windows7/Vista : Bitmap
  WindowsXP : JPEG
- Quality (when JPEG selected)
  Setting range : 1 to 10
  Default : 5
- Binning
  Setting range : None, 1/4, 1/16
  Default Windows7/Vista : 1/4
  WindowsXP : None

(4) Displayed image

Set image conditions for images displayed on the monitor.
Default : All
Setting range : All, read images only, errors only

(5) Displayed number

Set the bank No. for images displayed on the monitor.
Default : All
Setting range : ALL, 1 to 10 (parameter bank No.)

(6) [Zoom in/Zoom out] button

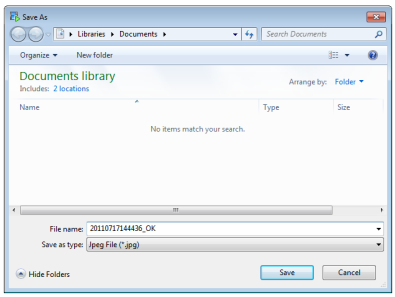
You can click this button, then click the image on the screen to zoom in or zoom out.
Zoom in ..... right double-click the image
Zoom out ..... left double-click the image

(7) [Save image] button

Click this to save the image displayed on the monitor screen.
The default file name is <time indicated on PC>_<read result judgment>. <file extension>.
The file extension is determined according to the setting of the live view image quality. (Bitmap or jpeg)
In the reading judgment, the following characters are displayed.

- When reading is successful: OK
- When reading error occurs, the capture image: ERR
- Monitor image: XX

* The verification judgment result of the preset registration data is not reflected.

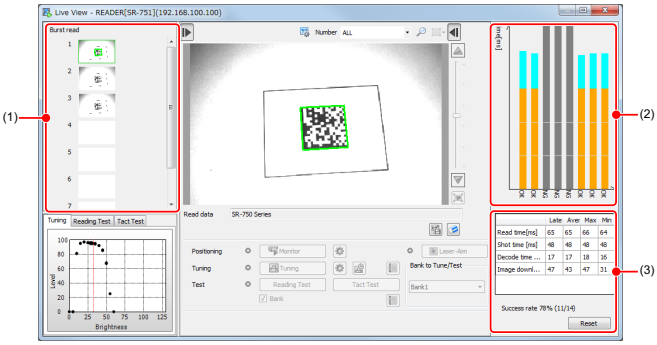


[Clear] button

Click to clear the monitor screen and parameter bank display window screen.

Burst read Live View * SR-750 Series

During burst read mode operation, this displays a dedicated Live View screen.



(1) [Burst read] window

Displays images for the specified burst scan count.

(2) Read history graph

Displays the history of performed burst reading operations on a graph.
(Displays maximum of 8)
Orange : displays the image at the time of scan
Blue : displays the decoding time image (total of decoding time during burst read).
Gray : displays a read fail.

(3) Read history display

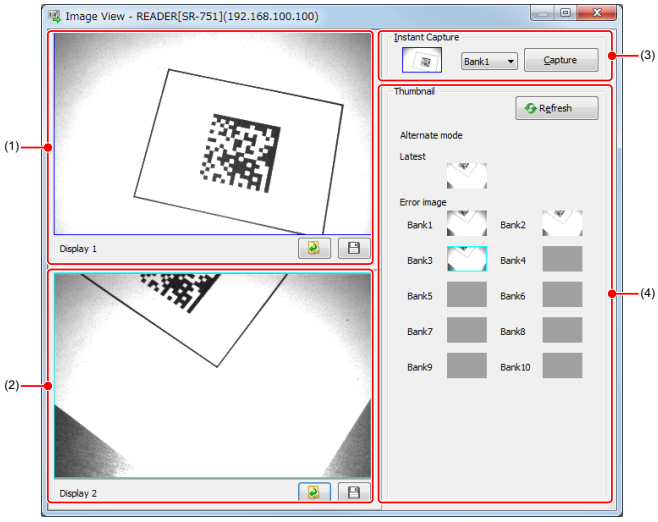
Displays the implementation history of performed burst reading operations on a graph.

* Image transfer time is an approximation when an image is obtained with the computer.

5-10 ImageView

Click the [Image View] icon to display the image view screen.
On the image view screen, you can confirm images saved in the SR-750 Series unit RAM/ROM or the SR-700 Series RAM, and read and confirm image captures and images saved on the PC.

Details of the image view screen



(1) Display 1

Displays images obtained with the SR-750/SR-700 Series unit. Instant captures and images selected as thumbnails are displayed here.

: [Open] button .....click to display image files saved on the PC.

: [Save] button.....save image files displayed on the screen as bitmap files.

(2) Display 2

Use to display image files saved on the PC.
Use for comparisons with images displayed on display 1.

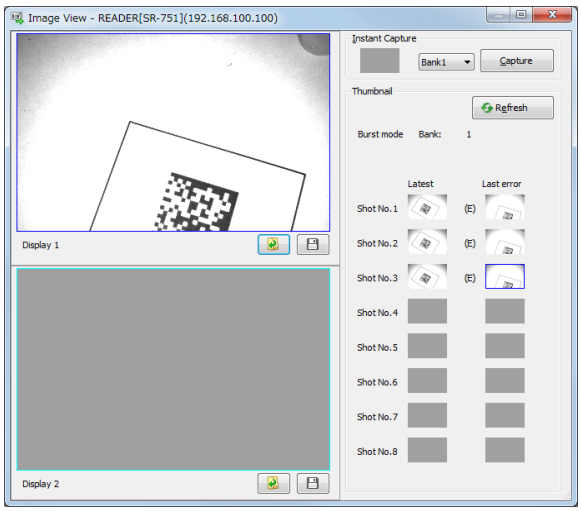
(3) Instant Capture

Capture images to the SR-750/SR-700 Series unit.
Specify the parameter bank number, then click the [Capture] button.
Instant captures are displayed on display 1, but to display on display 2, right click on the instant capture image, and select the display.

(4) Thumbnail

Images saved to RAM/ROM for SR-750 Series and to RAM for SR-700 are displayed.
Click the [Refresh] button to display the latest image saved in RAM/ROM.
Right-click images displayed as thumbnails to display on display 1 a zoomed image.
To display on display 2, right-click the thumbnail image, and select the display.

Image view screen in burst read mode

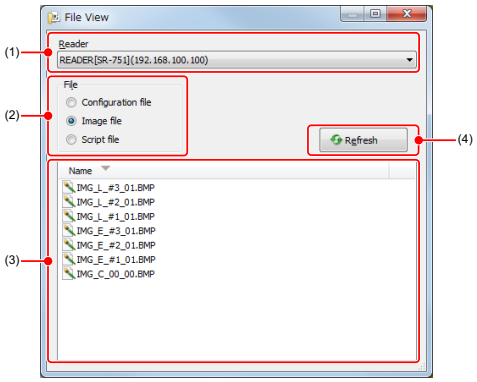


Thumbnail display is the burst read mode display.
Display burst images in order of scanning, and display images that could not be decoded on the error screen.

5-11 FileView

Click the [FileView] icon to display the FileView screen.
You can confirm, save, and delete image and configuration files saved in the SR-750 Series RAM/ROM and the SR-700 Series RAM.

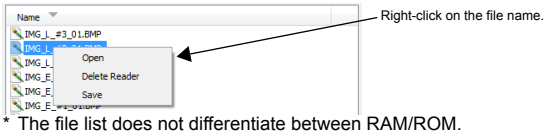
Details of the file view screen



(1) Reader list
If multiple units of the SR-750 Series are connected on the same network, then select on the FileView screen the SR-750 Series unit to confirm.
The reader name, model and IP address are displayed in the reader.

(2) File
Select the file types to display in FileView.

(3) File list
Displays files selected in (2).
Right-click on the file name to display the menu, from where you can perform [Open], [Delete], and [Save] operations.



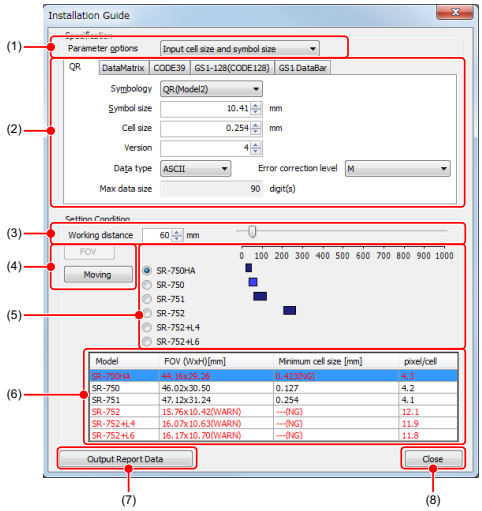
* The file list does not differentiate between RAM/ROM.

(4) [Refresh] button
Updates the file list.

5-12 Installation Guide

Click the [Installation Guide] icon to display the Installation guide screen.
Use the cell and symbol size to confirm the distance and field of view size that can be used with the SR-750/SR-700 Series unit.
Use when confirming the field of view when changing the symbol size, and when calculating moving exposures.

Details of the Installation Guide screen



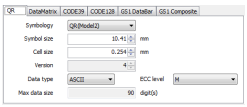
■ Specifications

Area for input of conditions of codes to read.

(1) Parameter options
Select the methods by which to specify code conditions.
- Specify cell size and symbol size ....method for inputting the cell size (narrow bar width) and the size of the code to print.
- Specify symbol size...method for inputting the code size. Use if the cell size is uncertain.
- Specify cell size.....method for inputting the cell size. Use if the data size (length) is not set.

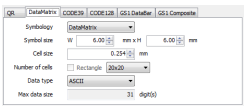
(2) Code tab
Select the code to read.
5 types of code (i.e. QR, DataMatrix, CODE39, CODE128, GS1 DataBar) can be calculated in the installation guide.

QR



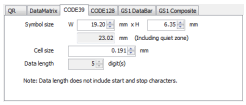
- Code type..... select form QR (model 2), QR (model 1), MicroQR.
- Symbol size..... input the vertical and horizontal lengths (including margins).
- Cell size ..... input the cell size.
- Version ..... input the QR code version.
- Data type..... select from numeric, ASCII, binary, or Kanji.
- ECC level ..... select from L, M, Q, and H.
- Max data size ... calculated from the version, data type, and error correction level.

DataMatrix



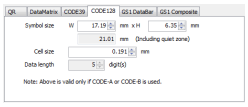
- Code type..... DataMatrix supports only ECC200.
- Symbol size..... input the vertical and horizontal lengths (including margins).
- Cell size ..... input the cell size.
- Number of cells ... select from the drop-down menu.
- Data type..... Select from numeric, ASCII, or binary.
- Max data size ... Calculated from the cell numbers and data type.

CODE39



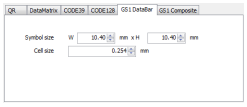
- Symbol size..... input the vertical and horizontal lengths (excluding margins).
- Narrow bar width ... Input the narrow bar width.
- Data length..... input the data length.

CODE128



- Symbol size..... input the vertical and horizontal lengths (excluding margins).
- Narrow bar width ... Input the narrow bar width.
- Data length..... input the data length.

GS1 DataBar



- Symbol size..... input the vertical and horizontal lengths (excluding margins).
- Narrow bar width ... Input the narrow bar width.

■ Mounting conditions

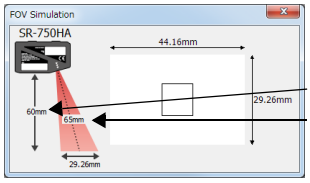
Input the mounting distance of the SR-750/SR-700 Series, and you can calculate the size of the field of view, and the exposure for moving reads.
Additionally, this displays the code read range (depth) specified in specifications.

(3) Mounting distance

Input the mounting distance, or move the slide bar.

(4) [FOV Simulation] button

Click this to display the distance input in (3), and the reading view range format selected in (5). Additionally, you can also confirm the read distance of the SR-750 Series unit.



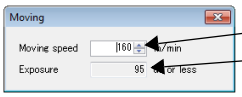
Calculates the distance from the code surface to the SR-750 Series unit as well as the size of the field of view as input in (3).

Mounting distance as input in (3)

Reading distance
* The read distance is calculate with a standard mounting angle (15°).

[Moving] button

Click this to open the Moving window.
Input the speed of the line upon which the SR-750/SR-700 Series is used to calculate the standard exposure. Input an exposure shorter than that calculated here in the calibration configuration, and carry out quick tuning.
If tuning is possible, then this judges that the set tracking at the set line speed is possible.



Input the planned line speed

Specify the planned exposure in calibration settings.

(5) Mounting distance standard graph

Displays the mounting distance depth based upon the cell size calculated in specifications on a bar graph.
Check the model name to be used and decide the distance of (3) within the range displayed in the bar graph.

(6) Mounting distance judgment area

Displays the field of view size, minimum cell size, and pixels/cell for the specified mounting distance.
If the code specified in "Specifications" is judged to be not readable at the distance specified in mounting distance, then the characters will be displayed in red.

(7) "Output Report Data" button

Click to output the data for the installation report.

(8) [Close] button

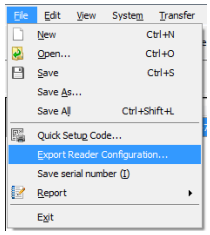
Click this to close the Installation guide.

5-13 Export Reader Configuration

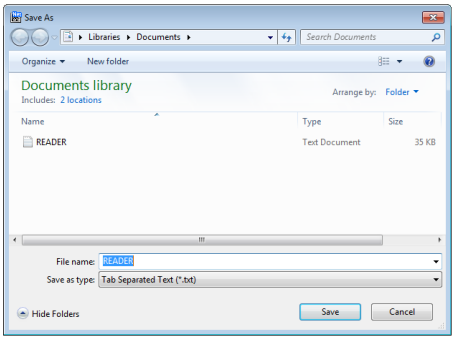
AutoID Network Navigator can export configured settings values as a text file.

Steps to export settings values

1 From [File] on the menu bar, select [Export Reader Configuration…].

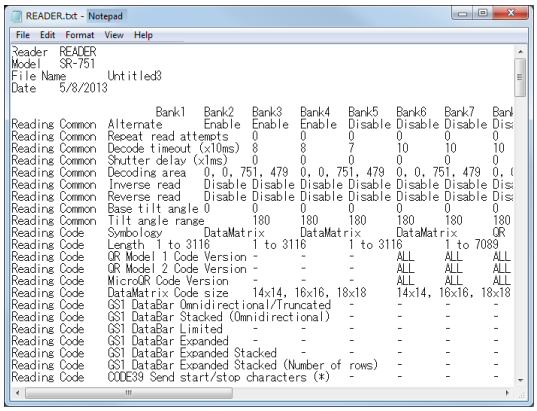


2 The [Save As] window will be displayed. Input the file name, and click [Save] button.



3 This concludes export of the table.

[Example configuration file]



```
READER.txt - Notepad
File  Edit  Format  View  Help
Reader  READER
Model   SR-751
File Name       Untitled3
Date    5/8/2013

                        Bank1   Bank2   Bank3   Bank4   Bank5   Bank6   Bank7   Bank
Reading Common  Alternate       Enable  Enable  Enable  Disable Disable Disable Dis
Reading Common  Repeat read attempts    0       0       0       0       0       0
Reading Common  Decode timeout (x10ms)  8       8       7       10      10      10
Reading Common  Shutter delay (x1ms)    0       0       0       0       0       0
Reading Common  Decoding area   0, 0, 751, 479  0, 0, 751, 479  0, 0, 751, 479  0, 0
Reading Common  Inverse read    Disable Disable Disable Disable Disable Disable Dis
Reading Common  Reverse read    Disable Disable Disable Disable Disable Disable Dis
Reading Common  Base tilt angle 0       0       0       0       0       0       0
Reading Common  Tilt angle range        180     180     180     180     180     180
Reading Code    Symbology       DataMatrix      DataMatrix      DataMatrix      QR
Reading Code    Length  1 to 3116       1 to 3116       1 to 3116       1 to 7089
Reading Code    QR Model 1 Code Version -       -       -       ALL     ALL     ALL
Reading Code    QR Model 2 Code Version -       -       -       ALL     ALL     ALL
Reading Code    MicroQR Code Version    -       -       -       ALL     ALL     ALL
Reading Code    DataMatrix Code size    14x14, 16x16, 18x18     14x14, 16x16, 18x18
Reading Code    GS1 DataBar Omnidirectional/Truncated   -       -       -       -
Reading Code    GS1 DataBar Stacked (Omnidirectional)   -       -       -       -
Reading Code    GS1 DataBar Limited     -       -       -       -       -       -
Reading Code    GS1 DataBar Expanded    -       -       -       -       -       -
Reading Code    GS1 DataBar Expanded Stacked    -       -       -       -       -
Reading Code    GS1 DataBar Expanded Stacked (Number of rows)   -       -       -
Reading Code    CODE39 Send start/stop characters (*)   -       -       -       -
```

5-14 Report Generator Function

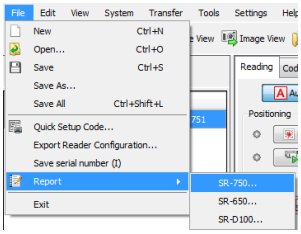
Report generator function

The AutoID Network Navigator report generation function uses tuning results and reading test results from the 2D code reader SR-1000, SR-700, SR-750 Series, SR-650 Series, and SR-D100 Series to output reports that match the conditions specified in the introduction guide etc.
Use this function to make reports of device test results, adjustment results before operation, etc.

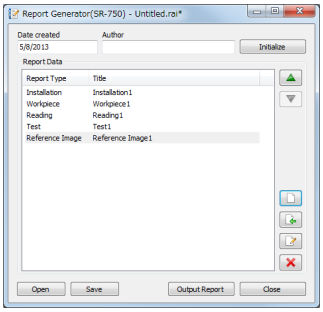
Using the report generator function

Activating the report generator function

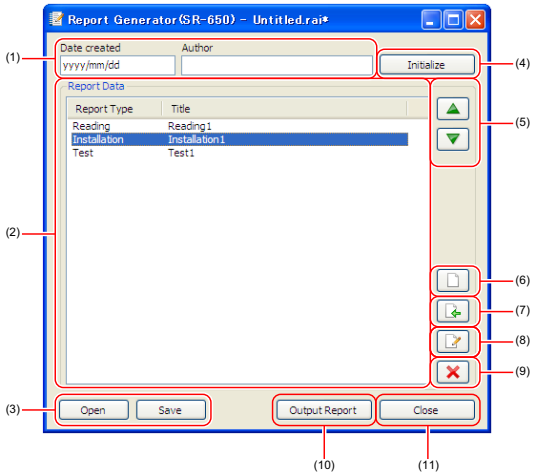
Run report generation function by selecting "File" → "Report Generator" → "SR-1000", "SR-700", "SR-750", "SR-650" or "SR-D100" on the Menu Bar.



The following screen will appear.
* The model name is displayed in the title. The format is the same.



Report generator function screen



(1) Date created, Author
Enter information for the date created and author.
(Up to 20 characters)
(2) Report Data
This displays the data type and order to be output to the report.
(Registration available up to 100 items)
(3) Open, Save
Open ... This reads the report generator file form.
Save .... This saves the report generator file form.
(Saved with the file extension: rai)
(4) Initialize
This initializes the report generator function screen.
(5) Up/Down button
This switches the order of the report selected on (2) (Report Data).
(6) New
Use this to create reports without the imported file.
(7) Import
Uses this to import the report data.
(8) Edit
This edits the report selected on (2) (Report Data).
(9) Delete
This deletes the report selected on (2) (Report Data).
(10) Output Report
This outputs the report data to the Excel file.
(11) Close
The report generator function screen is closed.

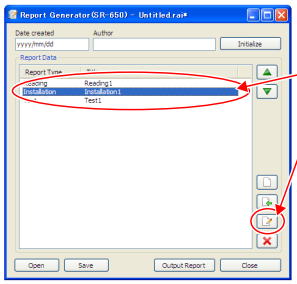
Report output procedure

(1) Preparation of original data

Create data needed for reports using the SR-1000, SR-700, SR-750 Series, SR-650 Series, or SR-D100 Series.
- Tuning data
- Reading test data
- Setting condition data, etc.

(2) Deciding the report format

Start the report generator function and import the data created for (1).
Use the up/down buttons to change the output order of report data, or use the edit button to additionally write to each report data and then create your target report.



Double-click the report data or click the "Edit" button to open the selected report screen. Then, you can edit the comment.

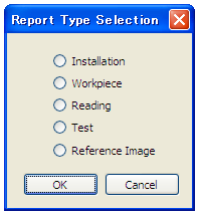
(3) Report output

Output the report-generated data to the Excel file.
* To use the report generator function, install Microsoft Office Excel to your PC beforehand.

5-15 Creating Reports for the SR-750/700 Series

Data that can be generated as report

The following data can be used for the SR-750/SR-700 Series.



- Installation Report (extension: rig)
  This outputs the report created on the installation guide including information such as working distance, size of field of view and exposure for moving, and also detailed information of codes entered to determine the conditions.
- Reading Report (extension: rtn)
  This outputs the result of auto tuning performed with the Live View activated, tuning image and the tuning graph.
- Test Report (extension: rbt)
  This outputs the results of reading rate measurement test and tact measurement test performed with the Live View activated, and also outputs the setting value, reading rate, brightness and read time of the parameter bank which performed the reading test.

NOTICE	**When the SR-700 is connected through the RS-232C interface, the read images are not output.**

The following items can be added to the report using the "New" button.
- Workpiece
- Reference Image
  Bitmap or JPEG image files can be added to output to the report. Also, workpiece images or setting environment images can be used as supplement materials.

Use the above items and create the target report.

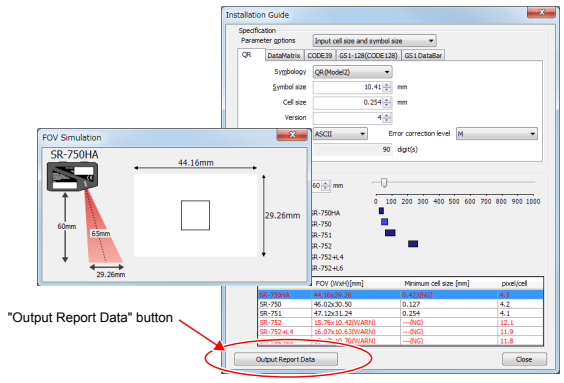
Report data generation method and report format

This section describes the generation method of each report data and describes the report format.

Installation Report

■ Generating the report data

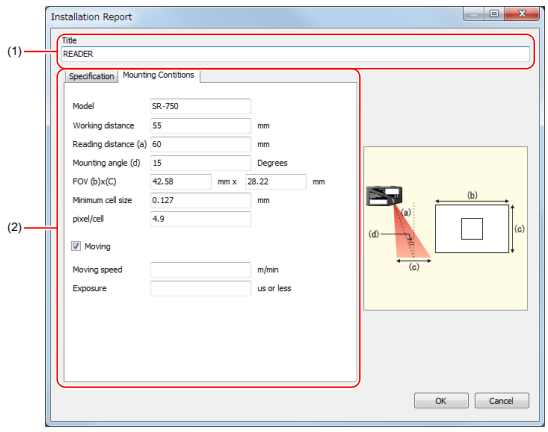
Generate the data for the installation report using the installation guide of AutoID Network Navigator.
When all values are entered on the installation guide, click the "Output Report Data" button and save the report data.



- Dividing file names can bring together generated multiple data under conditions where the working distance, etc. were changed, into one report. When creating reports under different conditions, save the report data changing file names.

■ Editing the report data

Start the report generator function and import the "Installation Report" to the Report Data section.
The following is the editing screen of the imported report data.



(1) Title
Enter the title of the installation report (up to 20 characters). This is used as a sheet name when output to the Excel file.
(2) Specification, Setting Condition
This displays the specification and setting condition specified on the installation guide.
- Specification: Code specifications for the specified 2D code and barcode
- Setting Condition: This displays the specified working distance and the size of field of view.
  If the "Moving" information is entered on the installation guide, it will be reflected in the "Moving" item.

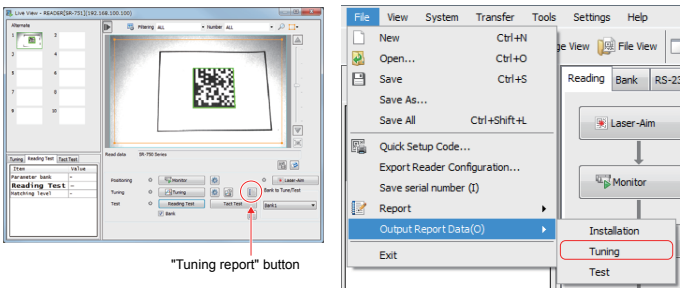
* When creating the reading report using the "New" button, all items can be entered.

Reading Report

■ Generating the report data

Obtain data used for reading reports on the SR-750 Series by starting AutoID Network Navigator live view and carrying out the tuning operation.
When the tuning operation is complete, click the "Tuning report" button and save the report data.
Save SR-700 Series reading report data by clicking "File" → "Output Report Data" → "Tuning" and then saving. Operate after running tuning in the "Reading" tab.

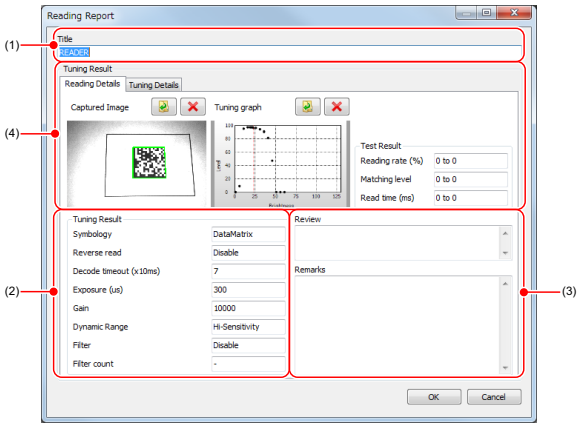
- "Live View" screen



- Generate report data using the latest tuning data.
  When tuning is performed multiple times, generate the report data each time the tuning result is obtained.
- Saving data by changing file names can bring together the generated multiple data into one report. When creating reports using various tuning results, save the report data changing file names.

■ Editing the report data

Start the report generator function and import the "Reading Report" to the Report Data section.
The following is the editing screen of the imported report data.



(1) Title
Enter the title of the reading report (up to 20 characters). This is used as a sheet name when output to the Excel file.
(2) Reading Results
This displays the tuning conditions and tuning result values.
(3) Review, Remarks
Put your review or remarks regarding the tuning result.
(Review: Up to 100 characters, Remarks: Up to 255 characters)
(4) Captured image, Tuning graph
This displays the tuning result image obtained in tuning and the tuning graph.

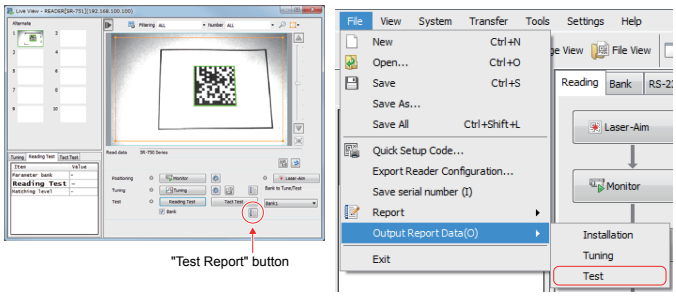
* When creating the reading report using the "New" button, all items can be entered.
Also, Bitmap and JPEG files can be imported to the captured image and tuning graph.

Test Report

■ Generating the report data

Obtain data used for test reports on the SR-750 Series by starting AutoID Network Navigator live view, specifying a subject bank, and running reading rate test and read time tests.
When the test operation is complete, click the "Test Report" button and save the report data.
Save SR-700 Series test report data by clicking "File" → "Output Report Data" → "Test" and then saving. Operate after running reading rate tests and read time tests in the "Reading" tab.

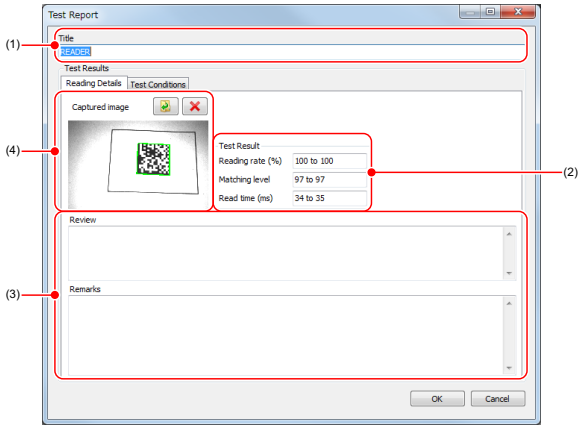
• "Live View" screen



• Generate report data using the latest test data.
When multiple bank tests are performed, generate the report data each time the test result is obtained.
• Saving data by changing file names can bring together the generated multiple data into one report. When creating reports using results of test performed at various parameter banks, save the report data changing file names for each test performed.

■ Editing the report data

Start the report generator function and import the "Test Report" to the Report Data section.
The following is the editing screen of the imported report data.



(1) Title
Enter the title of the test report (up to 20 characters). This is used as a sheet name when output to the Excel file.
(2) Test Results
This displays the reading test results.
• Test Result : Reading rate (%), Matching level, Read time (ms)
• Test Details: This displays the setting values of parameter bank used for the test.
(3) Review, Remarks
Put your review or remarks regarding the test results.
(Review: Up to 100 characters, Remarks: Up to 255 characters)
(4) Captured image
This displays the last image at the reading test.
* Any Bitmap image or JPEG image can also be inserted.

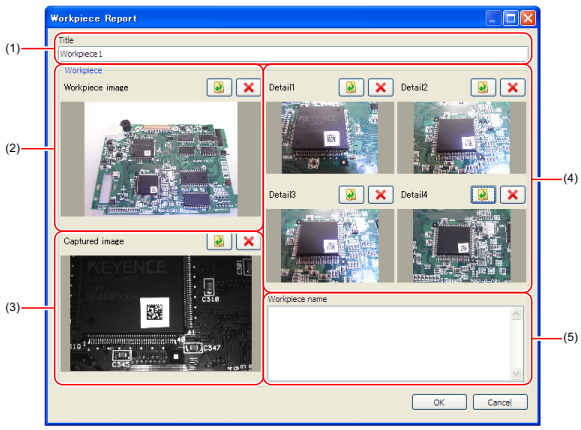
* When creating the reading report using the "New" button, all items can be entered.
Also, Bitmap and JPEG files can be imported to the captured image.

Workpiece Report

Use the workpiece report for supplemental explanations such as adding a reading target workpiece image to the report. Import the workpiece picture (Bitmap or JPEG) and create as report data.

■ Editing the report data

The following is the editing screen for the workpiece report.



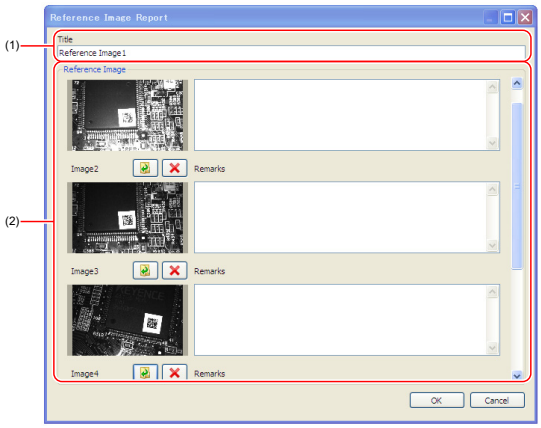
(1) Title
Enter the title of the workpiece report (up to 20 characters). This is used as a sheet name when output to the Excel file.
(2) Workpiece image
Import image data that shows the entire image of the target workpiece. (Bitmap or jpeg)
(3) Captured image
Import the image obtained with the SR-750/SR-700 Series.
(4) Detail 1 to 4
Up to 4 detailed images of workpiece can be imported. (Bitmap or jpeg)
(5) Workpiece name
Enter the workpiece name or other comments. (Up to 255 characters)

Reference Image Report

This can be used as a supplemental explanation report using other image data.

■ Editing the report data

The following is the editing screen for the reference image report.



(1) Title
Enter the title of the reference image report (up to 20 characters). This is used as a sheet name when output to the Excel file.

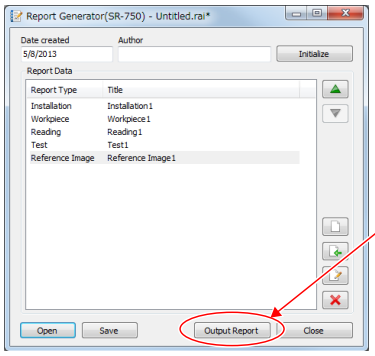
(2) Reference Image
Enter the image data and remarks regarding the image. Up to 9 reference images can be registered.
Image 1 to 9: Bitmap or jpeg data
Remarks: Up to 255 characters

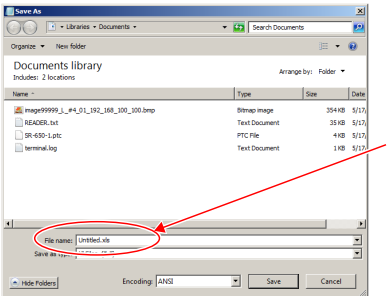
Report output method

This outputs the collected report data to the Excel file. The EXCEL file can be modified according to your preference.

■ Report output method

Click the "Output Report" button on the report generator screen and save as an Excel file to the specified folder.

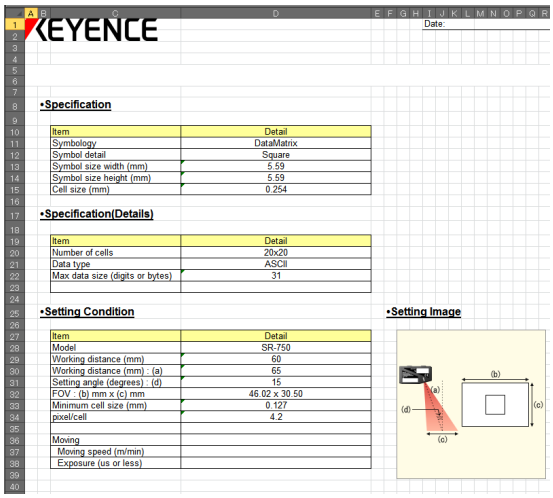




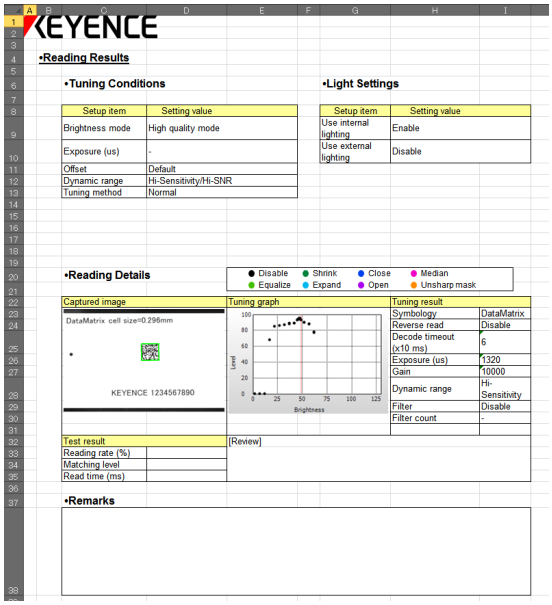
Excel report image

This is the image when the report is output to the Excel file.

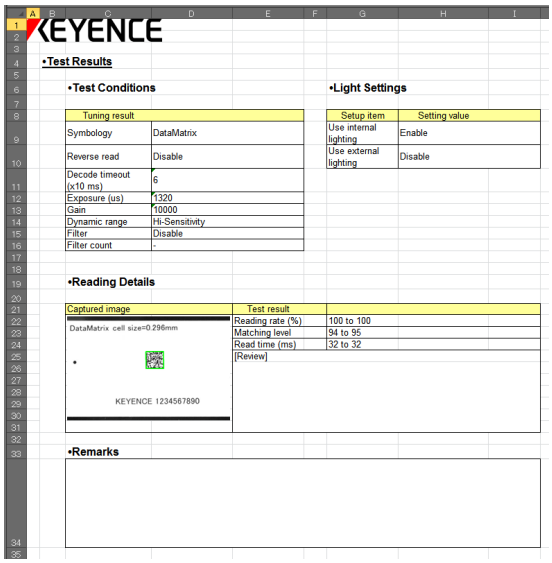
■ Installation Report



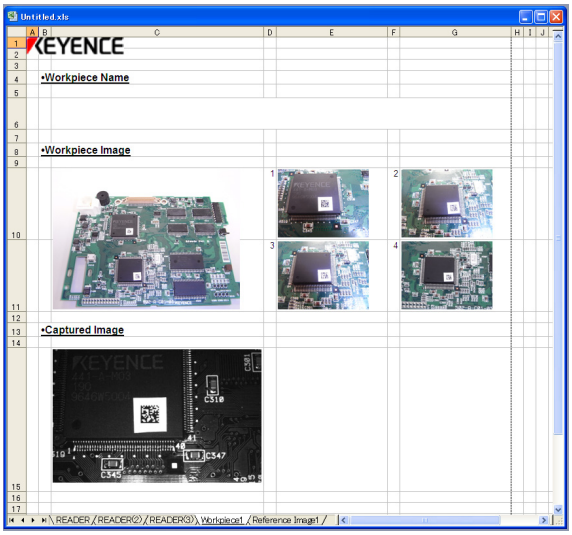
■ Reading Report



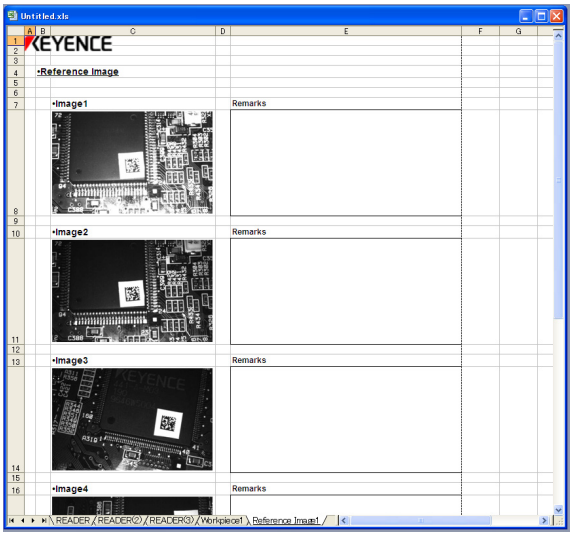
■ Test Report



■ Workpiece Report



■ Reference Image Report

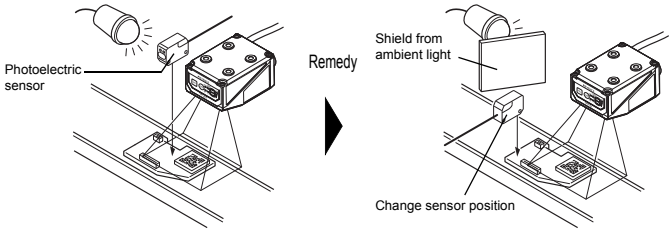


6-1 Before Mounting the SR-750/SR-700 Series SR-750 SR-700

This section describes points to be checked before mounting the SR-750/SR-700 Series. Check the mounting conditions as follows.

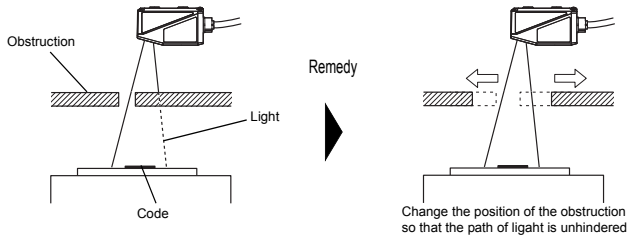
■ Confirm that ambient light (sunlight, other lights, photoelectric sensors, etc.) is not affecting the SR-750/SR-700 Series.

Prevent ambient light from entering the light receiving area for the SR-750/SR-700 Series. Ambient light may lead to unstable readings or incorrect readings.



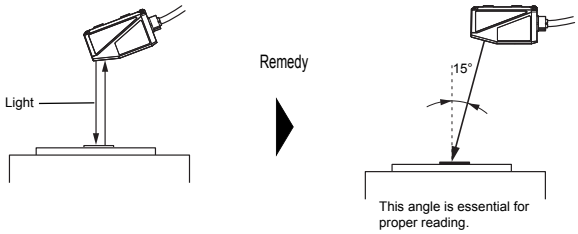
■ Check whether the reader's beam is obstructed.

If the beams of light are obstructed, the barcode may become undetectable.



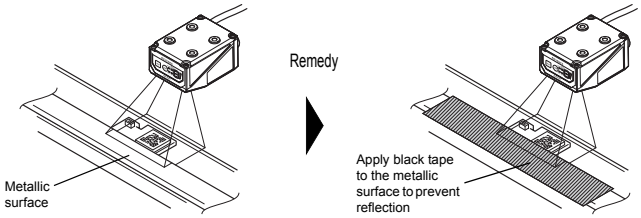
■ Check whether the reader's angle creates a specular reflection.

If the beam reflects on the code at a right angle (specular reflection), the reading may be unstable or incorrect.



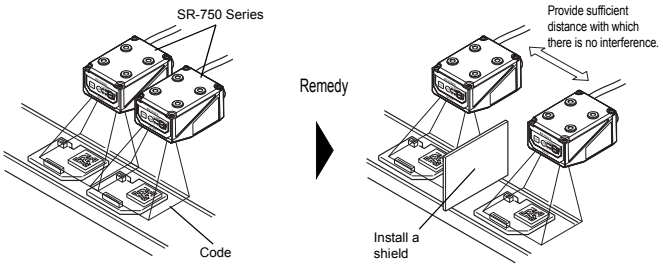
■ Confirm there are no metallic or mirrored surfaces in the light receiving area.

If strong reflected light from a shiny surface enters the receiver of the SR-750/SR-700 Series, the reading may become unstable or produce unstable results.



■ When using several SR-750/SR-700 Series in a row, confirm that they do not interfere with each other.

If light from one SR-750/SR-700 Series unit enters the receiver of another, the reading may become unstable.



NOTICE	**Use a light shield or a similar object to ensure that the SR-750/700 Series does not receive strong light (direct or reflected) output from a laser marker or similar device. The SR-750/700 Series may be damaged if it receives strong light.**

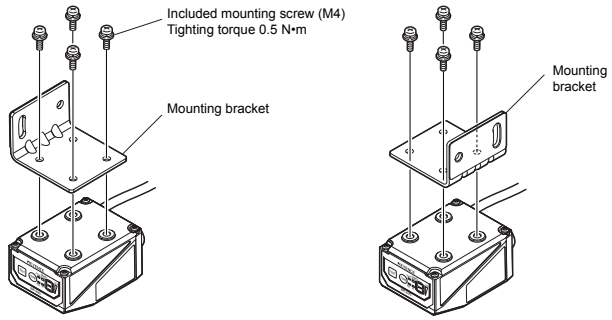
6-2 Mounting the SR-750 Series SR-750

This section describes the mounting method of the SR-750 Series.

When using the included mounting bracket

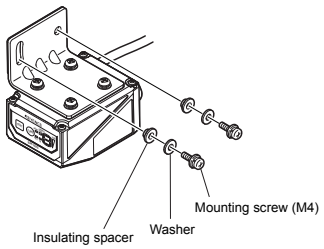
1 Attach the SR-750 Series to the included mounting bracket.

Select the appropriate mounting method from below according to the application.



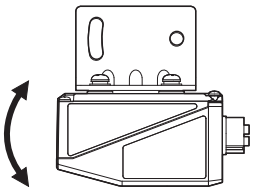
2 Fix the mounting bracket to the device.

* Mounting screws (M4) are not included. The thickness of the mounting bracket, insulating spacer and washer included is approximately 4 mm.



3 Adjust the installation angle of the SR-750 Series.

The adjustment angle for the mounting bracket is ± 10°.

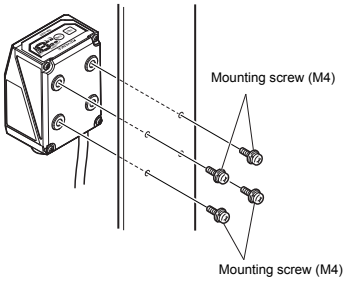


NOTICE	• **Be sure to mount the supplied insulation spacer to suppress the influences of electrical noise from the device. If the insulation spacer is not mounted, electrical noise may be generated causing reading error or incorrect reading.** • **On the bottom of the mounting bracket, the insulation sheet is attached. Do not peel off this sheet.**

When not using the included mounting bracket

With this method, you can attach the SR-750 Series to the device without using the included mounting bracket.
Prepare the following item before mounting the SR-750 Series.
- Main unit mounting screw (M4)...Screw hole depth of the SR-750 Series: 5 mm

1 Fix the SR-750 Series at the mounting position with M4 screws. (Tighting torque 0.5 N•m)

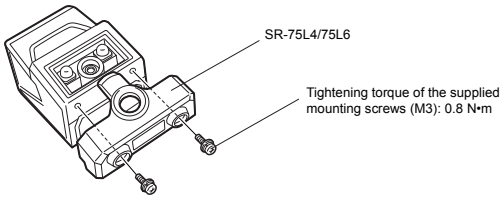


2 Adjust the installation angle and distance of the SR-750 Series.

NOTICE	**To suppress the influence of electrical noise from the device, provide insulation for the mounting part of the SR-750 Series and the device. If insulation is not provided, electrical noise may be generated causing reading error or incorrect reading.**

Mounting the lens attachment (SR-75L4/75L6)

Following is the mounting procedure of the lens attachment (SR-75L4/75L6).
Fix the lens attachment using the 2 supplied mounting screws (M3).
Do not allow fingerprints, etc. to attach to the reading surface or lens surface of SR-752 when mounting.



NOTICE	**Do not allow water, dust or oil to attach to the scanner. Reading error may occur. If soil is attached, wipe it off lightly using a dry and soft cloth. (Do not soak the cloth in alcohol.)**

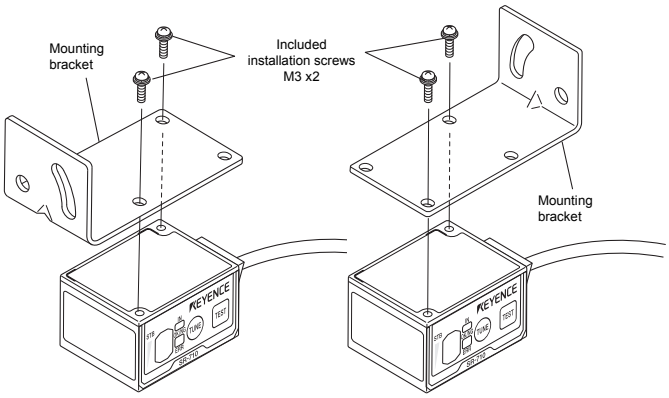
6-3 Mounting the SR-700 Series

SR-700

■ Using the included mounting bracket

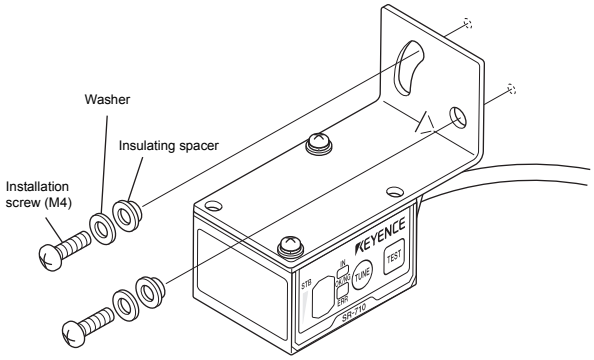
1 Attach the SR-700 Series to the mounting bracket.

Secure the mounting bracket with the included M3 screws.



2 Secure the mounting bracket to the device.

Secure the mounting bracket to the device using the installation screws, purchased separately, with the included insulating spacers and washers. The installation screws should be at least 3.7 mm (thickness of the bracket, washer, etc.) + 3 mm long.

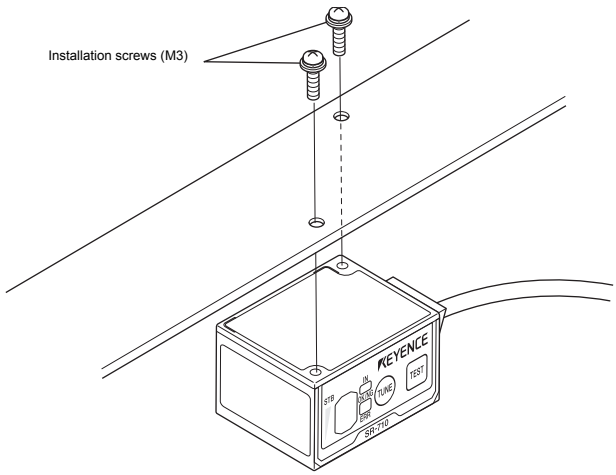


NOTICE	• **Make sure to attach the included insulating spacers to prevent excessive noise from the device.** • **Reading errors may occur if the insulating spacers are not attached.**

■ Attaching directly to the device

Secure the SR-700 Series with screws (M3).

Point **The installation screws, purchased separately, should not be any longer than the length of the plate thickness + 4 mm.**



NOTICE	• **Use insulating material when installing the SR-700 Series to prevent excessive noise from the device.** • **Reading errors may occur if the insulating material is not attached.**

6-4 Installing the Dedicated Communication Unit

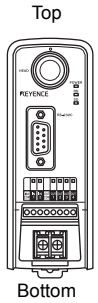
SR-700

This section describes the procedure for mounting the N-R2/R4/UB/L1 dedicated communication unit.

Precautions

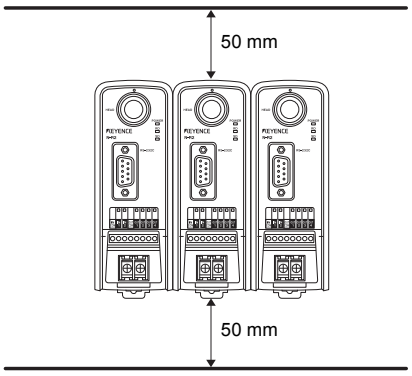
■ Mounting area

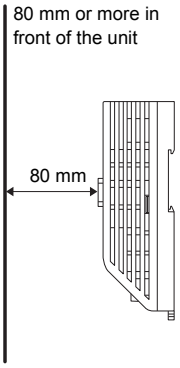
- Install the dedicated communication unit vertically.
  When the installation direction changes, provide adequate spacing so that heat does not build up.



- For ventilation, provide spacing of 50 mm or more on the top and bottom of the N-R2/R4/UB/L1. As long as this is the only source of heat generation, the unit can be installed without extra spacing on the right and left sides.
- Provide spacing of 80 mm or more in the front of the unit so that the head and other wiring can be connected.

50 mm or more on the top and bottom; no extra spacing required on either side





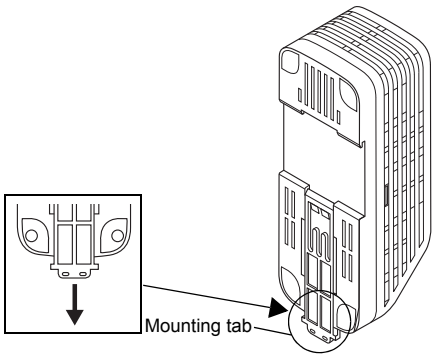
■ Installation precautions

- When installing the dedicated communication unit, do not block the ventilation slots on the top and bottom of the unit. Otherwise, heat may build up inside the unit, causing product failure.
- If the temperature on the bottom of the unit may exceed the upper limit of the operating temperature (50ºC), take appropriate measures such as applying forced air cooling or ensuring proper ventilation by increasing the spacing around the unit so that the temperature does not exceed the upper limit of the operating temperature (50ºC).

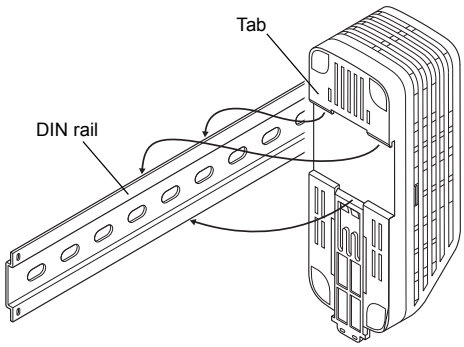
Installing the Dedicated Communication Unit

Installing the dedicated communication unit on a DIN rail

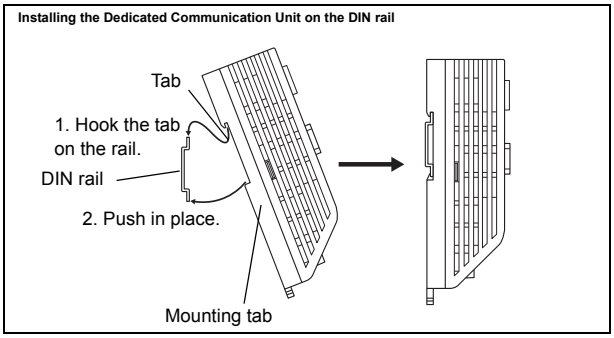
1 Lower the mounting tab on the back of the N-R2/R4/UB/L1.
Verify that the mounting tab is in the position shown in the following diagram.



2 Install the unit on the DIN rail as shown in the figure.



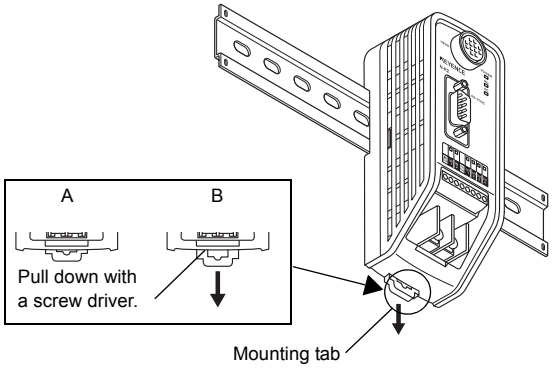
3 Secure the unit in place by raising the mounting tab on the back of the N-R2/R4/UB/L1.



* Use a DIN rail that has a thickness of 1.1 mm or less.

Removing the dedicated communication unit from the DIN rail

1 Lower the mounting tab as shown in B, in the following diagram, and then remove the communication unit.



2 After the communication unit is removed, return the mounting tab to the state shown in A.

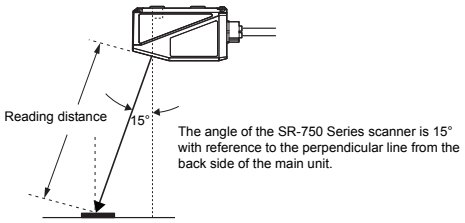
6-5 Adjusting the Mounting Position

SR-750 SR-700

When mounting the SR-750/SR-700 Series, adjust the installation angle and distance as shown below.

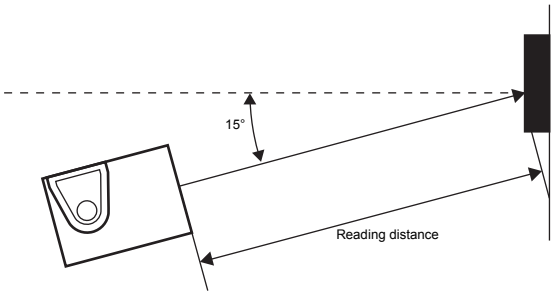
Installation angle

The scanner of the SR-750/SR-700 Series is tilted at a 15 degree angle against the code surface.
An optimal reading stability can be achieved when mounted with this angle.



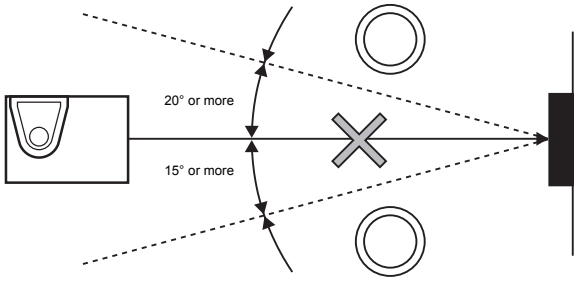
The scanner of the SR-700 Series should be positioned at an angle of 15° in relation to the 2D code or barcode surface when carrying out reading.

Reading distance



Point

Do not position the scanner to face directly at 2D codes or barcodes. Doing so may cause instability in reading due to mirror reflection.



NOTICE

- **Do not mount the unit so its scanner face is parallel to the code surface.**
  The optimal calibration may not be achieved or the reading may become unstable due to the light received from specular reflection.
- **The distances or angles that can be used for reading may vary according to the print quality and size of the code to be read or surrounding environment. Use the test mode, etc. to confirm the most appropriate mounting condition in the environment.**

Adjusting the reading distance and code position

■ Standard reading distance of the SR-750/SR-700 Series (focal distance)

The SR-750/SR-700 Series provides the most stable reading when it is mounted at the following distances.

Type	Model	Distance
High resolution	SR-750HA,SR-700HA	38 mm
Short-range	SR-750,SR-700	60 mm
Mid-range	SR-751,SR-710	100 mm
Long-range	SR-752	250 mm

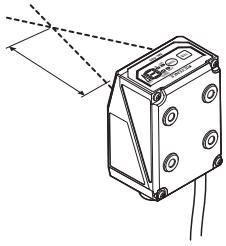
■ Code position adjustment

The SR-750/SR-700 Series is equipped with a laser pointer to adjust the code position.
Using the laser pointer enables you to adjust the most appropriate code position easily.

1 Press the TUNE button once on the SR-750/SR-700 Series to emit the laser pointer.

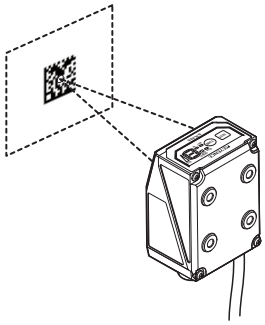
The laser pointer emits a laser beam as shown below.
* When SR-75L4/75L is attached, the emission of the laser pointer is not visible.

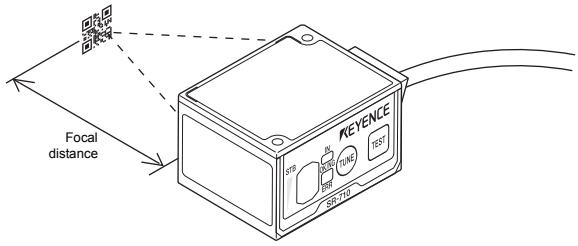
Focal distance
SR-750,SR-700HA : 38 mm
SR-750,SR-700 : 60 mm
SR-751,SR-710 : 100 mm
SR-752 : 250 mm



2 The position where the right and left laser beams cross is the center point of the visual field.

Adjust the center position of the code to this point.





6-6 Confirming the Reading Stability

After mounting the SR-750/SR-700 Series, check the reading stability with the mounted state. There are 2 methods for confirming the reading stability as follows.

- Using AutoID Network Navigator
- Using the "TUNE" and "TEST" buttons on the main unit.

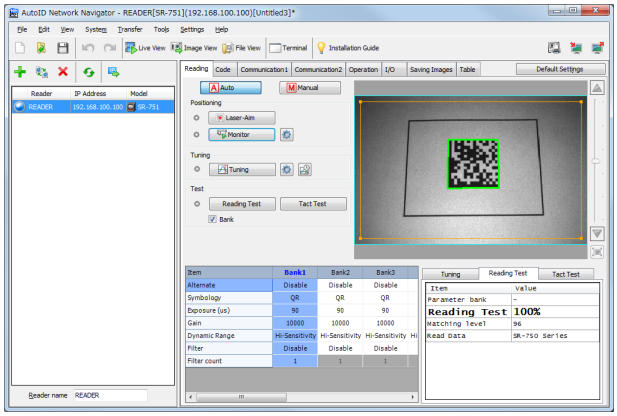
This section explains the method using AutoID Network Navigator.

1 Connect the SR-750/SR-700 Series to a computer on which AutoID Network Navigator is installed.

2 Start the AutoID Network Navigator and connect with the SR-750/SR-700 Series.

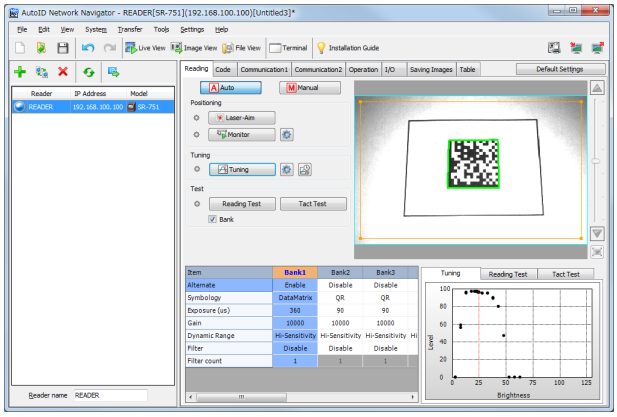
3 Press the "Laser-aim" button to emit the laser pointer and adjust the code position.

4 Press the "Monitor" button to check the code position.



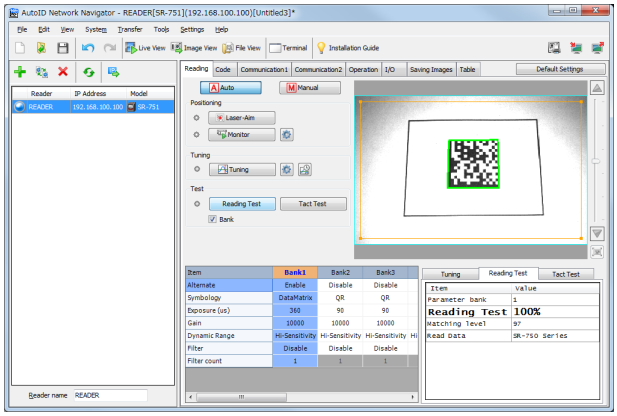
* The screenshot is of the SR-750 Series.

5 Press the "Tuning" button to perform calibration for the code.



* The screenshot is of the SR-750 Series.

6 Press the "Reading test" button to check the reading stability.



* The screenshot is of the SR-750 Series.

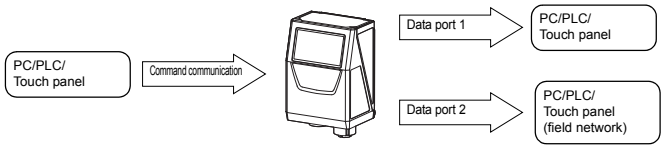
7 Checking the screen, perform fine adjustment of the installation angle and distance.

7-1 Communication of the SR-750 Series

SR-750

To communicate with a control device, the SR-750 Series has interfaces for RS-232C communication and Ethernet communication.
For these communication interfaces, the communication ports can be set as follows:

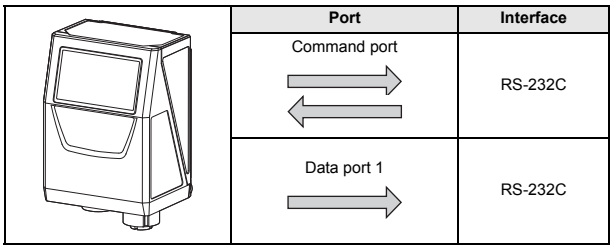
- Command port — Communication port to process operation/configuration commands and responses sent from a control device.
- Data port 1 — Port to output result data from the SR-750 Series.
- Data port 2 — Port to output result data from the SR-750 Series. This port is mainly used for control on the PLC link or field network.



Communication Port Assigning Image by Connection Method

This section describes communication port assigning images for different connection methods between the SR-750 Series and a control device.

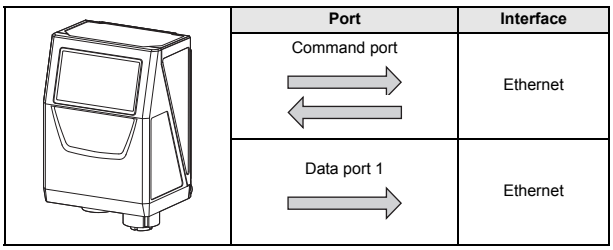
■ When sending operation/setting commands via RS-232C Communication



Port	Interface
Command port	RS-232C
Data port 1	RS-232C

This is the setting method for all basic communications using RS-232C.
To perform data control over a network, set the Data port 1 to Ethernet-TCP protocol.
* By setting the Data port 2 to Ethernet, data can be output to 2 systems: RS-232C and Ethernet.

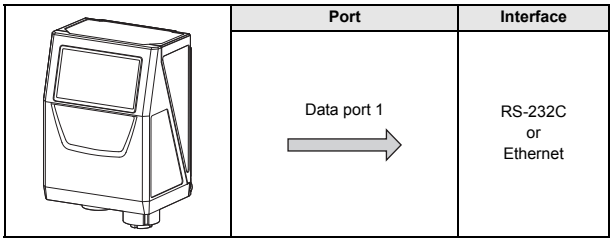
■ When sending operation/setting commands via Ethernet Communication



Port	Interface
Command port	Ethernet
Data port 1	Ethernet

This is the setting method for all basic communications using Ethernet.
* By setting the Data port 2 to Ethernet, data can be output to 2 types of Ethernet device.

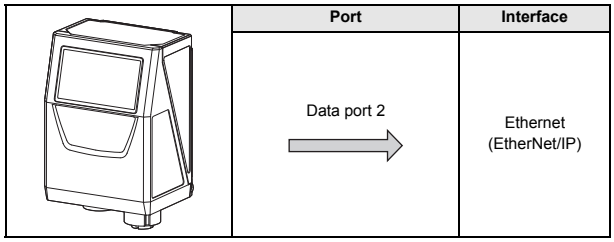
■ Perform reading operations using the trigger input terminal



Port	Interface
Data port 1	RS-232C or Ethernet

The above settings are valid when performing reading operations of the SR-750 Series using the trigger input.
Set the Data port 1 and Data port 2 according to the control devices connected.
When sending setting commands from the control device, select the appropriate host interface (RS-232C or Ethernet) for the Command port.
* Setting the Data port 2 enables output to 2 types.

■ When EtherNet/IP communication is the main communication



Port	Interface
Data port 2	Ethernet (EtherNet/IP)

The above settings are valid when controlling the SR-750 Series using EtherNet/IP.
When sending setting commands or operation commands from the control device for the purpose of adjustment, etc., select the appropriate host interface (RS-232C or Ethernet) for the Command and Data ports.
* Setting the Data port 2 enables output to 2 types.

NOTICE	• **PLC link, EtherNet/IP and PROFINET communications cannot be assigned to the Data port 1. Use the Data port 2.** • **RS-232C communication can be assigned only to either Data port 1 or Data port 2.**

7-2 Data Communication Format

SR-750 SR-700

This section describes the data communication format of the SR-750/SR-700 Series.
The data communication format is common for both the RS-232C and Ethernet.

Communication Format for Read Data

Read data is sent using the ASCII code with the header and terminator added, as shown below.

Header	Read Data	Terminator

Various data can be appended for read data.
Header and terminator can be selected from the following using AutoID Network Navigator. They also can be set to any string up to 5 characters.

● Header

None/ STX (0x02) / ESC (0x1B)

● Terminator

CR (0x0D) / CR LF (0x0D) (0x0A) / ETX (0x03)

Read Error Codes

If the code cannot be read, the SR-750/SR-700 Series will send a reading error code to the control device.
Read error code default setting: ERROR

Header	ERROR	Terminator

Read error codes can be set to any string of text, up to 8 characters, using AutoID Network Navigator.
Additionally, the device can be set to not send error codes.

Appending Data

Various types of data can be appended to read data.

■ Read data format

The data format for appending various types of data to read data is shown below:

Data size	Time	:	Detail error code	:	Code type	:	Symbol ID	Read data	:	Parameter bank numbers	:	Burst number	:	Scan count	:

Positioning level	:	Code vertex coordinates	:	Code center coordinates	:	Unused ECC ratio	:	Matching level	:	ISO/IEC15415 verification result	:

ISO/IEC TR 29158 (AIM DPM-1-2006) verification result	:	SAE AS9132 verification result	:	SEMI T10-0701 verification result	:	Japan pharmaceutical code verification result	:	ISO/IEC 16022	:	Image file name	:

Group name	:	Master/ Slave ID	:	Read time	Check-sum

Delimiter characters

- The colon (:) as a delimiting character can be changed via AutoID Network Navigator (one character).
- No delimiter character is inserted after "Data size" and "Symbol ID", and before "Checksum".

Precautions when appending data

- Appended data can be set via a command or from AutoID Network Navigator.
- Only the selected data will be appended to the read data. The data size changes because of this.
- Checksum defers by the contents of the appended data.

Details of Appended Data

■ Data size

The data size is the total size of parts (1), (2), and (3), plus 4 bytes.

	(1)	(2)	(3)	
Header	Data size	Read data + appended data	Checksum	Termi-nator

■ Time * SR-750 Series

Appends the time the data was output.
Appended data range: YYYYMMDDhhmmss

- Data format

YYYYMMDDhhmms	:	Read data

■ Read detailed error code * SR-750 Series

Factors that caused read errors are judged for each burst number.
The Read detailed error code is appended before the Read data.

Burst number 1 detailed error code	:	Burst number 2 detailed error code	:	…	:	Burst number n detailed error code	:	Read data

n: Maximum value of the burst No.

- The detailed error code is appended starting with burst No. 1.
- The detailed error code is appended with the following contents.

Detailed error code	Description
0	Reading success
1	No code
2	The set decode timeout period elapsed.
3	Scanning aborted.
9	Reading images failed.

■ Code type

The type of read code can be appended before the read data.

Code type ID	Read data
0	Reading error
1	QR
2	DataMatrix
3	PDF417, MicroPDF417
5	GS1 DataBar
6	CODE39
7	ITF
8	2of5 (Industrial 2of5)
9	NW-7(Codabar)
10	JAN/EAN/UPC
11	CODE128
12	COOP 2of5
13	CODE93
14	CC-A/B(GS1 DataBar)
15	CC-A/B(EAN/UPC)
16	CC-A/B/C(GS1-128)
18	Pharmacode

■ Symbol ID

Appends the symbology identifier, specified by AIM, before the read data.
It is not appended when a reading has failed.

- Data format

Symbol ID	Read data

Code type	Detail	Symbol ID
QR	: Model 1	]Q0
	: Model 2, ECI not applied	]Q1
	: Model 2, ECI applied	]Q2
	: Model 2, ECI not applied, FNC1 (1st)	]Q3
	: Model 2, ECI applied, FNC1 (1st)	]Q4
	: Model 2, ECI not applied, FNC1 (2nd)	]Q5
	: Model 2, ECI applied, FNC1 (2nd)	]Q6
DataMatrix	: ECC 200	]d1
	: ECC 200, FNC1 (1st)	]d2
	: ECC 200, FNC1 (2nd)	]d3
	: ECC 200, ECI applied	]d4
	: ECC 200, ECI applied, FNC1 (1st)	]d5
	: ECC 200, ECI applied, FNC1 (2nd)	]d6
PDF417, MicroPDF417	Standard	]L0
	Extended channel interpretation	]L1
	Basic channel interpretation	]L2
GS1 Databar		]e0
CODE39	No check digit validation	]A0
	Check digit is validated and transmitted.	]A1
	Check digit is validated but not transmitted.	]A3
ITF	No check digit validation	]I0
	Check digit is validated and transmitted.	]I1
	Check digit is validated but not transmitted.	]I3
2of5 (Industrial 2of5)		]S0
NW-7(Codabar)		]F0
JAN/EAN/UPC	UPC-A, UPC-E, JAN/EAN13	]E0
	JAN/EAN8	]E4
	UPC-A, UPC-E, JAN/EAN13 Addon 2, addon 5	]E3
CODE128	FNC1 not included.	]C0
	FNC1 on the first digit (GS1-128).	]C1
	FNC1 on the second digit.	]C2
COOP 2of5		]X0
CODE93		]G0
Trioptic CODE39		]A8

● **Format of symbol ID for composite code**

The symbol ID for composite code is output in the following data format:

Data format for composite code

Composite code :
(Example of GS1/CODE128+PDF)

]e0	**Bar code data**	**a**	**2D code data**

Composite code :
(Example of JAN/EAN/UPC+PDF)

]Em	**Bar code data**	**a**	**]e0**	**2D code data**

* m = Numeric value
* a = Composite delimiter (Can be changed with setting, up to 5 characters) (Default: No setting)

■ Parameter bank number

Appends the parameter bank number that was read.
It is not appended when a reading fails.

• Data format

Read data	**:**	**nn**

nn = parameter bank number (01 - 10)

■ Burst number * SR-750 Series

Outputs the burst number of the successfully read image in the burst read mode.
No data is appended for a failed reading.
This data is not appended in any mode other than the burst read mode.

• Data format

Read data	**:**	**n**

n = burst number (1 - 8)

■ Scan count

Appends the number of reading attempts of the SR-750/SR-700 Series while the timing input is turned ON.
Failed reading operations are also counted.

• Data format

Read data	**:**	**nnnnn**

nnnnn = scan count (1 - 65535)

■ Position level * SR-750 Series

Appends the position level of the read code.
When several codes are read for one scan (multi read), the average of all code position levels is output.
0 is appended when a reading fails.

• Data format

Read data	**:**	**level = n**

n = position level value (0 - 5)

■ Code vertex coordinates/Code center coordinates

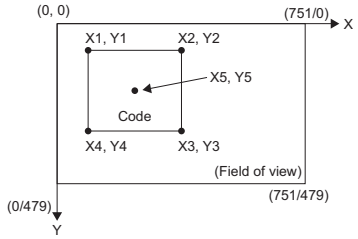
Appends the coordinates of the vertexes and center position of the read code.

• Data format

Code vertex coordinates :	**Read data**	**:**	**X1/Y1**	**:**	**X2/Y2**	**:**	**X3/Y3**	**:**	**X4/Y4**
Code center coordinates :	**Read data**	**:**	**X5/Y5**						

X1/Y1 to X4/Y4 : Code vertex coordinates (Xn = 0 - 751, Yn = 0 - 479)
X5/Y5 : Code center coordinates (X5 = 0 - 751, Y5 = 0 - 479)

Coordinates are specified for code positions in an image as below:



Reference

Output of the code vertex coordinate when performing multiple reading of the same code.
When multiple readings are performed for 1 scan, the coordinates are output in the following order:

- Coordinates with code center coordinates higher in the field of view (smaller in Y) are prioritized.
- If 2 coordinates have the same Y coordinates, the center coordinates of the code further to the left in the field of view (smaller in X) are prioritized.

Output format for multi read is as follows:

Read data 1, Read data 2, … , Read data n	**:**	**Read data 1 corner coordinates: Read data 2 corner coordinates: … : Read data n corner coordinates**	**:**	**Read data 1 center coordinates: Read data 2 center coordinates: … : Read data n center coordinates**

Point

If vertex coordinates are outside the decoding range, these values become outside the decoding range values.
(Reading is possible even if all the vertexes are not within the decoding range.)

■ Unused ECC ratio

Appends the unused error correction ratio.
The average value will be appended when several codes are read for 1 scan (multi read).
It is not appended when a reading fails.

• Data format

Read data	**:**	**nnn**	**%**

nnn = unused ECC ratio (0 - 100)

■ Matching level

Appends the matching level value of the read code.

- Matching levels of each code will be appended for the multi read.
- Value is not appended when a reading fails.

• Data format

Read data	**:**	**nnn**

nnn = matching level value (0 - 100)

■ Code quality verification result

Code quality verification results data can be appended.
The data formats are shown as below.

	Setting			Data format example
	Append grades	Append detailed verification result	Append values	
ISO/IEC15415	Alphabet	NG	NG	Read data: C
	Alphabet	NG	OK	Read data: C (-)
	Alphabet	OK	NG	Read data: C/A/C/B/A/B/-/-/A/A/A/B/A
	Alphabet	OK	OK	Read data: C(-)/A(-)/A(0.733)/C(-)/C(-)/B(-)/-(-)/-(-)/A(0.002)/A(0.002)/A(1.000)/B(-0.646)/A(-0.289)
	Numeric	NG	NG	Read data: 2.0
	Numeric	NG	OK	Read data: 2.0(-)
	Numeric	OK	NG	Read data: 2.0/4.0/2.0/3.0/4.0/3.0/2.0
	Numeric	OK	OK	Read data: 2.0(-)/4.0(-)/2.0(0.632)/3.0(-)/4.0(-)/3.0(0.072)/2.0(0.640)
ISO/IEC TR 29158 (AIM DPM-1-2006)	Alphabet	NG	NG	Read data: C
	Alphabet	NG	OK	Read data: C (-)
	Alphabet	OK	NG	Read data: C/A/C/B/A/B/-/-/A/A/A/B/A
	Alphabet	OK	OK	Read data: C(-)/A(-)/A(0.733)/C(-)/C(-)/B(-)/-(-)/-(-)/A(0.002)/A(0.002)/A(1.000)/B(-0.646)/A(-0.289)
	Numeric	NG	NG	Read data: 2.0
	Numeric	NG	OK	Read data: 2.0(-)
	Numeric	OK	NG	Read data: 2.0/4.0/2.0/3.0/4.0/3.0/2.0
	Numeric	OK	OK	Read data: 2.0(-)/4.0(-)/2.0(0.632)/3.0(-)/4.0(-)/3.0(0.072)/2.0(0.640)
SAE AS9132 * Settings for Select expression of grades are not reflected.		NG	NG	Read data: P
		NG	OK	Read data: P(-)
		OK	NG	Read data: F/P/P/F/P
		OK	OK	Read data: F(-)/P(0.632)/P(-)/F(0.852)/P(0.005)
		NG	NG	Read data: P
		NG	OK	Read data: P(-)
		OK	NG	Read data: F/P/P/F/P
		OK	OK	Read data: F(-)/P(0.632)/P(-)/F(0.852)/P(0.005)
SEMI T10-0701 * Settings for Select expression of grades, Append detailed verification result and Append values are not reflected.				Read data: 0.054/0.850/5.400/3.112
Japanese Pharmaceutical Code quality verification (Composite Symbol)	Alphabet	NG	NG	Read data:C:A:C
		NG	OK	Read data:C(-):A(-):C(-)
		OK	NG	Read data:C:A/A/A/A/A/A/A/A/A/A:C/C/C/A/A/A/A/C/C/A/A/A/A
		OK	OK	Read data:B(-):A(-)/A(1.000)/A(1.000)/A(0.938)/A(0.059)/A(0.871)/A(0.930)/A(1.000)/A(0.797)/A(0.031):B(-)/B(0.711)/B(0.711)/A(0.945)/A(0.055)/A(0.895)/A(0.945)/B(0.711)/A(0.633)/A(0.012)/A(0.914)/B(0.750)/A(0.750)
	Number	NG	NG	Read data:2.8:4.0:2.8
		NG	OK	Read data:2.8(-):4.0(-):2.8(-)
		OK	NG	Read data:2.1:4.0/4.0/4.0/4.0/4.0/4.0/4.0/4.0/4.0/4.0:2.1/3.0/3.0/4.0/4.0/4.0/4.0/3.0/4.0/4.0/4.0/4.0/4.0
		OK	OK	Read data:3.4(-):4.0(-)/4.0(1.000)/4.0(1.000)/4.0(0.934)/4.0(0.063)/4.0(0.867)/4.0(0.930)/4.0(1.000)/4.0(0.805)/4.0(0.031):3.4(-)/4.0(1.000)/4.0(1.000)/4.0(0.941)/4.0(0.055)/4.0(0.793)/4.0(0.840)/4.0(1.000)/4.0(0.832)/4.0(0.066)/4.0(0.914)/4.0(0.750)/4.0(0.750)
ISO/IEC16022	Alphabet	NG	NG	Read Data: C
	Alphabet	NG	OK	Read Data: C(-)
	Alphabet	OK	NG	Read data: C/A/C/B/A/B
	Alphabet	OK	OK	Read data: C(-)/A(-)/C(0.632)/B(0.069)/A(1.000)/A(0.118)/A(0.118)
	Numeric	NG	NG	Read Data: 2.0
	Numeric	NG	OK	Read Data: 2.0(-)
	Numeric	OK	NG	Read data: 2.0/4.0/2.0/3.0/4.0/3.0/2.0
	Numeric	OK	OK	Read data: 2.0(-)/4.0(-)/2.0(0.632)/3.0(0.069)/4.0(1.000)/4.0(0.118)/4.0(0.118)

■ Append order of verification results

Results of evaluation items for each verification are arranged in the following order.

Standards	Evaluation item names (English)	Evaluation item names (Japanese)	Abbreviated names	
ISO/IEC 15415	Overall	Total evaluation	ALL	
	Decode	Decode success/failure	DEC	
	Symbol Contrast	Symbol contrast	SC	
	Modulation	Modulation	MOD	
	Reflectance Margin	Reflectance margin	RM	
	Fixed Pattern Damage	Fixed pattern damage	FPD	
	Format Information Damage	Format information damage	FID	*1
	Version Information Damage	Version information damage	VID	*2
	Axial Nonuniformity	Axial nonuniformity	AN	
	Grid Nonuniformity	Grid nonuniformity	GN	
	Unused Error Correction	Unused error correction	UEC	
	Print Growth Horizontal	Print growth (horizontal)	PGH	
	Print Growth Vertical	Print growth (vertical)	PGV	
ISO/IEC TR 29158 (AIM DPM-1-2006)	Overall	Total evaluation	ALL	
	Decode	Decode success/failure	DEC	
	Cell Contrast	Cell contrast	CC	
	Cell Modulation	Cell modulation	CM	
	Reflectance Margin	Reflectance margin	RM	
	Fixed Pattern Damage	Fixed pattern damage	FPD	
	Format Information Damage	Format information damage	FID	*1
	Version Information Damage	Version information damage	VID	*2
	Axial Nonuniformity	Axial nonuniformity	AN	
	Grid Nonuniformity	Grid nonuniformity	GN	
	Unused Error Correction	Unused error correction	UEC	
	Print Growth Horizontal	Print growth (horizontal)	PGH	
	Print Growth Vertical	Print growth (vertical)	PGV	
SAE AS9132	Overall	Total evaluation	ALL	
	Quiet Zone	Quiet zone	QZ	
	Symbol Contrast	Symbol contrast	SC	
	Angular Distortion	Angular distortion	AD	
	Module Fill	Module fill	MF	
SEMI T10-0701	Symbol Contrast	Symbol contrast	SC	
	Signal to Noise Ratio	Signal to noise ratio	SNR	
	Horizontal Mark Growth	Horizontal mark growth	HMG	
	Vertical Mark Growth	Vertical mark growth	VMG	
	DataMatrix Cell Width	Average cell width	DMCW	
	DataMatrix Cell Height	Average cell height	DMCH	
	Horizontal Mark Move	Horizontal misplacement	HMM	
	Vertical Mark Move	Vertical misplacement	VMM	
	Cell Defects	Cell defects	CD	
	Finder Pattern Defects	Finder pattern defects	FPD	
	Unused Error Correction	Unused error correction	UEC1	*3
			UEC2	
			UEC3	
			UEC4	
			UEC5	
			UEC6	
			UEC7	
			UEC8	
			UEC9	
			UEC10	

Standards		Evaluation item names (English)	Evaluation item names (Japanese)	Abbreviated names
Japanese Pharmaceutical Code quality verification	1D & 2D	Overall Composite Symbol	Overall Composite Symbol	ALL
	1D	Overall	Overall	ALL
		Decode	Decode	DEC
		EdgeDetermination	EdgeDetermination	EDGE
		Symbol Contrast	Symbol Contrast	SC
		Minimum Reflectance	Minimum Reflectance	MINR
		Minimum Edge Contrast	Minimum Edge Contrast	MINE
		Modulation	Modulation	MOD
		Quiet Zone	Quiet Zone	QZ
		Decodability	Decodability	DCD
		Defects	Defects	DEF
	2D	Overall	Overall	ALL
		Decode	Decode	DEC
		EdgeDetermination	EdgeDetermination	EDGE
		Symbol Contrast	Symbol Contrast	SC
		Minimum Reflectance	Minimum Reflectance	MINR
		Minimum Edge Contrast	Minimum Edge Contrast	MINE
		Modulation	Modulation	MOD
		Quiet Zone	Quiet Zone	QZ
		Decodability	Decodability	DCD
		Defects	Defects	DEF
		Codeword Yield	Codeword Yield	CY
		Codeword Print Quality	Codeword Print Quality	CPQ
		Unused Error Correction	Unused Error Correction	UEC
ISO/IEC 16022		Overall	Total evaluation	ALL
		Decode	Decode success/failure	DEC
		Symbol Contrast	Symbol contrast	SC
		Axial Nonuniformity	Axial nonuniformity	AN
		Unused Error Correction	Unused error correction	UEC
		Print Growth Horizontal	Print growth (horizontal)	PGH
		Print Growth Vertical	Print growth (vertical)	PGV

*1 Enabled only for QR and micro QR code "-" is displayed for DataMatrix.
*2 QR code Model 2 Version 7 and later versions are only enabled. "-" is displayed for others.
*3 The number of items displayed for UEC, evaluation item for SEMI T10-0701 varies according to the code size.

■ Image file name * SR-750 Series

Appends the saved image file name linked to the read data (including an extension).
When no image is saved, "(no file)" is appended.
When there is an image to save, the saved file name is appended.

• Data format

No saved image :

Read data	:	(no file)

*1

Image to save is present :

Read data	:	(1)	_	(2)	_	(3)	_	(4)	.	(5)

*2

(1) Image count value (3 bytes)	IMG	:	When saved in ROM/RAM
	000 to 999	:	When sent via FTP • The number is counted from 000 at startup. • The counter value is incremented each time one image is sent. • When the counter value of 999 is incremented, the value returns to 000.
(2) Image type (1 byte)	S	:	OK image
	L	:	Latest
	E	:	Error image
	W	:	Unstable image
	N	:	Comparison NG
	C	:	Captured image
	X	:	No decoding process
(3) Operation number (2 bytes)	00	:	Latest
	01 to 10	:	From timing ON/OFF to specified number
	#1 to #8	:	Burst number
(4) Bank number (2 bytes)	01 to 10		
(5) Image file extension	ROM/RAM	:	bmp
	FTP	:	bmp or jpg

*1 (no file) occupies 9 bytes.
*2 When a reading error occurs, the data for the number of parameter banks registered are appended.

■ Image file name * SR-700 Series

The image file name is set in the following format:

Saved file number	_	Image type Identification character	_	Bank No.	.bmp

• Saved file number: 3-digit image file serial number
• Image type identification character : Character that indicates the image type
S .....Images successfully read
N .....Image NG
E .....Read error images
W ....Unstable images
C .....Instant Capture
• Bank No: Bank number used to obtain the image.
Example) Successfully read file name with the bank No. 1
001_S_01.bmp

■ Group name (When the Master/Slave function is used) * SR-750 Series

Appends the group name to be set when using the Master/Slave function.
• Data format

Read data	:	Group name

Group name: Up to 16 characters

■ Master/Slave ID * SR-750 Series

Appends the unit ID to be set when using the Master/Slave function.
• Data format

Read data	:	nn

nn: Unit ID (0 to 31)

■ Read time

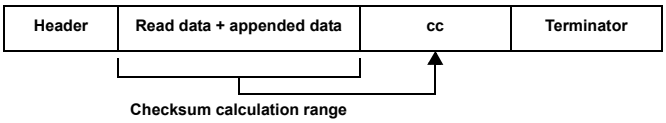
Appends the time required for the reading.
• Data format

Read data	:	nnnnn	ms

nnnnn = reading time (1 - 65535)

■ Checksum

The checksum is calculated using all characters that are not part of the header or the delimiter and is then appended immediately before the terminator with 2 characters.
For calculation details, refer to "15-7 Checksum Calculation Method (Page 152)"



7-3 RS-232C Communication

SR-750 SR-700

This section describes the RS-232C communication of the SR-750/SR-700 Series.

RS-232C Communication Configuration

Before using the RS-232C communication, set the communication conditions for the SR-750/SR-700 Series and the control device.

■ SR-750/SR-700 Series configuration

Use AutoID Network Navigator to configure the following:
- Communication conditions : Baud rate, data bit length, parity, and stop bit length
- Communication protocol : None, PASS/RTRY, or ACK/NAK
- Communication data format : Header and Terminator

Reference Set the same settings for both the control device and the SR-750/SR-700 Series.

■ Default settings for RS-232C

The default settings for RS-232C are as follows.
- Baud rate : 115200 bps
- Data bit length : 8 bit
- Parity : Even
- Stop bit length : 1 bit

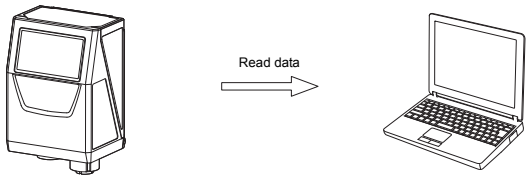
Reference Press and hold the Test button for 6 seconds or longer to return the SR-750 Series to the default configuration.
"3-1 Using the SR-750/700 Series (Page 17)"

Communication Protocol

RS-232C communication has 3 communication protocols available. Set it according to the usage.

No Handshaking (No-Protocol)

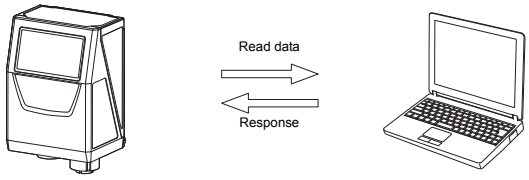
The SR-750/SR-700 Series sends read data to the control device without handshaking.



PASS/RTRY

The SR-750/SR-700 Series sends read data to the control device using the following protocol:

1 The SR-750/SR-700 Series sends data to the control device.



2 The SR-750/SR-700 Series waits for a response (PASS: Transmission successful, RTRY: Request to resend) from the control device.

The SR-750/SR-700 Series can still read codes while waiting for a response. Data read while waiting for a response from the computer will be stored in the send buffer.

3 The host computer sends one of the following responses to the SR-750/SR-700 Series.
- PASS: Transmission complete. (The device does not respond to PASS)
- RTRY: Resend the same data to the control device and wait for a PASS response.

Point
If the send buffer of the SR-750/SR-700 Series is overloaded, "E4" is displayed on the multi LED and reading operation is stopped.
- **When "PASS" is received, "OVER" is sent to the control device and an error occurs.**
- **When another "PASS" is received, the operation resumes.**

● **PASS and RTRY formats**

PASS [CR] (RTRY [CR]) or [STX] PASS [ETX] ([STX] RTRY [ETX])
* [ESC] at the beginning and [LF] at the end can be added.

Important
- **The SR-750/SR-700 Series is able to receive any command while waiting for a response. This allows for a response to a command to be sent without delay.**
- **If the SR-750/SR-700 Series receives a RESET command while waiting for a response, the send buffer will be cleared.**

ACK/NAK

This protocol uses [ACK] (0x06) instead of "PASS" and [NAK] (0x15) instead of "RTRY" in the PASS/RTRY protocol.
Other than the differences in the character strings to send, this protocol is identical to the PASS/RTRY protocol.

Point
If the send buffer of the SR-750/SR-700 Series is overloaded, reading operation will be stopped.
- **When "ACK" is received, "OVER" is sent to the control device and an error occurs.**
- **When another "ACK" is received, the operation resumes.**

■ ACK/NAK formats

Send [ACK] (0x06) and [NAK] (0x15) only, but do not append header nor terminator.

Send Buffer Capacity

- The send buffer of the SR-750/SR-700 Series can hold up to 10 KB of data. The number of characters for each entry saved in the send buffer includes the header and terminator.
- When the number of characters in data exceeds 10KB, the send buffer overflows.

■ Send Buffer Overflow

If the send buffer overflows, the SR-750/SR-700 Series will send the following message and an error occurs.
- "E" and "4" are displayed alternately on the multiple LED.
- ERR BUSY is output. (when OUT terminal is specified)
- When PASS/RTRY or ACK/NAK is set and PASS or ACK is received, "OVER" is output.

To resume from buffer overflowed status, try the following operations:
- Send the buffer clear command "BCLR" from the control device.
- When PASS/RTRY or ACK/NAK is set, send PASS or ACK again

* Send buffer also can be cleared with a "RESET" command or cycling power.
* When a "BCLR" command is received while the send buffer is not overflowed, data currently stored in the send buffer will be cleared.

7-4 Ethernet Communication

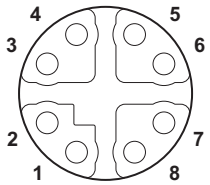
SR-750

Using the Ethernet communication, you can send data from the SR-750 Series, or send operating instructions or change settings from the control device. This section describes the basic specifications and functions of the SR-750 Series.

Basic Specifications

■ Ethernet port specifications

The SR-750 Series supports PoE (Power over Ethernet).
The pin arrangement of the Ethernet port on the SR-750 side is as follows:



Pin number	Not PoE	PoE-TypeA	PoE-TypeB
1	TX+	TX+/ V+	TX+
2	TX-	TX-/ V+	TX-
3	RX+	RX+/ V-	RX+
4	RX-	RX-/ V-	RX-
5	—	—	V-
6	—	—	V-
7	—	—	V+
8	—	—	V+

Signal name	TX+/ TX-	Sent signal
	RX+/ RX-	Receive signal
	V+/ V-	PoE power source

- Pin arrangement of KEYENCE Ethernet cable

M12	Signal name	RJ45	Wire color
1	TX+	1	White/Orange
2	TX-	2	Orange
3	RX+	3	White/Green
4	RX-	6	Green
5	V-	7	White/Brown
6	V-	8	Brown
7	V+	5	White/Blue
8	V+	4	Blue

* When making a cable using the optional connector OP-87362, use a cable of CAT5e or more.

Ethernet communication settings

■ SR-750 Series settings

Use the AutoID Network Navigator to set the following settings:
- IP address
- Subnet mask
- Default gateway

■ Ethernet default settings

The Ethernet default settings are as follows.
- IP address 192.168.100.100
- Subnet mask 255.255.255.0
- Default gateway 0.0.0.0

Reference Pressing the TUNE button for at least 5 seconds sets the temporary IP address setting mode.
"3-1 Using the SR-750/700 Series (Page 17)"

Communication Function

Function Outline

Ethernet communication of the SR-750 Series is available with the following functions:

■ Socket communication function

Sends read data of the SR-750 Series via socket communication.
Control the behavior of the SR-750 or change the settings via Ethernet by sending operation and configuration commands to the command send/receive port.
Communication protocol: TCP

■ PLC link function (only for MELSEC and KV Series)

The PLC link is created via Ethernet.
Compatible PLCs are MELSEC Series and KV Series. "9-1 PLC Link (Page 114)"
Communication protocol: UDP

■ PROFINET

The SR-750 Series can make PROFINET communication.
For details, refer to "12-1 PROFINET (Page 139)".
Communication protocol: PROFINET

■ EtherNet/IP function

The SR-750 Series can be connected as an EtherNet/IP adaptor.
For details, refer to "11-1 EtherNet/IP (Page 124)"
Communication protocol: EtherNet/IP

■ FTP function

The SR-750 Series operates as an FTP server or an FTP client and can transfer scanned image data or the setting file.
Communication protocol: FTP

■ Communication protocols for other functions

- Communication with Multimonitor: UDP
- Communication with FileView: FTP
- Master/Slave function: UDP

Port Numbers

This section describes the port numbers available on the SR-750 Series.

Port Name	Communication Method	Listen port/ Remote Port	Communication Protocol	SR-750 Series Port Number
Command port	Socket communication	Listen port	TCP	9004 *1 *2
Data port 1	Socket communication	Listen port	TCP	9004 *1 *2
		Remote port	TCP	1024 to 65535
Data port 2 *3	Socket communication	Remote port	TCP	1024 to 65535
	PLC link communication	Remote port	UDP	1024 to 65535
FTP communication port	FTP communication	—	FTP	20: FTP data port (ACTIVE mode) 21: FTP service port

*1 9013, 9014, 9015, 5920, and 44818 cannot be set as they are reserved for the reader system.
*2 When 9004 (initial value) is set, the command transmission/reception and the data output occur at the same port. If you want to assign different ports to the command transmission/reception and the data output, change the port number.
*3 Data port 2 performs client operations only.

7-5 Socket Communication SR-750

This section described the behavior and configuration items of the SR-750 Series to perform socket communication.

Command port

Use this port to send the operation/setting commands to the SR-750 Series via Ethernet.
The command port supports server operations only.
To send commands, establish a connection from the control device.

Server and Client Operations

Socket communication function of the data port supports both server and client operations.
Socket communication function for PLC port is available for client operations only.
Server operations and client operations can be selected using the IP address setting (Remote IP address setting) for Data port 1 and Data port 2.

■ Setting the SR-750 Series for server operations only *Data port 1 only

Set the IP address of the connection destination as follows.
IP address: 0.0.0.0
* Data port 2 does not function.

■ Setting the SR-750 Series for server and client operations

Set the IP address of the connection destination as follows.
IP address: Other than 0.0.0.0
* Data port 2 performs client operations only.

Continually Send Connection Requests

When a connection is not established, "Continually Send Connection Requests" configuration determines the establish request timing.

Configuration		Establish Request Timing
Continually Send Connection Requests	No	When read data is determined and data output is ready.
	Yes	As necessary when a connection is not established such as at power-on.

Keep Alive Function

This function checks whether the connection established with a remote device is still alive.

■ Operating conditions

Operates when the status of no communication continues for 60 seconds or more.

■ Operation details

Sends a Keep packet to the remote device and checks the response.
- Response: Keep the connection established.
- No response: Disconnect the connection.

7-6 FTP Communication SR-750

The SR-750 Series operates as FTP client or FTP server and can transfer scanned images.
This section describes operations for FTP communication.

Important **If the TEST button is pressed down, images are not transferred via FTP.**

FTP Communication Settings

■ FTP client operations/FTP server operations settings

Select FTP client operations or FTP server operations from the IP address setting for the FTP transmission setting.

- Setting the SR-750 Series for FTP server operations only
  IP address: 0.0.0.0
- Setting the SR-750 Series for FTP server and FTP client operations
  IP address: Other than 0.0.0.0

FTP Client Function

■ User name and password

Set the user name and pass word for FTP communication.
- User name : ASCII 16 characters or less (Default setting: admin)
- Password : ASCII 16 characters or less (Default setting: admin)

■ Image file

The following settings can be made for files sent from the SR-750 Series to FTP server.
- Specified format : Bitmap, JPEG
- JPEG image quality : 1 to 10
- Binning : None, 1/4, 1/16, 1/64

■ Image file name

When the unit operates as FTP client, file names vary depending on the edit image file name function status (Enable or Disable).
- Edit image file name function: Disable

File name : (1) _ (2) _ (3) _ (4) . (5)

(1) Image count value (3 bytes) 000 to 999
- The number is counted from 000 at startup.
- The counter value is incremented each time one image is sent.
- When the counter value of 999 is incremented, the value returns to 000.

(2) Image type (1 byte)
- S : OK image
- L : Latest
- E : Error image
- W : Unstable image
- N : Comparison NG
- C : Captured image
- X : No decoding process

(3) Operation number (2 bytes)
- 00 : Latest
- 01 to 10 : From timing ON/OFF to specified number
- #1 to #8 : Burst number

(4) Bank number (2 bytes) 01 to 10
(5) Image file extension bmp or jpg

- Edit image file name function: Enable
  Operates when the edit of image file name by script is enabled.
  Outputs data using the image file name edited by script.

■ Send FTP connection request as necessary

The connection request transmission timing for FTP server can be specified.

- Send FTP connection request as necessary
  - No : Send when the image transfer is confirmed and the image file output preparation is complete.
  - Yes : Send as necessary when FTP connection is not established, such as when the power is turned on.

■ Send NOOP command

When Send NOOP Command configuration is enabled, NOOP commands are sent periodically with the specified transmission interval.
Timeout disconnection of the FTP server at the connection destination can be avoided.

- Send NOOP command : Yes, No
- NOOP command transmission interval : 1 to 10 (in units of 1 minute)

■ Send PASV command

When Send PASV Command configuration is enabled, PASV commands are sent at the file transmission timing to the FTP server.

- PASV command transmission interval : Yes, No

■ Image transmission timing

The image transmission timing from the SR-750 Series is when the reading operation is complete.

- TRG BUSY signal is output during image transmission.
- Next reading operation cannot be started during image transmission.

FTP Server Function

■ FTP Server Operation

- No. of connections which can be established simultaneously: max. 2 connections
- Operates as Anonymous FTP Server.
- When there is no connection from FTP client for 60 seconds, FTP connection is cut.
- The SR-750 Series is not equipped with the function to retain time in the main unit. Therefore, the update time is fixed (Jan 01 2000). Connecting to the SNTP server updates the time data.

■ Files

The files treated as FTP server are the following 3 files.

- Setting file : Setting file of the SR-750 Series main unit (Extension: ptc)
- Image file : Image file obtained with the SR-750 Series (Extension: bmp)
- Script file : Script file set for the SR-750 Series (Extension: Lua)

NOTICE	**• Name the setting file "config.ptc" and send.** **• Name the script file "Fmtset.lua" and send.** **• File names other than the above cannot be used.**

■ Image file name

The file name is as follows when operating as FTP server.

File name : (1) _ (2) _ (3) _ (4) . (5)

(1) Image count value (3 bytes)	IMG	:	When saved in ROM/RAM
(2) Image type (1 byte)	S	:	OK image
	L	:	Latest
	E	:	Error image
	W	:	Unstable image
	N	:	Comparison NG
	C	:	Captured image
	X	:	No decoding process
(3) Operation number (2 bytes)	00	:	Latest
	01 to 10	:	From timing ON/OFF to specified number
	#1 to #8	:	Burst number
(4) Bank number (2 bytes)	01 to 10		
(5) Image file extension	bmp		

8-1 Details of Command Communication

SR-750 SR-700

This section describes the command types and communication format of the SR-750/SR-700 Series.

Types of Command Communication

There are 2 types of commands used with the SR-750/SR-700 Series:
These commands and responses are common to RS-232C communication and Ethernet communication. The ASCII codes are used for the transmission and reception.

■ Operation commands

Commands to control the SR-750/SR-700 Series operations.

■ Configuration commands

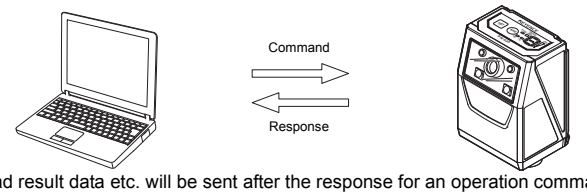
Commands to change or confirm the SR-750/SR-700 Series configuration.

Command Communication Process

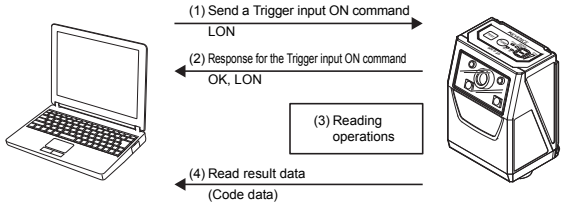
Command communication with the SR-750/SR-700 is performed as follows:

1 The host PC sends commands (operation/configuration commands) to the SR-750/SR-700 Series.

2 SR-750/SR-700 sends responses for the commands received.



Read result data etc. will be sent after the response for an operation command is sent.
[Example] Read result data when a timing ON command is used



Command Communication Format

■ Header and Terminator

There are two types of header and terminator for the SR-750/SR-700 Series. Use either of them.

Header	Terminator
None	CR
STX	ETX

Responses are sent with the same header and terminator of the corresponding send command.

Command	Response
Command CR →	Response CR
STX Command ETX →	STX Response ETX

* LF is appended at the end of the command. However, LF will not be added to the response.

Important

- **If ESC is appended at the beginning of the command, the ESC will clear the receive buffer of the SR-750/SR-700 Series.**
  If unnecessary characters appear in the receive buffer of the SR-750/SR-700 Series, append ESC at the command communication.
- **Set the character interval to 10 seconds or less when sending commands to the SR-750/SR-700 Series. If 10 seconds or more elapse, the SR-750/SR-700 Series will delete all received characters from the buffer.**

■ Send command format

Up to 2 parameters for each operation and configuration command are available. Commands are sent in the following format according to the number of parameters:

Number of Parameters	Send Command Format
None	Header | Command | Terminator
1	Header | Command | , | Parameter 1 | Terminator
2	Header | Command | , | Parameter 1 | , | Parameter 2 | Terminator

■ Response format

Responses for operation or configuration commands are sent in the following format:

Send Command Result	Send Command Format
Successful	Header | OK | , | Send command | Terminator
Failed	Header | ER | , | Send command | , | Error code | Terminator

■ Response error codes

Error code	Error Description	SR-750	SR-700
00	Undefined command received	SR-750	SR-700
01	Mismatched command format (Invalid number of parameters)	SR-750	SR-700
02	The parameter 1 value exceeds the set value	SR-750	SR-700
03	The parameter 2 value exceeds the set value	SR-750	SR-700
04	The parameter 2 is not set in HEX (hexadecimal) code.	SR-750	SR-700
05	The parameter 2 set in HEX (hexadecimal) code but exceeds the set value	SR-750	SR-700
10	There are 2 or more ! marks in the preset data The preset data is incorrect	SR-750	SR-700
11	The area specified data is invalid.	SR-750	SR-700
12	Specified data does not exist.	SR-750	SR-700
13	mm of %Tmm-*** exceeds 31.	SR-750	SR-700
14	There is no correct response to the %Tmm-KEYENCE command.	SR-750	SR-700
20	This command not executable in the current status was received (Execution error)	SR-750 SR-750	SR-700 SR-700
21	The buffer has overflowed, so commands cannot be executed	SR-750	SR-700
22	An error occurred while loading or saving parameters, so commands cannot be executed	SR-750	SR-700
23	Command cannot be executed while connecting with the setup software	SR-750	SR-700
30	No error image was saved to this number	SR-750	-
35	There are no settings for this read code	SR-750	-
40	The length of the command sent as a batch exceed 2048 bytes	SR-750	-
41	The length of the command sent as a batch exceed 2048 bytes	SR-750	-
42	A command not allowed in batch settings has been specified	SR-750	-
99	Other errors (Contact your nearest KEYENCE sales office.)	SR-750	SR-700

8-2 Operation Commands

This section describes the details of the operation commands of the SR-750/SR-700 Series.

Reading Operation Control

■ Timing ON command

Send command	Normal mode	LON	
	Bank settings	LON, bb or LONbb	bb: parameter bank number (01 - 10)
Response	Normal process	OK, LON (SR-750) None (SR-700)	
	Abnormal process	ER, LON, ee (SR-750) None (SR-700)	ee: Error code

■ Timing OFF command

Send command		LOFF	
Response	Normal process	OK, LOFF (SR-750) None (SR-700)	
	Abnormal process	ER, LOFF, ee (SR-750) None (SR-700)	ee: Error code

- Starts and finishes reading operations of the SR-750/SR-700 Series. Same operations as the timing ON/OFF signals from the IN terminal.
- Timing ON/OFF commands can be changed, up to 8 characters.
  When sending the trigger input command with the parameter bank number added, the data is read only with the specified parameter bank.
- Response is output upon receiving a send command.
- When a code reading was successful while the SR-750/SR-700 Series is in the Single reading mode and the data transmission is set to Send after read, do not send a timing OFF command. The response indicating the abnormal process is output.
- When a code cannot be read and the trigger input OFF command is sent, a reading error is output after response.
- Timing OFF command cannot finish reading when the reading was started with the IN terminal or the Test switch.
- An error code is output when a timing ON command is received again during the reading with a timing ON command. (Same for timing OFF commands)
- If Specify response character is set to "SR-600 compatible", response is not sent.
  * SR-750 Series
- If Specify response character is set to "User setting", the response command will have the same character string as the one set for Success response character and Failure response character.

"3-9 SR-600 Compatible Output Mode (Page 29)"

Preset Data Registration

■ Starting preset data registration

Send command		PRON	
Response	Normal process	OK, PRON (SR-750) None (SR-700)	
	Abnormal process	ER, PRON, ee (SR-750) None (SR-700)	ee: Error code

- These are used to register preset data for the SR-750 Series.
- When the preset data registration is completed, SR-750 outputs data in the following format:

PR00	:	Preset registered data

■ Finishing preset data registration

Send command		PROFF	
Response	Normal process	OK, PROFF (SR-750) None (SR-700)	
	Abnormal process	ER, PROFF, ee (SR-750) None (SR-700)	ee: Error code

- These are used to finish or stop preset registration for the SR-750 Series.
- After the SR-750 Series outputs preset registered data, do not send a PROFF command.
- When a PROFF command is sent to stop a preset registration, the following error code will be output after the response:

PR01	:	Read error

- If Specify response character is set to "SR-600 compatible", response is not sent.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

Reading Quick Setup Codes

■ Starting quick setup code reading

Send command		RCON	
Response	Normal process	OK, RCON	
	Abnormal process	ER, RCON, ee	ee: Error code

- When a reading operation started and all quick setup codes were read, the configuration will be saved in the ROM and applied to the operations. Communication settings are also applied.
  * Same for the quick setup code reading executed by the TUNE switch.
- If Specify response character is set to "SR-600 compatible", OK is returned for normal process and ERRee is returned for abnormal process.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

■ Finishing quick setup code reading

Send command		RCOFF	
Response	Normal process	OK, RCOFF	
	Abnormal process	ER, RCOFF, ee	ee: Error code

- Finishes reading when a quick setup code reading is not completed.
- When the SR-600 compatible output mode is "Enabled", OK and ERRee are returned for normal process and abnormal process respectively.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

■ Quick setup code status check

Send command		RCCHK	
Response	Normal process	OK = RCCHK = mm…	
		mm = OK	: Quick setup code reading successful
		READING	: Reading quick setup code
		NG	: Quick setup code reading failed
		NONE	: Quick setup code reading not executed
	Abnormal process	ER, RCCHK, ee	ee: Error code

- Checks the quick setup code reading status.

Test Mode Control

■ Starting reading rate test mode

Offline mode	Send command	Normal mode	TEST1	
		Bank settings	TEST1bb or TEST1, bb	bb: parameter bank number (01 - 10)
	Response	Normal process	OK, TEST1	
		Abnormal process	ER, TEST1, ee	ee: Error code
Online mode	Send command	Normal mode	#TEST1	
		Bank settings	#TEST1bb or #TEST1, bb	bb: parameter bank number (01 - 10)
	Response	Normal process	OK, #TEST1	
		Abnormal process	ER, #TEST1, ee	ee: Error code

■ Starting read time test mode

Offline mode	Send command	Normal mode	TEST2	
		Bank settings	TEST2bb or TEST2, bb	bb: parameter bank number (01 - 10)
	Response	Normal process	OK, TEST2	
		Abnormal process	ER, TEST2, ee	ee: Error code
Online mode	Send command	Normal mode	#TEST2	
		Bank settings	#TEST2bb or #TEST2, bb	bb: parameter bank number (01 - 10)
	Response	Normal process	OK, #TEST2	
		Abnormal process	ER, #TEST2, ee	ee: Error code

■ Starting code position test mode * SR-750 Series

Offline mode	Send command	Normal mode	TEST3	
		Bank settings	TEST3bb or TEST3, bb	bb: parameter bank number (01 - 10)
	Response	Normal process	OK, TEST3	
		Abnormal process	ER, TEST3, ee	ee: Error code

■ Finishing test mode

Offline mode	Send command	Normal mode	QUIT	
	Response	Normal process	OK, QUIT	
		Abnormal process	ER, QUIT, ee	ee: Error code
Online mode	Send command	Normal mode	#QUIT	
	Response	Normal process	OK, #QUIT	
		Abnormal process	ER, #QUIT, ee	ee: Error code

- This outputs the results of each test after a response.
- When a parameter bank number is appended at the end of the code, the test is executed only for the specified parameter bank.
- To finish the test mode, make sure to send an end command.
- The code position test mode is used only in offline mode.
- If Specify response character is set to "SR-600 compatible", OK is returned for normal process and ERRee is returned for abnormal process.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

I/O Terminal Control

■ Input terminal status check

Send command		INCHK, m
Response	Normal process	OK, INCHK, n..
		m = 1 - 2: Terminal number
		n = OFF (input terminal OFF), ON (input terminal ON)
	Abnormal process	ER, INCHK, ee ee: Error code

- Checks the input terminal status.
- If Specify response character is set to "SR-600 compatible", n(ON/OFF) is returned for normal process and ERRee is returned for abnormal process.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

■ Output terminal ON control (individual control)

Send command		OUTON, m
Response	Normal process	OK, OUTON
		m = 1 - 3: SR-750 terminal number
		1 - 4: SR-700 terminal number
	Abnormal process	ER, OUTON, eeee: Error code

- Controls the output terminal ON operations individually.

■ Output terminal OFF control (individual control)

Send command		OUTOFF, m
Response	Normal process	OK, OUTOFF
		m = 1 - 3: SR-750 terminal number
		1 - 4: SR-700 terminal number
	Abnormal process	ER, OUTOFF, ee ee: Error code

- Controls the output terminal OFF operations individually.

■ Output terminal ON control (batch control)

Send command		ALLON
Response	Normal process	OK, ALLON
	Abnormal process	ER, ALLON, ee ee: Error code

- Controls all output terminal ON operations.

■ Output terminal OFF control (batch control)

Send command		ALLOFF
Response	Normal process	OK, ALLOFF
	Abnormal process	ER, ALLOFF, ee ee: Error code

- Controls all output terminal OFF operations.

* If Specify response character is set to "SR-600 compatible" with the output terminal control, OK is returned for normal process and ERRee is returned for abnormal process.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

Soft Reset

Resets using a command to the condition at power-on without actually turning off the power.

Send command	RESET
Response	OK, RESET (SR-750)
	OK (SR-700)

- The SR-750 Series is reset after outputting a response.
- If Specify response character is set to "SR-600 compatible", OK is returned.
  * SR-750 Series

Clearing the Send Buffer

All data in the send buffer of the SR-750 Series is deleted.

Send command	BCLR
Response	OK, BCLR (SR-750)
	OK (SR-700)

- If Specify response character is set to "SR-600 compatible", OK is returned.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

Confirming the Read History

■ Read OK/error count history

Send command		NUM
Response	Normal process	OK, NUM, aaaaa, bbbbb, ccccc, ddddd, eeeee
		aaaaa = 00000 - 65535 : Read (comparison) OK count
		bbbbb = 00000 - 65535 : Comparison NG count
		ccccc = 00000 - 65535 : Read error count
		ddddd = 00000 - 65535 : Stable reading count
		eeeee = 00000 - 65535 : Trigger input count
	Abnormal process	ER, NUM, ee ee: Error code

- Checks the Read (comparison) OK count etc. since the unit was turned on.
- Turning the power off or sending a RESET command will reset the read history.
- This history does not include a count of OK/NG/ERR/TIMING results obtained when registering preset data.
- If Specify response character is set to "SR-600 compatible", ERRee is returned for abnormal process.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

■ Bank count history

Send command	NUMB
Response	OK, NUMB, BANK1, BANK2, · · ·BANK9, BANK10, TIMING

BANKn = Read OK count in BANKn: 0 to 4294967295
TIMING = Timing input count: 0 to 4294967295

- The count is reset at the following timings.
  - When the RESET command is received
  - At power OFF
  - When the TIMING count value reaches the limit and returns to 0, the bank count value is reset.
- Histories of unregistered banks are also output.

Image Scanning Control

■ Capture execution

Send command		SHOT, bb	bb: parameter bank number (01 - 10)
Response	Normal process	OK, SHOT, IMG_C_00_bb.(1) (SR-750)	
		(1) Extension (bmp or jpeg This is fixed to bmp when saving into RAM.) (SR-750)	
	Abnormal process	ER, SHOT, ee	ee: Error code

- Scans only once with the specified parameter bank.

Forced Control of Reading and Scanning Operations

■ Forced finishing of reading and scanning operations

Send command		CANCEL	
Response	Normal process	OK, CANCEL	
	Abnormal process	ER, CANCEL, ee	ee: Error code

- Command to force to finish of the running scanning operation (also reading operation).
- When a CANCEL command is received during a start read command operation, the SR-750 Series does not output a read error code.

■ Forced trigger lock

Send command		LOCK	
Response	Normal process	OK, LOCK	
	Abnormal process	ER, LOCK, ee	ee: Error code

- All reading and scanning operations are forced to stop.
- Until the trigger lock is released, reading and scanning operations cannot be executed.
- Turning the power off or using the RESET command can also cancel the forced lock.

■ Forced trigger lock release

Send command		UNLOCK	
Response	Normal process	OK, UNLOCK	
	Abnormal process	ER, UNLOCK, ee	ee: Error code

- Releases trigger lock.

■ Obtaining forced trigger lock status

Send command RLOCK
Response OK, RLOCK, nnnn
nnnn = forced trigger lock status
"LOCK" or "UNLOCK" is added.

Laser Pointer Control

The laser pointer for confirming a code position lights up or lights off using a command.

■ Laser Pointer ON (SR-750)

Send command		LDON	
Response	Normal process	OK, LDON	
	Abnormal process	ER, LDON, ee	ee: Error code

■ Laser Pointer ON (SR-700)

Send command		AMON	
Response	Normal process	OK, AMON	
	Abnormal process	ER, AMON, ee	ee: Error code

■ Laser Pointer OFF (SR-750)

Send command		LDOFF	
Response	Normal process	OK, LDOFF	
	Abnormal process	ER, LDOFF, ee	ee: Error code

■ Laser Pointer OFF (SR-700)

Send command		AMOFF	
Response	Normal process	OK, AMOFF	
	Abnormal process	ER, AMOFF, ee	ee: Error code

Tuning

■ Starting tuning

Send command TUNE, bb
Response OK, TUNE (SR-750)
OK (SR-700)
bb = 01 to 10: Reading bank number: 1 to 10

When tuning operation is complete, the result is output in the following formats.
Success : Tuning SUCCEEDED,Tms,00000x00
Failure : Tuning FAILED,Tms,00000x0y

Tms: Tuning time
x: Advice 0,1,2,4
0: No advice
1: Filter process change may be enabled.
2: Installation condition, lighting condition or marking condition adjustments should be considered.
4: Brightness may be insufficient.
y: Failure factor 1,2
1: Code detection impossible
2: Unstable reading

- Tuning process starts.
- When tuning is successful, the result is saved to the specified bank (also saved to the ROM).

■ Finishing tuning

Send command TQUIT
Response OK, TQUIT (SR-750)
OK (SR-700)

- Tuning process finishes.

■ Obtaining the alternate order

Send command		BANKORDER	
Response	Normal process	OK, BANKORDER, bb/bb/bb/· · ·	
		bb: parameter bank number (01 - 10)	
	Abnormal process	ER, BANKORDER, ee	ee: Error code

- The parameter bank numbers to alternate are returned in turn.
- The parameter bank numbers are returned with the number of parameter bank numbers registered with the SR-750 Series. (max. 16)
- If there is no parameter bank number to alternate, an error is returned.
- If Specify response character is set to "SR-600 compatible", bb/bb/bb· · · is returned for normal process and ERRee is returned for abnormal process.
  * SR-750 Series

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■ Initializing the parameter bank * SR-750 Series

Send command		BANKCLR, bb	bb: parameter bank number (00 - 10) 00 = Initialize all parameter banks 01 - 10 = Initialize specified parameter banks only
Response	Normal process	OK, BANKCLR	
	Abnormal process	ER, BANKCLR, ee	ee: Error code

- If Specify response character is set to "SR-600 compatible", OK is returned for normal process and ERRee is returned for abnormal process.

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■ Copying the parameter bank

Send command	BCOPY,mm,nn	mm: Bank number to copy from (01 - 10) nn: Bank number to copy to (01 - 10)
Response	OK,BCOPY	

- This is supported by version 1.50 or later of the SR-750 and version 1.10 or later of the SR-700.

Other Commands

■ Save settings

Send command		SAVE	
Response	Normal process	OK, SAVE	
	Abnormal process	ER, SAVE, ee	ee: Error code

- The SAVE command is sent to save in the memory the setting contents sent to the SR-750 Series.
- The command setting is applied after the response of the SAVE command is sent.

■ Obtaining configuration command status

Send command CMDSTAT
Response OK, CMDSTAT, nnnn
nnnn = none : No operation
wait : Wait for the setting applied
update : Program updating

- Command to obtain configuration change status. This is used to check the process status of a configuration command such as WN, WP, and WB.
- If Specify response character is set to "SR-600 compatible", nnnn is returned.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

■ Setting initialization

Send command		DFLT	
Response	Normal process	OK, DFLT	
	Abnormal process	ER, DFLT, ee	ee: Error code

- Resets the SR-750 Series to the default configuration.
- When the SR-600 compatible output mode is "Enabled", OK and ERRee are returned for normal process and abnormal process respectively.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

■ Obtain the BUSY status *SR-700 only

Send command BUSYSTAT
Response OK,BUSYSTAT,nnnn
nnnn = none : No processing
nnnn = update : Program updating
nnnn = file : Saving the file
nnnn = trg : Trigger busy

■ Obtaining MAC address * SR-750 Series

Send command EMAC
Response OK, EMAC, nnnn
nnnn = MAC address (12 bytes)

- Read the MAC address of the SR-750 Series.

■ Obtaining error status

Send command ERRSTAT
Response OK, ERRSTAT, nnnn
nnnn = none : No error
system : System error
update : Program update error
cfg : Set value error
ip : IP address duplication error
over : Send buffer overflow
plc : PLC link error
profinet : PROFINET error
lua : Script error

- Obtains the error status. If multiple errors occur, items are displayed one by one in the above order.
- When the error status is cleared, it resets to the no error status automatically.
- If Specify response character is set to "SR-600 compatible", nnnn is returned.
  * SR-750 Series

"3-9 SR-600 Compatible Output Mode (Page 29)"

■ Clearing PLC link error

Send command PCLR
Response OK, PCLR

- Clear the PLC link error.

■ Erasing error images * SR-750 Series

Send command		ICLR, bb	bb: parameter bank number (00 - 10) 00 = The most recent image is deleted 01 - 10 = Erasing error images of the specified parameter banks only
Response	Normal process	OK, ICLR	
	Abnormal process	ER, ICLR, ee	ee: Error code

- Read error images that have been saved to the SR-750 Series are erased.
- Images that have been saved onto RAM or ROM are erased.
- With bb = 00, the most recent image is erased in the burst read mode.
- When the specified number of images is set in the image saving mode, all images are erased with 00 set. If other values are sent, an error is returned.
- If Specify response character is set to "SR-600 compatible", OK is returned for normal process and ERRee is returned for abnormal process.

"3-9 SR-600 Compatible Output Mode (Page 29)"

■ Confirming type of model and main unit system version

Send command KEYENCE
Response OK, KEYENCE, SR-***, aaaaa aaaaa: Main unit system version

■ Backup of the settings * SR-700 Series

Send command BSAVE, m
Response OK, BSAVE
m = 1 to 8: ROM setting file number at copy destination
(config1.ptc, config2.ptc ….) (FmtLua1.lua FmtLua2.lua …)

<Description>

- Copies the RAM setting to both ROM setting (B: \config\config.ptc) and ROM setting specified as copy destination.
- When the script file is used, FmtLua.lua is copied to the ROM setting (B:\Lua\FmtLua*.lua) specified as copy destination.
- Sends response when copying is complete.

■ Loading backup settings * SR-700 Series

Send command BLOAD, m
Response OK, BLOAD
m = 1 to 8: 1: config1.ptc, FmtSet1.Lua
2: config2.ptc, FmtSet2.Lua
3: config3.ptc, FmtSet3.Lua
4: config4.ptc, FmtSet4.Lua
5: config5.ptc, FmtSet5.Lua
6: config6.ptc, FmtSet6.Lua
7: config7.ptc, FmtSet7.Lua
8: config8.ptc, FmtSet8.Lua

<Description>

- This loads the settings to RAM and ROM from the save destination file specified using the argument.
- After the settings are loaded, the settings are reflected to operations.

When executing the script file - status confirmation command

■ Obtaining the script processing time

Send command SCPTIME
Response OK, SCPTIME, now=AAus, max=BBus, min=CCus
AA: Returns the most recent script processing time.
BB: Returns the maximum value of the processing time.
CC: Returns the minimum value of the processing time.

- Returns the processing time of script executed after power ON.

■ Script debug setting

Send command SCPDBG, n
Response OK, SCPDBG
n=0: Script debug OFF
n=1: Script debug ON

- Sets whether to output debug from the script file to the command port or not.
- Setting the debug ON executes print(str) and outputs data.

■ Obtaining the script error results

Send command SCPERR
Response OK, SCPERR, mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm
mm… : Script error character string

- Returns the details of script error.

■ Obtaining the script version

Send command SCPVER
Response OK, SCPVER, mmmm, nnnn
mm...:Script library version
nn…: FmtSet.lua version (Only when FmtSet.lua exists and the version is defined)

- FmtSet.Lua version is the value stored in variable name "SCPVERSION" within the FmtSet.Lua file.
- This returns the script library version and the FmtSet.lua version.
- If the script library does not exist, the error code 12 is returned.
  * The script library is a library file to use the edit data function and the edit image file name function.

8-3 Details of Configuration Commands

This section describes the configuration commands of the SR-750/SR-700 Series.

Types of Configuration Commands

The SR-750/SR-700 Series setting commands include the following 5 types.

■ Parameter bank configuration command (WB/RB)

Command to set scan and code configuration to a parameter bank.
Changed configuration details are applied after a response for a configuration command is sent.

■ Code configuration command for tuning (WC/RC)

Command to set codes for auto tuning.
Up to 8 types of codes selected during auto tuning can be registered.
Changed configuration details are applied when a response for a configuration command is sent.

■ Operation configuration command (WP/RP)

Command to set items related to operation.
Changed configuration details are applied after a response for a configuration command is sent.

■ Communication configuration command (WN/RN)

Command to set items related to RS-232C and Ethernet communications.
Changed configuration details are applied after a SAVE command is received.

■ Batch transmission of configuration/confirmation commands (WA/RA)

The dedicated command has been prepared for batch transmission of multiple configuration/confirmation commands.
Use this command to reduce the number of times to send configuration/confirmation commands.

NOTICE	• **Send the SAVE command to save in the memory the contents changed by setting commands.** **If you do not send the SAVE command, when the power is turned off or the RESET command is received, the settings will return to the state before changed.** • **The setting contents sent during operation are reflected when the current operation finishes, not after the response is sent to the command.**

Details of Each Configuration Command

Parameter Bank Configuration Command Format (WB/RB)

Parameter bank configuration command is sent in the following format:

• Configuration change

Send command: **WB , bb mmm , nnn…**

Response — Normal process: **OK , WB**

Abnormal process: **ER , WB , ee** ee: Error code

• Configuration confirmation

Send command: **RB , bb mmm**

Response — Normal process: **OK , RB , nnn…**

Abnormal process: **ER , RB , ee** ee: Error code

bb : Parameter bank number 01 - 10 Fixed to 2 bytes
mmm : Command number Fixed to 3 bytes
nnn… : Setting value (varies according to command number)

example) Setting the Exposure of the parameter bank 1 to 300 μs.

Configuration change	Send command	WB, 01100, 0010
	Scan condition setting	OK, WB
Configuration confirmation	Send command	RB, 01100
	Response (Normal process)	OK, RB, 0010

■ Scan condition setting

Function		Command Number	Setting value	Explanation	Default	SR-750	SR-700
Lighting	Internal lighting use	000	0, 1	0 : Not used 1 : Used	1	SR-750	SR-700
	External lighting use	004	0, 1	0 : Not used 1 : Used	0	SR-750	SR-700
Scanning	Exposure	100	SR-750: 0003 to 0333 SR-700: 0009 to 0333	Exposure time = setting value × 30μs	SR-750: 0003 SR-700: 0009	SR-750	SR-700
	Dynamic range	101	2500 to 37500	Specify in units of 2500	10000	SR-750	SR-700
	Offset	102	000 to 255	Use the default value of 255 for normal use.	255	SR-750	SR-700
	Dynamic range	103	0 to 2	0 : Hi-Sensitive 1 : Hi-SNR 2 : Hi-DR	0	SR-750	SR-700
	Analog gain	104	10000 to 40000	Specify in units of 625 for the range from 10000 to 20000 Specify in units of 1250 for the range from 20000 to 40000	10000	SR-750	SR-700
Filter setting	1st filter type	200	0 to 7	0 : Disable 1 : Equalize 2 : Expand 3 : Shrink 4 : Open 5 : Close 6 : Median 7 : Unsharp Mask	0	SR-750	SR-700
	2nd filter type	201					
	3rd filter type	202					
	4th filter type	203					
	1st filter count	210	1 to 7	Specify with count	1	SR-750	SR-700
	2nd filter count	211					
	3rd filter count	212					
	4th filter count	213					

■ Code setting

Function		Command Number	Setting value	Explanation	Default	SR-750	SR-700
Code type		300	1 to 18	1 : QR 2 : DM 3 : PDF417 (microPDF 417) 5 : GS1 DataBar (RSS) 6 : CODE39 (Trioptic CODE 39) 7 : ITF 8 : 2of5 9 : NW-7 (Codabar) 10 : JAN/EAN/UPC 11 : CODE128 12 : COOP2of5 13 : CODE93 14 : CC-A/B (GS1 DataBar) 15 : CC-A/B (EAN/UPC) 16 : CC-A/B/C (GS1-128) 18 : Pharmacode	1	SR-750	SR-700
Codes to read		301	01 to 16		1	SR-750	-
Allow reduced detection count		302	0, 1	0 : Do not allow 1 : Allow	0	SR-750	-
Maximum read length		303	1 to 7089	Excluding CC-A/B/C 2D code	7089	SR-750	SR-700
Minimum read length		304	1 to 7089	Excluding CC-A/B/C 2D code	1	SR-750	SR-700
Maximum read length		315	1 to 2361	For CC-A/B/C 2D code	2361	SR-750	SR-700
Minimum read length		316	1 to 2361	For CC-A/B/C 2D code	1	SR-750	SR-700
Output length limitation		306	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700
Direction of output		307	0, 1	0 : Forward 1 : Backward	0	SR-750	SR-700
Length of output		308	1 to 7089		7089	SR-750	SR-700
Starting index of output		309	1 to 7089		1	SR-750	SR-700
Setting QR code reading version	Specifying QR Model 1 Code Version	400	0000 to 3FFF	Specifies version 1 to 14 with bit assign and set with HEX.	3FFF	SR-750	SR-700
	Specifying QR Model 2 Code version (1 to 20)	401	00000 to FFFFF	Specifies version 1 to 20 with bit assign and set with HEX.	FFFFF	SR-750	SR-700
	Specifying QR Model 2 Code version (21 to 40)	402	00000 to FFFFF	Specifies version 21 to 40 with bit assign and set with HEX.	FFFFF	SR-750	SR-700
	Specifying MicroQR Code Version (M1 to M4)	403	0 to F	Specifies version M1 to M4 with bit assign and set with HEX.	F	SR-750	SR-700

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Specifying the reading target size of DataMatrix code	410	0000000 to 3FFFFFFF	Specifies the code size of DataMatrix code with bit assign and set with HEX. ■Square 1st bit: 10x10 2nd bit: 12x12 3rd bit: 14x14 4th bit: 16x16 5th bit: 18x18 6th bit: 20x20 7th bit: 22x22 8th bit: 24x24 9th bit: 26x26 10th bit: 32x32 11th bit: 36x36 12th bit: 40x40 13th bit: 44x44 14th bit: 48x48 15th bit: 52x52 16th bit: 64x64 17th bit: 72x72 18th bit: 80x80 19th bit: 88x88 20th bit: 96x96 21st bit: 104x104 22nd bit: 120x120 23rd bit: 132x132 24th bit: 144x144 ■Rectangle 25th bit: 8x18 26th bit: 8x32 27th bit: 12x26 28th bit: 12x36 29th bit: 16x36 30th bit: 16x48	3FFFFFFF	SR-750	SR-700
GS1 DataBar settings	390	0, 1	GS1 DataBar Omnidirectional/ Truncated 0 : Disable 1 : Enable	1	SR-750	SR-700
	391	0, 1	GS1 DataBar Stacked/ StackedOmnidirectional 0 : Disable 1 : Enable	1	SR-750	SR-700
	392	0, 1	GS1 DataBar Limited 0 : Disable 1 : Enable	1	SR-750	SR-700
	393	0, 1	GS1 DataBar Expanded 0 : Disable 1 : Enable	1	SR-750	SR-700
	394	0, 1	GS1 DataBar ExpandedStacked 0 : Disable 1 : Enable	1	SR-750	SR-700
	395	2 to 11	GS1 DataBar Expanded Stacked (Number of rows) minimum	2	SR-750	SR-700
	396	2 to 11	GS1 DataBar Expanded Stacked (Number of rows) maximum	11	SR-750	SR-700
CODE39 settings	375	0, 1	Send start/stop characters 0 : Disable 1 : Enable	0	SR-750	SR-700
	376	0, 1	Inspect check-digit 0 : Disable 1 : Enable	0	SR-750	SR-700
	377	0, 1	Send check-digit 0 : Disable 1 : Enable	1	SR-750	SR-700
	378	0, 1	Read Trioptic CODE39 0 : Disable 1 : Enable	1	SR-750	SR-700
	379	0, 1	Full ASCII conversion 0 : Disable 1 : Enable	0	SR-750	SR-700

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
ITF settings	385	0, 1	Inspect check-digit 0 : Disable 1 : Enable	0	SR-750	SR-700
	386	0, 1	Send check-digit 0 : Disable 1 : Enable	1	SR-750	SR-700
NW-7 (Codabar) settings	380	0, 1	Send start/stop characters 0 : Disable 1 : Enable	1	SR-750	SR-700
	381	0, 1	Send start/stop characters letter type 0 : as lowercase 1 : as UPPERCASE	0	SR-750	SR-700
	382	0, 1	Inspect check-digit 0 : Disable 1 : Enable	0	SR-750	SR-700
	383	0, 1	Send check-digit 0 : Disable 1 : Enable	1	SR-750	SR-700
	384	0 to 6	Check-digit type 0 : Modulus 16 1 : Modulus 11 2 : Modulus 10/ Weight 2 3 : Modulus 10/ Weight 3 4 : Check DR 5 : Modulus 11-A 6 : Luhn	0	SR-750	SR-700
JAN/EAN/UPC settings	350	0, 1	UPC-E reading 0 : Disable 1 : Enable	1	SR-750	SR-700
	351	0, 1	EAN/JAN 8 digits reading 0 : Disable 1 : Enable	1	SR-750	SR-700
	352	0, 1	EAN/JAN 13 digits reading 0 : Disable 1 : Enable	1	SR-750	SR-700
	353	0, 1	UPC-A Output 0 : Output in 13 digits 1 : Output in 12 digits	0	SR-750	SR-700
	354	0, 1	Add "number system" to UPC-E 0 : Disable 1 : Enable	0	SR-750	SR-700
	355	0, 1	2-digit supplemental 0 : Disable 1 : Enable	1	SR-750	SR-700
	356	0, 1	5-digit supplemental 0 : Disable 1 : Enable	1	SR-750	SR-700
	357	0, 1	Ignore UPC without supplemental 0 : Disable 1 : Enable	0	SR-750	SR-700
	358	0, 1	GTIN compatible 14-digit output 0 : Disable 1 : Enable	0	SR-750	SR-700
CODE128 settings	366	0, 1	GS1-128 0 : Disable 1 : Enable	1	SR-750	SR-700
PDF417 settings	420	1 to 3	Set type of PDF417 codes to read 1 : Read PDF417 only 2 : Read MicroPDF only 3 : Read PDF417 and MicroPDF	3	SR-750	SR-700
Reading CC-A/B/C (GS1-128)	437	0, 1	Read CC-C code 0 : Disable 1 : Enable	1	SR-750	SR-700
Maximum number of Pharmacode bars	440	2 to 16	Specify number of bars	16	-	SR-700
Minimum number of Pharmacode bars	441	2 to 16	Specify number of bars	9	-	SR-700

■ Reading operation setting

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Alternate	600	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700
Internal bank retry count	601	00 to 32		00	SR-750	SR-700
Decode timeout duration	602	0001 to 0255	Specify in units of 10 ms	0010	SR-750	SR-700
Scan delay time	603	SR-750: 000 to 255 SR-700: 000 to 2550	Specify in units of 1 ms	000	SR-750	SR-700
Decoding area	604	SR-750: aaabbbcccddd SR-700: 0aaa0bbb0ccc0ddd	aaa : 000 to 650 (Even only) bbb : 000 to 378 (Even only) ccc : 101 to 751 (Odd only) ddd : 101 to 479 (Odd only) * The minimum size is 100 dots × 100 dots. (aaa, bbb) (ccc, ddd)	000000751479	SR-750	SR-700
Inverse	605	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700
Reverse	606	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700
Base tilt angle	607	0 to 359	Unit: 1 degree	0	SR-750	SR-700
Tilt angle range	608	0 to 180	Unit: 1 degree * Base tilt angle ± Tilt angle range will be enabled.	180	SR-750	SR-700
Grid correction	500	0, 1	0 : Disable 1 : Enable	1	SR-750	SR-700
Quiet zone scale factor	611	Other than GS1 DataBar: (SR-750/ SR-700) 4 to 11 (SR-700: CODE39/ CODE128/ JAN/ EAN/ UPC/ CODE93) 1 to 11 GS1 DataBar: 0 to 11	Quiet zone scale factor (x 1) *Barcode only • Other than GS1 DataBar: Applied to the quiet zones at both ends • GS1 DataBar: Applied to the right quiet zone of DataBar Limited	Depends on the code type.	SR-750	SR-700

Format of the Code Setting Command for Tuning (WC/RC)

Send the code setting command for tuning in the following formats.

- Configuration change

Send command: WC , mmmm , nnn…

Response — Normal process: OK , WC

Abnormal process: ER , WC , ee ee: Error code

- Configuration confirmation

Send command: RC , mmmm

Response — Normal process: OK , RC , nnn…

Abnormal process: ER , RC , ee ee: Error code

mmmm: Command number 4-byte fixed

nnn : Setting value (changeable according to the command number)

example) Setting the maximum read length to 1000 digits

Configuration change	Send command	WC, 0100, 1000
	Response (Normal process)	OK, WC
Configuration confirmation	Send command	RC, 0100
	Response (Normal process)	OK, RC, 1000

■ Tuning target code settings

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
QR code settings	0100	0001 to 7089	Maximum read length	7089	SR-750	SR-700
	0101	0001 to 7089	Minimum read length	1	SR-750	SR-700
DataMatrix code settings	0200	0001 to 3116	Maximum read length	3116	SR-750	SR-700
	0201	0001 to 3116	Minimum read length	1	SR-750	SR-700
PDF417 settings	0300	0001 to 2710	Maximum read length	2710	SR-750	SR-700
	0301	0001 to 2710	Minimum read length	1	SR-750	SR-700
	0303	1 to 3	PDF417 read code type settings 1 : PDF417 only 2 : MicroPDF only 3 : PDF417 and MicroPDF	3	SR-750	SR-700
GS1 DataBar settings	0500	01 to 77	Maximum read length	77	SR-750	SR-700
	0501	01 to 77	Minimum read length	1	SR-750	SR-700
	0502	0 to 11	GS1 DataBar Limited Right quiet zone scale factor setting	5	SR-750	SR-700
	0503	0, 1	GS1 DataBar Omnidirectional/ Truncated 0 : Disable 1 : Enable	1	SR-750	SR-700
	0504	0, 1	GS1 DataBar Stacked/ StackedOmnidirectional 0 : Disable 1 : Enable	1	SR-750	SR-700
	0505	0, 1	GS1 DataBar Limited 0 : Disable 1 : Enable	1	SR-750	SR-700
	0506	0, 1	GS1 DataBar Expanded 0 : Disable 1 : Enable	1	SR-750	SR-700
	0507	0, 1	GS1 DataBar ExpandedStacked 0 : Disable 1 : Enable	1	SR-750	SR-700
	0508	2 to 11	GS1 DataBar Expanded Stacked (Number of rows) minimum	2	SR-750	SR-700
	0509	2 to 11	GS1 DataBar Expanded Stacked (Number of rows) maximum	11	SR-750	SR-700
CODE39 settings	0600	03 to 50	Maximum read length	50	SR-750	SR-700
	0601	03 to 50	Minimum read length	3	SR-750	SR-700
	0602	(SR-750) 4 to 11 (SR-700) 1 to 11	Quiet zone scale factor	7	SR-750	SR-700
	0603	0, 1	Send start/stop characters 0 : Disable 1 : Enable	0	SR-750	SR-700
	0604	0, 1	Inspect check-digit 0 : Disable 1 : Enable * This setting does not function when the device is set to read Trioptic CODE39.	0	SR-750	SR-700
	0605	0, 1	Send check-digit 0 : Disable 1 : Enable * This setting does not function when the device is set to read Trioptic CODE39.	1	SR-750	SR-700
	0606	0, 1	Read Trioptic CODE39 0 : Disable 1 : Enable	1	SR-750	SR-700
	0607	0, 1	Full ASCII conversion 0 : Disable 1 : Enable * This setting does not function when the device is set to read Trioptic CODE39.	0	SR-750	SR-700

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
ITF settings	0700	02 to 50	Maximum read length	50	SR-750	SR-700
	0701	02 to 50	Minimum read length	6	SR-750	SR-700
	0702	4 to 11	Quiet zone scale factor	7	SR-750	SR-700
	0703	0, 1	Inspect check-digit 0 : Disable 1 : Enable	0	SR-750	SR-700
	0704	0, 1	Send check-digit 0 : Disable 1 : Enable	1	SR-750	SR-700
NW-7 (Codabar) settings	0900	03 to 50	Maximum read length	50	SR-750	SR-700
	0901	03 to 50	Minimum read length	4	SR-750	SR-700
	0902	4 to 11	Quiet zone scale factor	7	SR-750	SR-700
	0903	0, 1	Send start/stop characters 0 : Disable 1 : Enable	1	SR-750	SR-700
	0904	0, 1	Send start/stop characters letter type 0 : as lowercase 1 : as UPPERCASE	0	SR-750	SR-700
	0905	0, 1	Inspect check-digit 0 : Disable 1 : Enable	0	SR-750	SR-700
	0906	0, 1	Send check-digit 0 : Disable 1 : Enable	1	SR-750	SR-700
	0907	0 to 6	Check-digit type 0 : Modulus 16 1 : Modulus 11 2 : Modulus 10/ Weight 2 3 : Modulus 10/ Weight 3 4 : Check DR 5 : Modulus 11-A 6 : Luhn	0	SR-750	SR-700
JAN/EAN/UPC settings	1002	(SR-750) 4 to 11 (SR-700) 1 to 11	Quiet zone scale factor	7	SR-750	SR-700
	1003	0, 1	UPC-E reading 0 : Disable 1 : Enable	1	SR-750	SR-700
	1004	0, 1	EAN/JAN 8 digits reading 0 : Disable 1 : Enable	1	SR-750	SR-700
	1005	0, 1	EAN/JAN 13 digits reading 0 : Disable 1 : Enable	1	SR-750	SR-700
	1006	0, 1	UPC-A Output 0 : Output in 13 digits 1 : Output in 12 digits	0	SR-750	SR-700
	1007	0, 1	Add "number system" to UPC-E 0 : Disable 1 : Enable	0	SR-750	SR-700
	1008	0, 1	2-digit supplemental 0 : Disable 1 : Enable	1	SR-750	SR-700
	1009	0, 1	5-digit supplemental 0 : Disable 1 : Enable	1	SR-750	SR-700
	1010	0, 1	Ignore UPC without supplemental 0 : Disable 1 : Enable	0	SR-750	SR-700
	1011	0, 1	GTIN compatible 14-digit output 0 : Disable 1 : Enable	0	SR-750	SR-700

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
CODE128	1100	001 to 128	Maximum read length	128	SR-750	SR-700
	1101	001 to 128	Minimum read length	1	SR-750	SR-700
	1102	(SR-750) 4 to 11 (SR-700) 1 to 11	Quiet zone scale factor	7	SR-750	SR-700
	1103	0, 1	GS1-128 0 : Disable 1 : Enable	1	SR-750	SR-700
2 of 5 (Industrial 2of5) settings	0800	01 to 50	Maximum read length	50	SR-750	SR-700
	0801	01 to 50	Minimum read length	4	SR-750	SR-700
	0802	4 to 11	Quiet zone scale factor	7	SR-750	SR-700
COOP 2of5 settings	1200	02 to 50	Maximum read length	50	SR-750	SR-700
	1201	02 to 50	Minimum read length	4	SR-750	SR-700
	1202	4 to 11	Quiet zone scale factor	7	SR-750	SR-700
CODE93 settings	1300	01 to 50	Maximum read length	50	SR-750	SR-700
	1301	01 to 50	Minimum read length	1	SR-750	SR-700
	1302	4 to 11	Quiet zone scale factor	7	SR-750	SR-700
Pharmacode settings	1800	2 to 16	Maximum number of bars	16	-	SR-700
	1801	2 to 16	Minimum number of bars	9	-	SR-700
	1802	1 to 11	Quiet zone scale factor	9	-	SR-700
	1803	0 to 3	Code direction 0 : horizontal, read from left to right 1 : horizontal, read from right to left 2 : vertical, read from top to bottom 3 : vertical, read from bottom to top	0	-	SR-700
	1805	0, 1	Binary output 0 : Disable 1 : Enable	0	-	SR-700

Operation Configuration Command Format (WP/RP)

Operation configuration command is sent in the following format:

- Configuration change

Send command: WP , mmm , nnn…

Response — Normal process: OK , WP

Abnormal process: ER , WP , ee ee: Error code

- Configuration confirmation

Send command: RP , mmm

Response — Normal process: OK , RP , nnn…

Abnormal process: ER , RP , ee ee: Error code

mmm : Command number Fixed to 3 bytes

nnn… : Setting value (varies according to command number)

example) When setting the trigger input measurement method to "One-shot trigger" (one-shot signal trigger)

Configuration change	Send command	WP, 101, 1
	Response (Normal process)	OK, WP
Configuration confirmation	Send command	RP, 101
	Response (Normal process)	OK, RP, 1

■ I/O terminal setting

Function		Command Number	Setting value	Explanation	Default	SR-750	SR-700
IN terminal setting	IN1 terminal function	000	0 to 8	0 : Not used 1 : Timing input 2 : Preset input 3 : Start test mode 4 : Capture image 5 : Clear PLC link error 6 : Trigger lock 7 : Quick setup code reading 8 : Tuning operation	1	SR-750	SR-700
	IN2 terminal function	001	0 to 8	0 : Not used 1 : Timing input 2 : Preset input 3 : Start test mode 4 : Capture image 5 : Clear PLC link error 6 : Trigger lock 7 : Quick setup code reading 8 : Tuning operation	2	SR-750	SR-700
	IN1 terminal test mode assignment	002	SR-750: 1 to 3 SR-700: 1, 2	1 : Reading rate test 2 : Processing time test 3 : Position test	1	SR-750	SR-700
	IN2 terminal test mode assignment	003	SR-750: 1 to 3 SR-700: 1, 2	1 : Reading rate test 2 : Processing time test 3 : Position test	1	SR-750	SR-700
	In1 terminal capture image assigned bank	004	1 to 16	Bank number	1	SR-750	SR-700
	In2 terminal capture image assigned bank	005			1	SR-750	SR-700
	IN1 terminal input at power-on	006	0, 1	0 : Not use 1 : Enable	0	SR-750	SR-700
	IN2 terminal input at power-on	007	0, 1	0 : Not use 1 : Enable	0	SR-750	SR-700
	Synchronization of IN1 and TIMING LED	008	0, 1	0 : Disable 1 : Enable	1	SR-750	SR-700
	Synchronization of IN2 and TIMING LED	009	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700
	Input polarity	010	0, 1	0 : Normal open point 1 : Normal close point	0	SR-750	SR-700
	Input pulse width	011	0 to 2	0 : 1 ms 1 : 2 ms 2 : 10 ms	0	SR-750	SR-700
OUT terminal setting	OUT1 terminal assignment	020	SR-750: 0 to 3103 SR-700: 0 to 8672	0: Not selected 1: OK 2: Verification NG 4: ERROR 8: STABLE 16: PRESET_OK 32: TRG_BUSY 64: LOCK_BUSY 128: MODE_BUSY 256: ERROR_BUSY 1024: UNSTABLE 2048: TUNING OK 4096: SCRIPT CONTROL 8192: CONFIG BUSY Specify the setting by sum of the values of the items. SCRIPT CONTROL and CONFIG BUSY are for SR-700 only	1	SR-750	SR-700
	OUT2 terminal assignment	021	SR-750: 0 to 3103 SR-700: 0 to 8672	0: Not selected 1: OK 2: Verification NG 4: ERROR 8: STABLE 16: PRESET_OK 32: TRG_BUSY 64: LOCK_BUSY 128: MODE_BUSY 256: ERROR_BUSY 1024: UNSTABLE 2048: TUNING OK 4096: SCRIPT CONTROL 8192: CONFIG BUSY Specify the setting by sum of the values of the items. SCRIPT CONTROL and CONFIG BUSY are for SR-700 only	6	SR-750	SR-700
	OUT3 terminal assignment	022	SR-750: 0 to 3103 SR-700: 0 to 8672	0: Not selected 1: OK 2: Verification NG 4: ERROR 8: STABLE 16: PRESET_OK 32: TRG_BUSY 64: LOCK_BUSY 128: MODE_BUSY 256: ERROR_BUSY 512: EXT.LIGHT 1024: UNSTABLE 2048: TUNING OK 4096: SCRIPT CONTROL 8192: CONFIG BUSY Specify the setting by sum of the values of the items. EXT. LIGHT is for SR-750 only SCRIPT CONTROL and CONFIG BUSY are for SR-700 only	SR-750: 480 SR-700: 4	SR-750	SR-700
	OUT4 terminal function	023	0 to 8672	0: Not selected 1: OK 2: Verification NG 4: ERROR 8: STABLE 16: PRESET_OK 32: TRG_BUSY 64: LOCK_BUSY 128: MODE_BUSY 256: ERROR_BUSY 512: EXT.LIGHT 1024: UNSTABLE 2048: TUNING OK 4096: SCRIPT CONTROL 8192: CONFIG BUSY Specify the setting by sum of the values of the items.	8672	-	SR-700
	TRG_BUSY output upon power-up	024	0, 1	0 : Disable 1 : Enable	1	SR-750	SR-700
	Output ON duration for OUT terminal	025	001 to 255	Specify in units of 10 ms	50	SR-750	SR-700
	External lighting output polarity	026	0, 1	0 : N.O. (Normally open) 1 : N.C. (Normally closed)	0	SR-750	SR-700

■ Operation mode settings

Function		Command Number	Setting value	Explanation	Default	SR-750	SR-700
Trigger input measurement method	Power ON start test mode	100	0 to 2	0 : Do not start 1 : Reading rate test 2 : Read time test	0	-	SR-700
	Trigger input measurement method	101	0, 1	0 : Level trigger 1 : One-shot trigger	0	SR-750	SR-700
	One-shot trigger duration	102	SR-750: 0010 to 2550 SR-700: 0003 to 2550	Specify in units of 10 ms	100	SR-750	SR-700
	Trigger input ON command character string	103	hhhhhhhh···	SR-750: Maximum 8 characters SR-700: Maximum 32 characters can be specified from HEX (0x00 to 0x7F)	4C4F4E (LON)	SR-750	SR-700
	Trigger input OFF command character string	104	hhhhhhhh···	SR-750: Maximum 8 characters SR-700: Maximum 32 characters can be specified from HEX (0x00 to 0x7F)	4C4F4646 (LOFF)	SR-750	SR-700
	Trigger input ON/OFF recognition with one character	105	0, 1	0 : Not use 1 : Enable	0	SR-750	SR-700

Important

■ SR-750

The following strings can recognize a timing ON/OFF command as one-character:

SOH (0x01)	SO (0x0e)	EM (0x19)
STX (0x02)	SI (0x0f)	SUB (0x1a)
ETX (0x03)	DLE (0x10)	FS (0x1c)
EOT (0x04)	DC1 (0x11)	GS (0x1d)
ENQ (0x05)	DC2 (0x12)	RS (0x1e)
BEL (0x07)	DC3 (0x13)	US (0x1f)
BS (0x08)	DC4 (0x14)	
HT (0x09)	SYN (0x16)	
VT (0x0b)	ETB (0x17)	
FF (0x0c)	CAN (0x18)	

* If STX (0x02) or ETX (0x03) is set for either the timing ON or OFF command, the command is not recognized in the "<STX> command <ETX>" format.

■ SR-700

* When activated, the characters below can be specified in the timing ON/OFF command

	0	1	2	3	4	5	6	7
0	NUL	DLE	SP	0	@	'	'	p
1	SOH	DC1	!	1			a	q
2	STX	DC2	"	2			b	r
3	ETX	DC3		3			c	s
4	EOT	DC4	$	4			d	t
5	ENQ			5			e	u
6		SYN	&	6			f	v
7	BEL	ETB		7			g	w
8	BS	CAN	(	8			h	x
9	HT	EM	)	9			i	y
A		SUB	*	:			j	z
B	VT		+	;		[	k	{
C	CL	FS	,	<		\	l	¦
D		GS	-	=		]	m	}
E	SO	RS	.	>		^	n	~
F	SI	US	/	?			o	del

If specifying STX or ETX, command cannot be recognized in the format <STX> command <ETX> .

Function		Command Number	Setting value	Explanation	Default	SR-750	SR-700
Reading behavior setting	Reading mode setting	200	SR-750: 0 to 3 SR-700: 0, 1, 3	0 : Single 1 : Multi1 2 : Multi2 3 : Burst	0	SR-750	SR-700
	Data transmission	201	0, 1	0 : Send after read 1 : Send after timing off	0	SR-750	SR-700
	Multi read duplicate reading prevention interval	202	000 to 255	Specify by the 100 ms	10	SR-750	SR-700
	Duplicate reading prevention interval reset	213	0, 1	0 : Reset when a different code is read 1 : Do not reset during duplicate prevention interval.	0	SR-750	-
	Alternate start bank	203	01 to 10		1	SR-750	-
	Specifying alternate order	204	0, 1	0 : Order of parameter bank number 1 : Begin with successful bank	1	SR-750	SR-700
	Read error character string	205	hhhhhhhh...	Specify a maximum of 8 characters (HEX 16 bytes) with HEX (0x00 to 0x7F). Set FF if error codes are not output.	4552524F52 (ERROR)	SR-750	SR-700
	Matching level OK/NG judgment	206	0, 1	0 : Enable 1 : Disable	0	SR-750	SR-700
	Matching level threshold	207	00 to 99		70	SR-750	SR-700
	Laser-aim pulse duration in Multi read	209	00 to 99	Specify by the 10 ms	10	SR-750	-
	Parameter bank LED display when reading	212	0, 1	0 : Disable 1 : Enable	1	SR-750	SR-700
	Burst interval	208	000 to 255	Specify by the 1 ms	0	SR-750	SR-700
	Burst count	210	SR-750: 1 to 8 SR-700: 1 to 10		3	SR-750	SR-700
	Burst bank	211	01 to 10		1	SR-750	-
	Bank shift shortening operation	214	0, 1	0 : Disable 1 : Enable If the scanned image has been judged as containing no code, this setting decides whether the next scan will be performed immediately without waiting for the decode timeout period to pass.	1	SR-750	SR-700

Function		Command Number	Setting value	Explanation	Default	SR-750	SR-700
Code quality verification function	Code quality verification standard selection	230	0 to F	0 : No selected 1 : ISO/IEC 15415 2 : ISO/IEC TR 29158 (AIM DPM-1-2006) 4 : SAE AS9132 8 : SEMI T10-0701 Specify the setting with HEX using sum of each item.	0	SR-750	SR-700
	ISO/IEC15415 verification threshold	231	0 to 4	0 : Disable 1 : D 2 : C 3 : B 4 : A	0	SR-750	SR-700
	ISO/IEC TR 29158 (AIM DPM-1-2006) verification threshold	232	0 to 4	0 : Disable 1 : D 2 : C 3 : B 4 : A	0	SR-750	SR-700
	SAE AS9132 verification threshold	233	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700
	Implementation of Japanese Pharmaceutical Code quality verification	234	0 to 1F	0 : Not selected 1 : GS1-128 2 : GS1 DataBar Limited 4 : GS1 DataBar Stacked 8 : CC-A (GS1-DataBar Limited) 10 : CC-A (GS1-DataBar Stacked) The setting value for this item is treated as HEX. The setting is specified with HEX using sum of each item.	0	SR-750	SR-700
	Japanese Pharmaceutical Code quality verification threshold	235	0 to 4	0 : Disable 1 : D 2 : C 3 : B 4 : A	0	SR-750	SR-700
	ISO/IEC16022 code quality verification execution	236	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700
	ISO/IEC16022 evaluation result threshold value	237	0 to 4	0 : Disable 1 : D 2 : C 3 : B 4 : A	0	SR-750	SR-700
	Grade expression setting when appending values to verification result	350	0, 1	0 : Alphabet 1 : Numerical value	0	SR-750	SR-700
	Detailed item addition setting when appending values to verification result	351	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
	Evaluation value addition setting when appending values to verification result	352	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Codes to be read setting	Codes to read	250	1 to 128	-	1	-	SR-700
	Allow reduced detection count	251	0, 1	0 : Do not allow 1 : Allow	0	-	SR-700

Function		Command Number	Setting value	Explanation	Default	SR-750	SR-700
Maximum read number	QR	252	1 to 128	-	1	-	SR-700
	DataMatrix	253	1 to 128	-	1	-	SR-700
	PDF417 (micro PDF)	254	1 to 128	-	1	-	SR-700
	GS1 DataBar	255	1 to 128	-	1	-	SR-700
	ITF	256	1 to 128	-	1	-	SR-700
	2of5	257	1 to 128	-	1	-	SR-700
	NW-7 (Codabar)	258	1 to 128	-	1	-	SR-700
	JAN/EAN/ UPC	259	1 to 128	-	1	-	SR-700
	CODE128	260	1 to 128	-	1	-	SR-700
	COOP2of5	261	1 to 128	-	1	-	SR-700
	CODE93	262	1 to 128		1	-	SR-700
	CC-A/B (GS1 DataBar)	263	1 to 64	-	1	-	SR-700
	CC-A/B (GS1 DataBar)	264	1 to 64	-	1	-	SR-700
	CC-A/B (EAN/UPC)	265	1 to 64	-	1	-	SR-700
	CC-A/B (GS1 128)	266	1 to 64	-	1	-	SR-700
	Pharmacode	267	1 to 128		1	-	SR-700
Output data order setting	Priority of code type number order	270	1 to 4	Priority = 1 (High), Priority = 4 (low) *1	1	-	SR-700
	Priority of scan order	271			2	-	SR-700
	Priority of code center X-coordinate	272			3	-	SR-700
	Priority of code center Y-coordinate	273			4	-	SR-700
	Code type number order setting	280	0, 1	0 : Ascending 1 : Descending	0	-	SR-700
	Scan order setting	281			0	-	SR-700
	Code center X-coordinate order setting	282			0	-	SR-700
	Code center Y-coordinate order setting	283			0	-	SR-700
	Data output for each bank setting	290		0 : Disable 1 : Enable * 2	0	-	SR-700

*1 If the priority is the same, the codes will be output in the following order: Code type number > Scan order > Code center X > Code center Y.

*2 Read data will be output in ascending bank number order (from the smallest number to the largest). Banks where reading was unsuccessful will output an error character string.

■Data appending function setting

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Time appending	300	0, 1	0 : Do not append 1 : Append	0	SR-750	-
Code type appending	301	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Symbol ID appending	302	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Bank number appending	303	0, 1	0 : Do not append 1 : Append	0	SR-750	-
Scan count appending	305	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Read time appending	306	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Position level appending	307	0, 1	0 : Do not append 1 : Append	0	SR-750	-
Code vertex appending	308	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Code center appending	309	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Unused ECC ratio appending	310	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Matching level appending	312	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
File name appending (full path display)	313	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Burst number appending	318	0, 1	0 : Do not append 1 : Append	0	SR-750	-
Read detailed error code appending	319	0, 1	0 : Do not append 1 : Append	0	SR-750	-
Setting the function to append ISO/IEC15415 verification result.	340	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Setting the function to append ISO/IEC TR 29158 (AIM DPM-1-2006) verification result.	341	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Setting the function to append SAE AS9132 verification result	342	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Setting the function to append SEMI T10-0701 verification result	343	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Verification result addition setting for Japanese Pharmaceutical Code	344	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Setting the function to append ISO/IEC16022 verification result.	345	0, 1	0 : Do not append 1 : Append	0	SR-750	SR-700
Setting for Master/Slave group name addition	320	0, 1	0 : Do not append 1 : Append	0	SR-750	-
Setting for Master/Slave ID addition	321	0, 1	0 : Do not append 1 : Append	0	SR-750	-
Data edit function (Data edit by script)	360	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700

■ Verification/Preset function setting

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Number of verification start digits	400	0001 to 7089		0001	SR-750	SR-700
Number of verification digits	401	000 to 494	Maximum value for sequential value verification = 9	494	SR-750	SR-700
Preset data registration	402	hhhhhhhh···	Up to 494 characters (HEX 988 bytes) can be specified from HEX (0x00 to 0x7F). FF : Not set Example: To register ABC123 WP,402, 414243313233	FF	SR-750	SR-700
Verification method	403	0, 1	0 : Normal 1 : Sequential value verification	0	SR-750	SR-700
Incremental setting for sequential value verification	404	-9999 to +9999	-9999 to +9999	+0001	SR-750	SR-700

■ Image data saving function setting

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Saving destination of read OK images	500	SR-750: 0, 3 SR-700: 0, 1	0 : Disable saving 1 : Saving to RAM 3 : FTP transmission	0	SR-750	SR-700
Saving destination of verification NG images	501	SR-750: 0, 3 SR-700: 0, 1	0 : Disable saving 1 : Saving to RAM 3 : FTP transmission	SR-750: 0 SR-700: 1	SR-750	SR-700
Saving destination of read error images	502	SR-750: 0 to 3 SR-700: 0, 1	0 : Disable saving 1 : Saving to RAM 2 : Saving to ROM 3 : FTP transmission	1	SR-750	SR-700
Saving destination of unstable images	503	SR-750: 0, 3 SR-700: 0, 1	0 : Disable saving 1 : Saving to RAM 3 : FTP transmission	SR-750: 0 SR-700: 1	SR-750	SR-700
Saving destination of capture images	504	1, 3	1 : Saving to RAM 3 : FTP transmission	1	SR-750	-
Image saving mode	505	0 to 2	0 : Latest bank image 1 : Specified number of images after trigger input ON 2 : Specified number of images after trigger input OFF	0	SR-750	SR-700
Specify the number of images to save from trigger input ON/OFF	506	01 to 10		10	SR-750	SR-700
Burst number to save when burst read error occurs	507	BBBBBBBB	B = 0, 1 0 : Disable saving 1 : Save * Burst number 1 is on the top.	11111111	SR-750	-
Edit image file name function (Edit image file name by script)	510	0, 1	0 : Disable 1 : Enable	0	SR-750	-
Image format setting	511	0, 1	0 : BMP 1 : JPG	1	-	SR-700
JPEG quality	512	1 to 10	10 is the highest	5	-	SR-700
Binning setting	513	0 to 4	0 : No binning 1 : 1/4 skipping 2 : 1/9 skipping 3 : 1/16 skipping 4 : 1/64 skipping	1	-	SR-700

■ Other settings

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Output data on TEST switch	600	0, 1	0 : Disable 1 : Enable	1	SR-750	SR-700
Delimiter character	601	hh	Specify 1 character (2 HEX characters) from (0x00 to 0x7F)	3A	SR-750	SR-700
Inter delimiter	602	hhhhhhhh···	Specify up to 5 characters (10 HEX bytes) from HEX (0x00 to 0x7F). FF : Not set	2C	SR-750	SR-700
Data filling size	603	000 to 999		000	SR-750	SR-700
Data filling character	604	hh	Specify 1 character (2 HEX characters) from (0x00 to 0x7F)	20	SR-750	SR-700
Silent Mode	606	SR-750: 0 to 128 SR-700: 0 to 256	0 : Not selected 1 : Verification OK, Read OK 2 : Verification NG 4 : Read ERROR 8 : Stable reading 16 : Unstable reading 32 : Preset result 64 : Test Mode 128: Tuning Specify the setting by sum of the values of the items.	0	SR-750	SR-700
Reader name	607	hhhhhhhh	Specify up to 8 characters (16 HEX bytes) from UNICODE (UTF-16 BigEndian). FF : Not set	00520045 00410044 00450052 (READER)	SR-750	SR-700
Monitor output data priority display position	609	0, 1	0 : Display data from front 1 : Display data from back	0	SR-750	-
Trigger command response character string	610	0 to 2	0 : Default 1 : SR-600 compatible, detailed reply 2 : User setting 3 : Echo back *SR-700	0	SR-750	SR-700
TUNE button lock	611	0, 1	0 : Disable lock 1 : Enable lock	0	SR-750	SR-700
Laser aimer setting by TUNE button	612	0 to 3	0 : None 1 : Emit in test mode only 2 : Emit in operating mode only 3 : Emit always	3	SR-750	-
Automatic pointer lighting setting	209	0 to 2	0 : Does not light automatically 1 : Light automatically 2 : Light automatically only when capturing images	1	-	SR-700
Trigger command success response character string	613	hhhh…	Up to 8 characters can be specified. Specify characters with HEX (0x00 to 0x7F). *This is valid when the trigger command response character setting is User setting.	4F4B	SR-750	SR-700
Trigger command failure response character string	614	hhhh…		4552	SR-750	SR-700
Camera rotation settings	901	0, 1	0 : Normal Mode 1 : 180 degrees rotation	0	SR-750	-

■ Tuning settings

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Brightness adjustment mode	801	0, 1	0 : Image quality priority, high quality mode 1 : Speed priority, high speed mode	0	SR-750	SR-700
Speed priority, exposure time in high speed mode	802	3 to 333	Exposure time = setting value × 30 μs	0005	SR-750	SR-700
Offset setting	803	000 to 255	Use the default value of 255 for normal use.	255	SR-750	SR-700
Dynamic range setting	804	0, 1	0 : Hi-Sensitive/ Hi-SNR 1 : Hi-DR	0	SR-750	SR-700
Tuning mode	805	0, 1	0 : Normal Mode 1 : Filter	0	SR-750	SR-700
Allow reduced detection count while tuning	806	0, 1	0 : Do not allow 1 : Allow	1	-	SR-700
Codes to read while tuning	808	01 to 16		1	SR-750	-
Allow reduced detection count while tuning	809	0, 1	0 : Do not allow 1 : Allow	0	SR-750	-
Tuning target code	820	SR-750: 1 to 16657 SR-700: 1 to 20000	1: QR 2: DM 4: PDF417 (microPDF) 10: GS1 DataBar 20: CODE39 (Trioptic CODE 39) 40: ITF 80: 2of5 100: NW7 (Codebar) 200: JAN/EAN/ UPC 400: CODE128 800: COOP2of5 1000: CODE93 2000: CC-A/B (GS1 DataBar) 4000: CC-A/B (EAN/UPC) 8000: CC-A/B/C (GS-128) 20000: Pharmacode Specify the setting using sum of each item.	16657	SR-750	SR-700
Black-white reverse read setting when tuning	823	0 to 2	0 : Disable 1 : Enable 2 : Automatic	2	SR-750	SR-700
Internal lighting when tuning	821	0, 1	0 : Not used 1 : Used	1	SR-750	SR-700
External lighting when tuning	822	0, 1	0 : Not used 1 : Used	0	SR-750	SR-700

Communication Configuration Command Format (WN/RN)

Communication configuration command is sent in the following format:

- Configuration change

Send command: WN , mmm , nnn…

Response — Normal process: OK , WN

Response — Abnormal process: ER , WN , ee ee: Error code

- Configuration confirmation

Send command: RN , mmm

Response — Normal process: OK , RN , nnn…

Response — Abnormal process: ER , RN , ee ee: Error code

mmm : Command number Fixed to 3 bytes

nnn… : Setting value (varies according to command number)

example: Changing SR-750 Series IP address to "192.168.100.1"

Configuration change	Send command	WN, 200, 192.168.100.1
	Response (Normal process)	OK, WN
Configuration confirmation	Send command	RN, 200
	Response (Normal process)	OK, RN, 192.168.100.1

Important **To change and apply the communication configuration, make sure to send a SAVE command.**

■ Communication port settings

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Command port configuration	000	0 to 2	0 : Not used 1 : RS232C 2 : Ethernet	1	SR-750	-
Data port 1 configuration	001	0 to 2	0 : Not used 1 : RS232C 2 : Ethernet	1	SR-750	-
Data port 2 configuration	002	0 to 2	0 : Not used 1 : Reserve 2 : Ethernet	2	SR-750	-
Append checksum	003	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700
Append data size	004	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700
Header settings	005	hhhh···	Specify up to 5 characters (16 HEX bytes) from HEX (0x00 to 0x7F). FF : Not set	FF	SR-750	SR-700
Terminator settings	006	hhhh···	Specify up to 5 characters (16 HEX bytes) from HEX (0x00 to 0x7F). FF : Not set	0D	SR-750	SR-700

■ RS-232C communication settings

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Baud rate setting	100	0 to 4	0 : 9600bps 1 : 19200bps 2 : 38400bps 3 : 57600bps 4 : 115200bps	4	SR-750	SR-700
Data length setting	101	0, 1	0 : 7bit 1 : 8bit	1	SR-750	SR-700
Parity check setting	102	0 to 2	0 : Disable 1 : Even 2 : Odd	1	SR-750	SR-700
Stop bit length setting	103	0, 1	0 : 1bit 1 : 2bit	0	SR-750	SR-700
Communication protocol setting	104	0 to 2	0 : No Handshaking 1 : PASS/RTRY 2 : ACK/NAK	0	SR-750	SR-700
RTS/CTS protocol settings	106	0, 1	0 : Disable 1 : Enable	0	-	SR-700

■ Ethernet communication settings

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
IP address setting	200	a. b. c. d	a : 0 to 255 b : 0 to 255 c : 0 to 255 d : 0 to 255	192.168.100.100	SR-750	-
Subnet mask setting	201	8 to 30	Specify with bit length 255.255.255.0 ···24 255.0.0.0 ···8	24	SR-750	-
Default gateway setting	202	a. b. c. d	a : 0 to 255 b : 0 to 255 c : 0 to 255 d : 0 to 255	0.0.0.0 (Not set)	SR-750	-
IP address setting at connection destination	203	a. b. c. d	a : 0 to 255 b : 0 to 255 c : 0 to 255 d : 0 to 255 * Set when used as a client	0.0.0.0 (Not set)	SR-750	-
Port number setting for connection destination	204	1024 to 65535		9004	SR-750	-
Setting of connection establishment request transmission	205	0, 1	0 : Disable 1 : Enable	0	SR-750	-
Port number setting for Data port 1	206	1024 to 65535	Unavailable: 9013, 9014, 9015, 9016, 5920, 44818	9004	SR-750	-
Port number setting for command port	207	1024 to 65535	Unavailable: 9013, 9014, 9015, 9016, 5920, 44818	9004	SR-750	-
Keep/Alive function setting for Data port 1	208	0, 1	0 : Not use 1 : Enable	1	SR-750	-
Command port Keep/Alive function setting	209	0, 1	0 : Not use 1 : Enable	1	SR-750	-

■ Data port 2 settings and PLC link settings

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Remote IP address (TCP communication)	300	a.b.c.d	a : 0 to 255 b : 0 to 255 c : 0 to 255 d : 0 to 255 Use when the protocol is TCP.	0.0.0.0 (Not set)	SR-750	-
Remote port (TCP communication)	301	1024 to 65535	Use only for TPC protocol.	5000	SR-750	-
Protocol setting	303	SR-750: 0 to 5 SR-700: 0 to 3	0 : MC protocol 1 : SYSWAY*1 *1: When Data port 2 is set to Ethernet, 1 cannot be used. 2 : KV STUDIO 3 : None or TCP*2 *2: SR-750: Save to Data port 2 settings. SR-700: Non-procedural only 4 : EtherNet/IP 5 : PROFINET	SR-750:4 SR-700:0	SR-750	SR-700
DM front address	304	MC: 0 to 32767 SYSWAY: 0 to 9999 KV: 0 to 65534		0	SR-750	SR-700
Control region address	305	MC: 0 to 7F SYSWAY: 0 to 6143 KV: 1 to 599		0	SR-750	SR-700
Response region address	306	MC: 0 to 7F SYSWAY: 0 to 6143 KV: 1 to 599		0	SR-750	SR-700
Output data length setting	307	001 to 100	* Set the upper limit of writing length.	64	SR-750	SR-700

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
PLC link timing input	308	0, 1	0 : Disable 1 : Enable	0	SR-750	SR-700
Timing/Data wait	309	00 to 99	SR-750: by the 100ms SR-700: by the 10ms	SR-750: 1 SR-700: 10	SR-750	SR-700
Retry duration (s)	310	SR-750: 01 to 30 SR-700: 01 to 10	by the second	5	SR-750	SR-700
EtherNet/IP data handshake setting	321	0, 1	0 : Do not handshake 1 : Handshake	0	SR-750	-
EtherNet/IP Input assembly data size setting	322	0040 to 1400	by 1	500	SR-750	-
EtherNet/IP Output assembly data size setting	323	0040 to 1400	by 1	500	SR-750	-
EtherNet/IP Byte swapping setting	324	0, 1	0 : Disable (ROCKWELL) 1 : Enable (KEYENCE/ OMRON)	0	SR-750	-
PROFINET device name	330	nnn…	Up to 240 characters Specify with ASCII codes * Device naming rule 1 : PROFINET device name length: 1 to 240 characters 2 : 1 label length: 1 to 63 characters 3 : Only [a to z] (alphabet lower case), [0 to 9] (numbers), [-] (hyphen), [.] (period) can be used for a device name. 4 : [-] (hyphen) cannot be used at the beginning of the label. 5 : [-] (hyphen) cannot be used at the end of the label. 6 : port-xyz, port-xyz-abcde cannot be the name of the first label. abcde and xyz mean [0 to 9] (numbers). 7 : Device names cannot be made in the IP address format. (n.n.n.n n=0.....999) 8 : Labels cannot start with xn-. 9 : The first character of labels cannot be a number. If these rules are not observed, an error occurs.	sr-750	SR-750	-
PROFINET handshake	331	0, 1	0 : Do not handshake 1 : Handshake	0	SR-750	-

■ FTP Communication Settings

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
IP address of the connection destination FTP server	400	a.b.c.d	a : 0 to 255 b : 0 to 255 c : 0 to 255 d : 0 to 255 For 0.0.0.0., the FTP client does not operate.	0.0.0.0 (Not set)	SR-750	-
User name of the connection destination FTP server	401	aaaa···	ASCII setting (max. 16 characters)	admin	SR-750	-
Password of the connection destination FTP server	402	aaaa···	ASCII setting (max. 16 characters)	admin	SR-750	-
Directory transfer at connection	403	0, 1	0 : Disable 1 : Enable	0	SR-750	-
Directly name of the transfer destination	404	aaaa···	ASCII setting (max. 32 characters)	image	SR-750	-
FTP connection request transmission as necessary	405	0, 1	0 : Disable 1 : Enable	0	SR-750	-
NOOP command transmission	406	0, 1	0 : Disable 1 : Enable	1	SR-750	-
NOOP command transmission interval	407	01 to 10	units: minute	1	SR-750	-
PASV command transmission	408	0, 1	0 : Disable 1 : Enable	0	SR-750	-
Format setting for FTP transmission	411	0, 1	0 : Bitmap 1 : JPEG	1	SR-750	-
JPEG quality for FTP transmission	412	01 to 10		05	SR-750	-
Binning setting for FTP transmission	413	0 to 3	0 : No binning 1 : 1/4 skipping 2 : 1/16 skipping 3 : 1/64 skipping	1	SR-750	-

■ Master/Slave function settings

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Master/Slave operation configuration	500	0 to 2	0 : Disable 1 : Multi drop link 2 : Multi head	0	SR-750	-
Master/Slave ID during operation	501	0 to 31	If 0 is set, it operates as Master.	0	SR-750	-
Number of read data in Multi Head mode	502	1 to 8		1	SR-750	-
Master/Slave function group name	503	nnnn…	Up to 16 characters Specify with ASCII codes * 0x20 to 0x7E of ASCII codes can be used.	GROUP 01	SR-750	-
Multi-drop link settings	107	0, 1	0 : Disable 1 : Enable	0	-	SR-700
ID number during multi-drop link	108	1 to 31		1	-	SR-700

■ SNTP settings

Function	Command Number	Setting value	Explanation	Default	SR-750	SR-700
Remote SNTP server address	520	a. b. c. d	a : 0 to 255 b : 0 to 255 c : 0 to 255 d : 0 to 255 If 0.0.0.0 is set, the SNTP server is not accessed.	0.0.0.0	SR-750	-
Time zone	521	0 to 33	0 to 32 0 : GMT-12:00 1 : GMT-11:00 2 : GMT-10:00 3 : GMT-9:00 4 : GMT-8:00 PSD 5 : GMT-7:00 6 : GMT-6:00 CST, Mexico City, Central America 7 : GMT-5:00 EST 8 : GMT-4:30 9 : GMT-4:00 AST 10 : GMT-3:30 11 : GMT-3:00 Brasilia 12 : GMT-2:00 Central Atlantic 13 : GMT-1:00 14 : GMT London, UTC 15 : GMT+1:00 Berlin, Brussels, Rome, Paris, Berne 16 : GMT+2:00 Athens, Jerusalem 17 : GMT+3:00 Kuwait 18 : GMT+3:30 19 : GMT+4:00 Moscow 20 : GMT+4:30 21 : GMT+5:00 22 : GMT+5:30 New Delhi 23 : GMT+5:45 24 : GMT+6:00 25 : GMT+6:30 26 : GMT+7:00 Bangkok 27 : GMT+8:00 Kuala Lumpur, Singapore, Taipei, Beijing 28 : GMT+9:00 Japan, Seoul 29 : GMT+9:30 30 : GMT+10:00 Canberra, Sydney 31 : GMT+11:00 32 : GMT+12:00 33 : GMT+13:00	28	SR-750	-
Update cycle (min)	522	1 to 99		1	SR-750	-

Batch transmission of setting/confirmation commands (WA/RA)

The SR-750 Series has the dedicated command that has been prepared for batch transmission of multiple setting/confirmation commands (WB/RB, WC/RC, WP/RP, WN/RN). Use this command to reduce the number of times to send setting commands.

Batch transmission command format

Send the batch transmission command in the following formats.

- Configuration change

Send command: WA , Setting command 1 , Setting command 2 , …

Response — Normal process: OK , WA

Response — Abnormal process: ER , WA , n , Error command type , ee

- Configuration confirmation

Send command: RA , Setting command 1 , Setting command 2 , …

Response — Normal process: OK , RA , Confirmation command 1 response , Confirmation command 2 response , …

Response — Abnormal process: ER , RA , n , Error command type , ee

Setting command 1, Setting command 2 : Setting command type
Confirmation command 1, Confirmation command 2 : Confirmation command type
n : Location where an error occurs Head 1
Error command type : Type of command where an error occurs
ee : Error code

- When using the batch transmission command, the reflecting order of the setting is the same as the sending order of the setting commands.
- Make sure to send the SAVE command after sending the batch transmission command containing the communication setting command.
- The batch transmission command can send up to 2048 bytes of number of characters (excluding header and terminator).
- The location (n) of the error command returns the location first confirmed from the head of the transmission command.

Each Setting/Confirmation Command Format

When using the batch transmission command, link each setting/confirmation command in the following format after deleting W/R from each command.

■ Parameter bank configuration command

Change command: B , bb mmm , nnn…

Confirmation command: B , bb mmm

Confirmation command response: B , bb nnn…

bb : Parameter bank number 01 - 10 Fixed to 2 bytes
mmm : Command number Fixed to 3 bytes
nnn… : Setting value (varies according to command number)

■ Code configuration command for tuning

Change command: C , A mmmm , nnn…

Confirmation command: C , A mmmm

Confirmation command response: C , A nnn…

A : Code setting number 1 to 8 1-byte Fixed to 1 byte
mmmm : Command number Fixed to 4 bytes
nnn… : Setting value (changeable according to the command number)

■ Operation configuration command

Change command: P , mmm , nnn…

Confirmation command: P , mmm

Confirmation command response: P , nnn…

mmm : Command number Fixed to 3 bytes
nnn… : Setting value (varies according to command number)

■ Communication configuration command

Change command	N	, mmm	, nnn…
Confirmation command	N	, mmm	
Confirmation command response	N	, nnn…	

mmm : Command number Fixed to 3 bytes
nnn··· : Setting value (varies according to command number)

example)

(1) Batch transmission of the WB command and WP command

Send command	WA	,	B	,	01700	,	2	,	P	,	200	,	0	,	P	,	201	,	1
Response	OK	,	WA																

(2) Confirm the setting content sent at (1)

Send command	RA	,	B	,	01700	,	P	,	200	,	P	,	201				
Response	OK	,	RA	,	B	,	2	,	P	,	0	,	P	,	1		

(3) Sending multiple WN commands

Send command	WA	,	N	,	000	,	2	,	N	,	001	,	2	,	N	,	002	,	1
Response	OK	,	WA																

* After sending WN commands, make sure to send the SAVE command to reflect the setting.

(4) Confirm the setting content sent at (3)

Send command	RA	,	N	,	000	,	N	,	001	,	N	,	002				
Response	OK	,	RA	,	N	,	2	,	N	,	0	,	N	,	1		

9-1 PLC Link

SR-750 SR-700

This chapter presents an overview and the control method of the PLC link.

PLC Link

With the PLC link, data can be directly written to the PLC (programmable logic controller) internal memory (data memory, data register) via the RS-232C interface and Ethernet interface for the SR-750 Series and via the RS-232C interface for the SR-700 Series.
Since the SR-750/SR-700 Series directly controls memory in the PLC, it eliminates the need for a communication program. Therefore, man-hours needed to create programs can be reduced.

Important

The following restrictions are imposed regarding the use of the PLC link:
- **The SR-750/SR-700 Series configuration cannot be changed via PLC link.**
- **Test mode cannot be activated via PLC link.**
- **Operation command and setup command cannot be sent via PLC link.**
- **Due to long communication time, it is not suitable for a line that requires high-speed processing.**
- **The amount of data that can be processed depends on the output data length. A maximum number of digits is 100. (Default output data length is 64 digits.)**

List of supported PLCs

RS-232C Interface

SR-750 SR-700

■ KEYENCE

Series name	Connection method	Model
KV Series	CPU built-in port	KV-3000, KV Nano Series
	Communication unit	KV-L20V/L20R, KV-N10L/NC10L/NC20L

■ Mitsubishi Electric

Series name	Connection method	Model
MELSEC Series	Serial communication unit	QJ71C24N/-R2
		LJ71C24/-R2

■ OMRON

Series name	Connection method	Model
SYSMAC Series	CPU built-in port	CS1 Series
		CJ1 Series
		CJ2 Series*
		CP1 Series*
	Serial option board	CP1W-CIF01
		CP1W-CIF11
		CP1W-CIF12
	Serial communication unit	CJ1W-SCU□□(-V1)
		CS1W-SCU□□-V1
	Communication board	CS1-SUB□□-V1

* A serial option board is necessary, depending on the model.

Ethernet Interface

SR-750

■ KEYENCE

Series name	Connection method	Model
KV Series	CPU built-in port	KV-5000/5500
	Ethernet unit	KV-LE21V/LE20V, KV-NC1EP

■ Mitsubishi Electric

Series name	Connection method	Model
MELSEC Series	CPU built-in port	Q03UDECPU, Q04/06/10/13/20/26/50/100UDEHCPU Q03/04/06/13/26UDVCPU L02CPU/06CPU/26CPU-BT
	Ethernet unit	QJ71E71-100/-B5/-B2

Devices that can be used

Devices accessible via PLC link are as follows:

PLC	Specified area	Device name	Available range
KV Series	Control region	Input relay, output relay	R100 to R59915*1
	Response region		
	Data region	Data memory	DM0 to DM65534
MELSEC Series	Control region	Input device	Y0 to Y7FF*2
	Response region	Output device	X0 to X7FF*2
	Data region	Data register	0 to 32737
SYSMAC Series	Control region	CIO, internal auxiliary relay	0 to 6143 ch
	Response region		
	Data region	Data memory	D0000 to D9999

- The available range is a maximum value of the device accessible when the PLC link function is used. To specify the DM front address, control region address, or response region address, configure by taking into account the number of necessary devices.
- The device region that can actually be used may not be configured up to a maximum value or may include unavailable area, depending on specifications and configuration. For more information on available regions, refer to the appropriate PLC manual.

*1 AutoID Network Navigator entry field range: 1 to 599
*2 AutoID Network Navigator entry field range: 0 to 7F

- Specifying the Control region address and the Response region address
  Inputting 2 in the AutoID Network Navigator entry field means that the shaded area as indicated below is specified.

	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
1																
2																←
3																
4																
5																

←Front address

9-2 Configuration

SR-750 SR-700

This section describes the configuration of the SR-750/SR-700 Series and PLC.

SR-750/SR-700 Series configuration

Configure the SR-750/SR-700 Series using the AutoID Network Navigator as follows:

1 Set the interface to "RS-232C" or "Ethernet" under the PLC communication in the Communication 2 tab. * SR-750 Series
- When the interface is set to "RS-232C", command communication and PC host output interface configuration are switched to "Not used".

2 Select the protocol appropriate for the PLC to be used.
- Mitsubishi MELSEC Series : MC Protocol
- OMRON SYSMAC Series : SYSWAY * RS-232C only
- KEYENCE KV Series : KV STUDIO

3-1 When the interface is set to RS-232C, set "Baud rate", "Data length", "Stop bit length" to match the configuration in the PLC.

3-2 When the interface is set to Ethernet, set "IP address" and "Port number" in the PLC.

4 Set "PLC link timing input".
To perform read operation using A00: PLC timing area, set "PLC link timing input" in the [Table] tab to "Enable".
To input the timing signal directly into the SR-750 or SR-700, set to "Disable".

5 Set "DM address", " Control region address", and "Response region address".
"9-3 Device Assignment (Page 116)"

Configuring the KV Series

RS-232C Interface

Operation	KV BUILDER/KV STUDIO mode
Interface	RS-232C *1
Division	0
Baud rate	Automatic *2
Data bit length	8 bits *2
Parity	Even (e) *2
Stop bit length	1 bit *2
Checksum	None *2
RS/CSFlow control	Disable

*1 To use port2, set the interface to "RS-232C".
*2 For KV BUILDER/KV STUDIO mode, a fixed value is used.

Ethernet Interface

IP address	192.168.0.10 (default)
Subnet mask	255.255.255.0 (default)
Port (VT)	8502 (default)

MELSEC Series Configuration

RS-232C Interface

■ QJ71C24N/-R2

Set communication conditions with the GX-Developer.
("I/O assignment configuration" in "PC parameters")

Type	Intelligent
Type name	Name of the unit to be installed
Points	32 points
First XY	First output signal of the target unit (hexadecimal number)

("Option configuration" under "I/O assignment settings" in "PC parameters")

Unit type	Serial communication/modem interface unit
Unit type name	Name of the unit to be installed

("Switch configuration" under "I/O assignment configuration" in "PC parameters")

Setting item	Value
Operation configuration	Independent
Data bit length	8 bits
Parity bit	Present
Odd/even parity	Odd (o)
Stop bit length	1 bit
Checksum code	Present
Writing during RUN	Allowed
Configuration change	Allowed
Communication rate configuration	9600 bps
Communication protocol configuration	MC protocol (format 5)
Division configuration	0

Ethernet Interface

■ QJ71E71-100/-B5/-B2

Set communication conditions with the GX-Developer.
("I/O assignment configuration" in "PC parameters")

Type	Intelligent
Type name	Name of the unit to be installed
Points	32 points
First XY	First output signal of the target unit (hexadecimal number)

(Target unit number for "Ethernet/CC IE/MELSECNET" in "Network parameters")

Network type	Ethernet
First I/O No.	Number specified in "I/O assignment configuration" in PC parameters
Network No.	Any number
Group No.	Any number
Division	Any number
Mode	Online

("Operation configuration" for "Ethernet/CC IE/MELSECNET" in "Network parameters")

Communication data code configuration	Binary code communication
Initial timing configuration	Always waiting for OPEN (Communication possible during STOP)
IP address	192.168.0.20 *1
Writing permitted during RUN	Check
Send frame configuration	Ethernet (V2.0)
TCP living confirmation configuration	KeepAlive is used.

*1 Configure so that it matches the network.
* The port number is 5000.

■ Q03UDECPU, Q04/06/10/13/20/26/50/100UDEHCPU Q03/04/06/13/26UDVCPU

Set communication conditions with the GX-Developer.
("Built-in Ethernet port configuration" in "PC parameters")

IP address	192.168.0.20 *1
Subnet mask patterns	255.255.255.0 *1
Default router IP address	192.168.0.254 *1
Communication data code configuration	Binary code communication
Writing permitted during RUN (FTP and MC protocol)	Check

*1 Configure so that it matches the network.
("Built-in Ethernet port configuration" in "PC parameters")

Protocol	UDP
Open system	MC protocol
Port number with Ethernet module installed	232C (hexadecimal number) * Any number

* The port number of the SR-750 Series must be specified in decimal number while the Q Series port number with Ethernet module installed is specified in hexadecimal number.

Example)

Hexadecimal number	⇨	Decimal number
232C		9004

■ L02CPU/26CPU-BT

Set communication conditions with the GX-Works2.
("Built-in Ethernet port configuration" in "PC parameters")

IP address	192.168.0.20 *1
Subnet mask patterns	255.255.255.0 *1
Default router IP address	192.168.0.254 *1
Communication data code configuration	Binary code communication
Writing permitted during RUN (FTP and MC protocol)	Check

*1 Make the configuration appropriate to the network.
("Built-in Ethernet port configuration" in "PC parameters")

Protocol	UDP
Open system	MC protocol
Port number with Ethernet module installed	232C (hexadecimal number) * Any number

* The port number of the SR-750 Series must be set in decimal numbers.

Configuring the SYSMAC Series

RS-232C Interface

Set communication conditions with the CX-Programmer.

■ CPU built-in port

PLC system configuration→Upper link port (serial port)

Communication configuration	User configuration
Baud rate	9600 bits/s
Parameter	7,2,E
Mode	Upper link
ID No.	0

* When communication configuration is established as a standard, baud rate and parameters are fixed as above.

■ Serial communication unit/board

CJ1W-SCU□□(-V1)
CS1W-SCU□□-V1
CS1-SUB□□-V1
I/O table/unit configuration

Presence or absence of optional configuration	Optional configuration
Communication mode	Upper link
Data length	7 bits
Stop bit	2 bits
Parity	Even
Transmission rate	9600 bps
CTS control	None
Upper link ID No	0

9-3 Device Assignment

SR-750 SR-700

To use the SR-750/SR-700 Series over the PLC link, functions of the SR-750/SR-700 Series need to be assigned to the PLC devices.
For the SR-750/SR-700 Series, the first address of each device is assigned in response to target function.

- Control region : Device used to write a command from the PLC. One channel is used for device assignment.
- Response region : Device used to write a response from the SR-750/SR-700 Series. One channel is used for device assignment.
- Data region : Device used to write alternate instructions of the SR-750 or SR-700 Series, or to write result data from the SR-700 Series.

Function Assignment of Control Region, Response Region, and Data Region

This section describes assignment of functions of each region.

Assignment of Control Region Functions

When the control region address A is specified, functions are assigned in order as shown below starting with the specified beginning address.

A15	A14	A13	A12	A11	A10	A09	A08	A07	A06	A05	A04	A03	A02	A01	A00
Reserved area															

Address	Description	Data description	SR-750/700 Write	PLC Write
A00	PLC timing area	0:Instruction for timing OFF 1: Instruction for timing ON	×	○
A01	Data write processing method	0: Real time processing 1: Sequential processing	×	○
A02	Sequential processing Data write enabled	0: Data write disabled 1: Data write enabled	×	○

* When performing the trigger input ON/OFF using the PLC timing area, set "PLC link timing input" to "Enable".

Assignment of Response Region Functions

When the response region address B is specified, functions are assigned in order as shown below starting with the specified beginning address.

B15	B14	B13	B12	B11	B10	B09	B08	B07	B06	B05	B04	B03	B02	B01	B00
Reserved area															

Address	Description	Data description	SR-700 Write	PLC Write
B00	PLC timing input response area	0: Timing OFF 1: Instruction for timing ON	○	×
B01	Reserved area	—	—	—
B02	Sequential processing Data write request	0: No data 1: Data write request	○	×
B03	Sequential processing Data write complete	0: Data write incomplete 1: Data write complete	○	×
B04	Real time processing Data being written	0: No data being written 1: Data being written	○	×

* Do not use the reserved area.

Assignment of Data Region Functions

When the data region address D is specified, functions are assigned in order as shown below starting with the specified beginning address.

Address	Description	Data description	SR-750/700 Write	PLC Write
D+00	Specify reading bank	0: Do not specify bank (Alternate) 1 to 16: Specify bank n • SR-750/SR-700 Series: 1 to 10 • SR-D100: 1 to 16*5	×	○
D+01	Specify ID*5	Specify the Master/Slave ID for timing input when the Multi drop is set. 0 to 31: Unit ID	×	○
D+02	Output data length	Length of data (read data + append data) output from the SR-750/SR-700 Series. * Length of data most recently output when using the Master/Slave function.	○	×
D+03	Data writing process count	Read data writing count from the SR-750/SR-700 Series to PLC is displayed.	○	×
D+04	1st and 2nd digits of output data	ASCII code 2 characters*2*3*4 Data of Master ID: 0 is displayed when using the Master/Slave function.	○	×
D+05	3rd and 4th digits of output data	ASCII code 2 characters*2*3*4 Data of Master ID: 0 is displayed when using the Master/Slave function.	○	×
…	…	…		
D+53	99th and 100th digits of output data	ASCII code 2 characters*2*3*4 Data of Master ID: 0 is displayed when using the Master/Slave function.	○	×
D+54	Data writing ID*5	ID of Master/Slave unit to which most recent data is written is displayed.	○	×
D+55	Timing input count for Master*5	Timing input count for Master is displayed.	○	×
D+56 to D+59	Reserved area		×	×
D+60 to D+109	Output data 1 to 100 digits*5	Data of Slave ID: 1 is displayed when using the Master/Slave function.	○	×
D+110 to D+159	Output data 1 to 100 digits*5	Data of Slave ID: 2 is displayed when using the Master/Slave function.	○	×
…	…	…	…	…
D+1560 to D+1609	Output data 1 to 100 digits*5	Data of Slave ID: 31 is displayed when using the Master/Slave function.	○	×

*1 When the next data reaches at the count of 65535, the value of count returns to 1.
*2 When the output data length is an odd number, [NUL] (0x00) is written in the "Output data length + 1".
*3 The order in which data of each PLC is stored is as follows:
MELSEC : Low order byte → High order byte
SYSMAC : High order byte → Low order byte
KV : High order byte → Low order byte
*4 The data length output from the SR-750/SR-700 Series depends on the data output length set in the SR-750/SR-700 Series. (Default: 64 digits)
*5 Used only when Master/Slave function is set. * SR-750 Series
* 0-byte data is output as data with a length of 0.

Point

If output data cannot fit in the output data region, data after that length will be discarded.
However, for the length of D+02, the data length output by the SR-750/SR-700 Series is written.

Detailed Description of Device Assignment Function

Read timing area (A00, B00)

This function is used when "PLC link timing input" is set to "Enable" on the SR-750/SR-700 Series.
The usage varies depending on the measurement method.

■ Assigning read timing area

Address	Description	Data description
A00	PLC timing area	0: Instruction for timing OFF 1: Instruction for timing ON
B00	PLC timing input response area	0: Timing OFF 1: Instruction for timing ON

- When the A00 address switches to ON (1), the SR-750/SR-700 Series starts reading.
- The B00 address is an area used to verify if the SR-750/SR-700 Series has recognized A00 correctly.
  When the SR-750/SR-700 Series recognizes A00 correctly (=LED emits light), B00 switches to ON (1).

■ Level trigger operation procedure

1 Set the A00 and B00 addresses to OFF (0).

2 To start the SR-750/SR-700 Series reading (turn on timing), set the A00 address to ON (1).

3 When the SR-750/SR-700 Series recognizes the A00 address, the B00 address switches to ON (1), and reading starts.

If the B00 does not switch to ON (1), do not perform the following operations because the SR-750 Series has not recognized the A00 address.

4 Once the code has been read, new data is written into D+04 to D+53.

5 To turn off the timing, set the A00 address to OFF (0).

6 When the SR-750/SR-700 Series recognizes the A00 address, the B00 address switches to OFF (0), and the timing turns OFF.

7 When a read error occurs, an error code is written into D+04 to D+53.

Point

When the timing of the SR-750/SR-700 Series is turned ON/OFF at high speed with the A00 address, the SR-750/SR-700 Series may miss the A00 address, causing an error such as failure to turn ON/OFF trigger input. In such a case, program to allow checking with the B00 address to see if the SR-750/SR-700 Series recognized the A00 address.

■ One-shot trigger operation procedure

1 Set the A00 and B00 addresses to OFF (0).

2 To start the SR-750/SR-700 Series reading (turn on timing), set the A00 address to ON (1).

3 When the SR-750/SR-700 Series recognizes the A00 address, the B00 address switches to ON (1), and reading starts.

If the B00 does not switch to ON (1), do not perform the following operation, because the SR-750/SR-700 Series has not recognized the A00 address.

4 Read operation is carried out for "one-shot trigger duration" configured for the SR-750/SR-700 Series.

5 Once the code has been read, new data is written into D+04 to D+53. When a read error occurs, an error code is written into D+04 to D+53.

6 When the A00 address is set to OFF (0), the B00 address switches to OFF (0).

Data write processing method (A01 to A02, B02 to B04, D+03)

The following 2 methods for writing data are available, depending on applications:

■ Real time processing

Address	Description	Data description
A01	Data write processing format	0: Real time processing 1: Sequential processing
B04	Real time processing Data being written	0: No data being written 1: Data being written

- To conduct real time processing, set the A01 address to OFF (0) in advance.
- When data is being written into the PLC, B04 switches to ON (1), and it switches to OFF (0) when write is completed.

Point

When the SR-750/SR-700 Series reads bar codes at intervals faster than PLC communication, data that is not written into the PLC will be stored in the send buffer of the SR-750/SR-700 Series.
The SR-750/SR-700 Series can hold up to 100 pieces of data. When data exceeds the limit, all data in the buffer is erased and "OVER" is written into the D+04 to D+53 address.
When a send buffer overflow occurs, the SR-750/SR-700 Series stops operation, writes "OVER" into the PLC, and then returns to an operating state.

■ Real time processing operating procedure

1 Set the A01 address to OFF (0).

2 When the SR-750/SR-700 Series is writing read data into the D+04 to D+53 address, the B04 address switches to ON (1).

3 When writing of read data is complete, the B04 address returns to OFF (0).

4 Confirm that the B04 address has returned to OFF (0) and program data in the D+04 to D+53 address.

The D+03 address value increments every time 1 piece of data is written. By checking the D+03 address value when the B04 address returns to OFF (0), an omission can be prevented.

■ Sequential processing

Address	Description	Data description	Data format
A01	Data write processing method	0: Real time processing 1: Sequential processing	Binary
A02	Sequential processing Data write enabled	0: Data write disabled 1: Data write enabled	
B02	Sequential processing Data write request	0: No data 1: Data write request	
B03	Sequential processing Data write complete	0: Data write incomplete 1: Data write complete	

- To conduct sequential processing, set the A01 address to ON (1) in advance.
- When the A02 address value is ON (1), the SR-750/SR-700 Series writes code data read into the D+04 to D+53 address.
- When data writing is completed, set the B03 address to ON (1).
- When read data is in the SR-750/SR-700 Series, the B02 address switches to ON (1).
- When the A02 address is OFF (0), the SR-750/SR-700 Series stores data in the send buffer without writing new data.

Point

In sequential processing, when the A02 address is OFF (0), new data is not sent to the PLC, but stored in the send buffer of the SR-750/SR-700 Series. When a maximum number of 100 pieces of data is exceeded, a buffer overflow occurs, and operation stops. When a buffer overflow occurs, operation stops until "OVER" is sent to the PLC.
When the PLC is ready for receiving data, be sure to set the A02 address to ON (1).

■ Sequential processing operating procedure

1 Set the A01 address to ON (1).

2 When the SR-750/SR-700 Series completes reading codes, the B02 address switches to ON (1). When the A02 address is set to ON (1), the SR-750/SR-700 Series writes read data into the D+04 to D+53 address.

3 When read data writing is completed, the B03 address switches to ON (1). When the switch of the B03 address to ON (1) is confirmed, set the A02 address to OFF (0).

When the A02 address switches to OFF (0), the B03 address also switches to OFF (0). The B02 address switches to OFF (0) when there is no data in the SR-750/SR-700 Series, but stays ON (1) when data remains.

4 When the A02 address switches to OFF (0), program data in the D+04 to D+53 address.

Specify read bank (D+00)

Specify a bank used for read operation.

Address	Description	Data description	Data format
D+00	Specify read bank	0: Bank not specified (alternate) 1 to 10: Bank n specified	Binary code

Output data length (D+02)

The area is used to write data length output from the SR-750/SR-700 Series.

Address	Description	Data description	Data format
D+02	Output data length	Length of data output from the SR-750/SR-700 Series.	Binary code

Point

The output data means "Appended data + Read data".

Output data (D+04 to D+53)

Address	Description	Data description	Data format
D+04 to D+53	Output data	2 characters of ASCII code/ address*1 *2 *3	ASCII code

*1 When the output data length is an odd number, [NUL] (0x00) is written in the "Output data length + 1".
*2 The order in which data of each PLC is stored is as follows:
MELSEC : Low order byte → High order byte
SYSMAC : High order byte → Low order byte
KV : High order byte → Low order byte
*3 The data length output from the SR-750/SR-700 Series depends on the data output length set in the SR-750/SR-700 Series main unit. (Default: 64 digits)

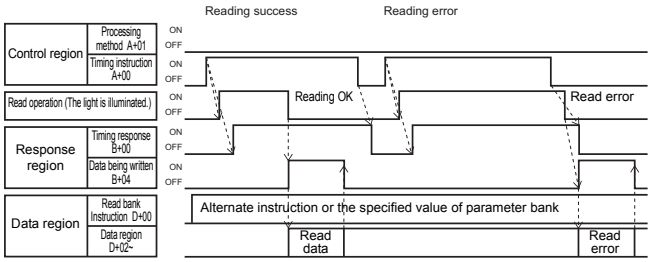
9-4 Reference Program SR-750 SR-700

This section introduces simple reference programs regarding the PLC link with the SR-750/SR-700 Series.
In actual operation, program by taking into account error handling, etc.

Timing diagram

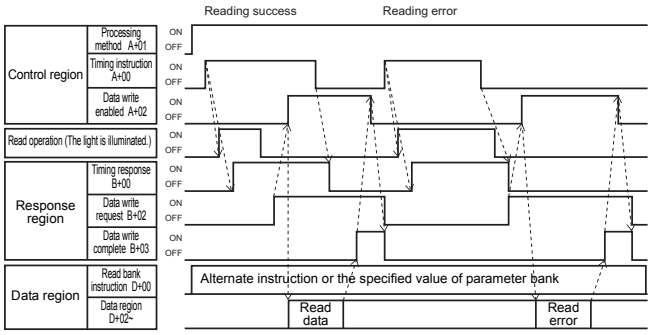
In the following timing diagram, an explanation of operation of devices and the SR-750/SR-700 Series in real time processing and sequential processing is given. Construct an operation program by referring to the timing diagram.

■ Real time processing



- When starting the program, specify the alternate function or parameter bank number to be used. (D+00 region)
- Read data is overwritten in the data region (D+02 and over). To transfer data, do so at the timing for setting the flag (B+04) to OFF.
- Data from D+02 will be overwritten. As a result, if the length changes, since there may remain previous data in the region, program to delete data from D+04, after transferring data if necessary.

■ Sequential processing



- When starting the program, set the processing method (A+01) to sequential processing, and specify the alternate function or parameter bank number to be used in the D-00 region.
- When data write request (B+02) is ON and data write complete (B+03) is OFF, program to set data write enabled (A+02) to ON.
  This setting makes it possible to obtain all data even when multiple pieces of data are sent.
- When data write complete (B+03) is set to ON, new data is written into D+02 and over. Perform a data transfer at the timing for setting data write complete flag (B+03) to ON.
- Data after D+02 will be overwritten. As a result, if the length changes, since previous data may remain in the region, program to delete data from D+04, if necessary, after transferring data.

Reference Program

This is a reference program for the use of the KV Series. In this program, error handling is not considered, thus program by taking into account error handling and test in actual operation.

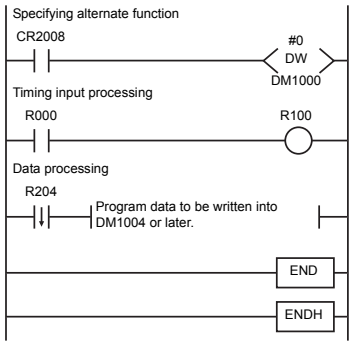
■ SR-750/SR-700 Series configuration

It is assumed that the SR-750/SR-700 Series is configured as follows:

- Timing : Level trigger
- Read mode : Single
- Memory assignment DM front address: DM1000
  Control region address: R100
  Response region address: R200
- PLC link timing input : Yes

* When using for testing purposes, execute data port 2 interface designation for SR-750 or SR-700 and communication settings for KV Series.

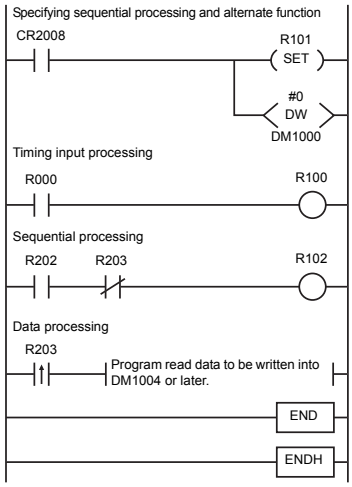
■ Real time processing



Write "0" into DM1000 and set to use the alternate function.

Input R000 as read timing.

■ Sequential processing



Set up the R101 and set it to sequential processing.

Write "0" into DM1000 and set to use the alternate function.

Input R000 as read timing.

Use the data write request flag (R202), data write enabled flag (R102), data write complete flag (R203) to perform sequential processing.

9-5 PLC Link Error

This section describes how to handle a communication error when it occurs during PLC link.

■ Operation when a PLC link error occurs

When a PLC link error occurs, the SR-750/SR-700 Series exhibits the following behavior:
- "E7" is displayed on the multiple LED indicator.
- When ERR BUSY is set to the output terminal, the set output terminal turns on.

Since the operation is stopped during this period, no timing input signal is accepted.

■ Check points

When an error occurs, check the following points:
- Check that the cable between the SR-750/SR-700 Series and PLC is correctly connected.
- Check that the correct communication cable, including wiring, is used. Check for breaks.
- Is the SR-750/SR-700 Series correctly set to the PLC link?
- Was the PLC to be connected turned on again after setting is complete?
- Is the PLC configuration correct?
- Is the address configuration for each control within the range of use of the PLC?
- Are the devices specified for each control address within the range of use of the SR-750/SR-700 Series?

■ Procedure for PLC link error recovery

Use the following procedure to clear the PLC link error of the SR-750/SR-700 Series and resume communication.
- Turn the SR-750/SR-700 Series back on.
- Hold the TUNE button on the SR-750/SR-700 Series for 3 seconds.
- When Clear PLC link error is set to the IN terminal, turn on the IN terminal.
- Send the Clear PLC link error command (PCLR) from the command port.
- Send the Reset command (RESET) from the command port.

When the PLC link error is cleared, data stored in the send buffer will be cleared.

If the problem persists despite the above action, contact your nearest KEYENCE sales office.

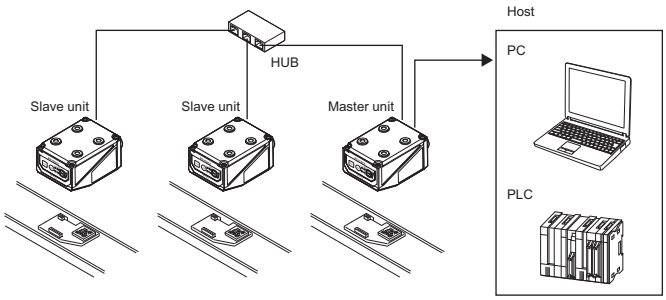
10-1 Master/Slave function

SR-750

The Master/Slave function has two types of modes: Multi drop link mode and Multi head mode. This section describes the overview of each mode.

Multi drop link mode

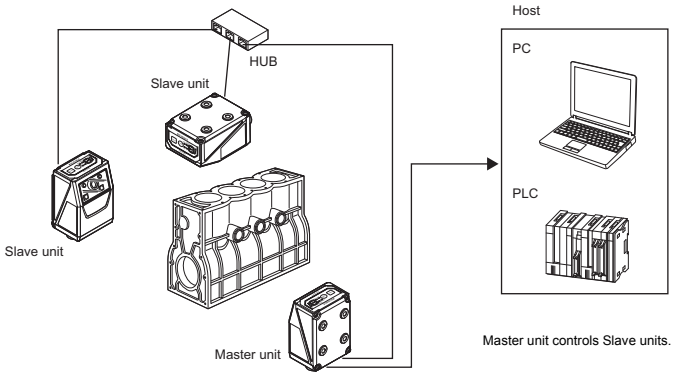
With this mode, one Master unit collects the read data of multiple SR-1000, SR-D100, and SR-750 Series units (up to 32 units) operating with different purposes and sends the data to the host.
Because the host only has to communicate with the SR designated as Master, the host does not need to consider the communication control for multiple units. Thus, the system load is reduced with the simple program. Also for PLC, only one communication unit is necessary to control multiple units. This enables the simple device configuration.



Master unit sends data of Slave units to the host.

Multi head mode

Use this mode when you do not know the position of a code in one reading target workpiece or when the workpiece is larger than the field of view and the entire workpiece cannot fit within the field of view using one unit.
Because multiple SR-1000, SR-D100 and SR-750 Series units (up to 8 units) can be handled as one device, the host does not need to consider the control for multiple units, and the program becomes simple.



Master unit controls Slave units.

10-2 Setting procedure

SR-750

Make the setting according to the following procedure.

Master unit/Slave unit settings

(1) Ethernet setting for each code reader

Change each reader's IP address avoiding duplication of IP address.
Make the same setting for Subnet mask.

(2) Operation setting, group name and unit ID setting

Target mode : Select either the Multi drop mode or the Multi head mode.
Group name : Set the same group name for all units. (Up to 1-byte 16 characters)
If there is no problem with the default setting, no need to change.
Unit ID : Set Master ID and Slave IDs.
Set different IDs for all units.

(3) Append data setting

Set append data for each unit. If read data is only necessary, this setting is not required.
Edit data function can also be set for each unit.

Master unit settings

(4) Multi-code reading setting *Only in the Multi head mode

Set the number of codes to be read. (Number of read data: 1 to 8)

(5) Communication method selection

Decide which communication method the Master unit will use.
[Communication 2] setting
- Master unit
  - Command port : Select a desired communication method.
  - Data port 1 and 2 : Select a desired communication method.
- Slave unit
  - Command port : Not used
  - Data port 1 and 2 : Not used

(6) Header, terminator, etc. setting

Set the header, terminator, data length and checksum on the Master unit.

(7) Data transmission timing setting *Only in the Multi head mode

Set the data transmission timing.

Important

With the Master/Slave function, the following communication methods cannot be set.
- **EtherNet/IP (only in multi-drop link)*1**
- **PROFINET (only in multi-drop mode)*1**
- **Multi 1 read mode**
- **Multi 2 read mode**
- **Burst read mode (Only for the Multi head mode)**

***1 Master unit version conditions**
- **SR-1000: Version 1.10 or later**
- **SR-750: Ver1.50 or later**
- **SR-D100: No corresponding version**

For the following items, the Slave unit settings will not be reflected. They depend on the Master unit settings.
• Header • Terminator • Data length • Checksum
Communication protocol: UDP
Communicates via Directed Broadcast.
When using the Master/Slave function, both Ethernet and RS-232C can be selected for data output from Master. However, connection between master and Slave must be made with Ethernet.

Usable reading modes and protocols

■ Usable reading modes

Reading mode	Multi drop link	Multi head
Single	○	○
Multi 1	-	-
Multi 2	-	-
Burst	○	-

■ Usable protocols with data port 1 and 2

Protocol	Multi drop link	Multi head
Non-procedure	○	○
TCP	○	○
MC protocol	○	○
SYSWAY	○	○
KV STUDIO	○	○
EtherNet/IP	-	○*1
PROFINET	-	○*1

*1 Master unit version conditions
- SR-1000: Version 1.10 or later
- SR-750: Ver1.50 or later
- SR-D100: No corresponding version

Advanced setting

■ When creating multiple Master/Slave groups within the same network

With the Master/Slave function, communication with other units in the same group is made. In this case, by making different group names, multiple Master/Slave groups can be made in the same network.

10-3 Multi drop link mode

SR-750

With the Multi drop link mode, reading operations of each SR-1000, SR-D100, or SR-750 Series are controlled by each unit. However, transmission of timing commands and sending read data are collected and controlled by the Master unit.

Control methods of Multi drop link mode

The Multi drop link mode has the following 3 control methods.
- Control for reading by inputting the timing signal to each SR-1000, SR-D100 and SR-750 Series
- Control for reading by sending commands to each SR-1000, SR-D100 and SR-750 Series via Master unit
- Control for reading by making the PLC link communication to each SR-1000, SR-D100 and SR-750 Series via Master unit
  (For memory map, etc., refer to Chapter 10 PLC Link.)

Important

Only read data is sent to the Master unit.
Other data including test mode, preset registration results, etc. are not output.

Usable commands in the Multi drop link mode

■ Timing ON command

Send command	%Tmm–LON	mm: Master/Slave ID (00 to 31)
	%Tmm–LON,bb	bb: Bank No. (01 to 16) * For SR-750, bb: 01 to 10 are valid. With mm≠00, if bb: 11 to 16 are assigned, no response is returned.
Response	%Tmm–OK,LON	
	%Tmm–OK,LON,bb	

■ Timing OFF command

Send command	%Tmm–LOFF	mm: Master/Slave ID (00 to 31)
Response	%Tmm–OK,LOFF	

■ Command to obtain model code and main unit version

Send command	%Tmm–KEYENCE	mm: Master/Slave ID (00 to 31)

■ CANCEL command (Cancels operations of the Master unit and Slave Units.)

Send command	%Tmm–CANCEL	mm: Master/Slave ID (00 to 31)

* Master unit ID and Slave unit IDs are shown below.
  - Master unit ID: 00
  - Slave unit ID: 01 to 31

10-4 Multi head mode

SR-750

With the Multi head mode, while the Master unit and Slave units are synchronized, one reading operation is performed simultaneously and controlled. The timing input instruction is made to the Master unit.

Important

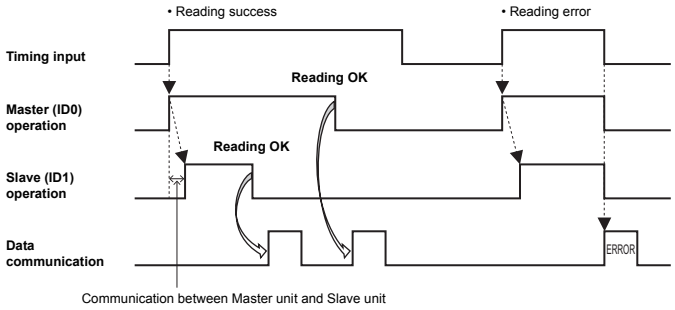
Multi head mode: On the SR-750 set as the Master unit, you cannot configure the following settings under Saving Images.
- **OK image**
- **Comparison NG**
- **Unstable image**

Read data format

In the Multi head mode, the data format differs depending on the data transmission timing.

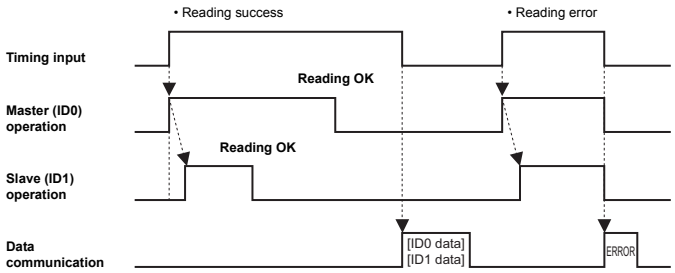
Number of read data: 2, Data transmission timing: Send after reading

■ Timing chart



Read data of each ID are sent to the upper level via the Master unit.

Number of read data: 2, Data transmission timing: Send after timing OFF



If there are multiple read data and transmission is made after timing OFF, the data is output from the smaller ID number regardless of the order of reading.

■ Data format

Header	ID0 (Master) read data	Inter-delimiter	ID1 (Slave) read data	Inter-delimiter	…	Terminator

Control methods of Multi head mode

The Multi head mode has the following 3 control methods.
- Control for reading by inputting the timing signal to Master SR-1000, SR-D100 or SR-750 Series
- Control for reading by sending the timing ON command to Master SR-1000, SR-D100 or SR-750 Series
- Control for reading by making the PLC link communication to Master SR-1000, SR-D100 or SR-750 Series
  (For memory map, etc., refer to Chapter 9 PLC Link.)

Important

- **Only read data is sent to the Master unit.**
  Other data including test mode, preset registration results, etc. are not output.
- **Data transmission timing setting is made on the Master unit.**
  Set "Send after read" for all Slave units.
- **Set the number of codes to be read to the total number of connected Master/Slave units or less. If the number of codes to be read is more than the total number of units, reading cannot be completed.**

Usable commands in the Multi head mode

■ Timing ON command

Send command LON
Response OK,LON

■ Timing OFF command

Send command LOFF
Response OK,LOFF

■ Command to obtain model code and main unit version

Send command %Tmm–KEYENCE mm: Master/Slave ID (00 to 31)

■ CANCEL command (Cancels operations of the Master unit and Slave Units.)

Send command CANCEL

11-1 EtherNet/IP

SR-750

This section describes an overview of EtherNet/IP.

EtherNet/IP

EtherNet/IP is an industrial communications network proposed by ODVA (Open DeviceNet Vendor Association, Inc.).
EtherNet/IP communication can share the network with normal Ethernet communication.

■ Scanner and adaptor

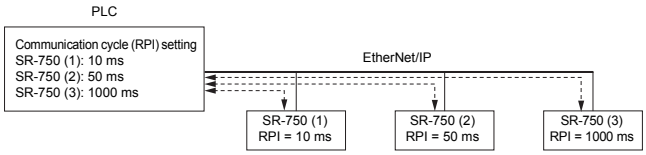
In EtherNet/IP communication, one device opens a communication line called "connection" to another device.
The device which opens the connection is called the "scanner" (originator), and the receiving device is called the "adaptor" (target). A PLC is primarily used as the scanner. The SR-750 becomes the adaptor device.

Cyclic communication and message communication

In EtherNet/IP, there is cyclic communication (Implicit message) that handles periodic sending and receiving of data, and there is also message communication (Explicit message) which handles sending and receiving of commands/responses arbitrarily.

■ Cyclic communication

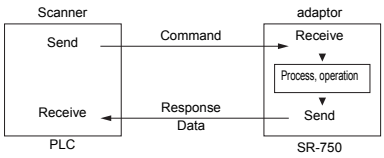
In cyclic communication, RPI (communication cycle) can be set according to the priority of data that is sent and received. Overall communication load adjusted data can be sent and received.



The communication cycle (RPI) put together in order of priority can be set and network load can be adjusted.

■ Message communication

In message communication, timing is controlled through commands/responses.



SR-750 Series EtherNet/IP Communication Specifications and Function Overview

■ SR-750 Series EtherNet/IP Communication Specifications

Cyclic communication (Implicit message)	Number of connections	16*	
	Communication size	KEYENCE KV Series	4 to 1444 bytes
		Rockwell Automation ControlLogix CompactLogix	4 to 496 bytes
		OMRON CJ/CS Series	4 to 1436 bytes
Message communication (Explicit Message)	Number of connections	16*	
	Applicable messaging methods	UCMM (unconnected type), Class 3 (connected type)	

* There is a total of 16 connections in cyclic communication and message communication.

■ SR-750 Series EtherNet/IP function overview

The following describes the functions that can control the SR-750 Series using EtherNet/IP.

Function	Description
Reading instruction	Performs reading instructions. Also performs reading end, bank setting reading, etc.
Preset instructions	Records successfully read data as preset data. Also registers or deletes preset data from the PLC.
Calibration instructions	Performs calibration. Can save calibration results in the set bank.
Error-handling	Checks the cause of the error that occurred in the main unit, and returns the error. (Example: Buffer overflow check/cancellation)
Main unit status acquisition	Checks the main unit status (BUSY status).
Operation results acquisition	Acquires read data. When set to silent mode, the read data is not updated.
Terminal status acquisition	Acquires input terminal and output terminal status.
Main unit reset instructions	Displays the SR-750 Series software reset.

NOTICE

About the exclusion process
The SR-750 Series can simultaneously give control instructions to multiple interfaces (I/O terminal, RS-232C, Ethernet Communication (TCP/IP), EtherNet/IP communication, test key operation). However, when a control instruction is being received from one interface, instructions from other interfaces cannot be received.

List of applicable PLC models

Refer to each PLC instruction manual for the corresponding PLC setting procedures.

PLC manufactured by KEYENCE

KV Series

PLC model	EtherNet/IP Communication unit	Firmware version	Software used	Version of software used
KV-3000	KV-EP21V	Ver. 2 or later	KV STUDIO	Ver. 6.0 or later
KV-5000	KV-EP21V	Ver. 2 or later		
KV-5500	-(Built-in port or KV-EP21V)	Ver. 2 or later		

PLC manufactured by Rockwell Automation

Control Logix / Compact Logix

PLC model	EtherNet/IP Communication unit	Firmware version	Software used	Version of software used
1756 ControlLogix	1756-ENBT/1756-EN2T	Ver. 13 or later	RsLogix5000	Ver. 13 or later
1769 CompactLogix	-(Built-in port)	Ver. 13 or later		

SLC5/05 category PLC

PLC model	EtherNet/IP Communication unit	Firmware version	Software used	Version of software used
1761/1766 MicroLogix	-(Built-in port)/ 1761-NET-ENI	Series A, Revision A, FRN1	RsLogix500	Ver. 7.10 or later
1762/1763/1764 MicroLogix	1761-NET-ENI			

PLC manufactured by Omron

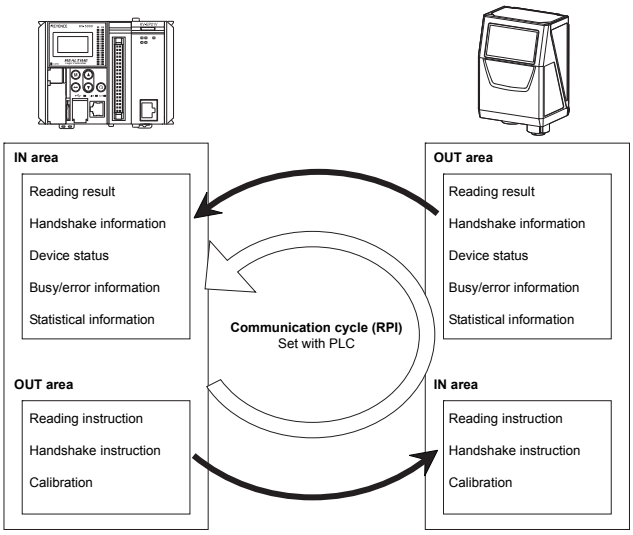
PLC model	EtherNet/IP Communication unit	Firmware version	Software used	Version of software used
SYSMAC CJ2	-(CJ2 built-in port or CJ1W-EIP21)	Ver. 1.0 or later	CX-One	Ver. 3.0 or later
SYSMAC CJ1	CJ1W-EIP21	Ver. 1.0 or later		
SYSMAC CS1	CS1W-EIP21	Ver. 1.0 or later		

11-2 Cyclic communication SR-750

This section describes the SR-750 Series cyclic communication setting procedures and functions.

SR-750 Series cyclic communication

When cyclic communication is performed in the SR-750 Series using EtherNet/IP, SR-750 series functions are assigned to the PLC devices. Use the function allocated to each device according to the intended usage.



NOTICE	• **Communication settings such as cyclic communication's communication cycle and data size are performed in the PLC. When there is a large load in the network which connects many devices including EtherNet/IP devices, delays or packet loss may occur. Perform a thorough verification before operation.** • **When performing EtherNet/IP communication with PLCs (SLC5/05 MicroLogix Series manufactured by Rockwell, etc.) that do not support cyclic communication, use message communication.**

Cyclic communication setting procedures

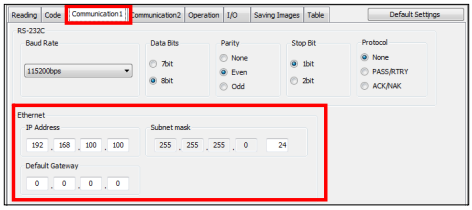
This section describes the setting procedures when performing cyclic communication.

SR-750 Series settings

For the SR-750 Series, use the AutoID Network Navigator and perform the following settings.

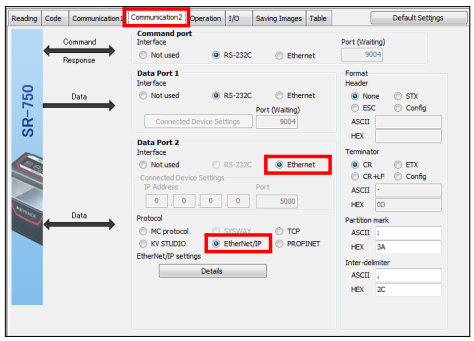
1 Communication 1 tab

- IP address setting
- Subnet mask setting
- Default gateway setting



2 Communication 2 tab

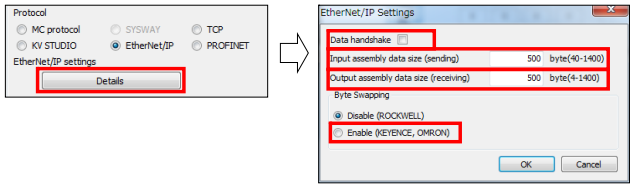
- Set the PLC communication interface and protocol.
  Interface : Ethernet
  Protocol : EtherNet/IP



3 PLC communication's EtherNet/IP settings

Click the EtherNet/IP setting button, open the EtherNet/IP setting screen, and perform the following settings.

- Data size : Set "maximum result data size + 44 bytes" or more.
- Data handshake : Put a check on this when performing a handshake process.
- Data area byte swap : The storage order of data memory (Read result data/Preset data) can be changed.
  Disable: Writes data in an ascending order.
  Enable: Writes data in a descending order.



PLC settings

■ About PLC settings

When performing cyclic communication, perform the following settings in the PLC.

(1) Settings for the connection used

(2) Device settings used in cyclic communication
(For setting procedures, refer to the manual of each PLC.)
* When using the KV Series, making a selection within KV STUDIO will automatically set (1) and (2).

■ Connection used

Open a connection from the scanner using EtherNet/IP during cyclic communication.
There are various types of connections. Usable connections vary depending on the device.
Connections that the SR-750 Series can use are as follows:

Connection type	Data type	Instance ID	Size (byte)	RPI (ms)
Exclusive Owner (Data transmission + control)	Result data (Input Assemblies)	0X64(100)	40 to 1400	10 to 10000
	Control data (Output Assemblies)	0X65(101)	8 to 1400	
Input Only (Data transmission only)	Result data (Input Assemblies)	0X64(100)	40 to 1400	10 to 10000
	Control data (Output Assemblies)	0XFE(254)	0	

- **Exclusive Owner**
  This connection can perform the following communications.
  - PLC → SR-750 ..... Control instruction
  - SR-750 → PLC ..... Data Send

  Use this connection to send read data of SR-750, and also when PLC performs control instruction to SR-750 such as start of reading.
  Multiple "Exclusive Owner" connections cannot be used for a single unit of SR-750.

- **Input Only**
  This connection can perform the following communications.
  - SR-750 → PLC..... Data Send

  This connection is used only when sending read data of SR-750.
  Multiple "Input only" connections can be used for a single unit of SR-750. (Max. 16)
  For multiple PLCs to receive data transmission from a single SR-750, set the PLCs as follows.
  * Each connection's trigger timing is performed through cyclic. The SR-750 Series connection type supports both Point to Point and Multicast.
  * When using the KV series, the connection names are assigned as follows.
    1: Exclusive Owner ⇒result data / control data Class1
    2: Input-Only ⇒result data Class1(Input-Only)

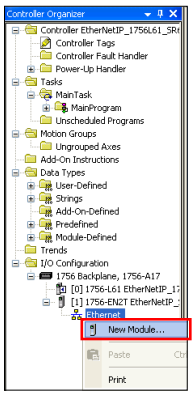
KV-5500 Series settings

Information regarding connection for KV-5500 and SR-D100 has been prepared.
Download the information from KEYENCE homepage.

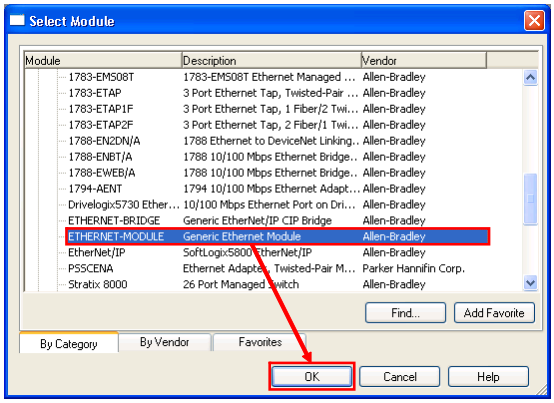
Control/Compact Logix Series settings

The following is the procedure for registering the SR-750 Series in EtherNet/IP communication using Control Logix.
Compact Logix can also be set using the same operation.

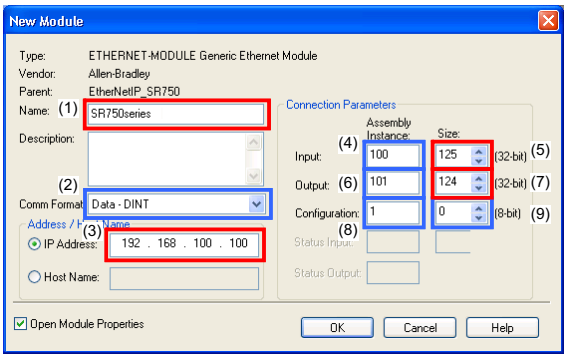
1 Right-click the EtherNet/IP enabled device on the RSLogix5000 and select New Module.



2 Click the Communications' [+] button, select ETHERNET-MODULE (Generic Ethernet Module), and click OK.



3 Set the ETHERNET-MODULE as follows:



(1) Name	: Optional setting
(2) Comm Format	: Optional setting *1
(3) IP Address	: SR-750 Series IP address setting
(4) Input (Assembly Instance)	: 100 (fixed)… Input the instance ID of result data (Input Assemblies) in decimal number.
(5) Input (Size)	: SR-750 Series Input assembly size setting *4
(6) Output (Assembly Instance)	: 101 (fixed)… Input the instance ID of control data (Output Assemblies) in decimal number.
(7) Output (Size)	: SR-750 Series Output assembly size setting *2*4
(8) Configuration	: 1*3
(9) Configuration Size	: 0*3

*1 This can be optionally set. However, considering the structure of the assembly object, it is much easier to program if it set to a format in which 4-byte alignment is possible.
*2 When operating using Input Only, set (6) to 254 and (7) to 0.
*3 The SR-750 Series does not use Configuration. However, input the above value since not doing so will result in an incomplete input error.
*4 Input assembly size for the SR-750 Series is set in 8 bits (1-byte unit), the size for RSLogix5000 is set in 32 bits (4-byte unit).
When setting, make sure that the SR-750 Input assembly size and Output assembly size are the same or more of the values for (5) and (7).

CJ Series settings

1 Set the PLC network communication.
Using the CX-Developper, make the communication settings of PLC's IP address, etc.

2 Set the EtherNet/IP network configuration for PLC and SR-750.
Using Network Configurator, set the network configuration.
* The EDS file for the SR-750 is in the [AutoID Network Navigator] - [EDS] folder of SR-H4W.

3 Register the transmission area tag and the reception area tag for PLC.
Right-click the PLC icon on Network Configurator, select [Parameter] – [Edit], enter the [Edit device parameter] setting screen, and edit the tag.

4 Make the setting to relate the PLC tag with the SR-750 tag.
Register the device on the [Edit device parameter] setting screen and make the connection assignment setting.
Transfer the configuration parameters to the PLC to complete the setting.

[Setting example]
Connection I/O type: Class1

Originator device (PLC)			Target device (SR-750)	
Input tag set	E0_00000 - [500byte]	⇦	Output tag set	Input_100 - [500byte]
Connection type	Multi-cast connection			
Output tag set	D00000 - [500byte]	⇨	Input tag set	Output_101 - [500byte]
Connection type	Point to Point connection			

* For operation details of CX-Developper and Network Configurator, see "SYSMAC CS/CJ Series EtherNet/IP Unit User's Manual" published by Omron.

Cyclic communication data assignment

Data assignment during cyclic communication is performed as follows.

Result data (Input Assemblies)

Input Assemblies is a device that write responses from the SR-750 Series to the PLC.
When using this device, each device function is assigned as follows.
Device status, Result Data, etc. are written to the Input Assemblies.

■ Input Assemblies memory map (Instance ID: 0x64)

SR-750 → PLC

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0				ERR BUSY	MODE BUSY	LOCK BUSY	TRG BUSY	BUSY	General Error	Buffer Overflow Error				Read Data Update Complete	Read Data Update Available	Error
1	External Instruction Operation Failure				Tuning Failure	Preset Data Registration Failure	Preset Reading Failure	Reading Error	External Instruction Operation Complete				Tuning Complete	Preset Data Registration Complete	Preset Reading Complete	Reading Complete
2				SAE AS9132 Unstable	AIM DPM Unstable	ISO/ IEC15415 Unstable	Matching Level Unstable	Unstable		OUT3 Status	OUT2 Status	OUT1 Status			IN2 Status	IN1 Status
3																
4									Matching Level							
5									ISO/IEC15415 Grade							
6									AIM DPM Grade							
7																
8	Reading Error Cause															
9	Preset Reading Failure Cause															
10	Preset Data Registration Failure Cause															
11	Tuning Failure Cause															
12																
13																
14																
15	External Instruction Operation Error Cause															
16	General Error Cause															
17	Slave ID															
18	Read Data Ready Count															
19	Read Data Update Count															
20	Trigger input count for master															
21	Read Data Size															
22 and above	Read Data															

Gray parts are reserved areas for the system.

Control data (Output Assemblies)

Output Assemblies is a device that write instructions from the PLC to the SR-750 Series.
When using this device, each device function is assigned as follows.
Output Assemblies performs device control instructions, error clear, handshake process, etc.

■ Output Assemblies memory map (Instance ID: 0x65)

PLC → SR-750

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0					Tuning Start Request	Preset Data Registration Start Request	Preset Reading Start Request	Reading Start Request	Error Clear Transmission Buffer Clear						Read Data Update Permitted	
1									External Instruction Operation Complete Clear				Tuning Complete Clear	Preset Data Registration Complete Clear	Preset Reading Complete Clear	Reading Complete Clear
2	Bank number/BLOAD file number															
3																
4																
5	Preset Data Size															
6 and above	Preset Data															

Gray parts are reserved areas for the system.

Parameter details of result data (Input Assemblies)

Input Assemblies (Address 0, Bit 0 to Bit 7) Handshake and error status

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0																

Address	Bit	Name	Description	Data contents
0	0	Error	This Bit turns ON when either "6 Buffer Overflow Error" or "7 General Error" Bit is ON.	0 : No error 1 : Error
0	1	Read Data Update Available	This Bit is used when using handshake.* This displays whether read data exists or not.	0 : No read data 1 : Read data available
0	2	Read Data Update Complete	This Bit is used when using handshake.* This turns ON when read data update is complete.	0→1: Result data update complete
0	6	Buffer Overflow Error	This turns ON when buffer overflow error occurs.	0 : No error 1 : Error
0	7	General Error	This turns ON when errors other than buffer overflow error occur. If this turns ON, the error code is output to "Address 16 General Error Cause".	0 : No error 1 : Error

* Handshake is a communication procedure to make the permission system for read data writing.
* If there are multiple read codes, use handshaking in the multi head mode of the master/slave function.

Input Assemblies (Address 0, Bit 8 to Bit 13) BUSY status

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0																

Address	Bit	Name	Description	Data contents
0	8	BUSY	This Bit turns ON when any of the following BUSY Bits (9 to 13) is ON.	0 : - 1 : BUSY status
0	9	TRG BUSY	TRG BUSY	0 : - 1 : TRG BUSY status
0	10	LOCK BUSY	LOCK BUSY	0 : - 1 : LOCK BUSY status
0	11	MODE BUSY	MODE BUSY	0 : - 1 : MODE BUSY status
0	12	ERR BUSY	ERR BUSY	0 : - 1 : ERR BUSY status

Input Assemblies (Address 1, Bit 0 to Bit 7) Completion status

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1																

Address	Bit	Name	Description	Data contents
1	0	Reading Complete	This turns ON when reading is complete.*1	0 : - 1 : Complete*2
1	1	Preset Reading Complete	This turns ON when preset reading is complete.	0 : - 1 : Complete*2
1	2	Preset Data Registration Complete	This turns ON when preset data registration is complete.	0 : - 1 : Complete*2
1	3	Tuning Complete	This turns ON when tuning is complete.	0 : - 1 : Complete*2
1	7	External Instruction Operation Complete	This turns ON when "Reading", "Preset reading" or "Tuning" is performed with the IN terminal or command and the operation is complete.	0 : - 1 : Complete*2

*1 This Bit also turns ON when the character string of "ERROR" is output when reading error occurs.
*2 This returns to 0 when turning the applicable clear Bit ON or at next operation.

▶ Important

After "1 Preset Reading Complete", "2 Preset Data Registration Complete" or "3 Tuning Complete", wait 5 seconds or more and start reading operation. If reading operation starts before 5 seconds elapse, it does not operate normally.
In the multi head mode of the master/slave function, the "Reading Complete" bit remains OFF.

Input Assemblies (Address 1, Bit 8 to Bit 15) Error status

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1																

Address	Bit	Name	Description	Data contents
1	8	Reading Error	This turns ON when reading error or comparison NG occurs.	0 : - 1 : Reading error, Comparison NG*
1	9	Preset Reading Failure	This turns ON when preset reading fails.	0 : - 1 : Preset reading failure*
1	10	Preset Data Registration Failure	This turns ON when preset data registration fails.	0 : - 1 : Preset data registration failure*
1	11	Tuning Failure	This turns ON when tuning fails.	0 : - 1 : Tuning failure*
1	15	External Instruction Operation Failure	This turns ON when "Reading", "Preset reading" or "Tuning" is performed with the IN terminal or command and the operation fails.	0 : - 1 : External instruction operation failure*

* If any of the above errors occurs, the error code is output to "Failure cause status (Input Assemblies address 8 to 16)".

Input Assemblies (Address 2, Bit 0 to Bit 6) Terminal status

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
2																

Address	Bit	Name	Description	Data contents
2	0	IN1 Status	This represents IN1 terminal status.	0 : OFF 1 : ON
2	1	IN2 Status	This represents IN2 terminal status.	0 : OFF 1 : ON
2	4	OUT1 Status	This represents OUT1 terminal status.	0 : OFF 1 : ON
2	5	OUT2 Status	This represents OUT2 terminal status.	0 : OFF 1 : ON
2	6	OUT3 Status	This represents OUT3 terminal status.	0 : OFF 1 : ON

* The above chart shows the contents when the input polarity setting of the SR-750 is Norm. open (normally open).
  For Norm. closed (normally closed), the data is reversed as 0: ON 1: OFF.
* For assigning functions to terminals, refer to "3-6 Multi-I/O Function".

Input Assemblies (Address 2, Bit 8 to Bit 12) Judgment result status for matching level and code quality verification function

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
2																

Address	Bit	Name	Description	Data contents
2	8	Unstable	This Bit turns ON when any of the following Unstable Bits (9 to 12) is ON.	0 : Stable 1 : Unstable
2	9	Matching Level Unstable	Matching level judgment result	0 : Stable 1 : Unstable
2	10	ISO/IEC15415 Unstable	ISO/IEC15415 verification judgment result	0 : Stable 1 : Unstable
2	11	AIM DPM Unstable	ISO/IEC TR 29158 (AIM DPM-1-2006) verification judgment result	0 : Stable 1 : Unstable
2	12	SAE AS9132 Unstable	SAE AS9132 Unstable verification judgment result	0 : Stable 1 : Unstable

* Use this status when the code quality verification function of SR-750 is enabled. For the code quality verification function settings, refer to "3-12 Code quality verification function".
  In the multi head mode of the master/slave function, the matching level and the status of the code quality verification function cannot be used.

Input Assemblies (Address 17, 20) Master/slave

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
17																
20																

Address	Bit	Name	Description	Data contents	Data type
17		Slave ID	The ID of the reader to which the most recent data was written is displayed.	0 to 31	UINT
20		Trigger input count for master	The trigger input count for the master unit (ID: 0) is displayed.	0 to 65535*	UINT

* These are used in the multi head mode of the master/slave function.
* If the count is 65535, it will be reset to 0 when the next read data arrives.

Input Assemblies (Address 4 to 6) Total evaluation grade for matching level and code quality verification function

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
4																
5																
6																

Address	Bit	Name	Description	Data contents	Data type
4		Matching Level	Matching Level * If multiple codes are read, the minimum value is output.	0 to 100	UINT
5		ISO/IEC15415 Grade	Total evaluation grade for ISO/IEC15415 verification	4 : A 3 : B 2 : C 1 : D 0 : F	UINT
6		AIM DPM Grade	Total evaluation grade for ISO/IEC TR 29158 (AIM DPM-1-2006)	4 : A 3 : B 2 : C 1 : D 0 : F	UINT

* Use this status when the code quality verification function of SR-750 is enabled.
  For the code quality verification function settings, refer to "3-12 Code quality verification function".

Input Assemblies (Address 8 to 16) Failure cause status

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
8																
9																
10																
11																
15																
16																

Address	Bit	Name	Description	Data contents	Data type
8		Reading Error Cause	When any of the error statuses (Input Assemblies Address 1, Bit 8 to Bit 15) turns on, the error code is output to the applicable location.	Error code*	UINT
9		Preset Reading Failure Cause			UINT
10		Preset Data Registration Failure Cause			UINT
11		Tuning Failure Cause			UINT
15		External Instruction Operation Error Cause			UINT
16		General Error Cause			UINT

For error codes, refer to List of error codes (Page 141).

Input Assemblies (Address 18 to 19) Read data status

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
18																
19																

Address	Bit	Name	Description	Data contents	Data type
18		Read Data Ready Count	Read Data Ready Count	0 to 65535*	UINT
19		Read Data Update Count	Read Data Update Count	0 to 65535*	UINT

* When the count number reaches 65535 and the next data arrives, the count number returns to 0.

Input Assemblies (Address 21 or above) Read data

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
21																
22																
⋮																

Address	Bit	Name	Description	Data contents	Data type
21		Read Data Size	Read data length	0 and above*	UINT
22 and above		Read Data	Read Data	Read data*	BYTE[]

* When the header, terminator and append data are set to the read data of SR-750, the header, terminator, append data and inter-delimiter are also output. [CR] has been set to the terminator as the default setting. Accordingly, [CR] is appended after the read data for output.
* If the silent mode is set for SR-750, read data is not output.
* [NUL]0x00 is appended to the end of result data.

Parameter details of control data (Output Assemblies)

Output Assemblies (Address 0, Bit 1 to Bit 7) Handshake/Clear bit

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0																

Address	Bit	Name	Description	Data contents
0	1	Read Data Update Permitted	This Bit is used when using handshake. This displays whether read data exists or not.	0→1: Writing read data is permitted. 1→0: -
0	7	Error Clear Transmission Buffer Clear	The following Bits of Input Assemblies are cleared. • Buffer Overflow Error • General Error • Read Result Ready Count • Result Data Update Count • Read data stored in the transmission buffer of the SR-750 Series	0 : No read data 1 : Read data available

Output Assemblies (Address 0, Bit 8 to Bit 11) Reading start request/Each operation instruction

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0																

Address	Bit	Name	Description	Data contents
0	8	Reading Start Request	The SR-750 Series starts reading. *1	0→1: Reading start 1→0: Reading stop
0	9	Preset Reading Start Request	Preset reading starts.	0→1: Preset reading start 1→0: Preset reading stop
0	10	Preset Data Registration Start Request	Specified preset data is registered to Address 5, 6 and above.*2	0→1: Preset data registration start 1→0: -
0	11	Tuning Start Request	Tuning starts.*3	0→1: Tuning start 1→0: Tuning stop

*1 When specifying a bank, specify "Address 2 Bank number"
*2 Preset data can be deleted by setting "1" for Address 5, setting "0xFF" for Address 6 and then registering the preset data.
*3 Before starting tuning, specify "Address 2 Bank number".
If the bank number is illegal, a tuning error occurs.

Point

Exclusive control of reading Start/each operation instruction
For reading Start/each operation instruction, priority is given to the operation performed first. An error will occur if another operation is performed during operation.

Output Assemblies (Address 1, Bit 0 to Bit 7) Completion bit clear

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1																

Address	Bit	Name	Description	Data contents
1	0	Reading Complete Clear	"Reading Complete" Bit of Input Assemblies is cleared.*	0→1: Bit clear
1	1	Preset Reading Complete Clear	"Preset Reading Complete" Bit of Input Assemblies is cleared.*	0→1: Bit clear
1	2	Preset Data Registration Complete Clear	"Preset Data Registration Complete" Bit of Input Assemblies is cleared.*	0→1: Bit clear
1	3	Tuning Complete Clear	"Tuning Complete" Bit of Input Assemblies is cleared.*	0→1: Bit clear
1	7	External Instruction Operation Complete Clear	"External Instruction Operation Complete" Bit of Input Assemblies is cleared.*	0→1: Bit clear

* When Complete Bits are cleared, Error/Failure Bits of each operation are also cleared.

Output Assemblies (Address 2) Bank number

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
2																

Address	Bit	Name	Description	Data contents	Data type
2		Bank Number	Input a bank number here and start reading. Then, reading is performed with the parameter bank specified. Input a bank number here and start tuning. Then, the tuning result is stored to the specified parameter bank.	Parameter bank number: 1 to 10*	UINT

* If inputting a parameter bank number other than 1 to 10 to start reading, then the alternate reading is performed.
* If inputting a parameter bank number other than 1 to 10 to start tuning, then an error occurs.

Output Assemblies (Address 5 and above) Preset data

Address	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
5																
6																
⋮																

Address	Bit	Name	Description	Data contents	Data type
5		Preset Data Size	Preset data length	0 and above	UINT
6 and above		Preset Data	Preset data is specified. (Terminator is not necessary.)	Preset data	BYTE[]

List of error codes

Error code	Type of error	Error description
0	No error	-
100 to 199	Command error	Values with 100 added to the "Command communication response error code" (page 9-4) are applicable.
201	Reading error	Reading failed.
202	Comparison error	The read data did not match the preset data.
210	Tuning failure	The code could not be found within the field of view while tuning.
213	Tuning failure	Tuning was aborted.
120	Operation instruction error	Another operation instruction was received during operation. In this case, the incoming instruction is not performed.
102	Bank number error	The parameter bank number specification is invalid. Example: A number other than 01 to 16 is specified in tuning operation.
220	Preset data error	The preset data specification is invalid. Example: The specified preset data size is invalid when preset data is registered.
230	EIP data update error	Read data larger than the specified size in the cyclic communication was received.

Cyclic communication operation procedures

The SR-750 Series offers two trigger input measurement methods: "Level trigger" and "One-shot trigger".
Refer to "4-2 Timing Mode (Page 42)"

This section describes the SR-750 Series cyclic communication operation procedures for each trigger input measurement method.
The following timing chart and operation descriptions use Output Assemblies "Read Start Request" (Address 0 Bit 8) for read start instruction of the SR-750 Series. The procedure without handshake is used for description.

Level trigger operation procedure

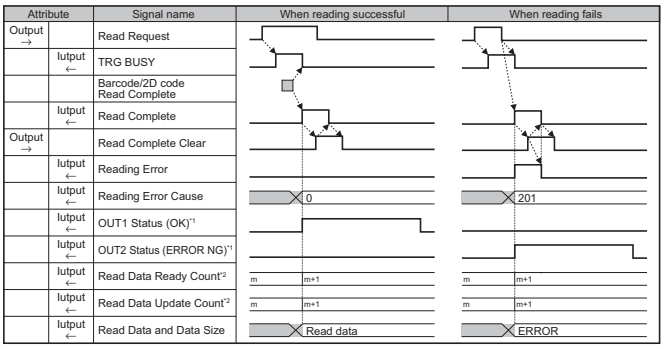
This section describes the example when the trigger input measurement method of the SR-750 Series is set to the level trigger.

■ Timing chart

The attributes (signal directions) are described using the following directions.

Iutput ← : PLC←SR-750

Output → : PLC→SR-750



*1 Operations of OUT1 status and OUT2 status are described using the default settings of the SR-750 Series operation and multi I/O.

*2 The read data ready count value and read data update count value may differ depending on the operation status and communication frequency.
For example, when a code is read and then the next reading is complete before updating the PLC data is complete, the result data load count value will have one more count value.

■ When reading is successful

1 When "Read Request" of PLC turns OFF (0)→ON (1), the SR-750 Series starts reading operation and turns "TRG BUSY" ON (1).

2 The SR-750 Series operates as follows when reading a code.

- It turns "TRG BUSY" OFF(0) and "Read Complete" ON (1), and then writes the reading error cause to "Reading Result".
- It writes the output data and number of characters of output data to "Read Data" and "Read Data Size".

* When reading is successful, the reading error cause is "0" (No error).

3 When "Read Complete" of the SR-750 Series is ON (1), turn "Read Complete Clear" of PLC ON (1).

4 When "Read Complete Clear" of PLC turns ON (1), the SR-750 Series turns "Read Complete" OFF (0). When "Read Complete" OFF (0) is confirmed, turn "Read Complete Clear" of PLC OFF (0).

■ When reading fails

1 When "Read Request" of PLC turns OFF (0)→ON (1), the SR-750 Series starts reading operation and turns "TRG BUSY" ON (1).

2 When "Read Request" of PLC turns OFF (0) before the SR-750 Series read the code, the SR-750 Series operates as follows.

- It turns "TRG BUSY" OFF (0) and "Read Complete" and "Reading Error" ON (1), and then writes the "Reading Error Cause".
- It writes the output data and number of characters of output data to "Read Data" and "Read Data Size".

* When reading error occurs, "201" is written to "Reading Error Cause".

3 When "Read Complete" of the SR-750 Series is ON (1), turn "Read Complete Clear" of PLC ON (1).

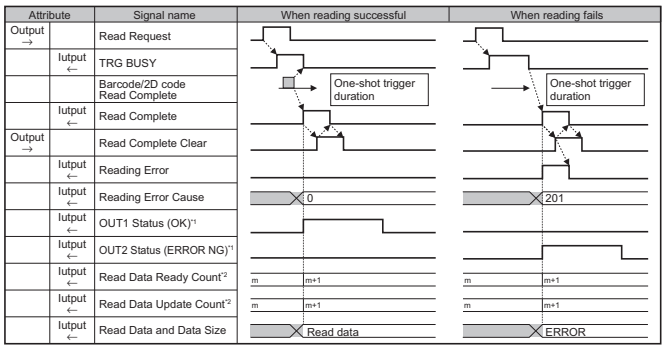
4 When "Read Complete Clear" of PLC turns ON (1), the SR-750 Series turns "Read Complete" and "Reading Error" OFF (0).
When "Read Complete" OFF (0) is confirmed, turn "Read Complete Clear" of PLC OFF (0).

NOTICE	**When [Read Request] is turned ON/OFF at high speed while the EtherNet/IP cyclic cycle (RPI) is slow, the change of rising/falling of [Read Request] may not be transmitted to the SR-750 Series.**

One-shot trigger operation procedure

This section describes the example when the trigger input measurement method of the SR-750 Series is set to the one-shot trigger.

■ Timing chart



*1 Operations of OUT1 status and OUT2 status are described using the default settings of the SR-750 Series operation and multi I/O.

*2 The read data ready count value and read data update count value may differ depending on the operation status and communication frequency.
For example, when a code is read and then the next reading is complete before updating the PLC data is complete, the result data ready count value will have one more count value.

■ When reading is successful

1 When "Read Request" of PLC turns OFF (0)→ON (1), the SR-750 Series starts reading operation and turns "TRG BUSY" ON (1).

2 The SR-750 Series operates as follows when reading a code within the specified one-shot time.

- It turns "TRG BUSY" OFF(0) and "Read Complete" ON (1), and then writes the read operation result code to "Read Result Code".
- It writes the output data and number of characters of output data to "Result Data" and "Result Data Size".

* When reading is successful, the reading error cause is "0" (No error).

3 When "Read Complete" of the SR-750 Series is ON (1), turn "Read Complete Clear" of PLC ON (1).

4 When "Read Complete Clear" of PLC turns ON (1), the SR-750 Series turns "Read Complete" OFF (0).
When "Read Complete" OFF (0) is confirmed, turn "Read Complete Clear" of PLC OFF (0).

■ When reading fails

1 When "Read Request" of PLC turns OFF (0)→ON (1), the SR-750 Series starts reading operation and turns "TRG BUSY" ON (1).

2 When the one-shot time elapses before the SR-750 Series read the code, the SR-750 Series operates as follows.

- It turns "TRG BUSY" OFF (0) and "Read Complete" and "Reading Error" ON (1), and then writes the "Reading Error Cause".
- It writes the output data and number of characters of output data to "Read Data" and "Read Data Size".

* When reading error occurs, "201" is written to "Reading Error Cause".

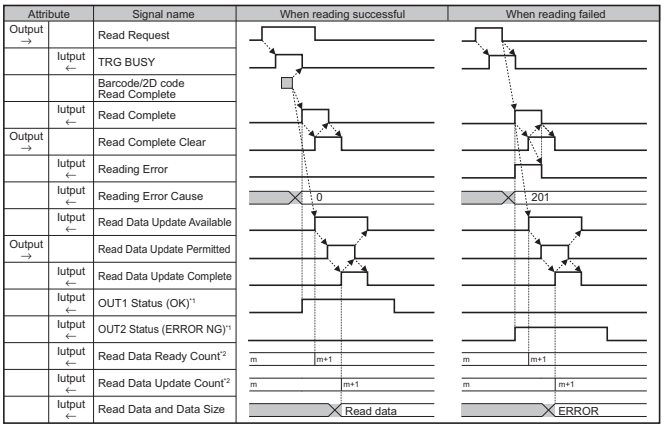
3 When "Read Complete" of the SR-750 Series is ON (1), turn "Read Complete Clear" of PLC ON (1).

4 When "Read Complete Clear" of PLC turns ON (1), the SR-750 Series turns "Read Complete" and "Reading Error" OFF (0).
When "Read Complete" OFF (0) is confirmed, turn "Read Complete Clear" of PLC OFF (0).

Data processing procedure using the handshake process

This section describes the data processing procedure using the handshake process.
The following procedure is described using the example when the trigger input measurement method of the SR-750 Series is set to the level signal trigger.

■ Timing chart



*1 Operations of OUT1 status and OUT2 status are described using the default settings of the SR-750 Series operation and multi I/O.
*2 The read data ready count value and read data update count value may differ depending on the operation status and communication frequency.
For example, when a code is read and then the next reading is complete before updating the PLC data is complete, the result data ready count value will have one more count value.

■ Data processing flow

1 When "Read Request" of PLC turns OFF (0)→ON (1), the SR-750 Series starts reading operation and turns "TRG BUSY" ON (1).

2 The SR-750 Series operates as follows when reading a code.
- It turns "TRG BUSY" OFF (0) and "Read Complete" ON (1), and then writes the read operation result code to "Read Result Code".
- It turns "Read Data Update Available" ON (1).
- * When reading is successful, the reading error cause is "0" (No error).

3 When "Read Complete" of the SR-750 Series is ON (1), turn "Read Complete Clear" of PLC ON (1).

4 When "Read Complete Clear" of PLC turns ON (1), the SR-750 Series turns "Read Complete" OFF (0).
When "Read Complete" OFF (0) is confirmed, turn "Read Complete Clear" of PLC OFF (0).

5 If "Read Data Update Available" of the SR-750 Series is ON (1), turn "Read Data Update Permitted" ON (1).

6 When "Read Data Update Permitted" of PLC turns ON (1), the SR-750 Series operates as follows.
- It turns "Read Data Update Complete" ON (1).
- It writes the read data and read data length to "Read Data" and "Read Data Size".
  (If append data has been set, the append data and delimiter are also included.)

7 When "Read Data Update Complete" of the SR-750 Series turns ON (1), process the obtained result data on PLC and turn "Read Data Update Permitted" OFF (0).

8 When "Read Data Update Permitted" of PLC turns OFF (0), the SR-750 Series turns "Read Data Update Available" and "Read Data Update Complete" OFF (0).

NOTICE	**The SR-750 Series is equipped with the send buffer of 10 KB. Even if the data processing on the PLC is unfinished, the next reading operation is possible. (Operations 1 to 5 are possible.) When the next result data is ready on the SR-750 Series, even if "Read Data Update Permitted" of PLC changes ON (1) → OFF(0), "Read Data Update Available" of the SR-750 Series maintains ON (1) status without changing to OFF (0).** **Repeat turning "Read Data Update Permitted" of PLC ON (1)/OFF (0) until "Read Data Update Available" turns OFF (0). Or, send the transmission buffer clear command (BCLR) from the command port and delete data in the transmission buffer.**

11-3 Message Communication

SR-750

This section describes how to use message communication.

Message communication (Explicit message)

Message communication overview

Message communication is a function that uses objects and services (Service Code) prepared in the EtherNet/IP device and then issues and transmits commands arbitrarily. Message communication is used for applications such as reading and writing adaptor device settings.
There are established standard items, as well as device specific items in the objects and services in message communication.
The SR-750 Series uses specific objects and services and can perform operations such as parameter reading/writing and resetting.

Reference The SR-750 Series message communication function is compatible with UCMM (unconnected type) and CLASS 3 (connected type).

Objects and services

In message communication, data are sent and received using objects and services.
When services for SR-750 Series objects are executed, data output, settings reading, and specified operations are executed.

Message communication basic format and process flow

During message communication, the EtherNet/IP scanner and the SR-750 Series communicate by sending and receiving Explicit messages. The following shows a basic example of sent Explicit message command formats and response formats returned from the SR-750 Series.

Commands

The following are the command formats sent from the EtherNet/IP scanner to the SR-750 Series.

■ Command formats

Item	Description
Service code	Specifies the Service.
Class ID	Specifies the Class ID according to service.
Instance ID	Specifies the Instance ID according to service.
Attribute ID	Specifies the Attribute ID according to service.
Service data	Specifies the Service Data according to service.

Responses

The following are the response formats sent from the SR-750 Series to the EtherNet/IP scanner.

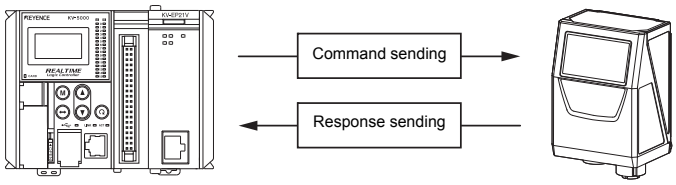
■ Response formats

Item	Description
General status (1 byte)	Returns the General Status in response to the command. Returns 00H when operation is successful.
Additional status (2 bytes)	Returns Additional Status.
Service response	Returns the result data in response to the command.

Message communication operation

Operation of the SR-750 Series

This section introduces some operations that are available when using message communication.



Commands are sent from the scanner to execute services for the SR-750 Series.
The SR-750 Series sends back a response as a service execution result.
The service code, class ID, instance ID, and attribute ID is specified in the command and then sent.
The setting value (service data) is necessary when writing parameters.

Command	Response
Service code Class ID Instance ID Attribute ID Service data	General status Additional status Service response data

* The attribute ID and service data may not be necessary depending on the command used.
Service response data may not be generated depending on the command used.

Message communication setting procedure

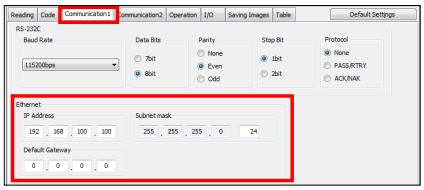
This section describes the setting procedure when performing message communication with the SR-750 Series.

SR-750 Series settings

■ SR-750 Series settings

1 Communication 1 tab

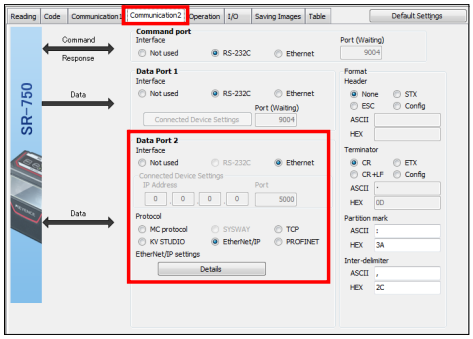
- IP address setting
- Subnet mask setting
- Default gateway setting



2 Communication 2 tab

Set the PLC port interface and protocol.

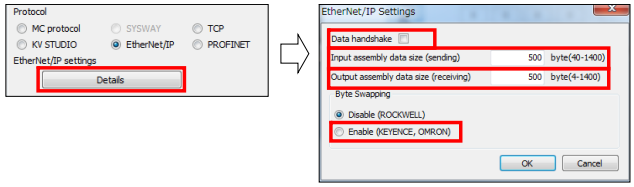
- Interface : Ethernet
- Protocol : EtherNet/IP



3 PLC port's EtherNet/IP settings

Click the "EtherNet/IP setting" button, open the EtherNet/IP setting screen, and perform the following settings.

- Data handshake : Put a check on this when performing a handshake process.
- Data size : Set to maximum read data size + 44 bytes or more.
- Data area byte swap : Specify the byte swap for the result data area and user data area.
  Disable : Retrieves data in an ascending order.
  Enable : Retrieves data in a descending order.



Point

The storage order of the data memory can be changed by changing the availability of the data area's byte swap. By using this function, storing data is made possible so that program processing can be performed easily for PLC data memories of various brands.

SR-750 Series object configuration

Objects that the SR-750 Series can use are as follows:

■ Object configuration

Class ID	Object name	Description	Reference page
105 (0x69)	SR AutoID Reader Object*	Object which delivers the SR-750 Series status and parameter writing/reading.	133 Page
1 (0x01)	Identity Object	Object which delivers general information, main unit reset, etc.	134 Page

* The SR AutoID Reader Object is not an object within EtherNet/IP standards but rather it is an object that KEYENCE developed to make the SR-750 Series easier to operate.

How to decipher the SR-750 Series object table

Reading the object table (attribute)

(1) Instance ID	(2) Attribute ID	(3) Name	(4) Response parameter	
			Data Type	Description
1 (0x01)	108 (0x6C)	IN/OUT Status	UINT	bit0: IN1 Status bit1: IN2 Status bit4: OUT1 Status bit5: OUT2 Status bit6: OUT3 Status

Item	Description
(1) Instance ID	The instance ID is shown in decimal (hexadecimal).
(2) Attribute ID	The attribute ID is shown in decimal (hexadecimal).
(3) Name	Denotes the attribute name.
(4) Response parameter	Displays the receiving parameter's data type and each parameters description.

Reading the object table (service)

(1) Instance ID	(2) Service code	(3) Service data		(4) Name	(5) Description
		Data type	Data		
1 (0x01)	0x4B	UINT	Bank Number	Read Start	Starts reading.

Item	Description
(1) Instance ID	The instance ID is shown in decimal (hexadecimal).
(2) Service code	The service code is shown in decimal (hexadecimal).
(3) Service data	Displays the type of the service data and service data description.
(4) Name	Displays the service name.
(5) Description	Displays the service function description.

Data type

The data types are defined as follows.

Data type	Description	Range	
		Min.	Max.
BOOL	Boolean	0: FALSE	1: TRUE
SINT	Short integer	-128	127
INT	Integer	-32768	32767
DINT	Double precision integer	-2^{31}	$2^{31}-1$
LINT	Long integer	-2^{63}	$2^{63}-1$
USINT	Unsigned short integer	0	255
UINT	Unsigned integer	0	65535
UDINT	Unsigned double precision integer	0	$2^{32}-1$
ULINT	Unsigned long integer	0	$2^{64}-1$
String	String (1 byte/character)	-	-
SSTRING	String (1 byte/character)	-	-
BYTE	Bit sequence: 8-bit	-	-
WORD	Bit sequence: 16-bit	-	-
DWORD	Bit sequence: 32-bit	-	-
LWORD	Bit sequence: 64-bit	-	-

SR-750 Series Object Details

This section describes the SR-750 Series object configuration.

SR AutoID Reader Object (Class ID: 105 (0x69))

This object delivers the SR-750 Series connected status and device writing/reading.
This is an object specific to the SR-750 Series.

■ Attributes

The SR AutoID Reader Object supports the following attributes.

Instance ID	Attribute ID	Name	Response parameter	
			Data	Description
1 (0x01)	100 (0x64)	Read Status	UINT	bit0 : Error bit1 : Result Data Available bit2 : Result Data Strobe bit3 to 5 : Reserved bit6 : Buffer Overflow Error bit7 : General Error bit8 : BUSY bit9 : TRG BUSY bit10 : LOCK BUSY bit11 : MODE BUSY bit12 : ERR BUSY bit13 : FILE BUSY bit14 to 15 : Reserved
			UINT	bit0 : Read Complete bit1 : Read Failure
			UINT	bit0 : Unstable bit1 : Matching Level Unstable bit2 : ISO/IEC 15415 Unstable bit3 : AIM DPM Unstable bit4 : SAE AS9132 Unstable
			UINT	Read Result Code
	101 (0x65)	Preset Status	UINT	bit0 : Error bit1 : Result Data Available bit2 : Result Data Strobe bit3 to 5 : Reserved bit6 : Buffer Overflow Error bit7 : General Error bit8 : BUSY bit9 : TRG BUSY bit10 : LOCK BUSY bit11 : MODE BUSY bit12 : ERR BUSY bit13 : FILE BUSY bit14 to 15 : Reserved
			UINT	bit0 : Preset Complete bit1 : Preset Failure bit2 to 15 : Reserved
			UINT	Reserved
			UINT	Preset Result Code
	102 (0x66)	Register Preset Data Status	UINT	bit0 : Error bit1 : Result Data Available bit2 : Result Data Strobe bit3 to 5 : Reserved bit6 : Buffer Overflow Error bit7 : General Error bit8 : BUSY bit9 : TRG BUSY bit10 : LOCK BUSY bit11 : MODE BUSY bit12 : ERR BUSY bit13 to 15 : Reserved
			UINT	bit0 : Register Preset Data Complete bit1 : Register Preset Data Failure bit2 to 15 : Reserved
			UINT	Reserved
			UINT	Register Preset Data Result Code
	103 (0x67)	Tune Status	UINT	bit0 : Error bit1 : Result Data Available bit2 : Result Data Strobe bit3 to 5 : Reserved bit6 : Buffer Overflow Error bit7 : General Error bit8 : BUSY bit9 : TRG BUSY bit10 : LOCK BUSY bit11 : MODE BUSY bit12 : ERR BUSY bit13 to 15 : FILE BUSY
			UINT	bit0 : Tune Complete bit1 : Tune Failure bit2 to 15 : Reserved
			UINT	Reserved
			UINT	Tune Result Code

Instance ID	Attribute ID	Name	Response parameter	
			Data	Description
1 (0x01)	107 (0x6B)	EXT. Request Status	UINT	bit0 : Error bit1 : Result Data Available bit2 : Result Data Strobe bit3 to 5 : Reserved bit6 : Buffer Overflow Error bit7 : General Error bit8 : BUSY bit9 : TRG BUSY bit10 : LOCK BUSY bit11 : MODE BUSY bit12 : ERR BUSY bit13 to 15 : Reserved
			UINT	bit0 : EXT. Request Complete bit1 : EXT. Request Failure bit2 to 15 : Reserved
			UINT	bit0 : Unstable bit1 : Matching Level Unstable bit2 : ISO/IEC 15415 Unstable bit3 : AIM DPM Unstable bit4 : SAE AS9132 Unstable
			UINT	EXT. Request Result Code
	108 (0x6C)	IN/OUT Status	UINT	bit0 : IN1 Status bit1 : IN2 Status bit2 to 3 : Reserved bit4 : OUT1 Status bit5 : OUT2 Status bit6 : OUT3 Status bit7 to 15 : Reserved
	109 (0x6D)	Statistics	UINT	Read (Comparison) OK Count
			UINT	Comparison NG Count
			UINT	Read Error Count
			UINT	Stable Reading Count
			UINT	Read Input Count
			UINT	Reserved
	110 (0x6E)	Result Data Count	UINT	Result Data Ready Count
			UINT	Result Data Update Count
	111 (0x6F)	General Error Code	UINT	General Error Code
	112 (0x70)	Read (Comparison) OK Count	UINT	Read (Comparison) OK Count
	113 (0x71)	Comparison NG Count	UINT	Comparison NG Count
	114 (0x72)	Read Error Count	UINT	Read Error Count
	116 (0x74)	Read Input Count	UINT	Read Input Count
	128 (0x80)	Result Data Ready Count	UINT	Result Data Ready Count
	129 (0x81)	Result Data Update Count	UINT	Result Data Update Count

Instance ID	Service code	Attribute ID	Name	Response parameter	
				Data	Description
1 (0x01)	Get_ Attribute_ Single 14 (0x0E)	144 (0x90)	Unstable Inspect Configuration	UINT	bit0 : Matching Level Inspect Valid bit1 : ISO/IEC15415 Inspect Valid bit2 : AIM DPM Inspect Valid bit3 : SAE AS9132 Inspect Valid bit4 to 7 : Reserve
	Set_ Attribute_ Single 16 (0x10)	145 (0x91)	Matching Level Threshold	UINT	99 to 00
		146 (0x92)	ISO/IEC15415 Threshold	UINT	0: Disabled 1(D) to A(4)
		147 (0x93)	AIM DPM Threshold	UINT	0: Disabled 1(D) to A(4)
	Get_ Attribute_ Single 14 (0x0E)	152 (0x98)	Matching Level	UINT	100 to 00
		153 (0x99)	ISO/IEC15415 Grade	UINT	4(A) to 0(F)
		154 (0x9A)	AIM DPM Grade	UINT	4(A) to 0(F)

■ Service

The SR AutoID Reader Object supports the following services.

Instance ID	Service code	Service data	Name	Description
		Data type: Data		
1 (0x01)	14 (0x0E)	-	Get_Attribute _Single	Obtains the attribute's one item.
	16 (0x10)	-	Set_Attribute_ Single	Obtains the attribute's one item.
	75 (0x4B)	UINT: Bank Number	Read Start	Starts reading.
	76 (0x4C)	-	Read Stop	Stops reading.
	77 (0x4D)	-	Preset Start	Starts preset data reading.
	78 (0x4E)	-	Preset Stop	Stops preset data reading.
	79 (0x4F)	UINT: Preset Data Size BYTE[]: Preset Data	Register Preset Data	Registers preset data. Preset data can be deleted when Size is (1) and Data is (0xFF).
	80 (0x50)	-	Tune Start	Starts calibration.
	81 (0x51)	-	Tune Stop	Stops calibration.
	83 (0x53)	-	Error Clear	Clears the error.
	84 (0x54)	-	EXT. Request Complete Clear	Clears the operation status from the external command.
	85 (0x55)	UINT: Result Data Size UINT: Offset	Get Result Data	Acquires read data. Response data UINT : Result Data Size UINT : Rest Result Data Size BYTE[] : Result Data
	86 (0x56)	-	Sequence Reset	Clears the following information: • Result Data Ready Count • Result Data Update Count • Main unit statistical information • Buffering data • Sequence bit
	87 (0x57)	-	Lock	Sets the operation lock command.
	88 (0x58)	-	Unlock	Sets the operation unlock command.
	90 (0x5A)	-	Read Complete Clear	Clears the Read Complete and Read Failure bits.
	91 (0x5B)	-	Preset Complete Clear	Clears the Preset Complete and Preset Failure bits.
	92 (0x5C)	-	Register Preset Data Complete Clear	Clears the Register Preset Data Complete and Register Preset Data Failure bits.
	93 (0x5D)	-	Tune Complete Clear	Clears the Tune Complete and Tune Failure bits.

Identity Object (Class ID: 1 (0x01))

This object is used to acquire equipment information.
The SR-750 Series offers the hardware reset service.

■ Service

The Identity Object supports the following services.

Instance ID	Service code	Service data	Name	Description
		Data (Data type)		
1	5 (0x05)	-	Reset	Performs hardware reset.

SR-750 Series typical operation examples

(1) Start reading (Read Start)
Gives the command to start reading for the SR-750 Series.

Command details		Response details (normal termination)	
Class ID	: 105 (0x69)	General status	: None
Instance ID	: 1	Additional status	: None
Service code	: 75 (0x4B)	Service data	: None
Attribute ID	: None		
Service data			
UINT	: Bank No.		

(2) Stop reading (Read Stop)
Gives the command to stop reading for the SR-750 Series.

Command details		Response details (normal termination)	
Class ID	: 105 (0x69)	General status	: None
Instance ID	: 1	Additional status	: None
Service code	: 76 (0x4C)	Service data	: None
Attribute ID	: None		
Service data	: None		

(3) Preset reading start (Preset start)
Gives the command to start preset reading for the SR-750 Series.

Command details		Response details (normal termination)	
Class ID	: 105 (0x69)	General status	: None
Instance ID	: 1	Additional status	: None
Service code	: 77 (0x4D)	Service data	: None
Attribute ID	: None		
Service data	: None		

(4) Preset reading stop (Preset Stop)
Gives the command to stop preset reading for the SR-750 Series.

Command details		Response details (normal termination)	
Class ID	: 105 (0x69)	General status	: None
Instance ID	: 1	Additional status	: None
Service code	: 78 (0x4E)	Service data	: None
Attribute ID	: None		
Service data	: None		

(5) Preset data registration
Performs the preset data registration command for the SR-750 Series.

Command details		Response details (normal termination)	
Class ID	: 105 (0x69)	General status	: None
Instance ID	: 1	Additional status	: None
Service code	: 79 (0x4F)	Service data	: None
Attribute ID	: None		
Service data			
UINT	: Data size		
BYTE[494]	: Data		

* Sets the data size to 1 and the data to 0xFF. If sent, preset data can be cleared.

(6) Calibration instructions
Gives the command to start reading for the SR-750 Series.

Command details		Response details (normal termination)	
Class ID	: 105 (0x69)	General status	: None
Instance ID	: 1	Additional status	: None
Service code	: 80 (0x50)	Service data	: None
Attribute ID	: None		
Service data			
UINT	: Bank No.		

(7) Stop calibration
Gives the command to stop reading for the SR-750 Series.

Command details		Response details (normal termination)	
Class ID	: 105 (0x69)	General status	: None
Instance ID	: 1	Additional status	: None
Service code	: 81 (0x51)	Service data	: None
Attribute ID	: None		
Service data	: None		

(8) Get result data
Acquires the SR-750 Series operation results.

Command details		Response details (normal termination)	
Class ID	: 105 (0x69)	General status	: None
Instance ID	: 1	Additional status	: None
Service code	: 85 (0x55)	Service data	
Attribute ID	: None	UINT	: Result Data Size
Service data		UINT	: Rest Result Data Size
UINT	: Data size	BYTE[]	: Result Data
UINT	: Offset		

(9) Get attribute (Get_Attribute_Single)
Acquires the SR-750 Series attribute value.

Command details		Response details (normal termination)	
Class ID	: Class ID	General status	: None
Instance ID	: Instance ID	Additional status	: None
Service code	: 14 (0x0E) *Get_Attribute_Single	Service data	: Attribute parameter
Attribute ID	: Attribute ID		
Service data	: None		

11-4 Reference Program

SR-750

This section introduces a reference program when performing communication using EtherNet/IP on the SR-750 Series.

Reference Program

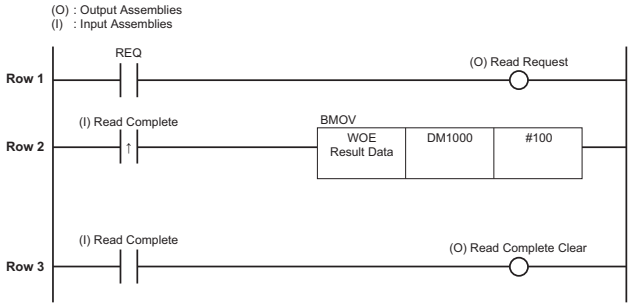
This section introduces a reference program when performing communication using EtherNet/IP on the SR-750 Series.
During actual operation, perform programming while taking error processing into account.

[Cyclic communication] without handshake

This is a reference program when using the setting without handshake in EtherNet/IP setting on AutoID Network Navigator.

■ For the KV Series

Reference program chart



Description of the reference program

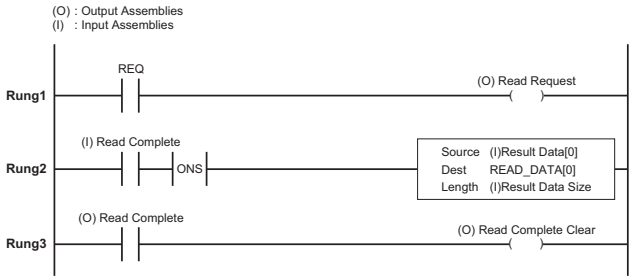
Row 1 : This starts Read Request and starts reading.
Row 2 : When Result Complete is ON, the data written to Result Data are copied to DM1000.
Row 3 : When Read Complete is ON, Read Complete Clear turns ON.

■ For the Control Logix/Compact Logix (RSLogix 5000)

Description of tags used in the sample

Name	Data type	Description
REQ	BOOL	Bit to order to start/stop reading
READ_DATA	SINT[256]	Memory to store read data

Reference program chart



Description of the reference program

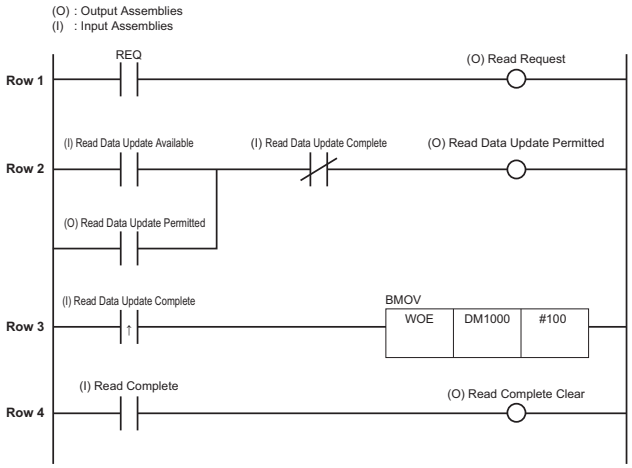
Rung1: This starts Read Request and starts reading.
Rung2: With the rising of Result Complete, the data written to Result Data are copied to DM1000.
Rung3: When Read Complete is ON, Read Complete Clear turns ON.

[Cyclic communication] with handshake

This is a reference program to start/stop reading or load data by using the cyclic communication with handshake.

■ For the KV Series

Reference program chart



Description of the reference program

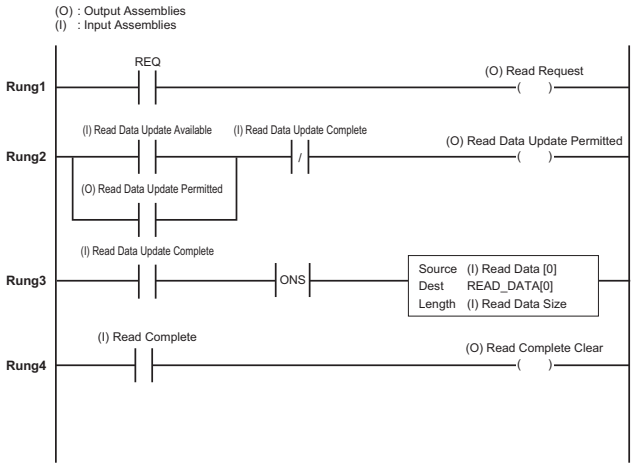
Row 1 : When the timing (REQ) signal turns ON, Read Request turns ON.
Row 2 : When Read Data Update Available turns ON and Read Data Update Complete turns OFF, Read Data Update Permitted turns ON.
Read Data Update Permitted is self-retained.
* Read Data Update Available turns ON when read data is buffered to SR-750.
Row 3 : When Read Data Update Complete turns ON, the data for the specified bytes are transferred from read data to DM1000.
* Read Data Update Complete turns ON when writing read data from SR-750 to PLC is complete.
Row 4 : When Read Complete is ON, Read Complete Clear turns ON.

■ For the Control Logix/Compact Logix (RSLogix 5000)

Description of tags used in the sample

Name	Data type	Description
REQ	BOOL	Bit to order to start/stop reading
READ_DATA	SINT[256]	Memory to store read data

Reference program chart



Description of the reference program

Rung1: When the timing (REQ) signal turns ON, Read Start Request turns ON.
Rung2: When Read Data Update Available turns ON and Read Data Update Complete turns OFF, Read Data Update Permitted turns ON.
Read Data Update Permitted is self-retained.
* Read Data Update Available turns ON when read data is buffered to SR-750.
Rung3: When Read Data Update Complete turns ON, read data is transferred to READ_DATA.
* Read Data Update Complete turns ON when writing read data from SR-750 to PLC is complete.
Rung4: When Read Complete is ON, Read Complete Clear turns ON.

[Message communication] with handshake

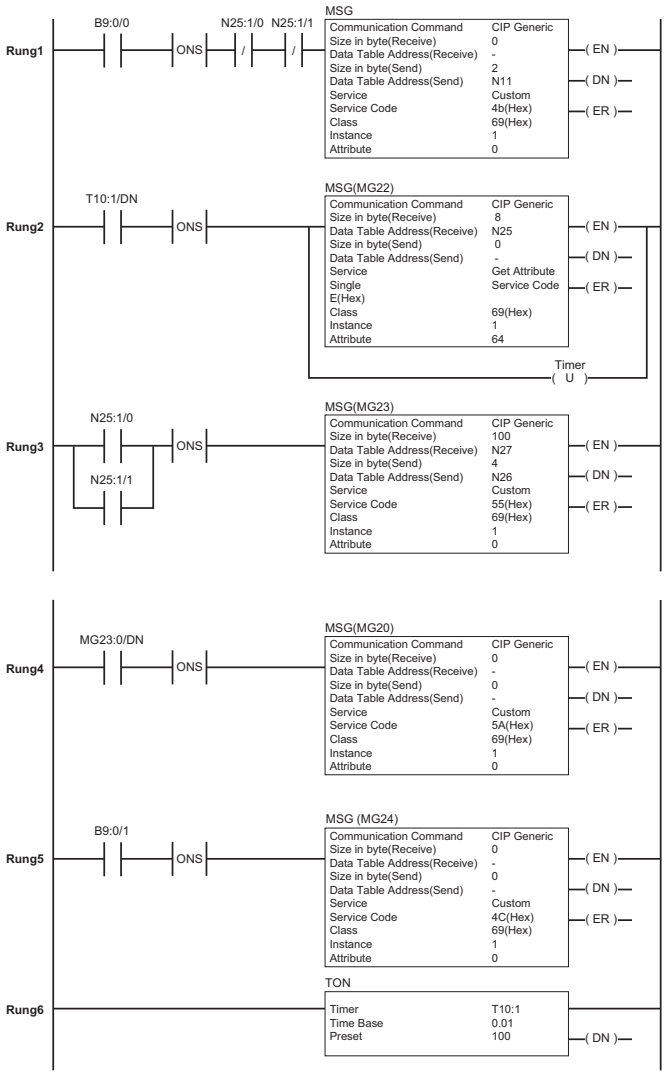
This is a reference program to start/stop reading or load data in message communication.

■ For the Micro Logix (RSLogix 500)

Description of tags used in the sample

Name	Data type	Description
B9:0/0	Binary	Bit to order to start/stop reading
T10	Timer	Timer
N11	Integer	Memory that stores Bank No.
MG20	Message	Message to perform Read Complete Clear
MG21		Message to perform Read Start
MG22		Message to perform Get Attribute Single for Read Status
MG23		Message to perform Get Result Data
MG24		Message to perform Read Stop
N25	Integer	Memory that stores Get Attribute Single result of MG22
N26	Integer	Message command to receive the result data
N27	Integer	Memory that stores Get Result Data result of MG23
RIX30	Extended Routing Information	Extended Routing Information for MG20
RIX31		Extended Routing Information for MG21
RIX32		Extended Routing Information for MG22
RIX33		Extended Routing Information for MG23
RIX34		Extended Routing Information for MG24

Reference program chart



Description of the reference program

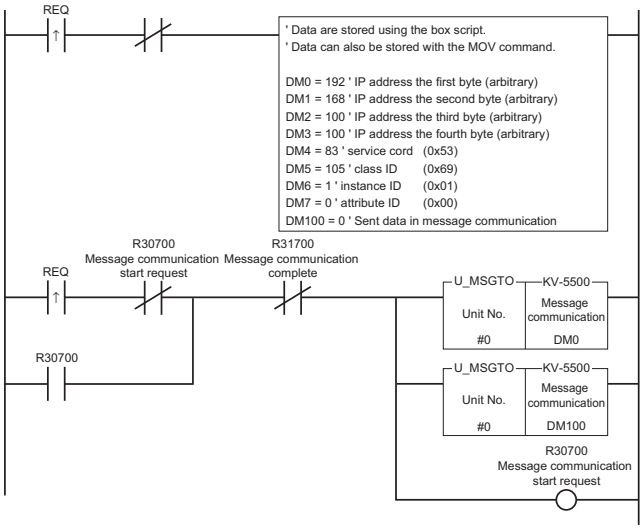
Rung1: When Read Complete and Read Failure are OFF, the read start message is sent at the rising of B9:0:0.
Rung2: For each timeout of the timer, Get Attribute Single is performed for Read Status.
The result is written to Read Status Res.
Rung3: At the rising of either Result Status Res[1].0(Read Complete) or 1(Read Failure), Get Result Data is performed.
The result is written to Read Data Res.
Rung4: Read Complete Clear is performed.
Rung5: This starts B9:0/1 and sends the read end message.
Rung6: The timer is being performed to perform Rung2.

[Message communication] Buffer Overflow Error and General Error occurred.

This is a reference program to disable Buffer Overflow Error and General Error using the message communication.

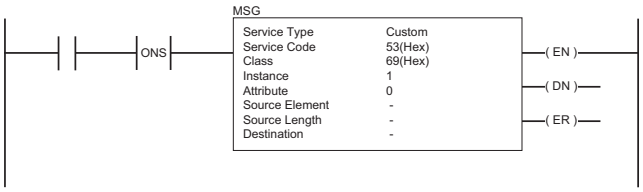
■ For the KV Series

Reference program chart



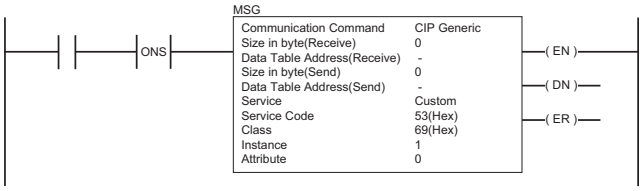
■ For the Control Logix/Compact Logix (RSLogix 5000)

Reference program chart



■ For the Micro Logix (RSLogix 500)

Reference program chart



Point

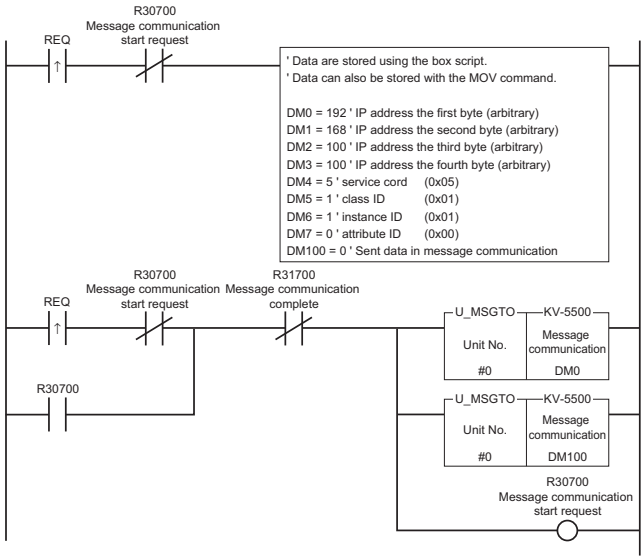
With this operation, the Error Clear operation is performed for the SR-750.
Buffer Overflow Error and General Error are cleared, and the result data within Result Data Available, Result Data Strobe and SR-750 are cleared.
When performing using the cyclic communication, the operation will become the same by setting the Error Clear bit to ON.

[Message communication] Hardware reset processing

This is a reference program for hardware reset (restart) in message communication.

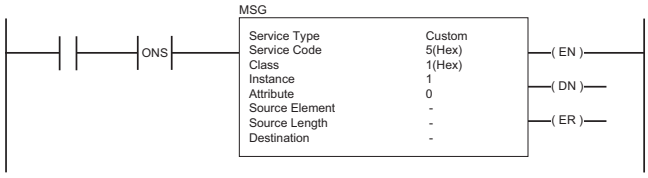
■ For the KV Series

Reference program chart



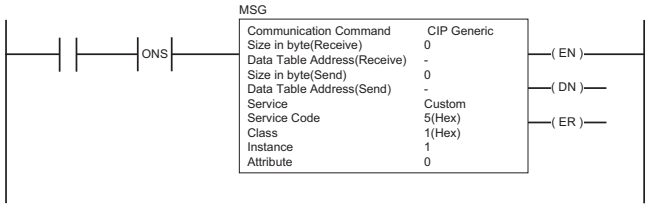
■ For the Control Logix/Compact Logix (RSLogix 5000)

Reference program chart



■ For the Micro Logix (RSLogix 500)

Reference program chart



Point

With this operation, the software reset operation can be performed for the SR-750.
This operation returns the SR-750 Series to the state when the power is turned on.
This operation cannot be performed in cyclic communication.

12-1 PROFINET

SR-750

PROFINET is the open communication standard specified by PI (PROFIBUS & PROFINET International). PROFINET compatible devices can communicate regardless of vendor. The SR-750 Series is compliant with Conformance Class A. Also, the SR-750 Series supports cyclic communication.

Cyclic communication

Cyclic communication enables high-speed control at several ms to several tens of ms intervals by communicating at update time interval. The SR-750 Series can be controlled by referring to and updating variables or devices within PLC without considering communication. This makes programs on the PLC side simpler.

▶ Important **When controlling the SR-750 Series, set the update time of cyclic communication to 8 ms or longer.**

SR-750 Series PROFINET function overview

Function	Description
Timing input control	Controls timing input ON/OFF. Timing input with the parameter bank specified is possible.
Preset data control	Read OK data can be set as preset data. Also, preset data can be registered or deleted from PLC.
Tuning	Tuning can be performed by specifying the parameter bank.
Data handshake	Whether to write read data to PLC can be controlled.
Error handling	Errors that occurred on the main unit can be checked. After eliminating error factors, the SR-750 Series can be restored from the error state.
Statistical information acquisition	Read count and read data update count can be checked.
Operation status acquisition	Read data can be acquired, and I/O status or marking verification result can be checked.

▶ Important **Maximum read length is 246 digits.**

Operation flow to start PROFINET communication

(1) Check specifications.

- Check if the PLC to be connected is compatible with PROFINET connection.
- Check the input and output data allocation status.

(2) Make the PROFINET communication setting for the SR-750 Series.

Make this setting for PROFINET connection of SR-750 Series.
Setting items: IP address, subnet mask, default gateway, PROFINET communication enable/disable, PROFINET device name, data handshake enable/disable

▶ Important **Set the PROFINET device name avoiding the same device name within the network.**
The PROFINET communication cannot be made with the temporary IP address set for the SR-750 Series. Be sure to set the IP address.
When "Send Configuration" is performed after setting PROFINET for the SR-750 Series, the SR-750 Series main unit restarts.

(3) Establish PROFINET communication.

When registering the SR-750 information to PLC, use the GSDML file of SR-750.

(4) Perform necessary tasks.

List of applicable PLC models

Siemens PLC

PLC series	Software used	Version of software used
S7-300	STEP 7	V5.5.0.0 and later versions
S7-400	STEP 7	V5.5.0.0 and later versions
S7-1200	STEP 7 Basic	Version V11Update 1

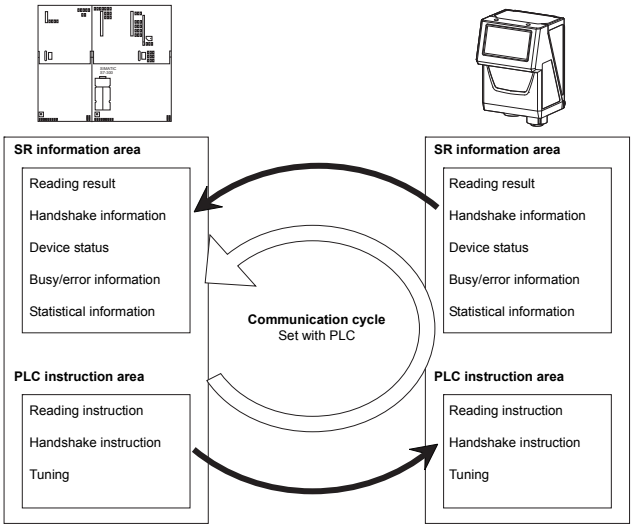
PROFINET device naming rule

1. PROFINET device name length: 1 to 240 characters
2. 1 label length: 1 to 63 characters
3. Only [a to z] (alphabet lower case) [0 to 9] (numbers), [-] (hyphen), [.] (period) can be used for a device name.
4. [-] (hyphen) cannot be used at the beginning of the label.
5. [-] (hyphen) cannot be used at the end of the label.
6. port-xyz, port-xyz-abcde cannot be the name of the first label.
   a, b, c, d, e, x, y, z means [0 to 9] (numbers)
7. Device names cannot be made in the IP address format (n.n.n.n n=0,…,999).
8. Labels cannot start with xn-.
9. The first character of labels cannot be a number.

12-2 Cyclic communication

SR-750

When cyclic communication is performed in the SR-750 Series using PROFINET, SR-750 series functions are assigned to the PLC devices. Use the function allocated to each device according to the intended usage.



▶ Important **Communication settings such as cyclic communication's communication cycle and data size are performed in the PLC. When there is a large load in the network which connects many devices including PROFINET devices, delays or packet loss may occur. Perform thorough verification before operation.**

SR information area (I address)

The SR information area is divided into areas as follows.

Bit area

In the following areas, information is divided by bit.
Information is represented with 0 or 1.

Slot	Size	Module name	Bit address	Name	Description	Data contents	Remarks
1	1 byte	Handshake and General Error Status Bits	0	Error	Error status indication	0 : No error 1 : Error	
			1	Result Data Available	Read data Transmission buffer retention status indication	0 : No read data 1 : Read data available	* Only when data handshake is enabled
			2	Result Data Strobe	Read data PLC update complete flag	0→1: Read data update complete 1→0: -	
			3	(Reserved)	Reserved area		
			4	(Reserved)	Reserved area		
			5	(Reserved)	Reserved area		
			6	Buffer Overflow Error	Buffer overflow error Cleared by Error Clear Bit	0 : No error 1 : Error	
			7	General Error	SR operation failure error Cleared by Error Clear Bit	0 : No error 1 : Error	

Slot	Size	Module name	Bit address	Name	Description	Data contents	Remarks
2	1 byte	BUSY Status Bits	0	BUSY	OR of each BUSY signal	0 : No BUSY status 1 : BUSY status	
			1	TRG BUSY	Main unit in TRG BUSY status	0 : No TRG BUSY status 1 : TRG BUSY status	
			2	LOCK BUSY	Main unit in LOCK BUSY status	0 : No LOCK BUSY status 1 : LOCK BUSY status	
			3	MODE BUSY	Main unit in MODE BUSY status	0 : No MODE BUSY status 1 : MODE BUSY status	
			4	ERR BUSY	Main unit in ERR BUSY status	0 : No ERR BUSY status 1 : ERR BUSY status	Cancellation is required.
			5	FILE BUSY	Main unit in FILE BUSY status	0 : No FILE BUSY status 1 : FILE BUSY status	
			6	(Reserved)	Reserved area		
			7	(Reserved)	Reserved area		
3	1 byte	Completion Status Bits	0	Read Complete	Read operation completion notification	0 : Incomplete 1 : Complete	This is cleared at the start of Clear Bit in each status or at the start of the next operation.
			1	Preset Complete	Preset read completion notification	0 : Incomplete 1 : Complete	
			2	Register Preset Data Complete	Preset data registration completion notification	0 : Incomplete 1 : Complete	
			3	Tune Complete	Tuning completion notification	0 : Incomplete 1 : Complete	
			4	(Reserved)	Reserved area		
			5	(Reserved)	Reserved area		
			6	(Reserved)	Reserved area		
			7	EXT. Request Complete	External instruction operation completion notification	0 : Incomplete 1 : Complete	1 is output when "Reading", "Preset reading" and "Tuning" are performed via external terminals or commands and results are obtained.
4	1 byte	Error Status Bits	0	Read Failure	Reading error notification	0 : - 1 : Reading error	The cause of failure can be checked with Read Result Code. This is cleared at the start of Read Complete Clear Bit or at the start of the next operation.
			1	Preset Failure	Preset reading error notification	0 : - 1 : Preset reading Error	The cause of failure can be checked with Preset Result Code. This is cleared at the start of Preset Complete Clear Bit or at the start of the next operation.
			2	Register Preset Data Failure	Preset data registration failure notification	0 : - 1 : Preset data registration failure	The cause of failure can be checked with Preset Data Result Code. This is cleared at the start of Register Preset Data Complete Clear Bit or at the start of the next operation.
			3	Tune Failure	Tuning failure notification	0 : - 1 : Tuning failure	The cause of failure can be checked with Tune Result Code. This is cleared at the start of Tune Complete Clear Bit or at the start of the next operation.
			4	(Reserved)	Reserved area		
			5	(Reserved)	Reserved area		
			6	(Reserved)	Reserved area		
			7	EXT. Request Failure	External instruction operation failure notification	0 : - 1 : External instruction operation failure	1 is output when "Reading", "Preset reading" and "Tuning" are performed via external terminals or commands and the operation fails. The cause of failure can be checked with EXT.Request Result Code. This is cleared at the start of EXT. Request Complete Clear Bit or at the start of the next operation.
5	1 byte	Terminal Status Bits	0	IN1 Status	Input terminal 1 status	0 : OFF 1 : ON	
			1	IN2 Status	Input terminal 2 status	0 : OFF 1 : ON	
			2	(Reserved)	Reserved area		
			3	(Reserved)	Reserved area		
			4	OUT1 Status	Output terminal 1 status	0 : OFF 1 : ON	
			5	OUT2 Status	Output terminal 2 status	0 : OFF 1 : ON	
			6	OUT3 Status	Output terminal 3 status	0 : OFF 1 : ON	
			7	(Reserved)			

Slot	Size	Module name	Bit address	Name	Description	Data contents	Remarks
6	1 byte	Unstable Read Status Bits	0	Unstable	Unstable reading status OR of each Unstable	0 : Stable 1 : Unstable	
			1	Matching Level Unstable	Matching level judgment result unstable	0 : Stable 1 : Unstable	
			2	ISO/IEC 15415 Unstable	ISO/IEC 15415 verification result unstable	0 : Stable 1 : Unstable	
			3	AIM DPM Unstable	ISO/IEC TR 29158 (AIM DPM) verification result unstable	0 : Stable 1 : Unstable	
			4	SAE AS9132 Unstable	SAE AS9132 verification result unstable	0 : Stable 1 : Unstable	
			5	(Reserved)	Reserved area		
			6	(Reserved)	Reserved area		
			7	(Reserved)	Reserved area		

*1 Handshake is a communication procedure to make the permission system for read data writing.
If there are multiple read data elements, use handshaking in the multi head mode of the master/slave function.
*2 In the multi head mode of the master/slave function, the "Read Complete" bit remains OFF.

Word area and byte area

In the following areas, information is represented with the following units.

- Word areas : Areas where 0 to 65535 is represented as a 2-byte unsigned integer
- Byte area : Areas where a character code such as ASCII code is represented

Slot	Size	Module name	Representation method	Name	Description	Data contents	Remarks
7	8 byte	Matching Level and Total Evaluation Grade Status	Word	Matching Level	Matching level	100 to 0	If multiple codes are read, the smallest value is displayed.
			Word	ISO/IEC15415 Grade	ISO/IEC15415 total evaluation grade	4 : A 3 : B 2 : C 1 : D 0 : F	
			Word	AIM DPM Grade	ISO/IEC TR 29158 (AIM DPM) total evaluation grade	4 : A 3 : B 2 : C 1 : D 0 : F	
			Word	(Reserved)	Reserved area		
8	20 byte	Operation Result Status	Word	Read Result Code	Reading operation result code	Error code	Refer to List of error codes.
			Word	Preset Result Code	Preset data read result code	Error code	
			Word	Register Preset Data Result Code	Preset data registration result code	Error code	
			Word	Tune Result Code	Tuning operation result code	Error code	
			Word	(Reserved)	Reserved area		
			Word	(Reserved)	Reserved area		
			Word	(Reserved)	Reserved area		
			Word	EXT. Request Result Code	External instruction operation result code	Error code	Refer to List of error codes.
			Word	General Error Code	General error code	Error code	
			Word	(Reserved)	Reserved area		
				Slave ID	The ID of the reader to which the most recent data was written is displayed.	0 to 31	This is only used with the master/slave function.
9	8 + (data size) byte	• Read Data 32Byte • Read Data 64Byte • Read Data 128Byte • Read Data 246Byte * Select one of them.	Word	Result Data Ready Count	Result data reception count		The number returns to 0 if it exceeds 65535.
			Word	Result Data Update Count	Result data update count		
			2	Trigger Input Count for Master	The trigger input count for the master unit (ID: 0) is displayed.	0 to 65535*	UNIT
			Word	(Reserved)	Reserved area		
			Word	Result Data Size	Result data size (byte)		
			• 32 bytes • 64 bytes • 128 bytes • 246 bytes	Result Data	Result data output (Array of bytes)	Result data output	• When append data has been set, the append data is output. • When the silent mode is set, this area is not updated. • NULL (0x00) is appended after result data.

*1 In the multi head mode of the master/slave function, the matching level and the status of the code quality verification function cannot be used.

PLC instruction area (Q address)

The PLC instruction area is divided into areas as follows.

Bit area

In the following areas, information is divided by bit.
Information is represented with 0 or 1.

Slot	Size	Module name	Bit address	Name	Description	Data contents	Remarks
10	1 byte	Latch and Error Clear Control Bits	0	(Reserved)	Reserved area		
			1	Result Data Latch	Result data update permitted	0→1: Writing to result data device permitted 1→0: -	This functions only when handshake is enabled.
			2	(Reserved)	Reserved area		
			3	(Reserved)	Reserved area		
			4	(Reserved)	Reserved area		
			5	(Reserved)	Reserved area		
			6	(Reserved)	Reserved area		
			7	Error Clear	Error clear	0→1: Error clear 1→0: -	The following error statuses and data are cleared. • Buffer Overflow Error • General error • Result data acquisition count • Result data update count • Result data stored in the transmission buffer
11	1 byte	Operation instruction Control Bits	0	Read Request	Reading start request	0→1: Start reading 1→0: Stop reading	When specifying the bank, specify to Bank Number module.
			1	Preset Request	Preset reading start request	0→1: Preset read start 1→0: Preset read stop	Reading not possible in the specified bank
			2	Register Preset Data Request	Preset data registration request	0→1: Preset data registration 1→0: -	Specify to User Data Size/User Data Module. When deleting preset data, set the user data size to 1, set the user data to 0xFF and register preset data.
			3	Tune Request	Tuning start request	0→1: Start tuning 1→0: Stop tuning	Specify the tuning target bank number to Bank Number module.
			4	(Reserved)	Reserved area		
			5	(Reserved)	Reserved area		
			6	(Reserved)	Reserved area		
			7	(Reserved)	Reserved area		
12	1 byte	Completion Clear Control Bits	0	Read Complete Clear	Reading complete clear	0→1: Complete clear 1→0: -	Read completion notification and read failure notification clear
			1	Preset Complete Clear	Preset reading complete clear	0→1: Complete clear 1→0: -	Preset read completion notification and preset read failure notification clear
			2	Register Preset Data Complete Clear	Preset data registration complete clear	0→1: Complete clear 1→0: -	Preset data registration completion notification and preset data registration failure notification clear
			3	Tune Complete Clear	Tuning complete clear	0→1: Complete clear 1→0: -	Tuning completion Notification and tuning failure notification clear
			4	(Reserved)	Reserved area		
			5	(Reserved)	Reserved area		
			6	(Reserved)	Reserved area		
			7	EXT. Request Complete Clear	External instruction operation complete clear	0→1: Complete clear 1→0: -	External instruction operation completion and external instruction operation failure notification clear

Word area and byte area

In the following areas, information is represented with the following units.
- Word areas : Areas where 0 to 65535 is represented as a 2-byte unsigned integer
- Byte area : Areas where a character code such as ASCII code is represented

Slot	Size	Module name	Bit address	Name	Description	Data contents	Remarks
13	2 byte	Parameter Bank Number	Word	Bank Number	Bank Number	1 to 10	Bank Number • For reading start request 1 to 10: Bank setting read Other than 1 to 10: Alternate read • For tuning start request 1 to 10: Tuning result storage bank Other than 1 to 10: Error
14	2 + (user data size) byte	• User Data 32byte • User Data 64byte • User Data 128byte • User Data 252byte * Select one of them.	Word	User Data Size	Preset data size		Specify preset data size.
			Bytes (preset data size)	User Data	Preset data		Specify preset data. (Terminator is not necessary.)

Error code

Error	Error code	Meaning
No error	0	Reading success/operation success
Reading error	201	Reading error
Comparison error	202	The read code does not match the preset data.
Tuning failure (Symbol unclear)	210	The code could not be found within the field of view while tuning.
Tuning failure (Aborted)	213	Tuning was aborted midway.
Control instruction reception error	120	Another operation instruction was received during operation. (Operation instruction is not performed.)
Bank No. error	102	The bank number specification is invalid (other than 1 to 16).
Preset data error	220	Preset data specification is invalid. (Specified size is outside the range.)
PROFINET data update error	230	Shortage of specified size (Result data and present data size is beyond the limit.)

13-1 Installing MultiMonitor SR-750

This section describes how to install, start and shut down the MultiMonitor.

Installation Procedure

This section assumes that MultiMonitor will be installed on a Windows 7-based computer with the following drive configuration:
Drive C: Hard disk drive
Drive E: DVD-ROM drive

1 Turn on the PC and start Windows.

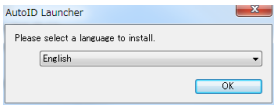
Important

- **To install AutoID Network Navigator, you need to log on as a user with the privileges to change the system, such as Administrator or Computer Administrator.**
- **Quit all active applications before starting the installation. The installation may take longer if antivirus software or other applications are active on the computer.**

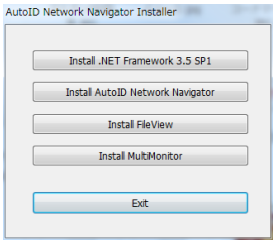
2 Insert the "AutoID Network Navigator DISC" into the DVD-ROM drive of the PC.

3 Select a language to install and press [OK].

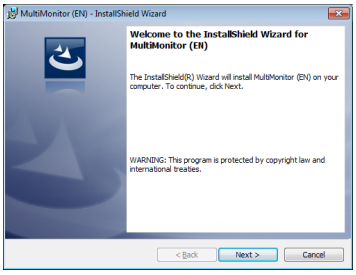
"The AutoID Network Navigator installer" will start.



4 Click [Install MultiMonitor].

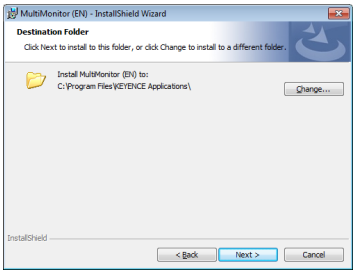


5 Click "Next".

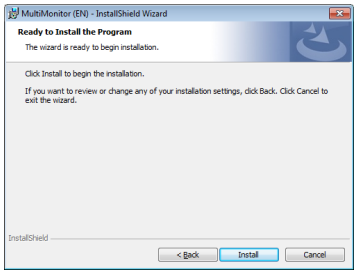


6 Click "Next".

[Destination Folder] is displayed. Click on the "Change" button to change to the folder in which the application will be installed.

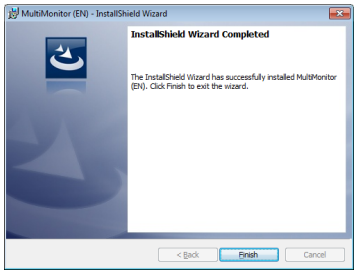


7 Click [Install].



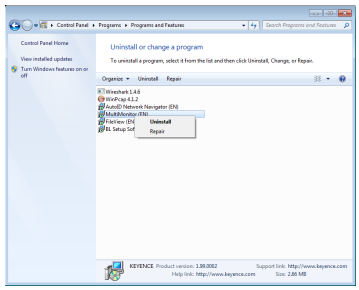
8 Click "Finish".

When the [InstallShield Wizard Completed] window appears, MultiMonitor install is complete.



■ Uninstall Method

From the Start menu, select [Control panel] - [Programs] - [Programs and Features] - [Uninstall or change a program], select the program to uninstall from the list, and click [Uninstall].



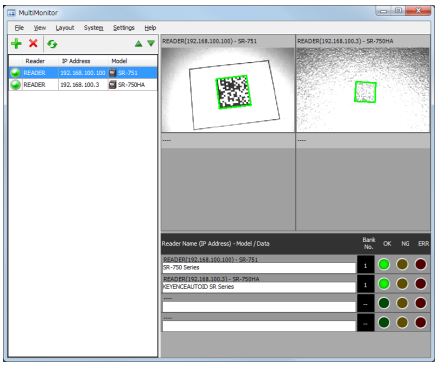
Startup Procedure

Start up MultiMonitor.

1 From the Start menu, select [Programs (P)] → [KEYENCE Applications] → [AutoID] → [MultiMonitor (EN)]. Or, double-click on the desktop.

2 The following window will appear.

If the SR-750 Series is within the same network, then this will be automatically detected.



Shutdown Procedure

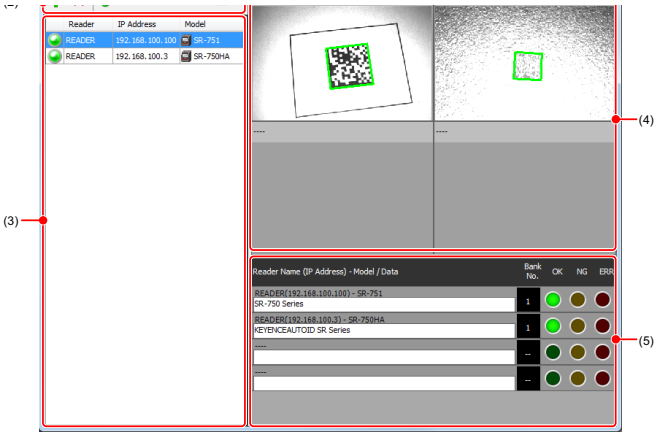
Shut down MultiMonitor.

1 Click the button at the right end of the title bar. Or, press the Alt + F4 keys.

The MultiMonitor will shut down.

13-2 Using MultiMonitor

Software for real time monitoring of the SR-750 Series. This can display up to 16 SR-750 Series at once.
This can be used as easy-to-understand monitoring software.



(1) Menu Bar

You can operate MultiMonitor functions and check software versions.

- View····· Change the display method of MultiMonitor.
  Reader list: Select from display/hide for the reader view.
  LiveView display: Select from display/hide for the LiveView area.
  Status display: Select from display/hide for the status area.
- Layout ····· Specify the number of devices displayed on the MultiMonitor.
- System ····· Register and delete the SR-750 Series.
- Settings ····· Select network cards, automatic search at start-up, and LiveView quality settings.
- Help ····· Confirm the version of MultiMonitor.
- File ····· Shut down MultiMonitor.

(2) System icon

Register in MultiMonitor, delete, and change the display order in the reader view.

(3) Reader view

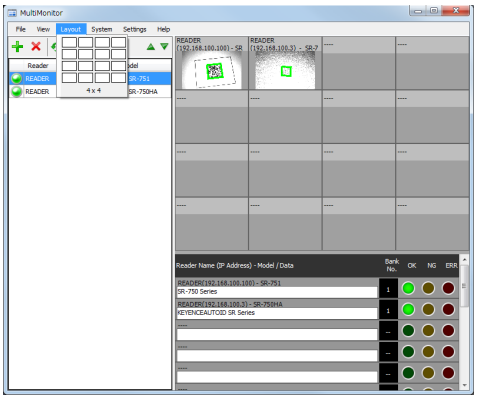
Display the SR-750 Series registered to the MultiMonitor.

- Right-clicking on any of the reader name, IP address, or model will enable selection of registration, deletion, or changing of configuration of the reader.
- Double-click the IP address to specify the IP address of the connected reader.
- Clicking the indicator to the left of the reader name will change the communication status between MultiMonitor and the SR-750 Series.

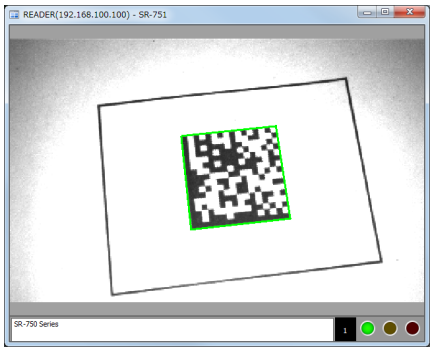
Lamp status	Description
	MultiMonitor and the SR-750 Series are communicating. This displays images in real time, and also displays read data.
	MultiMonitor and the SR-750 Series are not communicating.

(4) LiveView area

Confirm the images obtained with the SR-750 Series in real time.
From the menu bar, you can confirm the number of devices displayed. (1 to 16)
[Display illustrates 16 devices]



Double-clicking any of the images can enlarge the image.
[Enlarged image]



(5) Status area

Area that displays results data for the SR-750 Series.

■ Notes for MultiMonitor

- While AutoID Network Navigator is running, MultiMonitor cannot be started.
- While MultiMonitor is running, AutoID Network Navigator cannot be started.
- The SR-750 Series cannot be controlled from MultiMonitor

14-1 Installing FileView

SR-750

This section describes how to install, start and shut down the FileView.

Installation Procedure

This section assumes that FileView will be installed on a Windows 7-based computer with the following drive configuration:
Drive C: Hard disk drive
Drive E: DVD-ROM drive

1 Turn on the PC and start Windows.

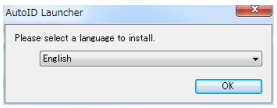
Important

- **To install AutoID Network Navigator, you need to log on as a user with the privileges to change the system, such as Administrator or Computer Administrator.**
- **Quit all active applications before starting the installation. The installation may take longer if antivirus software or other applications are active on the computer.**

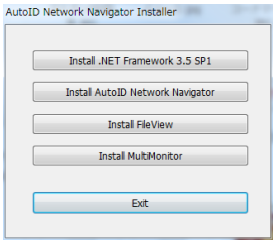
2 Insert the "AutoID Network Navigator DISC" into the DVD-ROM drive of the PC.

3 Select a language to install and press [OK].

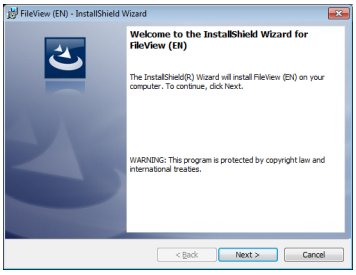
"The AutoID Network Navigator installer" will start.



4 Click [Install FileView].

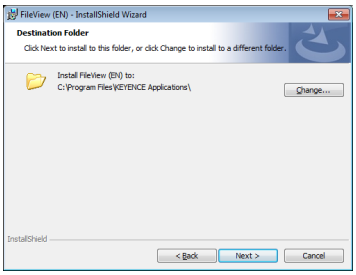


5 Click "Next".

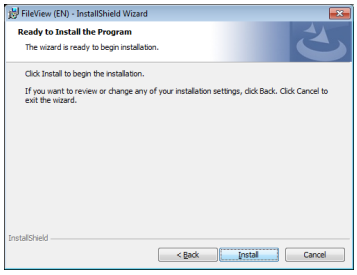


6 Click "Next".

[Destination Folder] is displayed. Click on the "Change" button to change to the folder in which the application will be installed.

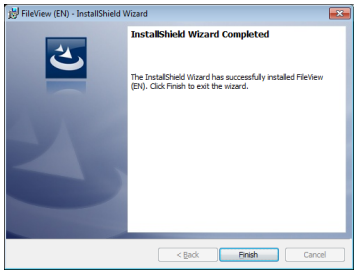


7 Click [Install].



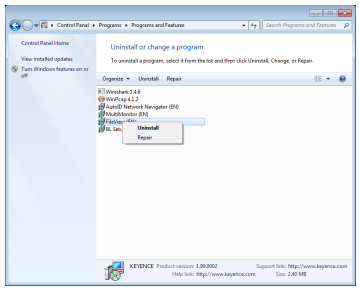
8 Click "Finish".

When the [InstallShield Wizard Completed] window appears, FileView install is complete.



■ Uninstall Method

From the Start menu, select [Control panel] - [Programs] - [Programs and Features] - [Uninstall or change a program], select the program to uninstall from the list, and click [Uninstall].



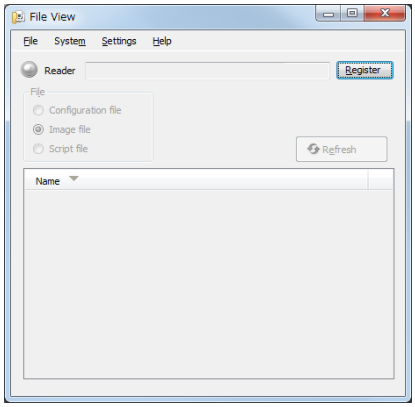
Startup Procedure

Start up FileView.

1 From the Start menu, select [Programs (P)] → [KEYENCE Applications] → [AutoID] → [FileView (EN)].
Or, double-click on the desktop.

2 The following window will appear.

The SR-750 Series registration is required to confirm files.



Shutdown Procedure

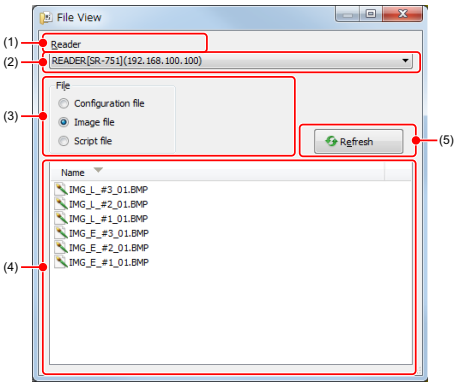
Shut down FileView.

1 Click the button at the right end of the title bar. Or, press the Alt + F4 keys.

The FileView will shut down.

14-2 Using FileView

Software that isolates the FileView software function from AutoID Network Navigator. Without starting AutoID Network Navigator, you can manipulate image data and configuration files stored in the SR-750 Series RAM/ROM.



(1) Menu Bar

- System ····· Register readers.
- Settings ····· Select network cards.
- Help ····· Confirm the version of FileView.
- File ····· Shut down FileView.

(2) Reader view

Displays the reader name, model and IP address of the SR-750 Series connected to FileView.

- Click the indicator to change the status of communications between FileView and the connected SR-750 Series.

Lamp status	Description
	FileView and the SR-750 Series are communicating. Operations on images saved to the SR-750 Series are available.
	FileView and the SR-750 Series are not communicating. In this status, operations on internal files are not available.

(3) Remote Drive/File

Select the drive for Remote Drive and the file type to display in FileView.

(4) File list

Displays files selected in (3).
Right-click on the file name to display the menu, from where you can perform [Open], [Delete], and [Save] operations.

(5) [Update] button

Updates the file list.

■ Notes for FileView

- While AutoID Network Navigator is running, FileView cannot be started.
- While FileView is running, AutoID Network Navigator cannot be started.
- The SR-750 Series cannot be controlled from FileView.
- Name the setting file "config.ptc" and send.
- Name the script file "Fmtset.lua" and send.
- File names other than the above cannot be used.

15-1 SR-750/SR-700 Series Specifications

SR-750 SR-700

SR-750 Series general specifications

Model			SR-750HA	SR-750	SR-751	SR-752	SR-752+ SR-75L4	SR-752+ SR-75L6
Type			High resolution	Close-range	Mid-range	Long-range	400 mm lens attached	600 mm lens attached
Receiver	Sensor		CMOS Image Sensor					
	Number of pixels		752×480 pixels					
Lighting	Light source		Red LED					
Laser pointer	Light source		Visible semiconductor laser, Wavelength 660 nm					
	Output		60 μW					
	Pulse duration		200 μs					
	Laser class		Class 1 Laser Product (IEC60825-1, FDA(CDRH) Part 1040.10*2)					
Reading specifications	Supported symbol	2D code	QR, MicroQR, DataMatrix (ECC200), GS1 DataMatrix, PDF417, Micro PDF417, GS1 Composite (CC-A, CC-B, CC-C)					
		Barcode	*1	Code39, ITF, 2of5(Industrial 2of5), COOP 2of5, NW-7(Codabar), Code128, GS1-128, GS1 DataBar, Code93, JAN/EAN/UPC, Trioptic Code39, CODE39 FullASCII				
	Minimum resolution	2D code	0.082 mm	0.127 mm	0.19 mm	0.19 mm	0.33 mm	0.5 mm
		Barcode	-	0.127 mm	0.127 mm	0.17 mm	0.22 mm	0.33 mm
	Reading distance (typical examples)	2D code	22 to 50 mm (Cell size= 0.25 mm)	40 to 80 mm (Cell size= 0.25 mm)	45 to 165 mm (Cell size= 0.5 mm)	180 to 305 mm (Cell size= 0.5 mm)	300 to 490 mm (Cell size= 0.5 mm)	460 to 690 mm (Cell size= 0.5 mm)
		Barcode	-	30 to 100 mm (Narrow bar width = 0.33 mm)	45 to 195 mm (Narrow bar width = 0.5 mm)	180 to 330 mm (Narrow bar width = 0.5 mm)	250 to 540 mm (Narrow bar width = 0.5 mm)	400 to 760 mm (Narrow bar width = 0.5 mm)
	Focal distance		38 mm	60 mm	100 mm	250 mm	400 mm	600 mm
	Reading view range (focal distance) (typical value)		26 mm× 17 mm	42 mm× 27 mm	70 mm× 45 mm	65 mm× 41 mm	108 mm× 69 mm	165 mm× 106 mm
I/O specifications	Control input	Points	2					
		Input type	Bidirectional voltage input					
		Maximum rating	26.4 VDC					
		Minimum ON voltage	15 VDC					
		Maximum OFF current	0.2 mA or less					
	Control output	Points	3					
		Output type	Photo MOS relay output					
		Maximum rating	30 VDC					
		Maximum load current	1 output: 50 mA or less, 3 Total output 100 mA or less					
		Leakage current when OFF	0.1 mA or less					
		Residual voltage when ON	1 V or less					
	Ethernet	Communication standard	10BASE-T/100BASE-TX					
		Supported protocol	TCP/IP, SNTP, FTP, BOOTP, MC Protocol, KVSTUDIO, EtherNet/IP, PROFINET					
	Serial communication	Communication standard	RS-232C compliant					
		Transmission speed	9600, 19200, 38400, 57600, 115200 bps					
		Synchronization method	Asynchronous					
		Supported protocol	No-Protocol, MC Protocol, SYSWAY, KVSTUDIO					
Environmental resistance	Enclosure rating		IP65					
	Ambient temperature		0 to 45°C					
	Ambient storage temperature		-10 to +50°C					
	Relative humidity		35 to 95% RH (No condensation)					
	Storage ambient humidity		35 to 95% RH (No condensation)					
	Ambient luminance		Sunlight: 10000lx, Incandescent lamp: 6000lx, Fluorescent lamp: 2000lx					
	Operating environment		No dust or corrosive gas present					
	Vibration		10 to 55 Hz Double amplitude 1.5 mm/ 3 hours each in X, Y and Z directions					
Rating	Power voltage*3		Control port: 24 V DC ±10% or Ethernet port: PoE TypeA/B 36 to 57 V (Cannot supply at the same time)					
	Current consumption		Control port: 220mA or less (When 24 VDC power supply is used) Ethernet port: PoE Power Class 2*4					
Weight			Approx. 160 g			Approx. 175 g	Approx. 185 g	

*1 Barcodes fitted into the visual field range in size can be read.
*2 The laser classification for FDA(CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No.50.
*3 To comply with CSA No.61010-1/UL61010-1/IEC61010-1, use the following power supply. The power supply that provides Class 2 output as defined in the CEC and NEC, or the power supply that has been evaluated as a Limited Power Source as defined in CAN/CSA-C22.2 No.60950-1/UL60950-1/IEC60950-1.
*4 Peak operating current for PoE Power Class 2: 210mA maximum.

SR-700 Series general specifications

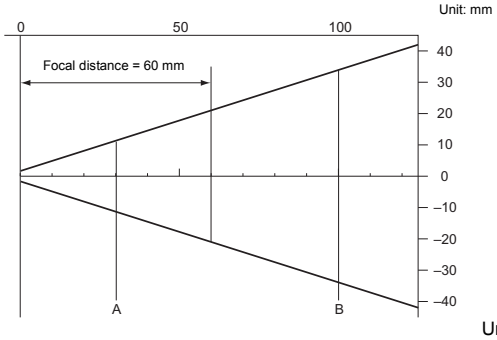
Model			SR-700HA	SR-700	SR-710
Type			High resolution	Short-range	Mid-range
Receiver	Sensor		CMOS Image Sensor		
	Number of pixels		752×480 pixels		
Lighting	Light source		High intensity red LED		
Laser pointer	Light source		Visible semiconductor laser (660 nm)		
	Output		60 μW		
	Pulse duration		200 μs		
	Laser class		Class 1 (IEC60825-1, FDA CDRH Part 1040.10)		
Reading specifications	Supported symbol	2D code	QR, MicroQR, DataMatrix (ECC200), GS1 DataMatrix, PDF417, Micro PDF417, GS1 Composite (CC-A,CC-B,CC-C)		
		Barcode	*1	Code 39, ITF, 2of5 (Industrial 2of5), COOP 2of5, NW-7 (Codabar), Code 128, GS1-128 (EAN-128), GS1 DataBar, Code 93, JAN/EAN/UPC, Trioptic Code 39, CODE39 FullASCII, Pharmacode	
	Minimum resolution	2D code	0.082 mm	0.127 mm	0.19 mm
		Barcode	-	0.127 mm	0.127 mm
	Reading distance (typical examples)	2D code	22 to 50 mm (Cell size= 0.25 mm)	40 to 80 mm (Cell size= 0.25 mm)	45 to 165 mm (Cell size= 0.5 mm)
		Barcode	-	30 to 100 mm (Narrow bar width = 0.33 mm)	45 to 195 mm (Narrow bar width = 0.5 mm)
	Focal distance		38 mm	60 mm	100 mm
	Reading view range (focal distance) (typical value)		26 mm x 17 mm	42 mm x 27 mm	70 mm x 45 mm
I/O specifications	Control input		2 non-voltage inputs (IN1, IN2)		
	Control output		4 NPN open collector outputs (OUT1 to OUT4) 30 mA max. (24 V or less) Residual voltage when ON 0.8 V or less, leakage current when OFF 0.1 mA or less		
	RS-232C	Communication method	RS-232C standards		
		Transmission speed	9600, 19200, 38400, 57600, 115200 bps		
		Synchronization method	Asynchronous		
		Supported protocol	No-Protocol, MC Protocol, SYSWAY, KV STUDIO		
		Data bit length	7/8 bits		
		Stop bit length	1/2 bits		
		Parity check	None/Even/Odd		
	USB		Full-speed USB 2.0 interface		
Environmental resistance	Enclosure rating		IP65		
	Ambient temperature		0 to +45°C		
	Ambient storage temperature		-10 to +50°C		
	Relative humidity		35 to 95% RH (No condensation)		
	Ambient luminance		Sunlight: 10,000lx, incandescent lamp 6,000lx, fluorescent lamp: 2,000lx		
	Operating environment		Location without dust or corrosive gas		
	Vibration		10 to 55 Hz: double amplitude 1.5 mm in the X, Y and Z directions. 3 hours respectively.		
Rating	Power voltage		5 VDC +5%, -10%		
	Current consumption		630 mA or less		
Weight			Approx. 160 g (including the cable)		

*1 Barcodes fitted into the visual field range in size can be read.

Reading range characteristics (Typical)

Reading distance with cell sizes (narrow bar width) other than the chart below can be confirmed using the introduction guide for AutoID Network Navigator.
Refer to 📖 "5-12 Installation Guide (Page 74)"

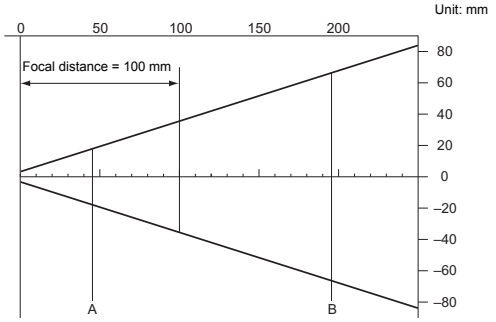
■ SR-750, SR-700



Unit: mm

Code type	Cell size Narrow bar width	A	B
2D code	0.127	50	70
	025	40	80
Barcode	0.127	46	74
	0.33	30	100

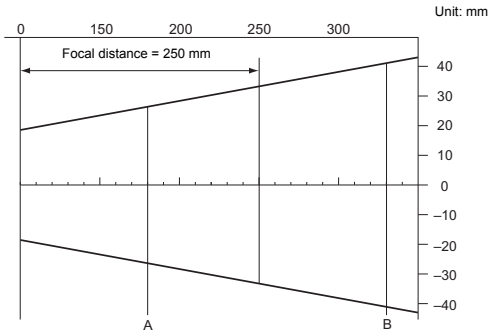
■ SR-751, SR-710



Unit: mm

Code type	Cell size Narrow bar width	A	B
2D code	0.25	65	130
	0.5	45	165
Barcode	0.127	75	110
	0.5	45	195

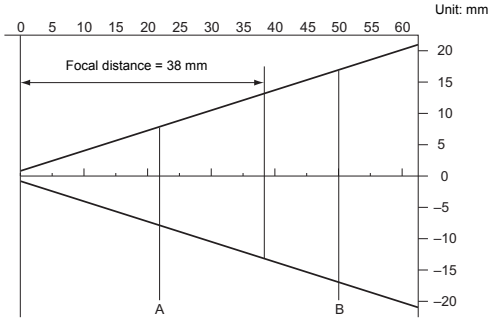
■ SR-752



Unit: mm

Code type	Cell size Narrow bar width	A	B
2D code	0.19	220	260
	0.25	210	270
	0.33	200	280
	0.5	180	305
Code39	0.17	220	260
	0.25	180	330
Code128	0.25	195	275

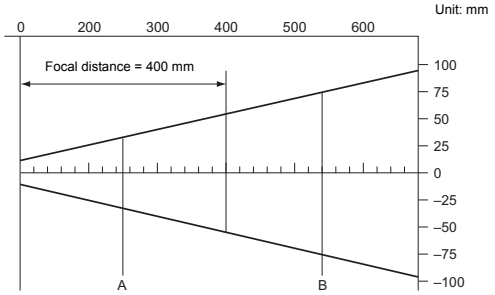
■ SR-750HA, SR-700HA



Unit: mm

Code type	Cell size	A	B
2D code	0.08	31	39
	0.127	27	42
	0.25	22	50

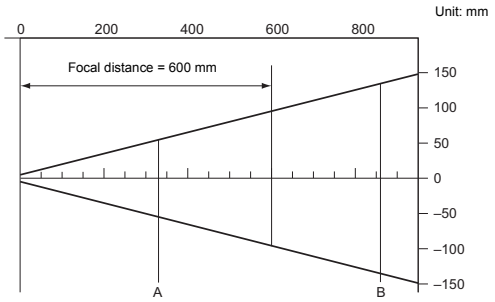
■ SR-752+SR-75L4 (400 mm lens)



Unit: mm

Code type	Cell size	A	B
2D code	0.33	350	450
	0.5	300	490
Code39	0.22	370	440
	0.5	250	540
Code128	0.25	350	450

■ SR-752+SR-75L6 (600 mm lens)



Unit: mm

Code type	Cell size	A	B
2D code	0.5	460	690
	1	330	860
Code39	0.33	500	690
	0.5	400	760
Code128	0.33	500	690

15-2 N-R2/R4/UB/L1 Specifications

■ General specifications

Model		N-R2	N-R4	N-UB	N-L1
Power supply for barcode reader		5 VDC ±5%, (650 mA)			
Display		LED x 9 (Power supply status, data transmission/reception status, I/O terminal status)			LED x 11 Power supply status, data send/receive status, I/O terminal status LINK status, communication speed)
Terminating resistance		-	100	-	-
Environmental resistance	Ambient temperature	0 to 50°C			
	Ambient storage temperature	–20 to 60°C			
	Relative humidity	35% to 85% (No condensation)			
	Operating environment	No dust or corrosive gas			
	Vibration	10 to 55 Hz Amplitude 1.5 mm, 2 hours for X, Y, and Z axes.			
Rating	Power voltage	24 VDC (+10%, –20%)			
	Current consumption	380 mA or less			
Weight		Approx. 135 g	Approx. 135 g (Excluding the connector)	Approx. 155 g	

■ I/O specifications

Model			N-R2	N-R4	N-UB	N-L1
Terminal block	Input	Points	2 (IN1, IN2)			
		Input type	Bidirectional voltage input			
		Maximum rated input	26.4 VDC			
		Minimum ON voltage	15 VDC			
		Maximum OFF current	1 mA			
	Output	Points	4 (OUT1 to 4)			
		Output type	Photo MOS relay output			
		Rated output load	30 VDC, 100 mA			
		Leakage current when OFF	0.1 mA or less			
		Residual voltage when ON	1 V or less			

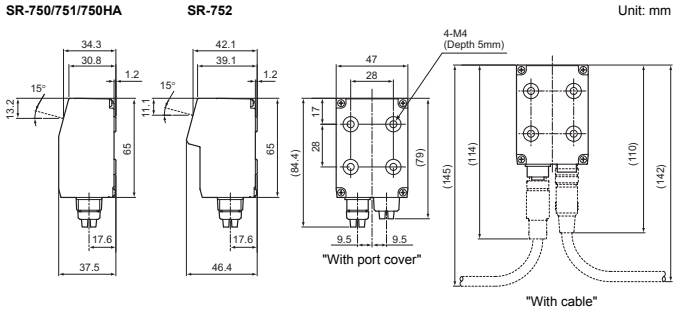
■ Communication specifications

Model		N-R2	N-R4	N-UB	N-L1
Head interface	Connector	1 (12-pin round connector)			
	Communication standard	RS-232C compliance			
	Communication speed	4800, 9600, 19200, 31250, 38400, 57600, 115200 bits/s		4800, 9600, 19200, 38400, 57600, 115200 bits/s	
	Data bit length	7/8 bit			
	Parity check	None/Even/Odd			
	Stop bit length	1/2 bit			
	Flow control	Hardware/software/none selectable		Hardware flow control (Required)	
Host interface	Connector	1 (D-sub 9pin connector)	1 (removable 5-pin connector)	1 (USB - Type B)	1 (RJ-45)
	Communication standard	RS-232C compliance	RS-422A/RS-485 (Maximum connectable units: 31) Switchable	USB 2.0 (Full-Speed 12 Mbps)	IEEEB02.3 compliant 10BASE-T/ 100BASE-TX
	Total communication cable length	15 m or less (including the head cable)	1.2 km or less	5 m or less	100 m or less

15-3 SR-750 Series Dimensions

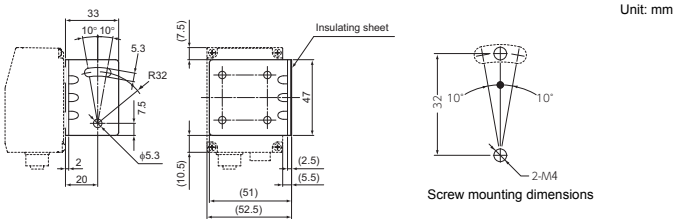
SR-750

■ SR-750 Series

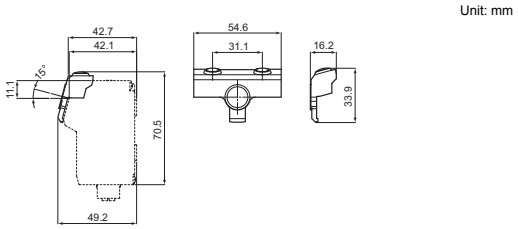


■ Mounting bracket

* On the bottom of the mounting bracket, the insulation sheet is attached. Do not peel off this sheet.

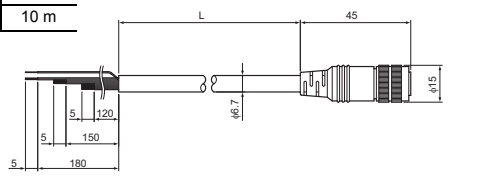


■ Lens attachment (SR-75L4/75L6)

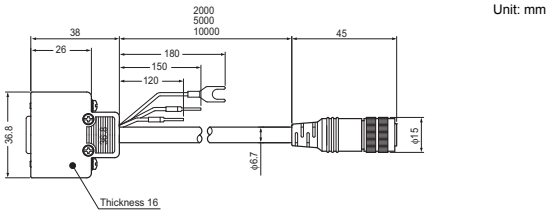


■ Control cable (OP-87224/87225/87226/87353/87354/87355)

Model	L
OP-87224/87353	2 m
OP-87225/87354	5 m
OP-87226/87355	10 m



■ Control cable (OP-87527/87528/87529)

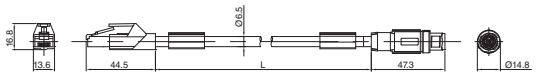


180 mm: Brown, blue and black tubes
150 mm: Black, pink, light blue and white
120 mm: Gray, green and white-blue

■ NFPA79 compliant Ethernet cable (OP-87359/87360/87361)

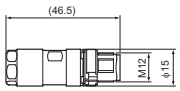
Model	L
OP-87359	2 m
OP-87360	5 m
OP-87361	10 m

Unit: mm



■ Ethernet assembly plug (OP-87362)

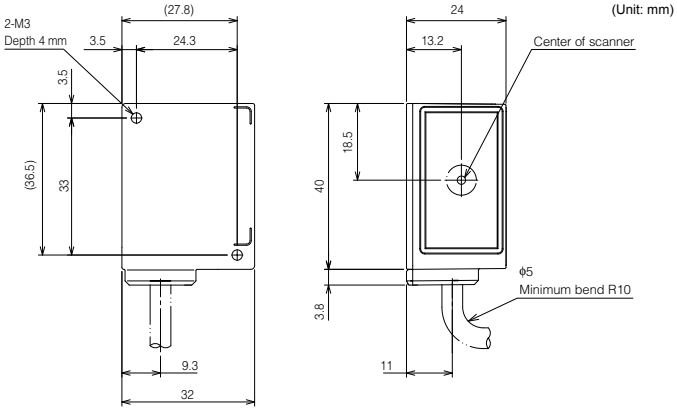
Unit: mm

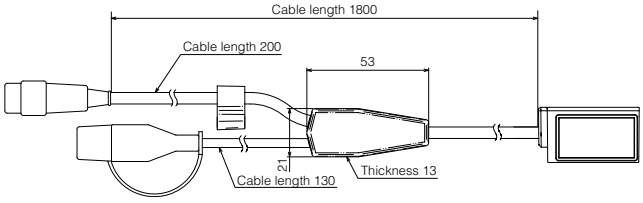


15-4 SR-700 Series Dimensions

■ SR-700/710/700HA

(Unit: mm)

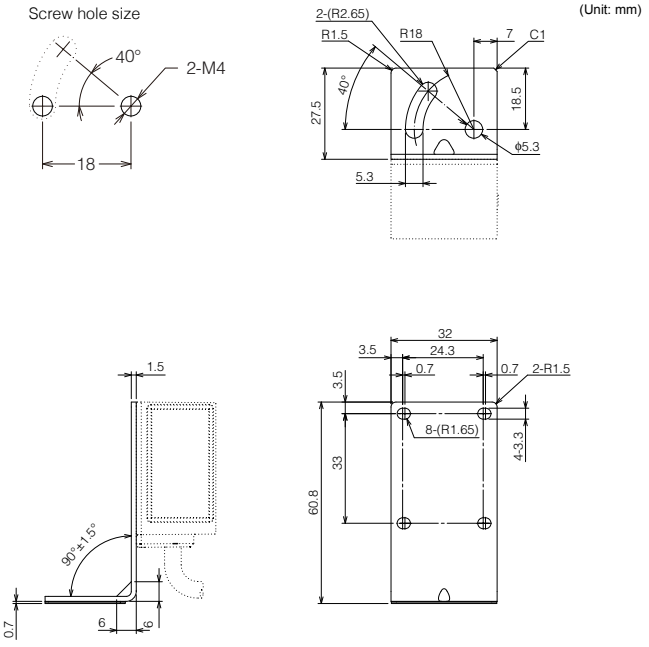




■ Mounting bracket

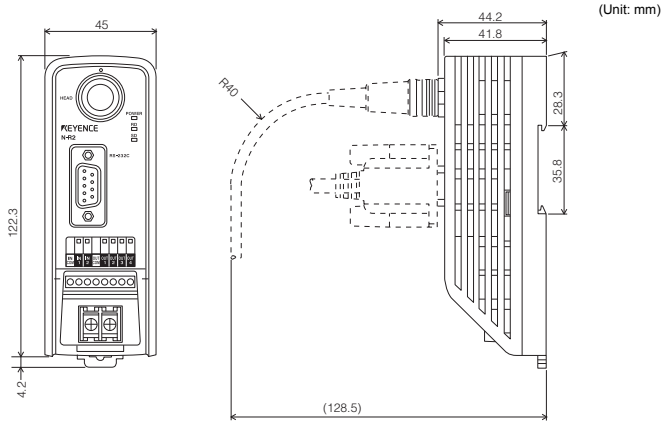
* An insulating sheet is affixed to the bottom surface of the mounting bracket. Do not remove the sheet.

(Unit: mm)



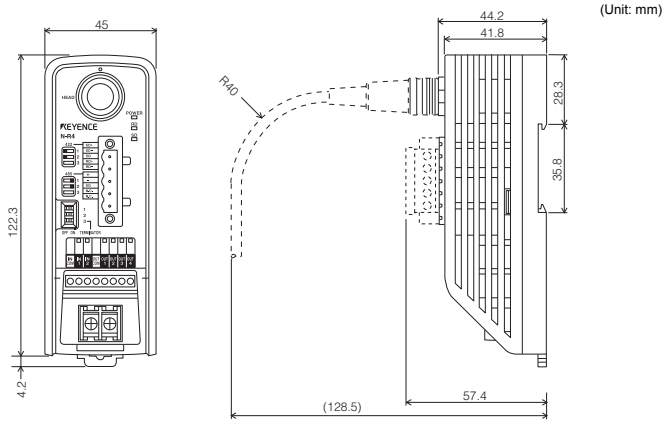
■ N-R2

(Unit: mm)



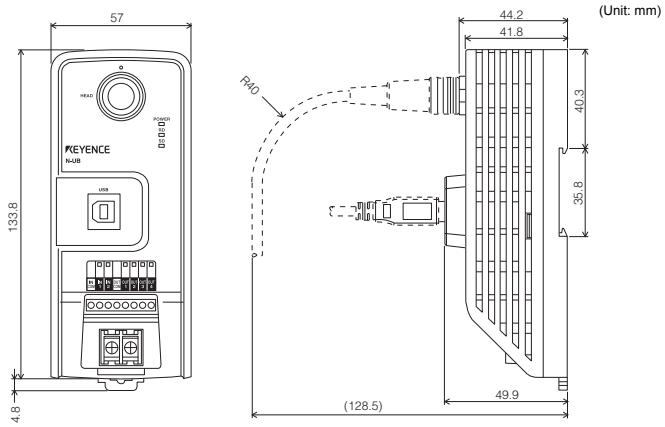
■ N-R4

(Unit: mm)



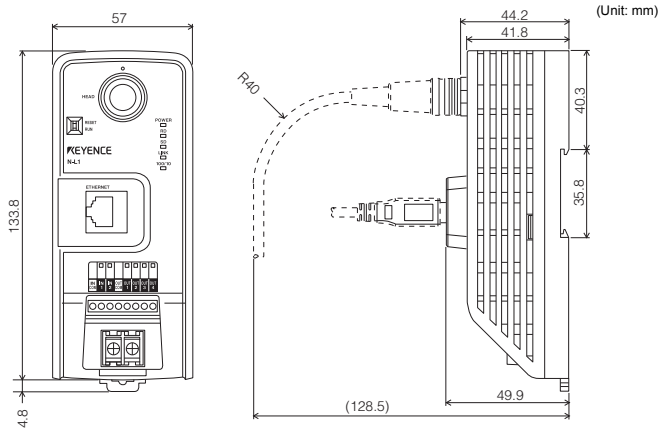
■ N-UB

(Unit: mm)



■ N-L1

(Unit: mm)



15-5 SR-750/SR-700 Series Field of View Size

The size of the field of view for the SR-750/SR-700 Series is as follows.

SR-750HA, SR-700HA

Unit: mm

Reading distance		20	25	30	40	50	60
Field of view size	Width	15	18	21	28	34	41
	Height	10	12	14	18	22	27

SR-750, SR-700

Unit: mm

Reading distance		40	50	60	80	100	120
Field of view size	Width	29	35	42	55	69	82
	Height	19	23	28	36	46	54

SR-751, SR-710

Unit: mm

Reading distance		50	75	100	130	170	210
Field of view size	Width	36	53	70	91	117	145
	Height	24	35	46	60	78	96

SR-752

Unit: mm

Reading distance		175	200	225	250	275	300
Field of view size	Width	45	52	57	64	71	77
	Height	30	34	37	42	47	51

SR-752+SR-75L4

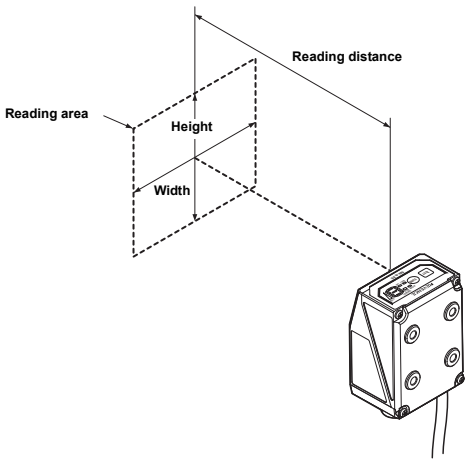
Unit: mm

Reading distance		250	300	350	400	450	500
Field of view size	Width	66	79	92	108	118	131
	Height	44	52	61	69	78	87

SR-752+SR-75L6

Unit: mm

Reading distance		500	550	600	650	700	750
Field of view size	Width	132	145	165	172	185	198
	Height	87	96	106	113	122	131



* Field of view size other than the above can be confirmed using the introduction guide for AutoID Network Navigator.
In the introduction guide, reading distance and field of view size have been calculated by entering the setting distance.
Refer to 📖 "5-12 Installation Guide (Page 74)"

NOTICE	**There are cases where, depending on the conditions of the code or installation environment, a code is unreadable even though the code to be read fits within the reading range. In the actual operation, perform sufficient reading tests and confirm stable reading is achieved.**

15-6 Troubleshooting

If you suspect that your SR-750/SR-700 Series device is operating abnormally, check the following.
If this does not solve the problem, contact your nearest KEYENCE sales office.

Unable to read 2D codes and bar codes

■ Is the SR-750 Series turned ON?

Check the power activation state of the SR-750 Series. The SR-750 Series supports the power supply from the control cable or PoE power supply devices. Confirm the power supply state according to the configurations to be used.
Refer to 📖 "1-4 Connecting the SR-750 Series Power Source (Page 5)"

■ Is the illumination LED on?

- Check the wirings of the power source and trigger input. When the power is correctly supplied, POW LED lights up. When the trigger input line correctly operates, IN LED lights up.
- Is [Internal lighting] set to [Disable]? Reset it and try again.
- Have the buttons on the reader been activated? The buttons prevent reading when they are being used.
  Check the buttons and turn them off.

■ Is the code setting correct?

Confirm the following settings in the AutoID Network Navigator.
- Recorded code type
- Number of digits read
- Other settings for each code

■ Has the device been calibrated for these codes?

It may be necessary to perform a quick calibration after confirming the settings in the AutoID Network Navigator.
There are 10 different parameter banks that can be registered with quick calibration.
Registering parameters such as the worst print quality or the fastest movement may prevent read errors from occurring.
When parts of several codes exist the scan range, decoding may take longer. Set the decode timeout to a longer limit and try reading again.
When using the calibrated parameter bank, set the alternate to "Enable".

■ Are the installation distance and angle optimal?

- Confirm the distance from the SR-750/SR-700 Series device to the target code. Focal length is as follows. SR-750/700: 60 mm, SR-751/710: 100 mm, SR-752: 250 mm, SR-750HA/700HA: 38 mm, SR-752+SR-75L4: 400 mm. SR-752+SR-75L6: 600 mm
- Use the test mode to determine the code read ratio.
- Confirm the installation angle is not in the specular reflection range.

■ Is the scanner dirty?

Use a soft cloth to clean any water, oil or dust from the scanner.

■ Is there a problem with the print quality of the code?

It may be difficult to read codes that have many cracks, chips, specks or blurs. Codes printed on a dot impact printer or an inkjet printer often have many of the above problems.

Unable to perform quick calibration

■ Is the laser pointer on?

Turn the laser pointer off and then retry the quick calibration.

■ Is the code registration for the tuning setting correct?

Using the tuning setting of AutoID Network Navigator, check if the type of code to be used has been registered correctly.
Register the code correctly, send the setting and restart calibration.
In default settings, Pharmacode cannot be calibrated. * SR-700 Series

■ Are the quick tuning conditions specified properly?

Confirm that the tuning conditions are properly set for the code to be read.
- Calibration type
- Inverse/Reverse
- Decode range

Set the conditions correctly, send the setting and restart calibration.

Unable to connect the AutoID Network Navigator and SR-750 Series

If the SR-750 cannot be connected with the AutoID Network Navigator, check the following 5 STEPs.

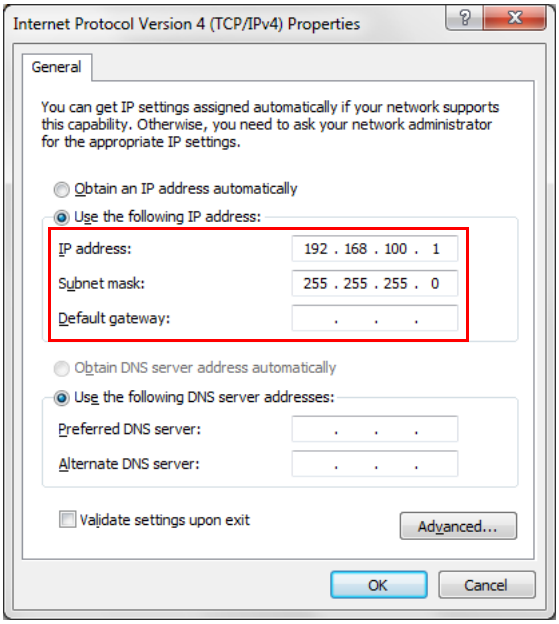
STEP1	Check the LED of the SR-750 Series
STEP2	Network settings of the PC
STEP3	Check the security software of the PC
STEP4	Check the AutoID Network Navigator
STEP5	Temporary IP address setting for the SR-750 Series

STEP1 Check the LED of the SR-750 Series

Is "ENET LINK LED" lighting?
If the above LED is not lighting (blinking), wiring may be incorrect.
Check the following.
- Is the SR-750 Series turned ON?
- Is the Ethernet cable securely connected?
- Is the Ethernet cable not damaged?
- Is the network HUB turned ON?

STEP2 Network settings of the PC

Is the correct IP address set for the PC?



Check the [Local Area Connection] and check if the IP address has been input. If "Obtain IP address automatically" has been selected, connecting with the SR-750 Series is impossible. Make sure to input the IP address.

STEP3 Check the security software of the PC

Has the communication been blocked by security software of the PC?
If security software is operating on the PC, it may be blocking the communication. Disable the security software, and then make communication again.
* Restarting the PC may be necessary after disabling the security software.

STEP4 Check the AutoID Network Navigator

Is the correct Ethernet port selected?
When connecting with the SR-750 using the AutoID Network Navigator, specify the Ethernet card to which the SR-750 is connected.
From [Setting (S)] - [Network card selection (N)] on the AutoID Network Navigator, select the adaptor for which the IP address set in [STEP2] is displayed.
* If the PC has a wireless LAN port, this is considered as the same state that multiple Ethernet cards exist. Select the correct Ethernet card.

STEP5 Temporary IP address setting for the SR-750 Series

Was the temporary IP address set?
Press and hold the [TUNE] switch of the SR-750 Series for **5 seconds**. After LED 1 to 4 light up, release your finger.

Click the temporary IP address setting icon on the AutoID Network Navigator.

Click the [Auto detection] button. When the reader is detected, connection is successful.

If connection still fails even with the above operation, check the following as well.
- When a network HUB is being used, directory connect the SR-750 to the PC without using the HUB.

Unable to communicate via the RS-232C properly

■ Is the SR-750/SR-700 Series connected to the AutoID Network Navigator?

Is the indicator lamp of the AutoID Network Navigator lit in blue? This state means that the SR-750/SR-700 Series is being operated from the AutoID Network Navigator.
Finish the operations performed using the AutoID Network Navigator and click the status indicator. When the color changes to one other than blue, communicate again.
(If a command is sent via RS-232C to the SR-750/SR-700 Series communicating with AutoID Network Navigator, the error response (Error No. 23) will be output.)

■ Are the command port and Data port 1 set to RS-232C?

To control the SR-750 Series using the RS-232C, set the command port and Data port 1 to RS-232C.
Using the AutoID Network Navigator, check the "Communication 2" tab.
Refer to 📖 "5-4 Details of Settings View (Page 51)"

■ Are the RS-232C communication settings set properly?

Check if the RS-232C settings both for the SR-750 Series and the control host are set properly.
Using the AutoID Network Navigator "Communication 1" tab, confirm the RS-232 settings of the SR-750 Series.
Refer to 📖 "5-4 Details of Settings View (Page 51)"

■ Is the RS-232C cable properly connected?

Check if the control cable of the SR-750 Series is connected to RS-232C port of the control host properly.
Refer to 📖 "1-5 Connecting the SR-750 Series Control Cable and Wiring (Page 5)"

Unable to communicate via Ethernet correctly

■ Are the command port, Data port 1 and Data port 2 set to Ethernet?

To control the SR-750 Series using the Ethernet, set the command port, Data port 1 and Data port 2 to Ethernet.
Using the AutoID Network Navigator, check the "Communication 2" tab.
Refer to 🕮 "5-4 Details of Settings View (Page 51)"

■ Is there a response to a ping?

Send a ping from the host to the SR-750 Series and check the network for problems.

● When there is no response:

- Check that the cable is connected correctly.
  ⇒Check for disconnected cable or check that HUB is turned on.
- Check that the SR-750 Series is turned on correctly.
  ⇒The SR-750 Series operates with 24 V DC or PoE.
- Check that network configuration on the SR-750 Series are configured correctly.
  ⇒Check the IP address and subnet mask port number of the SR-750 Series.

● When there is a response:

- Check that the port number of the SR-750 Series is set correctly.
- Check that the IP address and the port number of the device to which SR-750 Series is connected are set correctly.

■ Check that communications are established between the host and SR-750 Series on a one-to-one basis but communications fail on a one-to-multiple basis.

Is "E5" displayed on the multiple LED displays of the SR-750 Series? In that case, the same IP address may have been set for multiple units of the SR-750 Series. Check the IP address of each SR-750 Series on the same network.

An error code is displayed on the multiple LED display of the SR-750/SR-700 Series.

Check the error code displayed on the multiple LED display of the SR-750/SR-700 Series.

- "E" and "4" are displayed alternately ....Send buffer overflow of the SR-750/SR-700 Series has occurred. Send the buffer clear command "BCLR" from the host or turn the SR-750/SR-700 Series on again.
- "E" and "5" are displayed alternately ....If multiple units of the SR-750 Series are connected on the same network, the IP address of the SR-750 Series has been duplicated.
  Check the IP address of the SR-750 Series and make the setting again.

* If other error codes occur, consult your nearest dealer.

An error response is returned after commands are sent

When operation/setting commands are sent to the SR-750/SR-700 Series, an error response may be returned.

Error response | ER | , | Command | , | ee | ee = Error code

- ee = 00 is returned.....The sent command is not the command of the SR-750/SR-700 Series.
  Check whether the character string of the sent command is wrong or not.
- ee = 01 is returned.....The format or parameter of the sent command may be incorrect.
  Check if the parameter value of the sent command is appropriate.
- ee = 20 is returned.....The sent command cannot be executed with the current operation status of the SR-750/SR-700 Series.
  ex. The timing command was sent again during reading operation.
  The test command was sent during reading operation. · · ·etc
  Check the operation status of the SR-750/SR-700 Series.
- ee = 21 is returned.....Buffer overflow of the SR-750/SR-700 Series has occurred.
  Send the buffer clear command "BCLR" to the SR-750/SR-700 Series or turn the SR-750/SR-700 Series on again.
- ee = 23 is returned.....A command was sent from the RS-232C port during AutoID Network Navigator operation.
  Finish the AutoID Network Navigator first and send the command again.

Refer to 🕮 "Response error codes (Page 95)"

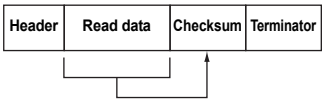
15-7 Checksum Calculation Method

- A checksum can be appended to the read data when it is being sent.
  * No checksum can be appended to commands or responses.
- The checksum allows you to check if garbled text was caused during the RS-232C communication.
  If the checksum does not match due to concurrent use of the PASS/RTRY and ACK/NAK protocols, create a program that requests to send again (RTRY or NAK).

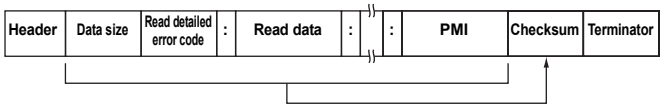
Checksum calculation range and location

The checksum is calculated using all characters that are not a part of the header or the terminator and 2 characters of ASCII code are appended immediately before the terminator.

■ Data format



■ With appended data



Checksum calculation method

The checksum (cc) is calculated, assuming that the read data is "ABC123".
The characters are converted to ASCII code and the converted codes are expressed in 8-bit binary numbers as shown below.
A bitwise exclusive OR operation (XOR) is performed on each character.

Header	ABC 123	Checksum	Terminator

ASCII code		bit		
A → 41h	→	0100	0001	
B → 42h	→	0100	0010	
C → 43h	→	0100	0011	
1 → 31h	→	0011	0001	
2 → 32h	→	0011	0010	
3 → 33h	→	0011	0011	⊕
		↓	↓	
		0111	0000	→ 70h

* The exclusive OR generates 1 when there is an odd number of 1 bit and 0 when there is an even number of 1 bit.

The checksum is the character representation of the hexadecimal value in 2-digit ASCII code after the above operation.
Therefore, cc = 70 (37h 30h)
Example:

Header	ERROR	Checksum	Terminator

leads to a cc of 58.

Header	KEYENCE	:	100%	Checksum	Terminator

leads to a cc of 74.

Reference

Exclusive OR equation
Perform a bitwise operation based on the following equation:
0⊕0 = 0
0⊕1 = 1
1⊕0 = 1
1⊕1 = 0

* ⊕ : Exclusive OR operator

Conversion from hexadecimal number to binary number
Refer to the following chart for converting ASCII code to binary number.

Hexadecimal number	0	1	2	3	4	5	6	7
Binary number	0000	0001	0010	0011	0100	0101	0110	0111
Hexadecimal number	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
Binary number	1000	1001	1010	1011	1100	1101	1110	1111

15-8 ASCII Code List

			High-order 4 bits							
	Hexadecimal		0	1	2	3	4	5	6	7
		Binary	0000	0001	0010	0011	0100	0101	0110	0111
Low-order 4 bits	0	0000		DLE	(SP)	0	@	P	‘	p
	1	0001	SOH	DC1	!	1	A	Q	a	q
	2	0010	STX	DC2	“	2	B	R	b	r
	3	0011	ETX	DC3	#	3	C	S	c	s
	4	0100	EOT	DC4	$	4	D	T	d	t
	5	0101	ENQ	NAK	%	5	E	U	e	u
	6	0110	ACK	SYN	&	6	F	V	f	v
	7	0111	BEL	ETB	‘	7	G	W	g	w
	8	1000	BS	CAN	(	8	H	X	h	x
	9	1001	HT	EM	)	9	I	Y	i	y
	A	1010	LF	SUB	*	:	J	Z	j	z
	B	1011	VT	ESC	+	;	K	[	k	{
	C	1100	CL	FS	,	<	L	\	l	|
	D	1101	CR	GS	-	=	M	]	m	}
	E	1110	SO	RS	.	>	N	^	n	~
	F	1111	SI	US	/	?	O	_	o	del

15-9 Software License

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15-10 Precautions on Regulations and Standards for the SR-750 Series

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Keyence Corporation has confirmed that this product complies with the essential requirements of the applicable EC Directive, based on the following specifications. Be sure to consider the following specifications when using this product in the Member State of European Union.

● EMC Directive

• Applicable standards EN61326-1, Class A
Remarks:
These specifications do not give any guarantee that the end-product with this product incorporated complies with the essential requirements of EMC Directive. The manufacturer of the end-product is solely responsible for the compliance on the end-product itself according to EMC Directive.

■ CSA Certificate

This product complies with the following CSA and UL standards and has been certified by CSA.
• Applicable st,andards: CAN/CSA C22.2 No.61010-1
UL61010-1
Be sure to consider the following specifications when using this product as a product certified by CSA.
• Overvoltage category Ⅰ
• Use this product under pollution degree 3.
• Use this product at the altitude of 2000 m or less.
• Indoor use only.
• When using this product, use the following power supply.
  • CSA or UL certified power supply that provides Class 2 output as defined in the CEC (Canadian Electrical Code) and NFPA79 (NEC: National Electrical Code), or
  • CSA or UL certified power supply that has been evaluated as a Limited Power Source as defined in CAN/CSA-C22.2 No. 60950-1/UL60950-1.
• Either PoE or 24V power supply shall be used.
• The symbol ⎓ on the product means "Direct current".

■ FDA (CDRH) Regulations

This product complies with the following FDA (CDRH) regulations.
• FDA(CDRH) Part 1040.10, Class 1 Laser Product
The laser classification for FDA(CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No.50.

■ FCC Regulations

This product complies with the following FCC EMI regulations.
• FCC Part 15 Subpart B, Class A Digital Device
• FCC CAUTION
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

■ IC (Industry Canada) Regulations

This product complies with the following IC EMI regulations.
• ICES-003, Class A Digital Apparatus

■ Radio Waves Act in South Korea

Class A Equipment
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.
Note: This caution is effective for the Korean Radio Act only.

A 급 기기 (업무용 방송통신기자재)
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15-11 Precautions on Regulations and Standards for the SR-700 Series

■ CE Marking

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● EMC Directive

• Applicable standards EN61326-1, Class A
• This product is intended to be used in an industrial electromagnetic environment.

Remarks:
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■ CSA Certificate

This product complies with the following CSA and UL standards and has been certified by CSA.
• Applicable standards: CAN/CSA C22.2 No.61010-1
UL61010-1
Be sure to consider the following specifications when using this product as a product certified by CSA.
• Overvoltage category Ⅰ
• Use this product under pollution degree 2.
• Use this product at the altitude of 2000 m or less.
• Indoor use only.
• When using this product, use the following power supply.
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  • CSA or UL certified power supply that has been evaluated as a Limited Power Source as defined in CAN/CSA-C22.2 No. 60950-1/UL60950-1.

■ FDA (CDRH) Regulations

This product complies with the following FDA (CDRH) regulations.
• FDA(CDRH) Part 1040.10, Class 1 Laser Product
The laser classification for FDA(CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No.50.

■ FCC Regulations

This product complies with the following FCC EMI regulations.
• FCC Part 15 Subpart B, Class A Digital Device
• FCC CAUTION
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

■ IC (Industry Canada) Regulations

This product complies with the following IC EMI regulations.
• ICES-003, Class A Digital Apparatus

■ Radio Waves Act in South Korea

Class A Equipment
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.
Note: This caution is effective for the Korean Radio Act only.

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15-12 Precautions on Regulations and Standards for Communication Units N-R2/R4/UB/L1

■ UL certification

The communication units N-R2/R4/UB/L1, have obtained the following UL/C-UL certifications:
- File No.: E207185, Category: NRAQ/NRAQ7, Applicable standards: UL508
- File No.: E167973, Category: NWGQ2/NWGQ8, Applicable standards: UL60950-1

Be sure to observe the following installation and environment conditions:
- Pollution degree 2
- Overvoltage category Ⅰ

NOTICE	**Do not connect directly to the branch circuit. This product must be supplied power by a suitable, approved isolated transformer or power supply not exceeding 200 VA max.**

■ FCC Regulations

The communication units N-R2/R4/UB/L1 comply with the following FCC EMI regulations:
- FCC Part 15 Subpart B, Class B digital devices
- FCC CAUTION
  Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

■ Canada IC (Industry Canada) Regulations

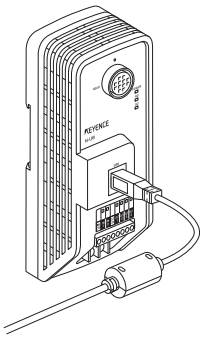
The communication units N-R2/R4/UB/L1 comply with the following IC EMI regulations:
- ICES-003, Class B digital apparatus

■ CE Marking

The communication units N-R2/R4/UB/L1 comply with essential requirements of the EMC Directives. The following EN standards are applied:
- Applicable standards (EMI) EN55011, Class A
  EN55032, Class B (N-L1: Class A)
- Applicable standards (EMS) EN61000-6-2
  EN61000-6-1

* The length of the communication and power cables should be less than 30 m.
* For the N-UB, install a ferrite core on the USB cable as shown below.

Recommended types:
Model: ZCAT2035-0930 (TDK)
OP-31973 (Keyence)



15-13 Copyright indications

TOPPERS/JSP Kernel
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Revision History

Date of printing	Version	Revision contents
May 2013	2nd edition	
September 2013	3rd edition	Erroneous descriptions corrected
January 2014	4th edition	Additions made for added functions
October 2014	5th edition	SR-700 Series was added
February 2015	6th edition	Additions made for added functions
April 2015	7th edition	
May 2017	8th edition	Details related to standards have been updated.

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