Supports verification
for a wide range of codes.

SR-750

Compact 1D and 2D Code Reader

that enables stable reading of difficult codes

| Black resin | Metal | PCB |
| Scratched | Misaligned | Curved surface |

A New Algorithm Developed for

Capture & Process

that Enables Stable Reading

Our original corrective capture and process
techniques provide the best-in-its-class reading
capability even for difficult-to-read codes.

A newly developed algorithm
automatically selects
the optimal settings from
as many as 250000
correction patterns.

Capture

Automatically selects optimal reading
conditions such as brightness and
filters to clarify codes as much as
possible before reading.

Process

A newly developed processing
method ensures accurate black/white
reproduction even for irregular codes.

Reading Capability

A newly developed algorithm provides best-in-its-class reading capability. Difficult codes can also be scanned stably, including those directly marked on uneven workpieces.

Easy Tuning

The SR-750 is just as easy to operate as any other SR Series so that anyone can enjoy its excellent reading performance. In addition, the optimal settings can be obtained in three simple steps through automatic tuning.

Predictive Maintenance

Image quality can be judged based on industrial standards.
It is also possible to output judgement results as signals, so that you can understand clearly when maintenance is required in the printing process.

Reading rate **100%** Reading rate **100%**
Grade **A** Grade **D**
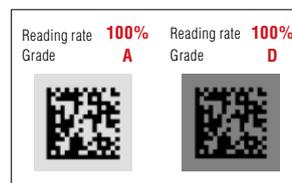
A New Algorithm Provides Best-in-its-class Reading Capability

Captures Codes Clearly

Corrects codes that are difficult to read due to print density or other conditions so that they can be captured clearly. The optimal capture settings are automatically selected according to code conditions.

Capture Brightness Correction

Corrects the brightness by automatically selecting the optimal settings for capture from 129 levels of brightness.
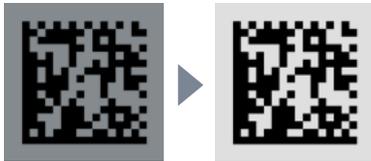
Examples of codes to be highly affected

Black resin　　PCB　　Brass

Contrast Threshold Correction

Automatically corrects black/white classification thresholds and optimises the contrast between code and background.
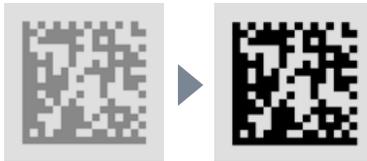
Examples of codes to be highly affected

Nylon resin　　Low contrast　　Ceramic

Image Reduction & Correction

Reduces the image size to one that is ideal for decoding the code that is captured in the field of view.

Examples of codes to be highly affected

Primary noise　　Dot printing　　Stray dots
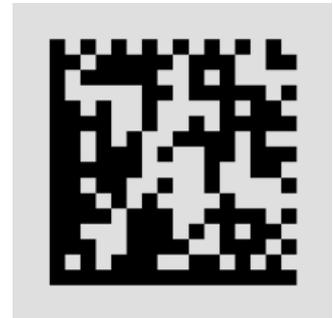
Correction through Filters

Automatically selects the best filter and filtering intensity for the captured image to correct it.

Examples of codes to be highly affected

Bleeding　　Thick printing　　Thin printing

Geometric Correction

Corrects distortion, such as that found on cylinders.
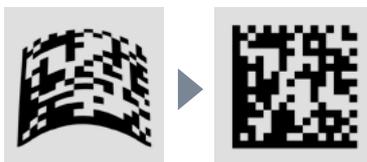
Examples of codes to be highly affected

Parallel distortion　　Trapezoidal distortion　　Tread barrel distortion

Processes Captured Codes

Thanks to condition-based processing, read errors are reduced even if codes on captured images are difficult to read.

Local Concentration Black/White Classification Algorithm

Conventionally, black/white thresholds are set for the "entire" code, which makes it difficult to detect unevenly printed codes. To solve this problem, we have developed a new algorithm, called local concentration black/white classification algorithm, to allow thresholds to be set for "each part" of a code. This algorithm enables highly accurate black/white classification even for DPM codes, on which uneven print density often occurs.

Conventional Technique	Local Concentration Technique

Threshold Determination

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Binary Processing

Our local concentration black/white classification algorithm divides a code into smaller pieces to perform binary processing using thresholds specified for each part. This enables accurate black/white classification without being affected by uneven print density.

* The above illustration is only for reference and does not mean that a code is always divided into 16 parts.

2D Code Search in Captured Images

A newly developed WHS (High Speed & High Stability) search programme can detect a 2D code in the field of view immediately so that high-speed, stable search is ensured even when the code position changes or there are several 2D code-like patterns in the field of view.

Binary processing enables immediate detection of 2D codes even if there is a code-like pattern in the field of view.
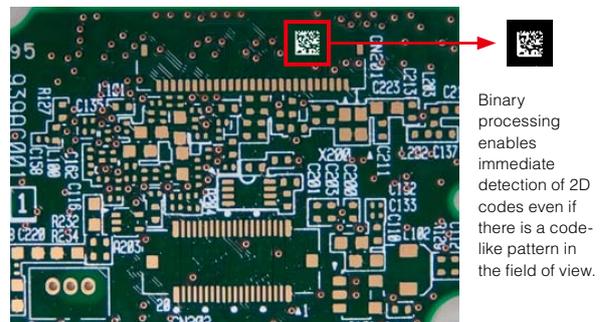
Defective Code Positioning Programme

A newly developed defective code positioning programme can identify four corners of a 2D code based on a similar code detection pattern, leading to a significant improvement in code detection performance.

Examples of codes to be highly affected

Scratched   Stray dots   Misaligned dots   Thin pattern   Narrow quiet zone
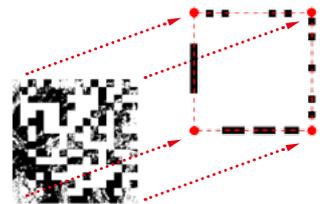
High Performance with Easy Tuning

Simple Setting in Three Steps

Setup is completed through a simple procedure. Anyone can achieve advanced reading capability with easy tuning either from the setting software or the main unit.

From the setting software — Setting software: AutoID Network Navigator **SR-H5W**

1 Pointer
Set the workpiece

2 Monitor
Check on the monitor

3 Tuning
Just click

Reduces manhours for setup with the setting software's Live View

Reading tests can be easily executed. SR-750 Series checks reading ratio, cycle time, and banks that are used for reading.
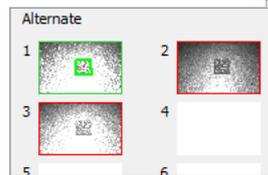
It also checks the preset codes.
[→ Parameter bank function See P. 9]
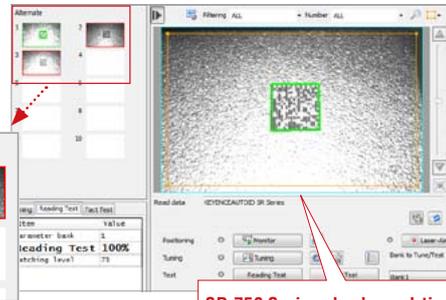
SR-750 Series checks real-time images while tuning.

Automatic selection of optimal settings
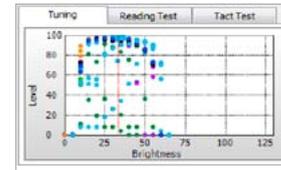
Automatically selects the optimal settings from various combinations of correction patterns, such as filters, and brightness levels.

From the main unit

TUNE button/ TEST button
Activates tuning mode or test mode

Multi-LED display
Displays reading stability and bank numbers

1 POSITIONING
Use the laser pointer to position the code in the reading area

TUNE **Push!**
Positioning
Lights up the pointer

2 TUNING
Automatically determines the optimal reading conditions

TUNE **Push!**
Searches reading conditions
Reading test

3 BANK REGISTRATION
Registers reading conditions to the main unit

TEST TUNE **Push!**
Selects bank number
Bank registration

# Stable Operation with the Preventive Maintenance Function

Image Quality Check by Code Reader

The SR-750 Series is the first product in this class that is capable of judging the image quality of a scanned code. This enables you to identify image deterioration before an error occurs, thus ensuring stable operation.

Matching Level Judging Function — Enables safety factors of scanning to be compared

After a code is scanned successfully, it can be determined how easily the SR-750 Series has scanned it. This information can be used to check the safety factor of scanning or as a correlation index for the parameter bank during tuning.

> **Two codes, which both have a reading rate of 100%, can still be distinguished by a safety factor**
>
> | Reading rate | **100%** |
> |---|---|
> | Matching level | **75** |
>
> | Reading rate | **100%** |
> |---|---|
> | Matching level | **43** |
>
> The above shows that the left code has a higher safety factor than the right one.
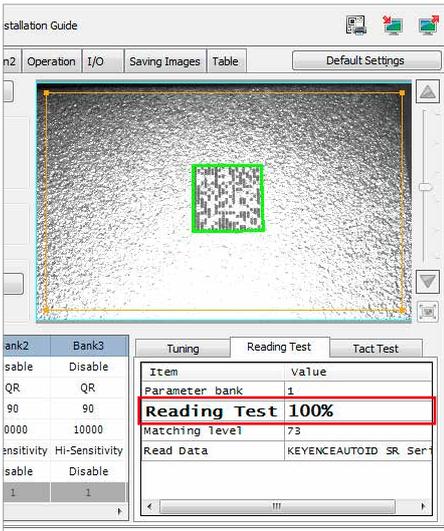
Image Verification Function — Verification based on image quality standards

Total grades can be judged based on output verification result data or preset thresholds and then output as signals.
This function is designed for 2D codes (QR, DataMatrix, GS1 Composite, PDF417).

Output data **AD-ERMT-55841:B**

Total grade judgement

Judgement can also be performed for each character

Supported Standards	● ISO/IEC 15415	● ISO/IEC TR 29158 (AIM DPM-1-2006)
	● ISO/IEC 16022	● SAE AS9132 ● SEMI T10-0701

The multi-I/O function outputs image verification results

Various operating conditions can be assigned to two input terminals and three output terminals.

▌Sample outputs of image verification results

OUT1: Stable read output (STABLE)

**OUT2:** Unstable read output (UNSTABLE)

OUT3: Read error output (ERROR)

Any thresholds can be set for STABLE and UNSTABLE.

Compatible with a Wide Variety of Applications

## Four Models and Dedicated Lens Attachments to Support Various Reading Conditions

The four models of the SR-750 Series cover a wide range of applications from reading tiny codes printed on very small parts to reading codes from a long distance. In addition, KEYENCE's Parameter Bank function enables stable reading even if the size or shape of the parts changes.

	High-resolution type **SR-750HA**	Close-range type **SR-750**	Middle-range type **SR-751**	Long-range type **SR-752**	Long-range type + lens **SR-752** + **SR-75L4**	Long-range type + lens **SR-752** + **SR-75L6**
Minimum resolution	0.082 mm	0.127 mm	0.19 mm	0.19 mm	0.33 mm	0.5 mm
Focal distance	38 mm	60 mm	100 mm	250 mm	400 mm	600 mm

Reading distance (mm)

Minimum resolution **0.082 mm**

Max. **305 mm**

Max. **490 mm**

Max. **690 mm**

Lens attachment SR-75L4/75L6

The detection distance can be extended further by installing the attachment on the SR-752 long-range type.

The reading range above is a value measured with a KEYENCE test label. Max. 305 mm, 490 mm, and 690 mm are for DataMatrix (cell size 0.5 mm).

Supports Ethernet (TCP/IP, FTP, EtherNet/IP™, PROFINET) + PoE

In addition to data, it can also transfer captured images in real time and quickly check reading status or read error images. Through the use of the standard Ethernet connection, it can be easily integrated into most multi-vendor network environments.

PC

EtherNet/IP™   PROFI NET®

SR-750 Series

PC   PLC

PoE POWER SUPPLY

Can supply power via PoE

Power can be supplied from the Ethernet cable, making it possible to streamline the laying of power source cables and allowing for reduction in cost and manhours.

Checks through software   FTP

Read image data

SUPPORTS MULTIPLE MONITORS

SR-750 Series checks image data captured at the manufacturing site in real time (up to 16 readers). Able to instantly judge a reading status during operation.

Master/Slave Function for Using Multiple Readers Effectively

This function reduces the programming load on the host computer drastically when multiple SR-750 readers are used.

Two modes are available: multi-drop link mode and multi-head mode.

(The SR-1000 Series can also be used in combination.)

Multi-drop link mode

In this mode, data read by multiple SR-750 Series readers (up to 32) working for different purposes are sent collectively by a single master to the host. This eliminates the need for the host to control communication among multiple readers, simplifying programmes in the system.

HUB

Slave station   Slave station   Master station

The master station sends data from slave stations to the host.

Host

PC

PLC
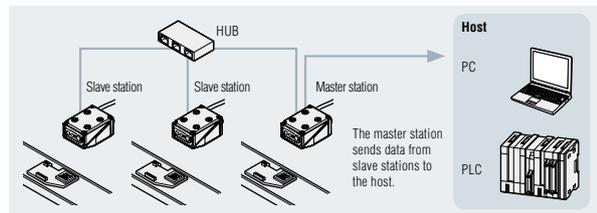
Multi-head mode

This mode allows multiple SR-750 Series readers (up to 8) to be handled as a single device. As a result, the host does not need to consider control over multiple devices, leading to simpler programmes.

*Communication and control via EtherNet/IP™ and PROFINET are also possible.

Slave station

HUB

The master station controls slave stations.

Host

PC

PLC

Slave station   Master station
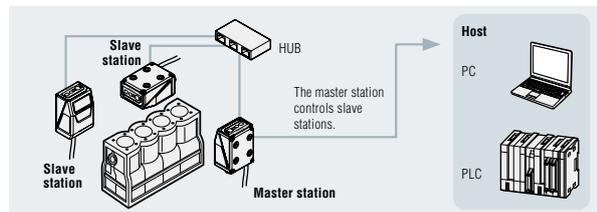
Powerful on Fast-Moving Workpieces

Burst read function: Acquires up to 8 consecutive images. The decoding process is performed after continuous imaging, allowing for higher speed code detection.

High-speed image capture performance:
The built-in ultra-high-intensity LED, bright enough even in a short exposure time, and high-speed digital signal processor (DSP) can capture moving objects effectively. (Reference: Max. 170 m/min with a KEYENCE test label)

Continuous imaging

A   B   C   D

A B C D   A B C D

Continuous imaging   Decode

Read data output
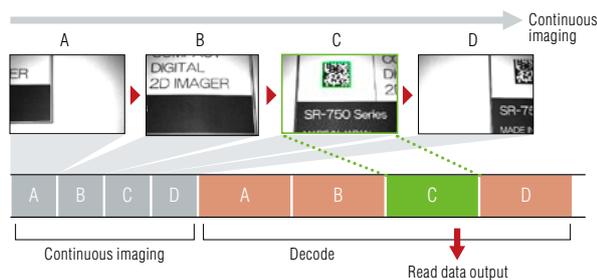
Automatic Selection of Optimal Reading Conditions (Parameter Bank Function)

Even if difficult codes are mixed with ordinary codes on the same line, the SR-750 Series will automatically alternate between registered parameters until the proper reading conditions are found.

Ordinary marking   Black/white inversion   Contrast low   Misalignment

REGISTER   REGISTER   REGISTER   REGISTER

BANK 1   BANK 2   BANK 3   BANK 10

Automatically alternates 10 banks. Reads using the best conditions.
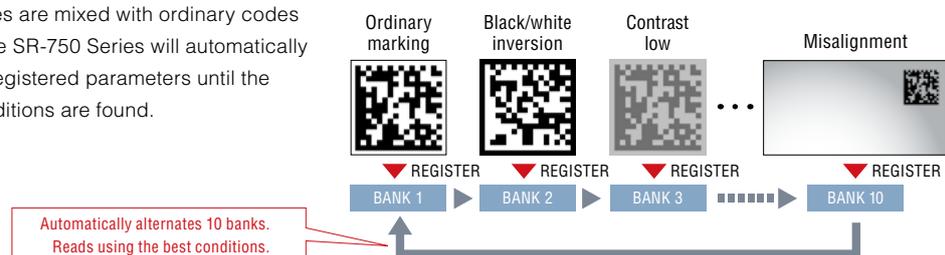
Data Edit Function

Output data and FTP image file names can be edited, leading to a reduction in data processing on the host.

PLC Link Function

Read data is written directly into the PLC data memory, reducing man-hours for programming.

Supported protocols	KEYENCE KV Series (KV STUDIO mode) Mitsubishi Electric MELSEC Series (MC protocol form 5) OMRON SYSMAC Series (SYSWAY* RS-232C only)

MAIN UNIT

High-resolution type **SR-750HA**

Close-range type **SR-750**

Middle-range type **SR-751**

Long-range type **SR-752**

LENS ATTACHMENT

400 mm lens: **SR-75L4**
600 mm lens: **SR-75L6**

CABLE

Control cable
2 m: **OP-87224**
5 m: **OP-87225**
10 m: **OP-87226**

NFPA79 compliant control cable
2 m: **OP-87353**
5 m: **OP-87354**
10 m: **OP-87355**

NFPA79 compliant control cable
(D-sub 9-pin)
2 m: **OP-87527**
5 m: **OP-87528**
10 m: **OP-87529**

NFPA79 compliant
Ethernet cable
2 m: **OP-87359**
5 m: **OP-87360**
10 m: **OP-87361**

SETTING SOFTWARE

AutoID Network Navigator **SR-H5W**

READING RANGE CHARACTERISTICS [TYPICAL]

Unit: mm

SR-750HA: High-resolution type

Code type	Cell size	A	B
DataMatrix QR	0.08	31	39
	0.127	27	42
	0.25	22	50

Focal distance 38 mm
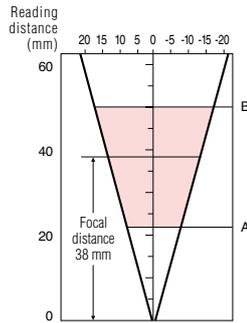
SR-750: Close-range type

Code type	Cell size Narrow bar width	A	B
DataMatrix QR	0.127	50	70
	0.25	40	80
Code39	0.127	46	74
	0.33	30	100
Code128	0.25	34	90

Focal distance 60 mm
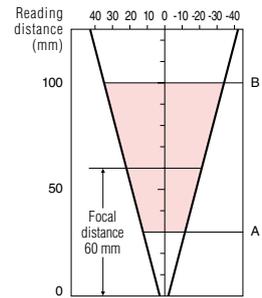
SR-751: Middle-range type

Code type	Cell size Narrow bar width	A	B
DataMatrix QR	0.25	65	130
	0.5	45	165
Code39	0.127	75	110
	0.5	45	195
Code128	0.25	50	150

Focal distance 100 mm
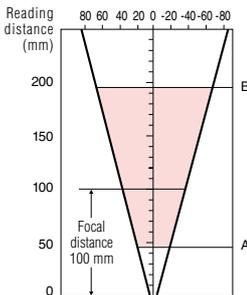
SR-752: Long-range type

Code type	Cell size Narrow bar width	A	B
DataMatrix QR	0.19	220	260
	0.25	210	270
	0.33	200	280
	0.5	180	305
Code39	0.17	220	260
	0.5	180	330
Code128	0.25	195	275

Focal distance 250 mm
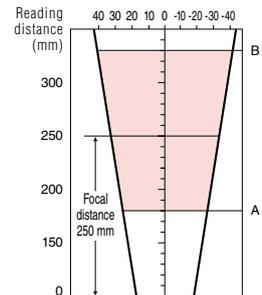
SR-752 + **SR-75L4** (400 mm lens)

Code type	Cell size Narrow bar width	A	B
DataMatrix QR	0.33	350	450
	0.5	300	490
Code39	0.22	370	440
	0.5	250	540
Code128	0.25	350	450

Focal distance 400 mm
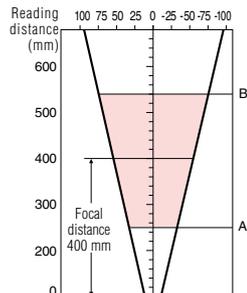
SR-752 + **SR-75L6** (600 mm lens)

Code type	Cell size Narrow bar width	A	B
DataMatrix QR	0.5	460	690
	1	330	860
Code39	0.33	500	690
	0.5	400	760
Code128	0.33	500	690
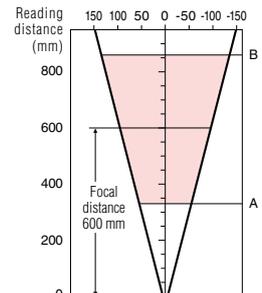
Focal distance 600 mm

Unit: mm

Main unit

SR-750/751/750HA

34.3
30.8
1.2
13.2
15°
65
17.6
37.5

SR-752

42.1
39.1
12
11.1
15°
65
17.6
46.4

With port cover

47
28
4-M4
(Depth: 5)
17
28
(79)
(84.4)
9.5 9.5

With cable

(114)
(110)
(145)
(142)

Mounting bracket

33
10° 10°
Dimension for 5.3 the screw holes.
R32
7.5
2-M4
ø5.3
2
20

(7.5)
Insulating sheet
47
(10.5)
(2.5)
(5.5)
(51)
(52.5)
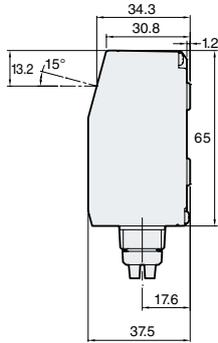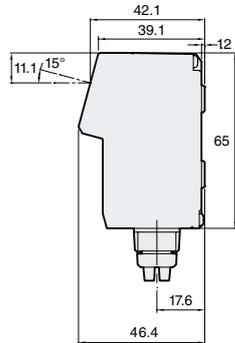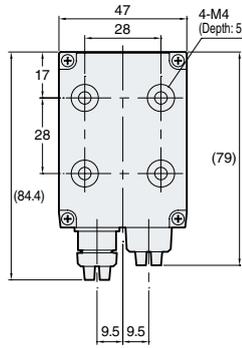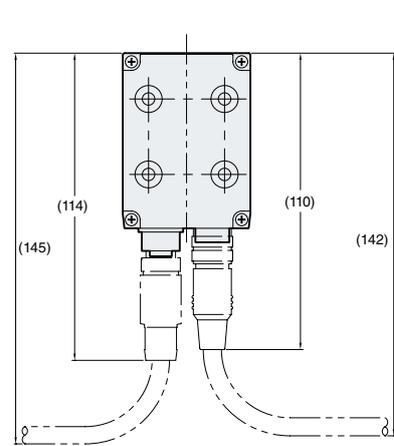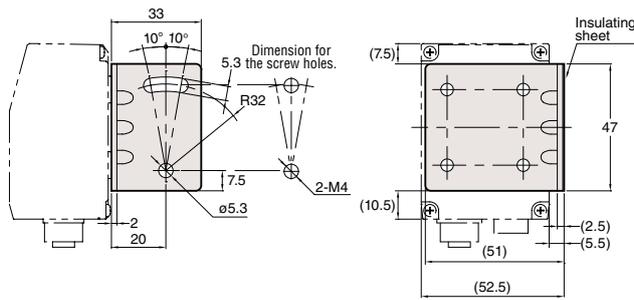
Long-focal distance lens **SR-75L4/75L6**

54.6
31.1
16.2
33.9

42.7
42.1
11.1
15°
70.5
49.2

Control cable

L
45
ø6.7
ø15
5 120
5 150
5 180
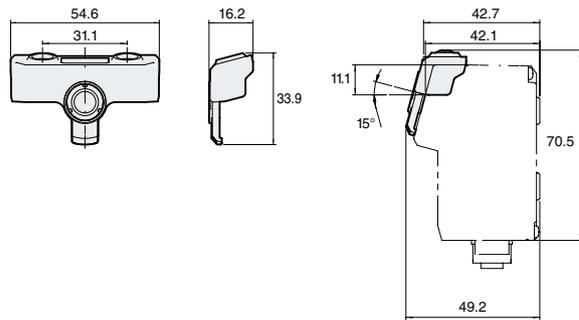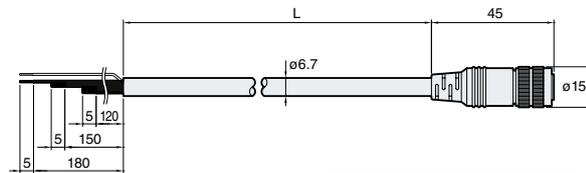
Model	L
OP-87224/87353	2 m
OP-87225/87354	5 m
OP-87226/87355	10 m

NFPA79 compliant Ethernet cable

44.5
L
47.3
ø6.5
ø14.8
16.8
13.6
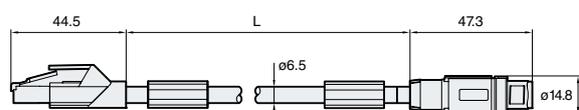
Model	L
OP-87359	2 m
OP-87360	5 m
OP-87361	10 m

Ethernet plug assembly
OP-87362

(46.5)
M12
ø15
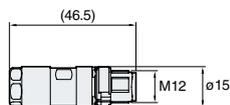
SPECIFICATIONS (MAIN UNIT)

Model		SR-750HA	SR-750	SR-751	SR-752	SR-752 + SR-75L4	SR-752 + SR-75L6
Type		High-resolution type	Close-range type	Middle-range type	Long-range type	With 400 mm lens	With 600 mm lens
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	QR, MicroQR, DataMatrix (ECC200), GS1 DataMatrix, PDF417, MicroPDF417, GS1 Composite (CC-A/CC-B/CC-C)					
	Supported symbol — Barcode	[*1]	CODE39, ITF, 2of5 (Industrial 2of5), COOP 2of5, NW-7 (Codabar), CODE128, GS1-128, GS1 DataBar, CODE93, JAN/EAN/UPC, Trioptic CODE39, CODE39 Full ASCII				
	Minimum resolution — 2D	0.082 mm	0.127 mm	0.19 mm	0.19 mm	0.33 mm	0.5 mm
	Minimum resolution — Barcode	–	0.127 mm	0.127 mm	0.17 mm	0.22 mm	0.33 mm
	Reading distance (typical examples) — DataMatrix QR	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)
	Reading distance (typical examples) — 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
	Field of view (at focal distance)	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 — Number of inputs	2					
	Control input — Input type	Bidirectional voltage input					
	Control input — Maximum rating	26.4 VDC					
	Control input — Minimum ON voltage	15 VDC					
	Control input — Maximum OFF current	0.2 mA or less					
	Control output — Number of outputs	3					
	Control output — Output type	Photo MOS relay output					
	Control output — Maximum rating	30 VDC					
	Control output — Maximum load current	1 output: 50 mA or less, Total of 3 outputs: 100 mA or less					
	Control output — Leakage current when OFF	0.1 mA or less					
	Control output — Residual voltage when ON	1 V or less					
	Ethernet — Communication standard	10BASE-T/100BASE-TX					
	Ethernet — Supported protocol	TCP/IP, FTP, SNTP, BOOTP, MC protocol, KV STUDIO, EtherNet/IP™, PROFINET					
	Serial communication — Communication standard	RS-232C compliant					
	Serial communication — Transmission speed	9600, 19200, 38400, 57600, 115200 bps					
	Serial communication — Supported protocol	No-protocol, MC protocol, SYSWAY, KV STUDIO					
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: 10000 lux, Incandescent lamp: 6000 lux, Fluorescent lamp: 2000 lux					
	Operating environment	No dust or corrosive gas present					
	Vibration	10 to 55 Hz Double amplitude 1.5 mm/55 to 500 Hz: Acceleration 5G, 3 hours each in X, Y and Z directions					
Rating	Power voltage[*3]	Control port: 24 VDC ±10% or Ethernet port: PoE TypeA/B 36 to 57 V (Cannot supply at the same time)					
	Current consumption	Control port: 220 mA (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.
  - one that provides Class 2 output as defined in the CEC and NEC, or
  - one 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: 210 mA maximum.
* PROFINET is a trademark or registered trademark of PROFIBUS International.
* EtherNet/IP™ is a trademark or registered trademark of ODVA.

SPECIFICATIONS (SETUP SOFTWARE)

Model	SR-H5W
Supported OS	Microsoft Windows 8 Professional or later 32 bit/64 bit (Except for Windows RT) Microsoft Windows 7 Professional or later 32 bit/64 bit Microsoft Windows VISTA Business/Ultimate SP2 or later 32 bit*
Running environment	Processor: 2.0 GHz or faster Memory: 1 GB (32 bit) or 2 GB (64 bit) DVD-ROM drive: Required for installation Screen resolution: 1024 × 768 or better

* Windows Vista is not supported with the SR-G100.
• .NET Framework 3.5 SP1 or above has been installed. • An internet connection is required when installing .NET 3.5 on Windows 8.
• The Control Panel is used for executions when installing .NET 3.5 on Windows 8.

KEYENCE

Please visit: www.keyence.com

SAFETY INFORMATION
Please read the instruction manual carefully in order to safely operate any KEYENCE product.