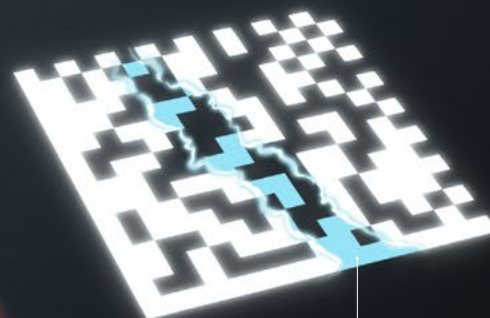# KEYENCE

AI-Powered Code Reader

NEW SR-X Series

PoE Now Available

Reading even damaged codes
WORLD'S FIRST AI & Link System

Smart. Simple. Stable.

Introducing a compact, ultra-high performance
code reader with built-in AI

SR-X Series

AI-Powered Code Reader
NEW SR-X Series

All-in-one code reader built for challenging operations

As products around the world become smaller and more sophisticated, the parts they use are becoming more complex and diverse. This calls for a new kind of reading performance.

— Built-in AI makes previously unreadable codes readable

Impressive advances in reading performance make it possible to track changes in targets, environment, and marking conditions.

— Advanced functionality beyond just code reading

Simply being able to read codes is not always enough.

As a direct sales company, KEYENCE can create products that directly meet the needs of users.

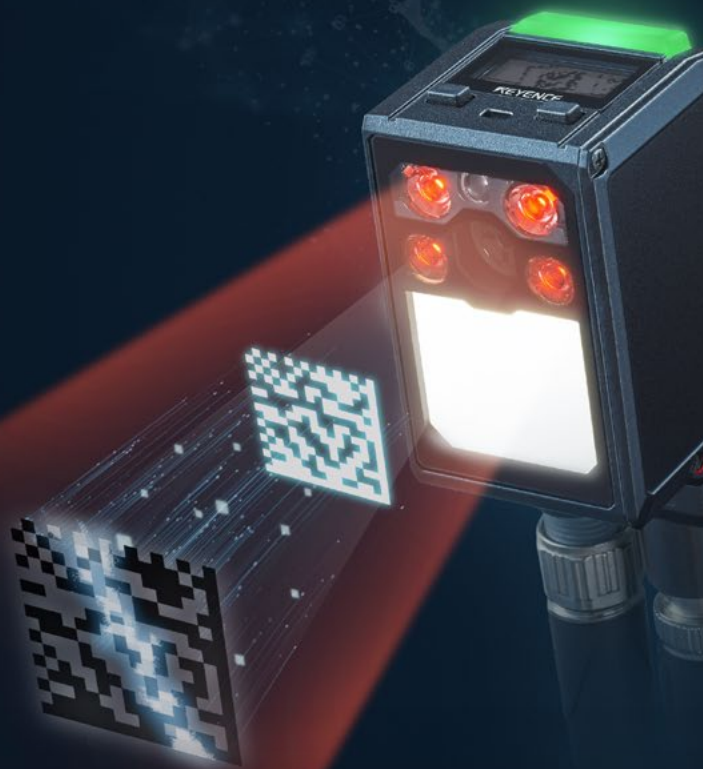This all-in-one reader is just such a product.

[Operation]

Reading

Strive for 100% read rates

| WORLD'S FIRST | Using AI and information sharing between readers results in advanced code reading performance and stability. |

[Maintenance]

Analysis

Quickly identify the causes of errors

| WORLD'S FIRST | Joining barcode data to statistical information makes it possible to monitor the statuses of all code readers on a network. |

WORLD'S FIRST

Link devices to improve reading and analysis

SR-X Link System

The ability to link SR-X Series devices to each other increases reading performance while also allowing for comparison of various factors between code readers.

Scan the QR code for more information on the SR-X Series

[Setup]

Simplicity

Incredibly easy for any user

The SR-X Series offers improved usability over KEYENCE's conventional SR Series of readers.

[Selection/Design]

Usability

Capture any target in any environment

The high performance and ultra-compact size of the advanced housing design allow for installation in virtually any environment. A wide variety of optional accessories is also available.
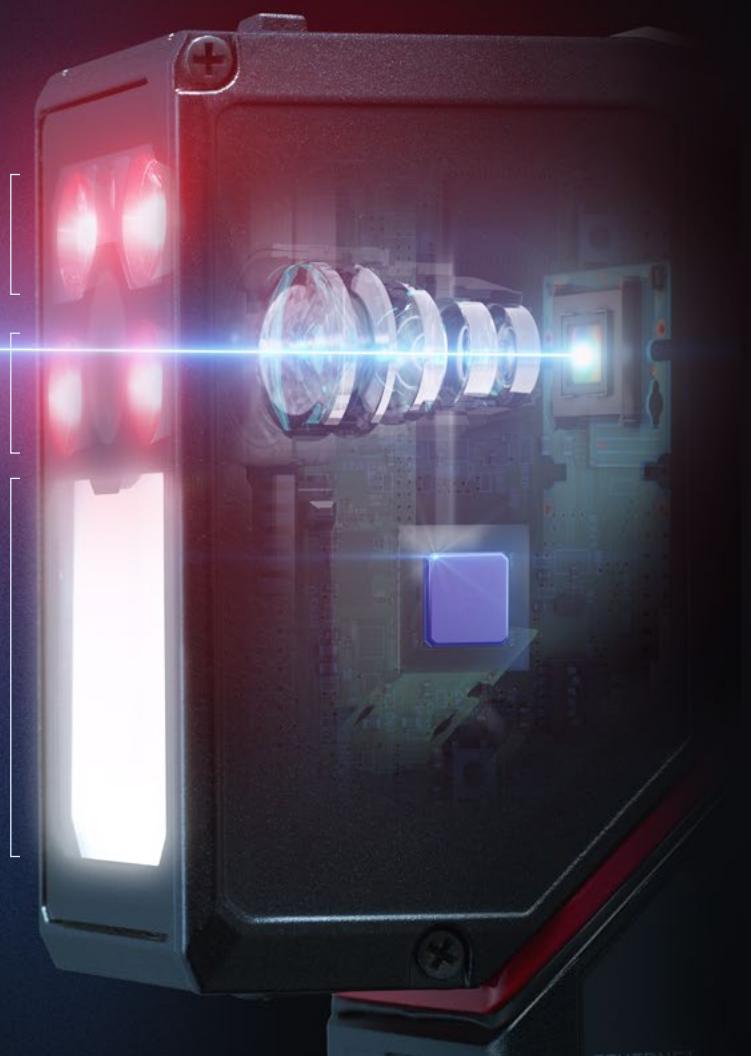
35.5 mm

56.0 mm

37.0 mm

OK → OK → OK

Reading

Strive for 100% reading rates

Using AI and information sharing between readers results in advanced code reading performance and stability.
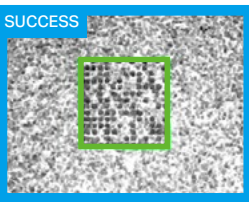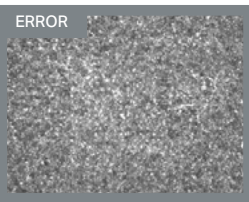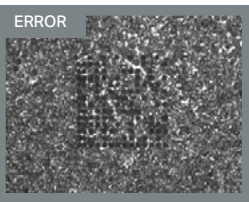
Direct lighting
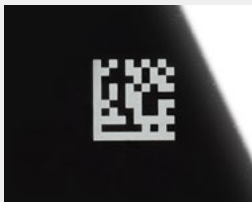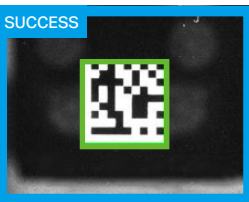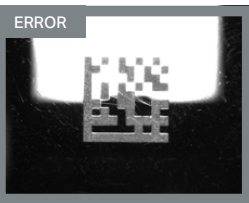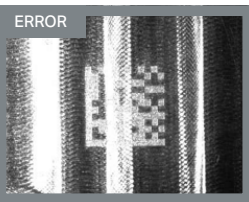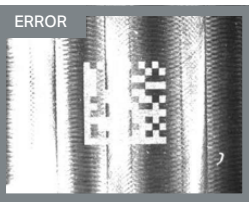
Polarized lighting

Diffused lighting

Automatically selects optimal lighting conditions for the target

Built-in 3-way lighting (direct, polarized, diffused)   * SR-X300 Series

Typical examples		Direct lighting	Polarized lighting	Diffused lighting
Pin stamp marking on cast surface		SUCCESS	ERROR	ERROR
Black resin		ERROR	SUCCESS	ERROR
Hairline metal surface		ERROR	ERROR	SUCCESS

* SR-X300 Series: SR-X300, SR-X300W, SR-X300P, and SR-X300WP
SR-X100 Series: SR-X100, SR-X100W, SR-X100P, and SR-X100WP

6

Impressive imaging capabilities with integrated design

Integrated lens, lighting, and high-resolution CMOS

With a typical camera lens, the corners of the captured image are distorted and essentially unusable for reading. KEYENCE's newly developed imaging lens makes effective use of the entire area captured by the CMOS image sensor, ensuring readability even in the corners of the image.

Before

The lens and lighting must be selected according to the target and marking status, requiring both time and effort to ensure the components are ideal for the conditions.
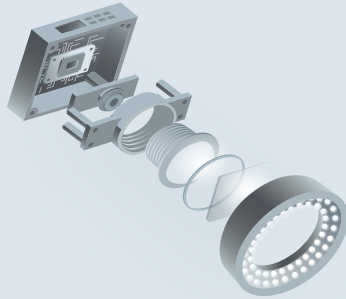
☐ Lighting
☐ Lens
☐ CMOS
☐ F-stop
☐ Filter

After

The integrated design enables completely automatic configuration of the best settings with no need to select equipment or adjust settings.

NEW
New HDR wide CMOS

NEW
Newly developed LED lighting system
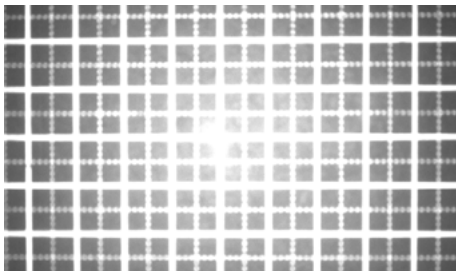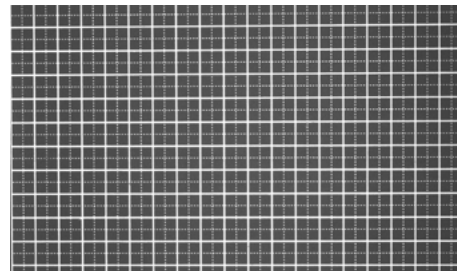
NEW
Ultra-compact imaging lens
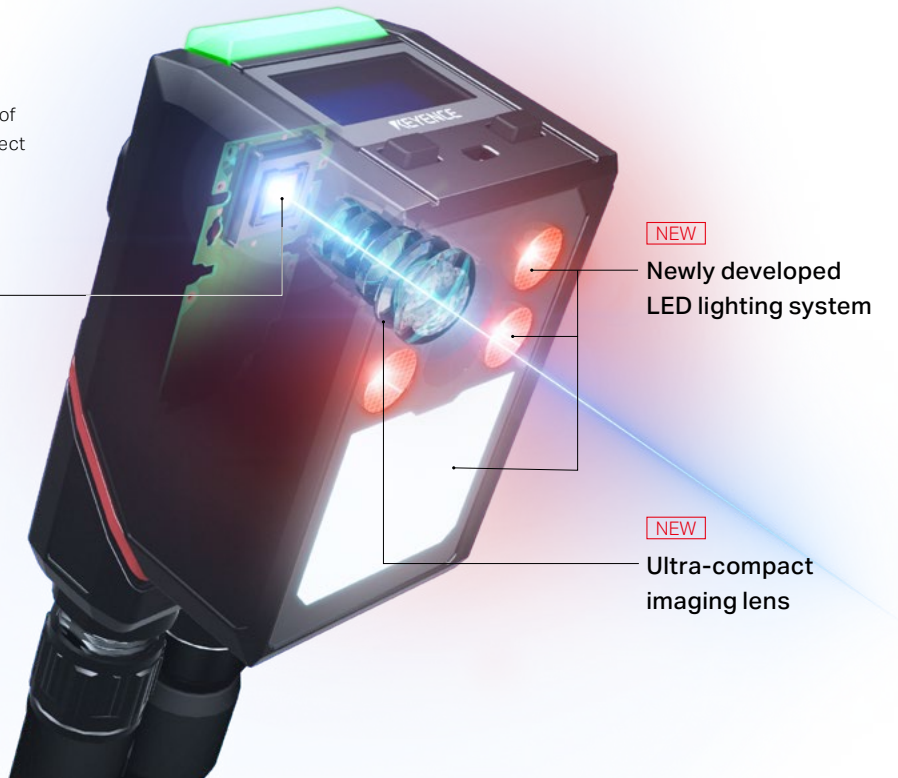
▸ The entire field of view is bright and evenly lit to maximize use of the high-resolution CMOS with minimal wasted imaging area.

Before — Ensuring even lighting throughout the entire field of view is difficult with conventional models.

After — Lighting is distributed evenly throughout the field of view, maximizing use of the imaging area.

Reading

Reliably identify codes
SR-X Drive: A new decoding algorithm from KEYENCE

▸ **New search algorithm for reliable reading of damaged codes**

When reading a code, the code reader analyzes the finder pattern around the code to determine the code's position patterns in the image. However, damage can occur during processing, preventing codes from being readable. KEYENCE's newly developed search algorithm dramatically improves detection even of damaged codes.

Pattern searching for damaged codes
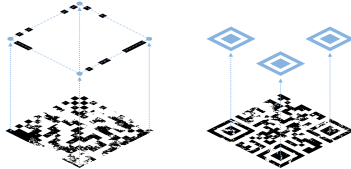
Typical examples of alignment/finder pattern damage
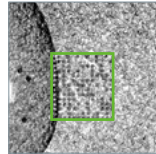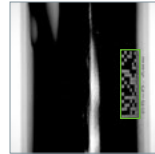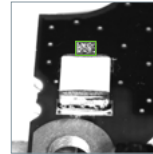
Stains Cylinders Hidden codes Wear on marking
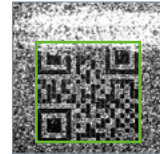
Heat map search algorithm

The algorithm emphasizes areas with significant variation between black and white in the captured image. This drastically improves the success rate and speed of searches compared with conventional search methods, which start from the top of the image, to ensure faster, higher stability reading.
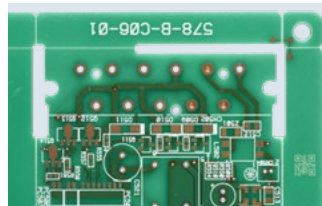
PCB
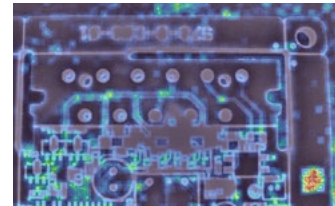
* After heat map processing

▸ **WORLD'S FIRST** AI filter for reading difficult codes *SR-X300 Series

Optimized specifically for code reading, the built-in inference-specific AI chip was created through learning of a database of over 100,000 images. This results in dramatically improved code reading performance.

AI filters

Before

After

▸ **AI filter effect examples**

Stains Scratches Rough backgrounds Uneven cell color
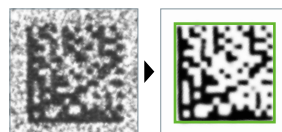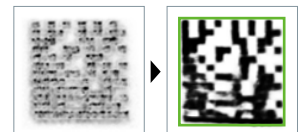
Improved stability with multi-core processing *SR-X100 Series 5-core

6-core parallel processing system

The SR-X Series is designed for simultaneous processing and decoding using 6 cores in parallel for every captured image. The new system adds a dedicated AI core to the existing 2-core decoding algorithm for improved reading success rate over the conventional SR Series and faster total read time.

▸ SR-X300/X300W example: 6-core parallel processing system diagram | 2× more cores than conventional models

CPU	Master CPU	CPU	Conventional decoding CPU	NPU	For AI filters	CPU	SR-X Drive decoding CPU
	Capture + image transfer		Conventional decoding		AI filter		SR-X Drive decoding

	Image 1	Image 2	Image 3
CPU	1st	2nd	3rd
CPU	1st	2nd	3rd
CPU	1st	2nd	3rd
NPU	AI filter	AI filter	AI filter
CPU	1st	2nd	3rd
CPU	1st	2nd	3rd

For even greater reading performance, see the SR-X Link System on P. 16.

Stable reading of small codes *SR-X300 Series

High-resolution lens attachment

● Minimum cell size:
10 µm 0.39 Mil

Increasing the PPC size provides stable reading even for extremely small codes.

● Ultra-deep depth of field

The newly designed lens with an ultra-deep depth of field provides reading of even incredibly small codes from different heights.

32 to 47 mm
1.26" to 1.85"

9

Analysis

Quickly identify the causes of errors

Joining barcode data to statistical information makes it possible to monitor the statuses of all code readers on a network.

| Identify problems before they occur

‣ Code verification function

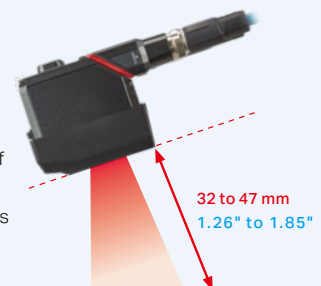Code verification is essential for tasks with growing importance, including ensuring reading stability in later processes and offering support for marking quality control requests from suppliers.

2D codes

Total grade judgment
Judgment can also be given for each parameter

Output data

AD-ERMT-55841: B

[Supported standards]
‣ ISO/IEC 29158:2020
‣ ISO/IEC TR 29158
  (AIM-DPM-1-2006)
‣ ISO/IEC 15415
‣ ISO/IEC 15416
‣ ISO/IEC 16022
‣ SAE AS9132
‣ SEMI T10-0701

Barcodes

4 912345 123459

Total grade judgment
Judgment can also be given for each parameter

Output data

4912345123459: B
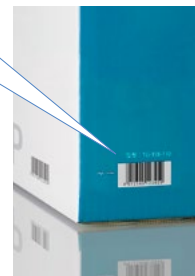
‣ Matching level function

Rather than confirming whether reading was possible or not, a code's quality can be checked using a scale of 1 to 100.

	Reading rate	**100%**
	Matching level	**75**

	Reading rate	**100%**
	Matching level	**43**

Use the matching level to distinguish between codes with reading rates of 100%.

Software not required for analysis, setup, or monitoring

SR Web Tool

The SR Web Tool can be used to monitor and adjust the operation of the reader from a web browser. Simply enter the IP address of the SR-X Series device into a web browser on a tablet or PC in the same network to configure settings, collect statistics, and gather images for error analysis. Users can also manage multiple units from a single browser.

SR Web Tool

1. Setup: Web Navigator

2. Analysis: Web Traceability Tool

3. Monitoring: Web Multi Monitor

* Multiple languages supported

▸ **1.** Setup tool

Web Navigator

Follow step-by-step operations for faster installation and setup.
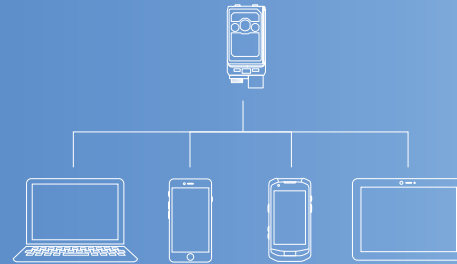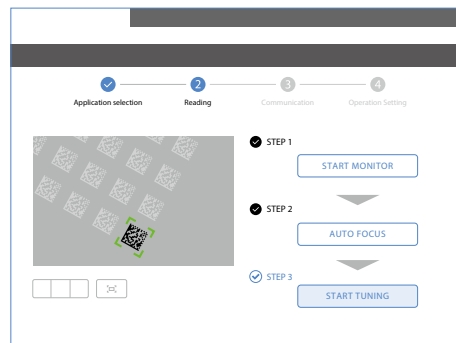

▸ **2.** Analysis tool

Web Traceability Tool

Use statistical information and error images to quickly track which readers failed to read a code, when, and why.

This reduces time spent analyzing the cause of errors and taking appropriate countermeasures, all without having to develop additional programs.

* Cause of error: Hidden code

▸ **3.** Monitoring tool

Web Multi Monitor

Monitor the operating status of multiple units in operation.

Check that all devices are operating normally and use a single screen to monitor several devices at once (LiveView).
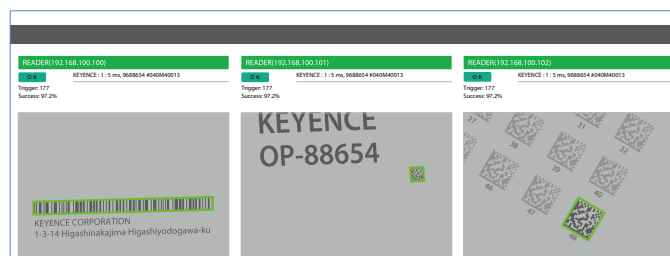
Simplicity

Incredibly easy for any user

The SR-X Series offers unparalleled ease-of-use so users of any skill level can operate and set up the device.

1 Monitoring

2 Automatic focusing

3 Tuning

Easy 3-step setup
Simple 3-button setup with remote operability

The software not only facilitates reader setup but also simplifies operability to perform preliminary testing.

1 Start monitor ▸ **2** AF Auto Focus ▸ **3** Start tuning

▸ **Enjoy even greater ease of use with KEYENCE original software**

Tuning monitor
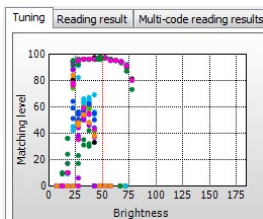
The optimal settings are automatically determined from multiple combinations of image processing filters and brightness levels.

Parameter bank function

The reader will automatically alternate between registered parameter banks until the proper reading conditions are determined.

Normal marking — Register — BANK 1 ▸
Low-contrast marking — Register — BANK 2
Misalignment — Register — BANK 16

Automatically alternate between 16 banks to determine the best reading conditions.
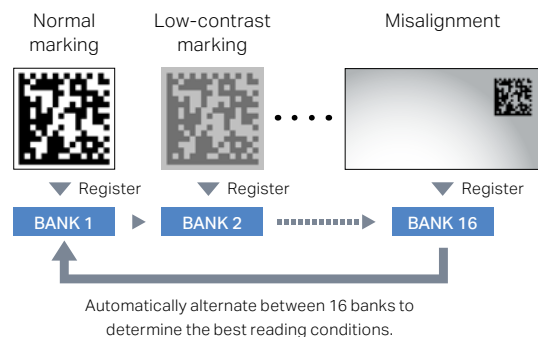
Easily usable by anyone—from installation to verification

‣ Angle sensor and pointer for easy positioning

Easily check and output the most stable angle characteristics to quickly recreate or restore the best installation conditions.

Angle sensor *SR-X300 Series
The angle is displayed on both the main unit display and in the software.
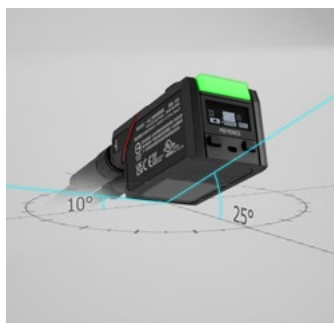
Pointer
The pentagon shape points toward the center of the field of view.

‣ Simple setup for common applications

The device automatically suggests the best settings for the reading application selected in the configuration software.
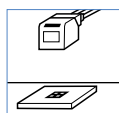
Reading stationary targets
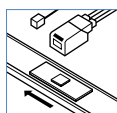
Reading moving targets
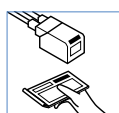
Hands-free reading
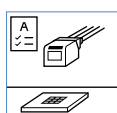
Print quality verification

‣ Easily check whether stable operation is possible

Reading stability can be confirmed beforehand with numerical values. This prevents reading problems from occurring after installation.
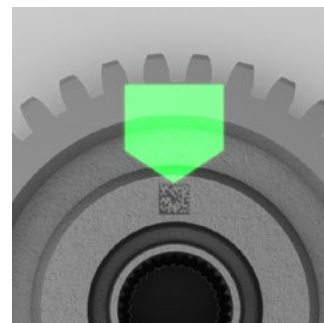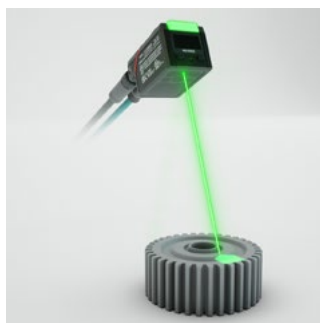
‣ Reading rate measurement test

Reading Test
100 %
Matching level
99
☐ Bank specification
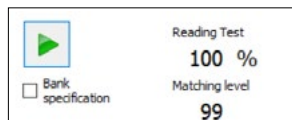
The reading rate* is displayed.
* The proportion of successful reads in 10 scans.

‣ Read time test

Read time
27 ms
☐ Bank specification
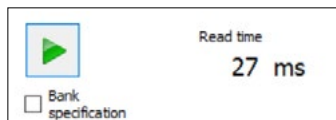
The read time* (tact time) is displayed.
* The length of time from the timing trigger to read completion.

‣ Code verification test

Overall
A
☐ Bank specification
ISO/IEC 15415

Decode	A	4.0
Symbol Contrast	A	4.0
Modulation	A	4.0
Reflectance Margin	A	4.0
Fixed Pattern Damage	A	4.0
Format Info. Damage	A	4.0
Version Info. Damage	-	-
Axial Nonuniformity	A	4.0
Grid Nonuniformity	A	4.0
Unused Err. Correction	A	4.0

Determination of code readability with results displayed in a list

‣ Depth of field measurement test

‣ Speed measurement test

Usability

Capture any target in any environment

The device has 72% less volume than conventional models in addition to offering impressively high performance.

This helps keep equipment small, reduces the time spent on design, and allows for easy retrofitting.

35.5 mm
1.40"

37.0 mm
1.46"

56.0 mm
2.20"

* Compared with conventional KEYENCE products (SR-2000).

Usable anywhere Works in virtually any location at any distance with any target

● Rotating connector

The cables can be rotated by up to 180° to suit the available space.

* SR-X300 Series

● Various mounting brackets

A wide variety of optional brackets are available to suit any situation.

Standard bracket

Adjustable angle mounting bracket

SR compatible mounting bracket

Universal mounting bracket
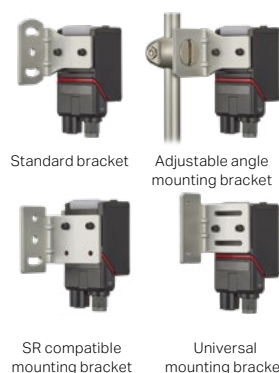
● Polarizing filters (included as standard)

The code reader automatically selects the best polarizing filter for the target to eliminate glare and stabilize reading.

● Ultra-compact autofocusing module

Never worry about how changes in temperature or deterioration over time affect imaging.

61% less volume than conventional models

14

Reliable Usable in any environment

● IP67 enclosure rating

A double-packed structure assures a high level of waterproofing.

● Tempered glass

The device comes equipped with scratch-resistant tempered glass.
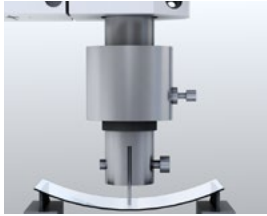
● Optional protectors

ESD attachment
Protects against electrostatic discharge failures.

Laser protector
Ensures usability near laser markers.
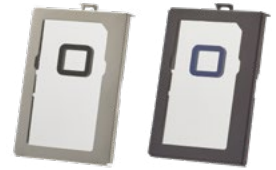
● High-flex cables (included as standard)

Never worry about the machine stopping due to a damaged cable.

90°

R

W
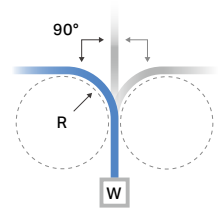
Further improving usability

● Simplified wiring with PoE

PoE-compatible models are also available.
Power can be supplied via Ethernet cables, which simplifies wiring and reduces costs and wiring time.

*SR-X300P, SR-X300WP, SR-X100P, and SR-X100WP

No PoE (24 V power supply)

24 VDC

PoE

PoE HUB

PoE power supply
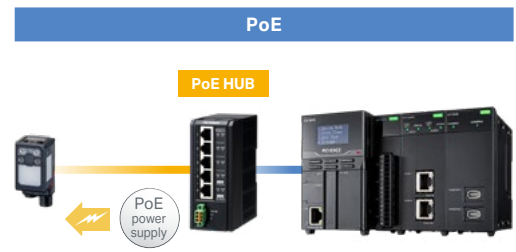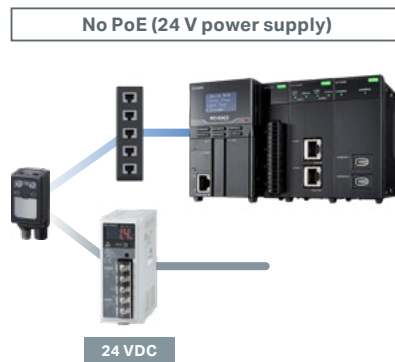
● USB Type-C port

The USB Type-C port eliminates the need to check for cable insertion direction, making adjustment easy even in complicated machines.

● Large-capacity 4 GB memory

Save up to 68,000 images— useful for analyzing errors.
*SR-X300 Series

Unrestricted usability around the world

● Compliant with industrial communication standards

EtherNet/IP™
PROFINET CC-A/CC-B/CC-C
SFTP
EtherCAT®
OPC UA

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Conversion connectors with support for common cables

Power supply cable

M12 A-coded 12-pin (included as standard)
M12 A-coded 4-pin **OP-88631**
M12 L-coded 5-pin **OP-88632**

Link devices to improve analysis and reading

WORLD'S FIRST SR-X Link System

Problems with conventional systems

WORLD'S FIRST Web Traceability Tool

Cause of reading errors is unclear

When an error occurs, the cause can be unclear even after checking each code reader. Understanding the entire process and determining a solution takes time, and the worksite must also be shut down.

←	RECORD	BANK HISTORY

Symbology

Read Data

ERROR

Read time

1508 ms

Matching level

-
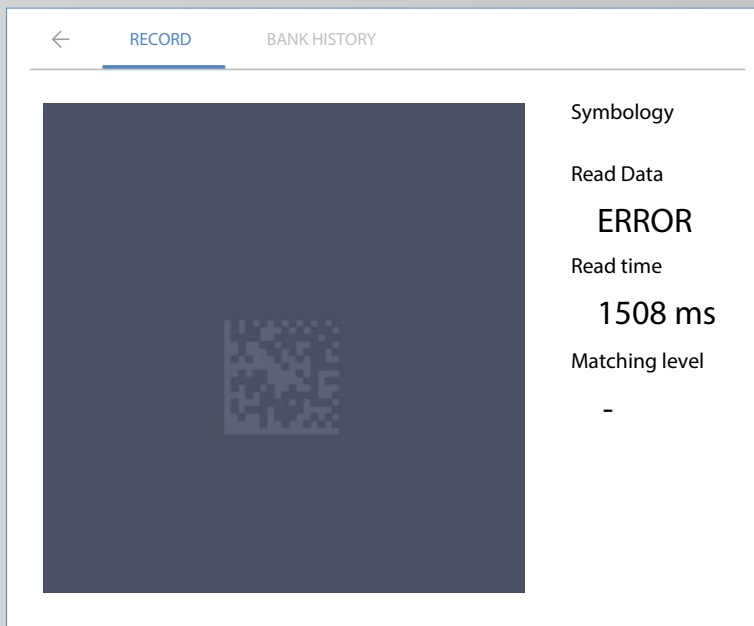
- Images are not clear
- Selected lighting is not ideal
- Reading time is too short for correct reading
- Determination of where the problem first occurred is difficult

▼

Addressing problems and situations that arise takes time

WORLD'S FIRST Linked Decoding

Reading failures due to degradation and deterioration of code quality

Code quality can degrade or deteriorate throughout the manufacturing process due to glare, dirt, stains, and other factors, which can lead to reading failures.

OK → Oil stain — ERROR → Damage — ERROR

Quickly identify causes of errors

The ability to identify changes before an error occurs means there's no need to shut down the worksite. Moreover, even if an error does occur, the code conditions can be checked at each reader, ensuring quick identification of the cause and faster resolution to problems.

Focal distance is incorrect

Installation angle is incorrect

	1	2	3
	READER(192.168.100.201)	READER(192.168.100.202)	READER(192.168.100.204)
	A:\IMAGE\001_S_01.JPG	A:\IMAGE\008_S_01.JPG	A:\IMAGE\001_S_01.JPG
Focal distance	100 mm 3.94"	102 mm 4.02"	135 mm 5.31"
Installation angle	20 0	22 0	-2 0
Bank number	Bank 1	Bank 1	Bank 1
Type of internal lighting			
Contrast adjustment method	HDR	HDR	HDR

Item	Possible causes
Reading image (OK/NG image)	Differences in code conditions or external environment
Installation angle	Incorrect angle of installation
Reading processing time	Inconsistent reading performance
Focal distance	Incorrect installation distance
Lighting	Incorrect lighting settings
Matching level	Inconsistent reading performance

Linked readers improve reading

With linked decoding, cell information from a code successfully read by a specified reader in the same network can be used to help other readers with changes in codes due to glare, stains, scratches, or other defects.

Oil stain — Damage

OK → Link OK → Link OK

The 2D code's pattern is broken down into elements for matching.
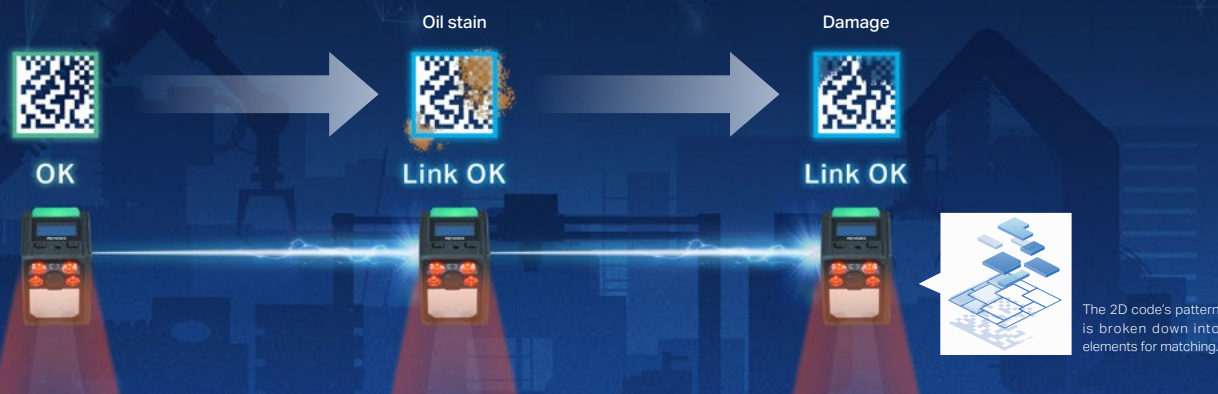
Industrial Applications

Electronic device industry

Hairline metal surfaces of magazines and trays

Conventional models	SR-X Series
ERROR	OK

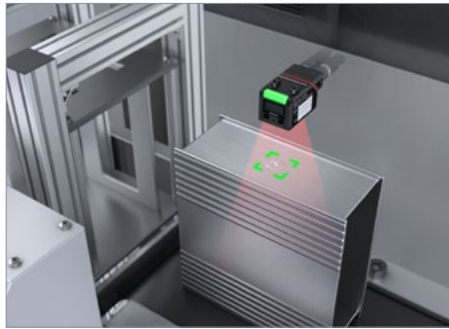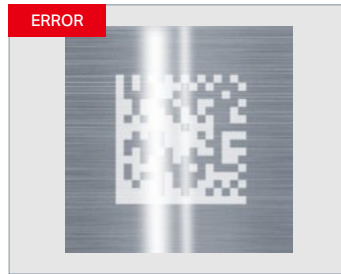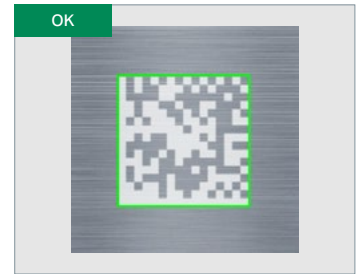Magazines and trays that store products sometimes have hairline metal surfaces or become scratched through repeated use, making codes difficult to read. Even in such situations, the SR-X Series is capable of stable reading.
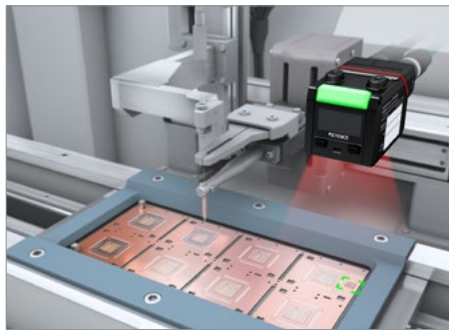
Color changes caused by heat treatment of lead frames
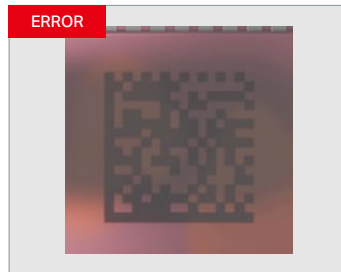
When lead frames are treated, color irregularities can occur. Uneven coloring can cause a gradation-like appearance, making codes difficult to read. Eliminating the gradation-like effects makes it possible to accurately read the data.
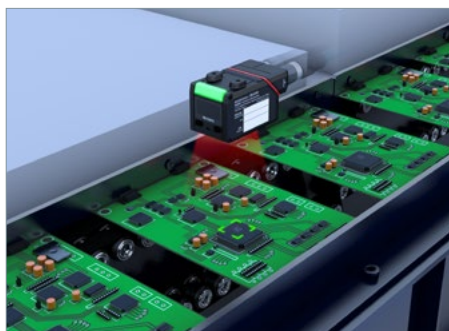
Low-contrast codes on IC chips
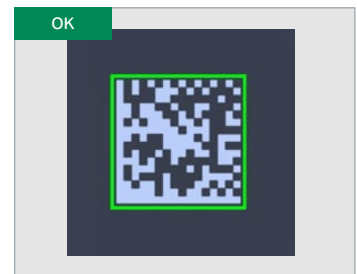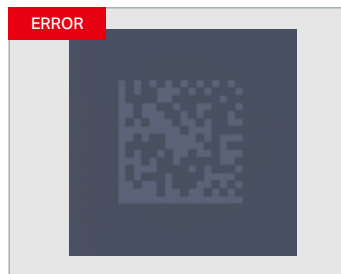
Marking on resin molds for IC chips can result in difficult-to-read coloring, and sometimes the code becomes faint. In such cases, enhancing the contrast can make the code readable.
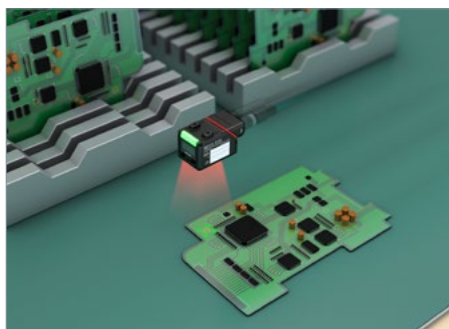
Flux on PCBs
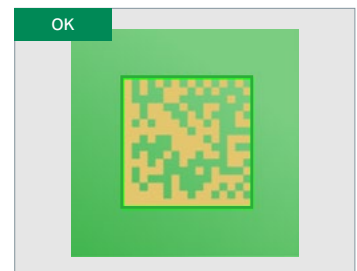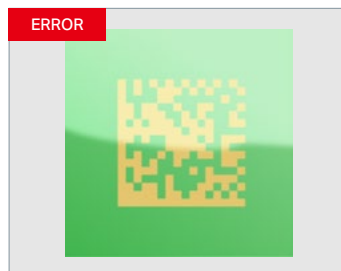
Flux applied to PCBs can sometimes make reading difficult due to glare. Even in such cases, the SR-X Series can read codes with minimal influence from reflections.

Automotive industry

Hairline metal surface on battery case

ERROR

OK
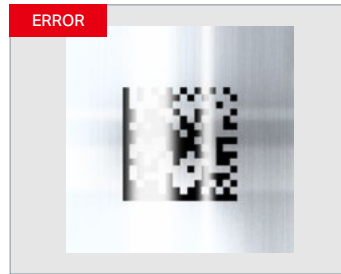
Battery cases can have hairline metal surfaces that make reading difficult due to reflections. The SR-X Series can minimize the effects of the hairline metal surface to ensure stable reading.
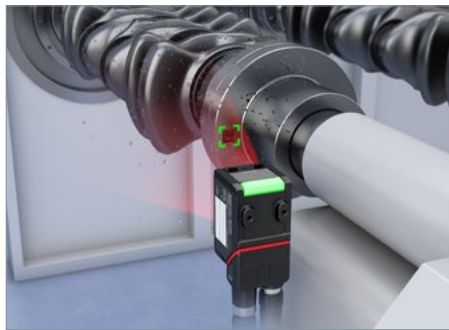
Water droplets on crankshaft

ERROR

OK

Crankshafts undergo a cleaning process, making it necessary to read codes covered with water droplets. Reducing the influence from those droplets makes it possible to accurately read the data.
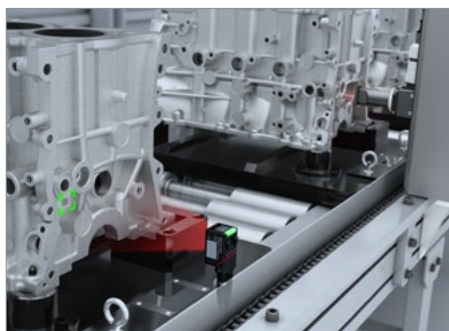
Dot smearing on cylinder blocks

ERROR

OK
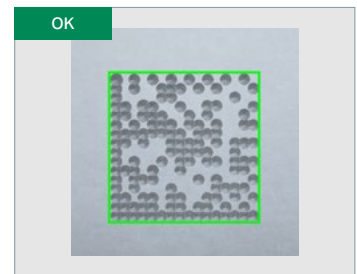
Dot peen marking is often used for marking codes on cylinder blocks. In some cases, wear on the marking pen tip may cause the dots to appear thick. Image processing filters can be used in such cases to make reading possible.
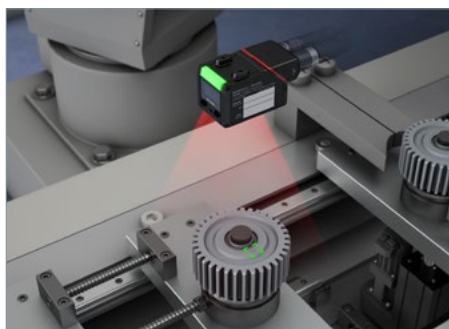
Changes in gears caused by quenching

ERROR

OK

A quenching process is sometimes used on gears. This minimizes the contrast of codes, sometimes resulting in greater reading difficulty. Even in such cases, the SR-X Series increases the contrast to make the code readable.

Industrial Applications

Food, pharmaceutical, and cosmetic industries

Conventional models	SR-X Series

Deflections/reflections on pouch products

ERROR → **OK**
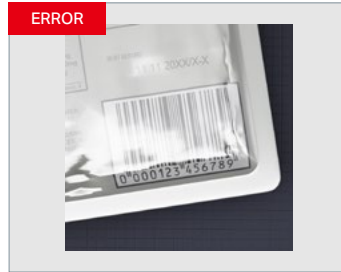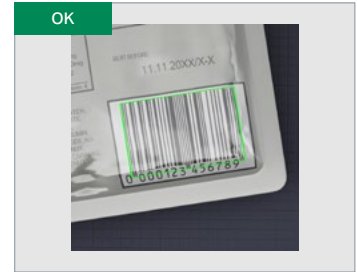
Pouches can sometimes make reading difficult due to reflections as the surface flexes or when highly reflective materials are used. In such cases, correcting for such deflections and reflections makes reading possible.
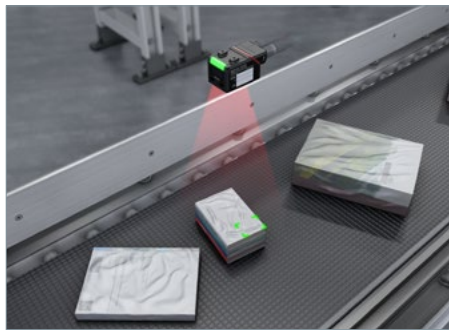
Reflections on vinyl coverings

ERROR → **OK**
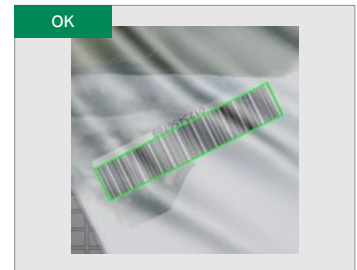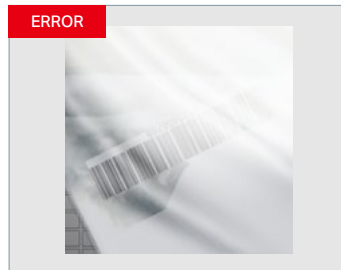
Vinyl coverings often make codes difficult to read due to reflections, and taking the product out of the covering in order to read can take time and effort. Reducing the influence from such reflections can make reading possible even in such situations.

Blurred printing on cardboard boxes

ERROR → **OK**
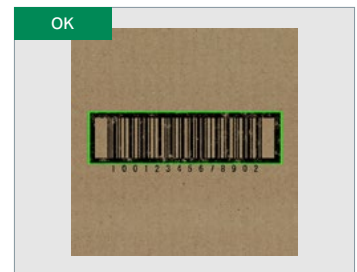
Readability of cardboard boxes can be affected by poor ink adherence and scuffing. The SR-X Series' image processing functions make reading possible even with blurry codes.
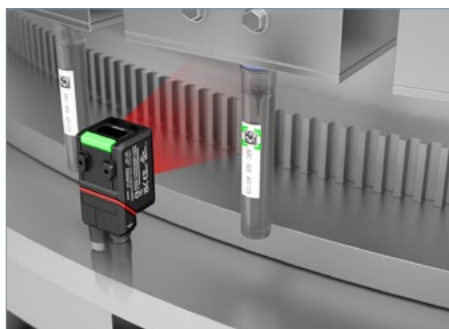
Reflections on test tubes/bottles

ERROR → **OK**
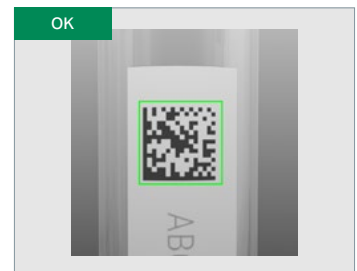
Codes on test tubes and bottles are often marked on curved surfaces, and light shining on such surfaces from a reader can cause reflections, making reading impossible. Using a polarizing filter to cut such reflections stabilizes reading.

Solutions for difficult-to-read codes
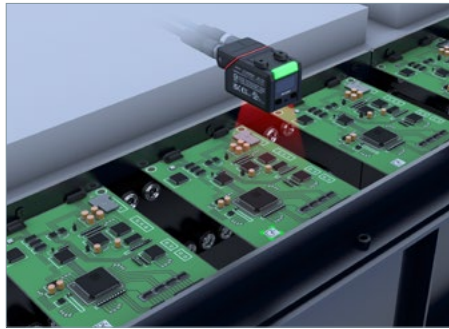
Misaligned marking on PCBs

Conventional models → **SR-X Series**

ERROR → OK
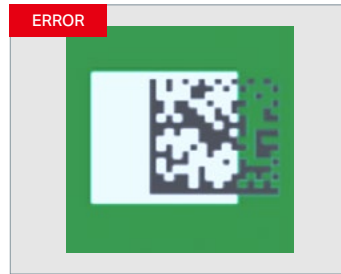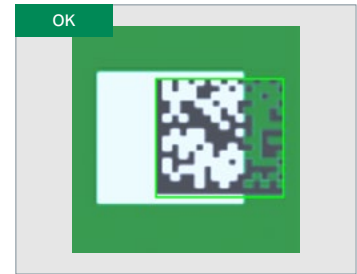
Timing deviations can cause silkscreen-marked codes on PCBs difficult to read, but even in such situations, the SR-X Series can ensure stable reading.
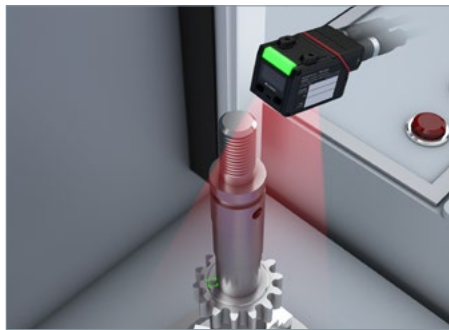
Hidden marking on shafts

ERROR → OK
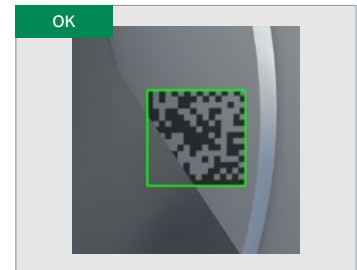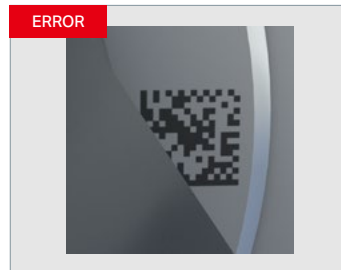
In some cases, codes may be partially hidden due to installation restrictions. The linked decoding function makes reading possible even when a code is partially hidden.
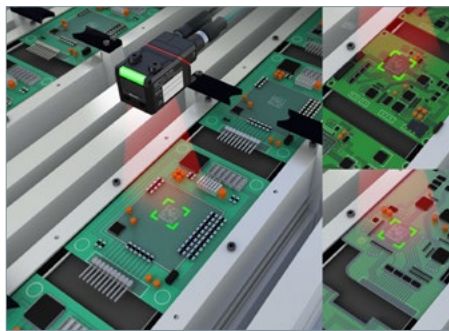
PCB material variations

ERROR → OK
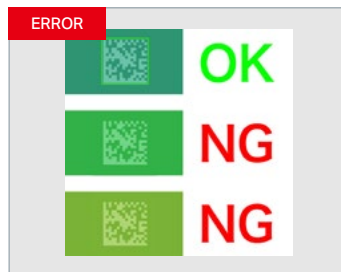
Variations exist between even the same PCB material from different suppliers, resulting in the need to change settings frequently. The bank function can be used to handle such variations.
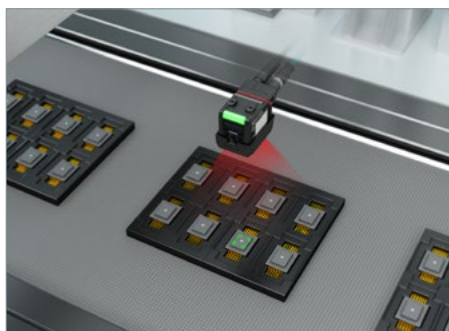
Miniaturization of IC parts

ERROR → OK
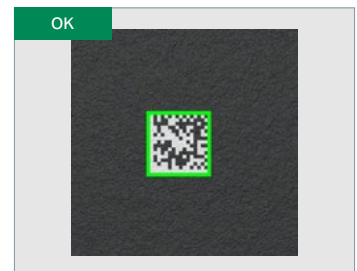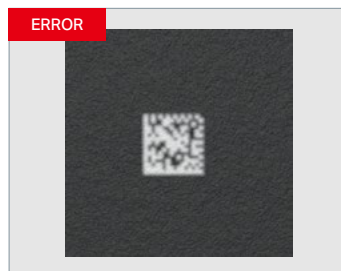
As electronic components become smaller and smaller, markings are also becoming increasingly smaller. The high resolution of the SR-X Series ensures stable reading even with incredibly small codes. Attachments that increase resolution even further are also available.

Additional Features to Improve Operations

These functions facilitate reading and data processing for greater on-site usability

Presentation Mode

Present codes by hand to an always-on reader

Traditionally, scanning codes by hand is a process that requires the operator to pick up the code in one hand and the code reader in the other to then scan the code. Presentation mode simplifies that into a single step: Present the code and the reader does the rest.

Advanced Multi-Head

Expand the field of view or read multiple surfaces

The SR-X Series can be combined with the SR-5000 and SR-2000 for an even greater field of view.
Master stations are capable of summarizing data from slave stations, allowing users to control multiple readers as if they were a single code reader. Because the host is not required to control multiple readers individually, programming work can be greatly reduced.

| HUB | Slave station | Slave station | Master station | Host (PC, PLC, etc.) |
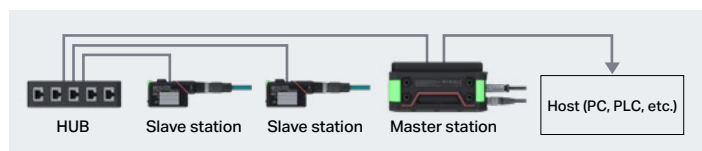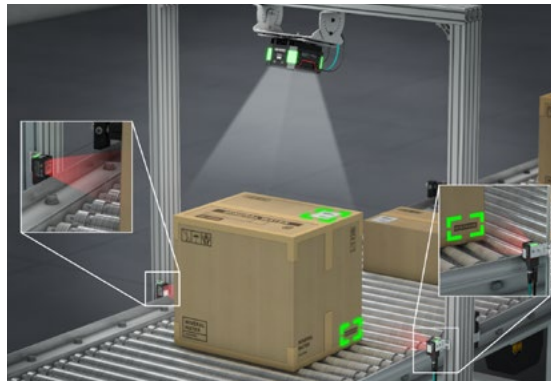
Data Editing

Customizable data output formatting

Customizable data output formats eliminate the need for programming corrections on the host side (PC, PLC, etc.), resulting in shorter data processing times.

Multiple code data output sequence control

Output order can be changed

Extraction of specific data

12578

Output signal control

OK/NG output based on corner coordinates of code

OK   NG

	2D codes	QR, MicroQR, DataMatrix (ECC200), GS1 DataMatrix
Symbol A	Barcodes	CODE39, ITF, NW-7 (Codabar), CODE128, GS1-128, JAN/EAN/UPC, CODE39 Full ASCII
Symbol B	2D codes	PDF417, MicroPDF417, GS1 Composite (CC-A/CC-B/CC-C)
	Barcodes	GS1 DataBar, CODE93, 2of5 (Industrial 2of5), COOP 2of5, Trioptic CODE39, Pharmacode
Symbol C	2D codes	DotCode, Maxi Code, Aztec Code, Postal
	Barcodes	–

SR-X300/X300P

Minimum resolution   Unit: mm inch

Distance	Symbol A 2D codes	Symbol A Barcodes	Symbol B 2D codes	Symbol B Barcodes	Symbol C 2D codes	Symbol C Barcodes
70 2.7559"	0.024 0.0009"	0.082 0.0032"	0.040 0.0016"	0.082 0.0032"	0.060 0.0024"	-
150 5.9055"	0.048 0.0019"	0.082 0.0032"	0.066 0.0026"	0.082 0.0032"	0.106 0.0042"	-
300 11.8110"	0.099 0.0039"	0.082 0.0032"	0.137 0.0054"	0.082 0.0032"	0.219 0.0086"	-
600 23.6220"	0.200 0.0079"	0.123 0.0048"	0.278 0.0109"	0.167 0.0066"	0.444 0.0175"	-
1000 39.3701"	0.335 0.0132"	0.205 0.0081"	0.465 0.0183"	0.279 0.0110"	0.744 0.0293"	-

Field of view   Unit: mm inch

Installation distance	Field of view H	Field of view V
70 2.76"	21 0.83"	13 0.51"
150 5.91"	50 1.97"	31 1.22"
300 11.81"	104 4.09"	65 2.56"
400 15.75"	141 5.55"	88 3.46"
600 23.62"	213 8.39"	133 5.24"
800 31.50"	285 11.22"	178 7.01"
1000 39.37"	357 14.06"	223 8.78"
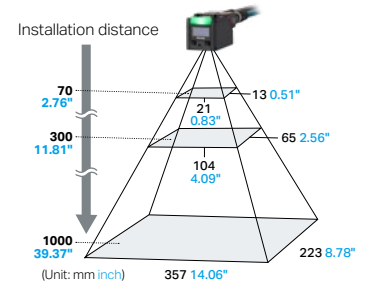
SR-X300W/X300WP

Minimum resolution   Unit: mm inch

Distance	Symbol A 2D codes	Symbol A Barcodes	Symbol B 2D codes	Symbol B Barcodes	Symbol C 2D codes	Symbol C Barcodes
50 1.9685"	0.060 0.0024"	0.082 0.0032"	0.100 0.0039"	0.082 0.0032"	0.150 0.0059"	-
150 5.9055"	0.126 0.0050"	0.082 0.0032"	0.175 0.0069"	0.105 0.0041"	0.280 0.0110"	-
300 11.8110"	0.251 0.0099"	0.153 0.0060"	0.348 0.0137"	0.209 0.0082"	0.557 0.0219"	-
600 23.6220"	0.500 0.0197"	0.306 0.0120"	0.694 0.0273"	0.417 0.0164"	1.111 0.0437"	-
1000 39.3701"	0.832 0.0328"	0.509 0.0200"	1.156 0.0455"	0.694 0.0273"	1.849 0.0728"	-

Field of view   Unit: mm inch

Installation distance	Field of view H	Field of view V
50 1.97"	44 1.73"	28 1.10"
150 5.91"	134 5.28"	83 3.27"
300 11.81"	267 10.51"	166 6.54"
400 15.75"	355 13.98"	222 8.74"
600 23.62"	532 20.94"	333 13.11"
800 31.50"	710 27.95"	443 17.44"
1000 39.37"	887 34.92"	554 21.81"
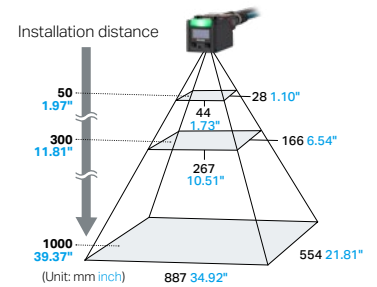
SR-X100/X100P

Minimum resolution   Unit: mm inch

Distance	Symbol A 2D codes	Symbol A Barcodes	Symbol B 2D codes	Symbol B Barcodes	Symbol C 2D codes	Symbol C Barcodes
70 2.7559"	0.024 0.0009"	0.082 0.0032"	0.04 0.0016"	0.082 0.0032"	0.060 0.0024"	-
150 5.9055"	0.048 0.0019"	0.082 0.0032"	0.066 0.0026"	0.082 0.0032"	0.106 0.0042"	-
300 11.8110"	0.099 0.0039"	0.082 0.0032"	0.137 0.0054"	0.082 0.0032"	0.219 0.0086"	-
600 23.6220"	0.200 0.0079"	0.123 0.0048"	0.278 0.0109"	0.167 0.0066"	0.444 0.0175"	-
1000 39.3701"	0.335 0.0132"	0.205 0.0081"	0.465 0.0183"	0.279 0.0110"	0.744 0.0293"	-

Field of view   Unit: mm inch

Installation distance	Field of view H	Field of view V
70 2.76"	15 0.59"	11 0.43"
150 5.91"	35 1.38"	27 1.06"
300 11.81"	74 2.91"	55 2.17"
400 15.75"	99 3.90"	75 2.95"
600 23.62"	150 5.91"	113 4.45"
800 31.50"	201 7.91"	152 5.98"
1000 39.37"	252 9.92"	190 7.48"
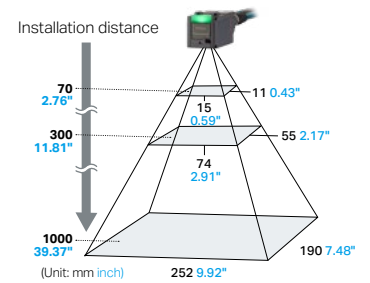
SR-X100W/X100WP

Minimum resolution   Unit: mm inch

Distance	Symbol A 2D codes	Symbol A Barcodes	Symbol B 2D codes	Symbol B Barcodes	Symbol C 2D codes	Symbol C Barcodes
50 1.9685"	0.060 0.0024"	0.082 0.0032"	0.100 0.0039"	0.082 0.0032"	0.150 0.0059"	-
150 5.9055"	0.126 0.0050"	0.082 0.0032"	0.175 0.0069"	0.105 0.0041"	0.280 0.0110"	-
300 11.8110"	0.251 0.0099"	0.153 0.0060"	0.348 0.0137"	0.209 0.0082"	0.557 0.0219"	-
600 23.6220"	0.500 0.0197"	0.306 0.0120"	0.694 0.0273"	0.417 0.0164"	1.111 0.0437"	-
1000 39.3701"	0.832 0.0328"	0.509 0.0200"	1.156 0.0455"	0.694 0.0273"	1.849 0.0728"	-

Field of view   Unit: mm inch

Installation distance	Field of view H	Field of view V
50 1.97"	31 1.22"	23 0.91"
150 5.91"	94 3.70"	71 2.80"
300 11.81"	189 7.44"	142 5.59"
400 15.75"	251 9.88"	189 7.44"
600 23.62"	377 14.84"	284 11.18"
800 31.50"	503 19.80"	378 14.88"
1000 39.37"	628 24.72"	473 18.62"
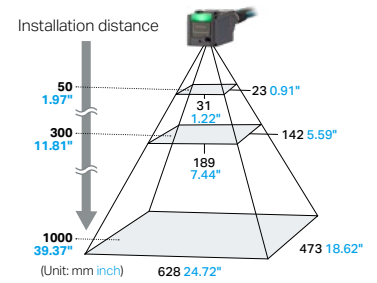
SR-X300/X300P + SR-XHR

Minimum resolution   Unit: mm inch

Distance	Symbol A 2D codes	Symbol A Barcodes	Symbol B 2D codes	Symbol B Barcodes	Symbol C 2D codes	Symbol C Barcodes
32 1.2598"	0.010 0.0004"	0.082 0.0032"	0.020 0.0008"	0.082 0.0032"	0.030 0.0012"	-
40 1.5748"	0.010 0.0004"	0.082 0.0032"	0.020 0.0008"	0.082 0.0032"	0.030 0.0012"	-
47 1.8504"	0.012 0.0005"	0.082 0.0032"	0.020 0.0008"	0.082 0.0032"	0.030 0.0012"	-

Field of view   Unit: mm inch

Installation distance	Field of view H	Field of view V
32 1.26"	8.7 0.34"	5.4 0.21"
40 1.57"	10.7 0.42"	6.6 0.26"
47 1.85"	12.3 0.48"	7.7 0.30"
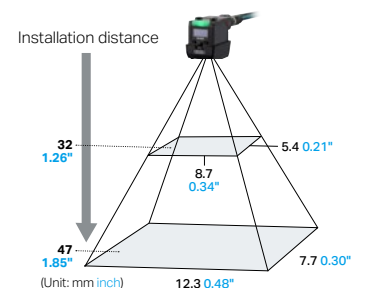
■ SR-X300/X300W
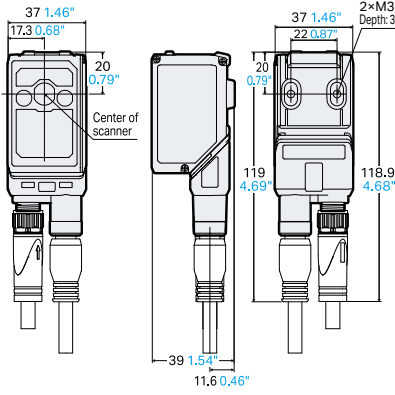
■ SR-X100/X100W
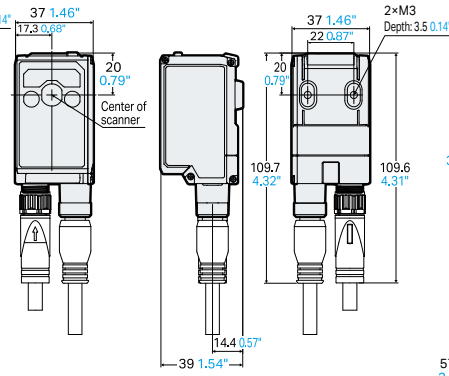
■ SR-X300/X300W (rotating connector)
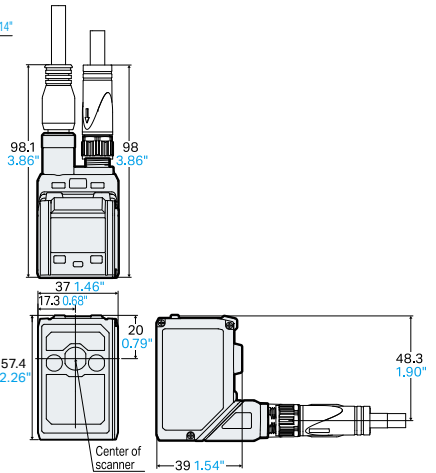
■ SR-X300P/SR-X300WP
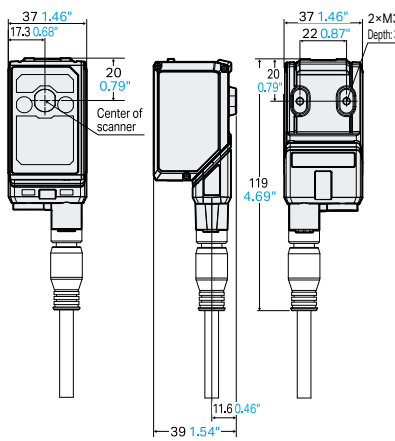
■ SR-X100P/SR-X100WP
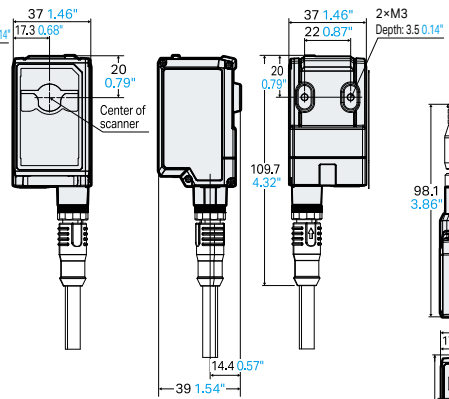
■ SR-X300P/X300WP (Rotating connector)
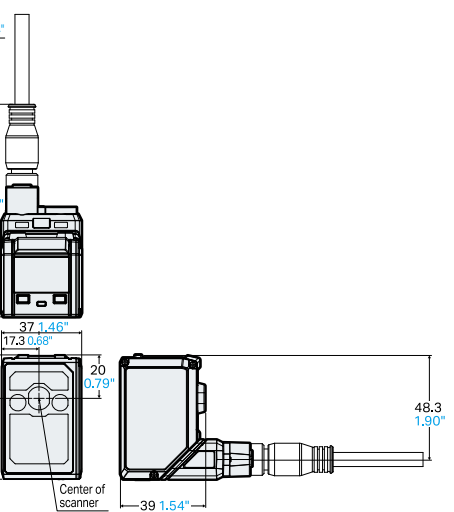
■ Mounting bracket (OP-88696)
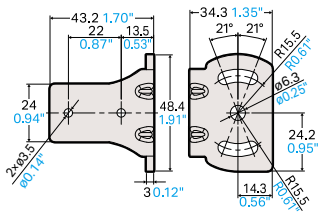
■ Adjustable bracket (OP-88697)
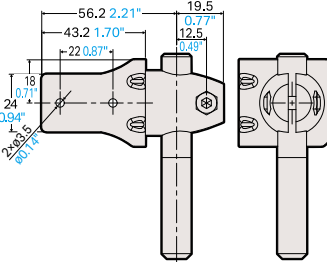
■ Interchangeable mounting bracket 1 (OP-88698)
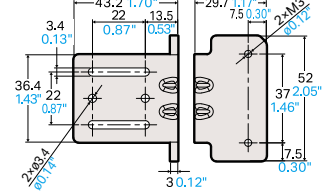
■ Interchangeable mounting bracket 2 (OP-88699)
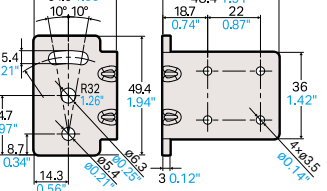
■ ESD attachment (SR-XESD)
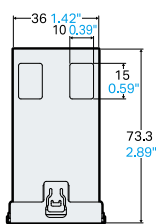
■ High-resolution lens attachment (SR-XHR)
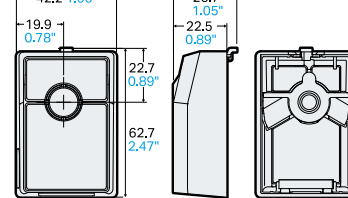
■ SR-EC1/SR-PN1
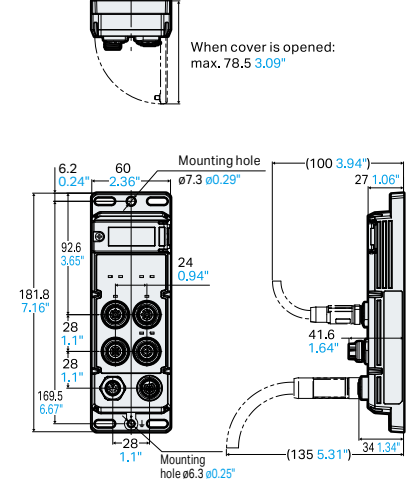
■ Laser protector (SR-XLP)
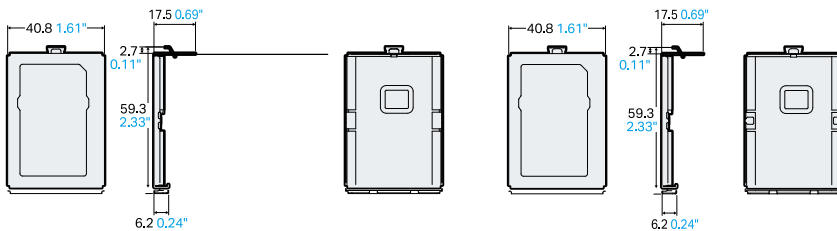
24

❚ With mounting bracket (OP-88696)
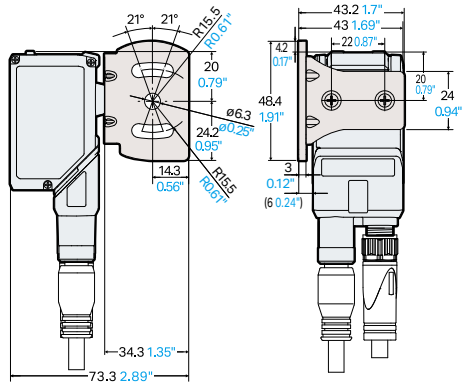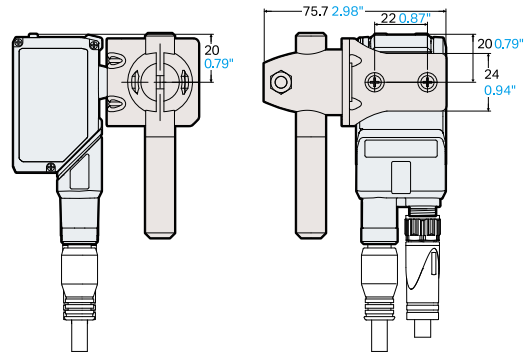
21° 21°
R15.5 R0.61"
20 0.79"
ø6.3 ø0.25"
24.2 0.95"
14.3 0.56"
R15.5 R0.61"
43.2 1.7"
43 1.69"
22 0.87"
4.2 0.17"
20 0.79"
24 0.94"
48.4 1.91"
3 0.12"
(6 0.24")
34.3 1.35"
73.3 2.89"

❚ With adjustable bracket (OP-88697)

75.7 2.98"
22 0.87"
20 0.79"
20 0.79"
24 0.94"

❚ With interchangeable mounting bracket 1 (OP-88698)

42 1.65"
37 1.46"
7.5 0.30"
22.2 0.87"
2 × M3 ø0.12"
43.2 1.70"
13.5 0.53"
22 0.87"
52 2.05"
20 0.79"
22 0.87"
36.4 1.43"
3 0.12"
(6 0.24")
2 × 3.4 0.13"

❚ With interchangeable mounting bracket 2 (OP-88699)

34.3 1.35"
10° 10°
5.4 0.21"
R32 R1.26"
24.7 0.97"
14.3 0.56"
8.7 0.34"
48.4 1.91"
22 0.87"
5.5 0.22"
20 0.79"
36 1.42"
20.4 0.80"
54.9 2.16"
3 0.12"
(11.2 0.44")
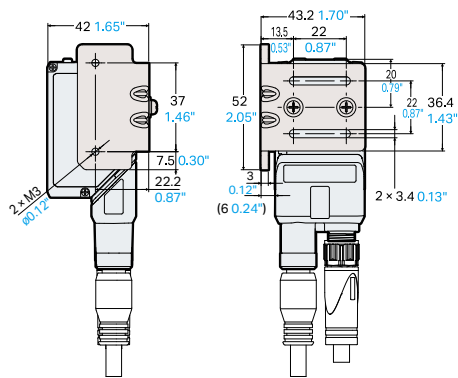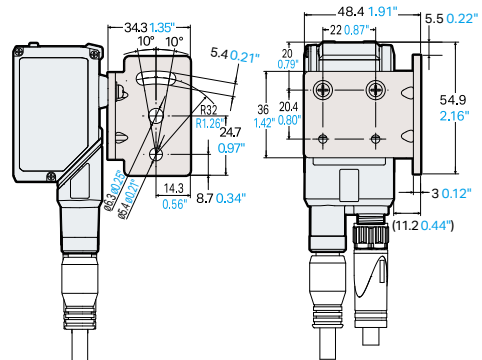
❚ Control cable (OP-88678 to OP-88680)

L
44.4 1.75"
ø6.7 ø0.26"
ø14 ø0.55"
5 0.20"
180 7.09"
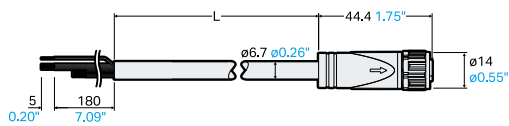
❚ Control cable with L-shaped connector (OP-88684 to OP-88686)

L
38.4 1.51"
ø14 ø0.55"
ø6.7 ø0.26"
32 1.26"
5 0.20"
180 7.09"
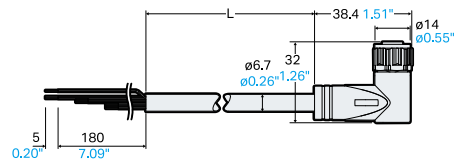
❚ Control cable with D-sub 9-pin connector (OP-88681 to OP-88683)

38 1.50"
26 1.02"
150 5.91"
L
44.4 1.75"
ø6.7 ø0.26"
ø14 ø0.55"
36.8 1.45"
Thickness: 16 0.63"
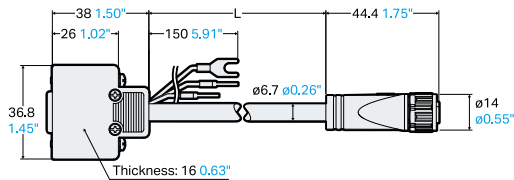
❚ Control cable with D-sub 9-pin, L-shaped connector (OP-88687 to OP-88689)

38 1.5"
26 1.02"
150 5.91"
L
38.4 1.51"
ø14 ø0.55"
32 1.26"
ø6.7 ø0.26"
36.8 1.45"
Thickness: 16 0.63"
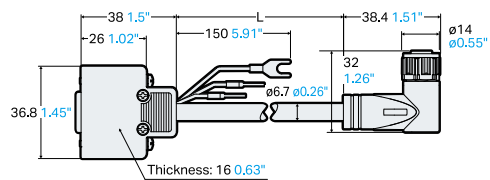
❚ Ethernet cable (OP-87230 to OP-87232)

44.7 1.76"
L
47.3 1.86"
17.1 0.67"
ø6.4 ø0.25"
ø14.8 ø0.58"
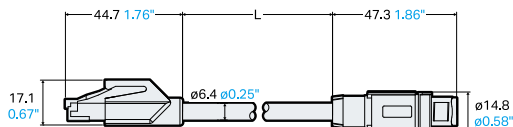
❚ Ethernet cable with L-shaped connector (OP-88301 to OP-88303)

44.7 1.76"
L
36.2 1.43"
ø15 ø0.59"
ø12 ø0.47"
17.1 0.67"
ø6.4 ø0.25"

25
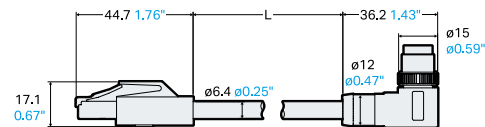
Introducing KEYENCE's newest EtherCAT® and PROFINET CC-C network communication units

KEYENCE's newest network communication units are compatible with EtherCAT® and PROFINET CC-C networks in addition to conventionally supported network protocols, making it possible to use devices from various manufacturers on the same network. Wiring is also simplified thanks to easily connectable connector cables that reduce the time and effort needed for wiring. Daisy-chaining of multiple units is also possible for significantly reduced wiring time.

M12 connectors for simplified wiring

Simplified wiring with easily connectable cables

EtherCAT®/PROFINET

Power supply
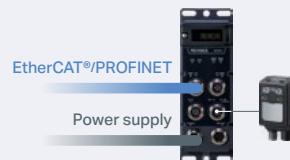
Compact and environmentally resistant for installation anywhere

IP67-rated readers and communication units

System configuration diagram — SR-EC1/SR-PN1
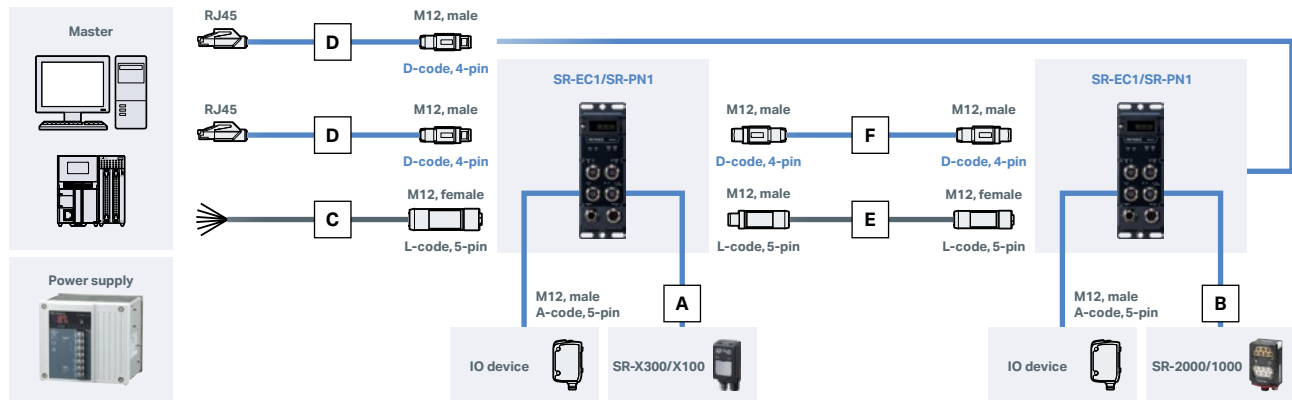
Type	Shape	Model	Product name	Length	Type	Shape	Model	Product name	Length
A		OP-88776	SR-X cable	2 m 6.6'	D		OP-87230	M12, D-code, male, RJ45 Ethernet cable	2 m 6.6'
		OP-88777		5 m 16.4'			OP-87231		5 m 16.4'
		OP-88778		10 m 32.8'			OP-87232		10 m 32.8'
B		OP-88779	SR cable	2 m 6.6'	E		OP-88785	M12, L-code, male / M12, L-code, female Power supply cable	0.3 m 1.0'
		OP-88780		5 m 16.4'			OP-88786		2 m 6.6'
		OP-88781		10 m 32.8'			OP-88787		10 m 32.8'
C		OP-88782	M12, L-code, female, stranded Power supply cable	2 m 6.6'	F		OP-88788	M12, D-code, male / M12, D-code, male Ethernet cable	0.3 m 1.0'
		OP-88783		5 m 16.4'			OP-88789		2 m 6.6'
		OP-88784		10 m 32.8'			OP-88790		5 m 16.4'
							OP-88791		10 m 32.8'

Specifications

Main unit

Model		SR-EC1	SR-PN1
Type		EtherCAT® communication unit	PROFINET communication unit
Network	Connector type	M12, 4-pin, female, D-code	
	Transmission speed	100 Mbps	
	Supported network	EtherCAT®	PROFINET
	Supported profile	CoE	Conformance Class C
Power supply	Connector type	IN: M12, 5-pin, male, L-code OUT: M12, 5-pin, female, L-code	
	Power voltage	24 VDC, -20 to +25%	
	Allowable current	V1, V2: Max. 16 A each; Total: 24 A *	
	Power consumption	Approx. 1.6 W	
Environmental resistance	Enclosure rating	IP65/67 (IEC 60529)	
	Operating ambient temperature	0 to +45°C 32°F to 113°F	
	Storage ambient temperature	-10 to +50°C 14°F to 122°F	
	Operating ambient humidity	35 to 85% RH (no condensation)	
	Storage relative humidity	35 to 85% RH (no condensation)	
Weight		Approx. 270 g 9.53 oz	

* Use a load of 12 A or less for each of V1 and V2 and a total load of 20 A or less when using OP-88782 to OP-88787 power cables.

System configuration diagram

SR-X unit

24-V power supply model	PoE models

24-V power supply model

Standard type (2.3 megapixels) **SR-X300**

Wide-field type (2.3 megapixels) **SR-X300W**

Standard type (1.4 megapixels) **SR-X100**

Wide-field type (1.4 megapixels) **SR-X100W**

PoE models

Standard type (2.3 megapixels) **SR-X300P**

Wide-field type (2.3 megapixels) **SR-X300WP**

Standard type (1.4 megapixels) **SR-X100P**

Wide-field type (1.4 megapixels) **SR-X100WP**

Cable

	24-V power supply model								PoE models	USB for setup
	Control cable						Ethernet cable (NFPA79-compliant)		Ethernet cable (NFPA79-compliant)	USB cable
	NFPA79-compliant				EtherCAT® PROFINET CC-C					
	–		D-sub 9-pin type			–	L-shaped connector*	–	Type-C
	–	L-shaped connector*	–	L-shaped connector*						
2 m 6.6'	OP-88678	OP-88684	OP-88681	OP-88687	OP-88776	OP-87230	OP-88301	OP-87359	OP-88569 (1.5 m 4.9')
5 m 16.4'	OP-88679	OP-88685	OP-88682	OP-88688	OP-88777	OP-87231	OP-88302	OP-87360	
10 m 32.8'	OP-88680	OP-88686	OP-88683	OP-88689	OP-88778	OP-87232	OP-88303	OP-87361	

PROFINET

EtherCAT.

Ethernet

PROFINET CC-C
SR-PN1

EtherCAT®
SR-EC1

EtherNet/IP **PROFINET**
TCP/IP, FTP, PLC link

USB converter
SR-UR1

USB
OP-51580
OP-86941

24 VDC

I/O terminal

RS-232C

Power supply cable	Ethernet cable
OP-88782	OP-87230
OP-88783	OP-87231
OP-88784*	OP-87232

PoE HUB

USB
For setup

Serial/PLC link

USB keyboard
USB-COM

Power supply

24 VDC power supply

Operation host (PLC)

PLC

HMI   Management server   Factory

Operation host (PC)

PC/Panel PC/ Board PC

Management server

PC for setup

PC

Setup software **SR-H8W**

- AutoID Network Navigator
- AutoID Keyboard Wedge
- AutoID Terminal
- MultiMonitor
- FileView
- Various driver files
- EDS/GSDML files
- SR SDK
- AutoID Navigator (for old models)

* Use a load of 12 A or less for each of V1 and V2 and a total load of 20 A or less when using OP-88782 to OP-88787 power cables.
* L-shaped connectors are dedicated for SR-X100/X100W.

Option

ESD attachment **SR-XESD**

Laser protector **SR-XLP**

High-resolution lens attachment **SR-XHR**

Mounting bracket **OP-88696**

Interchangeable mounting bracket 1 **OP-88698**

Adjustable bracket **OP-88697**

Interchangeable mounting bracket 2 **OP-88699**

Conversion cable for SR-2000 Series **OP-88764**

Interchangeable cable **OP-88846**

L-shaped conversion cable for SR-X100P/X100WP **OP-88999**

Specifications

Main unit

Model			SR-X300	SR-X300W	SR-X300 + SR-XHR	SR-X100*1	SR-X100W*1
Type			Standard type (2.3 megapixels)	Wide-field type (2.3 megapixels)	High-resolution type	Standard type (1.4 megapixels)	Wide-field type (1.4 megapixels)
Receiver	Sensor		CMOS image sensor				
	Number of pixels		1920 × 1200			1360 × 1024	
	Focus		Auto*2				
Emitter	Illumination light source		High-intensity red/white LED			High-intensity red LED	
	Pointer light source		High-intensity green LED				
Reading specifications	Supported symbols	2D codes	QR, MicroQR, DataMatrix(ECC200), DMRE, GS1 DataMatrix, PDF417, MicroPDF417, GS1 Composite (CC-A/CC-B/CC-C), DotCode, Maxi Code, Aztec Code				
		Barcodes	CODE39, ITF, 2of5 (Industrial 2of5), COOP 2of5, NW-7 (Codabar), CODE128, GS1-128, GS1 DataBar, CODE93, JAN/EAN/UPC, Trioptic CODE39, CODE39 Full ASCII, Pharmacode, Postal (Japan Postal, IMB)				
	Minimum resolution	2D codes	0.024 mm 0.0009"	0.060 mm 0.0024"	0.010 mm 0.0004"	0.024 mm 0.0009"	0.060 mm 0.0024"
		Barcodes	0.082 mm 0.0032"	0.082 mm 0.0032"	0.082 mm 0.0032"	0.082 mm 0.0032"	0.082 mm 0.0032"
	Reading distance		70 to 1000 mm 2.76" to 39.37"	50 to 1000 mm 1.97" to 39.37"	32 to 47 mm 1.26" to 1.85"	70 to 1000 mm 2.76" to 39.37"	50 to 1000 mm 1.97" to 39.37"
	Reading field of view		104 × 65 mm 4.09" × 2.56" (at a distance of 300 mm 11.81")	267 × 166 mm 10.51" × 6.54" (at a distance of 300 mm 11.81")	12.3 × 7.7 mm 0.48" × 0.30" (at a distance of 47 mm 1.85")	74 × 55 mm 2.91" × 2.17" (at a distance of 300 mm 11.81")	189 × 142 mm 7.44" × 5.59" (at a distance of 300 mm 11.81")
I/O specifications	Control input	Number of inputs	2				
		Input type	Bidirectional voltage input				
		Maximum rating	30 VDC				
		Minimum ON voltage	15 VDC				
		Maximum OFF current	0.2 mA				
	Control output	Number of outputs	3				
		Output type	Photo MOS relay output				
		Maximum rating	30 VDC				
		Maximum load current	50 mA or less for 1 output, or 100 mA or less in total for 3 outputs				
		Leakage current when OFF	0.1 mA or less				
		Residual voltage when ON	1 V or less				
	Ethernet	Communication standard	IEEE 802.3-compliant 100BASE-TX				
		Supported protocols	TCP/IP, SNTP, FTP, SFTP, HTTP, HTTPS, BOOTP, EtherNet/IP™, PROFINET, KV STUDIO, MC protocol, OMRON PLC link, OPC UA				
	Serial communication	Communication standard	RS-232C-compliant				
		Communication speed	600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps				
		Supported protocols	No-protocol, KV STUDIO, MC protocol, SYSWAY				
	USB	Communication standard	USB 2.0 High Speed compliant				
Environmental resistance	Enclosure rating		IP65/IP67 (IEC60529)*3				
	Operating ambient temperature		0 to +45°C 32 to 113°F				
	Storage ambient temperature		-10 to +50°C 14 to 122°F				
	Operating ambient humidity		35 to 85% RH (No condensation)				
	Storage ambient humidity		35 to 85% RH (No condensation)				
Rating	Power supply voltage		24 VDC +25%/-20%				
	Current consumption		Approx. 750 mA			Approx. 650 mA	
Weight			Approx. 200 g 7.06 oz		Approx. 225 g 7.94 oz	Approx. 180 g 6.35 oz	

System ROM rewrites: 100000
*1 AI filter is equipped in the SR-X300 Series only.
*2 The focal position can be adjusted automatically during installation or tuning.
*3 Attach a USB port cover to meet the protective structural specification.

PoE models

Model			SR-X300P/SR-X300WP	SR-X100P/SR-X100WP
I/O Specifications	Control I/O		N/A	
	Ethernet	Communication standard	100BASE-TX	
	Serial communication		N/A	
Power supply	Power supply		IEEE802.3af PoE Class 3	
	Power consumption	Max.	13 W	13 W
		Average	4.0 W	3.3 W
		Standby	2.5 W	2.5 W

* Aside from the above, PoE models have the same specifications as 24 V models.

Setup software (AutoID Network Navigator)

Model	SR-H8W
Supported OS	Windows 11 Pro or later Windows 10 Pro or later, 32 bit/64 bit Windows 8 Pro or later, 32 bit/64 bit (excluding Windows RT)
Operating environment	Processor: 2.0 GHz or better, Memory: 8 GB or more, Free space on hard disk drive: 1 GB or more (free space for saving other data is also required), DVD-ROM drive: Required during installation, Screen resolution: 1440 × 1080 or higher

• .NET Framework 4.6.1 or later must be installed.
• Microsoft Visual C++ Redistributable Package (x86) for Visual Studio 2015, 2017, and 2019 must be installed.
• Windows, Visual Studio, Microsoft Edge, Internet Explorer, and Excel are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

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