Compact design only requires 50 mm installation space

Smallest in class *1

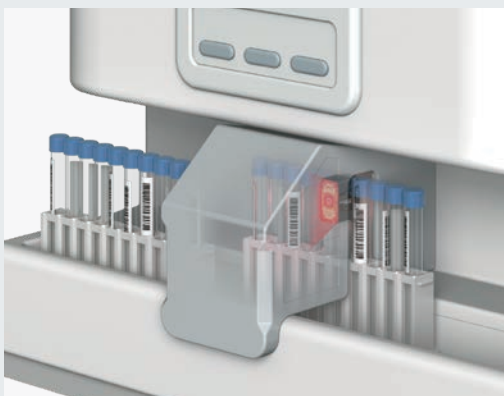*1. Fixed mount industrial imager-based 2D code readers with 3 Mpix or more. (Based on Omron investigation in September 2022)
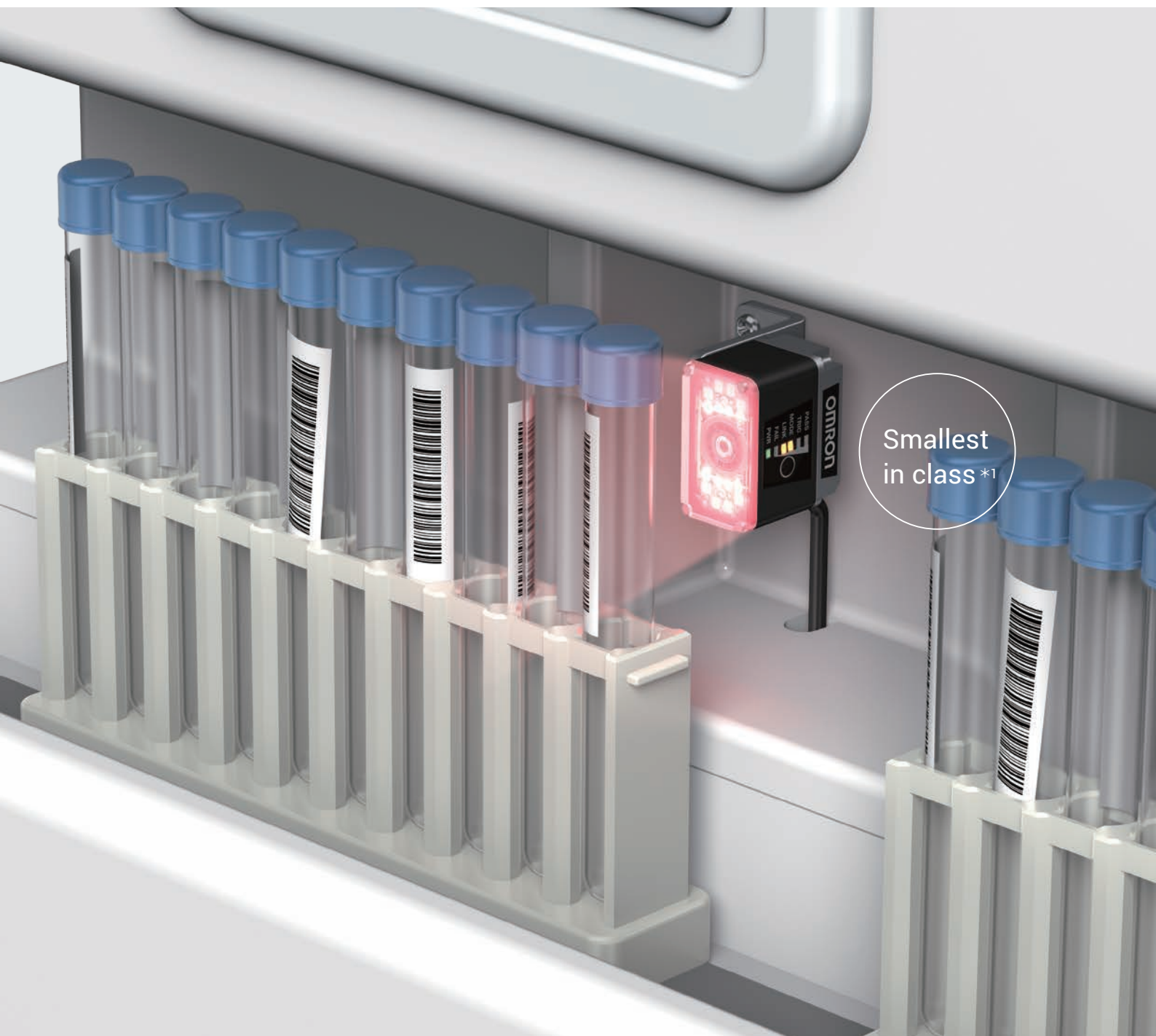
The most compact design in its class for space-saving installation[1]

Fits in 50 mm space

44.5 mm

44.5 mm

25.4 mm

Code readers built into machines need to be space-saving designs and offer flexibility in design change according to end users' requirements. To meet these needs, we have developed the V430-F/V420-F Series that is an easy-to-integrate, ultra-compact code reader with optical options that allow standardization of designs.

In addition, stable reading and quick troubleshooting can reduce unscheduled downtime, making traceability easier and more reliable.

Examples of installation in machines

Vitro diagnostic analyzer

Electronic component manufacturing equipment

*1. Fixed mount industrial imager-based 2D code readers with 3 Mpix or more. (Based on Omron investigation in September 2022)

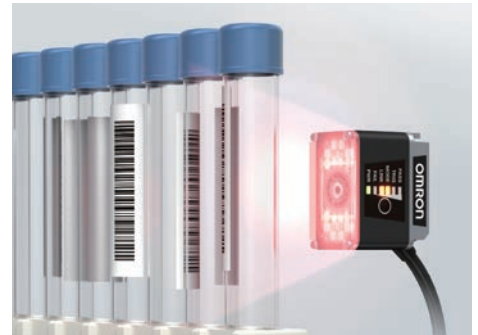# Delivers three essential features for code readers
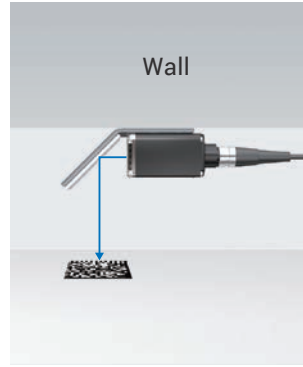
Easy integration and customization

Options for confined spaces

**Right angle connector**

Wall

When wiring space is limited

Right angle mirror

Wall

When there is not enough space over a code

Wide view with short reading distance

The product line up includes models with up to 5 Mpix that provide a wide-angle of view and a short reading distance. The code readers that have the same size and reading distance are available with different field of view, allowing you to easily meet machine end users' requirements without redesign.

Up to
5 Mpix

50 mm

Middle view model
25 mm × 34 mm

Wide view model
39 mm

52 mm
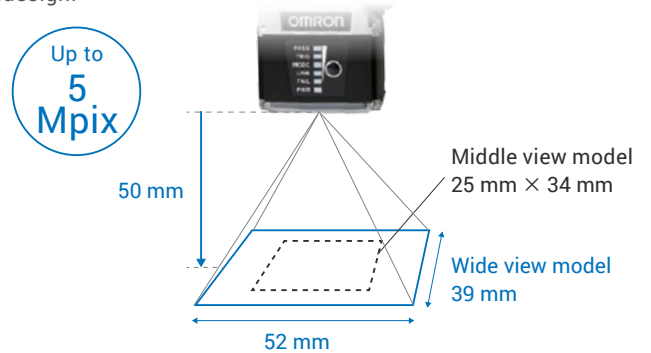
Easy fine-tuning of reading angle

L bracket

The reading angle of the code reader that is loosely screwed to the L bracket can be adjusted using the position adjustment holes.
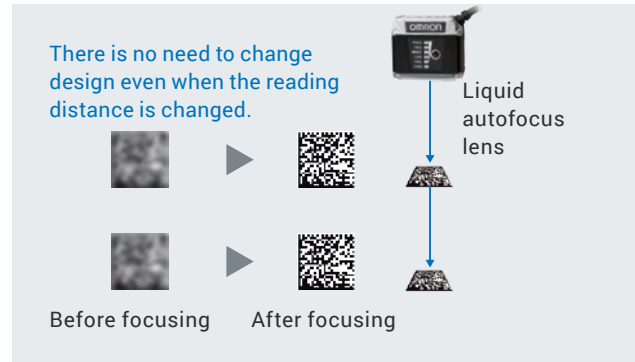
Aiming light

Aiming light assists you in positioning and locating codes in the center of the code reader's field of view.

No need to change reading distance or code reader itself

The autofocus lens eliminates the need to change hardware design when target objects are changed. The V430-F/V420-F Series provides unlimited autofocus and long life.

There is no need to change design even when the reading distance is changed.

Liquid autofocus lens

Before focusing   After focusing

Various interfaces to communicate with PC or PLC

The V430-F/V420-F Series includes models with a major interface to connect to the host PC or PLC.

**MicroHAWK
V430-F Series**

Ethernet TCP/IP
EtherNet/IP™
PROFINET

**MicroHAWK
V420-F Series**

RS-232C
USB
Ethernet over USB

A variety of optical accessories to standardize designs

The V430-F/V420-F Series has optical accessories to easily meet varying requirements from machine end users. All you need is replace the accessory without changing the code reader, helping you standardize designs.

Enhance contrast
Outer LEDs
Red, blue, white, and IR

Eliminate uneven lighting and halation

Polarizer

Diffuser

Protect against static
ESD safe window

Protect against laser radiation
YAG filter

Outer LEDs

A blue LED provides more contrast than a red LED for some color combinations of the bar code or 2D code and background. This increases reading reliability without relying on decoding ability.
Even if the color combination varies depending on items, reliable code reading is possible by using preferable outer LEDs without changing the code reader.

Examples of color combinations of code and background

Red LEDs		✓	✓	
Blue LEDs	✓			✓

Note: Images are illustration purposes only. Actual presentation will vary depending on the marking method and material.
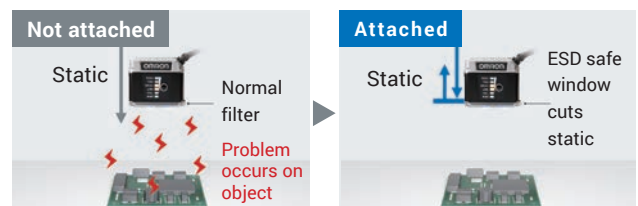
Polarizer and diffuser

Attaching a polarizer or diffuser reduces halation and reflection without the need to install the code reader at an angle.

Polarizer

Halation ▶ Reduces halation

Diffuser

Uneven lighting ▶ Reduces uneven lighting
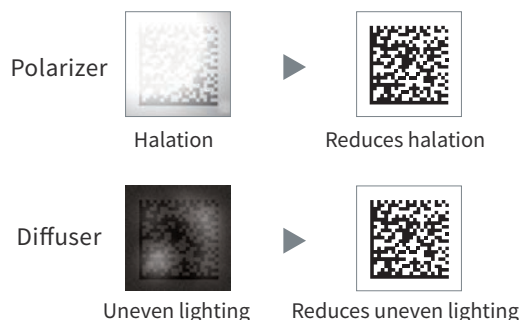
ESD safe window

The ESD safe window is used to prevent line or object problems caused by electrostatic discharge (ESD) from the code reader.

Not attached
Static
Normal filter
Problem occurs on object

Attached
Static
ESD safe window cuts static

YAG filter

When the code reader is installed near YAG laser equipment (e.g., laser marker, laser engraver, and laser cutter), the YAG filter is used to protect image elements against laser light.

Ring light model

This model can provide reliable inspection even under uneven lighting conditions, which is difficult with a standard light. (The ring light model is available with V430-F 1.2 Mpix models.)
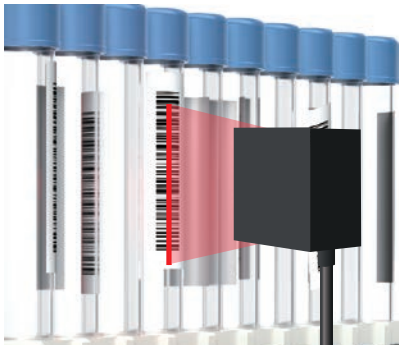
Reliable reading of misaligned or poorly printed codes

Reliable reading regardless of code position variations

This imager-based code reader provides a wide reading area and reliably reads codes even if there are variations in code positions on objects.

1D scanner

The scan type cannot read misaligned labels due to its linear reading area.
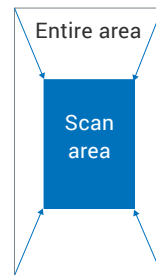

Fail to read

V430-F/V420-F

The imager type can read misaligned labels thanks to its wide reading area.

Able to read

Increase speed

Using the WOI function[1] that narrows the scan area, the code reader can read codes as fast as the scan type.


＊1. The Window of Interest (WOI) function scans codes within a window of interest.

Reliable reading despite inconsistent print quality

The V430-F/V420-F Series includes our unique and robust X-Mode decoding algorithms. Expanded X-Mode algorithms can reliably read distorted and damaged codes by correcting variations in print quality.
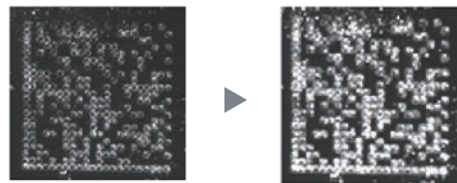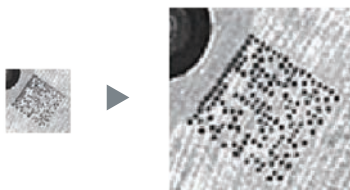
Damaged Mode

Corrects damaged 2D codes.
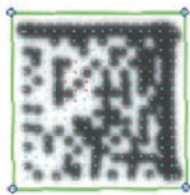
Morphology

Enhances the contrast of cells.

Scale Up
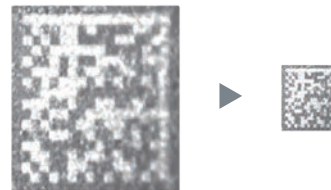
Scales up the captured image to the ideal size.

Scale Down

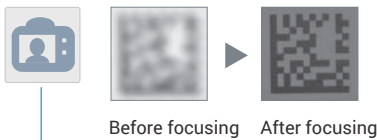Scales down the captured image to the ideal size.

Automatic setting of reading conditions

Parameter settings are optimized automatically. Specific skills are no longer required.

Step1 **Optimize focus distance.** *2

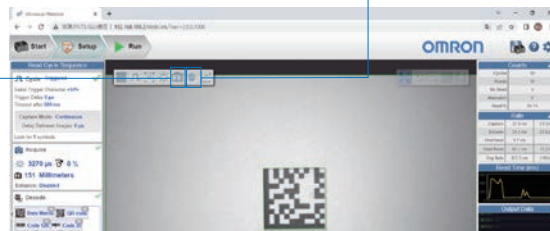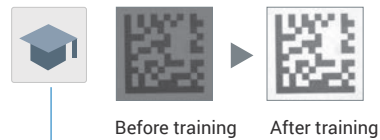Select the Autofocus icon to automatically adjust the focus distance of the code reader.

Autofocus icon

Before focusing   After focusing

Step2 **Optimize reading conditions.** *3

Select the Train icon and then click a code on the screen to optimize shutter speed, preprocessing, and other parameters.

Train icon

Before training   After training


Flexible output of reading results

You can compare character strings using wildcards and partially output strings.

ISO grading of code print quality

The Print Quality Grading function enables an in-line check of the relative quality change and the parameter where the change occurred, avoiding problems.

Applicable standards

ISO/IEC 15415
ISO/IEC 15416
ISO/IEC TR29158
(AIM DPM-1-2006)*4
ISO/IEC 16022*5

Example of output data

AB-1234567-B

Grade
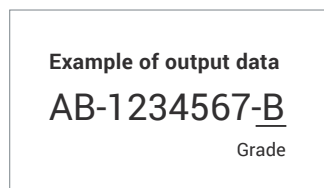
Batch output of results from up to 8 code readers

A Daisy Chain is a grouping of 2 to 8 code readers that function as one. The host PLC needs to control only the master code reader, reducing programming effort.

PLC (host)

Data output

HUB

Slave   Slave   Slave   Master
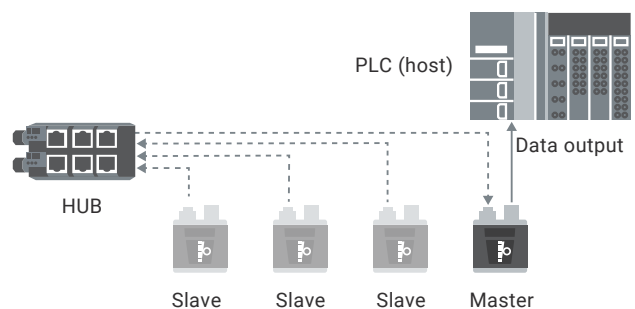
Easy communication with Omron PLC

We provide EtherNet/IP™ and serial communications connection guides and sample project files so that virtually anyone who is unfamiliar with building a system using Omron products can easily set up and check communications. Ask your Omron representative for more information.

∗ 2. Available with the autofocus model.
∗ 3. The following parameters are adjusted during training: gain, exposure, window of interest (WOI), pre-processing, pre-processing size, and pixel binning.
∗ 4. Data Matrix only.   ∗ 5. The grading criteria in ISO/IEC 16022 have been integrated with ISO/IEC 15415.

Easy status monitoring and quick troubleshooting

Easy access to code readers on browser-based software WebLink

The V430-F/V420-F Series has pre-installed software for setup. There is no need to install software on your PC or to seek the same software version on your PC. You can easily troubleshoot using a PC or tablet with the browser-based interface. When you are connected to the intranet, you can flexibly deal with problems from the factory, office or anywhere else.
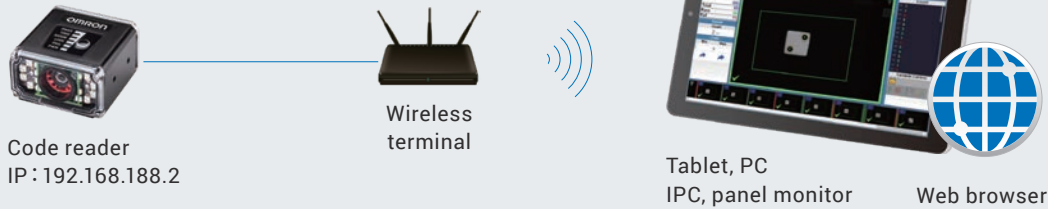

Reading error occurs.

Operator goes to factory with PC.

Operator checks and tunes code reader on web browser.

Configuration example using a wireless terminal

Remote access is possible if devices are on the same network.

Code reader
IP：192.168.188.2

Wireless terminal

Tablet, PC
IPC, panel monitor

Web browser

Enter the IP address of the code reader to display into the web browser.
http://192.168.188.2

Note: When wireless connection is not available, the code reader needs to be connected to the device with a web browser using a cable.
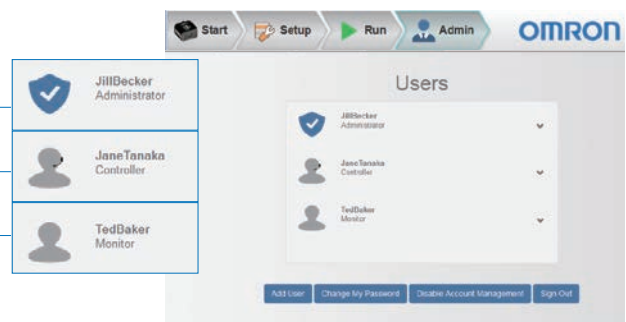
Access control to prevent unintended setting change

Privilege levels and passwords can be set to open any session of WebLink. This prevents settings from being changed by incorrect operation.

Administrator: Full Access as well as the ability to manage user accounts and enable or disable Account Management

Controller: Full Access

Monitor: View-Only Access

Intuitive usability requiring no specialized experience or skills

Easy-to-use UI design, and easy-to-understand tutorial and help functions guide inexperienced operators through the process of setup and adjustment.

Easy-to-understand intuitive design

3-step navigation bar

Statistical results

Easy-to-see reading results

Filmstrip

Reading results together with the images are constantly updated, allowing you to check errors in real time.

Functions to assist inexperienced users in setup and tuning

Guided Tour

Guided Tour guides users through operating procedures by showing explanation of icons.

Help

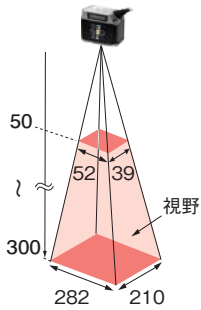You can quickly learn how to operate WebLink without referring to manuals.

Code readers

Auto Focus Multi Code Reader
MicroHAWK V430-F/V420-F Series

5 Mpix

Wide view

(Unit: mm)

Reading distance	Field of view		Minimum cell size	
	H	V	Bar code	2D code
50	52	39	0.0269	0.0470
100	98	73	0.0503	0.0881
150	144	107	0.0738	0.1291
200	190	142	0.0979	0.1713
250	236	176	0.1213	0.2123
300	282	210	0.1448	0.2533

Middle view

(Unit: mm)
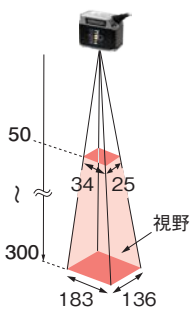
Reading distance	Field of view		Minimum cell size	
	H	V	Bar code	2D code
50	34	25	0.0172	0.0302
100	64	48	0.0331	0.0579
150	94	70	0.0483	0.0844
200	123	92	0.0634	0.1110
250	153	114	0.0786	0.1375
300	183	136	0.0937	0.1641

1.2 Mpix

Wide view

(Unit: mm)
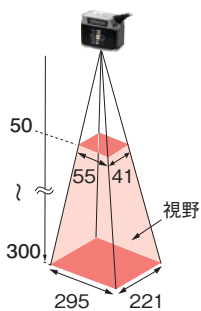
Reading distance	Field of view		Minimum cell size	
	H	V	Bar code	2D code
50	55	41	0.0422	0.0738
100	103	77	0.0792	0.1386
150	151	113	0.1163	0.2034
200	199	149	0.1533	0.2683
250	247	185	0.1903	0.3331
300	295	221	0.2274	0.3979

Middle view

(Unit: mm)
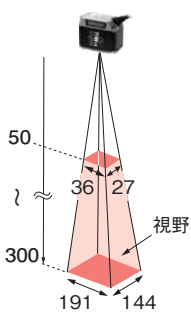
Reading distance	Field of view		Minimum cell size	
	H	V	Bar code	2D code
50	36	27	0.0278	0.0486
100	67	50	0.0514	0.0900
150	98	73	0.0751	0.1314
200	129	97	0.0998	0.1746
250	160	120	0.1235	0.2160
300	191	144	0.1481	0.2593

Note: Refer to the datasheets (Cat. No. Q274, Q275) for details of models and specifications.

1.2 Mpix

Narrow view

(Unit: mm)
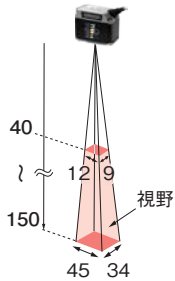
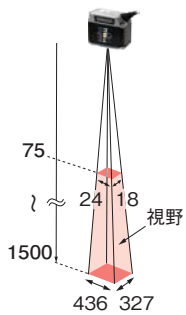| Reading distance	Field of view		Minimum cell size	
	H	V	Bar code	2D code
40	12	9	0.0093	0.0162
100	31	23	0.0237	0.0414
150	45	34	0.0350	0.0612

Long range

(Unit: mm)

Reading distance	Field of view		Minimum cell size	
	H	V	Bar code	2D code
75	24	18	0.0185	0.0324
100	31	23	0.0237	0.0414
300	89	67	0.0689	0.1206
500	147	110	0.1132	0.1980
700	204	153	0.1574	0.2755
900	262	197	0.2027	0.3547
1100	320	240	0.2469	0.4321
1300	378	283	0.2912	0.5095
1500	436	327	0.3364	0.5887

0.3 Mpix

Wide view

(Unit: mm)
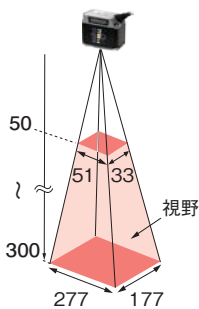
Reading distance	Field of view		Minimum cell size	
	H	V	Bar code	2D code
50	51	33	0.1375	0.2406
100	97	62	0.2583	0.4521
150	142	90	0.3750	0.6563
200	187	119	0.4958	0.8677
250	232	148	0.6167	1.0792
300	277	177	0.7375	1.2906

Middle view

(Unit: mm)
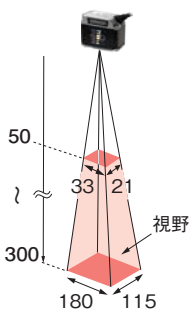
Reading distance	Field of view		Minimum cell size	
	H	V	Bar code	2D code
50	33	21	0.0875	0.1531
100	63	40	0.1667	0.2917
150	92	59	0.2458	0.4302
200	121	77	0.3208	0.5615
250	151	96	0.4000	0.7000
300	180	115	0.4792	0.8385

Additional propositions to improve machine performance

We support you in solving issues of code reading, which the V430-F/V420-F Series cannot solely solve, by offering other products.
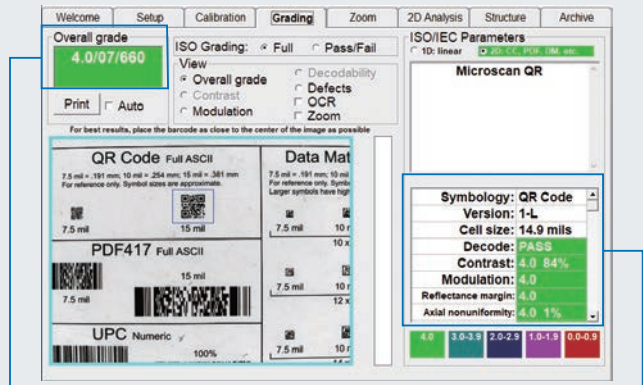
Proposition 1

Code verification system to international standards avoids unreadability

Code verification systems generate print quality reports according to ISO Standards. This is helpful to define intercompany criteria for ensuring print quality and to provide evidence.

Grading results

LVS-958 □ /LVS-9510-series
Code Verification System

An overall grade is determined from the results of individual verification items.

Quality is graded through verification items specified in international standards.

Proposition 2

Handheld code reader checks IDs outside machine

Models with X-Mode algorithms to reliably read DPM are available. The alcohol-disinfectable body makes the code readers safe for use in production sites where infection measures are required [*1].
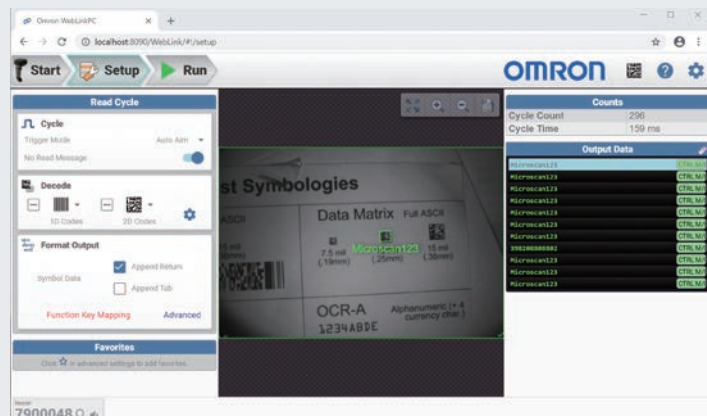

For healthcare use

For paper and labels

For DPM

V410-H Handheld Code Reader

Simple setting: **WebLink**PC

[*1]. Use isopropyl alcohol 70%.

C-mount code reader enables more flexible customization of reading range and distance
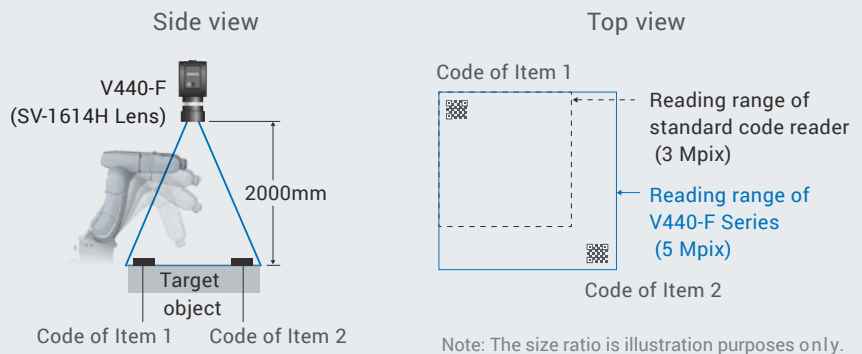
Various combinations of the V440-F C-Mount Code Reader and lens offer flexibility to customize the field of view and installation distance.

V440-F C-Mount Code Reader

Application example When adding management with 2D codes
Condition 1: Code reader does not interfere with equipment.
Condition 2: The same equipment can read codes located at different positions.

The V440-F Series can read codes in a large field of view from a long distances at high resolution (5 Mpix).

Side view

V440-F
(SV-1614H Lens)

2000mm

視野
Target object

Code of Item 1   Code of Item 2

Top view

Code of Item 1

Reading range of standard code reader (3 Mpix)

Reading range of V440-F Series (5 Mpix)

Code of Item 2

Note: The size ratio is illustration purposes only.

RFID is ideal for processes where code quality would be worse

Since codes are attached to surfaces, they can sometimes easily be blemished or deteriorate, resulting in reading failure. Data management using RFID is suitable for such environments because data can be read without being affected by blemishes.

Example in digital industry (assembly process)

Code reader

RFID
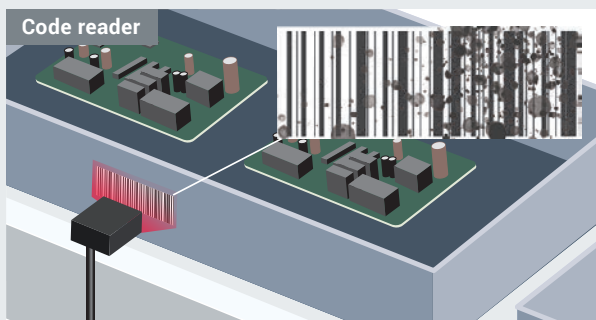
V680S
RFID System

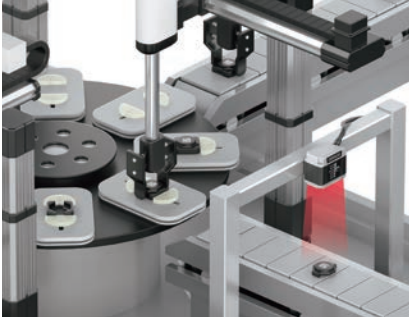The reading rate gradually decreases due to aged deterioration and blemishes.
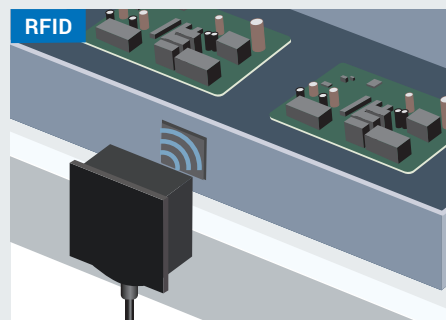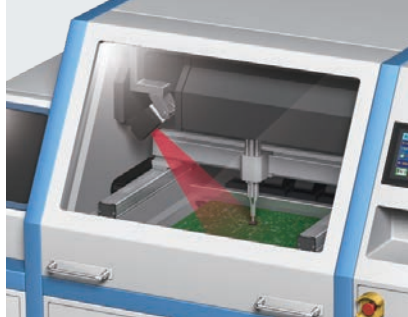
RFID is robust and reliable enough to use for a long time.
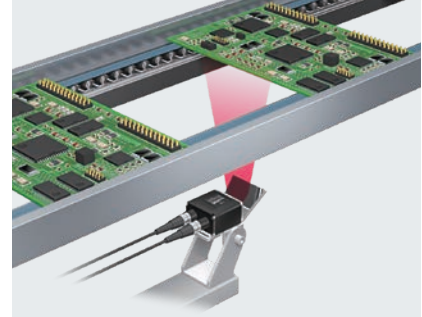
Applications

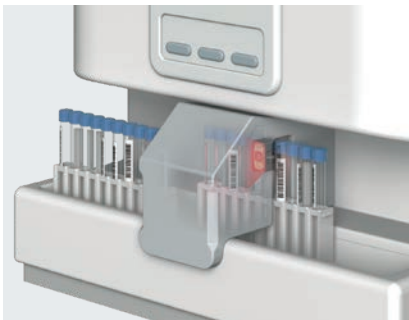## Digital industry

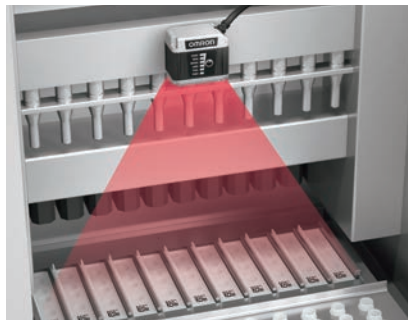Installation in complicated space

Retrofit into small machine

Installation in space with limited depth

Biochemical analyzer and medical device industry

Integration into vitro diagnostic analyzer

Integration into nucleic acid extractor

Integration into laboratory analyzer

Food industry

Reading on high-speed production line
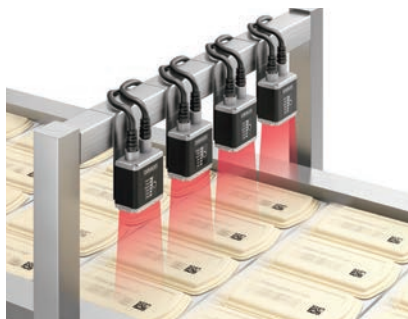
4-line parallel reading in confined space

Reading from beneath conveyor

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QR code is the registered trademark of DENSO WAVE.
Windows is registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
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