OMRON Handheld Code Readers

V530-series Handheld 2-Dimensional Code Readers are also available.

V530-H3 Series

Handheld 2-Dimensional Code Readers

See the V530-H3 brochure for details (Catalog No. Q126-E1-1).

Specifications

Model		V530-H301	V530-H302	V530-H303
Performance specifications	Readable codes	Data Matrix (ECC200) : 10 × 10 to 26 × 26 QR Code (Model 1, 2) : Version 1 to 6 (21 × 21 to 41 × 41)		
	Field of vision	3 × 3mm	6 × 6mm	6 × 6mm
	Resolution	50µm	100µm	100µm
	Lighting method	Coaxial lighting	Oblique lighting	Back lighting
	Reading method	Touch		
General specifications	Ambient operating temperature	0 to 38°C (with no icing or condensation)		
	Ambient operating humidity	35% to 85% (with no condensation)		
	Ambient operating environment	No corrosive gases		
	Storage temperature	-25 to 60°C		
Weight		Approx. 100 g (not including cable)		
Case material		ABS resin (reading section: POM)		

For information on OMRON 2-Dimensional Code Readers and RFID, see **http://www.fa.omron.co.jp/products/prd/info_sensing/**
THE ABOVE WEB SITE IS APPARENTLY ONLY IN JAPANESE.

General Precautions

The user must operate the product according to the performance specifications described in the brochure.

Before using the product under conditions which are not described in the brochure or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems, machines, and equipment that may have a serious influence on lives and property if used improperly, consult your OMRON representative.

Make sure that the ratings and performance characteristics of the product are sufficient for the systems, machines, and equipment, and be sure to provide the systems, machines, and equipment with double safety mechanisms.

The product has been produced at OMRON Ayabe which obtained ISO9001-approval for its quality system and ISO14001-approval for its environmental management system from international certification bodies.

OMRON

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Authorized Distributor:

Cat. No. Q127-E1-1

Note:Specifications subject to change without notice.

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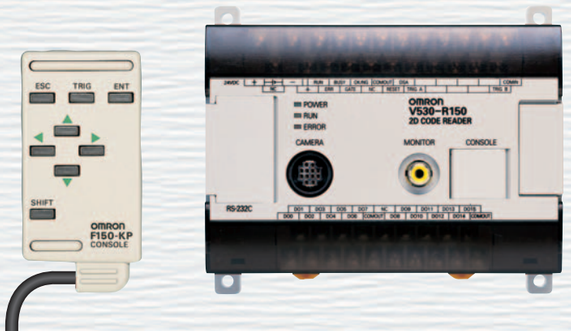
NEW

OMRON

Conforms to SEMI Standards

Intelligent Light Source and a Two-camera Unit Expand Applications

V530-R150E-3, V530-R150EP-3 2-Dimensional Code Reader (Fixed Type)



Upgraded Version

Compatible with Data Matrix ECC200, Data Matrix ECC000-140 and QR Codes.

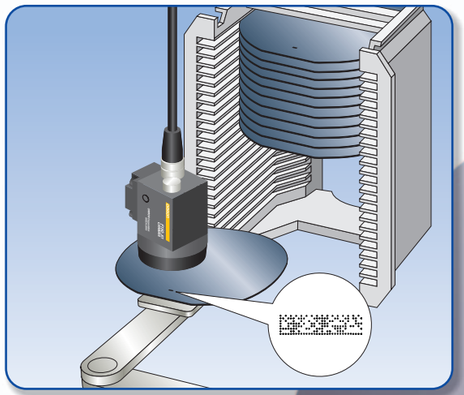
CE

Fixed 2-Dimensional Code Reader Opti mizes Information Management

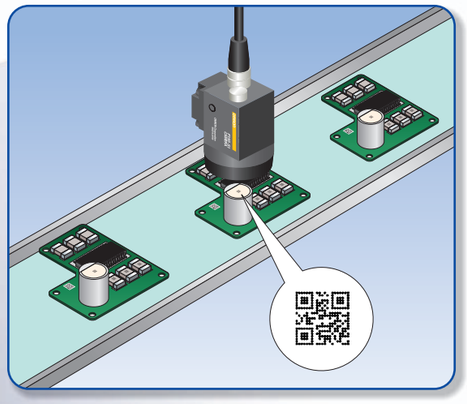
The management of production data and product histories is greatly enhanced by integrating objects and information.

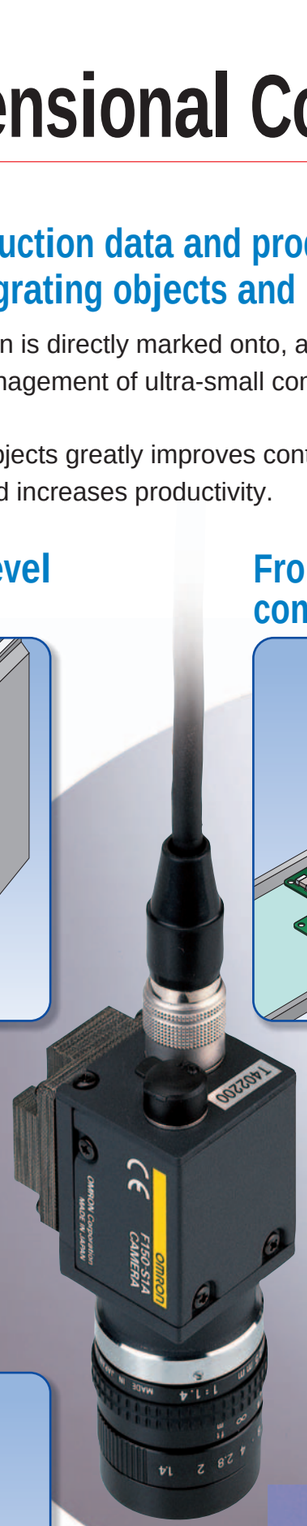
The 2-dimensional code information is directly marked onto, and read from, physical objects to simplify the management of ultra-small components, glass PCBs, wafers, and other items in single units.
This ability to manage individual objects greatly improves control over the history and quality of key components, and increases productivity.

From batch processing level to wafer level

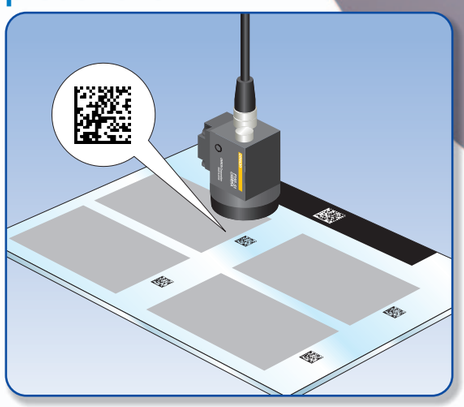


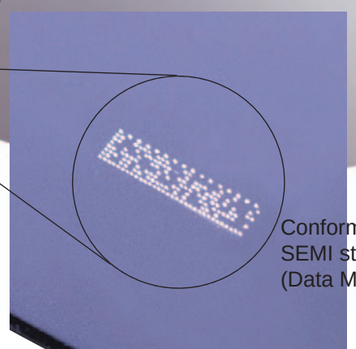
From PCB level to component level





From sheet level to piece level





Conforms to SEMI standard T7 (Data Matrix)

Intelligent Light Source and a Two-camera Unit respond to a wide variety of applications

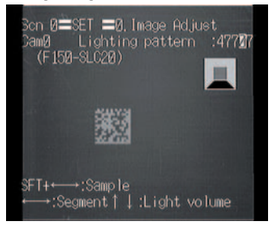
The addition of Intelligent Light Source and a Two-camera Unit to the product line makes it easier to provide optimal lighting and imaging for a wide variety of workpieces.

Intelligent Light Source

Versatile lighting control and a dome shape that minimizes external interference provide stable images for 2-dimensional code reading.

Ring lighting

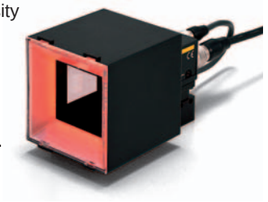
Intelligent Light Source



Reduces the background effects of metal processed parts.

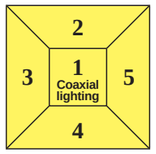
A variety of Lighting Methods

The lighting direction and intensity can be changed. In addition, coaxial lighting is available with the F150-SLC20. Optimal lighting methods can be set for a wide variety of workpieces.



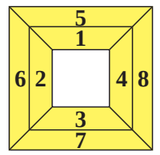
F150-SLC20 (Field of vision: 20 mm)

The light intensity can be set for each of five lighting blocks, in eight steps.



F150-SLC50 (Field of vision: 50 mm)

The light intensity can be set for each of eight lighting blocks, in eight steps.

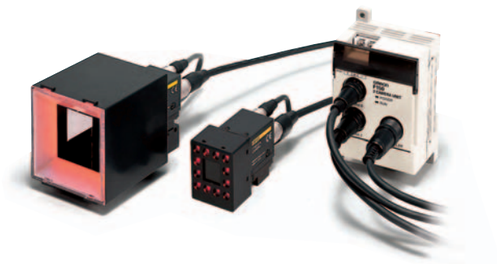


Lighting controlled from Menus

- The lighting block and intensity can be controlled from the Controller menu. Settings can be easily changed without having to touch the light itself.
- Because light is handled as scene data, the lighting conditions can be varied to match model changes on mixed-product lines.
- The Controller manages light settings numerically, for accurate reproducibility.

Two-camera Unit

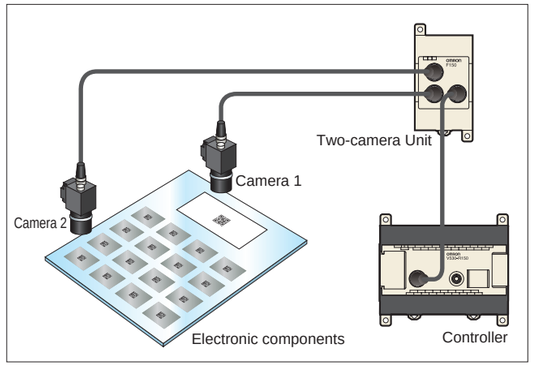
Two cameras can be switched by a single Controller.



Application Example

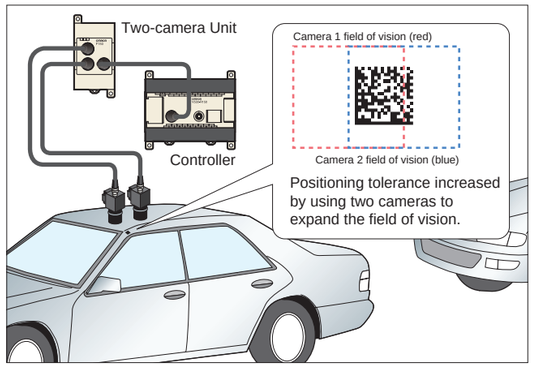
Simultaneous single-product and lot management

Single products and lots can be managed simultaneously.



Greater positioning tolerance

For applications that cannot be covered by the field of vision of only one camera.

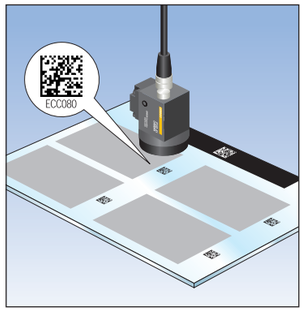


Expanded Range of Readable Codes and Matrix Sizes

Compatible with Data Matrix ECC000-140

The V530-R150E-3 Controller and V530-R150EP-3 Controller are capable of reading Data Matrix ECC000-140*.

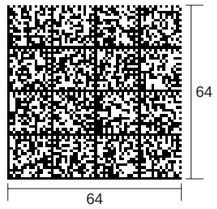
*Compatible with ECC000,050, 080, 100, and 140.



Compatible with Data Matrix ECC200, with Up to 64 X 64 Cells

To enable the use of more information, ECC200 codes with up to 64 ✕ 64 cells (max. of 418 alphanumeric characters) can be read.

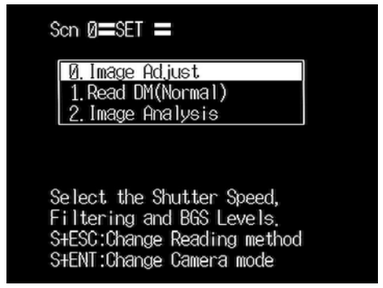
Max. of 64 alphanumeric characters



Max. of 418 alphanumeric characters

New Guidance Function for the Settings Display

The addition of a guidance function on the display greatly simplifies setting.



Easy Analysis

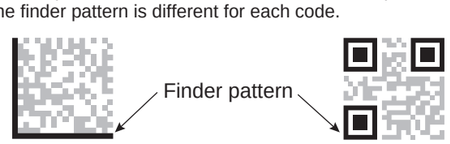
Easy-to-Read Analytical Data Format

See the reading status at a glance on the reading information display.

The finder pattern, cell recognition, reading data, etc., can all be viewed on the display.

Finder pattern (cutting symbol)

Use this pattern to detect the 2-dimentional code position. The finder pattern is different for each code.



Easy Detection of Nonconforming Items

Easy Image Analysis

The image analysis mode helps to detect the cause of marking problems.

Store up to 24 Defect Images

Use the stored images to confirm defect types.

*Stored images are kept until the V530-R150E-3 Controller or V530-R150EP-3 Controller is turned OFF.

System Configuration

Cameras

★F150-SLC20 Camera with Intelligent Light Source (Field of vision: 20 mm)

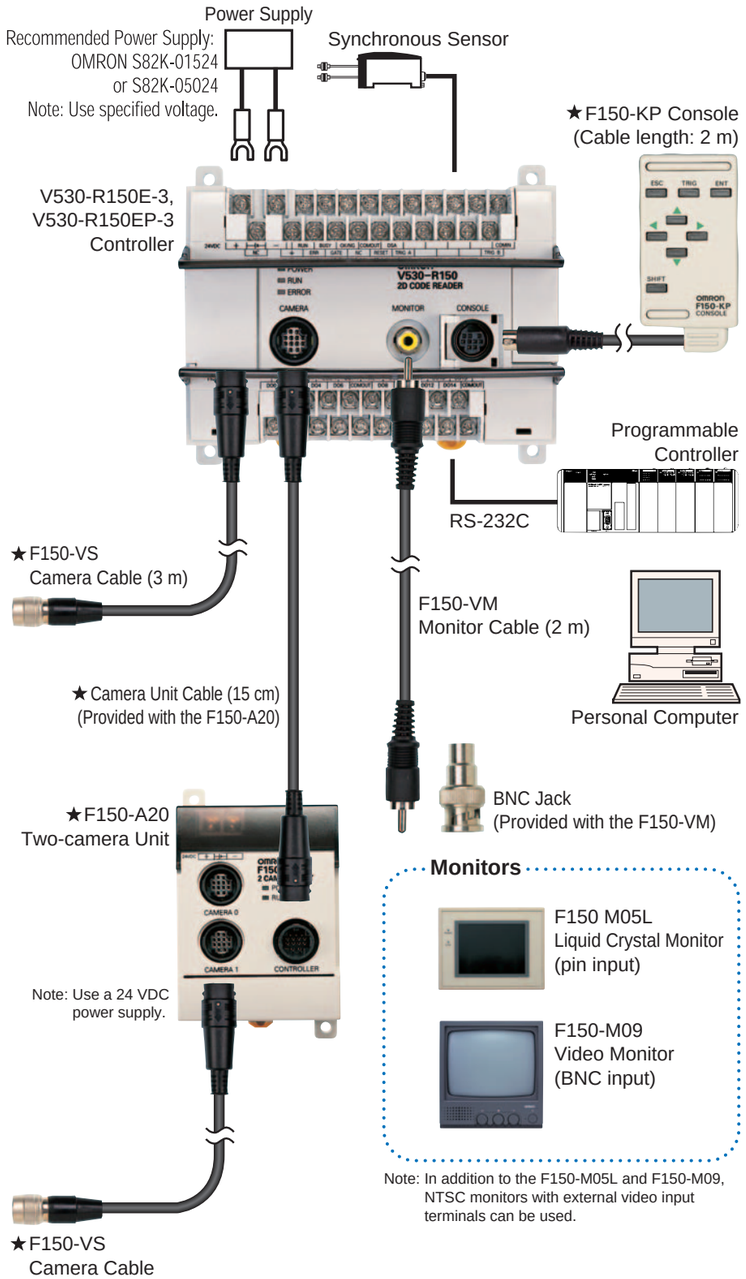
★F150-SLC50 Camera with Intelligent Light Source (Field of vision: 50 mm)

★F150-SL20A Camera with Light Source (Field of vision: 20 mm)
F150-SL50A Camera with Light Source (Field of vision: 50 mm)

★F150-S1A Camera

Refer to page 9 concerning the use of this camera.

*If the field of vision does not match the size of the target object, you can use an ordinary CCTV lens and lighting.



Monitors

F150 M05L
Liquid Crystal Monitor
(pin input)

F150-M09
Video Monitor
(BNC input)

Note: In addition to the F150-M05L and F150-M09, NTSC monitors with external video input terminals can be used.

★Products indicated with a star (★) are specially designed for use with the V530-R150E-3 Controller and V530-R150EP-3 Controller. They cannot be substituted with other products.

Models

Name	Model No.
Controller	V530-R150E-3, V530-R150EP-3
Console	F150-KP
Camera	F150-S1A
Camera Cable (3 m)	F150-VS
Monitor Cable (2 m)	F150-VM
Liquid Crystal Monitor	F150-M05L
Video Monitor	F150-M09

Specifications

2-Dimensional Code Reader
V530-R150E-3 / V530-R150EP-3

Item	Specifications	
Model	V530-R150E-3	V530-R150EP-3
Input/Output type	NPN	PNP
Readable codes	Data Matrix ECC200 : 10 × 10 to 64 × 64, 8 × 18, 8 × 32, 12 × 26, 12 × 36, 16 × 36, 16 × 48 Data Matrix ECC000, 050,080, 100, 140 : 9 × 9 to 25 × 25 QR Code (Model 1, 2) : 21 × 21 to 41 × 41 (Version 1 to 6)	
Readable direction	360°	
Number of pixels (resolution)	512 (H) × 484 (V)	
Number of connectable cameras	1 (Using F150-A20: 2 max.)	
Number of scenes	10	
Image memory function	Maximum of 24 images stored.	
Operation method	Menu selectable	
Processing method	Gray	
Monitor interface	1 channel (over scan monitor)	
RS-232C I/F	1 channel	
Parallel I/O	3 inputs and 9 outputs including control I/O points	
Power supply voltage	20.4 to 26.4 VDC	
Enclosure rating	IEC 60529, IP 20	
Current consumption	Approx. 0.5 A	
Ambient temperature	Operating: 0 to 50°C Storage: -25 to 65°C (with no icing or condensation)	
Ambient humidity	Operating / Storage : 35% to 85% (with no condensation)	
Weight	Approx. 390 g	

Camera
F150-SLC20/50 Camera with Intelligent Light Source
F150-SL20A /50A Camera with Light Source
F150-S1A Camera

Item		Specifications
Camera	Picture element	1/3" CCD
	Effective pixels	659 (H) × 494 (V)
	Shutter function	Electronic frame shutter Shutter speed: 1/100, 1/500, 1/2000, or 1/10000 sec (menu selectable)
Lens	Mounting distance	F150-SLC20 : 15 to 25mm F150-SLC50 : 16.5 to 26.5mm F150-SL20A : 61 to 71mm F150-SL50A : 66 to 76mm
	Field of vision	F150-SLC20/SL20A : 20 × 20mm F150-SLC50/SL50A : 50 × 50mm
Light	Light source	F150-SLC20/50: Red LED/Green LED, F150-SL20A/50A: Red LED
	Lighting method	Pulse (synchronized with camera shutter)
Ambient temperature		Operating: 0 to 50°C, storage: -25 to 60°C (with no icing or condensation)
Ambient humidity		Operating/Storage: 35% to 85% (with no condensation)
Weight (camera only)		F150-SLC20: Approx. 280 g, F150-SLC50: Approx. 370 g, F150-SL20A /50A: Approx. 135 g, F150-S1A: Approx. 80 g

Two-camera Unit
F150-A20

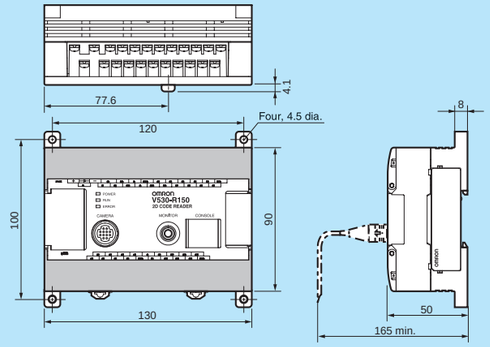
Item	Specifications
Number of connectable cameras	2
Camera mode	2-camera selectable Single, independent (camera 0/1)
Power supply voltage	20.4 to 26.4 VDC
Current consumption	Approx. 0.3 A
Ambient temperature	Operating: 0 to 50°C storage: -25 to 65°C (with no icing or condensation)
Ambient humidity	Operating/Storage: 35% to 85% (with no condensation)
Weight (2-camera unit only)	Approx. 220 g

Monitor

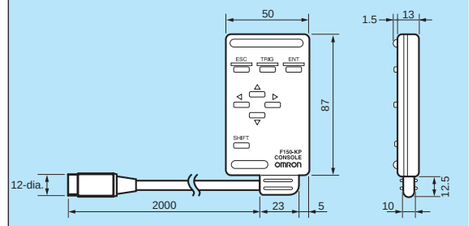
Item / Name / Model No.	Liquid Crystal Monitor F150-M05L	Video Monitor F150-M09
Size	5.5 inches	9 inches
Type	Liquid crystal color TFT	CRT monochrome
Resolution	320 × 240 dots	800 TV lines min. (at center)
Input signal	NTSC composite video (1.0 V / 75)	
Power supply voltage	20.4 to 26.4 VDC	100 to 240 VAC (-15%, +10%)
Current consumption	Approx. 700 mA	Approx. 200 mA
Ambient temperature	Operating: 0 to 50°C storage: -25 to 65°C (with no icing or condensation)	Operating: -10 to 50°C storage: -20 to 65°C (with no icing or condensation)
Ambient humidity	Operating/Storage: 35% to 85% (with no condensation)	10% to 90% (with no condensation)
Weight (monitor only)	Approx. 1 kg	Approx. 4.5 kg

Dimensions (Unit: mm)

2-Dimensional Code Reader
V530-R150E-3, V530-R150EP-3

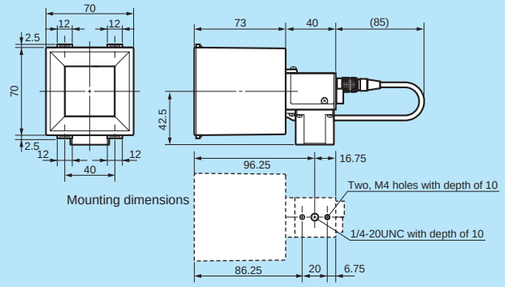


Console
F150-KP

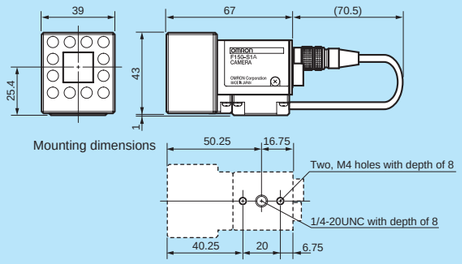


Camera

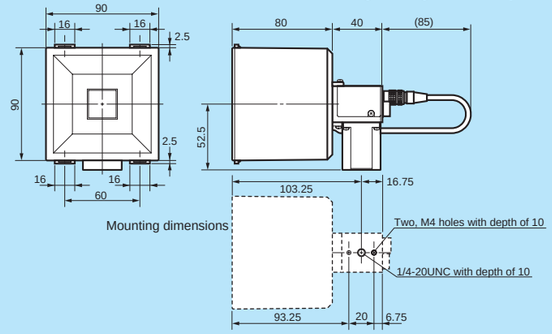
F150-SLC20 (Camera with F150-LTC20 Intelligent Light Source)



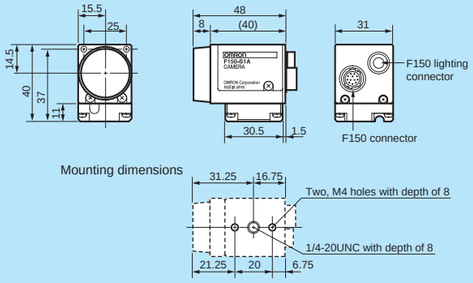
F150-SL20A /SL50A (Camera with Light Source)



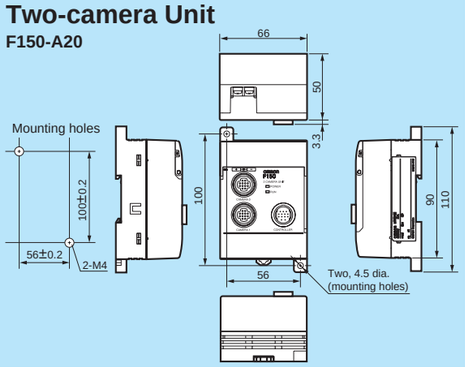
F150-SLC50 (Camera with F150-LTC50 Intelligent Light Source)



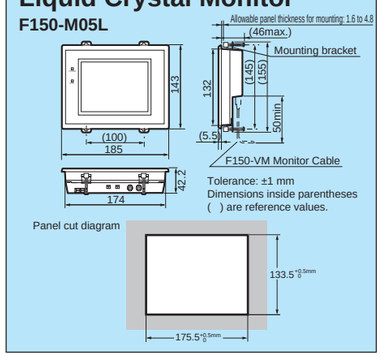
F150-S1A (Camera only)



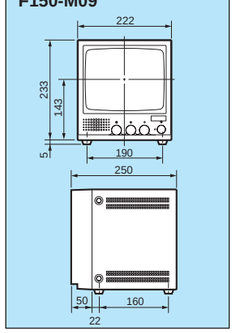
Two-camera Unit
F150-A20



Liquid Crystal Monitor
F150-M05L

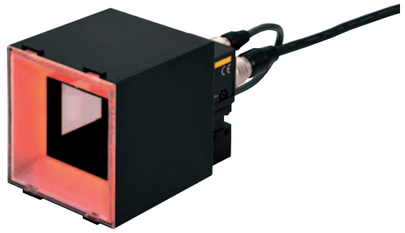


Video Monitor
F150-M09



Cameras with Light Source

Cameras with Intelligent Light Source



Models

20-mm field of vision	F150-SLC20
50-mm field of vision	F150-SLC50

*These models consist of an F150-S1A Camera with Lens and Intelligent Light Source.

Cameras with Light Source

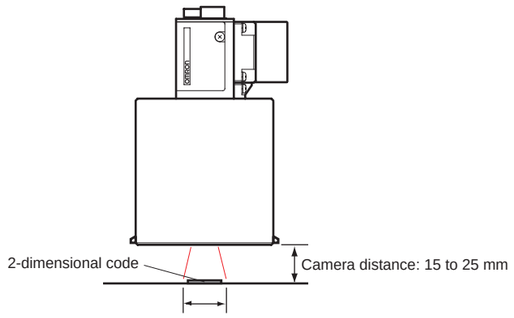
20-mm field of vision	F150-SL20A
50-mm field of vision	F150-SL50A

*These models consist of an F150-S1A Camera with Lens and Light.

2-Dimensional Code Reader Distance vs. Field of Vision

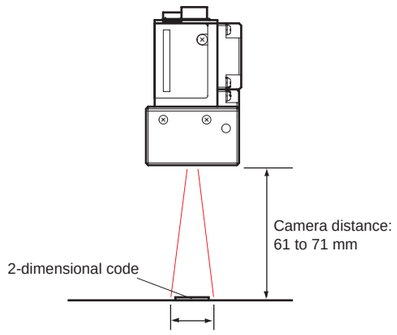
Mount the Camera at a distance that will provide accurate imaging of the 2-dimensional codes.

F150-SLC20



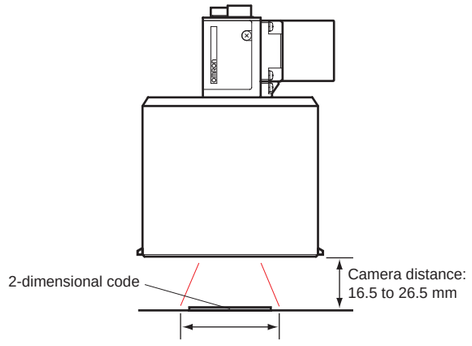
Field of vision (20 mm × 20 mm)

F150-SL20A



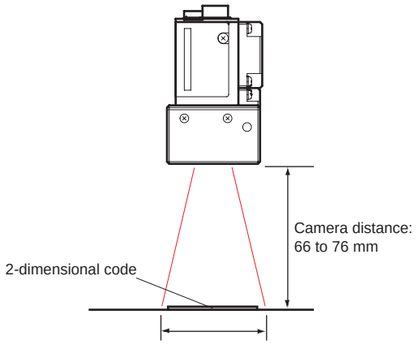
Field of vision (20 mm × 20 mm)

F150-SLC50



Field of vision (50 mm × 50 mm)

F150-SL50A



Field of vision (50 mm × 50 mm)

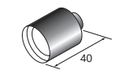
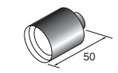
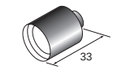
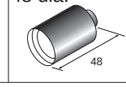
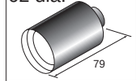
Using the Camera with Intelligent Light Source or Camera with Light Source

- The Lens has a fixed focus. Because there is a certain amount of variation in the field of vision and focus of each Lens, the mounting distance must be adjusted each time the Lens or Camera is replaced.
- The camera mounting distance is approximate. Use a mounting method that allows the distance to be adjusted back and forth in the direction of the 2-dimensional code.

Lenses

- Refer to the following optical graph to select the Lens and Extension Tube according to the field of vision and camera mounting distance being used.

CCTV Lenses

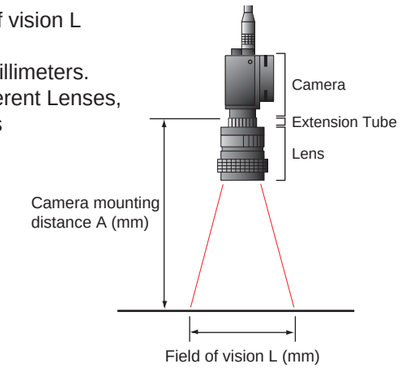
CCTV Lenses						
Model	3Z4S-LE C815B	3Z4S-LE B1214D-2	3Z4S-LE C1614A	3Z4S-LE B2514D	3Z4S-LE B5014A	3Z4S-LE B7514C
Dimensions	42 dia. 	42 dia. 	30 dia. 	30 dia. 	48 dia. 	62 dia. 
Locking mechanism	Focus/iris locking mechanism					None

Extension Tubes

Model	Length
3Z4S-LE EX-C6	A set of six Extension Tubes that are 40, 20, 10, 5, 1, and 0.5 mm in length respectively.

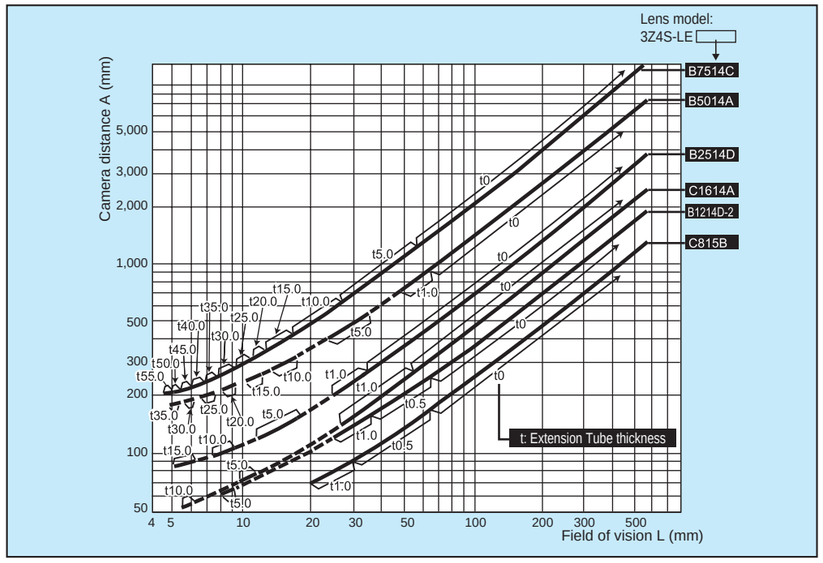
Reading the Optical Graph

The X axis of the graph shows field of vision L in millimeters, and the Y axis shows the camera mounting distance A in millimeters. The curves on the graph indicate different Lenses, and the "t" values indicate the lengths of the Extension Tubes.



- All values are approximate. When mounting, it is recommended that you use a method that allows the camera mounting distance to be adjusted by sliding the camera back and forth in the direction of the 2-dimensional code.

Optical Graph



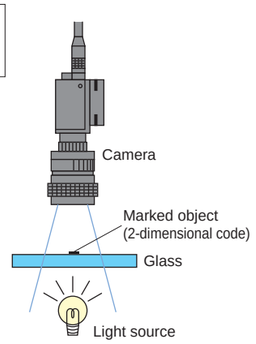
Lighting Methods

Select the appropriate lighting method for the material of the marked object.

Back Lighting

Codes on transparent objects such as glass PCBs can be read by detecting the contrast between transmitted and blocked light.

Applications: Transparent objects such as LCD glass

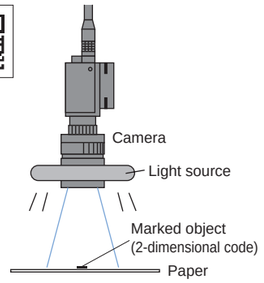


Reflected Lighting

Ring Lighting

For codes printed onto paper or other light-diffusing objects, ring lights can be used to illuminate the marked object. The difference in the reflection factors of the background and the marking enables stable detection.

Applications: Paper labels and corrugated cardboard

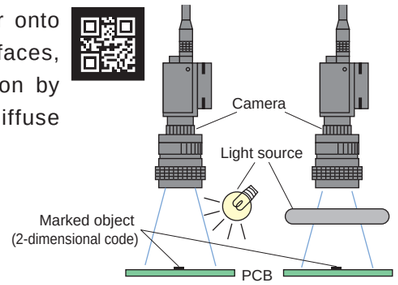


Oblique Lighting

Ring lighting close to the marked object

For codes inscribed with a laser maker onto PCBs and other relatively glossy surfaces, oblique lighting provides stable detection by distinguishing between regular and diffuse reflected light.

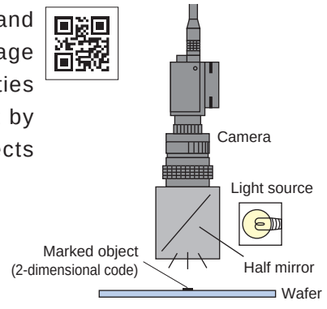
Applications: Direct marking on PCBs and electronic parts



Coaxial Lighting

For codes marked directly onto wafers and other mirror-like surfaces, a stable image with few shadows from surface irregularities can be obtained from the marked object by using coaxial lighting, because it detects only regular reflected light.

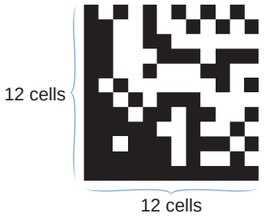
Applications: Mirror-like objects such as wafers



Data Capacity

Data Matrix

The relation between matrix size (number of cells) and data capacity is shown in the table at right. In this example, the matrix size is 12 × 12 cells.

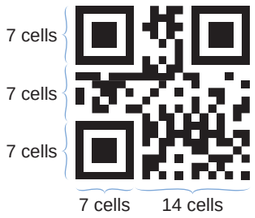


< Data Matrix ECC200 >

Matrix size	Maximum data capacity				
	Numbers	Alphanumeric characters	Symbols	Japanese Kanji (Shift JIS)	JIS8
10 × 10	6	3	3	——	1
12 × 12	10	6	5	1	3
14 × 14	16	10	9	3	6
16 × 16	24	16	14	5	10
18 × 18	36	25	22	8	16
20 × 20	44	31	28	10	20
22 × 22	60	43	38	14	28
24 × 24	72	52	46	17	34
26 × 26	88	64	57	21	42
32 × 32	124	91	81	30	60
36 × 36	172	127	113	42	84
40 × 40	228	169	150	56	112
44 × 44	288	214	190	71	142
48 × 48	348	259	230	86	172
52 × 52	408	304	270	101	202
64 × 64	560	418	372	139	278
8 × 18	10	6	5	1	3
8 × 32	20	13	12	4	8
12 × 26	32	22	20	7	14
12 × 36	44	31	28	10	20
16 × 36	64	46	41	15	30
16 × 48	98	72	64	23	47

QR Code

The relation between matrix size (number of cells) and data capacity is shown in the table at right. In this example, the matrix size is 21 × 21 cells.



< QR Code Model 2 >

Matrix size (version)	Error correction	Maximum data capacity			
		Numbers	Alphanumeric characters (upper case only)	JIS8	Japanese Kanji (Shift JIS)
21 × 21 (version 1)	L (7%)	41	25	17	10
	M (15%)	34	20	14	8
	Q (25%)	27	16	11	7
	H (30%)	17	10	7	4
25 × 25 (version 2)	L (7%)	77	47	32	20
	M (15%)	63	38	26	16
	Q (25%)	48	29	20	12
	H (30%)	34	20	14	8
29 × 29 (version 3)	L (7%)	127	77	53	32
	M (15%)	101	61	42	26
	Q (25%)	77	47	32	20
	H (30%)	58	35	24	15
33 × 33 (version 4)	L (7%)	187	114	78	48
	M (15%)	149	90	62	38
	Q (25%)	111	67	46	28
	H (30%)	82	50	34	21
37 × 37 (version 5)	L (7%)	255	154	106	65
	M (15%)	202	122	84	52
	Q (25%)	144	87	60	37
	H (30%)	106	64	44	27
41 × 41 (version 6)	L (7%)	322	195	134	82
	M (15%)	255	154	106	65
	Q (25%)	178	108	74	45
	H (30%)	139	84	58	36