

MELSENSOR
Vision Sensor

e-Factory



MELSENSOR

GLOBAL IMPACT OF MITSUBISHI ELECTRIC



Through Mitsubishi Electric's vision, "Changes for the Better" are possible for a brighter future.

Changes for the Better

"Changes for the Better" represents the Mitsubishi Electric Group's attitude to "always strive to achieve something better", as we continue to change and grow. Each one of us shares a strong will and passion to continuously aim for change, reinforcing our commitment to creating "an even better tomorrow".

Mitsubishi Electric is involved in many areas including the following:

Energy and Electric Systems

A wide range of power and electrical products from generators to large-scale displays.

Electronic Devices

A wide portfolio of cutting-edge semiconductor devices for systems and products.

Home Appliance

Dependable consumer products like air conditioners and home entertainment systems.

Information and Communication Systems

Commercial and consumer-centric equipment, products and systems.

Industrial Automation Systems

Maximizing productivity and efficiency with cutting-edge automation technology.

Our advances in AI and IoT are adding new value to society in diverse areas from automation to information systems. The creation of game-changing solutions is helping to transform the world, which is why we are honored to be recognized in the 2019 "Forbes Digital 100" as one of world's most influential digital corporations.



Easily automate inspection and measurement, enabling quality improvement

Mitsubishi Electric vision sensors are light integrated and compact size, realizing “Easy to Use” in various production lines.



INDEX

Introduction	04
Applications	06
Vision sensors	08
Configuration tool	16
Product list	20
Specifications	24
External dimensions	30
Support	33

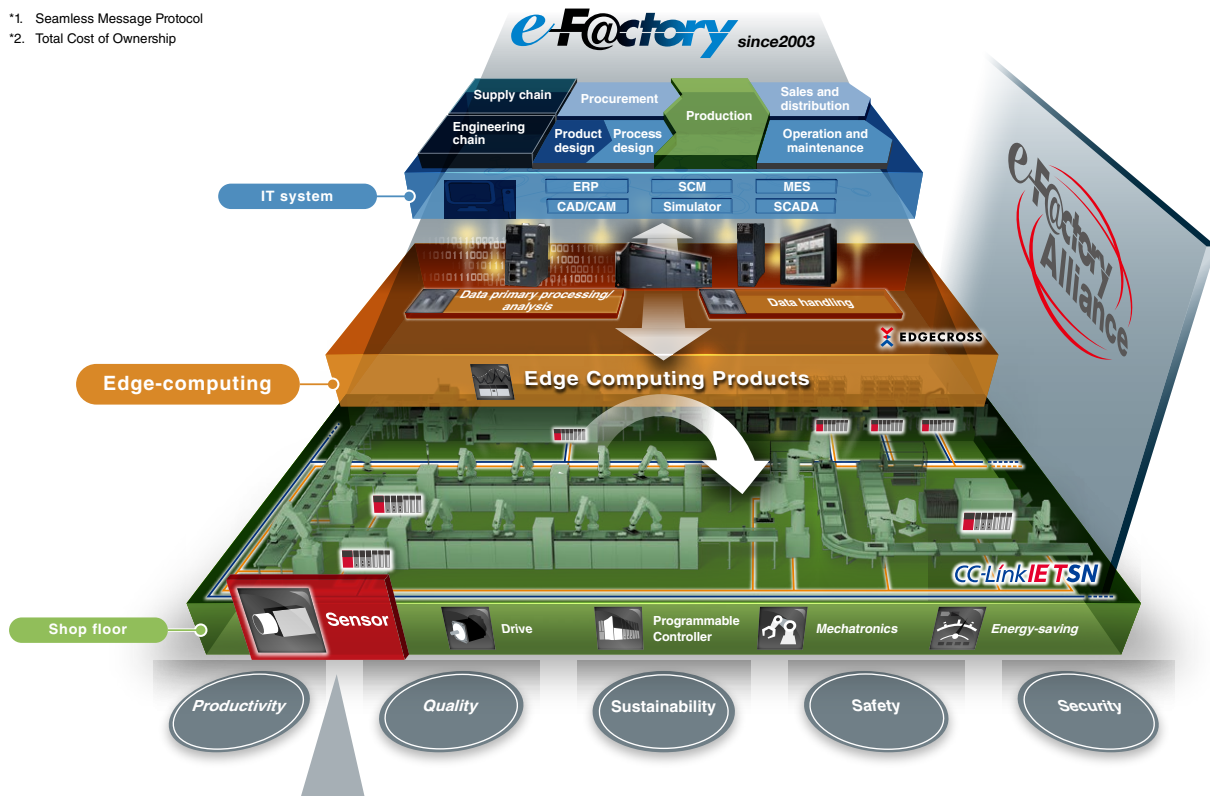
Powered by
COGNEX

This product is manufactured
by Cognex Corporation.




e-F@ctory is the Mitsubishi Electric solution for improving the performance of any manufacturing enterprise by enhancing productivity, and reducing the maintenance and operations costs together with seamless information flow throughout the plant by using a combination of factory automation and IT technologies.

The vision sensor is the key device on the shop floor that detects data necessary for e-F@ctory in real time. Mitsubishi Electric vision sensors which support CC-Link IE Field Network Basic and SLMP*1 are highly compatible with Mitsubishi Electric factory automation products. Measuring results are seamlessly coordinated with the edge computing level, realizing smooth analysis for reducing TCO*2.

*1. Seamless Message Protocol
 *2. Total Cost of Ownership



Specifications/functions comparison

Item			
	VS80	VS70	VS20
Imagery	Monochrome/color	Monochrome/color	Monochrome/color
Lighting/filter	-	Integrated	Integrated
Protective structure	IP40	IP67	IP65
Autofocus	-	●	-
PoE adapter	●	-	-
Presence/absence	●	●	●
Measurement	●	●	●*1
Location*2	●	●	-
OCR/OCV*3	●	●	-
Code reading	●	●	-
Geometry	●	●	-

VS80

Equipped with PatMax RedLine®*4, the VS80 can identify works traveling at high speed. Its compact footprint easily fits into space-constrained areas, hard-to-reach areas, and is installable on the robot hands. PoE equipped stand-alone vision sensor with reduced wiring. Monochrome models and color models are available.

VS70

Equipped with PatMax RedLine®, the VS70 can identify works traveling at high speed. Lightings, lenses, and filters can be selected from a wide range of option products, allowing customization according to customer requirements. Monochrome models and color models are available.

VS20

Simple presence/absence checks can be done. Monochrome models and color models which support color verification are available. Even novice users can make a setting easily and quickly. The design can be changed between in-line and right-angle according to the installation space.

*1. Excluding some models

*2. Function to output position information of the detected work.

*3. Alphabet and numeral reading

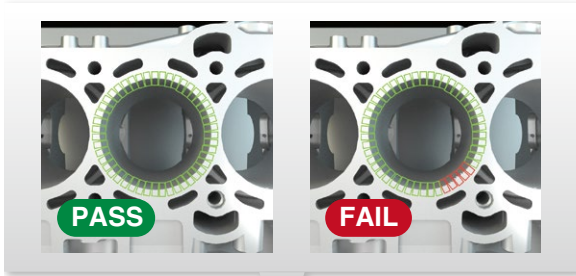
*4. High-speed/high-accuracy pattern matching algorithm



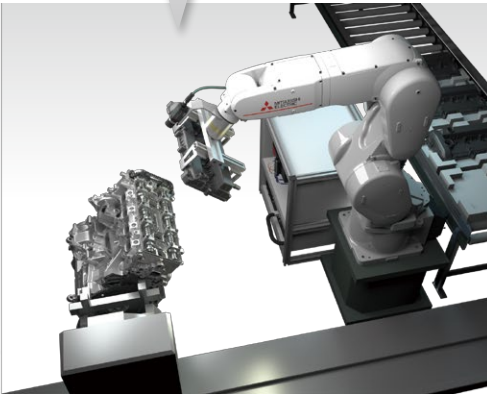
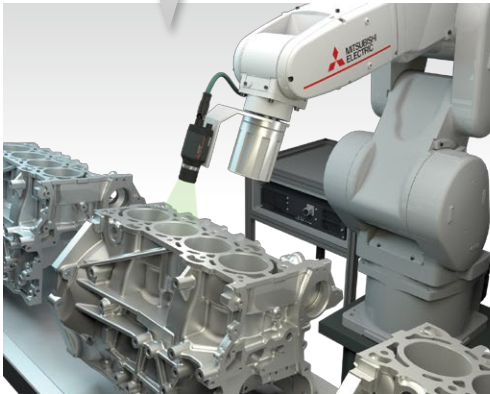
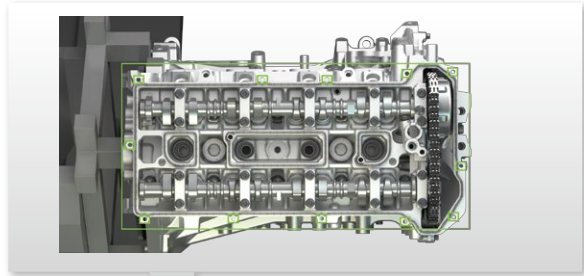
Vision sensors enable various operations such as location, presence/absence inspection, and measurement of different works.

Automotive industry

■ Cylinder opening inspection

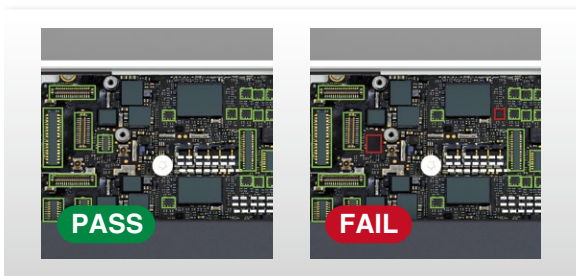


■ Cylinder head location

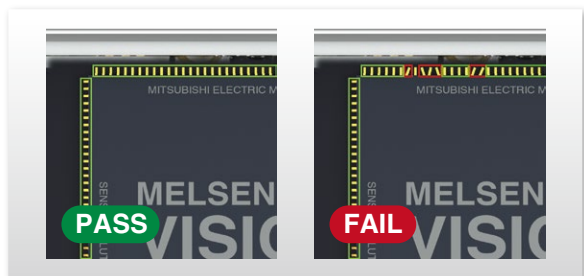


Electric/electronics industry

■ Part presence/absence inspection



■ IC package pin inspection

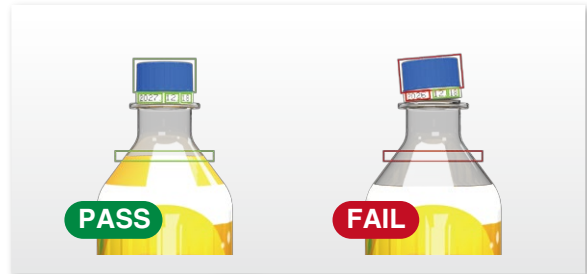


Food industry

■ Label inspection

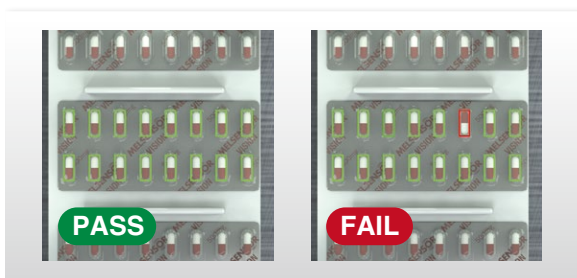


■ Liquid level, expiration data, and cap inspection

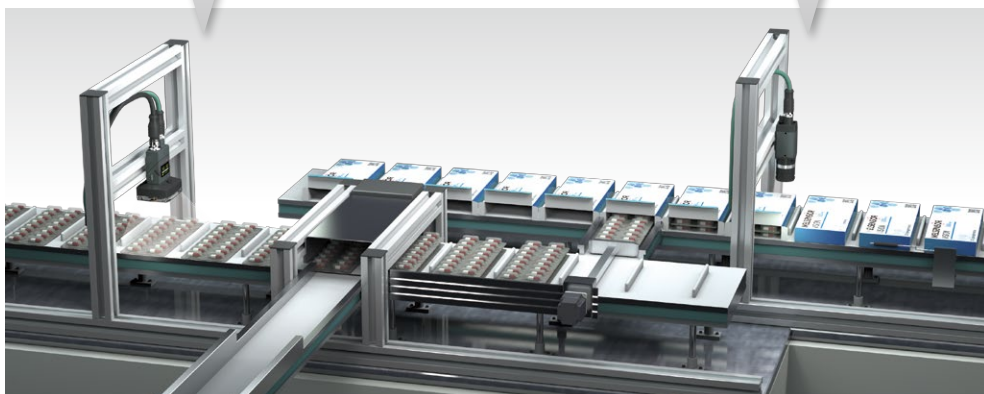


Pharmaceutical industry

■ Blister pack pharmaceutical inspection



■ Barcode reading verification



Easily realizes automated inspection/measurement

Vision sensor



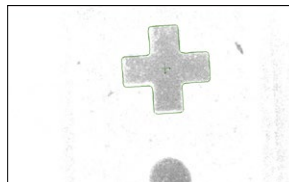
High-performance and robust PatMax RedLine®

VS80 VS70 VS20

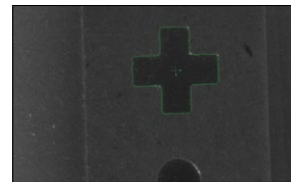
PatMax RedLine® technology can find object shapes even in images which are difficult to detect due to noise, low contrast and reflection. The vision sensor detects out-of-focus images due to distortion of an object and variation of thickness at high speed, reducing inspection time such as pattern matching, filtering, defect detection, and barcode reading.



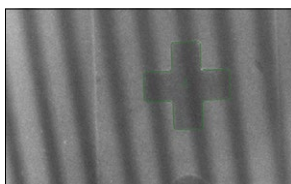
Good



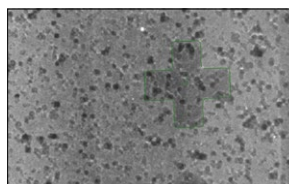
Low contrast/overexposure



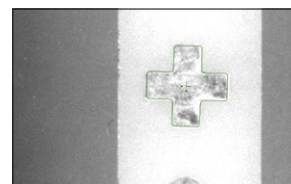
Low contrast



Noise (stripe)

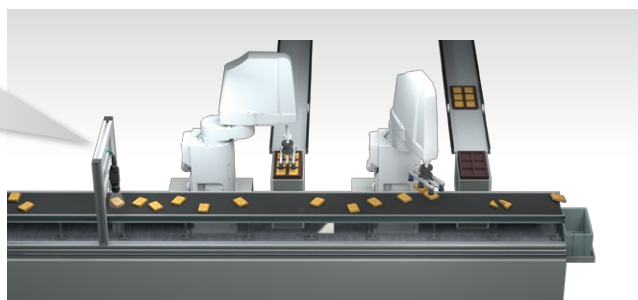
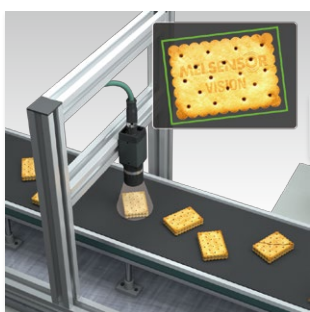


Noise (coarse particle)



Clutter (extra feature)

Since PatMax RedLine® can calculate an accurate position adjusted value, a mechanism to align objects is no longer required, thereby contributing to cost reduction and downsizing of facility.



All necessary functions included

VS80 VS70 VS20

Mitsubishi Electric vision sensors are integrated vision sensors with all necessary functions embedded. Image acquisition, powerful vision tool library, and inspection result output function are available.



Support color verification

VS80 VS70 VS20

Color sensor model supports presence/absence applications, including color verification.



Color model



Monochrome model

Integrated lighting and filter

VS80 VS70 VS20

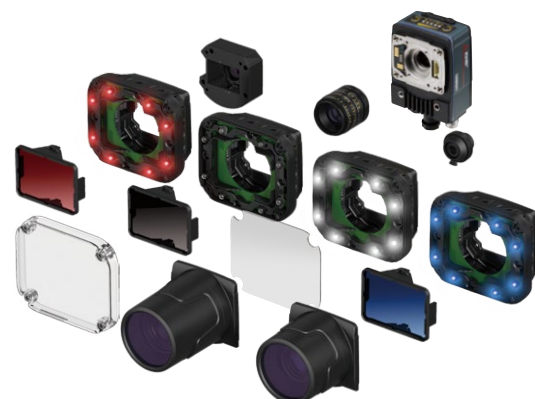
A high-powered LED ring light can be attached to the product front and does not require an external lighting. Novice user can easily install the product. The integrated filter type eliminates the need to attach a filter to the light and lens.



Extensive option products

VS80 VS70 VS20

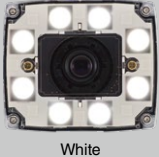



Lightings, lenses, and filters can be selected from a wide range of option products, providing users with flexibility to customize according to requirements. Also, these field-changeable options support change of works and conditions after installation.



Lighting according to measured item characteristics

VS80 VS70 VS20

Lighting can be changed according to measured object and color.

Color	Features	General applications
 White	<ul style="list-style-type: none"> Visualizes all wavelength except black Ideal for color camera 	<ul style="list-style-type: none"> For color verification For shooting objects traveling at high speed
 Blue	<ul style="list-style-type: none"> Visualizes tiny objects with high scattering rate 	<ul style="list-style-type: none"> For inspecting blue objects For finding minor defect at high resolution
 Red	<ul style="list-style-type: none"> Wavelength highest in sensitivity 	<ul style="list-style-type: none"> For shooting red objects
 Near infrared	<ul style="list-style-type: none"> Low scattering rate and high transmittance Visualizes objects which are difficult to visualize in visible light 	<ul style="list-style-type: none"> For inspecting scratches, missing parts, and letters under near infrared transmissive dye ink



Colors that are opposite each other on Hue circle are called complementary colors. Lighting complementary color of the item color changes the item color closer to black.

Field customizable to your applications

VS80 VS70 VS20

Lens/lighting can be selected according to the operating environment

Lens/lighting can be selected from options according to the system.

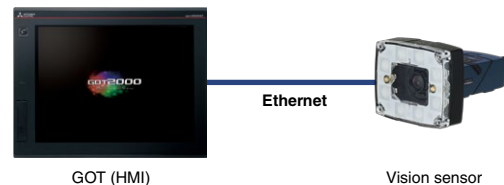


Vision sensor monitor function

VS80 VS70 VS20

Through its interconnectivity with the MELSENSOR vision sensor and the GOT (HMI), the vision sensor system can be easily configured with a GOT (HMI), vision sensor, and Ethernet cable only.

Monitoring of the vision sensor and parameter registration can be done from the GOT (HMI) screen, realizing operation of the vision sensor system without a computer.



Specifications

Item	Specifications
Number of detectable vision sensor (modules)	Max. 64
Number of monitor/editable job files	Max. 100
Editable parameters	Parameters for correcting inspection area and model area
Creating new job files	Not allowed**1
Vertical display	Not allowed

*1. To create a new job file, use In-Sight Explorer for MELSENSOR Vision.

Compatible products

Product	Series	Firmware version
Vision sensor	VS80, VS70, VS20	Ver. 5.7.5
GOT (HMI)	GOT2000 Series GT27, GT25	Ver. 1.235V or later

Compact/reduced wiring stand-alone type

Vision sensor VS80

PatMax RedLine®

Waterproof

Integrated lighting

Autofocus



I/O connector

Ethernet connector

Compact vision with reduced wiring fits anywhere

Ultra-compact-size sensors (31 mm x 31 mm x 75 mm) can be installed at the maximum angle of 45 degrees. The VS80 integrates into tight spaces in the machinery, hard-to-reach spaces between machines, and on the robot hand.



PoE*1 minimizes cabling

The sensor with PoE can be connected with one dedicated cable, minimizing cabling.

*1. Power Over Ethernet

Product lineup

Select products according to applications.

■ Monochrome

Item		VS80M-100 VS80M-100-E	VS80M-200 VS80M-200-□	VS80M-400 VS80M-400-□	VS80M-202 VS80M-202-□	VS80M-402 VS80M-402-□
Image resolution (pixels)	640 x 480	●	●	●	-	-
	1600 x 1200	-	-	-	●	●
Maximum image acquisition speed (frame/s)			217		53	
Processor performance*2 (times)		1	1.5	2	1.5	2
PatMax RedLine®			VS80M-□-R, VS80M-□-ER: supported VS80M-□, VS80M-□-E: not supported*3			
EasyBuilder		●	●	●	●	●
Spreadsheet			VS80M-□, VS80M-□-R: supported VS80M-□-E, VS80M-□-ER: not supported*3			

■ Color

Item		VS80C-100	VS80C-200-R	VS80C-400-R	VS80C-202-R	VS80C-402-R
Image resolution (pixels)	640 x 480	●	●	●	-	-
	1600 x 1200	-	-	-	●	●
Maximum image acquisition speed (frame/s)			135		33	
Processor performance*2 (times)		1	1.5	2	1.5	2
PatMax RedLine®		Not supported		Supported		
EasyBuilder		●	●	●	●	●
Spreadsheet			Supported			

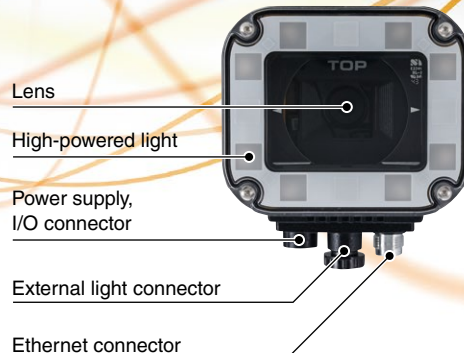
*2. Magnification based on the VS80M-100-E

*3. Please refer to page 20 for details.

Integrated lighting/compact size

Vision sensor VS70

- PatMax RedLine®
- Waterproof
- Integrated lighting
- Autofocus



Autofocus module equipped*1

Autofocus module brings a camera into focus easily, reducing time for initial setting and set-up change. Even when installing the camera in a hard-to-reach space, it is easy to bring the camera into focus.

*1. Manual focus lenses are also available.

Water-proof/dust-proof

The product complies with IP67 rating, dust-proof and water-proof performance are assured.

Product lineup

Select products according to applications.

■ Monochrome

Item		VS70M-600 VS70M-600-□	VS70M-800 VS70M-800-□	VS70M-802 VS70M-802-□
Image resolution (pixels)	640 x 480	●	●	-
	800 x 600	●	●	-
	1600 x 1200	-	-	●
Maximum image acquisition speed (frame/s)		When image resolution is set to 640 x 480: 217 When image resolution is set to 800 x 600: 165		53
Processor performance*2 (times)		1	1.25	1.25
PatMax RedLine®		VS70M-□-R, VS70M-□-ER: supported VS70M-□, VS70M-□-E: not supported*3		
EasyBuilder		●	●	●
Spreadsheet		VS70M-□, VS70M-□-R: supported VS70M-□-E, VS70M-□-ER: not supported*3		

■ Color

Item		VS70C-600-R	VS70C-800-R	VS70C-802-R
Image resolution (pixels)	640 x 480	●	●	-
	800 x 600	●	●	-
	1600 x 1200	-	-	●
Maximum image acquisition speed (frame/s)		When image resolution is set to 640 x 480: 135 When image resolution is set to 800 x 600: 100		33
Processor performance*2 (times)		1	1.25	1.25
PatMax RedLine®		Supported		
EasyBuilder		●	●	●
Spreadsheet		Supported		

*2. Magnification based on the VS70M-600-E

*3. Please refer to page 20 for details.

Ideal for simple presence/absence inspection

Vision sensor VS20

PatMax RedLine®

Waterproof

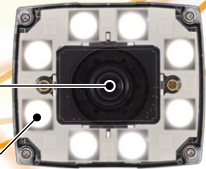
Integrated lighting

Autofocus



Lens

High-powered lighting



Ethernet connector

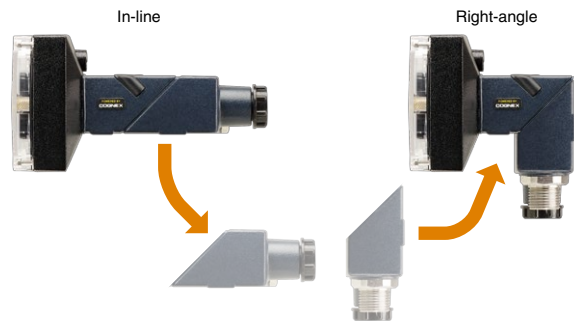
Power supply, I/O, RS-232 connector



Field customizable to your applications

Compact palm-sized

Integrated compact size ideal for installation in space-constrained production lines. The configuration can be changed according to the installation space.



Product lineup

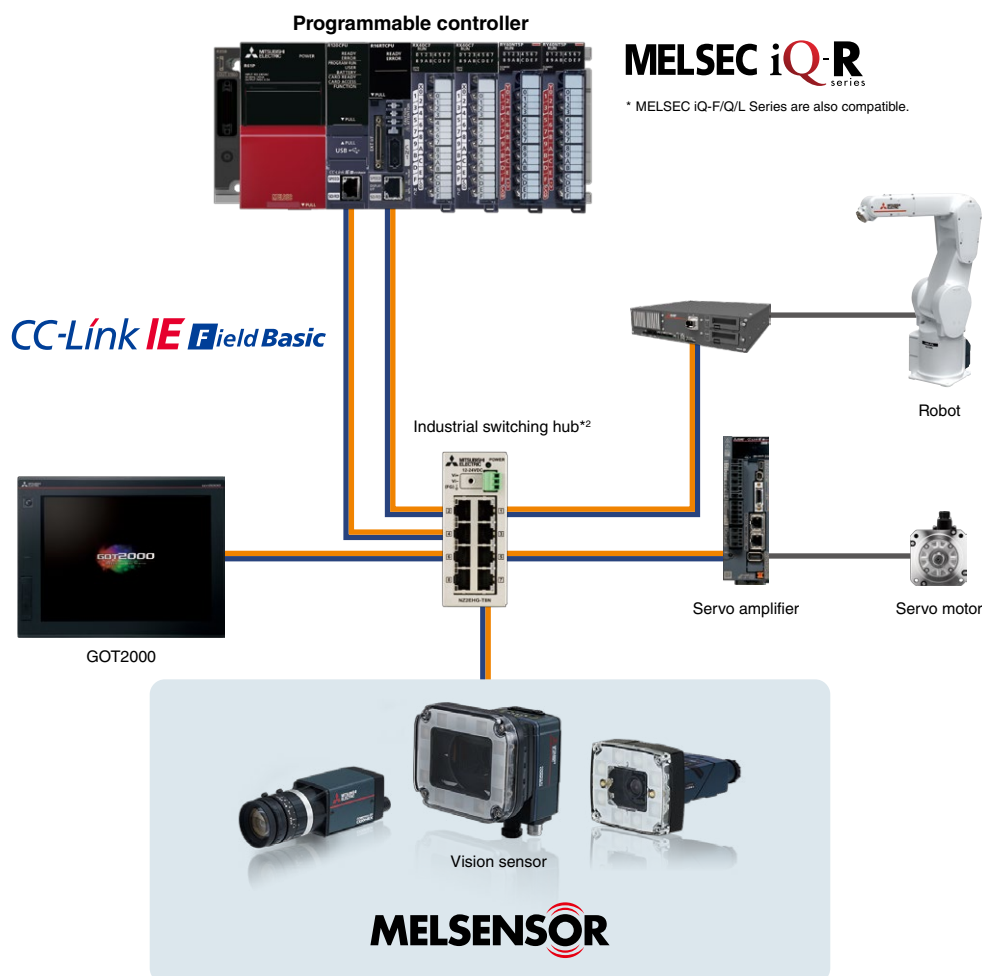
Different models according to applications are available.

Item		VS20M-11F310	VS20M-12F410	VS20C-12F410	VS20M-13F410	VS20C-13F410
Imagery		Monochrome	Monochrome	Color	Monochrome	Color
Image resolution (pixel)	640 x 480 (standard)	●	●	●	●	●
	640 x 480 (2 x image magnification)	-	●	●	●	●
	800 x 600 (2 x image magnification)	-	-	-	●	●
Maximum image acquisition speed (frame/s)		40	75	55	75	55
Processor performance*1 (times)		1	2	2	2	2
PatMax Redline®		-	-	-	-	-
EasyBuilder		●	●	●	●	●
Spreadsheet		-	-	-	-	-

*1. Considering VS20M-11F310 as 1.

Compatibility with Mitsubishi Electric factory automation products

- The vision sensor is compatible with CC-Link IE Field Network Basic*1, iQSS, and SLMP, enabling easier connection to Mitsubishi Electric products such as programmable controllers, robots, and motion controllers
- Control/monitoring/parameter setting of the vision sensor and result acquisition can be done from the programmable controller
(Ex.) Turning on/off of devices can trigger the vision sensor
- Recognition images of the vision sensor are transferred to the GOT (HMI) or IT system via an FTP server, realizing traceability by comparing recognition results and recognition images



CC-Link IE Field Network Basic compatible

CC-Link IE Field Network Basic interface functions are embedded, realizing high-compatibility with the programmable controller such as easier setup. Measured values and judgment results are acquired via network. In addition, settings of the vision sensor can be checked and changed from the programmable controller.

iQSS compatible*3

Automatic detection of the vision sensor and linkage with dedicated tools enable reduction in total cost in design/setup/operation/maintenance.

iQSS enables setup and monitoring with engineering tool of the programmable controller

iQ Sensor Solution (iQSS) provides a solution at the sensor level in e-F@ctory.

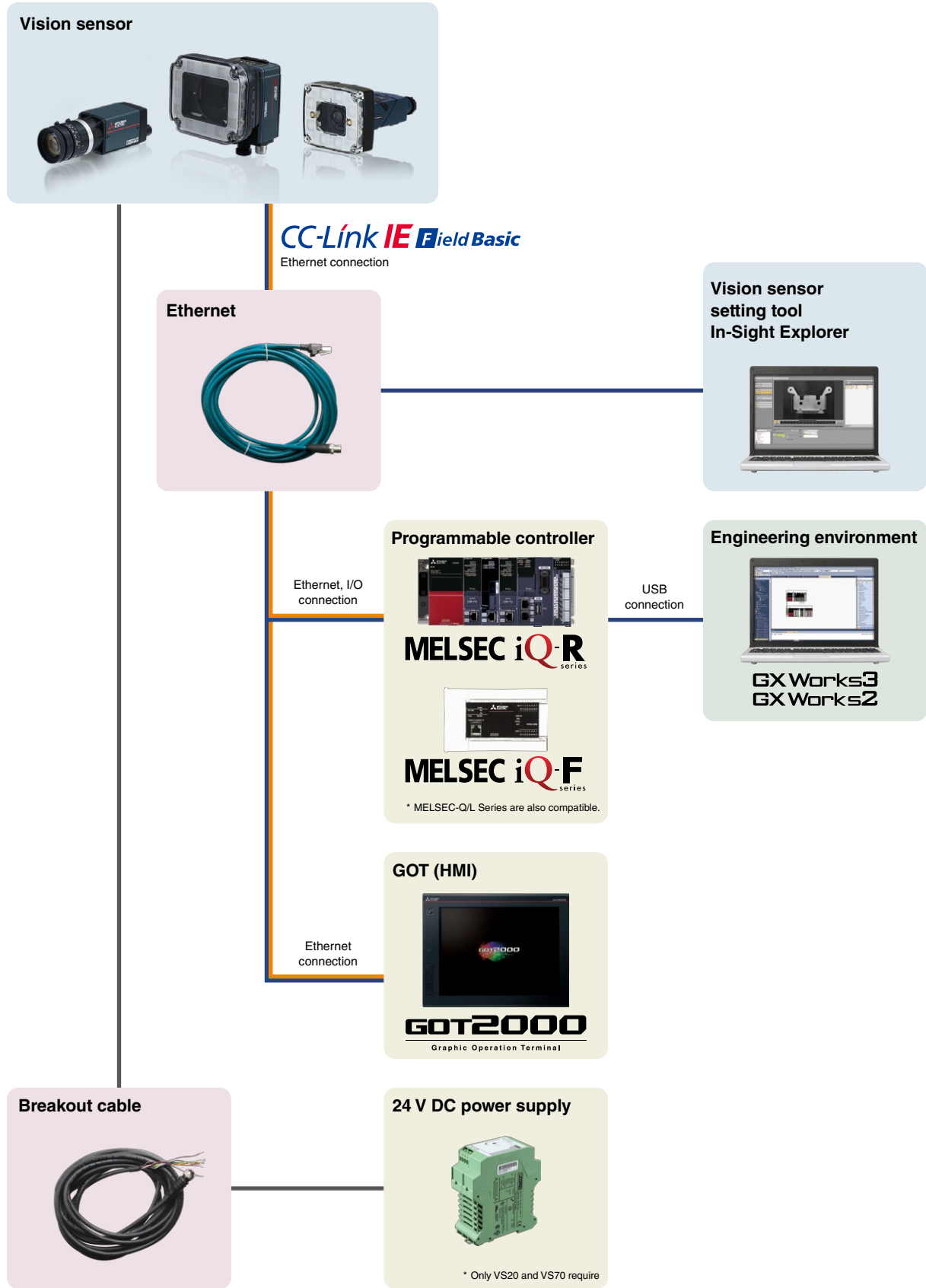
- Easy setup
- Sensor monitor
- Dedicated tool linkage

*1. VS70/VS80 are compatible with In-Sight Explorer for MELSENSOR Vision of version 5.4.3 later and VS20 is compatible with version 5.6.2 or later.

*2. VS80 can be connected using PoE hub only.

*3. For details, please refer to "Sensor solution iQ Sensor Solution catalog (L(NA)16029ENG)"

System configuration



Applications

Vision sensors

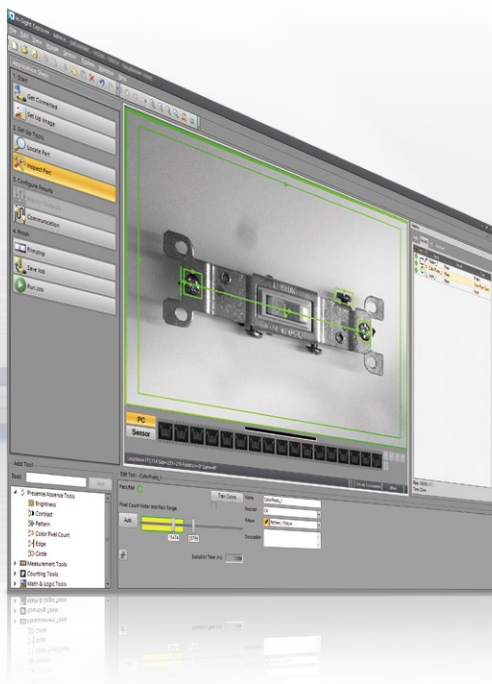
Configuration tool

Product list

Specifications

External dimensions

* For details, please refer to the relevant product manuals (SH(NA)-081769ENG, SH(NA)-081889ENG, SH(NA)-081891ENG).



High-speed/high-accuracy/
highly-reliable image processing tool
brings innovation to the shop floor

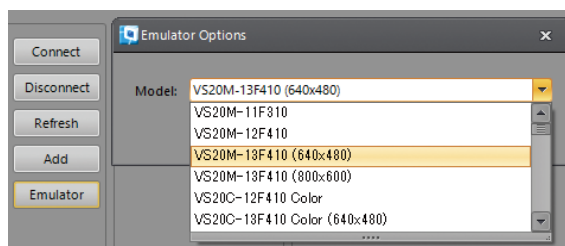
In-Sight Explorer

for MELSENSOR Vision

Common functions for EasyBuilder/spreadsheet

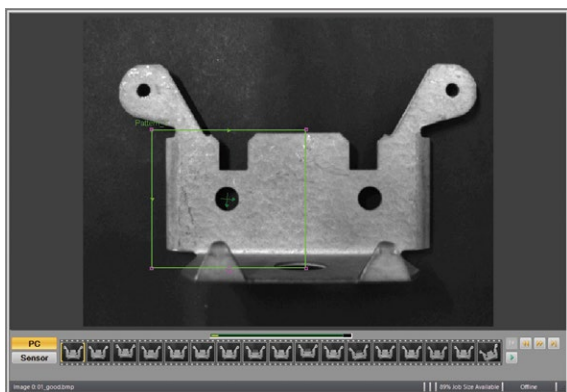
■ Emulation

Even if a vision sensor is not connected, selecting a vision sensor from the list enables operation check and job creation. If the image of inspection target is available, operation check or job change can be done on the spot.



■ Film strip

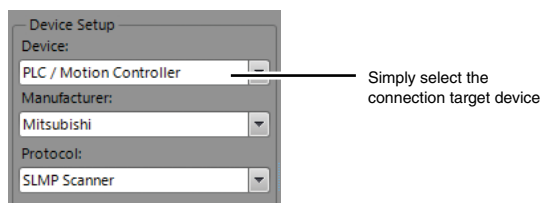
Up to 20 images of inspection history can be stored inside the vision sensor, allowing reference anytime without affecting inspection. The images can be stored in the external FTP server also.



■ Easy communication setting

Communication with various factory automation products such as programmable controllers, robots, and motion controllers is possible just by selecting a communication target. Communication setting time can be substantially reduced.

Communication target selection



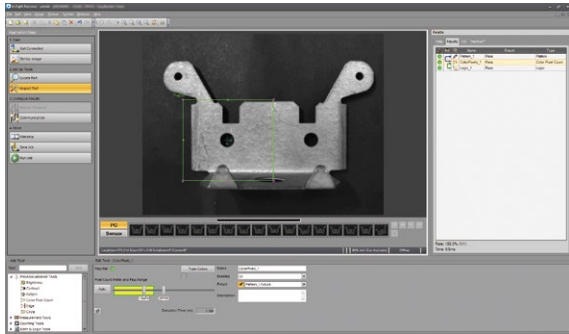
Communication setting



Two development environments

In-Sight Explorer includes two development environments “EasyBuilder” and “spreadsheet.” Select suitable development environment according to the application to setup.

■ EasyBuilder

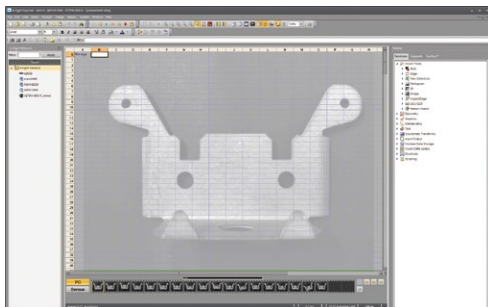


Easy-to use development environment. The vision sensor can be easily setup with four steps, allowing even novice users to configure vision applications easily.

Item	VS80	VS70	VS20
EasyBuilder			
Location tools	●	●	●*1
Presence/absence tools	●	●	●*1
Measurement tools	●	●	●*1
Counting tools	●	●	●*1
Identification tools	●	●	-
Geometry tools	●	●	-
Math & logic tools	●	●	-
Plot tools	●	●	-
Image filter tools	●	●	-
Defect detection tools	●	●	-
Calibration tools	●	●	-

*1. Some models do not support tools and functions. For further details, please refer to the relevant product manual. Please refer to page 28 for details.

■ Spreadsheet



Spreadsheet is a development environment suitable for creating a complex vision application. Vision sensor functions can be maximized with this spreadsheet. By flexibly arranging functions on the spreadsheet, applications can be created.

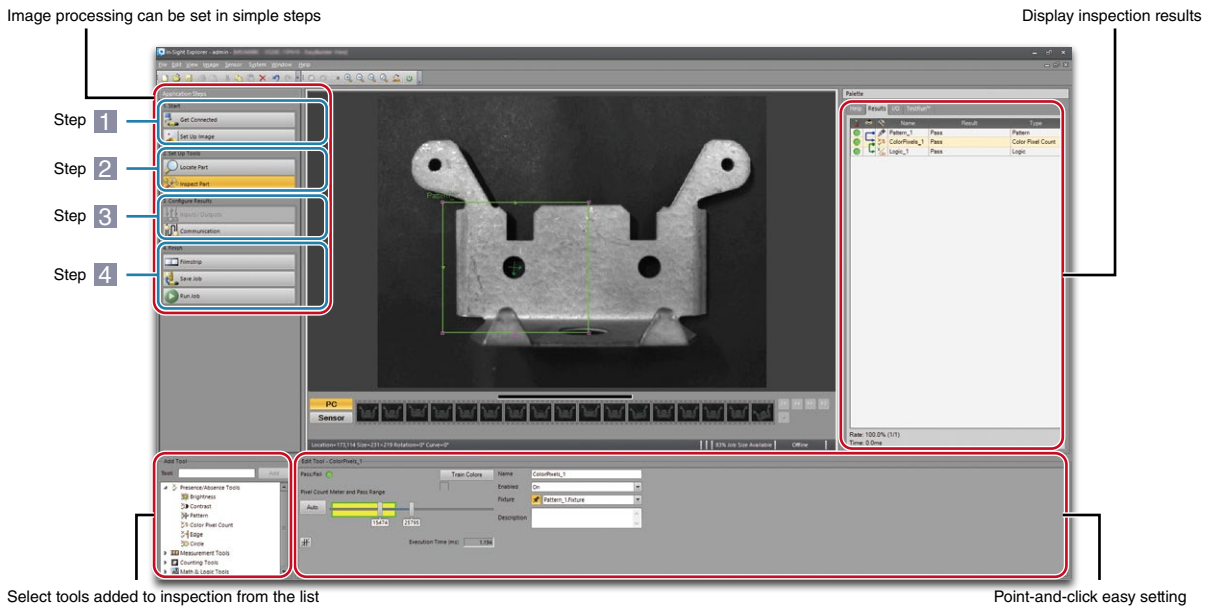
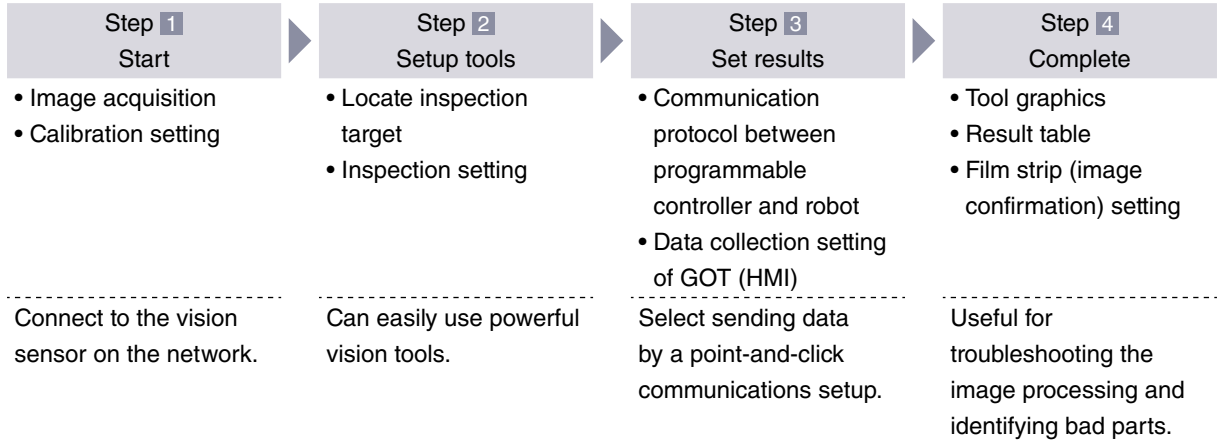
Item	VS80	VS70	VS20
Spreadsheet			
Vision tools	●	●	-
Geometry	●	●	-
Graphics	●	●	-
Mathematics	●	●	-
Text	●	●	-
Coordinate transforms	●	●	-
Input/output	●	●	-
Clocked data storage	●	●	-
Vision data access	●	●	-
Structures	●	●	-
Scripting	●	●	-

EasyBuilder

VS80 VS70 VS20

■ Quick intuitive setup

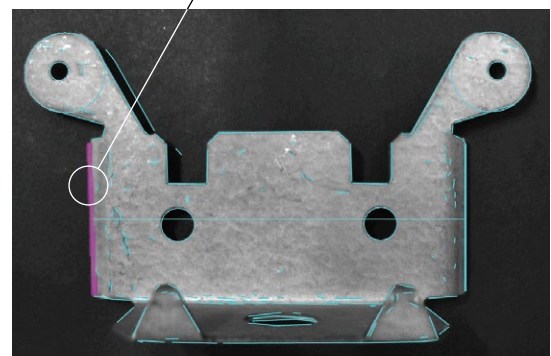
The easy-to-use In-Sight Explorer enables configuration from image acquisition to result output in four steps. Both novice and experienced users can handle the tool easily.



■ Click to specify measurement area

Image processing can be easily configured with intuitive operation as EasyBuilder*1 automatically extracts possible measurement points.

Simply select possible measurement area automatically extracted with "EasyBuilder"



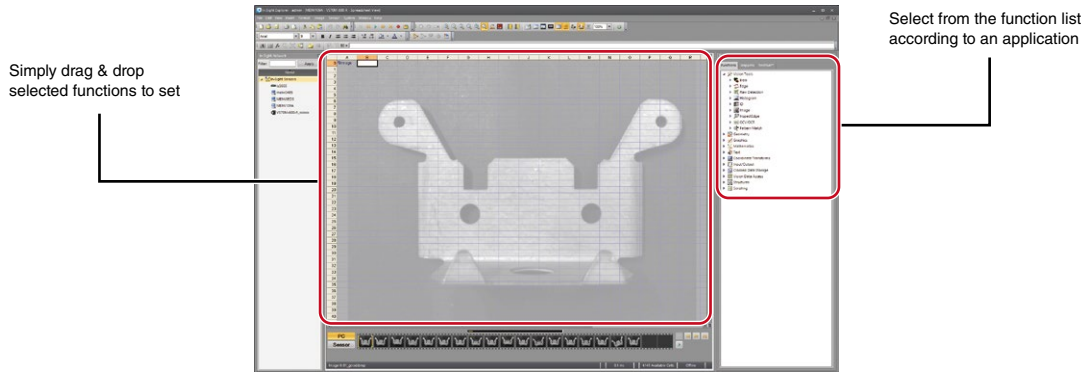
*1. Environment where image processing is configured by menu selection without a program

Spreadsheet

VS80 VS70 VS20

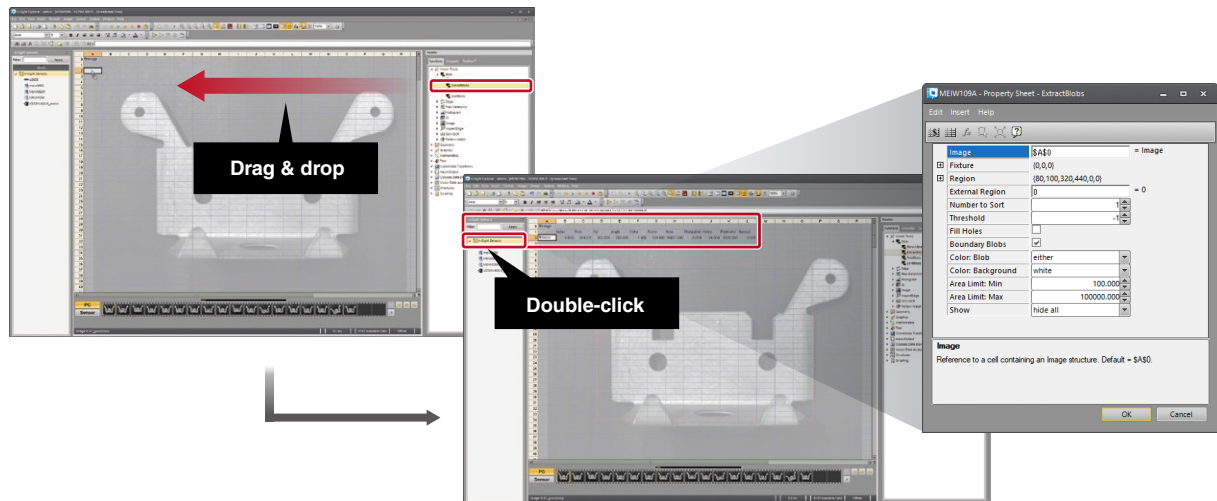
■ Complex application data is easily created

By flexibly arranging functions on the spreadsheet, jobs can be created. This spreadsheet is ideal for configuring complex applications.



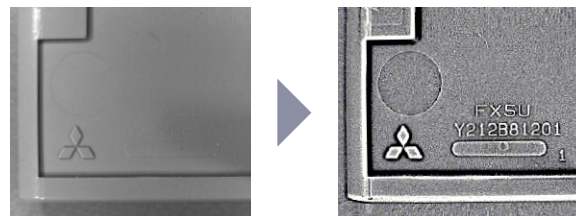
■ Drag & drop to add functions

Select a function from the function list on the right, then add it to the area to create a job. After adding functions, parameters can be entered on the property sheet.



■ SurfaceFX function

SurfaceFX is one of image filter tools. By capturing four separate images each illuminated by one quadrant of the illuminator, SurfaceFX outputs an image which highlights scratches on the surface and defects that are recessed or embossed. SurfaceFX isolates features that are embossed or scratches on the metal surface hardly found by normal shooting.



Note: For details on how to obtain solution templates, please contact your local Mitsubishi Electric sales office or representative.

Product list

Vision sensor

Type	Model	Outline
VS80	VS80M-100-E	Monochrome, 640 x 480, processor performance x 1
	VS80M-100	Monochrome, 640 x 480, processor performance x 1, spreadsheet is supported
	VS80M-200-E	Monochrome, 640 x 480, processor performance x 1.5
	VS80M-200-ER	Monochrome, 640 x 480, processor performance x 1.5, PatMax RedLine®
	VS80M-200	Monochrome, 640 x 480, processor performance x 1.5, spreadsheet is supported
	VS80M-200-R	Monochrome, 640 x 480, processor performance x 1.5, spreadsheet is supported, PatMax RedLine®
	VS80M-400-E	Monochrome, 640 x 480, processor performance x 2
	VS80M-400-ER	Monochrome, 640 x 480, processor performance x 2, PatMax RedLine®
	VS80M-400	Monochrome, 640 x 480, processor performance x 2, spreadsheet is supported
	VS80M-400-R	Monochrome, 640 x 480, processor performance x 2, spreadsheet is supported, PatMax RedLine®
	VS80M-202-E	Monochrome, 1600 x 1200, processor performance x 1.5
	VS80M-202-ER	Monochrome, 1600 x 1200, processor performance x 1.5, PatMax RedLine®
	VS80M-202	Monochrome, 1600 x 1200, processor performance x 1.5, spreadsheet is supported
	VS80M-202-R	Monochrome, 1600 x 1200, processor performance x 1.5, spreadsheet is supported, PatMax RedLine®
	VS80M-402-E	Monochrome, 1600 x 1200, processor performance x 2
	VS80M-402-ER	Monochrome, 1600 x 1200, processor performance x 2, PatMax RedLine®
	VS80M-402	Monochrome, 1600 x 1200, processor performance x 2, spreadsheet is supported
	VS80M-402-R	Monochrome, 1600 x 1200, processor performance x 2, spreadsheet is supported, PatMax RedLine®
	VS80C-100	Color, 640 x 480, processor performance x 1, spreadsheet is supported
	VS80C-200-R	Color, 640 x 480, processor performance x 1.5, spreadsheet is supported, PatMax RedLine®
VS80C-400-R	Color, 640 x 480, processor performance x 2, spreadsheet is supported, PatMax RedLine®	
VS80C-202-R	Color, 1600 x 1200, processor performance x 1.5, spreadsheet is supported, PatMax RedLine®	
VS80C-402-R	Color, 1600 x 1200, processor performance x 2, spreadsheet is supported, PatMax RedLine®	
VS70	VS70M-600-E	Monochrome, 640 x 480/800 x 600, processor performance x 1
	VS70M-600-ER	Monochrome, 640 x 480/800 x 600, processor performance x 1, PatMax RedLine®
	VS70M-600	Monochrome, 640 x 480/800 x 600, processor performance x 1, spreadsheet is supported
	VS70M-600-R	Monochrome, 640 x 480/800 x 600, processor performance x 1, spreadsheet is supported, PatMax RedLine®
	VS70M-800-E	Monochrome, 640 x 480/800 x 600, processor performance x 1.25
	VS70M-800-ER	Monochrome, 640 x 480/800 x 600, processor performance x 1.25, PatMax RedLine®
	VS70M-800	Monochrome, 640 x 480/800 x 600, processor performance x 1.25, spreadsheet is supported
	VS70M-800-R	Monochrome, 640 x 480/800 x 600, processor performance x 1.25, spreadsheet is supported, PatMax RedLine®
	VS70M-802-E	Monochrome, 1600 x 1200, processor performance x 1.25
	VS70M-802-ER	Monochrome, 1600 x 1200, processor performance x 1.25, PatMax RedLine®
	VS70M-802	Monochrome, 1600 x 1200, processor performance x 1.25, spreadsheet is supported
	VS70M-802-R	Monochrome, 1600 x 1200, processor performance x 1.25, spreadsheet is supported, PatMax RedLine®
	VS70C-600-R	Color, 640 x 480/800 x 600, processor performance x 1, spreadsheet is supported, PatMax RedLine®
	VS70C-800-R	Color, 640 x 480/800 x 600, processor performance x 1.25, spreadsheet is supported, PatMax RedLine®
VS70C-802-R	Color, 1600 x 1200, processor performance x 1.25, spreadsheet is supported, PatMax RedLine®	
VS20	VS20M-11F310	Monochrome, 640 x 480 (standard), processor performance x 1
	VS20M-12F410	Monochrome, 640 x 480 (standard, 2 x image magnification), processor performance x 2
	VS20C-12F410	Color, 640 x 480 (standard, 2 x image magnification), processor performance x 2
	VS20M-13F410	Monochrome, 640 x 480 (standard, 2 x image magnification)/800 x 600 (image magnification x 2), processor performance x 2
	VS20C-13F410	Color, 640 x 480 (standard, 2 x image magnification)/800 x 600 (image magnification x 2), processor performance x 2

Option

* Options are manufactured by Cognex Inc. and other companies.

VS80

Type	Model	Outline
Lens*1	LMC-ML-M0822UR	8 mm F2.2, aperture lens
	LMC-ML-M1218UR	12 mm F1.8, aperture lens
	LMC-ML-M1616UR	16 mm F1.6, aperture lens
	LMC-ML-M2516UR	25 mm F1.6, aperture lens
	LMC-ML-M3520UR	35 mm F2.0, aperture lens
Cable		
Ethernet cable	CCB-84901-2001-01	0.6 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-02	2 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-05	5 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-10	10 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-15	15 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-30	30 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2002-02	2 m cable, M12 connector↔RJ-45 connector, right-angle
	CCB-84901-2002-05	5 m cable, M12 connector↔RJ-45 connector, right-angle
	CCB-84901-2002-10	10 m cable, M12 connector↔RJ-45 connector, right-angle
	Breakout cable	CCB-M8IO-00
CCB-M8IO-02		2 m cable, M8 connector↔5 stranded wires
CCB-M8IO-05		5 m cable, M8 connector↔5 stranded wires
CCB-M8IO-10		10 m cable, M8 connector↔5 stranded wires
CCB-M8IO-15		15 m cable, M8 connector↔5 stranded wires
PoE switching hub		
PoE injector	CPS-24V-POE1	1-port PoE hub, 24 V DC power supply
	CPS-24V-POE4	4-port PoE hub, 24 V DC power supply, class 3 compatible
PoE adapter	CPS-AC-POE1A-JP	1-port PoE adapter, AC power supply
Optional mounting kit		
Optional mounting kit	BKT-IS8K-01	Mounting block with four screw holes (M3) for installing the vision sensor on the installation surface
I/O module		
I/O module	CIO-MICRO	I/O extension module
I/O module cable	CCB-M8DSIO-00	0.7 m cable
	CCB-M8DSIO-02	2 m cable
	CCB-M8DSIO-05	5 m cable
	CCB-M8DSIO-10	10 m cable
	CCB-M8DSIO-15	15 m cable

*1. C-mount lens not listed above also can be used.

VS70

Type	Model	Outline
Lens		
S-mount (M12) lens	LM12-06-01	6 mm F2, fixed aperture lens*2
	LM12-08-01-F2.2	8 mm F2.2, fixed aperture lens*2
	LM12-12-01-F2.3	12 mm F2.3, fixed aperture lens*2
	LM12-16-01	16 mm F2.5, fixed aperture lens*2
	LM12-25-01	25 mm F2, fixed aperture lens*2
	DM300-LENS-10	10.3 mm F5, lens kit
	DM300-LENS-10-IR	10.3 mm F5, lens kit for infrared light
	DM300-LENS-16	16 mm F9, lens kit
	DM300-LENS-25	25 mm F6, lens kit
	C-mount lens	LEC-CFF16-F11
LEC-CFF16-F16		16 mm F16, fixed aperture lens
LEC-CFF25-F11		25 mm F11, fixed aperture lens
LEC-CFF25-F16		25 mm F16, fixed aperture lens
LEC-CFF35-F11		35 mm F11, fixed aperture lens
LEC-CFF35-F16		35 mm F16, fixed aperture lens
LEC-59873		50 mm F2-F22, fixed aperture lens*3
LFC-9F1B		9 mm F1.4, aperture lens
LFC-12.5F		12.5 mm F1.4, aperture lens
LFC-16F1		16 mm F1.4, aperture lens
LFC-25F1		25 mm F1.4, aperture lens
LFC-35F1		35 mm F1.6, aperture lens
LFC-50F1		50 mm F2.3, aperture lens*3
Autofocus module		ISAF-7000-8MM (-ME)
Tool kit		
Installation tool kit	ISLN-7000-SMNT	Adapter for S-mount (M12) lens, lens locking cone, installation tool
Lens removal tool kit	ISAF-7000-TOOL	Removal tool kit for autofocus lens
Lens cover		
Standard lens cover	COV-7000-CMNT	Standard lens cover, lens cover adapter
Extended lens cover	COV-7000-CMNT-EX	Extended lens cover, lens cover adapter

*2. The accessories and illumination accessories can be used when using an autofocus module as well as when using other modules.

*3. Attach the extended lens cover (COV-7000-CMNT-EX).

VS70

Type	Model	Outline
Light cover		
Light cover set including illumination with LED ring light	ISLM-7000-WHI (-ME)	Illumination with white LED ring light, light cover, hex wrench (A Japanese manual is included.)* ¹
Light cover set for LED ring light	ISLM-7000-00-ME	Light cover, hex wrench, A Japanese manual is included* ¹ * ²
Light cover for LED ring light	COV-7000-CLR	Clear cover* ¹
	COV-7000-PL-FULL	Polarized cover* ¹
Light cover with LED illumination	DM300-CLCOV-WHI	White LED illumination, clear cover
	DM300-DLCOV-BL	Blue LED illumination, lens cover with diffuse filter
	DM300-DLCOV-RE	Red LED illumination, lens cover with diffuse filter
	DM300-DLCOV-IR	IR LED illumination, lens cover with diffuse filter
	DM300-PLCOV-RE	Red LED illumination, lens cover with polarized filter
	DM300-DLCOV-RE-ESD	Red LED illumination, ESD safe, and lens cover with diffuse filter
Clear cover	DM300-CLCOV	Clear cover
Light		
LED ring light	ISL-7000-WHI	White, used with the light cover for LED ring light attached.* ¹
	ISL-7000-BL	Blue, used with the light cover for LED ring light attached.* ¹
	ISL-7000-RD	Red, used with the light cover for LED ring light attached.* ¹
	ISL-7000-IR	Infrared light, used with the light cover for LED ring light attached.* ¹
Bar light	IVSL-YLW2X-625 (-W)	Red narrow (wide)
	IVSL-YLW2X-625P	Red narrow with linear polarizer
	IVSL-YLW2X-850	Infrared narrow
	IVSL-YLW300-WHI (-W)	White narrow (wide)
	IVSL-YLW300-470 (-W)	Blue narrow (wide)
	IVSL-YLW300-625 (-W)	Red narrow (wide)
	IVSL-LX520-470	Blue
	IVSL-LX520-625	Red
	IVSL-LX520-LP	With linear polarizer
Bandpass filter	ISF-7000-BLBP435	Blue* ¹
	ISF-7000-RDBP605	Red* ¹
	ISF-7000-IRBP815	Infrared light* ¹
High-powered integrated light	DM360-HPIL-RE-P	Polarized red LED high-powered integrated light ESD safe
	DM360-HPIL-RE	Non-polarized red LED high-powered integrated light
High-powered lights	DM30X-HPIA-WHI (-W)	White narrow (wide)
	DM30X-HPIA-470 (-W)	Blue narrow (wide)
	DM30X-HPIA-625 (-W)	Red narrow (wide)
	DM30X-HPIA-625P	Red narrow with polarizer
	DM30X-HPIA-IR (-W)	Infrared narrow (wide)
Extension kit	DM300-EXT	Spacer used together with the long focal length lens (M12)
Cable		
Breakout cable	CCBL-05-01	5 m cable, M12 connector↔12 stranded wires, straight
	CCB-PWRIO-05 (R)	5 m cable, M12 connector↔12 stranded wires, twisted pair, straight (right-angle)
	CCB-PWRIO-10 (R)	10 m cable, M12 connector↔12 stranded wires, twisted pair, straight (right-angle)
	CCB-PWRIO-15 (R)	15 m cable, M12 connector↔12 stranded wires, twisted pair, straight (right-angle)
Ethernet cable	CCB-84901-2001-01	0.6 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-02	2 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-05	5 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-10	10 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-15	15 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-30	30 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2002-02	2 m cable, M12 connector↔RJ-45 connector, right-angle
	CCB-84901-2002-05	5 m cable, M12 connector↔RJ-45 connector, right-angle
	CCB-84901-2002-10	10 m cable, M12 connector↔RJ-45 connector, right-angle
	External light cable	CCB-M12LTF-00
CCB-M12LTF-01		1 m cable
CCB-M12LTF-02		2 m cable
CCB-M12LTF-05		5 m cable
CCB-FOV25-MAL-012		Use for bar light (IVSL-LX520-□)
IVSL-5PM12-J300		0.3 m cable
IVSL-5PM12-J500		0.5 m cable
IVSL-5PM12-J2000		2 m cable
Power supply		
Power supply	ACC-241	24 V DC power supply
Power cord	CBLI-24VDJP	Japanese power cord
	CBLI-24VDUS	North America power cord
	CBLI-24VDUK	United Kingdom power cord
	CBLI-24VDEU	Europe power cord
Power cable for external light	IVSL-5PM12-5	Use for bar light (IVSL-LX520-□)
I/O module		
I/O module	CIO-MICRO	I/O extension module
	CIO-1400	I/O extension module
I/O module cable	CCB-PWRIO-MOD-02	2 m cable, M12 connector↔15 pin connector (DB15)
	CCB-PWRIO-MOD-05	5 m cable, M12 connector↔15 pin connector (DB15)
Mounting bracket		
Mounting bracket	ISB-7000-7K	Mounting bracket for fixing the vision sensor VS70 on the mounting surface

*1. The accessories and illumination accessories can be used when using an autofocus module as well as when using other modules.

*2. Attach the extended lens cover (COV-7000-CMNT-EX).

VS20

Type	Model	Outline
Lens		
S-mount (M12) lens	LM12-03-01	3.6 mm F2.0, fixed aperture lens
	LM12-06-01	6 mm F2, fixed aperture lens
	LM12-08-01-F25	8 mm F2.5, fixed aperture lens
	LM12-12-01	12 mm F1.9, fixed aperture lens
	LM12-16-01	16 mm F2.5, fixed aperture lens
LM12-25-01	25 mm F2, fixed aperture lens	
Spacer		
Lens spacer (M12)	LM12-SPACER-16-01	Use together with 16 mm lens
	LM12-SPACER-25-01	Use together with 25 mm lens
Filter and light cover		
Polarizer	IMPF-2000-POLAR2	Polarization
Filter	IMBF-2000-BP470	Blue bandpass filter
	IMRF-2000-BP635	Red bandpass filter
	IMIF-2000-BP850	IR bandpass filter
Light cover	IFS-2000-HBRING-CV	Replacement ring light cover
Light		
LED ring light	IFS-2000-HBRING-WH	High-powered white
	IFS-2000-HBRING-BL	High-powered blue
	IFS-2000-HBRING-RD	High-powered red
	IFS-2000-HBRING-IR	High-powered near infrared
Cable		
Ethernet cable	CCB-84901-2001-01	0.6 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-02	2 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-05	5 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-10	10m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-15	15 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2001-30	30 m cable, M12 connector↔RJ-45 connector, straight
	CCB-84901-2002-02	2 m cable, M12 connector↔RJ-45 connector, right-angle
	CCB-84901-2002-05	5 m cable, M12 connector↔RJ-45 connector, right-angle
	CCB-84901-2002-10	10 m cable, M12 connector↔RJ-45 connector, right-angle
Breakout cable	CCB-PWRIO-05 (R)	5 m cable, M12 connector↔12 stranded wires, twisted pair, straight (right-angle)
	CCB-PWRIO-10 (R)	10 m cable, M12 connector↔12 stranded wires, twisted pair, straight (right-angle)
	CCB-PWRIO-15 (R)	15 m cable, M12 connector↔12 stranded wires, twisted pair, straight (right-angle)
Power supply		
Power supply	ACC-24I	24 V DC power supply
Power cord	CBLI-24VDJP	Japanese power cord
	CBLI-24VDUS	North America power cord
	CBLI-24VDUK	United Kingdom power cord
	CBLI-24VDEU	Europe power cord
Mounting bracket		
Mounting bracket	DM100-UBRK-000	General-purpose mounting bracket
	DM100-PIVOTM-00	Pivot mounting bracket
Plate adapter	BKT-2000-ADAPT-00	Flat surface mounting plate adapter
I/O module		
I/O module	CIO-1400	I/O extension module
I/O module cable	CCB-PWRIO-MOD-02	2 m cable, M12 connector↔15 pin connector (DB15)
	CCB-PWRIO-MOD-05	5 m cable, M12 connector↔15 pin connector (DB15)

Specifications

General specifications

Item	VS80	VS70	VS20
Ambient operating temperature	0...35°C (Case temperature: less than 50°C) 0...40°C (Case temperature: less than 50°C)		0...40°C
Ambient storage temperature	-20...80°C		
Maximum humidity	Less than 80% RH, non-condensing		Less than 95% RH, non-condensing
Vibration resistance	IEC 60068-2-6: A vibration of 10 G (10 to 500 Hz at 100 m/s ² with 15 mm width) was applied to each X, Y, and Z direction for 2 hours. (VS70: with cables/cable plugs and appropriate lens cover attached)		
Shock resistance	IEC 60068-2-27: 18 half sinusoidal shocks (3 shocks for each X, Y, and Z direction) with 80 G (800 m/s ² at 11 ms) were applied. (VS70: with cables/cable plugs and appropriate lens cover attached)		IEC 60068-2-27: 1000 half sinusoidal shocks with 11 G in 10 ms were applied.
Operating atmosphere	There is no danger of corrosive gases, flammable gases, and strong alkaline substances to adhere.		
Protective structure	IP40 (with cables connected and appropriate lens attached)	IP67 (with cables connected and appropriate lens attached)	IP65 (when all connectors are attached to cables or shielded by a sealing cap)
Installation location*1	Outside a control panel		

*1. Do not install it in the following places:

- Where the ambient temperature or humidity exceed the applicable ranges
- Where condensation occurs due to sudden temperature changes
- Where there is corrosive or flammable gas
- Where there are a lot of conductible dust, iron filings, or salt
- Where in danger of organic solvents, such as benzene, thinner, and alcohol or strong alkaline substances such as caustic soda to adhere
- Where subject to much vibration or shock
- Where in danger of liquid such as water, oil, or chemicals to adhere

Performance specifications

VS80

Specifications	VS80M-100 VS80M-100-E	VS80M-200 VS80M-200-□	VS80M-400 VS80M-400-□	VS80M-202 VS80M-202-□	VS80M-402 VS80M-402-□
Memory	512 MB flash memory, unlimited storage when storing in the remote network device image processing: 512MB SDRAM				
Imager type	1/1.8 inch CMOS, global shutter 3.6 mm diagonal, 4.5 x 4.5 μm square pixels			1/1.8 inch CMOS, global shutter 9 mm diagonal, 4.5 x 4.5 μm square pixels	
Lens	C-mount				
Image resolution (pixels)	640 x 480			1600 x 1200	
Bit depth	256 gray levels (8 bits/pixel)				
Electronic shutter speed	14 μs...520 ms			20 μs...940 ms	
Maximum image acquisition speed*2*3 (frame/s)	217			53	
Power consumption (W)	Max. 6.49 (supplied with PoE (class 2))				
Trigger	Opto-isolated image acquisition trigger input x 1, remote software commands via Ethernet				
Discrete inputs	N/A Option: General-purpose input x 8 (available when connecting a CIO-MICRO I/O module)				
Discrete outputs	Opto-isolated NPN/PNP high-speed output x 2 Option: General-purpose output x 8 (available when connecting a CIO-MICRO I/O module)				
Network communication	CC-Link IE Field Network Basic, SLMP scanners, SLMP, EtherNet/IP™, MODBUS®/TCP, TCP/IP, UDP, FTP, Telnet (native mode), DHCP (default at shipment from the factory), fixed and link local IP address setting				
Material	Zinc die-cast housing				
Installation	M3 screw hole x 4				
Dimensions (mm)	31.0 x 31.2 x 75.1				
Weight (g)	132.2				

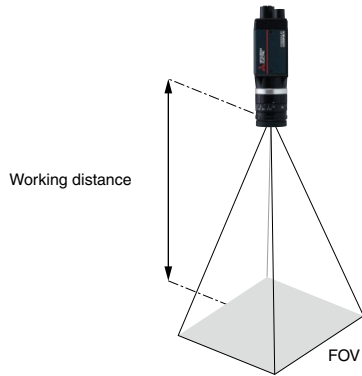
Specifications	VS80C-100	VS80C-200-R	VS80C-400-R	VS80C-202-R	VS80C-402-R
Memory	512 MB flash memory, unlimited storage when storing in the remote network device image processing: 512 MB SDRAM				
Imager type	1/1.8 inch CMOS, global shutter 3.6 mm diagonal, 4.5 x 4.5 μm square pixels			1/1.8 inch CMOS, global shutter 9 mm diagonal, 4.5 x 4.5 μm square pixels	
Lens	C-mount				
Image resolution (pixels)	640 x 480			1600 x 1200	
Bit depth	24-bit color				
Electronic shutter speed	14 μs...520 ms			20 μs...940 ms	
Maximum image acquisition speed*2*3 (frame/s)	135			33	
Power consumption (W)	Max. 6.49 (supplied with PoE (class 2))				
Trigger	Opto-isolated image acquisition trigger input x 1, remote software commands via Ethernet				
Discrete inputs	N/A Option: General-purpose input x 8 (available when connecting a CIO-MICRO I/O module)				
Discrete outputs	Opto-isolated NPN/PNP high-speed output x 2 Option: General-purpose output x 8 (available when connecting a CIO-MICRO I/O module)				
Network communication	CC-Link IE Field Network Basic, SLMP scanners, SLMP, EtherNet/IP™, MODBUS®/TCP, TCP/IP, UDP, FTP, Telnet (native mode), DHCP (default at shipment from the factory), fixed and link local IP address setting				
Material	Zinc die-cast housing				
Installation	M3 screw hole x 4				
Dimensions (mm)	31.0 x 31.2 x 75.1				
Weight (g)	132.2				

*2. The number of image sensor rows can be set in In-Sight Explorer. Decreasing the number of rows will increase the number of frames per second acquired by a vision sensor. For details, refer to the help of In-Sight Explorer.

*3. The maximum frame rate of full image frame capture when all of the following conditions are applied.

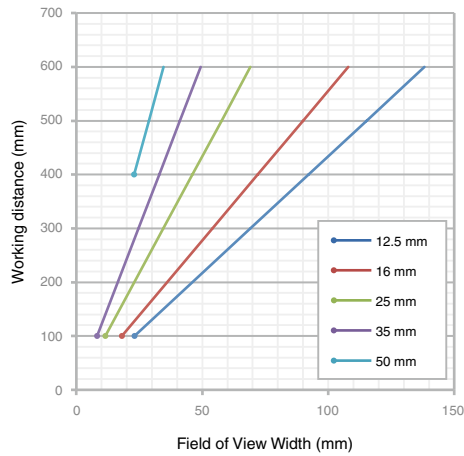
- Minimum exposure
- No connection with In-Sight Explorer
- Images are captured with an image acquisition trigger input

Working distance

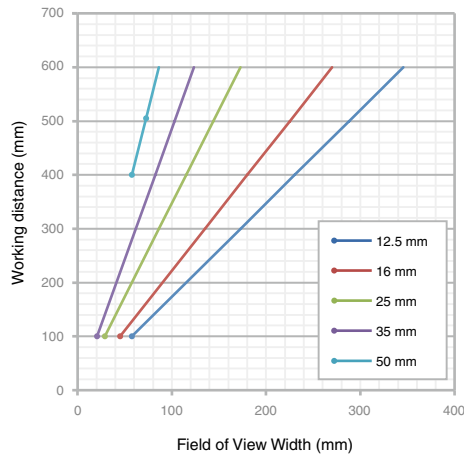


The distance from a lens to an inspection target is referred to as “working distance”, and an area where a vision sensor can see at that distance is referred to as “field of view”

Horizontal Field of View (640 x 480)



Horizontal Field of View (1600 x 1200)



Performance specifications

VS70

Specifications	VS70M-600 VS70M-600-□	VS70M-800 VS70M-800-□	VS70M-802 VS70M-802-□
Memory	7.2 GB flash memory, unlimited storage when storing in the remote network device image processing: 512 MB SDRAM		
Imager type	1/1.8 inch CMOS, global shutter 4.5 mm diagonal, 4.5 x 4.5 μm square pixels		1/1.8 inch CMOS, global shutter 9 mm diagonal 4.5 x 4.5 μm square pixels
Lens	C-mount, S-mount/M12, autofocus*1		
Image resolution (pixels)	640 x 480, 800 x 600*2		1600 x 1200
Bit depth	256 gray levels (8 bits/pixel)		
Electronic shutter speed	14 μs...520 ms: image resolution 640 x 480 14 μs...550 ms: image resolution 800 x 600		20 μs...940 ms
Maximum image acquisition speed*3*4 (frame/s)	217: image resolution 640 x 480 165: image resolution 800 x 600		53
SD memory card	Micro SD memory card slot for saving jobs or image files x 1 Micro SD memory card: SDHC standard, maximum capacity 8 GB		
Power consumption	24 V DC ± 10 %, 36 W (1.5 A) maximum		
Power output	24 V DC/750 mA maximum to an external light		
Trigger	Opto-isolated image acquisition trigger input x 1, remote software commands via Ethernet		
Discrete inputs	General-purpose input x 3 (available when connected with a breakout cable*5) Option: General-purpose input x 8 (available when connecting a CIO-MICRO I/O module) General-purpose input x 7 (available when connecting a CIO-1400 I/O module)		
Discrete outputs	High-speed output x 4 (available when connected with a breakout cable*5) Option: High-speed output x 2, general-purpose output x 8 (available when connecting a CIO-MICRO I/O module) High-speed output x 2, general-purpose output x 6 (available when connecting a CIO-1400 I/O module)		
Network communication	CC-Link IE Field Network Basic, SLMP scanners, SLMP, EtherNet/IP™, MODBUS®/TCP, TCP/IP, UDP, FTP, Telnet (native mode), DHCP (default at shipment from the factory), fixed and link local IP address setting		
Material	Die-cast and extruded aluminum housing		
Installation	M3 screw hole x 4		
Dimensions (mm)	35.7 x 60.5 x 90.0		
Weight (g)	240		

Specifications	VS70C-600-R	VS70C-800-R	VS70C-802-R
Memory	7.2 GB flash memory, unlimited storage when storing in the remote network device image processing: 512 MB SDRAM		
Imager type	1/1.8 inch CMOS, global shutter 4.5 mm diagonal, 4.5 x 4.5 μm square pixels		1/1.8 inch CMOS, global shutter 9 mm diagonal 4.5 x 4.5 μm square pixels
Lens	C-mount, S-mount/M12, autofocus*1		
Image resolution (pixels)	640 x 480, 800 x 600*2		1600 x 1200
Bit depth	24-bit color		
Electronic shutter speed	14 μs...520 ms: image resolution 640 x 480 14 μs...550 ms: image resolution 800 x 600		20 μs...940 ms
Maximum image acquisition speed*3*4 (frame/s)	135: image resolution 640 x 480 100: image resolution 800 x 600		33
SD memory card	Micro SD memory card slot for saving jobs or image files x 1 Micro SD memory card: SDHC standard, maximum capacity 8 GB		
Power consumption	24 V DC ± 10 %, 36 W (1.5 A) maximum		
Power output	24 V DC/750 mA maximum to an external light		
Trigger	Opto-isolated image acquisition trigger input x 1, remote software commands via Ethernet		
Discrete inputs	General-purpose input x 3 (available when connected with a breakout cable*5) Option: General-purpose input x 8 (available when connecting a CIO-MICRO I/O module) General-purpose input x 7 (available when connecting a CIO-1400 I/O module)		
Discrete outputs	High-speed output x 4 (available when connected with a breakout cable*5) Option: High-speed output x 2, general-purpose output x 8 (available when connecting a CIO-MICRO I/O module) High-speed output x 2, general-purpose output x 6 (available when connecting a CIO-1400 I/O module)		
Network communication	CC-Link IE Field Network Basic, SLMP scanners, SLMP, EtherNet/IP™, MODBUS®/TCP, TCP/IP, UDP, FTP, Telnet (native mode), DHCP (default at shipment from the factory), fixed and link local IP address setting		
Material	Die-cast and extruded aluminum housing		
Installation	M3 screw hole x 4		
Dimensions (mm)	35.7 x 60.5 x 90.0		
Weight (g)	240		

*1. Autofocus can be performed up to 20000 times.

*2. The default resolution is 800 x 600 pixels. The resolution can be set as 640 x 480 pixels in In-Sight Explorer. For details, refer to the help of In-Sight Explorer.

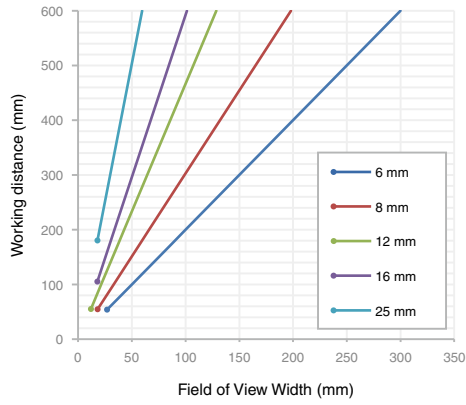
*3. The number of image sensor rows can be set in In-Sight Explorer. Decreasing the number of rows will increase the number of frames per second acquired by a vision sensor. For details, refer to the help of In-Sight Explorer.

*4. The maximum frame rate of full image frame capture when all of the following conditions are applied.
• Minimum exposure • No connection with In-Sight Explorer • Images are captured with an image acquisition trigger input

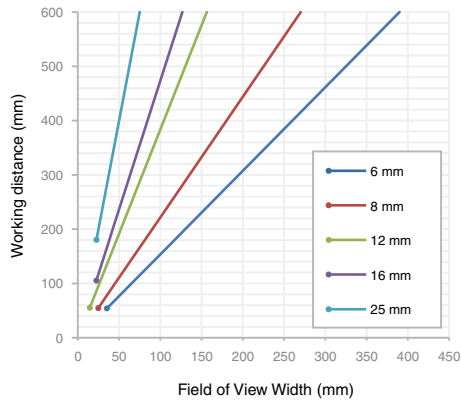
*5. "High-speed output 2/Input 2" and "High-speed output 3/Input 3" of a breakout cable can be used as a high-speed output or a general purpose input by changing the setting in In-Sight Explorer. These lines are set as output (high-speed output) by default.

Working distance

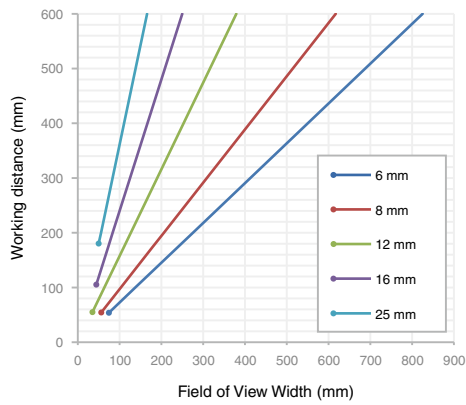
**Horizontal Field of View
(640 x 480)**



**Horizontal Field of View
(800 x 600)**



**Horizontal Field of View
(1600 x 1200)**



Performance specifications

VS20

Specifications	VS20M-11F310	VS20M-12F410	VS20C-12F410	VS20M-13F410	VS20C-13F410
Memory	32 MB flash memory, unlimited storage when storing in the remote network device image processing: 128 MB SDRAM				
Imager type	1/3-inch CMOS, 4.8 mm x 3.6 mm (W x H), 3.75 μm sq. pixels				
Imagery	Monochrome	Monochrome	Color	Monochrome	Color
Lens	S-Mount/M12, 8 mm (standard), options: 3.6 mm, 6 mm, 12 mm, 16 mm, 25 mm				
Image resolution (pixels)	640 x 480 (standard)	640 x 480 (standard) 640 x 480 (2 x image magnification mode)		640 x 480 (standard) 640 x 480 (2 x image magnification mode) 800 x 600 (2 x image magnification mode)*1	
Bit depth	256 gray levels (8 bits/pixel)		24-bit color	256 gray levels (8 bits/pixel)	24-bit color
Lighting	Equipped as standard: LED ring light (white), option: LED ring light (red, blue, near-infrared)				
Electronic shutter speed	1 μs...1000 ms				
Maximum image acquisition speed*2 (frame/s)	40	75	55	75	55
Power consumption	24 V DC ± 10%, 48 W (2.0 A) maximum when the illumination is ON.				
Trigger	<ul style="list-style-type: none"> • Opto-isolated image acquisition trigger input x 1 • Remote software commands via Ethernet 				
	Voltage	<ul style="list-style-type: none"> • ON: 15...24 V DC (standard 24 V DC) • OFF: 0...5 V DC (standard 0 V DC) 			
Discrete inputs	3.6 mA/12 V DC, 7.5 mA/24 V DC, resistance: Max. 5.48 kΩ				
	Voltage	Opto-isolated general-purpose input x 1 Option: General-purpose input x 7: available when connecting a CIO-1400 I/O module ON: 15...24 V DC (standard 24 V DC), OFF: 0...5 V DC (standard 0 V DC)			
Discrete outputs	3.6 mA/12 V DC, 7.5 mA/24 V DC, resistance: Max. 5.48 kΩ				
	Current*3	Opto-isolated high-speed output x 4 Option: High-speed output x 2, general-purpose output x 6: available when connecting a CIO-1400 I/O module 28 V DC maximum through external load ON status: Max. 50 mA (sink or source), leakage current in OFF status: Max. 100 μA, external load resistance: 240 Ω to 10 kΩ Each line is rated at a maximum 50 mA and protected against over-current, short circuits, and transients from switching inductive loads. A protection diode is required for a high inductive load.			
Network communication	CC-Link IE Field Network Basic, SLMP scanner, SLMP, EtherNet/IP™, MODBUS®/TCP, TCP/IP, UDP, FTP, Telnet (native mode), DHCP (default at shipment from the factory), fixed and link local IP address setting				
Other communications	RS-232 (R x D, T x D (TIA/EIA-232-F compliant))				
Material	Aluminum housing				
Installation	M3 screw hole x 4				
Dimensions (mm)	In-line configuration: 92 x 60 x 52, Right-angle configuration: 62 x 60 x 67				
Weight (g)	200				

*1. The default resolution is 640 x 480 pixels. The resolution can be set as 800 x 600 pixels in In-Sight Explorer. For details, refer to the help of In-Sight Explorer.

*2. The maximum frame rate when all of the following conditions are applied.

- Minimum exposure
- No connection with In-Sight Explorer
- Image resolution: 640 x 480 (2 x image magnification mode for VS20M-12F410 and VS20M-13F410 models).

*3. When I/O module (CIO-1400) is connected, high-speed output is sink type up to 50 mA only and general-purpose output is sink type or source type up to 100 mA which can be set by the user.

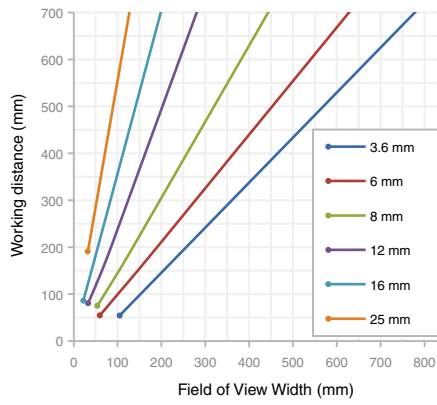
EasyBuilder function list

Item	VS20M-11F310	VS20M-12F410	VS20C-12F410	VS20M-13F410	VS20C-13F410
Location tools	Pattern	●	●	●	●
	Edge, edge intersection, and circle*4	-	-	-	●
Presence/absence tools	Pattern	●	●	●	●
	Color pixel count, brightness, contrast	-	●	●	●
Measurement tools	Edge, circle	-	-	●	●
	Distance, angle, and diameter of circle	-	-	-	●
Counting tools	Pattern, edge	-	-	●	●

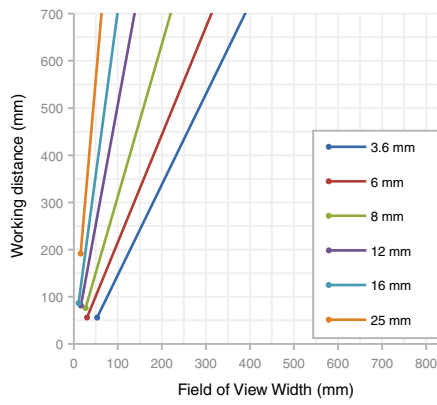
*4. Location information detected can be used for inspection by other tools.

Working distance

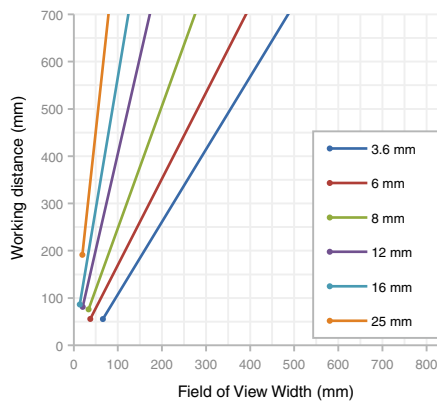
**Horizontal Field of View
(640 x 480 (default))**



**Horizontal Field of View
(640 x 480 (2 x image magnification mode))**



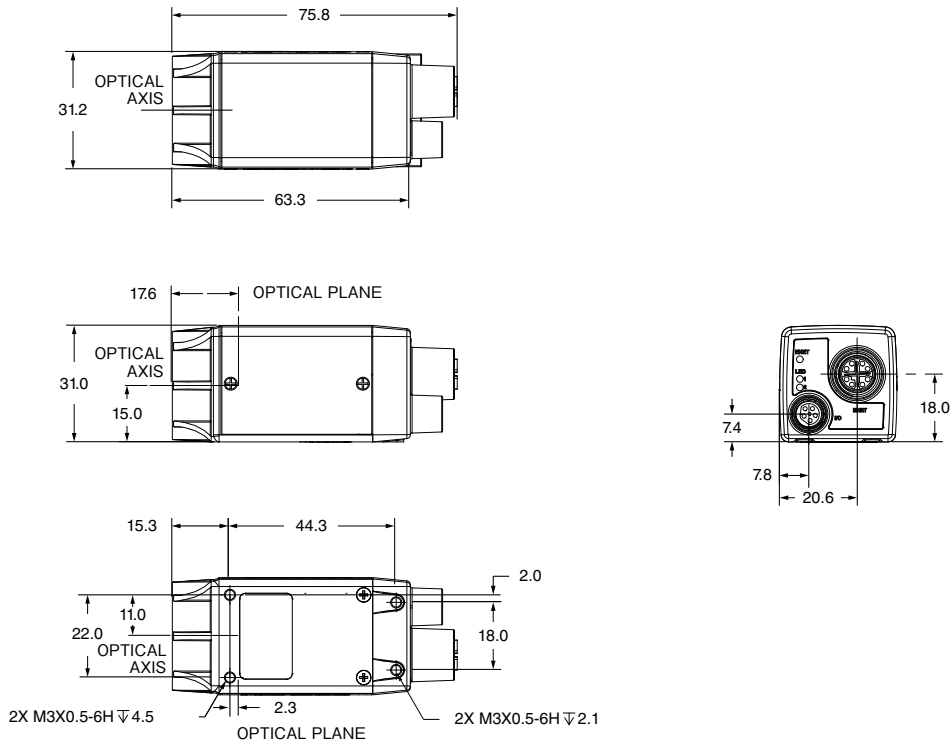
**Horizontal Field of View
(800 x 600 (2 x image magnification mode))**



External dimensions

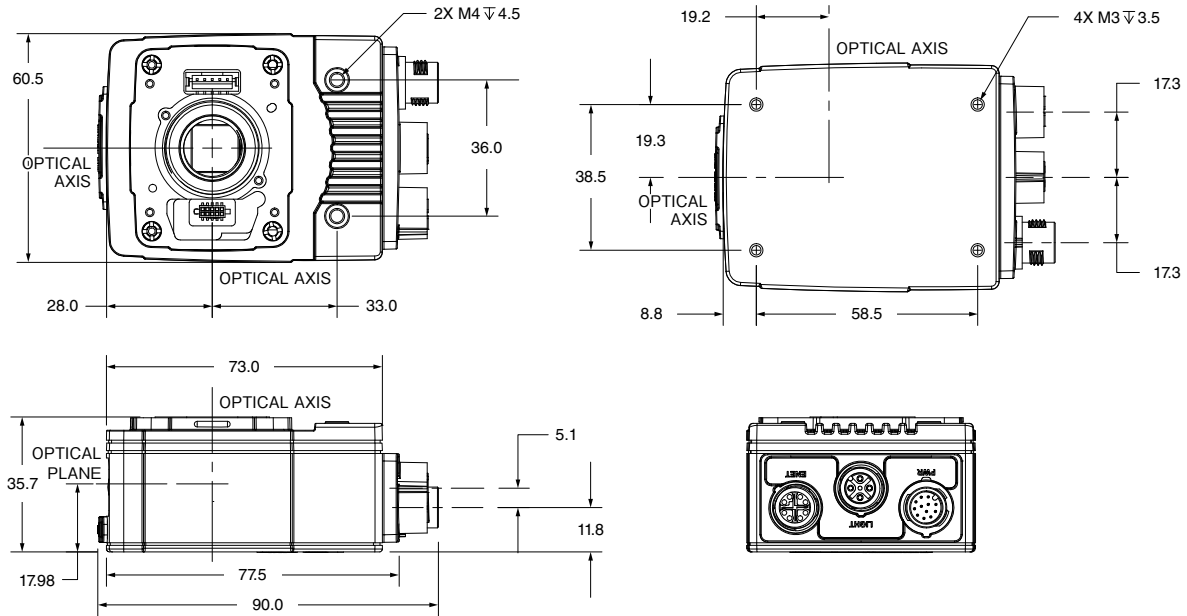
(unit: mm)

VS80

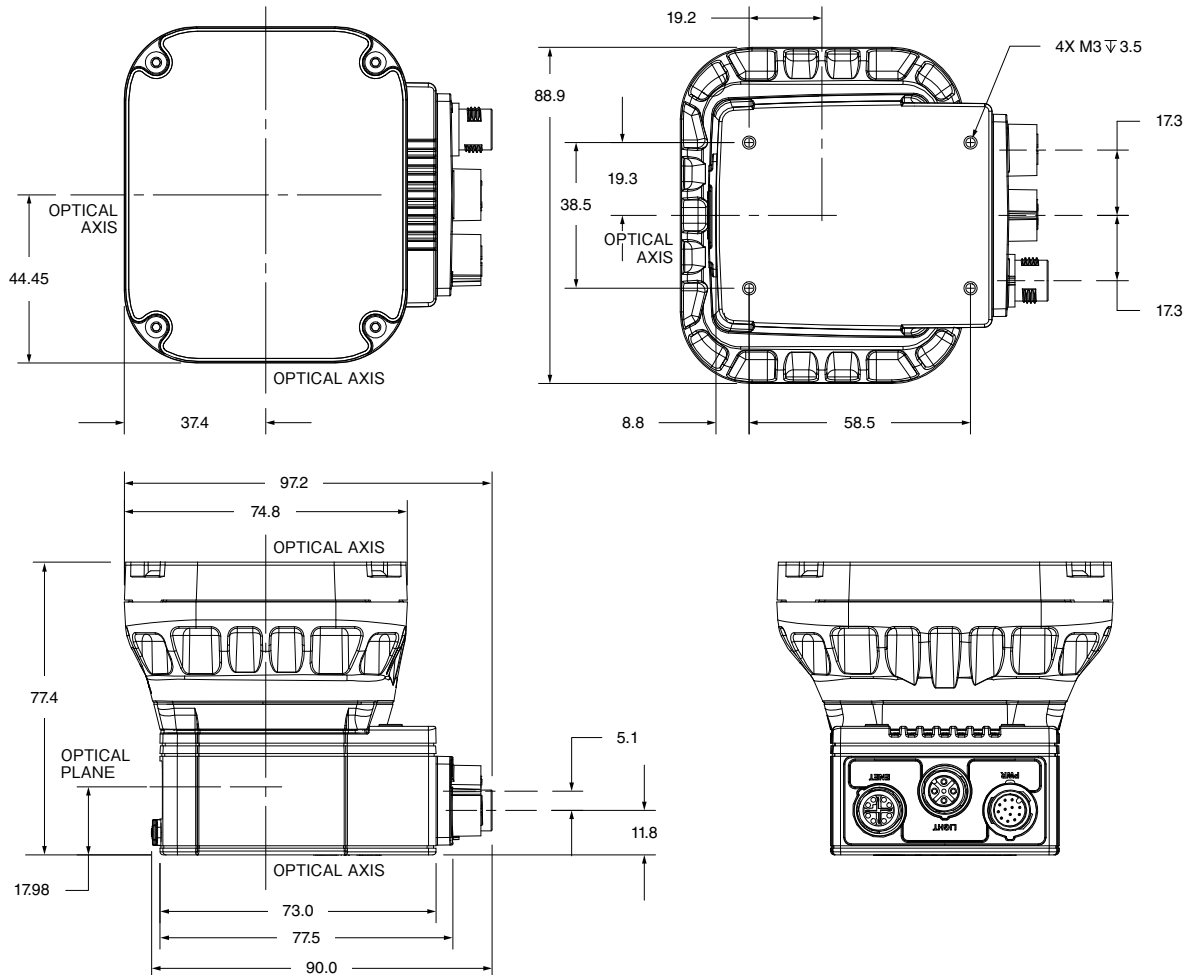


VS70

Base unit

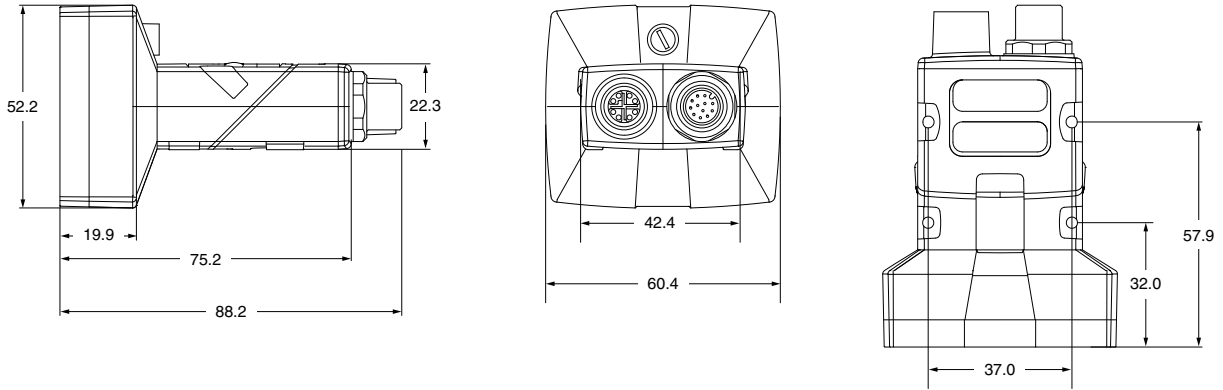


With lighting

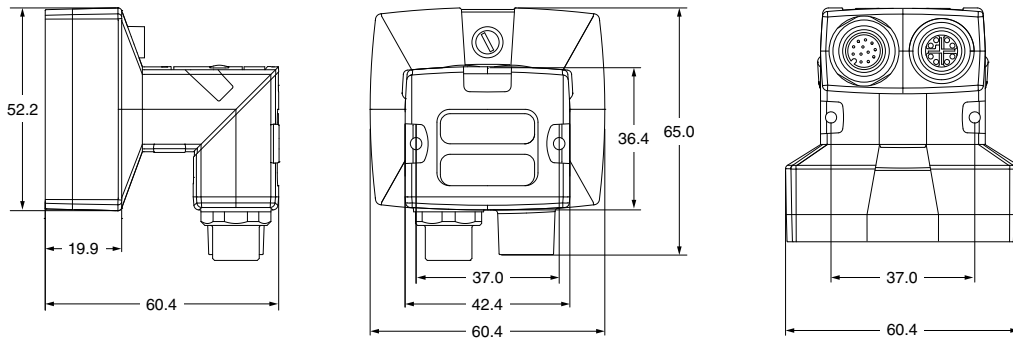


VS20

In-line configuration



Right-angle configuration



Extensive global support coverage providing expert help whenever needed

Global FA centers

EMEA

Europe FA Center

MITSUBISHI ELECTRIC EUROPE B.V. Polish Branch
Tel: +48-12-347-65-81

Germany FA Center

MITSUBISHI ELECTRIC EUROPE B.V. German Branch
Tel: +49-2102-486-0 / Fax: +49-2102-486-1120

UK FA Center

MITSUBISHI ELECTRIC EUROPE B.V. UK Branch
Tel: +44-1707-27-8780 / Fax: +44-1707-27-8695

Czech Republic FA Center

MITSUBISHI ELECTRIC EUROPE B.V. Czech Branch
Tel: +420-255 719 200

Italy FA Center

MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch
Tel: +39-039-60531 / Fax: +39-039-6053-312

Russia FA Center

MITSUBISHI ELECTRIC (RUSSIA) LLC ST. Petersburg Branch
Tel: +7-812-633-3497 / Fax: +7-812-633-3499

Turkey FA Center

MITSUBISHI ELECTRIC TURKEY A.S. Umraniye Branch
Tel: +90-216-526-3990 / Fax: +90-216-526-3995

Asia-Pacific

China

Beijing FA Center

MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. Beijing FA Center
Tel: +86-10-6518-8830 / Fax: +86-10-6518-2938

Guangzhou FA Center

MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. Guangzhou FA Center
Tel: +86-20-8923-6730 / Fax: +86-20-8923-6715

Shanghai FA Center

MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. Shanghai FA Center
Tel: +86-21-2322-3030 / Fax: +86-21-2322-3000

Tianjin FA Center

MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. Tianjin FA Center
Tel: +86-22-2813-1015 / Fax: +86-22-2813-1017

Taiwan

Taipei FA Center

SETSUYO ENTERPRISE CO., LTD.
Tel: +886-2-2299-9917 / Fax: +886-2-2299-9963

Korea

Korea FA Center

MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD.
Tel: +82-2-3660-9632 / Fax: +82-2-3664-0475

Thailand

Thailand FA Center

MITSUBISHI ELECTRIC FACTORY AUTOMATION (THAILAND) CO., LTD.
Tel: +66-2682-6522-31 / Fax: +66-2682-6020

ASEAN

ASEAN FA Center

MITSUBISHI ELECTRIC ASIA PTE. LTD.
Tel: +65-6470-2480 / Fax: +65-6476-7439

Malaysia

Malaysia FA Center

Malaysia FA Center
Tel: +60-3-7626-5080 / Fax: +60-3-7658-3544

Indonesia

Indonesia FA Center

PT. MITSUBISHI ELECTRIC INDONESIA Cikarang Office
Tel: +62-21-2961-7797 / Fax: +62-21-2961-7794

Vietnam

Hanoi FA Center

MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED Hanoi Branch Office
Tel: +84-24-3937-8075 / Fax: +84-24-3937-8076

Ho Chi Minh FA Center

MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED
Tel: +84-28-3910-5945 / Fax: +84-28-3910-5947

Philippines

Philippines FA Center

MELCO Factory Automation Philippines Inc.
Tel: +63-(0)2-8256-8042

India

India Ahmedabad FA Center

MITSUBISHI ELECTRIC INDIA PVT. LTD. Ahmedabad Branch
Tel: +91-7965120063

India Bangalore FA Center

MITSUBISHI ELECTRIC INDIA PVT. LTD. Bangalore Branch
Tel: +91-80-4020-1600 / Fax: +91-80-4020-1699

India Chennai FA Center

MITSUBISHI ELECTRIC INDIA PVT. LTD. Chennai Branch
Tel: +91-4445548772 / Fax: +91-4445548773

India Coimbatore FA Center

MITSUBISHI ELECTRIC INDIA PVT. LTD. Coimbatore Branch
Tel: +91-422-438-5606

India Gurgaon FA Center

MITSUBISHI ELECTRIC INDIA PVT. LTD. Gurgaon Head Office
Tel: +91-124-463-0300 / Fax: +91-124-463-0399

India Pune FA Center

MITSUBISHI ELECTRIC INDIA PVT. LTD. Pune Branch
Tel: +91-20-2710-2000 / Fax: +91-20-2710-2100

Americas

USA

North America FA Center

MITSUBISHI ELECTRIC AUTOMATION, INC.
Tel: +1-847-478-2469 / Fax: +1-847-478-2253

Mexico

Mexico City FA Center

MITSUBISHI ELECTRIC AUTOMATION, INC. Mexico Branch
Tel: +52-55-3067-7511

Mexico FA Center

MITSUBISHI ELECTRIC AUTOMATION, INC. Queretaro Office
Tel: +52-442-153-6014

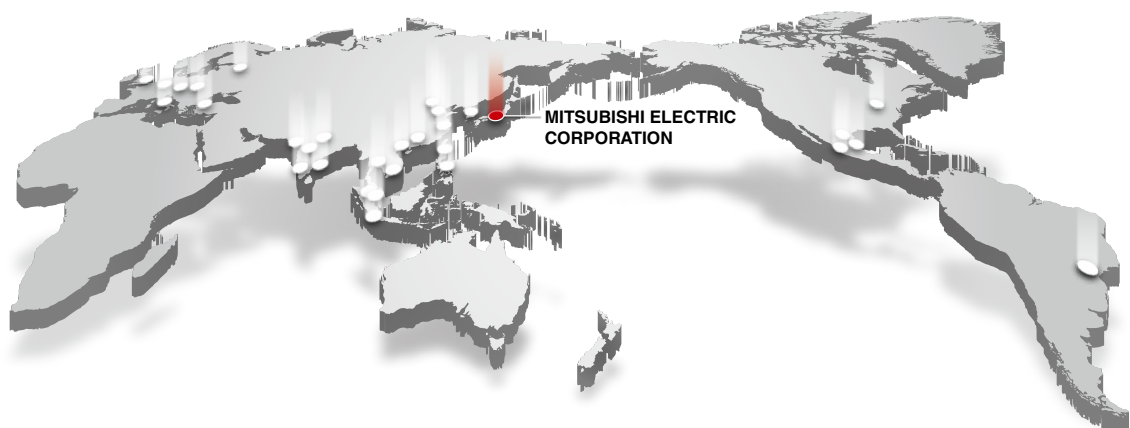
Mexico Monterrey FA Center

MITSUBISHI ELECTRIC AUTOMATION, INC. Monterrey Office
Tel: +52-55-3067-7521

Brazil

Brazil FA Center

MITSUBISHI ELECTRIC DO BRASIL COMERCIO E SERVICOS LTDA.
Tel: +55-11-4689-3000 / Fax: +55-11-4689-3016



Model name of vision sensor The vision sensor displays the model name as shown below.

VS **80** - **0** -

1 2 3 4 5 6 7

1.Vision sensor

3.Camera specifications

5.Applications

7.Extended functions

M	Monochrome
C	Color

0	General-purpose
---	-----------------

	PatMax RedLine®	Spreadsheet
E	-	-
ER	●	-
N/A	-	●
R	●	●

2.Series

4.Processor performance

6.Resolution

1	x 1
2	x 1.5
4	x 2

0	640 x 480
2	1600 x 1200

VS **70** - **0** -

1 2 3 4 5 6 7

1.Vision sensor

3.Camera specifications

5.Applications

7.Extended functions

M	Monochrome
C	Color

0	General-purpose
---	-----------------

	PatMax RedLine®	Spreadsheet
E	-	-
ER	●	-
N/A	-	●
R	●	●

2.Series

4.Processor performance

6.Resolution

6	x 1
8	x 1.25

0	640 x 480/800 x 600
2	1600 x 1200

VS **20** - **F** **10**

1 2 3 4 5 6

1.Vision sensor

3.Camera specifications

4.Grade

5.Frame speed

6.Combination of lighting lens

M	Monochrome
C	Color

11	Low
12	Middle
13	High

F3	Low speed
F4	High speed

10	White illumination, 8 mm lens
----	-------------------------------

2.Series

PatMax RedLine is registered trademarks of Cognex Corporation.

EtherNet/IP is trademarks of ODVA, Inc.

MODBUS is a registered trademark of Schneider Electric USA, Inc.

All other company names and product names used in this document are trademarks or registered trademarks of their respective companies.

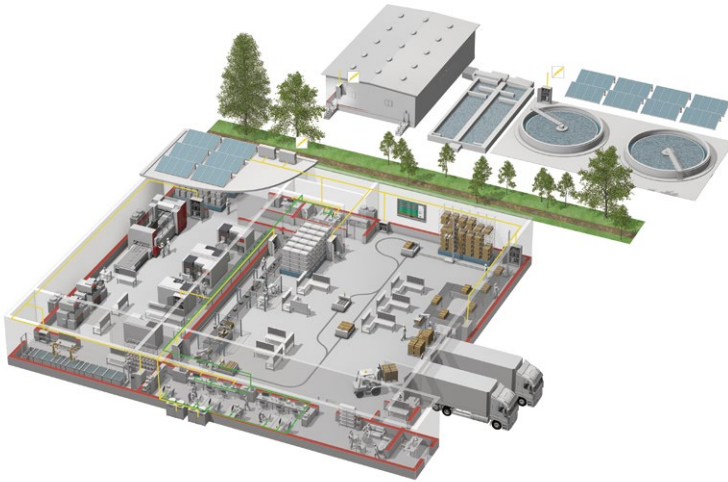
Precautions before use

This publication explains the typical features and functions of the products herein and does not provide restrictions or other information related to usage and module combinations. Before using the products, always read the product user manuals. Mitsubishi Electric will not be held liable for damage caused by factors found not to be the cause of Mitsubishi Electric; opportunity loss or lost profits caused by faults in Mitsubishi Electric products; damage, secondary damage, or accident compensation, whether foreseeable or not, caused by special factors; damage to products other than Mitsubishi Electric products; or any other duties.

⚠ For safe use

- To use the products given in this publication properly, always read the relevant manuals before beginning operation.
- The products have been manufactured as general-purpose parts for general industries, and are not designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the products for special purposes such as nuclear power, electric power, aerospace, medicine or passenger-carrying vehicles, consult with Mitsubishi Electric.
- The products have been manufactured under strict quality control. However, when installing the products where major accidents or losses could occur if the products fail, install appropriate backup or fail-safe functions in the system.

YOUR SOLUTION PARTNER



Mitsubishi Electric offers a wide range of automation equipment from PLCs and HMIs to CNC and EDM machines.

A NAME TO TRUST

Since its beginnings in 1870, some 45 companies use the Mitsubishi name, covering a spectrum of finance, commerce and industry.

The Mitsubishi brand name is recognized around the world as a symbol of premium quality.

Mitsubishi Electric Corporation, established in 1921, is active in space development, transportation, semi-conductors, energy systems, communications and information processing, audio visual equipment and home electronics, building and energy management and automation systems, and has 183 factories, laboratories and offices worldwide in over 140 countries.

This is why you can rely on Mitsubishi Electric automation solution - because we know first hand about the need for reliable, efficient, easy-to-use automation and control in our own factories.

As one of the world's leading companies with a global turnover of over 4 trillion Yen (over \$40 billion), employing over 146,000 people, Mitsubishi Electric has the resource and the commitment to deliver the ultimate in service and support as well as the best products.



Low-voltage Power Distribution Products



Transformers, Med-voltage Distribution Products



Power Monitoring and Energy Saving Products



Power (UPS) and Environmental Products



Compact and Modular Controllers



Servos, Motors and Inverters



Visualization: HMIs



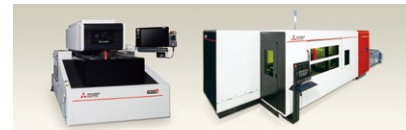
Edge Computing Products



Numerical Control (NC)



Collaborative and Industrial Robots



Processing machines: EDM, Lasers

* Not all products are available in all countries.

Country/Region	Sales office	Tel/Fax
USA	MITSUBISHI ELECTRIC AUTOMATION, INC. 500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A.	Tel : +1-847-478-2100 Fax : +1-847-478-2253
Mexico	MITSUBISHI ELECTRIC AUTOMATION, INC. Mexico Branch Boulevard Miguel de Cervantes Saavedra 301, Torre Norte Piso 5, Ampliacion Granada, Miguel Hidalgo, Ciudad de Mexico, Mexico, C.P.115200	Tel : +52-55-3067-7512
Brazil	MITSUBISHI ELECTRIC DO BRASIL COMERCIO E SERVICOS LTDA. Avenida Adelino Cardana, 293, 21 andar, Bethaville, Barueri SP, Brasil	Tel : +55-11-4689-3000 Fax : +55-11-4689-3016
Germany	MITSUBISHI ELECTRIC EUROPE B.V. German Branch Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany	Tel : +49-2102-486-0 Fax : +49-2102-486-7780
UK	MITSUBISHI ELECTRIC EUROPE B.V. UK Branch Travellers Lane, UK-Hatfield, Hertfordshire, AL10 8XB, U.K.	Tel : +44-1707-28-8780 Fax : +44-1707-27-8695
Ireland	MITSUBISHI ELECTRIC EUROPE B.V. Irish Branch Westgate Business Park, Ballymount, Dublin 24, Ireland	Tel : +353-1-4198800 Fax : +353-1-4198890
Italy	MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch Centro Direzionale Colleoni - Palazzo Sirio, Viale Colleoni 7, 20864 Agrate Brianza (MB), Italy	Tel : +39-039-60531 Fax : +39-039-6053-312
Spain	MITSUBISHI ELECTRIC EUROPE, B.V. Spanish Branch Carretera de Rubi, 76-80-Apdo. 420, E-08190 Sant Cugat del Valles (Barcelona), Spain	Tel : +34-935-65-3131 Fax : +34-935-89-1579
France	MITSUBISHI ELECTRIC EUROPE B.V. French Branch 25, Boulevard des Bouvets, 92741 Nanterre Cedex, France	Tel : +33-1-55-68-55-68 Fax : +33-1-55-68-57-57
Czech Republic	MITSUBISHI ELECTRIC EUROPE B.V. Czech Branch, Prague Office Pekarska 621/7, 155 00 Praha 5, Czech Republic	Tel : +420-255-719-200
Poland	MITSUBISHI ELECTRIC EUROPE B.V. Polish Branch ul. Krakowska 48, 32-083 Balice, Poland	Tel : +48-12-347-65-00
Sweden	MITSUBISHI ELECTRIC EUROPE B.V. (Scandinavia) Hedvig Mollersgata 6, 223 55 Lund, Sweden	Tel : +46-8-625-10-00 Fax : +46-46-39-70-18
Russia	MITSUBISHI ELECTRIC (RUSSIA) LLC St. Petersburg Branch Piskarevsky pr. 2, bld 2, lit "Sch", BC "Benua", office 720; 195027 St. Petersburg, Russia	Tel : +7-812-633-3497 Fax : +7-812-633-3499
Turkey	MITSUBISHI ELECTRIC TURKEY A.S. Umraniye Branch Serifali Mah. Kale Sok. No:41 34775 Umraniye - Istanbul, Turkey	Tel : +90-216-969-2500 Fax : +90-216-661-4447
UAE	MITSUBISHI ELECTRIC EUROPE B.V. Dubai Branch Dubai Silicon Oasis, P.O.BOX 341241, Dubai, U.A.E.	Tel : +971-4-3724716 Fax : +971-4-3724721
South Africa	ADROIT TECHNOLOGIES 20 Waterford Office Park, 189 Witkoppen Road, Fourways, South Africa	Tel : +27-11-658-8100 Fax : +27-11-658-8101
China	MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. Mitsubishi Electric Automation Center, No.1386 Hongqiao Road, Shanghai, China	Tel : +86-21-2322-3030 Fax : +86-21-2322-3000
Taiwan	SETSUYO ENTERPRISE CO., LTD. 6F, No.105, Wugong 3rd Road, Wugu District, New Taipei City 24889, Taiwan	Tel : +886-2-2299-2499 Fax : +886-2-2299-2509
Korea	MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD. 7F to 9F, Gangseo Hangang Xi-tower A, 401, Yangcheon-ro, Gangseo-Gu, Seoul 07528, Korea	Tel : +82-2-3660-9569 Fax : +82-2-3664-8372
Singapore	MITSUBISHI ELECTRIC ASIA PTE. LTD. 307 Alexandra Road, Mitsubishi Electric Building, Singapore 159943	Tel : +65-6473-2308 Fax : +65-6476-7439
Thailand	MITSUBISHI ELECTRIC FACTORY AUTOMATION (THAILAND) CO., LTD. 12th Floor, SV.City Building, Office Tower 1, No. 896/19 and 20 Rama 3 Road, Kwaeng Bangpongpan, Khet Yannawa, Bangkok 10120, Thailand	Tel : +66-2682-6522-31 Fax : +66-2682-6020
Vietnam	MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED Unit 01-04, 10th Floor, Vincom Center, 72 Le Thanh Ton Street, District 1, Ho Chi Minh City, Vietnam	Tel : +84-28-3910-5945 Fax : +84-28-3910-5947
Indonesia	PT. MITSUBISHI ELECTRIC INDONESIA Gedung Jaya 8th Floor, JL. MH. Thamrin No.12, Jakarta Pusat 10340, Indonesia	Tel : +62-21-31926461 Fax : +62-21-31923942
India	MITSUBISHI ELECTRIC INDIA PVT. LTD. Pune Branch Emerald House, EL-3, J Block, M.I.D.C., Bhosari, Pune-411026, Maharashtra, India	Tel : +91-20-2710-2000 Fax : +91-20-2710-2100
Australia	MITSUBISHI ELECTRIC AUSTRALIA PTY. LTD. 348 Victoria Road, P.O. Box 11, Rydalmere, N.S.W 2116, Australia	Tel : +61-2-9684-7777 Fax : +61-2-9684-7245

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
www.MitsubishiElectric.com