ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *OMRON F160-C10V2* at our website: *Click HERE*

This document provides information mainly for selecting suitable models. Please read the *F160-2 Vision Sensor SETUP MANUAL* (Cat. No. Z170) carefully for information that the user must understand and accept before purchase, including information on warranty, limitations of liability, and precautions.

OMRON

OMRON Corporation
Industrial Automation Company

Sensing Devices Division H.Q.
Application Sensors Division
Shiokoji Horikawa, Shimogyo-ku,
Kyoto, 600-8530 Japan
Tel: (81)75-344-7068/Fax: (81)75-344-7107

Regional Headquarters

OMRON EUROPE B.V.
Sensor Business Unit,
Carl-Benz-Str. 4, D-71154 Nufringen,
Germany
Tel: (49)7032-811-0/Fax: (49)7032-811-199

OMRON ELECTRONICS LLC
1 East Commerce Drive, Schaumburg, IL 60173
U.S.A.
Tel: (1)847-843-7900/Fax: (1)847-843-8568

OMRON ASIA PACIFIC PTE. LTD.
83 Clemenceau Avenue,
#11-01, UE Square,
239920 Singapore
Tel: (65)6835-3011/Fax: (65)6835-2711

OMRON (CHINA) CO., LTD.
Room 2211, Bank of China Tower,
200 Yin Cheng Road (M),
Shanghai, 200120 China
Tel: (86)21-5037-2222/Fax: (86)21-5037-2200

Authorized Distributor:

Cat. No. Q133-E1-04

Note:Specifications subject to change without notice.

Printed in Japan
0506-1M (0203) (C)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

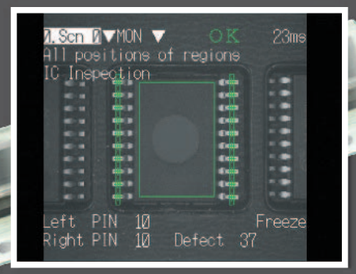
CE

OMRON

Faster and more powerful than anything in its class!

F160-2

Vision Sensor



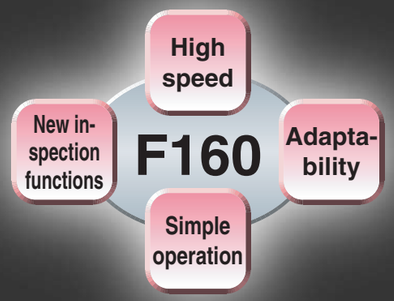


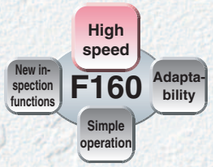
realizing

Great Performance from a Sensor with No Blind Spots



The development of the F160 represents the arrival of a remarkable vision sensor that answers the needs of today's inspection line. It has the processing speed required for ultra high-speed lines and, using memory cards, has the capacity required for multi-product lines. Choose from a comprehensive selection of cameras for just the right type of inspection, and customize screens and operations to ensure optimum on-site operability. Initial setup can be performed even by inexperienced operators thanks to user-friendly conversational menus, and inspection performance has been comprehensively improved using new algorithms.
All of OMRON's technology and know-how has come together to bring you the optimum vision sensor - the F160, a sensor you can use with confidence.

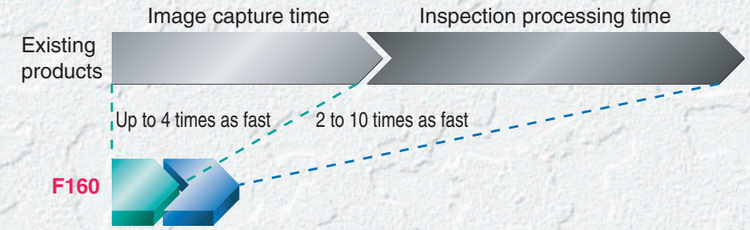




Creating New Possibilities with Incredible Speed

The F160 can be applied to ultra high-speed lines. It allows a greater range of inspections within the required tact time, contributing greatly to the improvement of inspection quality.

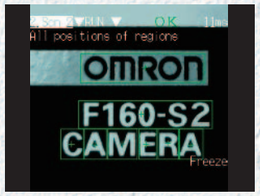
The newly-developed Double-speed Camera allows images to be captured up to 4 times faster than with previous cameras, and image processing can now be achieved 2 to 10 times faster than before. For example, gray search for the image shown in Picture 1 below can be performed for 5,000 items-a-minute inspection lines. Also, because each individual inspection is made at high speed, the total inspection time for complicated applications has been dramatically reduced. This creates extra time for inspections that were not possible before, leading to significant improvements in inspection quality.



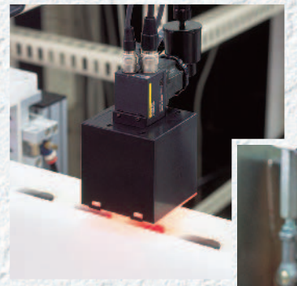
• Example: Gray Search Processing (Picture 1)

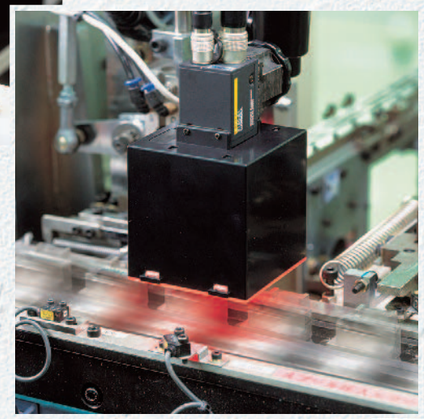


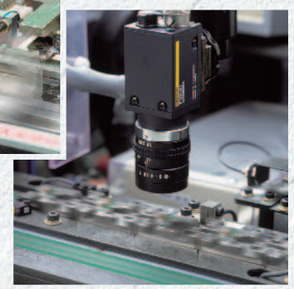
• Example: More than one inspection item









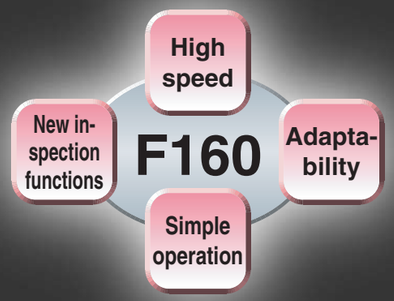


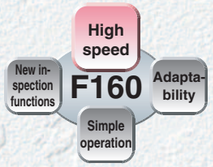
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Great Performance from a Sensor with No Blind Spots



The development of the F160 represents the arrival of a remarkable vision sensor that answers the needs of today's inspection line. It has the processing speed required for ultra high-speed lines and, using memory cards, has the capacity required for multi-product lines. Choose from a comprehensive selection of cameras for just the right type of inspection, and customize screens and operations to ensure optimum on-site operability. Initial setup can be performed even by inexperienced operators thanks to user-friendly conversational menus, and inspection performance has been comprehensively improved using new algorithms.
All of OMRON's technology and know-how has come together to bring you the optimum vision sensor - the F160, a sensor you can use with confidence.

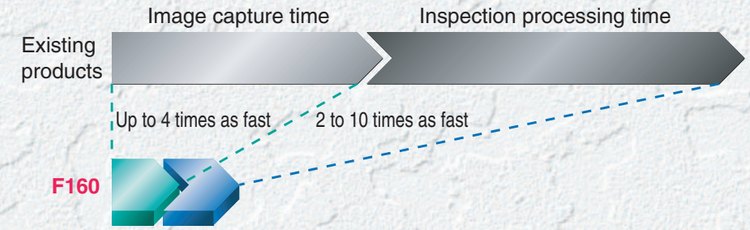




Creating New Possibilities with Incredible Speed

The F160 can be applied to ultra high-speed lines. It allows a greater range of inspections within the required tact time, contributing greatly to the improvement of inspection quality.

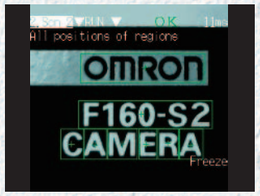
The newly-developed Double-speed Camera allows images to be captured up to 4 times faster than with previous cameras, and image processing can now be achieved 2 to 10 times faster than before. For example, gray search for the image shown in Picture 1 below can be performed for 5,000 items-a-minute inspection lines. Also, because each individual inspection is made at high speed, the total inspection time for complicated applications has been dramatically reduced. This creates extra time for inspections that were not possible before, leading to significant improvements in inspection quality.



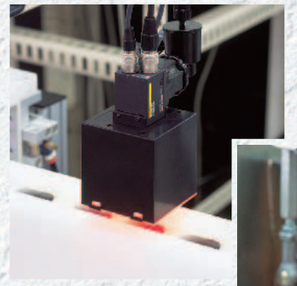
• Example: Gray Search Processing (Picture 1)

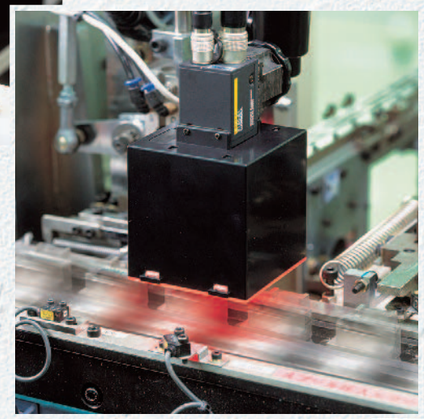


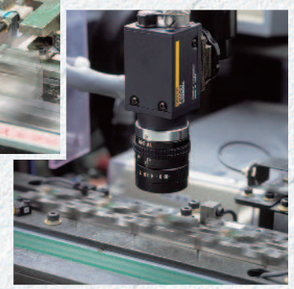
• Example: More than one inspection item











Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

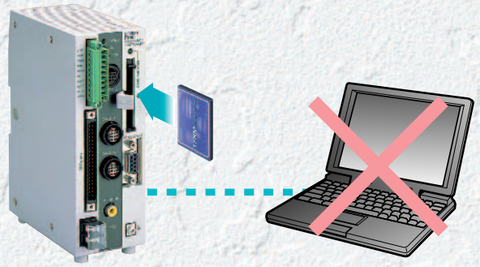
Use in a Wide Variety of Applications with a Greatly Reduced Installation Time

■ Data-handling Capacity Increased with Memory Cards

The F160 enables reductions in setup costs and allows a greater number of scenes to be used.

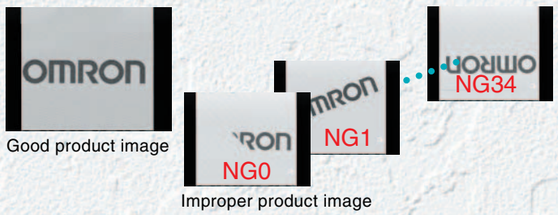
The F160 is equipped with a memory card slot that allows the number of available scenes to be increased simply by inserting a card.

Note: The actual number of scenes that can be saved depends on the scene settings.



■ Increased Functionality for Storing Images

Up to 35 screens of measurement images and improper images (i.e. images of improper products) can be stored. Also, because the most recent improper image can be viewed while performing measurement, problems in the inspection line can be analyzed without stopping production.



Good product image

Improper product image

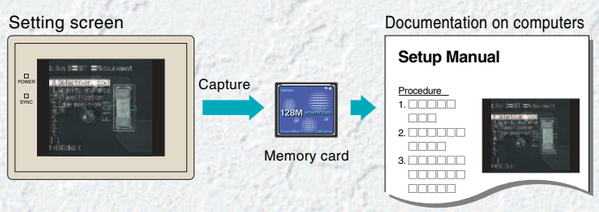
■ I/O Monitor

The status of input and output terminals can be displayed on the screen. This function can be used for checking wiring when making adjustments to the system.



■ Screen Capture

Images of menu setting screens, measurement screens, and improper images can be captured and stored in the memory card. This feature is very useful for creating documentation.



A Wide Variety of Cameras

OMRON's Double-speed Cameras or F150 Cameras can be connected. Use the Camera that meets your speed, cost, and lighting requirements.

● Double-speed Camera

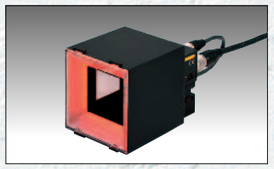
F160-S2/SLC20/SLC50



The shutter speed can be set to one of 8 settings from the Controller. Cameras with intelligent lighting are also included in the lineup.

● F150 Camera

F150-S1A/SLC20/SLC50/SL20A/SL50A



Compact and cost-effective. Models with intelligent lighting or compact LED lighting are available.

Customize Operations, Screens, and Output to Suit Your Requirements

Operations

■ Menu Masking

Incorrect operation can be prevented by masking menu items for settings that must not be changed. This function also simplifies the operations required to change menu settings and helps save time.



■ Password Setting

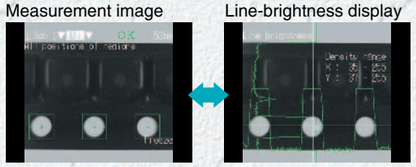
Passwords can be set to restrict the personnel allowed to operate the F160. This function helps to improve security and reduce incorrect operation.

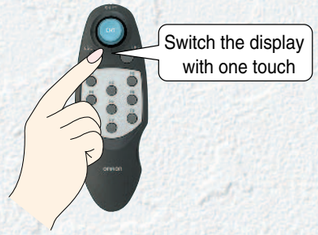


■ Shortcut Keys

Frequently used operations can be allocated to specific console keys. Menus can be switched at the touch of a button.

Measurement image Line-brightness display





Screens

■ Screen Messages

Screen messages can be changed to suit the on-site environment and can be displayed in any desired position on the screen.



■ Drawing Figures

Figures such as lines, boxes, circles, and cross cursors can be drawn. It is also possible to draw these figures at measurement positions.

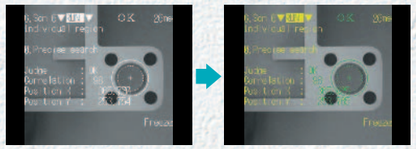


■ It is possible to select the character-size and the display can be black-white inverted.



■ Color Display

Messages and figures can be made easier to view by using different colors.



Output

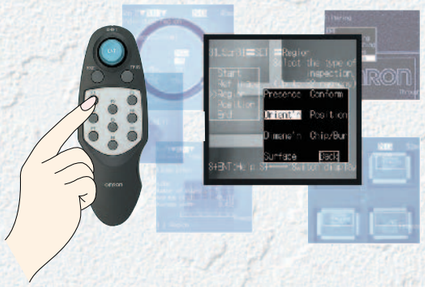
■ RS-232C Format

The output format can be changed to suit system specifications.



■ Conversational Menus

The F160 also has menus designed in a conversational style so that even personnel with little experience can perform settings with ease.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

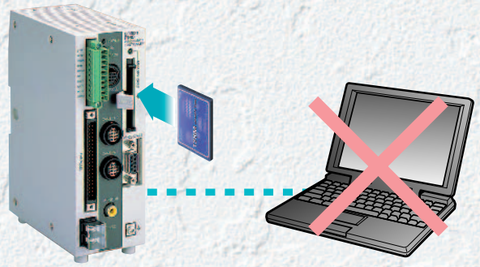
Use in a Wide Variety of Applications with a Greatly Reduced Installation Time

■ Data-handling Capacity Increased with Memory Cards

The F160 enables reductions in setup costs and allows a greater number of scenes to be used.

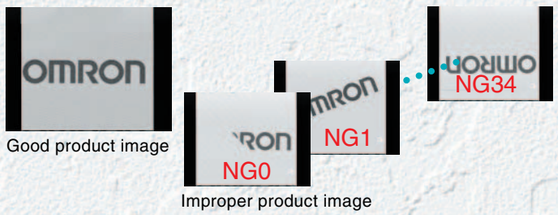
The F160 is equipped with a memory card slot that allows the number of available scenes to be increased simply by inserting a card.

Note: The actual number of scenes that can be saved depends on the scene settings.



■ Increased Functionality for Storing Images

Up to 35 screens of measurement images and improper images (i.e. images of improper products) can be stored. Also, because the most recent improper image can be viewed while performing measurement, problems in the inspection line can be analyzed without stopping production.



Good product image

Improper product image

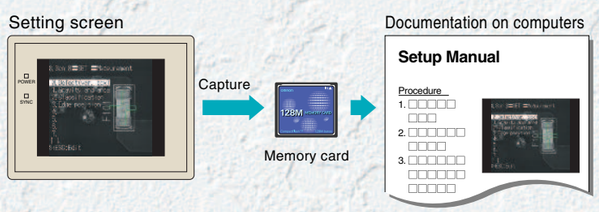
■ I/O Monitor

The status of input and output terminals can be displayed on the screen. This function can be used for checking wiring when making adjustments to the system.



■ Screen Capture

Images of menu setting screens, measurement screens, and improper images can be captured and stored in the memory card. This feature is very useful for creating documentation.



A Wide Variety of Cameras

OMRON's Double-speed Cameras or F150 Cameras can be connected. Use the Camera that meets your speed, cost, and lighting requirements.

● Double-speed Camera

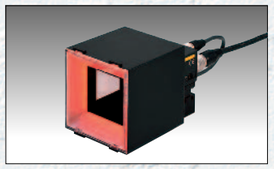
F160-S2/SLC20/SLC50



The shutter speed can be set to one of 8 settings from the Controller. Cameras with intelligent lighting are also included in the lineup.

● F150 Camera

F150-S1A/SLC20/SLC50/SL20A/SL50A



Compact and cost-effective. Models with intelligent lighting or compact LED lighting are available.

Customize Operations, Screens, and Output to Suit Your Requirements

Operations

■ Menu Masking

Incorrect operation can be prevented by masking menu items for settings that must not be changed. This function also simplifies the operations required to change menu settings and helps save time.



■ Password Setting

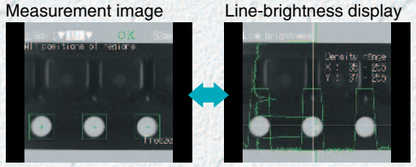
Passwords can be set to restrict the personnel allowed to operate the F160. This function helps to improve security and reduce incorrect operation.

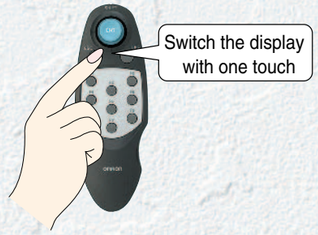


■ Shortcut Keys

Frequently used operations can be allocated to specific console keys. Menus can be switched at the touch of a button.

Measurement image Line-brightness display





Screens

■ Screen Messages

Screen messages can be changed to suit the on-site environment and can be displayed in any desired position on the screen.



■ Drawing Figures

Figures such as lines, boxes, circles, and cross cursors can be drawn. It is also possible to draw these figures at measurement positions.

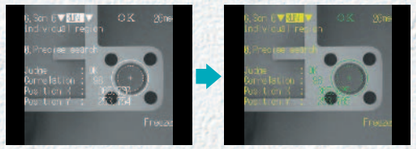


■ It is possible to select the character-size and the display can be black-white inverted.



■ Color Display

Messages and figures can be made easier to view by using different colors.



Output

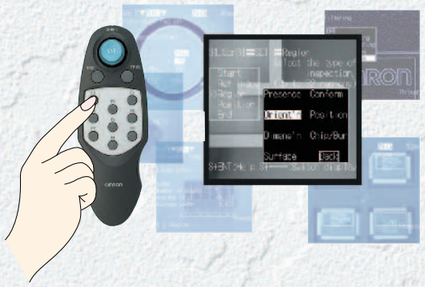
■ RS-232C Format

The output format can be changed to suit system specifications.

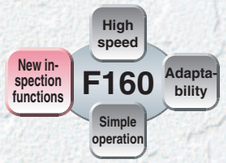


■ Conversational Menus

The F160 also has menus designed in a conversational style so that even personnel with little experience can perform settings with ease.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



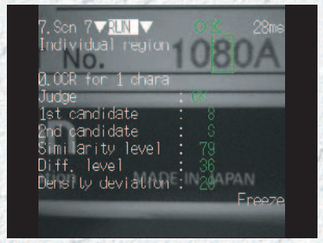
Inspection Revolutionized with New Algorithms

■ QUEST Character Recognition

The F160 uses OMRON's character recognition system - QUEST.

Features

- The user does not have to register characters.
- High-level of discrimination of similar characters.
- Adapts to fluctuations in shape and size.



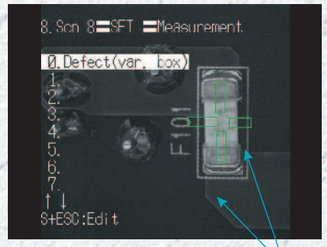
Use for any type of character



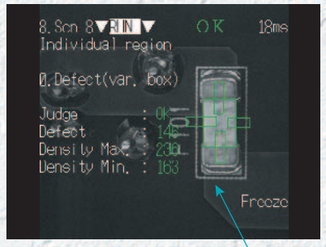
■ "Variable Box" Measurement for Defect Inspection

The measurement region can be set to change automatically when performing inspections for objects with varying sizes, such as electronic chip components. This feature ensures that the optimum measurement regions are always used for inspection.

Setting screen



Measurement screen



Set frames for adjusting the region size.

The inspection region automatically adapts to the object size.

■ Flexible Search

Using this method, matching is performed using more than one reference image and so the F160 can perform inspection for objects with varying shapes. This feature helps to reduce incorrect judgements.



Matching can be performed for products with varying shapes by using more than one reference image.

A Variety of Functions Accessible with Easy-to-Use Menus

■ Rotation Search

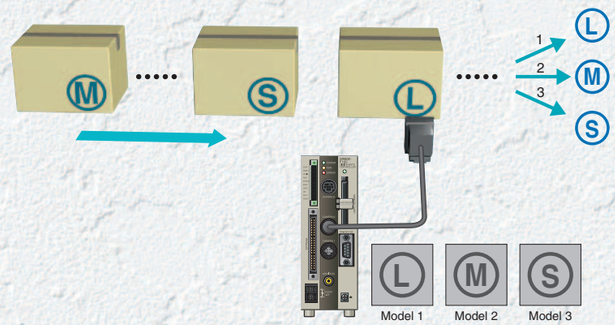
Using this method, search is performed while the image is rotated. Processing is performed 10 times faster than with existing models. Using angle interpolation, it is possible to detect angles with a high degree of precision.



Example: Searching in a rotation range of 360 with a skipping angle of 5 .

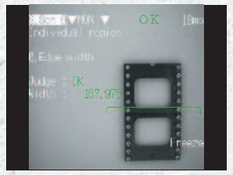
■ Classification

A search is performed for more than one model, and the model number with the highest correlation is output. The flexible search function can be used for applications involving objects with different shapes.



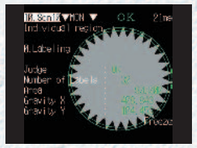
■ Edge Width

The positions of both edges of an object are detected with high accuracy, and from this the width of the object is calculated. It is not necessary to set expressions for calculating the width.



■ Labeling

The number of labels (i.e., objects) inside the measurement region is counted. After they have been sorted according to area or center of gravity, the measurement data for specified labels is output.



Counting gears



Inspecting the position and number of buttons

■ Position Displacement Compensation

With the F160, compensation using only the outline of the object, 2-stage position compensation, and setting priorities for the compensation direction are all possible.



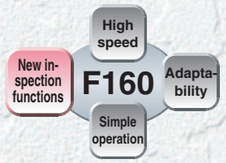
Compensation in the X direction followed by compensation in the Y direction.

■ Expressions

Judgement and data output based on a maximum of 32 expressions is possible. Up to 32 variables (representing other expressions) can be used, enabling more complex calculations.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



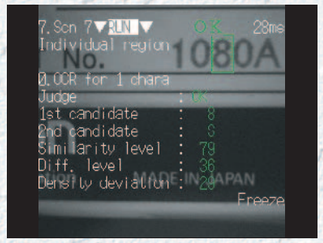
Inspection Revolutionized with New Algorithms

■ QUEST Character Recognition

The F160 uses OMRON's character recognition system - QUEST.

Features

- The user does not have to register characters.
- High-level of discrimination of similar characters.
- Adapts to fluctuations in shape and size.



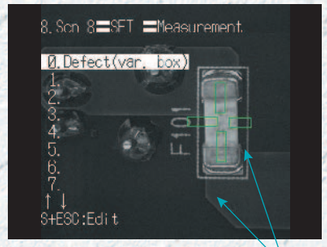
Use for any type of character



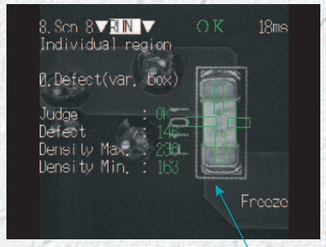
■ "Variable Box" Measurement for Defect Inspection

The measurement region can be set to change automatically when performing inspections for objects with varying sizes, such as electronic chip components. This feature ensures that the optimum measurement regions are always used for inspection.

Setting screen



Measurement screen



Set frames for adjusting the region size.

The inspection region automatically adapts to the object size.

■ Flexible Search

Using this method, matching is performed using more than one reference image and so the F160 can perform inspection for objects with varying shapes. This feature helps to reduce incorrect judgements.



Matching can be performed for products with varying shapes by using more than one reference image.

A Variety of Functions Accessible with Easy-to-Use Menus

■ Rotation Search

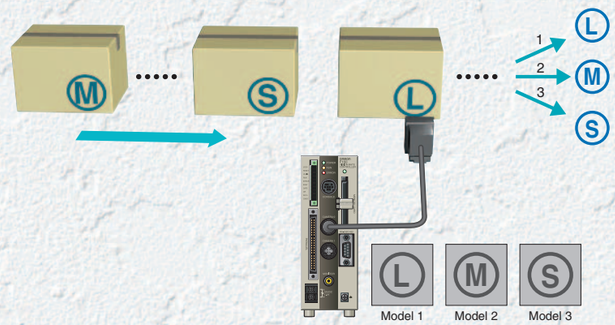
Using this method, search is performed while the image is rotated. Processing is performed 10 times faster than with existing models. Using angle interpolation, it is possible to detect angles with a high degree of precision.



Example: Searching in a rotation range of 360 with a skipping angle of 5 .

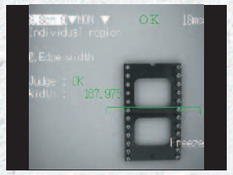
■ Classification

A search is performed for more than one model, and the model number with the highest correlation is output. The flexible search function can be used for applications involving objects with different shapes.



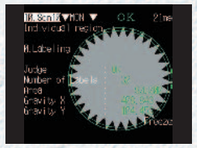
■ Edge Width

The positions of both edges of an object are detected with high accuracy, and from this the width of the object is calculated. It is not necessary to set expressions for calculating the width.



■ Labeling

The number of labels (i.e., objects) inside the measurement region is counted. After they have been sorted according to area or center of gravity, the measurement data for specified labels is output.



Counting gears



Inspecting the position and number of buttons

■ Position Displacement Compensation

With the F160, compensation using only the outline of the object, 2-stage position compensation, and setting priorities for the compensation direction are all possible.



Compensation in the X direction followed by compensation in the Y direction.

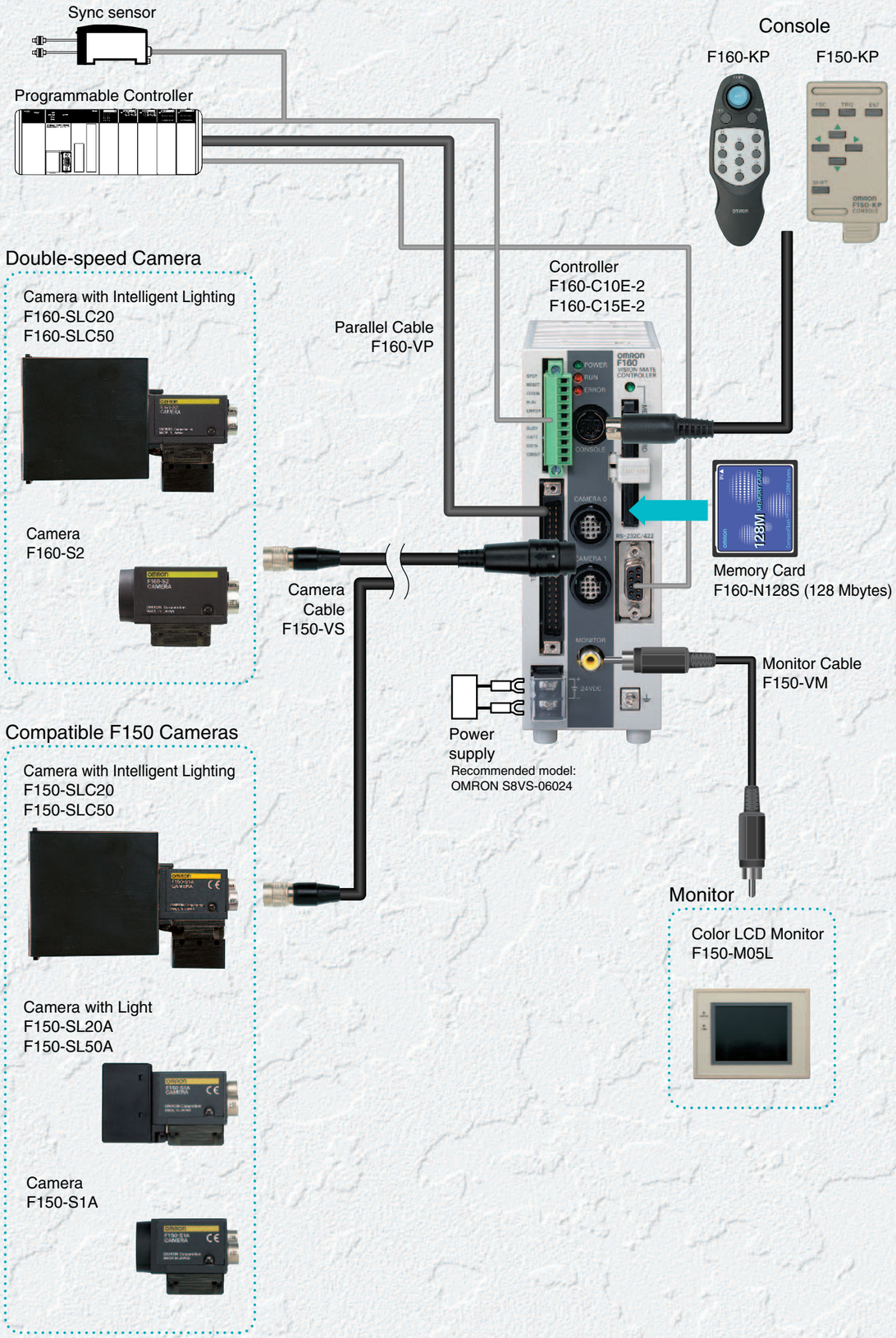
■ Expressions

Judgement and data output based on a maximum of 32 expressions is possible. Up to 32 variables (representing other expressions) can be used, enabling more complex calculations.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

System Configuration

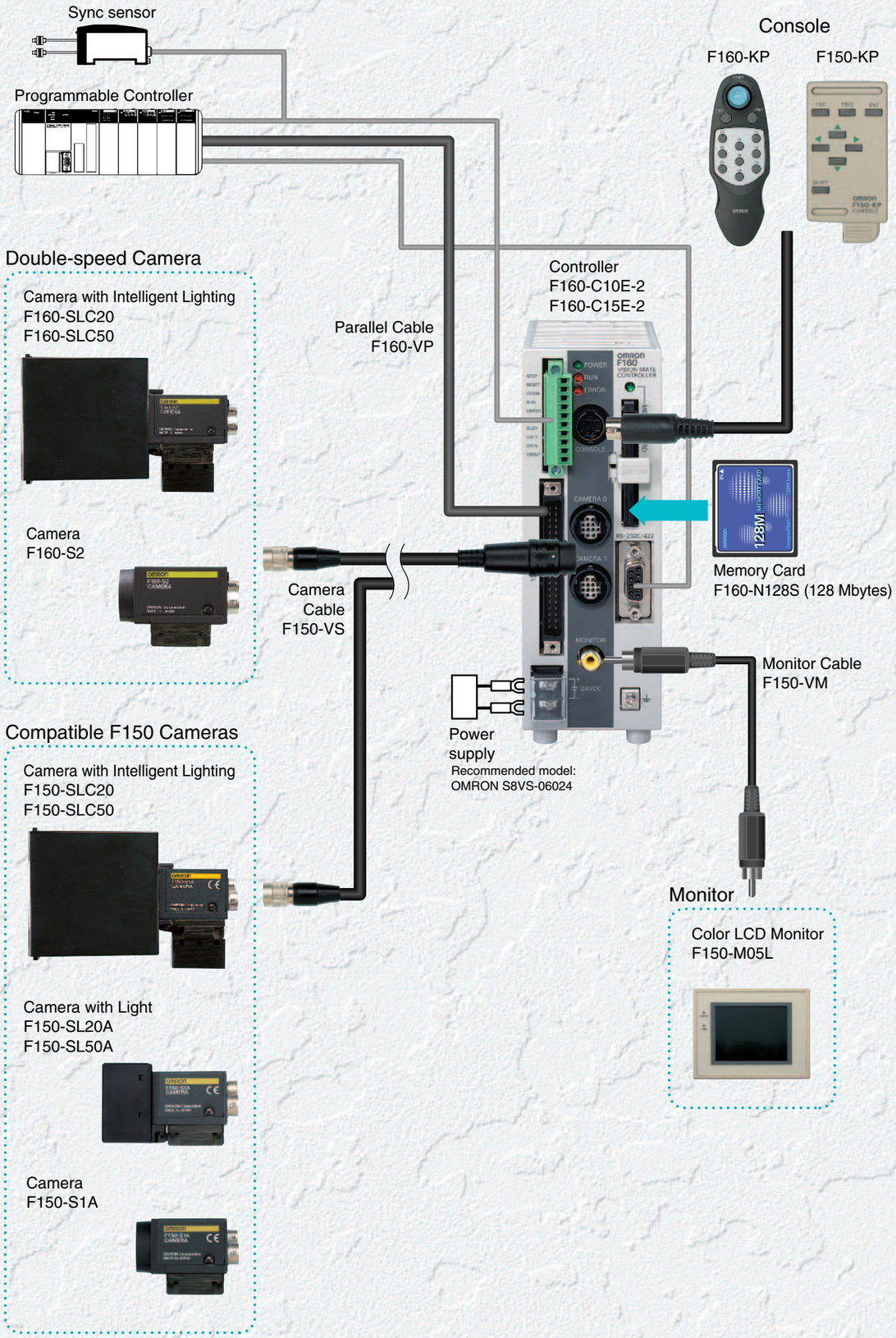


Standard Models

Name		Model number	Comments
Controller		F160-C10E-2	NPN input/output
		F160-C15E-2	PNP input/output
Double-speed Camera	**Camera with Intelligent Lighting**	F160-SLC20	
		F160-SLC50	
	Camera only	F160-S2	With partial function.
Compatible F150 Cameras	**Camera with Intelligent Lighting**	F150-SLC20	
		F150-SLC50	
	Camera with Light	F150-SL20A	
		F150-SL50A	
	Camera only	F150-S1A	
Console		F160-KP	
		F150-KP	
Color LCD Monitor		F150-M05L	
Memory Card		F160-N128S	Memory capacity: 128 Mbytes
Camera Cable		F150-VS	For Double-speed Camera and compatible F150 Cameras. Cable length: 3 m
Monitor Cable		F150-VM	Cable length: 2 m
Parallel Cable		F160-VP	Loose-wire cable for parallel I/O connectors. Cable length: 2 m

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

System Configuration



Standard Models

Name		Model number	Comments
Controller		F160-C10E-2	NPN input/output
		F160-C15E-2	PNP input/output
Double-speed Camera	**Camera with Intelligent Lighting**	F160-SLC20	
		F160-SLC50	
	Camera only	F160-S2	With partial function.
Compatible F150 Cameras	**Camera with Intelligent Lighting**	F150-SLC20	
		F150-SLC50	
	Camera with Light	F150-SL20A	
		F150-SL50A	
	Camera only	F150-S1A	
Console		F160-KP	
		F150-KP	
Color LCD Monitor		F150-M05L	
Memory Card		F160-N128S	Memory capacity: 128 Mbytes
Camera Cable		F150-VS	For Double-speed Camera and compatible F150 Cameras. Cable length: 3 m
Monitor Cable		F150-VM	Cable length: 2 m
Parallel Cable		F160-VP	Loose-wire cable for parallel I/O connectors. Cable length: 2 m

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Specifications

■ Ratings/Functions

● Controller: F160-C10E-2/C15E-2

Item	Specifications		Conversational Menu Mode	Expert Menu Mode
Connectable Cameras			F150-S1A/SL20A/SL50A/SLC20/SLC50, F160-S2/SLC20/SLC50 etc.	
Number of Cameras connectable			1	2
Number of pixels			512 x 484 (H x V)	
Number of scenes			32 (Expansion possible using Memory Card.)	
Image storage function			Maximum of 35 images stored	
Filtering			——	Smoothing (strong, weak), edge enhancement, edge extraction (horizontal, vertical, both horizontal and vertical), dilation, erosion, median, background suppression
Position displacement compensation			Set either automatically or manually Compensation directions: X, Y, and θ (360°) directions	Compensation directions: X, Y, and θ (360°) directions Detection methods: Binary center of gravity, axis angle, labeling, rotation search, gray search, edge position
Number of measurement regions			32 regions per scene	
Applications			7 types available (presence, orientation, dimensions, defects, conformity, position, chips and burs)	——
Measurement data			Automatically selected according to the application.	Gravity and area, gravity and axis, gray search, precise search, rotation search, flexible search, relative search, defect, area (variable box), defect (variable box), edge position, edge pitch, edge width, density average, labeling, OCR for 1 character, classification
Data operation functions (expressions)			——	Number : 32 expressions can be set for judgements, data, and variables used in other expressions Operations : Arithmetic operations, square root, absolute value, remainder, distance, angle, maximum, minimum, SIN, COS, ATAN, AND, OR, NOT
Results output			Overall judgements, judgements for each measurement region	Overall judgements, judgements for each measurement region, expression results, measurement/expression data
Functions for customizing operations			——	Menu masking, password setting, shortcut keys
Functions for customizing screens			——	Display items : Character strings (measurement values, judgement results, times, user-specified characters, measurement region names) Figures (lines, boxes, circles, cross cursors) Specified parameters : Display color, position, size
Number of slots for Memory Cards			1	
Monitor interface			1 channel (color, monochrome)	
Serial communications			RS-232C/422A, 1 channel	
Parallel I/O			13 inputs and 23 outputs including control I/O points	
	Input/ Output type	NPN	F160-C10E	
		PNP	F160-C15E	
Power supply voltage			20.4 to 26.4 VDC	
Current consumption			Approx. 1.6 A (with two F160-SLC50 Cameras connected)	
Ambient temperature			Operating: 0 to 50°C Storage: -25 to 65°C (with no icing or condensation)	
Ambient humidity			Operating and storage: 35% to 85% (with no condensation)	
External dimensions			56 x 160 x 110 (W x H x D) mm (not including connectors and other protruding parts)	
Weight			Approx. 570 g (Controller only)	

● Double-speed Camera: F160-S2

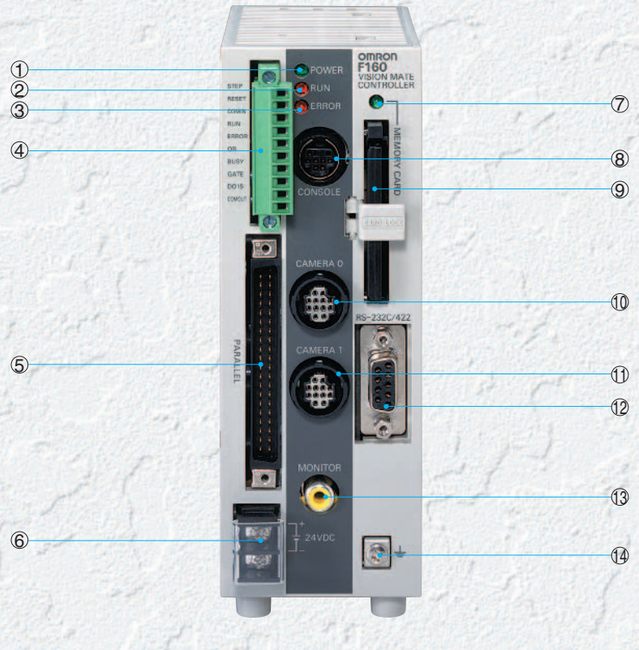
Picture element	1/3" Interline CCD
Effective pixels	659 x 494 (H x V)
Scanning method	1/60-s non-interlace (frame) mode, 1/120-s 2:1 interlace (field) mode
Shutter	Electronic shutter; select from 8 shutter-speed settings (1/120 to 1/20,000 s) using menu.
Camera with Intelligent Lighting	F160-SLC20 (field of vision: 20 mm), F160-SLC50 (field of vision: 50 mm)
External dimensions	31 x 40 x 54.5 (W x H x D) mm (not including connectors and other protruding parts)
Weight	Approx. 85 g (Camera only)

● Monitor

Item / Name / Model number	F150-M05L Color LCD Monitor
Size	5.5 inches
Type	Liquid crystal color TFT
Resolution	320 x 240 dots
Input signals	NTSC composite video (1.0 V/75 Ω)
Power supply voltage	20.4 to 26.4 VDC
Current consumption	Approx. 700 mA
Ambient temperature	Operating: 0 to 50°C Storage: -25 to 65°C (with no icing or condensation)
Ambient humidity	Operating or storage: 35% to 85% (with no condensation)
Weight (Monitor only)	Approx. 610 g
Accessories	Instruction manual and 4 mounting brackets

Component Names and Functions

● F160-C10E-2/C15E-2



① **Power indicator**
Lit while power is ON.

② **RUN indicator**
Lit while the F160 is in Run Mode.

③ **ERROR indicator**
Lit when an error has occurred.

④ **I/O terminals (control lines)**
Connect the F160 to external devices such as sync sensors or PLCs.

⑤ **I/O connector (data lines)**
Connects the F160 to external devices such as sync sensors or PLCs.

⑥ **Power supply terminals**
Connect the power supply.

⑦ **Memory Card indicator**
Lit while power is supplied to the Memory Card.

⑧ **Console connector**
Connects the F160 to the Console.

⑨ **Memory Card slot**
Holds the Memory Card.

⑩ **Camera 0 connector**
Connects to Camera 0.

⑪ **Camera 1 connector**
Connects to Camera 1.

⑫ **RS-232C/422 connector**
Connects the F160 to an external device such as a computer or PLC.

⑬ **Monitor connector**
Connects to the Monitor.

⑭ **Ground terminal**
Connects to the ground wire

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Specifications

■ Ratings/Functions

● Controller: F160-C10E-2/C15E-2

Item	Specifications		Conversational Menu Mode	Expert Menu Mode
Connectable Cameras			F150-S1A/SL20A/SL50A/SLC20/SLC50, F160-S2/SLC20/SLC50 etc.	
Number of Cameras connectable			1	2
Number of pixels			512 x 484 (H x V)	
Number of scenes			32 (Expansion possible using Memory Card.)	
Image storage function			Maximum of 35 images stored	
Filtering			——	Smoothing (strong, weak), edge enhancement, edge extraction (horizontal, vertical, both horizontal and vertical), dilation, erosion, median, background suppression
Position displacement compensation			Set either automatically or manually Compensation directions: X, Y, and θ (360°) directions	Compensation directions: X, Y, and θ (360°) directions Detection methods: Binary center of gravity, axis angle, labeling, rotation search, gray search, edge position
Number of measurement regions			32 regions per scene	
Applications			7 types available (presence, orientation, dimensions, defects, conformity, position, chips and burs)	——
Measurement data			Automatically selected according to the application.	Gravity and area, gravity and axis, gray search, precise search, rotation search, flexible search, relative search, defect, area (variable box), defect (variable box), edge position, edge pitch, edge width, density average, labeling, OCR for 1 character, classification
Data operation functions (expressions)			——	Number : 32 expressions can be set for judgements, data, and variables used in other expressions Operations : Arithmetic operations, square root, absolute value, remainder, distance, angle, maximum, minimum, SIN, COS, ATAN, AND, OR, NOT
Results output			Overall judgements, judgements for each measurement region	Overall judgements, judgements for each measurement region, expression results, measurement/expression data
Functions for customizing operations			——	Menu masking, password setting, shortcut keys
Functions for customizing screens			——	Display items : Character strings (measurement values, judgement results, times, user-specified characters, measurement region names) Figures (lines, boxes, circles, cross cursors) Specified parameters : Display color, position, size
Number of slots for Memory Cards			1	
Monitor interface			1 channel (color, monochrome)	
Serial communications			RS-232C/422A, 1 channel	
Parallel I/O			13 inputs and 23 outputs including control I/O points	
	Input/ Output type	NPN	F160-C10E	
		PNP	F160-C15E	
Power supply voltage			20.4 to 26.4 VDC	
Current consumption			Approx. 1.6 A (with two F160-SLC50 Cameras connected)	
Ambient temperature			Operating: 0 to 50°C Storage: -25 to 65°C (with no icing or condensation)	
Ambient humidity			Operating and storage: 35% to 85% (with no condensation)	
External dimensions			56 x 160 x 110 (W x H x D) mm (not including connectors and other protruding parts)	
Weight			Approx. 570 g (Controller only)	

● Double-speed Camera: F160-S2

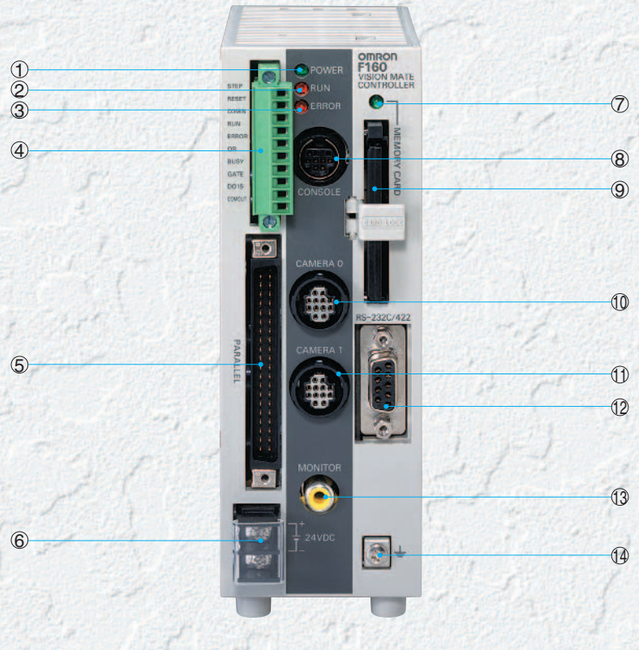
Picture element	1/3" Interline CCD
Effective pixels	659 x 494 (H x V)
Scanning method	1/60-s non-interlace (frame) mode, 1/120-s 2:1 interlace (field) mode
Shutter	Electronic shutter; select from 8 shutter-speed settings (1/120 to 1/20,000 s) using menu.
Camera with Intelligent Lighting	F160-SLC20 (field of vision: 20 mm), F160-SLC50 (field of vision: 50 mm)
External dimensions	31 x 40 x 54.5 (W x H x D) mm (not including connectors and other protruding parts)
Weight	Approx. 85 g (Camera only)

● Monitor

Item / Name / Model number	F150-M05L Color LCD Monitor
Size	5.5 inches
Type	Liquid crystal color TFT
Resolution	320 x 240 dots
Input signals	NTSC composite video (1.0 V/75 Ω)
Power supply voltage	20.4 to 26.4 VDC
Current consumption	Approx. 700 mA
Ambient temperature	Operating: 0 to 50°C Storage: -25 to 65°C (with no icing or condensation)
Ambient humidity	Operating or storage: 35% to 85% (with no condensation)
Weight (Monitor only)	Approx. 610 g
Accessories	Instruction manual and 4 mounting brackets

Component Names and Functions

● F160-C10E-2/C15E-2



① **Power indicator**
Lit while power is ON.

② **RUN indicator**
Lit while the F160 is in Run Mode.

③ **ERROR indicator**
Lit when an error has occurred.

④ **I/O terminals (control lines)**
Connect the F160 to external devices such as sync sensors or PLCs.

⑤ **I/O connector (data lines)**
Connects the F160 to external devices such as sync sensors or PLCs.

⑥ **Power supply terminals**
Connect the power supply.

⑦ **Memory Card indicator**
Lit while power is supplied to the Memory Card.

⑧ **Console connector**
Connects the F160 to the Console.

⑨ **Memory Card slot**
Holds the Memory Card.

⑩ **Camera 0 connector**
Connects to Camera 0.

⑪ **Camera 1 connector**
Connects to Camera 1.

⑫ **RS-232C/422 connector**
Connects the F160 to an external device such as a computer or PLC.

⑬ **Monitor connector**
Connects to the Monitor.

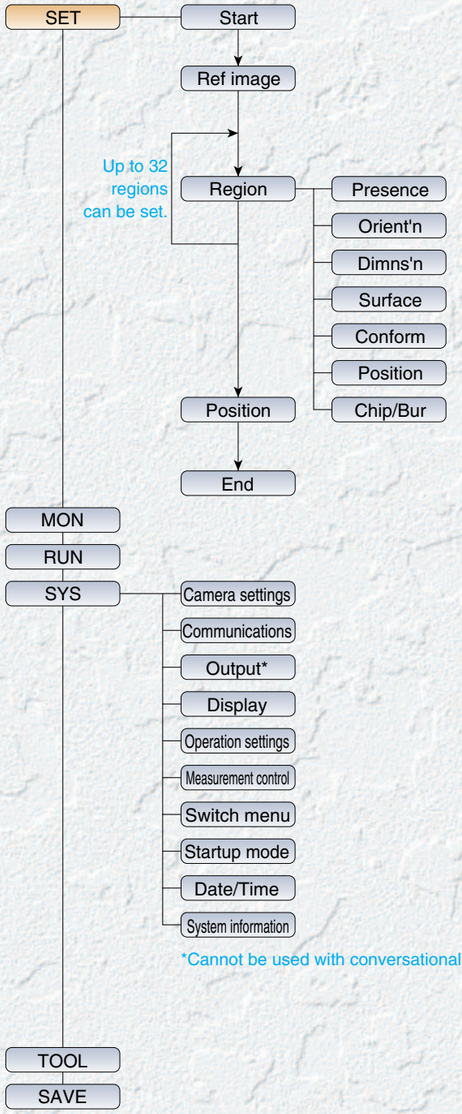
⑭ **Ground terminal**
Connects to the ground wire

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Menus

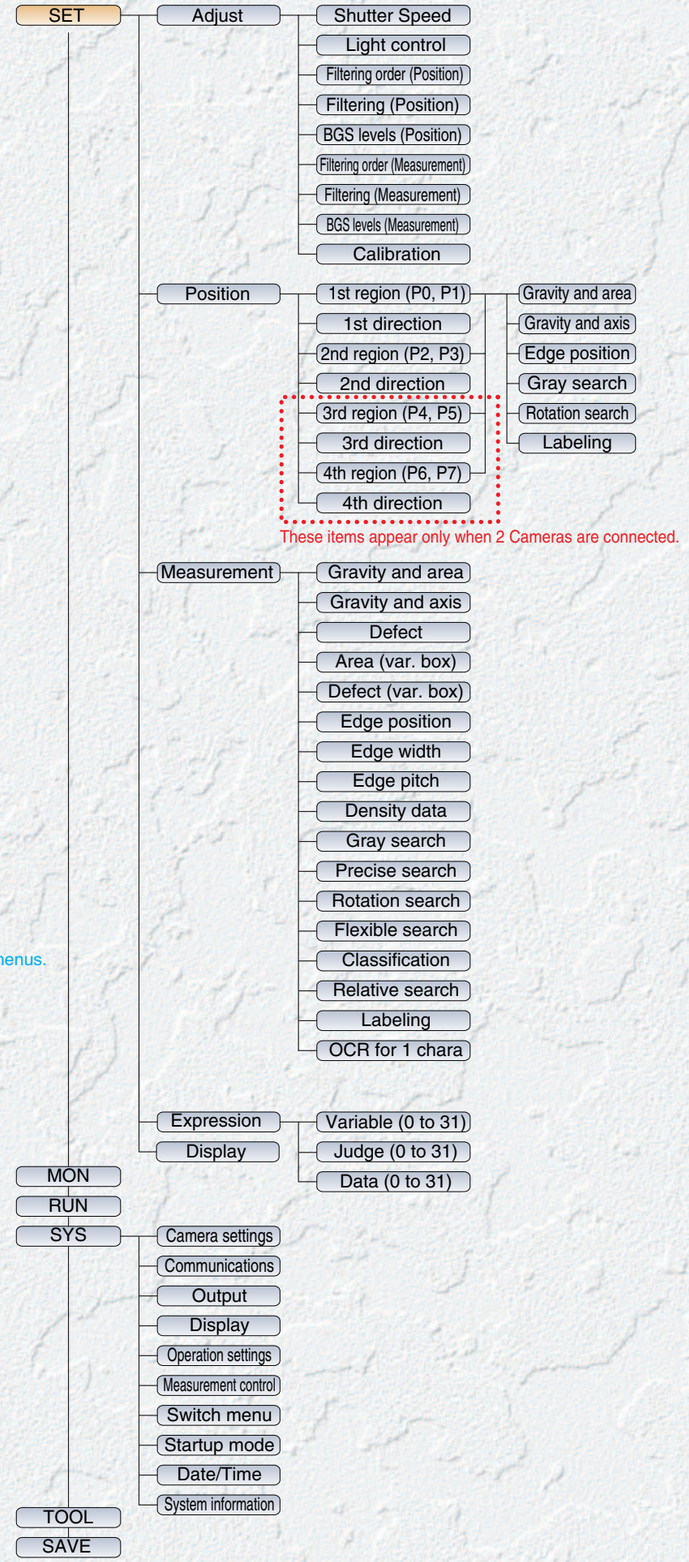
■ Menu Trees

● Conversational Menu Mode



*Cannot be used with conversational menus.

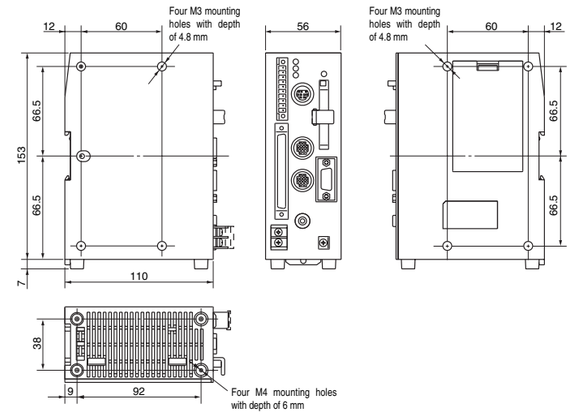
● Expert Menu Mode



Dimensions (Unit: mm)

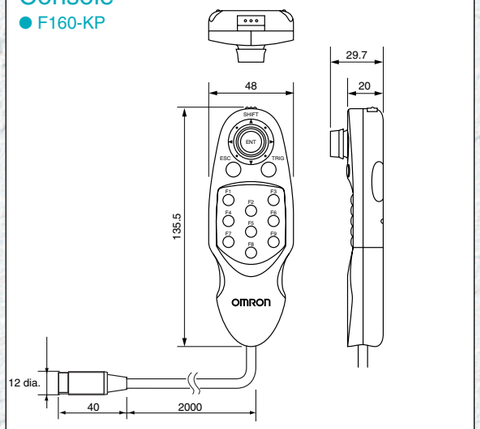
Controller

● F160-C10E-2/C15E-2

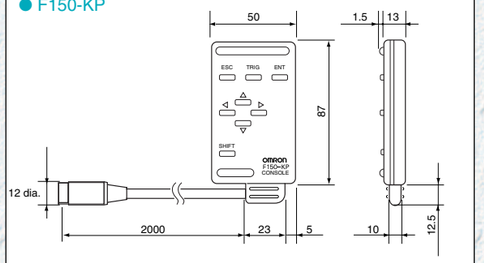


Console

● F160-KP

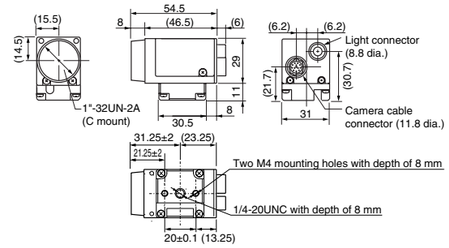


● F150-KP

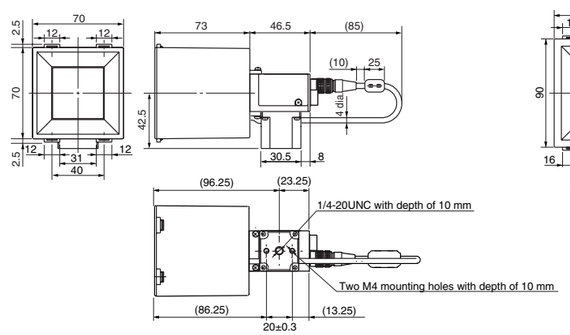


Double-speed Camera

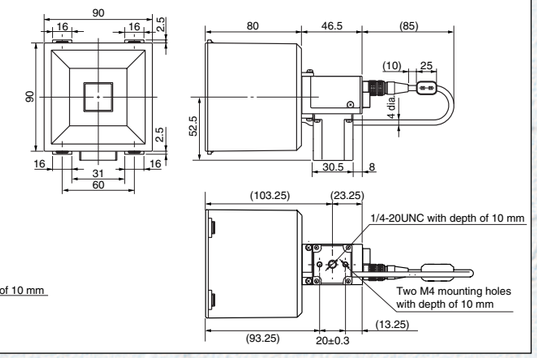
● F160-S2



● F160-SLC20

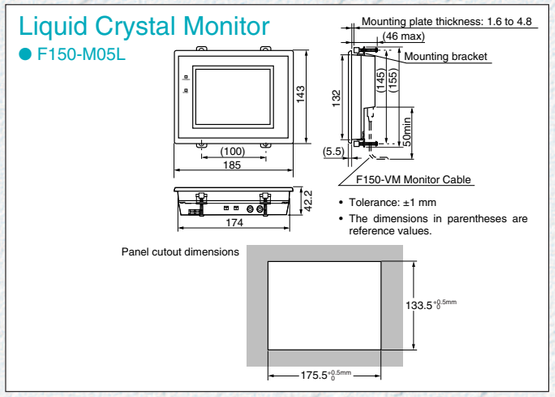


● F160-SLC50



Liquid Crystal Monitor

● F150-M05L

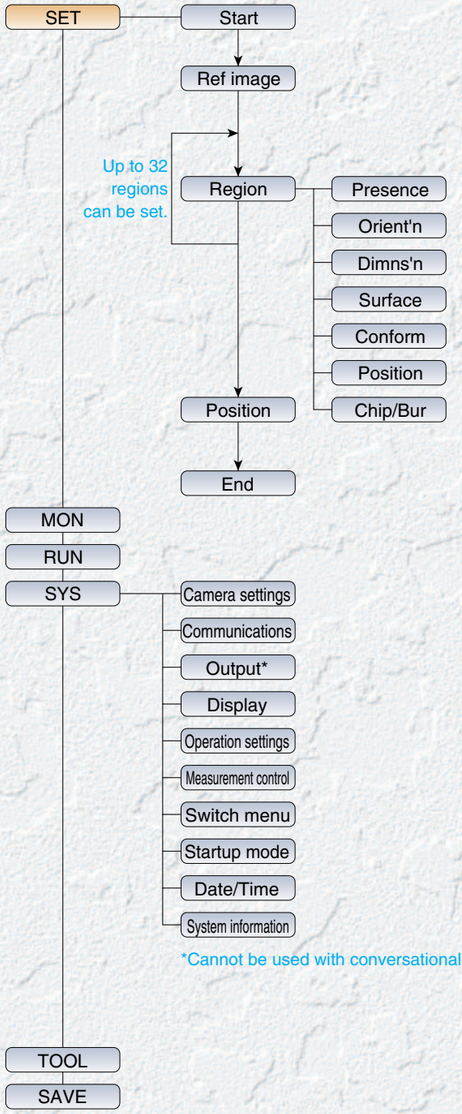


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Menus

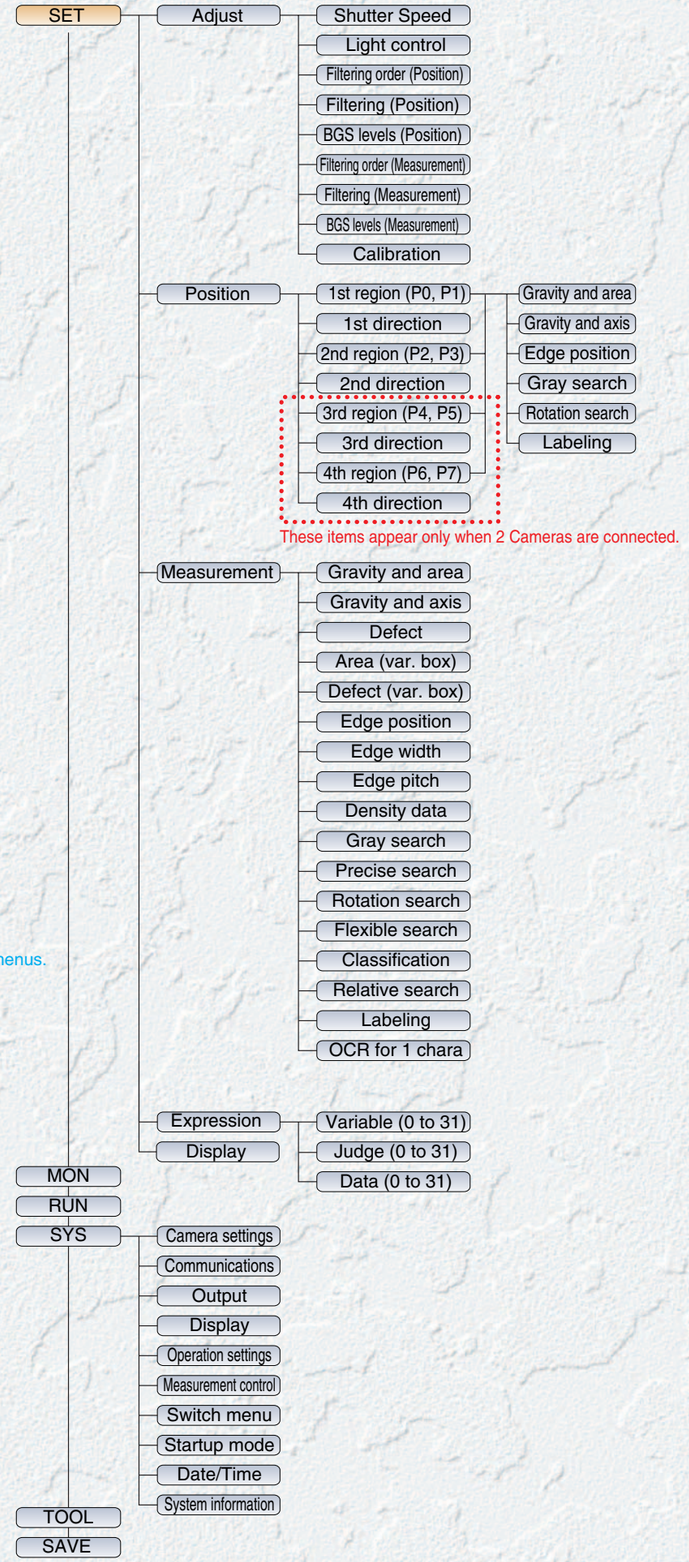
■ Menu Trees

● Conversational Menu Mode



*Cannot be used with conversational menus.

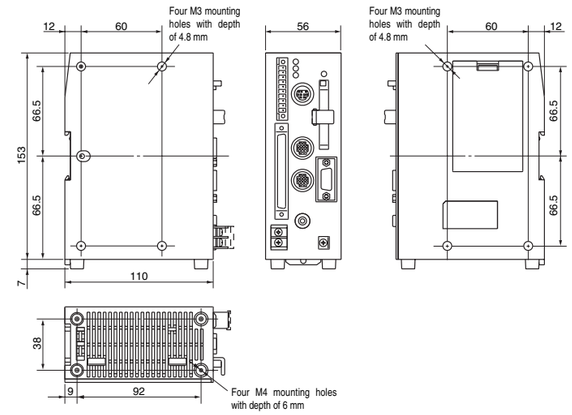
● Expert Menu Mode



Dimensions (Unit: mm)

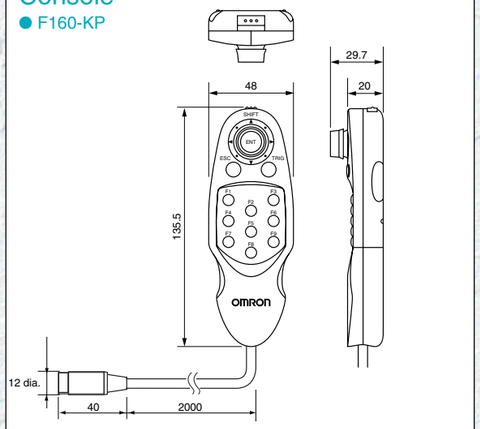
Controller

● F160-C10E-2/C15E-2

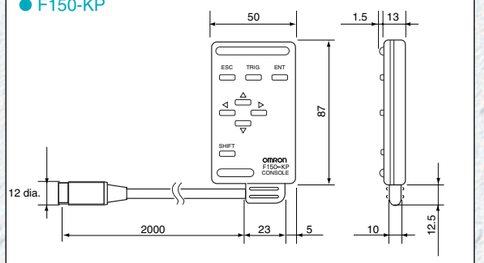


Console

● F160-KP

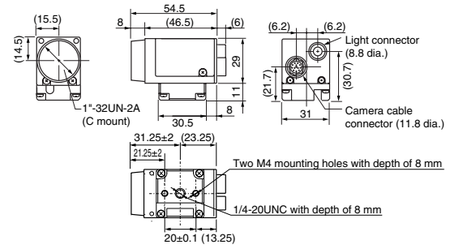


● F150-KP

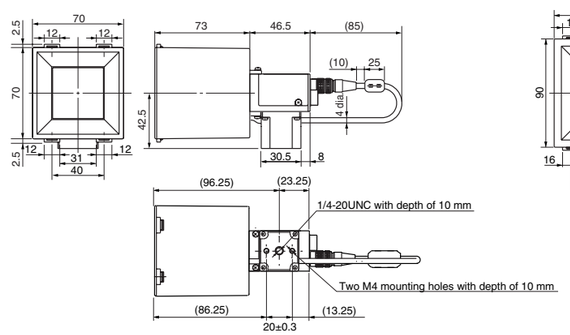


Double-speed Camera

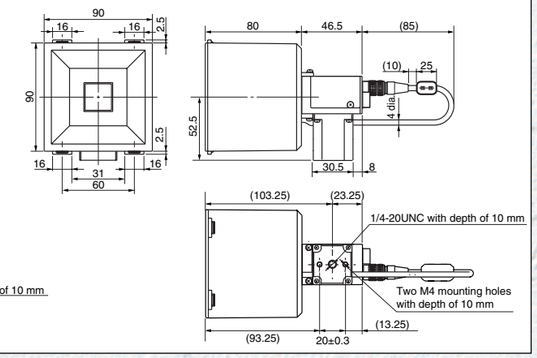
● F160-S2



● F160-SLC20

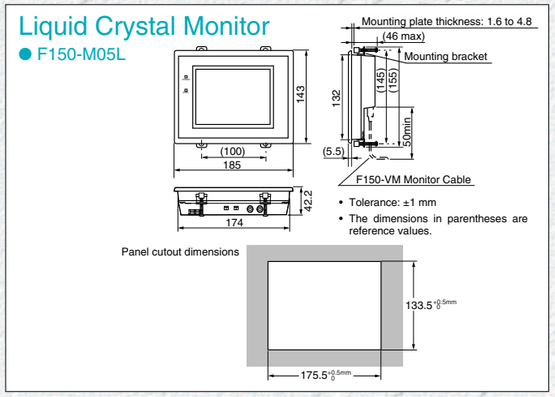


● F160-SLC50



Liquid Crystal Monitor

● F150-M05L



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Lenses (for use with the F160-S2 and F150-S1A only)

Note: The Lenses and Extension Tubes that appear on this page have not yet been released.

CCTV Lenses

● With reference to the optical graph below, select the lens and combination of Extension Tubes that give the required field of vision and camera distance.

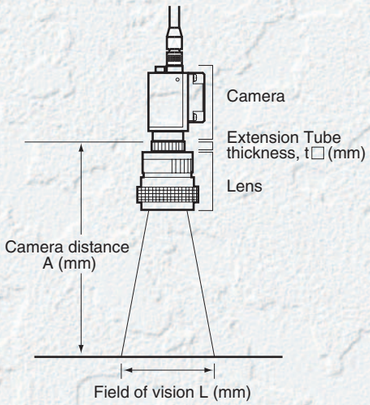
Item \ Model	CCTV Lenses							
	3Z4S-LE ML-0614	3Z4S-LE ML-0813	3Z4S-LE ML-1214	3Z4S-LE ML-1614	3Z4S-LE ML-2514	3Z4S-LE ML-5018	3Z4S-LE ML-7527	3Z4S-LE ML-10035
Appearance								
Focal length	6 mm	8 mm	12 mm	16 mm	25 mm	50 mm	75 mm	100 mm
Brightness	F1.4	F1.3	F1.4			F1.8	F2.7	F3.5
Filter size	M27 P0.5	M25.5 P0.5	M27 P0.5			M30.5 P0.5		
Lock mechanism	With lock screw for focus and aperture							

Extension Tubes

Model	Contents
3Z4S-LE ML-EXR	A set of seven Extension Tubes of thicknesses 40, 20, 10, 5, 2, 1, and 0.5 mm respectively.

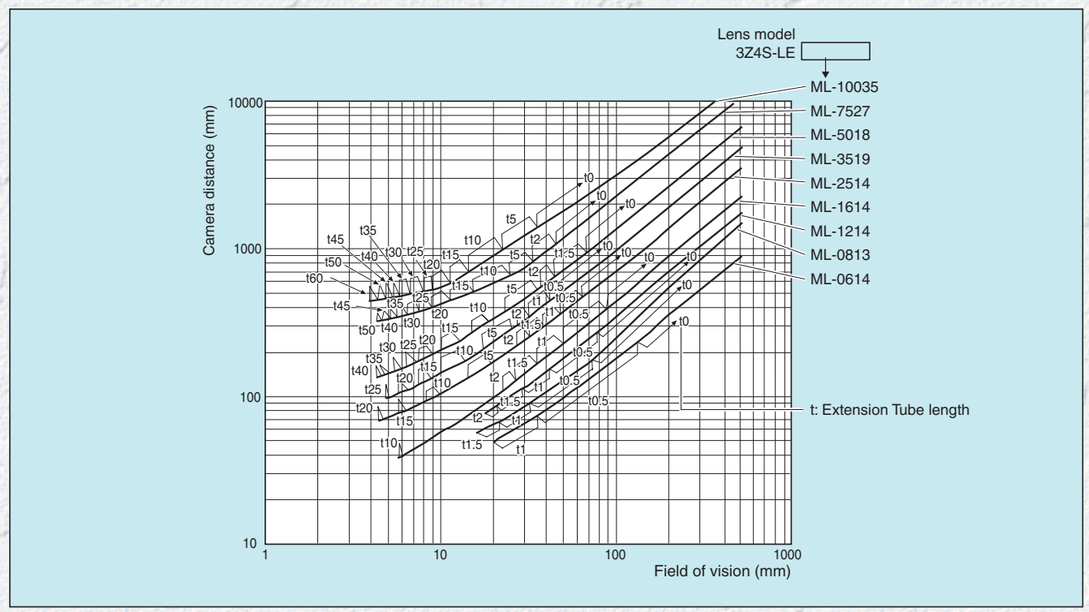
Meaning of Optical Graph

The X axis of the graph shows the field of vision L (mm), and the Y axis shows the camera distance A (mm). The curves on the graph indicate different lenses, and the "t" values indicate the lengths of the Extension Tubes.



Optical Graph

● The values given in the optical graph are only approximate values. It is recommended that the camera distance is adjusted by sliding the Camera forward or backward to get the required field of vision for actual operation.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This document provides information mainly for selecting suitable models. Please read the *F160-2 Vision Sensor SETUP MANUAL* (Cat. No. Z170) carefully for information that the user must understand and accept before purchase, including information on warranty, limitations of liability, and precautions.

OMRON

OMRON Corporation
Industrial Automation Company

Sensing Devices Division H.Q.
Application Sensors Division
Shiokoji Horikawa, Shimogyo-ku,
Kyoto, 600-8530 Japan
Tel: (81)75-344-7068/Fax: (81)75-344-7107

Regional Headquarters

OMRON EUROPE B.V.
Sensor Business Unit,
Carl-Benz-Str. 4, D-71154 Nufringen,
Germany
Tel: (49)7032-811-0/Fax: (49)7032-811-199

OMRON ELECTRONICS LLC
1 East Commerce Drive, Schaumburg, IL 60173
U.S.A.
Tel: (1)847-843-7900/Fax: (1)847-843-8568

OMRON ASIA PACIFIC PTE. LTD.
83 Clemenceau Avenue,
#11-01, UE Square,
239920 Singapore
Tel: (65)6835-3011/Fax: (65)6835-2711

OMRON (CHINA) CO., LTD.
Room 2211, Bank of China Tower,
200 Yin Cheng Road (M),
Shanghai, 200120 China
Tel: (86)21-5037-2222/Fax: (86)21-5037-2200

Authorized Distributor:

Cat. No. Q133-E1-04

Note:Specifications subject to change without notice.

Printed in Japan
0506-1M (0203) (C)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

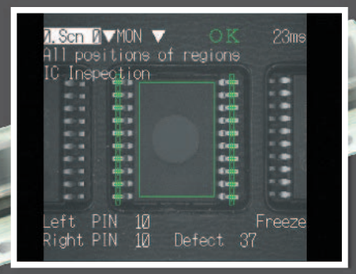
CE

OMRON

Faster and more powerful than anything in its class!

F160-2

Vision Sensor





realizing

Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the product.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Disclaimers

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the product may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased product.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

ERRORS AND OMISSIONS

The information in this catalog has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

COPYRIGHT AND COPY PERMISSION

This catalog shall not be copied for sales or promotions without permission.

This catalog is protected by copyright and is intended solely for use in conjunction with the product. Please notify us before copying or reproducing this catalog in any manner, for any other purpose. If copying or transmitting this catalog to another, please copy or transmit it in its entirety.

Cat. No. Q133-E1-04

2007.3

OMRON Corporation

Industrial Automation Company

http://www.ia.omron.com/

In the interest of product improvement, specifications are subject to change without notice.

(c)Copyright OMRON Corporation 2007 All Rights Reserved.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP