NEW

OMRON

Network Vision Sensor Series

F210-C10-ETN/F210-C15-ETN
F500-C10-ETN/F500-C15-ETN

Sensing
&
Storage
&
Network

Enhanced Storage & Network Function
Innovation to Quality Management

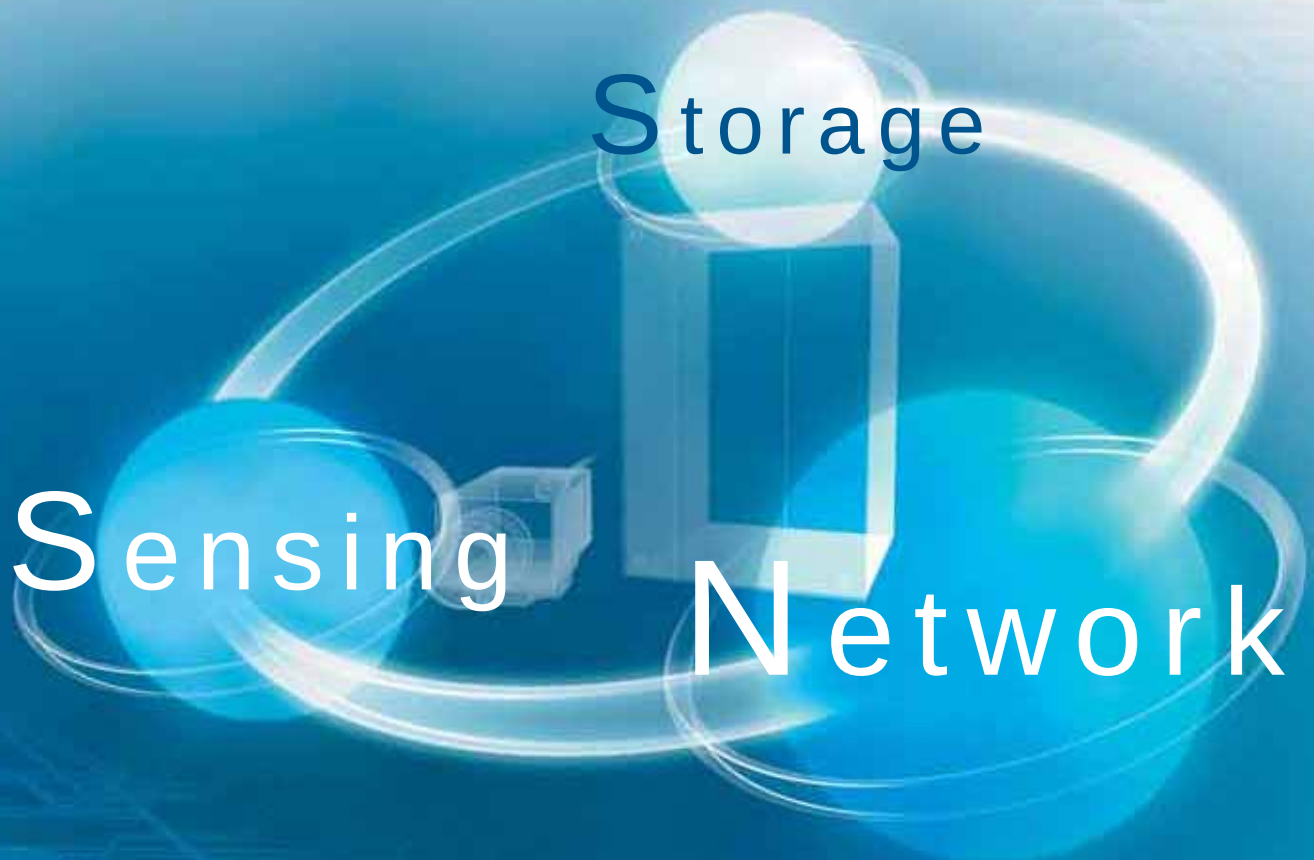
Evolution of Vision Sensors – from “Quality Detection” to “Quality Management”

Support to find the optimal settings for Quality Detection.

Support to improve daily Quality Enhancement by storing the data and images.

Support to transfer the data and images to the Quality Management System.

Greater precision and higher inspection stability have long been demanded from Vision Sensors. Recently, users have also been asking how they can get better use from inspection results and other data, with statements like, "I want to save the inspection images and use them to improve quality" and "I need to combine our inspection results with other data for accurate tracing."
OMRON's Network Vision Sensor Series incorporates an entirely new concept to meet these post-inspection needs.



Sensing Functions

Digital Interface

The Network Vision Sensor Series uses a Digital Interface Camera that is less susceptible to noise and inputs clearer images.

1-million-pixel Model

New

250,000-pixel Model

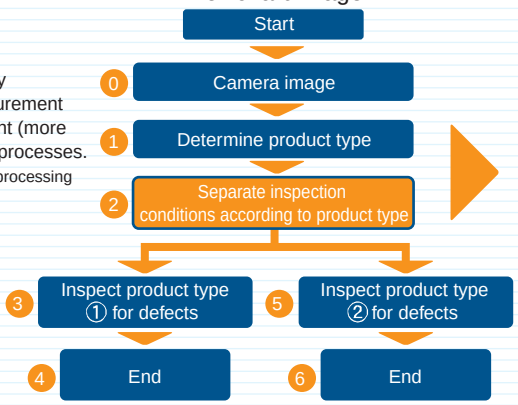
Flow Menus

Flexible Application Support

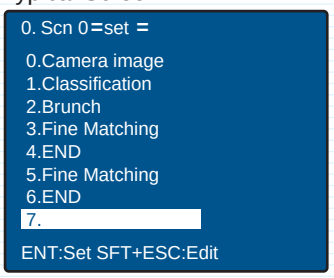
The menu system flexibly supports applications by combining processing items in response to measurement results and input signals, and giving you multi-point (more than 100*) region settings and multiple image preprocesses.

*The number of region varies depending on the size and processing items.

Flowchart Image



Typical Screen



Macros

Easy Customization, and No Need Compiling

Easy programming takes care of specific tasks that cannot be handled by menus alone, like displaying only the menus for routine work, carrying out complicated calculations, and simplifying robot communications.
This eliminates the need for special programming development.

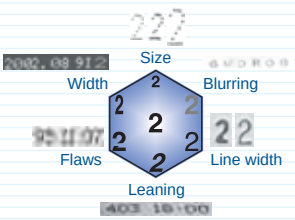
*Reverse Customization part in Customization Manual can help to make the macros easier.

Advanced Measurement Algorithms

A wealth of original OMRON measurement algorithms are provided.

Ideal for detecting minute defects and soiling

Fine Matching



Character verification with no dictionary registration required

QUEST Character Verification

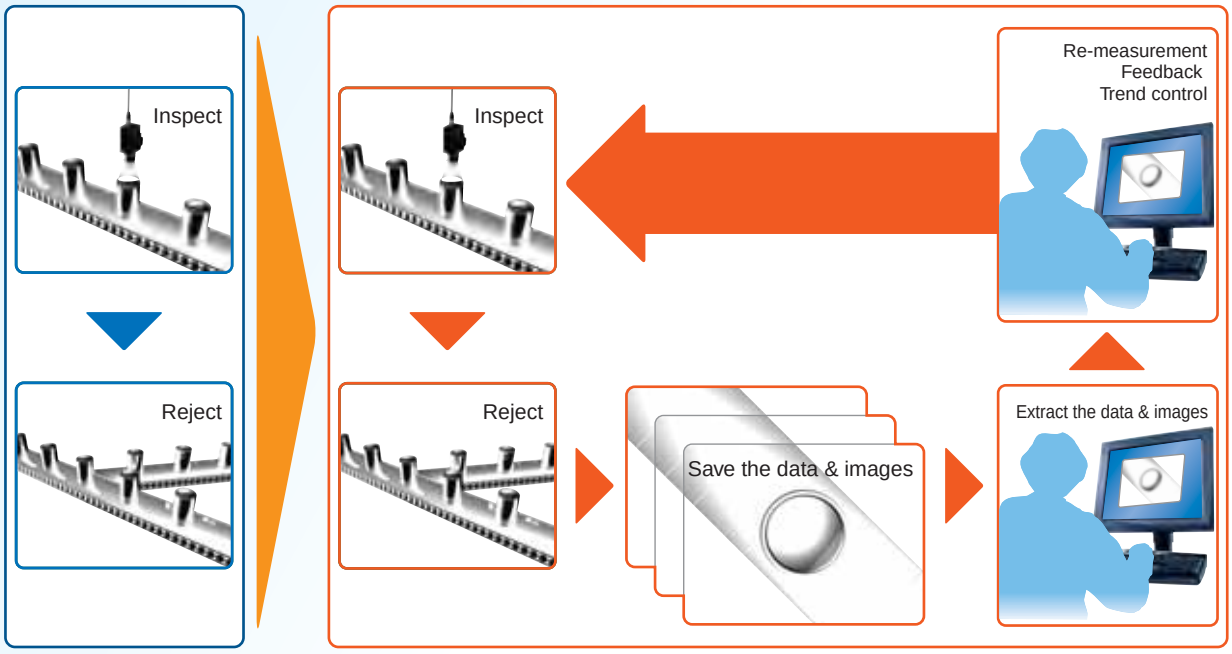
Low-contrast mark positioning

ECM Search

Storage Functions

Storage Functions Are Integrated with the Vision Sensor

Evolution from "OK or NG" to Quality Management



Data with measurement images, values, time stamps, and more can be stored.

Highly useful for adjusting the optimal inspection conditions at start-up and producing history reports for quality control.

Up to 1,500 images can be stored.

Enhanced Image Storage Functions

Offline Viewing

Compressing images mode: This function can increase the number of images to be stored. Up to 1,500 images can be stored inside the Controller.

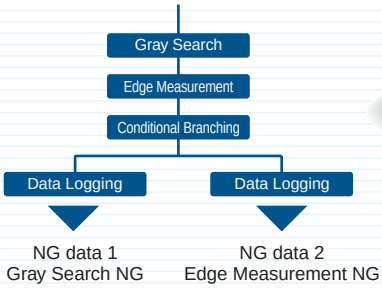
Offline Analysis

No Compressing images mode: The saved images are used to confirm inspection precision or to check results after resetting inspection conditions.

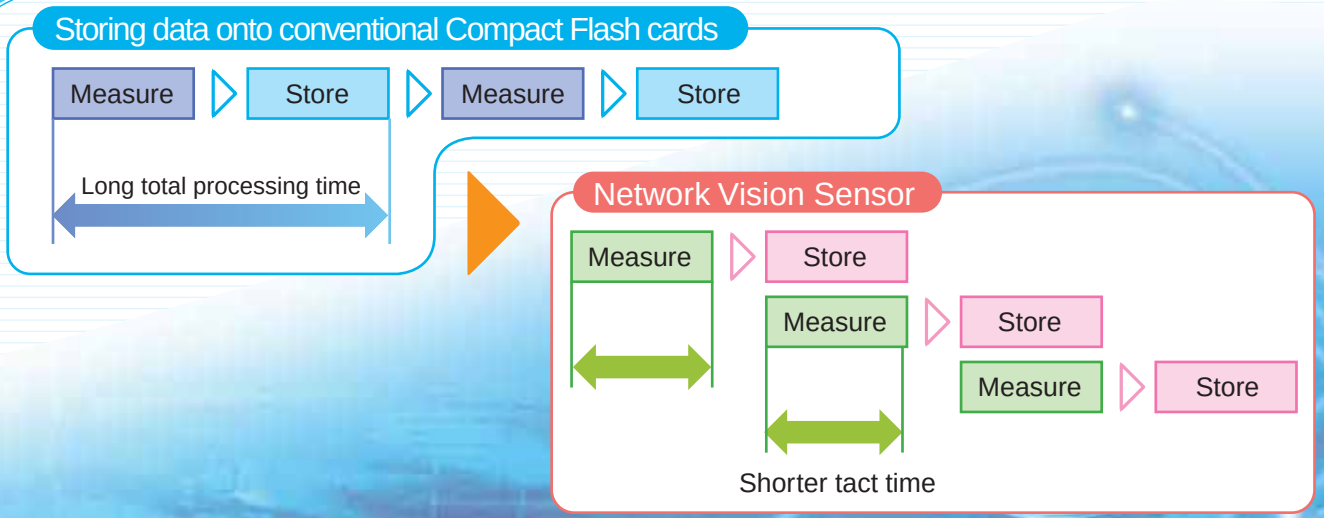
Optimal Storage Mode for Various purpose.

Save Data & Images by Each Inspection Item

The flow menus and macros support to store the data and images by each item. This strongly supports the trend control of inspection results and analysis aimed at improving quality.



Execute Measurement and Storage Functions Independently



Network Functions

Monitoring, Setting and Collecting measurement data – all remotely via Ethernet.

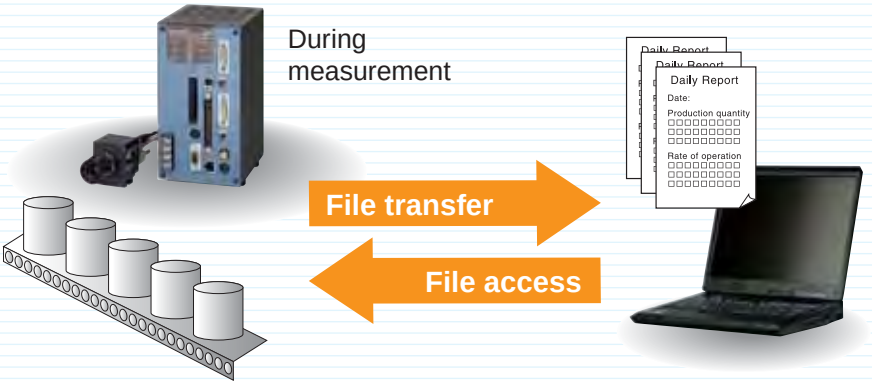
Real-time Monitor Function (Industry First)

You can display images from the Vision Sensor on your personal computer in real-time*1 using Ethernet. This lets you monitor live inspection images from a remote location.*2 You can also simultaneously view the images on a personal computer from several Controllers connected to the network.

*1 The transfer speed for live image depends on the network environment.
*2 Remote monitoring across a firewall is not possible.

Independent Measurement, Storage, and Communications

The data stored in the Controller can be transferred to a personal computer at any time. This lets you analyze the data without lowering the rate of operation for your production line.



High-speed Ethernet 100Base-TX

Even large-volume image files can be transferred at high speed. Naturally, multiple Controllers can be controlled from a single personal computer.

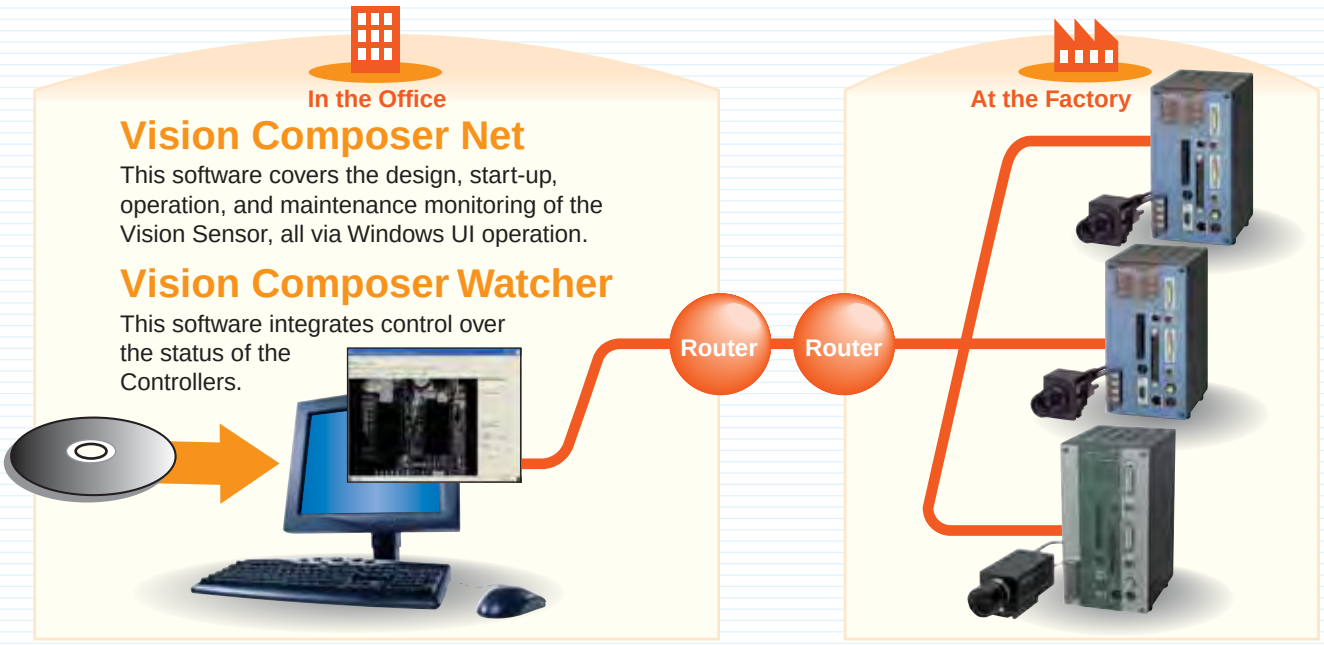
Remote Operations

Operations such as executing or stopping Vision Sensor measurement, setting or changing scene data, and collecting files saved on the Controller can all be done from a personal computer in another part of the plant, or even in a distant location.

The operations that were previously done from the Console can all be performed from a personal computer.

Vision Composer Net & Watcher

Two types of PC-tool maximize performance of the Network Vision Sensor.



Vision Composer Net

Security Function

The security function allows you to classify the operations of registered users into three ranks (Administrator, Supervisor, or Operator) depending on their access privileges.

Administrator	Change system data Register users Add access privileges
Supervisor	Add model data Re-register models Change inspection items
Operator	Change criteria Change display screens Adjust inspection regions

Screen Captures

Previously, images were stored via a Compact Flash Card inserted into the Controller. It is now possible to capture network-transferred live images on a personal computer at any desired point in time.

Capture on personal computer

Save

Vision Composer Watcher

Monitor Operating Conditions from a Remote Location

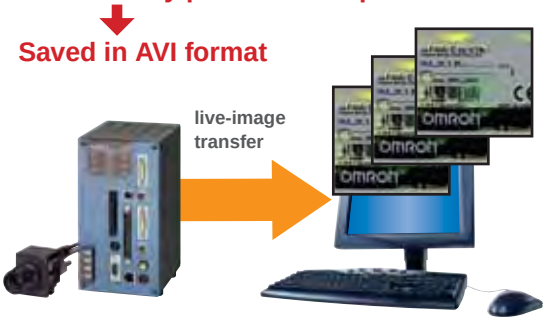
Controller A	Inspection A	During operation
Controller B	Inspection B	During maintenance
Controller C	Inspection C	Failure

Recording

Live images sent by the Controller can be recorded by a personal computer using the AVI format. Effective for trend control.

Recorded by personal computer

Saved in AVI format



Logging

This function lets you accumulate a variety of production data, including images, measurement values, time stamps, production quantity, and defect rates. The macro function in the Controller then makes it possible to process this into the form of data that you need.

Sensing Applications

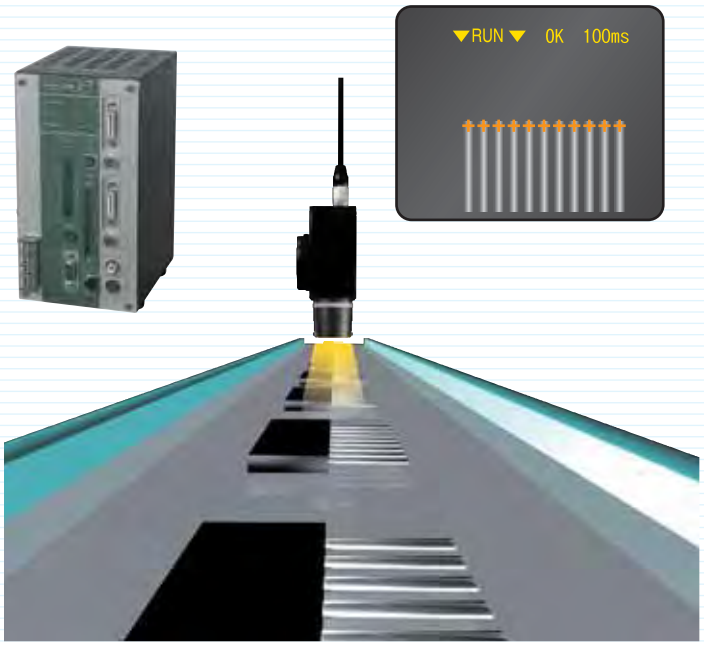
Connector Lead Measurement

Sensing

The high-resolution 1-million-pixel Camera produces highly precise measurements over a wide field of view, which enables rough positioning and large workpiece measurements with only a small number of passes.

Macros

Macros are ideal for determining accurate lead lengths to assure linearity near the lead tip, and for statistical processing of measurement data for trend control.



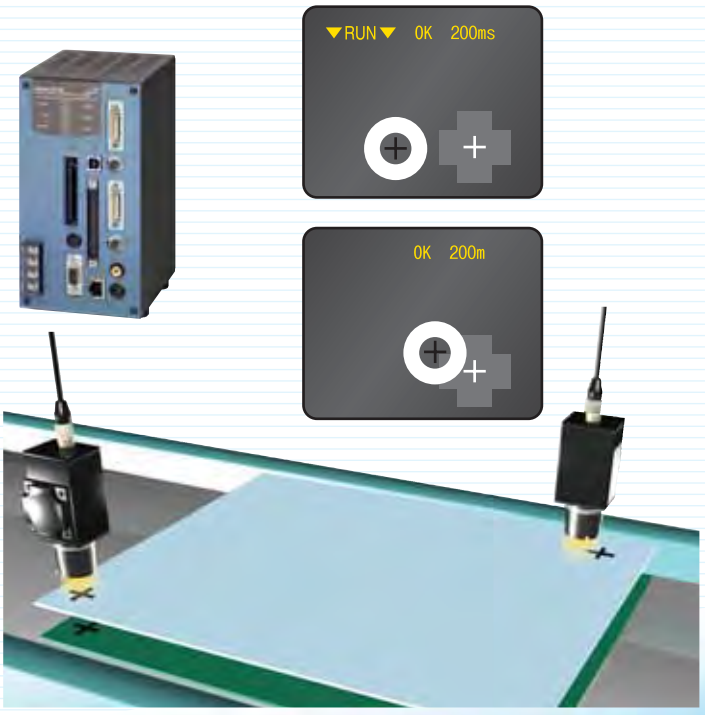
LCD Substrate Alignment

Sensing

The sharp, clear images of the Digital Interface Camera and OMRON's original EC technology algorithm lets you attain high-precision positioning even for low-contrast marks and overlaid marks with missing parts.

Macros

Positioning with even greater precision can be achieved by using original calibration methods. Macros can also be used to match protocols for output to a PLC or stage controller.



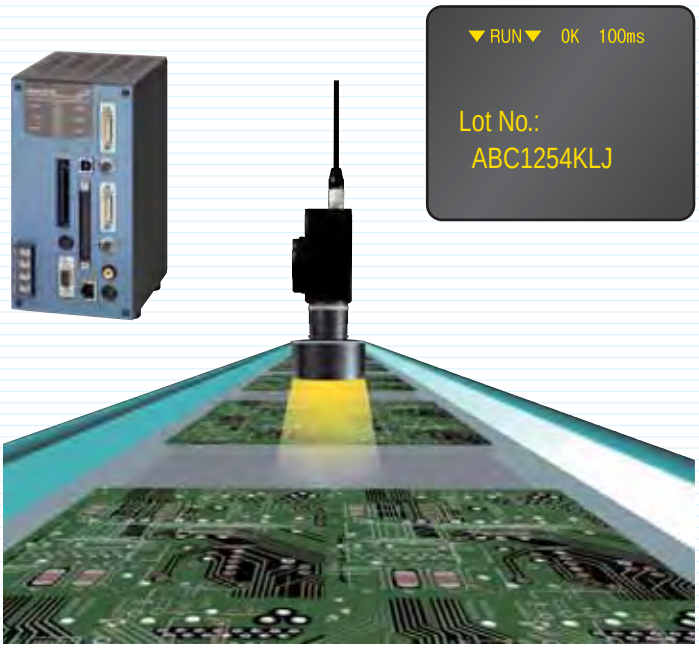
Character Verification on PCBs

Sensing

The easy setting of OMRON's original Quest character verification algorithm, which requires no dictionary registration, provides a level of recognition that approaches human sensitivity. Using a 1-million-pixel Camera, a character string can be verified in a single pass.

Macros

Macros can be used to process statistical data, such as the recognition rate and number of NG characters, or to correct for differences between the present time display and an external clock.



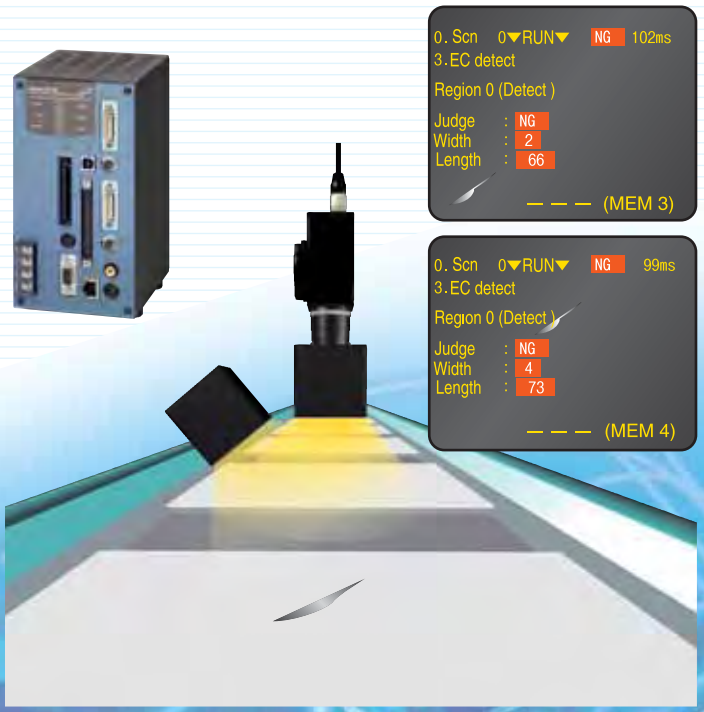
Detecting Cracks in Ceramic Substrates

Sensing

Cracks can be detected in ceramic substrates with a high degree of stability. An original OMRON algorithm eliminates the effects of irregular lighting and surface roughness to detect only the cracks.

Macros

When cracks cannot be detected using lighting directed from above, macros can be used to alter the lighting, for example, to enable oblique lighting.
(Lighting that is capable of external dimming is required.)

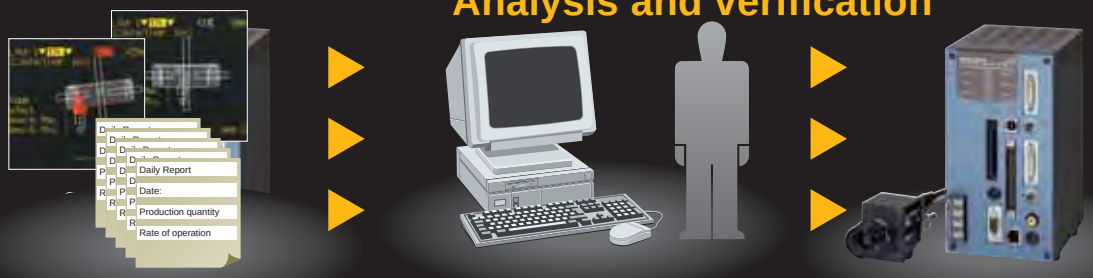


Storage & Network Applications

Start-up, Adjustments

Determine Optimal Inspection Conditions.

Accumulated measurement values
and images



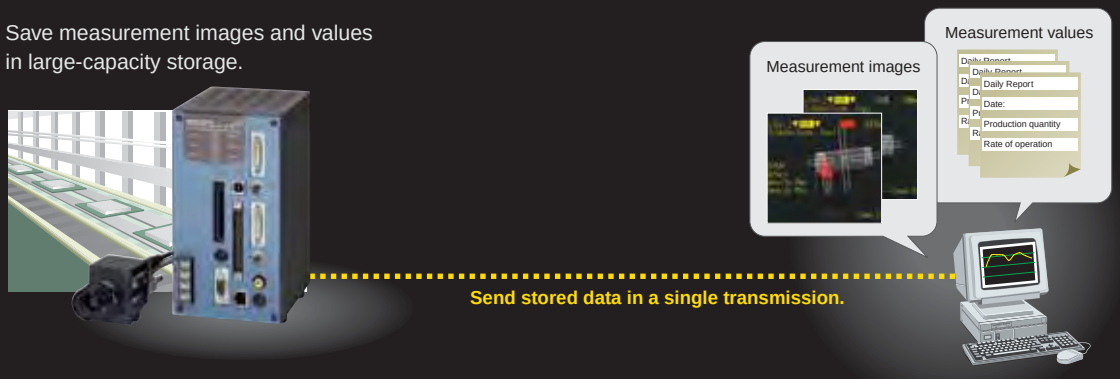
Analyze and verify accumulated measurement values and images

Optimal parameters can be determined by analyzing the images and measurement values accumulated in large-capacity storage. When image processing parameters have been changed, stored measurements can be re-measured.

Operation, Management

Monitor operating conditions for production management.

Save measurement images and values
in large-capacity storage.

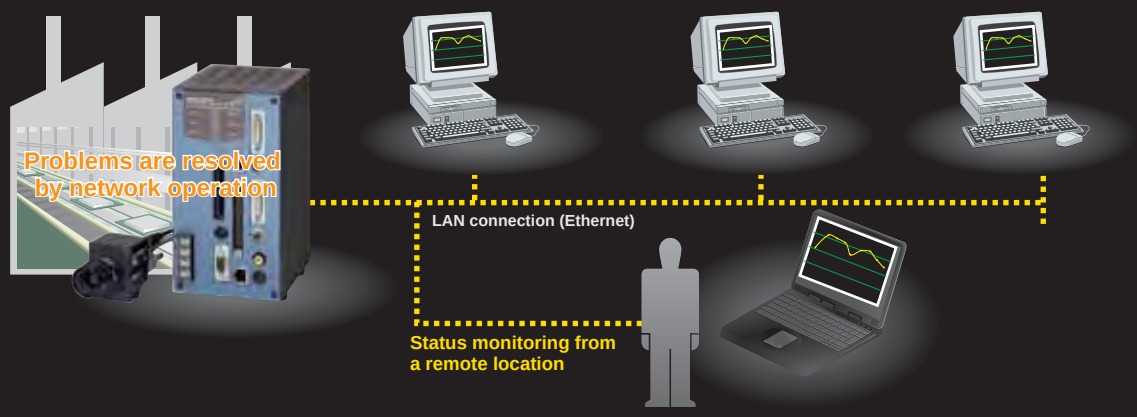


Measurement images and values can be saved in large-capacity storage.

You can save a wealth of measurement images and values in large-capacity storage. Because measurement and storage functions are independent, they have no effect on processing time.

Maintenance

Quick Problem Finding and Solving via Network.



The operating status can be observed over the network.

It is easy to collect historical data for defect analysis and quality control improvements.

System Configuration

CCTV Lenses*2

3Z4S-LE C1614A

3Z4S-LE B2514D

3Z4S-LE B5014A

High-precision Lenses

F500-LE16

F500-LE25

F500-LE50

Controllers

F210-C10-ETN (NPN)
F210-C15-ETN (PNP)

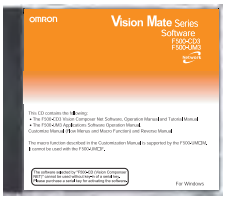
NEW

F500-C10-ETN (NPN)
F500-C15-ETN (PNP)

Application Software

F500-UM3ME/3FE

PC Support Software*1



F500-CD3E

Monitors

F500-M10L

F150-M05L

Consoles

F150-KP

F160-KP

Digital Interface Cameras

F210-S1 NEW

F500-S1

Camera Cables*3

F500-VS 2M

F500-VS2 2M
NEW

Monitor Cable

F150-VM 2M

*1 Vision Composer Net and Vision Composer Watcher are bundled with personal computer software.
*2 A variety of CCTV Lenses are available in addition to those shown above.
*3 In addition to the standard 2-meter cable length, 5- and 10-meter lengths are available.

Specifications

F210-C10-ETN/F210-C15-ETN

Connected Camera	F210-S1
No. of connectable Cameras	2
Processing resolution	512(H)x484(V)
No. of scenes	32 (Can be increased using Memory Cards.)
Image memory function	35 images max.
Storage	64 MB non-volatile memory
Operation and settings	Measurement items installed using Applications Software. Menu operations used to combine measurement items. Vision Composer Net can be used for operation and settings.
Menu language	Japanese or English (switchable)
Serial communications	USB series B: 1 channel
	RS-232C/422: 1 channel
Network communications	Ethernet 100Base-TX/10Base-T
Parallel I/O	11 inputs, 22 outputs
Monitor interface	Composite video output: 1 channel, S-VIDEO output: 1 channel
Memory Card interface	Compact Flash card slot, 1 channel
Power supply voltage	20.4 to 26.4 V DC
Current consumption	2.1 A max. (with two F210-S1 Cameras connected)
Ambient temperature	Operating: 0 to +50°C
	Storage: -25 to +65°C with no icing or condensation
Ambient humidity	Operating/storage: 35% to 85% with no condensation
Dimensions	100 x 198 x 134 (W x H x D) (without connectors and other protrusions)
Weight	Approx. 1.6 kg (Controller only)
Accessories	Ferrite core for Console (1) Setup Manual

F500-C10-ETN/F500-C15-ETN

Connected Camera	F500-S1
No. of connectable Cameras	2
Processing resolution	1024(H)x1024(V)
No. of scenes	32 (Can be increased using Memory Cards.)
Image memory function	35 images max.
Storage	256 MB non-volatile memory
Operation and settings	Measurement items installed using Applications Software. Menu operations used to combine measurement items. Vision Composer Net can be used for operation and settings.
Menu language	Japanese or English (switchable)
Serial communications	USB series B: 1 channel
	RS-232C/422: 1 channel
Network communications	Ethernet 100Base-TX/10Base-T
Parallel I/O	11 inputs, 22 outputs
Monitor interface	Composite video output: 1 channel, S-VIDEO output: 1 channel
Memory Card interface	Compact Flash card slot, 1 channel
Power supply voltage	20.4 to 26.4 V DC
Current consumption	2.1 A max. (with two F500-S1 Cameras connected)
Ambient temperature	Operating: 0 to +50°C
	Storage: -25 to +65°C with no icing or condensation
Ambient humidity	Operating/storage: 35% to 85% with no condensation
Dimensions	100 x 198 x 134 (W x H x D) (without connectors and other protrusions)
Weight	Approx. 1.6 kg (Controller only)
Accessories	Ferrite core for Console (1) Setup Manual

F210-S1

Imaging device	1/3-inch CCD
Pixel size	7.4µm (H) x 7.4µm (W)
Shutter	Electronic shutter, 8 shutter speeds (1/60 to 1/12,000 s), changed via menu
Partial function	Seven settings
Communications interface	Conforms to Camera Link
Ambient temperature	Operating: 0 to +50°C
	Storage: -25 to +60°C with no icing or condensation
Ambient humidity	Operating/storage: 35% to 85% with no condensation
Dimensions	43 x 43 x 49 mm (WxHxD) (without connectors and other protrusions)
Weight	Approx. 110 g
Accessories	Instruction Manual

F500-S1

Imaging device	2/3-inch CCD
Pixel size	6.45µm (H) x 6.45µm (W)
Shutter	Electronic shutter, 10 shutter speeds (1/24 to 1/10,000 s), changed via menu
Partial function	Four settings
Communications interface	Conforms to Camera Link
Ambient temperature	Operating: 0 to +50°C
	Storage: -25 to +60°C with no icing or condensation
Ambient humidity	Operating/storage: 35% to 85% with no condensation
Dimensions	50 x 40 x 90 mm (WxHxD) (without connectors and other protrusions)
Weight	Approx. 270 g
Accessories	Instruction Manual

F500-M10L

Size in inches	10.4 inches
Type	LCD TFT
Resolution	640 x 480
Brightness	350 cdm/m (typical)
Input signal	NTSC composite video (1.0 V/75 Ω termination), S-VIDEO
Power supply voltage	20.4 to 26.4 V DC
Current consumption	1.0 A max.
Ambient temperature	Operating: 0 to +50°C
	Storage: -20 to +65°C with no icing or condensation
Ambient humidity	Operating/storage: 30% to 80% with no condensation
Weight	Approx. 1.8 kg
Accessories	Instruction Manual, 4 mounting brackets
Dimensions	285 x 225 x 49 (WxHxD)

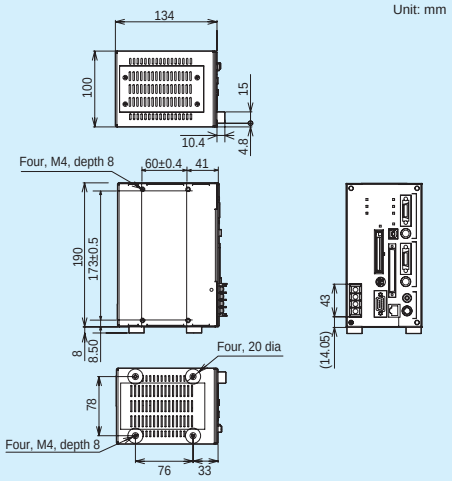
System Requirements for F500-CD3E Vision Composer Net

CPU	Pentium III 600 MHz min.(Pentium III 1 GHz min. recommended)
OS	Windows 2000 Professional, Service Pack 4 or higher Windows XP Home Edition, Service Pack 2 or higher Windows XP Professional, Service Pack 2 or higher
Memory	192 MB min. (256 MB min. recommended)
Hard disk	300 MB min. available space
Monitor	Resolution: 1,024 x 768 min. Display colors: High Color (16-bit) min. (True Color (32-bit) min. recommended)
Network	10BaseT-compliant network(100Base-TX recommended)
Vision Sensor	
Controller	F210-C10-ETN/F210-C15-ETN, F500-C10-ETN/F500-C15-ETN
Applications software	F500-UM Version 3.00 or later

Dimensions

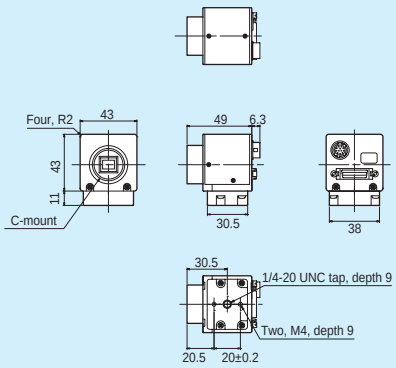
Controller **F210-C10-ETN/F210-C15-ETN**
F500-C10-ETN/F500-C15-ETN

Unit: mm



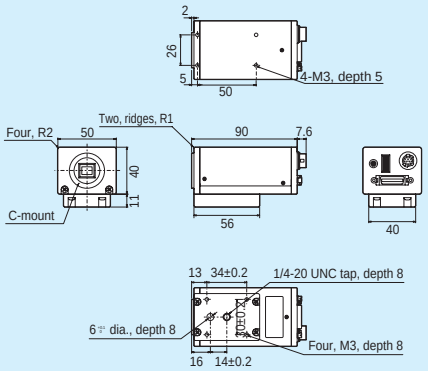
Camera **F210-S1**

Unit: mm



Camera **F500-S1**

Unit: mm



This document provides information mainly for selecting suitable models.
Please read the document Cat. No. SCHB-751A or Cat. No. SCHB-747B carefully for information that the user must understand and accept before purchase, including information on warranty, limitations of liability, and precautions.

OMRON Corporation
Industrial Automation Company

Application Sensors Division
Sensing Devices and
Components Division H.Q.
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. BEIJING OFFICE
Room 1028, Office Building, Beijing Capital Times Square,
No. 88 West Chang'an Road, Beijing, 100031 China
Tel: (86)10-8391-3005/Fax: (86)10-8391-3688

Authorized Distributor:

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