

Vision System

FH-2050-□/-5□50-□ Series

AI-based automated visual inspection

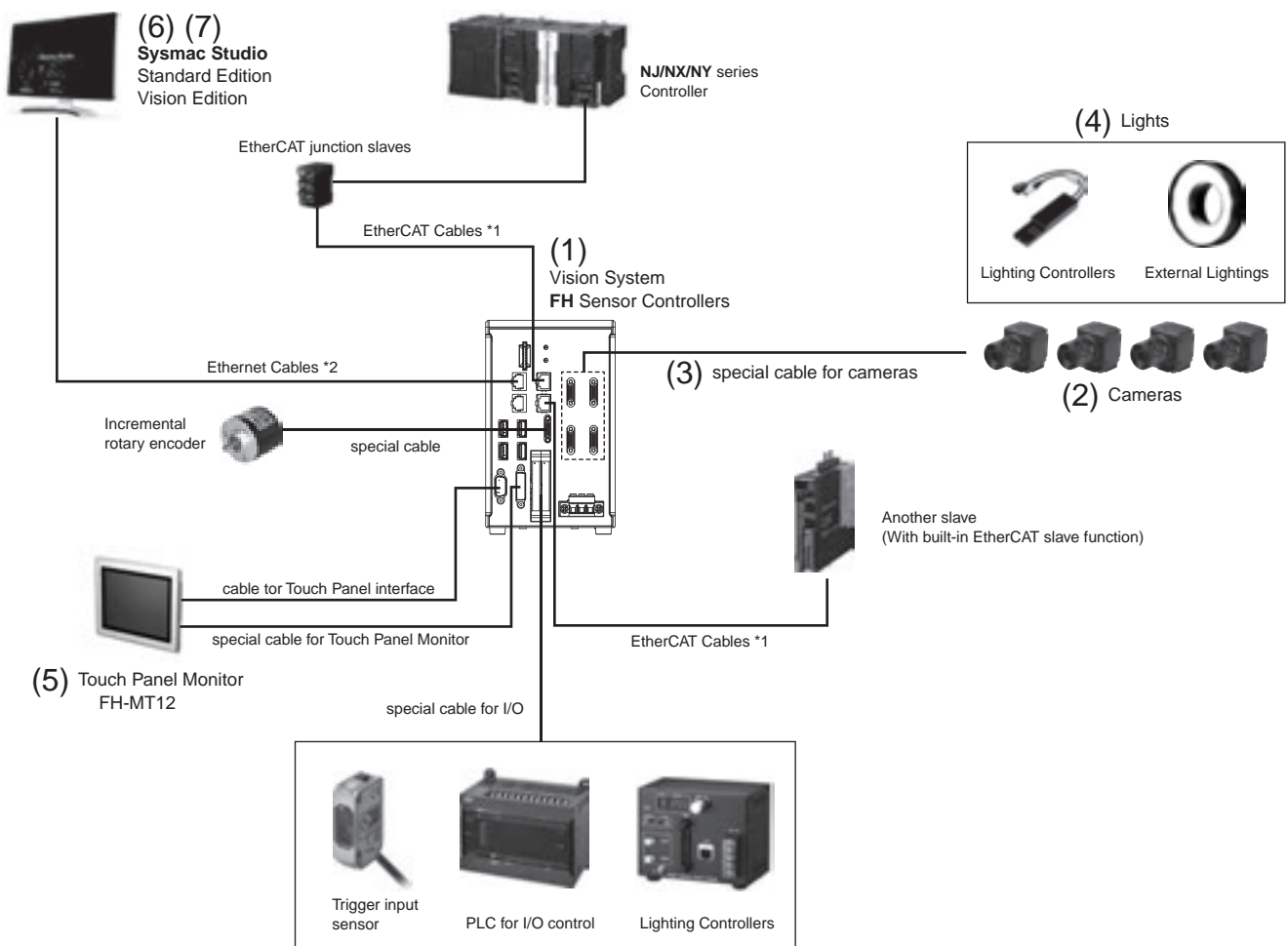
- AI reproduces human sensibility and experience
- Software for flexible automation
- Design interface for quick setup



System configuration

EtherCAT connections for FH series

Example of the FH Sensor Controllers (4-camera type)



*1. To use STP (shielded twisted-pair) cable of category 5 or higher with double shielding (braiding and aluminum foil tape) for EtherCAT and RJ45 connector.
 *2. To use STP (shielded twisted-pair) cable of category 5 or higher for Ethernet and RJ45 connector.

FH-2050-□/-5□50-□ Series



(1) Controllers

Select a controller based on the required processing speed and network.

| | Series | CPU | Performance | Memory | No. of connectable cameras | Fieldbus |
|---------------------------------------|----------------|-----------------------------------|-------------|----------------------|----------------------------|----------------------------------|
| High-speed, Large-capacity Controller | FH-5550 Series | Intel® Core™ i7 processor 4 cores | ★★★★★ | RAM 32 GB, ROM 64 GB | 8 max. | PROFINET, EtherNet/IP®, EtherCAT |
| High-speed Controller | FH-5050 Series | Intel® Core™ i7 processor 4 cores | ★★★★★ | RAM 8 GB, ROM 32 GB | 8 max. | PROFINET, EtherNet/IP®, EtherCAT |
| Standard Controller | FH-2050 Series | Intel® Celeron® processor 2 cores | ★★★ | RAM 8 GB, ROM 32 GB | 8 max. | PROFINET, EtherNet/IP®, EtherCAT |

★: The more stars, the higher the performance.

| Optional product (sold separately) | Model |
|---------------------------------------|----------|
| Scratch Detect AI Software Installer* | FH-UMA11 |

* This product can be installed on the FH-5□50-series Controller (version 6.40 or later).

(2) Cameras

Choose the right camera to suit your required number of pixels. Easy-to-use cameras with built-in light are also available.



| No. of pixels | High-speed camera | Standard camera | Rolling shutter camera | Camera with built-in light |
|-------------------|-------------------|-----------------|------------------------|----------------------------|
| 20.4 Mpix* | --- | --- | FH-S□21R | --- |
| 12 Mpix | FH-S□X12 | --- | --- | --- |
| 5 Mpix | FH-S□X05 | FZ-S□5M3 | FH-S□05R | --- |
| 4 Mpix | FH-S□04 | --- | --- | --- |
| 3.2 Mpix | FH-S□X03 | --- | --- | --- |
| 2 Mpix | FH-S□02 | FZ-S□2M | --- | --- |
| 1.6 Mpix | FH-S□X01 | --- | --- | --- |
| 0.4 Mpix/0.3 Mpix | FH-S□X | FZ-S□ | --- | FZ-SQ□□□□ |

* 20.4 Mpix Cameras can be used with the FH-5050/2050-series High-speed, Large-capacity Controllers.

(4) Lights

Omron offers a complete line-up of lights required for image processing. The use of the camera-mount lighting controller allows you to control lighting conditions from the FH Controller, making system configuration simple.



External lighting controller

| Description | LED | High-brightness LED |
|----------------------------------|-----------------|---------------------|
| Camera-mount Lighting Controller | FLV-TCC | FL-TCC |
| Bar Light | FLV-BR | FL-BR |
| Direct Ring Light | FLV-DR | FL-DR |
| Low Angle Ring Light | FLV-DL | --- |
| Coaxial Light | FLV-CL | --- |
| Shadowless Light | FLV-FR/FP/FS/FQ | --- |
| Spot Light | FLV-EP | --- |
| Direct Back/Edge Type Light | FLV-DB/FB | --- |
| Dome Light | FLV-DD | --- |
| Photometric Stereo Light * | --- | FL-PS |

* The FL-TCC Camera-mount Lighting Controller cannot be used. Use the FL-TCC1PS Lighting Controller for Photometric Stereo Light.

Built-in lighting controller

| Description | Model |
|-------------|-------|
| MDCM Light | FL-MD |

Refer to the Vision Accessory Catalog (Cat. No. Q198) for details.

(5) Touch panel monitor

The touch panel monitor is optimized for the operation of the FH Series.



| Description | Model |
|---|------------|
| Touch Panel Monitor 12.1 inches | FH-MT12 |
| DVI-Analog Conversion Cable for Touch Panel Monitor | FH-VMDA □□ |
| USB Cable for Touch Panel Monitor | FH-VUAB □□ |

* RS-232C cables for long-distance connections are also available. Refer to Ordering Information for details.

(3) Camera cables

The cable line-up includes bend-resistant cables and right-angle cables. Use the FZ-VSJ Cable Extension Unit for cable extensions.



| Description | Model |
|---|--------------|
| Camera Cable | FZ-VS□ □□M |
| Bend-resistant Camera Cable | FZ-VSB3 □□M |
| Super-bend-resistant Camera Cable | FZ-VSBX □□M |
| Right-angle Camera Cable | FZ-VL□ □□M |
| Bend-resistant Right-angle Camera Cable | FZ-VSLB3 □□M |
| Cable Extension Unit | FZ-VSJ |

(6) Sysmac Studio

The development environment for the Sysmac platform allows you to configure and simulate the FH Series on your PC.



| Description | Model |
|-----------------------------------|---------------|
| DVD for installation | SYSMAC-SE200D |
| Software license (Vision Edition) | SYSMAC-VE001L |

(7) Application producer


This development environment enables you to customize FH functions. It includes sample codes and wizards that will help you develop your own interfaces and processing items.



| Description | Model |
|----------------------|---------|
| DVD for installation | FH-AP1 |
| Software license | FH-AP1L |

Ordering Information

FH Series Sensor Controllers

| Item | CPU | AI function | | No. of cameras | Output | Model | |
|---|---------------------------------------|-----------------------------------|-----------------|----------------|--------|---------|------------|
| | | AI Scratch Detect Filter * | AI FineMatching | | | | |
|  | High-speed, Large-capacity Controller | Intel® Core™ i7 processor 4 cores | Available | Available | 2 | NPN/PNP | FH-5550 |
| | | | | | 4 | NPN/PNP | FH-5550-10 |
| | | | | | 8 | NPN/PNP | FH-5550-20 |
| | High-speed Controller | Intel® Core™ i7 processor 4 cores | Available | Available | 2 | NPN/PNP | FH-5050 |
| | | | | | 4 | NPN/PNP | FH-5050-10 |
| | | | | | 8 | NPN/PNP | FH-5050-20 |
| | Standard Controller | Intel® Celeron® processor 2 cores | Not available | Available | 2 | NPN/PNP | FH-2050 |
| | | | | | 4 | NPN/PNP | FH-2050-10 |
| | | | | | 8 | NPN/PNP | FH-2050-20 |







* Optional FH-UMA11 Scratch Detect AI Software Installer is required.

Optional Products (Sold Separately)





| Item | Model |
|--|----------|
| Scratch Detect AI Software Installer * | FH-UMA11 |

* This product can be installed on the FH-5□50-series Controller (version 6.40 or later).

Cameras

| Item | Lens mount | Descriptions | Color / Monochrome | Image Acquisition Time *1 | Model |
|---|------------|--|--------------------|---------------------------|----------|
|  | C mount | 20.4 million pixels (Supported controller: FH-5□50(-□)/2050(-□) Series) *2 | Color | 42.6 ms *3 | FH-SC21R |
| | | | Monochrome | | FH-SM21R |
|  | C mount | 12 million pixels *2 | Color | 24.9 ms *3 | FH-SCX12 |
| | | | Monochrome | | FH-SMX12 |
| | | 5 million pixels | Color | 10.3 ms *3 | FH-SCX05 |
| | | | Monochrome | | FH-SMX05 |
| | | 3.2 million pixels | Color | 6.6 ms *3 | FH-SCX03 |
| | | | Monochrome | | FH-SMX03 |
| | | 1.6 million pixels | Color | 6.5 ms | FH-SCX01 |
| | | | Monochrome | | FH-SMX01 |
| | | 0.4 million pixels | Color | 1.9ms | FH-SCX |
| | | | Monochrome | | FH-SMX |
|  | M42 mount | 12 million pixels *2 | Color | 25.7 ms *3 | FH-SC12 |
| | | | Monochrome | | FH-SM12 |
|  | C mount | 4 million pixels | Color | 8.5 ms *3 | FH-SC04 |
| | | | Monochrome | | FH-SM04 |
| | | 2 million pixels | Color | 4.6 ms *3 | FH-SC02 |
| | | | Monochrome | | FH-SM02 |
| | | 0.3 million pixels | Color | 3.3 ms | FH-SC |
| | | | Monochrome | | FH-SM |
|  | C mount | 5 million pixels | Color | 71.7ms | FH-SC05R |
| | | | Monochrome | | FH-SM05R |
| | | 5 million pixels | Color | 38.2 ms | FZ-SC5M3 |
| | | | Monochrome | | FZ-S5M3 |
|  | C mount | 2 million pixels | Color | 33.3 ms | FZ-SC2M |
| | | | Monochrome | | FZ-S2M |
| | | 0.3 million pixels | Color | 12.5 ms | FZ-SC |
| | | | Monochrome | | FZ-S |

FH-2050-□/-5□50-□ Series

| Item | Lens mount | Descriptions | Color / Monochrome | Image Acquisition Time *1 | Model | |
|--|---|----------------------------------|----------------------------|---------------------------|---------|-----------|
|  | Small Digital CCD Cameras (Lens required) | Lenses for small camera required | 300,000-pixel flat type | Color | 12.5 ms | FZ-SFC |
| | | | | Monochrome | | FZ-SF |
|  | | | 300,000-pixel pen type | Color | 12.5 ms | FZ-SPC |
| | | | | Monochrome | | FZ-SP |
|   | Intelligent Compact Digital CMOS Camera | Built-in lens | Narrow view | Color | 16.7 ms | FZ-SQ010F |
| | | | Standard view | Color | | FZ-SQ050F |
| | | | Wide View (long-distance) | Color | | FZ-SQ100F |
| | | | Wide View (short-distance) | Color | | FZ-SQ100N |

*1 The image acquisition time does not include the image conversion processing time of the sensor controller.

The camera image input time varies depending on the sensor controller model, number of cameras, and camera settings. Check before you use the camera.

*2 Up to four cameras of this model can be connected to one controller. Up to eight cameras including other models can be connected to an FH-5550-20, 5050-20 or 2050-20.

*3 Frame rate in high speed mode when the camera is connected using two camera cables. For other conditions, refer to the table on the next page.








| Model | | | FH-SM02 | FH-SC02 | FH-SM04 | FH-SC04 | FH-SM12 | FH-SC12 | FH-SMX | FH-SCX | FH-SMX01 | FH-SCX01 | FH-SMX03 | FH-SCX03 | FH-SMX05 | FH-SCX05 | FH-SMX12 | FH-SCX12 | FH-SM21R | FH-SC21R |
|---------------------------|-------------|--------------------|---------|---------|----------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Image Acquisition Time *4 | 2 Cables *5 | High Speed Mode *6 | 4.6 ms | 8.5 ms | 25.7 ms | --- | --- | 6.6 ms | 10.3 ms | 24.9 ms | 42.6 ms | | | | | | | | | |
| | | Standard Mode | 9.7 ms | 17.9 ms | 51.3 ms | --- | --- | 14.1 ms | 22.1 ms | 53.5 ms | 90.1 ms | | | | | | | | | |
| | 1 Cables | High Speed Mode *6 | 9.2 ms | 17.0 ms | 51.3 ms | 1.9 ms | 6.5 ms | 13.2 ms | 20.6 ms | 50.0 ms | 83.3 ms | | | | | | | | | |
| | | Standard Mode | 19.3 ms | 35.8 ms | 102.0 ms | 3.8 ms | 14.7 ms | 28.2 ms | 44.1 ms | 106.4 ms | 175.4 ms | | | | | | | | | |

*4 The image acquisition time does not include the image conversion processing time of the sensor controller.

*5 Two Camera ports of the controller are used per one camera.

*6 Up to 5 m Camera Cable length.

Camera Cables

| Item | Descriptions | Model *3 |
|---|--|-------------|
|  | Camera Cable Cable length: 2 m, 3 m, 5 m, or 10 m *2 | FZ-VS3 □M |
|  | Bend resistant Camera Cable Cable length: 2 m, 3 m, 5 m, or 10 m *2 | FZ-VSB3 □M |
|  | Super Bend resistant Camera Cable Cable length: 5 m or 10 m | FZ-VSBX □M |
|  | Right-angle Camera Cable *1 Cable length: 2 m, 3 m, 5 m, or 10 m *2 | FZ-VSL3 □M |
|  | Bend resistant Right-angle Camera Cable *1 Cable length: 2 m, 3 m, 5 m, or 10 m *2 | FZ-VSLB3 □M |
|  | Long-distance Camera Cable Cable length: 15 m *2 | FZ-VS4 15M |
|  | Long-distance Right-angle Camera Cable *1 Cable length: 15 m *2 | FZ-VSL4 15M |
|  | Cable Extension Unit Up to two Extension Units and three Cables can be connected. (Maximum cable length: 45 m *2) | FZ-VSJ |

*1 This Cable has an L-shaped connector on the Camera end.

*2 The maximum cable length depends on the camera being connected, and the model and length of the cable being used. For further information, refer to the *Cameras / Cables Connection Table and Maximum Extension Length Using Cable Extension Units FZ-VSJ* table.

When a High-speed Digital CMOS Camera FH-S□02/-S□04/-S□12/-S□X03/-S□X05/-S□X12/-S□21R is used in the high speed mode of transmission speed, two camera cables are required.

*3 Insert the cables length into □ in the model number as follows. 2 m = 2, 3 m = 3, 5 m = 5, 10 m = 10

Cameras / Cables Connection Table

| Camera Cables | Model | Cable length | High-speed Digital CMOS cameras | | | | | | | |
|---|---------------------|--------------|---------------------------------|--|--|--|--|--|--|--|
| | | | 300,000-pixel | | 2 million-pixel | | 4 million-pixel | | 12 million-pixel | |
| | | | FH-SM/SC | | FH-SM02/SC02 | | FH-SM04/SC04 | | FH-SM12/SC12 | |
| | | | — | High speed mode of transmission speed select | Standard mode of transmission speed select | High speed mode of transmission speed select | Standard mode of transmission speed select | High speed mode of transmission speed select | Standard mode of transmission speed select | |
| Camera Cables Right-angle camera cables | FZ-VS3 FZ-VSL3 | 2 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 3 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 5 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 10 m | Yes | No | Yes | No | Yes | No | Yes | |
| Bend resistant camera cables Bend resistant Right-angle Camera Cable | FZ-VSB3 FZ-VSLB3 | 2 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 3 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 5 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 10 m | Yes | No | Yes | No | Yes | No | Yes | |
| Super Bend resistant Camera Cable | FZ-VSBX | 5 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 10 m | Yes | No | Yes | No | Yes | No | Yes | |
| Long-distance camera cable Long-distance right-angle camera cable | FZ-VS4 FZ-VSL4 | 15 m | Yes | No | Yes | No | Yes | No | Yes | |

| Camera Cables | Model | Cable length | High-speed Digital CMOS cameras | | | | | | | | | |
|---|---------------------|--------------|--|--|--|--|--|--|--|--|--|--|
| | | | 400,000-pixel | | 1.6 million-pixel | | 3.2 million-pixel | | 5 million-pixel | | 12 million-pixel | |
| | | | FH-SMX/SCX | | FH-SMX01/SCX01 | | FH-SMX03/SCX03 | | FH-SMX05/SCX05 | | FH-SMX12/SCX12 | |
| | | | High speed mode of transmission speed select | Standard mode of transmission speed select | High speed mode of transmission speed select | Standard mode of transmission speed select | High speed mode of transmission speed select | Standard mode of transmission speed select | High speed mode of transmission speed select | Standard mode of transmission speed select | High speed mode of transmission speed select | Standard mode of transmission speed select |
| Camera Cables Right-angle camera cables | FZ-VS3 FZ-VSL3 | 2 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 3 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 5 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 10 m | No | Yes | No | Yes | No | Yes | No | Yes | No | |
| Bend resistant camera cables Bend resistant Right-angle Camera Cable | FZ-VSB3 FZ-VSLB3 | 2 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 3 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 5 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 10 m | No | Yes | No | Yes | No | Yes | No | Yes | No | |
| Super Bend resistant Camera Cable | FZ-VSBX | 5 m | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | 10 m | No | Yes | No | Yes | No | Yes | No | Yes | No | |
| Long-distance camera cable Long-distance right-angle camera cable | FZ-VS4 FZ-VSL4 | 15 m | No | Yes | No | Yes | No | Yes | No | Yes | Yes | |

| Camera Cables | Model | Cable length | Digital CMOS Camera | | | Digital CCD cameras | | |
|---|---------------------|--------------|---------------------|--|--|---------------------|---------------|-----------------|
| | | | 5 million-pixel | 20.4 million-pixel | | 5 million-pixel | 300,000-pixel | 2 million-pixel |
| | | | FH-SM05R/SC05R | FH-SM21R/SC21R | | FZ-S5M3/SC5M3 | FZ-S/SC | FZ-S2M/SC2M |
| | | | — | High speed mode of transmission speed select | Standard mode of transmission speed select | — | — | — |
| Camera Cables Right-angle camera cables | FZ-VS3 FZ-VSL3 | 2 m | Yes | Yes | Yes | Yes | Yes | Yes |
| | | 3 m | Yes | Yes | Yes | Yes | Yes | Yes |
| | | 5 m | Yes | Yes | Yes | Yes | Yes | Yes |
| | | 10 m | Yes | No | Yes | No | Yes | Yes |
| Bend resistant camera cables Bend resistant Right-angle Camera Cable | FZ-VSB3 FZ-VSLB3 | 2 m | Yes | Yes | Yes | Yes | Yes | Yes |
| | | 3 m | Yes | Yes | Yes | Yes | Yes | Yes |
| | | 5 m | Yes | Yes | Yes | Yes | Yes | Yes |
| | | 10 m | Yes | No | Yes | No | Yes | Yes |
| Super Bend resistant Camera Cable | FZ-VSBX | 5 m | Yes | Yes | Yes | Yes | Yes | Yes |
| | | 10 m | Yes | No | Yes | No | Yes | Yes |
| Long-distance camera cable Long-distance right-angle camera cable | FZ-VS4 FZ-VSL4 | 15 m | Yes | No | Yes | No | Yes | Yes |

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| Camera Cables | Model | Cable length | Small digital CCD cameras Pen type / flat type | Intelligent Compact Digital CMOS Camera |
|--|---------------------|--------------|---|--|
| | | | FZ-SF/SFC FZ-SP/SPC | FZ-SQ□ |
| Camera Cables Right-angle camera cables | FZ-VS3 FZ-VSL3 | 2 m | Yes | Yes |
| | | 3 m | Yes | Yes |
| | | 5 m | Yes | Yes |
| | | 10 m | Yes | Yes |
| Bend resistant camera cables Bend resistant Right-angle Camera Cable | FZ-VSB3 FZ-VSLB3 | 2 m | Yes | Yes |
| | | 3 m | Yes | Yes |
| | | 5 m | Yes | Yes |
| | | 10 m | Yes | Yes |
| Super Bend resistant Camera Cable | FZ-VSBX | 5 m | Yes | Yes |
| | | 10 m | Yes | Yes |
| Long-distance camera cable Long-distance right-angle camera cable | FZ-VS4 FZ-VSL4 | 15 m | Yes | Yes |

Maximum Extension Length Using Cable Extension Units FZ-VSJ

| Item | Model | Transmission speed (*1) | No. of CH used for connection (*2) | Maximum cable length using 1 Camera Cable (*1) | Max. number of connectable Extension Units | Using Cable Extension Units FZ-VSJ | | |
|--|--|-------------------------|------------------------------------|--|--|------------------------------------|--|--|
| | | | | | | Max. cable length | Connection configuration | |
| High-speed Digital CMOS Cameras | FH-SM/SC | --- | --- | 15 m (Using FZ-VS4/VSL4) | 2 | 45 m | [Configuration 1] Camera cable: 15 m × 3 Extension Unit: 2 | |
| | FH-SMX/SCX FH-SMX01/SCX01 | Standard | --- | 15 m (Using FZ-VS4/VSL4) | 2 | 45 m | [Configuration 1] Camera cable: 15 m × 3 Extension Unit: 2 | |
| | | High speed | --- | 5 m (Using FZ-VS□/VSL□) | 2 | 15 m | [Configuration 3] Camera cable: 5 m × 3 Extension Unit: 2 | |
| | FH-SM02/SC02 FH-SM04/SC04 FH-SM12/SC12 FH-SMX03/SCX03 FH-SMX05/SCX05 FH-SMX12/SCX12 | Standard | 1 | 15 m (Using FZ-VS4/VSL4) | 2 | 45 m | [Configuration 1] Camera cable: 15 m × 3 Extension Unit: 2 | |
| | | | 2 | 15 m (Using FZ-VS4/VSL4) | 4 (*3) | 45 m | [Configuration 2] Camera cable: 15 m × 6 Extension Unit: 4 | |
| | | High speed | 1 | 5 m (Using FZ-VS□/VSL□) | 2 | 15 m | [Configuration 3] Camera cable: 5 m × 3 Extension Unit: 2 | |
| | | | 2 | 5 m (Using FZ-VS□/VSL□) | 4 (*3) | 15 m | [Configuration 4] Camera cable: 5 m × 6 Extension Unit: 4 | |
| | Digital CMOS Cameras | FH-SM21R/SC21R | Standard | 1 | 15 m (Using FZ-VS4/VSL4) | 2 | 45 m | [Configuration 1] Camera cable: 15 m × 3 Extension Unit: 2 |
| | | | | 2 | 15 m (Using FZ-VS4/VSL4) | 4 (*3) | 45 m | [Configuration 2] Camera cable: 15 m × 6 Extension Unit: 4 |
| | | | High speed | 1 | 5 m (Using FZ-VS□/VSL□) | 2 | 15 m | [Configuration 3] Camera cable: 5 m × 3 Extension Unit: 2 |
| 2 | | | | 5 m (Using FZ-VS□/VSL□) | 4 (*3) | 15 m | [Configuration 4] Camera cable: 5 m × 6 Extension Unit: 4 | |
| FH-SM05R/SC05R | | --- | --- | 15 m (Using FZ-VS□/VSL□) | 2 | 45 m | [Configuration 1] Camera cable: 15 m × 3 Extension Unit: 2 | |
| FZ-S5M3/SC5M3 | | --- | --- | 5 m (Using FZ-VS□/VSL□) | 2 | 15 m | [Configuration 3] Camera cable: 5 m × 3 Extension Unit: 2 | |
| Digital CCD Cameras | FZ-S/SC FZ-S2M/SC2M | --- | --- | 15 m (Using FZ-VS4/VSL4) | 2 | 45 m | [Configuration 1] Camera cable: 15 m × 3 Extension Unit: 2 | |
| Small Digital CCD Cameras Flat type/ Pen type | FZ-SF/SFC FZ-SP/SPC | --- | --- | 15 m (Using FZ-VS4/VSL4) | 2 | 45 m | [Configuration 1] Camera cable: 15 m × 3 Extension Unit: 2 | |
| Intelligent Compact Digital CMOS Camera | FZ-SQ□ | --- | --- | 15 m (Using FZ-VS4/VSL4) | 2 | 45 m | [Configuration 1] Camera cable: 15 m × 3 Extension Unit: 2 | |

*1 The FH-S□□□ enables switching between standard and high speed modes. In high speed mode, images can be transferred approximately two times faster than in standard mode, but the connectable cable length will be shorter.

*2 The FH-S□□□ has two channels to connect Camera Cables. Connection to two channels makes image transfer two times faster than connection to one channel: high speed mode using two channels can transfer approximately four times as many images as standard mode using one channel.

*3 Each channel can be used to connect up to two Cable Extension Units: up to four extension units, two channels x two units, can be connected by using two channels.

Connection Configuration

| | Connection configuration using the maximum length of Camera Cables | Remarks |
|-----------------|--|---------|
| Configuration 1 | | |
| Configuration 2 | | |
| Configuration 3 | | |
| Configuration 4 | | |

*4 Select the Camera Cables between the Controller and Extension Unit, between the Extension Units, and between the Extension Unit and Camera according to the connected Camera.
 Different types or lengths of Camera Cables can be used for (1), (2), and (3) as well as for (4), (5), and (6). However, the type and length of Camera Cable (1) must be the same as those of Camera Cable (4), (2) must be the same as (5), and (3) must be the same as (6).

Monitor

| Item | Descriptions | Model |
|------|--|---------|
| | Touch Panel Monitor 12.1 inches For FH Sensor Controllers * | FH-MT12 |
| | LCD Monitor 8.4 inches | FZ-M08 |

* FH Series Sensor Controllers version 5.32 or higher is required.

Monitor Cables

| Item | Descriptions | Model |
|------|---|-----------------|
| | DVI-Analog Conversion Cable for Touch Panel Monitor/LCD Monitor Cable length: 2 m, 5 m or 10 m | FH-VMDA □M *1 |
| | RS-232C Cable for Touch Panel Monitor Cable length: 2 m, 5 m or 10 m | XW2Z-□□□PP-1 *2 |
| | USB Cable for Touch Panel Monitor Cable length: 2 m or 5 m | FH-VUAB □M *1 |

*1 Insert the cables length into □ in the model number as follows. 2 m = 2, 5 m = 5, 10 m = 10

*2 Insert the cables length into □□□ in the model number as follows. 2 m = 200, 5 m = 500, 10 m = 010.

A video signal cable and an operation signal cable are required to connect the Touch Panel Monitor.

| Signal | Cable | 2 m | 5 m | 10 m |
|------------------------------|-----------------------------|-----|-----|------|
| Video signal | DVI-Analog Conversion Cable | Yes | Yes | Yes |
| Touch panel operation signal | USB Cable | Yes | Yes | No |
| | RS-232C Cable | Yes | Yes | Yes |

Parallel I/O Cables/Encoder Cable

| Item | Descriptions | Model |
|------|--|----------------|
| | Parallel I/O Cable *1 Cable length: 2m, 5m or 15m | XW2Z-S013-□ *2 |
| | Parallel I/O Cable for Connector-terminal Conversion Unit *1 Cable length: 0.5 m, 1 m, 1.5 m, 2 m, 3 m, 5 m Connector-Terminal Block Conversion Units can be connected (Terminal Blocks Recommended Products: OMRON XW2K-34G-T) | XW2Z-□□□EE *3 |
| | Ultra-Compact Interface Wiring System (General-Purpose) | XW2K-34G-T *4 |
| | Encoder Cable for line-driver Cable length: 1.5 m | FH-VR 1.5M |

*1 2 Cables are required for all I/O signals.

*2 Insert the cables length into □ in the model number as follows. 2 m = 2, 5 m = 5, 15 m = 15





*3 Insert the cables length into □□□ in the model number as follows. 0.5 m = 050, 1 m = 100, 1.5 m = 150, 2 m = 200, 3 m = 300, 5 m = 500

*4 Refer to the XW2K Series Datasheet (Cat. No. G152) for details.

FH-2050-□/-5□50-□ Series

Parallel Converter Cable

When you change to connect the F series, FZ5 series, or FZ5-L series to FH series Sensor Controller, you can convert by using the appropriate parallel converter cable of FH-VPX series under the usable condition.

| Item | Applicable Model | | Usable Condition | Model |
|---|------------------|--------------|---|-------------|
|  | FZ□ series | | <ul style="list-style-type: none"> Do not use RESET signal. * Use with COMIN and COMUT are same power source. | FH-VPX-FZ |
|  | FZ□-L35x series | | <ul style="list-style-type: none"> Do not use RESET signal. * | FH-VPX-FZL |
|  | F160 series | F160-C10 | <ul style="list-style-type: none"> Do not use RESET signal. * Use with COMIN and COMOUT are same power source. Do not use DI5 and DI6. | FH-VPX-F160 |
|  | F210 series | F210-C10 | <ul style="list-style-type: none"> Do not use RESET signal. * Use with COMIN and COMOUT are same power source. Do not use DI8 and DI9. | FH-VPX-F210 |
| | | F210-C10-ETN | | |
| | F500 series | F500-C10 | | |





* Even if RESET signal cannot be used by conversion, conversion is possible to convert satisfying other usable condition.

Note: Cannot be used for the F160-C10CP/-C10CF.

Recommended EtherCAT and EtherNet/IP Communications Cables

Use Straight STP (shielded twisted-pair) cable of category 5 or higher with double shielding (braiding and aluminum foil tape) for EtherCAT. Use Straight or cross STP (shielded twisted-pair) cable of category 5 or higher for EtherNet/IP.

Cable with Connectors


| Item | Appearance | Recommended manufacturer | Cable length (m) | Model |
|---|---|--------------------------|------------------|----------------------|
| Cable with Connectors on Both Ends (RJ45/RJ45) Standard RJ45 plugs type *1 Wire Gauge and Number of Pairs: AWG26, 4-pair Cable Cable Sheath material: PUR Cable color: Yellow *2 |  | OMRON | 0.3 | XS6W-6PUR8SS30CM-YF |
| | | | 0.5 | XS6W-6PUR8SS50CM-YF |
| | | | 1 | XS6W-6PUR8SS100CM-YF |
| | | | 2 | XS6W-6PUR8SS200CM-YF |
| | | | 3 | XS6W-6PUR8SS300CM-YF |
| Cable with Connectors on Both Ends (RJ45/RJ45) Rugged RJ45 plugs type *1 Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Light blue |  | OMRON | 0.3 | XS5W-T421-AMD-K |
| | | | 0.5 | XS5W-T421-BMD-K |
| | | | 1 | XS5W-T421-CMD-K |
| | | | 2 | XS5W-T421-DMD-K |
| | | | 5 | XS5W-T421-GMD-K |
| Cable with Connectors on Both Ends (M12 Straight/M12 Straight) Shield Strengthening Connector cable *3 M12/Smartclick Connectors Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Black |  | OMRON | 10 | XS5W-T421-JMD-K |
| | | | 0.5 | XS5W-T421-BM2-SS |
| | | | 1 | XS5W-T421-CM2-SS |
| | | | 2 | XS5W-T421-DM2-SS |
| | | | 3 | XS5W-T421-EM2-SS |
| Cable with Connectors on Both Ends (M12 Straight/RJ45) Shield Strengthening Connector cable *3 M12/Smartclick Connectors Rugged RJ45 plugs type Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Black |  | OMRON | 5 | XS5W-T421-GM2-SS |
| | | | 10 | XS5W-T421-JM2-SS |
| | | | 0.5 | XS5W-T421-BMC-SS |
| | | | 1 | XS5W-T421-CMC-SS |
| | | | 2 | XS5W-T421-DMC-SS |
| | | | 3 | XS5W-T421-EMC-SS |
| | | | 5 | XS5W-T421-GMC-SS |
| | | | 10 | XS5W-T421-JMC-SS |

*1 Cables with standard RJ45 plugs are available in the following lengths: 0.2 m, 0.3 m, 0.5 m, 1 m, 1.5 m, 2 m, 3 m, 5 m, 7.5 m, 10 m, 15 m, 20 m. Cables with rugged RJ45 plugs are available in the following lengths: 0.3 m, 0.5 m, 1 m, 2 m, 3 m, 5 m, 10 m, 15 m. For details, refer to the Industrial Ethernet Connectors Catalog (Cat. No. G019).

*2 Cables colors are available in yellow, green, and blue.

*3 For details, contact your OMRON representative.

Cables / Connectors

| Item | | Recommended manufacturer | Model |
|--|---|--------------------------|--------------------------------|
| Products for EtherCAT or EtherNet/IP (100BASE-T/100BASE-TX) Wire gauge and number of pairs: AWG24, 4-pair cable | Cable | Hitachi Metals, Ltd. | NETSTAR-C5E SAB 0.5 x 4P CP *1 |
| | | Kuramo Electric Co. | KETH-SB #1 |
| | RJ45 Connector | Panduit Corporation | MPS588-C #1 |
| Products for EtherCAT or EtherNet/IP (100BASE-TX/10BASE-T) Wire gauge and number of pairs: AWG22, 2-pair cable | Cable | Kuramo Electric Co. | KETH-PSB-OMR #2 |
| | | JMACS Japan Co., Ltd. | PNET/B #2 |
| | RJ45 Assembly Connector  | OMRON | XS6G-T421-1 #2 |

- *1 We recommend you to use the above Cable and RJ45 Connector together.
- *2 We recommend you to use the above Cable and RJ45 Assembly Connector together.

Automation Software Sysmac Studio

Please purchase a DVD and licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. The license does not include the DVD.

| Item | Specifications | | | Model |
|---|---|--------------------|------------------------------|------------------|
| | | Number of licenses | Media | |
| Sysmac Studio Standard Edition Ver.1.□□ | The Sysmac Studio is the software that provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including the NJ/NX-series CPU Units, NY-series Industrial PC, EtherCat Slave, and the HMI. This software provides functions of the Vision Edition. Refer to OMRON website for details such as supported models and functions. | -- (Media only) | Sysmac Studio (32bit) DVD *1 | SYSMAC-SE200D |
| | | -- (Media only) | Sysmac Studio (64bit) DVD *1 | SYSMAC-SE200D-64 |
| | | 1 license | — | SYSMAC-SE201L |
| | | 3 license | — | SYSMAC-SE203L |
| | | 10 license | — | SYSMAC-SE210L |
| | | 30 license | — | SYSMAC-SE230L |
| | | 50 license | — | SYSMAC-SE250L |
| Sysmac Studio Vision Edition Ver.1.□□ *2 *3 | Sysmac Studio Vision Edition is a limited license that provides selected functions required for Vision Sensor FH-series/ Smart Camera FHV7-series/FQ-M-series settings. | 1 license | — | SYSMAC-VE001L |
| Sysmac Studio Robot Additional Option *3 | Sysmac Studio Robot Additional Option is a license to enable the Vision & Robot integrated simulation. | 1 license | — | SYSMAC-RA401L |

- *1 The same media is used for both the Standard Edition and the Vision Edition.
- *2 With the Vision Edition, you can use only the setup functions for FH-series/FQ-M-series Vision Sensors.
- *3 This product is a license only. You need the Sysmac Studio Standard Edition DVD media to install it.










Development Environment

Please purchase a CD-ROM and licenses the first time you purchase the Application Producer. CD-ROMs and licenses are available individually. The license does not include the CD-ROM.

| Product | Specifications | | | Model |
|----------------------|---|------------------------------------|--------|---------|
| | | Number of Model Standards licenses | Media | |
| Application Producer | Software components that provide a development environment to further customize the standard controller features of the FH Series. System requirements: CPU: Intel Pentium Processor (SSE2 or higher) OS: Windows 10 (32/64bit) Windows 11 .NET Framework: .NET Framework 3.5 SP1 or higher Memory: At least 2 GB RAM Available disk space: At least 2 GB Browser: Microsoft® Internet Explorer 6.0 or later Display: XGA (1024 × 768), True Color (32-bit) or higher Optical drive: CD/DVD drive The following software is required to customize the software: Microsoft® Visual Studio® 2008 Professional or Microsoft® Visual Studio® 2010 Professional or Microsoft® Visual Studio® 2012 Professional | -- (Media only) | CD-ROM | FH-AP1 |
| | | 1 license | — | FH-AP1L |

FH-2050-□/-5□50-□ Series

Accessories

| Item | Descriptions | | | Model | |
|---|--|---------------------------------------|--|--------------------------------|-----------------|
|  | USB Memory | 2 GB | | FZ-MEM2G | |
| | | 16 GB | | FZ-MEM16G | |
|  | SD Card | 2 GB | | HMC-SD293 | |
| | | 4 GB | | HMC-SD493 | |
| | | 16 GB | | HMC-SD1A3 | |
|  | Display/USB Switcher | | | FZ-DU | |
| — | Mouse Recommended Products Driverless wired mouse (A mouse that requires the mouse driver to be installed is not supported.) | | | --- | |
|  | EtherCAT junction slaves | 3 port | Power supply voltage: 20.4 to 28.8 VDC (24 VDC -15 to 20%) | Current consumption: 0.08 A | GX-JC03 |
| | | 6 port | | Current consumption: 0.17 A | GX-JC06 |
|  | Industrial Switching Hubs for EtherNet/IP and Ether- net | 5 port | | Current consumption: 0.07 A | W4S1-05D |
| — | Calibration Plate | | | FZD-CAL | |
| — | External Lights *1 | External lighting controller | LED | FLV Series | |
| | | | High-brightness LED | FL-BR/DR Series | |
| | | | Photometric Stereo Light | FL-PS Series | |
| | | | Built-in lighting controller | FL-MD Series | |
|     | For Intelligent Compact Digital CMOS Camera | Mounting Bracket | | FQ-XL | |
| | | Mounting Brackets | | FQ-XL2 | |
| | | Polarizing Filter Attachment | | FQ-XF1 | |
| | | Cover Attachment (for replacement) | | FQ-XF2 | |
| — | Mounting Bracket for FZ-S□, FH-S□05R, FZ-S□X | | | FZ-S-XLC | |
| | Mounting Bracket for FZ-S□2M | | | FZ-S2M-XLC | |
| | Mounting Bracket for FH-S□, FZ-S□5M□, FH-S□X05, FH-S□X12, FH-S□21R | | | FH-SM-XLC | |
| | Mounting Bracket for FH-S□12 | | | FH-SM12-XLC | |
| | M42 - F Mount Conversion Adapter | | | FH-ADF/M42-10 | |

*1 Refer to the Vision Accessory Catalog (Cat. No. Q198) for details.

Lenses

Refer to the *Vision Accessory Catalog* (Cat. No. Q198) for details.

| Resolution | Camera Model | Size of image element | Recommended lens | | |
|--------------------|----------------|-----------------------|--------------------------------|------------------|--|
| | | | Standard Lens | Telecentric Lens | Vibrations and Shocks Resistant Lens |
| 300,000-pixel | FZ-SF/SFC | 1/3" equivalent | FZ-LES Series | --- | --- |
| | FZ-SP/SPC | | | | |
| | FZ-S/SC | | | | |
| | FH-SM/SC | | | | |
| 400,000-pixel | FH-SMX/SCX | 1/2.9" equivalent | SV-V Series | VS-TCH Series | VS-MCA Series Non-telecentric Macro VS-MC Series |
| 1.6 million-pixel | FH-SMX01/SCX01 | | | | |
| 2 million-pixel | FZ-S2M/SC2M | 1/1.8" equivalent | SV-H Series | | |
| | FH-SM02/SC02 | 2/3" equivalent *1 | VS-H1 Series | | |
| 3.2 million-pixel | FH-SMX03/SCX03 | 1/1.8" equivalent | SV-H Series | VS-TCH Series | VS-MCA Series Non-telecentric Macro VS-MC Series |
| 4 million-pixel | FH-SM04/SC04 | 1" equivalent | VS-H1 Series | VS-TEV Series | VS-MCH1 Series |
| 5 million-pixel | FH-SM05R/SC05R | 1/2.5" equivalent | SV-H Series | VS-TCH Series | VS-MCA Series Non-telecentric Macro VS-MC Series |
| | FZ-S5M3/SC5M3 | 2/3" equivalent | | | |
| | FH-SMX05/SCX05 | 2/3" equivalent | | | |
| 12 million-pixel | FH-SMX12/SCX12 | 1.1" equivalent | VS-LLD Series VS-HVA Series | VS-TEV Series | --- |
| | FH-SM12/SC12 | 1.76" equivalent | VS-L/M42-10 Series | --- | VS-MCL/M42-10 Series |
| 20.4 million-pixel | FH-SM21R/SC21R | 1" equivalent | VS-LLD Series VS-HVA Series | VS-TEV Series | VS-MCH1 Series |

*1 A lens recommended for a 1" image element should be used for an image element size equivalent to 2/3". Vignetting may occur with a lens recommended for a 2/3" image element.

FH-2050-□/-5□50-□ Series

Ratings and Specifications (FH Sensor Controllers)

High-speed, Large-capacity Controller

| Sensor Controller Series | | FH-5550/5050 Series | | | FH-2050 Series | | | |
|---------------------------|--|--|--|--|--|--|----------------|--|
| Sensor Controller Model | | FH-5550/5050 | FH-5550/5050-10 | FH-5550/5050-20 | FH-2050 | FH-2050-10 | FH-2050-20 | |
| Parallel IO | | NPN/PNP (common) | | | | | | |
| Memory, Storage | | FH-5550 series: 32GB RAM, 64GB ROM FH-5050 series: 8GB RAM, 32GB ROM | | | 8GB RAM, 32GB ROM | | | |
| Number of cores | | 4 cores | | | 2 cores | | | |
| Main Functions | Operation Mode | Standard | Yes | | | | | |
| | | Double Speed Multi-input | Yes | | | | | |
| | | Non-stop adjustment mode | Yes | | | | | |
| | | Multi-line random-trigger mode | Yes (Maximum 8 lines) *1 | | | | | |
| | Parallel Processing | | Yes | | | | | |
| | Number of Connectable Camera | | 2 | 4 | 8 | 2 | 4 | 8 |
| | Supported Camera | FH-S series camera | All of the FH-S series cameras are connectable. | | All of the FH-S series cameras are connectable. *2 | All of the FH-S series cameras are connectable. | | All of the FH-S series cameras are connectable. *2 |
| | | FZ-S series camera | All of the FZ-S series cameras are connectable. | | | | | |
| | Camera I/F | | OMRON I/F | | | | | |
| | Possible Number of Captured Images | | Refer to page 13. | | | | | |
| | Possible Number of Logging Images to Sensor Controller | | Refer to the <i>Vision System FH Series User's Manual</i> (Cat. No. Z365). | | | | | |
| | Possible Number of Scenes | | 128 | | | | | |
| | Operating on UI | USB Mouse | Yes (wired USB and driver is unnecessary type) | | | | | |
| Touch Panel | | Yes (RS-232C/USB connection: FH-MT12) | | | | | | |
| Setup | | Create the processing flow using Flow editing. | | | | | | |
| Language | | Japanese, English, Simplified Chinese, Traditional Chinese, Korean, German, French, Spanish, Italian, Vietnamese, Polish | | | | | | |
| Serial Communication | | RS-232C × 1 | | | | | | |
| Ethernet Communication | Protocol | Non-procedure (TCP/UDP) | | | | | | |
| | I/F | 1000BASE-T × 2 | | | | | | |
| EtherNet/IP Communication | | Yes (Target/Ethernet port) | | | | | | |
| PROFINET Communication | | <ul style="list-style-type: none"> • Yes (Slave/Ethernet port) • Conformance class A | | | | | | |
| EtherCAT Communication | | Yes (slave) Refer to the <i>Vision System FH Series Catalog</i> (Cat. No. Q197) about EtherCAT Communications Specifications. | | | | | | |
| External Interface | Parallel I/O | <ul style="list-style-type: none"> • 12 inputs/31 outputs: <ul style="list-style-type: none"> • Use 1 Line. • Operation mode: Except Multi-line random-trigger mode. • 17 inputs/37 outputs: <ul style="list-style-type: none"> • Use 2 Lines. • Operation mode: Multi-line random-trigger mode. • 14 inputs/29 outputs: <ul style="list-style-type: none"> • Use 3 to 4 Lines. • Operation mode: Multi-line random-trigger mode. • 19 inputs/34 outputs: <ul style="list-style-type: none"> • Use 5 to 8 Lines. • Operation mode: Multi-line random-trigger mode. | | | | | | |
| | | Encoder Interface | | Input voltage: 5 V ± 5% Signal: RS-422A Line Driver Level Phase A/B/Z: 1 MHz | | | | |
| | | Monitor Interface | | DVI-I output (Analog RGB & DVI-D single link) × 1 | | | | |
| | | USB I/F | | USB3.0 host × 2 (BUS Power: Port5 V/0.5 A) USB2.0 host × 4 (BUS Power: Port5 V/0.5 A) | | | | |
| SD Card I/F | | SDHC × 1 | | | | | | |
| Indicator Lamps | Main | POWER: Green ERROR: Red RUN: Green ACCESS: Yellow | | | | | | |
| | Ethernet | NET RUN1: Green LINK/ACT1: Yellow NET RUN2: Green LINK/ACT2: Yellow | | | | | | |
| | SD Card | SD POWER: Green SD BUSY: Yellow | | | | | | |
| | EtherCAT | ECAT RUN: Green LINK/ACT IN: Green LINK/ACT OUT: Green ECAT ERR: Red | | | | | | |
| Power-supply voltage | | 20.4 VDC to 26.4 VDC | | | | | | |
| Current consumption | When connecting an intelligent compact digital camera • When connecting the following light or lighting controller without an external power supply FLV-TCC1, FLV-TCC4, FLV-TCC3HB FLV-TCC1EP, FL-TCC1 • When connecting the following light or lighting controller FL-TCC1PS, FL-MD□MC | 5.6 A max. | 7.7 A max. | 12.2 A max. | 4.6 A max. | 6.6 A max. | 11.2 A max. | |
| | Other than above | 4.5 A max. | 5.5 A max. | 7.3 A max. | 3.5 A max. | 4.3 A max. | 6.3 A max. | |
| Built-in FAN | | Yes | | | | | | |
| Usage Environment | Ambient temperature range | | Operating: 0°C to +45°C Storage: -20 to +65°C (with no icing or condensation) | | | Operating: 0°C to +50°C Storage: -20 to +65°C (with no icing or condensation) | | |
| | Ambient humidity range | | Operating: 35 to 85%RH Storage: 35 to 85%RH (with no condensation) | | | | | |
| | Ambient atmosphere | | No corrosive gases | | | | | |
| | Vibration tolerance | | Oscillation frequency: 10 to 150 Hz Half amplitude: 0.1 mm Acceleration: 15 m/s ² Sweep time: 8 minute/count Sweep count: 10 Vibration direction: up and down/front and behind/left and right | | | | | |
| | Shock resistance | | Impact force: 150 m/s ² Test direction: up and down/front and behind/left and right | | | | | |
| | Noise immunity | Fast Transient Burst | <ul style="list-style-type: none"> • DC power <ul style="list-style-type: none"> Direct infusion: 2kV, Pulse rising: 5ns, Pulse width: 50ns, Burst continuation time: 15ms/0.75ms, Period: 300ms, Application time: 1 min • I/O line <ul style="list-style-type: none"> Direct infusion: 1kV, Pulse rising: 5ns, Pulse width: 50ns, Burst continuation time: 15ms/0.75ms, Period: 300ms, Application time: 1 min | | | | | |
| Grounding | | Type D grounding (100 Ω or less grounding resistance) *3 | | | | | | |
| External Features | Dimensions | | 190 mm × 115 mm × 182.5 mm Note Height: Including the feet at the base. | | | | | |
| | Weight | | Approx. 3.4 kg | Approx. 3.6 kg | Approx. 3.6 kg | Approx. 3.0 kg | Approx. 3.2 kg | Approx. 3.2 kg |
| | Degree of protection | | IEC60529 IP20 | | | | | |
| Case material | | Cover: zinc-plated steel plate Side plate: aluminum (A6063) | | | | | | |
| Accessories | | Instruction Sheet (Japanese and English): 1. Installation Instruction Manual for FH series:1. General Compliance Information and Instructions for EU: 1. Member registration sheet: 1. Power source (FH-XCN): 1 (male). Ferrite core for camera cable: 2 (FH-5□50, FH-2050), 4 (FH-5□50-10, FH-2050-10), 8 (FH-5□50-20, FH-2050-20) | | | | | | |

*1 According to the CPU performance, FH-2050 series is recommended to use up to two lines in this mode.

*2 Up to eight cameras can be connected in total including up to four 12 or 20.4 million-pixel cameras.

*3 Existing third class grounding

Maximum Number of Loading Images during Multi-input

| Camera | Model | Max. Number of Loading Images during Multi-input *1 |
|---|---|---|
| Intelligent Compact Digital CMOS Cameras *2 | FZ-SQ010F/-SQ050F/-SQ100F/-SQ100N | 256 |
| 0.3 million pixels CCD/CMOS Cameras | FZ-S/-SC/-SF/SFC/-SH/-SHC/-SP/-SPC FH-SM/-SC | 256 |
| 0.4 million pixels CMOS Cameras | FH-SMX/-SCX | 256 |
| 1.6 million pixels CMOS Cameras | FH-SMX01/-SCX01 | 64 |
| 2 million pixels CCD Cameras | FZ-S2M/-SC2M | 64 |
| 2 million pixels CMOS Cameras | FH-SM02/-SC02 | 51 |
| 3.2 million pixels CMOS Cameras | FH-SMX03/-SCX03 | 36 |
| 4 million pixels CMOS Cameras | FH-SM04/-SC04 | 32 |
| 5 million pixels CCD/CMOS Cameras | FZ-S5M3/-SC5M3 FH-SMX05/-SCX05/-SM05R/-SC05R | 25 |
| 12 million pixels CMOS Cameras | FH-SM12/-SC12/-SMX12/-SCX12 | 10 |
| 20.4 million pixels CMOS Cameras | FH-SM21R/-SC21R | 6 |

*1 When using two camera cables for connection, the maximum number of loaded images during multi-input is twice the number given in the table.

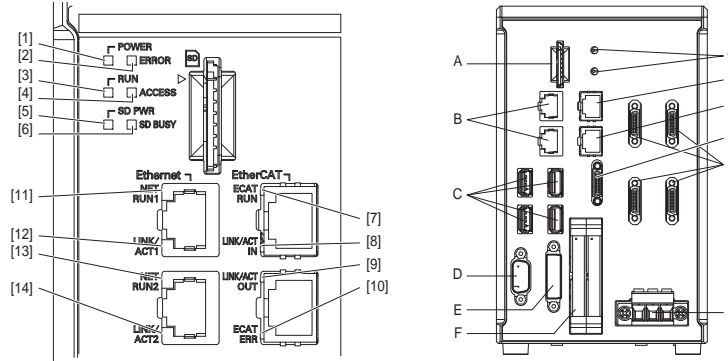
*2 The multi-input function cannot be used when the built-in light of an intelligent compact digital camera is used. Refer to the *Vision System FH/FZ5 Series User's Manual* (Cat. No. Z340) for details.

Refer to the *Vision System FH Series Catalog* (Cat. No. Q197) for more information on cameras and other accessories.

FH-2050-□/-5□50-□ Series

Components and Functions

Sensor Controllers
High-speed,
Large-capacity Controller
Standard Controller
(4-camera type)



| | Name | Description |
|------|---------------------------|---|
| [1] | POWER LED | Lit while power is ON. |
| [2] | ERROR LED | Lit when an error has occurred. |
| [3] | RUN LED | Lit while the layout turned on output setting is displayed. |
| [4] | ACCESS LED | Blinks while the internal nonvolatile memory is accessed. |
| [5] | SD POWER LED | Blinks while power is supplied to the SD memory card and the card is usable. |
| [6] | SD BUSY LED | Blinks while the SD memory card is accessed. |
| [7] | EtherCAT RUN LED | Lit while EtherCAT communications are usable. |
| [8] | EtherCAT LINK/ACT IN LED | Lit when connected with an EtherCAT device, and blinks while performing communications. |
| [9] | EtherCAT LINK/ACT OUT LED | Lit when connected with an EtherCAT device, and blinks while performing communications. |
| [10] | EtherCAT ERR LED | Lit when EtherCAT communications have become abnormal. |
| [11] | EtherNet NET RUN1 LED | Lit while EtherNet communications are usable. |
| [12] | EtherNet LINK/ACK1 LED | Lit when connected with an EtherNet device, and blinks while performing communications. |
| [13] | EtherNet NET RUN2 LED | Lit when EtherNet communications are usable. |
| [14] | EtherNet LINK/ACK2 LED | Lit when connected with an EtherNet device, and blinks while performing communications. |

| | Name | Description |
|---|---|--|
| A | SD memory card installation connector | Install the SD memory card. Do not plug or unplug the SD memory card during measurement operation. Otherwise measurement time may be affected or data may be destroyed. |
| B | EtherNet connector | Connect an EtherNet device. <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p style="text-align: center;">FH-2050 Series/FH-5□50 Series</p> <p>Upper port: Ethernet port Lower port: Ethernet port, EtherNet/IP port, and PROFINET port are sharing use.</p> </div> |
| C | USB connector | Connect a USB device. Do not plug or unplug it during measurement operation. Otherwise measurement time may be affected or data may be destroyed. |
| D | RS-232C connector | Connect an external device such as a programmable controller. |
| E | DVI-I connector | Connect a monitor. |
| F | I/O connector (control lines, data lines) | Connect the controller to external devices such as a sync sensor and PLC. |
| G | EtherCAT address setup volume | Used to set a node address (00 to 99) as an EtherCAT communication device. |
| H | EtherCAT communication connector (IN) | Connect the opposed EtherCAT device. |
| I | EtherCAT communication connector (OUT) | Connect the opposed EtherCAT device. |
| J | Encoder connector | Connect an encoder. |
| K | Camera connector | Connect cameras. |
| L | Power supply terminal connector | Connect a DC power supply. Wire the controller independently on other devices. Wire * the ground line. Be sure to ground the controller alone. |

* Use the attachment power terminal connector (male) of FH-XCN series.
 For details, refer to 5-3 Sensor Controller Installation on Vision System FH series Hardware Setup Manual (Z366).

Dimensions

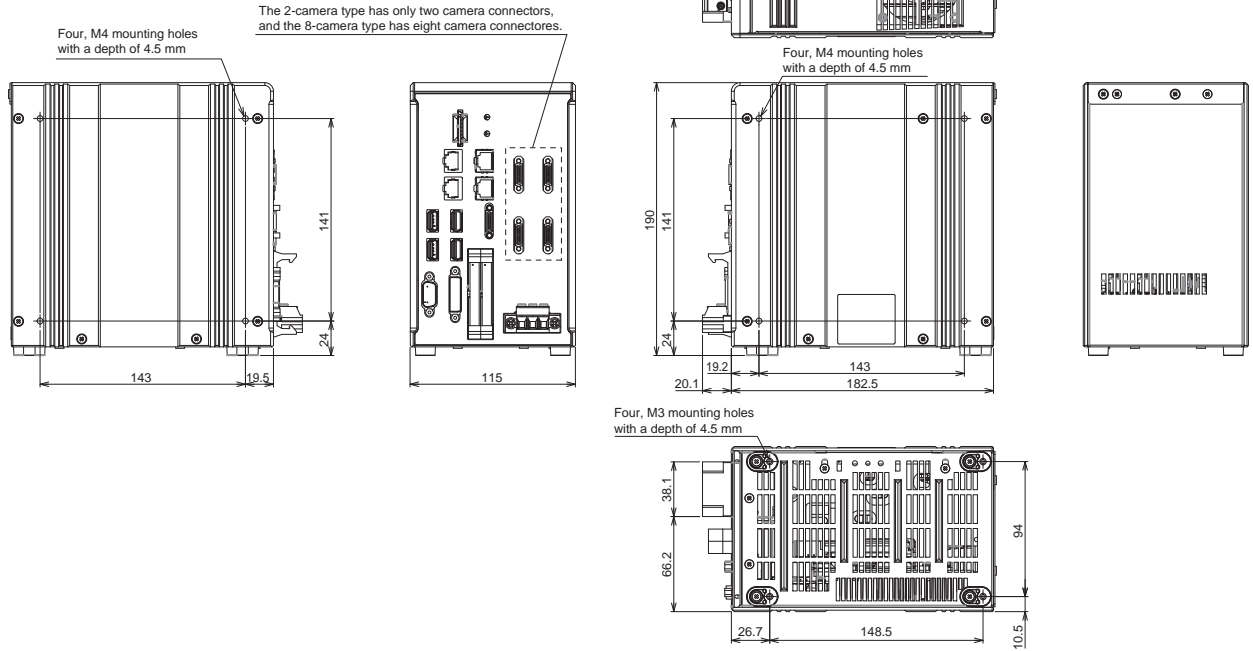
Sensor Controllers

High-speed, Large-capacity Controllers/Standard Controllers

FH-5550/-5550-10/-5550-20

FH-5050/-5050-10/-5050-20

FH-2050/-2050-10/-2050-20



FH-2050-□/-5□50-□ Series

Related Manuals

| Man.No. | Model number | Manual |
|---------|--------------|---|
| Z365 | FH/FHV7 | Vision System FH/FHV7 Series User's Manual |
| Z341 | FH/FHV7 | Vision System FH/FHV7 series Processing Item Function Reference Manual |
| Z342 | FH/FHV7 | Vision System FH/FHV7 Series User's Manual for Communications Settings |
| Z343 | FH/FHV7 | Vision System FH/FHV7 Series Operation Manual for Sysmac Studio |
| Z366 | FH | Vision System FH series Hardware Setup Manual |
| Z367 | FH | Vision System FH series Macro Customize Functions Programming Manual |
| Z437 | FH-UMAI | FH Application Software FH-UMAI Processing Item Function Reference Manual |
| Z438 | FH-UMAI | FH Application Software FH-UMAI Version Update Tool Operating Manual |

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