

Vision Sensor

FH Series

Vision System

Operation Manual for Sysmac Studio

FH-1□□□

FH-3□□□



Introduction

Thank you for purchasing the FH.

This manual provides information regarding functions, performance and operating methods that are required for using the FH.


When using the FH, be sure to observe the following:

- The FH must be operated by personnel knowledgeable in electrical engineering.
- To ensure correct use, please read this manual thoroughly to deepen your understanding of the product.
- Please keep this manual in a safe place so that it can be referred to whenever necessary.

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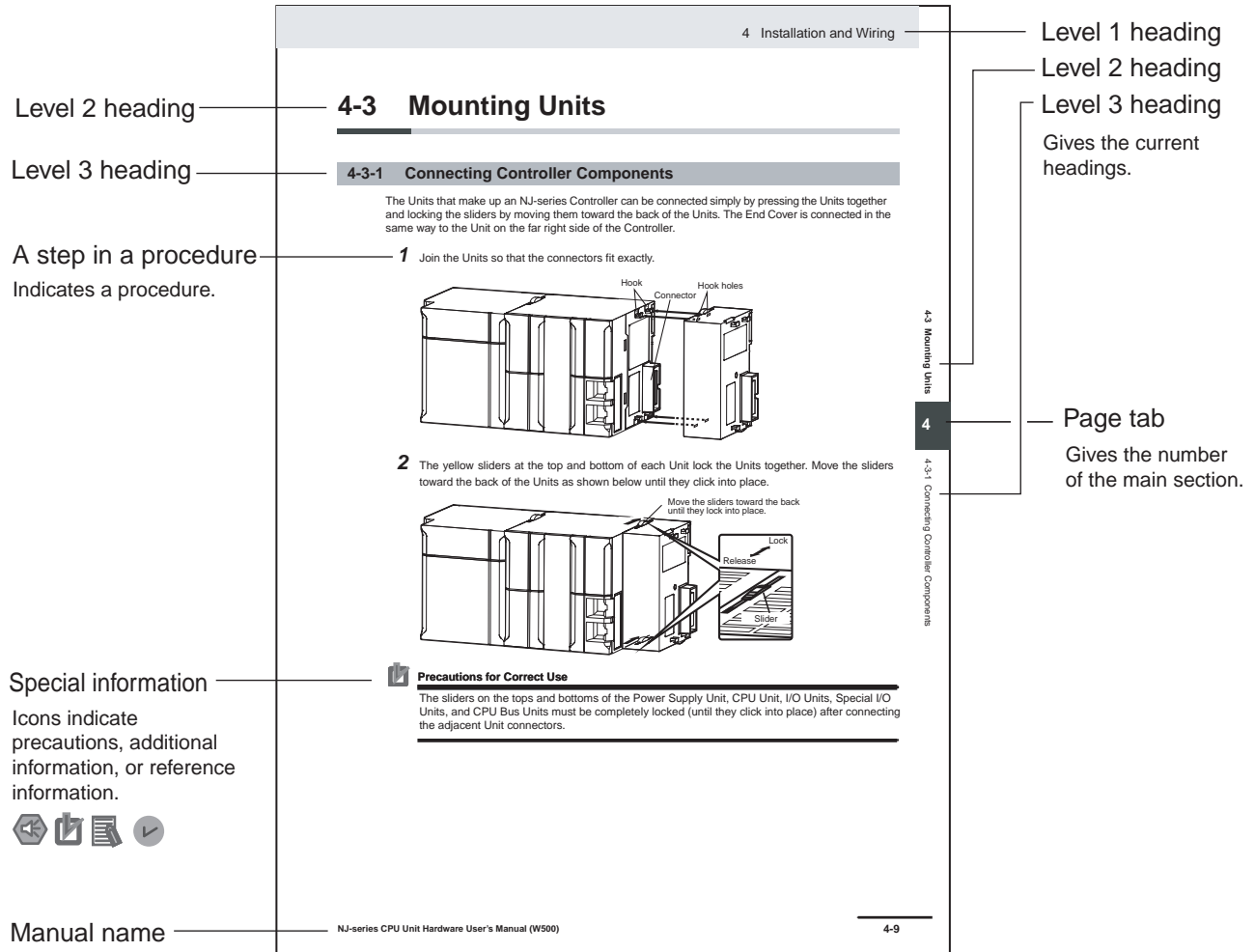
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Manual Structure

Page Structure

The following page structure is used in this manual.



This illustration is provided only as a sample. It may not literally appear in this manual.

Special Information

Special information in this manual is classified as follows:



Precautions for Safe Use

Precautions on what to do and what not to do to ensure safe usage of the product.



Precautions for Correct Use

Precautions on what to do and what not to do to ensure proper operation and performance.



Additional Information

Additional information to read as required.

This information is provided to increase understanding or make operation easier.



Version Information

Information on differences in specifications and functionality for CPU Units with different unit versions and for different versions of the Sysmac Studio is given.

Note References are provided to more detailed or related information.

Terminology

- For descriptions of the Controller terms that are used in this manual, refer to information on terminology in *NJ-series CPU Unit Software User's Manual* (Cat. No. W501) and *NJ-series CPU Unit Hardware User's Manual* (Cat. No. W500).
- For descriptions of the FH/FZ5 Sensor controller terms that are used in this manual, refer to information on terminology in *Vision System FH/FZ5 series User's Manual* (Cat. No. Z340).

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Related Manuals

The following manuals are related to the FH-series Sensor Controllers. Use these manuals for reference.

Manual name	Cat. No.	Model numbers	Application	Description
Vision System FH Series Operation Manual for Sysmac Studio (This manual)	Z343	FH-1□□□ FH-3□□□	Learning about how to configure settings for and operate the sensor controller for the FH Series from the Sysmac Studio FH Tools	In this manual, we will describe how to configure settings for and operate the sensor controller for the FH Series from the Sysmac Studio FH Tools.
Sysmac Studio Version 1 Operation Manual	W504	SYS-MAC-SE2□□□	Learning about the operating procedures and functions of the Sysmac Studio	Describes the operating procedures of the Sysmac Studio.
Vision System FH/FZ5 Series User's Manual	Z340	FH-1□□□ FH-3□□□ FZ5-L35□ FZ5-6□□ FZ5-11□□	Learning about how to configure settings for the FH/FZ5 Series Vision Sensors	In this manual, we will describe how to configure settings using the sensor controller for the FH/FZ5 Series Vision Sensors.
Vision System FH/FZ5 Series Processing Item Function Reference Manual	Z341	FH-1□□□ FH-3□□□ FZ5-L35□ FZ5-6□□ FZ5-11□□	Learning about how to configure settings for processing items for the FH/FZ5 Series Vision Sensors	In this manual, we will describe how to configure settings for processing items for the FH/FZ5 Series Vision Sensors.
Vision System FH/FZ5 Series User's Manual for Communications Settings	Z342	FH-1□□□ FH-3□□□ FZ5-L35□ FZ5-6□□ FZ5-11□□	Learning about how to configure communications settings for the FH/FZ5 Series Vision Sensors	In this manual, we will describe how to configure communications settings using the sensor controller for the FH/FZ5 Series Vision Sensors.

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Manual Revision History

The manual revision symbol is appended to the manual number on the front cover and back cover.

Man.No. Z343-E1-02

↑
Revision Symbol

Revision Symbol	Revision Date	Reason for Revision and Revised Page
01	June 2013	First edition
02	September 2013	Added offline debugging function, Support for software version 5.1 of the FH sensor controller.



1

Overview

This document describes the functional specifications of the Sysmac Studio FH tools (hereinafter referred to as "FH tools").

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1-1 Supported Models

The FH tool supports the following models in the FH Vision Sensor series.

Connection Device Type	Description
FH-3050	High-speed controller for 2-channel camera type
FH-3050-10	High-speed controller for 4-channel camera type
FH-3050-20	High-speed controller for 8-channel camera type
FH-1050	Standard controller for 2-channel camera type
FH-1050-10	Standard controller for 4-channel camera type
FH-1050-20	Standard controller for 8-channel camera type

1-2 Project Management

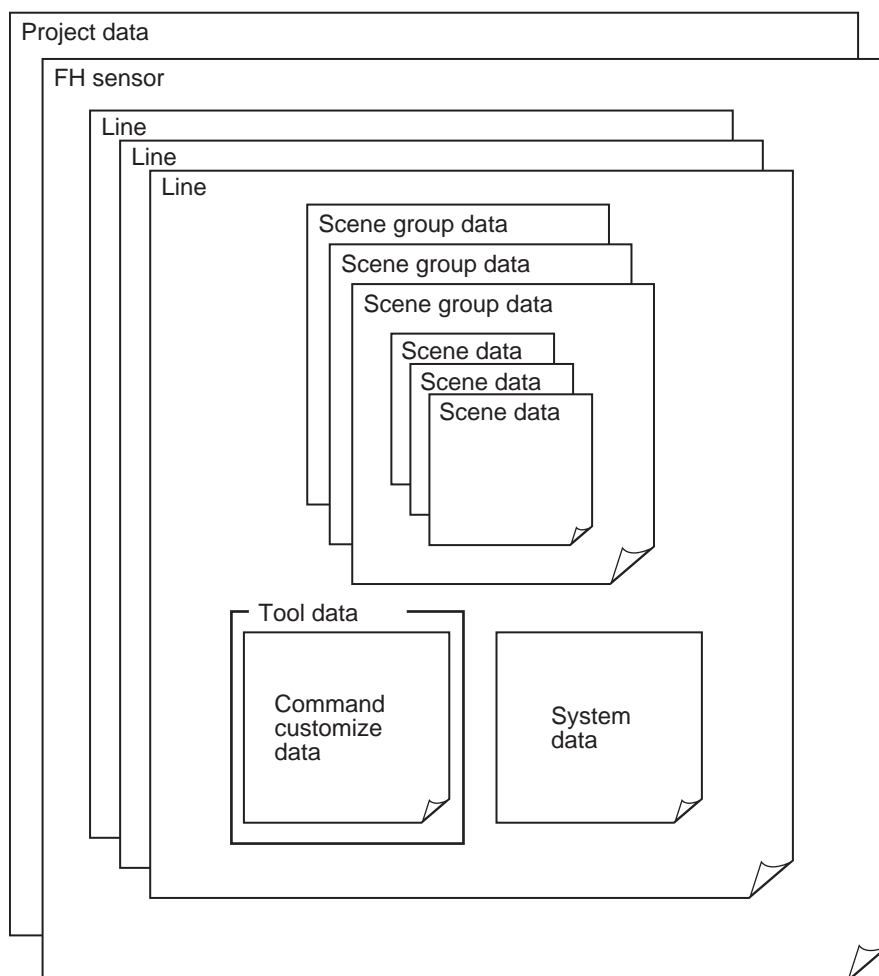
Sysmac Studio manages the configuration Information of each of the controller, servo, and vision sensor devices on a project basis.

One FH vision sensor series device can be registered to one project. With the FH vision sensor series, the following data is managed as project data.

- Scene group data (scene data)
- System data
- Tool data

With the FH vision sensor series, you can use multiple multi-line random-trigger modes. The data above is managed on a line basis for multiple multi-line random-trigger modes.

Project data manages these data together as one batch. These data can also be exported and imported individually as file data.



2

Basic Operations

This chapter describes the basic design flow and design items for using Sysmac Studio.

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2-1 Basic Design Flow 1

This section describes the flow for designing a system that uses NJ-series CPU Unit as a controller.

For details on the program on the NJ-series CPU Unit side, task design, and debugging, refer to *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

● New project settings

Create a project file.

1 Starting Sysmac Studio

Start Sysmac Studio.

Refer to *3-3-1 Starting and Exiting the Sysmac Studio* in *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

2 Designing a new project

Create a new project.

Refer to *3-3-2 Creating a Project File* in *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

● Controller configuration and settings

• Controller configuration

(1) Creating an EtherCAT configuration

Register FH as an EtherCAT slave in [EtherCAT].

Refer to *5-1 EtherCAT Configuration and Settings* in *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

(2) Registering device variables

When using or using after editing device variables for the user defined variables to connect the FH I/O information and program, register the device variables in [I/O Map].

Refer to *4-1-2 Creating Device Variables* in *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

• Controller settings

(1) Editing slave parameters

Edit the *Operation Settings* of the slaves.

Refer to *5-2-1 Creating the EtherCAT Slave Terminal Configuration* in *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

● Sensor connection

Establish an online connection with the sensor.

(1) Connecting a sensor

Refer to *Section 3 Connecting with a Vision Sensor*

- **Design**

Create the processing flow.

- (1) Creating flow

Refer to 2-6 *Basic Operations of Flow Editing* on page 2-26

- (2) Editing processing units

Refer to 4-2 *Editing a Processing Unit* on page 4-4

- **Online debugging of sensor**

Perform debugging using the actual device.

- (1) Performing test measurement

Perform test measurement on sample work. Adjust the parameters if necessary.

Refer to *Section 6 Online Debugging*

2-2 Basic Design Flow 2

This section describes the flow for designing a system that uses a controller other than NJ-series CPU Unit.

● New project settings

Create a project file.

(1) Starting Sysmac Studio

Start Sysmac Studio.

Refer to *3-3-1 Starting and Exiting the Sysmac Studio in Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

(2) Designing a new project

Create a new project.

Select a vision sensor for the category and FH for the device.

Refer to *2-3 Creating a New Project* on page 2-5

(3) Selecting sensor type

Select the sensor type and then establish an online connection.

Refer to step 3 on P. 2-6 of *2-3 Creating a New Project* on page 2-5

● Sensor configuration and settings

- Sensor configuration

(1) Creating an interface configuration for the sensor

Edit the interface configuration.

Refer to *5-1 Setting Procedure* on page 5-3

- Sensor settings

(1) Editing the communication conditions

Edit the communication conditions of the sensor.

Refer to *5-1 Setting Procedure* on page 5-3

● Design

Create the processing flow.

(1) Creating flow

Refer to *2-6 Basic Operations of Flow Editing* on page 2-26

(2) Editing processing units

Refer to *4-2 Editing a Processing Unit* on page 4-4

● Online debugging

Perform debugging using the actual device.

(1) Performing test measurement

Perform test measurement on sample work. Adjust the parameters if necessary.

Refer to *Section 6 Online Debugging*

2-3 Creating a New Project

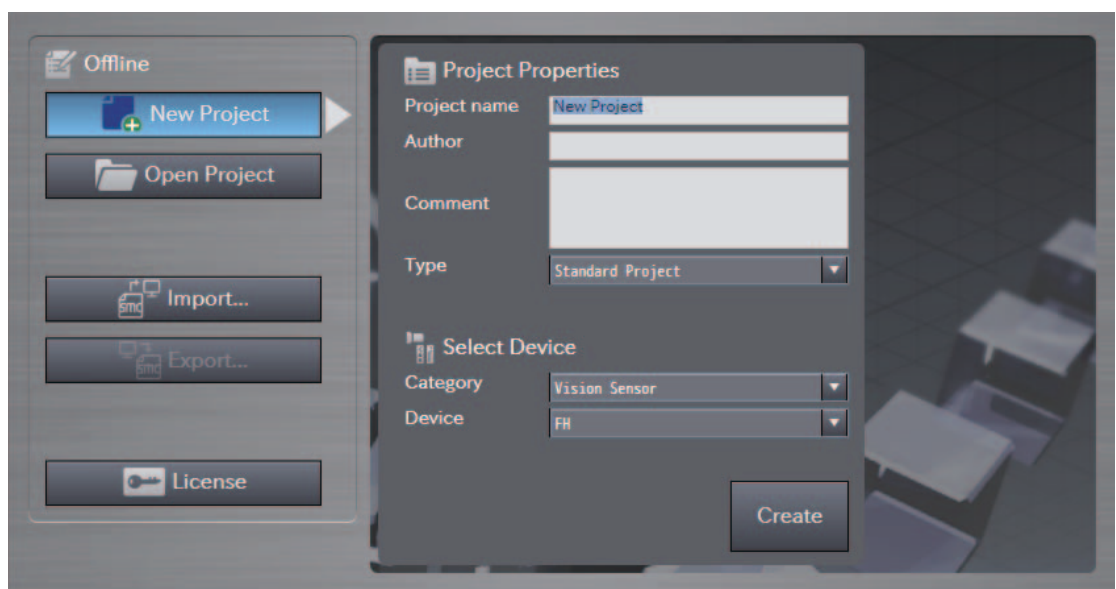
This section describes how to create a new project file. For details on the basic operations, refer to 3-3 *Creating a Project in Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

Here, we describe how to create a new project for the FH vision sensor (hereinafter referred to as "FH project").

2-3-1 Creating a New Project File from the Project Window

- 1 Click the [New Project] button in the project window.
- 2 In the [Project Properties] dialog box, enter the information in [Project name], [Author] (optional), and [Comment] (optional), select the following device from [Category] and [Device] of [Select Device], and click the [Create] button.

Item	Setting
Category	Vision sensor
Device	FH

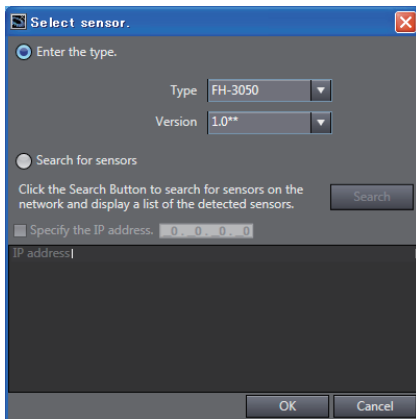


3 Select the FH vision sensor to which you connect.

When establishing an online connection, click [Search for sensors] and then click the [Search] button. The found sensors are displayed in a list. Select the sensor you wish to connect to and then click the [OK] button.

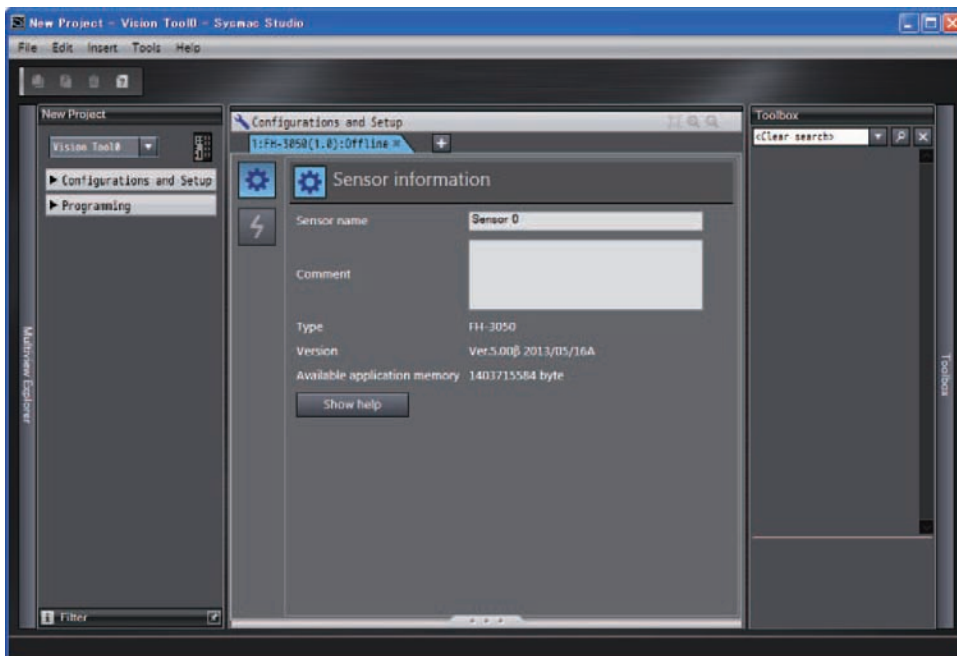
If you know the IP address of the sensor you wish to connect to beforehand or will connect to a sensor via a router, select the [Specify the IP address] check box and then enter the IP address in [IP address]. After input is complete, click the [OK] button.

If you wish to edit the settings offline, click [Enter the type], select the [Type] and [Version] items for the sensor you wish to edit, and then click the [OK] button.



4 A new project is created.

The project file is created and the next screen appears.



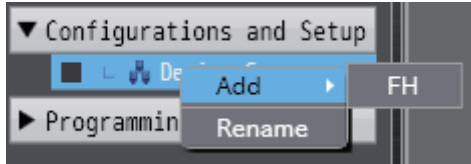
Precautions for Correct Use

An online connection cannot be established if the FH device registered to the project and the actual device are not the same type and version.

2-3-2 Adding FH Device to a Project

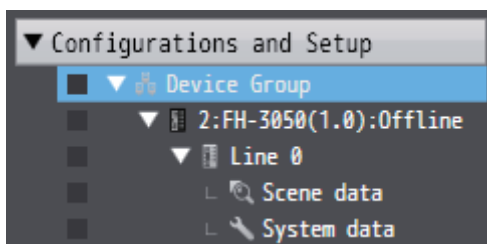
You can add an FH device to a project.

Right-click the Device Group and select [Add | FH].



The sensor selection screen appears. Select the sensor type.

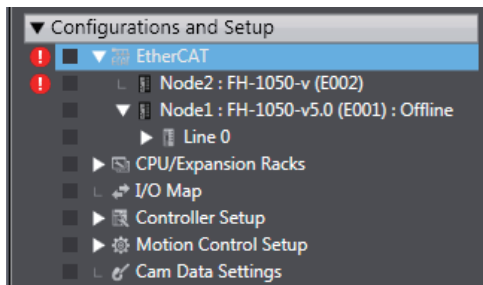
The selected FH device is registered.



Precautions for Correct Use

Only one FH device can be added to a project.

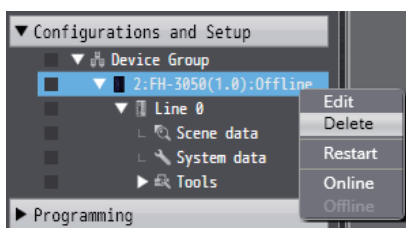
If multiple FH devices are registered, "!" is displayed in the type field of the invalid FH devices.



2-3-3 Deleting FH Device from a Project

You can delete FH device from a project.

Right-click the FH vision sensor you wish to delete and select [Delete].

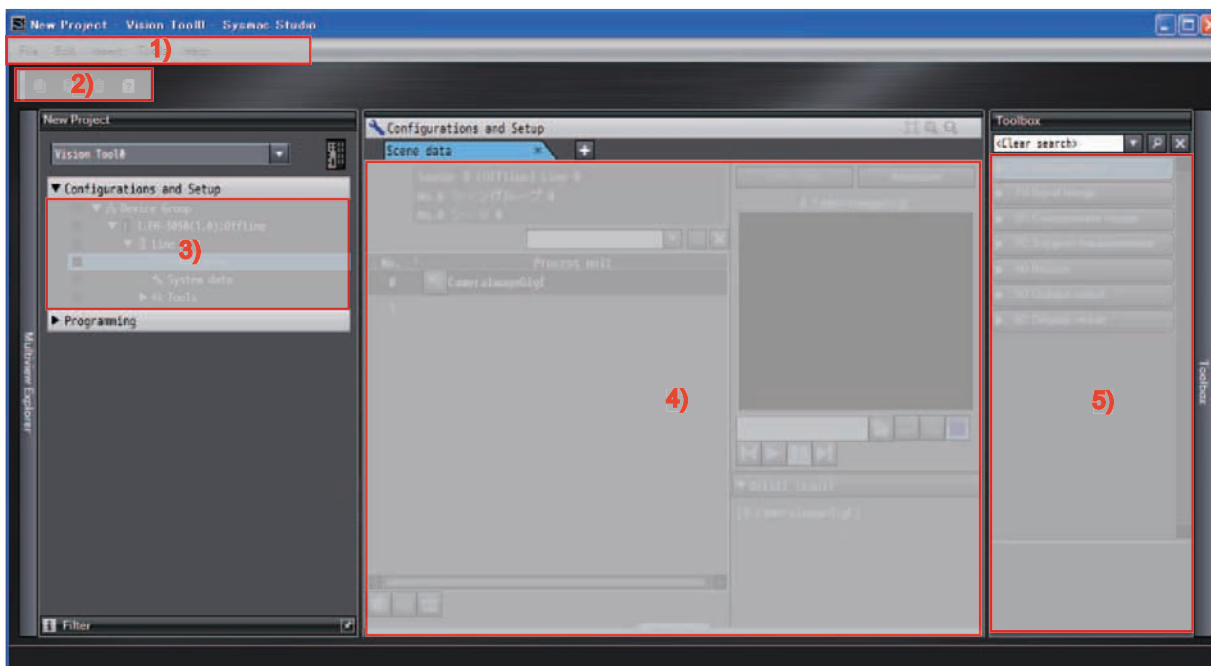


2-4 Description of Screen Components

This section describes the screen components in FH project.

For a description of the screen components in NJ-series CPU Unit project, refer to *3-4 Parts of the Window in Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

2-4-1 Application Window



No.	Name
1	Menu Bar
2	Toolbar
3	Multiview Explorer
4	Edit Pane
5	Toolbox

2-4-2 Menu Bar

	Menu Name	Description
File	Close	Closes the project.
	Save	Saves the project.
	Save As	Saves the project with a different name.
	Save As New Number	Saves the project with a new update number.
	Import	Imports an exported file so that it can be edited in the tool.
	Export	Saves the project as an external file.
	Page Settings	Sets the print attributes (margins and other attributes).
	Print	Executes the print command.
	Exit	Closes Sysmac Studio.
Edit	Copy	Copies the selected item.
	Paste	Pastes the copied item.
	Delete	Deletes the selected item.
Insert	Controller	Inserts an NJ301 or NJ501 project.
	Vision Sensor	Inserts an FQ-M or FH project.
	Displacement Sensor	Inserts a ZW project.
Tools	Options	Displays the Options menu.
Help	Help Contents	Displays "Vision System FH Series Operation Manual Sysmac Studio (Cat. No. Z343)."
	Online Registration	Performs online registration.
	Keyboard Mapping Reference	Displays the shortcut key reference.
	About Sysmac Studio	Displays the version of Sysmac Studio.

2-4-3 Toolbar

Button Name	Description
Copy	Copies the selected item.
Paste	Pastes the copied item.
Delete	Deletes the selected item.
Help	Displays Vision System FH Series Operation Manual Sysmac Studio (Cat. No. Z343)

2-4-4 Multiview Explorer

- This pane will be the access point for all data of the FH series.
- You can right-click any data item that can be set and select an item from the menu (context menu). You can also display various editing screens in the Edit Pane.
- Multiview Explorer can be displayed or hidden by clicking the display/hidden bar on the left side of the window. Even when hidden, it can be displayed temporarily by placing the mouse pointer over the display/hidden bar. Moving the mouse pointer away from the bar returns the Multiview Explorer to the hidden state.

List of the layers and items that make up the Multiview Explorer and the menu items displayed by right-clicking

Tree View Items		Menu Item	Description		
Device Group		Add FH	Adds a sensor to the project.		
		Rename	Changes the device group name.		
Type		Edit	Displays the main screen in the Edit Pane.		
		Delete	Deletes the sensor from the project.		
		Online	Switches the connection state with the sensor to online.		
		Offline	Switches the connection state with the sensor to offline.		
		Restart	Restarts the sensor.		
		Change Version	Changes the sensor version. When the version is changed, the setting data is initialized. This menu item only appears in NJ Project.		
		Line X (X=0,1,,,7)		Monitor window	Displays the monitor window in the Edit Pane.
Scene maintenance window	Displays the Scene maintenance window in the Edit Pane.				
Save data	Saves the sensor settings data to non-volatile memory.				
Rename	Changes the line name.				
Save to file	Saves scene group 0 + system data to a file.				
Load from file	Loads scene group 0 + system data from a file.				
Scene data				Edit	Displays the scene data editing screen in the Edit Pane.
				Save to file	Saves the scene group data to a file.
				Load from file	Loads the scene group data from a file.
System data				Edit	Displays the system settings editing screen in the Edit Pane.
				Save to File	Saves the system data to a file.
				Load from File	Loads the system data from a file.
Tools				Customize I/O command	
		Save to file	Saves the customized I/O settings data to a file.		
		Load from file	Loads the customized I/O settings data from a file.		
		User Data		Edit	Displays the user data tool in the Edit Pane.
				Save file	Displays the file saving tool in the Edit Pane.
Calibration Support Tool		Edit	Displays the calibration support tool in the Edit Pane.		

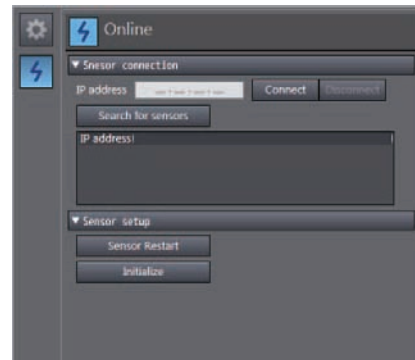
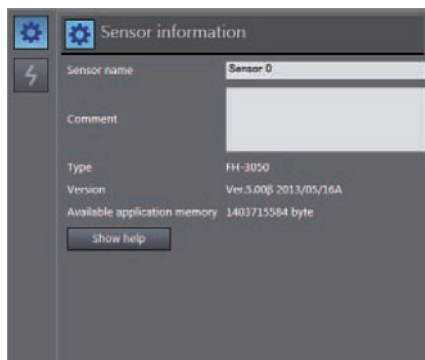
2-4-5 Edit Pane

This pane is for displaying and editing the detailed data of all items.

The following nine screens are provided.

Screen	Description	Reference Page
Sensor connection screen	This allows you to access the sensor information, the connection with the sensor, the main screen of each line, etc.	P. 2-11
Monitor window	This allows you to check the measurement results.	P. 2-12
Scene maintenance window	This allows you to change the scene data settings. It also allows you to perform test measurement and check the measurement results.	P. 2-15
Scene data editing screen	This allows you to set the scene data.	P. 2-18
System data editing screen	This allows you to set the system data.	P. 2-19
Communication command customize tool screen	This displays the I/O command customize tool in the Edit Pane.	—
User Data tool screen	This allows you to edit the user data.	—
File Save Tool screen	This allows you to copy or move files between the RAM-Disk/USB memory of the sensor or between the RAMDisk/USB memory and a PC. It also allows you to save the logging image stored in the vision sensor memory to the RAMDisk or USB memory of the sensor, or to the memory of a PC.	P. 8-4
Calibration support tool screen	This allows you to check the calibration settings.	P. 8-3

Sensor connection screen



This allows you to access the sensor information, the connection with the sensor, the main screen of each line, etc.

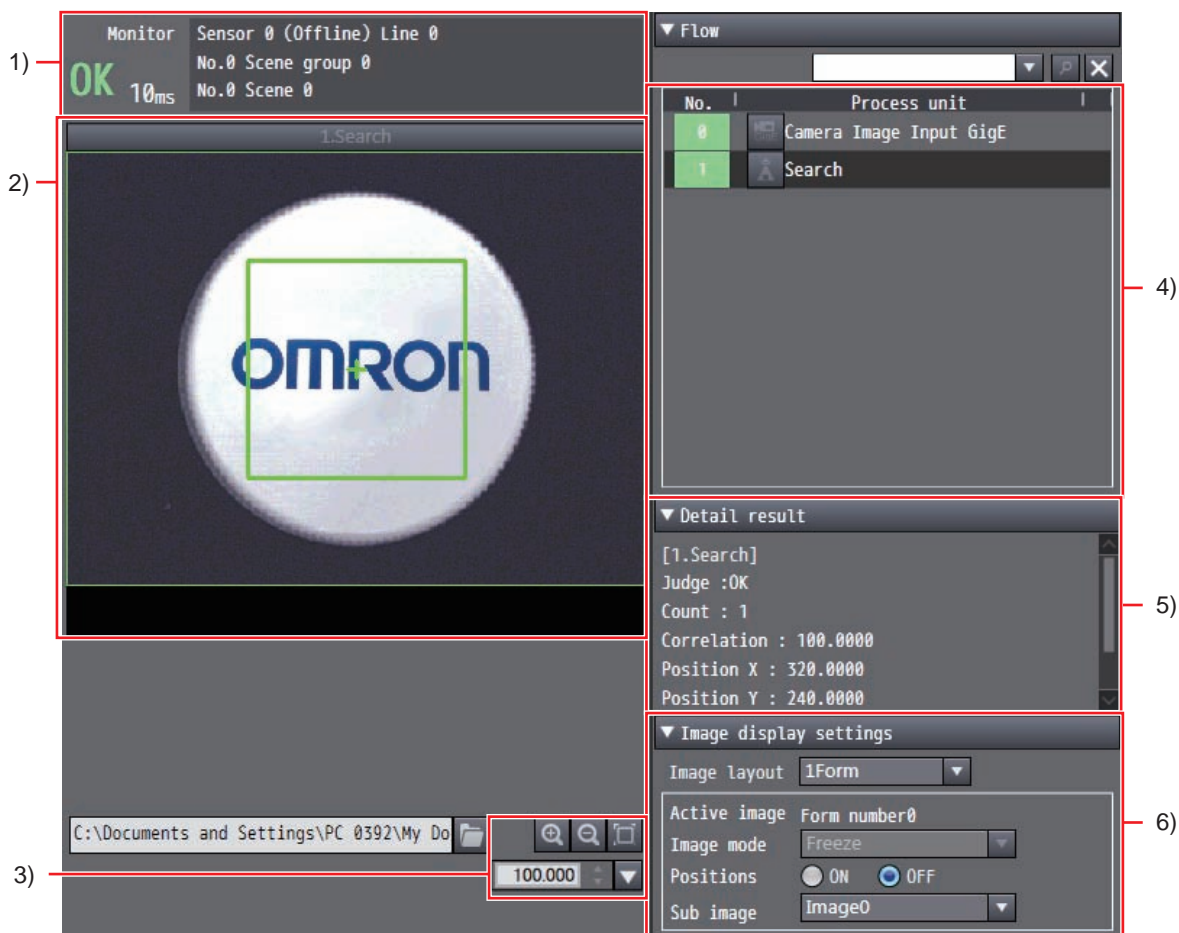
Group	Item	Description
Sensor information	Sensor name	Allows you to change the sensor name.
	Comment	Allows you to enter a comment for the sensor.
	Type	Displays the sensor type information.
	Version	Displays the sensor version information.
	Available application memory	Displays the amount of available application memory.
Online	IP address	Sets the IP address of the sensor for online connections.
	Connect	Establishes an online connection to the sensor with the specified IP address.
	Disconnect	Disconnects the sensor currently connected with an online connection.
	Search for sensors	Searches for sensors within the same network.
	Sensor Restart	Restarts the sensor.
	Initialize	Initializes the sensor.



Additional Information

For details on the settings in the sensor connection screen, refer to *3-2 Establishing an Online Connection with a Vision Sensor* on page 3-4.

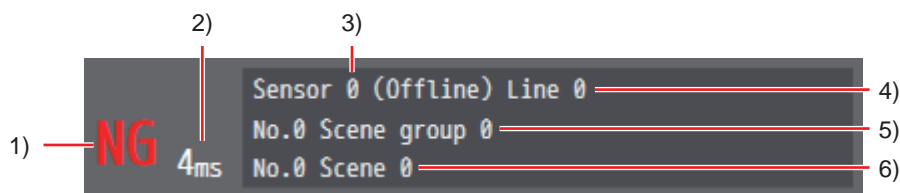
Monitor window



This allows you to check the measurement results.

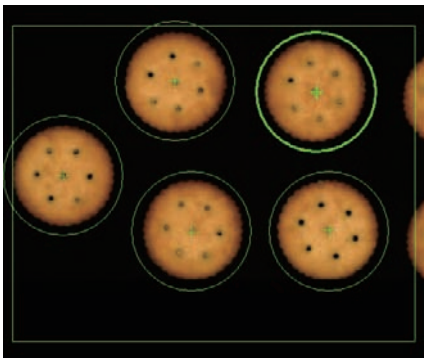
No.	Screen Component	Description	Reference Page
1	Status display area	Allows you to access the sensor information, the connection with the sensor, the main screen of each line, etc.	P. 2-13
2	Image display area	Allows you to check the measurement results.	P. 2-13
3	Image size control section	Enlarges or reduces the selected image.	P. 2-13
4	Flow	Displays the processing flow for the relevant line or current scene.	P. 2-14
5	Detail result	Displays the results for the processing unit selected in the flow.	P. 2-14
6	Image display settings	Sets the displays settings for images displayed in the image display area.	P. 2-15

● Status display area



No.	Item	Description
1	Judgment result	Displays the judgment result (OK or NG).
2	Processing time	Displays the processing time for the most recent measurement process.
3	Sensor name and IP address	Displays the sensor name and IP address. When the sensor is offline, "Offline" is displayed instead of the IP address.
4	Line name	Displays the line for which information is currently being displayed.
5	Scene group name	Displays the current scene group number and scene group name.
6	Scene name	Displays the current scene number and scene name.

● Image display area



This displays the image and measurement result (graphic) for the processing unit selected in the flow display.

The settings for image display in the image display area can be changed in the Image display settings menu. For details on the Image display settings menu, refer to *Image display settings* on page 2-15.


While an image is displayed enlarged, you can change the display area by left-clicking and dragging the displayed image.

● Image size control section

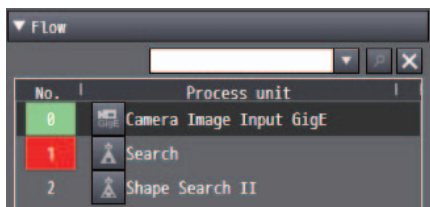


This allows you to enlarge or reduce the selected image.

Button	Description
	Enlarges the image. Image display is enlarged in 20% steps. (Upper limit: 1600%)
	Reduces the image. Image display is reduced in 20% steps. (Lower limit: 1%)
	Makes the image fit the display frame.

Button	Description
	Enlarges or reduces the image.

● **Flow**



This displays the processing flow for the relevant line or current scene.

If a processing unit displayed in the list is selected, the following display information is linked and so changes accordingly.

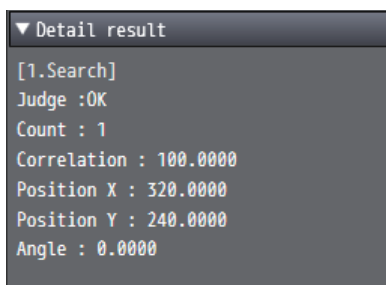
- Image display information
- Detailed result display information

If multiple images are displayed, the display information of the image with the focus on it changes.

If a processing unit is searched in the search area, the focus moves to the found processing unit.

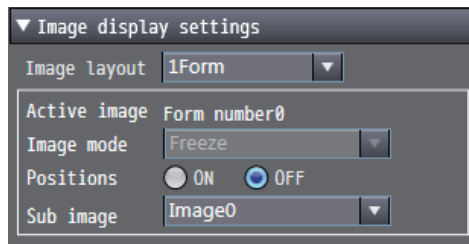
Item	Description
Search	Searches for the specified processing unit from within the processing flow.
Flow list	Displays the processing flow for the relevant line or current scene.

● **Detail result**



This displays the results for the processing unit selected in the flow.

● Image display settings



Item	Description
Image layout	Selects the number of images to display. Selection items: 1Form, 2Form, and 4Form
Image mode	Selects the image mode for the image with the focus on it. Selection items: Through, Freeze, and NG image
Positions	Selects position list display for the image with the focus on it. Selection items: OFF and ON
Sub image	Selects the sub image number for the image with the focus on it. Select items: Image0, Image1,..., image31

This sets the displays settings for images displayed in the image display area.

Scene maintenance window



This allows you to copy, switch, and clear scene data and scene group data. It also allows you to perform test measurement and check the measurement results.

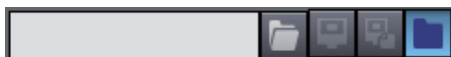
● Status display area

This is the same as in the monitor window. Refer to *Status display area* on page 2-13.

● Image display area

This is the same as in the monitor window. Refer to *Image display area* on page 2-13.

● File selection section



Button	Description
	Displays camera images. Selection is not possible when offline.
	Displays logging images. Selection is not possible when offline.
	Displays file images. When online, displays images in the RAMDisk or USB memory of the sensor. When offline, displays images in the following folder on the PC. C:\Documents and Settings\ <user name="">\My Documents\OMRON FH</user>
	Selects an image file when a file image is selected.

● Image control section



Button	Description
	Performs continuous measurement of images. In the case of camera images, continuously measures and displays camera images. In the case of logging images, continuously measures and displays images in the logging folder. In the case of file images, continuously measures and displays images in the folder. When logging images and file images are selected, continuous measurement is stopped after all images are measured.
	Stops continuous measurement.
	Measures and displays the previous image.
	Measures and displays the next image.

● Image size control section

This is the same as in the monitor window. Refer to *Image size control section* on page 2-13.

● Data save

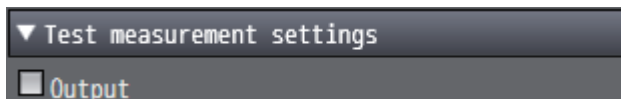
This saves the settings data to non-volatile memory of the FH sensor.

● Measure

Performs a single measurement.

The measurement process is performed for the file image that is currently displayed.

- **Test measurement settings**



Item	Description
Output	Outputs the measurement results to an external device when test measurement is performed.

- **Flow**

This is the same as in the monitor window. Refer to *Flow* on page 2-14.

- **Detail result**

This is the same as in the monitor window. Refer to *Detail result* on page 2-14.

- **Image display settings**

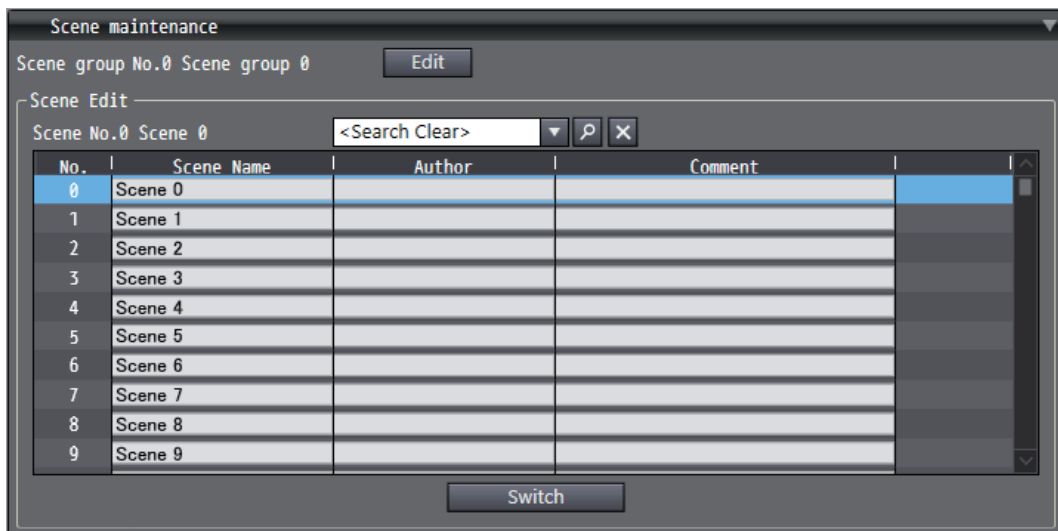
This is the same as in the monitor window. Refer to *Image display settings* on page 2-15.

- **Scene maintenance area**

Clicking the scene maintenance item bar opens the scene maintenance window.

This screen allows you to manage and switch the scene group data and scene data.

For details on the specifications, refer to 2-5 *Basic Operations of Scene Data* on page 2-21.



Scene data editing screen

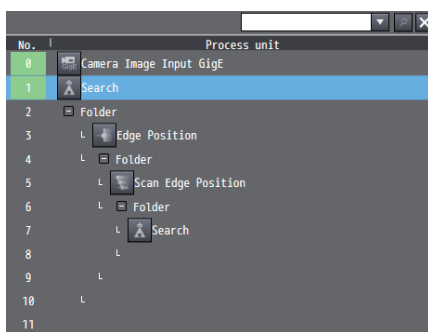


This editing screen allows you to build the processing unit flow.

A new processing unit can be added to the flow by dragging and dropping any processing unit in the Toolbox on to the list.

It is also possible to check the image that is the measurement target, and the measurement results for each processing unit.

● Flow display



This displays the processing flow for the relevant line or current scene.

Each editing process (adding, copying, deleting, etc.) of the processing units in the flow can be performed.

Item	Description
Search	Searches for the specified processing unit from within the processing flow.
Flow list	Displays the processing flow for the relevant line or current scene.

The registered processing units are displayed in the flow list.

- **Data save**

This is the same as in the Scene maintenance screen. Refer to *Data save* on page 2-16.

- **Measure**

This is the same as in the Scene maintenance screen. Refer to *Measure* on page 2-16.

- **File selection section**



This is the same as in the Scene maintenance screen. Refer to *File selection section* on page 2-16.

- **Image control section**



This is the same as in the Scene maintenance screen. Refer to *Image control section* on page 2-16.

- **Detail result**

This is the same as in the monitor window. Refer to *Detail result* on page 2-14.

System data editing screen



This editing screen allows you to set the system data.

System data is managed on a group basis and the editing items for each group are displayed by clicking the corresponding icon.

No.	Name
1	Icon
2	Group name display area
3	Editing item display area

For details on each group, refer to *8-5 Changing the System Environment* on page 8-8.

Tool settings editing screen

The tool settings editing screen displays the editing screens of the following tools.

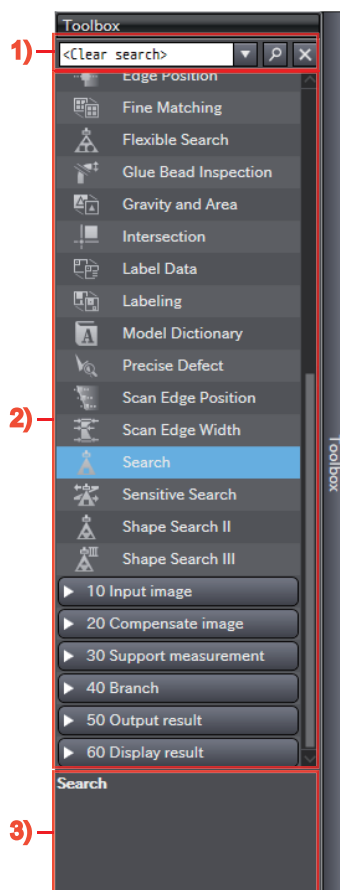
For details on each tool, refer to *Section 8 Other Useful Functions*.

Tool	Functional Overview
Communication Command Customize setting tool	Edits custom commands.
Calibration support tool	Allows you to check the calibration settings.
File save tool	Saves the image data to a file.
User data tool	Allows you to edit the user data, set the initial settings, and enter a comment that describes the data.

2-4-6 Toolbox

The Toolbox displays a list of the processing units that can be used.

When the scene editing screen is displayed in the Edit Pane, you can add a processing unit by selecting any processing unit and dragging and dropping it onto the flow list in the scene editing screen.



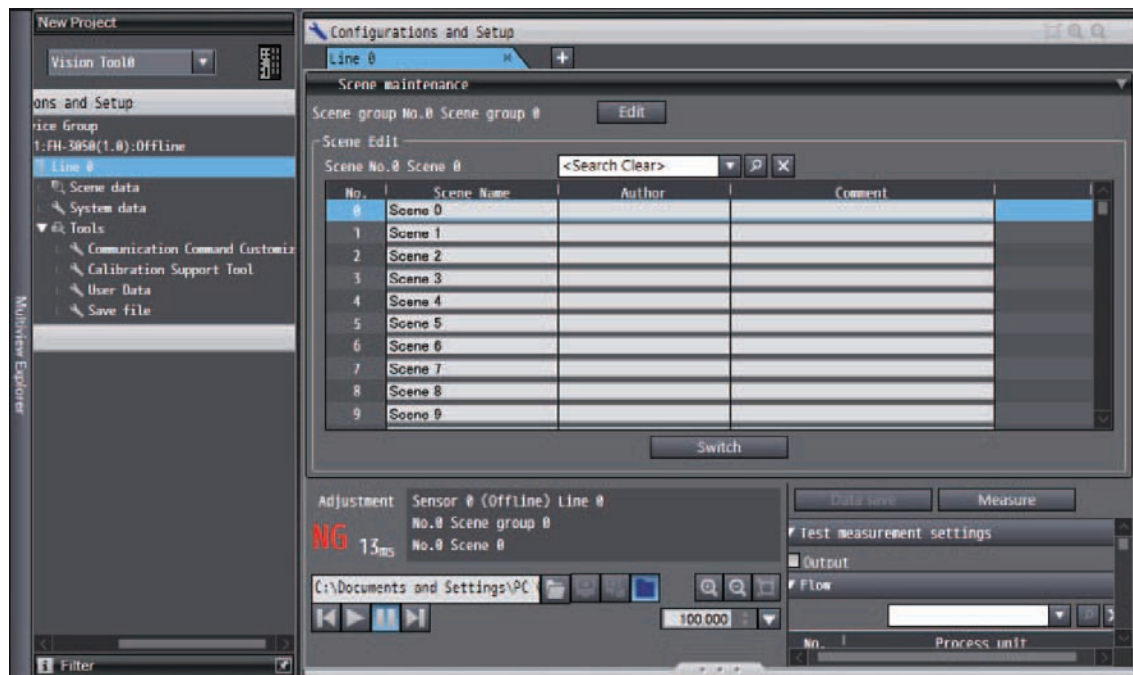
No.	Item	Operation
1	Processing item search window	Searches for processing items.
2	Processing item area	Displays the available processing units.
3	Guidance	Displays an overview of the selected processing unit.

2-5 Basic Operations of Scene Data

An FH vision sensor can handle multiple scene data.

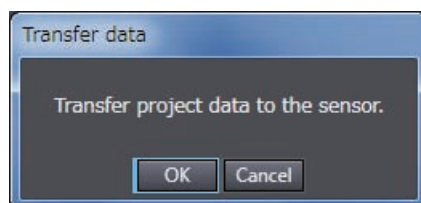
You can perform operations such as switching, copying, and deleting scenes with the scene maintenance functions in the scene maintenance window.

Right-click [Line X] in the Multiview Explorer and select [Scene maintenance screen] from the menu. Click [Scene maintenance] and show [Scene maintenance] Pane.



Additional Information

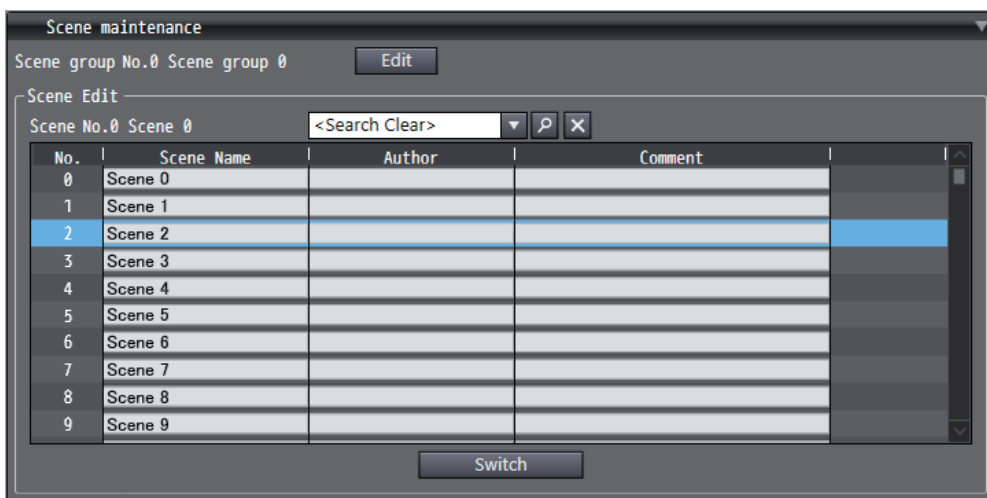
Project data that has been edited offline can be transferred to an FH vision sensor. The following message appears when an online connection is established or the first time an editing screen is opened.



If you select [OK], the settings data are transferred to the vision sensor. After the transfer completes, restart the vision sensor to reflect the settings data.

2-5-1 Switching Scenes

You can switch scenes by selecting the target scene in the scene list and then clicking the [Switch] button.

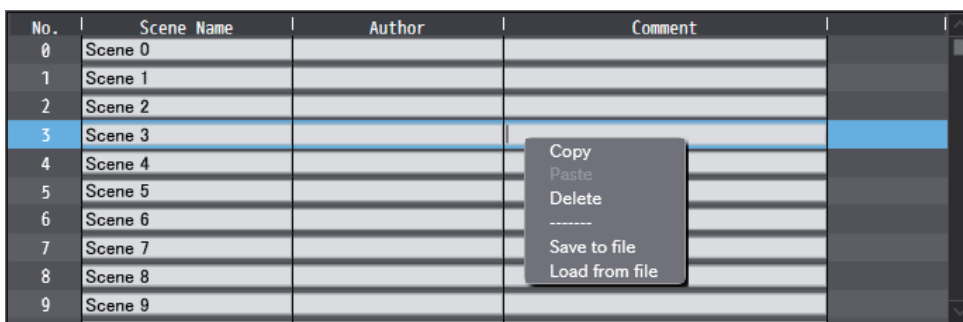


When scene switching is performed, the scene data editing screen is closed automatically if it is open in the Edit Pane.

2-5-2 Managing Scenes

Right-clicking a target scene in the scene list displays the following menu.

Select the menu item for the operation you wish to perform.



Item	Description
Copy	Copies the selected scene.
Paste	Pastes the copied scene.
Delete	Clears the selected scene.
Save to file	When online, saves the selected scene as a scene data file to the RAMDisk or USB memory of the sensor. When offline, saves it to the following folder on the PC. C:\Documents and Settings\ <user name="">\My Documents\OMRON FH</user>
Load from file	When online, loads a scene data file in the RAMDisk or USB memory of the sensor to the selected scene. When offline, loads the scene data file in the following folder on the PC. C:\Documents and Settings\ <user name="">\My Documents\OMRON FH</user>

2-5-3 Entering Scene Information

The scene list displays the following information.

No.	Scene Name	Author	Comment
0	Scene 0		
1	Scene 1		
2	Scene 2		
3	Scene 3		
4	Scene 4		
5	Scene 5		
6	Scene 6		
7	Scene 7		
8	Scene 8		
9	Scene 9		

Item	Description
Scene Name	Displays the scene name. (Maximum of 15 characters)
Author	Displays the author name. (Maximum of 15 characters)
Comment	Displays the comment. (Maximum of 255 characters)

Each item in the list can be directly edited.

2-5-4 Searching for a Scene

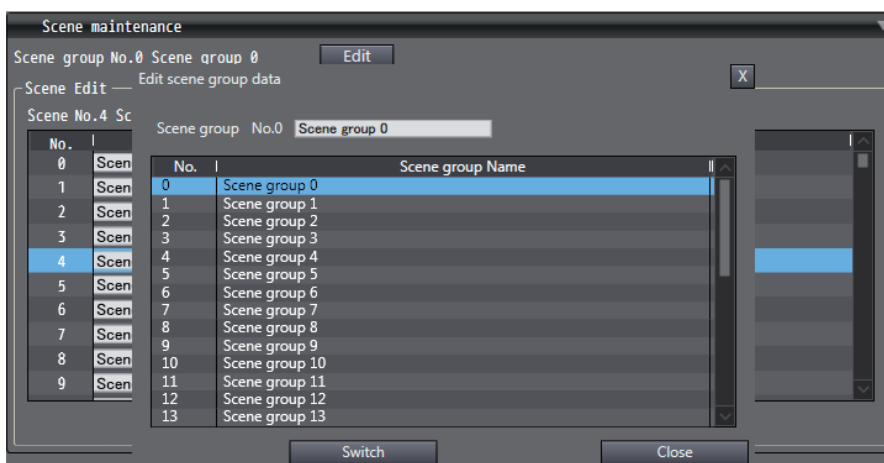
You can search for a scene in the list by entering any scene name in the search box and then clicking the search button (🔍). Clicking the search clear button (✖) clears the search results.



2-5-5 Switching Scene Groups

Clicking the scene group editing button displays the scene group editing window.

You can switch scene groups by selecting the target scene group in the list and then clicking the [Switch] button.

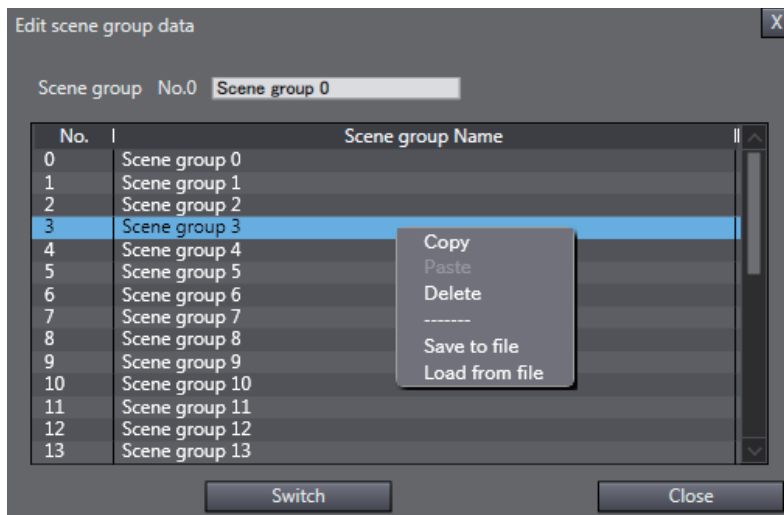


When scene switching is performed, the scene data editing screen is closed automatically if it is open in the Edit Pane.

2-5-6 Managing Scene Groups

Right-clicking a target scene group in the scene group list in the scene group editing window displays the following menu.

Select the menu item for the operation you wish to perform.



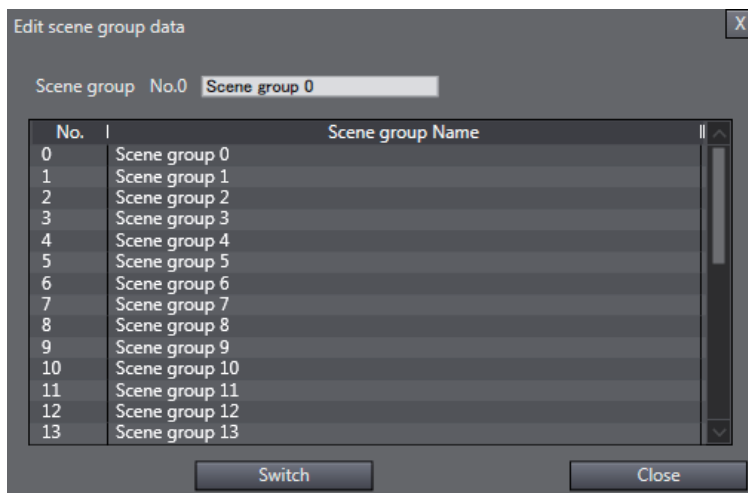
Item	Description
Copy	Copies the selected scene group.
Paste	Pastes the copied scene group.
Delete	Clears the selected scene group.
Save to file	When online, saves the selected scene group as a file to the RAMDisk or USB memory of the sensor. When offline, saves it to the following folder on the PC. C:\Documents and Settings\ <user name="">\My Documents\OMRON FH</user>
Load from file	When online, loads a scene data file in the RAMDisk or USB memory of the sensor to the selected scene group. When offline, loads the scene data file in the following folder on the PC. C:\Documents and Settings\ <user name="">\My Documents\OMRON FH</user>

2-5-7 Entering Scene Group Information

The scene group list displays the following information.

Item	Description
Scene group Name	Displays the scene group name.

The current scene group name can be edited.

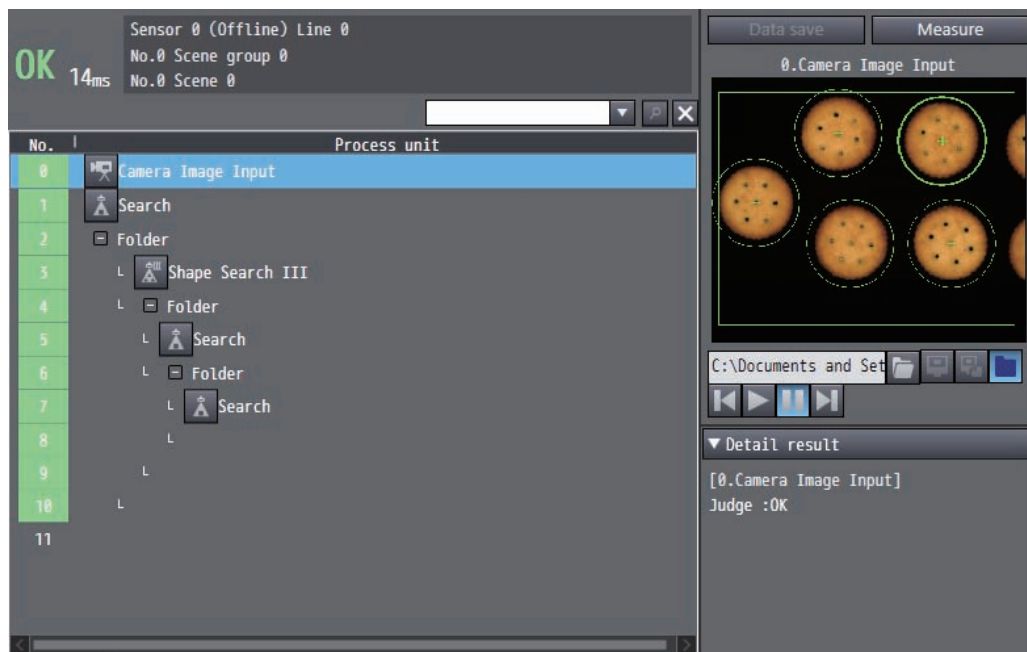
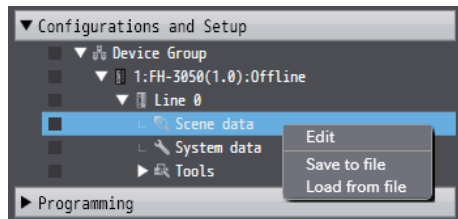


2-6 Basic Operations of Flow Editing

This section describes how to edit the flow.

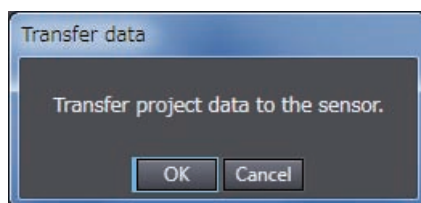
Edit the flow in the scene data editing screen. For details on the scene data editing screen, refer to *Scene data editing screen* on page 2-18.

You can open the scene data editing screen in the Edit pane by double-clicking scene data, or by right-clicking it and selecting [Edit] from the menu.



Additional Information

Project data that has been edited offline can be transferred to an FH vision sensor. The following message appears when an online connection is established or the first time an editing screen is opened.

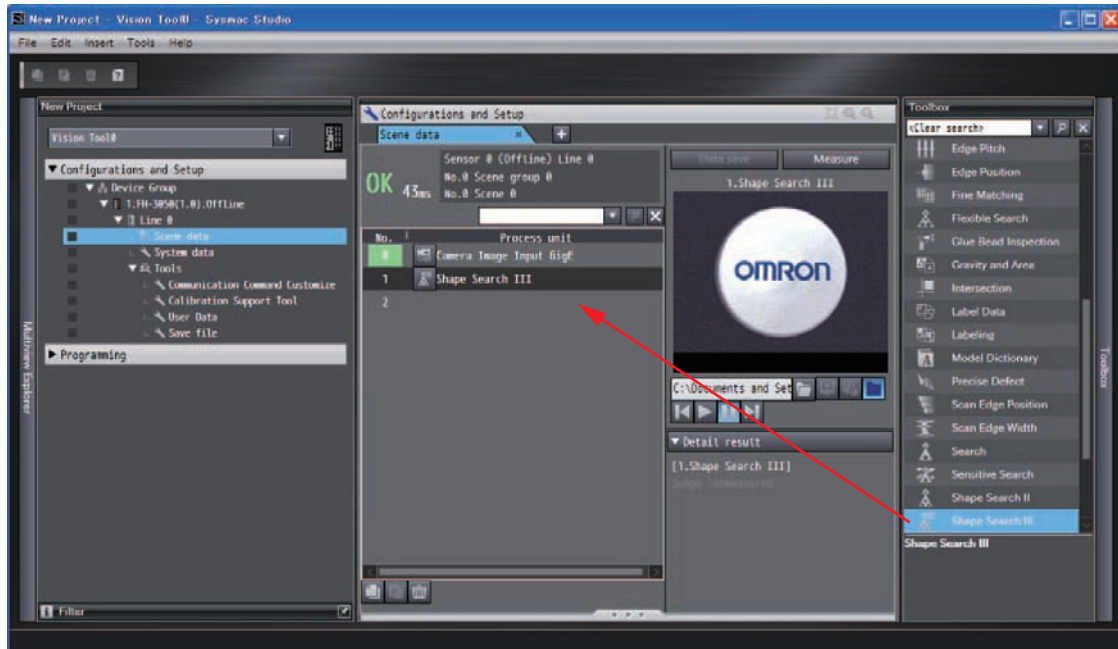


If you select [OK], the settings data are transferred to the vision sensor. After the transfer completes, restart the vision sensor to reflect the settings data.

2-6-1 Adding a Processing Unit

When you wish to add a new processing unit to the flow, first select any processing unit from the Toolbox.

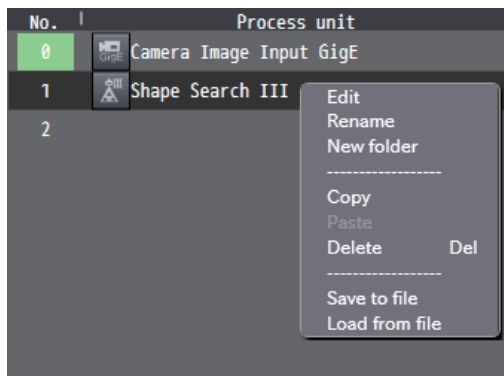
Then drag the selected processing unit to the place you wish to insert it in the flow list.



2-6-2 Managing Processing Units

Right-clicking a target processing unit in the flow list displays the following menu.

Select the menu item for the operation you wish to perform.






Item	Description
Edit ^{*1}	Opens the processing unit editing screen.
Rename	Changes the name of the processing unit.
New folder	Inserts a folder unit.
Copy	Copies the selected processing unit.
Paste	Pastes the copied processing unit.
Delete	Clears the selected processing unit.
Save to file	Saves the settings data of the processing unit to a file. When online, saves it to the RAMDisk or USB memory of the sensor. When offline, saves it to the following folder on the PC. C:\Documents and Settings\ <user name="">\My Documents\OMRON FH</user>
Load from file	Loads the settings data of the processing unit from a file. When online, loads the file in the RAMDisk or USB memory of the sensor. When offline, loads the file in the following folder on the PC. C:\Documents and Settings\ <user name="">\My Documents\OMRON FH</user>

*1. If the processing item is not supported in the edit operation, the following message appears.

"The Procltem has not been supported."

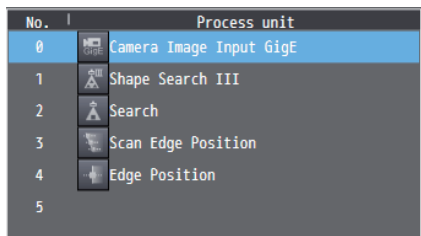
Menu buttons

Button	Description
	Copies the processing unit with the focus on it.
	Pastes the copied processing unit.
	Deletes the processing unit with the focus on it.

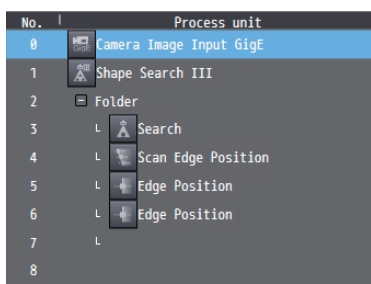
Display is hierarchical in the flow list when the following processing units are used.

- Folder unit
- Parallelize unit
- Parallelize task unit

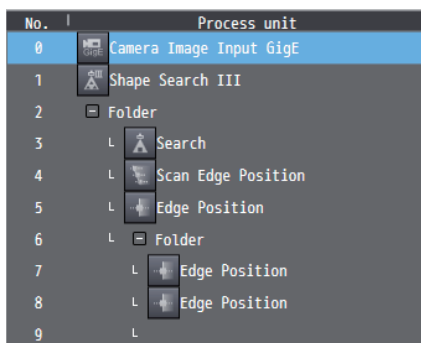
<No folder unit>



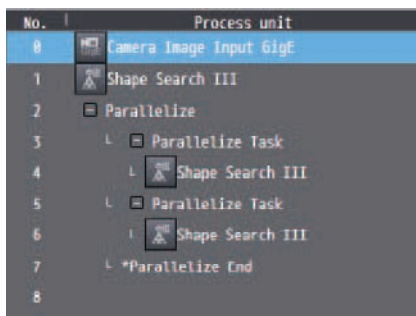
<Folder unit layer 1>



<Folder unit layer 2>



<Parallelize unit>



2-6-3 Searching for a Processing Unit

You can search for a processing unit in the flow list by entering any processing unit name in the search box and then clicking the search button (🔍). Clicking the search clear button (✖) clears the search results.



2-7 Function List

2-7-1 List of Functions Provided with the FH Tool

The following shows the functions provided with the FH tool and the usage conditions.

Classification	Item	Function	When Online Editing	When Offline Editing	
Project management	Menu Item	File	Close	<input type="radio"/>	<input type="radio"/>
			Save	<input type="radio"/>	<input type="radio"/>
			Save As	<input type="radio"/>	<input type="radio"/>
			Save As New Number	<input type="radio"/>	<input type="radio"/>
			Import	<input type="radio"/>	<input type="radio"/>
			Export	<input type="radio"/>	<input type="radio"/>
			Page Settings	<input type="radio"/>	<input type="radio"/>
			Print	<input type="radio"/>	<input type="radio"/>
			Exit	<input type="radio"/>	<input type="radio"/>
		Edit	Copy	<input type="radio"/>	<input type="radio"/>
			Paste	<input type="radio"/>	<input type="radio"/>
			Delete	<input type="radio"/>	<input type="radio"/>
		Insert	Controller	<input type="radio"/>	<input type="radio"/>
			Vision Sensor	<input type="radio"/>	<input type="radio"/>
			Displacement Sensor	<input type="radio"/>	<input type="radio"/>
		Tools	Option	<input type="radio"/>	<input type="radio"/>
		Help	Help Contents	<input type="radio"/>	<input type="radio"/>
			Online Registration	<input type="radio"/>	<input type="radio"/>
			Keyboard Mapping Reference	<input type="radio"/>	<input type="radio"/>
About Sysmac Studio	<input type="radio"/>		<input type="radio"/>		
Edit operations	Toolbar	Copy	<input type="radio"/>	<input type="radio"/>	
		Paste	<input type="radio"/>	<input type="radio"/>	
		Delete	<input type="radio"/>	<input type="radio"/>	
		Help	<input type="radio"/>	<input type="radio"/>	

Classification	Item	Function		When Online Editing	When Offline Editing		
Parameter settings	Multiview	Device Group	Add FH	○	○		
			Rename	○	○		
		Type	Edit	○	○		
			Delete	○	○		
			Restart	○	○		
			Online	×	○		
			Offline	○	×		
			Line X	Monitor window	○	○	
		Scene maintenance window		○	○		
		Save data		○	×		
		Rename		○	○		
		Save to file		○	○		
		Load from file		○	○		
		Scene data	Edit	○	○		
			Save to file	○	○		
			Load from file	○	○		
		System data	Edit	○	○		
			Save to file	○	○		
			Load from file	○	○		
		Tools		Communication command customize	Edit	○	○
					Save to file	○	○
Load from file	○				○		
Multiview	Tools		Save file	Edit	○	○	
			Calibration Support Tool	Edit	○	○	
			User Data	Edit	○	○	
Measurement control	Edit Pane	Online measurement	Camera images	○	×		
			File images	○	○		
			* File images in the vision sensor	○	×		
			Logging images	○	×		
			File images	×	○		
		* File images in the PC	×	○			
Simulation	Integrated simulation	×	○				

2-7-2 Comparison with FH Series Unit Functions

The following table shows the main differences between the functions provided with an FH series device and the FH tool.

Classification	Item	Sysmac Studio	FH
Project management	Data management for a single FH vision sensor	○	○
	Data management for all devices	○	×
	Screen customization and screen layout control	×	○
	Creating and displaying dedicated dialog boxes	×	○
Tools	Communication command customize	○	○
	File save	○	○
	Calibration Support Tool	○	○
	NG analyzer	×	○
	User data tool	○	○
	Security settings	×	○
	Downloading and uploading setting values	○	○
	Image file saving	×	○
	Registered image management tool	×	○
	Flow viewer	×	○
	Reference position batch conversion tool	×	○
	Scene group data conversion tool	×	○
Simulation	Single simulation	○	○
	Integrated simulation	○	×

3

Connecting with a Vision Sensor

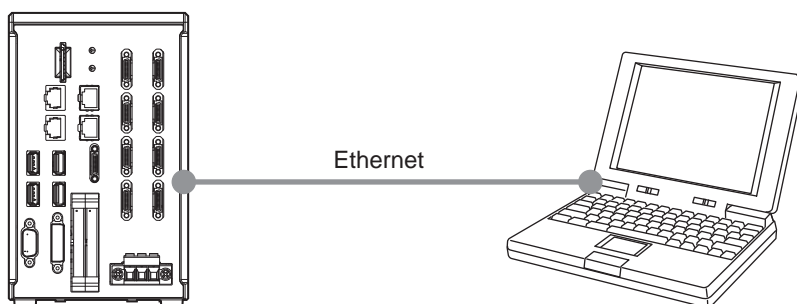
This section describes how to establish a connection with a vision sensor.

3-1	Adding FH Series Vision Sensor on the Network to a Project	3-3
3-2	Establishing an Online Connection with a Vision Sensor	3-4
3-2-1	Establishing an Online Connection from the Sensor Connection Screen	3-4
3-2-2	Establishing an Online Connection from the Multiview Explorer	3-6
3-3	Transferring Project Data to a Sensor	3-7
3-4	Ending a Connection with a Vision Sensor	3-8
3-4-1	Ending a Connection in the Sensor Connection Screen	3-8
3-4-2	Ending a Connection in the Multiview Explorer	3-9

3 Connecting with a Vision Sensor

To establish an online connection with FH vision sensor, configure settings and make adjustments, connect directly by Ethernet. You can also connect via a hub or router.

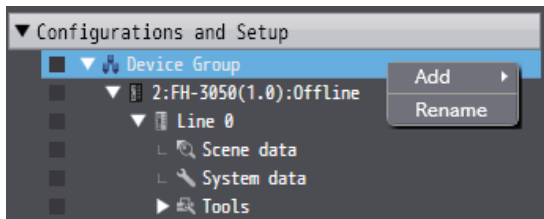
It is not possible to set and adjust FH vision sensor via NJ series controller.



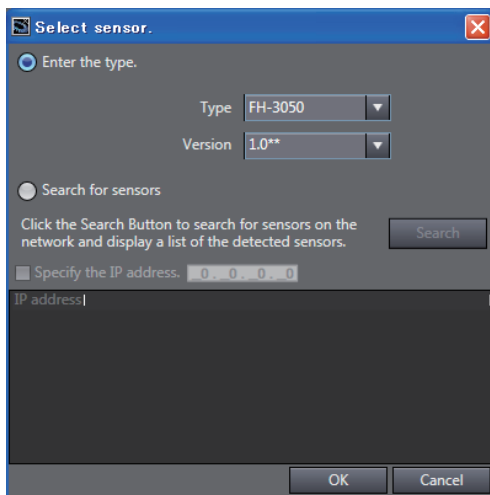
3-1 Adding FH Series Vision Sensor on the Network to a Project

When creating a new project or adding FH vision sensor to a project, select FH vision sensor on the network.

When connecting to the FH vision sensor, right-click [Device Group] in the Multiview Explorer and then select [Add | FH].



The following sensor selection screen appears.



When establishing an online connection, click [Search for sensors] and then click the [Search] button. The found sensors are displayed in a list. Select the sensor you wish to connect to and then click the [OK] button.

If you know the IP address of the sensor you wish to connect to beforehand or will connect to a sensor via a router, select the [Specify the IP address.] check box and then enter the IP address in [IP address]. After input is complete, click the [OK] button.

3-2 Establishing an Online Connection with a Vision Sensor

Connect with FH vision sensor on the network.



Precautions for Correct Use

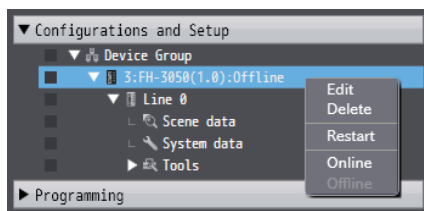
- When you connect vision sensors to Sysmac Studio by the network, set the same network addresses for all the vision sensors and computer where Sysmac Studio is running.
e.g., when the Ethernet settings set for the vision sensors are as follows, the network addresses of the vision sensors and the computer are "10.5.5.□."
 - IP address: 10.5.5.100
 - Subnet mask: 255.255.255.0
- If you plan to control the vision sensor from Sysmac Studio over the network, you will need to have the Remote Operation option for the Communication module for the FH sensor controller set to ON (initial setting).

For details on how to configure the settings, refer to *Vision System FH/FZ5 Series User's Manual* (Cat. No. Z340).

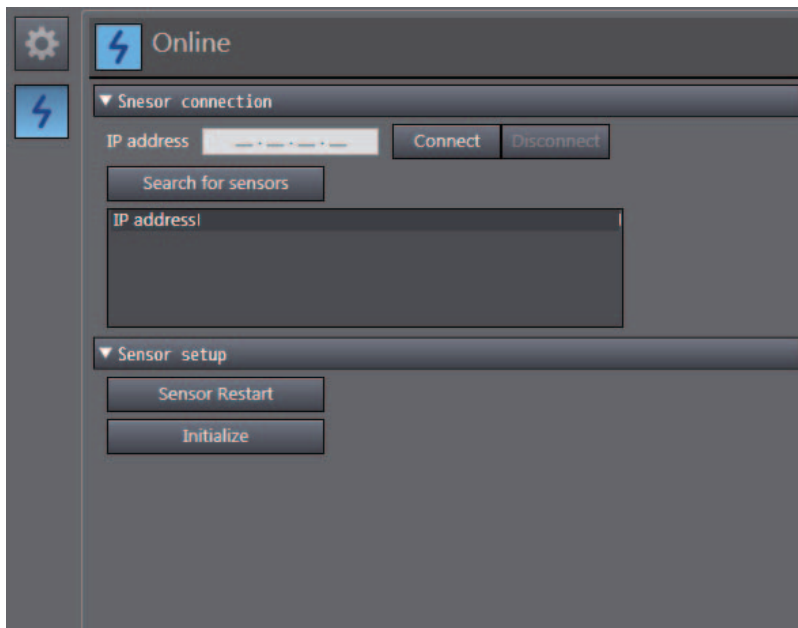
3-2-1 Establishing an Online Connection from the Sensor Connection Screen

You can open the sensor connection screen in the Edit Pane by double-clicking the type name of the FH vision sensor in the Multiview Explorer or by right-clicking it and selecting [Edit] from the menu.

<Multiview Explorer>



<Sensor connection screen>



Click the [Search for sensors] button of [Online] - [Sensor connection] to display a list of the IP addresses of the FH vision sensors on the same network. Select the FH vision sensor you wish to connect to and then click the [Connect] button.

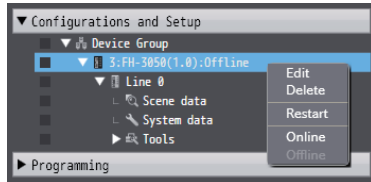
You can also directly enter an IP address in the IP address field.

If you wish to connect with an FH vision sensor via a router, directly enter the IP address and then click the [Connect] button.

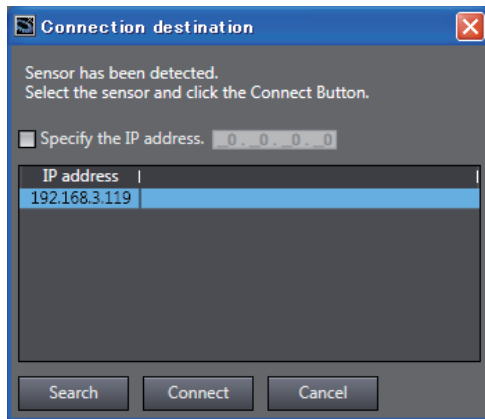
3-2-2 Establishing an Online Connection from the Multiview Explorer

If the FH vision sensor to be connected has already been set, you can establish an online connection with it by right-clicking the type name of the FH vision sensor in the Multiview Explorer and then selecting [Online].

For details on setting the FH vision sensor to be connected, refer to *3-2-1 Establishing an Online Connection from the Sensor Connection Screen* on page 3-4.

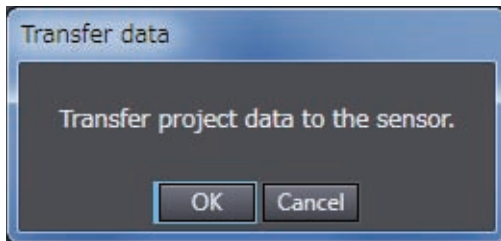


If the FH vision sensor that has already been set cannot be found, the automatically detected FH vision sensors are displayed in a list. Select the FH vision sensor you wish to connect to.

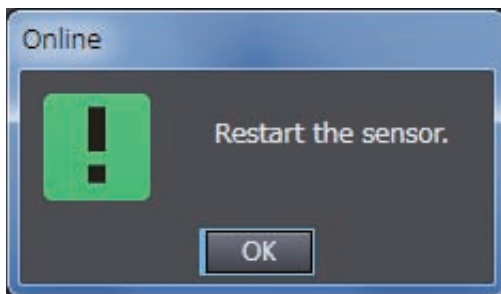


3-3 Transferring Project Data to a Sensor

Project data that has been edited offline can be transferred to FH vision sensor. The following message appears when an online connection is established or the first time an editing screen is opened.



If you select [OK] to transfer the project data, restart the sensor to reflect the data transferred to the sensor.

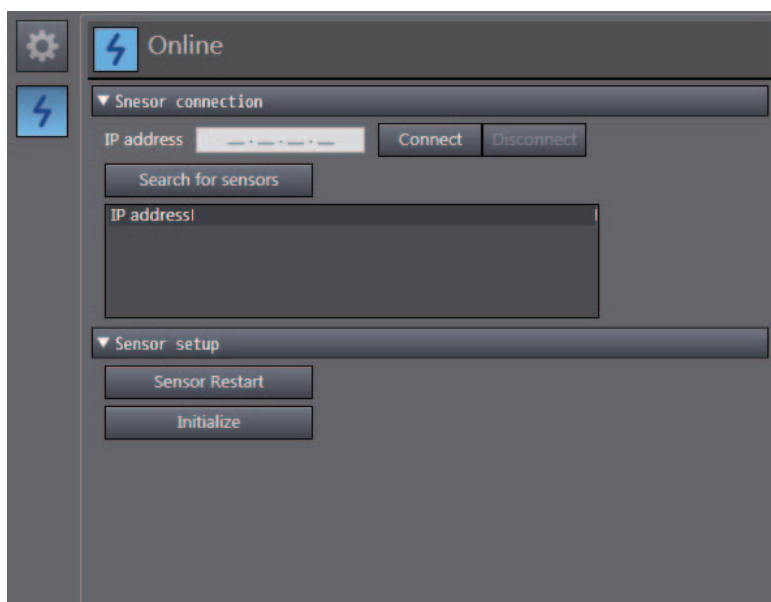


3-4 Ending a Connection with a Vision Sensor

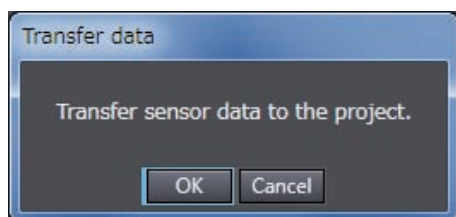
End the connection with a sensor currently connected with an online connection and switch to the offline state.

3-4-1 Ending a Connection in the Sensor Connection Screen

Open the sensor connection screen and then click the [Disconnect] button of [Online] - [Sensor connection].



The following message is displayed when returning to the offline state. Select whether to transfer the sensor settings data to the project.

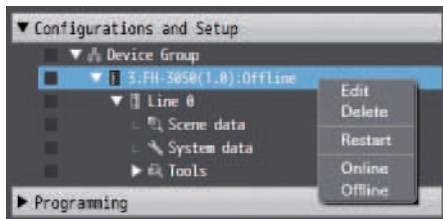


If [OK] is selected, the sensor settings data is reflected in the project.

If [Cancel] is selected, the sensor settings data is not reflected in the project. The editing state returns to the state before the online connection was established.

3-4-2 Ending a Connection in the Multiview Explorer

Right-click the type name in the Multiview Explorer and select [Offline] from the menu.



Just as described in "Ending a Connection in the Sensor Connection Screen," the connection state switches to offline after you select whether to transfer the sensor settings data to the project.

4

Configuring Measurement Settings

On the FH vision sensor, processing items can be combined to configure measurement details. This section provides an overview of the processing units and describes how to edit a processing unit.

4

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4-1 Overview of Processing Units

This section provides an overview of the processing units that can be edited in the FH tools.

For details on each of the processing units, refer to *Vision System FH/FZ5 Series Processing Item Function Reference Manual* (Cat. No. Z341).

4-1-1 Input Image

This is a processing unit for loading images from a camera.

The main setting items are as follows.

Group	Item
Camera setting	Sets the camera shooting conditions.
Screen adjust	Sets the conditions related to the lighting and lens.
White balance	Sets the white balance in images loaded from the camera to correct its color and to make the white parts appear as white.
Calibration	Configures the settings for converting measurement results to the actual dimensions.
HDR setting	Sets the method for combining images in order to obtain it with a wide dynamic range.
Bright adjust setting	Sets how much the brightness of loaded images to be adjusted.

4-1-2 Measurement

This is a processing unit for inspection and measurement.

The main setting items are as follows.

Group	Item
Model	Allows you to register the parts you wish to inspect as models.
Region setting	Sets the range for searching a model and the range for calculating the amount of a certain feature.
Detection point	Sets which parts of a model you wish to detect as the coordinates during measurement.
Ref. setting	Changes the measurement values that will be the reference registered during model registration and region setting.
Measurement condition	Sets the condition for performing measurement.
Judgment condition	Sets the judgment condition for measurement values.
Output conditions	Sets the reflection condition for the coordinates or overall judgment output as measurement results.
Color	Sets the color information used for measurement.

4-1-3 Compensate Image

This is a processing unit for correcting images.

The main setting items are as follows.

Group	Item
Filter setting	Sets the filter conditions for image correction.
Region setting	Sets the region for performing correction.
Output image	Selects the image to output.

4-1-4 Support Measurement

This is a processing unit for providing support for calculation processing, data acquisition and browsing, and other processing.

The main setting items are as follows.

Group	Item
Setting* ¹	Sets the condition for performing measurement.
Judgment condition	Sets the judgment condition for measurement values.
Output parameter	Sets the reflection condition for the coordinates or overall judgment output as measurement results.

*1. The item names differ for each processing unit.



Precautions for Correct Use

The decimal point symbol in the editing screen for macros and macro calculation processing items is fixed at "." (period), regardless of your computer's OS settings.

4-1-5 Branch

This is the processing unit for performing branching processing.

The main setting items are as follows.

Group	Item
Branch setting	Sets the condition for performing branching.
Setting	Sets the communication function and timeout function for performing flow control by communication.
Output conditions	Sets the reflection condition for the overall judgment.

4-1-6 Output Result

This is the processing unit for outputting measurement results to an external device.

The main setting items are as follows.

Group	Item
Setting	Sets the content to output.
Output format	Sets the format of the data to output.
Output conditions	Sets the reflection condition for the overall judgment.

4-1-7 Display Result

This is the processing unit for displaying any text, figure, or image on the screen displaying the measurement results.

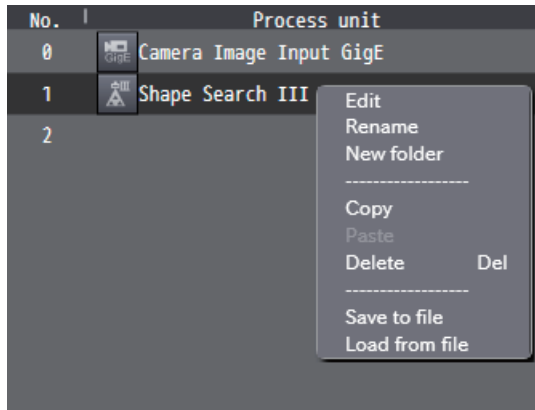
The main setting items are as follows.

Group	Item
Setting* ¹	Sets the content or condition to display.
Output conditions	Sets the reflection condition for the overall judgment.

*1. The item names differ for each processing unit.

4-2 Editing a Processing Unit

Right-click any processing unit in the flow list and then select [Edit] from the menu.
The editing screen of the selected processing unit appears.

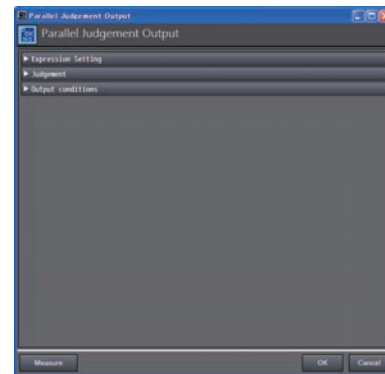


The editing screens of processing units are categorized into the following two types.

<Editing Screen with Image Display>



<Editing Screen without Image Display>



Each setting menu can be opened and closed on a group basis. In an editing screen with image display, an image or graphic information is displayed in accordance with the open menu.

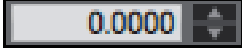





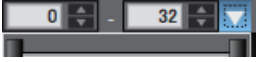

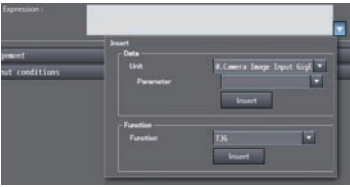
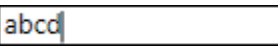




Clicking the [OK] button confirms the changes and closes the editing screen of the processing unit.

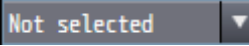
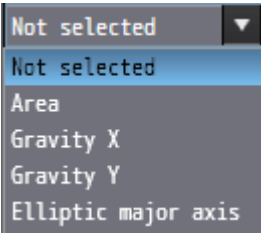
Clicking the [Cancel] button discards the changes and closes the editing screen of the processing unit.

The basic editing operations that can be performed with this tool are described below.

4-2-1 Parameter Settings

The following table lists the basic user interface components used for editing parameters.

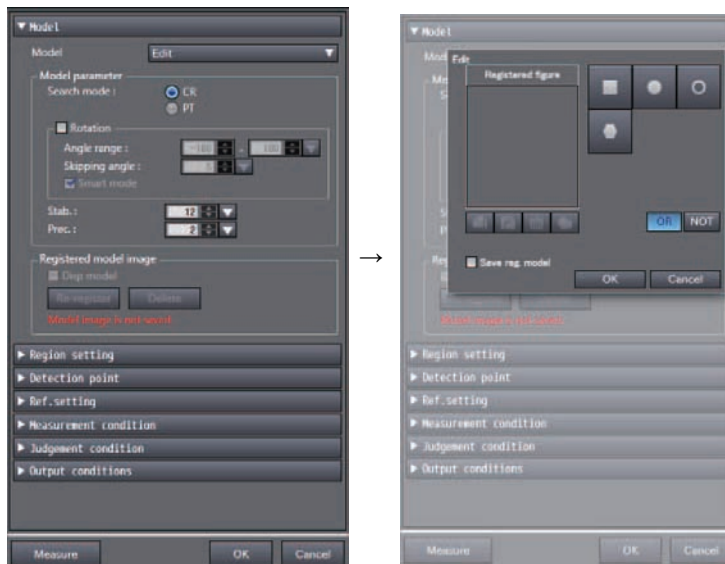
UI	Item	Description
	Numerical value input area	Allows you to enter numerical data. Entered data is treated as a double type value, but is displayed up to 4 digits after the decimal point.
Before clicking  After clicking 	Numerical value input area (With slider)	Allows you to enter numerical data. Entered data is treated as a double type value, but is displayed up to 4 digits after the decimal point. Clicking the button beside the numerical value input box displays a slider. Parameter values can be adjusted with the slider.
Before clicking  After clicking 	Numerical value upper limit and lower limit input area (With slider)	Allows you to enter numerical data for the upper and lower limits. Entered data is treated as a double type value, but is display is up to 4 digits after the decimal point. Clicking the button beside the numerical value input box displays a slider. Parameter values can be adjusted with the slider. It is not possible to set a lower limit value that is greater than the upper limit value.
Before clicking  After clicking 	Numerical value upper limit and lower limit input area (With slider) (With measurement value display)	This is the numerical value upper limit and lower limit input area with the addition of measurement value display. The bar at the place of the measurement value of the slider is green when the value is OK and red when it is NG.
Before clicking  After clicking 	Expression	Allows you to enter an expression. When input is complete, a validity check is performed for the expression. Clicking the button beside the text input box displays the calculation parameter input area. Any parameter can be inserted. Note When entering a calculation formula, the decimal point symbol is fixed at "." (period), regardless of your computer's OS settings.
	Text input area	Allows you to enter any text. The following characters cannot be entered. <ul style="list-style-type: none"> • ! • Tab
Unselected  Selected 	Radio button	Selects one item from multiple selection items.
Unchecked  Checked 	Check box	Enables or disable an item.

UI	Item	Description
Before clicking  After clicking 	Combo box	Selects one item from multiple selection items.

4-2-2 Editing an Area

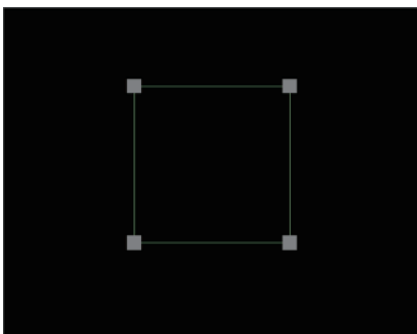
You can edit a model area or measurement area.

Click the area editing button to display the area editing menu.



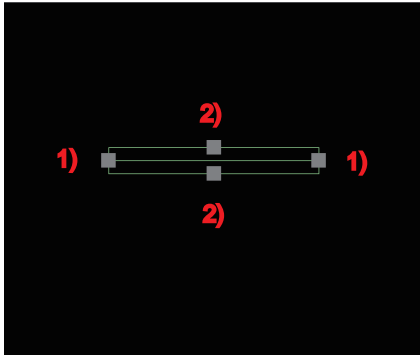
Six area editing functions are provided.

Rectangle



This function draws a rectangle. You can change the size of the rectangle by dragging the four corners. The rectangle can be moved by clicking and then dragging the inside of the rectangle.

Wide line

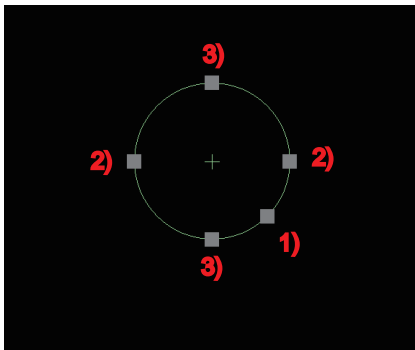


This function draws a wide line. You can change the size or direction by dragging the following vertices.

- Vertex (1)
You can change the length or direction of the line by changing the start point or end point.
- Vertex (2)
These allow you to change the width of the line.

The line can be moved by clicking and then dragging the inside of the area.

Ellipse

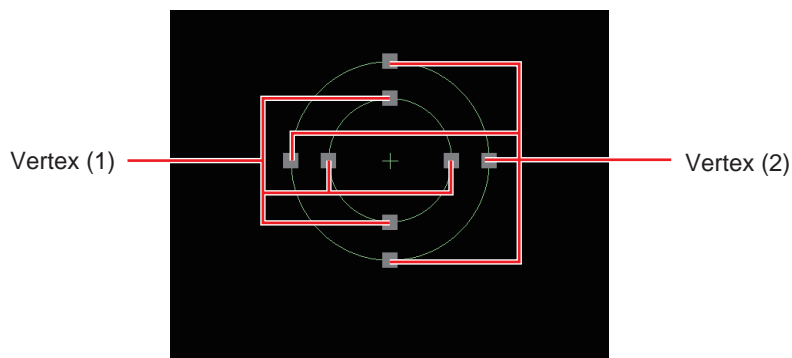


This function draws a circle or ellipse. You can change the size by dragging the following vertices.

- Vertex (1)
These allow you to change the overall size while maintaining the XY ratio.
- Vertex (2)
These allow you change the size in the X direction.
- Vertex (3)
These allow you change the size in the Y direction.

The ellipse can be moved by clicking and then dragging the inside of the area.

Circumference

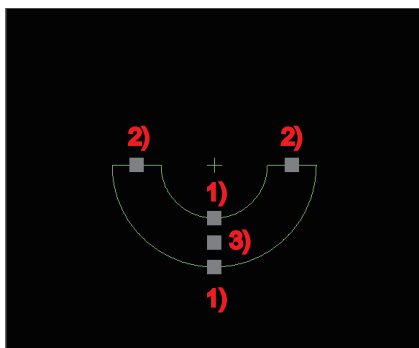


This function draws a circumference. You can change the size by dragging the following vertices.

- Vertex (1)
These change the radius of the inner circle.
- Vertex (2)
These change the size of the circle while maintaining the difference in the diameters of the inner and outer circles.

The circumference can be moved by clicking and then dragging the inside of the area.

Wide arc

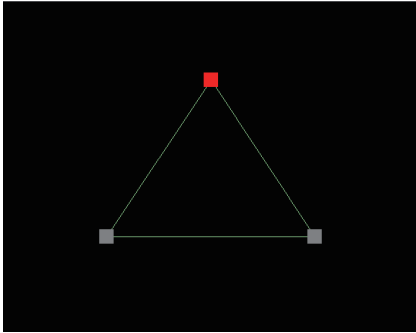


This function draws a wide arc. You can change the start point, end point, width, and position by dragging the following vertices.

- Vertex (1)
These allow you to change the width.
- Vertex (2)
These allow you to change the start point, end point, and radius.
- Vertex (3)
This allows you to move the center position while keeping the start point and end point positions fixed.

The arc can be moved by clicking and then dragging the inside of the area.

Polygon



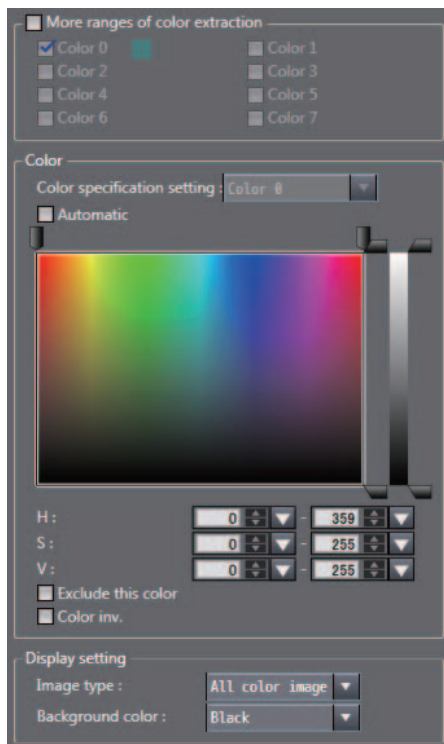
This function draws a polygon. Up to 10 vertices can be added.

Clicking any position on a side creates a new vertex.

You can change the position of a vertex by dragging it.

The polygon can be moved by clicking and then dragging the inside of the area.

4-2-3 Color Extraction



You can specify up to eight colors.

Also, when the Automatic check box is selected, enclosing any part in a displayed image automatically extracts the color of that part.

The color range can be specified by specifying the hue, saturation, and brightness.

The specifications are the same as for the user interface of the FH vision sensor.

For details, refer to *Vision System FH/FZ5 Series Processing Item Function Reference Manual* (Cat. No. Z341).

4-2-4 Color



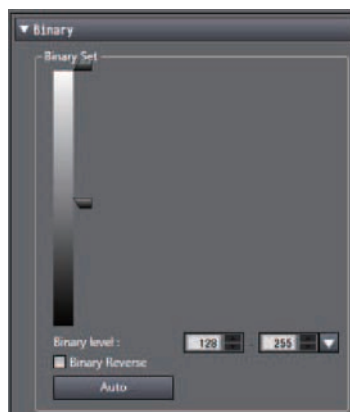
You can specify any color.

The color can be specified by specifying the hue, saturation, and brightness.

The specifications are the same as for the user interface of the FH vision sensor.

For details, refer to *Vision System FH/FZ5 Series Processing Item Function Reference Manual* (Cat. No. Z341).

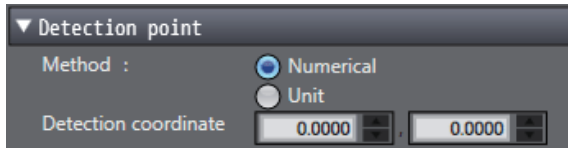
4-2-5 Binary



You can specify the range of binarization levels.

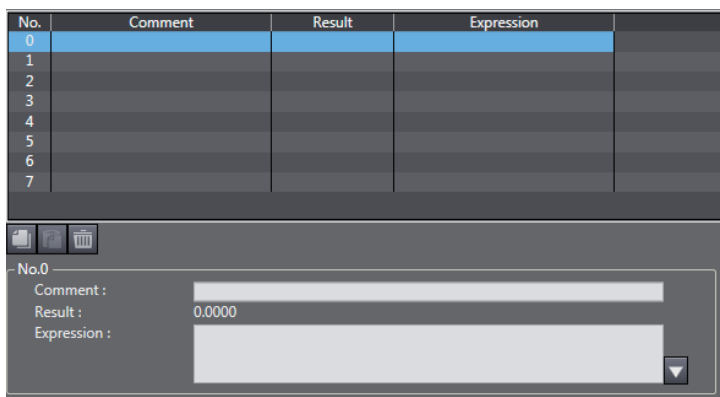
If you select the [Binary Reverse] check box, binarization is performed for outside of the range between the upper and lower limits.

4-2-6 Detection Point/Reference Point



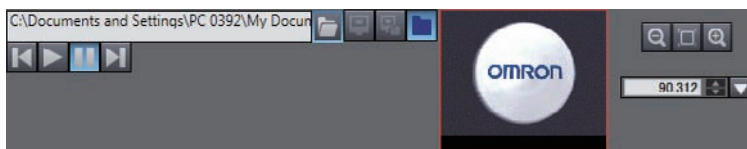
The detection point and reference point can be set with the numerical value input boxes. Clicking any place in the displayed image reflects that coordinate value as the setting value.

4-2-7 List

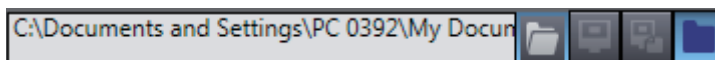


Selecting an item in the list displays the information for the selected item below the list. Each of the information items displayed below the list can be edited.

4-2-8 Image Control Area



File selection section



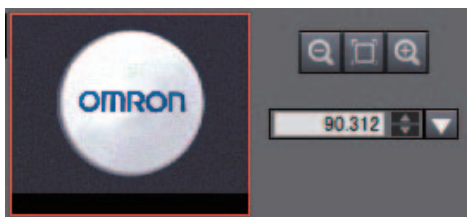
This allows you to select the image to display. Refer to *File selection section* on page 2-16.

Image control section



This allows you to control the measurement of the image. Refer to *Image control section* on page 2-16.

Image size control section



This allows you to enlarge or reduce the displayed image.

The place where the image is displayed in the left zoom area is enclosed in a rectangle.

You can move the display place by moving this rectangle.

Button	Description
	Enlarges the image. Doubles the size of displayed image. (Upper limit: 1600%)
	Reduces the image. Halves the size of displayed Image. (Lower limit: 1%)
	Makes the image to fit the display frame.
	The zoom ratio can be specified by directly entering a numerical value or by moving the slider.

5

Designing Exchange with External Devices

This section describes how to establish a connection with an external device.

5-1	Setting Procedure	5-3
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The FH vision sensor has the following interfaces.

- Parallel I/O
- RS-232C/422
- Ethernet
- EtherCAT



Each interface supports various communication protocols.

You can configure their communication settings in the system settings of the FH tools.

Configure the communication settings for each line when in the multiple multi-line random-trigger modes. However, some data is settings data that is common to the lines.

Group	Item	Attribute
Parallel I/O		Common to lines
		—
RS-232C/422		Common to lines
		—
Ethernet	Address settings	Common to lines
	Input/output settings	Individual to each line
EtherNet/IP		Individual to each line * Some parameters are common to lines
EtherCAT		Individual to each line

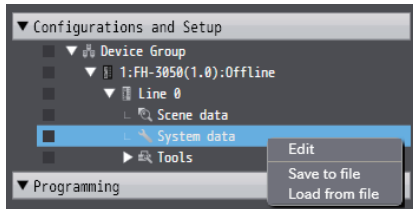
If the communication settings are changed, the FH vision sensor needs to be restarted.

If a parameter that requires a restart is edited, " " is displayed for the sensor type in the Multiview Explorer. If " " is displayed, save the settings and then restart the FH vision sensor.

For details on restarting, refer to *2-4-4 Multiview Explorer* on page 2-10.

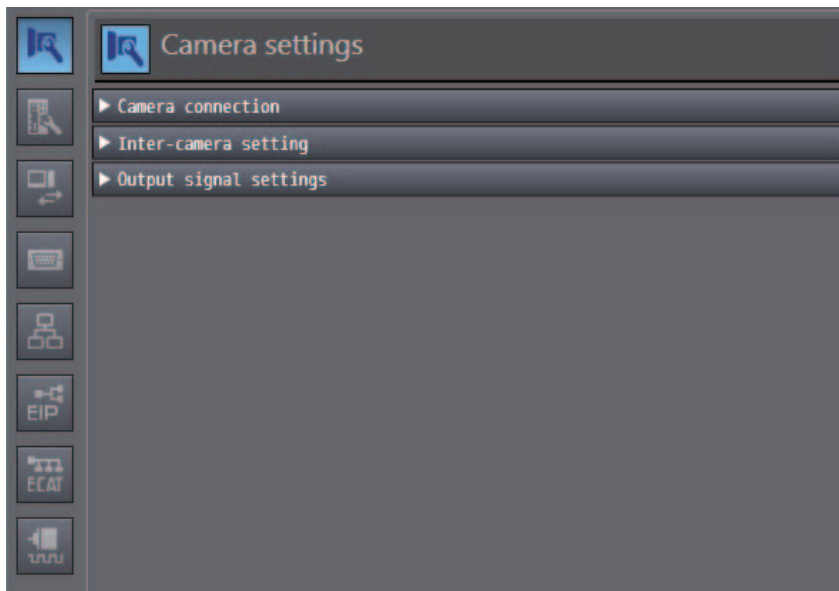
5-1 Setting Procedure






You can open the system settings screen by double-clicking [System data] in the Multiview Explorer or by right-clicking it and selecting [Edit] from the menu.



In the system settings screen, you can click any of the following buttons to configure the corresponding settings.

For details on the settings, refer to *Vision System FH/FZ5 Series User's Manual* (Cat. No. Z340).



Button	Setting Item	Description
	Parallel I/O	Sets the Parallel I/O settings.
	RS-232C/422	Sets the RS-232C/422 settings.
	Ethernet	Sets the settings related to Ethernet.
	EtherNet/IP	Sets the settings related to EtherNet/IP.
	EtherCAT	Sets the settings related to EtherCAT.



Precautions for Correct Use

- A restart is required after configuring the Ethernet, EtherNet/IP, and EtherCAT settings.
- When multi-line random-trigger mode is selected, the communication settings needs to be configured for each line.

However, the RS-232C/422 settings are common between the lines.

For the other communication settings, individually configure the settings in the system settings for each line.

6

Online Debugging

This section describes how to perform online debugging of the FH sensor controller.

6-1	Performing Test Measurement	6-2
6-1-1	Measuring Camera Images	6-2
6-1-2	Measuring File Images in the RAMDisk or USB Memory of the Vision Sensor	6-3
6-1-3	Measuring Logging Images in the Vision Sensor Memory	6-3
6-2	Checking Measurement Results	6-4
6-2-1	Checking Detailed Results	6-4
6-2-2	Changing the Image Display Settings	6-6
6-2-3	Checking Multiple Measurement Images at the Same Time	6-6
6-3	Checking Result Output	6-7
6-4	Saving Measurement Results	6-8
6-5	Saving Settings Data	6-9


6-1 Performing Test Measurement

You can perform test measurement with the FH tools.

Select from the following three test measurement target images when connected with an online connection.

Target Image	Measurement Type	Description
Camera image	Single measurement	Measures a camera image.
	Continuous measurement	Continuously measures camera images.
File image	Single measurement	Allows you to select and measure a file image in the RAMDisk or USB memory of the FH vision sensor.
	Continuous measurement	Continuously measures file images in the RAMDisk or USB memory of the FH vision sensor. Measurement ends when measurement of the images within the same folder finishes.
Logging image	Single measurement	Allows you to select and measure a logging image in the FH vision sensor memory.
	Continuous measurement	Continuously measures logging images in the FH vision sensor memory. Measurement ends when measurement of all logging images finishes.

6-1-1 Measuring Camera Images

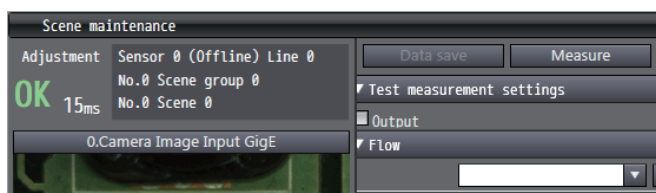
To select a camera image, first click the camera image button () in the file selection section.

Then select a camera image and click the [Measure] button.

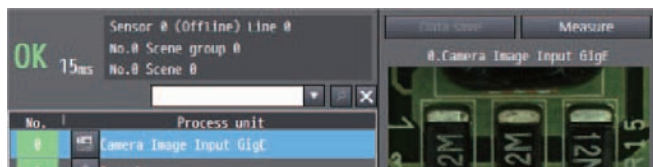
[Measure] is provided in the following editing screens.

- Scene maintenance window
- Scene editing screen
- Processing unit editing screen

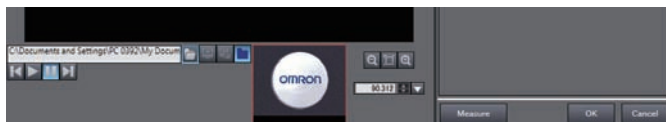
<Scene maintenance window>



<Scene editing screen>



<Processing unit editing screen>



To start continuous measurement, click the continuous measurement button (▶).

If you wish to stop continuous measurement, click the continuous measurement stop button (||).

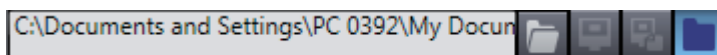
The settings data cannot be edited during continuous measurement.

6-1-2 Measuring File Images in the RAMDisk or USB Memory of the Vision Sensor

Select the measurement target file and click the [Measure] button.

Select the file as described below.

- 1 Click the [File] button.



- 2 Click the file selection button (📁) and then select the target file.
- 3 Click the [Measure] button.

To start continuous measurement, click the continuous measurement button (▶).

If you wish to stop continuous measurement, click the continuous measurement stop button (||).

The settings data cannot be edited during continuous measurement.

6-1-3 Measuring Logging Images in the Vision Sensor Memory

Select the measurement target logging image and click the [Measure] button.

Select the file as described below.

- 1 Click the [Logging image] button.
- 2 Click the [Measure] button.

If you wish to change the measurement target logging image, click the button for measuring the previous image (◀) or click the button for measuring the next image (▶).

To start continuous measurement, click the continuous measurement button (▶).

If you wish to stop continuous measurement, click the continuous measurement stop button (||).

The settings data cannot be edited during continuous measurement.

6-2 Checking Measurement Results

You can check the measurement results in each editing screen.

On the displayed image, the measurement results of the selected processing unit are displayed as a graphic.

6-2-1 Checking Detailed Results

Scene maintenance window, monitor window, and scene data editing screen

Open the [Flow] item and [Detail result] item and click the [Measure] button.

If you select any of the processing units in the list of the [Flow] item, the measurement result of each item that is a judgment result of that processing unit will be displayed in the [Detail result] item.

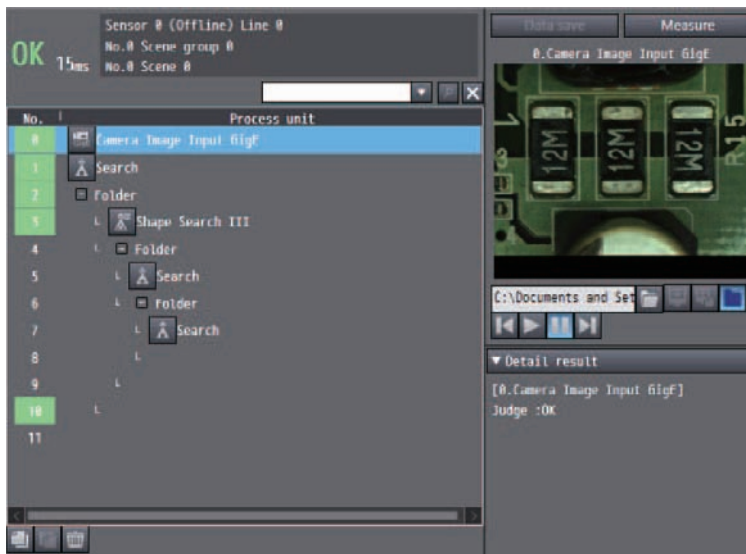
<Scene maintenance screen>



<Monitor window>



<Scene data editing screen>



Processing unit editing screen

Open the [Judgment condition] item and click the [Measure] button.

The measurement result of each item that is a judgment result of the processing unit is displayed

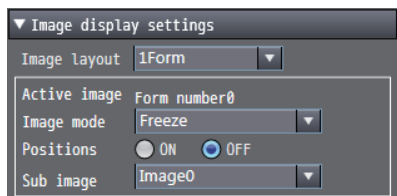


6-2-2 Changing the Image Display Settings

You can change the setting for displaying images in the scene maintenance window and monitor window.

Open the [Image display settings] item and change each items.

For details on the image display settings, refer to *Image display settings* on page 2-15.



Item	Description
Image layout	Selects the number of images to display. Selection items: 1Form, 2Form, and 4Form
Image mode	Selects the image mode for the image with the focus on it. Selection items: Through, Freeze, and NG image
Positions	Selects position list display for the image with the focus on it. Selection items: OFF and ON
Sub image	Selects the sub image number for the image with the focus on it. Selection items: Image0, Image1,..., image31

You can switch the result display content of the processing unit by changing the sub image number.

For details, refer to the content of each processing unit in *Vision System FH/FZ5 Series Processing Item Function Reference Manual* (Cat. No. Z341).

6-2-3 Checking Multiple Measurement Images at the Same Time

You can display multiple images by opening the [Image display settings] item and changing [Image layout].

For details on the image display settings, refer to *Image display settings* on page 2-15.

<2Form display>



<4Form display>



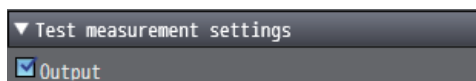
6-3 Checking Result Output

Normally, output to an external device is performed when the monitor window is open, but it is not performed while scene data is being edited in the following editing screens.

- Scene maintenance window
- Scene data editing screen
- Processing unit editing screen
- Editing screen of each tool

If you wish to output the measurement results in those screens, select the following check box in the adjustment screen.

- [Test measurement settings] - [Output]



6-4 Saving Measurement Results

If you wish to save measurement results or images, use the logging related processing units.

- Image logging
- Image conversion logging
- Data logging

These processing units can be used to output images and measurement results to the RAMDisk/USB memory of the FH vision sensor or the FH vision sensor memory.

For details on the processing units, refer to *Vision System FH/FZ5 Series Processing Item Function Reference Manual* (Cat. No. Z341).

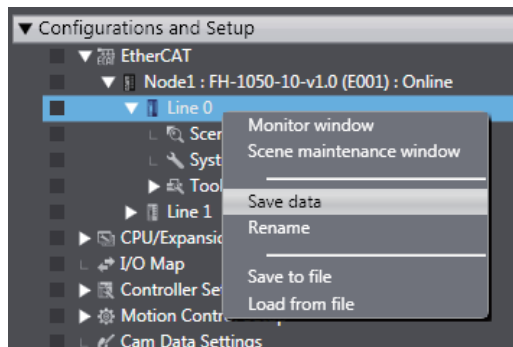
To acquire the files output to the RAMDisk or USB memory of the FH vision sensor, use the file management tool

For details, refer to *8-3 Using the File Save Tool* on page 8-4.

6-5 Saving Settings Data

After adjusting the settings data, you need to save the settings data to the flash memory of the FH vision sensor. There are the following two ways to save the settings data.

- (1) Right-click [Configuration and Setup] - [Device Group] - [FH-XXXX] - [Line X] in the Multi-view Explorer and then click [Save data].



- (2) Click the [Data save] button in the scene maintenance window.



The settings data can also be saved and managed as files.

- Scene data basis (Refer to 2-5-2 *Managing Scenes* on page 2-22)
- Scene group basis (Refer to 2-5-6 *Managing Scene Groups* on page 2-24)
- Processing unit basis (Refer to 2-6-2 *Managing Processing Units* on page 2-28)

7

Offline Debugging

This section describes offline debugging techniques for the FH sensor controller.

7-1	Performing Offline Simulation of Sensor Measurement Operation	7-2
7-2	Offline Debugging of the Sensor Control Program and Sensor Operation (Only When EtherCAT Connection)	7-3
7-2-1	Control Signals Supported with Offline Debugging	7-4
7-2-2	Offline Debugging Procedure for the Sensor Control Program	7-4

7-1 Performing Offline Simulation of Sensor Measurement Operation

Even when offline, simulation of the measurement operation can be performed using file images on the PC.

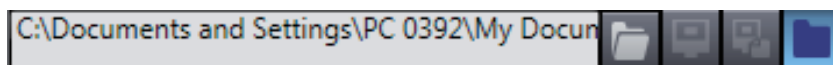
Selection and measurement of file image can be performed in the following editing screens.


- Scene maintenance window
- Scene editing screen
- Processing unit editing screen


Select the file as described below.




- 1 Click the [File] button.



- 2 Click the file selection button () and then select the target file.
- 3 Click the [Measure] button.

If you click the continuous measurement button (), continuous measurement of the images in the same folder is performed. Measurement ends when measurement of all the files finishes.

If you wish to stop continuous measurement part way through the process, click the continuous measurement stop button ().

The [Measure] button is provided in the monitor window, scene maintenance window, and processing unit editing screen.

For details, refer to *6-1-1 Measuring Camera Images* on page 6-2.



Additional Information

The images measured with the sensor can be saved as logging image files. Refer to *8-3-3 Saving a Logging Image as a File* on page 8-6.

7-2 Offline Debugging of the Sensor Control Program and Sensor Operation (Only When EtherCAT Connection)

In a system built with EtherCAT, you can perform simulation with the sequence control of NJ series controller and operation of FH image sensor linked.

Therefore, offline debugging for operation up until the output of the result is possible for measurement or various other processing performed when a measurement trigger or other control signal is input to the FH image sensor.

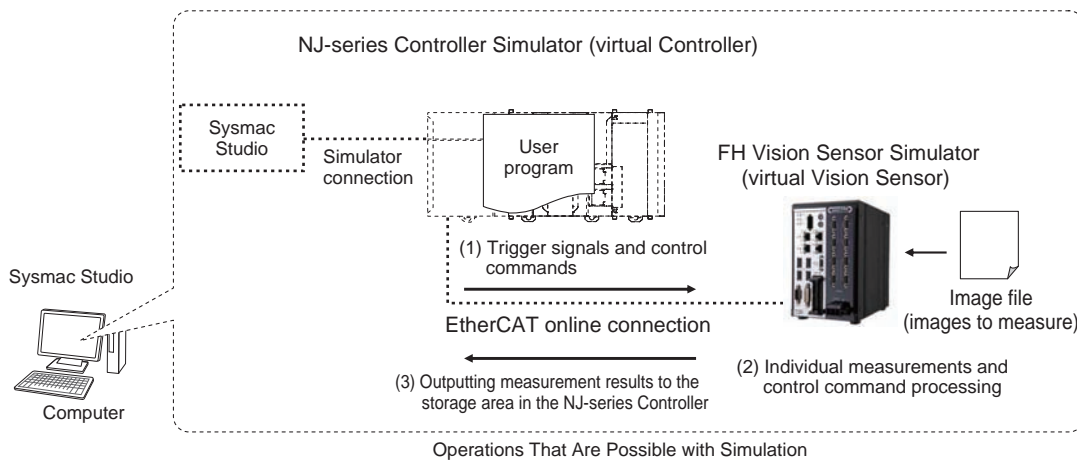
This simulation function is available only in Sysmac Studio (standard edition).



Additional Information

This simulation is supported from the following versions:

- Sysmac Studio (Standard Edition) Ver. 1.08
- FH Software Ver. 5.1*



7-2-1 Control Signals Supported with Offline Debugging

The following table shows the operation of each item that is PDO mapped in offline debugging.

Logic simulation is possible for this offline debugging. The ON/OFF times of each signal is not the same as the actual processing times.

Item		Signal Input and Output Timing	
Command area	Trigger	Triggers measurement	—
	Command Request	Executes a command	—
	Flow Command Request	Executes a flow command	—
	Result Set Request	Data output request	—
	Error Clear	Clears an error	—
Response area	Command Completion	Command completed	Turns ON when BUSY signal turns OFF.
	BUSY	Processing in progress	The BUSY ON time is fixed at 10 [PDO cycles].
	Trigger Ready	Trigger input ready state	OFF while BUSY is ON.
	Total Judgement	Outputs total judgement	Outputs when BUSY turns OFF.
	Run Mode	Run mode	Turns ON when monitor window is open.
	Trigger Ack	Trigger acknowledged state	Turns ON one [PDO cycle] after trigger input.
	Command Ready	Ready for command	OFF while BUSY is ON.
	Shutter Output	Outputs shutter trigger	Turns ON for one [PDO cycle] only after trigger input.
	Flow Command Completion	Flow command completed	Turns ON when Flow Command Busy turns OFF.
	Flow Command Busy	Executing flow command	ON time of Flow Command Busy is fixed at one [PDO cycle].
	Flow Command Wait	Ready for flow command	When flow control processing unit is used, turns ON one [PDO cycle] after BUSY turns ON.
	Error Status	Error signal	Turns ON when an error occurs.
	Result Notification	Data output completed	*1
Data area	DINT ResultData 0 to 63	DINT result data	*1
	LREAL Result-Data 0 to 31	LREAL result data	*1

*1. The output timing depends on the operating environment of the PC.

7-2-2 Offline Debugging Procedure for the Sensor Control Program

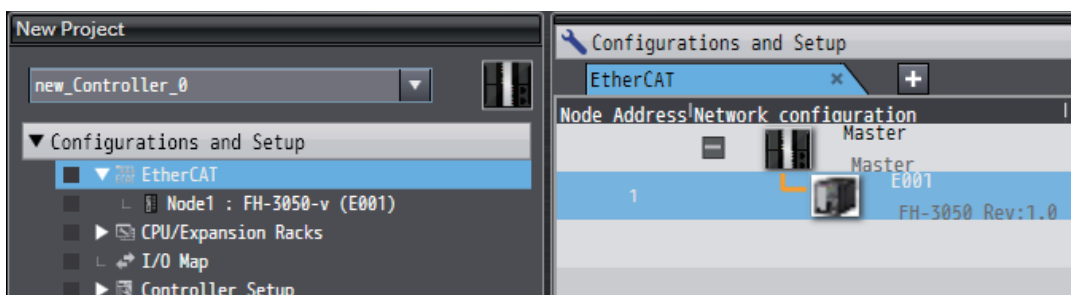
You can perform simulation with sequence control and image sensor operation linked to perform offline debugging. The procedure is as follows.

- 1** Add an image sensor to the EtherCAT slave configuration.
- 2** Configure the image sensor settings.
Refer to *Section 4 Configuring Measurement Settings*.
- 3** Input a measurement trigger using a control flag and check the result.

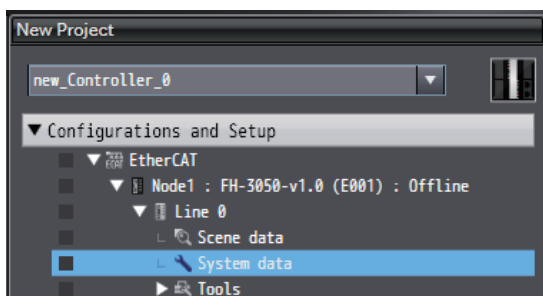
The following describes the procedure from adding an image sensor to the EtherCAT slave configuration to checking the result under the assumption that a sequence program has been prepared.

- 1 Add the [FH-XXXX] vision sensor to the EtherCAT slave configuration using either of the methods below.
 - Drag [FH-XXXX] from the [Tool box] and drop it on to the network configuration editing window.
 - When the master is selected in the network configuration editing window, double-click [FH-XXXX] displayed in the [Tool box].

For details on how to register to the EtherCAT slave, refer to 5-1 *EtherCAT Configuration and Settings* in *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).



- 2 Configure the vision sensor settings.
Double-click [NodeX: FH-XXXX]-[Line X]-[Scene data]/[System data] in the Multiview Explorer.

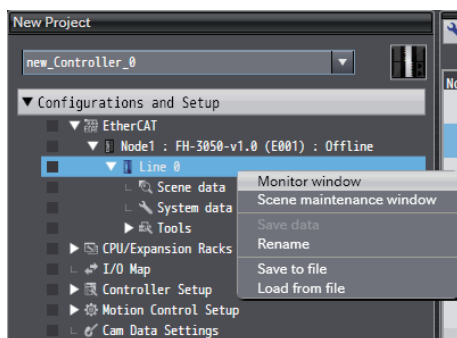


The corresponding data settings screen appears in the Edit Pane. Configure the various settings.

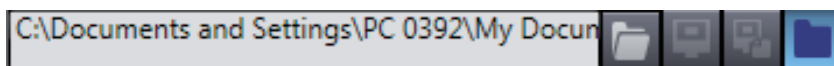
- 3 Create device variables.
Create device variables to access the FH.
For details on how to create device variables, refer to 4-1-2 *Creating Device Variables* in *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).
- 4 Create and build a program to operate the device.
For details on how to create a program, refer to 4-5 *Programming* in *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

5 Open the scene monitor window.

Right-click [FH-XXXX] - [Line X] in the network configuration editing pane and then select [Monitor window].

**6** Specify the measurement image.

Click the image file selection button and then select an image.

**Additional Information**

There are no image files immediately after installation of the FH tool. Acquire logged files or image files saved in the FH unit.

To acquire images, refer to *Saving Logged Images in the Controller Memory (RAM) to a RAM Disk or an External Memory Device* in *Vision System FH/FZ5 Series User's Manual* (Cat. No. Z340).

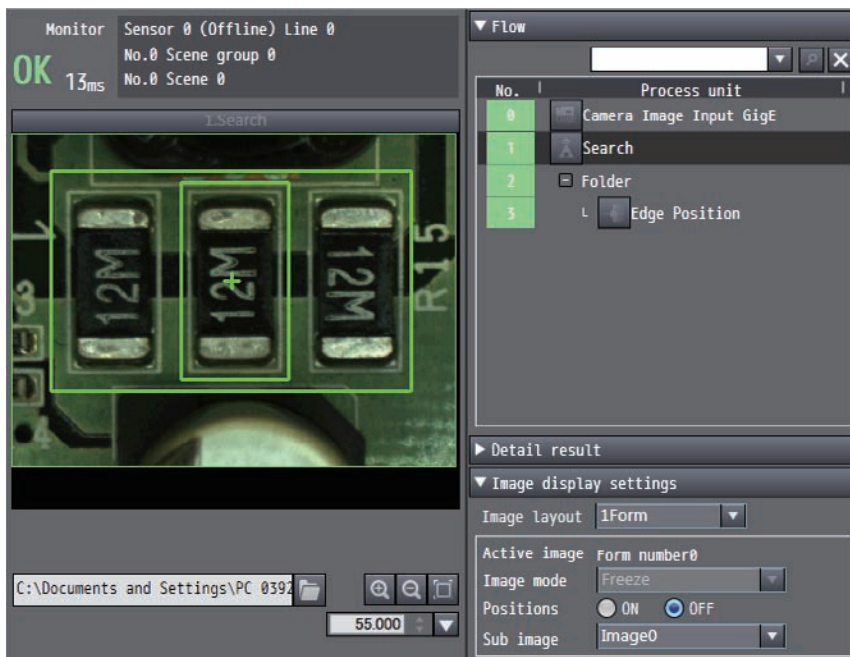
7 Select [Simulation] - [RUN].

The simulator starts.

When the simulator connection is complete, the simulator of the NJ series controller and FH vision sensor internally establish an online connection with EtherCAT and the NJ series controller enters the operating state.

For details on how to operate the simulator, refer to *7-3-1 Debugging with Program Simulation* in *Sysmac Studio Version 1 Operation Manual* (Cat. No. W504-E1-08 or later).

- 8 If you operate the control flag from sequence control and execute measurement, you will be able to check the measurement results in the following monitor window.



Additional Information

If the run mode (Status Flag: Run Mode) of the response area is OFF when simulation is executed, open the Monitor window.

When the Monitor window is opened, the run mode changes to ON.

8

Other Useful Functions

This section provides a list of useful tools that can be used in the configuration and operation of the FH series vision sensors.

8-1 Using the Command Customize Setting Tool	8-2
8-2 Using the Calibration Support Tool	8-3
8-3 Using the File Save Tool	8-4
8-3-1 Opening the File Save Tool	8-4
8-3-2 Copying a File	8-4
8-3-3 Saving a Logging Image as a File	8-6
8-4 Using the User Data Setting Tool	8-7
8-5 Changing the System Environment	8-8
8-6 Help	8-10

8-1 Using the Command Customize Setting Tool

This tool allows you to edit custom commands.

It is the same as the [Tools] - [Communication Command Customize] function provided with the FH vision sensor.

For details, refer to *Vision System FH/FZ5 Series User's Manual* (Cat. No. Z340).



Precautions for Correct Use

The decimal point symbol is fixed at "." (period), regardless of your computer's OS settings.

8-2 Using the Calibration Support Tool

A calibration support tool is available.

It is the same as the [Tools] - [Calibration Support Tool] function provided with the FH vision sensor.

For details, refer to *Vision System FH/FZ5 Series User's Manual* (Cat. No. Z340).

8-3 Using the File Save Tool

The file save tool allows you to copy and transfer files in the RAMDisk or USB memory of the FH vision sensor. It also allows you to output logging image files in the FH vision sensor memory.

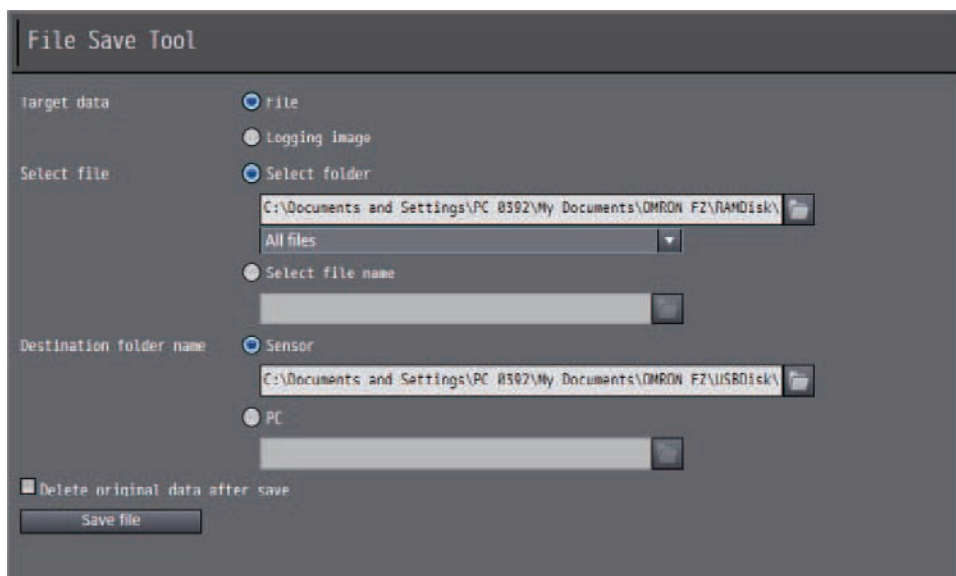
8-3-1 Opening the File Save Tool

To open the File Save Tool, select [Tools] - [Save file] in the Multiview Explorer and then either double-click [Save file] to pull up the Save screen or right-click and select [Edit] from the pop-up menu that appears.

The file management tool screen appears in the Edit pane.

8-3-2 Copying a File

You can copy a file in the RAMDisk or USB memory of the FH vision sensor and then save it under a different name or transfer it to the PC.



1 Select [File] for [Target data].

2 Select a file.

You can select data on a folder basis or on a file basis.

If you select an individual folder, you can narrow down the files by type.

The following file types can be selected to narrow down the data.

- All files
- Logging images (*.ifz, *.byr)
- Bitmap (*.bmp)
- CSV (*.csv)
- Scene data (*.scn)
- Scene group data (*.sgp)
- System data (*.ini)
- System settings + Scene group 0 data (*.bkd)
- Operation log (*.log)

3 Select the save destination folder.

To save the file by copying it to the RAMDisk or USB memory of the FH vision sensor, select [Sensor].

To save the file to the PC, select [PC].

When saving to the PC, you can save to the following folder.

C:\Documents and Settings\\My Documents\OMRON FH

If you wish to delete the original file after saving, select the [Delete original data after save] check box.

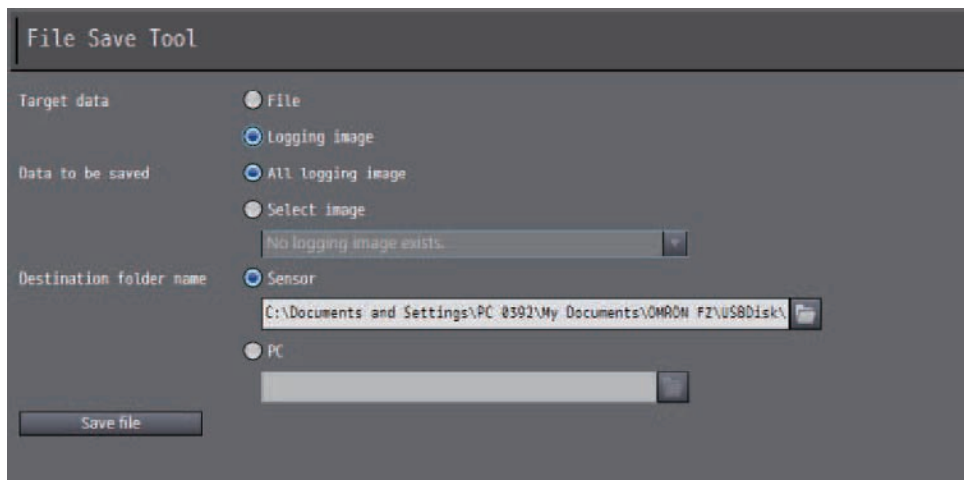
4 Save the file.

Click the [Save file] button to save the file.

The selected file is copied to the specified folder.

8-3-3 Saving a Logging Image as a File

You can save a logging image in the FH vision sensor memory as a file.



- 1** Select [Logging image] for [Target data].
- 2** Select the save target.
Select whether to save all logging images or a particular logging image.
- 3** Select the save destination folder.
To save the file to the RAMDisk or USB memory of the FH vision sensor, select [Sensor].
To save the file to the PC, select [PC].
When saving to the PC, you can save to the following folder.
C:\Documents and Settings\\My Documents\OMRON FH
- 4** Save the file.
Click the [Save file] button to save the file.
The selected logging file is output to the specified folder.

8-4 Using the User Data Setting Tool

This tool allows you to edit user data.

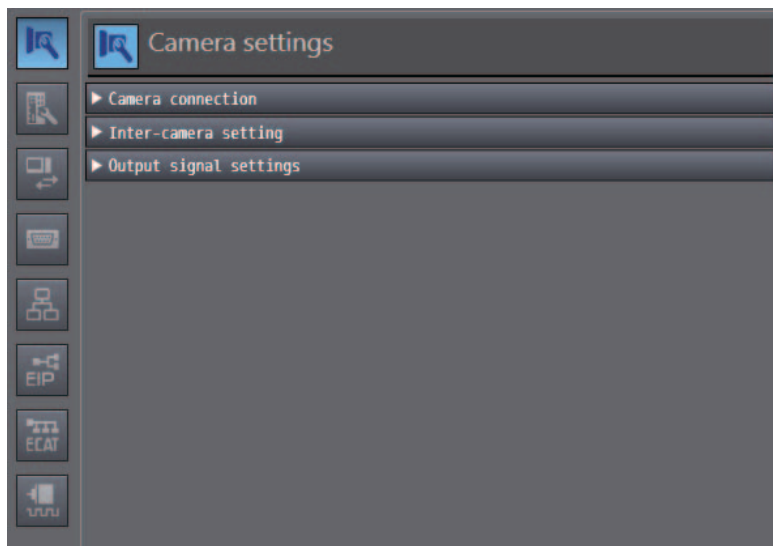
It is the same as the [Tools] - [User Data] function provided with the FH vision sensor.

For details, refer to the *Vision System FH/FZ5 Series User's Manual* (Cat. No. Z340).

8-5 Changing the System Environment

You can change the system data for the FH vision sensor in the system data editing screen.

Display the system data editing screen in the Edit Pane by double-clicking [System] in the Multiview Explorer or by right-clicking it and selecting [Edit] from the menu.



System data is classified into the groups shown in Table 1.

Clicking a group icon displays the editing items for the corresponding group.









System data includes parameters that require a restart to reflect the settings.

If a parameter that requires a restart is edited, "!" is displayed for the sensor type in the Multiview Explorer. If "!" is displayed, save the settings and then restart the FH vision sensor.

For details on restarting, refer to *2-4-4 Multiview Explorer* on page 2-10.

For details on each setting item, refer to *Vision System FH/FZ5 Series User's Manual* (Cat. No. Z340).

Table 1

Button	Item	Sub Item
	Camera settings	Camera connection Inter-camera setting Output signal settings
	Controller settings	Startup settings Fan control setting STEP setting Network drive settings Measurement setting Image logging settings Data log settings Operation log settings
	Parallel I/O settings	Settings
	RS-232C/422 settings	Settings PLC link settings
	Ethernet settings	Address settings Input/Output settings PLC link settings
	EtherNet/IP settings	EtherNet/IP communication
	EtherCAT settings	EtherCAT communication
	Encoder settings	Encoder settings

8-6 Help

You can display the FH tool manual.

Display the sensor connection screen in the Edit Pane by double-clicking the type in the Multiview Explorer or by right-clicking it and selecting [Edit] from the menu.

Click [Sensor Information] - [Help] to display the manual for the FH series vision sensors.



Limitations

This section provides a list of the limitations associated with the use of the FH sensor controller with the FH tools.

9-1 Limitations 9-2

9-1 Limitations

The FH tools have the following limitations.

Condition	Limitation
Registration of multiple FH series vision sensors to a project	Only one FH vision sensor can be registered to one project.
Editing of processing units	Limitations apply to editing processing units in Sysmac Studio. Refer to the following table.

List of the processing units supported in Sysmac Studio

○: Supported, x: Not supported

Processing Unit	Registration	Editing
Camera Image Input	○	x
Camera Image Input FH	○	○
Camera Image Input HDR	○	○
Camera Image Input HDR Lite	○	○
Camera Switching	○	○
Measurement Image Switching	○	○
Position Compensation	○	○
Filtering	○	○
Background Suppression	○	○
Brightness Correct Filter	○	○
Advanced Filter	○	x
Image Subtraction	○	x
Color Gray Filter	○	○
Extract Color Filter	○	○
Anti Color Shading	○	○
Stripes Removal Filter II	○	○
Polar Transformation	○	○
Trapezoidal Correction	○	○
Panorama	○	x
Machine Simulator	○	○
Search	○	○
Flexible Search	○	○
Sensitive Search	○	x
EC Circle Search	○	○
ECM Search	○	○
Ec Corner	○	○
Ec Cross	○	○
Shape Search II	○	○
Shape Search III	○	○
Classification	○	x
Edge Position	○	○
Edge Pitch	○	x
Scan Edge Position	○	○
Scan Edge Width	○	x
Circular Scan Edge Position	○	○
Circular Scan Edge Width	○	x
Intersection	○	○
Gravity and Area	○	○

○: Supported, x: Not supported

Processing Unit	Registration	Editing
Labeling	○	○
Label Data	○	○
Color Data	○	x
Defect	○	x
Precise Defect	○	x
Fine Matching	○	x
2DCode	○	x
Barcode	○	x
Character Inspection	○	x
Model Dictionary	○	x
Date Verification	○	x
Circle Angle	○	x
Glue Bead Inspection	○	x
Calculation	○	○
Macro Calculation	○	x
Circle Regression	○	○
Line Regression	○	○
Movement Single Position	○	○
Movement Multi Points	○	○
Convert Position Data	○	○
Position Data Calculation	○	○
Precise Calibration	○	○
Vision Master Calibration	○	○
PLC Master Calibration	○	○
Reference Calib Data	○	○
Camera Calibration	○	○
Get Unit Data	○	○
Get Unit Figure	○	○
Set Unit Data	○	○
Set Unit Figure	○	○
Detection Point	○	○
Image Logging	○	○
Image Conversion Logging	○	○
Data Logging	○	○
Trend Monitor	○	○
Statistics	○	○
User Data	○	○
Data Save	○	○
Robot Data	○	○
Stage Data	○	○
Iris	○	x
Focus	○	x
Macro	○	x
Wait	○	○
Elapsed Time	○	○
Parallelize	○	○
Parallelize Task	○	○
Conditional Branch	○	○
DI Branch	○	○
End	○	○
Selective Branch	○	○
Control Flow Normal	○	○

○: Supported, x: Not supported

Processing Unit	Registration	Editing
Control Flow PLC Link	○	○
Control Flow Parallel	○	○
Control Flow Fieldbus	○	○
Parallel Judgment Output	○	○
Data Output	○	○
Parallel Data Output	○	○
Fieldbus Data Output	○	○
Result Display	○	○
Display Image File	○	○
Display Last NG Image	○	○

10

Troubleshooting

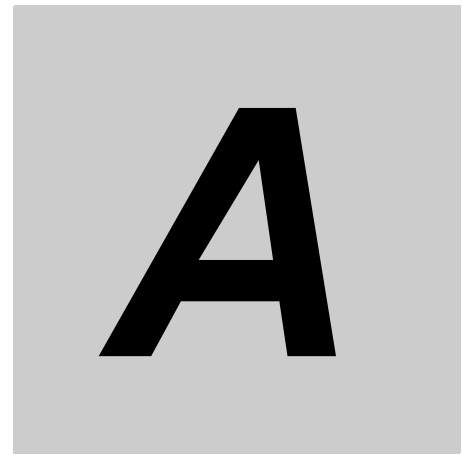
10-1 Troubleshooting for the EtherCAT	10-2
10-2 Sysmac Error Status	10-3

10-1 Troubleshooting for the EtherCAT

For details on how to perform troubleshooting for the EtherCAT, refer to *Vision System FH/FZ5 Series User's Manual for Communications Settings* (Cat. No. Z342).

10-2 Sysmac Error Status

For details on Sysmac error statuses, refer to *Vision System FH/FZ5 Series User's Manual for Communications Settings* (Cat. No. Z342).



Appendices

A-1	Sysmac Device Features	A-2
A-1-1	Sysmac Error Status	A-2
A-1-2	Saving the Node Address Setting	A-3
A-1-3	Serial Number Display	A-4
A-1-4	Compliance with ESI Specification (ETG.2000 S (R) V1.0.1)	A-4
A-1-5	SII Data Check	A-4

A-1 Sysmac Device Features

The control device product designed according to standardized communications and user interface specifications for OMRON control devices are called a Sysmac Device.

And the features available with such a Device is called Sysmac Device Features.

A-1-1 Sysmac Error Status

Because, in Sysmac Devices, errors that may occur in slaves are systematized, you can check the causes and remedies for errors with a common procedure.

The status of an error can be monitored in the Sysmac Error Status (2002-01 hex). To display the error status detected by the FH series Vision Sensor in Sysmac Studio, the Sysmac Error Status (2002-01 hex) must be mapped to the PDO. Sysmac Studio, by default, uses the 512th transmit PDO Mapping assignment to map the Sysmac Error Status (2002-01 hex) automatically to the PDO.



Additional Information

- For the Sysmac Error status (2002-01 hex), refer to *Vision System FH/FZ5 Series User's Manual for Communications Settings* (Cat. No. Z342).
 - For errors displayed in Sysmac Studio, refer to *NJ-series Troubleshooting Manual* (Cat. No. W503).
-

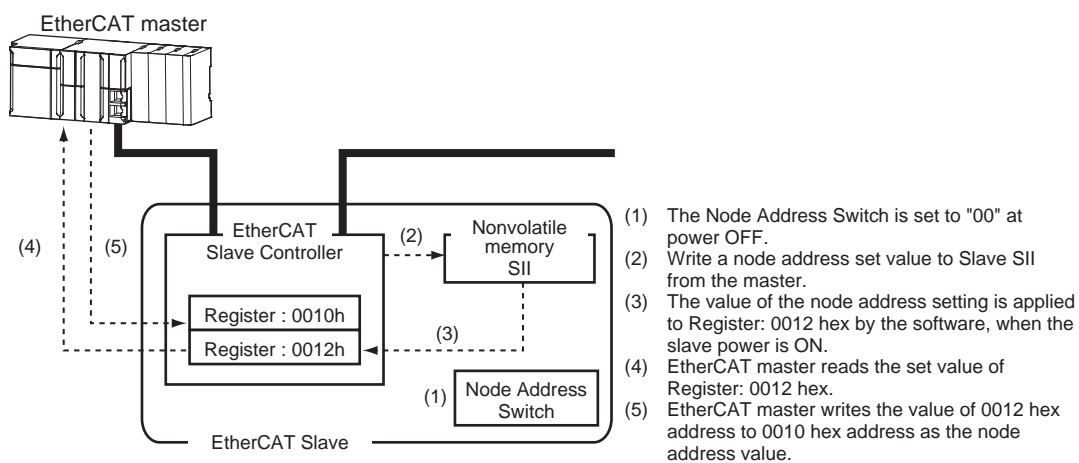
A-1-2 Saving the Node Address Setting

When the node address switch setting is "00" (Software Setup mode), the node address value you set in Sysmac Studio is enabled. If the node address switches are set to any other value, the value that is set on the switches is used as the node address.

In the Software Setup mode, in Sysmac Studio, execute [Write Slave Node Address] on the [EtherCAT Edit] screen to save the slave node address setting in the nonvolatile memory of the FH series Vision Sensor.

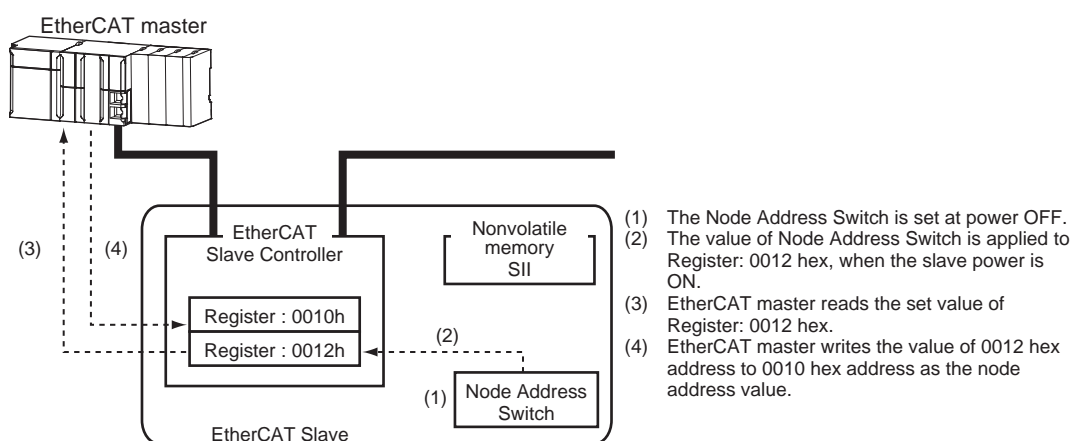
Software Setting

The set value saved as Slave Information Interface (SII) information in the nonvolatile memory of the slave is the node address.



Node Address Switch Setting

The value set on the node address switches is the node address.



A-1-3 Serial Number Display

The serial number saved in the nonvolatile memory of the Vision Sensor is displayed in the Serial Number (1018-04 hex). Controllers that support Sysmac Device Features can use this serial number to check the network configuration. To enable this check, in Sysmac Studio, set [Serial No. Check Condition] to [Set Value = Actual Unit] on the [EtherCAT Edit] screen. If the set condition is not met, a Network Configuration Check Error will occur.



Additional Information

This network configuration check detects any slave devices that have been replaced, which prevents you from forgetting to set parameters on those slaves.

A-1-4 Compliance with ESI Specification (ETG.2000 S (R) V1.0.1)

The ESI Specification is a set of specifications that define the entries required in an EtherCAT Slave Information (ESI) file.

A-1-5 SII Data Check

The Slave Information Interface (SII) is an interface area in the nonvolatile memory of an EtherCAT slave that stores the configuration information specific to that EtherCAT slave.

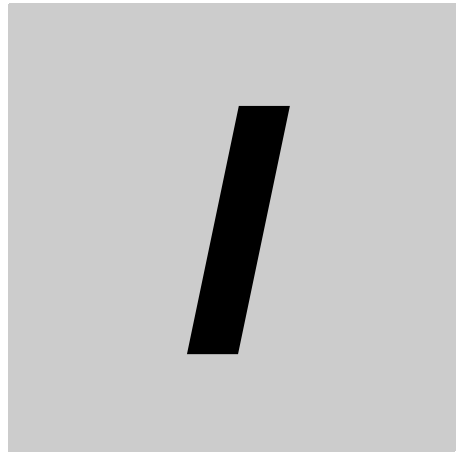
Sysmac Device EtherCAT slaves check the SII information from the slave side.

If one of these slaves finds that SII information with which it cannot operate was written, it generates an SII Check Error (Error No. 88.3). If this error persists even after turning OFF and then ON the power again, contact your OMRON sales representative.



Precautions for Correct Use

Do not use third-party or any other configuration tools to edit the SII information.



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