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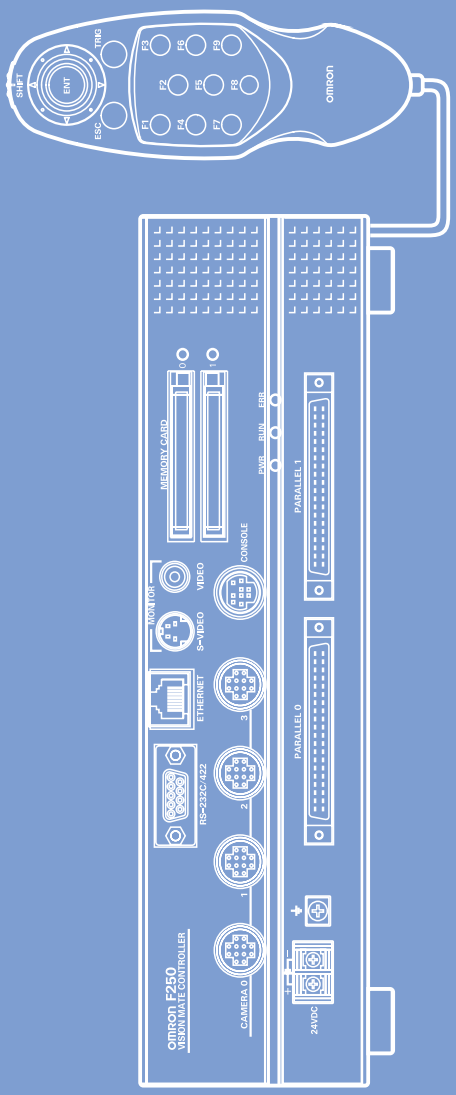
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OMRON



OPERATION MANUAL

Using This Manual

1 Basic Operating Procedures

2 Processing Items Setting Procedure

3 Test/Measurement Execution

4 Other Functions

5 System Settings

6 Communicating with External Devices

7 Appendix

Application Software

F500-UME

This manual explains basic operations, such as installing the Application Software, setting up inspection processes, and communications with external devices.

2

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Using This Manual

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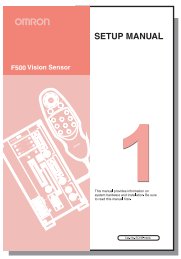
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Operation Procedure and Reference Manual

The following shows main contents of operation steps and manuals.Select the manual suitable for your purpose and read it before starting operation.

Connecting

Wiring



Setup Manual

(Supplied with the Controller)

The Setup Manual provides:
- Information for safety use of controller
- Procedures from package content check and installation up to connection of controller
- Information such as functions and specifications of controller and peripheral devices

Installing

Setting Inspection Conditions

Checking Settings and Starting Measurement

Outputting Data to External Device



Vision Mate Series Software (CD-ROM)

Vision Composer Net
Operation Manual

The Operation Manual provides:
- Method of operating the controller from Vision Composer Net
- Explanation of functions of Vision Composer Net

Tutorial Manual

The Tutorial Manual provides:
Exercises for basic operations of Vision Composer Net (※)

※ Two courses are available: Basic Course to learn how to perform measurement and adjustment, and Advanced Course to learn about a series of operations, starting from creation of Flow up to measurement and adjustment.
It is recommended that users begin with the Basic Course.

Application Software
Operation Manual

The Operation Manual provides:
- Installation method of application software
- Basic operating procedures
- Setting method of each processing item
- Communication method with external devices

Reverse Manual

The Reverse Manual provides:
Examples of vision sensor use
Useful methods for vision sensor use

Customize Manual

The Customize Manual provides the information necessary for customization and explains the macro function.

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Using This Manual

Hierarchical Structure and Printout Method for Manual

This manual consists of various PDF files. The hierarchical structure of the manual is shown on the next page.
Entire links in the manual are shown by Acrobat's index function, and the initial screen provides links to the front page of each section, and the front page of each section provides links to each item in that section

The manual can be printed one file at a time. Display the file to be printed out, open Acrobat's print dialog box, and then print the file according to the procedure displayed.

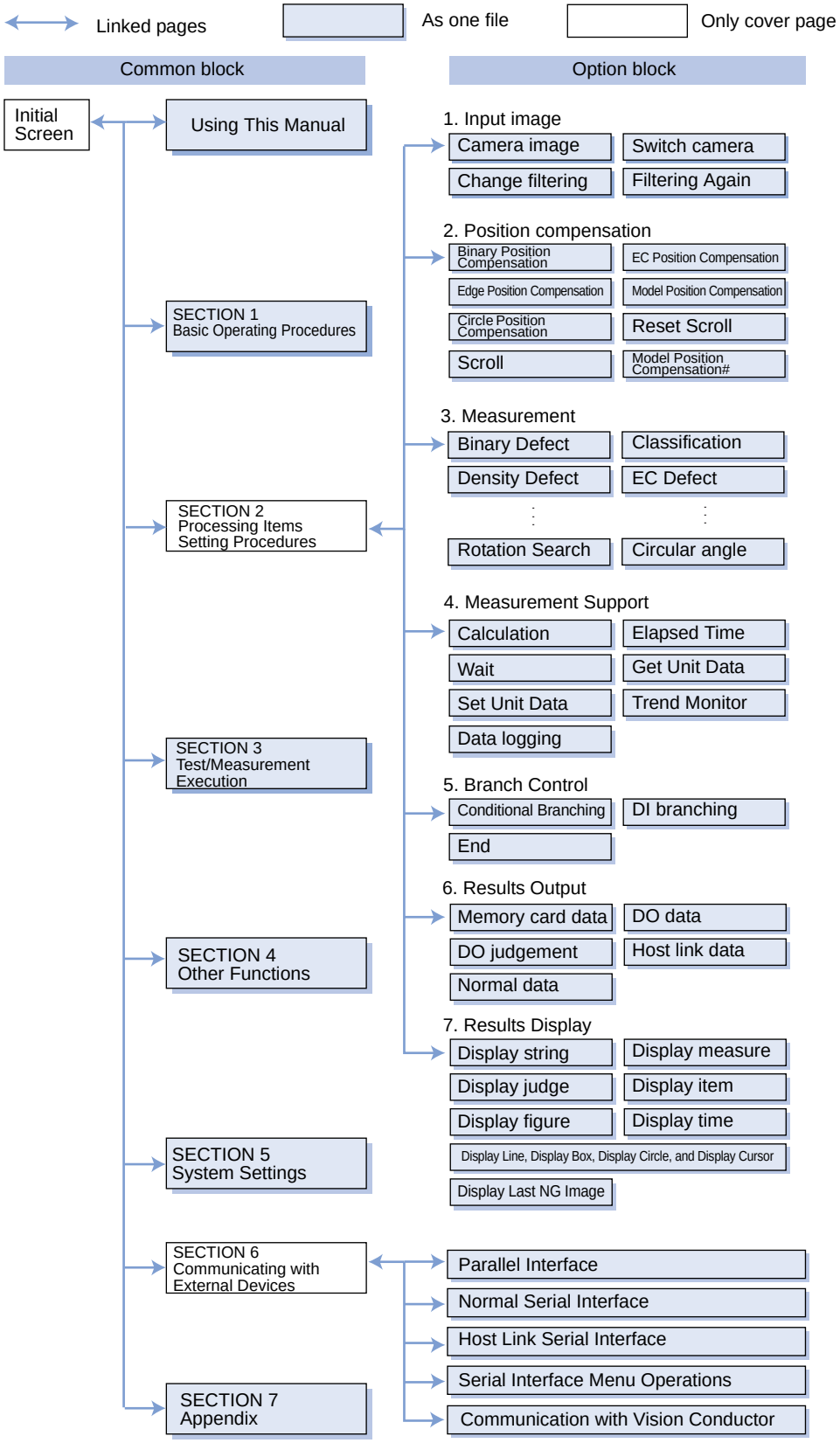
Full-Text Search Method

The catalogue function of Acrobat is used to enable full-text search in the entire Application Software Operation Manual and Vision Composer Net Operating Manual.
Select [Edit] - [Search] to display the search panel.
Enter "In the index named f500-cd.pdx" in [Where would you like to search?] and start search.



When displaying a manual using Adobe Reader, this function cannot be used unless Adobe Reader (full version) has been installed.

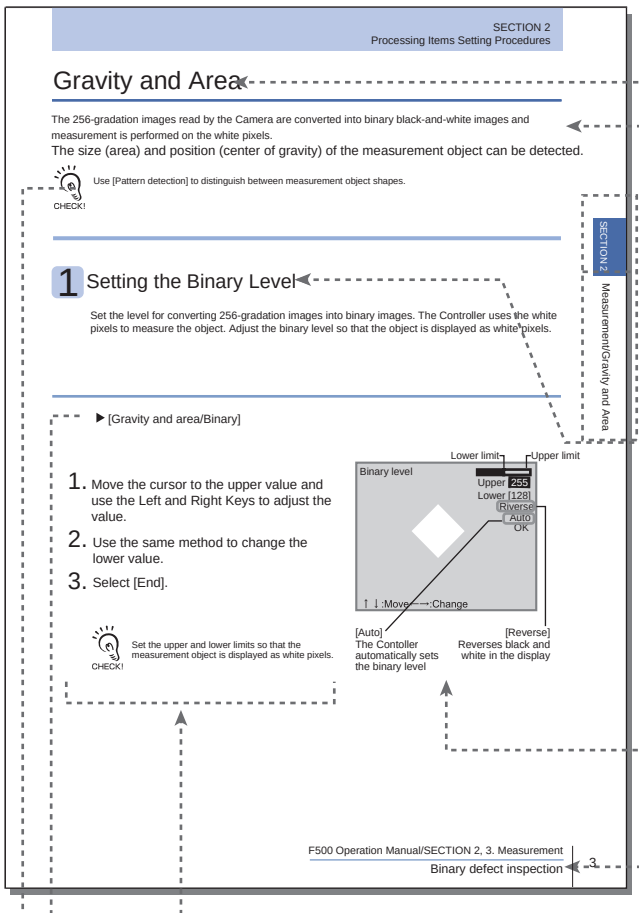
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Editor's Note

Page Format



■Title of each section

■Header

Indicates the contents of the page.

■Overview

Describes the overview and operation flow of the section.

■Index Label

Indicates to which section the current page belongs and the contents of the page.

■Sub-header

■Screen display

Indicates the status of the screen displayed on the left side.

■Section title/Processing Item

Describes the processing items in "SECTION 2 Processing Items Setting Procedures".

■Operation procedure and supplementary explanation

Indicates operation procedures and functions of operation keys. Helpful information regarding operation and reference pages is introduced here using symbols.

CHECK!

■Menu Hierarchy

Shows the menu hierarchy up to the corresponding operating screen.

■Overview and important point in application procedures

* This page does not exist.

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Notational Conventions

■ Key

Key operations are performed from the console.

Example: Press the SHIFT + TRIG Keys.

This statement indicates to press the TRIG Key while pressing the SHIFT Key down on the console.

Example: Select [SET].

This statement indicates to move the cursor to [Setting] and press the ENT Key.

■ Menu

In this manual, menu items displayed on the screen are enclosed with [ ].

Submenus are separated using “/”.

Example: Move to [SYS/Camera Settings].

This statement indicates to select the [Camera Settings] from [System] to move to the Camera Settings screen.

■ Operation procedure

Operation steps are numbered to indicate their order.

A supplementary explanation of the behavior, display or operation of the Controller after the execution of a step is given in the lines following the step.

Steps that vary with controller models are indicated by the following symbols.

F210 For F210

F250 For F250

F270 For F270

F500 For F500

ETN Contents regarding Ethernet-compatible models (i.e. models whose model name contains "ETN")

■ Visual Aids



Indicates points that are important in using product functions or in application procedures.



Indicates where to find related information.



Indicates information helpful in operation, such as the definition of terms.

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■ Symbols

The following symbols used in the manual may differ from those actually displayed in the screen.

In this case, they must be read as follows.

Symbols in manual	Screen display
↓	D, DWN, Down
←	L, LEFT, Left
→	R, RIGHT, Right
°	Not displayed
±	+/-
θ	Rotation, Angle
μ	u

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Functions Available for Each Controller Model

Functions that can be used vary with the controller to which the Application Software is installed.
For those items, refer to the table given below.

Processing item/Measurement items

The functions that cannot be used are shown for each model.

<table>
<tr><th colspan="2" rowspan="2">Function</th><th colspan="4">Controller</th></tr>
<tr><th>F210-C10/C15
F210-C10-ETN</th><th>F500-C10-ETN
F500-C15-ETN</th><th>F250-C50/C55</th><th>F270-C10/C15</th></tr>
<tr><td rowspan="4">Non-usable processing items</td><td>Input image Items</td><td colspan="4">No</td></tr>
<tr><td>Position Compensation Items</td><td colspan="2">Circle Position Compensation
Model Position Compensation</td><td colspan="2">No</td></tr>
<tr><td>Measurement Items</td><td>Pattern Inspection
Rotation Position
Classification
Density Defect Inspection</td><td>Pattern Inspection
Rotation Position Classification
Density Defect Inspection
Quest Character Verification*3
Lot Number OCV1*3
OCR for 1 character*3</td><td colspan="2">No</td></tr>
<tr><td>Measurement Support Items
Branching Control Items
Results Output Items
Results Display Items</td><td colspan="4">No</td></tr>
<tr><td rowspan="3">Run Function Mode *1</td><td>Nonstop adjust mode</td><td colspan="2">No</td><td>Yes</td><td rowspan="3">Yes
(Select one of the modes.)</td></tr>
<tr><td>1-line fast mode</td><td colspan="3">No</td></tr>
<tr><td>2-line random trigger mode</td><td colspan="3">No</td></tr>
<tr><td colspan="2">Macro Function *2</td><td colspan="4">Yes</td></tr>
</table>

*1: Run Function Mode
SECTION 3 Test/Measurement Execution

*2: Can be used only if the Application Software has the macro function.
SECTION 1 Basic operating procedures

*3: Can be used if the [+] mark is not attached to the type displayed when [SYS] - [System information] -[Controller] is selected.

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Serial Interface Menu Operations

The interfaces that can be used are shown below for each model.

Controller	Interface		
	RS-232C or RS-422	USB	Ethernet
F210-C10/C15	●	×	×
F250-C50/C55	●	×	● *
F270-C10/C15	●	×	● *
F210-C10-ETN/C15-ETN	●	●	○
F500-C10-ETN/C15-ETN	●	●	○

●: Only one interface can be used. It is not possible to use two or more interfaces at the same time.

○: For Vision Composer Net only

*: Not possible to connect to Vision Composer Net.

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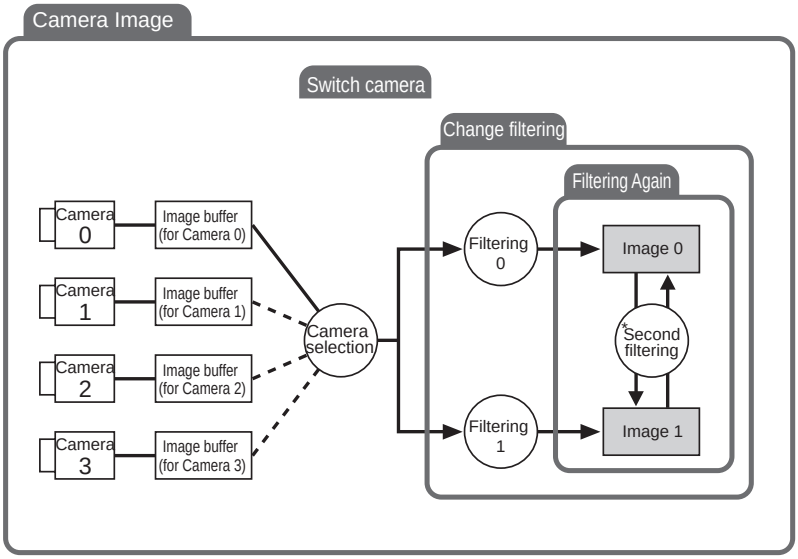
Processing Item Selection Guide

This software provides various processing items so that you can choose according to your application.
This section gives guidance regarding what items should be selected for what cases. This is guidance only. To check whether measurement can be performed correctly, actual measurement must be performed.
For details on processing items, refer to SECTION 2 Processing items Setting Procedure.

Input image Items	Go to p.11
Position Compensation Items	Go to p.12
Measurement Items	Go to p.13
Positioning (Measurement Objects Not On An Angle)	Go to p.13
Positioning (Measurement Objects On An Angle)	Go to p.14
Front/Rear Inspection	Go to p.14
Presence/Absence Inspection	Go to p.15
Dimensional Inspection/Measurement	Go to p.16
Chip/Bur Inspection	Go to p.16
Character Reading	Go to p.16
Character Verification	Go to p.17
Character Inspection	Go to p.17
Defect Inspection (Plain Background)	Go to p.18
Defect Inspection (Characters, Drawing and Patterns on Background)	Go to p.19
Quantity Inspection/Measurement	Go to p.19
Foreign Matter Inspection	Go to p.20
Classification	Go to p.20
BGA Inspection	Go to p.20
Measurement Support Items	Go to p.21
Branching Control Items	Go to p.21
Results Output Items	Go to p.21
Results Display Items	Go to p.22

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Input image Items



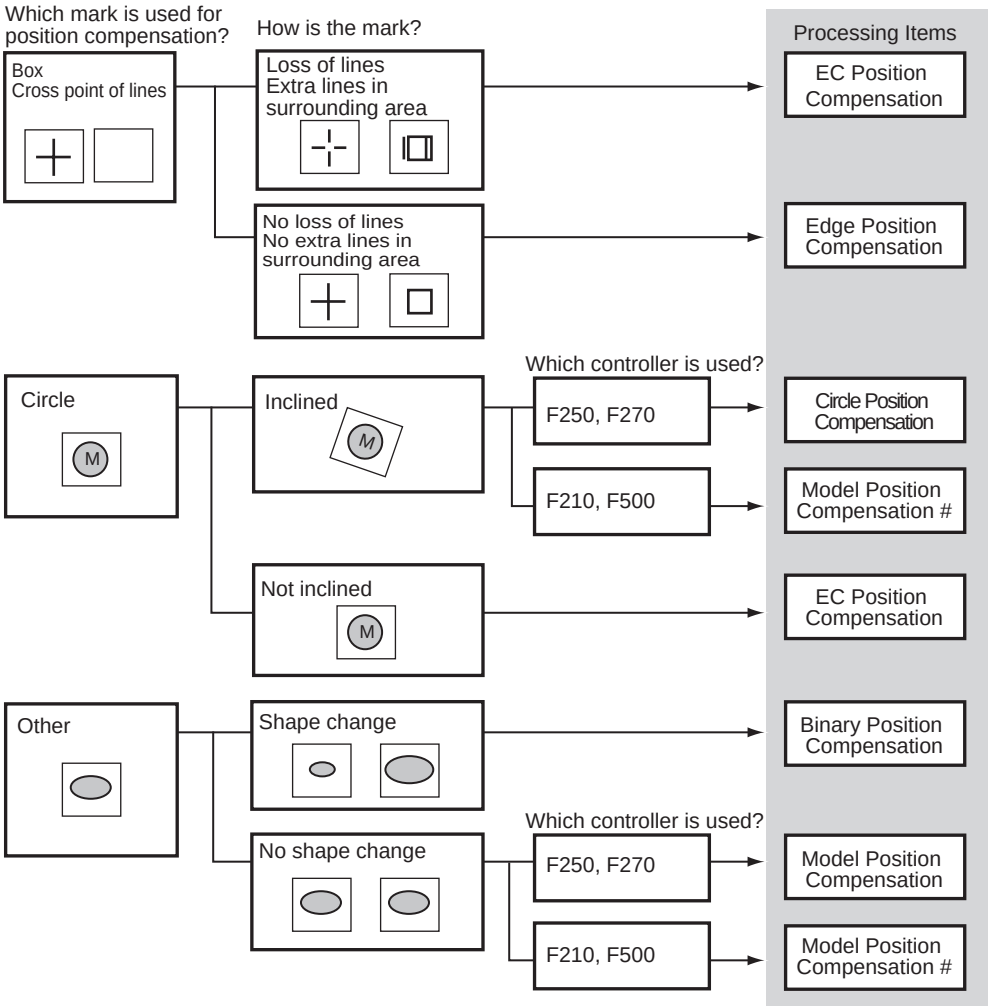
*: When [Filtering again] is selected

Processing item	Remark
Inputting Camera Images	This section describes how to make the series of settings required when storing conditions for reading Camera images and storing measurement object images to [Image 0] or [Image 1]. A Camera image must be read to perform measurements, and Camera image is thus set for unit 0 by default.Do not delete Camera image from unit 0 or change it to another processing item.
Switch camera	The Switch Camera processing item is used to switch the Camera (image buffer) from which images will be stored to [Image 0] and [Image 1]. New images are not read from the Camera. The filtering settings will be changed at the same time.
Changing Filtering	The Change Filtering processing item is used to change only the filtering settings for [Image 0] and [Image 1]. New images are not read from the Camera.
Filtering Again	The Filtering Again processing item is used to add filtering to an image.Images can be sent from [Image 0] to [Image 1] or from [Image 1] to [Image 0] to add filtering to the image when it is transferred. This processing item is used if stronger smoothing is required to eliminate noise or increase edge enhancement.

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Position Compensation Items

■ Position compensation



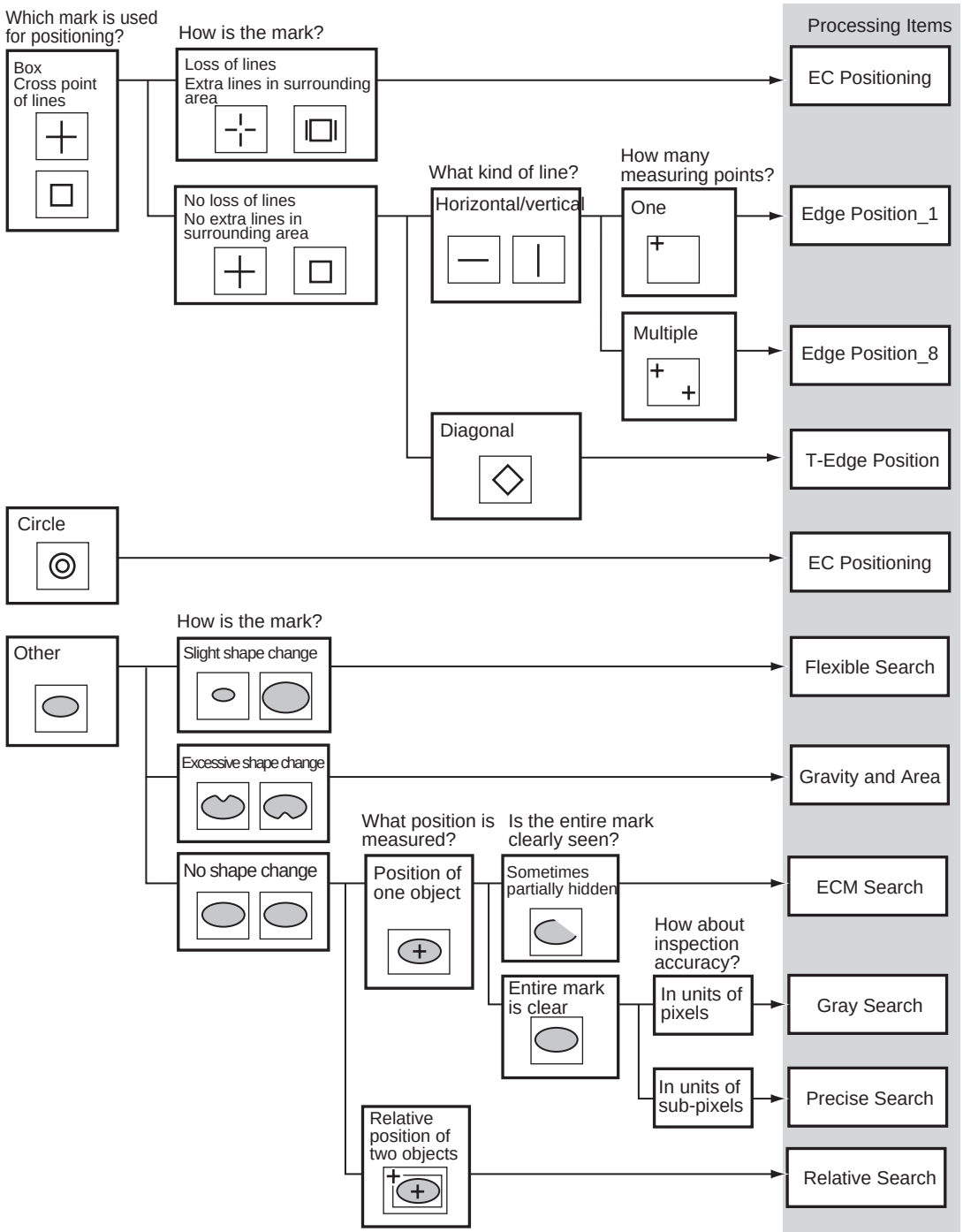
■ Other

Processing item	Remark
Reset Scroll	The Reset Scroll processing item is used to return images that were scrolled using position displacement compensation to their original position (the position when read to the image buffer). Example: To perform position displacement compensation separately on two measurement objects within the same field of vision.
Scroll	It can be used when the required results cannot be achieved with position compensation processing items. The Scroll processing item scrolls an image based on the measured values from other units. It can be used in combination with other general measurement processing items.

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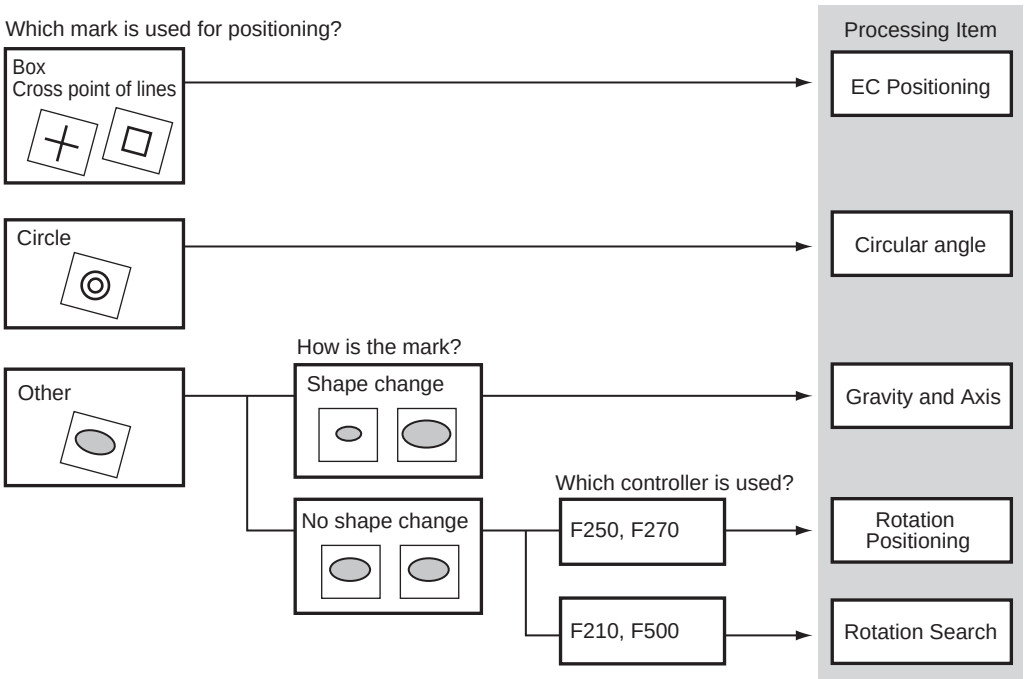
Measurement Items

■ Positioning (Measurement Objects Not On An Angle)

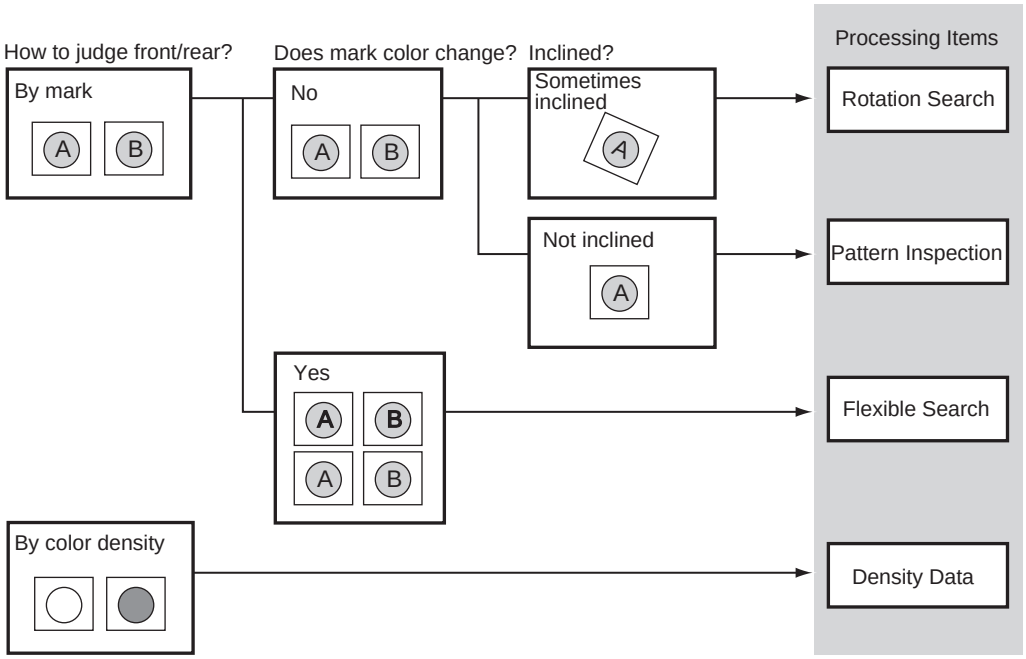


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■ Positioning (Measurement Objects On An Angle)

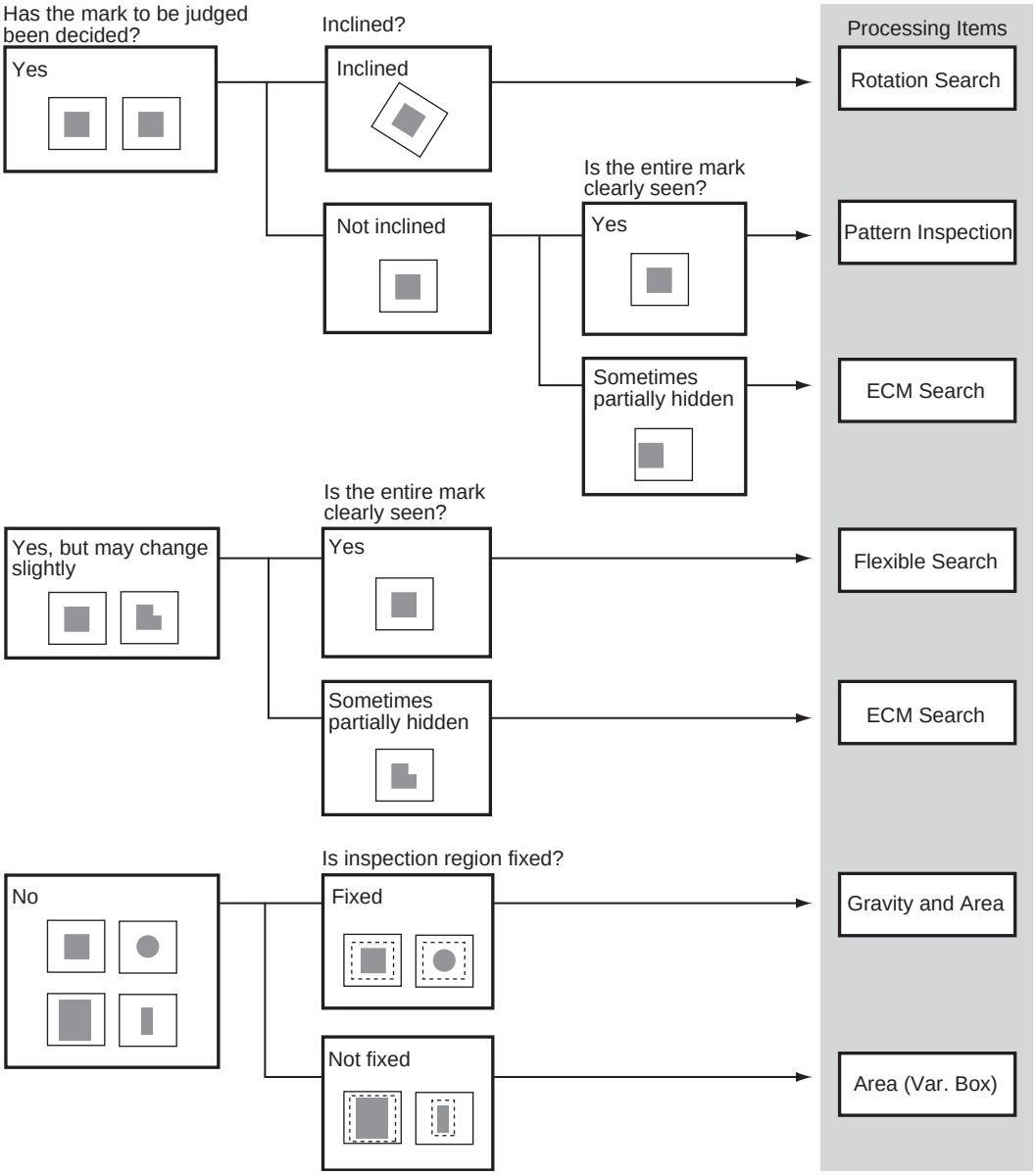


■ Front/Rear Inspection



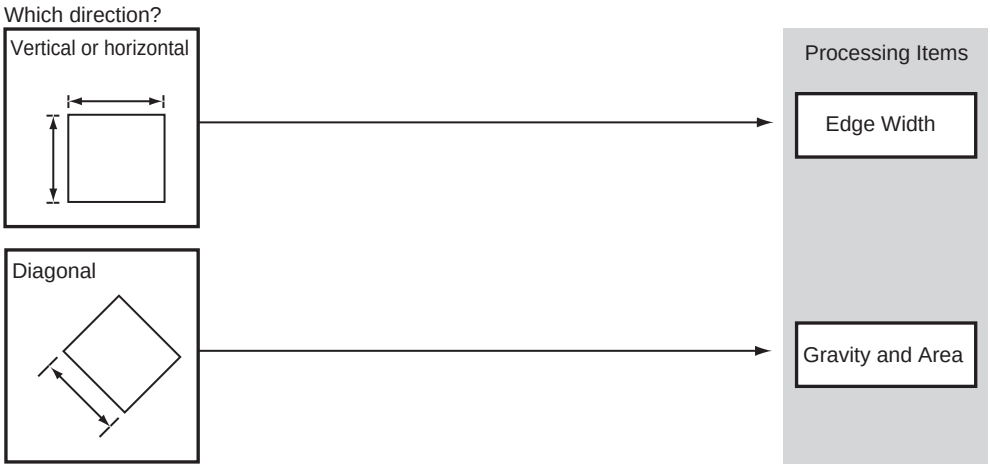
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■ Presence/Absence Inspection

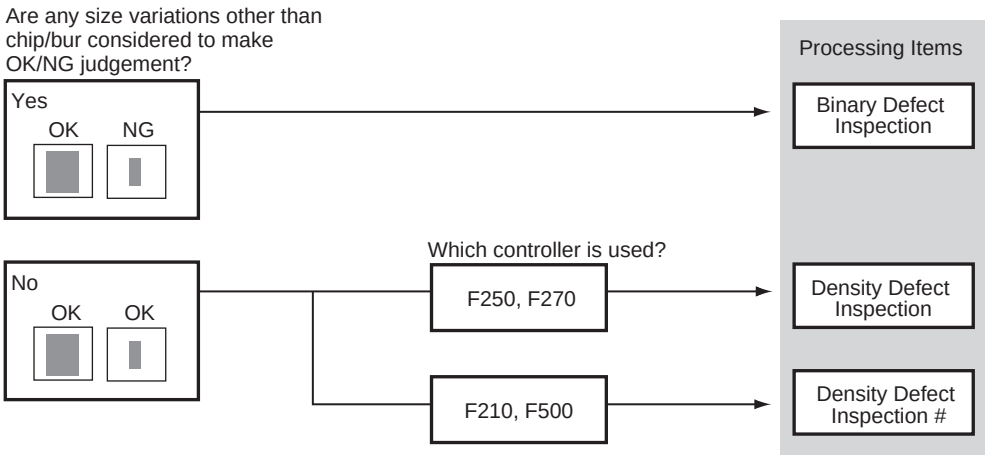


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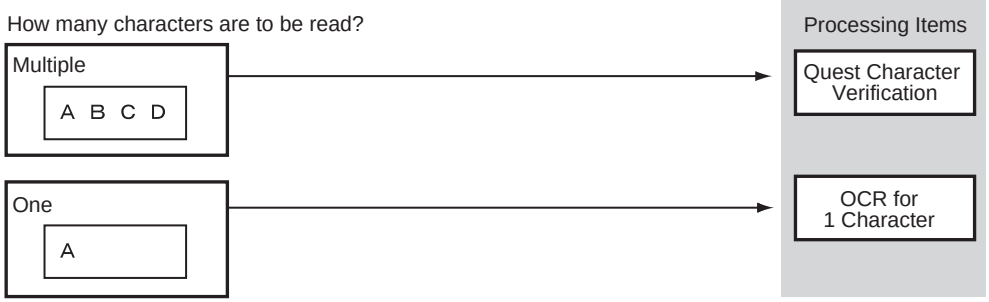
■ Dimensional Inspection/Measurement



■ Chip/Bur Inspection

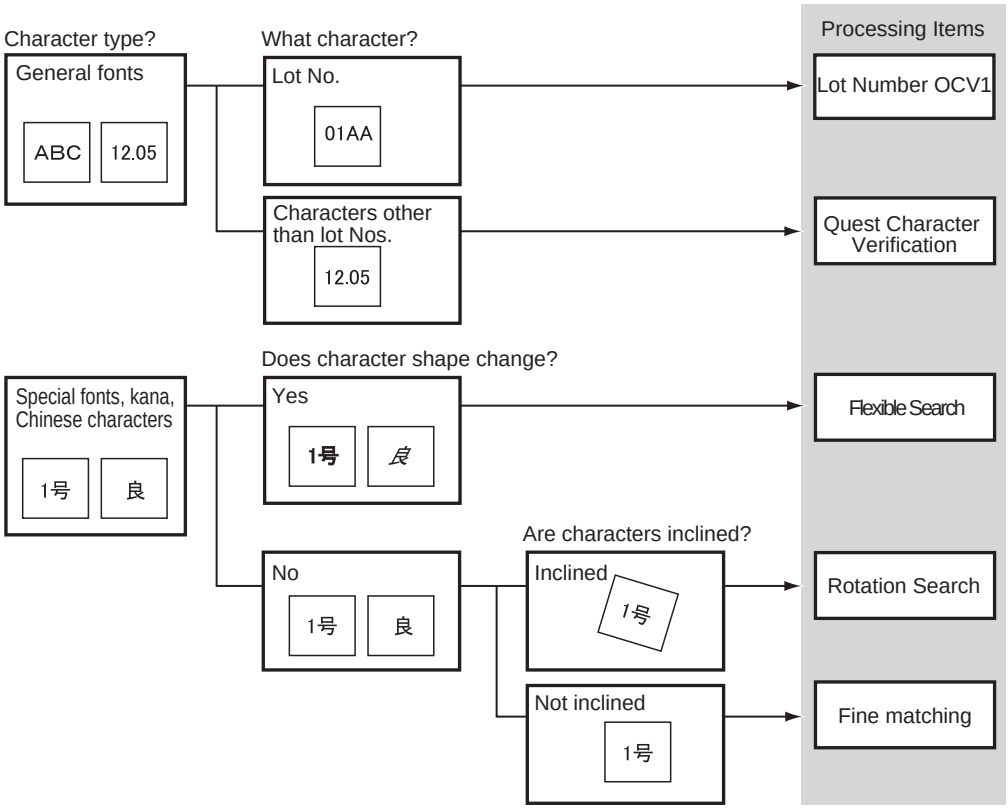


■ Character Reading

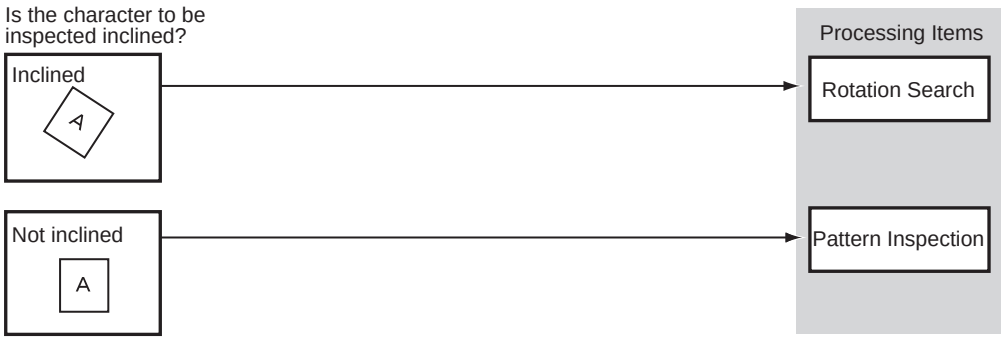


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■ Character Verification

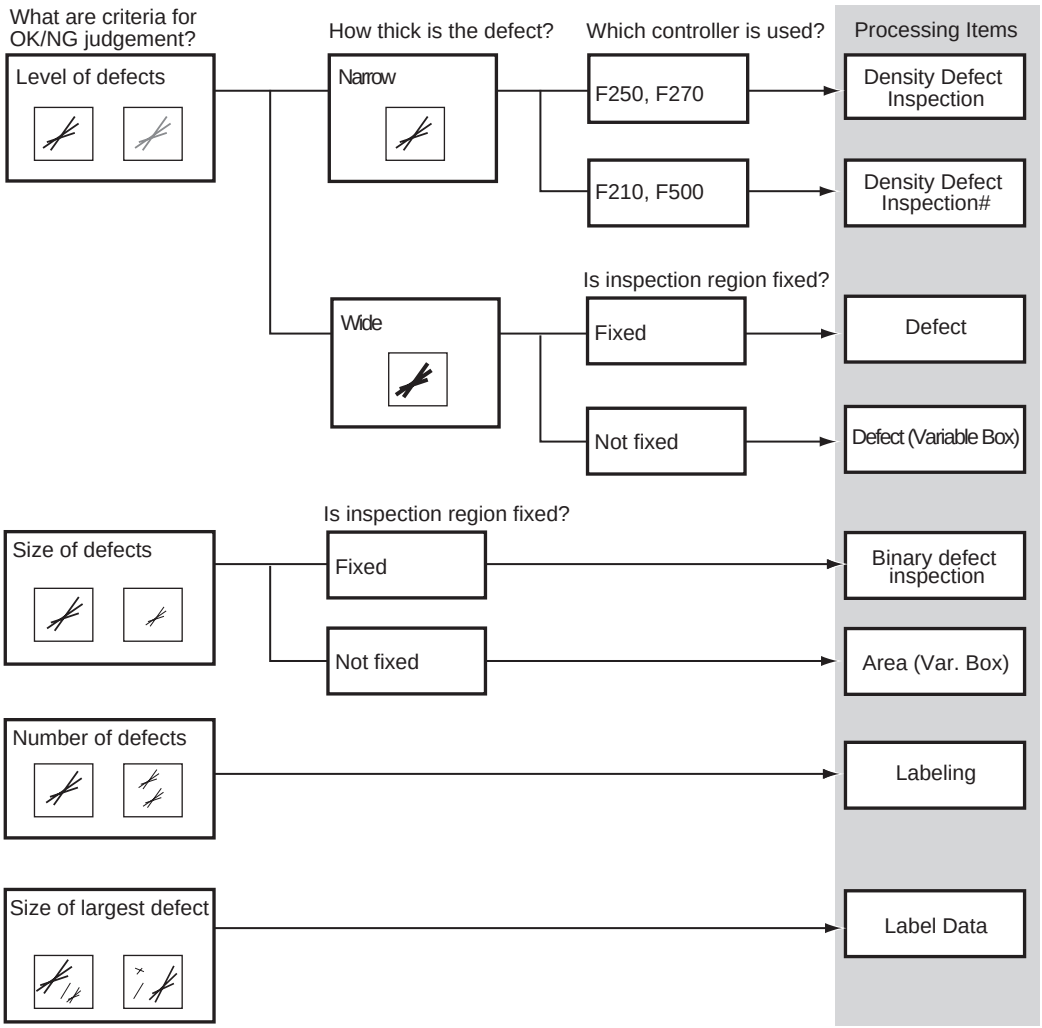


■ Character Inspection



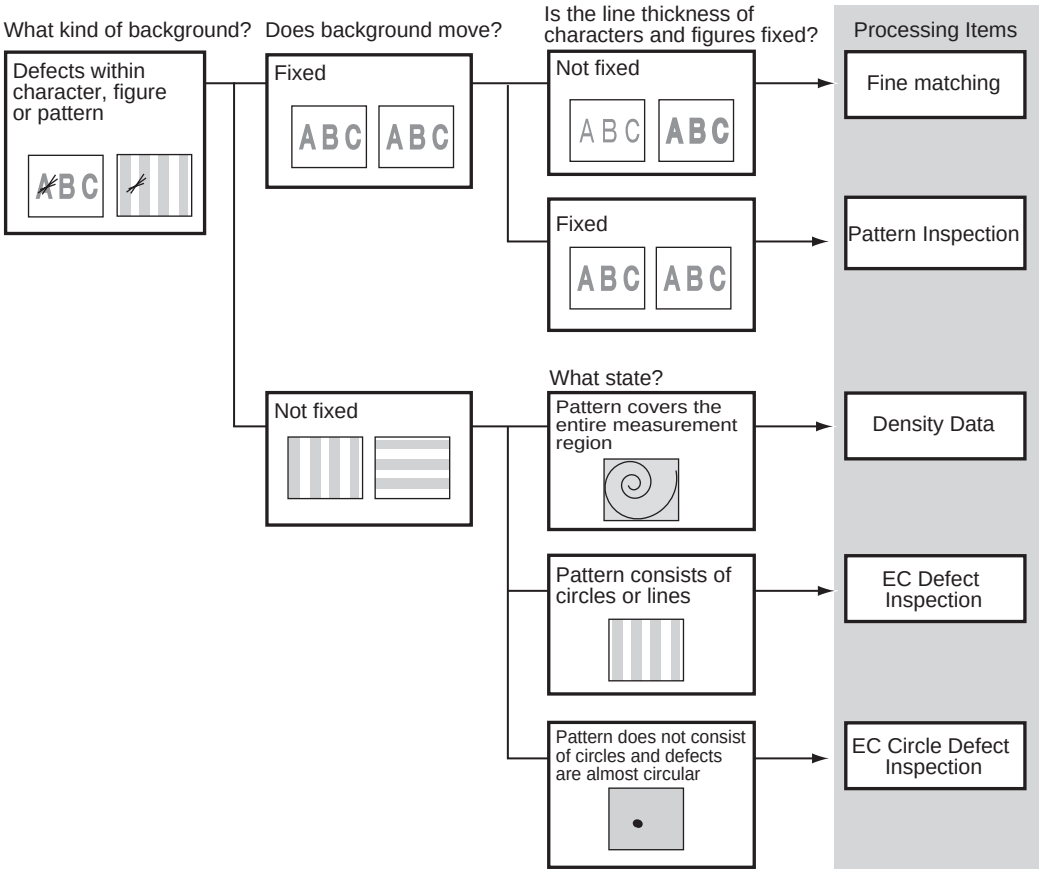
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■ Defect Inspection (Plain Background)

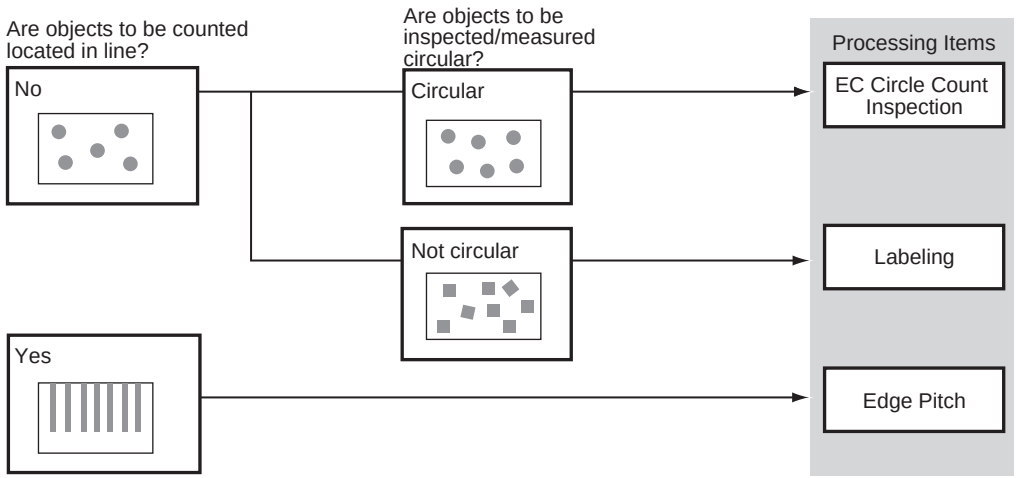


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■ Defect Inspection (Characters, Drawing and Patterns on Background)

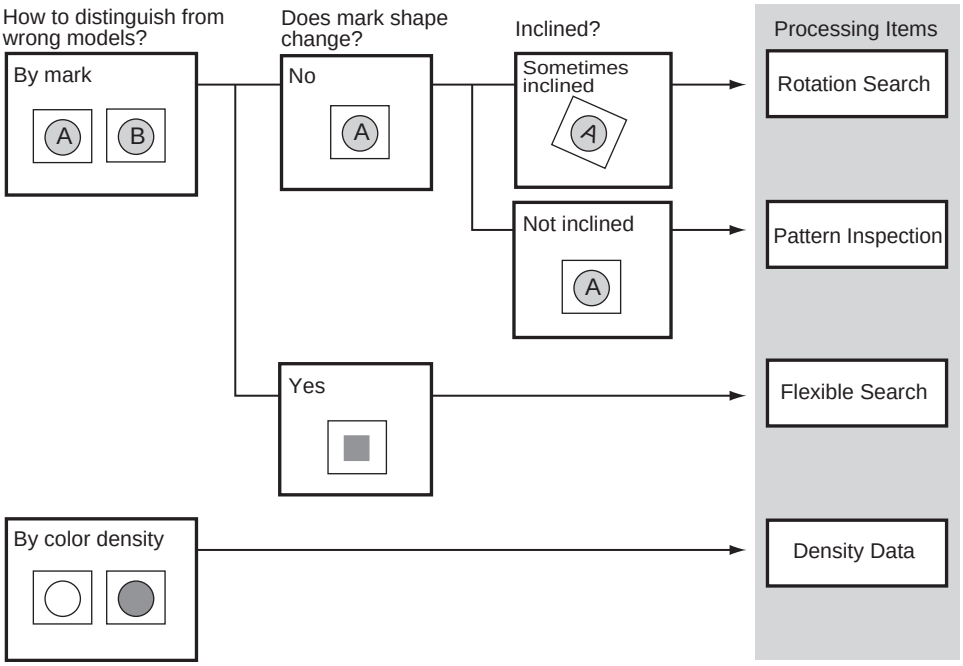


■ Quantity Inspection/Measurement

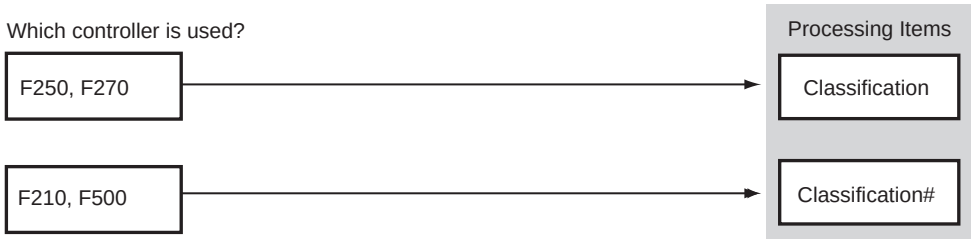


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■ Foreign Matter Inspection



■ Classification



■ BGA Inspection



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Measurement Support Items

Processing item	Remark
Calculation	The Calculation processing item is used to perform calculations using the results and measurement values for the processing items registered to the units.
Elapsed Time	The Elapsed Time processing item finds the amount of time (in ms) that has passed since the measurement trigger was input.
Wait	The Wait processing item temporarily stops the execution of the flowchart and holds processing for a set time.
Processing unit Data acquisition	The Get Unit Data processing item is used to obtain one piece of processing item data (measurement result, settings parameter, etc.) set in a flowchart.
Processing unit Data setting	The Set Unit Data processing item is used to replace data during measurement with processing item data (e.g., set parameters) set in the flowchart.
Trend Monitor	The Trend Monitor processing item is used to display the measurement results history on the Monitor.Observation of the measurement value trends helps to prevent frequent occurrences of non-conforming articles and to find the cause of NG results when they occur.
Data logging ETN	Used to output data to the storage via network. The data output to the storage can be handled by Vision Composer Net (option).

Branching Control Items

Processing item	Remark
Conditional Branching	This processing item is used, for example, when two or more products are being processed on the same production line and a different inspection is required for each. When the Branch processing item is used, two expressions and a condition are set and the processing is branched depending on the result of the comparison for the condition.
DI branching	Used for applications such as differentiating between product inspections on the same production line based on the time. The subsequent processing items are branched based on the information input to DI0 to DI4 on the terminal block.Up to 32 branches can be set.
End	The End processing item is the processing item set to the last unit in a branch flow. The End item is used to end the processing after branching.

Results Output Items

Processing item	Remark
Memory card data	Use the Memory Card Data processing item to output data to a Memory Card.
DO data output	The DO Data processing item is used to output data to Programmable Controllers, personal computers, and other external devices via a parallel interface.
DO judgement output	The DO judgement processing item is used to output Judgements to Programmable Controllers, personal computers, and other external devices via a parallel interface.
Host link data	The Host Link Data processing item is used to output data to Programmable Controllers and other external devices via a serial interface.
Normal data	Use the Normal Data processing item to output data to Programmable Controllers, personal computers, and other external devices via a serial interface.

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Results Display Items

Processing item	Remark
Display string	The Display String processing item is used to display any characters on the Run and Monitor Mode screens.
Display measure	Use this processing item to display any measurement data on the screens in Run and Monitor Modes. The display is set using expressions so the calculation results of expressions using region measurement values or measurement values can be displayed.
Display judge	The Display judgement processing item is used to display different characters for OK and NG calculation results on the screens in Run and Monitor Modes.
Display item	The Display Item processing item is used to display the name of one processing item set to the current scene on the screen in Run and Monitor Modes. If a comment is entered for the processing item, the comment will also be displayed.
Display Time	This processing item displays the date and time of the measurement on the screens in Run and Monitor Modes.
Display Figure	The Display Figure processing item is used to display figures (lines, boxes, circles, and arcs) at fixed positions on the screens in Run and Monitor Modes.
Line Display Results	Use these processing items to display on screens in Run and Monitor Modes the figures based on measurement results.
Box Display Results	
Circle Result Display	
Cross Cursor Display	
Display Last NG Image	The Display Last NG Image processing item is used to exit measurement after displaying the latest NG image on the monitor when performing measurement in 1-line fast mode (or 2-line random trigger mode) with F270.

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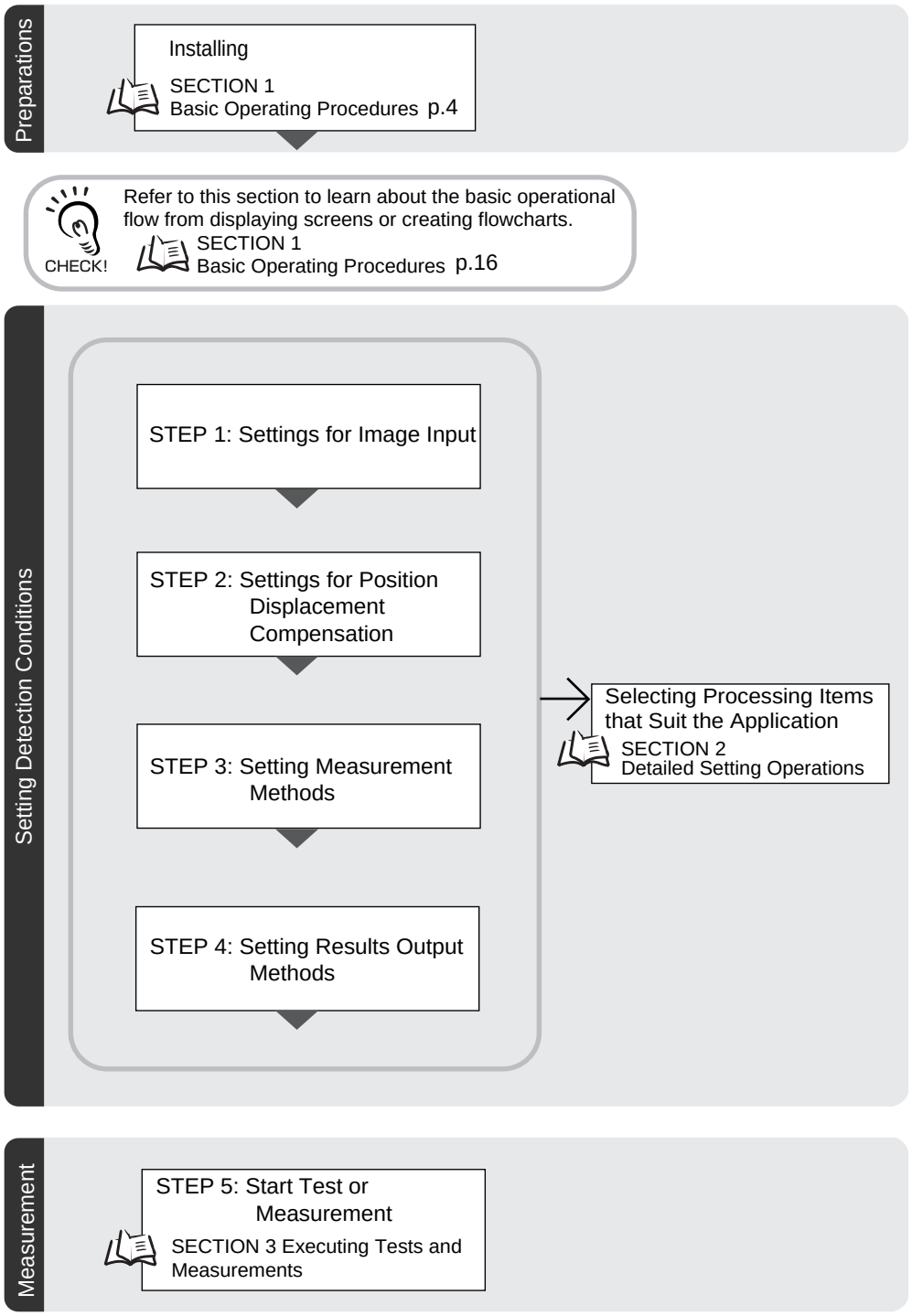
SECTION 1
Basic operating procedures

This section describes the basic operating procedures for the Application Software.

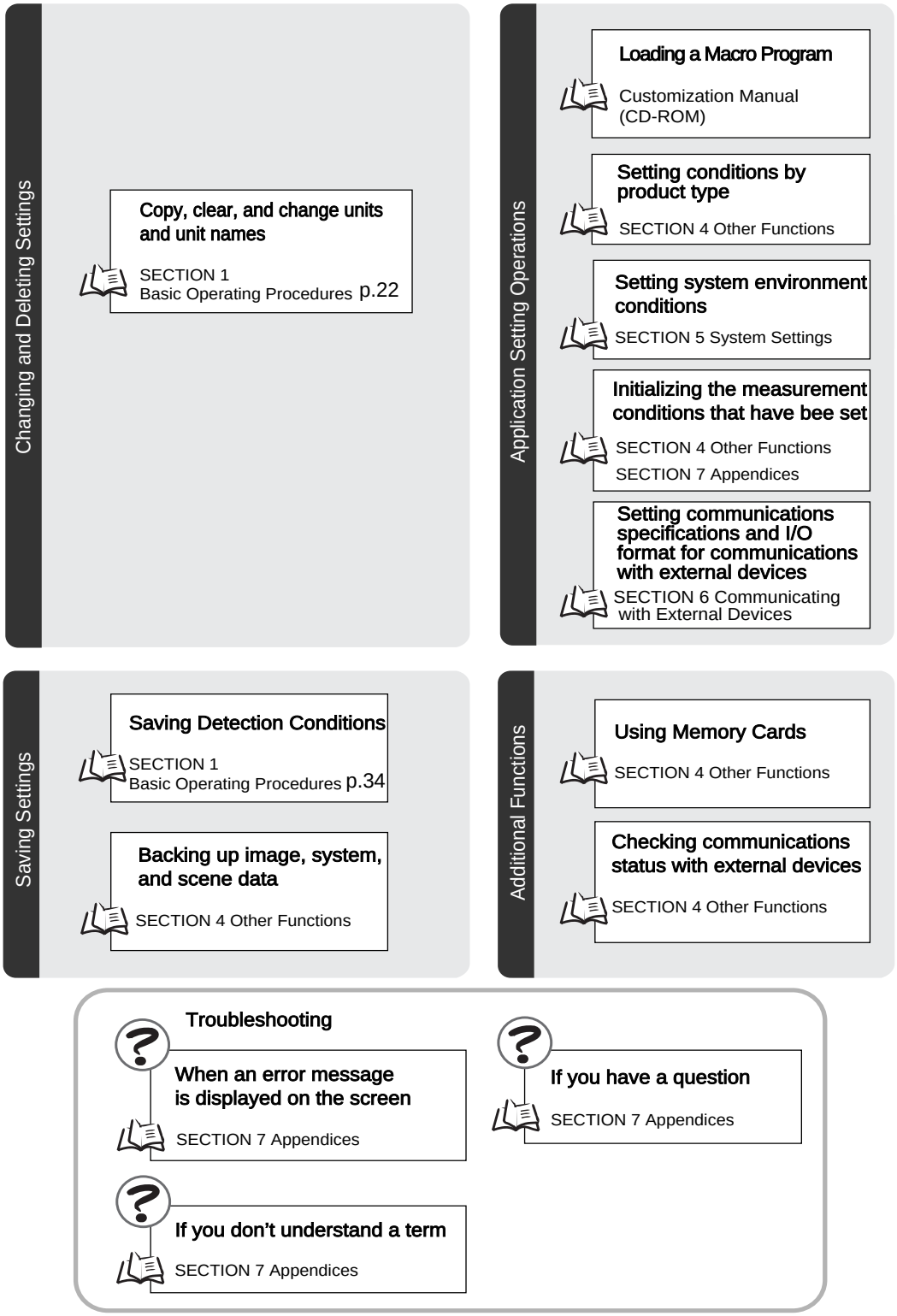
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Operational Flow



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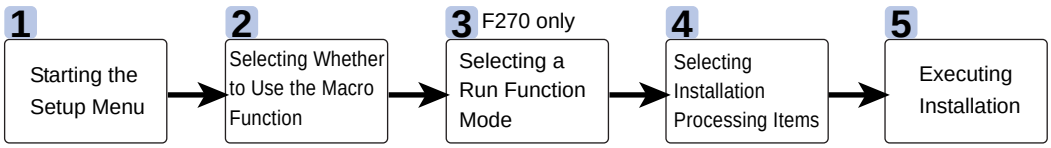


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Installing the Application Software

This section describes how to install the processing items in the Application Software to the Controller. The Setup Menus are used to install these processing items.
The installation procedure varies depending on the controller model and the application software used.

■ Installation Flow



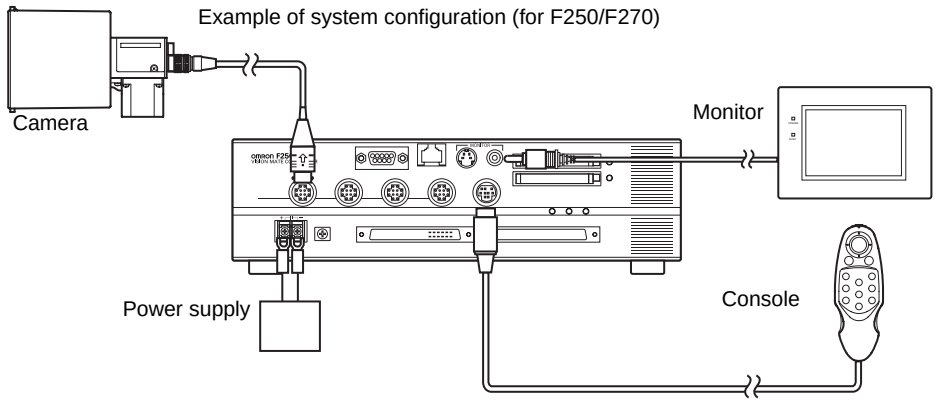
1 Starting the Setup Menu

CHECK!

Application Software
It will not be possible to start the Setup Menu if you change the contents of the memory card after installing it in a personal computer or other device.
Never perform the following with the memory card:

- Changing file names
- Moving, deleting or editing files
- Overwriting data
- Formatting

1. Check that the basic components are connected.



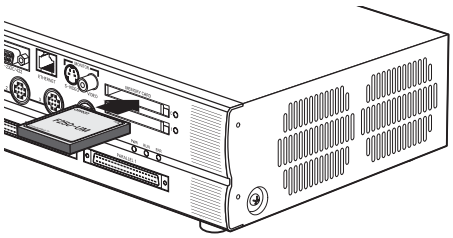
CHECK!

Always refer to the Setup Manual when connecting components or wiring the power supply or ground wires.

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2. Mount the Application Software Memory Card to Memory Card slot 0.

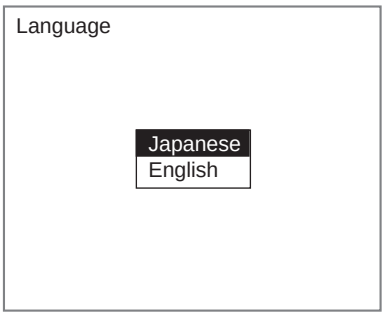
If the controller has two slots, mount the memory card to slot 0.



3. Turn ON the power supply switch to the Monitor.

4. Turn ON the controller's power supply.

The Language selections will be displayed.



5. Select a language.

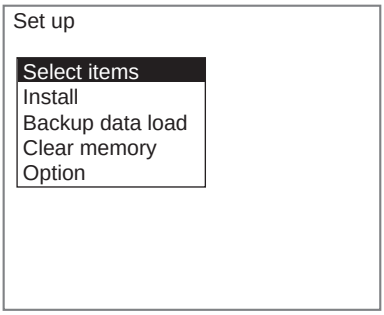
Use the Up or Down Key on the Console to move the cursor.
Japanese: Messages will be displayed in Japanese.
English: Messages will be displayed in English.

his manual shows screens displayed with English messages.

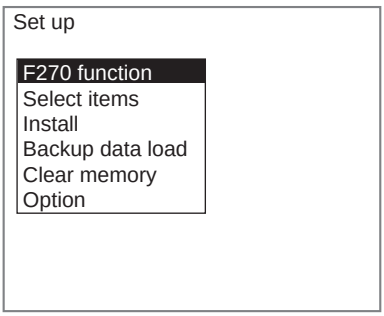
6. Press the ENT Key on the Console to confirm the language selection.

After a short time, the Basic Screen for the Setup Menus will be displayed.
The displayed screen varies depending on the controller model.

F210 F250 F500



F270



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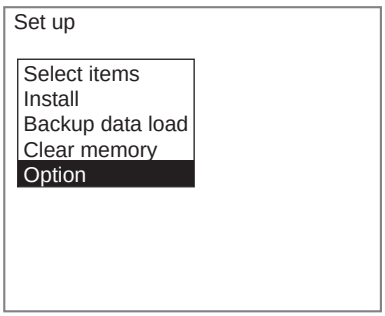
2 Selecting Whether to Use the Macro Function

(The following is effective only if the application software has the macro function.)
Select whether to use the macro customize function.
By default, [ON] is selected to use the macro function. If you want to use work memory for scene data, change the settings to [OFF]. Normally, leave the default setting selected.

Macro Function
Customize Manual (CD-ROM)

CHECK!
Before starting installation of the application software, select whether to use the macro function. Once the software is installed, it is not possible to change the setting.
If you want to change the setting, start the setup menu and reinstall the application software.

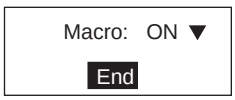
1. Select [Option].



The macro function selections appear.

2. Select whether to use the macro function.

3. Select [End].



The screen in **1.** will return.

- Proceed to 4 in the case of F210/F250/F500.
- Proceed to 3 in the case of F270.

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3 Selecting a Run Function Mode F270

F270 provides the following three run function modes. Select an appropriate mode according to your purpose.
Before starting installation, select a Run Function mode. Once measurement conditions have been set, it is not possible to change the Run Function mode only.

Selection	Details
Nonstop mode	Allows you to observe NG images or modify measurement conditions while continuing measurement. This eliminates the need to stop the production line for adjustment of measurement conditions or to wait for the line to stop before adjustment.
Fast mode (default setting.)	Allows inspections to be performed at a speed of up to a maximum of twice that of the conventional method. This mode is useful when you want to inspect more products or to reduce processing time for inspections, such as EC defect inspection that take a long time.
Random trig mode	Allows inspections by receiving two measurement triggers simultaneously. This allows one controller to perform different inspections simultaneously.

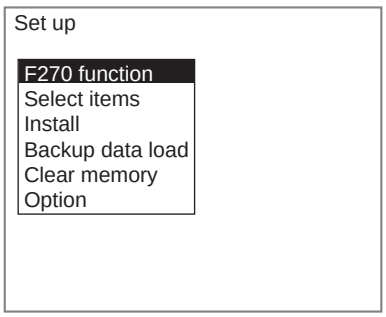
Details of Run modes

SECTION 3 Test/Measurement Execution

CHECK!

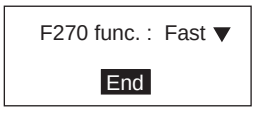
If you want to change the Run Function mode, start the setup menu and reinstall the application software.

1. Select [F270 function].



The Run Function mode selections will be displayed.

2. Select the desired Run Function mode.



3. Select [End].

The screen in **1.** will return.
When the screen in 1. reappears, select [Select items] - [Install].

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4 Selecting Installation Processing Items

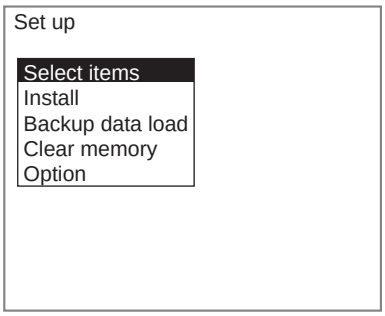
The application software provides many processing items.Select the processing items required for the application. Refer to SECTION 2 “Processing Items Setting Procedures” for an outline of each processing item.

CHECK!

Some items cannot be used depending on the model of the controller to be installed.

Editor's Note, Processing Item Selection Guide

1. Select [Select items].

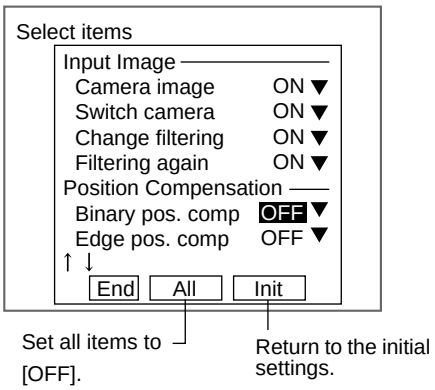


A list of processing items will be displayed.

To install all the processing items, select [All] and proceed to **6.**
For custom installation, proceed to **2.**

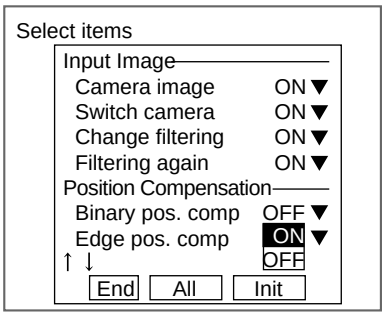
2. Move the cursor to the item to be installed.

3. If that item has been set to [OFF], press the ENT Key.



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The selections (ON/OFF) will be displayed.



4. Select [ON].

5. Repeat this process to select [ON] for the processing items to be installed and set [OFF] for the items that are not to be installed.

6. Select [End].

The screen in **1.** will return.

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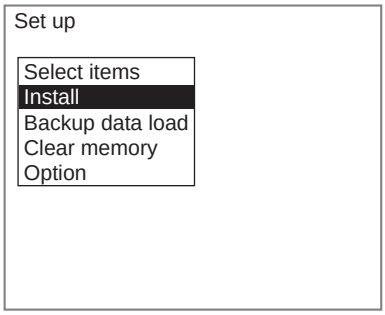
5 Executing Installation

This section describes how to install the selected processing items to the Controller.

CHECK! Before starting installation, select whether to use the macro function. Also select the desired Run Function mode.

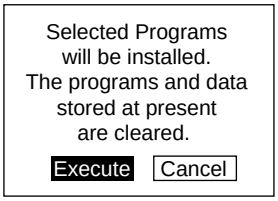
Macro Function p.6, Run Function Mode p.7

1. Select [Install].



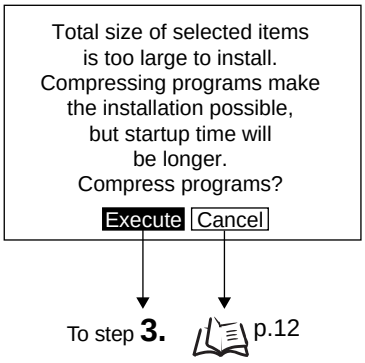
A confirmation message will be displayed.

2. Select [Execute].



The size of the processing items will be calculated to determine if they can be installed.
If the total size of the selected processing items is too large to be installed, a confirmation message will be displayed to ask if the files are to be compressed.

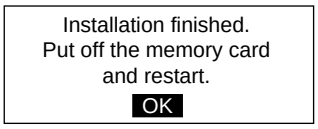
CHECK! Do not turn OFF the power or input a RESET signal while a message indicating that processing is in progress is being displayed. Data in memory will be destroyed, and the Controller may not operate correctly the next time it is started.



A confirmation message will be displayed once the installation has been completed.

CHECK! If an error message appears:

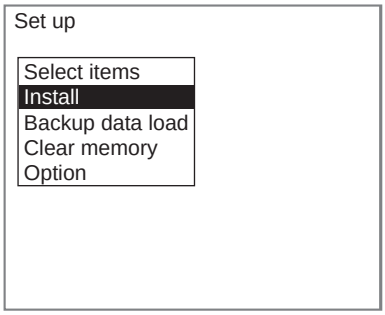
p.13



3. Press the ENT Key.

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The display will return to the main setup menu.



4. Turn OFF the controller's power supply.

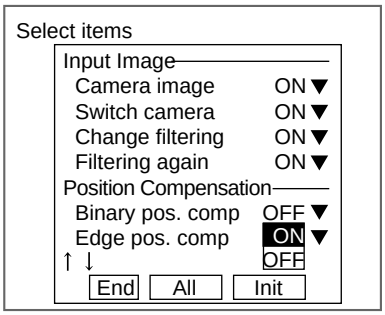
5. Remove the Application Software Memory Card from Memory Card slot 0.

6. Turn ON the controller's power supply.

CHECK! If the power supply is turned ON while the Application Software Memory Card is still mounted, the Setup Menu will be started again.Always remove the Application Software Memory Card before starting the Controller.

After a while the Camera Settings Screen will be displayed.
The displayed screen varies depending on the controller model.

Example: F250



Proceed to **7.** except for F500.
Proceed to **9.** in the case of F500.

7. Select the model of the connected Camera.

8. If using intelligent lighting, select its model.

9. Select [End].

SECTION 5 System Settings

The Basic Screen will be displayed.

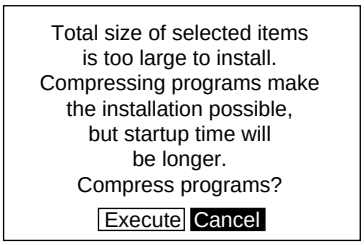


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■ Installation without Compressing Files

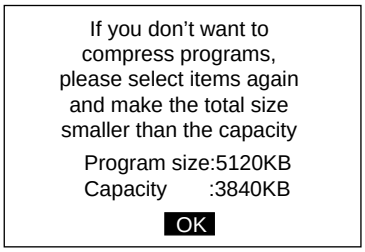
If the total program size of the selected items is greater than the file size that can be installed, a confirmation message will be displayed asking if the files are to be compressed.
If the files are compressed, the Controller startup time will be longer. Use the following procedure to change the selected processing items without compressing the files.

1. Select [Cancel] from the confirmation message.



The program size and capacity will be displayed.

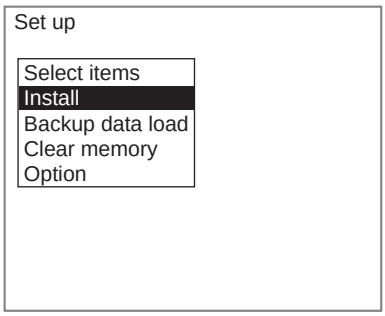
2. Select [OK].



The display will return to the main setup menu.

3. Select [Select items] and reselect the item.

p.8



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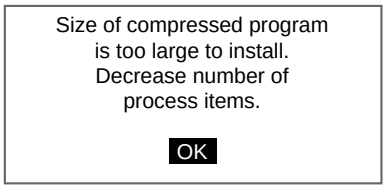
■ If an error message appears when installing compressed files

If the total size of the selected items is still greater than the file size that can be installed even though they have been compressed, an error message will be displayed. In this case, follow the procedure below to reselect processing items.

CHECK!

If this error message appears during reinstallation:
All of the previously installed program files will be cleared and the default controller settings will be restored.

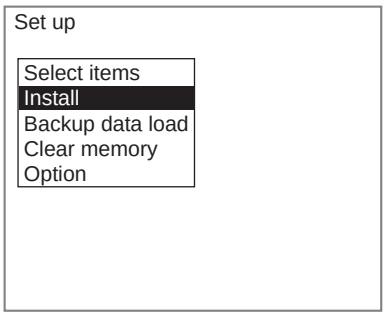
1. Select [OK] in the error message.



The display will return to the main setup menu.

2. Select [Select items] and reselect the item.

p.8

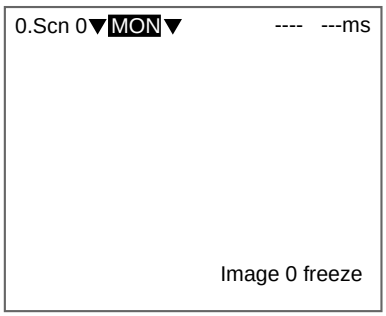


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Displaying Images and Focusing

Change the display image to through display to check what kind of image is being displayed. Adjust the position of the object to adjust the focus of the camera.

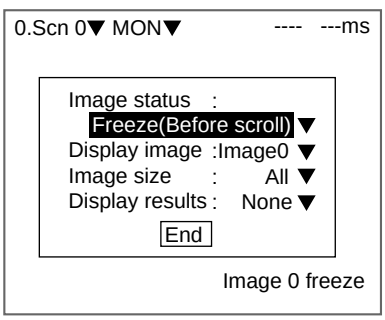
1. Change the display image to through display to check what kind of image is being displayed.
Press the SHIFT + ENT Keys.



The screen for changing the display image will be displayed.

2. Move the cursor to [Freeze (Before Scroll)].

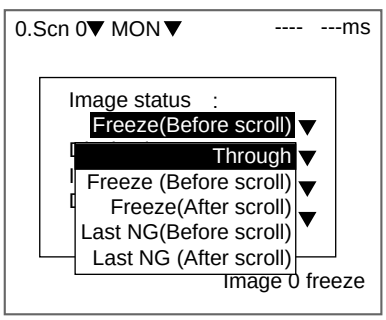
3. Press the ENT Key.



The selections will be displayed.

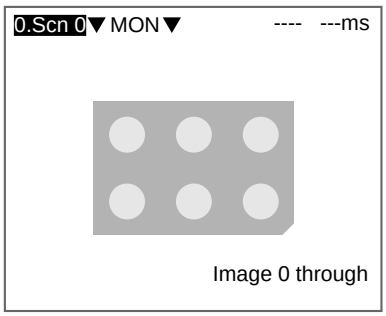
4. Select [Through].

5. Select [End].

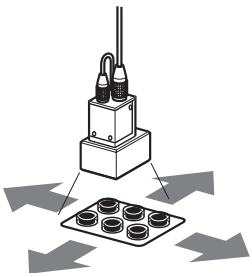


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The Through Display Screen will be displayed.



6. Adjust the position of the measurement object so that it appears at the center of the monitor screen.



Adjust the position of the object.

7. Focus the Camera.

- Cameras with a light (including Intelligent Lighting) have lenses with a fixed focal point.

  Adjust the Camera position based on the positioning distances in the Setup Manual to focus the Camera.

CHECK!

The light level for Intelligent Lighting can be adjusted from the Controller.

SECTION 2, 1.1 Inputting Camera Images, “Lighting Control” of “Camera Settings”.

- When using a Camera Unit that does not have a light

  Turn the focus ring to focus the Camera.

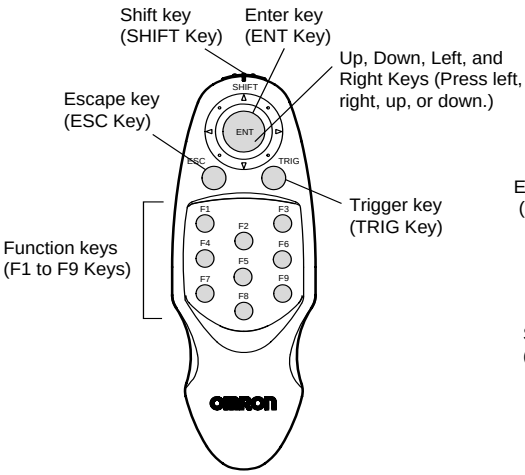
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Menu Operations

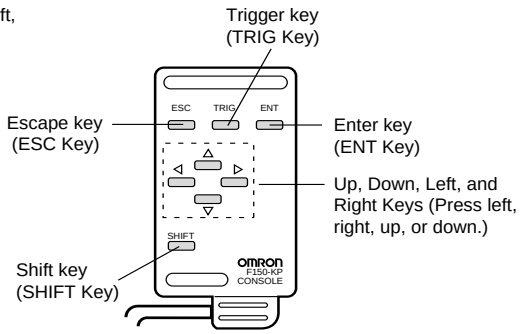
Input Devices

Menu operations are performed from either the Console or the serial interface.

■ F160-KP Console



■ F150-KP Console



Key	Key Function
Escape key (ESC Key)	Returns the user to the previous menu display or operation.
Trigger key (TRIG Key)	Execute the measurement.
Enter key (ENT Key)	Executes a function or sets a value. Note: On the F160-KP, also functions as a Cursor Key.
Shift key (SHIFT Key)	Pressing this key alone does not have any effect. Must be pressed in combination with another key to have any effect. Specific functions are assigned to combinations of the SHIFT Key and other keys for specific screens.
Cursor keys (Up, Down, Left, and Right Keys)	The Up and Down keys are used to move the cursor up or down, and also to set values. Use the Up key to increment a value by 1. Use the Down key to decrement a value by 1. Hold down the Up or Down key to increase or decrease a value rapidly. The Left and Right Keys are used to move the cursor left or right.
Function keys (F1 to F9 Keys)	Functions can be assigned to function keys F1 to F8. SECTION 5 System Settings The display can be captured using F9. SECTION 5 System Settings

CHECK!

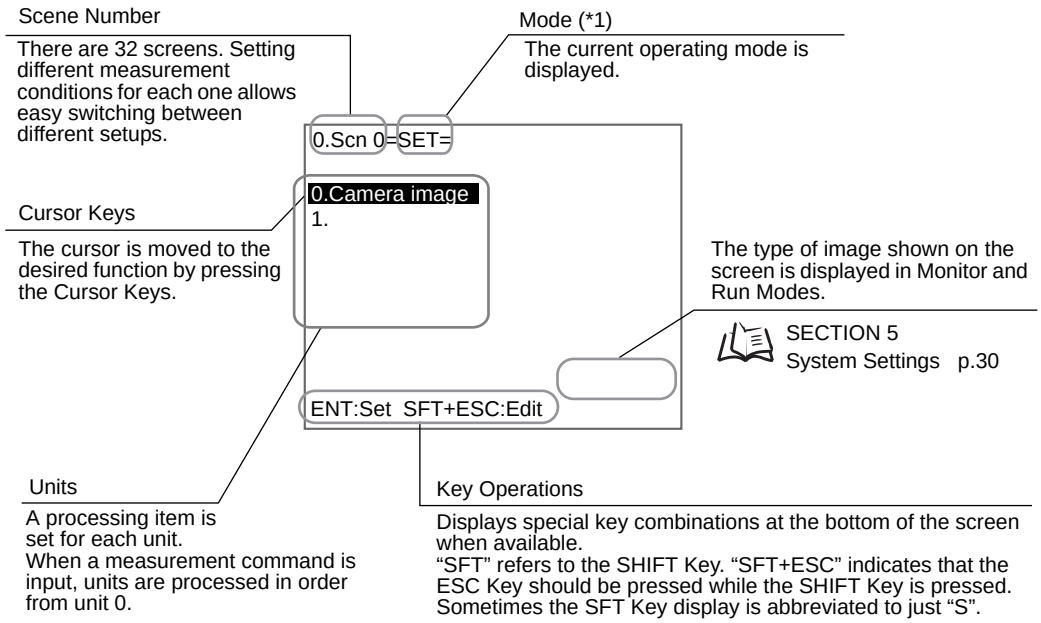
Menu operations can be performed from a personal computer via a serial interface.

SECTION 6, 4. Serial Interface Menu Operations,
“Key Input and Console Key Correspondence”

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Screen Displays

The Controller is operated by selecting functions from menus displayed on the screen.Familiarize yourself with each function before operating the Controller.



*1 Mode

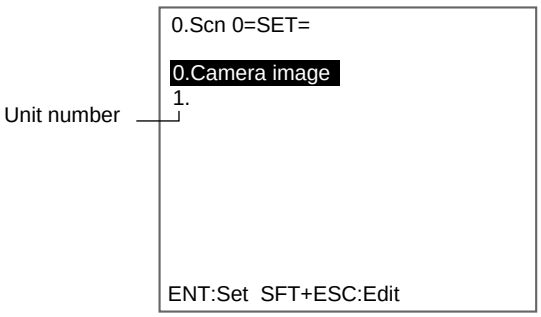
Display	Contents
Setting	Used to set the inspection conditions.
MON (Monitor)	Used to check whether inspections are being performed correctly under the set inspection conditions. The measurement results are displayed on the monitor only. The results cannot be output to external devices.
Measurement	Performs inspection. The measurement results are output to an external device via the parallel interface or serial interface.
SYS (System)	Used to set system conditions.
TOOL	Provides a data backup menu. Used to save settings and images to a computer as backup.
Save	Save Used to saves data to flash memory in the Controller. If new settings have been made, be sure to save the data before quitting.

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Creating Flowcharts

In the Application Software, measurement processing is broken up into different processing items to facilitate a variety of applications. These are called processing items.
Flowcharts are created using a combination of processing items to suit each application.

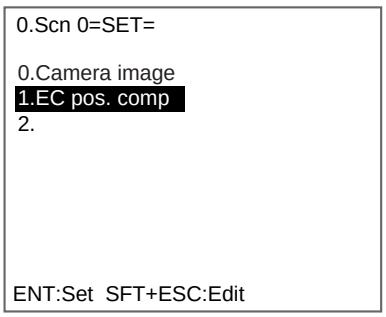
When Set Mode is entered, the number 1 will be displayed below [0.Camera image]. This number is called the unit number.



CHECK!

[Camera image] is set for unit 0 as the default processing item.
A camera image must be read to perform measurements, so never delete [Camera image] for unit 0 or change it to another processing item.

The processing items are set in order from unit 0.
Once a processing item is set for unit 1, unit 2 will automatically be displayed.



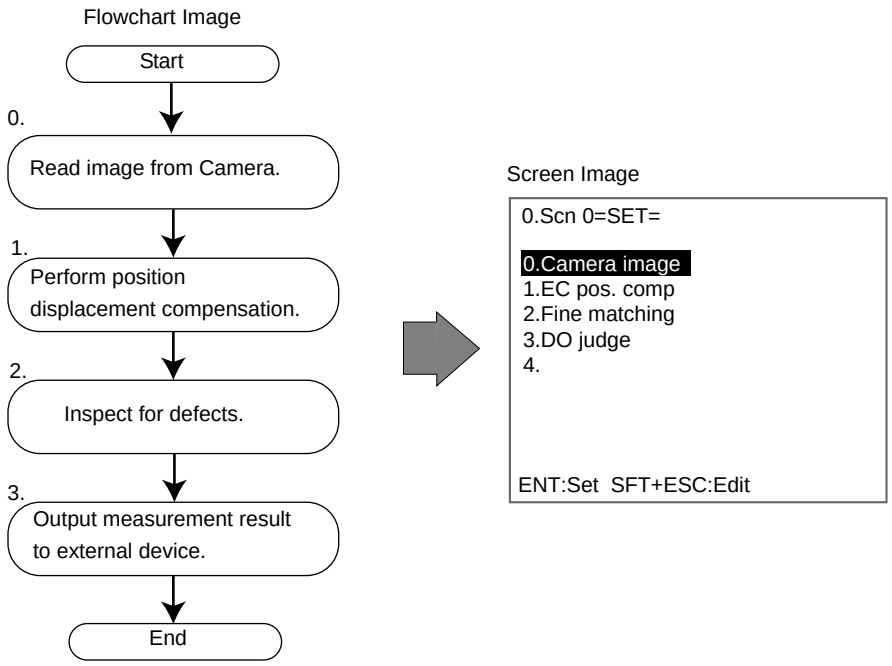
CHECK!

There is no limit to the number of units. Any number of units can be set provided the Controller has enough free memory.
Checking method for the remaining capacity of work memory (main)

SECTION 5 System Settings, “Checking System Information”

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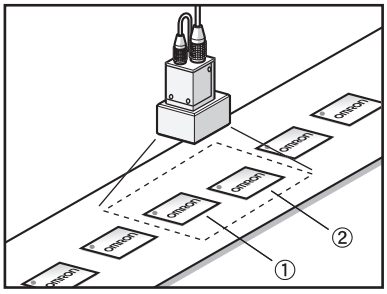
When a measurement command is input, processing items will be executed in order, starting from those set for unit 0. The desired processing item must be registered to each unit number as when creating a flowchart.



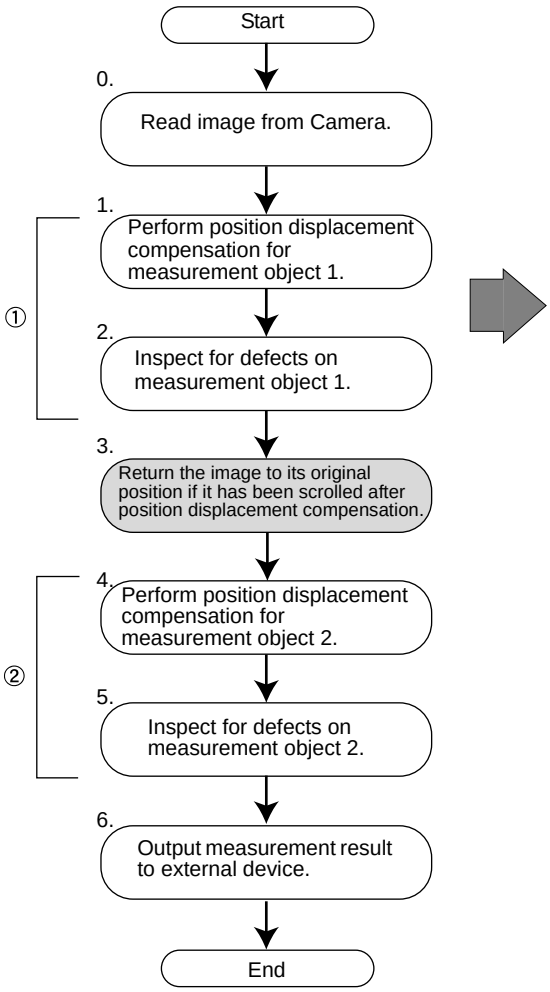
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The following type of processing is also possible by adjusting the registered order.

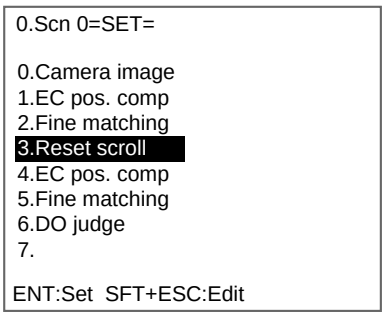
Example: To perform position displacement compensation separately on two measurement objects within the same field of vision.



Flowchart Image



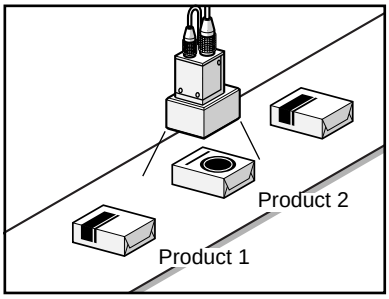
Screen Image



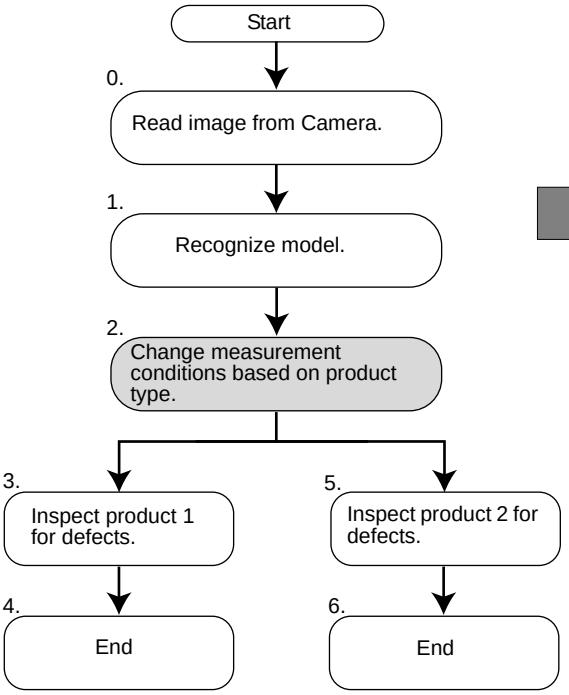
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The Application Software also has branch control processing items.

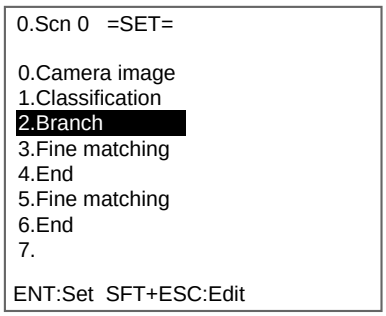
Example: Changing Inspection Conditions Based on the Upcoming Product



Flowchart Image



Screen Image

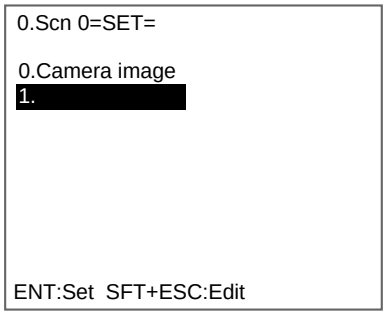


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■ Registering Processing Items to Units

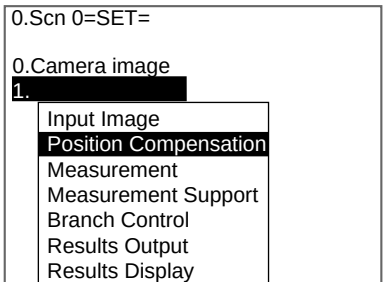
The registration procedure will be explained using the example of registering binary position compensation, one of the position compensation processing items. Change the procedure as required to register other processing items.

1. Move the cursor to a free unit number and press the ENT Key.



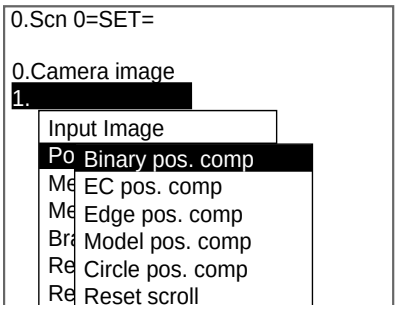
The processing item groups will be displayed.

2. Select [Position Compensation].

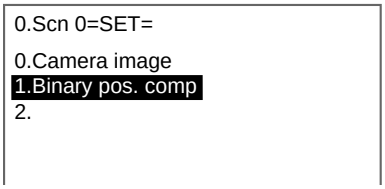


A list of the installed position compensation processing items will be displayed.

3. Select [Binary pos. comp].



Binary position compensation will be set for unit 1 and the next unit number (unit 2 in this case) will be displayed.



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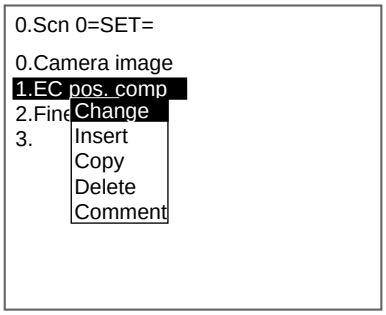
■ Changing to Other Processing Items

1. Move the cursor to the unit number of the processing item to be changed. Press the SHIFT+ESC Keys.



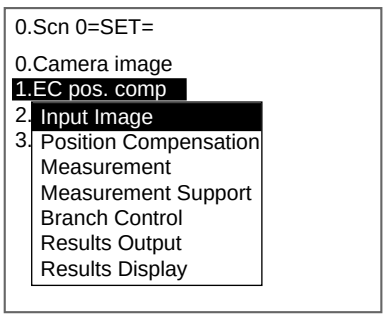
A list of options will be displayed.

2. Select [Change].



The processing item groups will be displayed.

3. Use the same procedure as for registering new processing items to register items for the inserted unit.



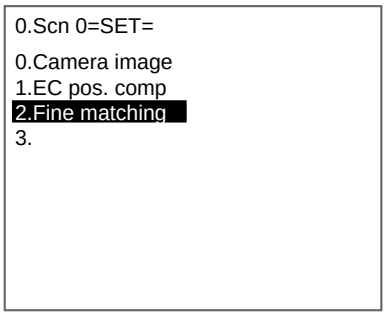
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■ Inserting Units

CHECK!

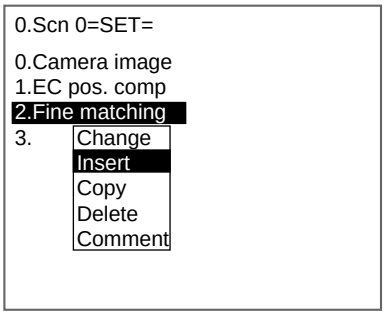
When a unit is inserted, the subsequent unit numbers will be increased. The unit numbers set in other units for outputting results and branching will also be increased automatically.

1. Move the cursor to the unit number of the processing item to be inserted. Press the SHIFT+ESC Keys.



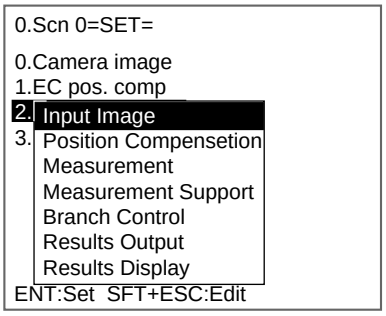
A list of options will be displayed.

2. Select [Insert].

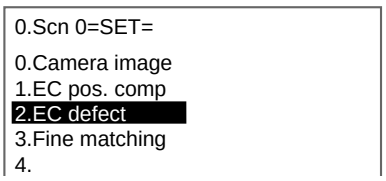


The processing item groups will be displayed.

3. Use the same procedure as for registering new processing items to register items for the inserted unit.



The selected processing item will be inserted.



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■ Copying from Other Units

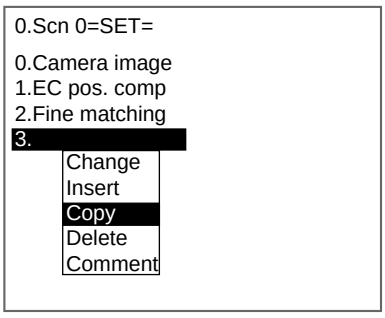
Settings data can be copied, which is convenient for reusing data when only a part of the settings need to be changed.

1. Move the cursor to the unit number of the processing item to be copied. Press the SHIFT+ESC Keys.

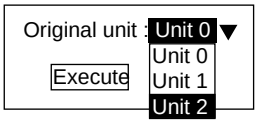


A list of options will be displayed.

2. Select [Copy].



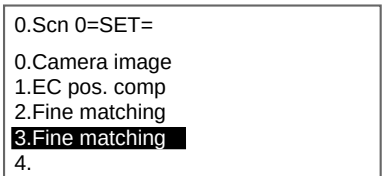
A screen for selecting the source unit for the data to be copied will be displayed.



3. Select the unit from which processing items are to be copied.

4. Select [Execute].

The data will be copied.



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■ Deleting Units

CHECK!

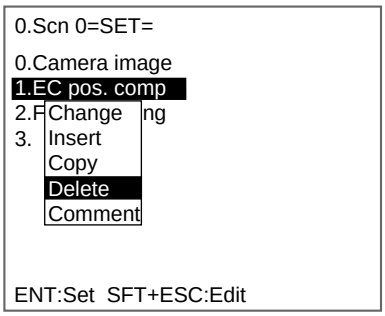
When units are deleted, the subsequent unit numbers will be decreased. The unit numbers set in other units for outputting results and branching will also be decreased automatically.

1. Move the cursor to the unit number of the processing item to be deleted. Press the SHIFT+ESC Keys.

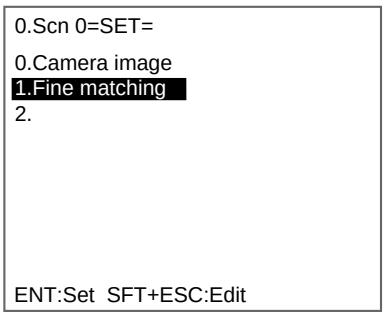


A list of options will be displayed.

2. Select [Delete].



The selected unit will be deleted and the subsequent unit numbers will be decreased.



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■ Changing Processing Item Names

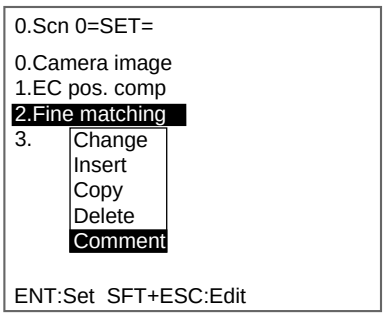
The names of processing items set to units can be changed to any name up to 16 characters long. This is useful for understanding settings when many units have been registered.

1. Move the cursor to the unit for which the name of the processing item is to be changed. Press the SHIFT+ESC Keys.



A list of options will be displayed.

2. Select [Comment].

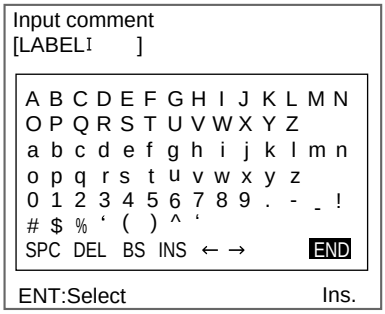


A software keyboard will be displayed.

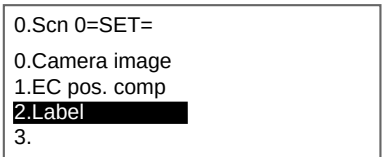
3. Enter a comment consisting of up to 16 characters.

4. Move the cursor to [END] and press the ENT Key.

Inputting Characters p.33



The item name will be changed.



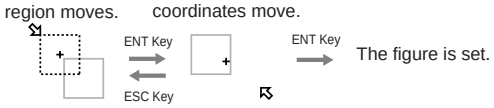
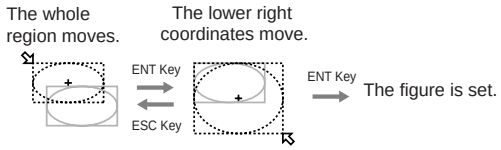
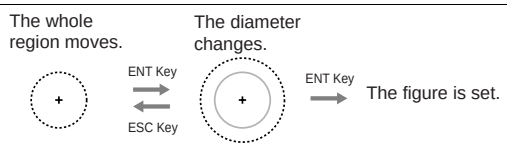
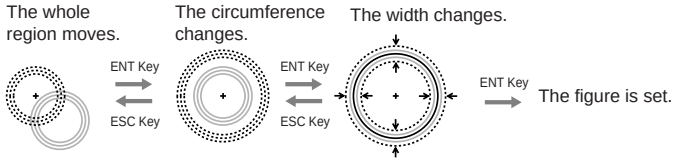
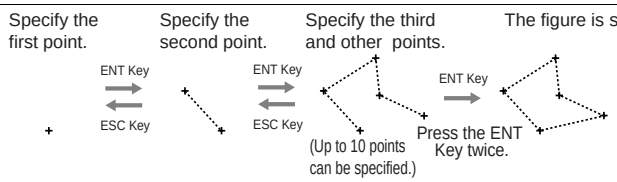
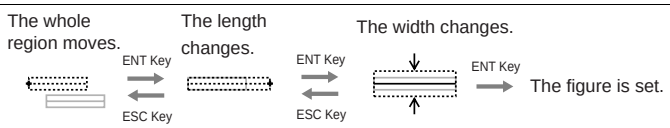
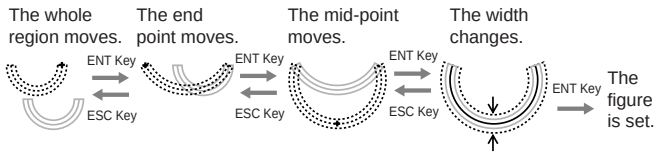
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Drawing a Region

Use the following method to draw model regions and measurement regions.
The region figures that can be drawn depend on the processing item. Refer to the explanation for each processing item for information on what figures can be drawn.

■ Drawing method

Move the cursor with the Up, Down, Left, and Right Keys. Use these keys together with the SHIFT Key to move the cursor quickly.
Press the ENT Key at the desired positions.
Press the ESC Key to undo the setting.

Measurement region selection	Drawing method
Box	
Ellipse	
Circle	
Circumference	
Polygon	
Line	
Arc	

CHECK! Enlarge the image if it is not clear or if you want to draw in detailed areas.

p.29

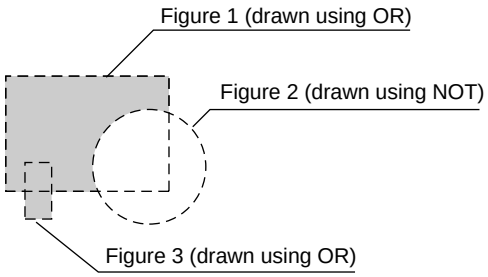
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- Drawing mode

  For many processing items, up to 3 figures can be combined to draw a measurement region.Select either the OR or NOT drawing mode.

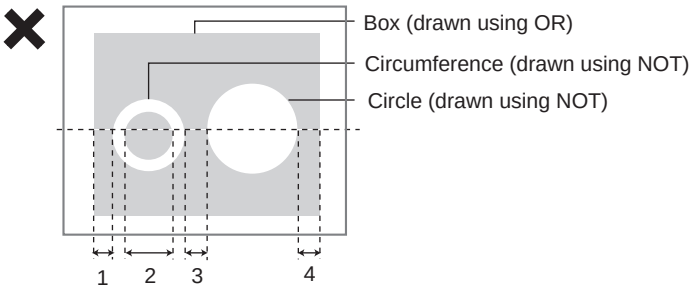
Drawing mode	Function
OR	Used to draw a shape as a model or region. All of the shapes that are drawn are registered as one region.
NOT	Used to delete part of a region.

In this example, the gray area will be the measurement region.
Regions with complicated shapes can be drawn and areas can be omitted from the measurement region by combining figures.



CHECK!

Set the model region so that no more than three areas lie along any one straight line.



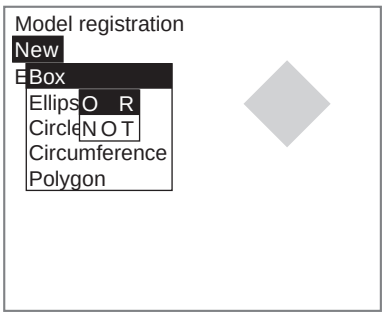
■ Drawing procedure

This section describes, as an example, how to draw model areas.

1. Select [New] in the model registration screen.

2. Select the desired figure.

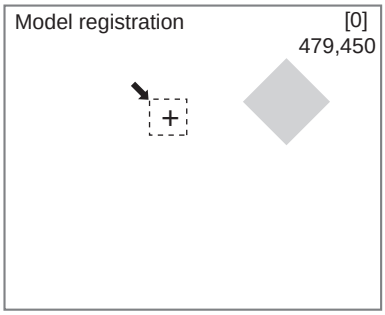
3. Select the desired drawing mode (OR/NOT).



- When you want to enlarge the view, go to **4.**
- When you do not want to enlarge the view, **6.**

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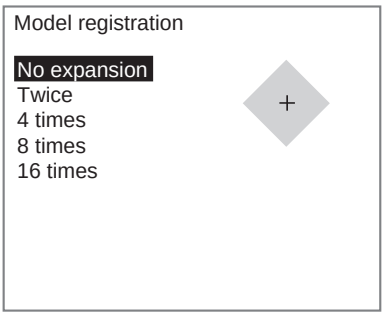
The Model Registration Screen will be displayed.



4. Move the cursor to the area you want to enlarge, and press the SHIFT+ESC Keys.

CHECK! Make sure that the cursor is located on the image.

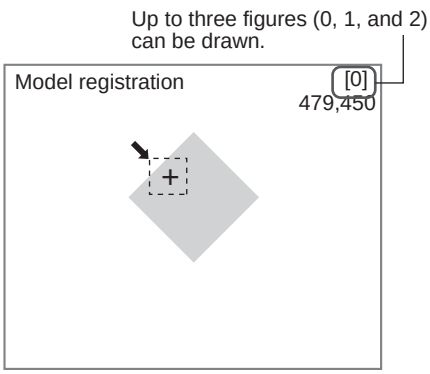
The magnification ratios will be displayed.



5. Select the desired ratio.

The image will change according to the magnification ratio set for the cursor position.

The image will be enlarged.



6. Draw the region to be registered as the model with the selected figure.

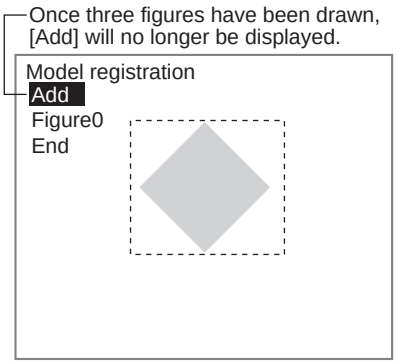
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The figure will be registered.

7. If additional figures are to be drawn, select [Add].

8. Repeat steps **2.** to **6.** to draw the figures.

9. After drawing is completed, select [End].



The settings will be registered.

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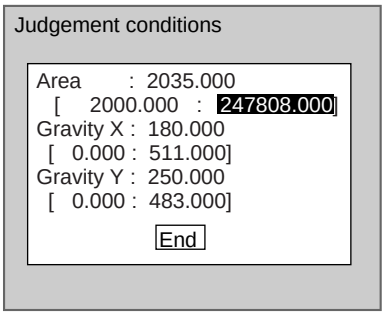
Inputting parameters

This section explains how to input values when setting measurement conditions or communications specifications.

1. Move the cursor to the item for which a value is to be changed.

In this example, the cursor is moved to [Area (upper limit)].

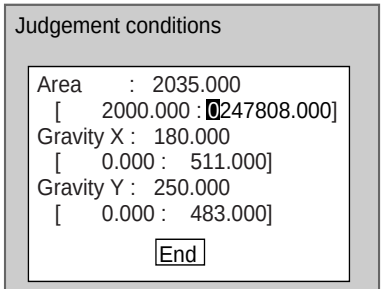
2. Press the ENT Key.



The cursor will change to a cursor the size of a single digit.

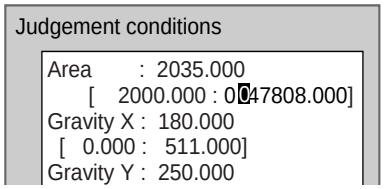
3. Move the cursor to the digit to be changed.

Left/Right Keys: Move the cursor.



4. Change the value.

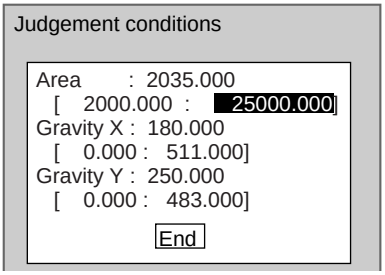
Up Key: Increase the value.
Down Key: Decrease the value.



5. Repeat this operation to change other digits.

6. Press the ENT Key.

The values will be set.

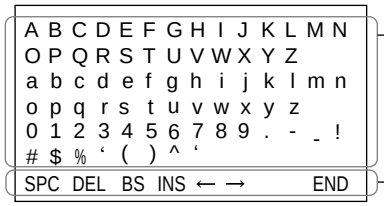


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Inputting Characters

This section explains how to input characters.

The software keyboard shown below is displayed on the screen where characters are input.



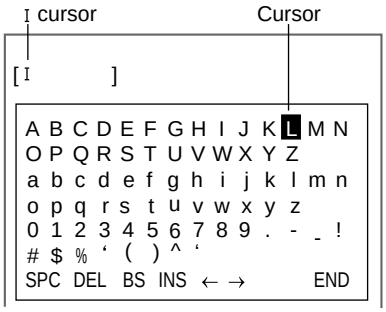
These characters can be input.

SPC	Inserts a space.
DEL	Deletes 1character to the right of the I cursor.
BS	Deletes 1character to the left of the I cursor.
INS	Switches between insert (default)/overwrite.
←	Moves the I cursor to the left.
→	Moves the I cursor to the right.
END	Ends character input.

1. Move the cursor to the character to be input.

Up/Down/Left/Right Keys: Move the cursor.

2. Press the ENT Key.



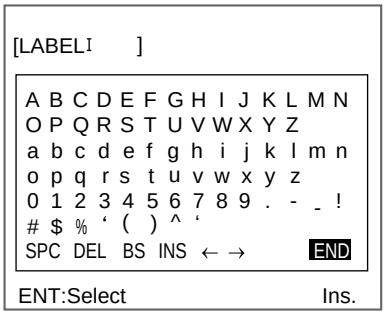
The character is set and the I cursor moves one space to the right.

3. Repeat these steps to input more characters.



4. Once all required characters have been input, move the cursor to [END].

5. Press the ENT Key.



The characters will be set.

CHECK!

Characters can be input from a personal computer via a serial interface.

Japanese characters can be input as comment from the personal computer. (Only characters of JIS level-1 can be input.)

SECTION 6, 4. Serial Interface Menu Operations

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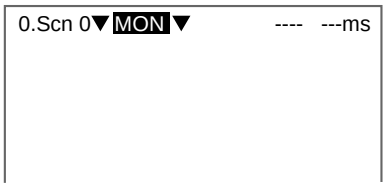
Save settings to flash memory before turning the power OFF

Therefore, when settings have been changed, be sure to save then to flash memory before turning OFF the power.
If the power is turned OFF without saving new settings, all of the setting changes will be lost. Stored images cannot be saved to flash memory so all stored images will be cleared when the power is turned OFF. If stored images are to be kept, backup the images to a personal computer or Memory Card.

SECTION 4 Other Functions, “Backing Up Settings”

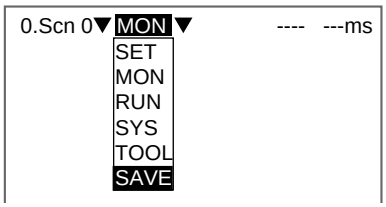
1. Display the basic screen for Monitor mode or Run mode.

2. Place the cursor on [MON] or [RUN], and press the ENT Key.



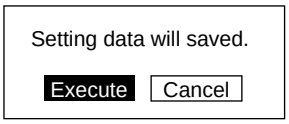
The mode selections will be displayed.

3. Select [SAVE].



A confirmation message will be displayed.

4. Select [Execute].



CHECK!

Do not turn OFF the power or input a RESET signal while a message indicating that processing is in progress is being displayed. Data in memory will be destroyed, and the Controller may not operate correctly the next time it is started.

When saving has been completed, the screen in **1.** will return.

5. Turn OFF the power supply to the Controller to shut down.

CHECK!

Using Scene Group Function
The scene data set to scene group 0 and system data will be saved to the Controller internal flash memory. If this save operation is executed, the settings data for scene groups 1 to 31 will be saved to the Memory Card mounted to drive 1.

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