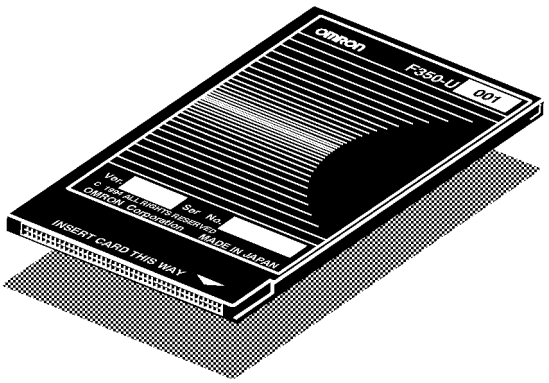
F350-U001E
Character Inspection Software 1

Operation Manual

Produced August 1995



Notice:

OMRON products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to the product.

⚠ DANGER! Indicates information that, if not heeded, is likely to result in loss of life or serious injury.

⚠ WARNING Indicates information that, if not heeded, could possibly result in loss of life or serious injury.

⚠ Caution Indicates information that, if not heeded, could result in relatively serious or minor injury, damage to the product, or faulty operation.

OMRON Product References

All OMRON products are capitalized in this manual. The word “Unit” is also capitalized when it refers to an OMRON product, regardless of whether or not it appears in the proper name of the product.

The abbreviation “PLC” means Programmable Controller (Programmable Logic Controller) and is not used as an abbreviation for anything else.

Quick BASIC is a registered trademark of Microsoft Corporation.

IBM and IBM PC/AT are registered trademarks of International Business Machines Corporation.

Visual Aids

The following headings appear in the left column of the manual to help you locate different types of information.

Note Indicates information of particular interest for efficient and convenient operation of the product.

1, 2, 3... 1. Indicates lists of one sort or another, such as procedures, checklists, etc.

Symbols

The following symbols appear at the bottom of each page in *Section 4 Functions and their Operation* and indicates which Application Program(s) is effective for a particular menu operation. The symbols and their corresponding Application Program are shown below.

General Characters	Inspection Program for General Characters
Production Date	Production/Expiration Date Verification Program
Date 1	Date and Lot Number Verification Program 1
Date 2	Date and Lot Number Verification Program 2

The following example indicates that the Inspection Program for General Characters is effective. The other Application Programs cannot be used.

General Characters | Production Date | Date 1 | Date 2

TABLE OF CONTENTS

About this Manual:

This manual describes the operation of the F350-U001E Character Inspection Software 1 and includes the sections described below.

Please read this manual carefully and be sure you understand the information provided before attempting to operate the F350-U001E Character Inspection Software 1.

Section 1 provides a general introduction to the F350 Character Inspection Software 1.

Section 2 describes the system configuration, starting and stopping the Application Program, and basic menu operation.

Section 3 describes the Character Inspection Software which includes four application programs, each used for a different type of inspection. The method of using each application program and the sequence of using the functions are described using typical inspections as examples.

Section 4 provides detailed explanation of the functions and their operation.

Section 5 provides a list of error messages, and the causes and remedies of them.

The **Appendix** provides menu hierarchy diagrams for this software.

⚠WARNING Failure to read and understand the information provided in this manual may result in personal injury or death, damage to the product, or product failure. Please read each section in its entirety and be sure you understand the information provided in the section and related sections before attempting any of the procedures or operations given.

SECTION 1
Introduction

This section provides a general introduction to the F350 Character Inspection Software 1.

1-1 Before Using this Manual

Copyright

The copyright of this software (the stored and written contents of the system memory card and manual) belongs to OMRON.

Copying and Modifications

This software may not be copied in whole or in part, except for the purposes of storage or for changes or modifications for the customer's own use.

This software may only be changed or modified for the customer's own use. However, OMRON accepts no responsibility for problems or damages arising from a customer's changes or modifications to the software.

Handling the System Memory Card

Do not leave the card in a dusty or wet place as this may lead to connection errors. To prevent destruction of system program data or deformation of the card, avoid high temperatures, high humidity, and direct sunlight. Also, do not bend, scratch or apply shocks to the card.

1-2 Applicable Manuals

The manuals applicable to the F350 Visual Inspection System are shown in the table below, according to the procedures used. There are three kinds of F350-series manuals:

- F350 Setup Menu Operation Manual: Included with the F350-C10E IMP Unit.
- F350 Application Software Operation Manual: Included with the F350-U□□□E Application Software.
- F350 OVL Reference Manual: Included with F350-L100E OVL Unit.

Procedure		Software	
		Application Programs	OVL program
System design	Consider the lighting environment, I/O devices, and so on, and arrange the system configuration. Design the system carefully, taking into account variations in conditions and the objects that are to be inspected.	F350-series catalog	
Assembly/Installation	Install the F350 Visual Inspection System by assembling the hardware and wiring the power supply and peripheral devices.	F350 Setup Menu Operation Manual	
Environmental settings	Start up the software and make the settings related to the F350 Visual Inspection System and the settings for starting, communicating with I/O devices, and so on.	Make the settings using the Setup Menu which is standard with F350-C10E IMP Unit. (Refer to the F350 Setup Menu Operation Manual.)	Mount the F350-L100E OVL Unit and program using OVL, a specialized BASIC programming language. (Refer to the F350 OVL Reference Manual.)
Inspection condition settings	Start up the software and make the settings related to inspection. Set the criteria for determining the inspection area and the acceptability of the inspected products.	Make the settings using the F350-U□□□E Application Programs. Do the actual testing according to the conditions that have been set. (Refer to the relevant F350 operation manual.)	Mount the F350-L100E OVL Unit and program using OVL, a specialized BASIC programming language. Do the actual testing according to the conditions that have been set. (Refer to the F350 OVL Reference Manual.)
Testing/Inspection	Do the actual testing according to the conditions that have been set. If adjustments are required, change the settings.		
Maintenance	Carry out periodic inspections. This is essential in order to maintain the F350 Visual Inspection System in optimum condition.	F350 Setup Menu Operation Manual	

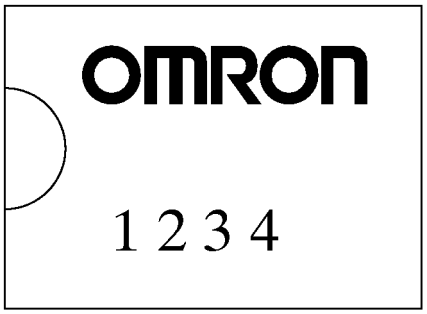
1-3 Features

This software verifies characters and detects defective markings. The F350 automatic calendar function automatically updates the inspected date.

Inspection Program for General Characters

Detects defects in alphanumeric characters. Supports a wide range of character inspections.

OK



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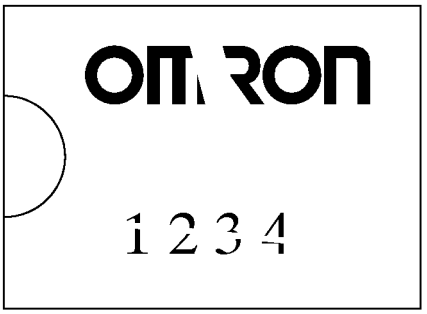
Missing areas



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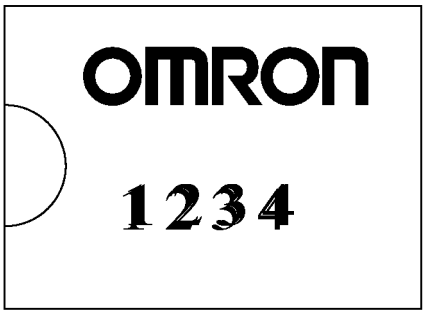
Blurring



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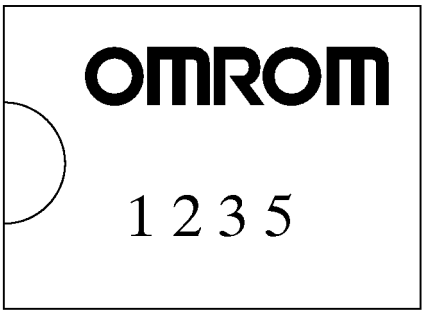
Incorrect characters



Production and Expiration Date Verification Program

Verifies the production and expiration dates. The F350 automatic calendar function automatically updates the inspection date.

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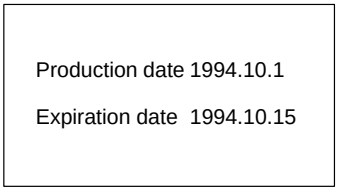

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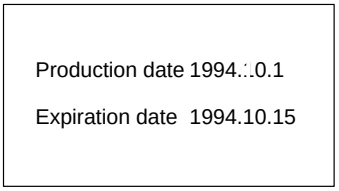

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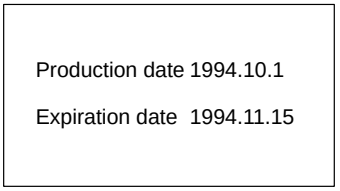
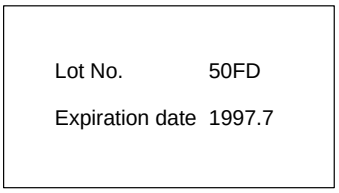


Date and Lot Number Verification Program 1

Verifies the date and lot number. The F350 automatic calendar function automatically updates the inspection date. The lot number pattern is set via the RS-232C.

OK



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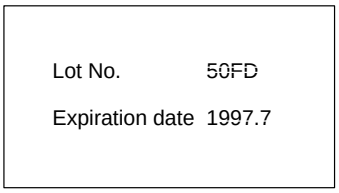

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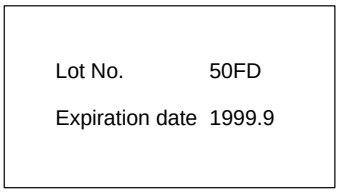
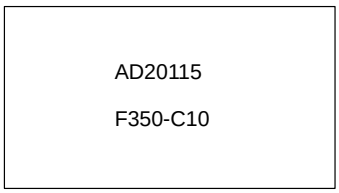


Date and Lot Number Verification Program 2

Verifies the date and lot number. This program is used if the date format does not confirm to the F350 date format. The date and lot number patterns are set via the RS-232C.

OK



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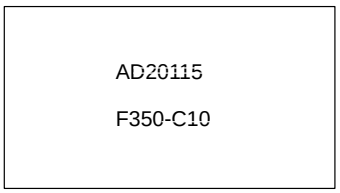

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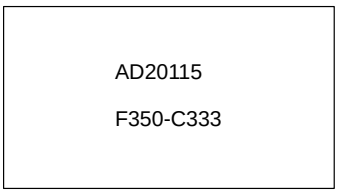


SECTION 2
Preparation for Operation

This section describes the system configuration, starting and stopping the Application Program, and basic menu operation.

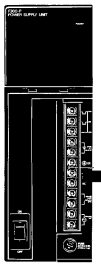
2-1 System Configuration

The number of cameras and I/O devices that can be used depends on the application software. Check that the system is correctly configured for the application software.

Basic System Configuration (Must be used.)

F300-P Power Supply Unit

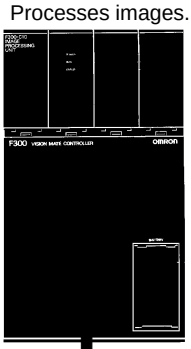
Supplies power to the entire system.



(Note: The F200-P Power Supply Unit cannot be mounted.)

F350-C10E IMP Unit

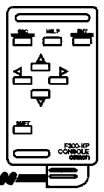
Processes images.



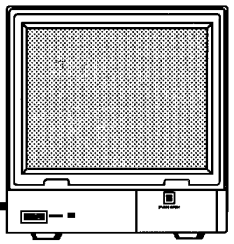
F300-FM MMI Unit

Provides Memory Card functions and menu operations via a Video Monitor and Console.

F300-KP Console

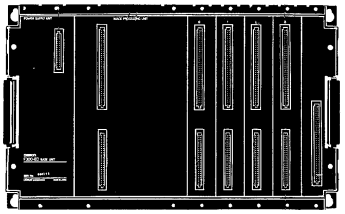


F300-M09 Video Monitor (100 VAC)



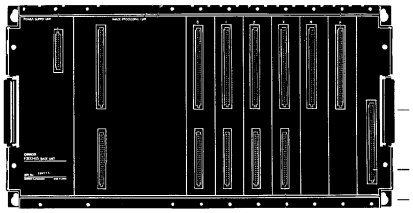
F309-VM Monitor Cable

F300-B3 (3 slots)



or

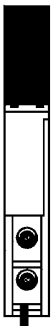
F300-B5 (5 slots)



Camera I/F Units (Use one.)

F300-A20 Normal Camera I/F Unit

For measuring stationary objects or moving objects using a strobe.



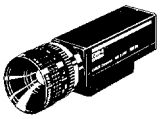
F300-A20R Shutter Camera I/F Unit

For measuring objects moving at high speed.

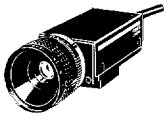
F309-VS Camera Cable

F309-VSR Shutter Camera Cable

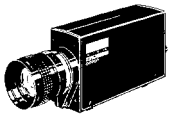
F200-S Camera



F300-S Camera



PJLG-55-Z Shutter Camera



Cameras (Connect up to 2 Cameras per Unit.)

Lens

Note: Strobe illumination cannot be used with the F200-S Camera.

F350-U001E Character Inspection Software 1
Demonstration software
Inspection program for general characters
Production/Expiration date verification program
Date and lot number verification program 1
Date and lot number verification program 2

Note
The demonstration software is provided for training. It cannot be used for actual inspections. Use this software with the basic configuration only.

Peripheral Devices

I/F Units (Use one that matches the peripheral devices connected.)

F300-E RS-232C I/F Unit
For saving scene and system data and carrying out menu operations via RS-232C interface.

Note
Use only for the date and lot number verification programs.

F300-D Terminal Block Unit
For inputting measurement instructions and outputting judgement results via a terminal block.

F300-DC Parallel I/O Unit
For inputting measurement instructions and outputting measurement values and judgement results via parallel I/O.

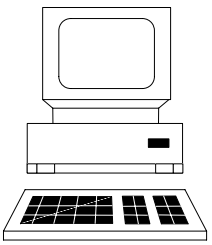
F300-FS Strobe I/F Unit
For flashing the strobe while taking images.

Up to two Strobe I/F Units can be mounted. During application software operation, all connected strobes flash. Refer to the section shown below for details about the strobe timing. Refer to *4-2-1 Selecting the Image Display: F.Freeze*.

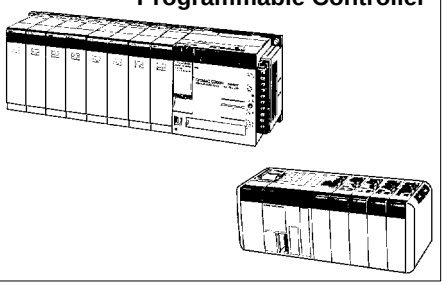
F300-G Dummy Unit
For inserting into empty slots to protect and strengthen connectors.

F309-VR
RS-232C Cable

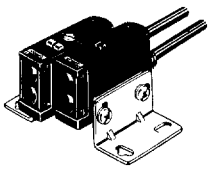
IBM PC/AT or Compatible



C200H or CQM1 Programmable Controller

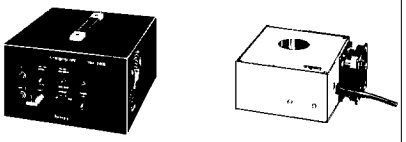


Synchronization Sensor



F309-VFS
Strobe Cable

Strobe Device



2-2 Starting and Stopping

2-2-1 Starting

The application software contains five different Application Programs. Select one Application Program and start it.

The five Application Programs are described below.

Application Program	Description	File name
Demonstration Software	This software allows the user to experience the search processing, which is the basic F350 technology. It cannot be used for actual inspections. Two modes are included: the 12-pattern search mode which simultaneously searches for 12 different model patterns and displays the correlation value for each pattern, and the rotating pattern search, which searches for 1 pattern and displays the correlation value in the optimal search position. The rotating pattern search can handle the rotation of a workpiece. The 12-pattern search is displayed when the software is started. Follow the instructions displayed on the screen.	DEMO0001.DEF
Inspection Program for General Characters	This menu searches for defects in alphanumeric characters. It supports a wide variety of alphanumeric character inspections for any application.	U001CHAR.DEF
Production/Expiration Date Verification Program	This menu verifies alphanumeric characters representing the production date and expiration date. Both the production date and expiration date can be automatically updated by the F350 automatic calendar function. It is possible to verify a single item: the production date alone or the expiration date alone.	U001DATE.DEF
Date and Lot Number Verification Program 1	This menu verifies alphanumeric characters such as the date and lot number. The lot number character string is set via the RS-232C. The date can be automatically updated by the F350 automatic calendar function. It is possible to verify a single item: the date alone or the lot number alone.	U001DTL1.DEF
Date and Lot Number Verification Program 2	This menu verifies alphanumeric characters such as the date and lot number. The date and lot number character strings are set via the RS-232C. A single item, the date alone or the lot number alone, can be verified.	U001DTL2.DEF

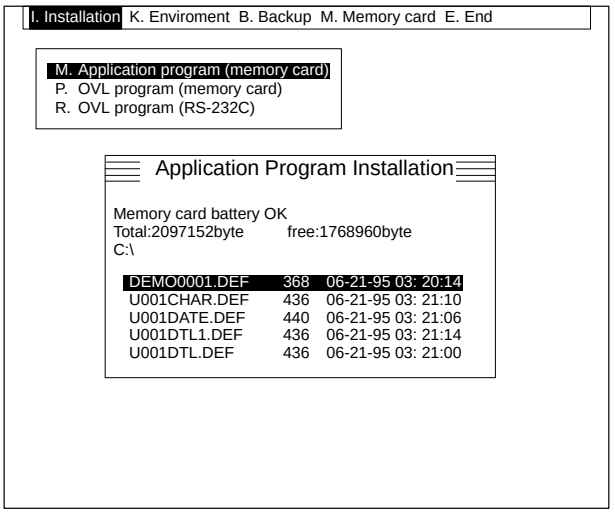
The Setup Menu is used to install and run the Application Programs. Operate the Setup Menu by referring to *3-1 Starting the Setup Menu* in the *F350 Setup Menu Operation Manual*.

Note When an Application Program is installed, previously installed software and set data are deleted from memory. Save this data, if it is required. Refer to *5.3 B.Backup* in the *F350 Setup Menu Operation Manual*.

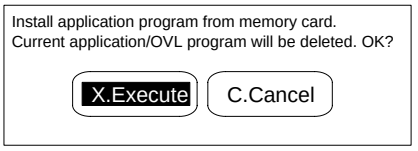
Procedure

1, 2, 3...

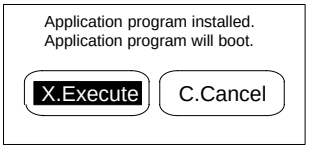
1. Select “I.Installation.”
2. Select “M.Application program (memory card).” The Application Program directory is displayed.



3. Select the file name. A confirmation message is displayed.

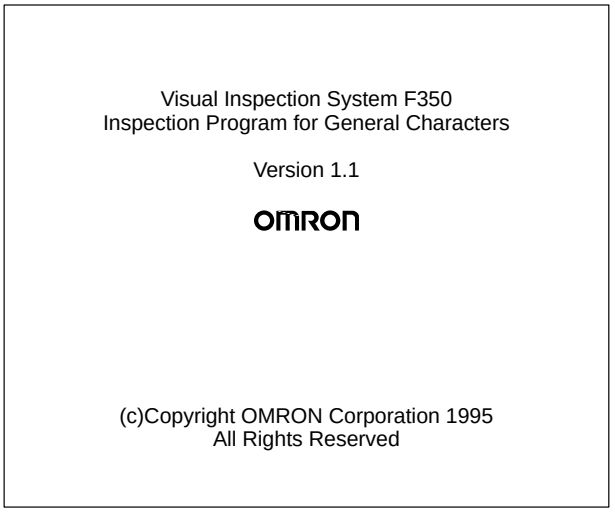


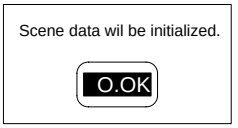
4. Select “X.Execute.” The Application Program is installed. A confirmation message is displayed when installation is complete.



5. Select “X.Execute.” The Application Program runs. A confirmation message asks if the scene data should be initialized.

   Example of initial screen for the inspection program for general characters:

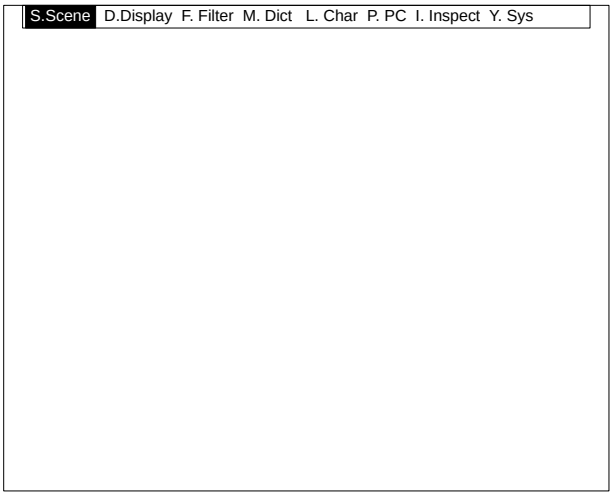




6. Select “O.OK.”

   The Application Program Basic Screen and the image from the connected camera 0 are displayed. Adjust the image focus.

   Basic Screen:



Note Do not turn off the power during menu installation or the F350 memory contents may be destroyed and the Unit will malfunction when it is turned on again.

When an Application Program is installed, it runs each time the power is turned on. Select “K.Environment” and “M.Initial Mode” in the Setup Menu to change the Application Program which runs initially. Refer to *5-2-1 Designating Startup Operations: M.Initial mode* in the *F350 Setup Menu Operation Manual*.

2-2-2 Stopping

Ensure the following points before stopping the menu:

- Data is not being saved, loaded, or copied.
- The orange memory card access indicator on the MMI Unit is not lit.

Procedure

1, 2, 3...

1. Turn off the F350 power.
2. Turn off the video monitor power.

   The setting data is stored when the F350 is turned off.

Note

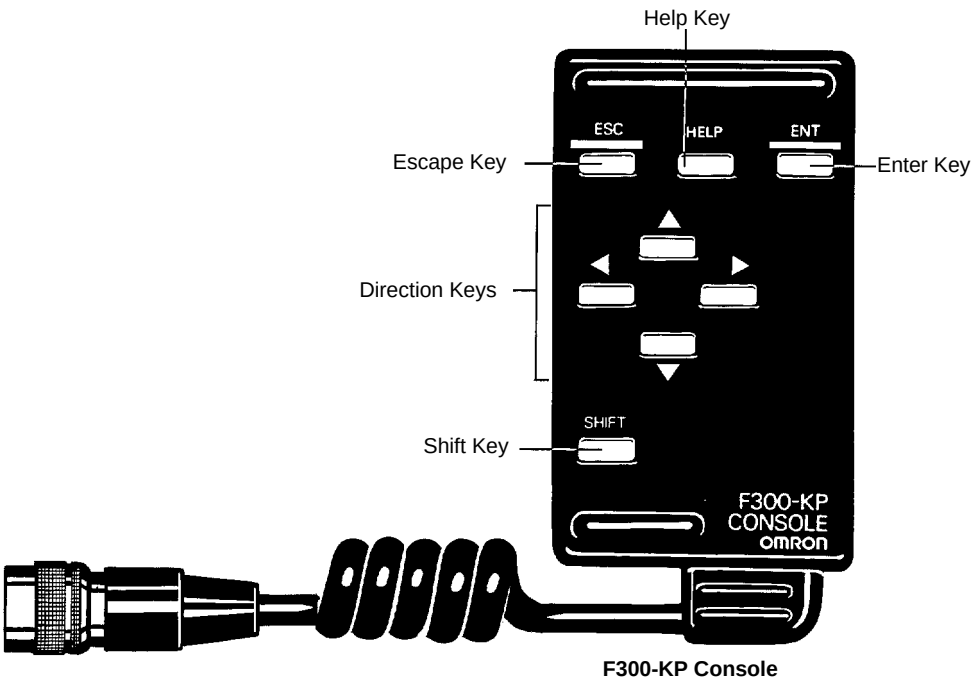
1. The Setup Menu and OVL system cannot be started using an application program. Quit the application program before starting the Setup Menu or OVL system.
2. To run the Setup Menu, turn on the power switch while holding down the Enter Key. Refer to *3-1 Starting the Setup Menu* in the *F350 Setup Menu Operation Manual*.
3. To start the OVL system, run the Setup Menu, change the "K.Environment/ M.Initial Mode" to "OVL prompt," and restart the F350. Refer to *2-2-1 Starting Up* in the F350 OVL Reference Manual.

2-3 Basic Menu Operation

The Application Programs are operated from the Console.

2-3-1 About the Console

The names of the various Console parts and their functions are described below. Only the basic key functions are described here. Some of them are assigned special functions in some of the menus. In this case, the key function is described in the comment line of the screen.

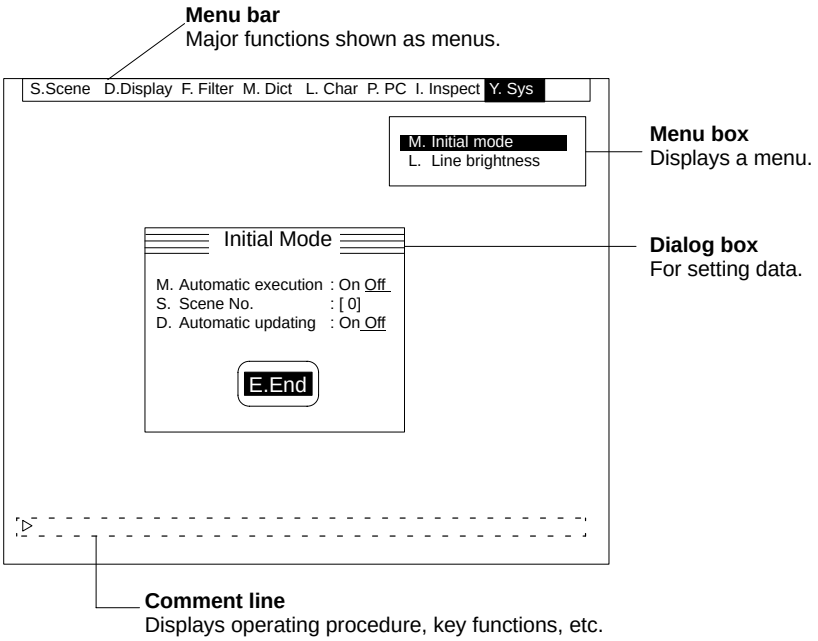


F300-KP Console

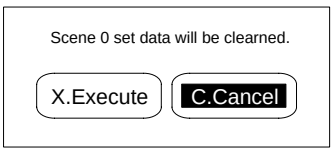
Marking	Name	Function
ESC	Escape Key	Interrupts processing and displays previous menu level.
HELP	Help Key	Assigned a different function in each menu. For example, it switches modes for the demonstration software.
ENT	Enter Key	Executes the function at the cursor position. If a menu is displayed, the next menu level of the cursor position is displayed. Set input data during data input.
▲ ▼	Direction Keys	Move the cursor up and down. In numerical input mode, the Direction Keys increase or decrease a number by 1. In character input mode, the Direction Keys change the character in ascending or descending order of character code.
▶ ◀		Move the cursor left and right.
SHIFT	Shift Key	Has no effect when pressed alone but changes the function of other keys when pressed simultaneously. The menus assign functions to combinations of the Shift Key with other keys.
Example: SHIFT+ESC		Displays the extended menu, if any exist.

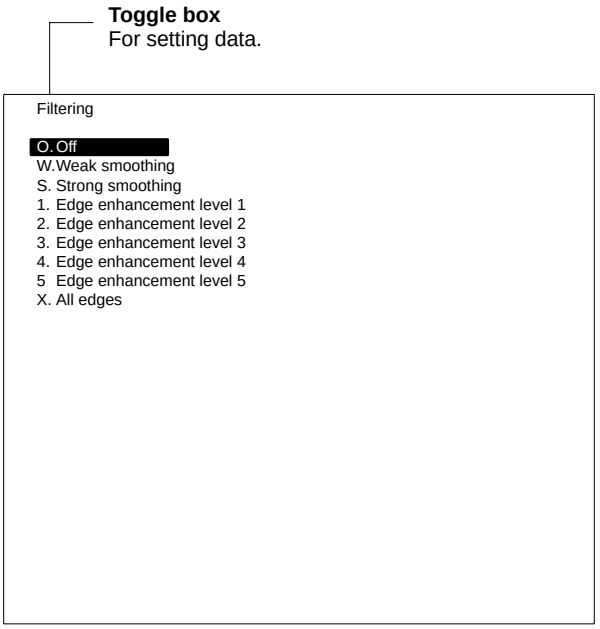
2-3-2 Key to the Screens

The menus and their functions are described below.



Message box
Displays confirmation and error messages.





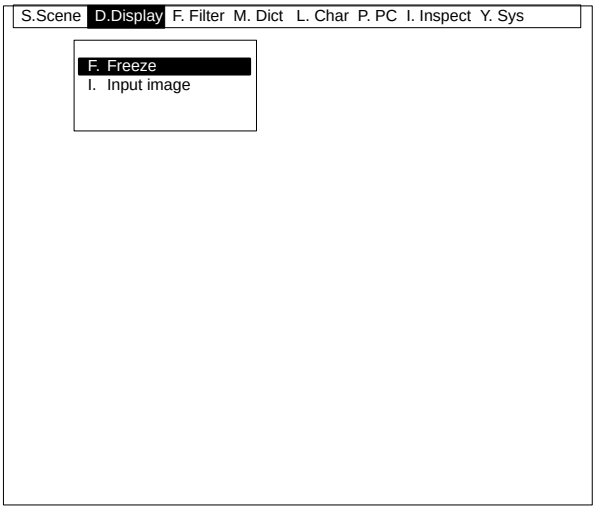
2-3-3 Selecting a Menu

The Application Programs are hierarchical and it is necessary to select related menus to set the data. Select the appropriate menu for operations such as setting data or conducting inspections. Refer to the menu hierarchical diagram to determine the overall menu hierarchy.

Procedure

1, 2, 3... 1. Move the cursor to the required menu item and press the Enter Key. The next level in the menu hierarchy is displayed. Repeat the procedure to move down another level.

2. Press the Escape Key. The previous level in the menu hierarchy is displayed. Press the Escape Key again to move up another level.



2-3-4 Setting Data

Dialog boxes and toggle boxes are both used on data setting screens. Dialog boxes allow multiple data settings to be made simultaneously when “E.End” is selected. Toggle boxes, however, allow one setting to be selected from several possibilities.

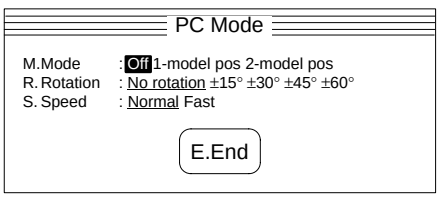
All settings are set to the initial values at the factory. Change the settings as required.

Setting Data in a Dialog Box

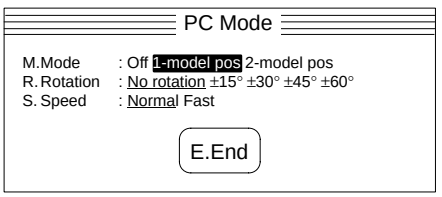
The current settings are underlined when a dialog box is displayed.

Procedure

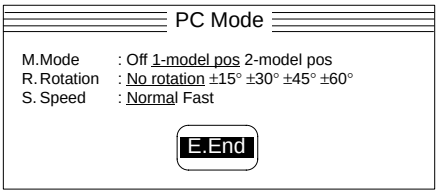
1, 2, 3... 1. Press the Up/Down Keys to move the cursor to the setting to be changed. The cursor moves to the current setting.



2. Press the Up/Down Keys to move the cursor to the required new data setting.



3. Move the cursor to “E.End” and press the Enter Key. The selected data is set.

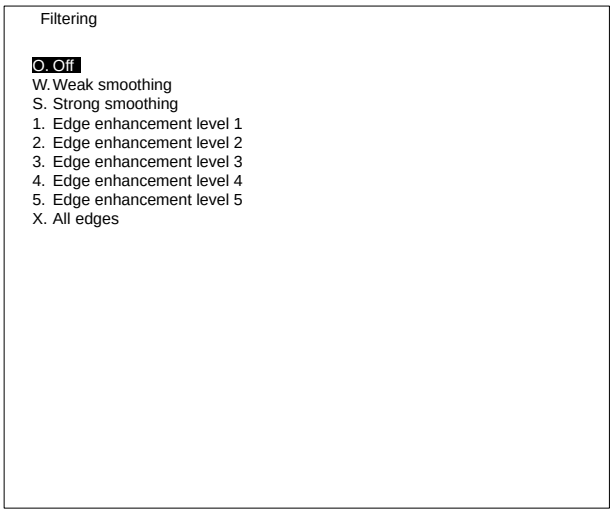


Setting Data in a Toggle Box

The cursor is at the current data setting when a toggle box is displayed.

Procedure

1, 2, 3... 1. Move the cursor to the required new data setting and press the Enter Key. The selected data is set.

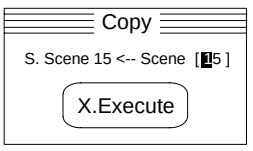


2-3-5 Inputting Numbers

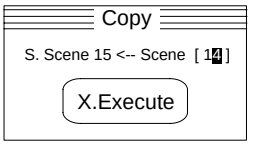
The method of inputting numbers to set scene numbers and date is described below. All settings are set to the initial values at the factory. Change the settings as required.

Procedure

1, 2, 3... 1. Move the cursor to the item for which a number is to be input and press the Enter Key. The number input mode is selected.



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



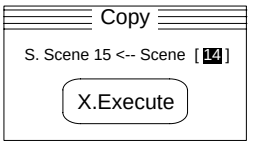
3. Press the Up/Down Keys to increase or decrease the number.

Entering a Minus Sign (–)

Move the cursor to the extreme left position and press the Up/Down Keys to display the minus sign.

Repeat steps 2 and 3 above to input multiple values.

4. Press the Enter Key. The values are input.



A convenient method exists for fine adjustment of a number. Move the cursor to the number to be changed and press the Direction Keys shown in the table below.

Key	Action
▶	Increases the least-significant digit by one.
◀	Decreases the least-significant digit by one.

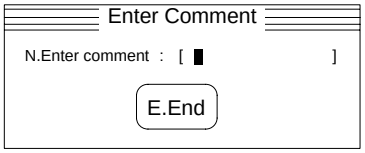
2-3-6 Inputting Characters

The method of inputting characters for scene comments or file names is described below.

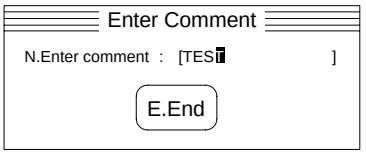
Procedure

1, 2, 3...

1. Move the cursor to the item for which a character is to be input and press the Enter Key. The character input mode is selected.

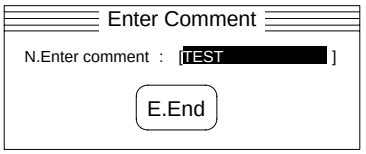


2. Move the cursor to the position where the character is to be input.



3. Press the Up/Down Keys to sequentially display the characters. The available characters are displayed in order of character code.

   Repeat steps 2 and 3 above to input multiple characters.



4. Press the Enter Key.

SECTION 3
Procedure for Using the Menus

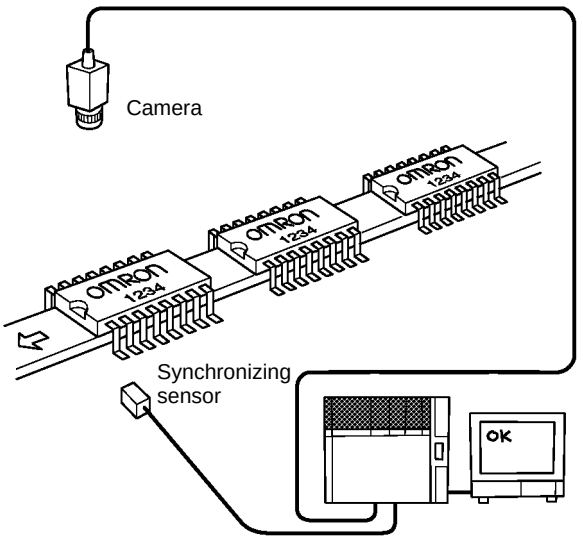
This section describes the character inspection software which includes four application programs, each used for a different type of inspection. The method of using each application program and the sequence of using the functions are described using typical inspections as examples.

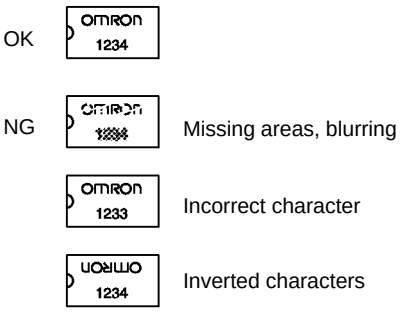
3-1 Inspection Program for General Characters

In this example, the characters printed on IC chips are inspected for missing areas, blurring, and incorrect characters.

The STEP signal is input from the synchronizing sensor when a test object arrives at the inspection position. The F350 synchronizes the inspection with the STEP signal.

The OK or NG (No Good) inspection result is output to the Terminal Block Unit to allow ejection of defective objects at the next stage.

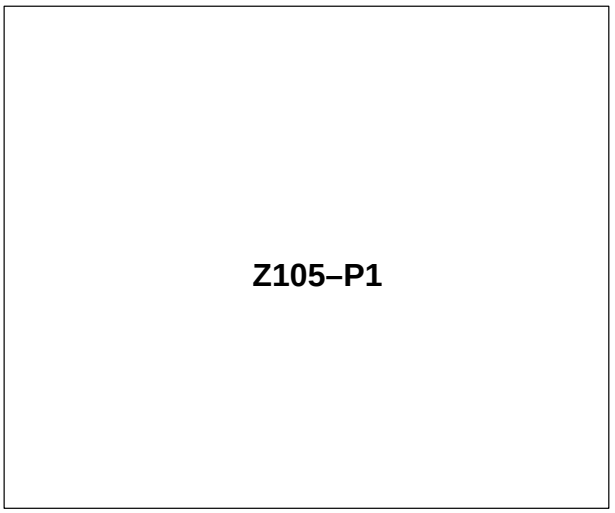




Procedure

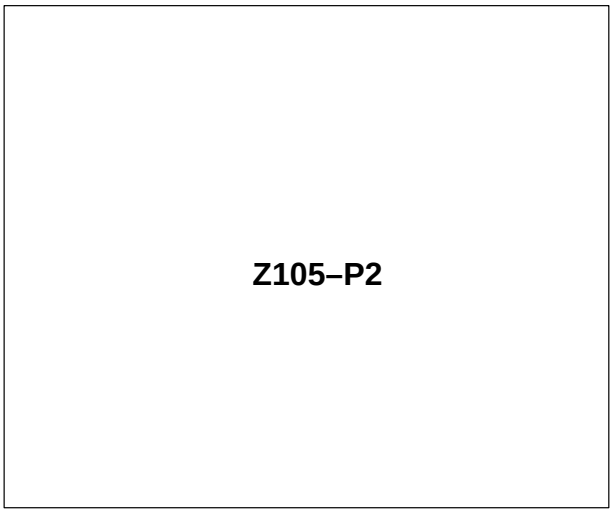
1, 2, 3... 1. **Select Scene Number**

Select scene 0. Subsequent data settings will apply to scene 0. Refer to *4-1-1 Selecting Scene Number: S.Scene*.



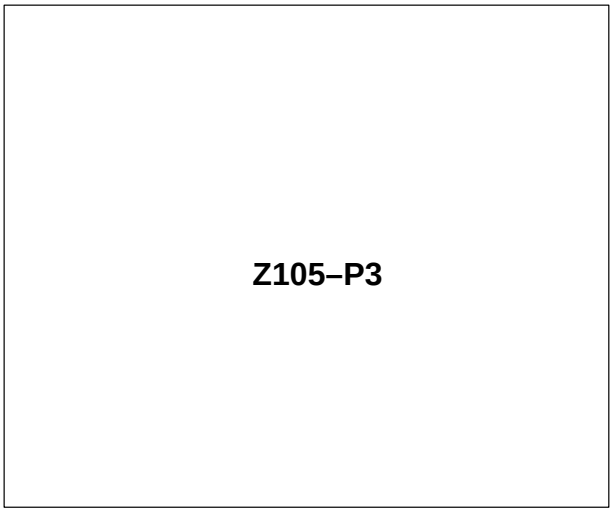
2. **Select Filtering**

Select weak smoothing. Smooths and stabilizes effects of noise and roughness of chip surface. Refer to *4-3 F.Filtering*.



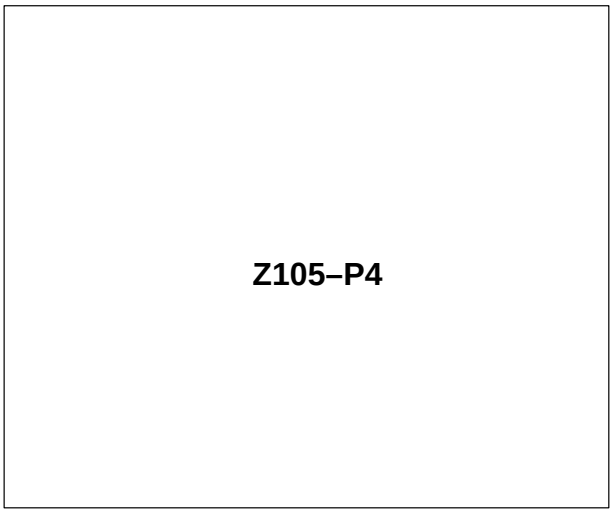
3. **Register the Dictionary**

   Register each character model for the inspection in dictionary 0 or 1. Refer to *4-4-1 Registering Character Models: R.Register*.



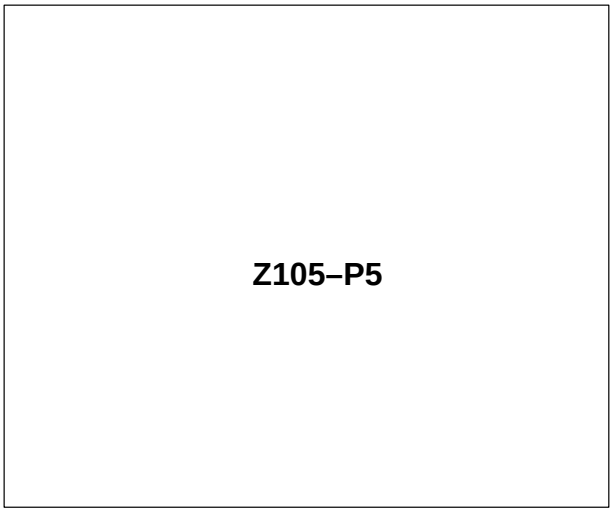
4. **Set the Inspection Region**

   Specify the inspection region where the printed characters exist. Refer to *4-5-1-1 Drawing the Inspection Region: R.Region*.



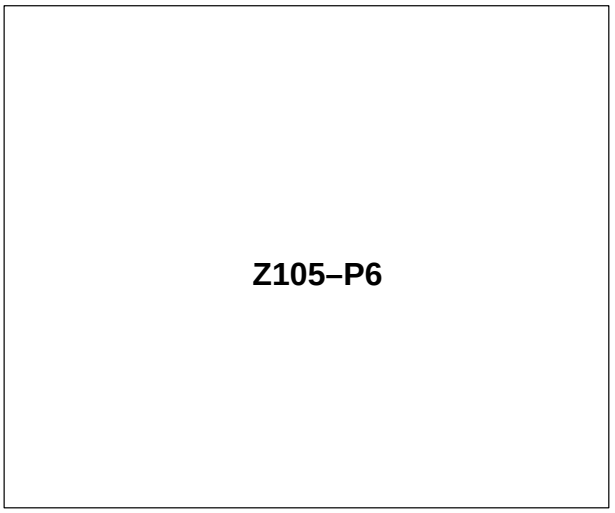
5. **Set the Inspection Character String**

   Sets the actual characters used for the inspection. Refer to *4-5-1-2 Setting the Inspection Character String: L.Character*.



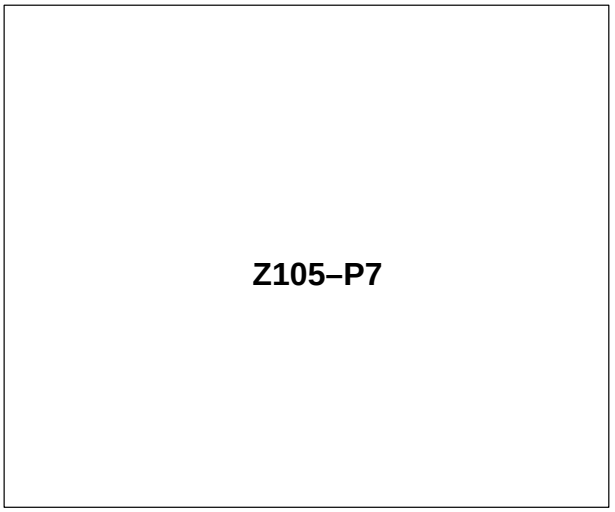
6. **Select the Dictionaries**

   Select the dictionaries 0 and 1 in which the character models for the inspection are registered. Refer to *4-5-1-3 Selecting the Dictionaries: D.Dictionary*.



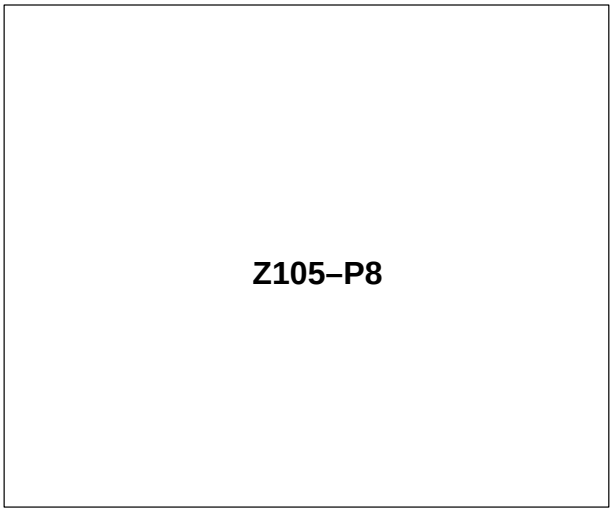
7. **Set the Evaluation Criterion**

   Set the evaluation criterion to the minimum limit of the correlation value for a non-defective part. Refer to *4-7-2 Setting the Evaluation Criterion: M.Inspection monitor*.



8. **Inspection**

   Run the inspection using inspection instructions. The inspection results are output to the video monitor and the Terminal Block Unit. Refer to *4-7-3 Running the Inspection: I.Inspection*.



3-2 Production/Expiration Date Verification Program

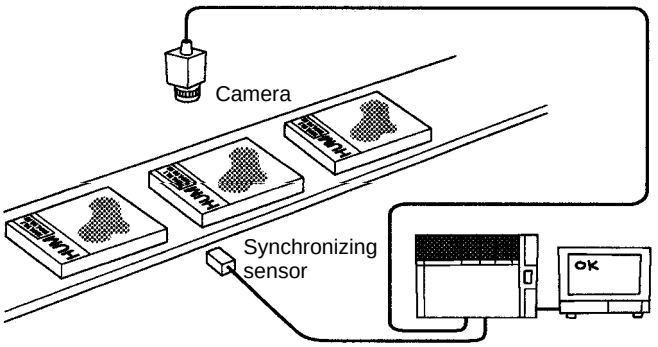
In this example, the production date and expiration date on food packaging are inspected for missing areas, blurring, and incorrect characters.

The production date and expiration date are set using the F350 internal calendar but manual update by instruction is used to allow the previous day's production to be inspected until 4 AM.

The STEP signal is input from the synchronizing sensor when a test object arrives at the inspection position. The F350 synchronizes the inspection with the STEP signal.

The position compensation function is set to allow inspection when the position of the packaging deviates from the inspection position.

The OK or NG inspection result is output to the Terminal Block Unit to allow ejection of defective objects at the next stage.



OK

Production date 1994.10.1
Expiration date 1994.10.15

NG

Production date 1994.10.1
Expiration date 1994.10.15

Missing areas, blurring

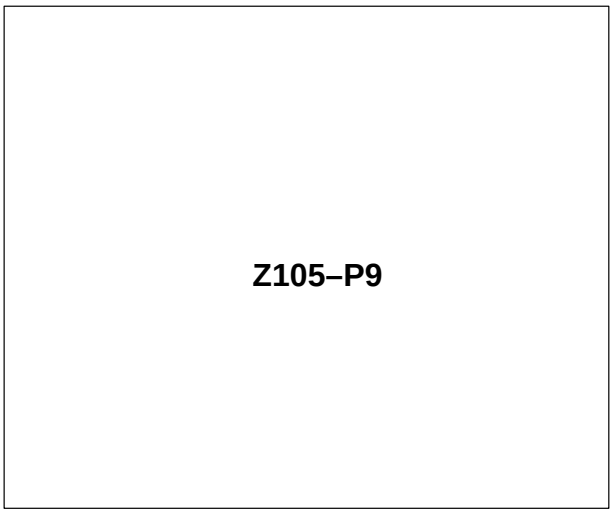
Production date 1994.10.1
Expiration date 1999.10.15

Incorrect character

Procedure

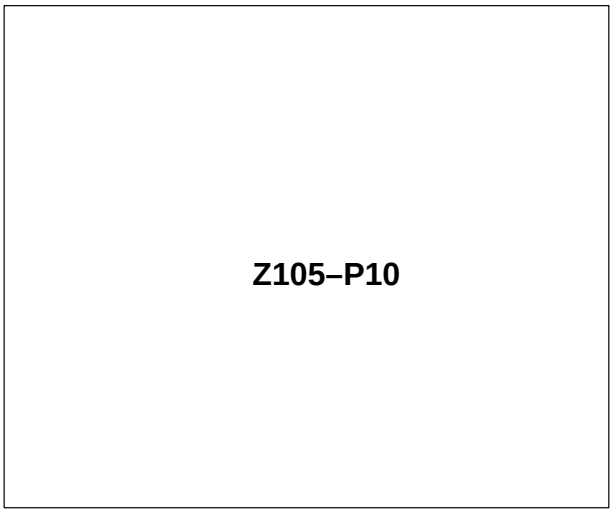
1, 2, 3... 1. **Select Scene Number**

Select scene 3. Subsequent data settings will apply to scene 3. Refer to *4-1-1 Selecting Scene Number: S.Scene*.



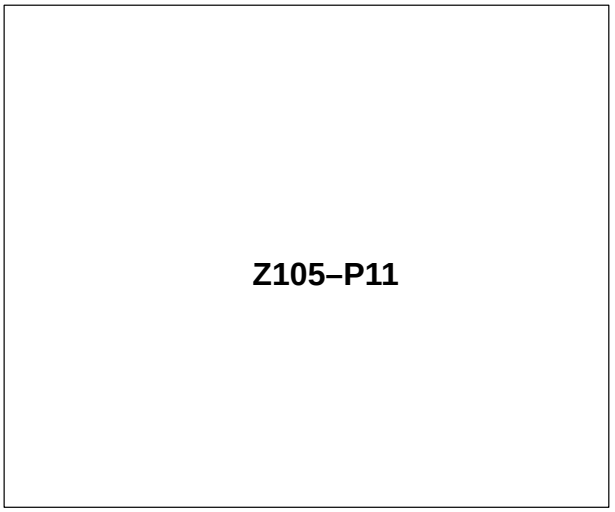
2. **Register a Dictionary**

Register the character models for the dates in a dictionary. Refer to *4-4-1 Registering Character Models: R.Register*.



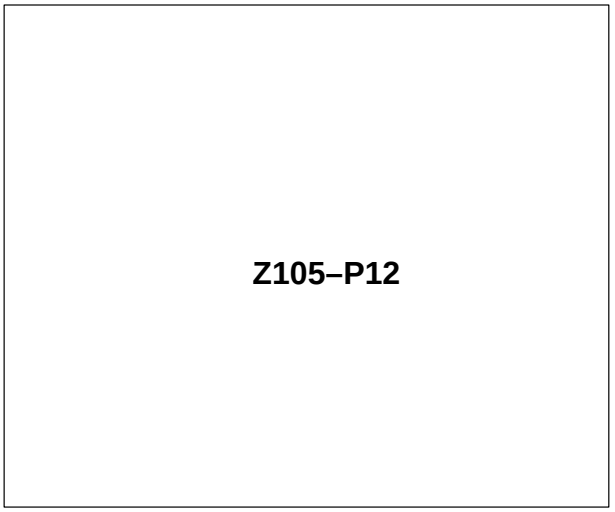
3. **Set Inspection Regions**

   Set the production date inspection region. Specify the inspection region where the production date is inspected. Refer to *4-5-2-1 Drawing the Production Date Region: R.Region*.



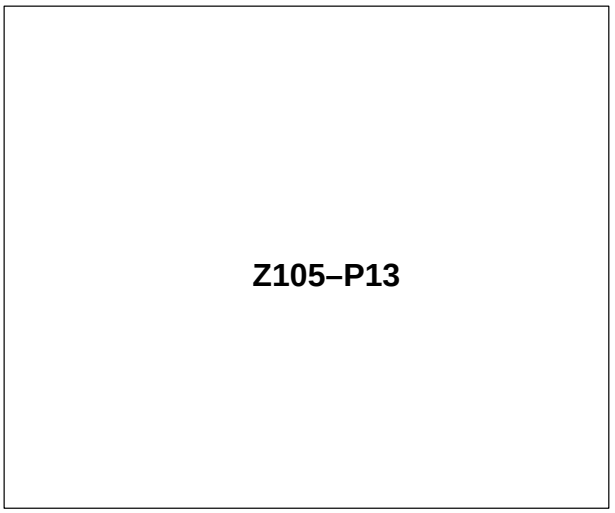
4. **Set the Production Date**

   The production date is automatically set by the internal calendar. Check the date of the internal calendar. Refer to *4-5-2-2 Checking Production Date: S.Reference* and *4-5-2-7 Changing the Internal Calendar: C.Calendar*.



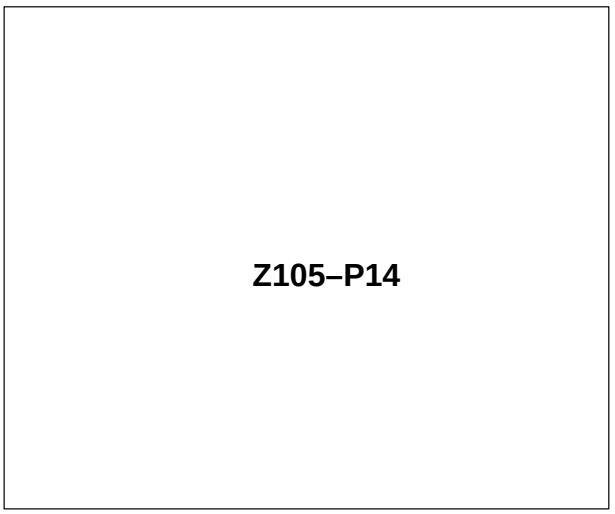
5. **Set the Expiration Date Inspection Region**

   Specify the inspection region where the expiration date is inspected. Refer to *4-5-2-3 Setting the Expiration Date Region: R.Region*.



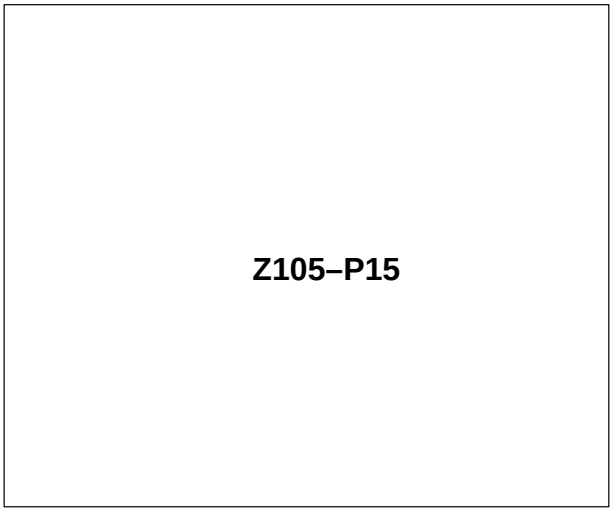
6. **Set the Expiration Period**

   Set the expiration period from the production date. The inspection expiration date is the production date + expiration period. Refer to *4-5-2-4 Setting the Expiration Period: L.Expiration period*.



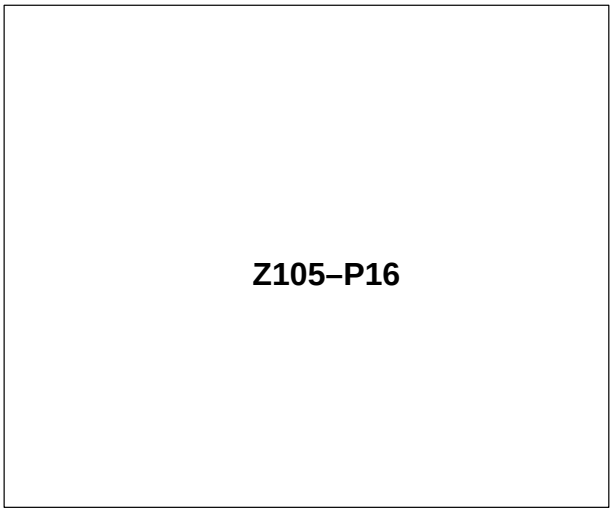
7. **Select the Date Format**

   Set the format of the production and expiration dates. Refer to *4-5-2-6 Selecting Date Format: F.Date format*.



8. **Set Position Compensation**

   Select the position compensation mode. In this example, select the 2-model position compensation mode because the positions of two marks are detected for position compensation. Refer to *4-6-1 Selecting the Position Compensation Mode: M.Position compensation mode*.

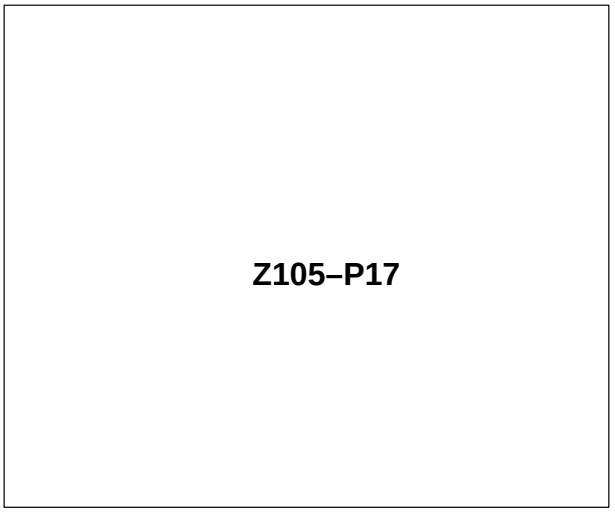


9. **Register the Position Compensation Model**

   Register the two marks as model 0 and model 1. Draw the region to search for the position compensation models if the marks are displaced. Refer to *4-6-2 Registering the Position Compensation Models :D.Model for position compensation*.

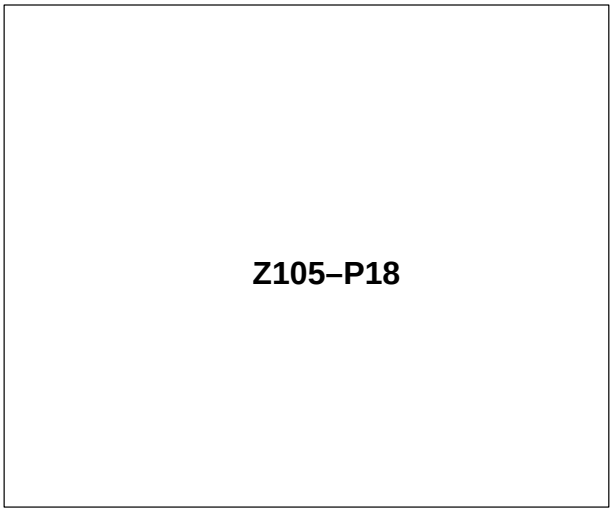
10. **Set the Evaluation Criterion**

    Set the evaluation criterion to the minimum limit of the correlation value for a non-defective part. Refer to *4-7-2 Setting the Evaluation Criterion: M.Inspection monitor*.



11. **Inspection**

    Run the inspection using inspection instructions. The inspection results are output to the video monitor and the Terminal Block Unit. Refer to *4-7-3 Running the Inspection: I.Inspection*.



12. **Change the Date**

Update the inspection dates according to the date of the internal calendar. The date can also be updated by inputting an instruction via the parallel I/O. Refer to *4-7-4 Changing the Date: U.Update*.

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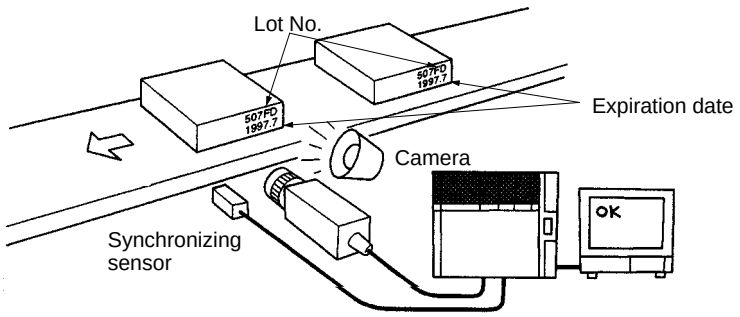
3-3 Date and Lot Number Verification Program 1

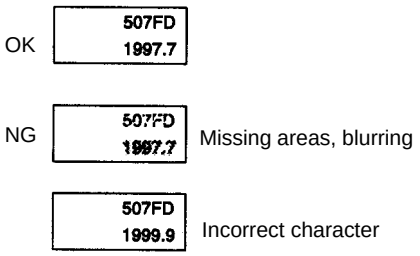
In this example, the expiration date and lot number on pharmaceutical boxes are inspected for missing areas, blurring, and incorrect characters.

The expiration date is set to be automatically updated according to the F350 internal calendar.

The STEP signal is input from the synchronizing sensor when a test object arrives at the inspection position. The F350 synchronizes the inspection with the STEP signal.

The OK or NG inspection result is output to the Terminal Block Unit to allow ejection of defective objects at the next stage.

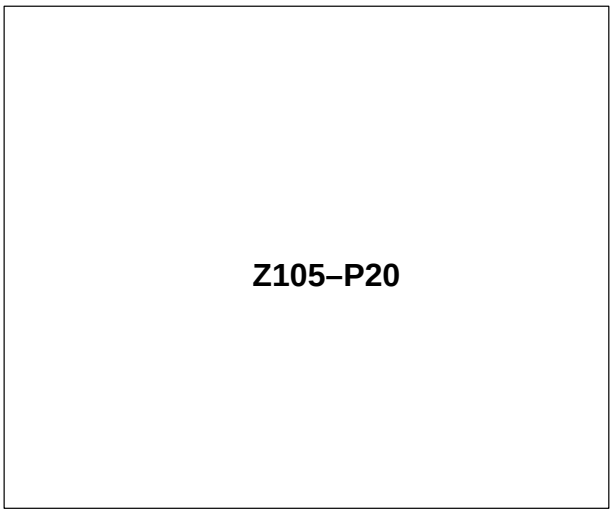




Procedure

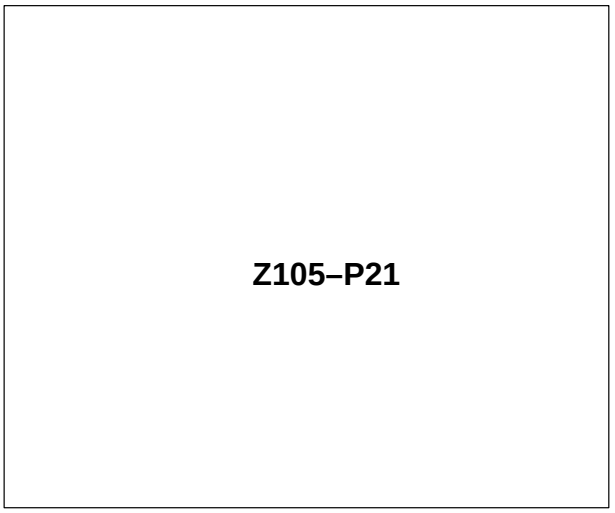
1, 2, 3... 1. **Select Scene Number**

Select scene 1. Subsequent data settings will apply to scene 1. Refer to *4-1-1 Selecting Scene Number: S.Scene*.



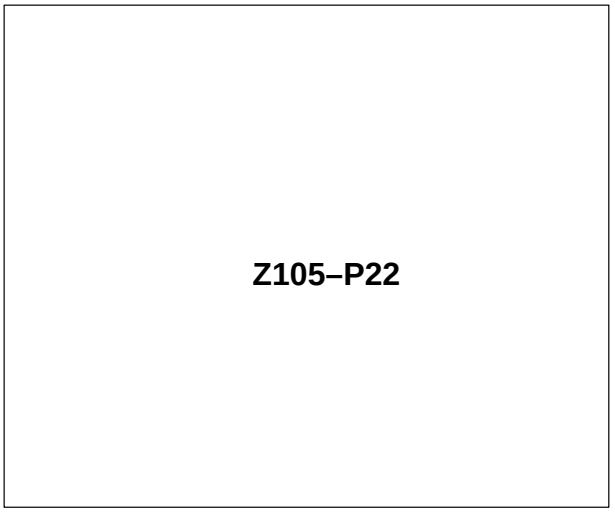
2. **Select the Filtering**

Select weak smoothing. Smooths out unevenness of the box surface. Refer to *4-3 F.Filtering*.



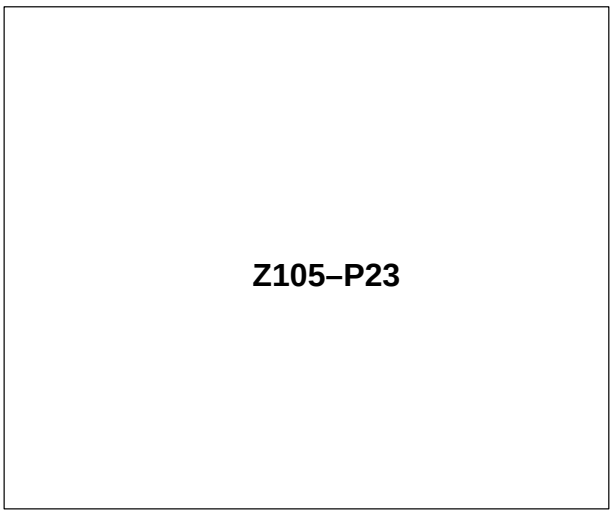
3. **Register a Dictionary**

   Register the character models for the date and character string in a dictionary. Refer to *4-4-1 Registering Character Models: R.Register*.



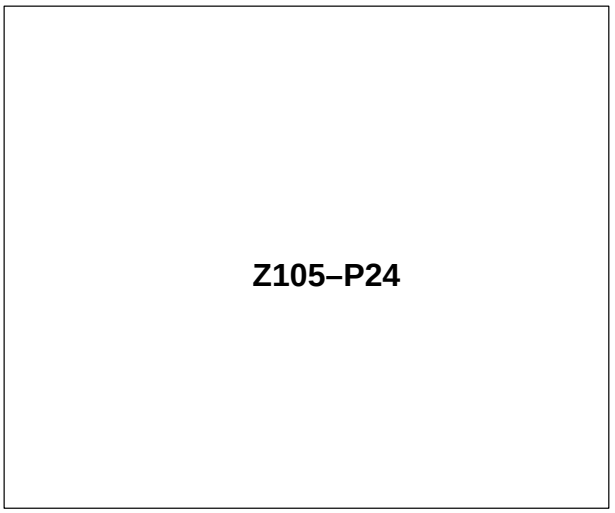
4. **Set Inspection Regions**

   Set the expiration date inspection region. Specify the inspection region where the expiration date is inspected. Refer to *4-5-3-1 Drawing the Date Region: D.Date region*.



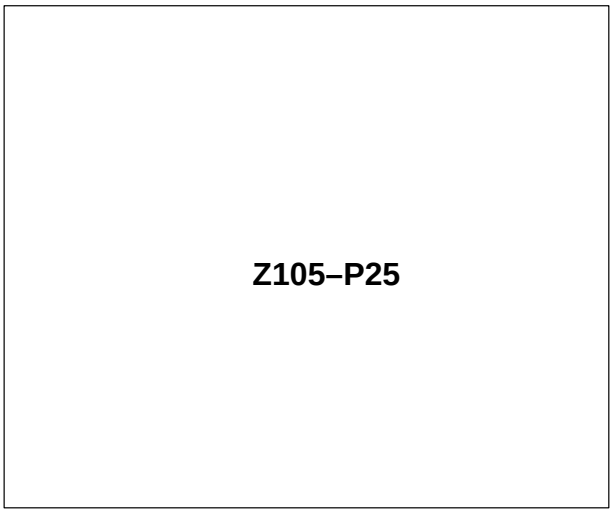
5. **Set the Inspection Date**

   Set the expiration date using an offset from the internal calendar date. Refer to *4-5-3-2 Setting the Date Offset: O.Offset date*.



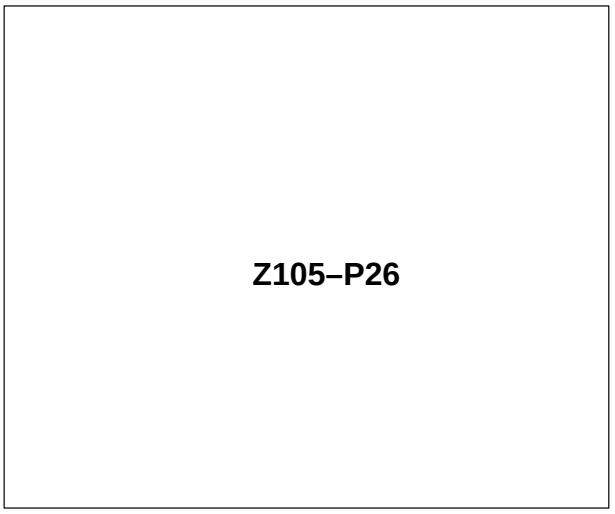
6. **Set the Lot Number Inspection Region**

   Specify the inspection region where the lot number is inspected. Refer to *4-5-3-4 Drawing the General Character Region: R.Region*.



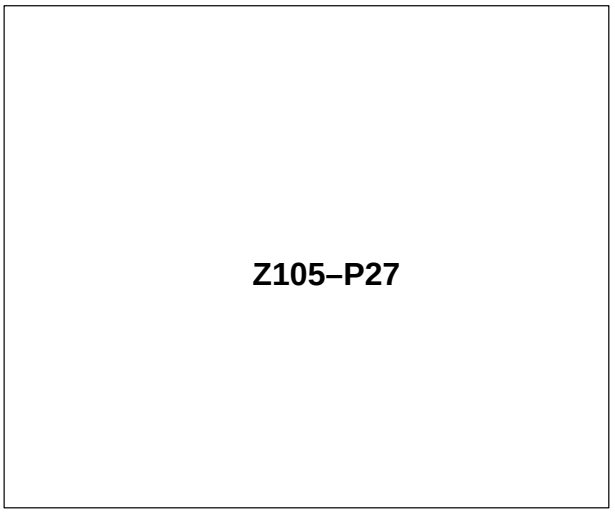
7. **Set the Lot Number to be Inspected**

   Refer to *4-5-3-5 Setting the Inspection Character String: L. Character*.



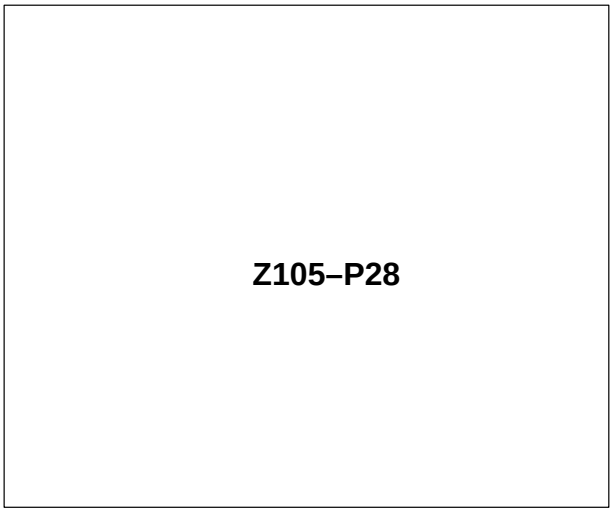
8. **Set the Evaluation Criterion**

   Set the evaluation criterion to the minimum limit of the correlation value for a non-defective part. Refer to *4-7-2 Setting the Evaluation Criterion: M.Inspection monitor*.



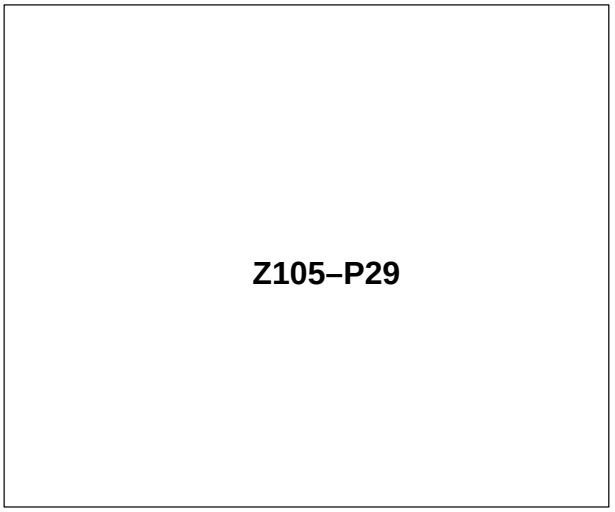
9. **Set Automatic Update of the Inspection Date**

   The inspection date is automatically updated according to the date of the internal calendar. Refer to *4-8-2 Automatic Update of the Inspection Date: M. Initial mode*.



10. **Inspection**

    Run the inspection using inspection instructions. Input instructions through the RS-232C. The inspection results are output to the video monitor and the Terminal Block Unit. Refer to *4-7-3 Running the Inspection: I.Inspection*.



3-4 Date and Lot Number Verification Program 2

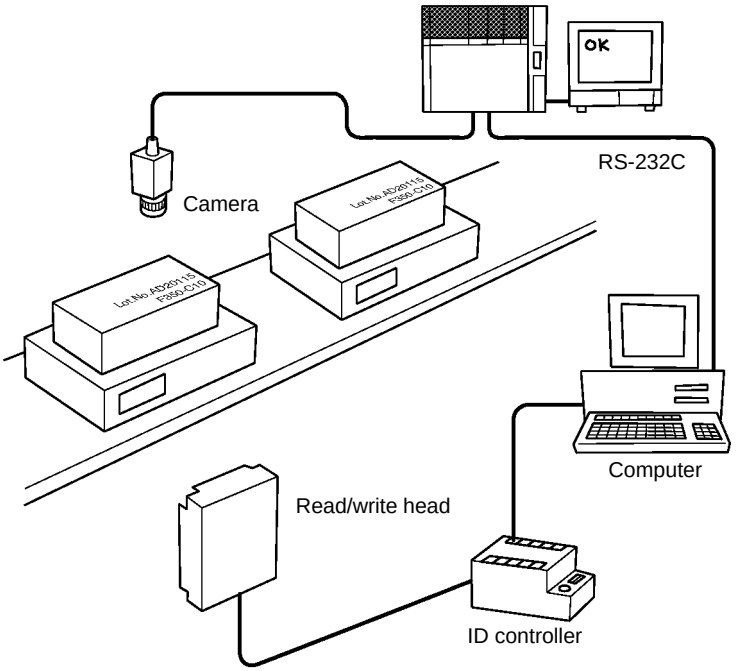
In this example, the lot number and product type printed on product packaging are inspected for blurring and incorrect characters.

The lot number and product type registered in the data carrier are read and input into the F350 via the RS-232C as the inspection character strings.

When a test object arrives at the inspection position, the character string settings and inspection instruction are input via the RS-232C and the F350 operates according to these instructions.

The position compensation function is set to allow inspection when the position of the lot number and product type printed on the packaging deviates from the inspection position.

The OK or NG inspection result is output to the Terminal Block Unit to allow ejection of defective objects at the next stage.

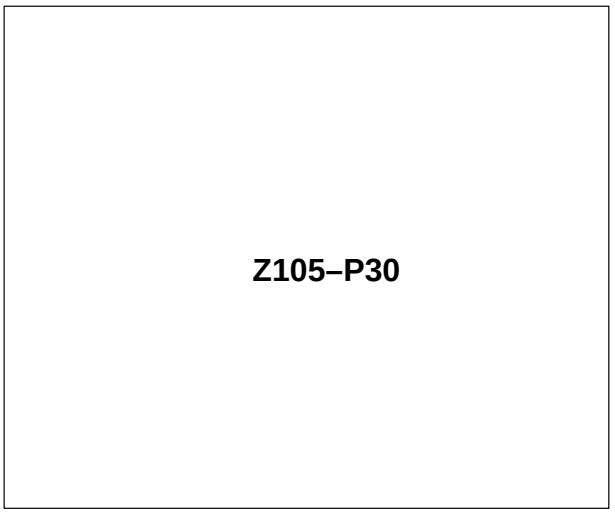


	ID memory data		Printing on packaging	
OK	Lot #:	AD20115	AD20115 F350-C10	
	Product type	F350-C10		
NG	Lot #:	AD20115	AD20115 F350-C100	Incorrect character
	Product type	F350-C10		

Procedure

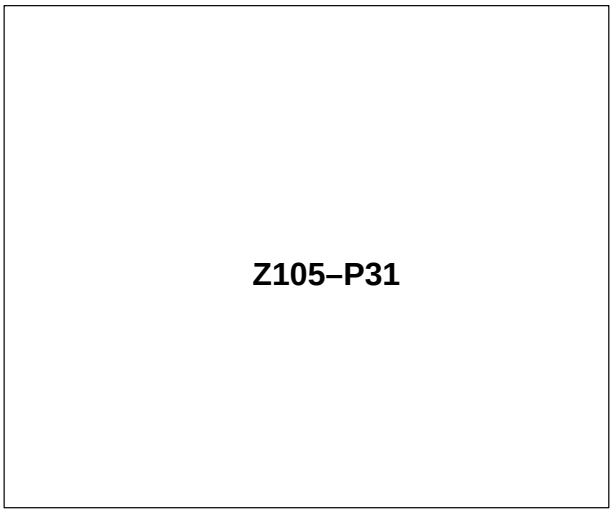
1, 2, 3... 1. **Select Scene Number**

Select scene 2. Subsequent data settings will apply to scene 2. Refer to *4-1-1 Selecting Scene Number: S.Scene*.



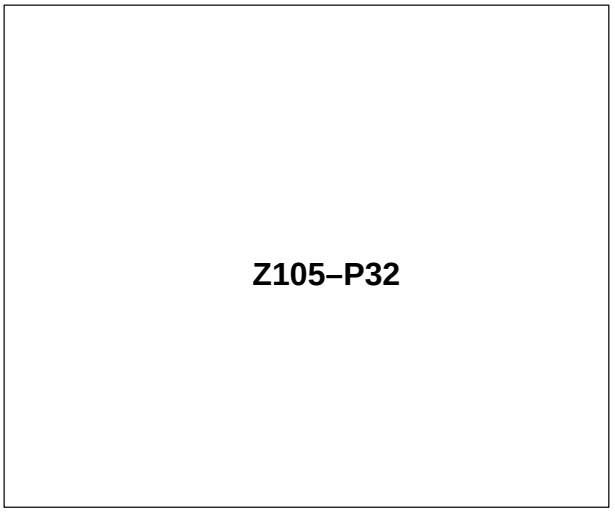
2. **Register a Dictionary**

Register the character models for the inspection in a dictionary. Refer to *4-4-1 Registering Character Models: R.Register*.



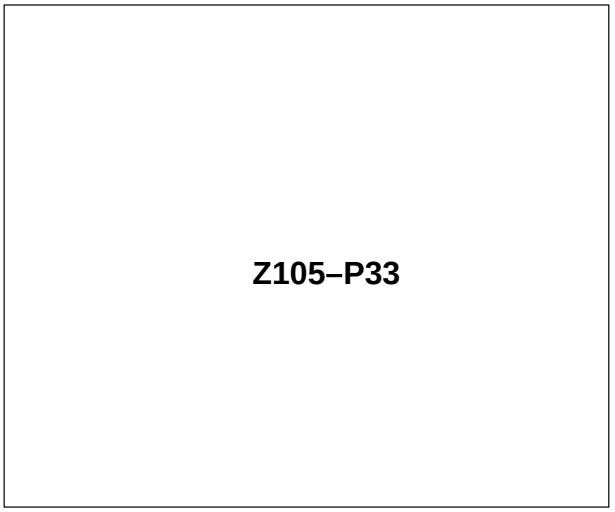
3. **Set Inspection Regions**

   Set inspection region 0. Specify the inspection region where the lot number is inspected. Refer to *4-5-4-1 Drawing the Inspection Region: R.Region*.



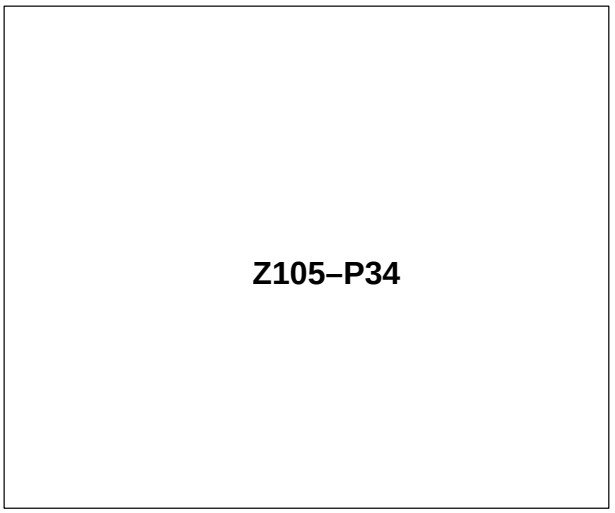
4. **Set the Inspection Character String**

   Set the lot number to be inspected. The lot number setting can be changed during the inspection by inputting the data from the data carrier via the RS-232C. Refer to *4-5-4-2 Setting the Inspection Character String: L.Characters*.



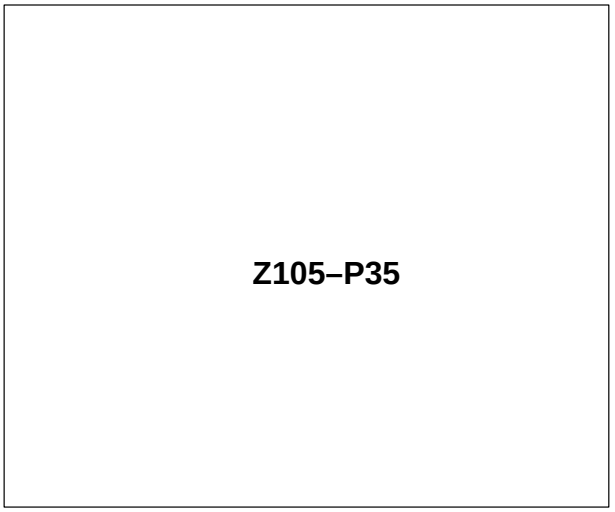
5. **Set Inspection Region 1**

   Specify the inspection region where the product type is inspected. Refer to *4-5-4-1 Drawing the Inspection Region: R.Region*.



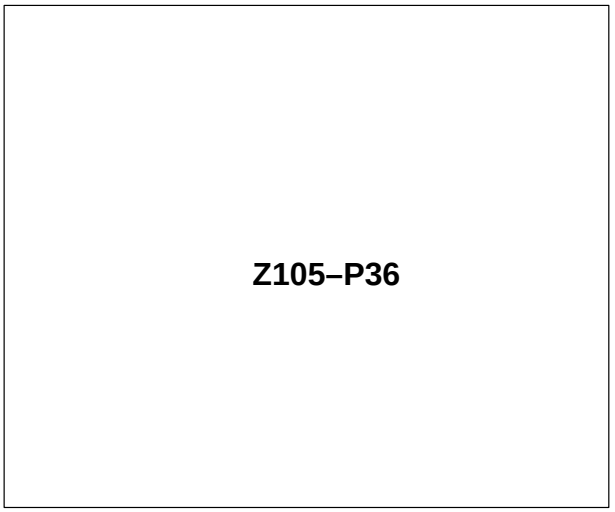
6. **Set the Inspection Character String**

   Set the product type to be inspected. The product type setting can be changed during the inspection by inputting the data from the data carrier via the RS-232C. Refer to *4-5-4-2 Setting the Inspection Character String: L.Characters*.



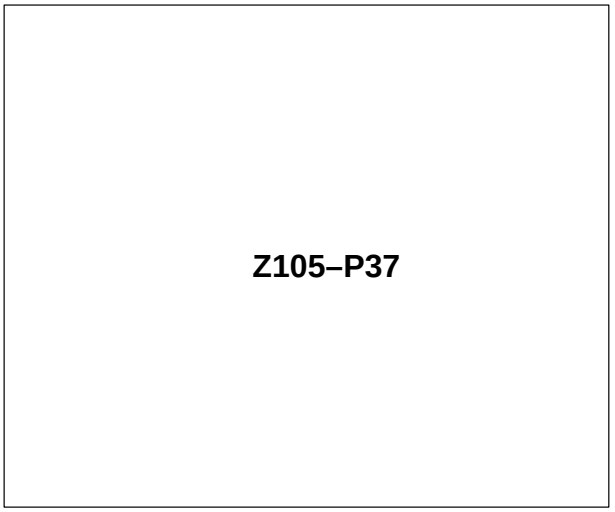
7. **Set Position Compensation**

   Select the position compensation mode. In this example, select the 1-model position compensation mode because the position of one corner of the box is detected for position compensation. Refer to *4-6-1 Selecting the Position Compensation Mode: M.Position compensation mode*.



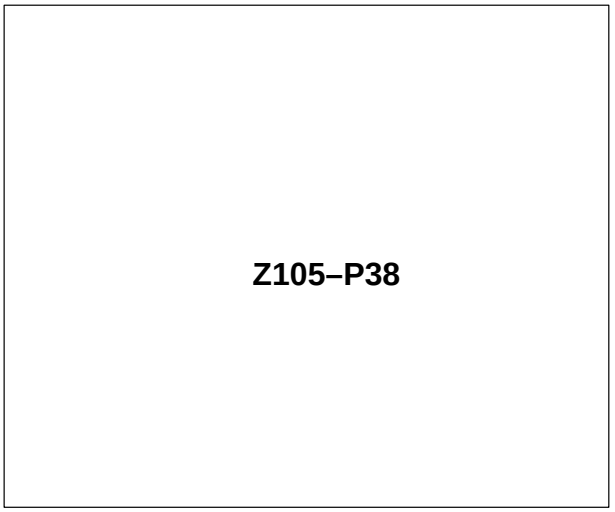
8. **Register the Position Compensation Model**

   Register the corner of the box as model 0. Draw the region to search for the position compensation model if the corner of the box is displaced. Refer to *4-6-2 Registering the Position Compensation Models*.



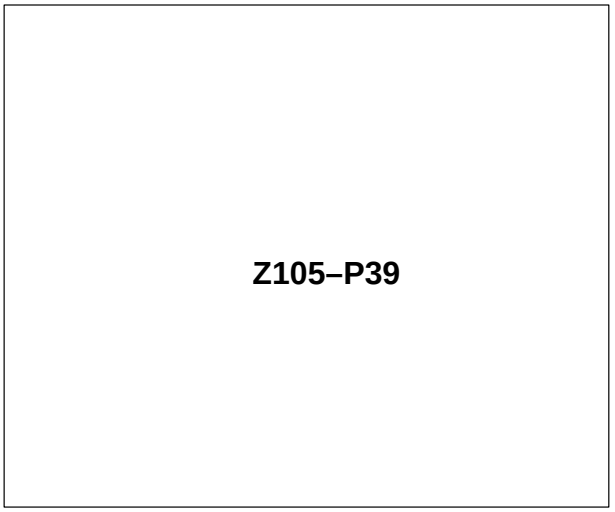
9. **Set the Evaluation Criterion**

   Set the evaluation criterion to the minimum limit of the correlation value for a non-defective part. Refer to *4-7-2 Setting the Evaluation Criterion: M.Inspection monitor*.



10. **Inspection**

    Run the inspection using inspection instructions. Input instructions through the RS-232C. The inspection results are output to the video monitor and the Terminal Block Unit. Refer to *4-7-3 Running the Inspection: I.Inspection*.



SECTION 4
Functions and their Operation

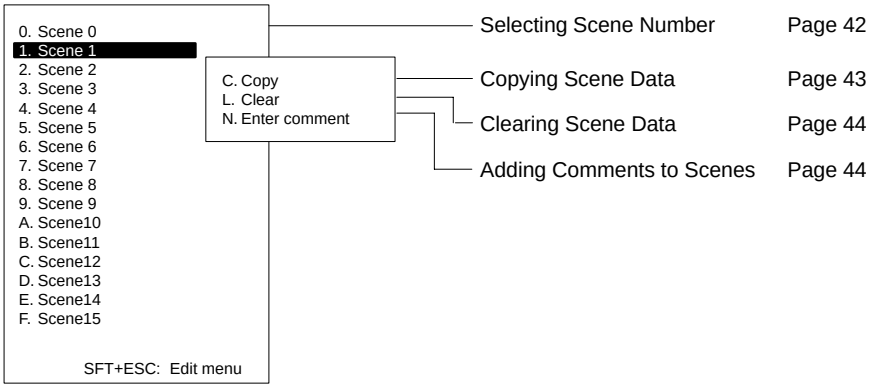
This section provides detailed explanation of the functions and their operation.

4-1 S.Scene

Character Inspection Software 1 allows 16 inspection conditions (scenes) to be set and stored. This data is known as scene data and is identified by a scene number.

Set inspection conditions can be stored as a scene. Refer to *5.3 B.Backup* in the F350 Setup Menu Operation Manual.

The S. Scene functions allow switching of scene numbers and editing of scene data.



4-1-1 Selecting Scene Number: S.Scene

Select the scene number to display. The inspection conditions can be set for this scene number and the inspection conducted according to the set inspection conditions.

Scene Number Displayed at Start Up

The scene number displayed after start up is the same scene number displayed when the Application Program was previously shut down.

The factory setting is Scene 0 and this scene number is displayed when the Unit is first started.

If “A. Automatic execution” is turned on using “Y. System/M. Initial Mode,” the inspection screen is displayed for the set scene number.

Refer to *4-8-1 Automatic Inspection: M.Initial mode*.

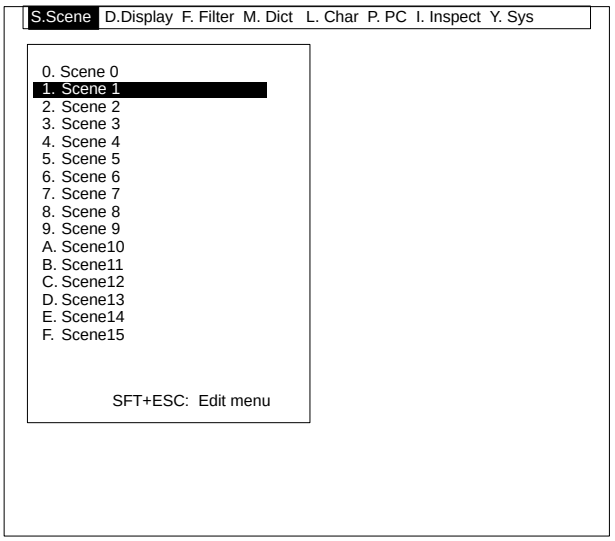
Display of Scene Comments

If a comment is input for a scene, the comment is displayed instead of the scene number.

Refer to *4-1-4 Adding Comments to Scenes: N.Enter comment*.

Procedure

Select the scene number. The selected scene is displayed.



4-1-2 Copying Scene Data: C.Copy

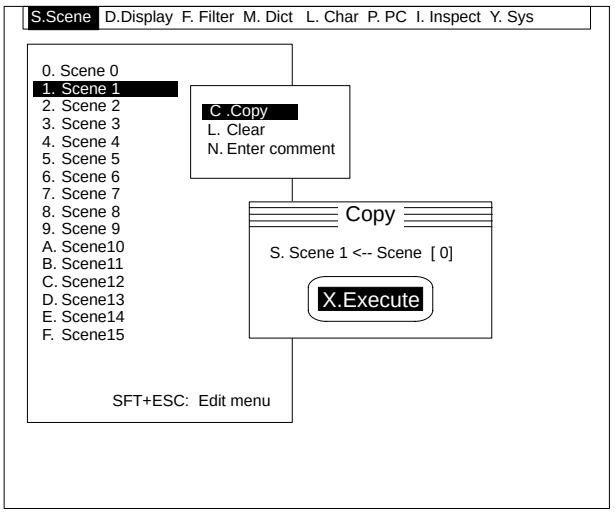
Write the scene data of the selected scene number to a different scene number. This function provides a convenient method of re-using existing data when scenes have many conditions in common.

Procedure

1, 2, 3... 1. Move the cursor to the copy source scene number and press the Shift and Escape Keys.

2. Select “C.Copy.”

3. Input the copy destination scene number.



4. Select “X.Execute.” The scene data is copied from the copy source scene number to the copy destination scene number.

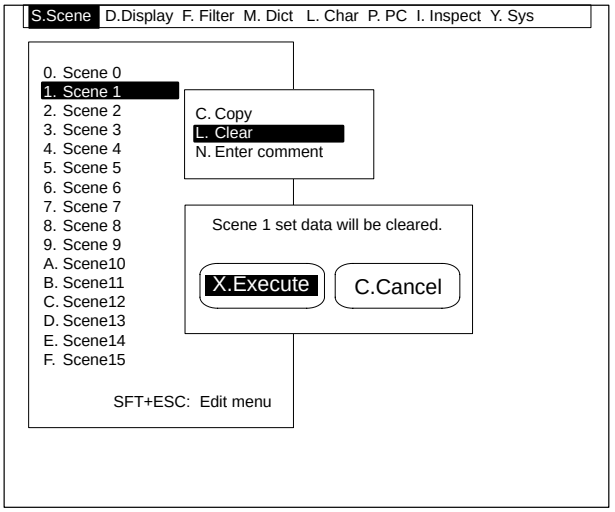
4-1-3 Clearing Scene Data: L.Clear

Set the scene data for the selected scene number to the initial (default) data. Clearing existing data with this instruction is recommended before setting new scene data.

Procedure

1, 2, 3...

1. Move the cursor to the scene number to be cleared and press the Shift and Escape Keys.
2. Select “L.Clear.” A confirmation message is displayed.



3. Check that the correct scene number is highlighted and select “X.Execute.” All scene data for the selected scene number reverts to the initial data.

4-1-4 Adding Comments to Scenes: N.Enter comment

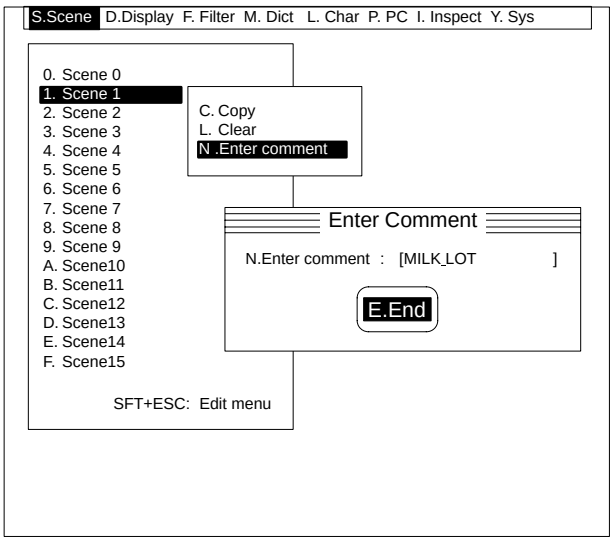
Add comments to scenes. Inspection details or the inspection line name input as a comment can be used as a scene title.

The length of a comment must be a maximum of ten normal characters.

Procedure

1, 2, 3...

1. Move the cursor to the scene number for which a comment is to be entered and press the Shift and Escape Keys.
2. Select “N.Enter comment.”
3. Enter the comment.



The following characters can be used in comments.

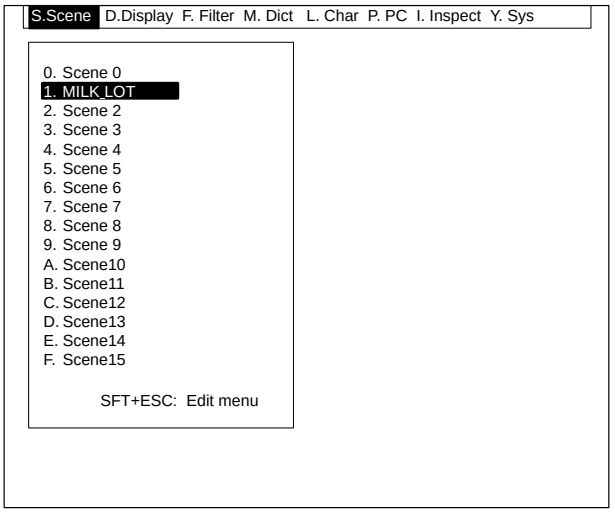
Least significant bits

Most significant bits

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	¥	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	¦	}	~	

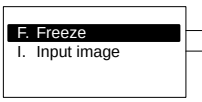
Character codes $30 to 7E.

4. Select “E.End.” The comment is displayed instead of the scene number.



4-2 D.Display

Use “D.Display” to set the image display method on the video monitor. Select the most convenient display method for setting the scene data or monitoring the inspection status.



Selecting the Image Display Page 45
Inputting the Image Page 46

4-2-1 Selecting the Image Display: F.Freeze

Images can be displayed as static (freeze) or dynamic (unfreeze) images. If “U.Unfreeze” is selected, the image from the camera is displayed directly. Select the unfreeze display to adjust the camera focus or make other adjustments.

Select “F.Freeze” to display a static image. Select the freeze display to obtain static images for the inspection of fast moving objects or to set data while observing a static image.

Using a Strobe

The strobe flashes continuously if “U.Unfreeze” is selected. If “F.Freeze” is selected, the strobe flashes when the image is input.

Image Input Timing

The static (freeze) image is updated when any of the following occurs:

- Start-up
- Different scene number is selected using “S.Scene”

- Image is input using “D.Display/I.Input image”
- Inspection is conducted using “I.Inspection/M.Inspection monitor”
- Inspection is conducted using “I.Inspection/I.Inspection”

Note **If the Position Compensation Function is Used**
If the position compensation function is used, the image cannot be frozen after positional compensation is complete.

Procedure

1, 2, 3...

1. Select “F.Freeze.”
2. Select the display method. The display method is selected. If “F.Freeze” is selected, the displayed image is the image at the time “F.Freeze” was selected.

4-2-2 Inputting the Image: I.Input image

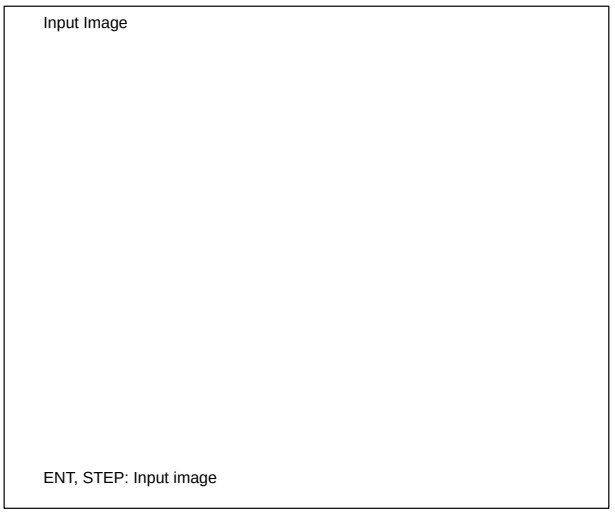
If the static (freeze) image is selected, the image can be input by pressing the Enter Key or using the STEP signal.

When the Enter Key is pressed or the STEP signal is input, the image is input and displayed as a static image. In addition, the “F.Freeze” display method is automatically selected.

Note **If the Position Compensation Function is Used**
If the position compensation function is used, the image cannot be frozen after positional compensation is complete.

Procedure

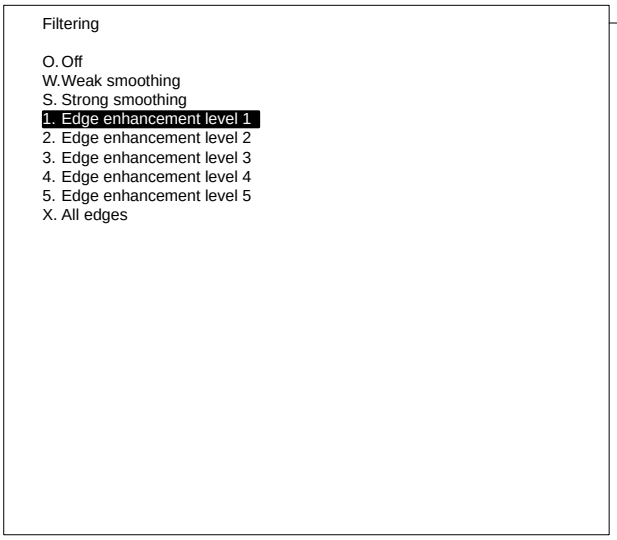
1, 2, 3... 1. Select I.Input image." A dynamic (unfreeze) image is displayed.
2. Press the Enter Key or turn ON the STEP signal. The static image at the time the Enter Key is pressed or the STEP signal turns ON is displayed.



4-3 F.Filtering

The F.Filtering functions process the camera image into an image more suitable for inspection. Select the filtering function to match the environment and inspection.

If filtering is selected for a scene, the filtered image is always displayed.



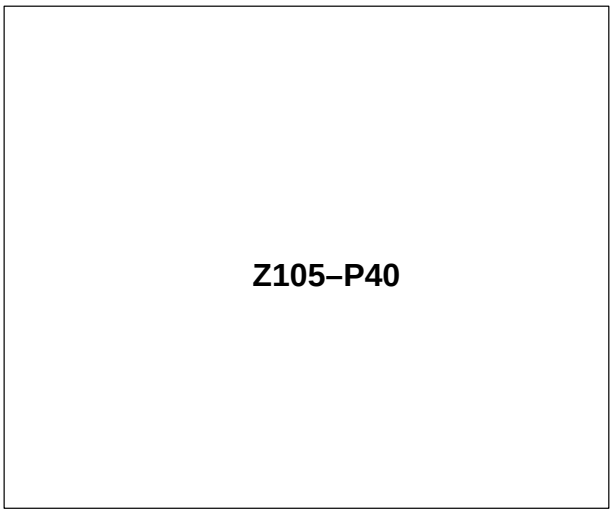
Select F.Filtering. Page 47

Note Correct inspection is not possible if different filtering is selected during inspection than at the time the model data was registered. Do not change the filtering after the model data is registered. The functions used to register the model data are shown below.

Menu	Functions to register model data
Inspection program for general characters Production/expiration date verification program Date and lot number verification program 1 Date and lot number verification program 2	M.Dictionary/P.Position compensation

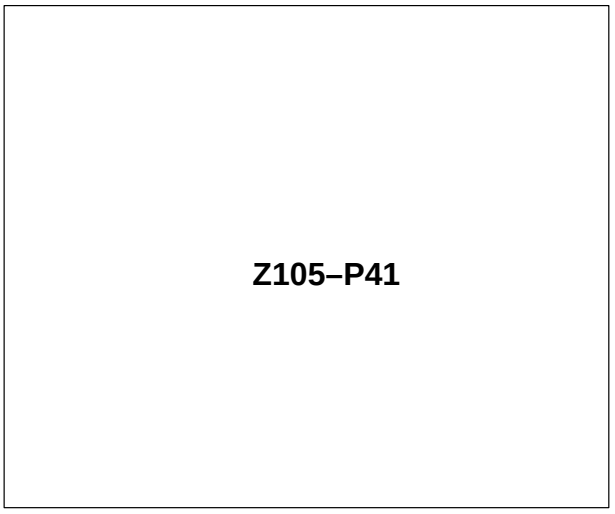
OFF

No filtering. The raw image is displayed.



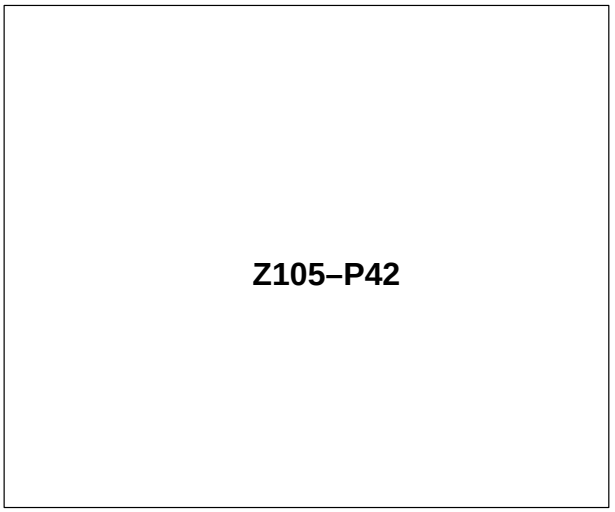
Smoothing

Displays a smoothed image with noise suppressed. Smoothing allows suppression of the effects of uneven lighting due to scratches, patterns, or roughness of the surface. Select either weak or strong smoothing.



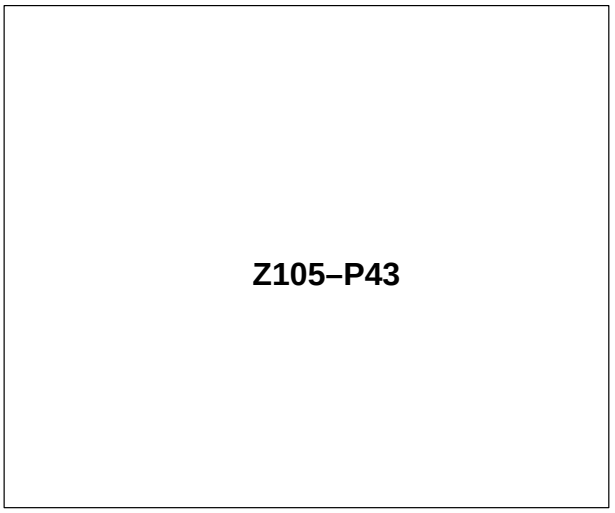
Edge Enhancement

Displays an image with enhanced edges between bright and dark regions. Select the degree of edge enhancement from 1 to 5. Edge enhancement 5 is stronger than edge enhancement 1.



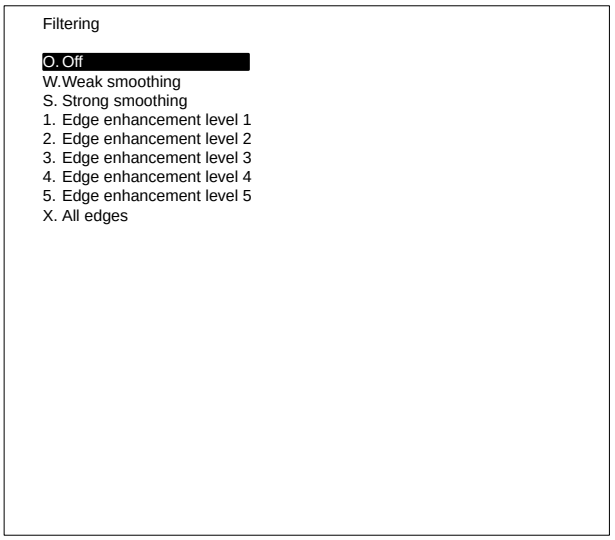
All Edges

Displays an image of the edges between bright and dark regions.



Procedure

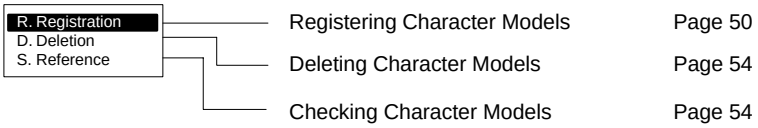
Select “F.Filtering.” The image is displayed using the filtering at the cursor position.



4-4 M.Dictionary

Character inspection software 1 uses character models stored in a dictionary to inspect and verify characters.

The M.Dictionary” function is used to register or delete character models in the dictionary.



4-4-1 Registering Character Models: R.Register

Register in a dictionary the character models used as the reference to inspect or verify characters. Dictionary characters are registered in the dictionary in advance. A maximum of six character models can be registered, allowing inspections of a mixture of characters or characters with deviations in quality.

The dictionaries are common for all scenes and cannot be created independently for each scene.

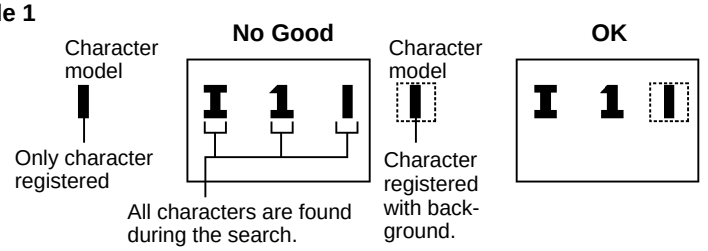
The maximum permitted number of dictionaries differs for each menu.

Menu	Number of dictionaries	Types of dictionary characters	Max. character models	Comments
Inspection program for general characters	5 (Dictionaries 0 to 4)	Dictionaries 0 to 3 44 Types: numbers (0 to 9), characters (A to Z), symbols (– / : . , % * +) The marks • and ’ can be registered using (.) and (,). Dictionary 4 Ten arbitrary marks (a to j) can be displayed using the dictionary characters (a to j), but they can be used to register any mark font.	308	Six character models can be registered in a single character dictionary.
Production/expiration date verification program Date and lot number verification program 1 Date and lot number verification program 2	1	44 Types: numbers (0 to 9), characters (A to Z), symbols (– / : . , % * +) The marks • and ’ can be registered using (.) and (,).	264	Six character models can be registered in a single character dictionary.

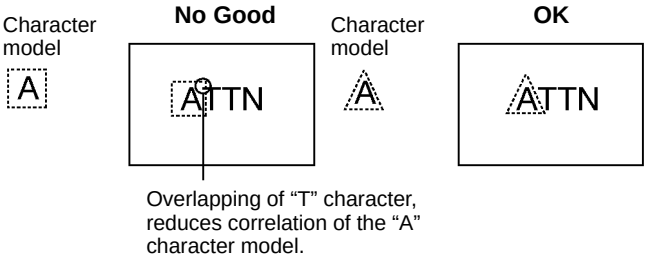
Note Correct inspection is not possible if different filtering is selected during inspection than at the time the model data was registered. If filtering is to be used for the inspection image, select this filtering before registering the model data. Refer to *4-3 F.Filtering*.

Inspection or verification of characters may not be possible if the character models are not registered correctly, as shown in the examples below.

Example 1



Example 2

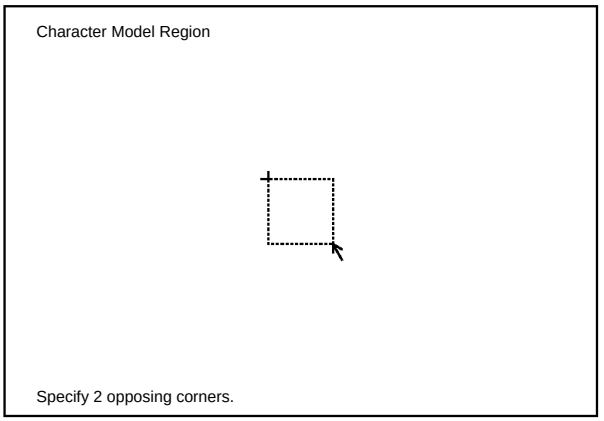


Procedure

1, 2, 3... 1. Select “R.Register.” A dotted box and arrow cursor are displayed.

2. Set the top-left coordinates of the rectangular region registered as the character model.

3. Set the bottom-right coordinates of the rectangular region registered as the character model.



Note A region cannot be specified less than 23 pixels horizontal and 19 pixels vertical. Use the masking function to register a smaller region.

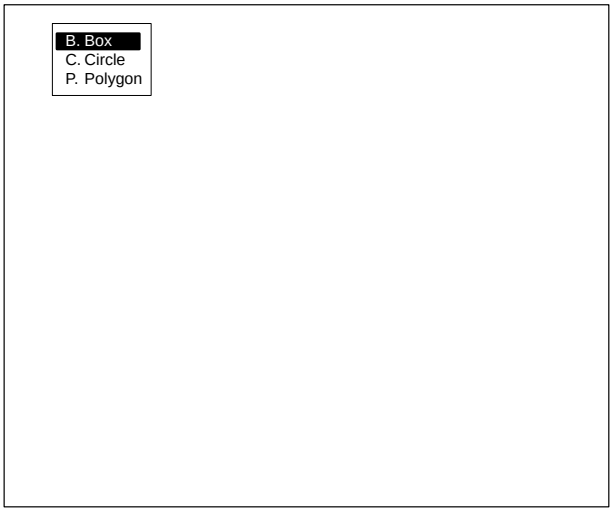
Follow the procedure described in steps 4 through 6 below to mask part of the rectangular region.

Move to step 7 to register the character model region.

4. Press the Shift and Escape Keys. A menu is display the drawing method.
5. Select the drawing method.

Drawing a Polygon

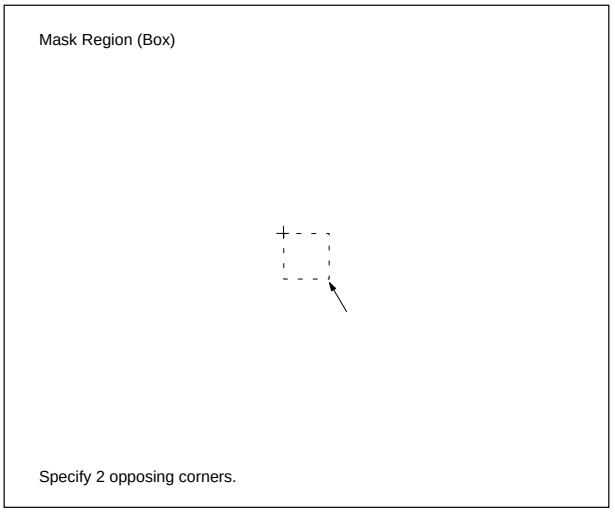
The number of points on the polygon must not exceed 63.



6. Specify the region to mask.

   Move the arrow cursor and select the appropriate coordinates for the drawing method.

   Press the Enter Key when the region has been specified. The character model region specification complete screen is displayed.

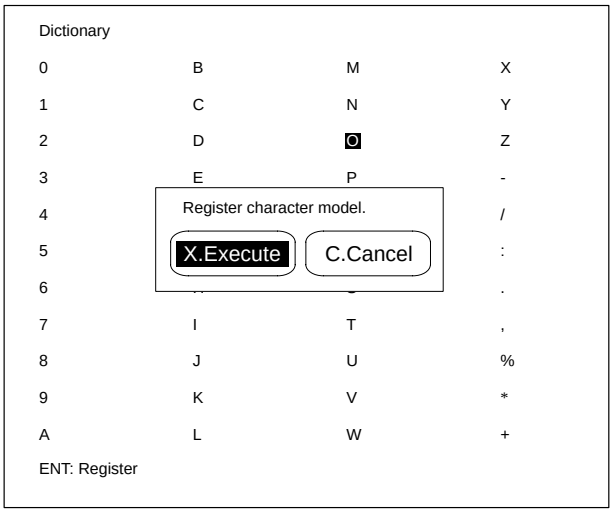


7. Press the Enter Key.

   A table of the character models registered in the dictionary is displayed.

8. Select the dictionary character.

   Move the cursor to the character for which the character model is to be registered and press the Enter Key. A confirmation message is displayed.



Note Switching Dictionary Number with Inspection Program for General Characters:
Hold down the Shift Key and press the Up/Down Keys to select the new dictionary number.

9. Select “X.Execute.”

   The character model is registered for the dictionary character.
   The displayed character model image is reduced in size.

   Press the Escape Key to revert to the display for step 2.
   Repeat steps 2 through 9 to register multiple character models.

4-4-2 Deleting Character Models: D.Delete

Delete a character model from a dictionary.

Procedure

1, 2, 3...

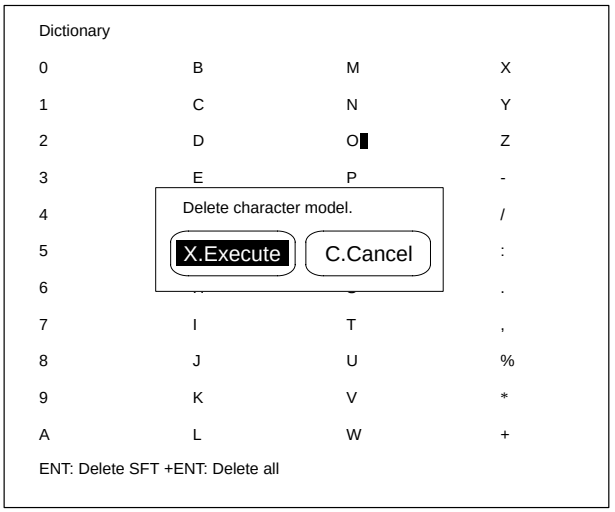
1. Select “D.Delete.”

   The character models registered in the dictionary are displayed.

   Note Switching Dictionary Number with Inspection Program for General Characters:
   Hold down the Shift Key and press the Up/Down Keys to select the new dictionary number.

2. Select the character model to be deleted.

   Move the cursor to the character model to be deleted and press the Enter Key. A confirmation message is displayed.



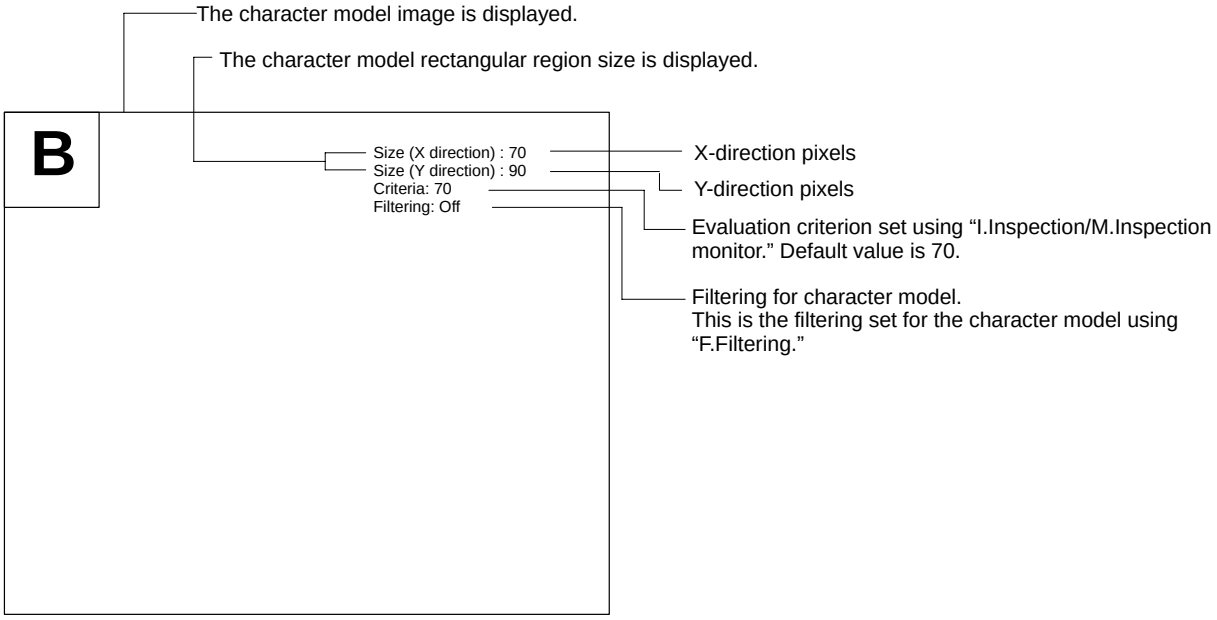
3. Select “X.Execute.”

All character models can be simultaneously deleted from the display dictionary by pressing the Shift and Enter Keys. A confirmation message is displayed. Select “X.Execute.”

4-4-3 Checking Character Models: S.Reference

Display character model data registered in the dictionary. The image, evaluation criterion, and filtering of the selected character model can be checked. Make sure that this data is correct before starting the inspection. However, data cannot be changed from this menu.

Note Correct inspection is not possible if different filtering is selected during inspection than at the time the model data was registered. Before starting the inspection, make sure that the selected filtering is the same as that selected at the time the model data was registered.

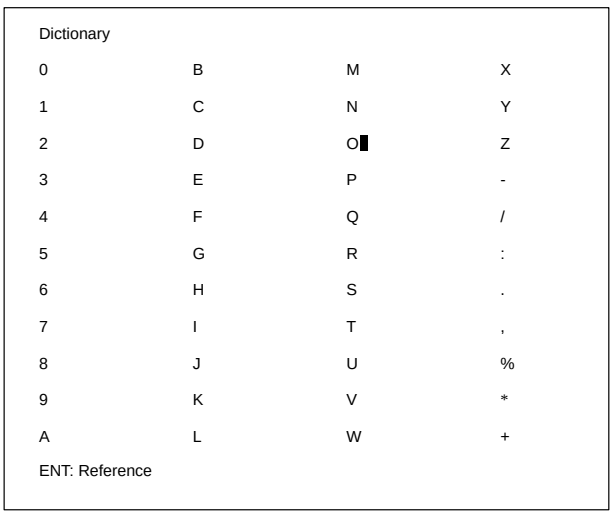


Procedure

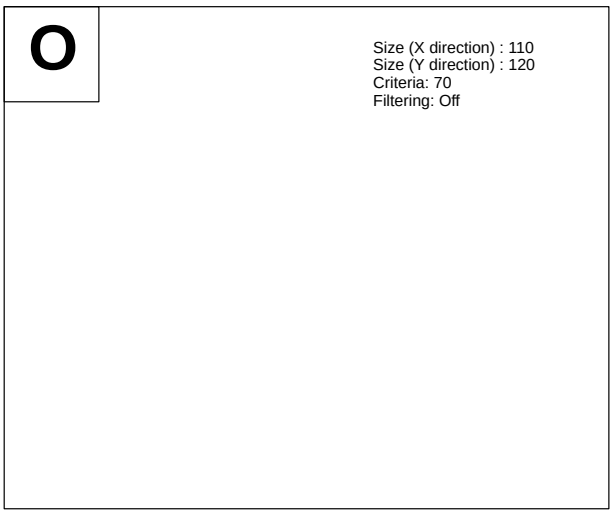
1, 2, 3... 1. Select “S.Reference.”

A table of character models registered in the dictionary is displayed.

Note Switching Dictionary Number with Inspection Program for General Characters:
Hold down the Shift Key and press the Up/Down Keys to select the new dictionary number.



2. Select the character model.
   The data is displayed for the specified character model.

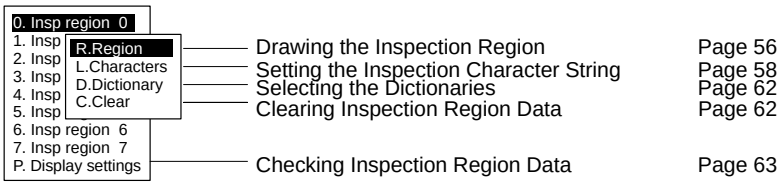


4-5 L.Character

The “L.Character” instruction sets the details of the date or character string to be investigated and sets the inspection region. Note that the setting method differs according to the menu used.

4-5-1 Inspection Program for General Characters

Sets the details of the character string and the inspection region. The Inspection Program For General Characters can simultaneously inspect a maximum of eight regions. The character string and dictionary can be set for each of the inspection regions.



4-5-1-1 Drawing the Inspection Region: R.Region

Set the rectangular inspection region. The image inside this region is used for the inspection.

Use the position compensation function if the position and orientation of the inspected object are not fixed and the inspection position lies outside the inspection region.

Refer to *4-6 P.Position Compensation*.

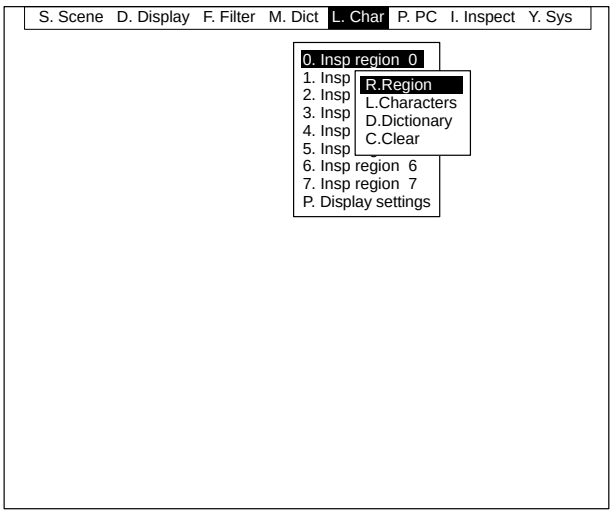
Note Using the Position Compensation Function:
Place an object at the reference position (position registered for the position compensation model) when drawing the inspection region.

Drawing the Region

Procedure

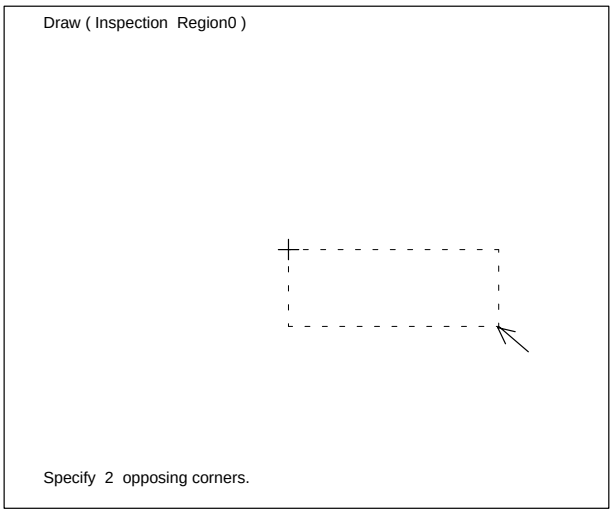
1, 2, 3...

1. Select “Inspection region no.” to specify the region to draw.
2. Select “R.Region.”



3. Select “B.Draw.”
4. Move the arrow cursor to specify two opposing corners of the rectangular region.

   The inspection region is displayed. Repeat steps 2 through 4 to modify the inspection region.



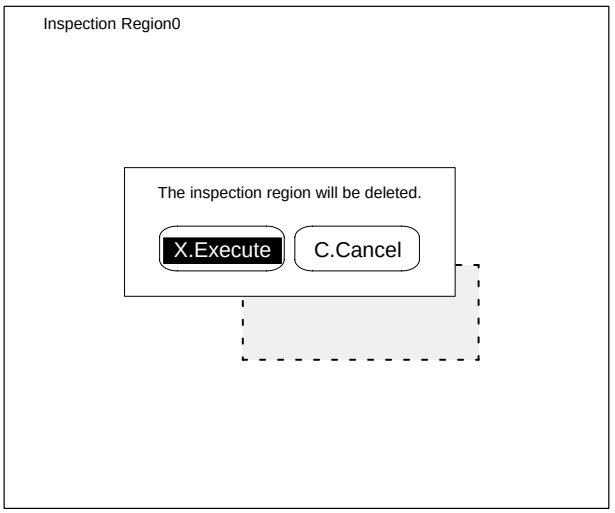
Deleting a Region

Procedure

1, 2, 3...

1. Select “Inspection region no.” to specify the region to delete.
2. Select “R.Region.”
3. Select “D.Delete.”

   A confirmation message is displayed.



4. Select “X.Execute.”

4-5-1-2 Setting the Inspection Character String: L.Character

Set the character string to be inspected in the inspection region. A character string up to 12 characters long can be set for any inspection region. The inspection program for general characters (common for all scenes) allows a maximum of 128 character strings to be registered in the table in memory.

The character strings registered in the table are numbered in the order they are registered, without regard to scene or inspection region numbers. During inspections, a character string can be selected from the table and changed.

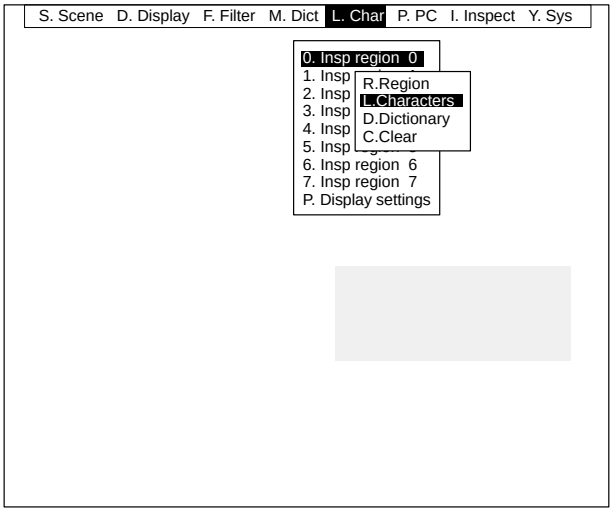
Refer to *4-7-3 Running the Inspection: I.Inspection*.

Setting a Character String

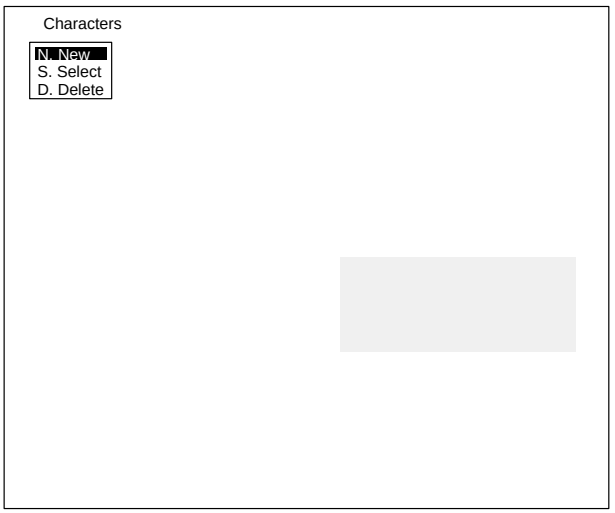
Procedure

1, 2, 3...

1. Select “Inspection region no.” to specify the region to set the character string.
2. Select “L.Character.”



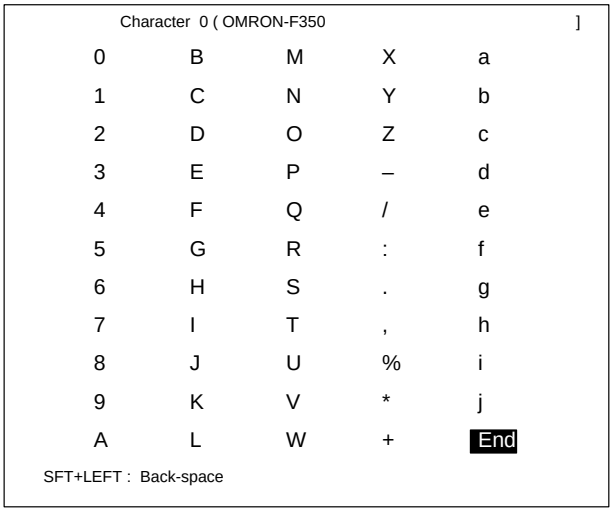
3. Select “N.New.”



4. Enter the character string.

   Move the cursor to each character and press the Enter Key.

Note Modifying a Character String:
Press the Shift and Left Keys to delete the previous character in the string.



5. Select “E.End.”

   The character string is registered in the character string table.The character string is used for the inspection of the specified inspection region number.

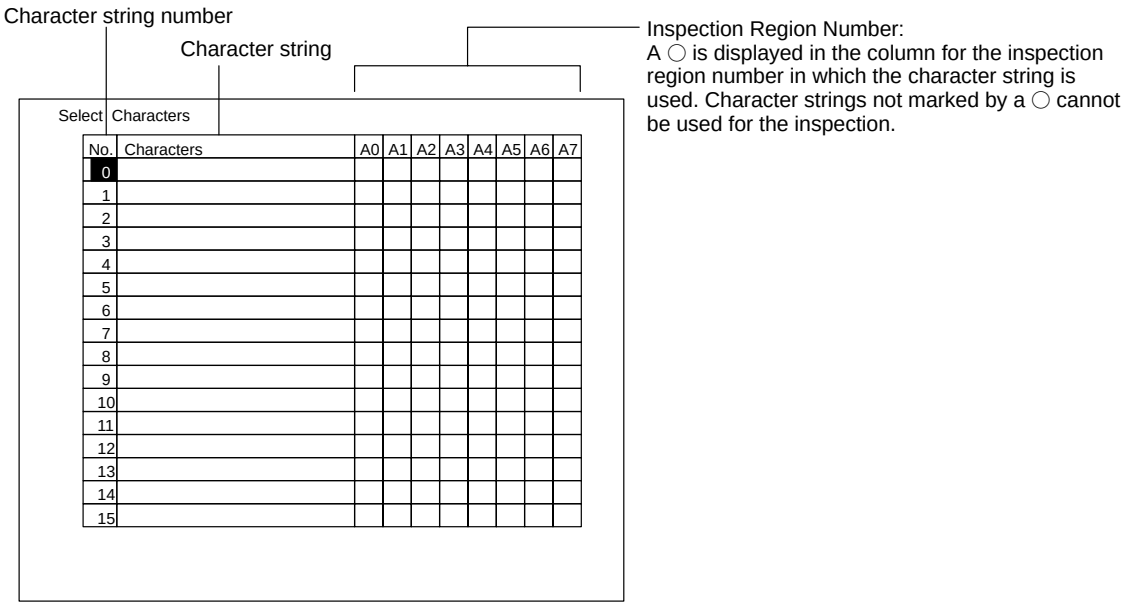
Changing a Character String

Procedure

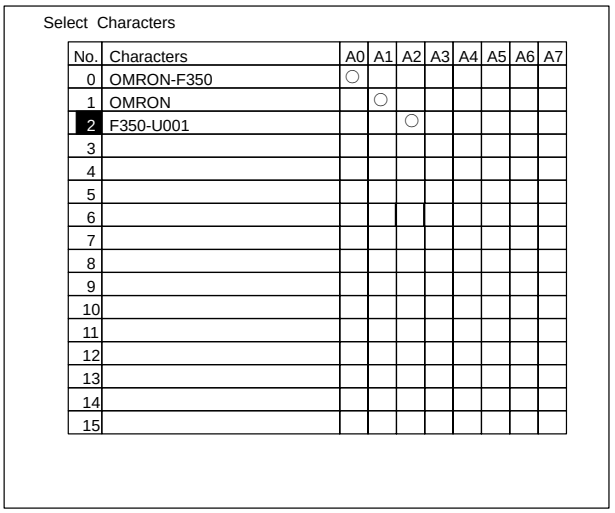
1, 2, 3...

1. Select “Inspection region no.” to specify the character string to change.
2. Select “L.Characters.”
3. Select “S.Select.”

   The current character string table is displayed.



4. Select the character string number.
   Press the Up/Down Keys to move the cursor to the required character string number and press the Enter Key.
   The selected character string is used for the specified inspection number.



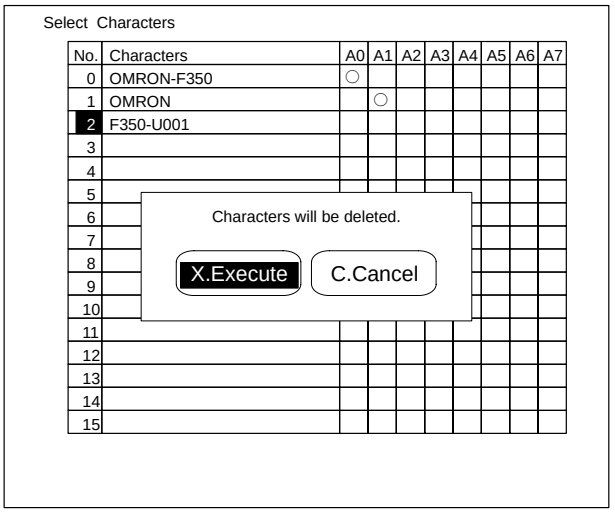
Note Checking the Settings:
Follow steps 1 through 3 to display the character string table and use this table to check the settings.

Deleting a Character String

Procedure

1, 2, 3...

1. Select “Inspection region no.” to specify the character string to delete.
2. Select “L.Characters.”
3. Select “D.Delete.”
   The current character string table is displayed.
4. Select the character string number to delete.
   A confirmation message is displayed.



5. Select “X.Execute.”
   The specified character string is deleted.

Note If the character string is deleted for an inspection number, this inspection cannot be run because the character string does not exist. A character string must be registered before the inspection is started.

4-5-1-3 Selecting the Dictionaries: D.Dictionary

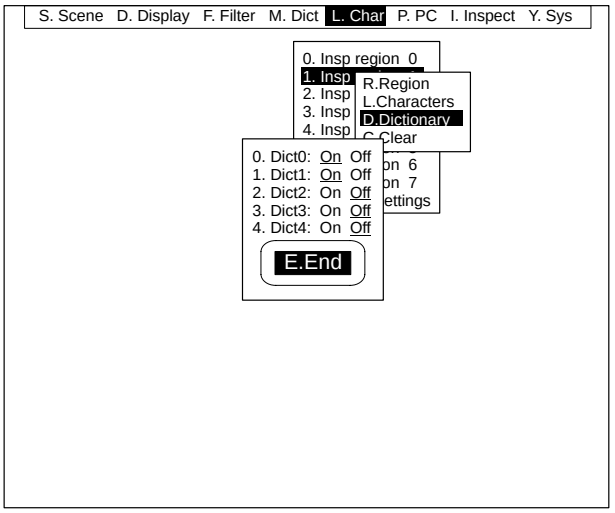
Set which dictionaries are used for the inspection of the character string in each inspection region. Set ON the dictionary number in which the character models for the inspection are registered. Multiple dictionaries can be used.

Note Inspection cannot be conducted if all dictionary numbers are set OFF. Set at least one dictionary number ON. The initial value at the factory is dictionary 0 set ON.

Procedure

1, 2, 3...

1. Select “Inspection region no.” for which the dictionary is specified.
2. Select “D.Dictionary.”
3. Turn ON the dictionaries to be used.



4. Select “E.End.”

4-5-1-4 Clearing Inspection Region Data: C.Clear

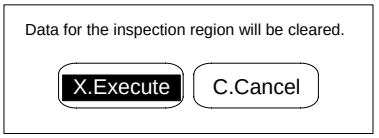
Clear all data related to inspection regions. This data is cleared when the unit is shipped from the factory. This instruction clears the inspection region and cancels the character string and dictionary settings.

Procedure

1, 2, 3...

1. Select “Inspection region no.” to specify the inspection region to clear.
2. Select “C.Clear.”

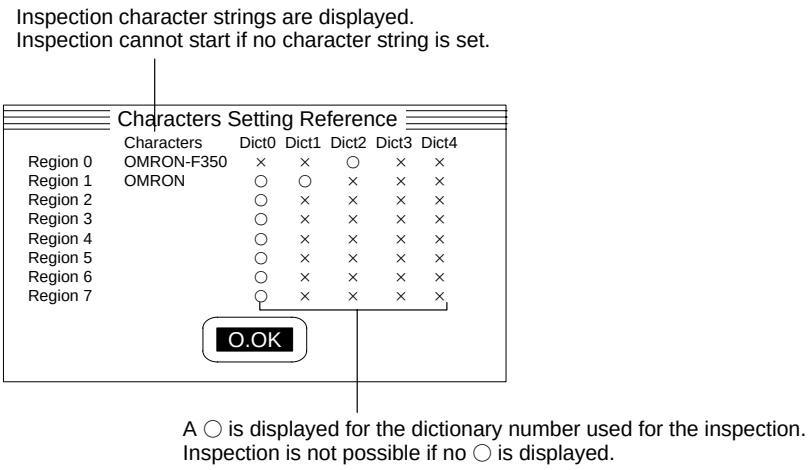
   A confirmation message is displayed.



3. Select “X.Execute.”

4-5-1-5 Checking Inspection Region Data: P.Display settings

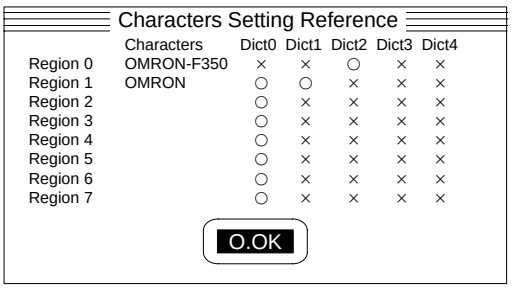
Display a table of all the data set of each inspection region number. Use this table to check that all data is set correctly before starting the inspection. However, data cannot be changed from this menu.



Procedure

1, 2, 3... 1. Select “P.Display settings.”

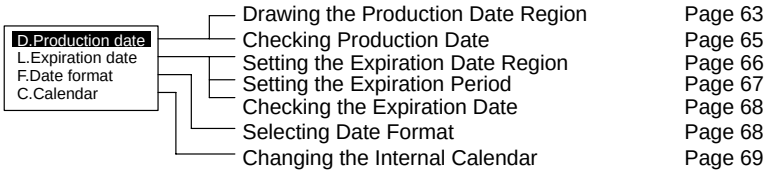
The character string and dictionary set for each inspection are displayed.



2. Select “O.OK.”

4-5-2 Production/Expiration Date Verification Program

Set the details of the date character string and the inspection regions. The Production/Expiration Date Verification Program can simultaneously inspect the dates in the production date and expiration date regions.



4-5-2-1 Drawing the Production Date Region: R.Region

Set the region to inspect the production date as a rectangular region. Use the position compensation function if the position and orientation of the inspected object are not fixed and the inspection position lies outside the inspection region.

Refer to *4-6 P.Position Compensation*.

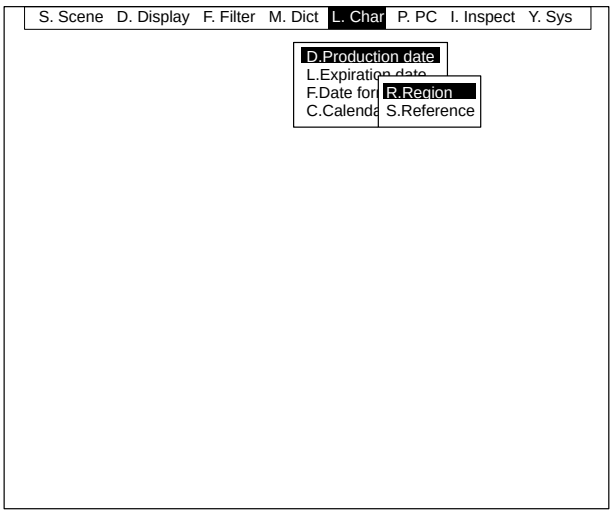
Note Using the Position Compensation Function:
Place an object at the reference position (position registered for the position compensation model) when drawing the inspection region.

Drawing the Region

Procedure

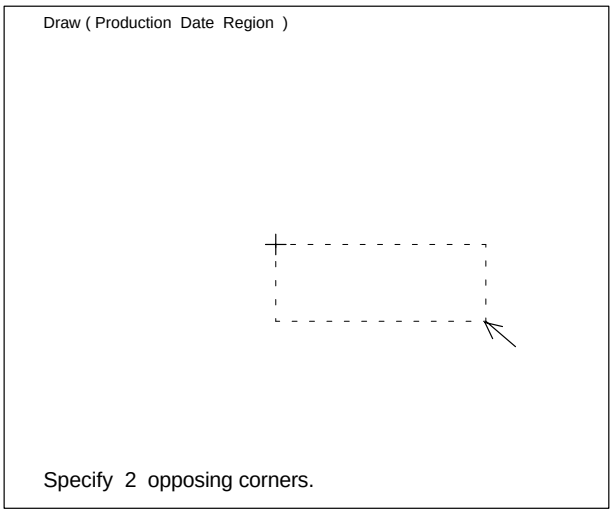
1, 2, 3...

1. Select “D.Production date.”
2. Select “R.Region.”



3. Select “B.Draw.”
4. Move the arrow cursor to specify two opposing corners of the rectangular region.

   The production date region is displayed. Repeat steps 3 and 4 to modify the production date region.

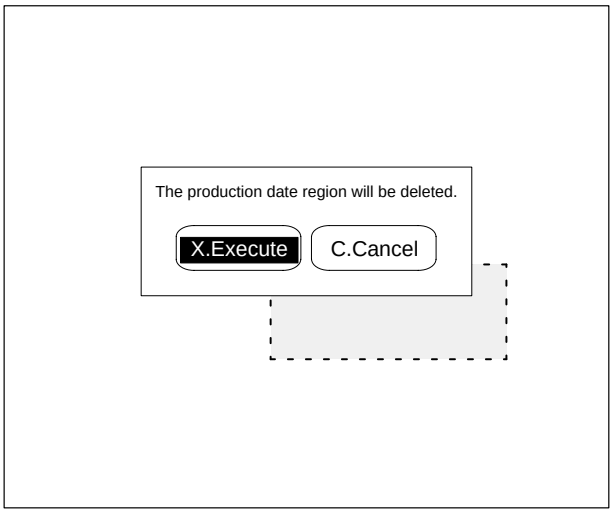


Deleting a Region

Procedure

1, 2, 3...

1. Select “D.Production date.”
2. Select “R.Region.”
3. Select “D.Delete.”
   A confirmation message is displayed.



4. Select “X.Execute.”

4-5-2-2 Checking Production Date: S.Reference

Check the production date to be used in the inspection. The current date from the F350 internal calendar is displayed. However, data cannot be changed from this menu.

Use“C.Calendar” to change the internal calendar.

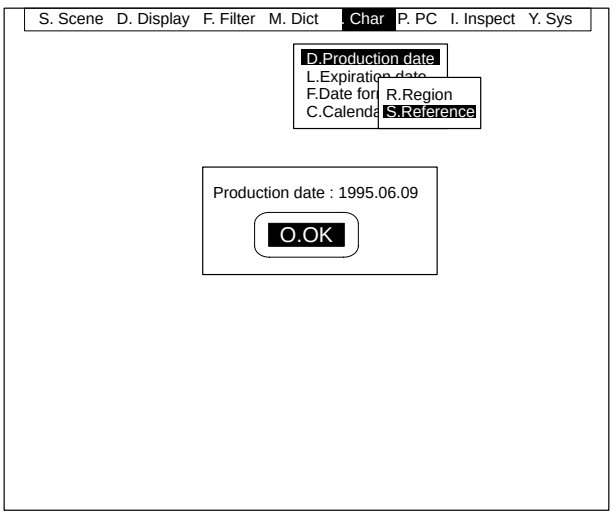
Refer to *4-5-2-7 Changing the Internal Calendar: C.Calendar*.

Procedure

1, 2, 3...

1. Select “D.Production date.”
2. Select “S.Reference.”
   The production date used for the inspection is displayed.

   Note Use “L.Character/F.Date format” to set the date display method. Refer to *4-5-2-6 Selecting Date Format: F.Date format*.



3. Select “O.OK.”

4-5-2-3 Setting the Expiration Date Region: R.Region

Set the region to inspect the expiration date as a rectangular region. Use the position compensation function if the position and orientation of the inspected object are not fixed and the inspection position lies outside the inspection region.

Refer to *4-6 P.Position Compensation*.

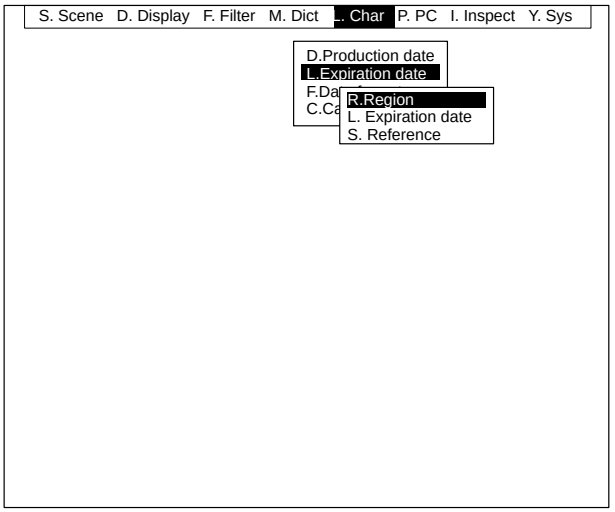
Note Using the Position Compensation Function:
Place an object at the reference position (position registered for the position compensation model) when drawing the inspection region.

Drawing the Region

Procedure

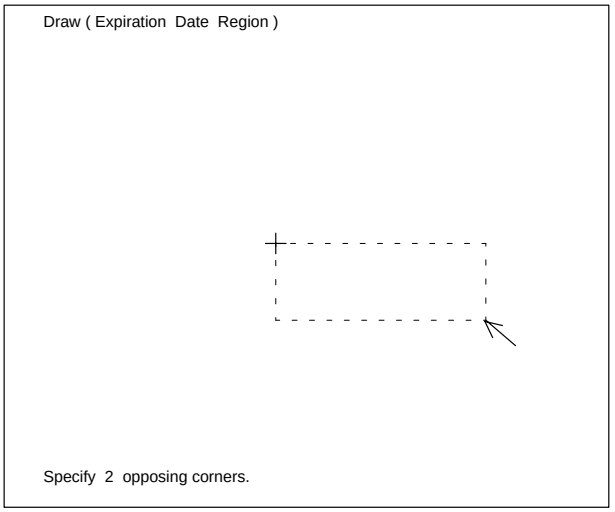
1, 2, 3...

1. Select “L.Expiration date.”
2. Select “R.Region.”



3. Select “B.Draw.”
4. Move the arrow cursor to specify two opposing corners of the rectangular region.

   The expiration date region is displayed. Repeat steps 3 and 4 to modify the expiration date region.

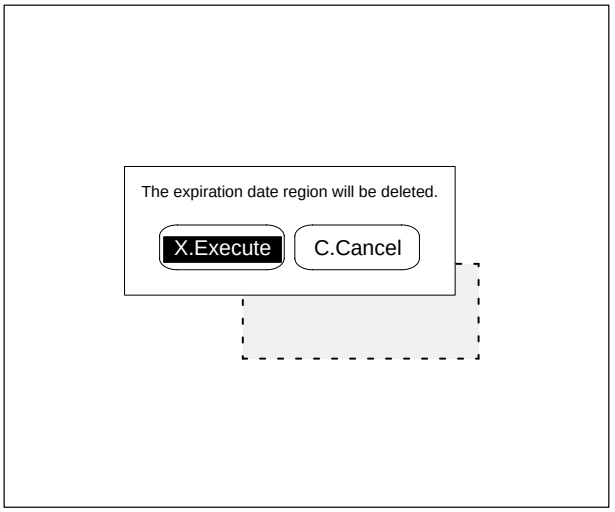


Deleting a Region

Procedure

1, 2, 3...

1. Select “L.Expiration date.”
2. Select “D.Delete.”
3. A confirmation message is displayed.
   Select “X.Execute.”



4. Select “X.Execute.”

4-5-2-4 Setting the Expiration Period: L.Expiration date

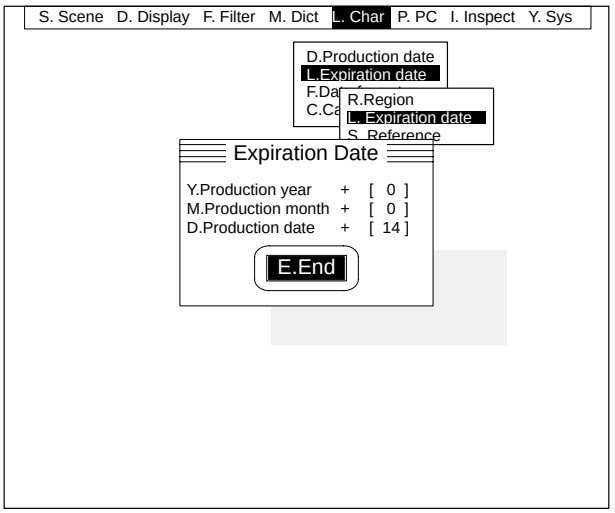
Set the period from 0 to 99 years or months or from 0 to 999 days. The expiration date is the production date + expiration period.

Procedure

1, 2, 3...

1. Select “L.Expiration date.”
2. Select “L.Expiration date.”
3. Set the expiration period.

Note Note the difference between the expiration date and expiration period.
The expiration period is the period between the production date and the expiration date, such that:
Expiration date = Production date + Expiration period



4. Select “E.End.”

4-5-2-5 Checking the Expiration Date: S.Reference

Check the expiration date to be used in the inspection. Make sure that the expiration date is the production date added to the expiration period set with “L.Expiration date/L.Expiration date.” However, data cannot be changed from this menu.

Use“L.Character/C.Calendar” to change the internal calendar.

Refer to *4-5-2-7 Changing the Internal Calendar: C.Calendar*.

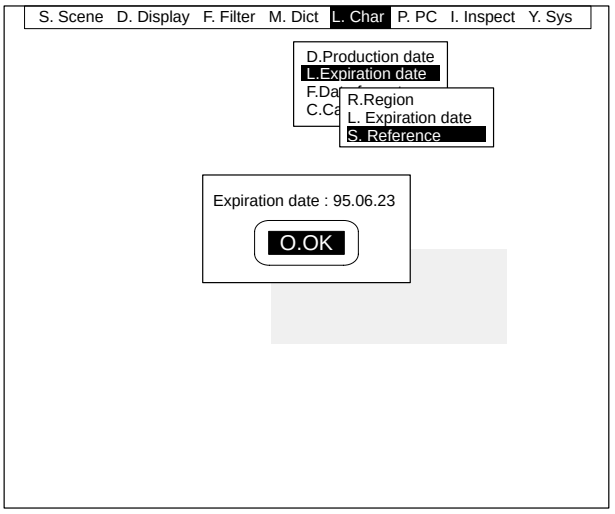
Procedure

1, 2, 3...

1. Select “L.Expiration date.”
2. Select “S.Reference.”

   The expiration date used for the inspection is displayed.

   Note Use “L.Character/F.Date format” to set the date display method. Refer to 4-5-2-6 Selecting Date Format.



3. Select “O.OK.”

4-5-2-6 Selecting Date Format: F.Date format

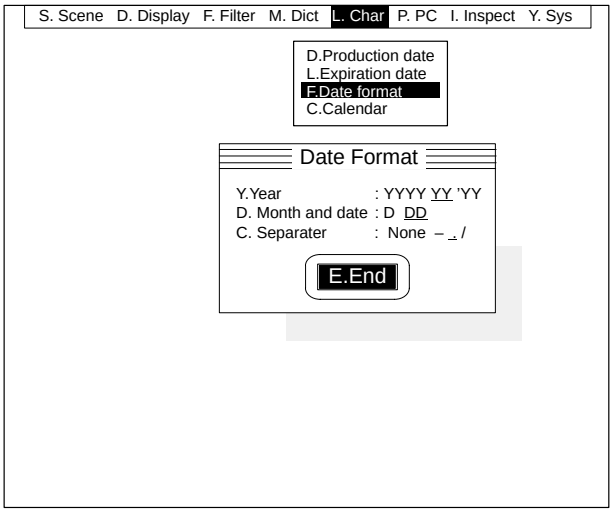
Set the format of the production date and expiration date. The inspected production date and expiration date have a common format on a single line in the order: year, month, day. Select the format of the year, month, day, and delimiter as shown in the following table.

Format		Description
Year	YYYY	Four digits
	YY	Two digits
	’YY	2 digits with apostrophe
Month and day	D	1 to 31
	DD	01 to 31
Delimiter	None	Year and month+day are separated by the specified delimiter character.
	-	
	.	
	/	

Procedure

1, 2, 3... 1. Select “F.Date format.”

2. Set the date format.



3. Select “E.End.”

4-5-2-7 Changing the Internal Calendar: C.Calendar

Change the F350 internal calendar. This menu changes the year, month, and day only and is used to temporarily change the inspection date for testing. Use the Setup Menu to adjust the time and date.

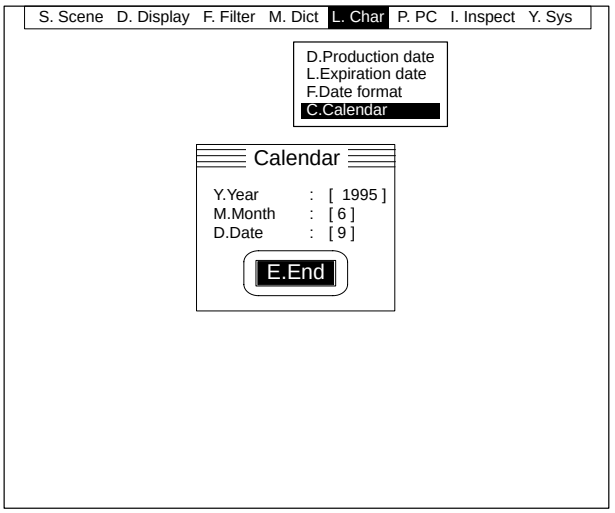
Refer to *5-2-6 Setting the Date and Time for the Timer: D.Date/time* in the F350 Setup Menu Operation Manual.

Item	Input range
Year	1980 to 2079 AD
Month	1 to 12
Day	1 to 31

Procedure

1, 2, 3... 1. Select “C.Calendar.”

2. Set the year, month, and day.

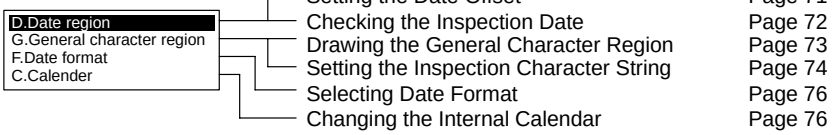


3. Select “E.End.”

   The date is changed in the internal calendar.

4-5-3 Date and Lot Number Verification Program 1

Set the inspection regions and details of the date and character string to be inspected. The Date and Lot Number Verification Program 1 can simultaneously inspect a date region and general character region. Only a date may be inspected in the date region but any character string, such as a lot number, can be inspected in the general character region.



4-5-3-1 Drawing the Date Region: D.Date region

Set the region to inspect the date as a rectangular region. This region is the subject of the date inspection.

Use the position compensation function if the position and orientation of the inspected object are not fixed and the inspection position lies outside the inspection region.

Refer to *4-6 P.Position Compensation*.

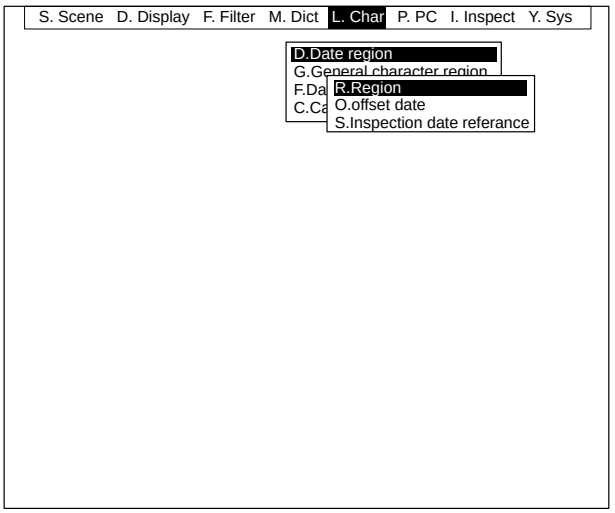
Note Using the Position Compensation Function:
Place an object at the reference position (position registered for the position compensation model) when drawing the inspection region.

Drawing the Region

Procedure

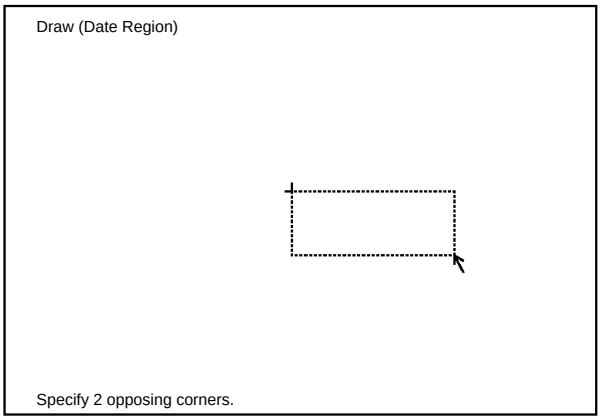
1, 2, 3...

1. Select “D.Date region.”
2. Select “R.Region.”
3. Select “B.Draw.”



4. Move the arrow cursor to specify two opposing corners of the rectangular region.

   The date region is displayed. Repeat steps 2 through 4 to modify the date region.



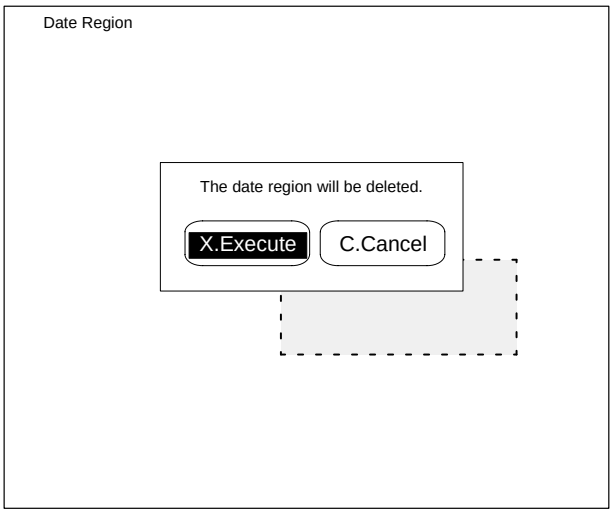
Deleting a Region

Procedure

1, 2, 3...

1. Select “D.Date region.”
2. Select “R.Region.”
3. Select “D.Delete.”

   A confirmation message is displayed.



4. Select “X.Execute.”

4-5-3-2 Setting the Date Offset: O.Offset date

The inspection date is based on the F350 internal calendar setting. Set the actual inspection date as an offset from the calendar date. Set the offset from 0 to 99 years or months or from 0 to 999 days.

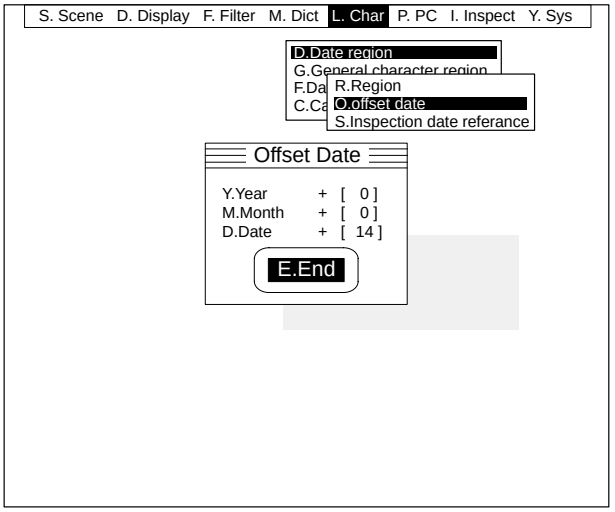
Procedure

1, 2, 3...

1. Select “D.Date region.”
2. Select “O.Offset date.”

3. Enter the offset value.

   Enter the offset from the internal calendar date. A negative offset cannot be input.



4. Select “E.End.”

4-5-3-3 Checking the Inspection Date

Check the inspection date. The displayed inspection date is the internal calendar date added to the offset value set with “R.Region/D.Date region/O.Offset date.” However, data cannot be changed from this menu.

Use “L.Character/C.Calendar” to change the internal calendar.

Refer to *4-5-3-7 Changing the Internal Calendar: C.Calendar*.

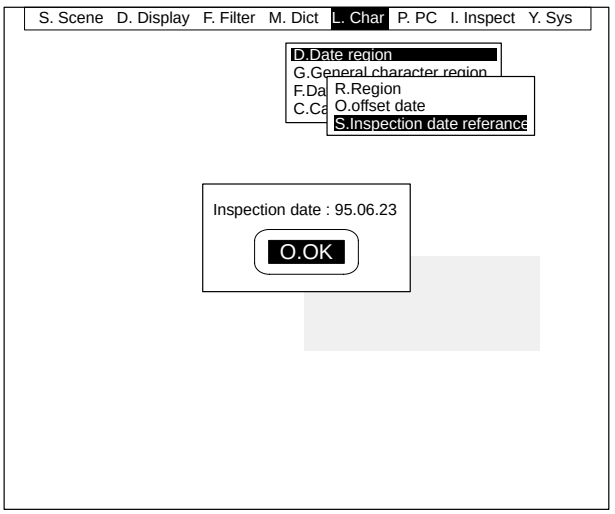
Procedure

1, 2, 3...

1. Select “D.Date region.”
2. Select “S.Inspection date reference.”

   The inspection date is displayed.

   Note Use “L.Character/F.Date format” to set the date display method. Refer to *4-5-3-6 Selecting Date Format: F.Date format*.



3. Select “O.OK.”

4-5-3-4 Drawing the General Character Region: R.Region

Set the region to inspect an arbitrary character string. This region is the subject of the character string inspection.

Use the position compensation function if the position and orientation of the inspected object are not fixed and the inspection position lies outside the inspection region.

Refer to *4-6 P.Position Compensation*.

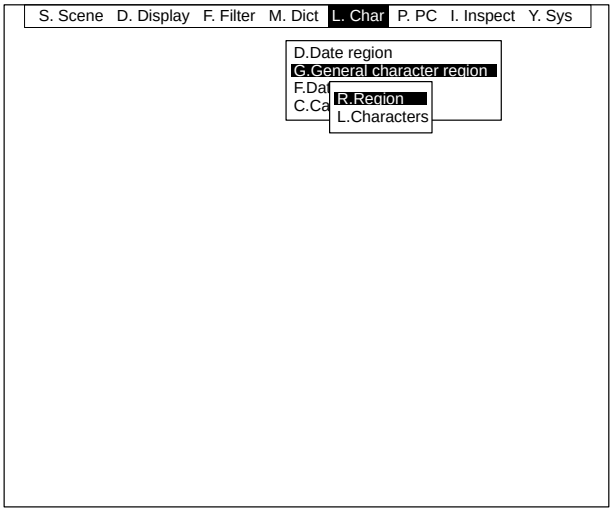
Note Using the Position Compensation Function:
Place an object at the reference position (position registered for the position compensation model) when drawing the inspection region.

Drawing the Region

Procedure

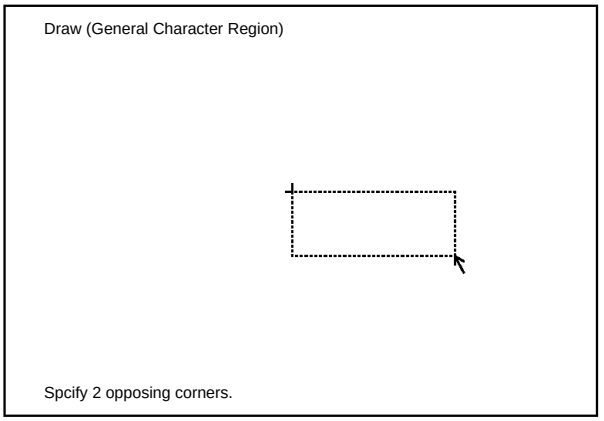
1, 2, 3...

1. Select “G.General character region.”
2. Select “R.Region.”



3. Select “B.Draw.”
4. Move the arrow cursor to specify two opposing corners of the rectangular region.

   The inspection region is displayed. Repeat steps 3 and 4 to modify the inspection region.



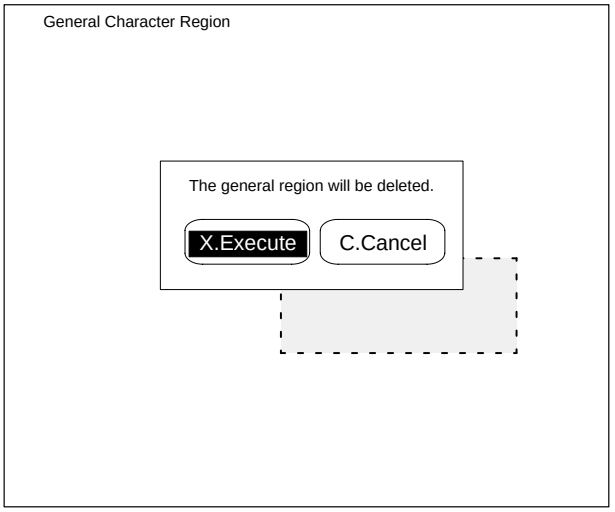
Deleting a Region

Procedure

1, 2, 3...

1. Select “G.General character region.”
2. Select “R.Region.”
3. Select “D.Delete.”

   A confirmation message is displayed.



4. Select “X.Execute.”

4-5-3-5 Setting the Inspection Character String: L.Character

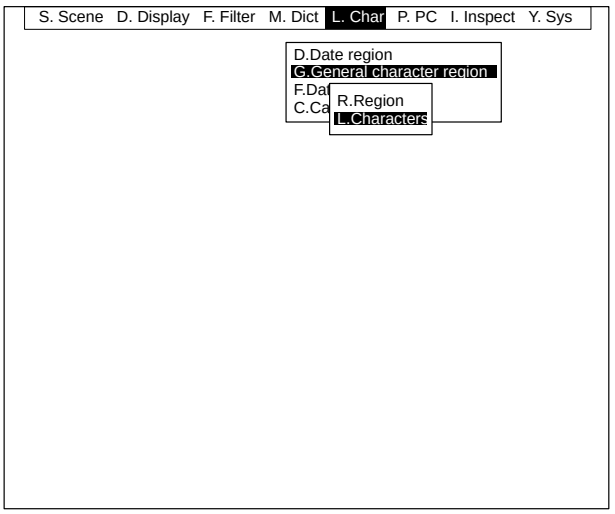
Set the character string to be inspected in the general character region. A character string up to 24 characters long can be set.

Setting a Character String

Procedure

1, 2, 3...

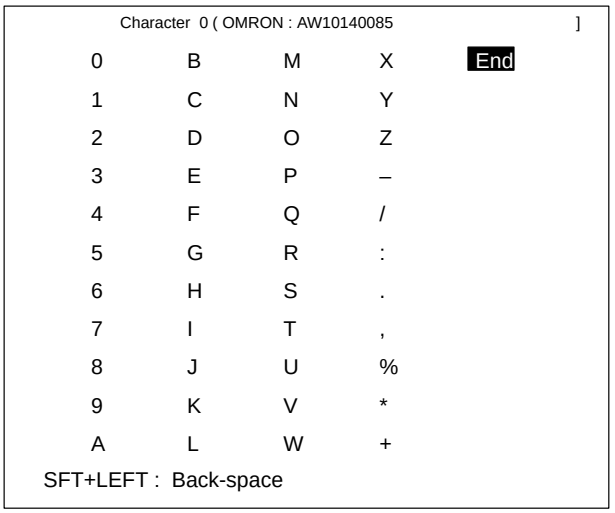
1. Select “G.General character region.”
2. Select “L.Character.”



3. Select “S.Set.”

4. Enter the character string.

   Move the cursor to each character and press the Enter Key.



5. Select “E.End.”

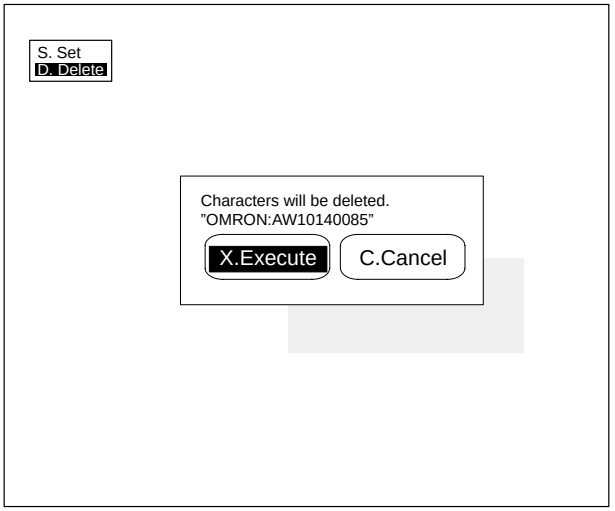
Deleting a Character String

Procedure

1, 2, 3...

1. Select “G.General character region.”
2. Select “L.Character.”
3. Select “D.Delete.”

   A confirmation message is displayed.



4. Select “X.Execute.”

4-5-3-6 Selecting Date Format: F.Date format

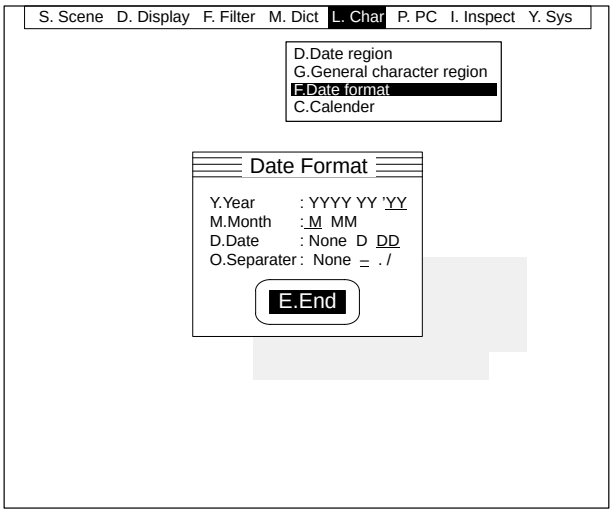
Set the format for the date inspection. The date is inspected on a single line in the order: year, month, day. Select the format of the year, month, day, and delimiter as shown in the following table.

Year, month, day, delimiter	Format	Description
Year	YYYY	Four digits
	YY	Two digits
	'YY	2 digits with apostrophe
Month	M	1 to 12
	MM	01 to 12
	None	Month not marked
Day	D	1 to 31
	DD	01 to 31
Delimiter	None	Year, month, and day are separated by the specified delimiter character.
	-	
	.	
	/	

Procedure

1, 2, 3...

1. Select "F.Date format."
2. Set the date format.



3. Select "E.End."

4-5-3-7 Changing the Internal Calendar: C.Calendar

Change the F350 internal calendar. This menu changes the year, month, and day only and is used to temporarily change the inspection date for testing. Use the Setup Menu to adjust the time and date.

Refer to *5-2-6 Setting the Date and Time for the Timer: D.Date/time* in the F350 Setup Menu Operation Manual.

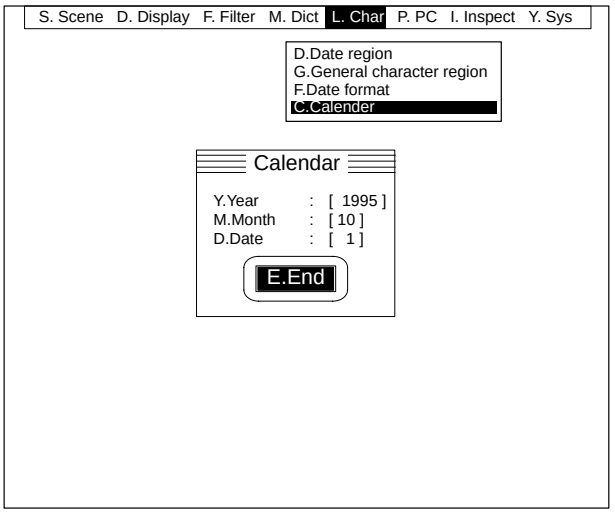
Set the year, month, and day in the ranges shown below.

Item	Input range
Year	1980 to 2079 AD
Month	1 to 12
Day	1 to 31

Procedure

1, 2, 3... 1. Select “C.Calendar.”

2. Set the year, month, and day.

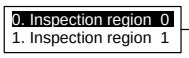


3. Select “E.End.”

   The date is changed in the internal calendar.

4-5-4 Date and Lot Number Verification Program 2

Set the inspection regions and details of the character strings to be inspected. The Date and Lot Number Verification Program 2 can simultaneously inspect any character string in up to the two regions.



Drawing the Inspection Region Page 77
Setting the Inspection Character String Page 79

4-5-4-1 Drawing the Inspection Region: R.Region

Set the rectangular inspection regions. The image inside this region is used for the inspection.

Use the position compensation function if the position and orientation of the inspected object are not fixed and the inspection position lies outside the inspection region.

Refer to *4-6 P.Position Compensation*.

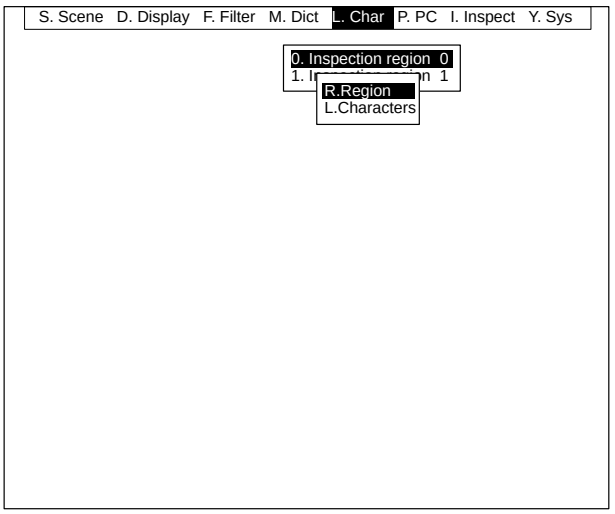
Note Using the Position Compensation Function:
Place an object at the reference position (position registered for the position compensation model) when drawing the inspection region.

Drawing the Region

Procedure

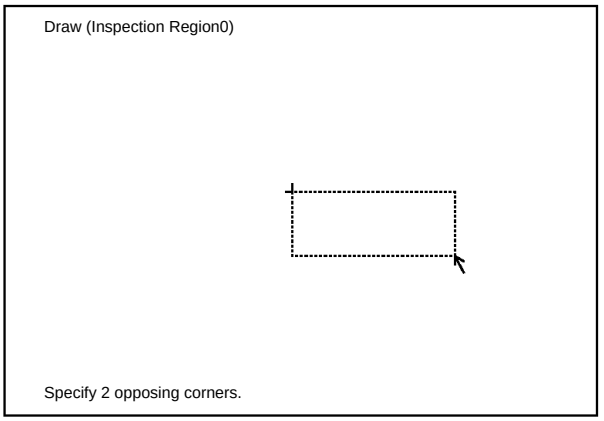
1, 2, 3...

1. Select “Inspection region no.” to specify the region to draw.
2. Select “R.Region.”



3. Select “B.Draw.”
4. Move the arrow cursor to specify two opposing corners of the rectangular region.

   The inspection region is displayed. Repeat steps 3 and 4 to modify the inspection region.



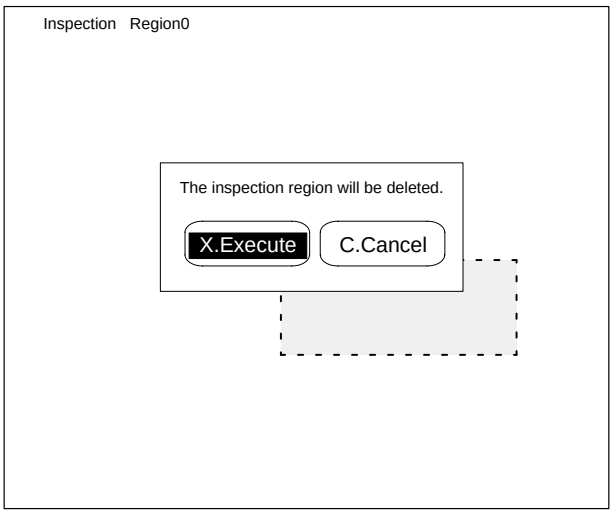
Deleting a Region

Procedure

1, 2, 3...

1. Select “Inspection region no.” to specify the region to delete.
2. Select “R.Region.”
3. Select “D.Delete.”

   A confirmation message is displayed.



4. Select “X.Execute.”

4-5-4-2 Setting the Inspection Character String: L.Characters

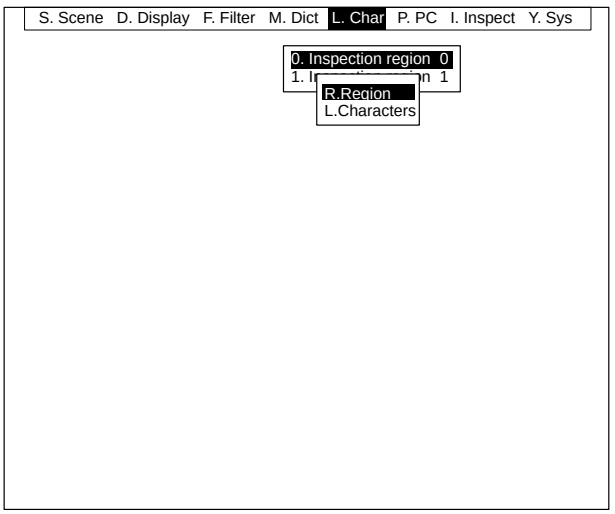
Set the character string to be inspected in the inspection region as up to 24 characters.

Setting a Character String

Procedure

1, 2, 3...

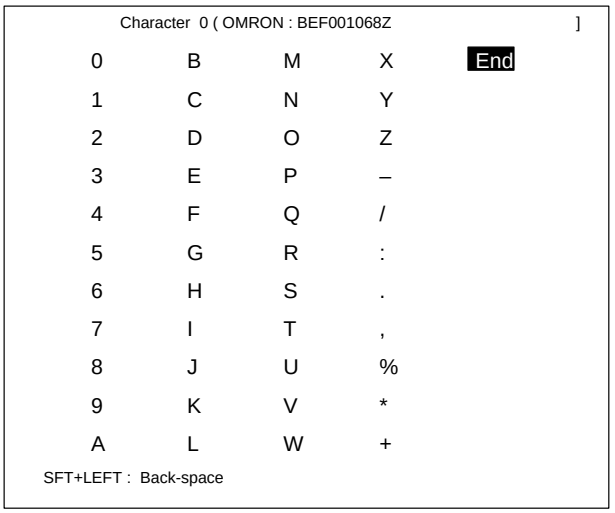
1. Select “Inspection region no.” to specify the region to set the character string.
2. Select “L.Characters.”



3. Select “S.Set.”

4. Enter the character string.

   Move the cursor to each character and press the Enter Key.



5. Select “E.End.”

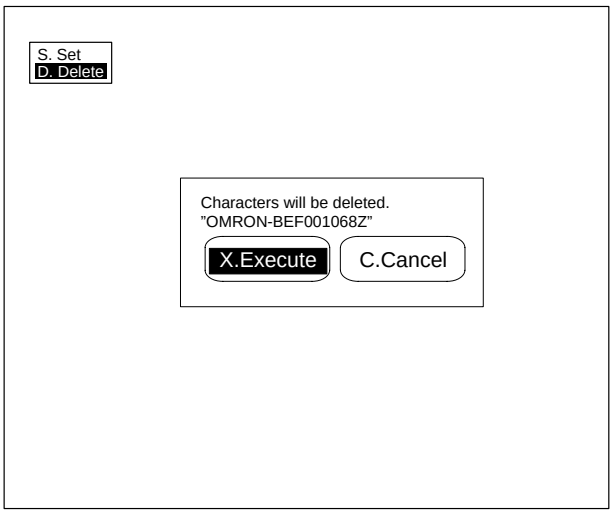
Deleting a Character String

Procedure

1, 2, 3...

1. Select “Inspection region no.” to specify the character string to delete.
2. Select “L.Characters.”
3. Select “D.Delete.”

   A confirmation message is displayed.



4. Select “X.Execute.”

4-6 P.Position Compensation

Use the position compensation function if the position and orientation of the inspected object are not fixed. The position compensation function automatically detects a displacement between the position of the current inspected object and the reference position (position registered for the position compensation model) and ensures that the image is displayed at the reference position. This ensures that the inspection position lies inside the inspection region.

M. Position compensation mode
D. Model for position compensation
Selecting the Position Compensation Mode Page 81
Registering the Position Compensation Models Page 83

4-6-1 Selecting the Position Compensation Mode: M.Position compensation mode

The position compensation mode must be selected before position compensation can be carried out. The angle range and speed must also be selected.

Selecting the Position Compensation Mode

Two different methods of position compensation can be used.

- 1-model Position Compensation:
  One feature (corner or mark) on the inspected object is used to determine the position and rotation of the object.
- 2-model Position Compensation:
  The angle of the line joining two features on the inspected object is used to determine the rotation of the object.

Refer to *4-6-2 Registering Position Compensation Models*.

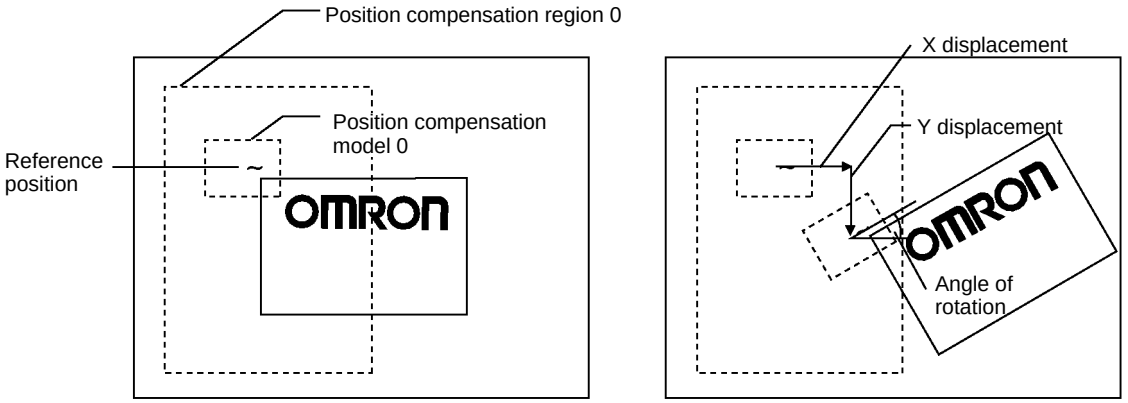
The method of position compensation used in each mode is described below.

To increase the accuracy of the registered reference position, set the display to static (freeze) before setting the position compensation data.

Refer to *4-2-1 Selecting the Image Display: F.Freeze*.

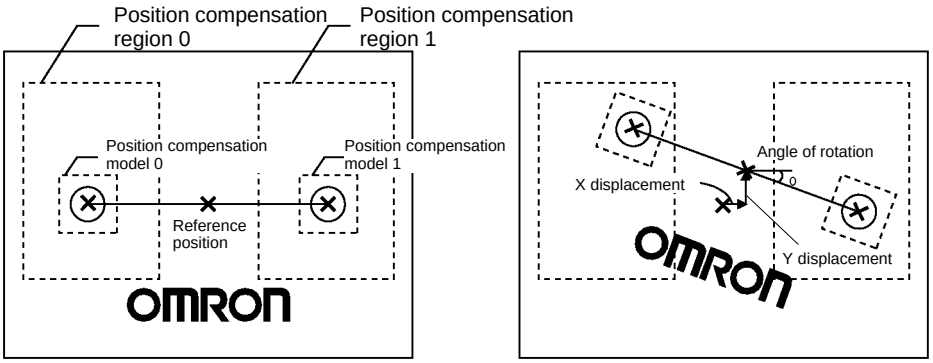
1-Model Position Compensation

A single model is searched for in the position compensation region. The displacement (X, Y, θ) is detected between the reference position coordinates and the coordinates with the highest correlation to the model, and the image scrolls by the detected amount of displacement.



2-Model Position Compensation

Two models are searched for in the position compensation region. The position with the highest correlation to the model is found for each model (model center coordinates). The center coordinates (X, Y) and rotation (θ) of the line joining the two model centers are detected and the image scrolls by the detected amount of displacement.



Selecting the Angle Range

Set the range of the angle of rotation of the inspected object using “R.Angle range.” Incorrect position correction results if the angle of rotation of the inspected object exceeds the set range.

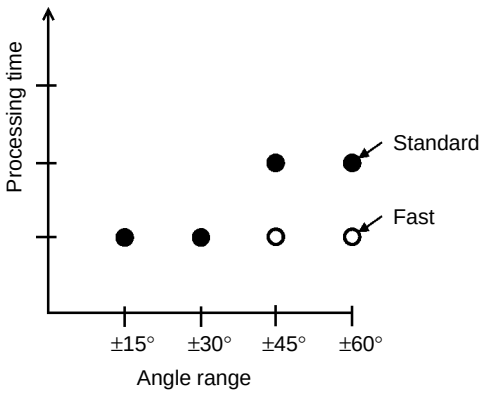
Selecting the Speed

Set the speed of position compensation. Set the speed to “Fast” to increase the position compensation speed by halving the vertical resolution of the position compensation model. Select “Fast” if positional detection accuracy of the position compensation model is unaffected by halving the vertical resolution of the position compensation model.

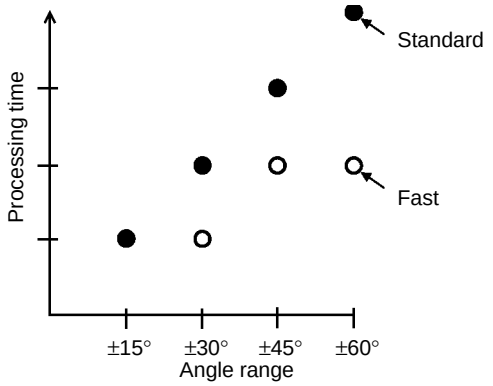
Note Setting “Fast” does not increase processing speed if a shutter camera is used.

The position compensation processing time differs according to the position compensation mode and angle range.

1-model Position Compensation Mode



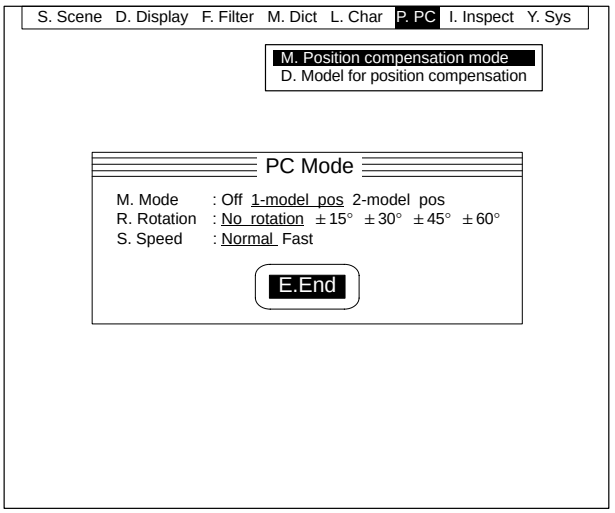
2-model Position Compensation Mode



Procedure

1, 2, 3... 1. Select “M.Position compensation mode”

2. Set the position compensation data.



3. Select “E.End.”

4-6-2 Registering the Position Compensation Models: D.Model for position compensation

Register the position compensation model and position compensation region. Specify a region of the image with a detectable feature as the position compensation model. The position of this feature at registration becomes the position compensation reference position. Make sure that the inspected object and the inspection region are in their correct positions.

The number of models which can be registered depends on which position compensation mode is selected, as follows:

- 1-model Position Compensation Mode: Register model 0 only, not model 1
- 2-model Position Compensation Mode: Register both model 0 and model 1

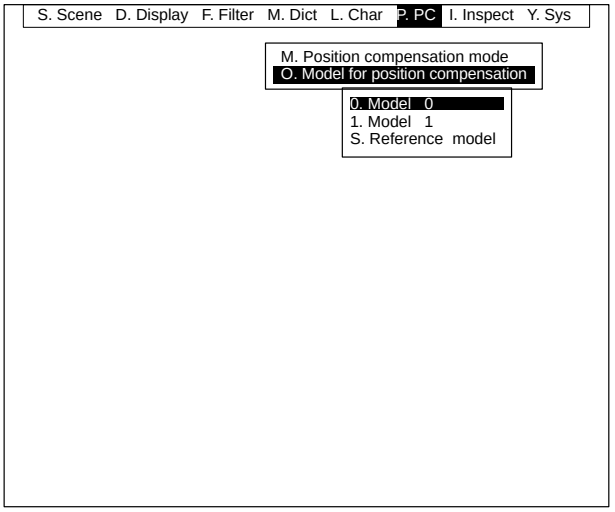
Specify the position compensation region such that the position compensation model can be searched for even if the inspected object is moving. Incorrect position correction results if the position compensation model cannot be found in the position compensation range.

Registering the Position Compensation Models

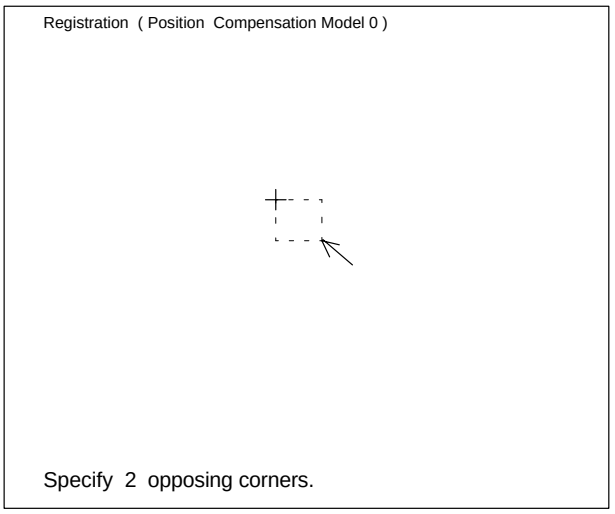
Procedure

1, 2, 3...

1. Select “D.Model for position compensation.”
2. Select “0.Model 0.”



3. Select “R.Registration.”
4. Specify two opposing corners of the rectangular region to be registered as the model.



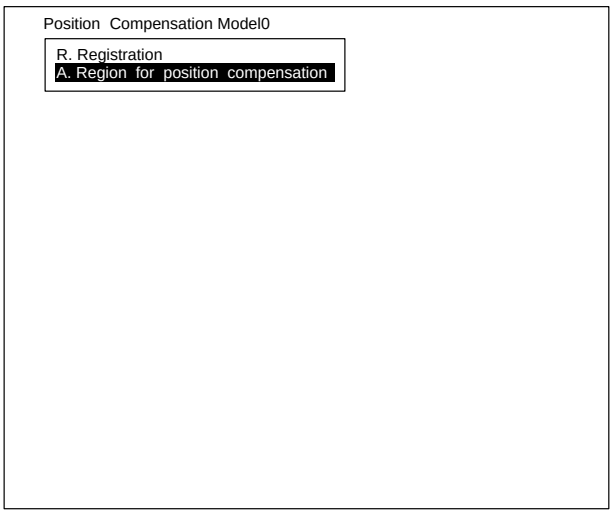
When the 2-model position compensation mode is selected, register model 1 in the same way as model 0. Repeat steps 3 and 4 using “1.Model 1.”

Drawing the Position Compensation Region

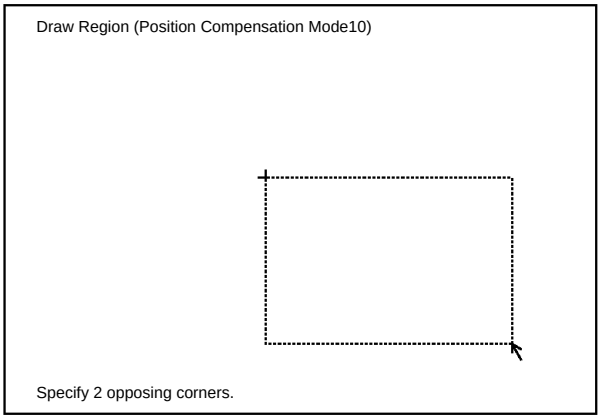
Procedure

1, 2, 3...

1. Select “D.Model for position compensation.”
2. Select “0.Model 0.”



3. Select “A.Region for position compensation.”
4. Select “B.Draw.”
5. Specify two opposing corners of the rectangular region to be registered as the position compensation region.



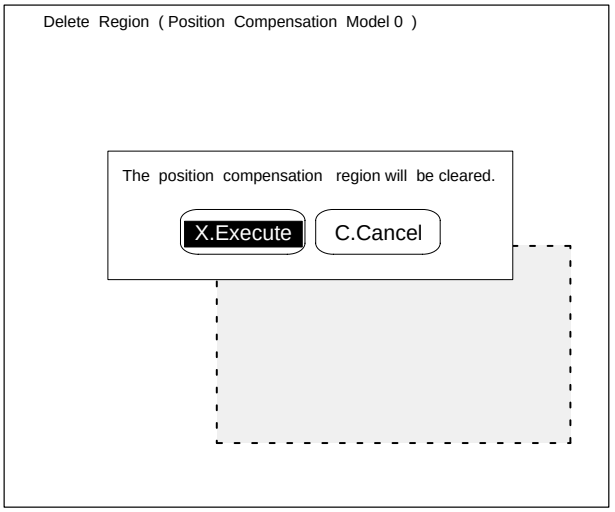
When the 2-model position compensation mode is selected, draw the region for model 1 in the same way as for model 0. Repeat steps 3 through 5 using “1.Model 1.”

Deleting the Position Compensation Region

Procedure

1, 2, 3...

1. Select “D.Model for position compensation.”
2. Select “0.Model 0.”
3. Select “A.Region for position compensation.”
4. Select “D.Delete.”
   A confirmation message is displayed.

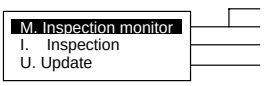


5. Select “X.Execute.”

When the 2-model position compensation mode is selected, draw the region for model 1 in the same way as for model 0. Repeat steps 3 through 5 using “1.Model 1.”

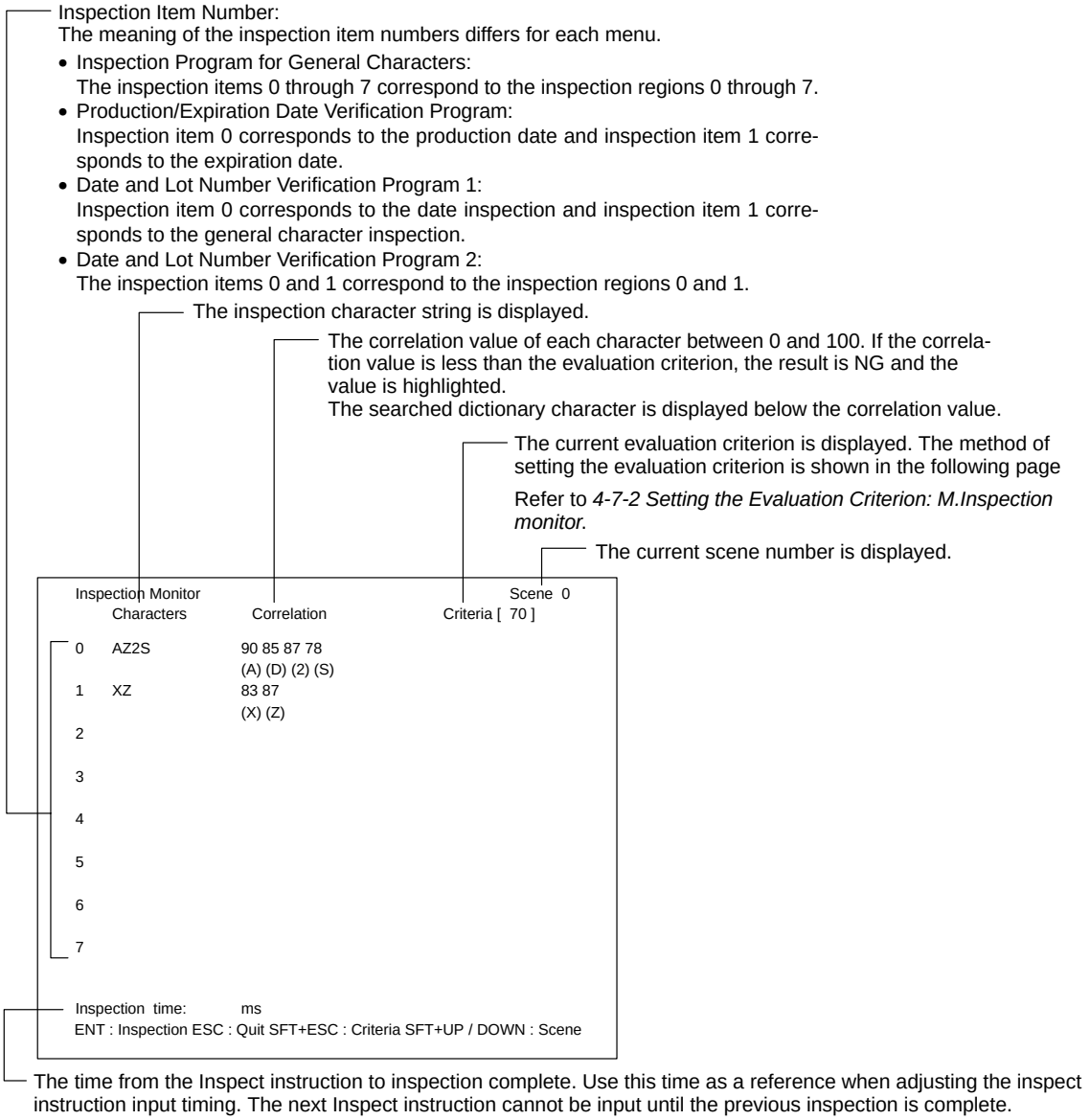
4-7 I.Inspection

Set the evaluation criterion and run the inspection based on the set conditions. When using a menu which uses the automatic calendar to inspect dates, the inspection date is updated to the calendar date.



4-7-1 Checking Correlation Value and Inspection Time: M.Inspection monitor

The correlation value for each character and the inspection time can be checked before starting the inspection. The inspection starts when the Inspect instruction is given and the result is displayed on the video monitor. However, the result is not output to any Terminal Block Unit, Parallel I/O Unit, or RS-232C I/F Unit which is mounted.



Note Instruction Input Timing:
The next instruction cannot be input until the previous instruction execution is complete. If a Terminal Block Unit or Parallel I/O Unit is mounted, the Busy signal remains ON during instruction execution. Check that the Busy signal has turned OFF before inputting the next instruction.

What Instructions Can Be Input

Note Switching to a Scene with No Inspection Items Set:
The Switch Scene instruction allows switching to a scene with no inspection items set, but only the End Inspection instruction is valid.

Console

The following instructions can be input from the Console.

Instruction	Keys	Action
Inspect	ENT	Starts the inspection and displays the evaluation result.
Switch Scene	SHIFT+ ▲ / ▼	Increase or decrease the number of the displayed screen.
End Inspection	ESC	Cancels the inspection screen and reverts to the M.Inspection menu.

Parallel I/O

The following instructions can be input from a Parallel I/O Unit or a Terminal Block Unit. In the table below, 1 indicates a bit is ON and 0 indicates a bit is OFF. An asterisk (*) indicates the bit may be either ON or OFF.

Inspection Program for General Characters

Instruction	Input data DI: 7 6 5 4 3 2 1 0	Action
Switch Scene	0 * 1 0 (Scene #) Example: 0 0 1 0 0 1 0 0	Switches the number of the displayed screen. Set the scene number from 0 to 15 specified with the bits DI0 to 3 and turn DI5 ON after 1 ms. The example switches to scene 4.
Switch Inspection Region	0 1 0 0 * (Inspection region #) Example: 0 1 0 0 0 0 0 1	Sets the inspection region in which the Switch Character String instruction is valid. This instruction has no effect on the inspection. The example sets the Switch Character String instruction to act in inspection region 1.
Switch Character String	1 (Character string #) Example: 0 1 0 0 0 0 0 1	Switches the character string number for the inspection region specified by the Switch Inspection Region instruction. Set the character string number in binary with the bits DI0 to 6. If the Switch Character String instruction is executed without executing the Switch Inspection Region instruction, the Switch Character String instruction acts on inspection region 0. The example sets character string 33.

Production/Expiration Date Verification Program and Date and Lot Number Verification Program 1

Instruction	Input data DI: 7 6 5 4 3 2 1 0	Action
Switch Scene	0 * 1 0 (Scene #) Example: 0 0 1 0 0 1 0 0	Switches the number of the displayed screen. Set the scene number from 0 to 15 specified with the bits DI0 to 3 and turn DI5 ON after 1 ms. The example switches to scene 4.
Change Date	* 1 0 * * * *	Changes the date used for the inspection to the date in the internal calendar.

Date and Lot Number Verification Program 2

Instruction	Input data DI: 7 6 5 4 3 2 1 0	Action
Switch Scene	0 * 1 0 (Scene #) Example: 0 0 1 0 0 1 0 0	Switches the number of the displayed screen. Set the scene number from 0 to 15 specified with the bits DI0 to 3 and turn DI5 ON after 1 ms. The example switches to scene 4.

STEP Signal Input The inspection runs once each time the STEP signal turns from OFF to ON.

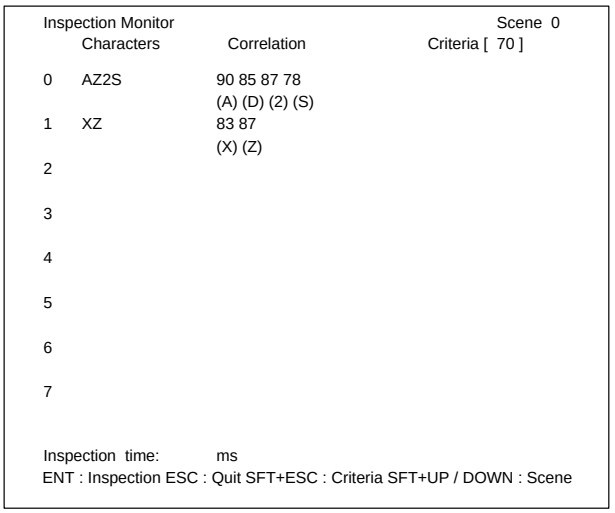
RS-232C Input The following commands can be input via the RS-232C for date and lot number verification programs 1 and 2. Add delimiters to the ASCII input codes listed below.

Note Match the communications specifications of the F350 and external device. Set either CR or CR+LF as the delimiter. Refer to *5-2-3 Setting the RS-232C Communications Specifications: R.RS-232C* in the F350 Setup Menu Operation Manual.
Only use channel 0.
The F300-E RS-232C Unit channel 1 cannot be used.

<table>
<tr><th>Instruction</th><th>Input data</th><th>Action</th></tr>
<tr><td>Inspect</td><td>M</td><td rowspan="2">Runs the inspection once.</td></tr>
<tr><td>m</td></tr>
<tr><td rowspan="4">Switch Scene</td><td>CTRL+E</td><td>Increases scene number by 1.</td></tr>
<tr><td>CTRL+X</td><td>Decreases scene number by 1.</td></tr>
<tr><td>S Scene #</td><td rowspan="2">Displays the specified scene number.</td></tr>
<tr><td>s Scene #</td></tr>
<tr><td>Change Character String</td><td>C Inspection region # Character string
c Inspection region # Character string</td><td>Changes to the specified inspection character string for the specified inspection region.
<table>
<tr><th>Menu</th><th>Inspection region #</th><th>Character string</th></tr>
<tr><td>Date and lot number verification program 1</td><td>1</td><td>Max. 24 characters</td></tr>
<tr><td>Date and lot number verification program 2</td><td>0 to1</td><td>Max. 24 characters</td></tr>
</table></td></tr>
<tr><td>End Inspection</td><td>Q
q</td><td>Ends the inspection.</td></tr>
</table>

Procedure

1, 2, 3... 1. Select “M.Inspection monitor.”
Shows the inspection monitor screen for the currently displayed scene.
2. Press the Enter Key.
The inspection monitor results are displayed.



4-7-2 Setting the Evaluation Criterion: M.Inspection monitor

Set the evaluation criterion to evaluate OK and NG inspection results. Set the evaluation criterion to the minimum limit of the correlation value for a non-defective part (OK result). A correlation value less than the set evaluation criterion is evaluated as a defect (NG result).

Determining the Evaluation Criterion

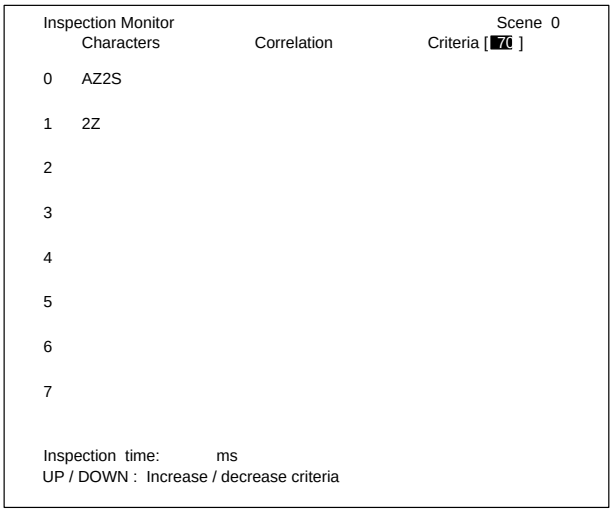
Run the inspection using various sample workpieces to get a feel for the correlation values. Set the evaluation criterion at the borderline between a satisfactory part and a defect.

Procedure

1, 2, 3...

1. Select “M.Inspection monitor.”
2. Press the Shift and Escape Keys.
3. Enter the evaluation criterion.
4. Press the Enter Key.

   The display reverts to the inspection screen.



4-7-3 Running the Inspection: I.Inspection

Runs the inspection based on the set inspection conditions. The inspection is run using instructions from the inspection screen.

Make all connections with the input devices if a Terminal Block Unit, Parallel I/O Unit, or RS-232C I/F Unit is used.

The inspection screen is displayed after the power supply is turned on and the system waits for an instruction to be input.

Refer to *4-8-1 Automatic Inspection: M.Initial mode*.

Inputting Instructions from the Inspection Screen

Note Instruction Input Timing

The next instruction cannot be input until the previous instruction execution is complete. If a Terminal Block Unit or Parallel I/O Unit is mounted, the Busy signal remains ON during instruction execution. Check that the Busy signal has turned OFF before inputting the next instruction.

Switching to a Scene with No Inspection Items Set

The Switch Scene instruction allows switching to a scene with no inspection items set, but only the End Inspection instruction is valid.

Console

The following instructions can be input from the Console.

Instruction	Keys	Action
Inspect	ENT	Starts the inspection and displays the evaluation result.
Switch Scene	SHIFT+ ▲ / ▼	Increase or decrease the number of the displayed screen.
End Inspection	ESC	Cancels the inspection screen and reverts to the M.Inspection menu.

Parallel I/O

The following instructions can be input from a Parallel I/O Unit or a Terminal Block Unit. In the table below, 1 indicates a bit is ON and 0 indicates a bit is OFF. An asterisk (*) indicates the bit may be either ON or OFF.

Inspection Program for General Characters

Instruction	Input data DI: 7 6 5 4 3 2 1 0	Action
Inspect	0 * * 1 * * * *	Continuous inspection while this instruction is input.
Switch Scene	0 * 1 0 (Scene #) Example: 0 0 1 0 0 1 0 0	Switches the number of the displayed screen. Set the scene number from 0 to 15 specified with the bits DI0 to 3 and turn DI5 ON after 1 ms. The example switches to scene 4.
Switch Inspection Region	0 1 0 0 * (Inspection region #) Example: 0 1 0 0 0 0 0 1	Sets the inspection region in which the Switch Character String instruction is valid. This instruction has no effect on the inspection. The example sets the Switch Character String instruction to act in inspection region 1.
Switch Character String	1 (Character string #) Example: 1 0 1 0 0 0 0 1	Switches the character string number for the inspection region specified by the Switch Inspection Region instruction. If the Switch Character String instruction is executed without executing the Switch Inspection Region instruction, the Switch Character String instruction acts on inspection region 0. The example sets character string 33.

Production/Expiration Date Verification Program and Date and Lot Number Verification Program 1

Instruction	Input data DI: 7 6 5 4 3 2 1 0	Action
Inspect	* * * 1 * * * *	Continuous inspection while this instruction is input.
Switch Scene	0 * 1 0 (Scene #) Example: 0 0 1 0 0 1 0 0	Switches the number of the displayed screen. Set the scene number from 0 to 15 specified with the bits DI0 to 3 and turn DI5 ON after 1 ms. The example switches to scene 4.
Change Date	* 1 0 * * * *	Changes the date used for the inspection to the date in the internal calendar.

Date and Lot Number Verification Program 2

Instruction	Input data DI: 7 6 5 4 3 2 1 0	Action
Inspect	* * * 1 * * * *	Continuous inspection while this instruction is input.
Switch Scene	0 * 1 0 (Scene #) Example: 0 0 1 0 0 1 0 0	Switches the number of the displayed screen. Set the scene number from 0 to 15 specified with the bits DI0 to 3 and turn DI5 ON after 1 ms. The example switches to scene 4.

STEP Signal Input

The inspection runs once each time the STEP signal turns from OFF to ON.

RS-232C Input

The following commands can be input via the RS-232C for date and lot number verification programs 1 and 2. Add delimiters to the ASCII input codes listed below.

Note Match the communications specifications of the F350 and external device. Set either CR or CR+LF as the delimiter. Refer to *5-2-3 Setting the RS-232C Communications Specifications: R.RS-232C* in the F350 Setup Menu Operation Manual.
Only use channel 0.
The F300-E RS-232C Unit channel 1 cannot be used.

<table>
<tr><th>Instruction</th><th>Input data</th><th>Action</th></tr>
<tr><td>Inspect</td><td>M</td><td rowspan="2">Runs the inspection once.</td></tr>
<tr><td></td><td>m</td></tr>
<tr><td rowspan="4">Switch Scene</td><td>CTRL+E</td><td>Increases scene number by 1.</td></tr>
<tr><td>CTRL+X</td><td>Decreases scene number by 1.</td></tr>
<tr><td>S | Scene #</td><td rowspan="2">Displays the specified scene number.</td></tr>
<tr><td>s | Scene #</td></tr>
<tr><td>Change Character String</td><td>C | Inspection region # | Character string

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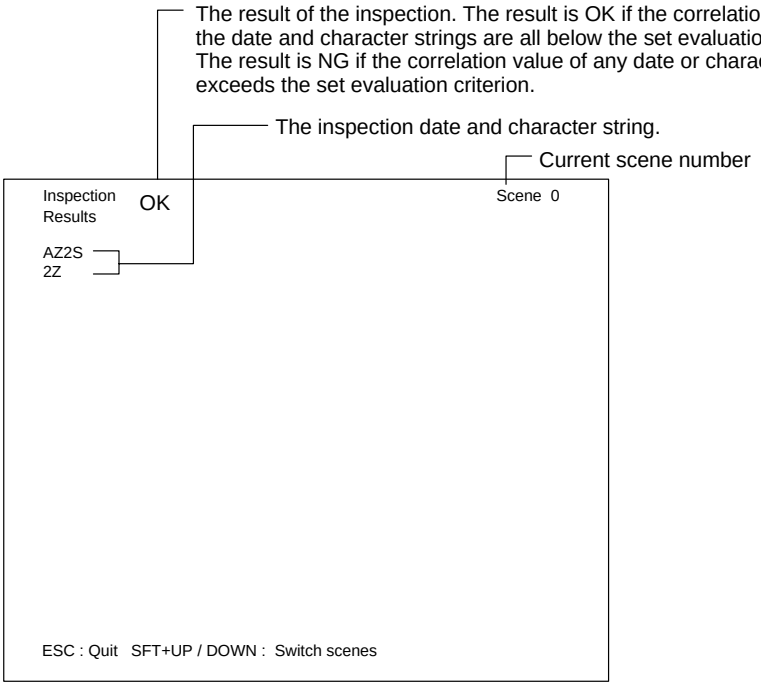
<tr><th>Menu</th><th>Inspection region #</th><th>Character string</th></tr>
<tr><td>Date and lot number verification program 1</td><td>1</td><td>Max. 24 characters</td></tr>
<tr><td>Date and lot number verification program 2</td><td>0 to1</td><td>Max. 24 characters</td></tr>
</table></td></tr>
<tr><td>End Inspection</td><td>Q

q</td><td>Ends the inspection.</td></tr>
</table>

Outputting the Inspection Result

Video Monitor

The inspection result is displayed on the video monitor in the format shown below.



Parallel I/O

The inspection result is output in bit D0 of the Parallel I/O Unit or a Terminal Block Unit, as shown below.

Inspection result	Output
The result is OK if the correlation values of the date and character strings are all below the set evaluation criterion.	0 (OFF)
The result is NG (no good) if the correlation value of any date or character string exceeds the set evaluation criterion.	1 (ON)

4-7-4 Changing the Date: U.Update

Updates the inspection date to the calendar date.

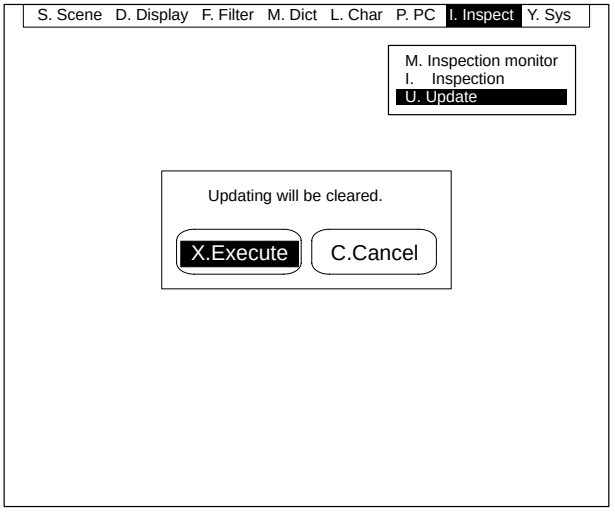
The inspection date can be automatically updated to the calendar date.

Refer to *4-8-1 Automatic Inspection: M.Initial mode*.

Procedure

1, 2, 3... 1. Select “U.Update.”

A confirmation message is displayed.

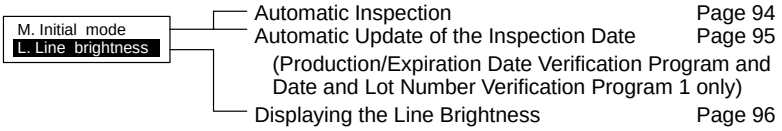


2. Select “X.Execute.”

The inspection date is updated to the calendar date.

4-8 Y.System

Set the environment data. The data set using “Y.System” does not directly affect the inspection conditions.



4-8-1 Automatic Inspection: M.Initial mode

The automatic inspection function displays the inspection screen and inputs the inspection instruction to start the inspection when the Application Program is started. Use this function to start inspection after all the inspection conditions are set as scene data.

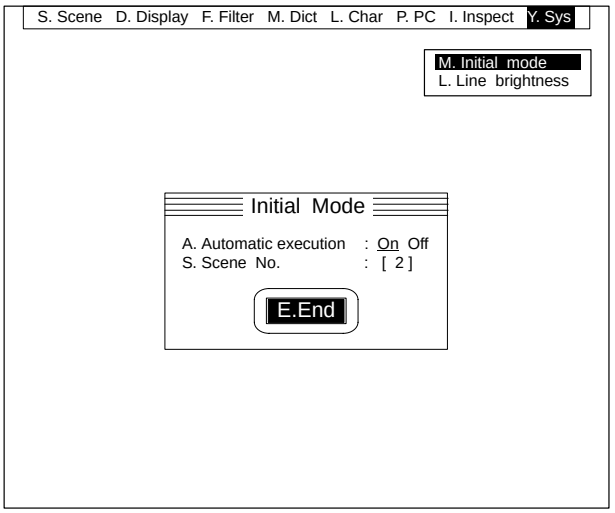
Procedure

1, 2, 3... 1. Select “M.Initial mode.”

2. Set “A.Automatic execution” ON.

3. Set the scene number in “S.Scene.”

   The inspection screen for the specified screen number is automatically displayed the next time the system is started.



4. Select “E.End.”

4-8-2 Automatic Update of the Inspection Date: M.Initial mode

This function can be used to automatically update the inspection date when using the Production/Expiration Date Verification Program or Date and Lot Number Verification Program 1.

Normally, the inspection date is not updated when an inspection screen is displayed, but if this function is turned on, the inspection date is automatically updated from the internal calendar.

Note The inspection date is automatically updated when the internal calendar date is changed. The Busy signal turns ON while the date is updated and the next measurement instruction cannot be input.

Manually Updating the Date

The following two methods are available to manually update the date:

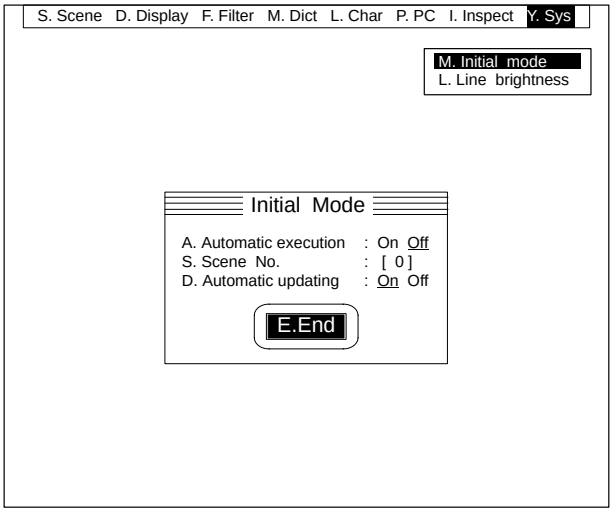
- Run “I.Inspection/U.Update,”
- Input the Update instruction during inspections.

Procedure

1, 2, 3... 1. Select “M.Initial mode.”

2. Set “D.Automatic update” ON.

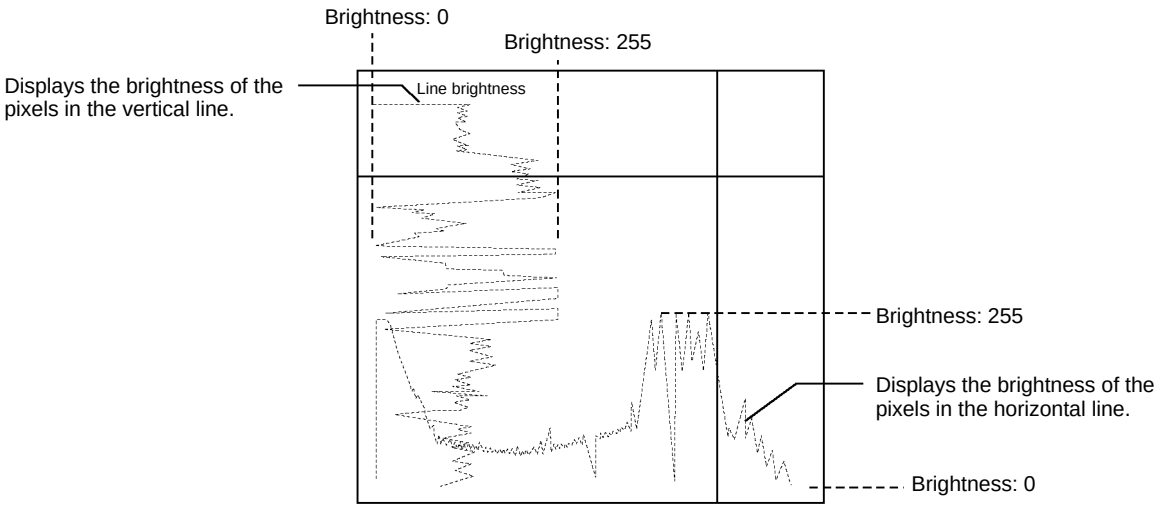
   The inspection date is automatically updated to the calendar date, even during inspections.



3. Select “E.End.”

4-8-3 Displaying the Line Brightness: L.Line brightness

Line brightness is the name given to a graph which indicates the brightness distribution along a line through the image. The line brightness can be displayed for any arbitrary vertical or horizontal lines through the image.

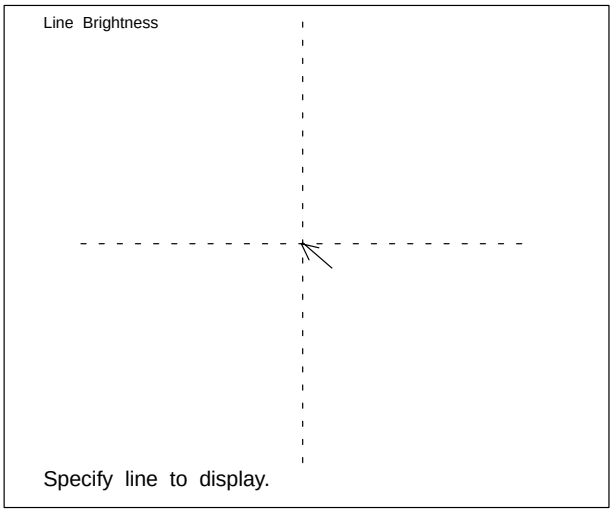


Procedure

1, 2, 3... 1. Select “L.Line brightness.”

Dotted lines are displayed vertically and horizontally through the cursor.

Note A static (freeze) image is displayed when “L.Line brightness” is selected. If “D.Display/F.Freeze” is set to “U.Unfreeze,” display the required image before selecting “L.Line brightness.”



2. Select the line.

Move the cursor to the line and press the Enter Key. The line brightness is displayed for the selected vertical and horizontal lines.

3. Press the Enter Key or the Escape Key.

Returns to the menu.

SECTION 5
Troubleshooting

This section provides a list of error messages, and the causes and remedies of them.

5-1 Troubleshooting

The error messages and corresponding remedies for the Inspection Program for General Characters, Production/Expiration Date Verification Program, Date and Lot Number Verification Program 1, and Date and Lot Number Verification Program 2 are displayed in alphabetical order.

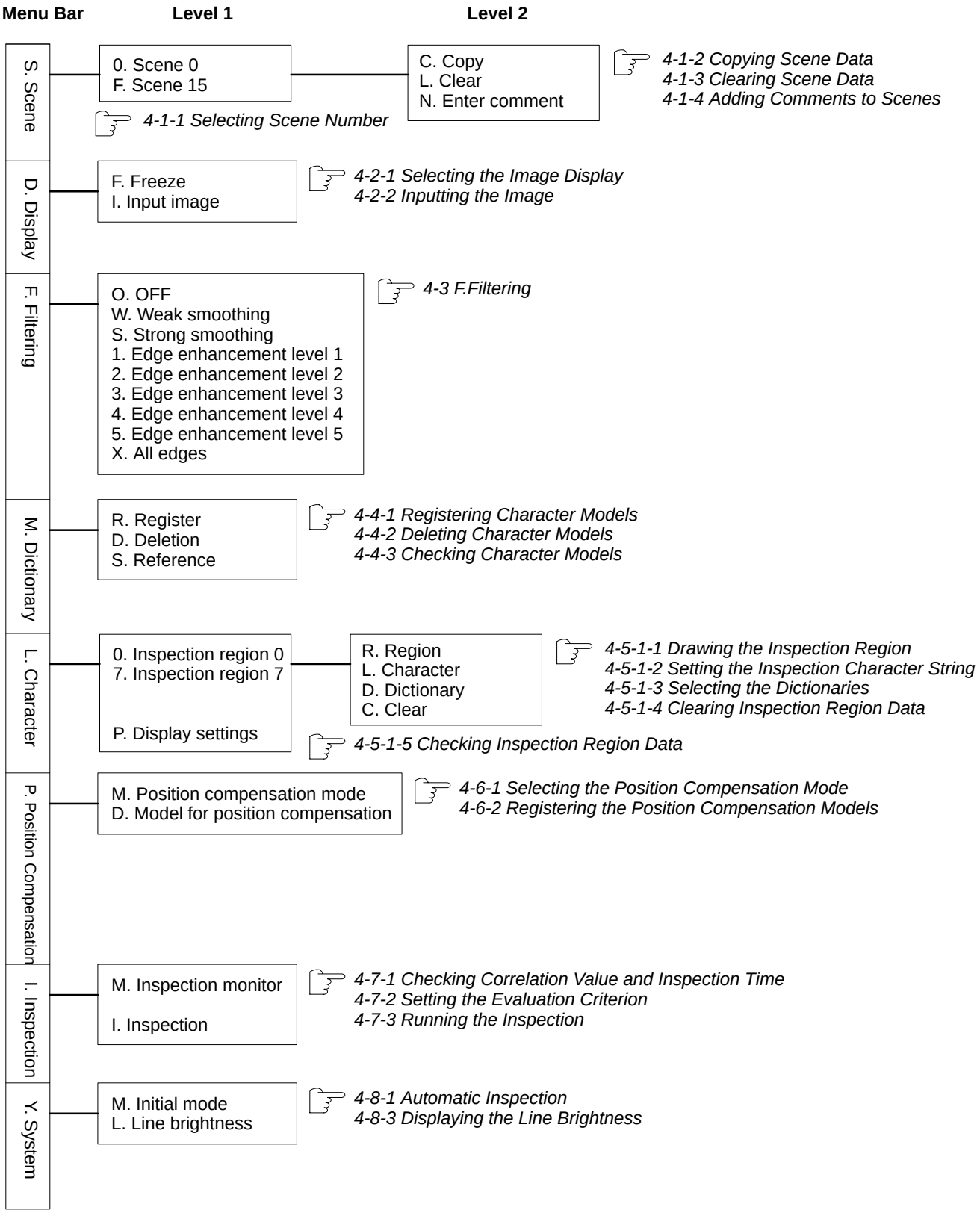
Note "○" means that the error is applicable to the program.

Error message	Cause and remedy	General characters	Production date	Date 1	Date 2
Cannot be registered. No space in model registration region.	No more models can be registered. Decrease the model region you are trying to register, delete unwanted models, or decrease the angle range for position compensation.	○	○	○	○
Cannot copy to the same scene number.	The copy source and copy destination are the same scene number. Select different scene numbers.	○	○	○	○
Incorrect setting combination.	An illegal combination was specified for the date. Set the date with a legal number of days for the specified month.	---	○	○	---
Model 1 cannot be used in the 1-model positioning mode.	Model 1 cannot be used in the 1-model position compensation mode. However, a model must be registered as position compensation model 0.	○	○	○	○
No additional characters can be registered.	The maximum permissible number of character strings is 128. This number is already registered.	○	---	---	---
No character model is registered.	Inspection is not possible because no character model is registered in the dictionary. Register the character model for the inspection character string.	○	○	○	○
No date region is set.	No date region can be deleted because no date region is set.	---	---	○	---
No dictionary is selected.	Inspection is not possible because no dictionary is selected. Select the dictionary in which the character models for the inspection are registered.	○	---	---	---
No expiration date region is set.	No expiration date region can be deleted because no expiration date region is set.	---	○	---	---
No general region is set.	No general character region can be deleted because no general character region is set.	---	---	○	---
No inspection characters registered.	Inspection is not possible because no character string is registered. Or, no character string can be deleted because no character string is registered. Register a character string.	○	---	○	○
No inspection characters selected.	Inspection is not possible because no character string is selected. Select the character string number.	○	---	---	---
No more character models can be registered in dictionary.	The maximum permissible number of character models is in one dictionary is 6. This number is already registered.	○	○	○	○
No position compensation model is registered.	Inspection is not possible because no position compensation model is registered. Register the position compensation model or models to suit the position compensation mode.	○	○	○	○
No position compensation region is set.	Inspection is not possible because no position compensation region is set. Set the position compensation region in which to search for the position compensation model.	○	○	○	○
No production date region is set.	No production date region can be deleted because no production date region is set.	---	○	---	---
Same position cannot be specified.	Drawing at the same position is not permitted. Draw at a different position.	○	○	○	○

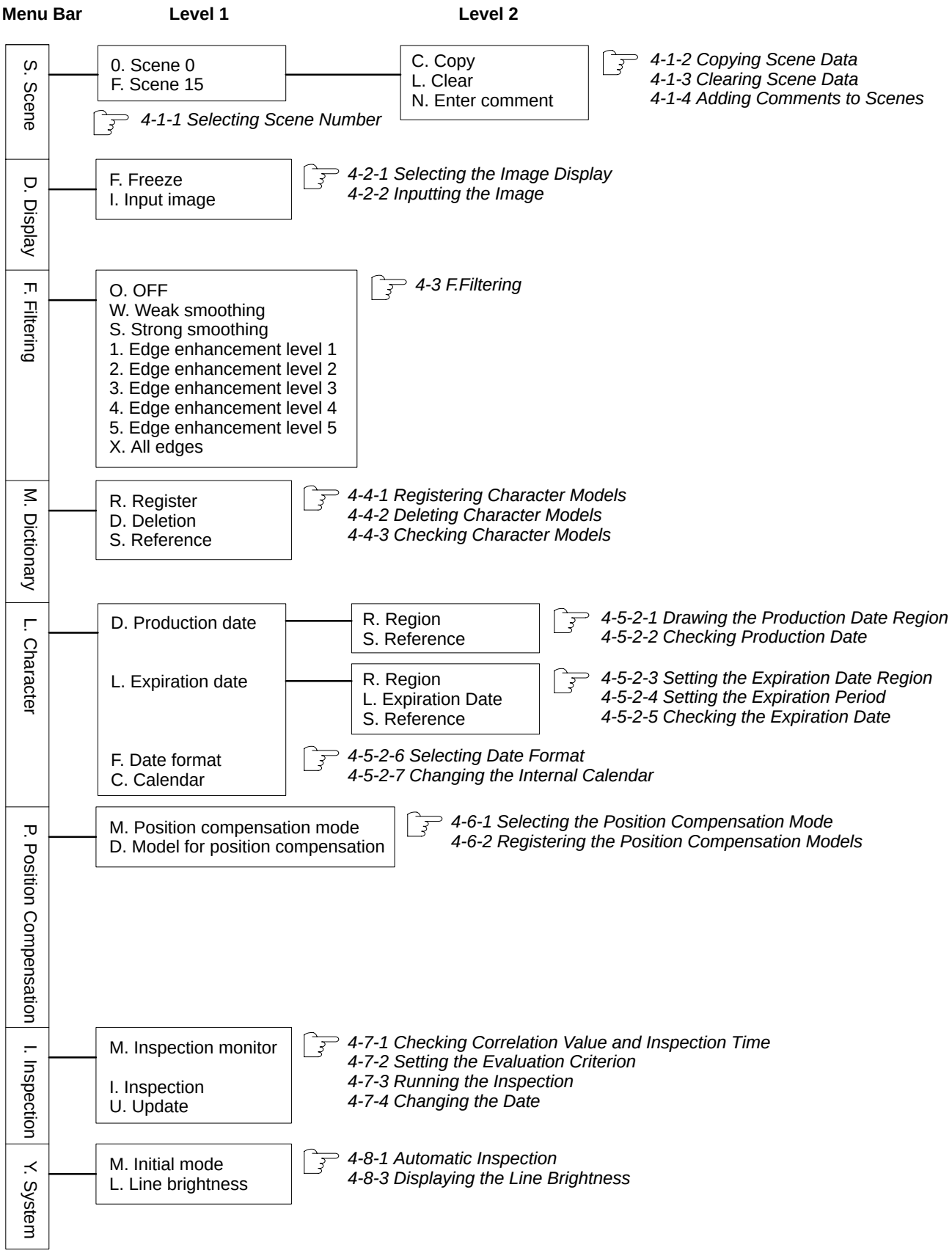
Error message	Cause and remedy	General characters	Production date	Date 1	Date 2
Scene data initializing.	Initializing the scene data to start the installed Application Program. All scene data will revert to the initial values.	○	○	○	○
	Initializing the scene data because exiting scene data is destroyed. All scene data will revert to the initial values.	○	○	○	○
The inspection region cannot be set.	Inspection is not possible because no inspection region is set. Or, no inspection region can be deleted because no inspection region is set. Set the region where the character string is to be searched as the inspection region.	○	○	○	○
The position compensation mode is turned OFF.	The position compensation model cannot be selected because the position compensation mode is turned off. First turn on the position compensation mode, then select the position compensation model.	○	○	○	○
Too many models. No more can be registered.	No more models can be registered. Delete unwanted models or decrease the angle range for position compensation.	○	○	○	○
Wrong inspection characters.	The character string could not be set via the RS-232C because the specified character string was incorrect. Input only characters registered in the dictionary. Do not input more than 24 characters.	---	---	○	○
Wrong model image.	The image is completely white or completely black and is unsuitable for registration as a character model. Register a character pattern as the character model.	○	○	○	○

Appendix A
Menu Hierarchy Diagrams

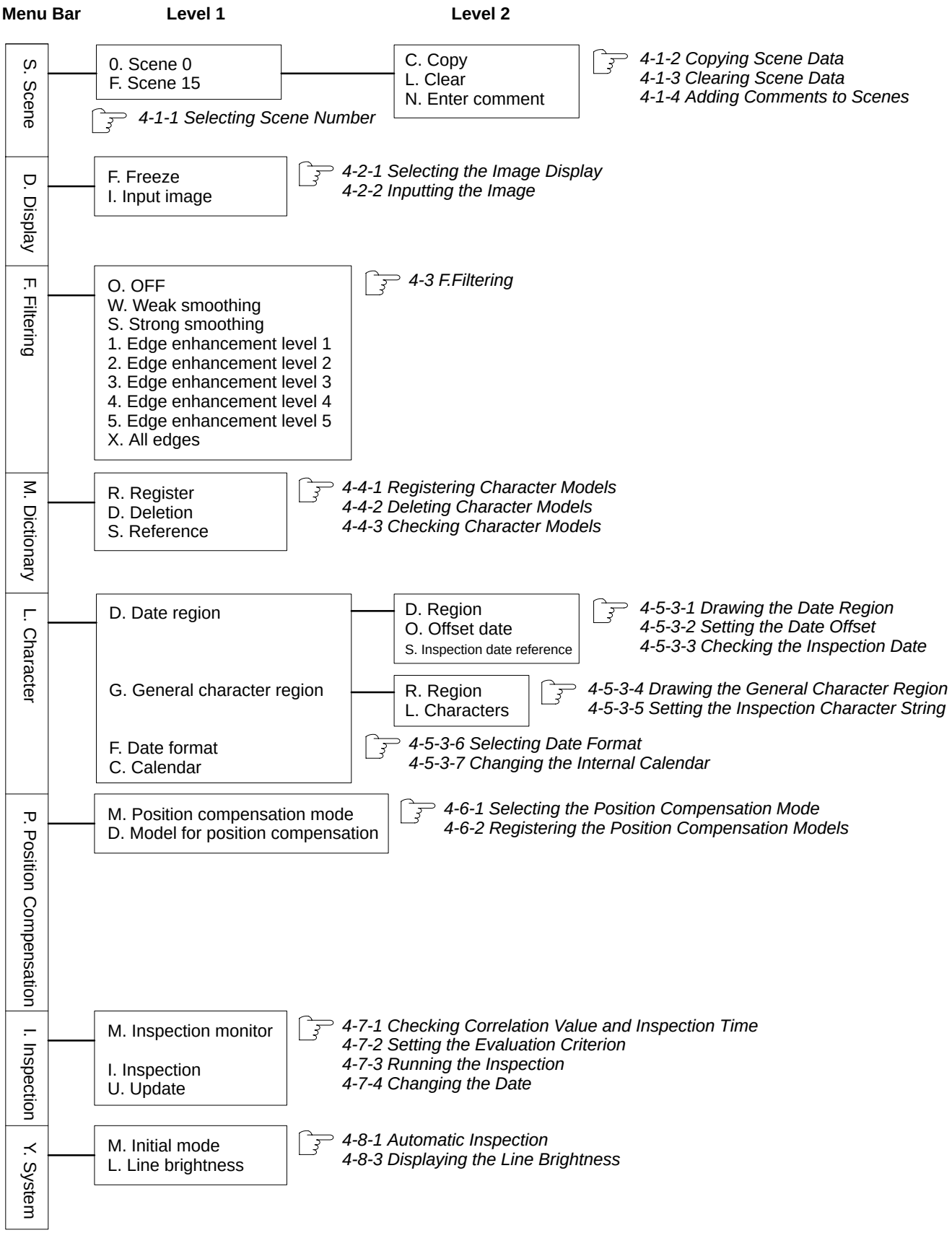
Inspection Program for General Characters



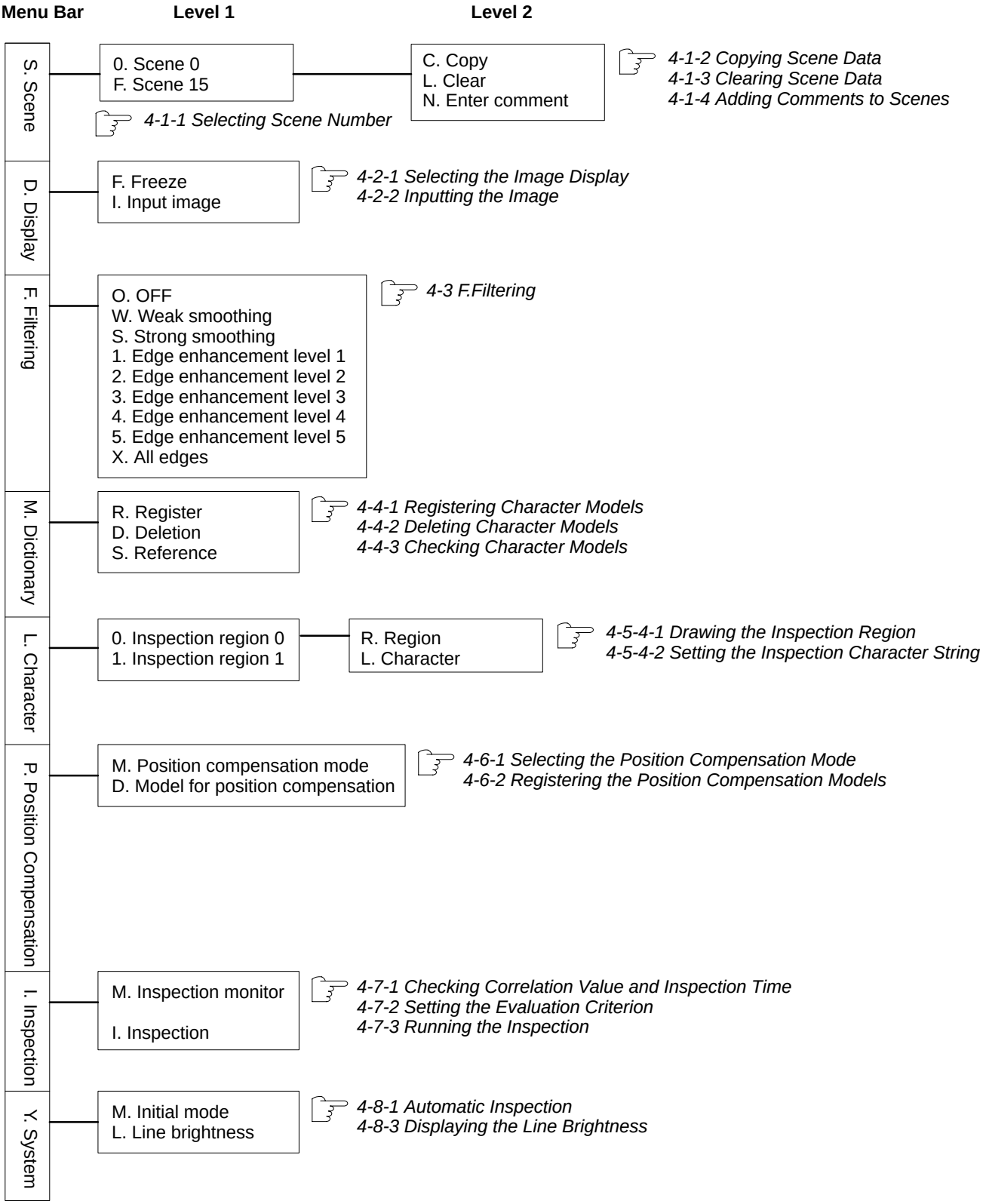
Production/Expiration Date Verification Program



Date and Lot Number Verification Program 1



Date and Lot Number Verification Program 2



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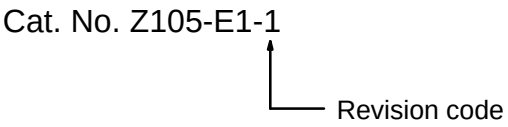
Revision History

A manual revision code appears as a suffix to the catalog number on the front cover of the manual.



The following table outlines the changes made to the manual during each revision. Page numbers refer to the previous version.

Revision code	Date	Revised content
1	August 1995	Original production