

**OMRON**

**v-TS**

PCB Inspection System  
**VT-S1080/S1040/Z600/S730-H/  
S730/S720/S530/S500**

**v-TS**

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**Teaching Manual**

# Before You Begin

Thank you for purchasing the PCB inspection system.

The PCB inspection system is the equipment used to inspect soldering or component implementation conditions and display the inspection results.

When using this system, observe the following:

- Read this manual carefully to understand the contents well, and make the proper use of this system accordingly.
- Keep this manual safely for ready reference at any time.
- For the basic operation of this system, also read the relevant manuals carefully to understand the contents well, and then make the proper use of this system accordingly.

## ● Intended Readers

This manual contains the information concerning the basic operation of inspection and image capturing. Readers of this manual should have undergone the previous PCB inspection system training with Omron Corporation.

# PCB Inspection System

## Teaching Manual

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## Read and Understand this Manual

Please read and understand this manual before using the products. Please consult your OMRON representative if you have any questions or comments.

## Terms and Conditions Agreement

Please observe the conditions (including precautions and warnings described in the manuals, catalogs, and specifications) of this product that are specified by OMRON for use, storage and disposal. The ordering or use of OMRON products implies your agreement to the Terms and Conditions described below, unless otherwise is specifically agreed. However, if there is any inconsistency between this Terms and Conditions Agreement and the description in this product's specification, the description in this product specification take precedence.

### 1. Definition

The definitions used in these Terms and Conditions are as follows:

- (1) Catalogues: Catalogs, specifications, instructions and manuals of OMRON products, including electronically provided information available on the OMRON electronic components information website, etc.
- (2) Usage conditions: Usage conditions, rating, performance, operating environment, handling instructions, cautions, prohibited use, etc. of OMRON products described in specifications, documentations or manuals.
- (3) Customer application: Application of OMRON products by customers which incorporates and/or uses OMRON products into/for components, electronic boards, devices, facilities or systems that are manufactured by customers.
- (4) Deliverable: Setting of OMRON product, Inspection program and Library created on OMRON product, include deliverable of Teaching service that Omron engineer creates, tunes and provide technical guidance on behalf of customers, etc.
- (5) Fitness: Refers to the (a) Fitness, (b) performance, (c) non-infringement of third-party intellectual property, (d) compliance with laws and regulations and (e)conformity to various standards of the OMRON products and Deliverable under the use for "Customer's Purpose".

### 2. Caution on Descriptions Using Catalogues and Use OMRON products

Attention is required to the following points for information obtained from Catalogues and Use OMRON products:

- (1) Rated values and performance values are the product of tests performed for separate single conditions, including but not limited to temperature and humidity. OMRON does not warrant rated values and performance values for multiple combined conditions.
- (2) Reference data are provided for reference only. OMRON does NOT warrant that OMRON products work properly at all times in the range of reference data.
- (3) Application examples are provided for reference only. Please confirm the fitness of OMRON products and Deliverable in your application and use your own judgment to determine the appropriateness of using them in such application. OMRON does NOT warrant the Fitness of OMRON products under such applications.
- (4) OMRON may discontinue the production of OMRON products or change the specifications of them for the purpose of improving such products or other reasons entirely at its own discretion.

### 3. Coverage

#### ①Warranty period

OMRON warrants that products shall be free of material defects and or workmanship for a period of one year after the date of purchase or the date when installed at the specified location.

(Excepting in the case where there is additional description in Catalogues)

#### ②Scope of warranty

- 1) If the User discovers defect of OMRON products (substantial non-conformity with the manual), and return it to OMRON within the above warranty period, OMRON will replace OMRON products without charge by offering media or download from OMRON's website. And if the User discovers defect of media which is attributable to OMRON and return it to OMRON within the above warranty period, OMRON will replace defective media without charge.
- 2) If OMRON is unable to replace defective media or correct OMRON products, the liability of OMRON and the User's remedy shall be limited to the refund of the license fee paid to OMRON for the product.

#### **4. Limitation of Liability**

- ①The above warranty shall constitute the user's sole and exclusive remedies against OMRON and there are no other warranties, expressed or implied, including but not limited to, warranty of merchantability or fitness for particular purpose. In no event, OMRON will be liable for any lost profits or other indirect, incidental, special or consequential damages arising out of use of the product.
- ②OMRON shall have no liability for defect of the product based on modification or alteration to the product by the user or any third party. OMRON shall not be responsible and/or liable for any loss, damage, or expenses directly or indirectly resulting from the infection of OMRON products, any software installed thereon or any computer equipment, computer programs, networks, databases or other proprietary material connected thereto by distributed denial of service attack, computer viruses, other technologically harmful material and/or unauthorized access.
- ③OMRON shall have no liability for software developed by third parties other than Omron based on this product or any consequence thereof.

#### **5. Applicable Conditions**

User shall not use OMRON products for the purpose that is not provided in the attached user manual.

#### **6. Change in Specification**

Specifications and accessories of OMRON products may be changed at any time based on improvements and other reasons.

#### **7. Export Controls**

Customers of OMRON products shall comply with all applicable laws and regulations of Japan and/or other relevant countries with regard to security export control, when exporting OMRON products and/or technical documents or providing such products and/or documents to a non-resident. OMRON may not provide customers with OMRON products and/or technical documents should they fail to comply with such laws and regulations.

## Meanings of Signal Words

### ● Indication and meaning for safe use

To ensure the safe use of Teaching System, we use several safety icons to alert the reader to certain safety issues in this manual. The warning messages listed here indicate extremely important safety issues. Be sure to follow these guidelines. The icons and their meanings are as follows:



### WARNING

Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.



### CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

## Meanings of Alert Symbols

The following alert symbols are used in this manual.

	Indicates general caution, warning, or danger.
	Indicates the possibility of explosion under specific conditions.
	Indicates the possibility of electric shock under specific conditions.
	Indicates the possibility of injury due to high temperature under specific conditions.
	Indicates the possibility of hand injury under specific conditions.
	Users of the system are requested to connect the ground wire for systems with a safety ground terminal safety and without fail.

## Alert statements in this Manual

The following alert statements apply to the products in this manual. Each alert statement also appears at the locations needed in the manual to attract your attention.

<b>WARNING</b>	
Serious injury may occasionally occur. Follow the installation procedures and be sure to install the system on a level foundation capable of supporting the weight of inspection equipment.	
Serious electric shock may occasionally occur. Never fail to ground the system.	
Fire or explosion may occur. Do not disassemble, break, heat, short-circuit between electrodes, or throw the battery into fire.	
Serious injury may occasionally occur. Do not place hands to the side PCB transfer section.	
<b>Security Measures</b> <b>Security measures to prevent unauthorized access</b> Take the following measures to prevent unauthorized access to our products. <ul style="list-style-type: none"><li>Install physical controls so that only authorized personnel can access controlsystems and equipment.</li><li>Reduce connections to control systems and equipment via networks to prevent access from untrusted devices.</li><li>Install firewalls to shut down unused communications ports and limit communications hosts and isolate control systems and equipment from the IT network.</li><li>Use a virtual private network (VPN) for remote access to control systems and equipment.</li><li>Adopt multifactor authentication to devices with remote access to control systems and equipment.</li><li>Scan virus to ensure safety of USB drives or other external storages before connecting them to control systems and equipment.</li></ul>	
<b>Data input and output protection</b> Validate backups and ranges to cope with unintentional modification of input/output data to control systems and equipment. <ul style="list-style-type: none"><li>Checking the scope of data</li><li>Checking validity of backups and preparing data for restore in case of falsificationand abnormalities</li></ul>	
<b>Data recovery</b> Backup data and keep the data up-to-date periodically to prepare for data loss.	
When using an intranet environment through a global address, connecting to an unauthorized terminal or to an unauthorized server may result in network security issues such as spoofing and tampering. You must take sufficient measures such as restricting access to the terminal, using a terminal equipped with a secure function, and locking the installation area by yourself.	

When constructing an intranet, communication failure may occur due to cable disconnection or the influence of unauthorized network equipment. Take adequate measures, such as restricting physical access to network devices, by means such as locking the installation area.	
When using a device equipped with the SD Memory Card function, there is a security risk that a third party may acquire, alter, or replace the files and data in the removable media by removing the removable media or unmounting the removable media. Please take sufficient measures, such as restricting physical access to the Controller or taking appropriate management measures for removable media, by means of locking the installation area, entrance management, etc., by yourself.	

<b>CAUTION</b>	
Electric shock may occasionally occur. Do not connect or disconnect the cables, when power is ON.	
Burns may occasionally occur. Do not connect or disconnect the cables, when power is ON.	
Injury may occasionally occur. Take caution not to bump against the front door if it needs to be open during maintenance or other operation on the system.	
Injury may occasionally occur. Be careful not to pinch your fingers when opening or closing the front door.	

## Precautions for Safe Use

Observe the following precautions for safe use of the products.

(1) Use the system at a location which meets the following conditions:

- Temperature of 10 to 35 °C
- Humidity of 35 to 80%
- No direct sunlight
- No possibility of dew condensation
- No spray of water, oil, or chemicals
- No water leakage or water

(2) Store the system in a location which meets the following conditions:

- Temperature of 0 to 40 °C
- Humidity of 35 to 80%
- No direct sunlight
- No possibility of dew condensation
- No spray of water, oil, or chemicals
- No water leakage or water

(3) When changing the monitor angle, take care not to trap your fingers under the monitor.

(4) To use the system safely, for the connecting part of conveyor, etc. installed in the upstream/downstream of the system, have a cover ready and mount it in accordance with the unit to be installed to prevent your hand or finger from entering from the loading/unloading port of the system.

(5) Use the rated voltage and power cable specified in the power supply specifications.

(6) Tighten the power cable with the tightening torque of 2.8N·m when connecting it to the breaker terminal block, and make sure that the cable is securely connected to prevent contact failure.

(7) When replacing a belt, make sure that the system power and main breaker are turned OFF.

(8) To replace the UPS battery, turn OFF the system power and main breaker. Make sure that the UPS power is turned OFF before starting replacement.

(9) Replacement of the battery must be performed with the system power and main breaker turned OFF, to prevent damage to the high precision CPU unit mechanism as well as malfunction due to electrostatics.

(10)When replacing, install a new battery within 5 minutes after the power is turned OFF. If the system remains without battery for more than 5 minutes, the stored data may be lost.

(11)Leakage, explosion, self-heating or fire may occur to the battery. Never short-circuit between the electrodes (+ and -), charge, demolish, heat, dispose or expose it in fire or to a strong shock. Any battery, which has been exposed to a strong shock caused by e.g. a fall on the floor, may leak. Therefore, do not use such a battery.

(12)When lubricating the system, make sure that the system power and main breaker are turned OFF.

(13)If grease contacts your skin during lubrication, sufficiently wash it off using water and soap.

(14)When cleaning the system, make sure that the system power and main breaker are turned OFF.

(15)Do not make rail adjustment with a PCB remaining inside in the Forcible Pass mode. The PCB may be damaged.

(16)Do not ride on the top plate. This may dent the plate resulting in an unexpected operation.

(17)If the system is operated without an UPS, data might be broken in the case of a power outage.

(18)If disposing this system, observe the instructions of the local government.

(19)Use a PCB to be inspected within the specified dimensions.

(20)When inserting the head into the machine, be careful of the head as there is a top plate.

- (21)Be sure to use the left switch in the machine to adjust the rail width in forced pass mode, and be careful not to touch the operating part while adjusting the width.
- (22)Be sure to check that the moving PCB is on the rail.
- (23)Do not stare at the illumination or projector during the inspection.

## Precautions for Correct Use

Observe the following precautions to prevent failure to operate, malfunctions, or undesirable effects on product performance.

- (1) When the door lock is released and the front door is opened, the interlock is activated. Do not open the door during operation except when necessary, such as when removing a PCB.
- (2) When the machine is operating normally, the door lock is engaged and the front door cannot be opened. The front door can only be opened and closed when a dialog is displayed prompting the user to confirm that no PCBs or foreign objects remain in the machine, or when the emergency stop switch is pressed.
- (3) Do not touch the camera or lens as they are adjusted at the time of shipment. Touching the camera or lens may affect the inspection performance.
- (4) Be sure to lock cables and connectors with locking mechanisms before use.
- (5) Do not connect a network or storage device that could be infected with a virus.
- (6) OMRON will deliver and relocate the machine. After delivery and installation, be sure to contact OMRON sales office before moving the machine.
- (7) Allow space for operation and maintenance before and after the machine. Also, avoid installing or covering the fan blowing space.
- (8) Avoid installing on soft floors such as carpets.
- (9) The customer is required to examine the loading/unloading outlet cover necessary for the installation of the machine, and create a loading/unloading outlet cover and a bracket for mounting the cover.
- (10)Do not touch components inside the machine when loading/unloading PCBs from the front cover.
- (11)Excessive tension of the belt may cause the belt to break. Be sure to follow the specified method.
- (12)Host link communication does not work with the dual lane specification.
- (13)If the UPS battery deteriorates, data in the computer may be damaged in the event of a power failure.  
If an error is detected, replace the battery immediately.
- (14)Use only recommended grease.
- (15)Wipe off the attached older grease with a waste cloth before applying new grease. Wipe off grease with a waste cloth even in the case that there is fallen grease below the stroke end.
- (16)The applied grease might fly off the lubricated parts. So, after lubrication is completed, wipe off the excessive grease with a waste cloth before using the system. Unless wiping off grease enough, grease or oil might drip from the LM guide due to the motion of the system, so wipe it off with a waste cloth.
- (17)When stopping the conveyor in the forced pass mode, make sure that there are no PCBs in the inspection machine and that no PCBs are being pulled into the inspection machine before stopping the conveyor. If the conveyor is stopped while the PCB is being transported or in the machine, the PCB may not be transported downstream.
- (18)When loading/unloading a PCB start the operation after ensuring that there is no foreign object in the operating part.
- (19)Do not impact the machine.
- (20)Do not store outside or in a humid place.

- (21)Do not turn off the main breaker while the system is terminating. Doing so may damage the hard disk.
- (22)Turning the power supply on and off repeatedly may damage the machine. If you turn the power off, wait at least 3 minutes before turning it on.
- (23)Do not save the back-ups of inspection programs and libraries on a CR-R/RW or DVD±R/RW, or their files will become read-only in attribute and fail to work normally when read into this system.
- (24)Since normal operation of this system has been verified in factory settings, do not apply any OS service pack or security patch, change the settings or update the driver. If you try any without our consent, it will be construed as a remodeling of the system, and will not be guaranteed.
- (25)The maintainer must manage the keys.
- (26)Be sure to remove the belt replacement jig after adjusting the belt tension. Doing so may cause damage to the machine.
- (27)If the belt is frayed, normal PCB transfer may not be possible. Cut off the fray.
- (28)To prevent damage to the machine, make sure that no foreign matter has fallen into the machine before using it or when opening the door during use.

## ● Notification

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may take appropriate measures.

This system individual unit may not comply with EC directive requirements.  
Use this system alone and do not use the system in other application.

## Related Manuals and Their Content

The following is a list of related manuals.

### An Explanation of the PCB Inspection System Operation (Operation)

- PCB Inspection System Operation Manual
    - VT-S1080/S1040/Z600 ..... (5634670-2)
    - VT-S730-H ..... (2808363-1)
    - VT-S730 ..... (8400508-2)
    - VT-S720 ..... (9908107-9)
    - VT-S530 ..... (4099496-8)
    - VT-S500 ..... (3731320-8)
- Contains information on the operation of the PCB Inspection System.

### About the Daily Maintenance, Hardware and Basic Operations of the PCB Inspection System

- PCB Inspection System Maintenance Manual
    - VT-S1080/S1040/Z600 ..... (5634679-6)
    - VT-S730-H ..... (2808941-9)
    - VT-S730 ..... (8500213-3)
    - VT-S720 ..... (9522302-2)
    - VT-S530 ..... (3110062-8)
    - VT-S500 ..... (2233264-8)
- The daily and periodical maintenance, hardware and basic operations of the PCB Inspection System are explained.

### An Explanation of the PCB Inspection System's Inspection Logic

- PCB Inspection System Inspection Logic Manual
    - VT-S1080/S1040/Z600/S730-H/S730/S720/S530/S500(8600371-0)
- Contains information on inspection logics of the PCB Inspection System.

### An Explanation of the PCB Inspection System's Teaching

This Teaching Manual

- v-TS Teaching Manual
    - VT-S1080/S1040/Z600/S730-H/S730/S720/S530/S500(8800381-5)
- Contains information on how to operate the teaching system of the PCB Inspection System, how to conduct teaching of an inspection program, etc.

# Operation Manual Layout

This Operation Manual was organized along the following lines:

## **Chapter 1 - Before Getting Started**

This chapter details an overview of the system, the menu structure, how to connect the system to the electric power supply, and other information necessary before starting.

## **Chapter 2 – Inspection Programming**

This chapter details the procedures for creating an inspection program.

## **Chapter 3 – Management Menu**

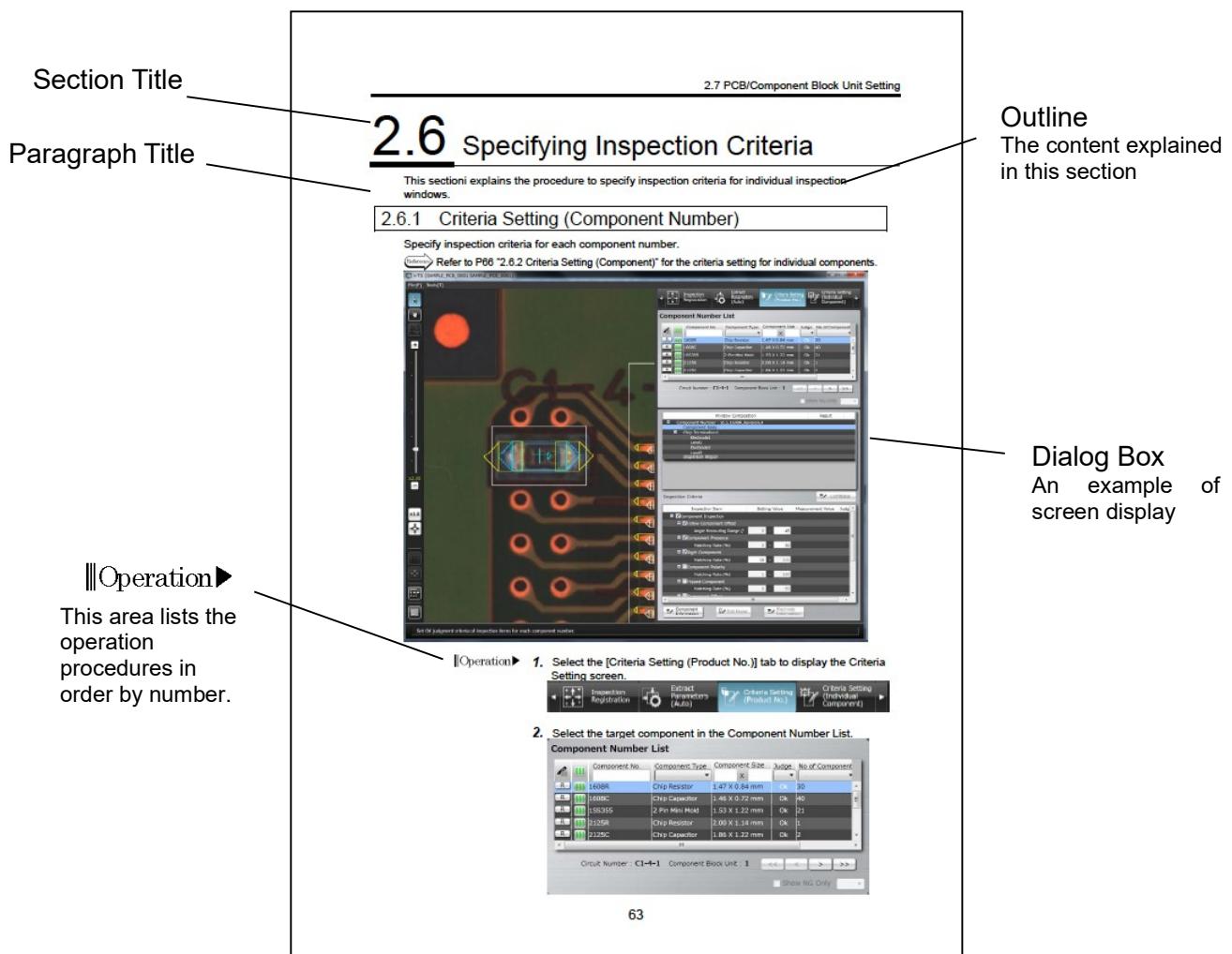
This chapter details the procedures for initial setting of quality criteria and model code.

## **Appendix – Teaching Flow**

This chapter details the teaching flows for initial programming, initial adjustment, and mass-production adjustment.

# How to Read This Manual

Below is an explanation of the layout and messages.



	This area explains some rules to abide in order to avoid losing data or damaging the machine. Please be sure to read this section and follow its instruction.
<b>Operation▶</b>	This area lists the operation procedures in order by number. When indicating a switch on the screen, this section will surround it with the marks <and>, while menus, any buttons in a dialog box, or other things selected by the touch panel will be surrounded by the marks [ and ].
	This area lists some information that is useful to know.
	This area lists the page number and length of sections with related information.
<b>S530</b>	This area describes an inspection program of VT-S530.
<b>S720A</b>	This area describes an inspection program of VT-S720A.
<b>S730</b>	This area describes an inspection program of VT-S730-H/S730.
<b>S10</b>	This area describes an inspection program of VT-S1080/S1040/Z600 (S10 Series).

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# **Chapter 1**

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# 1.1 Overview

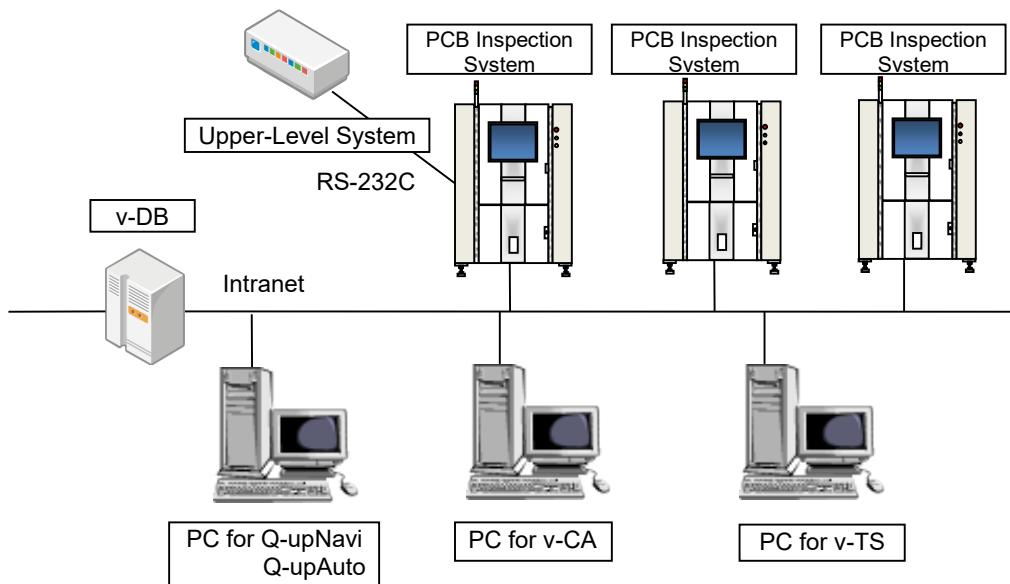
This section describes overview and configuration of the teaching system.

## 1.1.1 Overview of Teaching System

This system uses a PCB image captured by a PCB Inspection System to create and modify an inspection program.

Improving an inspection program also improves an inspection pass rate of the PCB Inspection System.

## 1.1.2 System Configuration



System Name	Abbreviation	Outline
PCB Inspection System VT-S1080 VT-S1040 VT-Z600 VT-S730-H VT-S730 VT-S720A VT-S530 VT-S500	S1080 S1040 Z600 S730-H S730 S720A S530 S500	Main unit of the inspection system. It inspects a PCB and captures a PCB image.
Teaching System v-TS	TS	Creates an inspection program to be used and saves it to the database.
Q-upNavi Q-upAuto Q-upOpti	Q-upNavi Q-upAuto Q-upOpti	Checks a production state and analyzes processes. This can work on a PC that runs the teaching system.
Visual Check Assistant v-CA	CA	Performs visual check based on an inspection result by the system and saves the visual check result to the database.
Database v-DB	DB	Stores inspection program creation information, inspection results, and inspection system management information.
Upper-level system	-	Connection to an upper-level system is made through RS-232C for transmission of PCB ID, etc.

### 1.1.3 PC Specifications for v-TS

#### ■ S1080/S1040/Z600

##### Hardware

Hardware Name	Specifications
CPU	Minimum: Intel® Core™ i7 6700 (3.60GHz, 8MB, 4C) or higher * use Intel HD Graphics 4600 or higher Recommendation: Intel® Core™ i7 11700 (3.60GHz, 16MB, 8C) or higher * use Intel UHD Graphics 600 or higher
Memory	Minimum: 32G (DDR3 1.333 MHz) or more Recommendation: 64G (DDR4 2.666 MHz) or more
HDD	Minimum: 1TB SATA 7200rpm or higher Recommendation: 1TB SSD or higher
Network	Gigabit Ethernet
Monitor	Size: 17-inch or higher Resolution: Horizontal: 1920 pixels (or higher) x Vertical 1080 pixels (or higher) Color: True Color (32-bit)
GPU	None
Power Supply Capacity	500W or more

##### Software

Software Name	Specifications
OS	Microsoft® Windows10® Pro 64-bit (English version) Microsoft® Windows11® Pro 64-bit (English version)

#### ■ S730-H/S730/S530

##### Hardware

Hardware Name	Specifications
CPU	Intel® Core™ i7 6700 (3.60GHz, 8MB, 4C) or higher * use AMD Radeon R7 450
Memory	32G (DDR3 1.333 MHz) or more
HDD	1TBx2 SATA 7200rpm or higher
Network	Gigabit Ethernet
Monitor	Size: 17-inch or higher Resolution: Horizontal: 1280 pixels (or higher) x Vertical 1024 pixels (or higher) or Horizontal: 1920 pixels (or higher) x Vertical 1080 pixels (or higher) Color: True Color (32-bit)

##### Software

Software Name	Specifications
OS	Microsoft® Windows7® Professional 64-bit Service Pack 1 (English version) Microsoft® Windows10® Pro 64-bit (English version) Microsoft® Windows11® Pro 64-bit (English version)

## ■ S720/S500

### Hardware

Hardware Name	Specifications
CPU	Intel® Core™ i7 4790 (3.60GHz, 8MB, 4C) or higher * use Intel HD 4600 Graphics
Memory	16G (DDR3 1.333 MHz) or more
HDD	1TBx1 SATA 7200rpm or higher
Network	Gigabit Ethernet
Monitor	Size: 17-inch or higher Resolution: Horizontal: 1280 pixels (or higher) x Vertical 1024 pixels (or higher) or Horizontal: 1920 pixels (or higher) x Vertical 1080 pixels (or higher) Color: True Color (32-bit)

### Software

Software Name	Specifications
OS	Microsoft® Windows7® Professional 64-bit Service Pack 1 (English version) Microsoft® Windows10® Pro 64-bit (English version) Microsoft® Windows11® Pro 64-bit (English version)

# 1.2 Basic Operations

The mouse and the keyboard can also be used as input devices for creating inspection program. This section describes the basics for how to use each.

## 1.2.1 Using the Mouse

The mouse is used for selecting menus and clicking options in dialog boxes. Moving the mouse on a flat surface will move the mouse cursor on the screen.

The mouse has two (2) buttons and a wheel and the left button is used for actions such as selecting indicated options. Clicking the right button shows a pull down menu alongside the mouse cursor. The wheel is used for scrolling the indicated contents in dialog boxes.

The mouse button is used for many purposes, including the following:

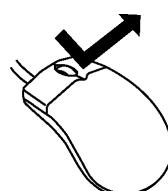
### ■ Click

After positioning the mouse cursor on the correct position, press the mouse button once. This is used in cases such as selecting an option in a dialog box or using an operation command.



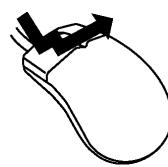
### ■ Right Click

Clicking the right button once lightly shows a pull down menu alongside the mouse cursor.



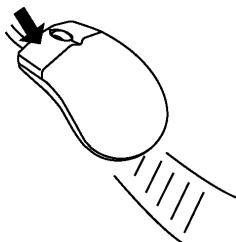
### ■ Double Click

After positioning the mouse cursor on the correct position, press the mouse button twice in a row, succession. This is used for actions such as selecting and opening a file.



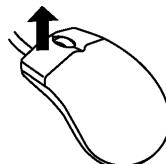
### ■ Drag

After fixing the mouse cursor on the correct position, move the cursor while pressing the mouse button. This is used for actions such as selecting multiple windows.



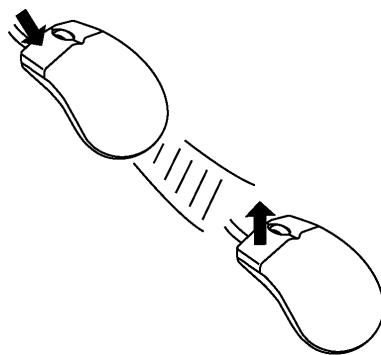
### ■ Drop

Release the mouse button that was being pressed. This is used for executing the area selected by dragging.



### ■ Drag and Drop

After fixing the mouse cursor on the correct position, move the cursor while pressing the mouse button and release the button at the desired place. This is used for actions such as moving a window.



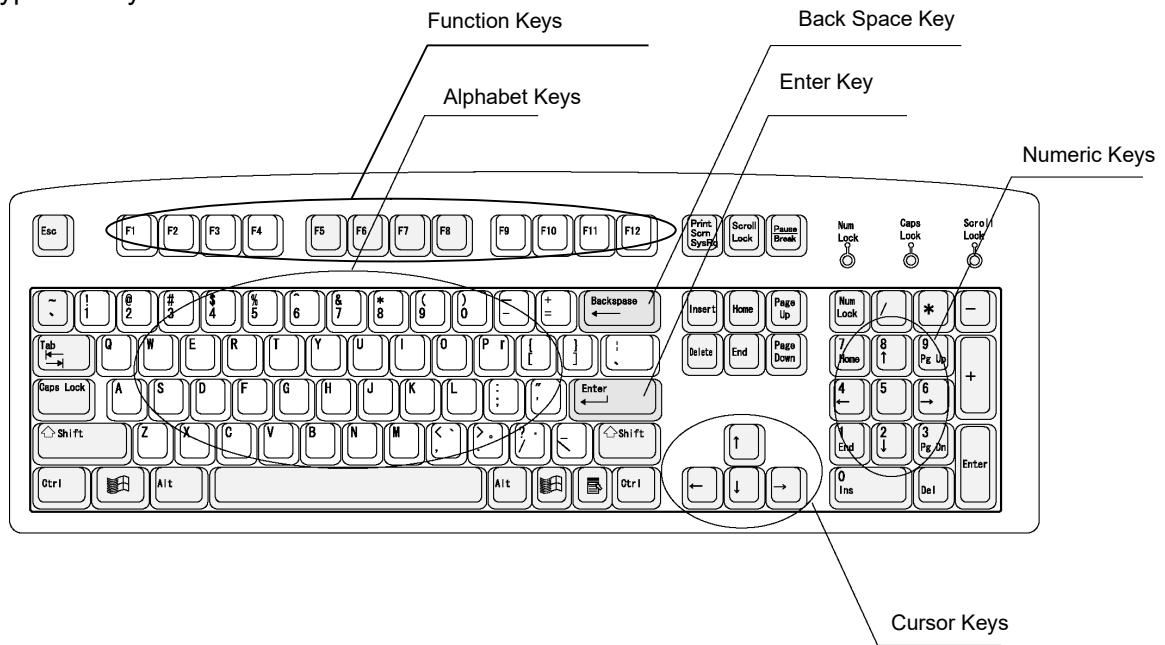
### ■ Scrolling the Wheel

Turning the wheel in dialog boxes where the scroll bar appears will scroll the contents. This is used for actions such as checking a list of inspection programs.



## 1.2.2 Using the Keyboard

The keyboard is used for actions such as inputting file names and shortcut keystrokes. The types of keys are listed below.



## ■ Alphabet Keys

These keys input letters. These are used for things like inputting the name of the inspection program, comments, component number names, circuit numbers, etc., in dialog boxes.

## ■ Numeric Keys

These keys input numbers. These are used for inputting numeric values in the dialog boxes.

### ■ Back Space Key

**Backspace** Erases the character to the left of the cursor.

## ■ Enter Key

Confirms the input data and sets them.

## ■ Cursor Keys

Moves the cursor in the direction indicated by the arrow.

## ■ Function keys

Executes the following function:

# 1.3 Startup & Termination of the System

This section describes how to start and end v-TS.

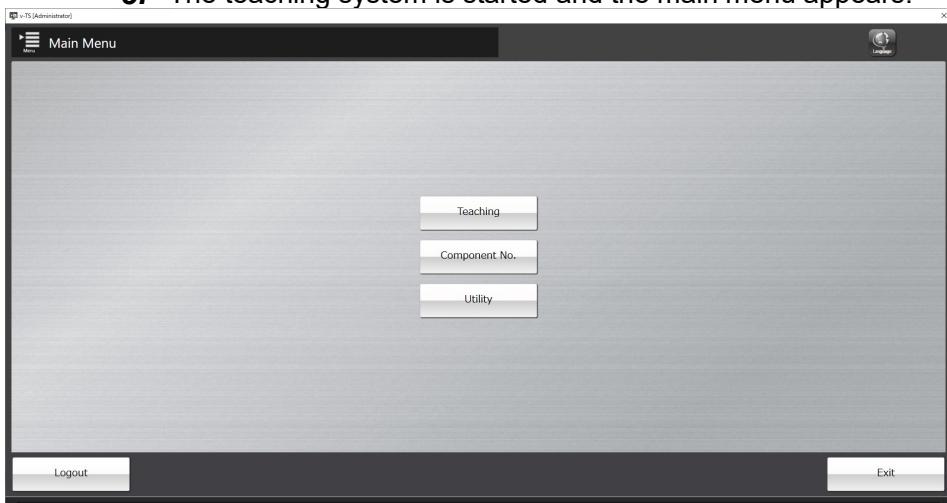
## 1.3.1 System Startup

**Please Note** Do not start other applications at the same time with this system.

- ||Operation▶ **1.** Turn ON the power of the PC.  
**2.** After OS is started, double-click the v-TS shortcut icon on the desktop.



- 3.** The teaching system is started and the main menu appears.



**Reference** To create an inspection program, go to P2-1, "Chapter 2 Inspection Programming."

To configure the system using the utility, go to P3-1, "Chapter 3 Management Menu."

**Memo** When the password function has been implemented, the login dialog appears. Log in to the system before starting a menu.

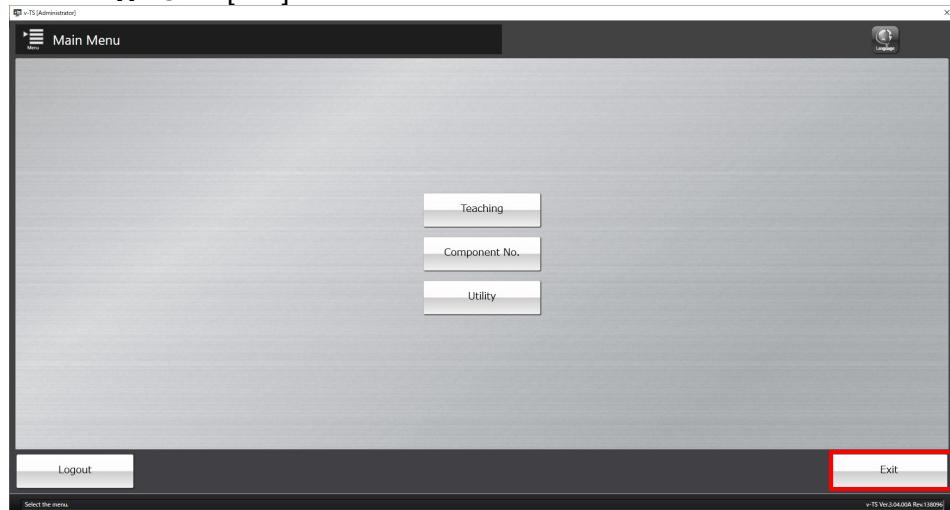
**Reference** Refer to "1.5 Login and Logout."

### 1.3.2 System Termination

Please Note →

When turning off the system, be sure to follow the procedures listed below. Turning off the PC power supply without going through the shutdown procedures could damage the hard disk drive.

Operation▶ 1. Click [Exit] on the main menu.



The Confirmation message will be displayed.



• Clicking [Cancel] will return the system to the main menu.

2. Click [OK].

The v-TS will be terminated and the desktop will be displayed.

3. On the [Start] menu of the OS, select [Shutdown].

The power of the PC will be turned off.

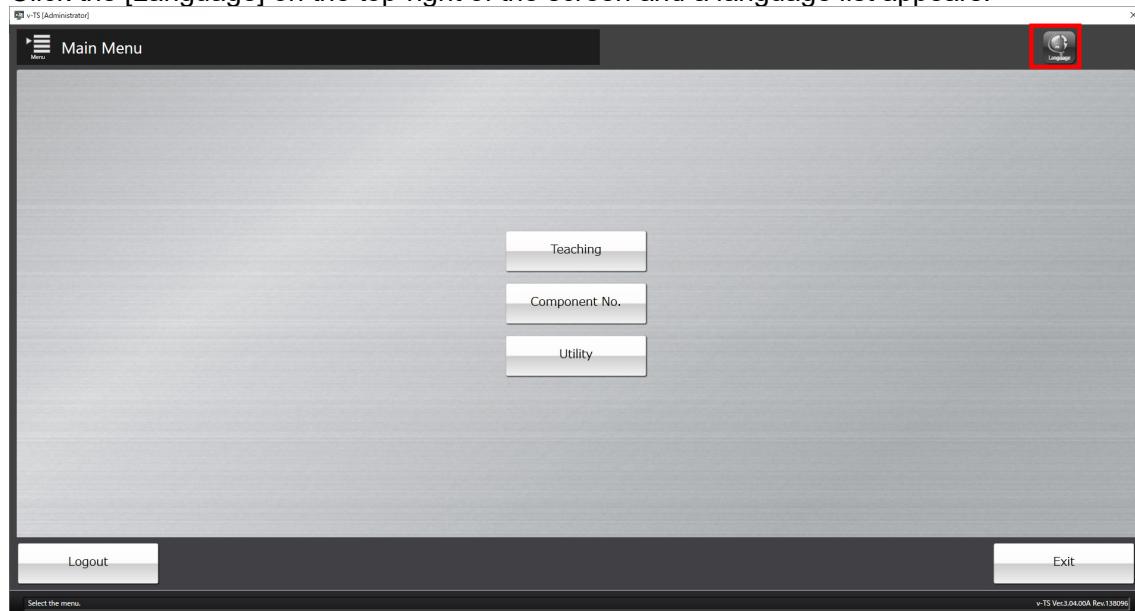
# 1.4 Switching Languages

This system allows you to select either English or Japanese as a display language.

Memo Switching Languages is available on:

Main menu, Teaching PCB selection screen, or any screen of the utility

Click the [Language] on the top-right of the screen and a language list appears.



Click a language you want to display.



# 1.5 Login and Logout

After the system starts, follow the login procedures from the main menu. Without following the procedures, no menu can be started. After all the operation is done, follow the logout procedures.

A user name and a password registered in v-DB Tool are required to log in. This function allows the user to limit access to the operator of the system.

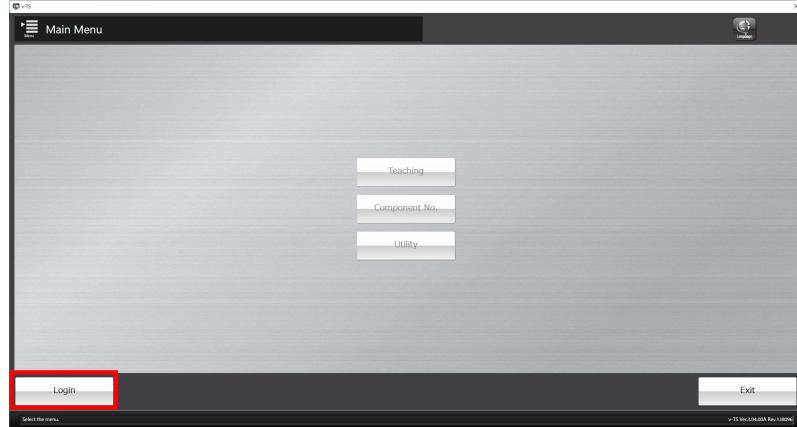


Refer to "Chapter 2 Using v-DB Tool" in the v-DB Operation Manual for v-DB Tool operation.

## 1.5.1 Login

Specify a user and log in to the system.

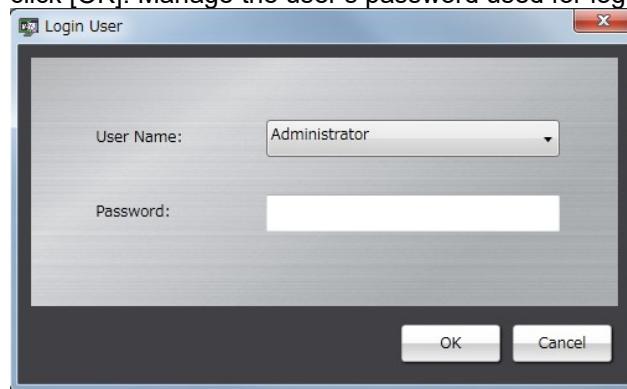
||Operation▶ 1. Click [Login] on the main menu.



**Memo** The login dialog automatically appears when v-TS starts.

2. The following dialog will appear.

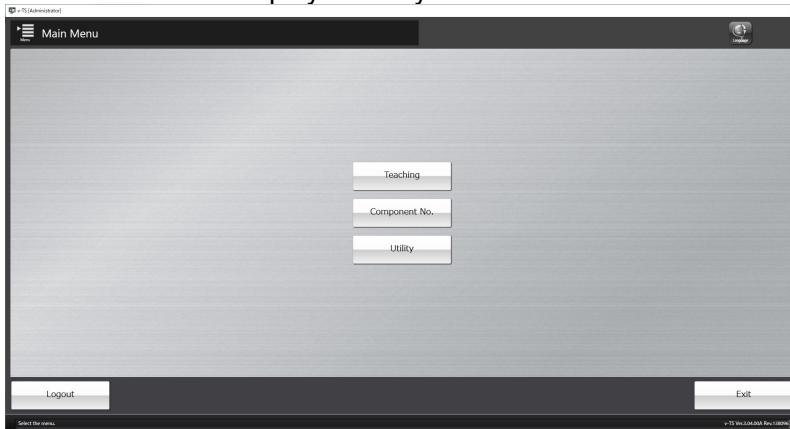
Select a user name from the list box, enter a password and then click [OK]. Manage the user's password used for login appropriately.



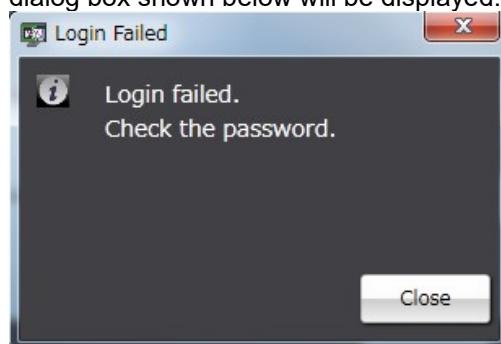
- Clicking [Cancel] will return the system to the main menu without logging in.

**Memo** The characters entered will be displayed as "●" in the space for the password.

3. When the user name and the password are entered correctly, the main menu will be displayed and you can start each mode.



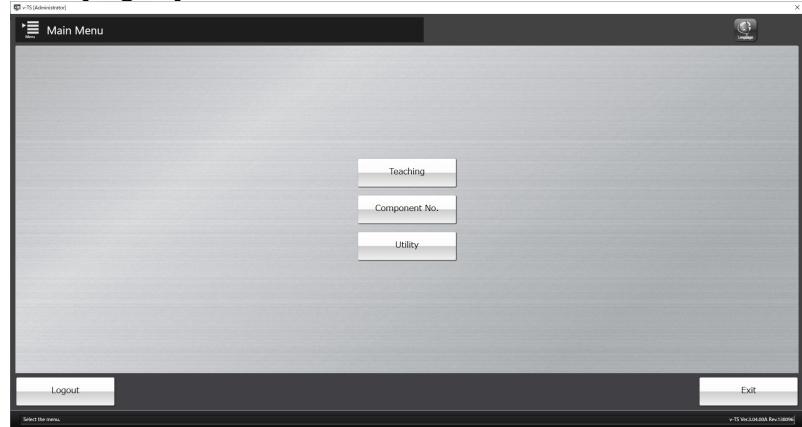
When the user name or the password is not entered correctly, a dialog box shown below will be displayed.



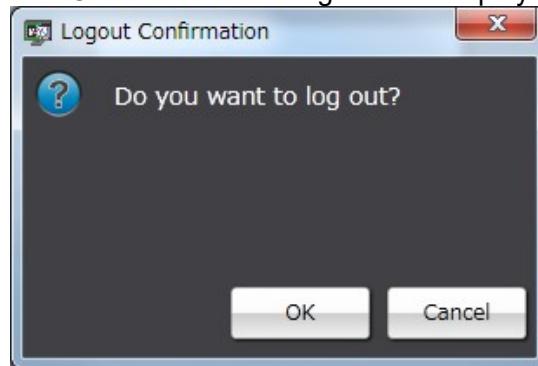
## 1.5.2 Logout

The following logout procedures are used when teaching operation is finished, or when the operator is changed

||Operation▶ 1. Click [Logout] on the main menu.



2. The Confirmation message will be displayed.



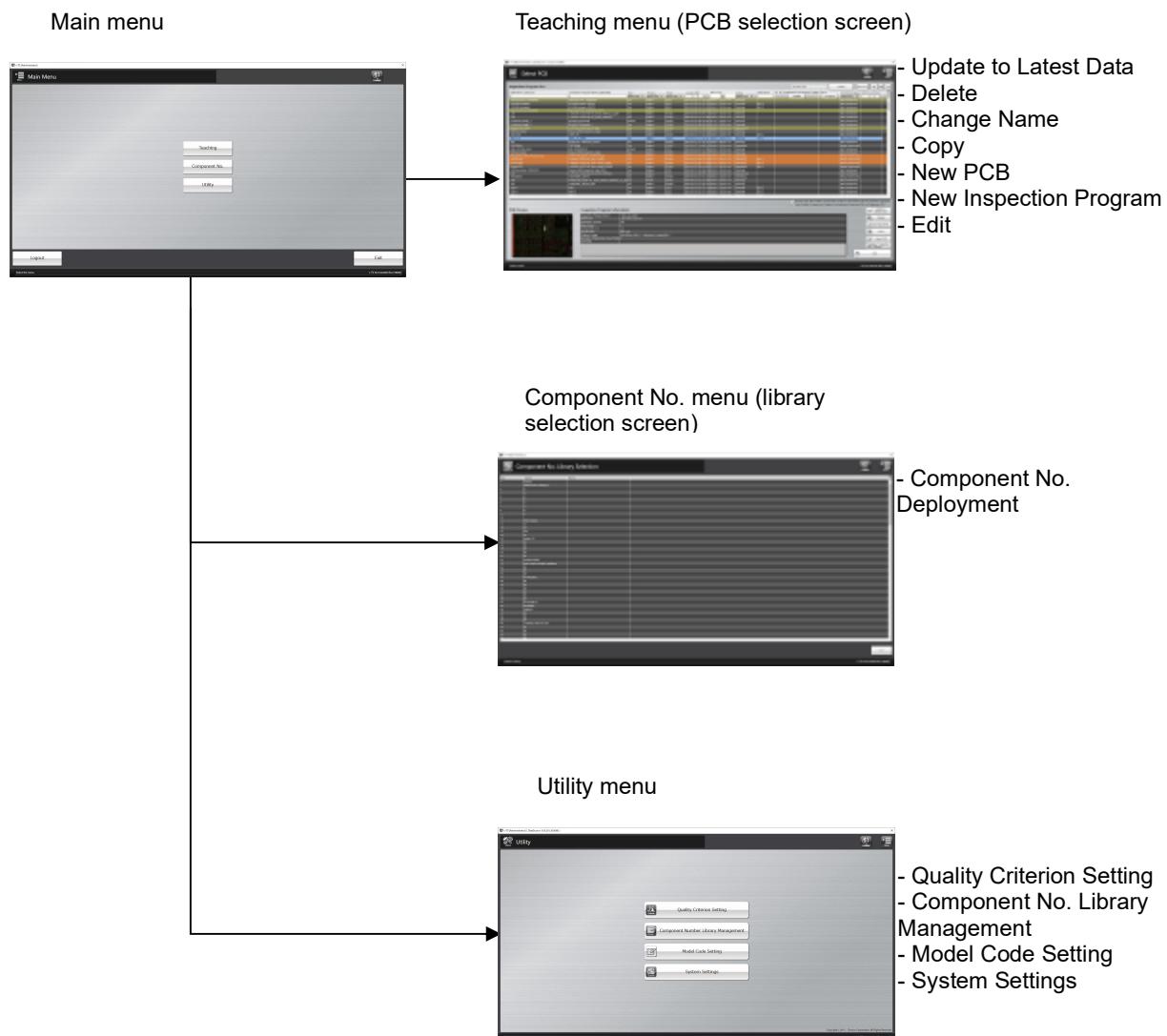
- Clicking [Cancel] will return the system to the main menu without logging out.

Clicking [OK] will close the dialog and return to the main menu. Then all the menus will not be able to be started. To continue to operate the system, follow the login procedure.

# 1.6 Menu Layouts

This system has the following menus:

By clicking the [Menu] button on the teaching, component number, or utility menu, you can return to the main menu.



**Memo** The component No. button on the main menu is displayed only when the [Use Deployment ON/OFF Setting Function] checkbox is set ON.

# **Chapter 2**

## **Inspection Programming**

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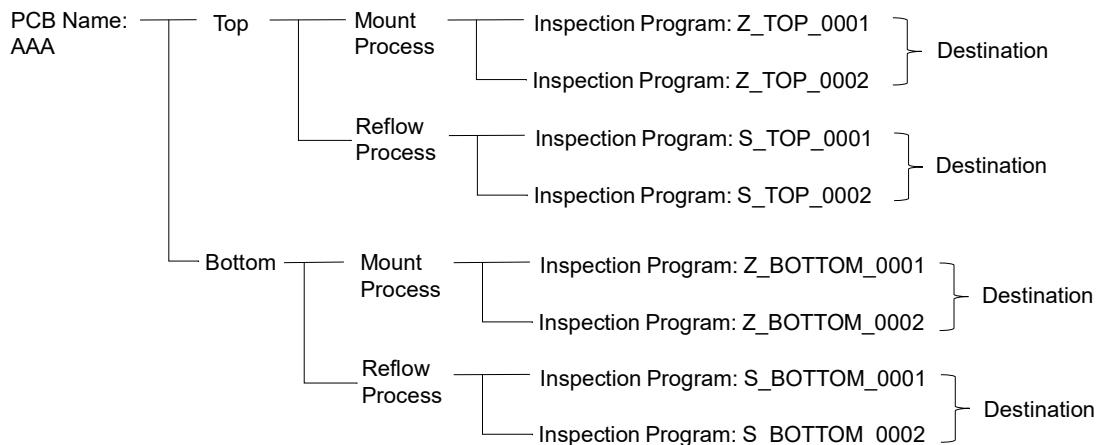
# 2.1 Basics of Teaching

This section describes the basics of teaching using v-TS.

## 2.1.1 Basic Knowledge of Teaching

### ■ Inspection Programs

Prepare a set of inspection programs for individual process (Z: Mount, and S: Reflow), PCB surface (top or bottom) and destination.



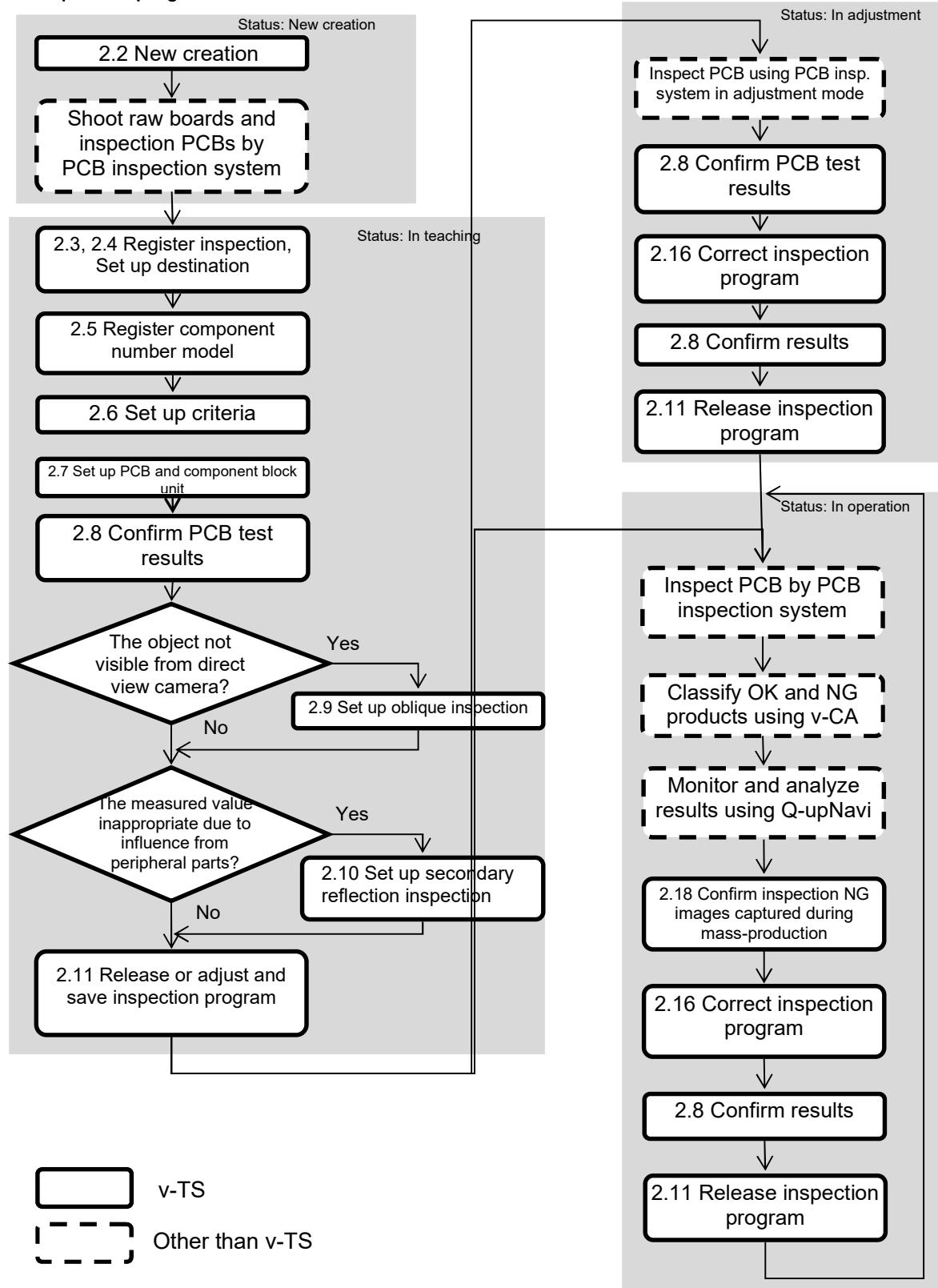
**Memo** v-TS only supports the creation of inspection programs for the implementation and reflow/flow processes.

**Memo** "Destination" here refers to the variations of PCBs including different components or component numbers, which go through the same printing process. Due to the difference of mounting configuration, different inspection programs are required and teaching must be performed separately.

To set up destination, refer to Section 2.16.8 "Setting up Destination."

## ■ Teaching Flow

### ■ Inspection program creation flow



## ■ Inspection Program Status

The status of the inspection program is updated in accordance with the program creation progress.

### <New>

Refers to the state after the creation of a new inspection program starts and before the bare and inspection PCB images are captured.

See 1) in the flow above.

### <Teaching>

Refers to the state where the PCB images are captured and before the inspection program is released.

See 2) to 5) in the flow above.

**Memo** An inspection programs in the teaching status cannot be used on the PCB inspection system.

PCBs can be captured by the PCB inspection system.

### <Adjusting>

Refers to the state where the inspection program is saved in adjustment and before the program is released.

See 6) to 9) in the flow above.

**Memo** An inspection program in the adjusting status can be used to obtain adjusted images on the PCB inspection system.

PCBs cannot be inspected by the PCB inspection system.

### <Operating>

Refers to the state after the inspection program is released.

See 11) to 14) in the flow above.

**Memo** An inspection programs in the Operating status can be used on the PCB inspection system.

In addition, even if the latest status of the inspection program is changed by saving it after releasing or adjustment, the inspection program when it was released can be inspected by the PCB inspection system continuously.

## ■ Component Number

Inspection criteria and inspection windows must be specified by the unit of component number in teaching.

A component number after teaching is registered in the library for reuse when additional inspection programs are created.

## ■ Component Number Library

A library is provided for managing component number information. Component number information is saved in the component number library. The inspection program obtains component number information by referring to the component number library. The inspection program itself does not have component number information. More than one component number libraries can be created, and identified by the library number and library name. If the system of component number names is different from each other among the customers, manage the component numbers using separate component libraries.

## ■ Inspection Windows

Inspection windows can be categorized into several types including Inspection Region Window, Component Body Window, Land Window and Electrode Window. Windows are positioned over the PCB image, and inspection criteria is specified for each window.

Each window is displayed in a different color as shown below:

- White...Inspection Region Window, Component Body Window or Electrode Window
- Yellow...Land Window
- Light Blue...Selected window

In addition, there are windows with no inspection criterion in addition to the windows above, displayed in the following colors, respectively:

- White: Component Body Plus Window, Lifted Component Window
- Gray: Component Body Minus Window, and Excluded Window (component number)
- Light green: Component Body Minus Window, Excluded Window (PCB)
- Yellow: Wrong Polarity/Height Reference Point Window
- Light Blue: Wrong Polarity/Height Measurement Point Window
- Yellow-green: Luminous Body Window



Refer to the Inspection Logic Manual, "1.4 Component Types and Individual Windows" for the window positioning procedure.

## ■ Model Calculation

The characteristic parameters used in inspection logics are automatically extracted based on the windows and model images specified for individual component numbers. The extracted characteristic parameters are registered in the library.

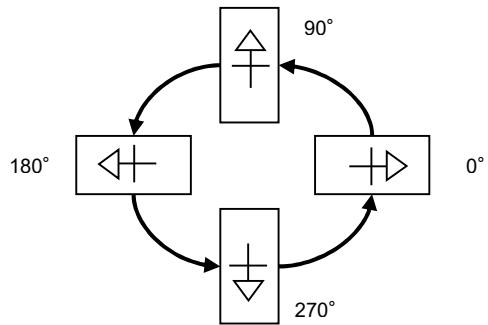


Refer to the Inspection Logic Manual, P1-2 "1.2 Inspection Parameter" for details on characteristic parameters.

---

## ■ Component Angle

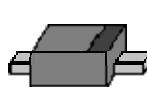
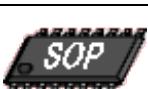
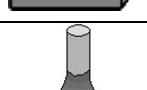
This system uses the symbols composed of "+" (representing the center of the component) and "Δ" (direction) to show the component angles.



## ■ Component Types

This system classifies components under the following categories.

Component Type

	Chip Resistor		Chip Capacitor
	Other Chip Components		Resistor Array (Micro-Lead)
	Resistor Array (Castellated Electrode)		Other Arrays (Non-Lead)
	MELF Component		2 Pin Mini Mold Package
	Inward L-Lead Package		Electrolytic Capacitor
	Transistor		Power Transistor
	SOP		QFP
	SOJ		QFJ
	SON (Micro-Lead)		QFN (Micro-Lead)
	SON (Non-Lead)		QFN (Non-Lead)
	Connector		BGA/CSP
	Other Non-Lead Packages		Other Bottom Surface Electrode Components
	Other Lead Packages		Insertion Component

## ■ Electrode Types

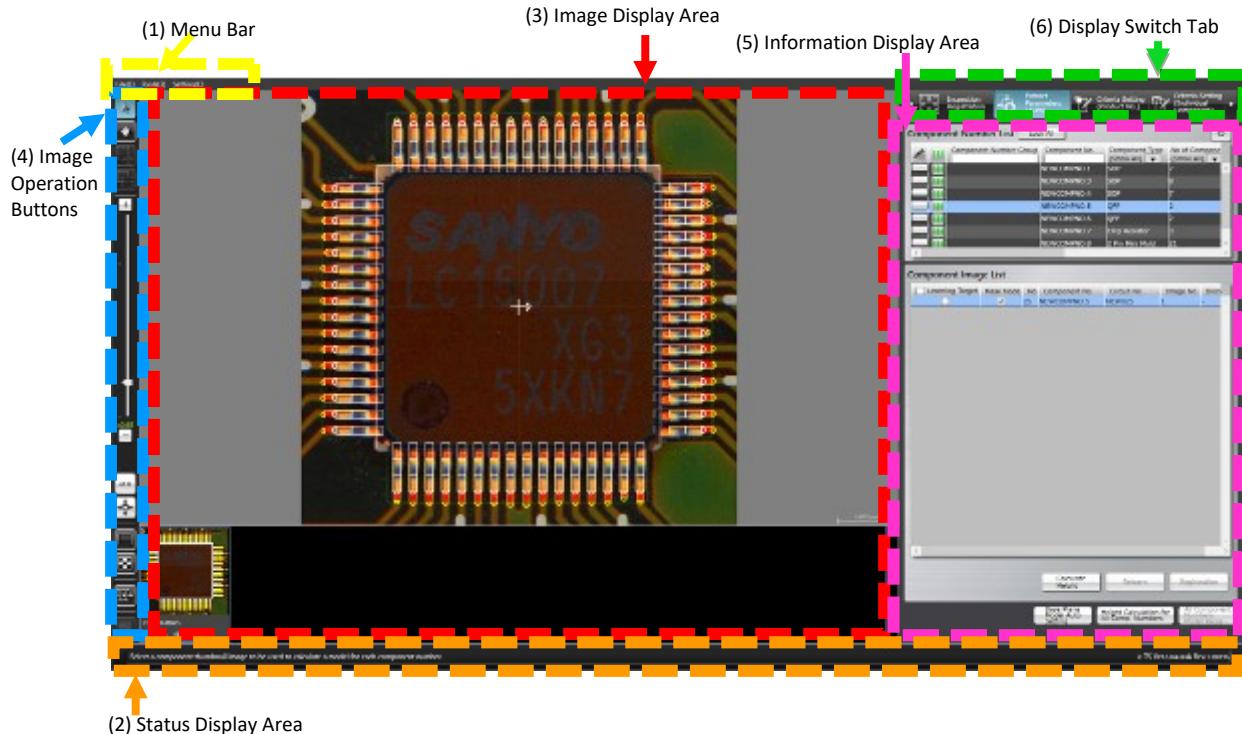
This system provides inspection in a specific way depending on the defined electrode type. The types of electrode that can be defined are determined according to the component types.

Electrode Type		
Chip-Type Electrode		Chip Resistor Chip Capacitor Other Chip Components MELF Component
Castellated Electrode		Resistor Array (Castellated Electrode) Other Lead Packages
Gull-Wing Lead		2-Pin Mini-Mold Package Transistor Power Transistor SOP, QFP Connector Other Lead Packages
Flat Lead		2-Pin Mini-Mold Package Electrolytic Capacitor Transistor Power Transistor Connector Other Lead Packages
Micro-Lead		Resistor Array (Micro-Lead) 2-Pin Mini-Mold Package Transistor SON (Micro-Lead) QFN (Micro-Lead) Other Lead Packages
Non-Lead		Other Arrays (Non-Lead) SON (Non-Lead) QFN (Non-Lead) Connector Other Non-Lead Packages Other Lead Packages
Inward L-Lead		Inward L-Lead Package Other Lead Packages
J-Lead		SOJ QFJ Other Lead Packages
Insertion Terminal (Straight)		Insertion Component

Insertion Terminal (Clinch)		Insertion Component
Terminal		Connector Other Lead Packages

## 2.1.2 Configuration of the Editing Screen

The screenshot below shows the configuration of the Inspection Program Editing screen. To view the editing screen, select a PCB you wish to edit from the inspection program list, and click [Edit] in the bottom right corner of the screen.



### (1) Menu Bar

Shows the following menu items:

- File Menu (Save, Save as, Save as Adjustment, Release, Change Details List, Recently Used Inspection Program, Reload, Inspection Coverage, and Quit)
- Tool (PCB Image Management, Component Number Group Setting, Mass Production Image, Move Component To Inspection Reference Position, Data Verification, Screen Brightness Adjustment, Forced Lock Release, and Area Assistance)
- Setting (Set PCB, Set Inspection Program and Set Application)

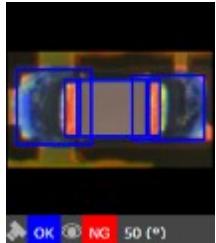
### (2) Status Display Area

Indicates the operation required on the currently displayed screen.

## (3) Image Display Area

Displays the relevant PCB image or component thumbnail images.

The description of component thumbnail image is shown below. The content displayed can be viewed when model editing is performed on the PCB after a component number is created.



- ① Presence of individual setup
- ② Image No.
- ③ Date & time of image saving
- ④ Date & time of inspection execution \*mass-production image only
- ⑤ Image Type  
(PCB Test Result/Model/Oblique Model//Mass Production Image/Mass Production Image  
(not registered))
- ⑥ Measured Value
- ⑦ Judgment Result (OK/NG)
- ⑧ Component Fault Name
- ⑨ Visual Check Result (OK/NG/Acceptable/None)
- ⑩ Component No. Name
- ⑪ Component Block Unit No.
- ⑫ Circuit No.
- ⑬ ID of the board from which the image was captured
- ⑭ Name of the board from which the image was captured
- ⑮ Name of the inspection program that registered the image
- ⑯ Name of the device used to capture the image
- ⑰ Name of the site that registered the image
- ⑱ Direction of oblique capturing ("-" for direct view image)
- ⑲ Version at the timing of image saving
- ⑳ Description of the model

In the model list, the following thumbnail information is displayed:

However, it is not displayed unless clicking [Model Editing] in the bottom right corner of the screen on the PCB after a component number is created.

①	②	③	④	⑤	⑥	⑦
Judge (Show All) ▾	(Show All) ▾	Component Number	Block No.	Circuit No.	PCB ID	(Show All) ▾
⑮	⑯	⑰	⑱	⑲	⑳	
Board Name	Program Name	Machine Name	Base Name	Oblique Angle (Show All) ▾	Version	Model Descrip
⑭	⑮	⑯	⑰	⑱	⑲	⑳

**Memo** If [Use Image ID] of system settings is set ON, [Image ID] is displayed.

For system settings, refer to Section 3.6 "Making System Settings."

①	②	③	④	⑤	⑥	⑦
No	Image ID	Image Saving Date/Time	Inspection Date	Thumbnail Type (すべて表示) ▾	Measure	(すべて表示) ▾

**Memo** The display order of the columns can be changed by dragging and dropping them.

Thumbnail Type (すべて表示) ▾	Measurement Va	Thumbnail Type (すべて表示) ▾	Judge (すべて表示) ▾	(す
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**Memo**

By double-clicking [Model Description], the model description entry dialog is displayed.

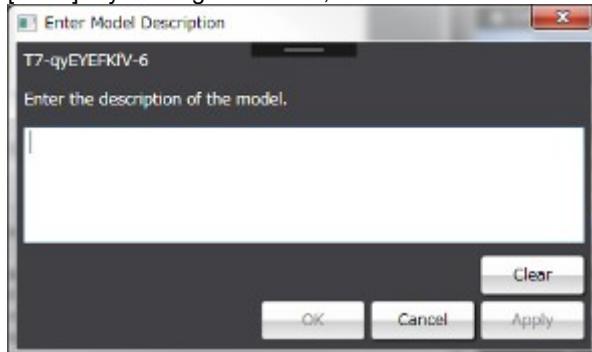
Text can be filled in by clicking the text box.

[OK]: By clicking this button, the edited content is applied and the dialog is closed.

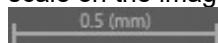
[Cancel]: By clicking this button, the edited content is discarded and the dialog is closed.

[Apply]: By clicking this button, the edited content is applied and the dialog is left open.

[Clear]: By clicking this button, the edited content is erased.



A scale is displayed in the bottom right portion of the image display area. The length of the scale on the image is displayed by number in mm according to the display magnification.



#### (4) Image Operation Buttons

Support the operation of the image display area e.g. selection of a window, image magnification or reduction.

The functions of individual buttons are explained below.

Refer to "2.1.3 Image Display Area Operation" for the image operation details.

##### ◆ Mouse Tool Buttons

Button	Function	Operation
	Select Window	Enables the selection and moving of a window using the mouse. Click to select and drag and drop to move a window.
	Move Field of Vision	Enables the moving of the field of vision using the mouse on the image display area. Drag the image display area to move the field of vision.
	Create Window	Enables the creation of a window using the mouse. Drag and drop to create a window in accordance with the image.
	Create Mask Window	Enables the creation of a window using the mouse. Drag and drop to create a window in accordance with the image.

◆ Display Magnification Buttons

Button	Function	Operation
	Magnify	Magnifies the image display area by one step increment. (Max. ratio: 10.0 times)
	Reduce	Reduces the image display area by one step increment. (Min. ratio: 0.01 times)
	Magnify/Reduce	The slider to magnify or reduce the image display area. Slide up the slider to magnify, and down to reduce.
	Original Size	Displays the image in the display area at the same magnification of pixels.
	Entire View	Displays the entire image of the PCB in the display area.

◆ Display Switch Buttons (Only effective on screens where thumbnails can be displayed)

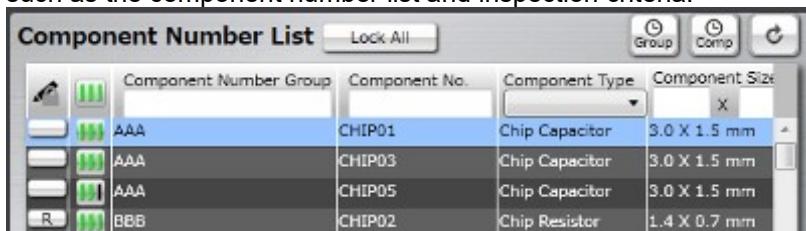
Button	Function	Operation
	PCB Display	Only displays the PCB image in the image display area. Clicking this button again brings back the default display (PCB image and component thumbnail images).
	Component Thumbnail Display	Clicking the button displays the component thumbnails in the image display area. Clicking this button again brings back the default display (PCB image and component thumbnail images).
	ColorHighLight/White Light Image Switching Button	Switches the lighting type of the board image. (Color highlight image, white image, emphasis white image)

◆ Auxiliary Tool Buttons

Button	Function	Operation
	Window Adjustment Dialog	Displays the window adjustment dialog. The dialog provides the adjustment of window position and size with buttons. Used when fine adjustment with the mouse is difficult.
	PCB Map	Displays the PCB map. Shows the current field of vision of the image display area on the PCB map in the form of a window. The field of vision can be moved by drag and drop of the window.

(5) Information Display Area

Editing operation can be proceeded while checking the information of individual components such as the component number list and inspection criteria.



■ Component Number List

The following shows the operation procedures of the Component Number List.

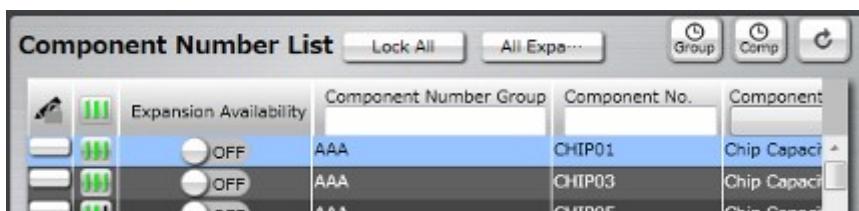
**Memo** The Component Number List comprises the Component Setting, Component Registration (Auto) and Criteria Setting (Product No.) screens.

&lt;Name&gt;

Name	Description
Component Number Group	A group of component numbers. In a component number group, windows, inspection criteria, and characteristic parameters are shared.
Component No.	Refer to 2.1.1 "Basic Knowledge of Teaching."
Component Type	Refer to 2.1.1 "Basic Knowledge of Teaching."
Component Size	Size of the component body window
Judgment	Judgment result when the PCB test is performed
No. of components	No. of components on the PCB
No. of electrodes	No. of electrodes of the component
Details of component No. change	When changing the inspection criteria or color parameters of a component number, text of change details or reason can be entered. This comment is saved for each revision of component number.
Description about component No.	Text to explain the characteristics of the component number is kept.
Change details of component No. group	When changing the inspection criteria or color parameters of a component No. group, text of change details or reason can be entered. This comment is kept for each revision of component No. group.
Description about component No. group	Text to explain the characteristics of the component No. group is kept.

**Memo** If [Use Deployment ON/OFF Setting Function] of system settings is set ON, [Deployment ON/OFF] is displayed.

For the deployment ON/OFF setting function, refer to Section 3.6.3 "Making Component No. Settings."



Double click [Description] or [Description about component No. group]. The [Description Entry] dialog box is displayed.

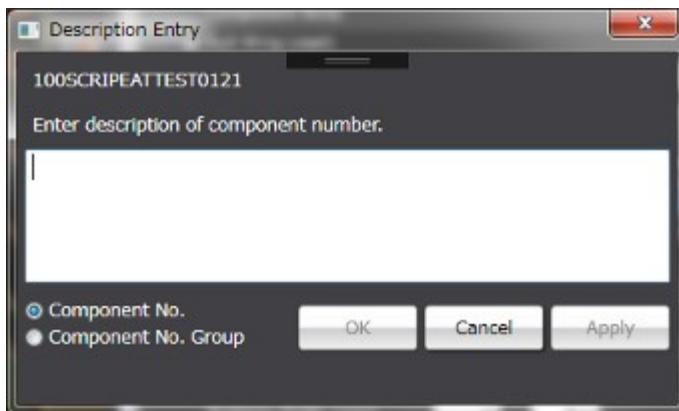
Text can be entered by clicking the text box.

[OK]: When clicked, the edited content is applied and the dialog box is closed.

[Cancel]: When clicked, the edited content is discarded and the dialog box is closed.

[Apply]: When clicked, the edited content is applied and the dialog box is kept open.

[Component No.][Component No. Group]: Description about component No. or component No. group can be entered by selecting a component No. or a component No. group, respectively.



**Memo** With the [Description Entry] dialog box open, the selected component number can be switched on the component number list.

**Memo** The Description Entry dialog can also be displayed by clicking [Component No. Description Entry] or [Component No. Group Description Entry] on the context menu displayed by right-clicking the component No.

By double-clicking [Component No. Change Details] or [Component No. Group Change Details], the [Componnet No. Change Details Entry] dialog is displayed.

Click [Fill in Comment] on the context menu. The [Fill in Component No. Comment] dialog is displayed.

Text can be entered by clicking the text box.

[OK]: When clicked, the edited content is applied and the dialog is closed.

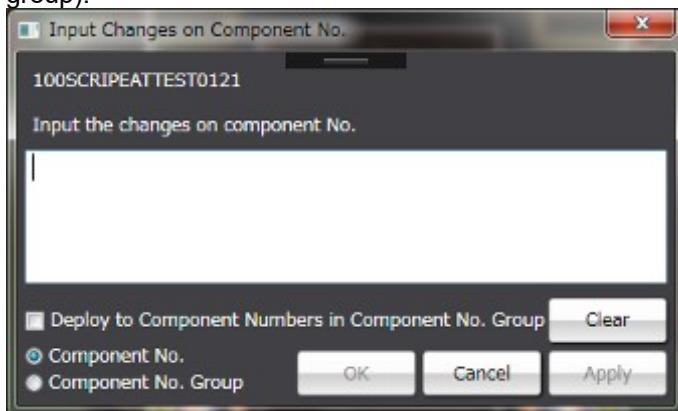
[Cancel]: When clicked, the edited content is discarded and the dialog is closed.

[Apply]: When clicked, the edited content is applied but the dialog is still open.

[Clear]: When clicked, the edited content is cleared.

[Component No.]/[Component No. Group]: Change details of a component No. or a component No. group can be entered by selecting a component No. or a component No. group, respectively.

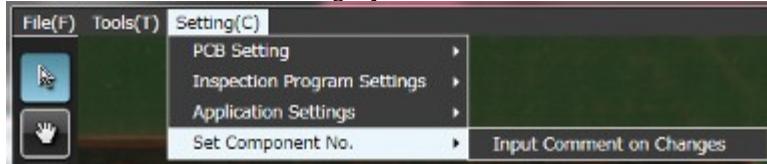
[Deploy to Component Numbers in Component No. Group]: When [OK] or [Apply] is clicked with this check box ON, the edited content is deployed to the component numbers in the component number group (not displayed when entering change details of a component No. group).



**Memo** It is able to switch the selected component number on the component number list with this dialog box open.

**Memo** The Component No. Change Details Entry dialog can also be displayed by clicking [Component No. Change Details Entry] or [Component No. Group Change Details Entry] on the context menu displayed by right-clicking the component No.

**Memo** This dialog box can also be displayed by clicking [Settings] - [Set Component No.] - [Input Comment on Changes].



#### <Component Number Lock>

To avoid data loss due to simultaneous update of component numbers, the software performs exclusive control using the component number lock function.

The buttons shown in the row represent the lock status of individual component numbers.

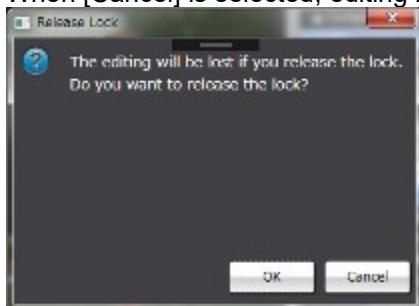
- ... Not locked. Read only. Editing is disabled.  
When you click the button, it changes to and editing is enabled.
- ... Locked. Editing is enabled but other users cannot edit.  
When you click the button, the lock will be released and the button changes to .
- ... Locked by other user (Locked).  
Editing is disabled until another user releases the lock.

When you click [Lock All], the component numbers of become at once.

When is clicked, it is confirmed if the edited content is discarded.

To discard the edited content and unlock, click [OK].

When [Cancel] is selected, editing is not unlocked.



When the component number information is not up to date, is displayed and the update check is performed by clicking .

To update the component number to the latest one, click [Update].

When you select [Do Not Update], the corresponding component number cannot be edited.



If an application program is shut down forcibly, it might occur that the lock state is not released correctly and component numbers cannot be edited. In this case, select [Tool] – [Forced Lock Release] on the menu bar, and select a lock release target to release the lock.

#### <Progress Signal>

The lighting status of the three signal bars shown in  row in the Component Number List represents the teaching status of individual product numbers.

The component numbers for oblique inspection are displayed in a different background color. The left signal bar lights up in red if the oblique image is not captured yet.

Oblique Inspection		Product Number Teaching Progress
No	Yes	
		The component number information is not specified yet
		A sample component for the component number has been registered
		All component windows have been automatically adjusted
		All component windows have been automatically adjusted, the model has been registered, and component and electrode heights have been configured
		The model has been registered, but the windows are not automatically adjusted yet (The number of electrodes of the component number has changed, or the number of electrodes of the component number does not match the number of lands because the process to add or delete a land is on the way.)

#### <Auto Adjustment>

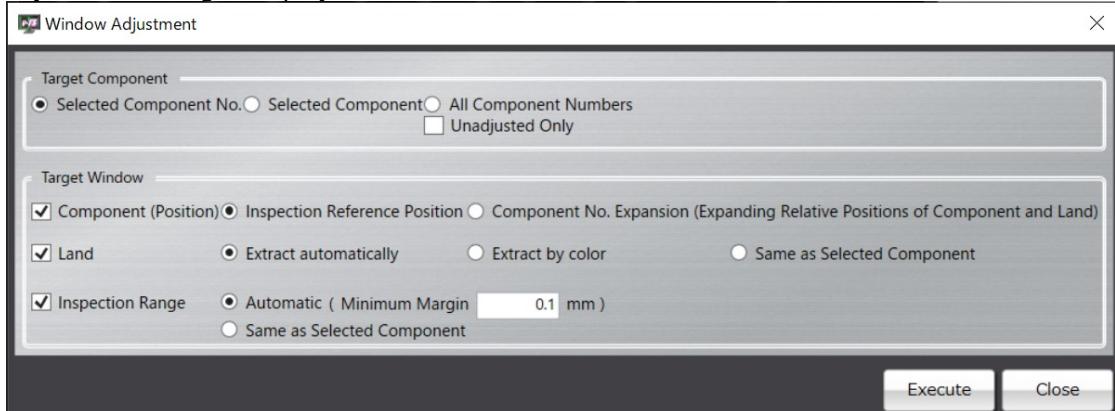
Use the [Adjust] button at the bottom of the Component Number List to automatically adjust the windows.

The [Automatic Adjustment] button is enabled only when the component number lock is locked ( -> 

**Memo** The [Adjust] button is available on the Component Registration screen and Criteria Setting (Product No.) screen.

**Memo** When adjusting the land using the inspection board, there is a possibility that the land position on the component side may not be correctly set because it is not visible. To avoid unintended conditions during inspection, always visually check the window's position settings after automatic adjustment. If you want to correctly set the land position on the component side, use a bare board for land adjustment.

On the criteria setting (component number) screen, click [Automatic Adjustment]. The window adjustment dialog is displayed.



Specify a target component and window, and click [Execute].

- Target Component . . . Selects a target component.
  - Selected Component No. Selected component number is set as a target.
  - Selected Component Selected component is set as a target.
  - All Component Number All component numbers are set as target.
- Unadjusted Only . . . Unadjusted component numbers or components are set as target out of the component numbers or components selected in the Target Component area.
- Target Window . . . Selects a target window.
  - Component (Position) Adjusts the component window.
    - Inspection criteria position Moves the component window to the inspection criteria position.
    - Component No. deployment (deploying the relative position to the land) Moves the component window according to the relative position to the land.
  - Land Adjust the land window.
    - Extract Automatically Land extraction is performed using image information.  
Note: If you check 'Bare Board Available' in the board information settings screen and perform 'Extract Automatically' for the land, the land window will be automatically adjusted using the master of the bare board in the board image management screen. If you uncheck it, the land window will be automatically adjusted using the master of the inspection board in the board image management screen.
- ➡ For the screen to toggle the 'Bare Board Available' check on or off, please refer to the board information settings screen in '2.2 Creating a New Inspection Program'.
- ➡ For the board image management screen, please refer to '2.17.1 Accessing the PCB Image Management Screen'.
- Same as Selected Component Makes the Land Window of the target component equal to that of the selected component.
- Inspection Region Adjusts the inspection range window.
  - Automatic Adjusts the inspection range window using the specified minimum margin.
  - Same as Selected Component Makes the inspection range window of the target component equal to that of the selected component.

&lt; Update &gt;

Click  on top-right component number list to update the list.



#### ■ Target Image List

For the component of the thumbnail image displayed in the image display area, height calculation, re-learning, and so on are performed.

 For the details of the method to operate the image on the target image list, refer to 2.5 "Registering the Component Number Model."

#### (6) Display Switch Tabs

Display switch tabs are provided. They are positioned in the order of the depth of teaching progress (from left to right).

The following shows the operation available with each tab.



Tab	Outline of Operation
 Inspection Registration	Load the mounting data and register the components to inspect. Specify the inspection windows (component body, land and electrode windows) by the unit of component number.
 Extract Parameters (Auto)	Select a component thumbnail for the component number, based on which a model is calculated. The characteristic parameters for the component number is then automatically extracted, and the model is registered in the library.
 Criteria Setting (Product No.)	Set the criteria values for each of the inspection items for the component number. Edit a component number model image registered in the library.
 Criteria Setting (Individual Component)	Specify the criteria values for each of inspection items for individual components.
 PCB/Component Block Unit Setting	Perform Component Block Unit settings (position change, copy or deletion) and mark settings (2D code).
 Confirm Result	Inspection images and adjustment images are read in, the PCB is tested, and the result is listed.
 Mass Production Image	Load mass-production images specified by Q-upNavi and images judged as inspection NG by v-TS, select an image to register it in the library. In addition, images checked on the [Save Image] column are also included in the mass-production images regardless of the inspection result.

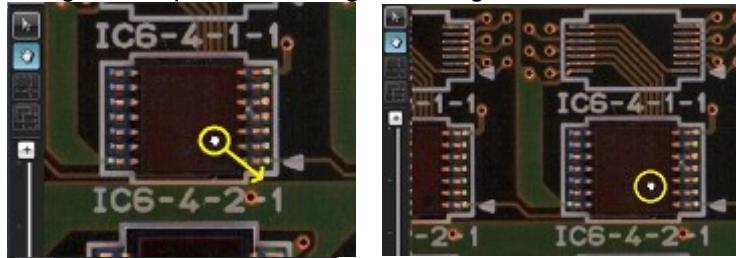
### 2.1.3 Image Display Area Operation

#### ■ Move Field of Vision

<For Small Movement>

- ||Operation▶ 1. Click  (Move Field of Vision) button in the Image Operation tool bar. The mouse cursor changes to .

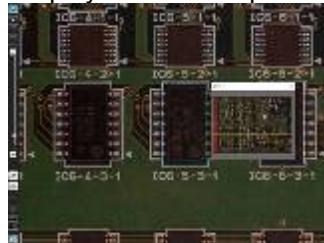
2. Drag and drop the PCB image to change the field of vision.



**Memo** Drag and drop using the right mouse button, instead of using the image operation button, can also move the field of vision.

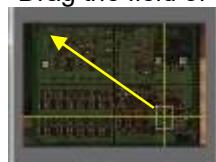
<For Large Movement>

- ||Operation▶ 1. Click  (PCB Map) button in the Image Operation tool bar to display the PCB map.



2. Locate the mouse cursor on the field of vision window in the PCB map (intersection of the yellow lines). The mouse cursor changes from  to .

3. Drag the field of vision window in the PCB map.



4. Drop the window at a desired location in the PCB map to position the field of vision.



## ■ Change Magnification Ratio

<Magnify/Reduce>

The image can be enlarged or reduced in the following three ways:

- 1) Click  (Magnify) button or  (Reduce) button in the Image Operation tool bar.
- 2) Move the slide bar up or down in the Image Operation tool bar.  
Move it upward to magnify, and downward to reduce.
- 3) Position the mouse cursor on the image display area and rotate the mouse wheel.  
Rotate it upward to magnify, and downward to reduce.

**Memo** The magnification ratio changes by one step increment as shown below:

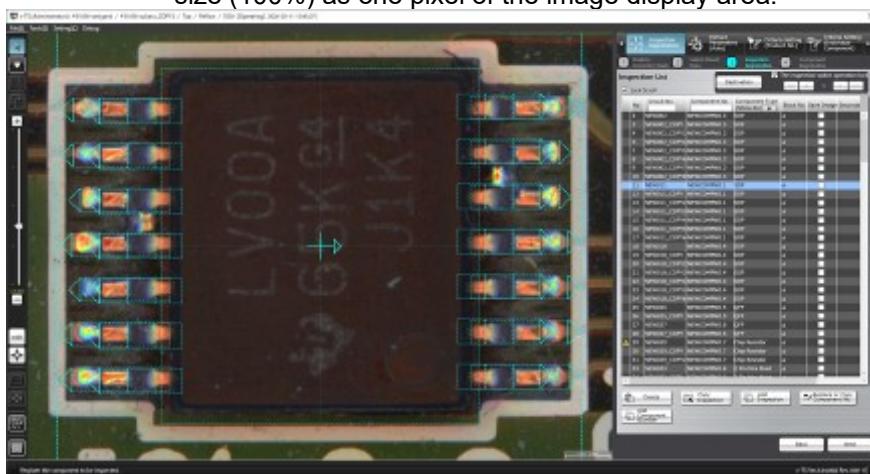
Maximum reduction ratio

x0.01 -> ... ->... -> x0.25 -> x0.50 -> x1.00 -> x2.00 -> ... -> x4.00

<Original Size Display>

Operation▶ 1. Click  (Original Size) button in the Image Operation tool bar.

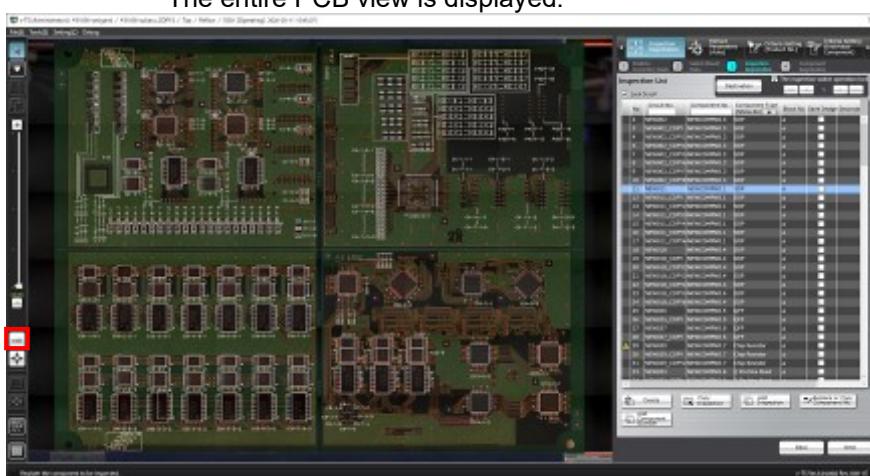
The software displays one pixel of the camera image in the same size (100%) as one pixel of the image display area.



<Entire PCB Display>

Operation▶ 1. Click  (Entire View) button in the Image Operation tool bar.

The entire PCB view is displayed.



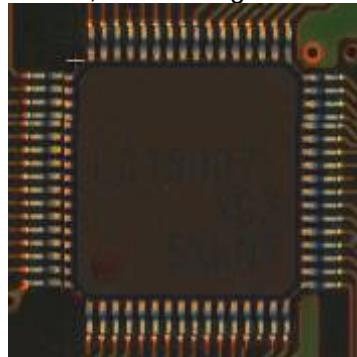
## ■ Create Window

Memo When creating a window, set the display magnification to 1.0 times or higher.

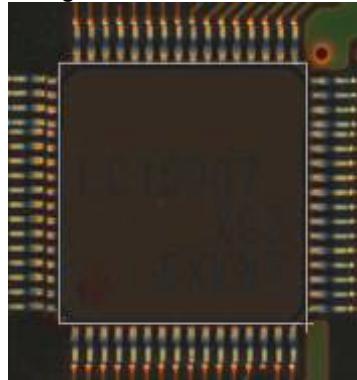
Memo A window in a size smaller than 0.1 mm × 0.1 mm cannot be created.

Operation▶ 1. Click  (Create Window) or  (Create Mask Window) button in the Image Operation tool bar.

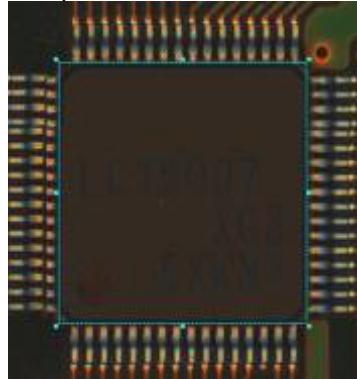
5. Move the mouse cursor at the top left corner of the window to create, surrounding the relevant location e.g. component or land.



6. Drag the cursor from the left top point diagonally to the right bottom.



7. Drop the cursor. The window is formed.



## ■ Change Window Size

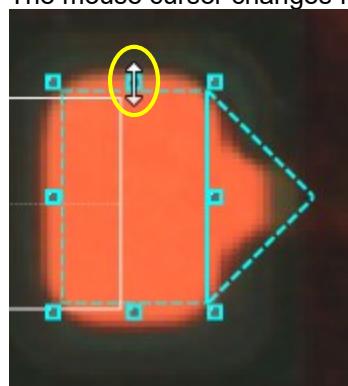
**Memo** When adjusting a window, set the display magnification to 1.0 times or higher.

Operation▶ 1. Click  (Select Window) or  (Create Window) button in the Image Operation tool bar.

2. Click the window in the image display area to resize.

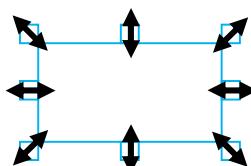
3. Position the mouse cursor on an operating point (shown in a small square) on the window.

The mouse cursor changes from  to .

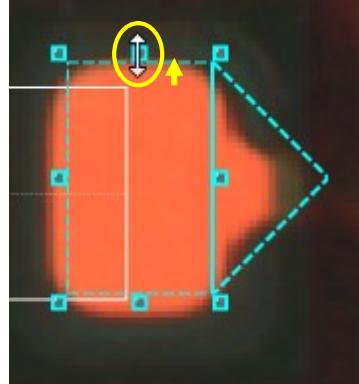


 The window which can be resized or moved is different depending on the screen. For details, refer to 2.16.1 "Modifying an Inspection Window."

**Memo** The direction of the mouse cursor changes depending on the operating point to choose, as shown below:



4. Drag and drop the selected operating point in the window to resize.



## ■ Move Window Position

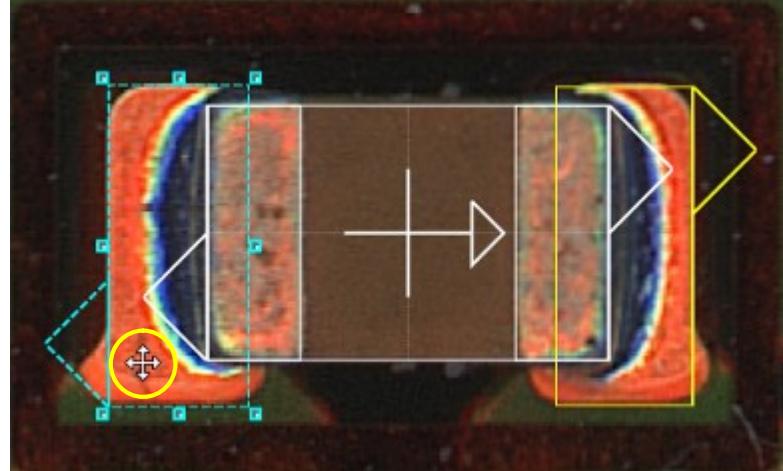
**Memo** When fitting the window position to the PCB image, set the display magnification to 1.0 times or higher.

Operation▶ 1. Click  (Select Window) button in the Image Operation tool bar.

2. Click the window in the image display area to move.

3. Position the mouse cursor inside the window.

The mouse cursor changes from  to .



4. Drag the window to move and drop it at a desired position, where the position is fixed.

## ■ Select Multiple Windows

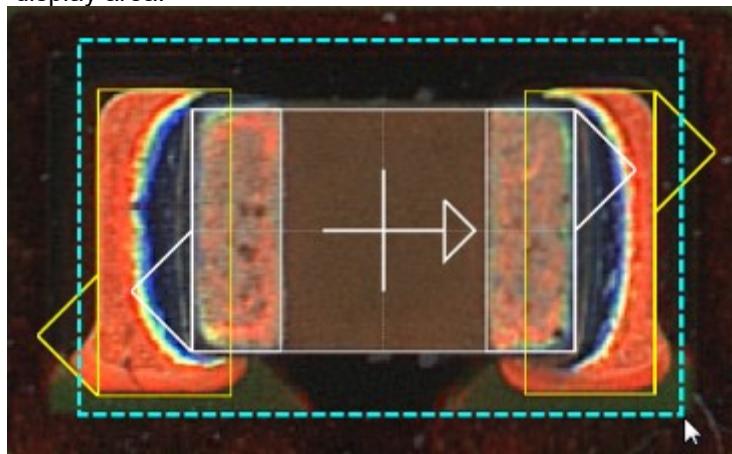
**Memo** The Component Body Window and electrode windows are selected as a set except for individual setting of the component or electrodes.

**Memo** For land setting, multiple selection is applied to the land window only. For electrode group, multiple selection is applied to the electrode window only.

<Select Adjacent Windows>

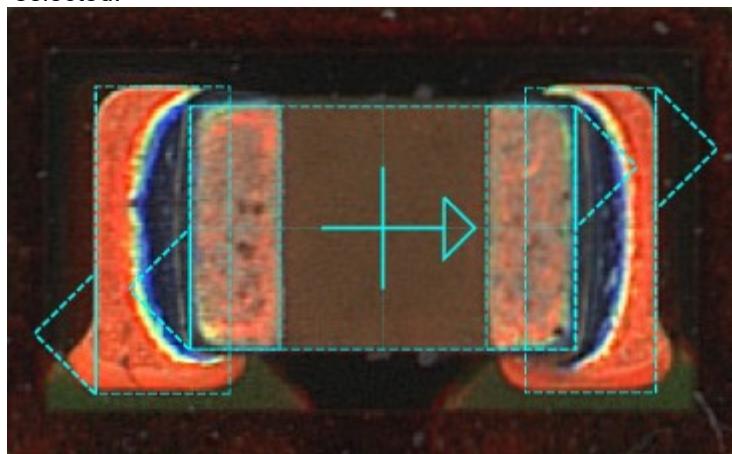
||Operation▶ 1. Click  (Select Window) button in the Image Operation tool bar.

2. Drag the mouse cursor to surround multiple windows in the image display area.



**Memo** No need to include the direction marks ( $\Delta$ ) on the windows in the dragging.

3. Drop the cursor. The windows in the dragged area are now selected.



<Select Distant Windows>

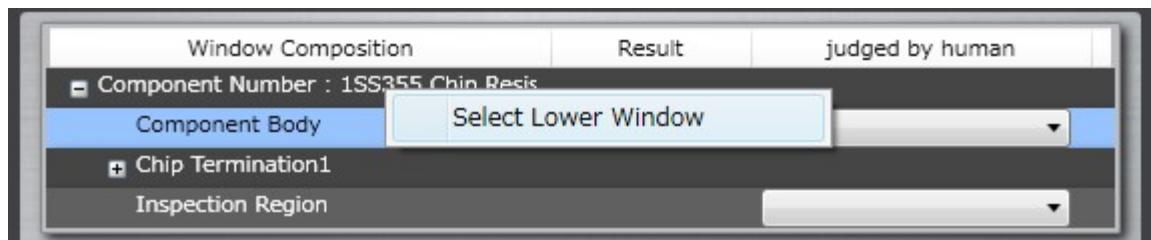
||Operation▶ 1. Click  (Select Window) button in the Image Operation tool bar.

2. Click the individual windows to select while holding down the [Ctrl] key on the keyboard.

**Memo** To cancel a selected window, click the same window again while holding down the [Ctrl] key.

<Select in Window Composition List>

||Operation▶ 1. Open the [Criteria Setting] screen.

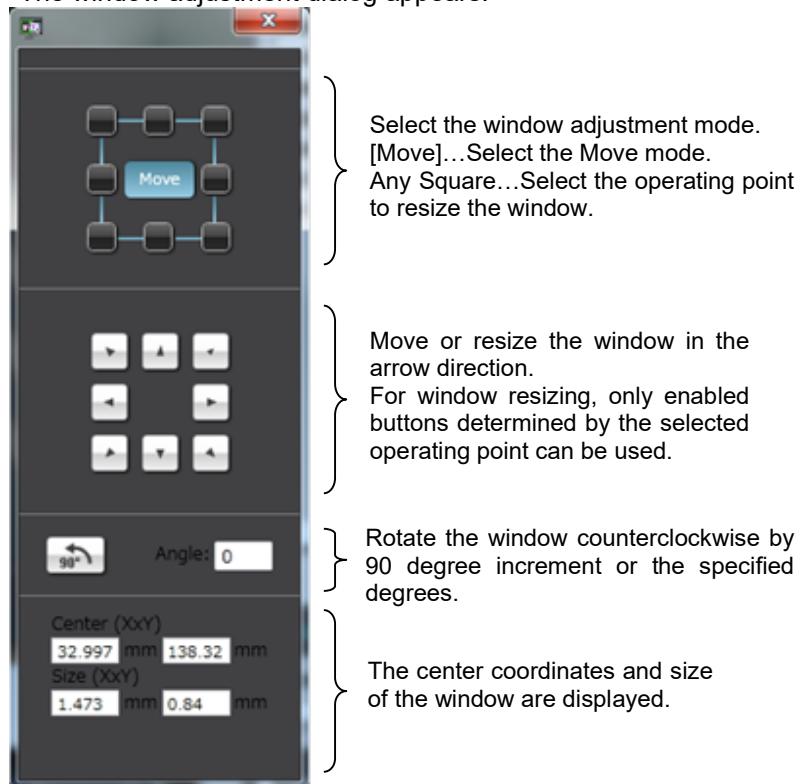


2. Right-click the [Component Number] row in the window composition list. To select electrode group windows, right-click the [Electrode Group] row.
3. Clicking [Select Lower Window] can select all the windows at lower levels.
  - Memo** Specific windows can be deselected or added to selection by clicking them while holding down the [Ctrl] key.
  - Memo** To select consecutive windows simultaneously, click the first window and then the last one while holding down the [Shift] key.

## ■ Window Adjustment Dialog

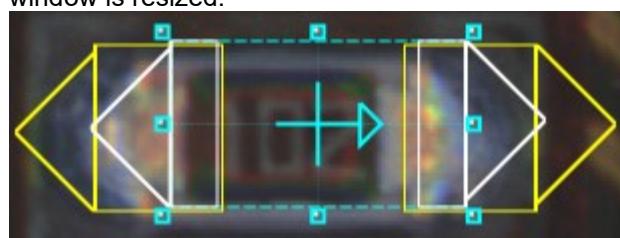
Operation▶ 1. Click  (Window Adjustment Dialog) button in the Image Operation tool bar. (User operations become effective when a window on the image is selected.)

2. The window adjustment dialog appears.



3. Click  (Select Window) button in the Image Operation tool bar and click to select the window to adjust.

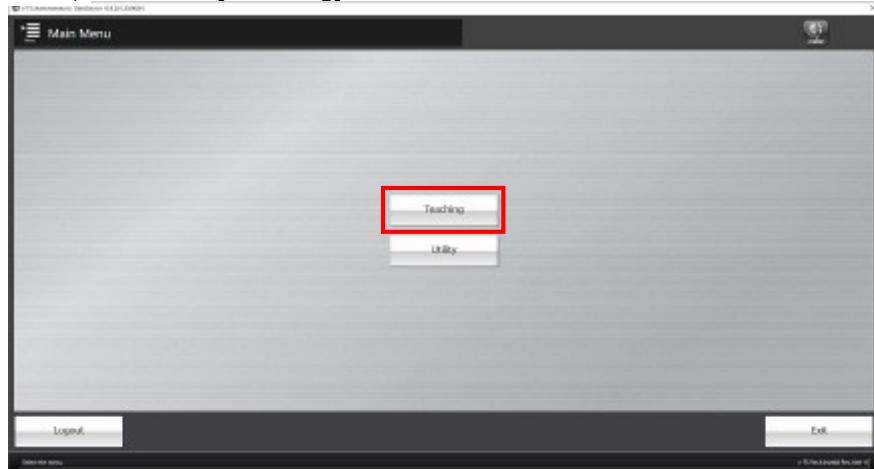
4. Click [Move] and the direction button (e.g. ) to move the window. To resize the window, click the operating point square and the direction button (e.g. ) corresponding to the direction in which the window is resized.



## 2.2 Creating a New Inspection Program

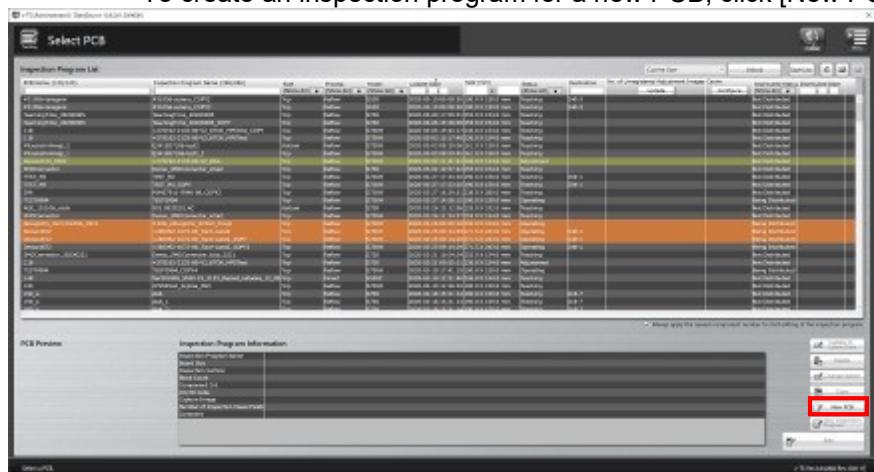
This section describes the procedure to create a new inspection program.

Operation▶ 1. Click [Teaching] in the main menu.

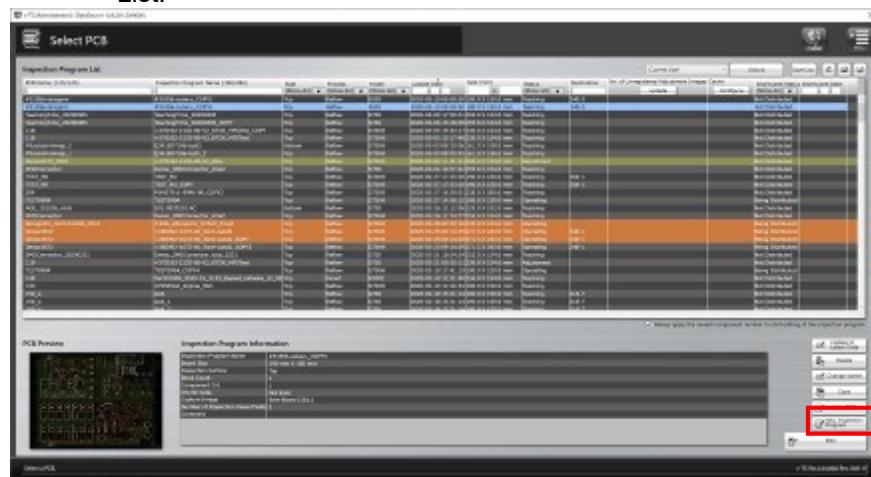


2. The Select PCB screen appears.

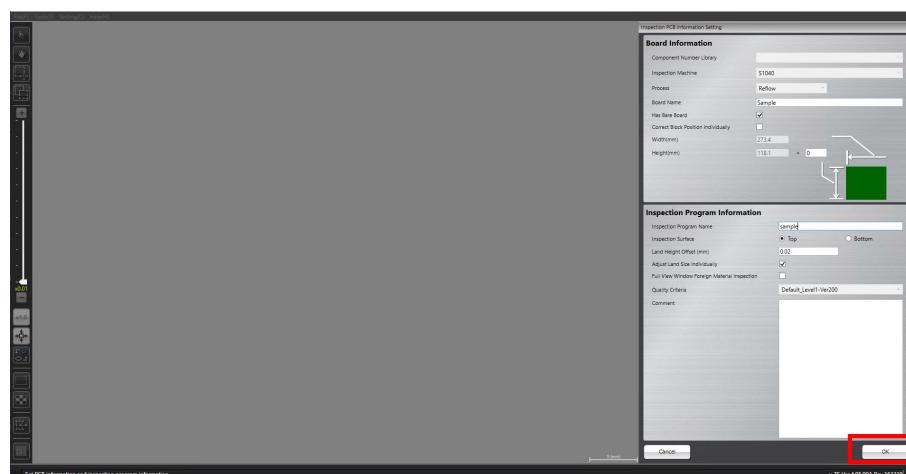
To create an inspection program for a new PCB, click [New PCB].



Click [New Inspection Program] to add a new inspection program for an existing PCB after selecting the PCB in the Inspection Program List.



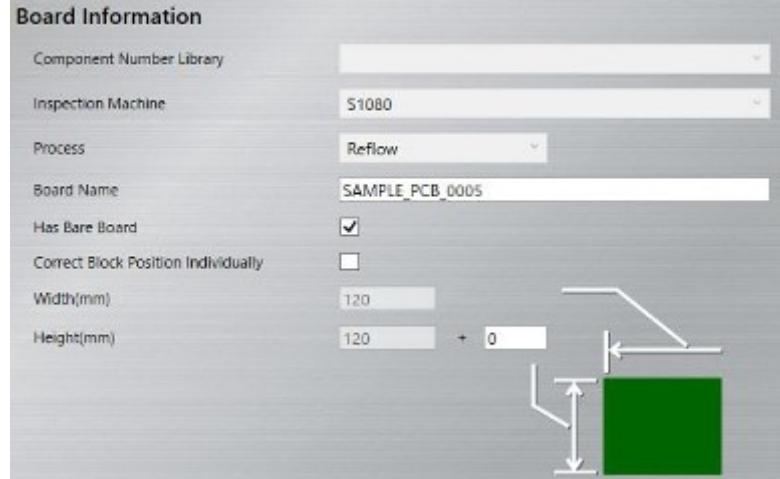
3. The PCB Information Setting screen appears.  
Enter the PCB and inspection program information and click [OK].



Click [Cancel] to abort the setting and return to the Select PCB screen.

### **Board Information**

\* The board information cannot be edited except “Has Bare Board” and “Adjust Block Position Individually” if [New Inspection Program] is clicked in Step 2.



■ **Component Number Library**

Specify the component number library to use for a PCB to create. The component number library can be edited through Utility - Component Number Library Management Screen.

■ **Inspection Machine**

Select the inspection machine to use for capturing the PCB image in the pull-down menu.

■ **Process**

Select “Reflow” or “Mount”.

■ **Board Name**

Enter the name of the PCB to create within 32 single-byte alphanumeric characters/symbols.

**Memo** Both upper and lower case alphabet characters can be used. However, they are not distinguished.

■ **Has Bare Board**

Set availability of bare board. When there is no bare board, click the check box to turn it OFF. Individual land window auto adjustment is not available, if the checkbox is turned OFF.

**Memo** If the checkbox is OFF, bare PCB image capturing cannot be skipped. Capture the inspection PCB image instead.

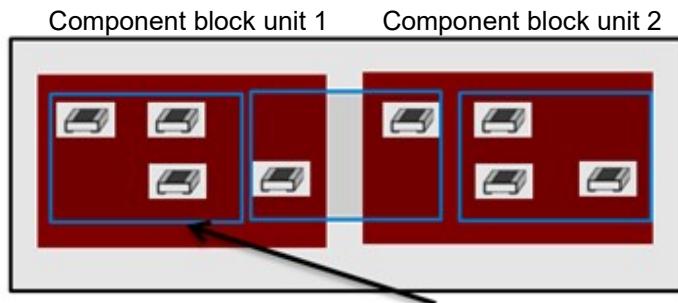
■ Adjust Block Position Individually (position correction for each component block unit)

This is a function to determine FOV so that one FOV is not applicable to inspection of a component which has multiple component block units.

Use this function when inspecting a flexible PCB and so on, which means that the status of position shift (direction and/or quantity) is different for each component block unit.

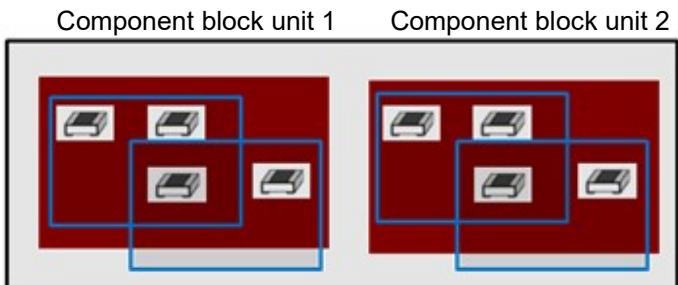
This function can be set up on v-TS for each inspection program, so that whether to perform position correction for each component block unit can be set up. To set it up, click the checkbox to specify ON/OFF.

<Position correction for each component block unit: OFF>



FOV (blue frame)

<Position correction for each component block unit: OFF>



FOV is arranged like the figures above, and positions are corrected in each FOV.



For details of this function, refer to Section 2.3 “Inspection Screen Position Correction” of the inspection logic manual.

**Memo** When setting ON this function, be careful of the following. Do not setting it ON unless needed.

- 1) Since the number of inspection FOV increases, tact time becomes longer.
- 2) Since the search range of position correction is broad, the matching rate of binarized images by pattern matching might become low, so the risk of failing position correction increases.

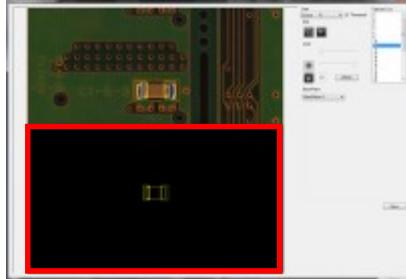
**Memo** Be careful about the following after setting ON/OFF this function:

Since the FOV is changed, teaching which uses adjustment images, such as PCB test or reference face model editing, might not be performed correctly due to the following phenomena:

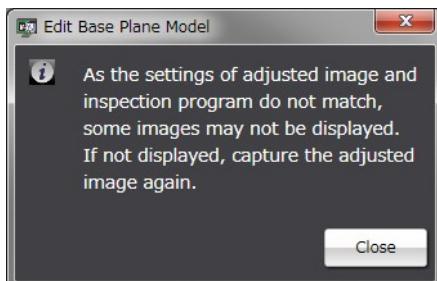
[Phenomena]

- 1) A false call occurs (during the PCB test)
- 2) A black image is displayed (when a reference level model is edited)

(Ex.: Reference level model editing screen inside the red frame)



- 3) A warning dialog is displayed.  
(when starting up reference level model editing)



For the countermeasures, obtain the adjustment image again after switching ON and OFF.



For editing of a reference level model, refer to Section 2.17.4  
“Editing a Reference Level Model.”

**Memo**

Turning ON/OFF of position correction for each component block unit can be changed even while the inspection program is being edited.



**Memo**

The Reference Level Model Editing is valid for S730-H/S730/S530.

■ Width (mm)

Enter the horizontal PCB size (Unit: mm.).

**Memo** A value in the range of 50.00 to 510.00, up to two decimal places can be entered.

**Memo** The width cannot be changed once specified.

### ■ Height (mm)

Enter the vertical PCB size (Unit: mm).

**Memo** A value in the range of 50.00 to 460.00, up to two decimal places can be entered.

**Memo** The height cannot be changed once specified.

The offset value can be changed after it is set, depending on the PCB variations. The offset value can be specified up to the first decimal place within the range from -0.5 to 0.5, which is retained in individual inspection programs.



Refer to "2.19.5 Renaming an Inspection Program" for the procedure to change the value.

## **Inspection Program Information**

### Inspection Program Information

Inspection Program Name	SAMPLE_PCB_0001
Inspection Surface	<input checked="" type="radio"/> Top <input type="radio"/> Bottom
Land Height Offset (mm)	0.02
Adjust Land Size Individually	<input type="checkbox"/>
Full View Window Foreign Material Inspection	<input type="checkbox"/>
Quality Criteria	Default_Level1-Ver200 <input type="button" value="▼"/>
Comment	<div style="height: 100px; width: 100%;"></div>

■ Inspection Program Name

Enter the name of a new inspection program within 48 single-byte alphanumeric characters/symbols.

Memo Symbols that can be used: ! # \$ % & ' ( ) - = ^ ~ @ [ { ; + } ] , . \_

**Memo** Both upper and lower case alphabet characters can be used. However, they are not distinguished.

■ **Inspection Surface**

Select the inspection PCB surface.

**S530**

**S730**

**S10**

■ **Land height offset (mm)**

Enter the height difference between the land and wiring pattern.

**Memo**

The reference surface is generated using the wiring pattern height. So, register an offset value to set the land surface height to zero.

■ **Adjust Land Size Individually**

Select the checkbox to enable the auto adjustment of the land windows individually when windows are positioned to multiple components of the same component number for component registration.

If the checkbox is not selected, the land windows of the same size as those positioned on the sample component are placed on all the components with the same component number.

**Memo**

The checkbox is selected by default.

■ **Full View Window Foreign Material Insepection**

If you want to enable the check of full field of view foreign matter inspection, turn it on.



Refer to "2.17.6 Setting full view foreign material inspection" for the details and editing method.

■ **Quality Criteria**

Select the criteria rule book to use in the pull-down menu.

**Memo**

By default, one of the following two can be selected:

- Default Level1-Ver200E: Preference for direct pass rate
- Default Level2-Ver200E: Preference for fault detection



Refer to P3-4 "3.3 Configuring Quality Criteria Setting" for the details and editing method on criteria rule books.

■ **Comment**

Enter comments such as supplemental information regarding the inspection program within 256 characters. (This is not case-sensitive.)

**Memo**

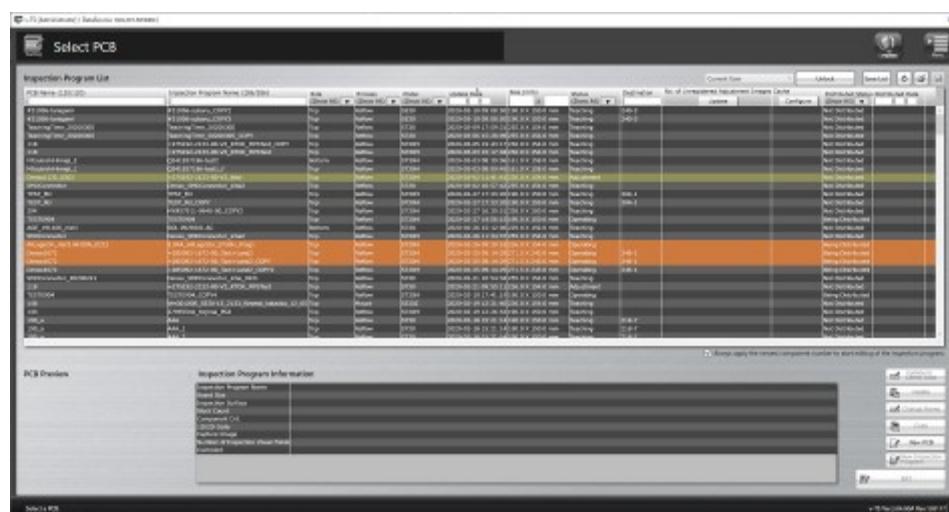
Alphanumeric characters and symbols can be used.

4. The following dialog appears. Capture the bare board and good inspection PCB images with the PCB inspection system.

 Refer to the Operation Manual of the inspection machine, Chapter 3: "Capturing PCB Image" for the procedure to capture a PCB image.



Click [Close]. The dialog closes and the Select PCB screen returns.



# 2.3 Opening an Inspection Program

This section explains the procedure to open an inspection program.

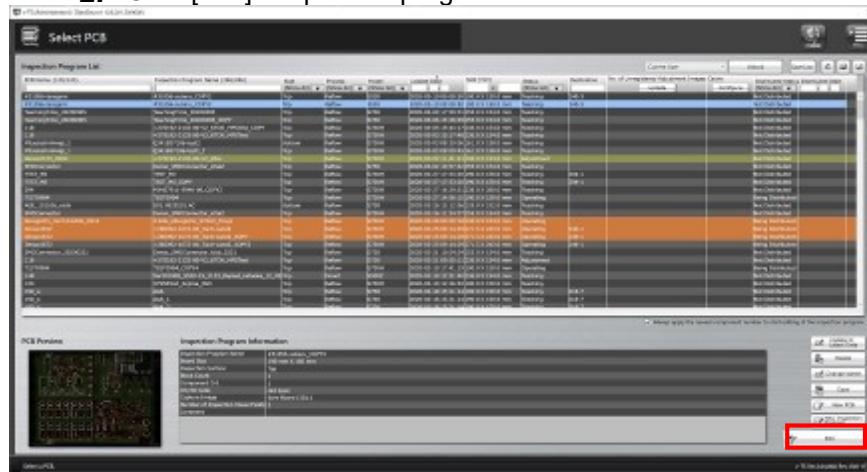
- Operation▶ 1.** Select a desired inspection program in the Inspection Program List in the Select PCB screen.  
When an inspection program is selected, information on the inspection program is displayed.

Inspection Program Information	
Inspection Program Name	SAMPLE_PCB_0001
Board Size	120 mm X 120 mm
Inspection Surface	Top
Block Count	0
Component Cnt.	0
1D/2D Code	Not Exist
Capture Image	
Number of Inspection Visual Fields	
Full View Window Foreign Material Inspection	OFF
Comment	

The content of the inspection program is as follows:

- Information on the PCB and inspection program is displayed.  
Inspection program name, PCB size, inspection side, and comment
- Details of the inspection program is displayed.  
Number of component block units, number of components, presence/absence of 1D/2D code, types and numbers of captured images, number of inspection fields of view including direct view and oblique view, presence/absence of Full View Window Foreign Material Inspection.

- 2.** Click [Edit] to open the program.



The following message appears if the PCB image is not captured yet.  
Capture the bare and inspection PCB images with the PCB inspection system and click [Edit] again.



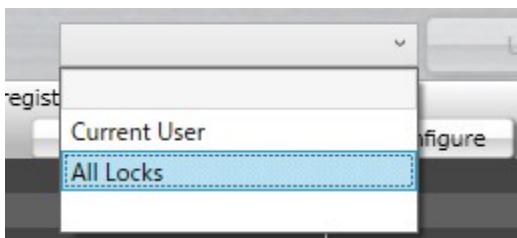
The inspection programs of the same PCB as the inspection program that other user is editing are all locked and displayed in khaki. You cannot edit, delete, change name or copy on the locked inspection programs and you cannot create a new inspection program.

Inspection Program List			
PCB Name	Inspection Program Name	Side	Process
MK	MK-C	Top	Reflow
MK-TEST	MK-TEST-TPCB-BLK	Top	Reflow
MK-TEST-TPCB-BLK	MK-TEST-TPCB-BLK Tool	Bottom	Reflow
MK-TEST-TPCB-BLK	MK-TEST-TPCB-BLK Bottom	Top	Reflow

**Memo** When you select a locked inspection program, only the [New PCB] button is enabled.

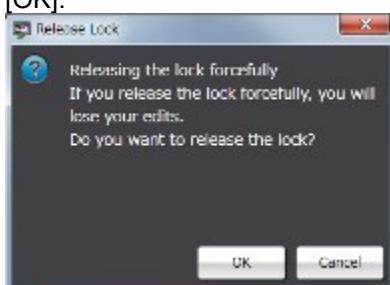
If you cannot release the lock even though the inspection program is not opened by any user, select a release method from the list box at the upper right, and then click [Release].

**Memo** When selecting [Utility Screen] - [Component No. Library Management] - [Import], lock might not be released although the inspection program is not being opened by any users.

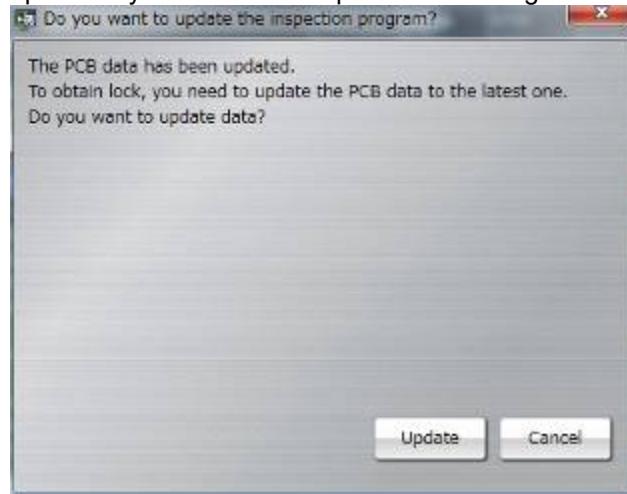


- Release The Current User Lock  
Releases the program locked by the user currently in operation.
- Release All Locks  
Releases the lock of all locked programs.

The lock release confirmation dialog appears. Make sure that no user is in the process of editing the inspection program and click [OK].



The update confirmation dialog appears if the inspection program is updated by other user or captured PCB image is added.



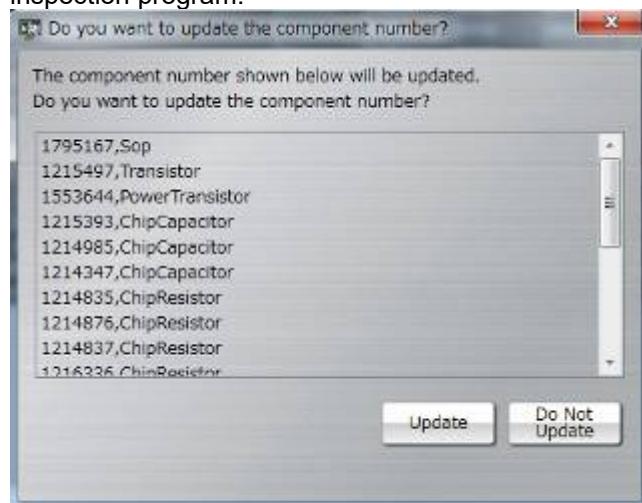
When you click [Update], the PCB data will be automatically updated and you can lock the inspection program and edit the content.

If you want to retain the backup of the inspection program before update, click [Cancel] to close the dialog and save the inspection program.

By clicking [Cancel], the screen moves to the page which was opened just before that.

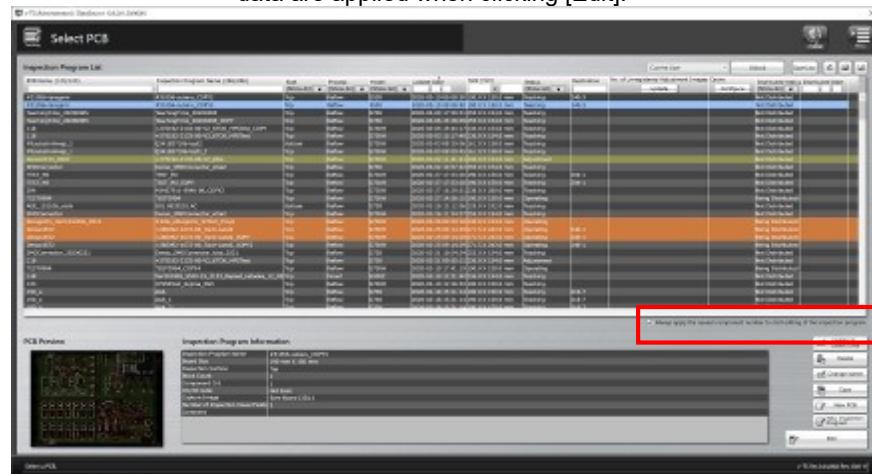
Refer to 2.19.1 Exporting an Inspection Program" for the procedure to save the inspection program..

If the component number data has been updated at the time of editing other inspection program, the component number update confirmation dialog will appear before you click [Edit] to open an inspection program.

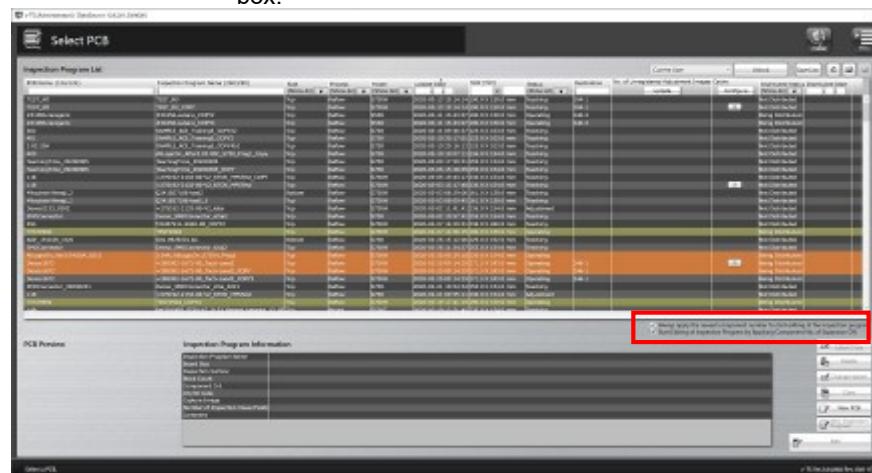


Click [Update] or [Do Not Update]. If you do not update, an update confirmation dialog will appear when you edit the component number.

**Memo** If [Start editing of the inspection program by always applying the latest component No.] is set ON, the latest component No. data are applied when clicking [Edit].



**Memo** If [Use Deployment ON/OFF Setting Function] of system settings is set ON, the [Start editing of the inspection program by applying the component number of deployment ON] check box.



If [Start editing of the inspection program by applying the component number of deployment ON] is set ON, the latest component number data of deployment ON are applied when clicking [Edit].

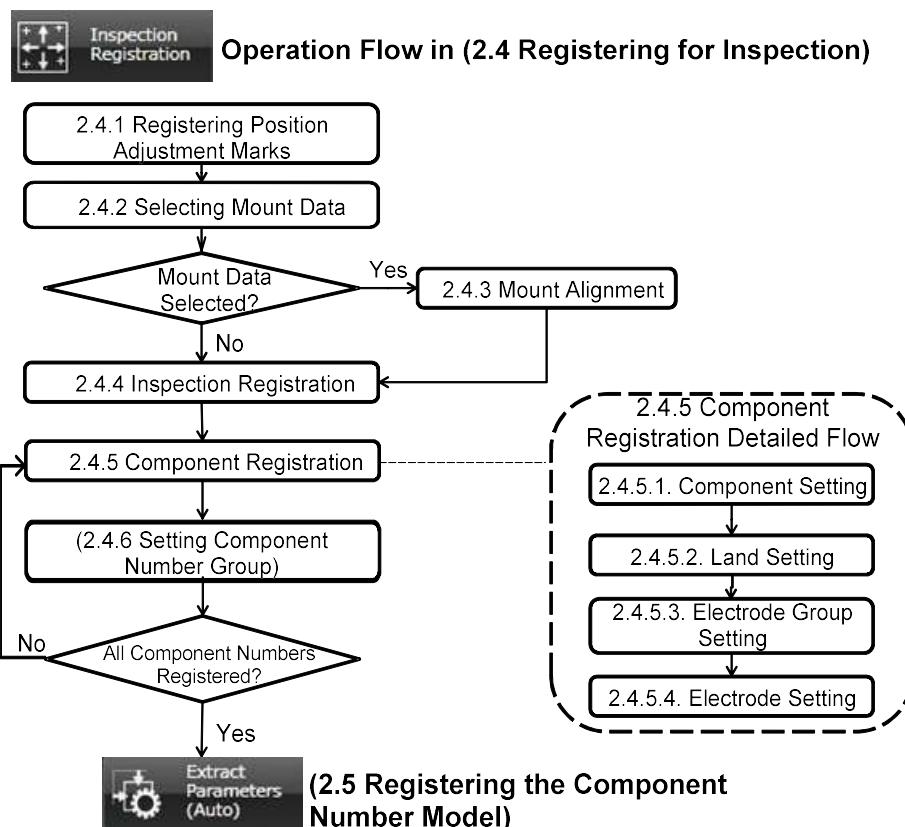


For [Deployment ON/OFF Setting Function], refer to Section 3.6.3 "Making Component No. Settings."

## 2.4 Registering for Inspection

This section details the operation required in the Inspection Registration screen.  
Position inspection windows on the component following the procedures below.

 Refer to the individual section described in the flow chart for details of each procedure.



**Memo** Clicking [Next] at the bottom of the screen switches the screen displays in the order shown in the flow chart, and [Back] switches them in the reverse order.

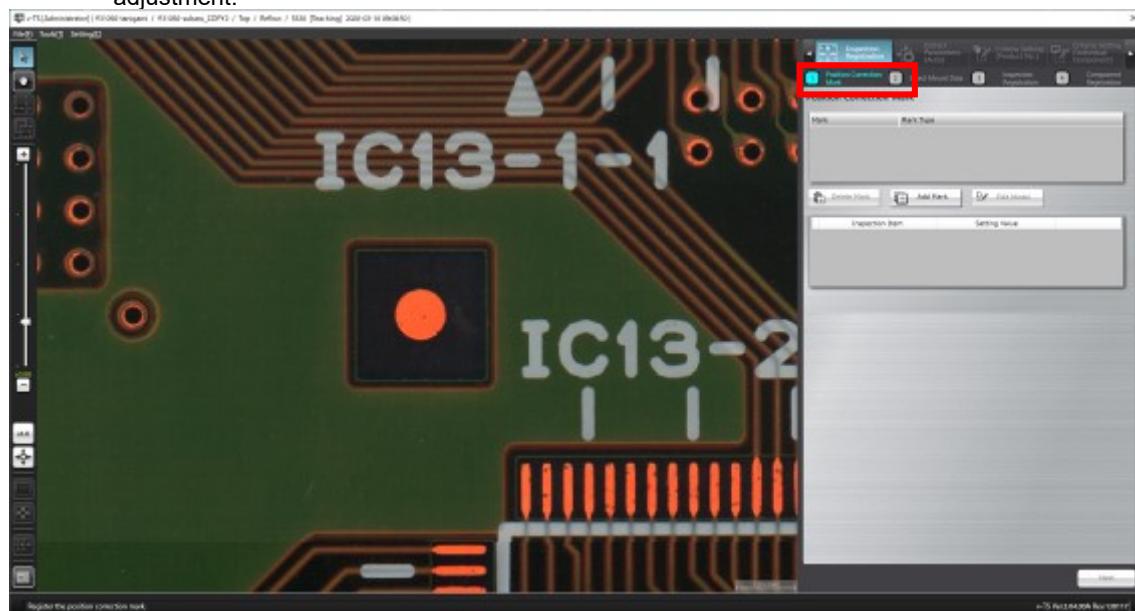
**Memo** The Inspection Registration screen (See 2.4.4 "Inspection Registration") appears as the initial screen if an inspection program with the mount data loaded is opened.

## 2.4.1 Registering Position Adjustment Marks

Register PCB position adjustment marks. Registering them provides more precise adjustment of inspection windows during PCB inspection.

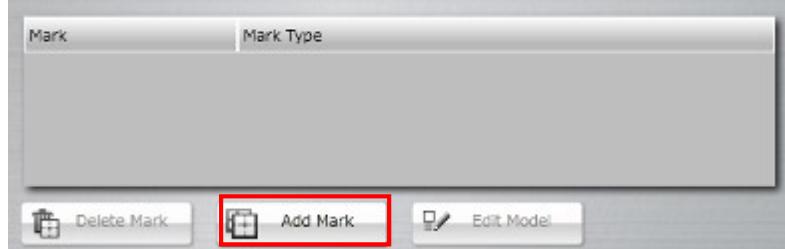
**Memo** Two PCB adjustment marks must be set. Those at the ends of a diagonal line of the PCB are normally selected.

Refer to the Inspection Logic Manual, "2.2 Fiducial Adjustment" for the details on PCB position adjustment.



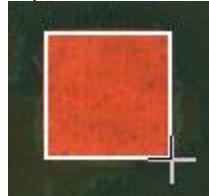
Operation▶ 1. Click [Add Mark].

**Position Adjustment Mark**

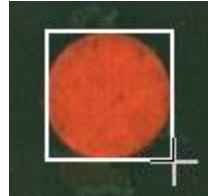


2. Click  (Create Window) button in the Image Operation tool bar.  
Drag the mouse cursor to a corner of the PCB to surround the adjustment marks.

Square Mark



Circular Mark



Drop the cursor. The mark detection area is automatically drawn.

**Memo**

The size of individual windows can be adjusted.

The minimum and maximum values of the outer window are as follows:

Minimum: 2.4 x 2.4mm

Maximum: visual field's size (different for each model)

3. Repeat Steps 1 and 2 for the mark at the diagonally opposite corner of the PCB.

4. Click [Edit Model].

**Position Adjustment Mark**

Mark	Mark Type
Position Adjustment Mark1	Position Adjustment Mark
Position Adjustment Mark2	Position Adjustment Mark

Delete Mark    Add Mark    Edit Model

**Memo**

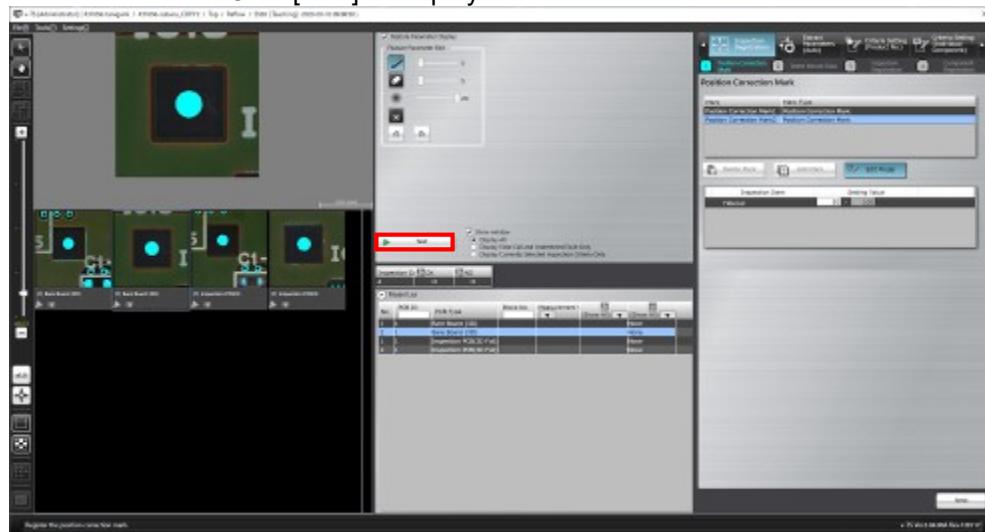
The [Edit Model] button becomes effective after two adjustment marks are registered.

**Memo**

When you select the position adjustment mark, the [Delete Mark] button becomes enabled.

5. The Model Editing screen is displayed.

Edit the color table to enable the detection of the adjustment marks.  
Click [Test] to display the detection result in a blue window.



**Memo** Position adjustment marks of other inspection PCBs or bare boards are also displayed.

**Memo** When conducting distance tests, it is recommended to use the detailed settings for fiducials.

→ For detailed settings of fiducials, please refer to '2.2 Fiducial Correction' in the Inspection Logic Manual.

→ Refer to "Model Editing Screen Operation" for the details on Model Editing screen operation.

6. Click [Next] at the bottom right of the screen to proceed to the Select Mount Data screen.

**Memo** The [Next] button will be enabled after conducting a test.

## 2.4.2 Selecting Mount Data

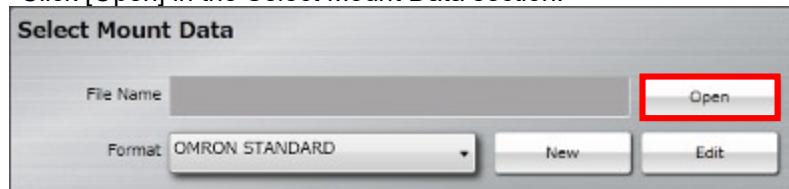
This section describes how to select mount data.

### 2.4.2.1 Selecting Mount Data in Specified Format

Obtain the information such as the component coordinates, component number and circuit number from the selected mount data.

**Memo** Loading of mount data is not required for a new inspection program. Skip this procedure and click [Next] to proceed to "2.4.4 Inspection Registration".

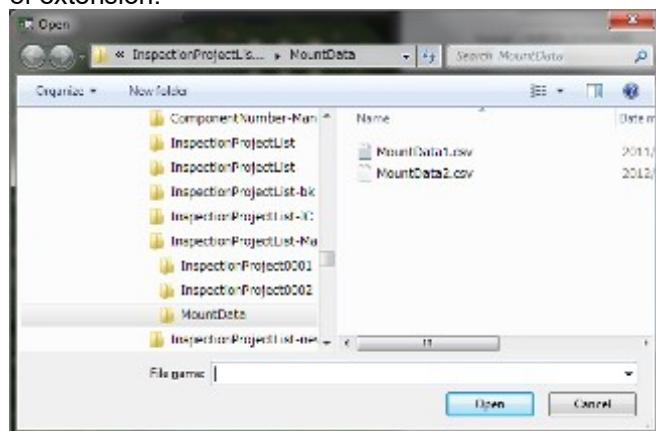
Operation▶ 1. Click [Open] in the Select Mount Data section.



2. The file selection dialog appears.

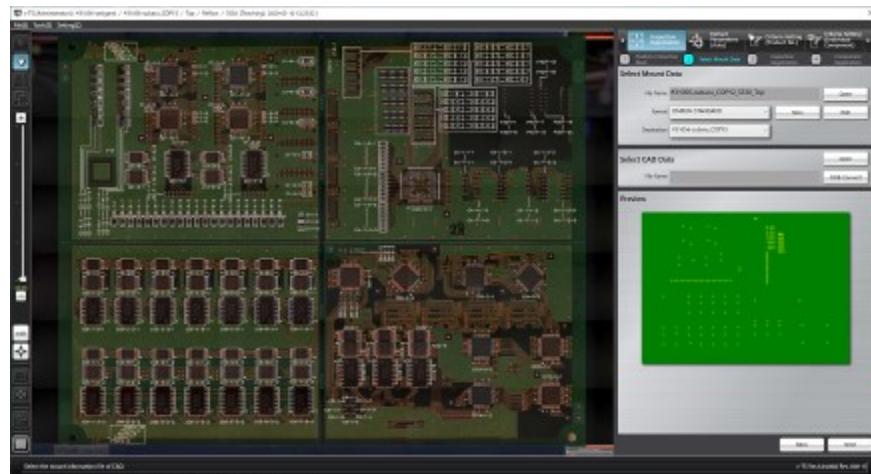
Specify the mount data file and click [Open].

Files with any extension can be read because there is no limitation of extension.



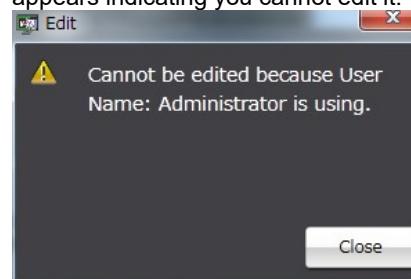
**3.** Select the format to display the data.

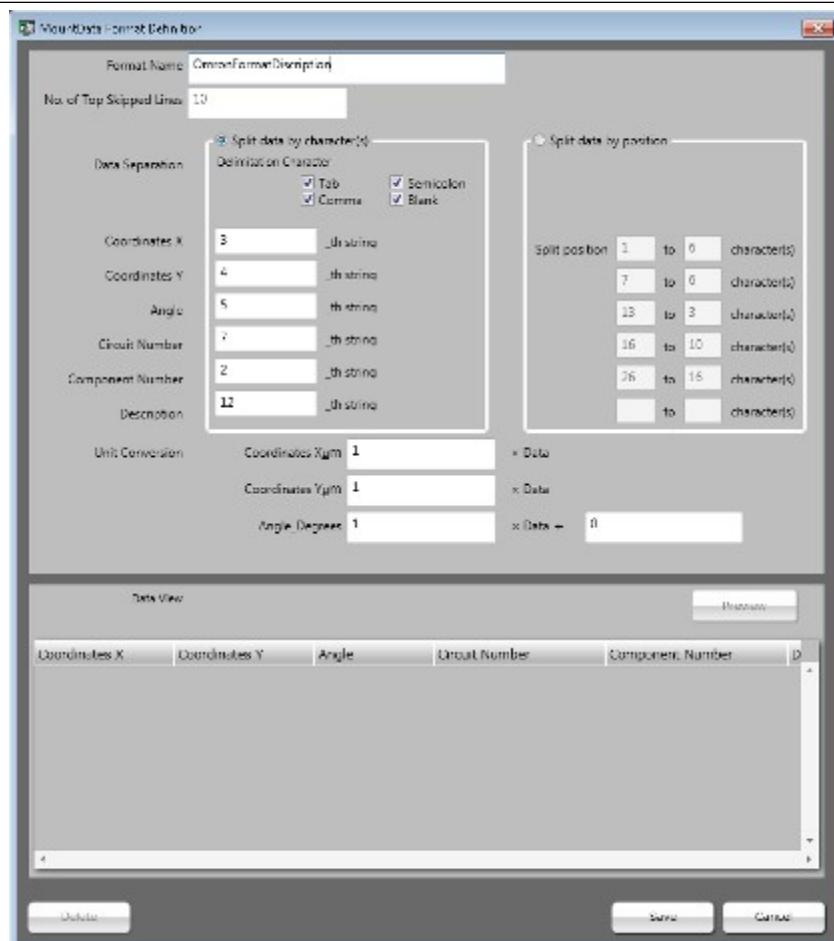
A map showing the positions of components is displayed in the preview area when an appropriate format is selected for the mount data.



If no corresponding format is available, click [New] or [Edit] to create the format.

**Memo** When other user is editing the format, the dialog below appears indicating you cannot edit it.





### ■ Format Name

Enter the format name within 32 single-byte alphanumeric characters/symbols.

**Memo** Symbols that can be used: ! # \$ % & ' ( ) - = ^ ~ @ ` [ { ; + } ] , . \_ \\_

**Memo** Both upper and lower case alphabet characters can be used. However, they are not distinguished.

### ■ No. of Top Skipped Lines

Enter the number of lines counting from the top, which must be skipped to avoid the loading of unnecessary information from the mount data file.

### ■ Data Separation

Specify the method of delimiting the data.

Mount data must be separated into the six items including X coordinate, Y coordinate, angle, circuit number, component number, and explanation.

**Memo** Explanation is not indispensable. Specify it arbitrarily.

- Split data by character(s)

The data is separated by the specified delimiting character.

Specify the delimiting character and the ordinal number of the delimiter (nth string) where each data item starts.

- Split data by position

The data is separated into sets of the specified numbers of characters.

Specify the ordinal numbers of the characters (from n to n + the number of characters) where each item starts and ends.

#### ■ Unit Conversion

Convert the unit of the X and Y coordinates of the mount data from mm (if it is used) to  $\mu\text{m}$  by multiplying the value by 1000 (1000 x Data). The angle must be converted to the value in the counterclockwise direction (-1 x Data + 0) if it is represented in the clockwise angle.

**Memo** Values up to 8 digits and 3 decimal places either in positive and negative numbers can be entered.

#### ■ Data View

Check if the individual data items are separated correctly.  
Click [Preview] to display the data separation view obtained by the setting.

**Memo** The coordinate values are rounded at the 4th decimal place.

**Memo** The angle is represented in 0 to 359 degrees, with the decimal 1st place rounded. A value exceeding 360 degrees or negative value is converted to the value in 0 to 359 degrees.

**Memo** The alphabets in the circuit number and component number are expressed in upper case letters.

**Memo** The effective numbers of characters for the circuit number and component number are up to 16 and 64 characters respectively. If the numbers exceed the limits, an error dialog appears and no data is displayed for the items in the data view.

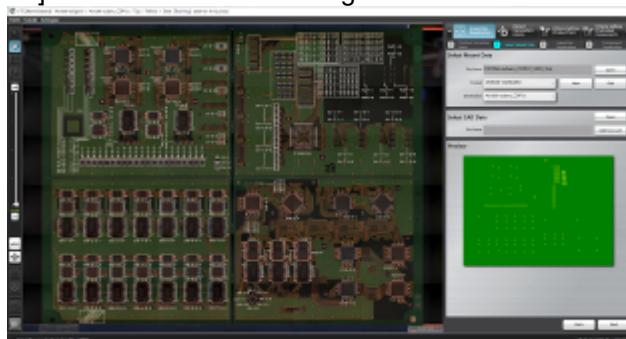
**Memo** The symbols that can be used for the circuit number and component number are as follows:

! # \$ % & ' ( ) - = ^ ~ @` [ { ; + } ] , \_

If the symbols not allowed (!#\$%&'( )-=?~@`[ { ; + } ] , \_) are used, the data view displays no data for the item. If a slash is used, it will be converted to a hyphen (-). The quotation marks ("") at the head and end of the entire string are ignored and only the string is displayed. However, if the mark is used inside the string, no data is displayed for the item in the data view.

Click [Save]. The format setting is saved and the dialog is closed.  
Clicking [Cancel] aborts the setting and closes the dialog.  
Click [Delete] to delete the format being edited and close the dialog.

4. Click [Next] to move to the Mount Alignment screen.



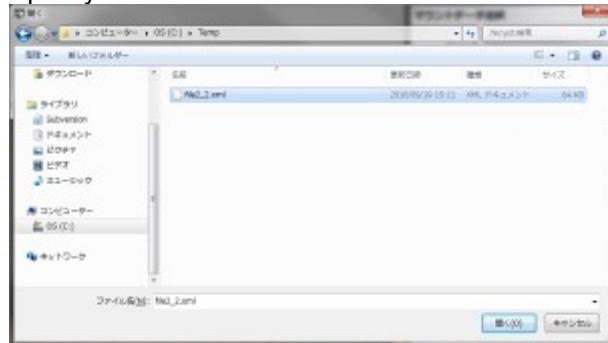
### 2.4.2.2 Reading in CAD Data

Obtain information about components from the Omron standard format XML file, and deploy it as mount data.

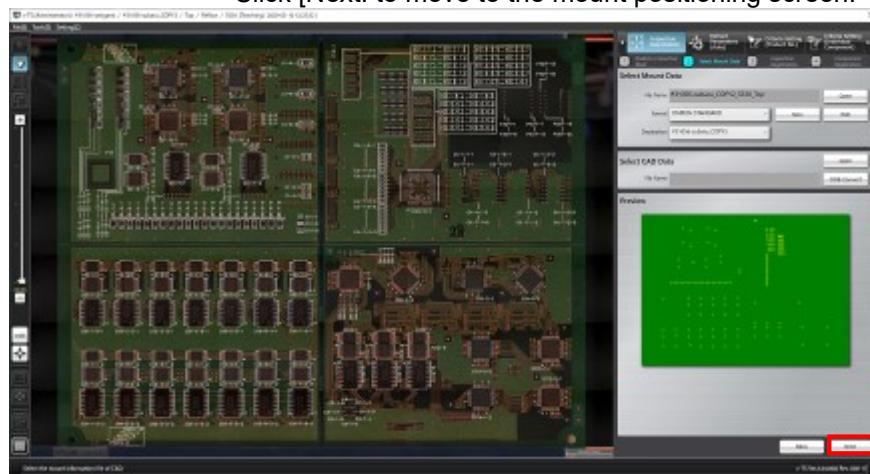
Operation▶ 1. Click [Open] on the CAD Data Selection window.



2. A folder selection dialog is displayed.  
Specify the Omron standard format XML file and click [Open].



3. A map of the component position is displayed on the preview. Click [Next] to move to the mount positioning screen.



### 2.4.2.3 Reading in CAD Data in ODB++ Format

Obtain component information of coordinates, number, and angle from CAD data in the ODB++ intelligent data format, and deploy it as mount data.

Operation▶ 1. On the ODB Data Selection window, click [ODB Convert].



2. A folder selection dialog is displayed.  
Specify a folder of ODB++ data and click [OK].



**Memo** If the CAD data in the ODB++ format is a compressed file, decompress the file in advance.

**Memo** Component shape is obtained from the following file in the folder decompressed.  
 - Applicable file name: component  
 - File path: <root path>/<steps>/<step\_name (PCB name)>/<layers>/<comp\_+\_top>  
 In the file, a "CMP" record is defined for each component. In the CMP record, it is specified which component shape (package) corresponds to the applicable component. So, the component shape is obtained from the package definition file (\*1).

**Memo** \*1 Component shape definition file  
 - Applicable file name: data  
 - File path: <root path>/<steps>/<step\_name (PCB name)>/<layers>/<eda>  
 A "PKG" record is defined for each component shape (package).

**Memo**

Electrode shape is obtained from the following file in the folder decompressed.

- Applicable file name: data
- File path: <root path>/<steps>/<step\_name (PCB name)>/<layers>/<eda>

Electrode shape is obtained from a PIN record, which is in the PKG record of the applicable component shape and defined for each electrode.

**Memo**

Land shape is obtained from the following file in the folder decompressed.

- Applicable file name: features
- File path:

Pattern: <root path>/<steps>/<step\_name (PCB name)>/<layers>/<pattern name (\*2)>

Resist: <root path>/<steps>/<step\_name (PCB name)>/<layers>/<resist name (\*2)>

With regard to land shape, an area in which the pattern is overlaid on the resist is calculated.

For the shape of pattern and resist, the shape definition of the "P" record is referred to in the features file in each layer folder.

**Memo**

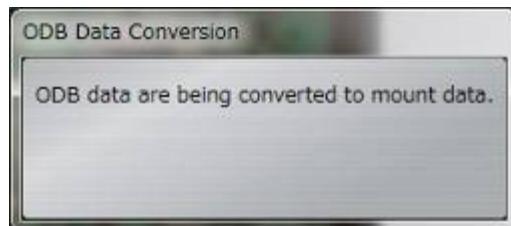
\*2 The name of the layer indicating a pattern or a resist can be specified arbitrarily when ODB data are created. So, for the correspondence between the pattern or resist and the folder of the layer, refer to the following matrix file.

- File name: matrix
- File path: <root path>/<matrix>

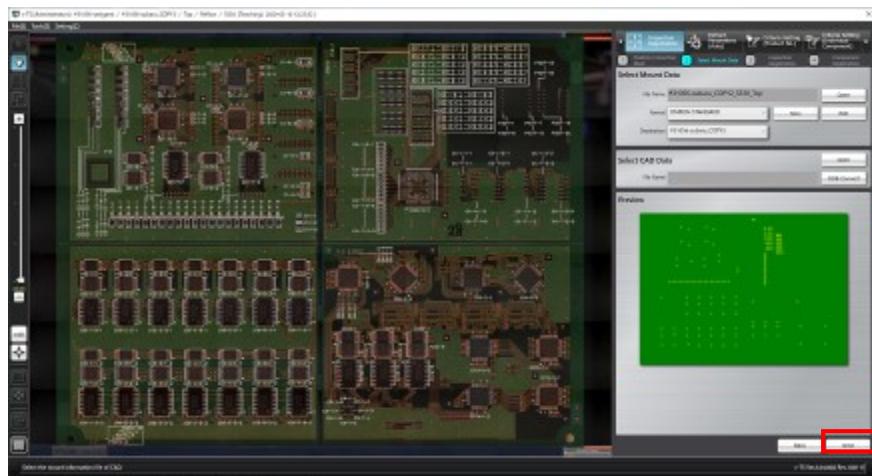
Pattern: The TYPE is "SIGNAL" in the layer definition section of the file (The first definition from the first line is used.)

Resist: The TYPE is "SOLDER\_MASK" in the layer definition of the file (The first definition from the first line is used.)

A dialog indicating that the ODB data are being converted is displayed. When processing finished, the map of component position is displayed in the preview.

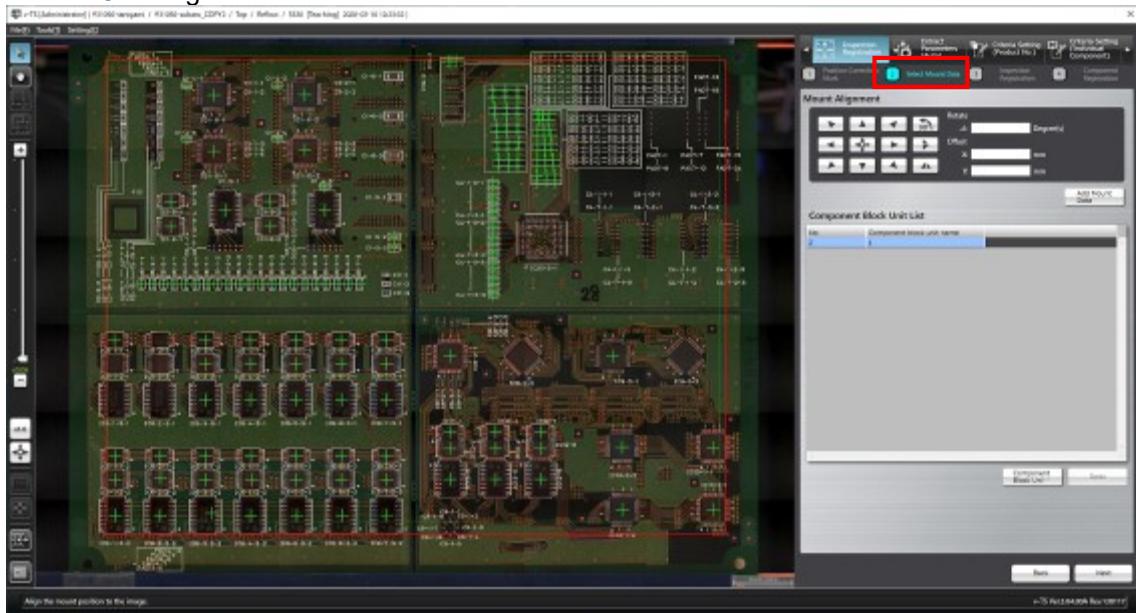


3. Click [Next] to move to the Mount Alignment screen.

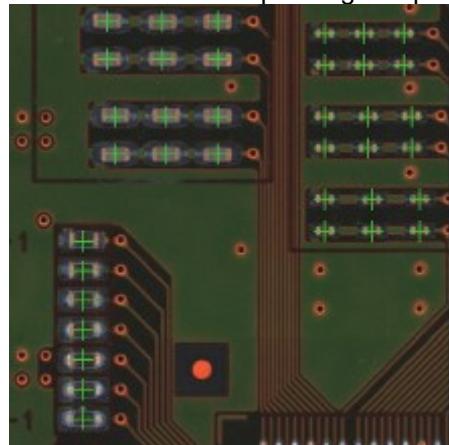


### 2.4.3 Mount Alignment

Align the coordinates of individual components in the mount data (loaded in the previous section) to the PCB image.



- Operation▶ 1. The mount positions shown by "+" marks are overlaid on the PCB image. Use the buttons or the mouse to align the "+" marks at the centers of the corresponding components on the PCB image.



#### Memo

For precise alignment, enlarge the PCB image and shift the field of vision to check that "+" marks are also aligned at the centers of the corresponding components in a different field of vision.

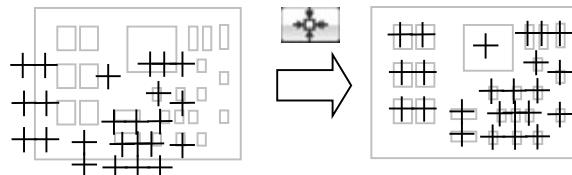
◆ Adjustment Using the Mouse

Click the Select Window button in the Mouse toolbar and drag the mount data to align the "+" marks to the centers of corresponding components.

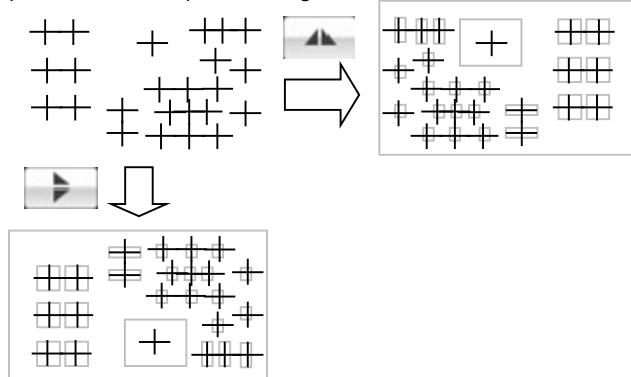
◆ Adjustment Using Buttons

	Move the mount data in the arrow direction.
	Rotate the mount data by 90 degrees counterclockwise.
	Vertically reverse the mount data.
	Horizontally reverse the mount data.
	Align the center of the mount data at the center of the PCB image.

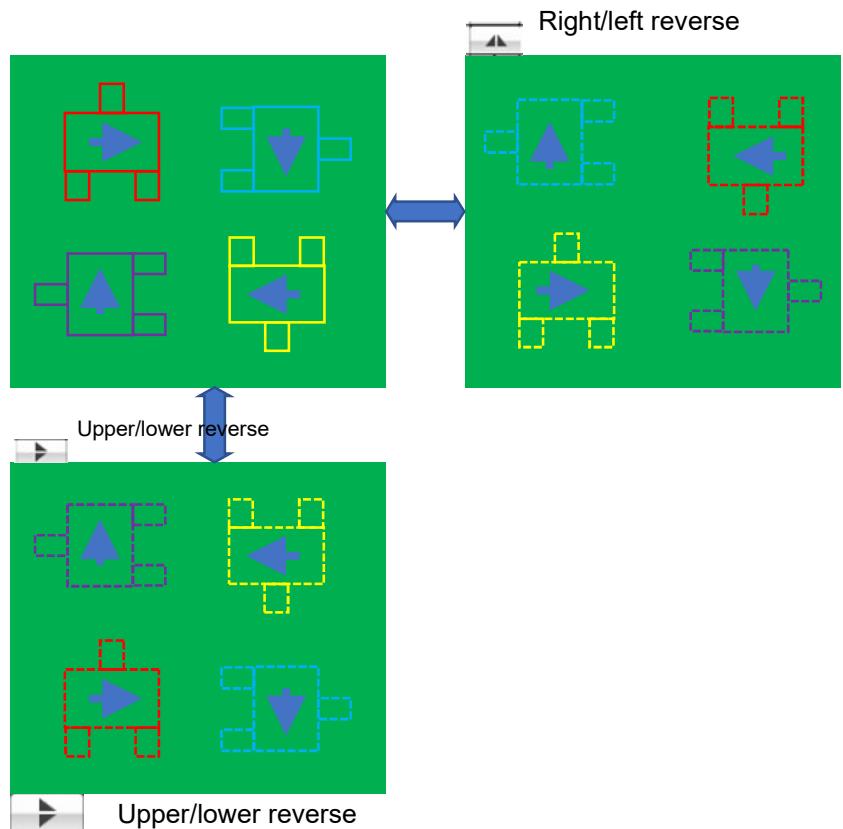
**Memo** Use to align the centers of the mount data and PCB image if the position deviation is large.



**Memo** If the mount data uses a different coordinate system from the PCB image, click to reverse the mount positions before position alignment.



The upper/lower reverse button and the right/left reverse button operate as follows:



#### Upper/lower reverse

The component coordinates are relocated vertically by line symmetry. The angle of each component is not converted. It is assumed that the mount data are kept with the components on the back of the PCB permeating the PCB and the angles of them are correct.

#### Right/left reverse

The component coordinates are relocated horizontally by line symmetry. The angle of each component is rotated at 180 degrees.

It is assumed that the mount data are kept with the components on the back of the PCB permeating the PCB and the angles of them are correct.

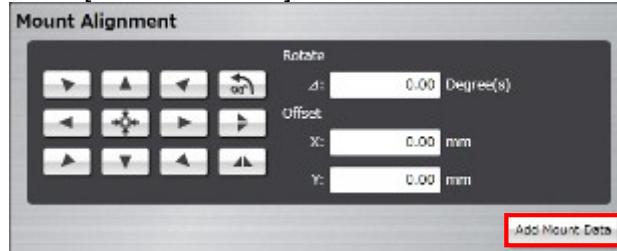
#### ◆ Adjustment by Inputting Values

The rotation angle and offset values obtained by the mouse or button operation are shown in the screen. Edit the angle and X and Y coordinate values directly for fine tuning.

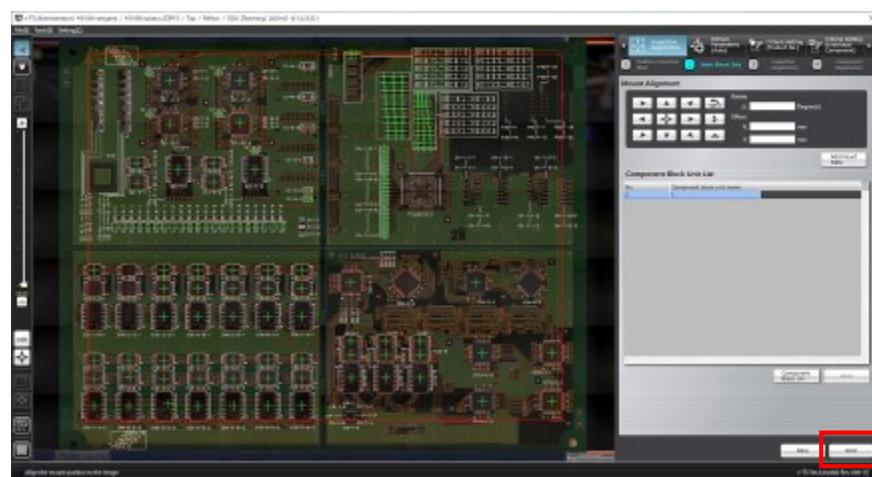
Rotate	<input type="text" value="0.00"/> Degree(s)
Offset	<input type="text" value="0.00"/> mm
	<input type="text" value="0.00"/> mm

**Memo** Up to two decimal places can be entered for the rotation angle and offset values.

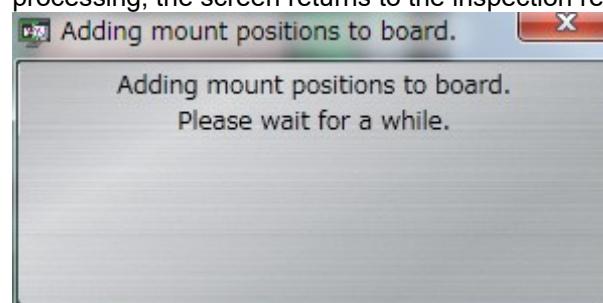
2. Click [Add Mount Data] to add more mount data and repeat Step 1.



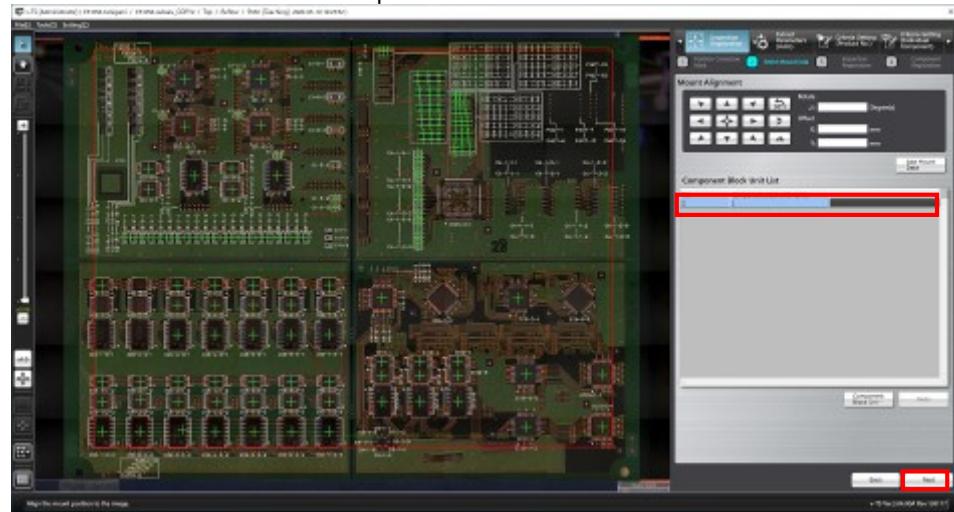
3. Click [Next].



The mount position addition processing dialog appears. After processing, the screen returns to the inspection registration screen.



**Memo** For destination, the list of component blocks on the inspection program is displayed. By selecting the component block from the component block list and clicking [Component Block Unit Deployment], the selected component block mount data can be deployed to all component blocks.

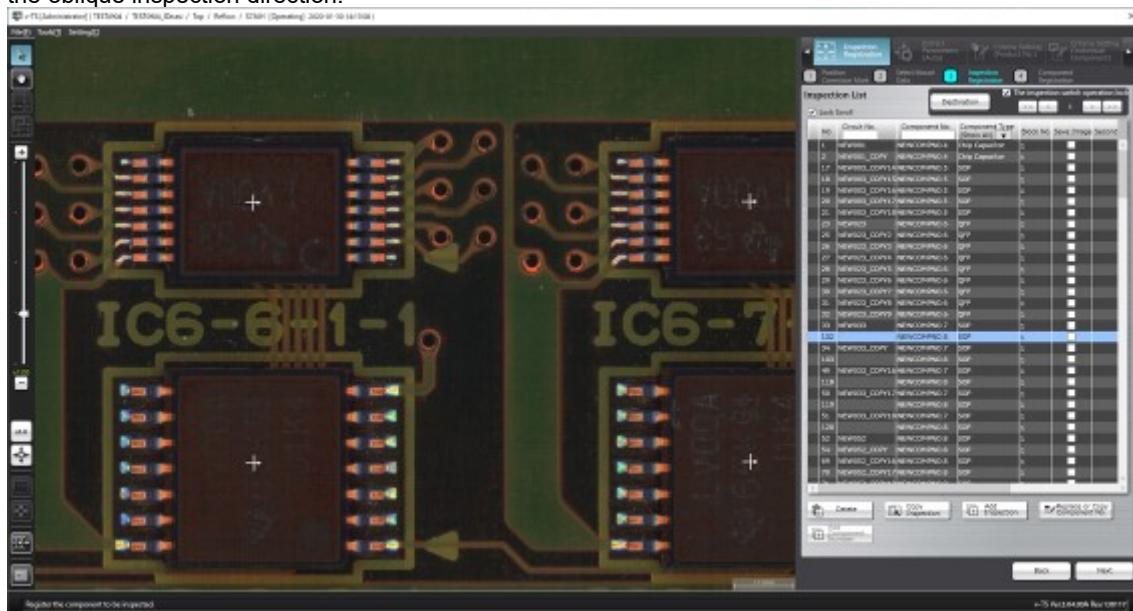


**Memo** The Omron standard format XML file contains information on component unit block. So, if mount data are read in by selecting CAD data, the deployment of component block unit is not displayed.

## 2.4.4 Inspection Registration

Register components to inspect based on the component information in the loaded mount data. Also the components whose images are saved while inspection is performed can be selected. Specify the inspection direction for the component numbers for oblique inspection, individually for each component.

 Refer to "2.9.3 Specifying Oblique Inspection Component and Direction" for the procedure to specify the oblique inspection direction.



## Operation▶

- Check that the components to inspect and their mount positions are available and ready for registration by moving the field of vision on the image display area or selecting the components in the Inspection List.

 Refer to "2.1.2 Configuration of the Editing Screen" for the image display area operation.

- Delete, add or rename the components for inspection as required.

**Delete Components from the Inspection List**

Select the component to delete in the Inspection List and click [Delete]. The "+" mark of the deleted component is not displayed in the image display area any more.

 A component can also be selected by switching the image display area to the Select Window mode and clicking the "+" mark with the mouse directly.

 Refer to "2.1.2 Configuration of the Editing Screen" for the image display area operation.

**Add Components to the Inspection List**

## ■ Copy an Existing Component

- Select the component to copy in the Inspection List and click [Copy Inspection].
- Click the center of the copy destination component in the image display area.
- After completing copying, click [Copy Inspection] to exit.

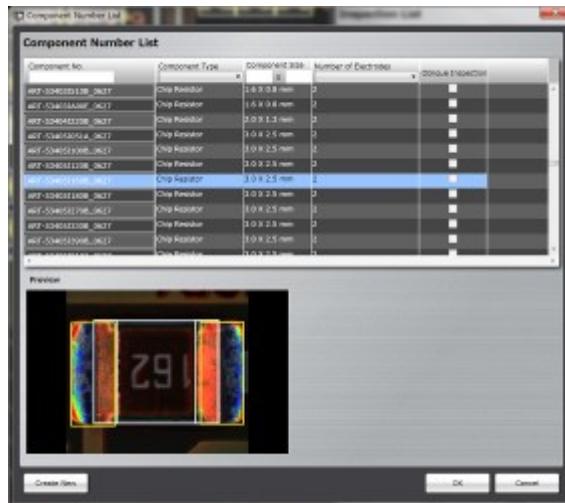
 The inspection windows are copied in the same sizes as the original. However, the inspection criteria common to the component number is specified, if the original component is individually set to specific criteria.

## ■ Specify the Component Number

- Click [Add Inspection].
- Enter the circuit number and click [...] to select the component number.



- The Component Number List is displayed.  
To add a new component number, click [Create New].  
The new component number is added at the last row of the Component Number List.  
Select the component number to add for inspection and click [OK].



**Memo** Click the added component number to edit its description (name).

- Click [OK] to close the dialog. Display the component to add in the image display area and click the center of it.

### Change the Circuit Number Description

Select the component in the inspection list, and click the circuit number.

The textbox becomes editable. Enter the new name.

A circuit number can be described within 16 single-byte characters.

**Memo** Lowercase alphabet characters are changed to uppercase when entering.

Allowed symbols ! # \$ % & ' ( ) - = ^ ~ @ ` [ { ; + } ] , . \_ —

**Memo** To change a circuit name with a customer-specific inspection program, you can select a target as shown below.



- ① Changing all circuit names that are the same in a component block unit

You can change all circuit number names that are the same in one component block unit.

- ② Changing a selected circuit name

You can change a circuit name being selected.

### To save the images of the specified component

On the inspection list, set ON the checkbox on the [Save image] column of the component saved.

1. Click [Next] to proceed to the Component Registration screen.

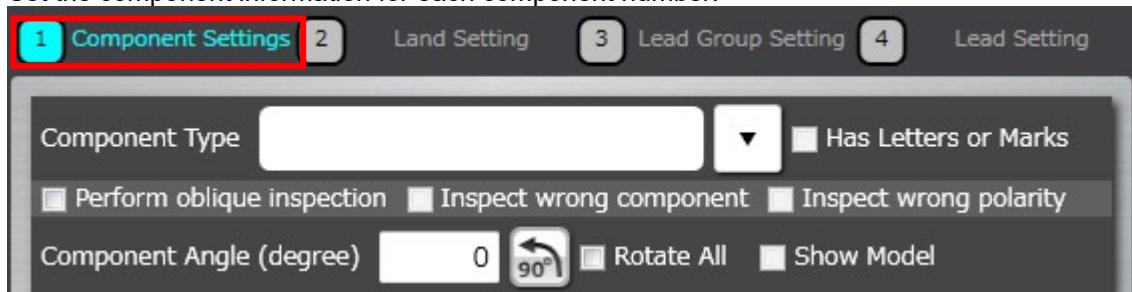
Refer to the next section for the component registration procedure.

## 2.4.5 Component Registration

Position the Component Body Window, land windows and electrode windows on a sample component of individual component numbers and set the component and electrode information for them.

### 2.4.5.1 Component Setting

Set the component information for each component number.



Operation▶ 1. Select the component number for the setting in the Component Number List.

Component Number List				
	Component Number Group	Component No.	Component Type	Component Size
R	1005C-GR1	1005C	Chip Capacitor	1.0 X 0.5 mm
R	ISS355	1SS355	Chip Resistor	1.8 X 1.2 mm
R		1608C	Chip Resistor	1.5 X 0.8 mm

**Memo** If the component number is registered in the library and the component information obtained from the library is used, this setting is not necessary.

**Memo** When the status is **R** (locked), click it to unlock **(not locked)** the component number.

**Memo** If the teaching status of the component number is **III** or **III**, perform automatic window adjustment.

Refer to (5) Information Display Area on “2.1.2 Configuration of the Editing Screen” for details on the status display of the component number and auto adjustment procedure.

If there are multiple components with the same component number, click **<<** **<** **>** **>>** below the Component Number List to switch the component displayed in the image display area. Select the sample component.

**Memo** Click **[<<]** to display the top component and **[>>]**, the last component.

**Memo** Select a component image rendered in clear colors, without noise such as shadow, as the sample component, which can enhance the accuracy of auto component window positioning for the same component number.

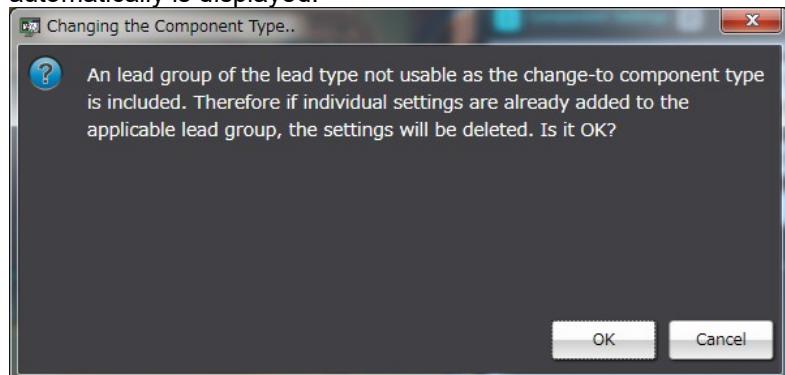
2. Select the component type in the list box.



→ Refer to "2.1.1 Basic Knowledge of Teaching", "Component Types" for the types of components.

**Memo** When a chip resistor, chip capacitor, or other chip/ melf component type is selected, the component body window is set up automatically. If you do not wish this window to be set up automatically, select [Setting] - [Application Settings] - [Component Window Setting Method] -> [Manual Settings] on the menu bar.

**Memo** When changing component type from a registered component, if lead type is not compatible with that of the new component type, a warning message showing that the individual settings of lead group, lead window, and land window are deleted automatically is displayed.



3. Find groups with the same shape and same color in the component number group list.

When setting the “Same size” toggle button ON, if you found an appropriate component number group, click the thumbnail and select [Add], then go to step 9.

If you couldn't, go to step 4. By typing a character string in the text box next to the [Same Size] toggle button, those images are filtered.



**Memo** Component number groups are configured based on the following guideline.

- Components with the same shape/size/electrode count shall belong to the same group.
- A group shall be configured for each color, e.g. white, black, and brown based on the visual check.
- A group shall be configured for each component color if there are multiple component colors.

(e.g.) Configuring a group of chip resistor (black) with the same shape and size.

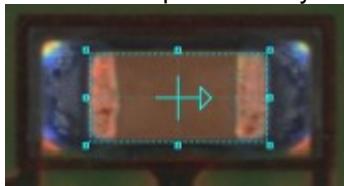


(e.g.) Configuring a group of chip capacitor (white/gray) with the same shape and size.



**Memo** Move the mouse cursor on the component number group thumbnail, the component number group preview window appears on the image. When a component number is added to the component number group, the setting of the component number is synchronized with the component number group. While creating a new component number group, saving/loading an inspection program before component registration (automatic) shows a dark preview image. After performing component registration (automatic), the image appears.

#### 4. Draw a Component Body Window in the image display area.



**Memo** Magnify the display area to draw a window for more precise window positioning.

Refer to "2.1.3 Image Display Area Operation" for the image display area operation.

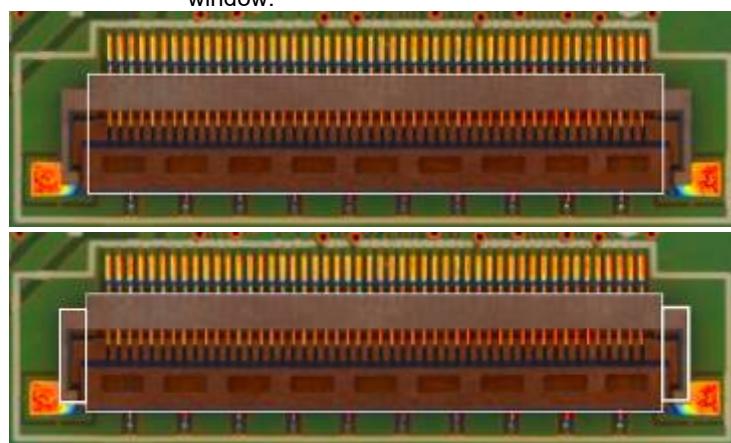
**Memo** The "+" mark moves to the center of the window after the component window is formed.

**Memo** If you cannot configure a component outline shape using a rectangular frame for an odd-shaped component after configuring the component body window, add a window to complement the component body window.



Create Window Button (Component Number)

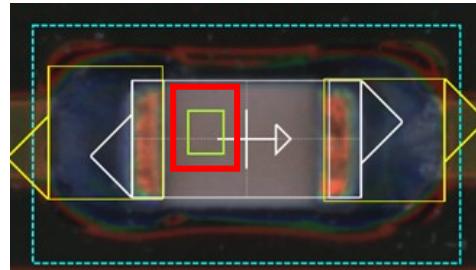
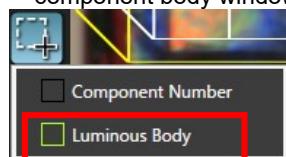
If a component outline is out of the component body window, add a plus window.





Create Window Button (Luminous Body)

It will create a luminous body window for use in distance inspection within the component body window.



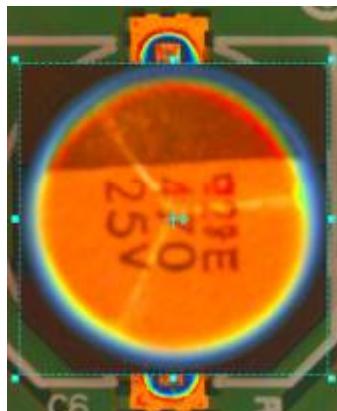
**Memo**

Only one luminous body window can be created within the component body window.



Create Mask Window Button

If a PCB is inside the component body window, add a minus window.



**Memo** Right-clicking on a plus/minus window displays the context menu.

When selecting [Copy on 2 Sides], the window can be copied as rotated by 180 degrees around the component.

When selecting [Copy on 4 Sides], the window can be copied as rotated by 90, 180, and 270 degrees around the component.

Selecting [Delete] allows you to delete the window.

**Memo** By pressing the [R] key as holding the [Ctrl] key on the keyboard, the plus or minus window being selected can be rotated by 45 degrees clockwise.

5. Check that the degree is correct if the component number registered in the library is used.

Component Angle (degree)	90	<input type="checkbox"/> 90°	<input type="checkbox"/> Rotate All	<input type="checkbox"/> Show Model
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Select the [Show Model] checkbox. A model image corresponding to the currently specified degree is displayed. Check the mounting position including the direction of the polarity.

To correct the angle, click  several times. To rotate all the components of the same component number at the same time, use the [Rotate All] checkbox, then specify the degrees.

To perform fine adjustment of the angle, directly enter the angle value.

**Memo** The [Show Model] checkbox is disabled for a new component number.

**Memo** Enter an angle from 0 to 359.9 degrees.

**Memo** If [Rotate All] is selected, angle adjustment by a direct entry is effective for only the displayed components.

- Specify if the component has the letter or symbol marking in the check box.

Has Letters or Marks

**Memo** The letters or symbol marks refer to the color and shape of the letters or marks attached to the component/polarity, and different inspection logic is required for those with the letter or symbol marks.

**Memo** For a chip resistor with a size of 1005 or less, a Component Window is created without character/symbol mark automatically.

 Refer to the Inspection Logic Manual, "3.2 Right Component" for details on the inspection for a right component.

- Specify options for component difference inspection, and polarity difference inspection in the check boxes.

Inspect wrong component

Inspect wrong polarity

**Memo** No check box is selected by default for all component types.

- Specify if oblique inspection is performed in the check box.

Perform oblique inspection

**Memo** Oblique inspection cannot be specified to "Yes", if "BGA/CSP" or "Others (Bottom Electrode)" is selected for the component type.

 Refer to "2.9 Setting Oblique Inspection" for the details of oblique inspection.

- Set a component size. Enter a numerical number of 0.1 mm or more.

Component Size (mm) X  Y

- 10.** Specify a component height. Enter a component height in a numeric value or 0.1mm or larger.

Component Size (mm)	X	0.555	Y	0.99	Z	Enter a height.
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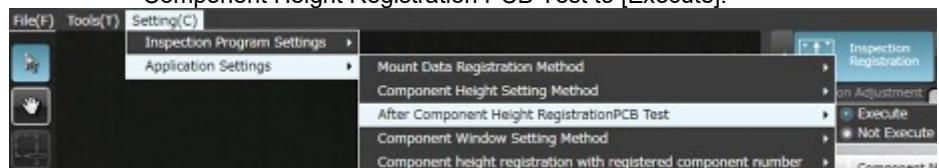
**Memo** To automatically calculate a component height upon learning instead of manual input, select Setting (C) - Component Height Setting Method - Auto Calculation.



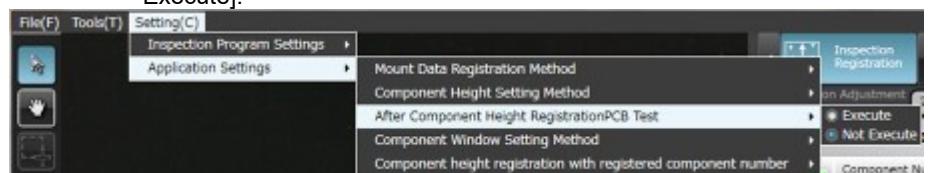
If you select auto calculation, you cannot enter a component height manually.

Component Height (mm)	The height is automatically
-----------------------	-----------------------------

**Memo** To register the central value of the component height as the result of the PCB test to the component number, select After Component Height Registration PCB Test to [Execute].



**Memo** If you select [Not Execute] for Component height registration with registered component number, the height registration to the already registered component number can be skipped. If you do not need to change the height criteria, select [Not Execute].



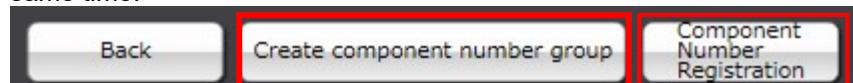
- 11.** If "Insertion Component" is selected, select the component surface in the list box.

"Top" refers to the side where components bodies are seen, and "Bottom", the side with inserted leads.

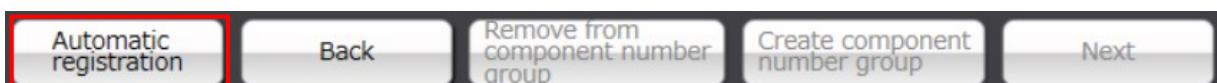
Component Type		Insertion Component	
<input type="checkbox"/> Has Letters or Marks			
Component Side	Bottom ▾		

**12.** Click [Next] to proceed to the Land Setting screen.

If you select "BGA/CSP" or "Others(Bottom Electrode)" for the component type, [Component Number Registration] will appear instead of [Next] as settings after land settings are not required. Click [Component Number Registration] and set other unregistered component numbers. To create a component number group based on the configured component number, click [Create component number group]. Component number registration is performed at the same time.

**Memo**

By clicking "Auto Register" on the inspection registration screen, you can automatically register part numbers. If all part numbers are successfully registered after the auto registration, the system will transition to the Parts Registration (Auto) screen. If there are any part numbers that fail to register, the system will remain on the inspection registration screen. (Applicable only to the S1080/S1040 inspection programs)

**Memo**

To avoid unintended inspections, please ensure to check the window, part type, electrode type, and presence or absence of text marks on the inspection registration screen after auto registration. If there are discrepancies between the image and the program settings, please manually correct them.

**Memo**

When you check "Raw Board Present" on the board information settings screen and perform "Auto Extract" for the lands, the system will use the raw board master from the board image management screen for land extraction. If you uncheck it and perform the extraction, the system will use the inspection board (3D Full) master from the board image management screen for land extraction.

**Memo**

Parts and electrodes are always extracted using the inspection board (3D Full) master.

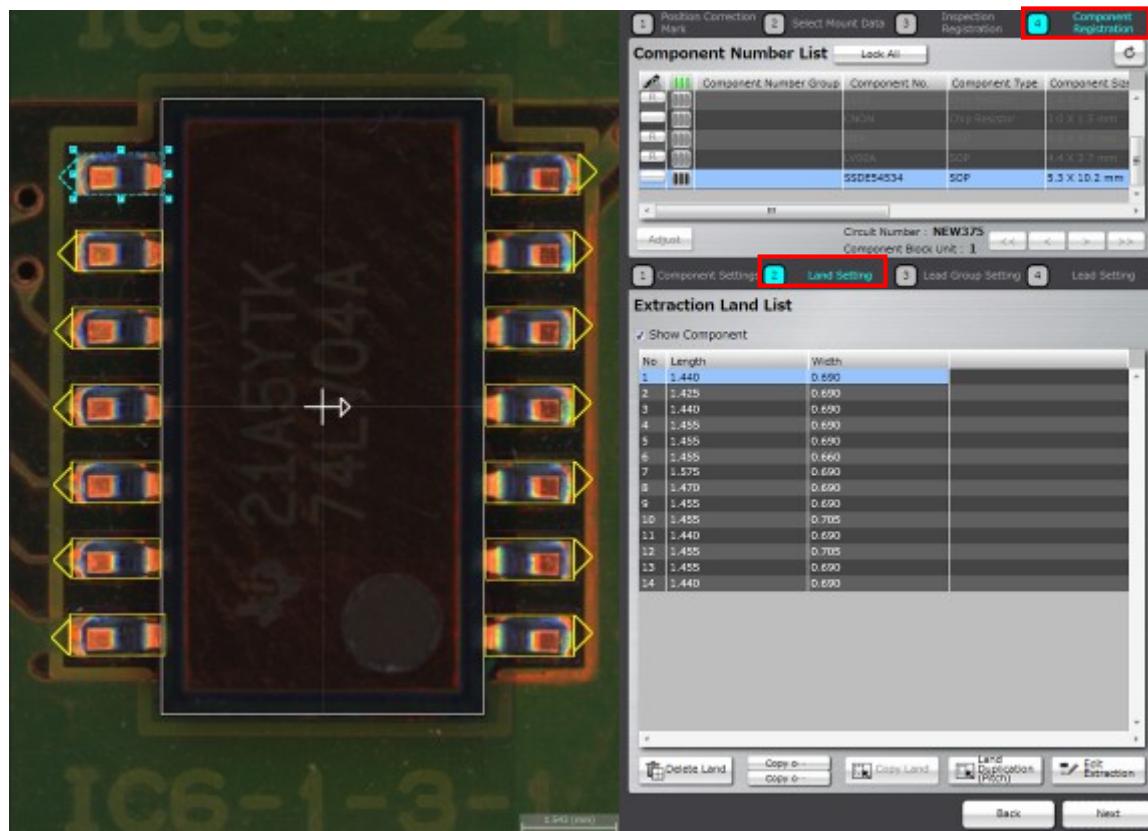
### 2.4.5.2 Land Setting

Land windows are automatically extracted and displayed on the screen, if they are not specified for the component yet, based on the bare PCB image. The size and position of the auto-extracted land windows can be adjusted on the screen.

**Memo** You cannot select the target component on the land settings screen. To change the component, click [Back] to return to the component settings screen and select a component, adjust the Component Body Window, and then click [Next].

**Memo** Land windows must be manually added or deleted, if the auto extraction failed (due to the wrong number of land windows).

→ Refer to “Add a land window” or “Delete a land window” of “2.4.5.2 Land Setting” for the procedures to add or delete land windows.



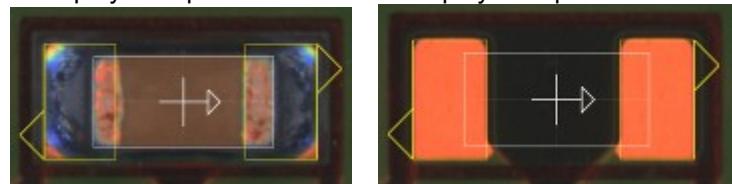
### • Adjust the Land Size

Adjust the size of auto-extracted land windows in accordance with the bare PCB image.

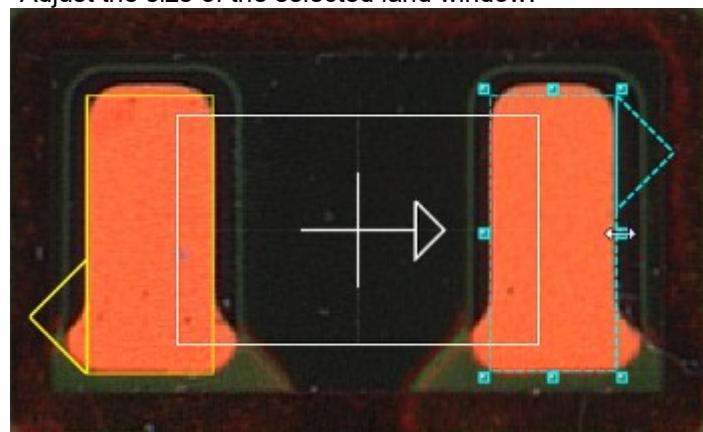
us  
Operation▶ 1. Deselect the [Display Component] checkbox.

Extraction Land List		
No	Length	Width
1	1.440	0.690
2	1.425	0.690

The image on the display area switches to the bare PCB image.  
<"Display Component" ON>    <"Display Component" OFF>



2. Select (Select Window) in the Image Operation tool bar, if it is not selected.
3. Select the land for adjusting the size.  
Click the land window in the image display area, or click the land in the Extraction Land List.
4. Adjust the size of the selected land window.



Refer to "2.1.3 Image Display Area Operation" for the image display area operation.

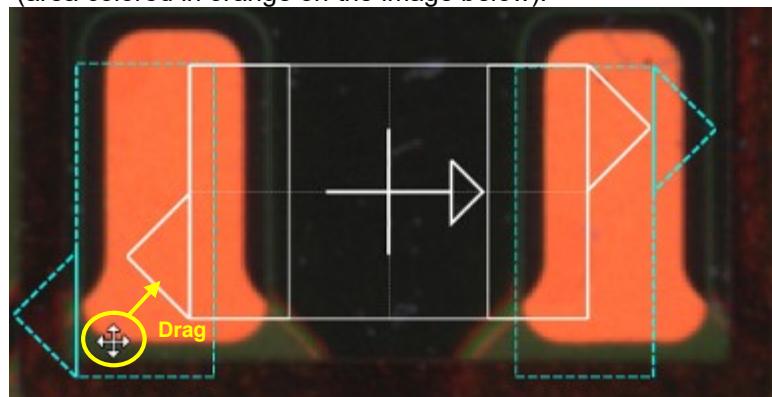
### • Adjust the Land Position

Align the auto-extracted land windows to the corresponding positions on the bare PCB image.

||Operation▶ 1. Deselect the [Display Component] checkbox.

Extraction Land List		
<input type="checkbox"/> Show Component		
No	Length	Width
1	1.440	0.690
2	1.425	0.690

2. Select  (Select Window) in the Image Operation tool bar, if it is not selected.
3. Drag the land windows to the land positions on the bare PCB image (area colored in orange on the image below).



 Refer to "2.1.3 Image Display Area Operation" for the image display area operation.

4. Click [Next] to proceed to the Electrode Group Setting screen.

**Memo** A length or width of the land can be entered as text by double-clicking.

No	Length	Width
1	1.440	0.690
2	1.425	0.690

Follow the procedures below as required if the land window auto extraction failed.

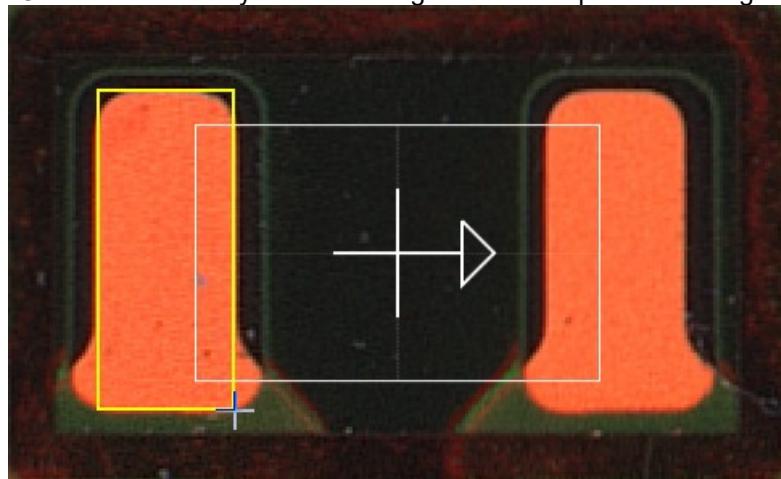
• **Add a Land Window**

Form a land window by directly drawing it on the image display area.

Operation▶ **1.** Deselect the [Display Component] checkbox to display the bare PCB image.

Extraction Land List		
No	Length	Width
1	1.440	0.690
2	1.425	0.690

- 2.** Click  (Create Window) button in the Image Operation tool bar.
- 3.** Create a window by almost tracing the land shape on the image.



 Refer to "2.1.3 Image Display Area Operation" for the image display area operation.

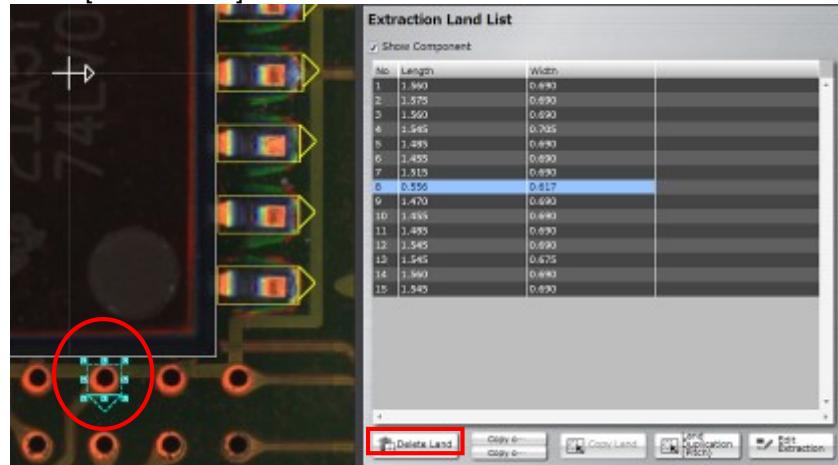
• **Delete a Land Window**

Delete extra land windows automatically extracted, if there are any.

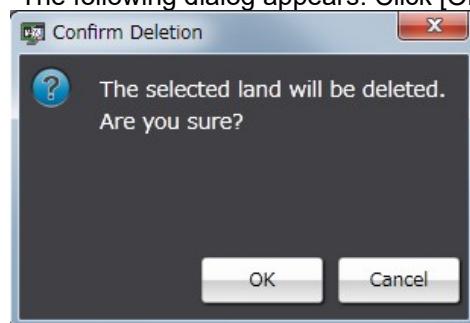
Operation▶ **1.** Select the land to delete.

Click the land window in the image display area, or click the land in the Extraction Land List.

**2.** Click [Delete Land].



**3.** The following dialog appears. Click [OK].



### • Copy a Land Window

A multiple number of land windows can be added efficiently for a component such as QFP, which requires many lands.

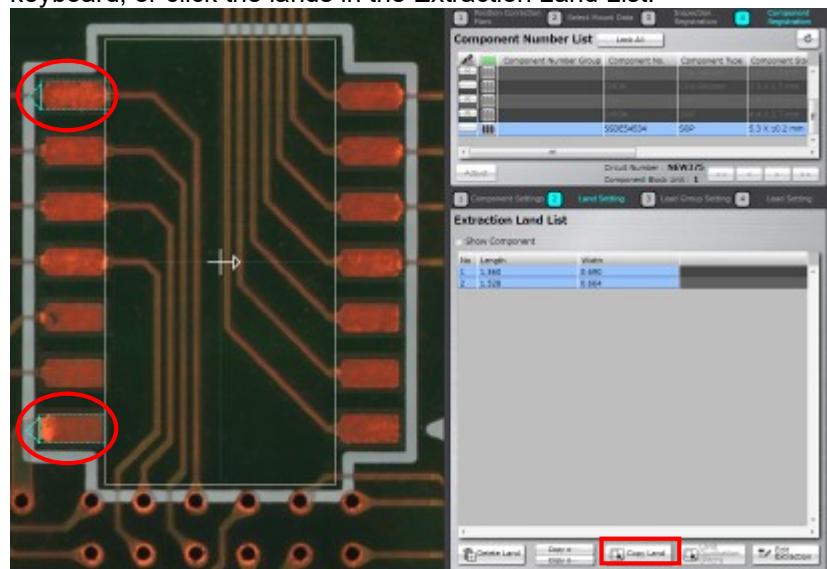
By selecting the lands at both ends of the same side, land windows are automatically copied and inserted among the selected lands.

#### Operation▶ 1. Add land windows to one side of the component.

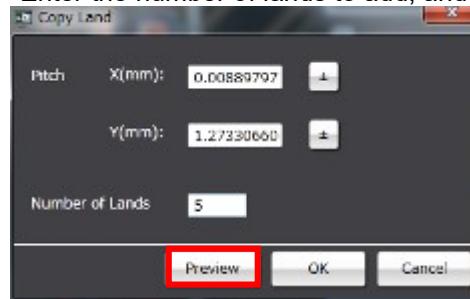
**Memo** Delete the land windows (if any) at positions other than the both ends of the side.

#### 2. Select the lands at both ends and click [Copy Land].

To select two lands simultaneously, click the land windows on the image display area while holding down the [Ctrl] key on the keyboard, or click the lands in the Extraction Land List.



#### 3. Enter the number of lands to add, and click [Preview].



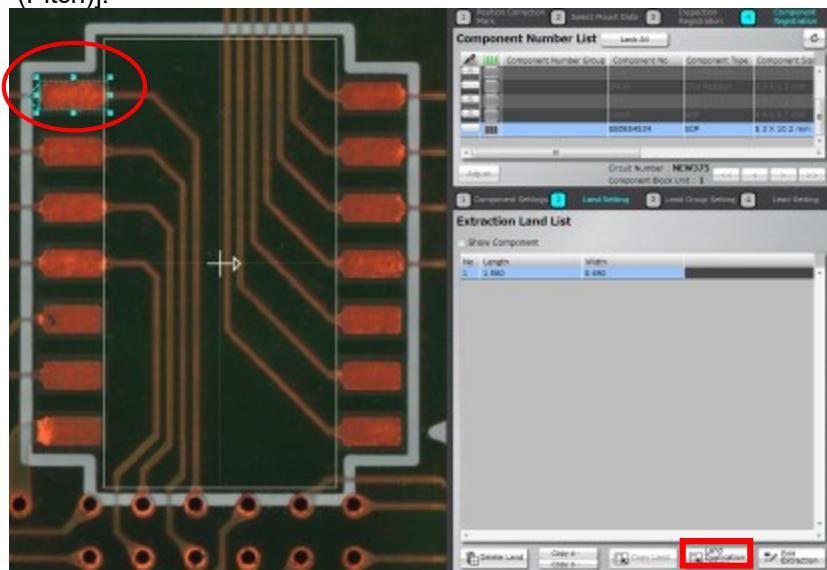
#### 4. Click [OK] to apply the result shown in the preview, or [Cancel] to abort it and quit land copying.

### • Land Duplication (Pitch)

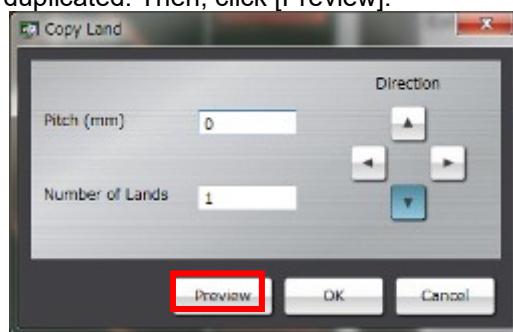
When using [Land Duplication (Pitch)], land can be duplicated by selecting a land used as a standard and specifying a value of pitch or direction.

||Operation▶ 1. Add lands used as a standard.

2. Select a land used as a standard and click [Land Duplication (Pitch)].



3. Enter the number of lands duplicated, pitch, and direction duplicated. Then, click [Preview].



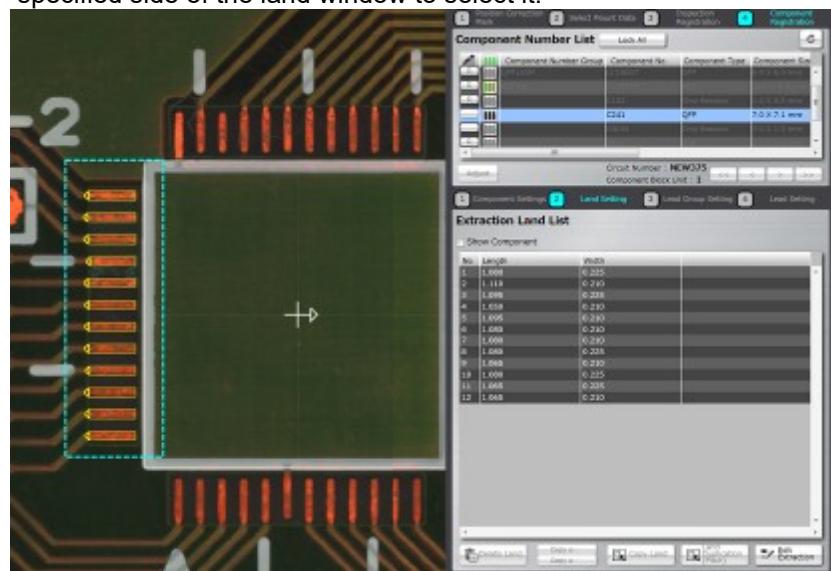
4. When determining land duplication using the information displayed on the preview, click [OK]. To quit land duplication and return to the original state, click [Cancel].

### • Copy on Two Sides or Four Sides

The land window group specified for one side of the component can be duplicated for the remaining sides.

Click [2nd Side Copy] for an SOP, and [4th Side Copy] for a QFP.

- Operation▶ 1. Drag and drop the cursor on the image display area to surround the specified side of the land window to select it.



2. Click [2nd Side Copy] or [4th Side Copy].



3. The land windows are copied on the remaining side(s) of the component.

Adjust the window positions if necessary.

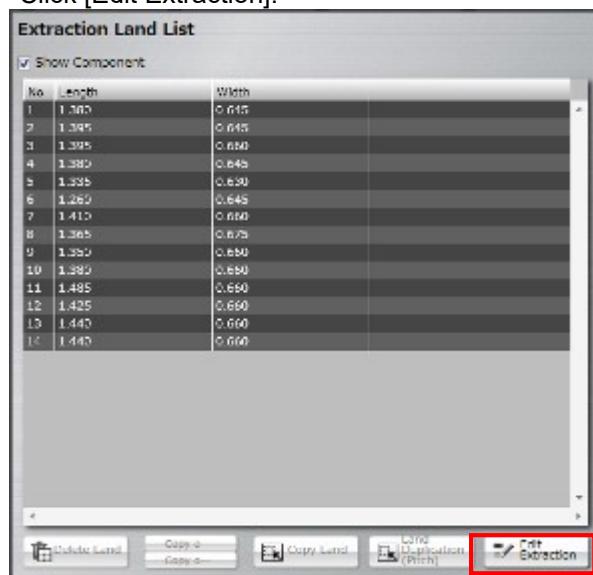
### • Edit the Auto Extraction Result

You can change the method of land extraction using the options.

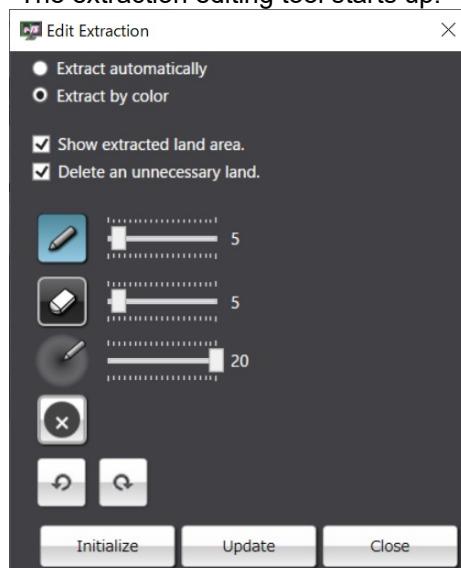
- [Extract automatically]: Land extraction is performed using image information.
- [Extract by color]: Land extraction is performed by teaching the system the color information of the land.

Note: If you check “There is a raw board” in the substrate information setting screen and perform “Automatic Extraction” of the land, the land window will be automatically adjusted using the master of the raw board in the substrate image management screen. If you uncheck it and perform the operation, the land window will be automatically adjusted using the master of the inspection board in the substrate image management screen.

||Operation▶ 1. Click [Edit Extraction].



2. The extraction editing tool starts up.



When you select [Extract Automatically] and press update, extraction will be performed on the selected circuit. (Proceed to step 6 of the operation procedure.)

**Memo**

When adjusting the land using the inspection board, please note that part of the land may be obscured by components, preventing correct positioning and potentially leading to inaccurate measurements in the 'End Overlap' and 'End Protrusion' inspections. Use the inspection board to extract the land window only if you can tolerate the possibility of not being able to measure 'End Overlap' and 'End Protrusion' accurately. If you want to measure 'End Overlap' and 'End Protrusion' accurately, check 'Bare Board Available' in the board information settings screen and extract the land window after imaging the bare board.

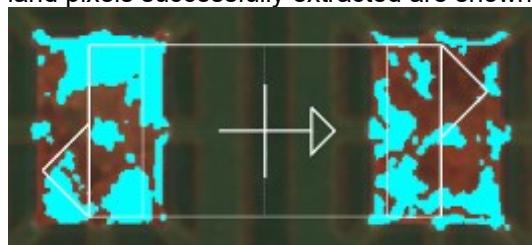


For the screen to toggle the 'Bare Board Available' check on or off, please refer to the board information settings screen in '2.2 Creating a New Inspection Program'.

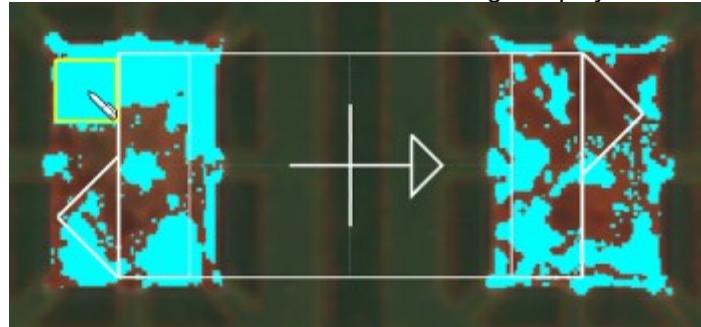
**Memo**

To avoid unintended conditions during inspection, always visually check the window's position settings after automatic adjustment.

Select the [Extract by Color] and [Show extracted land area]. The land pixels successfully extracted are shown in aqua color.



**3. Click unextracted land areas on the image display area.**



Refer to <Color Table Edit Tool> on “2.16.3 Editing a Model”.

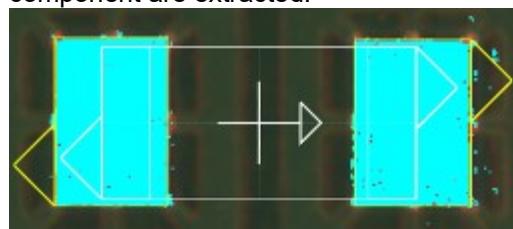
**Memo** Click [Initialize] to return to the pre-editing image.

**Memo** By switching the lighting type of the board image, it is possible to extract and edit both the color highlight image and the white illumination image. (Ver4.02 or later).

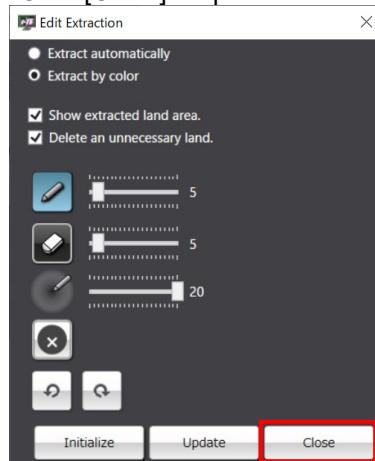
**4. Click [Update]. The land window is auto extracted and displayed.**

**5. If irrelevant locations e.g. the lands of other components in the surroundings are extracted, select the [Delete an unnecessary land.] checkbox and click [Update] again.**

Repeat Steps 3 to 6 until only the land windows for the relevant component are extracted.

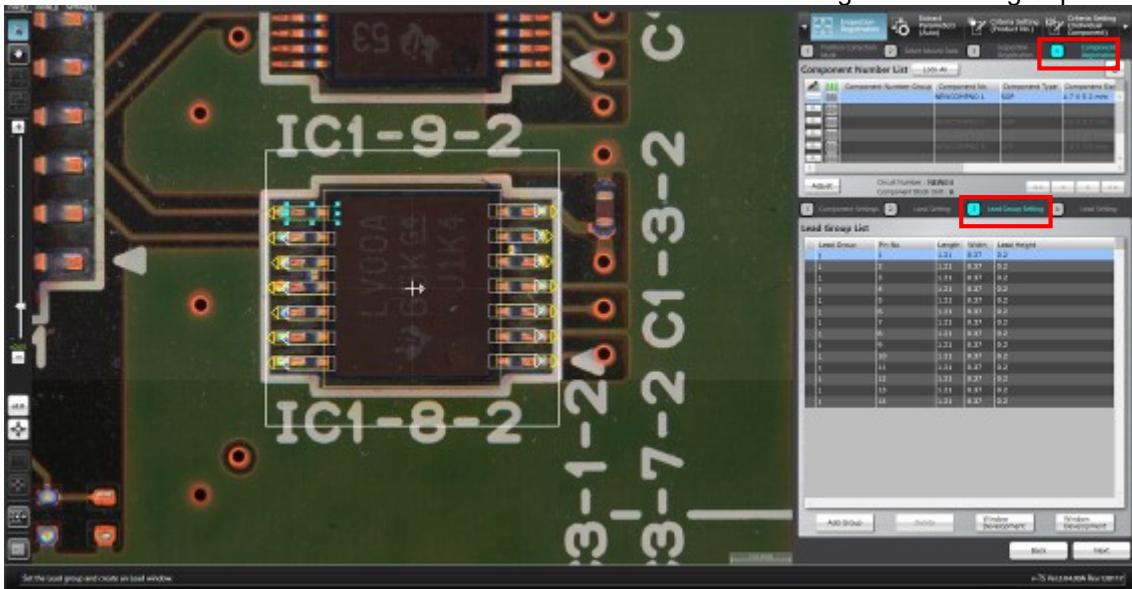


**6. Click [Close] to quit the extraction editing operation.**



### 2.4.5.3 Electrode Group Setting

This section describes the creation of electrode windows and setting of electrode groups.

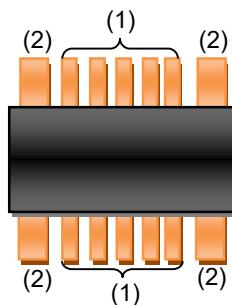


**Memo** Drawing windows is not required for chip-type components (i.e. chip resistors, chip capacitors or other chip components), since the electrode windows are automatically extracted.

#### Operation▶ 1. Set groups for each electrode.

Divide electrodes of different shapes and sizes into separate groups, since the electrode inspection criteria are specified by the unit of group.

The example below shows the group setting for an SOP with the electrodes on both ends (specified as Group 2) larger than the others.



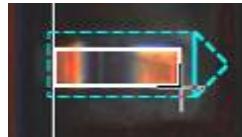
**Memo** The electrode group default setting is provided depending on the land window size.

To change the group setting, double-click the Electrode Group cell in the Electrode Group List to select the group.  
If the number of groups is not sufficient, click [Add Group]. A new group is specified under a new number.

Electrode Group	Pin No.	Length	Width	Electrode Height
1	1	0	0	0
1	2	0	0	0
1	3	0	0	0
1	4	0	0	0
1	5	0	0	0
1	6	0	0	0
1	7	0	0	0
1	8	0	0	0
1	9	0	0	0
1	10	0	0	0
1	11	0	0	0
1	12	0	0	0
1	13	0	0	0
1	14	0	0	0

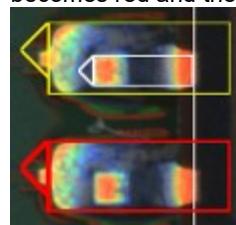
2. From the electrode group list, select a pin number to draw a window.

The land window in the image display area is selected, a new window is drawn to the electrode corresponding to its land window.



Memo

When you paste an electrode window to a land window that is different from the land window being selected, the land window becomes red and the [Next] button is disabled.

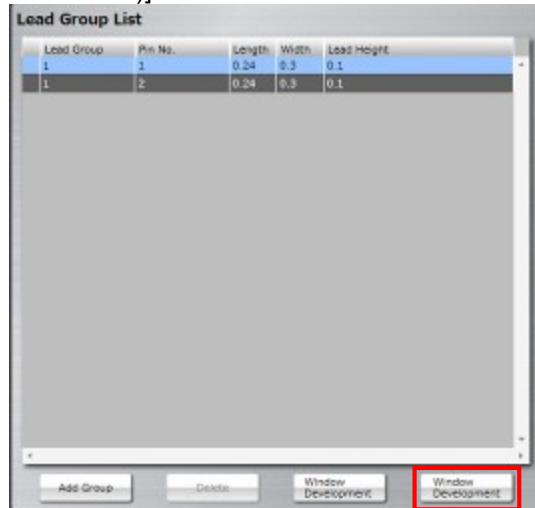


Memo

On the electrode row, you can enter an electrode size.

Electrode Group	Pin No.	Length	Width	Electrode Height
1	1	0.3	0.77	0.85

3. Select the electrode window drawn in Step 2, click [Window Development (Relative to Land W)] or [Window Development (Lead Extraction)].



Windows of the same size as the selected electrode window are positioned on the electrodes in the same group.

**Memo** For [Window Development (Relative to Land W)], the relative relationship between the selected lead window and land window is kept and the window size is developed to each lead within the same lead group.

For [Window Development (Lead Extraction)], the lead window position is extracted from the lead color and the window size is developed for each lead within the same lead group.

**Memo** When the positions of the land window and electrode window are not correct (land window is in red), the [Window Development (Land W Extraction)] and [Window Development (Lead Extraction)] button is disabled.

4. Select an individual electrode window to adjust the position and size.

**Memo** When an electrode window is resized, other electrode windows in the same group are also resized.

Refer to "2.1.3 Image Display Area Operation" for the image display area operation.

5. Perform Step 2 to 4 for each electrode group.

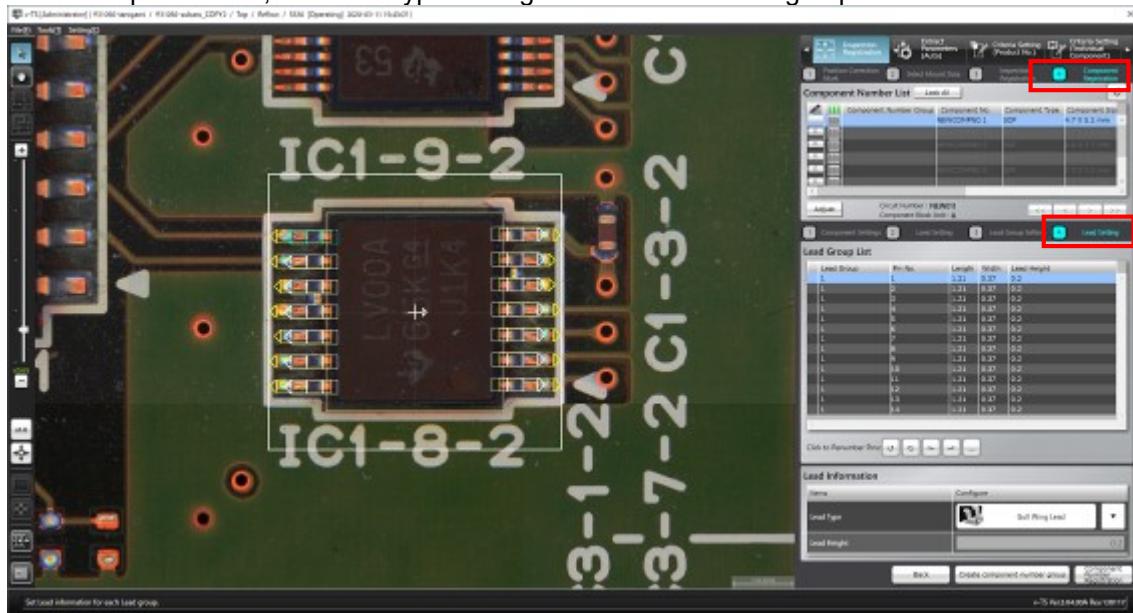
6. When modifying the land window after setting the electrode window, click [Back] to return to the land settings screen, modify the land window and then click [Next]. When mismatch between the electrode window and land window occurs (deleting a land, etc.), the [Delete] button is enabled. When you click [Delete], all the electrode windows are deleted. Perform operation from Step 1 again.

- 
7. Click [Next] to proceed to the Electrode Setting screen.

**Memo** The [Next] button will be enabled when you set electrode windows to all the land windows.

#### 2.4.5.4 Electrode Setting

Set a pin number, electrode type or height for each electrode group.



Operation▶ 1. Set a pin number if necessary.

Electrode Group List					
Electrode Group	Pin No.	Length	Width	Electrode Height	
1	1	1.31	0.39	0.2	
1	2	1.31	0.39	0.2	
1	3	1.31	0.39	0.2	
1	4	1.31	0.39	0.2	
1	5	1.31	0.39	0.2	
1	6	1.31	0.39	0.2	
1	7	1.31	0.39	0.2	
1	8	1.31	0.39	0.2	
1	9	1.31	0.39	0.2	
1	10	1.31	0.39	0.2	
1	11	1.31	0.39	0.2	
1	12	1.31	0.39	0.2	
1	13	1.31	0.39	0.2	

Click to Rerumber Pins:

Select a pin number increment direction from the options below:

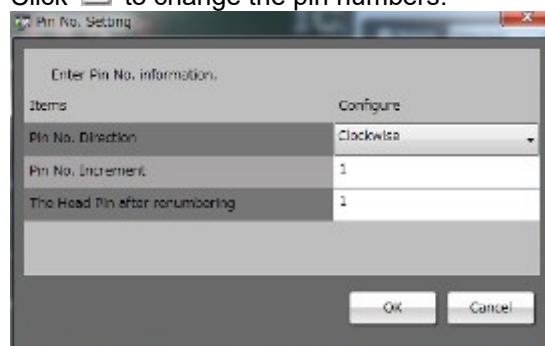
Button	Direction	Pin Numbering Example
	Counterclockwise	
	Clockwise	
	From Left to Right	
	From Right to Left	

**Memo** The currently selected pin is numbered "1" in the counterclockwise or clockwise direction.

**Memo** The top left pin and top right pin are numbered "1" in the left to right direction and right to left direction, respectively.

**Memo** The left to right and right to left directions are only effective for components such as SOPs with electrodes on both sides.

Click to change the pin numbers.



◆ Pin No. Direction: Select one of the four options above.

◆ Pin No. Increment: Enter an increment of the pin number.

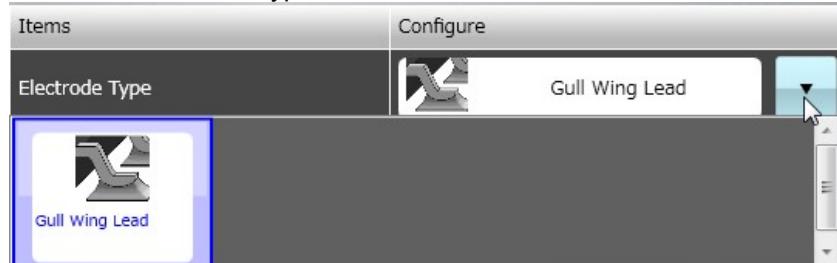
◆ The Head Pin after renumbering: Enter a pin number set on pin 1.

**Memo** This item can only be specified only when the pin number direction is clockwise or counterclockwise.

Click [OK] to apply the setting.

- 2.** Specify electrode information for individual electrode groups.  
Select an electrode window belonging to the target electrode group.  
Click to select the electrode window in the image display area, or click the electrode in the Electrode Group List.

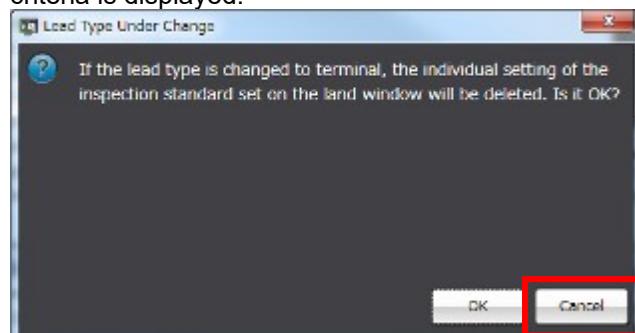
- 3.** Select the electrode type in the list box.



**Memo** Some electrode types may not be specified depending on the component type.

**Point** The selection of the electrode type is restricted depending on the component type. Refer to "Electrode Types" for details.

**Memo** If changing the lead type of a registered component to "terminal," there is no inspection criteria of land window available for terminals, so a warning window of deleting the individual settings of criteria is displayed.



**Memo** If agreeing the deletion of individual settings, select OK. In this case, the criteria individual settings specified on the land window of the applicable component are deleted.

- 4.** Specify the electrode height (Unit: mm).

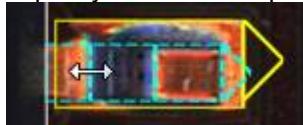


**Memo** The value is rounded at the 3rd decimal place.

**Memo** A value in the range of 0 to 99.99 can be entered.

**Memo** If automatic calculation is being selected for the component height setup method, the electrode height is calculated automatically while learning is performed.

**5. Specify the inflection points for a gull-wing lead.**

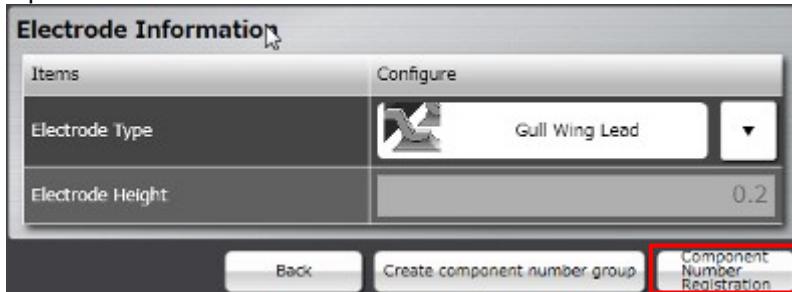


**Memo** When the positions of the inflection points are changed for any electrode, those of other electrodes in the same group are also changed.

Refer to "2.1.3 Image Display Area Operation" for the image display area operation.

**6. Perform Step 1 for the remaining electrode groups, too.**

**7. Click [Component Number Registration] after all the groups are specified with the electrode information.**



To create a component number group based on this component number, click [Create component number group]. A component number group is created simultaneously with the component number registration. Specify a component number group name.



Go to the Component Setting screen if there are any more component numbers to register.

Repeat the component setting to electrode setting procedures for the components to register.

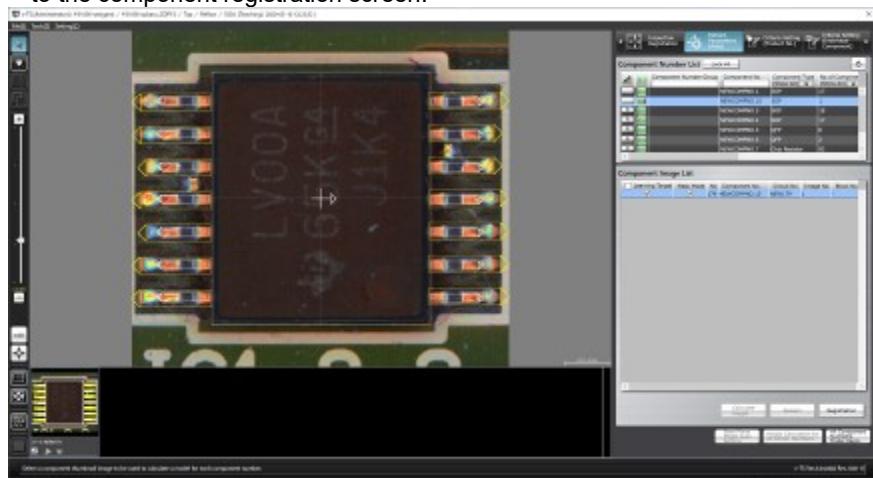
**Memo** When performing component number registration, windows are automatically pasted to all components of the same component number, and the component number status changes from to .

**Memo** The design information (land information) in the component number data is updated when a component number is registered.

**Memo** The pasting of the land window will be performed according to the extraction settings.

For details on extraction editing, please refer to "2.4.5.2 Land Setting Extraction Editing."

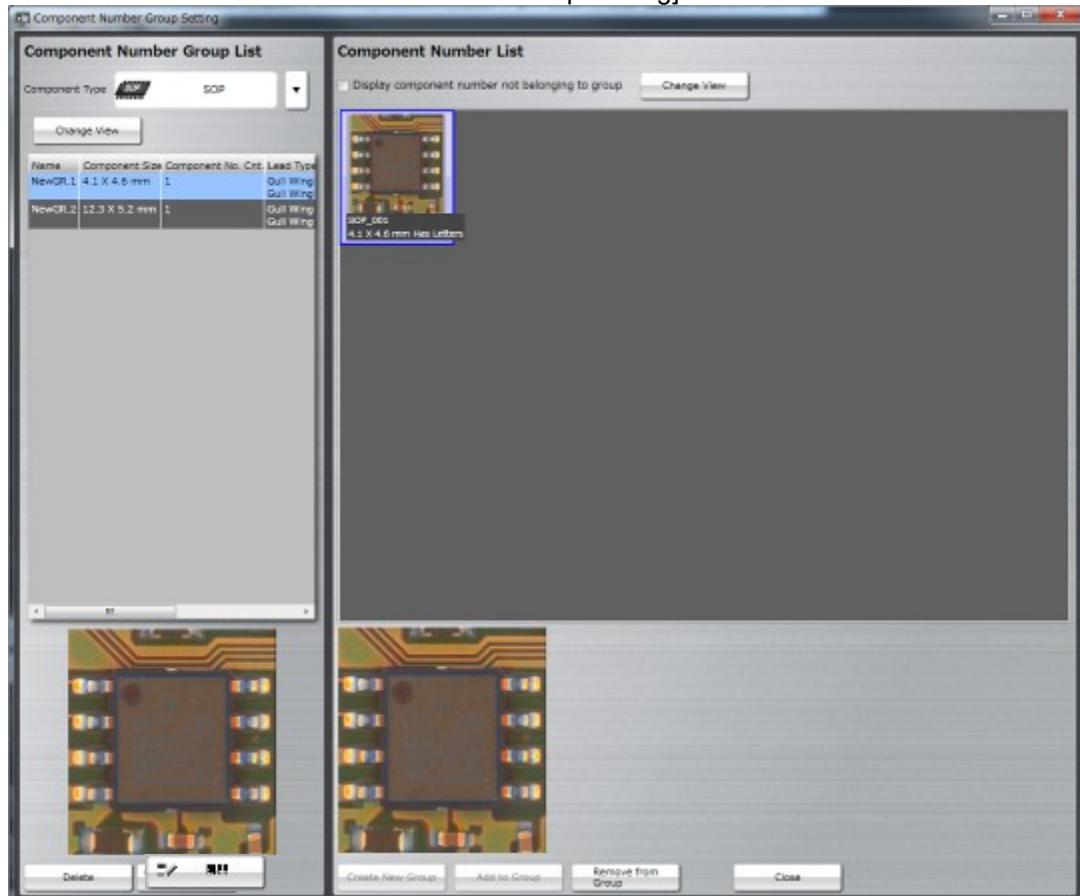
When registration for all component numbers is complete, the screen moves to the component registration screen.



## 2.4.6 Setting Component Number Group

Images and settings can be shared by grouping component numbers with the same shape or color as a component number group.

**Operation▶** **1.** On the menu bar in the editing screen, select [Tools] -> [Component Number Group Setting].



**Memo** In a component number group, all the windows, inspection settings, and color parameters are the same except the following:

- Mask model for wrong component inspection
- Mask model for wrong polarity inspection
- OCR
- 2C code (component)



Refer to "2.16.3 Editing a Model" for [Deploy].

### 2.4.6.1 Create New Component Number Group

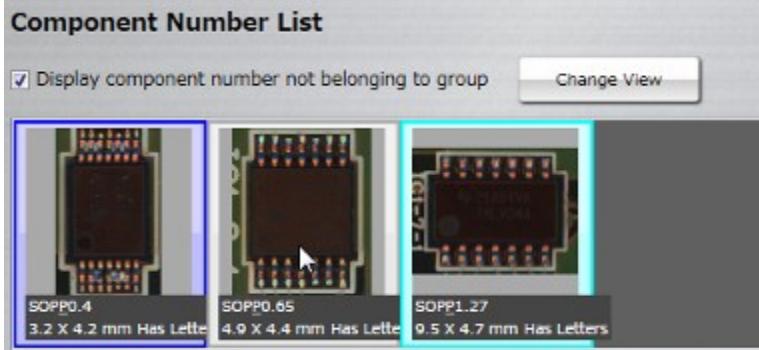
A new component number group is created based on an existing component number.

Operation▶

**1. Select a component type.**

Select a component type from the [Component Type] pull-down menu.

**2. Select a component number.**



**Memo** Only the same component numbers as the selected component type are displayed in the list.

Select the [Show component number not belonging to group] check box, and select a component number for which you want to create a group.

**3. Create a new component number group.**

Click [Create New Group] at the screen bottom. The component number group name dialog box appears. Enter a component number group name.



**Memo** You cannot specify the same component number group name in one component type.

### 2.4.6.2 Adding to Component Number Group

An existing component number is added to a component number group.

Operation▶

1. Select a component type.

Select a component type from the [Component Type] pull-down menu.

2. Select a component number group.

Name	Component Size	Co
SOP_127_08	4.7 X 3.9 mm	2
SOP065L006B02x01S-3PC040x020	1.2 X 1.9 mm	1
SOP127L008B06x05B-7PC080x040_J	4.4 X 5.4 mm	1
SOP127L008B05x05B-7PM090x040	4.4 X 5.0 mm	1

3. Select a component number.

Select the [Show component number not belonging to group] check box, and select a component number you want to add to the selected component number group.

By clicking [Change View], the display of component number can be toggled between image and thumbnail.

4. Add to the component number group.

Click [Add to Group] to add the component number to the component number group.

**Memo** When added to the group, data of the component number is synchronized with the component number group. Be careful that this may change the inspection result.

**Memo** If a component size of the component number you want to add differs from the component size of the component number group, you cannot add the component number to the group. In such a case, either create a new component number group or correct the component window size.

### 2.4.6.3 Deleting from Component Number Group

A component number is deleted from a component number group.

||Operation▶

**1. Select a component type.**

Select a component type from the [Component Type] pull-down menu.

**2. Select a component number group.**

**3. Select a component number.**

Unselect the [Display component number not belonging to group] check box, and select a component number you want to delete from the selected component number group to which the component number belongs.

**4. Delete from the component number group.**

Click [Delete from Group] to delete the component number from the component number group.

Memo

When a component number is deleted from a component number group, the setting of the component number group is succeeded to the component number. Be careful that the original setting of the component number before being added to the group is not restored.

Memo

A component number registered 1st to the component number group cannot be deleted from the group. To delete the 1st registered component number, delete the group first then create and register the group again.

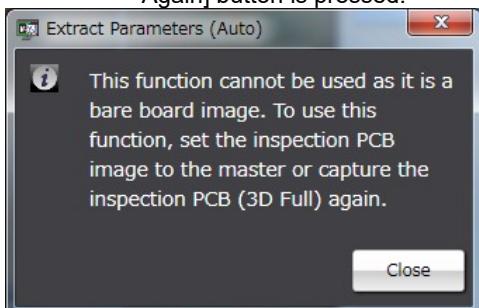
## 2.5 Registering the Component Number Model

Calculate the model for each component number and register the component information in the library.

Details of the information registered are the color parameter information needed for the 2D inspection logic and the height information and projector's light intensity needed for the 3D inspection logic.

**Memo** Model calculation refers to the automatic extraction of the characteristic parameters to detect the colors and shapes of the component and electrodes.

**Memo** On the PCB image management screen, if the bare board image column of the inspection PCB selected as the master PCB is checked, a warning message is displayed and processing is interrupted when the [Register] button, [Register All Component No. Models] button, or [Learn Again] button is pressed.



For the screen to operate the check box of bare board images, refer to Section 2.17.1 "Open PCB Image Management Screen."

Operation▶ 1. Select the "Extract Parameters (Auto)" tab.



2. Select the component number in the Component Number List.  
 The thumbnail images of the currently selected component and all the components with the selected component number are displayed in the image display area. If you select a component number belonging to a component number group, all the thumbnail images of the component number group are displayed.  
 When the button is (locked), click to change the component number state to not locked .



**Memo** Only the image for the component numbers with the right end progress signal bar lit ( or ) can be selected. To redo the model calculation for the component numbers with lit right end signal bar, click [Delete].

**Memo** Click button in the Image Operation tool bar to display a list of component thumbnail images in the image display area.

**Memo** The number of the images learned when a new component number is registered is displayed on the column of the the number of applicable images in [Component Number List].

Number of Target Images  
▼

Refer to "2.1.2 Configuration of the Editing Screen" for the image operation buttons.

- Check each component thumbnail image to determine if the image and windows are aligned. If not, adjust the positions and sizes of the windows.

Click a component thumbnail image or a component in the Component Image List to select it. The field of vision on the PCB image moves to the selected component.

**Memo** Size adjustment is only possible for land windows.

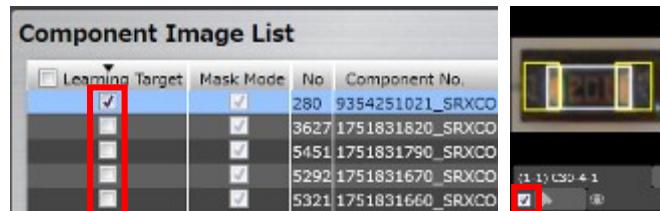
**Memo** The position of the Component Body Window and electrode windows cannot be adjusted separately.

Refer to "2.1.3 Image Display Area Operation" for the image display area operation.

- Select the component thumbnail image to use for model calculation and click the corresponding checkbox in the Component Image List or the checkbox next to the component thumbnail image.

**Component Image List**

Learning Target	Mask Mode	No.	Component No.
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	280	9354251021_SRXCO
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3627	1751831620_SRXCO
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5451	1751831790_SRXCO
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5292	1751831670_SRXCO
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5321	1751831660_SRXCO

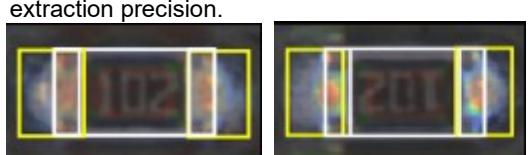


**Memo** The checkboxes for the components selected in inspection registration are selected by default.

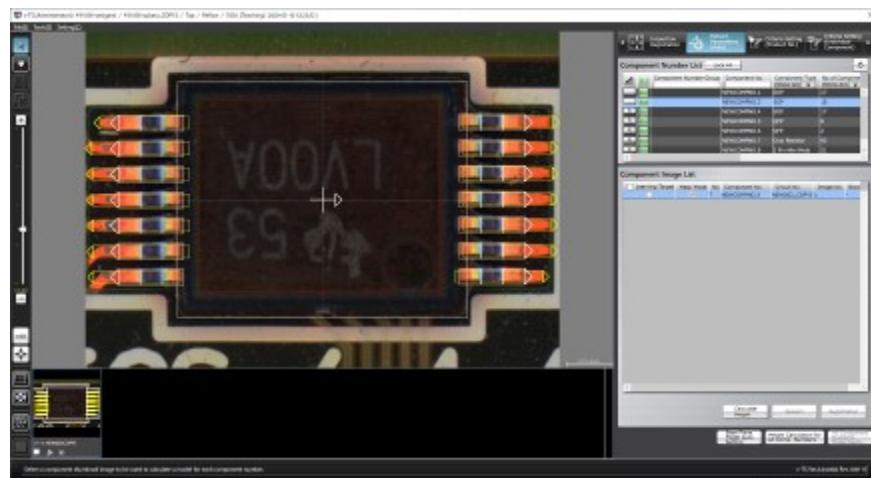
**Memo** It is automatically judged by the destination setting of the component of the inspection program which captured the image if the checkboxes in the learning target column on the applicable image list are checked ON or OFF. The components not included in the destination program are checked OFF. For the components included in the destination program, only the images of the inspection PCB captured by the destination program are checked ON. However, if images are present only in the master inspection program, the PCB images in the master inspection program are checked ON.

**Memo** Multiple learning target images can be selected. Clicking the checkbox at the header in the Component Image List can select all the images (checkboxes) simultaneously.

**Memo** For more precise extraction of characteristic parameters, select a good component image for the model as learning target. If there are multiple candidates with a slight difference e.g. in the electrode color, select them all to enhance extraction precision.



5. Repeat Steps 2 to 4 for the component numbers with no image specified yet.
6. Click [All Component Numbers Model Registration]. Model calculation will be automatically performed and models will be registered to the library.  
When performing model registration for one component number displayed on the screen, click [Registration].

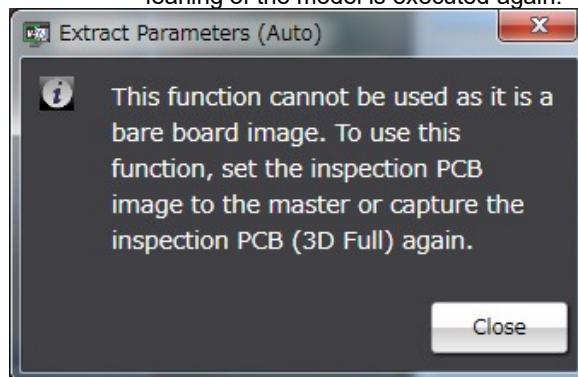


**Memo** When the image is not selected, the [Registration] and [All Component Numbers Model Registration] are not available.

- To learn with more model images as in mass production images, click [Learn Again].

**Memo** Pay attention that re-learning overwrites information already configured, such as a color.

**Memo** On the PCB image management screen, if the bare board image column of the inspection PCB selected as the master PCB is checked, a model image with no component is created. So, a warning message is displayed and processing is interrupted when the [Learn Again] button is pressed and learning of the model is executed again.



- To learn height again, clicking [Calculate Height] automatically calculates the height again. To learn the height again for all component numbers, click [Calculate Height for All Component #].

**Memo** [Calculate Height] does not affect information already configured, such as a color.

**Memo** Use this button when learning height to use the 3D logic.

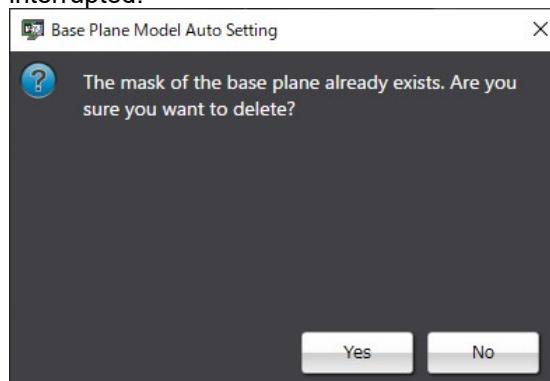
**Memo** Perform the PCB test to calculate the height of the component height of the component number. The median of the PCB test result is used to calculate height.

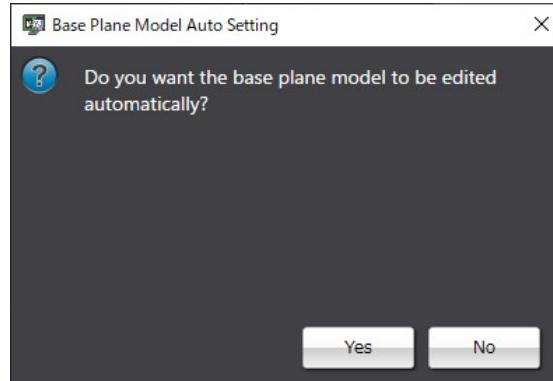
**Memo** On the PCB image management screen, if the bare board image column of the inspection PCB selected as the master PCB is checked, a warning message is displayed and processing is interrupted when the [Height Calculation] button or the [All Component No. Height Calculation] button is pressed and leaning of the model is executed again.



9. By clicking the [Reference Level Model Automatic Setup] button, the reference level model is adjusted automatically. Use this button to reduce the manual adjustment time of editing a reference level model when learning has not been performed yet on the existing reference level model.

**Memo** When the mask of the reference level model is already set, if the [Reference Level Model Automatic Setting] button is pressed, the dialog like below is displayed. By selecting [Yes], the mask of the existing reference level model is removed. Then, by selecting [Yes] on the screen of "Do you edit the reference level model automatically," the mask of the existing reference level model and the approximation method and separation setting of the reference level are updated. By selectin [No], the setting process is interrupted.





In addition, by pressing this button after learning of component numbers is performed and settings of component block unit are made, it is able to set the most appropriate base plane partitioning and the base plane approximation method automatically.



For settings of component block unit, refer to Section 2.7.1 "Component Block Unit Setting." For editing of the reference level model, refer to Section 2.17.4 "Editing a Reference Level Model."

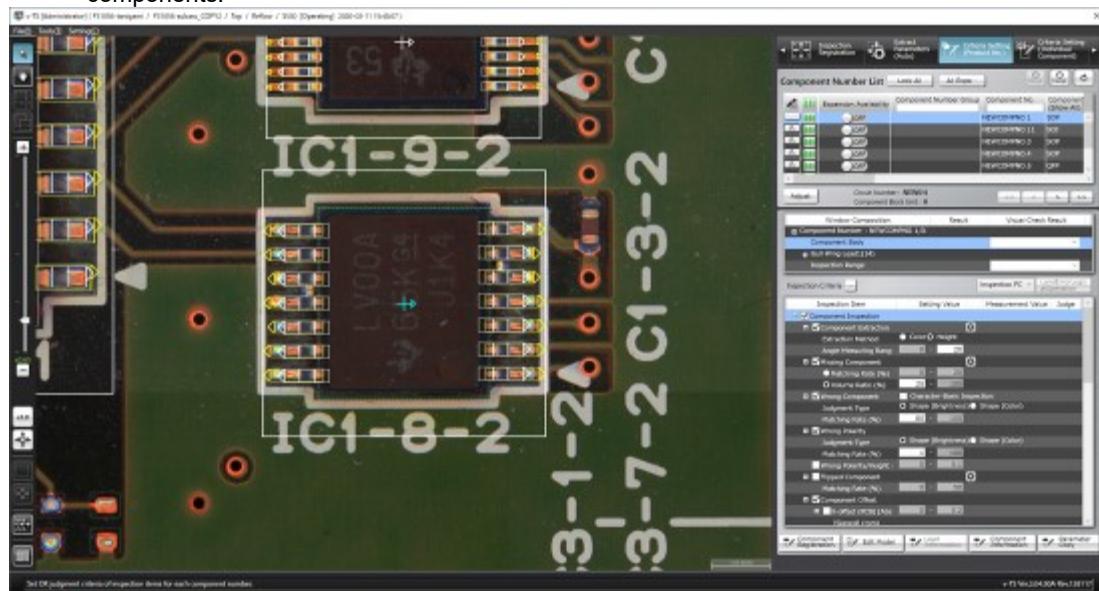
# 2.6 Specifying Inspection Criteria

This section explains the procedure to specify inspection criteria for individual inspection windows.

## 2.6.1 Criteria Setting (Product No.)

Specify inspection criteria for each component number.

Refer to "2.6.2 Criteria Setting (Individual Component)" for the criteria setting for individual components.

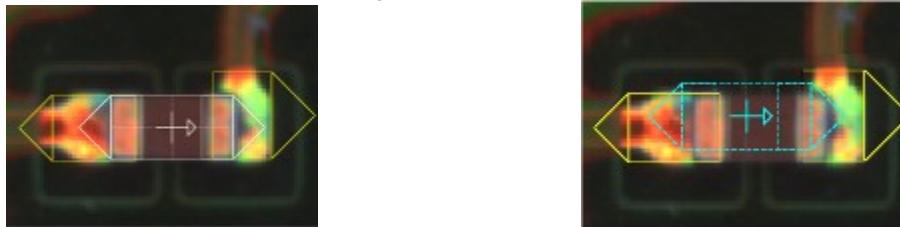


### Memo

On the Criteria Setting screen, the center position of the component is aligned to the reference position for component offset inspection (the center of the minimum bounding rectangle for land and electrode windows).

The component window must be aligned to the component image to teach the component colors before registering the component number model. However, once the component number model is registered, the alignment of the component window to the image is not required.

<Before Component Number Model Registration> <After Component Number Model Registration>



- Operation▶ 1. Select the [Criteria Setting (Product No.)] tab to display the Criteria Setting screen.



2. Select the target component in the Component Number List.

Component Number List			
	Component Number Group	Component No.	Component Type
R	1005C-GR1	1005C	Chip Capacitor 1.0 X 0.5 mm
R	1SS355	1SS355	Chip Resistor 1.8 X 1.2 mm
R		1608C	Chip Resistor 1.5 X 0.8 mm
R		2125C	Chip Resistor 1.9 X 1.4 mm
R		8216C	Chip Resistor 3.0 X 1.5 mm

Memo When the status is (locked), click it to change the component number status to not locked .

If you select a component number belonging to a component number group, all the component numbers in the component number group are included in the adjustment.

To automatically adjust individual inspection windows, select the target component number in the component number list, and click [Auto Adjustment].

Refer to (5) Information Display Area of "2.1.2 Configuration of the Editing Screen".

Height inspection means the following inspection logics:

- Component inspection (wrong polarity, component height, and lifted component)
- Electrode inspection (electrode posture - lifted electrode / coplanarity)

3. Select the target window in the Window Composition, or click the window in the image display area to select it.

The inspection items pertaining to the selected window are displayed.



**Memo** Use the combo box to switch the display of the inspection PCB image and unpopulated PCB image.

4. Select the inspection items by using the checkboxes.

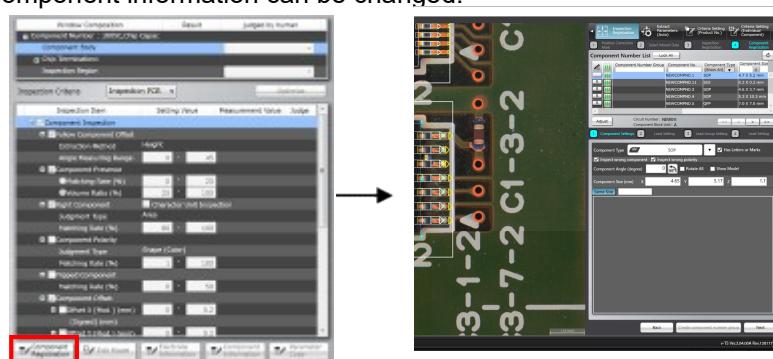
Inspection is performed for the items whose checkboxes are ON, and not performed for those with checkboxes OFF.

The inspection items with selected checkboxes require the inspection criteria for a good component judgment.

Refer to the Inspection Logic Manual for the details on the inspection items.

5. To check or edit the component information, click to select the Component Body item in the Window Composition, and click [Component Registration].

The display moves to the Component Setting screen, where the component information can be changed.



Refer to "2.4.5.1 Component Setting" for the editing procedure.

To check or change the component data (height and projector light intensity), click [Component Data]. In the component data setting dialog box, change component height, projector light intensity, or component level difference if necessary, and click [OK].

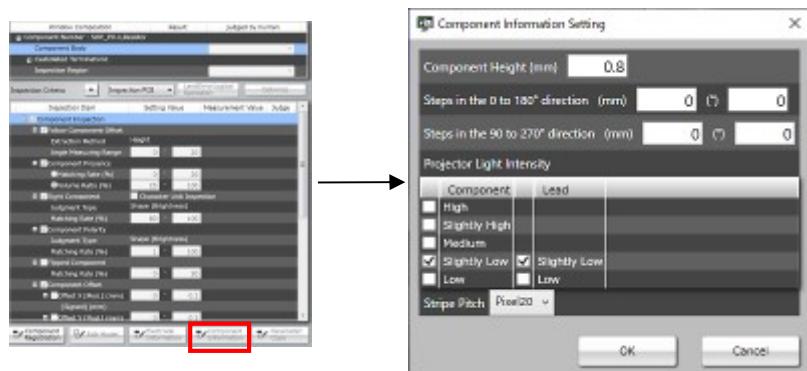
**Memo** Enter a value if the component upper surface has unevenness.

Items (mm) and (°) are independent input, respectively, and whichever being selected by the radio button for the component lift inspection (height/angle) is applied. If the measurement point is lower than the reference point, enter the value of unevenness as a numerical value using “-”.

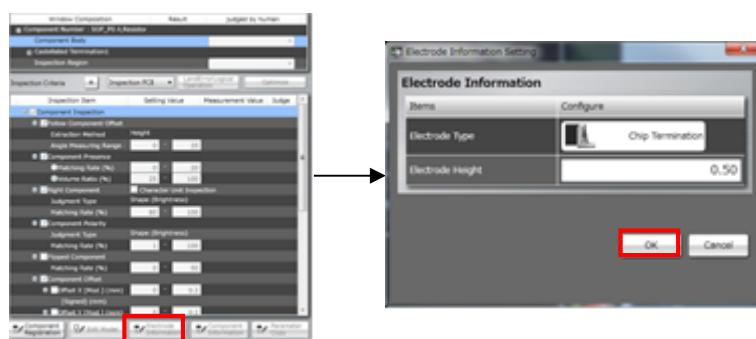
**Memo** Consider changing projector light intensity if a fault code of "Projector Light Intensity Low" or "Projector Light Intensity High" is displayed. If changing it thoughtlessly, inspection time might become longer or 3D shape might not be obtained correctly.

**Memo** When projector light intensity is changed, the projector light intensity of all component numbers belonging to the same component number group is updated. It is recommended to use the Deploy ON/OFF Setting function to deploy the changed projector light intensity to the inspection program after quality is confirmed.

**Memo** The projector light intensity of component number is displayed on the component number list of criteria setup (component number).



To check or edit the electrode information, click the target electrode group in the Window Composition to select it, and click [Electrode Information]. The Electrode Information Setting dialog appears. Change the electrode height as required and click [OK].

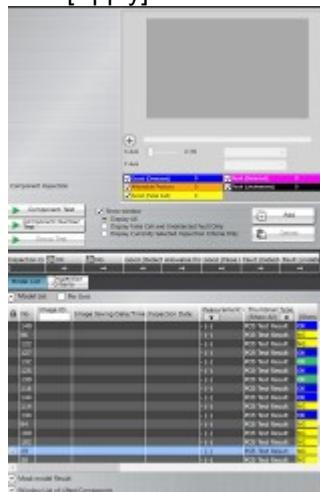


For manually editing the characteristic parameters automatically extracted in model calculation, click the target inspection item and click [Edit Model].



For the editing method, refer to Section 2.16.3 "Editing a Model." For the correction procedure of position extraction, refer to Appendix 7. "Position Correction and Position Extraction."

When setting judgment in combination of inspection result and/or inspection of a component # or whole component # group with the inspection result, click [Optimize]. The inspection criteria detail setting screen appears. Set a Boolean expression as needed and click [Apply].



Refer to "2.16.4 Optimizing Boolean Expressions and Inspection Criterion Values" for setting procedure.

## 6. Repeat Steps 2 to 5 for all the component numbers.

Refer to "2.16.3 Editing a Model" for deployment.

### Memo

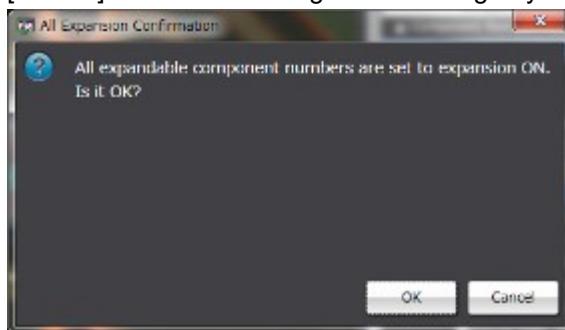
If [Deployment ON/OFF Setting Function] of system settings is set ON, the [Deploy All] button is displayed.



By clicking [Deploy All], the deploy all confirmation dialog is displayed.

[OK]: Sets all the component numbers which can be deployed to deployment ON.

[Cancel]: Closes the dialog without doing anything.



The condition in which component numbers can be deployed is as follows:

- Locked
- Finished component number

For [Deployment ON/OFF Setting Function], refer to Section 3.6.3 "Making Component No. Settings."

## 2.6.2 Criteria Setting (Individual Component)

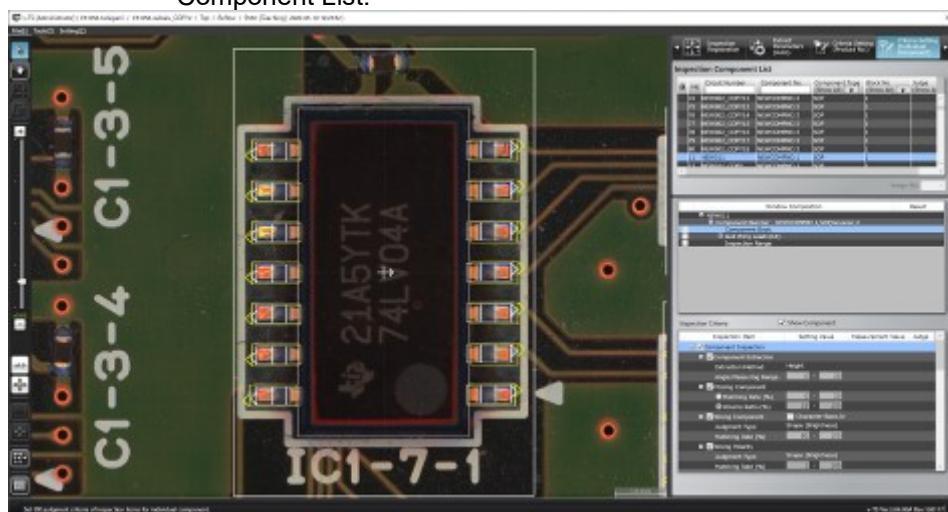
Inspection criteria can also be specified for individual components or windows independently from the component numbers.

**Memo** In individual component criteria setting, each of land windows and electrode windows can be specified individually.

- Operation▶ 1. Select the [Criteria Setting (Individual Component)] tab to display the Criteria Setting screen.



2. Select the component for individual setting in the Inspection Component List.



**Memo** Switch between an Inspection PCB image and an Unpopulated PCB image by clicking ON/OFF in the  **Display Component** check box.

3. Click the checkbox for the window for individual setting.

 is displayed in the box and the window is locked.

	Window Composition	Result
C1-4-1		
Component Number : Id,5,1608R,ChipResistor,Revision,2		
	Component Body	
	Chip Termination1	
	Electrode1	
	Land1	
	Electrode2	
	Land2	
	Inspection Region	

The editing of the inspection criteria for the locked window is enabled. At the same time, the editing of the same window is disabled on the Component Number Criteria Setting screen.

  is also displayed for the locked window in the Inspection Component List.

	No	Circuit Number	Component No.	Component Type	Block ID
	150	C1-4-1	1608R	Chip Resistor	1

 To unlock the window, click  in the Window Composition list. The lock release confirmation dialog appears. Click [OK] to cancel the individual setting and unlock the window. The global criteria for the component number is applied for the unlocked window.

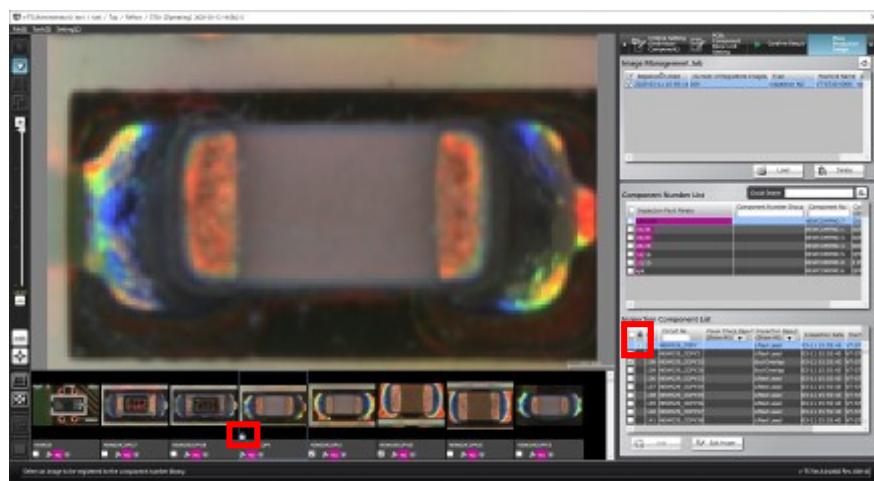


4. Specify inspection criteria for the window.

 Refer to Step 4 of "2.6.1 Criteria Setting (Product No.)" for the setting procedure.

**Memo** When the circuit of the mass production image (not registered) on the mass production image registration screen, an icon for individual setting is displayed on the list.

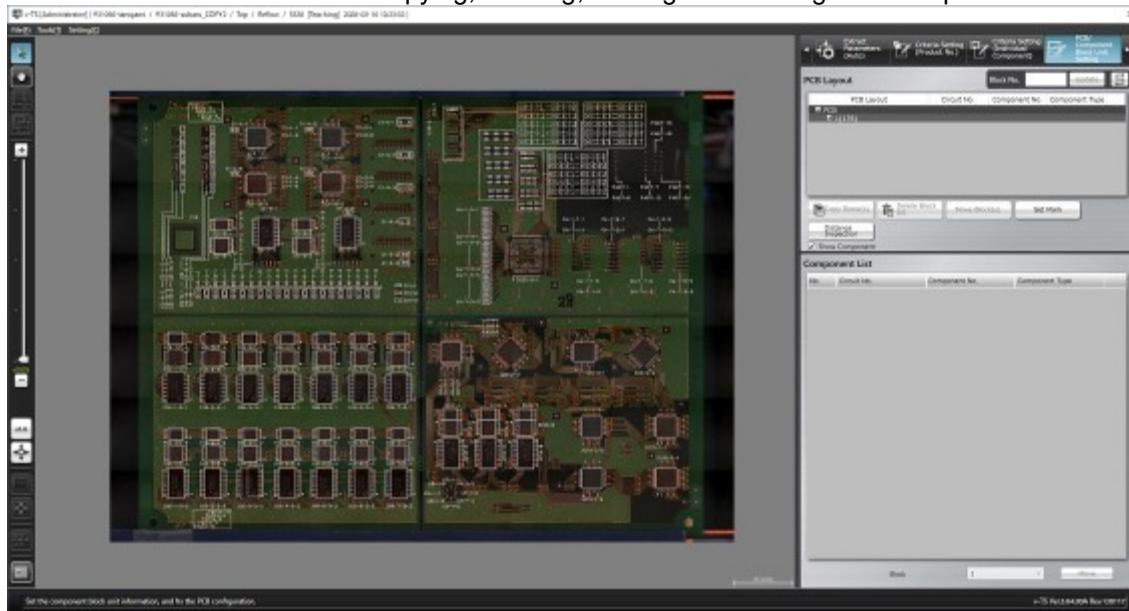
For this, mass production images (not registered) in which individual setting is applied can be judged with the simulation for mass production images. The circuit in which individual inspection criteria are configured as shown below is displayed as individual icons on the inspection component list and thumbnail screen.



# 2.7 PCB/Component Block Unit Setting

## 2.7.1 Component Block Unit Setting

This section describes the copying, deleting, moving and dividing of a Component Block Unit.



### ■ Open the Component Block Unit Setting Screen

Operation▶ 1. Click to select the [PCB/Component Block Unit Setting] tab.



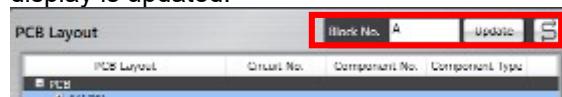
**Memo** If the [PCB/Component Block Unit Setting] tab is hidden, click at the right to display it.

### ■ Edit a Component Block Unit Number

Operation▶ 1. Click to select the target Component Block Unit in the PCB Layout list.

**Memo** Find the corresponding "Component Block Unit No. (The number of components)" in the PCB Layout column.

2. Enter a new Component Block Unit number and click [Update]. The Component Block Unit number is changed and the PCB Layout display is updated.



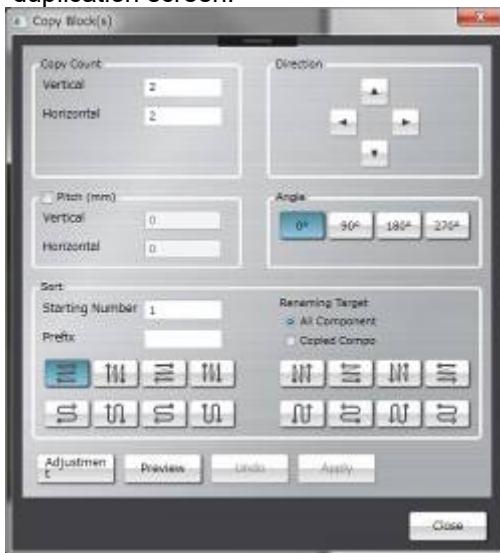
**Memo** A Component Block Unit number can be entered within 16 alphanumeric characters (Symbols cannot be used).

## ■ Copy a Component Block Unit

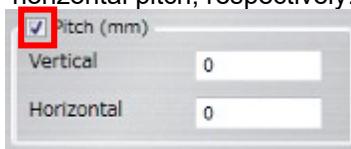
Operation▶ 1. Click to select the original Component Block Unit to copy in the PCB Layout list.

**Memo** Find the corresponding "Component Block Unit No. (The number of components)" in the PCB Layout column.

2. Click [Copy Block(s)] to start up the component block unit duplication screen.



3. Specify the number of component block units to create and click [Adjustment]. Component block units for XY position adjustment are displayed for vertical and horizontal directions. To copy a component block unit only in the vertical direction, enter "1" for the horizontal direction.
4. Align the window positions of component block units for position adjustment to the component block units at the end of the vertical/horizontal directions.
5. When duplicating a component block unit window by specifying pitch, select the checkbox of pitch and enter values of vertical and horizontal pitch, respectively.



**Memo** If the state of pitch selection is changed, the component block unit being duplicated is deleted.

**Memo** If the checkbox of pitch is selected, [Adjust] is disabled.

6. Select a direction to duplicate the component block unit.



**Memo** Up to two directions can be selected. If selecting two directions, they must be adjacent to each other.

7. The component block unit window is displayed by clicking [Preview]. If an angle is selected, the window is displayed as rotated CCW by the selected angle.

**Memo** If a component block unit for position correction is used, pitch is calculated for the specified number of component block units from the position of the component block unit for position correction, and component block unit windows are displayed at equal intervals.

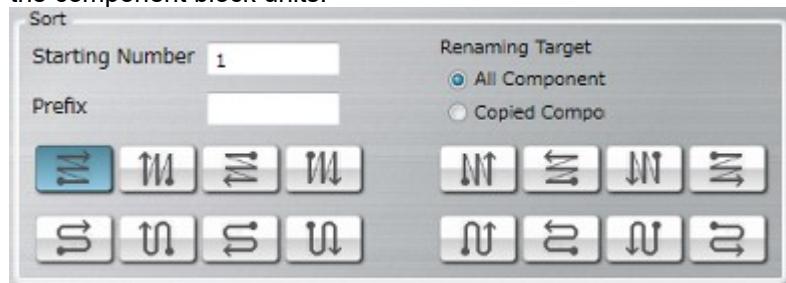
8. Assign the component block unit name again.

Starting Number: The component block units are named from the specified number in series.

Prefix: Set a prefix on the component block unit name.

Renaming target: Set the target of reassigning the component block unit names.

Setting of component block units sorting order: Set a sorting order of the component block units.



&lt;Setting of component block unit sorting order&gt;

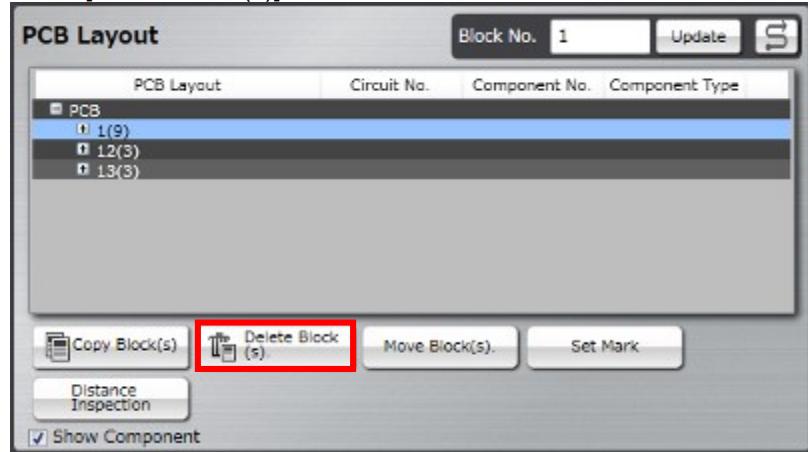
Button	Sorting order	Button	Sorting order

9. Click [Apply] to determine the duplication of the component block unit. All the component block units being duplicated are deleted by clicking [Undo].
10. When duplication of the component block units has finished, click [Close]. The software exits the component block unit duplication screen and returns to the component block unit setting screen.

## ■ Delete a Component Block Unit

Operation▶ 1. Click to select the Component Block Unit to delete in the PCB Layout list.

2. Click [Delete Block(s)].



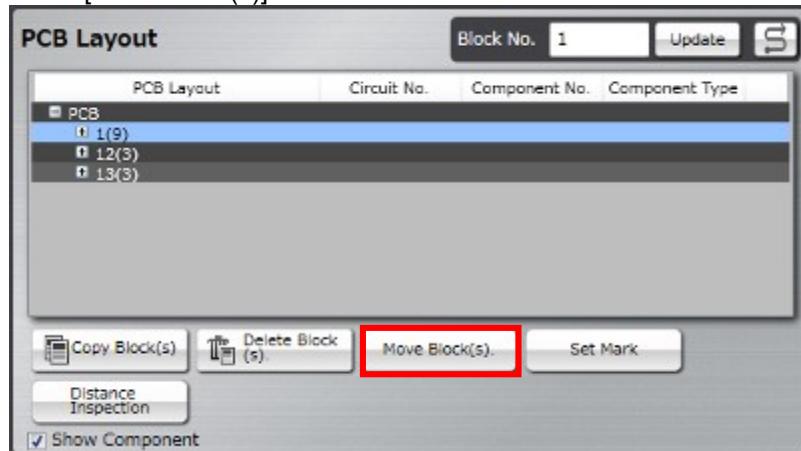
3. The dialog to confirm the deletion appears. Click [OK].



## ■ Move a Component Block Unit

Operation▶ 1. Click to select the Component Block Unit to move in the PCB Layout list.

2. Click [Move Block(s)].



**Memo** By default, an unpopulated PCB is displayed. By clicking the [Display Component] check box, you can switch ON/OFF of Display Component.

3. The PCB moving buttons are displayed.



Click button for the target direction, or drag the image display area to move the Component Block Unit.

Click if the Component Block Unit (or its copy) requires a rotation. A single click rotates the unit by 90 degrees in the counterclockwise direction.

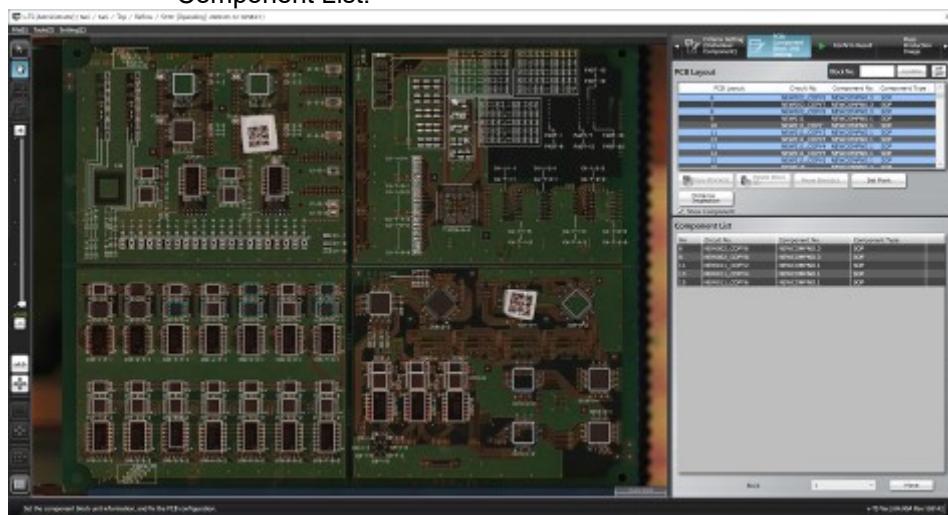
**Memo** Use the PCB entire view display function for rough position alignment, then tune the position using the magnified view.

Refer to "2.1.3 Image Display Area Operation" for the image display area operation.

## ■ Divide a Component Block Unit

Operation▶ 1. Click  (Select Window) button in the Image Operation tool bar.

2. Drag to specify the range to be separated from the Component Block Unit on the image display area. Drop the cursor. The components included in the specified range are added to the Component List.

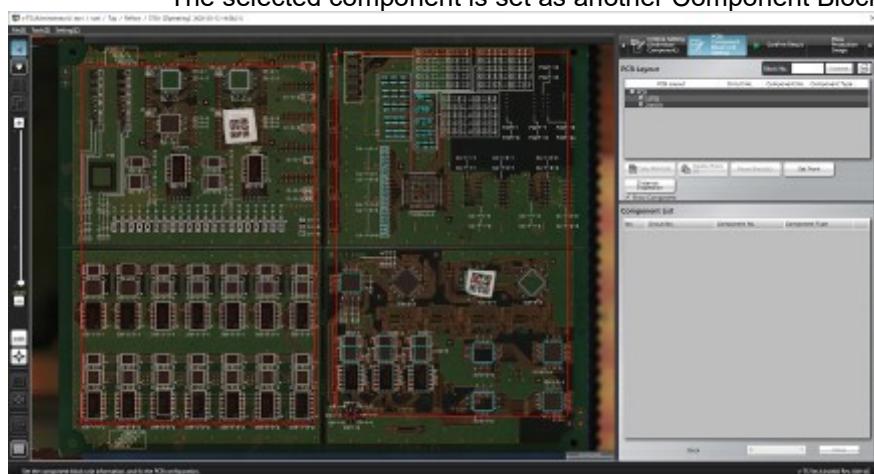


3. Select the destination Component Block Unit number the separated portion is moved to in the list and click [Move].

To add a new component block unit number, select [NEW].



The selected component is set as another Component Block Unit.



## 2.7.2 Mark Setting

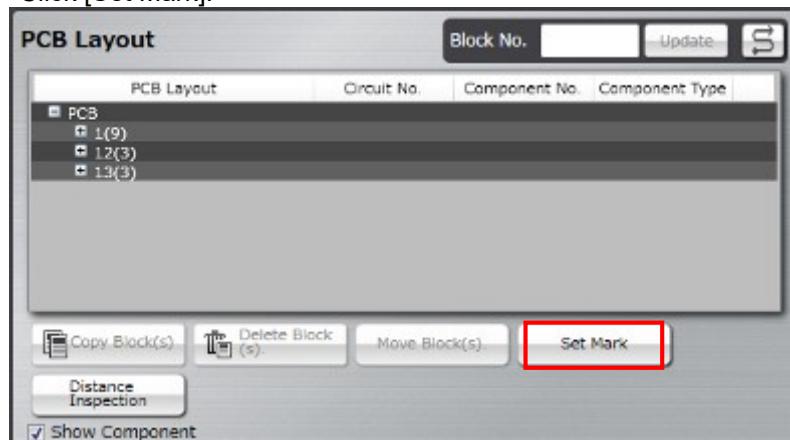
This section describes 2D code or Bad Mark setting.

 Refer to the Inspection Logic Manual for the details on 2D code or Bard Mark inspection.

- Operation▶ 1. Select the [PCB/Component Block Unit Setting] tab.



2. Click [Set Mark].

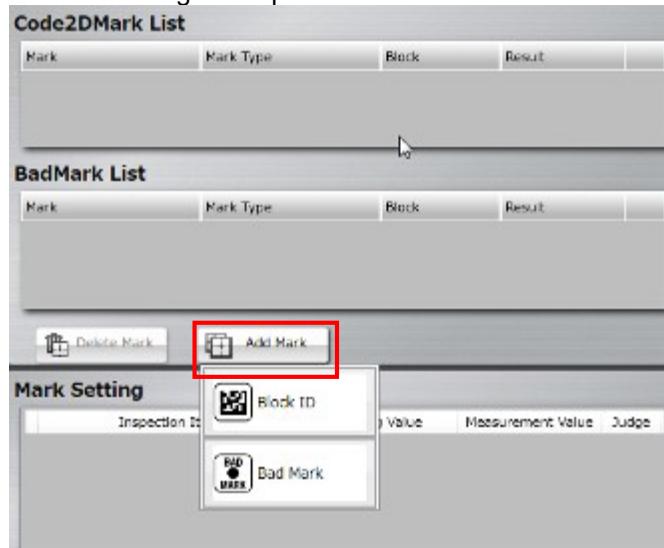


3. Select the target (PCB or Component Block Unit) of adding a mark on the PCB Layout list. Click [Add Mark] and select a mark type in the mark list.

Selectable mark types are as follows:

When selecting a PCB: PCB ID

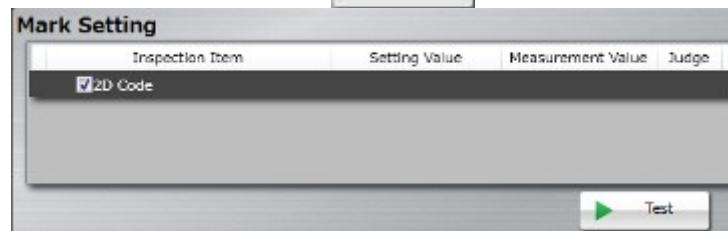
When selecting a component block unit: Block ID or Bad Mark



4. Drag and drop the cursor to surround the mark (2D code/bad mark) in the image display area.



5. On the mark setting screen, select a checkbox on the inspection item column, and click the button.



6. By clicking the button, the test result of the 2D code, measured value, and judgment are displayed.

A screenshot of three dialog boxes. The top box is 'Code2DMark List' with a table showing one entry: Mark 2DCode3, Mark Type 2D Code, Block 1, and Result (empty). The middle box is 'BadMark List' with an empty table. The bottom box is 'Mark Setting' with a table showing one entry: Inspection Item 2D Code, Setting Value (empty), Measurement Value (empty), and Judge (empty). At the bottom of the 'Mark Setting' box is a 'Test' button with a green arrow icon.

- 
7. When setting a bad mark, select the checkbox of the inspection item, and click the [Edit Model] button to edit the model of the bad mark.



8. Click the button. The result of the bad mark, measured values, and judgment are displayed.

**Memo** The display of the inspection result of PCB tests is switched depending on whether a bad mark is detected or not.  
- If detected: The inspection result of all the circuits of the component block units to which the bad mark belongs is not displayed.  
- If not detected: The inspection result of the circuits is displayed.

### 2.7.3 Performing Distance Inspection

Set the distance inspection.

#### ■ Set the Distance Inspection of Component Number

Operation procedure

- Select the [Criteria Setting (Product No.)] tab.



**Memo** If the [Criteria Setting (Product No.)] tab is not displayed on the screen, click at the right end (enclosed with red frames) will reveal any hidden tabs.

- Check [Distance inspection] and select the Detailed Settings button.

Expansion Availability	Component Number Group	Component No.	Component (Show All)
OFF		NEWCOMPNO.1	SOP
OFF		NEWCOMPNO.10	Chip Capacitor
OFF		NEWCOMPNO.11	Chip Capacitor
OFF		NEWCOMPNO.12	Insertion Component
OFF		NEWCOMPNO.13	Chip Capacitor

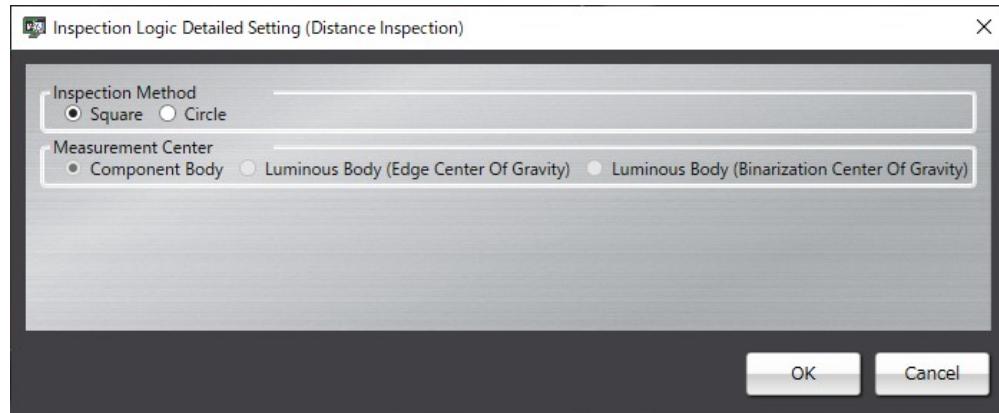
  

Window Composition		Result	Visual Check Result
Component Number : NEWCOMPNO.1,SK			
Component Body			
+ Gull Wing Lead1(14)			
Inspection Range			

Inspection Criteria	Inspection PC	General-purpose Logic	AI Inspection Logic	LandErrorLogic																																			
<table border="1"> <thead> <tr> <th>Inspection Item</th> <th>Setting Value</th> <th>Measurement Value</th> <th>Judge</th> </tr> </thead> <tbody> <tr> <td>[Signed] (°)</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Tilt (90 to 270°)</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="radio"/> Height [Absolute]</td> <td>0 -</td> <td>0.1</td> <td></td> </tr> <tr> <td>[Signed] (mm)</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="radio"/> Angle [Absolute]</td> <td>0 -</td> <td>5</td> <td></td> </tr> <tr> <td>[Signed] (°)</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Lift (Average Height)</td> <td>0 -</td> <td>0.1</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Distance Inspection</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Inspection Item	Setting Value	Measurement Value	Judge	[Signed] (°)				<input checked="" type="checkbox"/> Tilt (90 to 270°)				<input type="radio"/> Height [Absolute]	0 -	0.1		[Signed] (mm)				<input type="radio"/> Angle [Absolute]	0 -	5		[Signed] (°)				<input checked="" type="checkbox"/> Lift (Average Height)	0 -	0.1		<input checked="" type="checkbox"/> Distance Inspection						
Inspection Item	Setting Value	Measurement Value	Judge																																				
[Signed] (°)																																							
<input checked="" type="checkbox"/> Tilt (90 to 270°)																																							
<input type="radio"/> Height [Absolute]	0 -	0.1																																					
[Signed] (mm)																																							
<input type="radio"/> Angle [Absolute]	0 -	5																																					
[Signed] (°)																																							
<input checked="" type="checkbox"/> Lift (Average Height)	0 -	0.1																																					
<input checked="" type="checkbox"/> Distance Inspection																																							

3. Select the inspection method and the measurement center for the distance inspection.



**Inspection Method**

Square: The inspection method is set to a square range.

Circle: The inspection method is set to a circular range.

**Measurement Center**

Component Body: The measurement center is center of component body.

Luminous Body (Edge Center of Gravity): The measurement center is Luminous Body (Edge Center of Gravity).

Luminous Body (Binarization Center of Gravity): The measurement center is Luminous Body (Binarization Center of Gravity).

**Memo** The luminous body window is required to select Luminous Body (Edge Center of Gravity) or Luminous Body (Binarization Center of Gravity).

Refer to "Create Window Button (Luminous Body)" in "2.4.5.1 Component Setting" for luminous body window editing.

If the measurement center of Luminous Body (Binarization Center of Gravity) is misaligned, edit the luminous body color in the model editor.

Refer to "2.16.3 Editing a Model" for editing a Model.

## ■ Open the Distance Inspection Screen

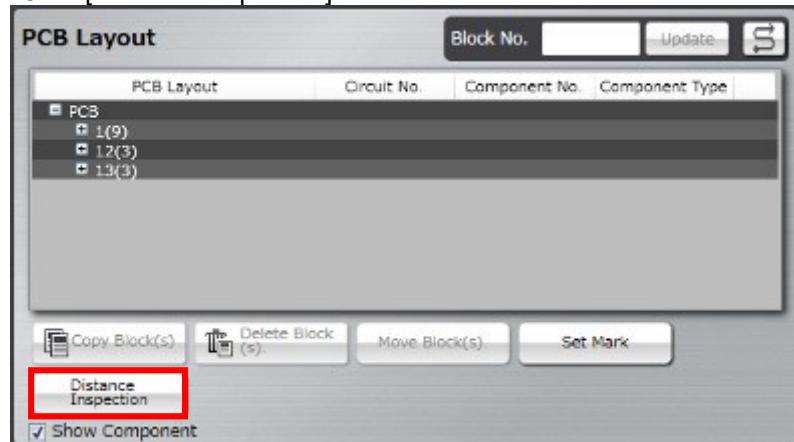
Operation procedure

1. Select the [PCB/Component Block Unit Setting] tab.

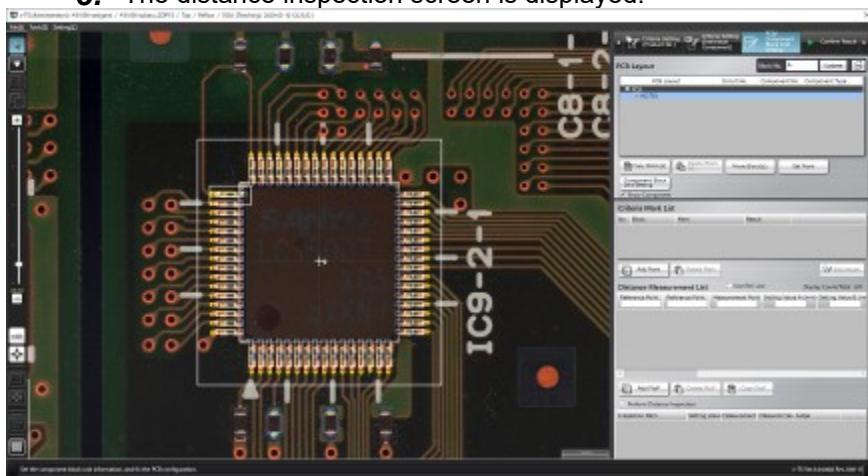


**Memo** If the [PCB/Component Block Unit Setting] tab is not displayed on the screen, when clicking at the right end (enclosed with red frames), a hidden tab is displayed.

2. Click [Distance Inspection].



3. The distance inspection screen is displayed.



## ■ Add a Criteria Mark

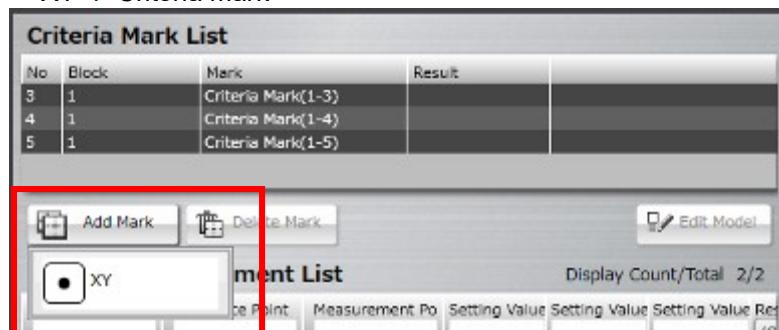
Operation▶ 1. Select the component block unit to add a criteria mark from the PCB layout.

**Memo** By selecting the component block unit, the [Add Mark] is enabled.

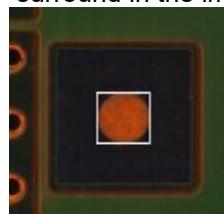
2. Click the [Add Mark] to select the mark you want to add from the list box.

The type of selectable marks is as follows.

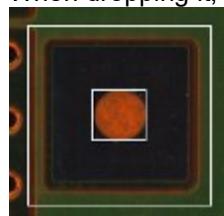
- XY : Criteria mark



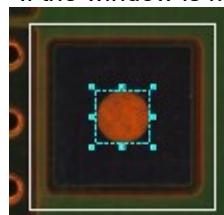
3. Drag the area you want to register as a criteria mark so as to surround in the image display area.



When dropping it, the mark search range is automatically drawn.

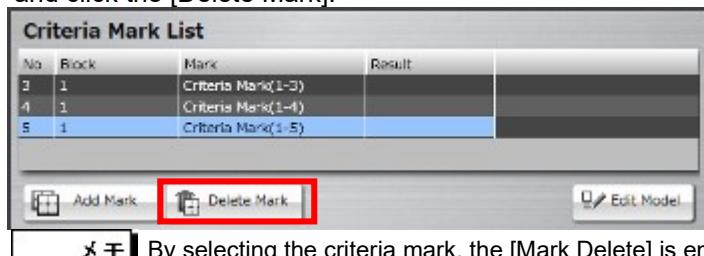


4. If the window is moved and resized, click the Criteria Mark.



## ■ Delete a Criteria Mark

- ||Operation▶ 1. Select the component block unit with the criteria mark you want to delete from the PCB layout.
2. Select the criteria mark you want to delete from the criteria mark list, and click the [Delete Mark].



**Memo** By selecting the criteria mark, the [Mark Delete] is enabled.

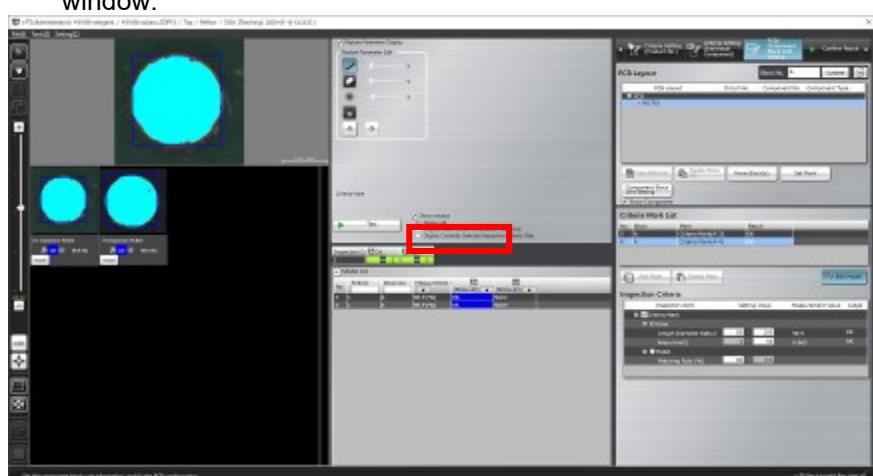
## ■ Edit Model of a Criteria Mark

- ||Operation▶ 1. Select the component block unit with the criteria mark you want to edit the model from the PCB layout.
2. Select the criteria mark you want to edit the model from the criteria mark list, and click [Edit Model].



**Memo** By selecting the criteria mark, the [Edit Model] is enabled.

3. The model editing screen is displayed.  
Edit the color table so that the criteria mark can be extracted.  
When clicking [Test], the extracted result is displayed on a blue window.



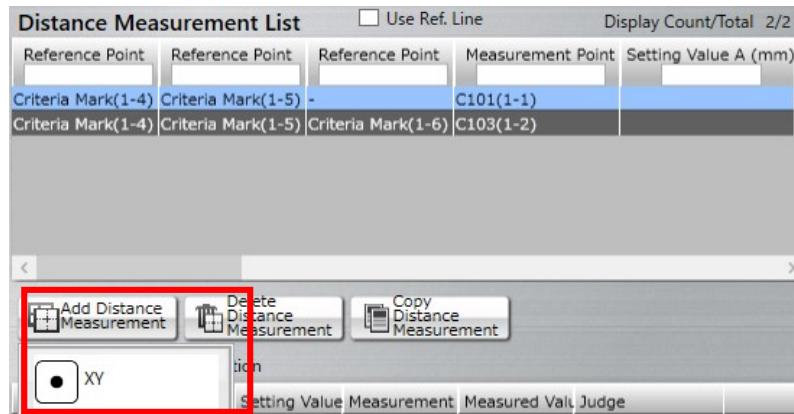
Refer to [Model Editing Screen Operation] for the operation method on the model editing screen.

## ■ Add a Distance Measuring Setting

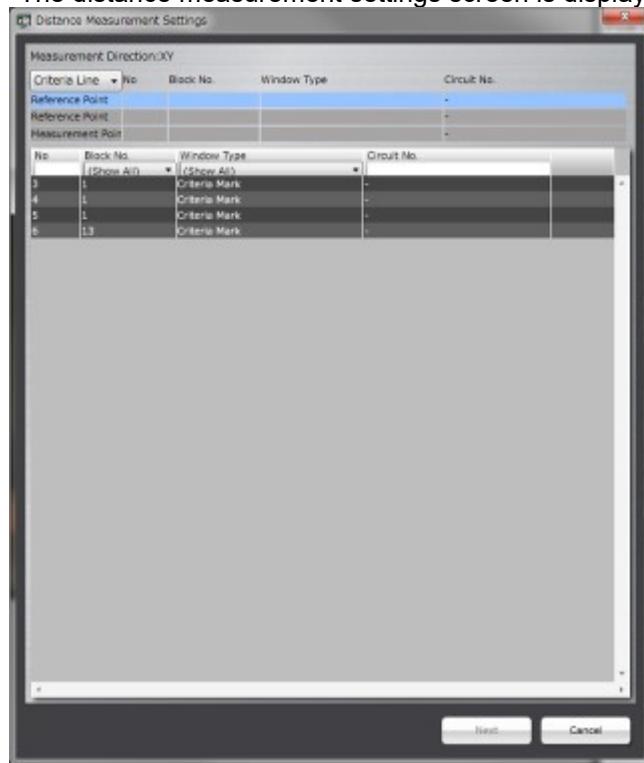
Operation▶ 1. Click [Add Distance Measurement], and select the mark you want to add from the list.

The type of selectable marks is as follows.

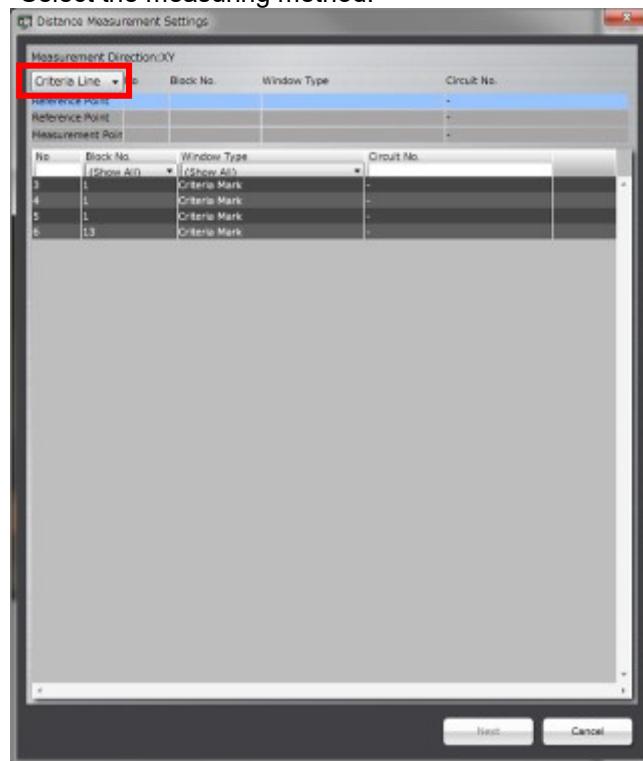
- XY : Criteria Mark



2. The distance measurement settings screen is displayed.

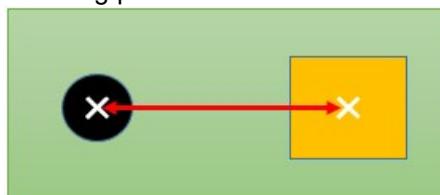


3. Select the measuring method.

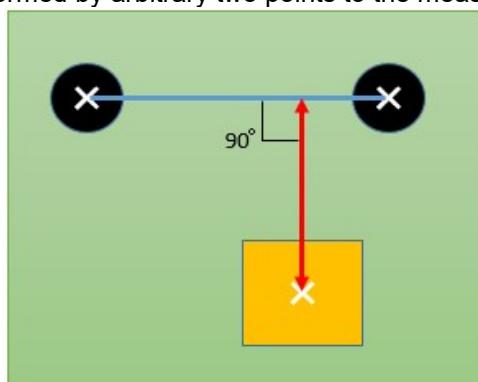


The type of selectable measuring method is as follows:

- Criteria point: Measure a distance from the criteria point to the measuring point.



- Criteria line: Measure the shortest distance from a straight line formed by arbitrary two points to the measuring point.



Refer to the Inspection Logic Manual for the details on the measuring method.

4. Select the first reference point, and click [Next].



**Memo** By selecting the reference point, [Next] is enabled.

**Memo** Depending on the measuring method selected, the operation when [Next] was clicked differs.

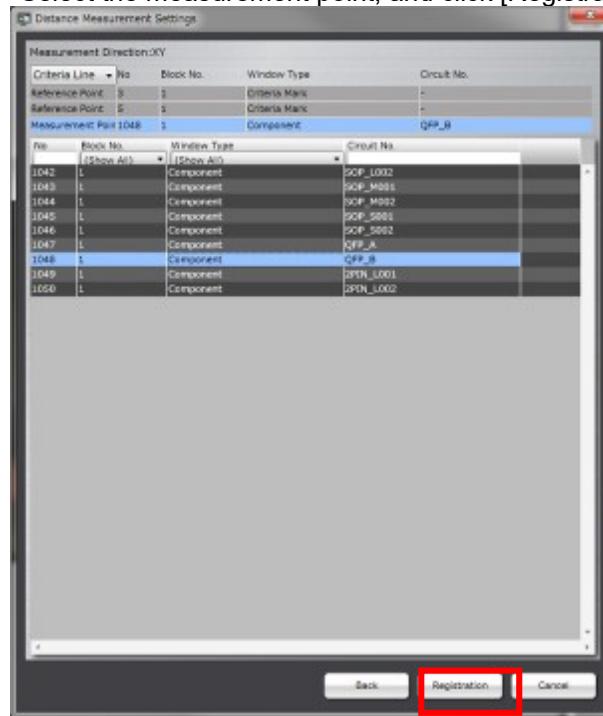
- If the next point is a measurement point: the screen will transition to Screen 6.
- If the next point is a reference point : the screen will transition to Screen 5.

5. Select the second reference point, and click [Next].



Memo] By selecting the reference point, [Next] is enabled.

6. Select the measurement point, and click [Registration].



Memo] By selecting the measurement point, [Registration] is enabled.

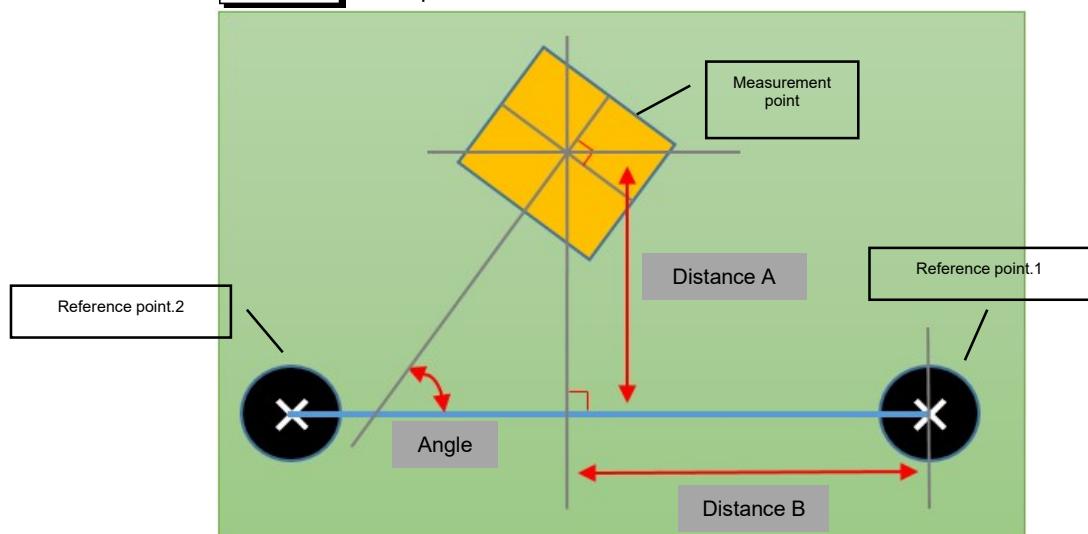
7. Select measurement target added from the distance measurement list, and set the inspection item.

Distance Measurement List					Display Count/Total 2/2	
Result (Show ▾)	Distance 1	Distance 2	Distance A	Distance B	Angle	Measured Value (Distance 1) Measure
<input type="button" value="On"/>	<input type="button" value="On"/>	<input type="button" value="On"/>	<input type="button" value="On"/>	<input type="button" value="On"/>	<input type="button" value="On"/>	<input type="button" value="On"/>
<input checked="" type="button" value="On"/>	<input type="button" value="On"/>					

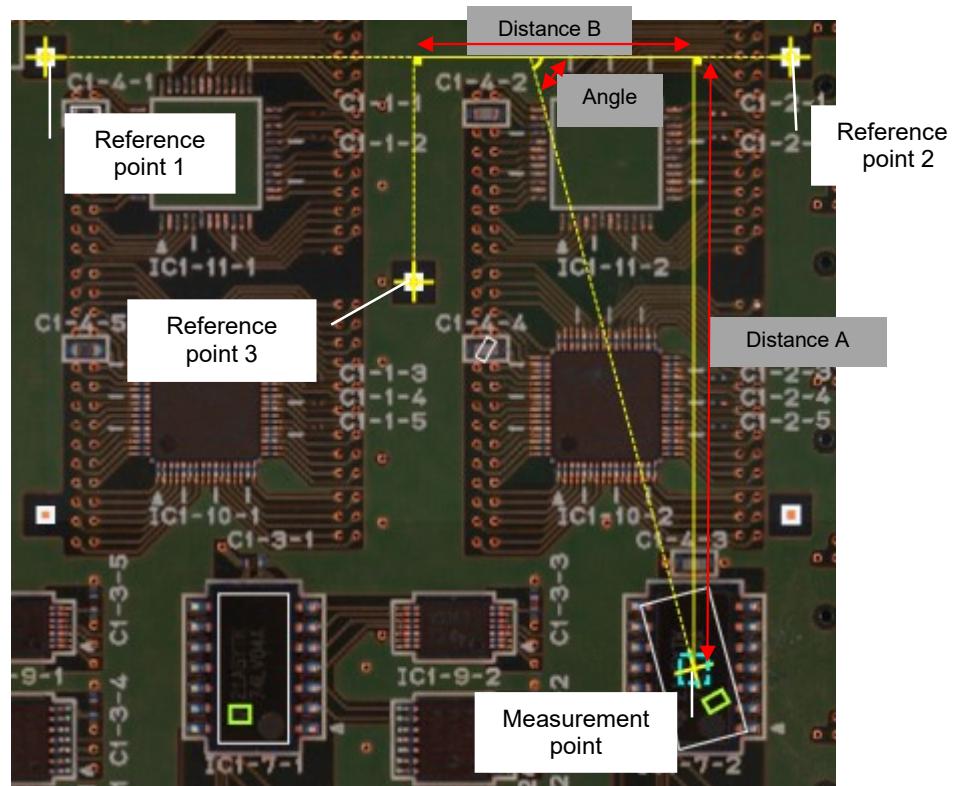
: Inspection non-target: By clicking, it changes to .

: Inspection target: By clicking, it changes to .

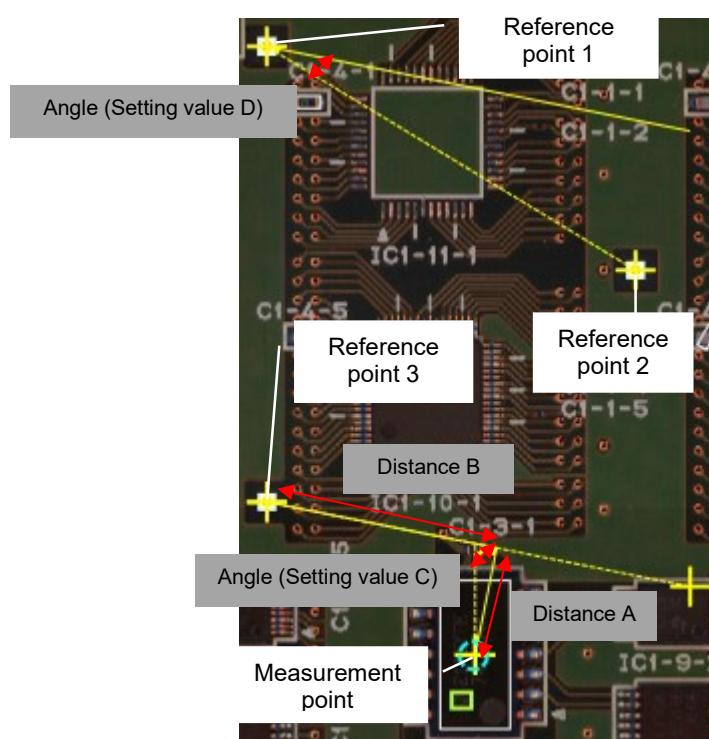
**Memo** Example of the criteria line.



Memo Example of the 3 Reference Points.



Memo Example of the Rotate 2 Reference Points.



**Memo** When selecting measurement target, the inspection criteria of the distance inspection is displayed. If [Perform Distance Inspection] is OFF, the distance inspection is not performed. Enable the distance inspection by the criteria setting.

 Refer to [2.6 Specifying Inspection Criteria] for the criteria setting method.

Inspection Item	Setting Value	Gap	Measured Val.	Result
Distance 1 (mm)	0.1	-	-	
Distance 2 (mm)	0.1	-	-	
Distance A (mm)	0.1	-	-	
Distance B (mm)	0.1	-	-	

- 8.** Select measurement target added from the distance measurement list, and input the setting value.
- (1) Setting value A (mm): Distance from the criteria line (Criteria point) to the measuring point (Distance A)
  - (2) Setting value B (mm): Distance from the criteria point on the criteria line (Distance B)
  - (3) Setting value C( $^{\circ}$ ): Tilt against the criteria line (Angle)
  - (4) Setting value D( $^{\circ}$ ): (Only used for 2-point rotation) The inclination of the line from reference point 1 to reference point 2 (Angle)

Measurement Point	Setting Value A (mm)	Setting Value B (mm)	Setting Value C ( $^{\circ}$ )	Setting Value D ( $^{\circ}$ )	Display Count/Total 7/7
	①	②	③	④	
1-1)	40.225				
1-2)	18.106	0.000	2.990		
1-3)	2.000	4.000	60.000		

**Memo** By double-clicking, the setting value can be input to the text.

Setting Value A (mm)	Setting Value B (mm)	Setting Value C ( $^{\circ}$ )	Setting Value D ( $^{\circ}$ )
40.225			
18.106	0.000	2.990	
2.000	4.000	60.000	

## ■ Delete Distance Measurement

Operation▶ 1. Select the component block unit with measurement target you want to delete from the PCB layout.

2. Select measurement target you want to delete from the distance measurement list to click the [Delete Distance Measurement].

Distance Measurement List					<input type="checkbox"/> Use Ref. Line	Display Count/Total 2/2
Reference Point	Reference Point	Reference Point	Measurement Point	Setting Value A (mm)		
Criteria Mark(1-4)	Criteria Mark(1-5)	-	C101(1-1)			
Criteria Mark(1-4)	Criteria Mark(1-5)	Criteria Mark(1-6)	C103(1-2)			

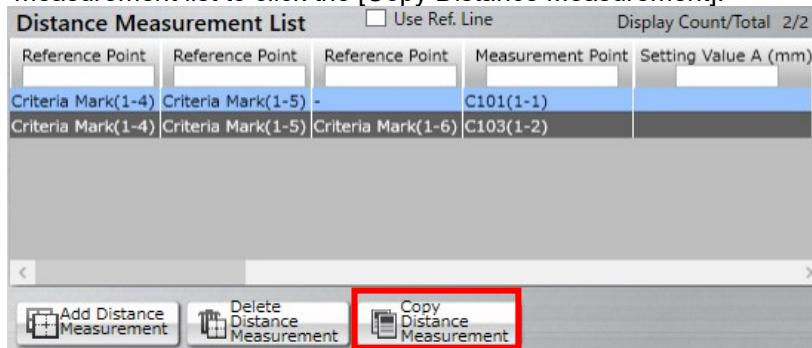
Add Distance Measurement	Delete Distance Measurement	Copy Distance Measurement
--------------------------	-----------------------------	---------------------------

**Memo** By selecting measurement target, the [Delete Distance Measurement] is enabled.

## ■ Copy Distance Measurement

Operation▶ 1. Select the component block unit with measurement target you want to copy from the PCB layout.

2. Select measurement target you want to copy from the distance measurement list to click the [Copy Distance Measurement].



Memo By selecting measurement target, the [Copy Distance Measurement] is enabled.

3. The distance measurement settings screen is displayed, and then select the measurement point to click [Registration].

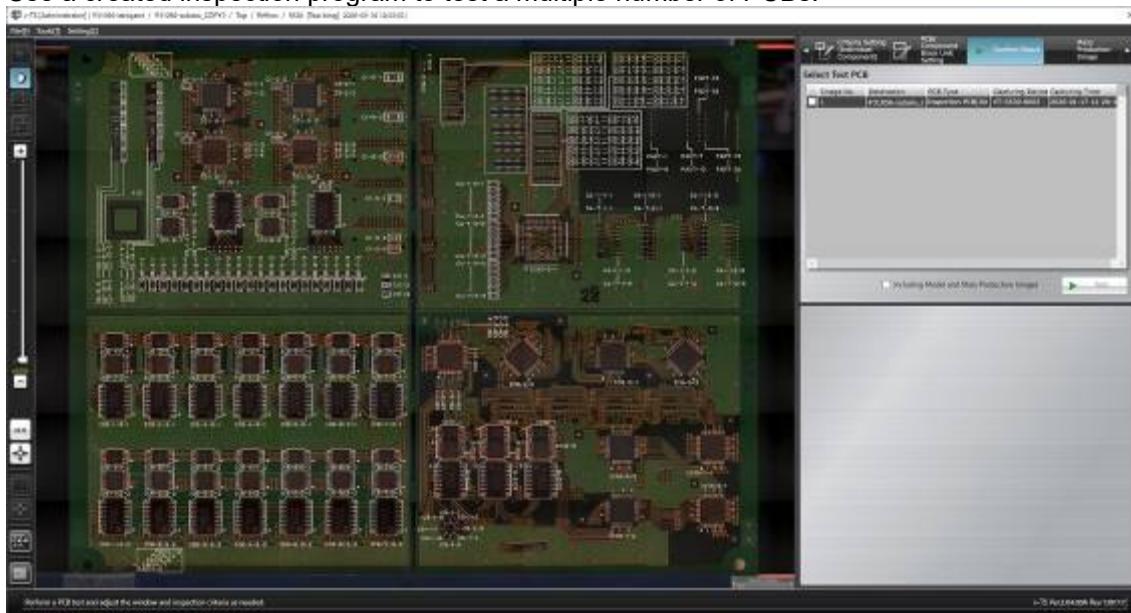
# 2.8 PCB Testing/Result Check

Test a created inspection program using PCBs to check the relevance of the inspection windows and criteria. For PCB test, you can select either a PCB image captured upon creation of the inspection program or an adjustment image under the adjustment mode. The modification of the inspection program is required if inspection false calls are output. To conduct inspection in the adjustment mode, the inspection program must be adjusted and saved.

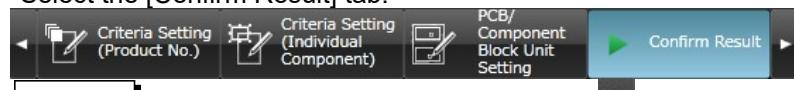
-  For the method of adjusting and saving inspection programs, refer to Section 2.11.4 "Adjusting and Saving an Inspection Program." For the method of conducting inspection in the adjustment mode, refer to the operation manual.
- Memo** Due to computational errors caused by differences in PC specifications, the measurement values of board tests and model tests may not fully replicate the inspections performed by the device.

## 2.8.1 Testing Using PCBs

Use a created inspection program to test a multiple number of PCBs.

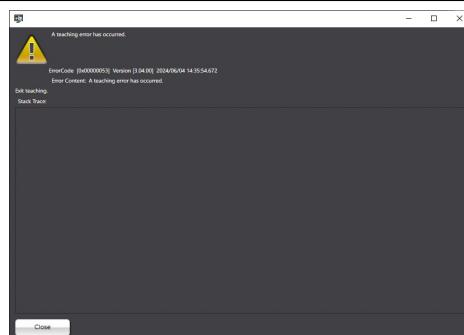


**Operation**▶ 1. Select the [Confirm Result] tab.



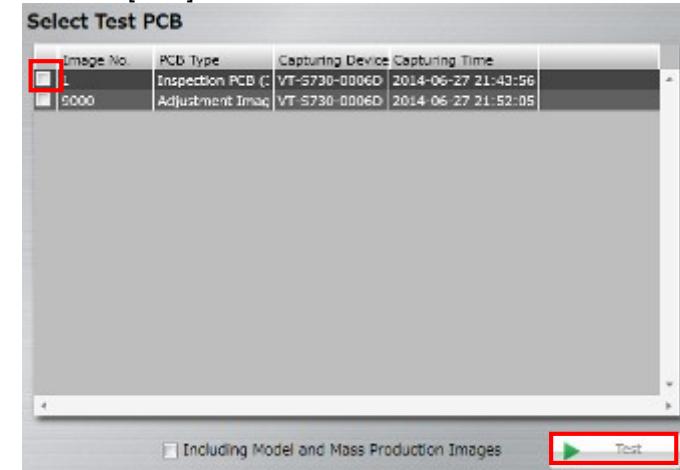
**Memo** If the [Confirm Result] tab is hidden, click  at the right to display it.

When the all component number status is not , the dialog below appears.



Click [Close] and exit teaching for all component numbers.

2. Click to select the checkbox for the PCB to use for test inspection, and click [Test].



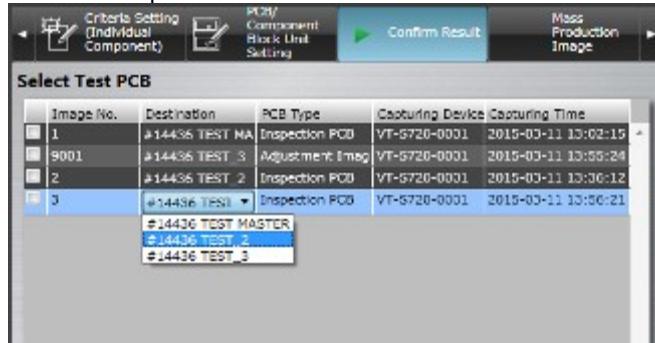
**Memo** Up to 3 PCBs can be selected.

**Memo** The master PCB is displayed at the top.

**Memo** If inspection has been already done in the adjustment mode, you can select the adjustment image.

**Memo** To include a model and/or mass-production image in the test, select the [Include Model and Mass-Production Image] check box.

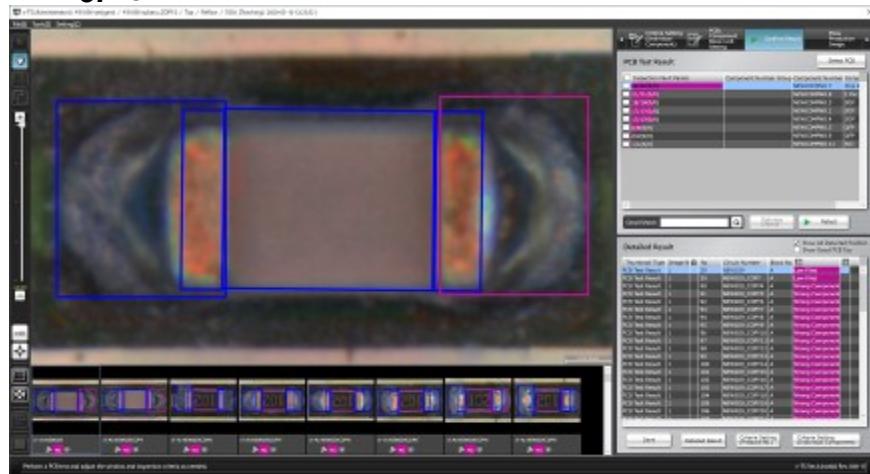
**Memo** If there are settings for destination, inspection can be performed for each destination.



The test starts and the progress is shown in the progress bar.  
Click [Cancel] to abort testing.



### 3. Check the test result.

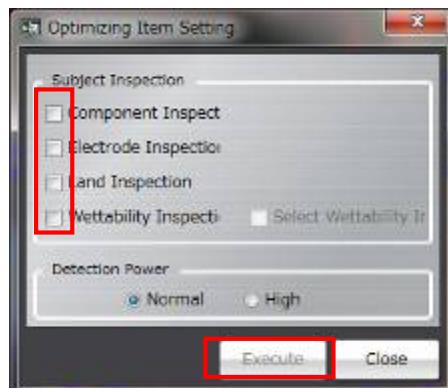


Refer to the next page for how to interpret the test result.

### 4. Select the component number check box and click [Optimize Criteria].

Inspection Fault Pareto	Component Number Group	Component Number	Comp
50/100(0/0)	1000C-GRI	1000C	Chip R
27/70(0/0)		1608C	Chip R
21/21(0/0)	1E5355	1E5355	Chip R
15/19(0/0)		SOP_P0.4	SOP
18/19(0/0)		SOP_P0.65	SOP
6/6(0/0)		QFP_P0.4	QFP
6/6(0/0)		QFP_P0.5	QFP
6/19(0/0)		SOP_P1.27	SOP
2/3(0/0)		2.125C	Chip R
1/3(0/0)		3216C	Chip R

The criteria optimization screen appears. Configure inspection items and outputs to optimize, and click [Execute].



For details of optimization, see 2.16.4 "Optimizing Boolean Expressions and Inspection Criterion Values."

By clicking [Execute], an inspection criterion value is selected from the distribution of the measured values of the selected target inspection so that the number of undetected faults and false call faults becomes minimal.

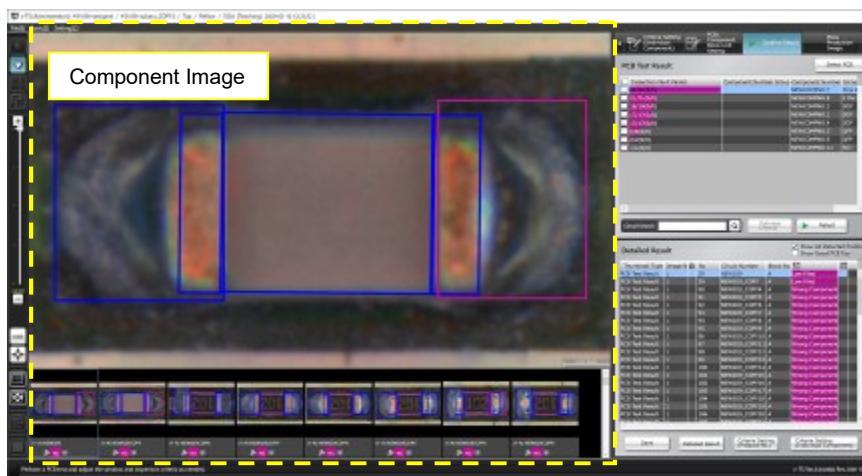
**Memo** The inspection criteria can also be optimized by the method of Step 4 of Section 2.8.1 "Testing Using PCBs." However, there are two differences as follows:

- On the inspection criteria setup screen of Section 2.16.4 "Optimizing Boolean Expressions and Inspection Criterion Values," inspection criterion value must be set up by selecting a component number one by one. On the other hand, when using the method of Step 4 of Section 2.8.1 "Testing Using PCBs," inspection criterion values for all component block numbers whose checkbox is ON can be set up in block.
- When criteria are optimized, the optimization results of all the checked component numbers are applied forcedly. So, save the inspection program before executing optimization. To cancel application, open the inspection program saved before optimizing the criterion.

**5. Click [Retest] to perform PCB test.**

**Memo** Up to 3 PCBs can be selected.

## 2.8.2 Interpreting PCB Test Result



- PCB Test Result

Shows the PCB test result as the number of inspection faults in a Pareto chart by the unit of component number.

**Memo** The numbers displayed on the inspection fault palate indicate the resultant numbers of component inspection.

NG components / All components (detected faults / actual faults)

**19/19(1/1)**

Detected faults: The number of faults which were detected as faulty by the inspection

Actual faults: The number of visually registered actual faults

**Memo** For the method of visual registration, refer to Section 2.16.5 "Registering Visual Check Results."

**Memo** Reducing undetected fault means reducing the difference between the detected faults and actual faults.

- Detailed Result

Displays a list of the inspection fault components and judgment results pertaining to the component number selected in the PCB Test Result list.

Enter a circuit name in [Circuit Search] and click button, then select a line with the same name from the detailed result list.

Click the [Show Good PCB Too] checkbox ON also to display components judged good.

Selecting the [Show All Detected Position] checkbox displays the Component Body Window, electrode windows and land windows extracted in inspection. Deselecting the checkbox does not display the windows.

**Memo** If multiple inspection items are judged faulty for a single component, the result is displayed in the order from smaller fault codes.

▪ Component Image

Displays a list of the inspection fault component thumbnail images relevant to the component number selected in the PCB Test Result list. Also shows a magnified image of the component selected in the Detailed Result list or the component thumbnail image list.

The windows where a fault is detected are displayed in a pink frame.

**Memo** The components in the thumbnail images are displayed at 0 degrees angle.

**Memo** The (image No. – component block unit No.) circuit number,  test result (OK/NG),

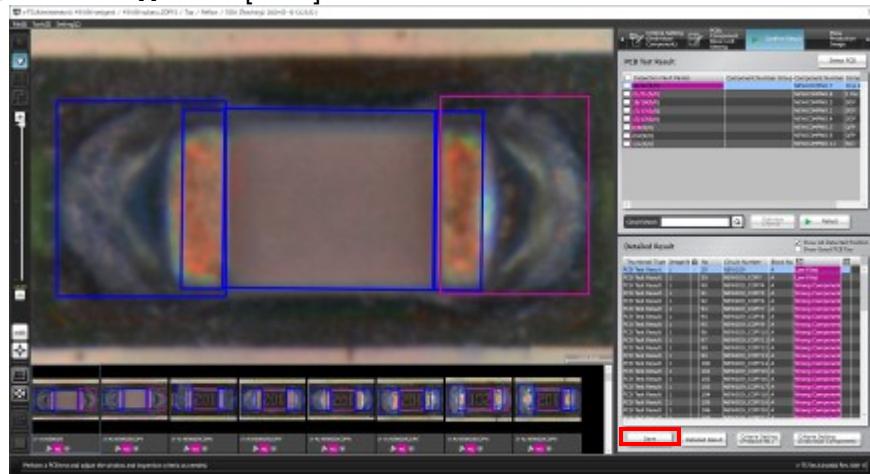
 visual check result with v-CA (OK/NG/None) are displayed below the individual component thumbnail images.

**Memo** Oblique images are not displayed, if the test is performed on a PCB used for oblique image capturing.

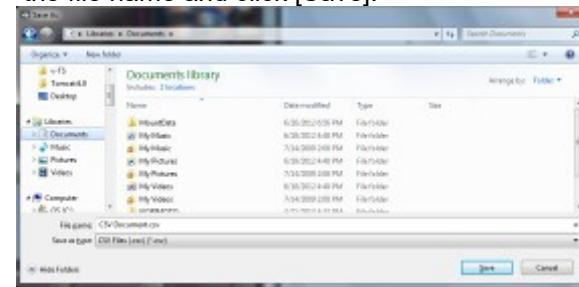
### 2.8.3 Saving Inspection Result

This section explains the procedure to save the PCB test result in the CSV format. It is used for managing the PCB test result, etc.

||Operation▶ 1. Click [Save].



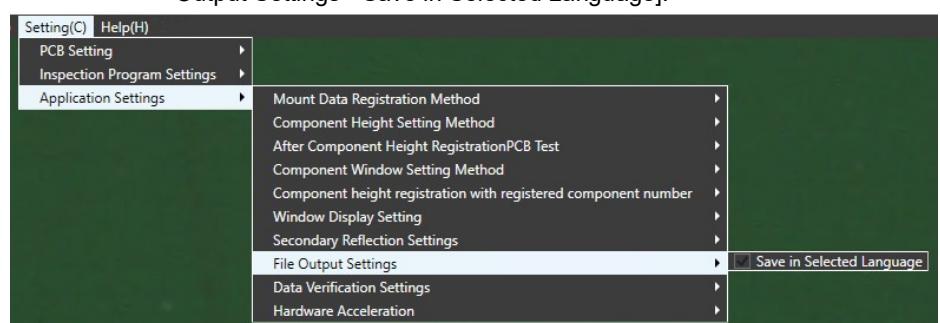
2. The file save dialog appears. Select the save destination, specify the file name and click [Save].



Refer to the next page for the details of output formats.

**Memo** To output the CSV file in the currently selected language, check [Menu Bar - Settings - Application Settings - File Output Settings - Save in Selected Language].

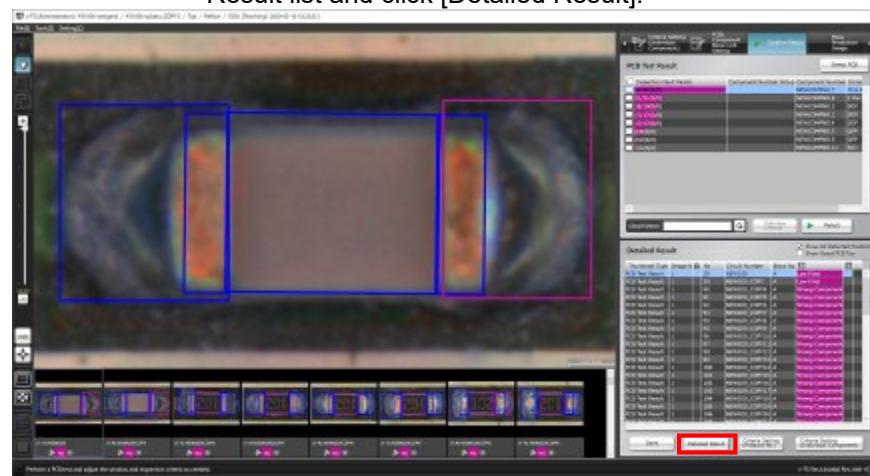
**Memo** To output the CSV file by the existing system definition, uncheck [Menu Bar - Settings - Application Settings - File Output Settings - Save in Selected Language].



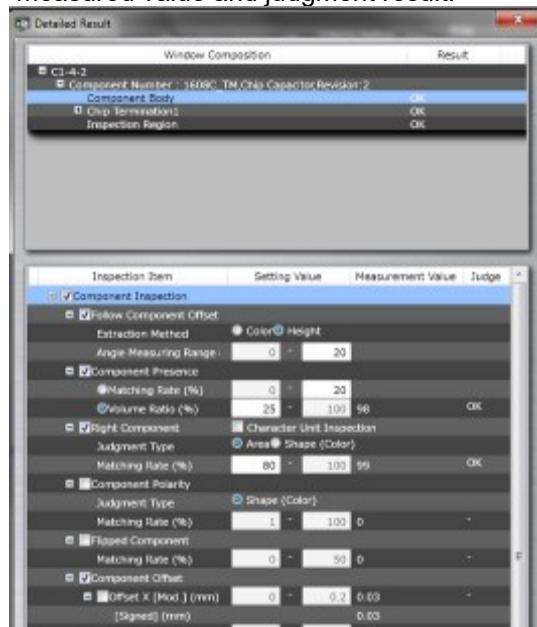
## 2.8.4 Displaying Inspection Detailed Result

This section shows the procedure to display the detailed result for an individual component.

- ||Operation▶ 1. Select the component to check its detailed result in the Detailed Result list and click [Detailed Result].



2. The Detailed Result dialog appears, showing the set value, measured value and judgment result.



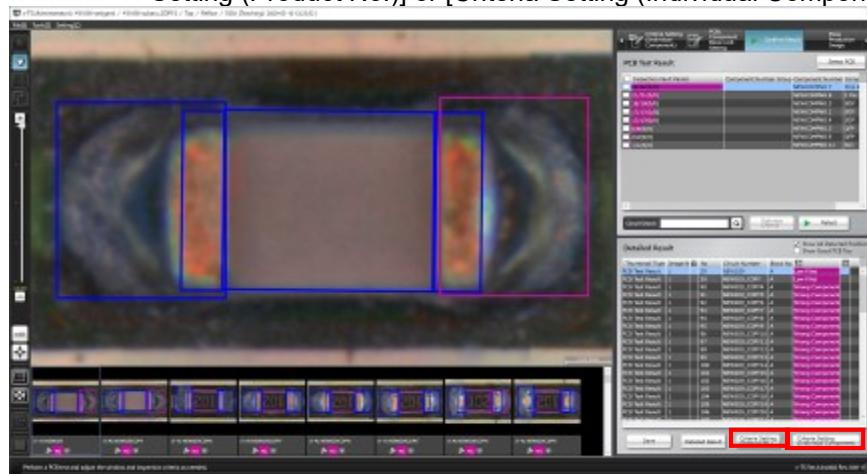
**Memo** If other component is selected while the dialog is open, the dialog display is updated with the detailed result for the selected component.

**Memo** In the Detailed Result dialog, criterion values can be changed and inspection values can be set ON/OFF.

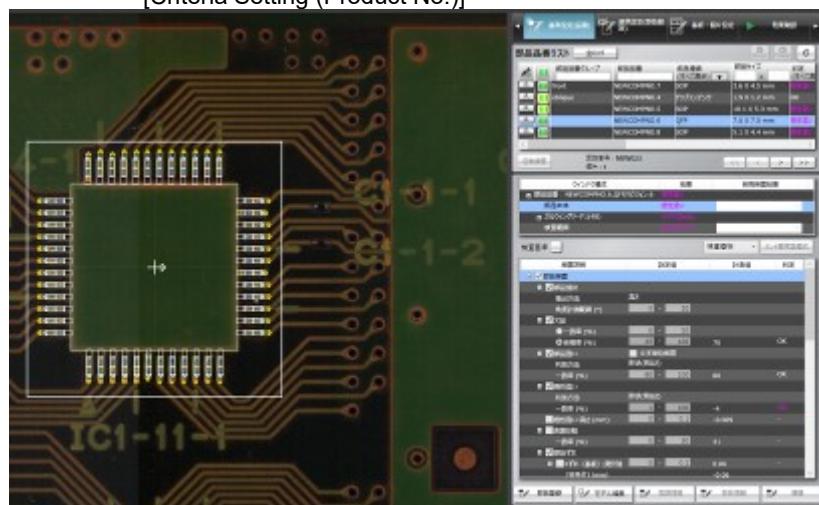
## 2.8.5 Modifying Inspection Criteria

This section shows the procedure to modify the inspection criteria of the components where a false call is output, by the unit of component number or component.

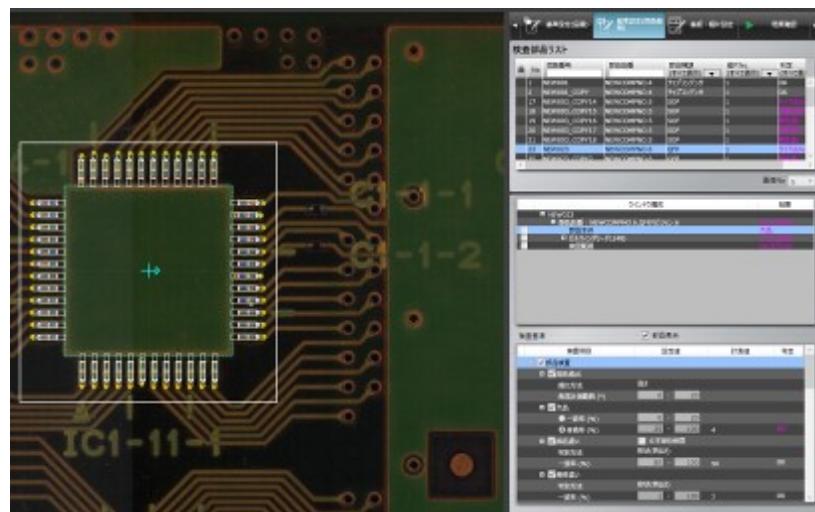
- ||Operation▶ 1. Select the component in the Detailed Result list, and click [Criteria Setting (Product No.)] or [Criteria Setting (Individual Component)].



2. The display switches to the Inspection Criteria screen.  
[Criteria Setting (Product No.)]



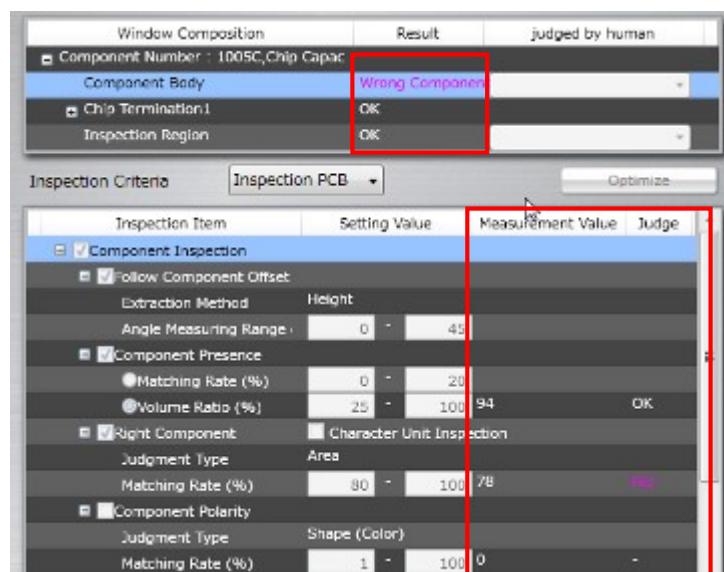
[Criteria Setting (Individual Component)]



**Memo** The screen displays the component selected in the result check screen.

The inspection result for the individual windows of the displayed component is shown in either of the "OK" or Fault Name descriptions, together with the measured value of each inspection item and its judgment (OK or NG).

[Criteria Setting (Product Number)]



The Inspection Criteria Setting screen for a component number displays the result ("OK" or Fault Name) in the Judge column in the Component Number List.

Component Number Group	Component No.	Component Type	Component Size	Judge
CR1	100SC	Chip Capacitor	1.0 X 0.5 mm	Missing Component
	155355	Chip Resistor	1.8 X 1.2 mm	Wrong Component
	1608C	Chip Resistor	1.5 X 0.8 mm	Wrong Component
	2125C	Chip Resistor	1.9 X 1.4 mm	Wrong Component
	3216C	Chip Resistor	3.0 X 1.5 mm	Wrong Component

3. Adjust the position and size of the windows where an inspection fault is output as required.

4. Select the inspection item to modify, and change the inspection criteria or edit the model.

**Memo** The changed criteria values replace the old values in the library when the inspection program is saved in the library.

→ Refer to "2.6.1 Criteria Setting (Product No.)" for criteria value editing by the unit of component number, and "2.6.2 Criteria Setting (Individual Component)" for the same by the unit of individual component.

**Memo** If the detected position does not match the image, editing of the component top color or electrode color (model editing operation) is required prior to changing the criteria value.

→ Refer to P2-169 "2.16.3 Editing a Model" for the model editing procedure.

# 2.9 Setting Oblique Inspection

Oblique inspection requires the settings for oblique inspection target component numbers, oblique image capturing, inspection criteria and direction. This chapter describes the procedures to make individual settings and test PCBs for oblique inspection.

**Memo**

You cannot specify oblique inspection for BGA/CSP, other bottom electrode component, and insertion component.

## 2.9.1 Setting Oblique Inspection Target Component Number

This section explains the procedure to specify an existing component number to the target of oblique inspection.



Refer to "2.4.5.1 Component Setting" for the procedure to specify a new component number to the target.

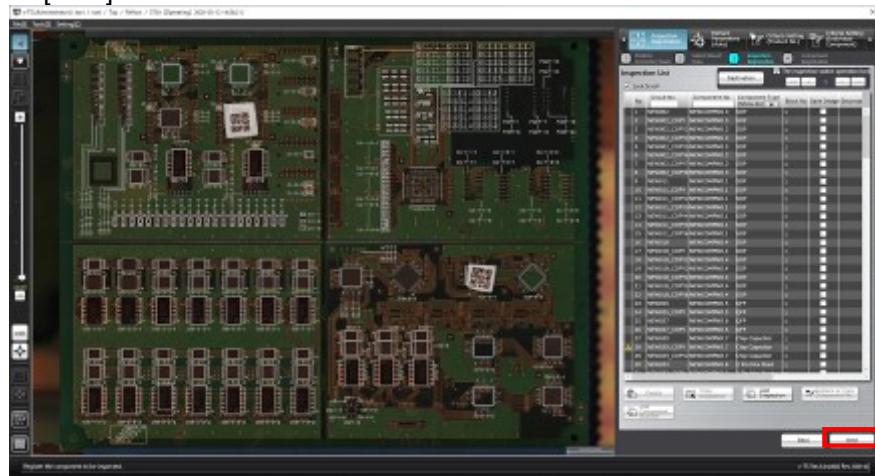
**Operation▶**

1. Select the [Inspection Registration] tab.

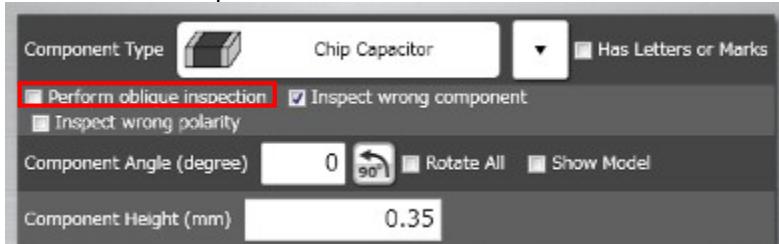


**Memo** If the [Inspection Registration] tab is hidden, click at the left to display it.

2. The display moves to the Inspection Registration screen. Click [Next].



3. The Component Registration screen is displayed. Select the component number for oblique inspection in the Component Number List, and select "Yes" in the oblique inspection row in the PCB Information panel.



**Memo** The component cannot be set to "Yes", if the component type is "BGA/CSP" or "Others (Bottom Electrode)".

4. If the PCB test has not been conducted for the inspection program, conduct the PCB test.

**Memo** Unless the PCB test has been conducted, it is not allowed to capture oblique images.

→ Refer to "2.8.1 Testing Using PCBs."

5. Save Adjustment the inspection program.

→ Refer to "2.11.1 Saving an Inspection Program" for the procedure to save the inspection program.

6. Exit inspection program editing and capture oblique image with the inspection system.

**Memo** If the inspection program is in the process of editing with v-TS, the program cannot be opened on the system to capture oblique image.

→ Refer to "2.15 Quitting Program Editing" for the procedure to exit inspection program editing.

## 2.9.2 Setting Criteria for Oblique Inspection Items

This section describes the procedure to specify the criteria for oblique inspection.

**Operation▶** 1. After capturing oblique image with the system, select the inspection program in the Select PCB screen on v-TS, and click [Edit].

2. Select an adjustment image with oblique to perform a PCB test.

3. Select the [Criteria Setting (Product No.)] tab to display the Criteria Setting screen.



**Memo** If the [Criteria Setting (Product No.)] tab is hidden, click at the left to display it.

4. Select the component number for oblique inspection in the Component Number List.

	Component No.	Component Type	Component Size	Judge	No. of Components
R	MK-TEST-2125R	Chip Resistor	1.95 X 1.25 mm	X	1
R	MK-TEST-3216R	Chip Resistor	3.02 X 1.52 mm	2	
R	MK-TEST-3216C	Chip Capacitor	2.92 X 1.49 mm	1	
	MK-TEST-QFP_P0.4	QFP	7.04 X 7.04 mm	6	
	MK-TEST-SOP_P0.4	SOP	3.72 X 4.38 mm	19	

Circuit Number : IC1-10-1 Component Block Unit : 1 << < > >>

Resize Selected   Show NG Only

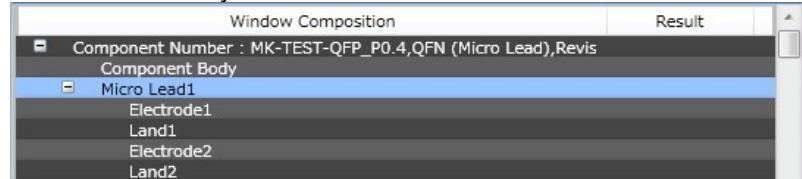
**Memo** When the status is (locked), click it to change the component number state to not locked .

**Memo** The progress signal is shown in the light yellow background in the Component Number List for oblique inspection target component numbers.



Refer to (5) Information Display Area of "2.1.2 Configuration of the Editing Screen" for details on the progress signals.

5. Select a window you wish to edit.

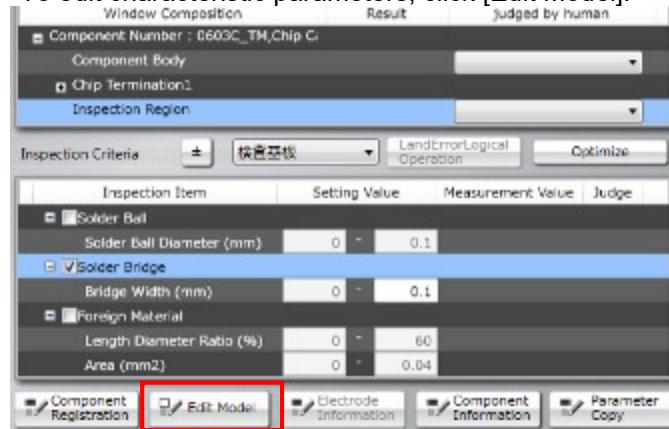


6. Specify ON or OFF or the oblique inspection checkbox and edit criteria values.

**Memo** Component numbers cannot be edited if their oblique image is not captured yet.

Refer to the Inspection Logic Manual for the details on the inspection items.

7. To edit characteristic parameters, click [Edit Model].



Refer to "2.16.3 Editing a Model" for the model editing procedure.

### 2.9.3 Specifying Oblique Inspection Component and Direction

This section explains the procedure to specify if oblique inspection is performed or not, as well as the procedure to set the direction of oblique inspection (if it is performed).

- Operation▶ 1. Select the [Inspection Registration] tab.



Memo If the [Inspection Registration] tab is hidden, click at the left to display it.

2. The display switches to the Inspection Registration screen. Checkboxes are displayed at the Oblique Inspection column, and the Top, Bottom, Left and Right columns in the direction of the electrode window.

Inspection List									
It. No.	Component No.	Component Type	Block No.	Oblique Inspection	Up	Down	Left	Right	
1-1	MK-TEST-QFP_P0.4	QFN (Micro Lead)	1	<input checked="" type="checkbox"/>					
2-1	MK-TEST-QFP_P0.4	QFN (Micro Lead)	1	<input checked="" type="checkbox"/>					
-1	MK-TEST-SOP_P0.4	SOP	1	<input checked="" type="checkbox"/>					
-2	MK-TEST-SOP_P0.4	SOP	1	<input checked="" type="checkbox"/>					

Memo Slanted components (the component angle is other than 0°, 90°, 180°, or 270°) cannot be targets for oblique inspection and therefore, checkboxes are not displayed for them.

Turn OFF the oblique inspection checkbox for components, if oblique inspection is not performed for them. Turn OFF the checkbox of specific directions, in which oblique inspection is not performed, if there are any.

Memo Turn OFF the direction where oblique inspection is obstructed due to a large adjacent component.

## 2.9.4 Including Oblique Inspection in PCB Test

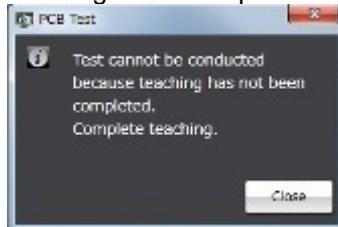
Perform PCB testing on the PCB used to capture oblique image, to check the validity of the oblique inspection criteria.

- ||Operation▶ 1. Select the [Confirm Result] tab.

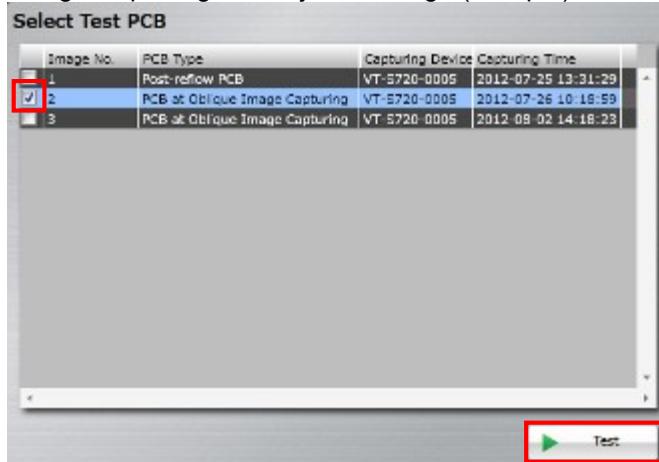


**Memo** If the [Confirm Result] tab is hidden, click ➤ at the right to display it.

The following dialog appears if direct view inspection teaching is not complete for some component numbers. Click [Close], and complete teaching for all component numbers.



2. Turn ON the checkbox to which the PCB type is "PCB at Oblique Image Capturing" or "Adjusted Image (Oblique)", and click [Test].



**Memo** Up to three PCBs can be selected.

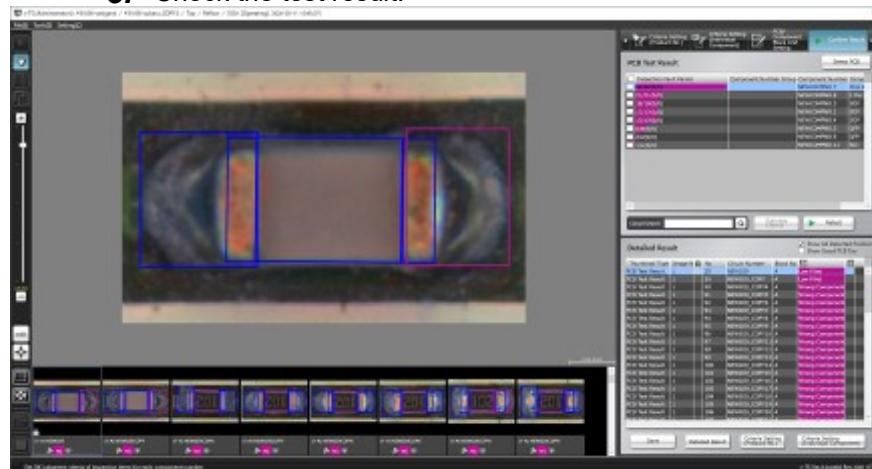
**Memo** The master PCB is displayed at the top.

The test starts and the progress is shown in the progress bar. Click [Cancel] to abort testing.



**Memo** The first test on a PCB used to capture oblique image requires more time than following tests, due to the necessity of image capture route calculation.

### 3. Check the test result.

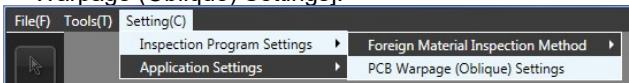


Click [Detailed Result] to check the result of individual oblique inspection items.

Refer to "2.8.2 Interpreting PCB Test Result" and the subsequent pages for the procedure to operate the PCB test result check screen.

**Memo** If the inspection range is not appropriate due to warpage of the PCB, adjust the allowable quantity of warp by the following steps.

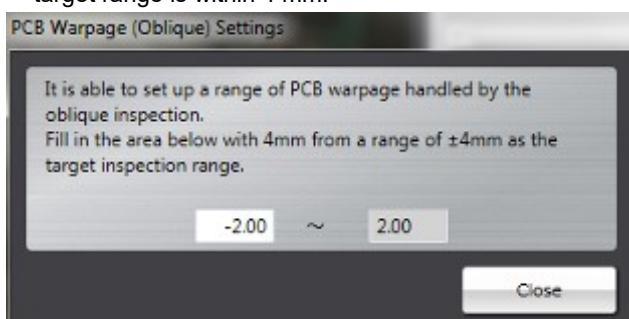
1. On the [Settings] menu, click [Inspection Program Settings] - [PCB Warpage (Oblique) Settings].



2. The screen below is displayed.

Fill in the lower limit of warpage as a range of -4.00mm to 0.00mm.

3. The upper limit of warpage is entered automatically so that the inspection target range is within 4 mm.



4. Click [File] - [Release] to release the inspection program.

# 2.10 Setting Secondary Reflection Inspection

This section describes the setup procedure of the secondary reflection inspection. Influence from noise generated by the reflected light from ambient components when a particular component is inspected can be controlled by the secondary reflection inspection.

**Memo**

It is unable to set up the secondary reflection inspection on a component with an inspection range window of 10mm or more square.

## 2.10.1 Setting a target component for the secondary reflection inspection

This section describes a procedure to change an existing component to a target component of the secondary reflection inspection.

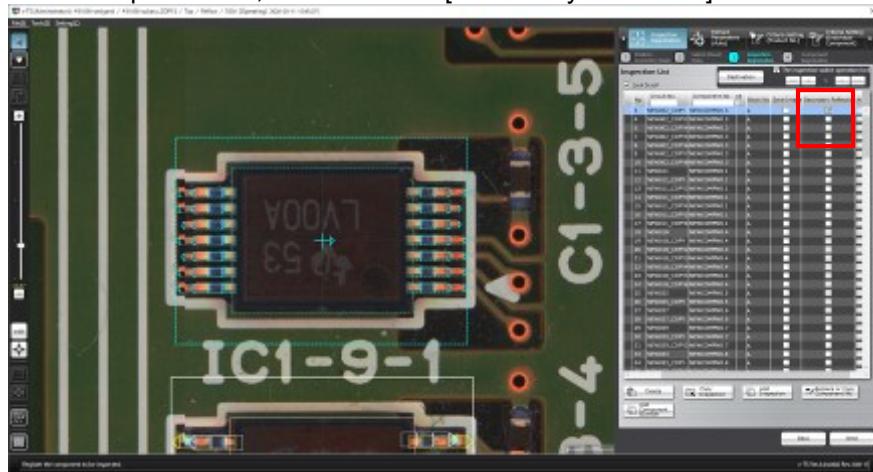
Operation procedure

1. Select the [Register Inspection] tab.

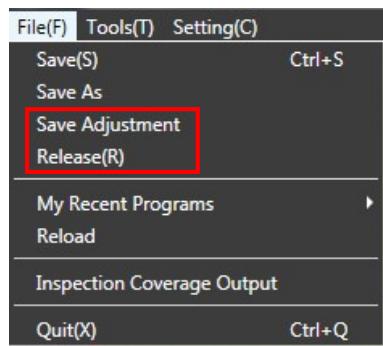


**Memo** If this tab is not being displayed, click on the left end. The hidden tab appears.

2. The screen moves to the inspection registration screen. Select a target component of the secondary reflection inspection from the inspection list, and check the [Secondary Reflection] checkbox.



3. Adjust and save the inspection program, or release it. (On the menu, select [File] - [Save Adjustment] or [Release].) After it is saved, close the inspection program.



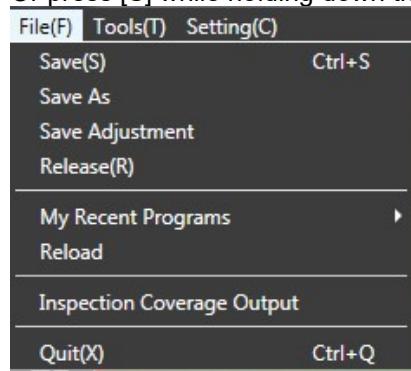
**Memo** If there is no component which is not the target of the secondary reflection inspection around the target component of it, a warning message is displayed when the inspection program is closed because the inspection reference surface cannot be created. If it happens, review the settings of the secondary reflection inspection.

# 2.11 Saving an Inspection Program

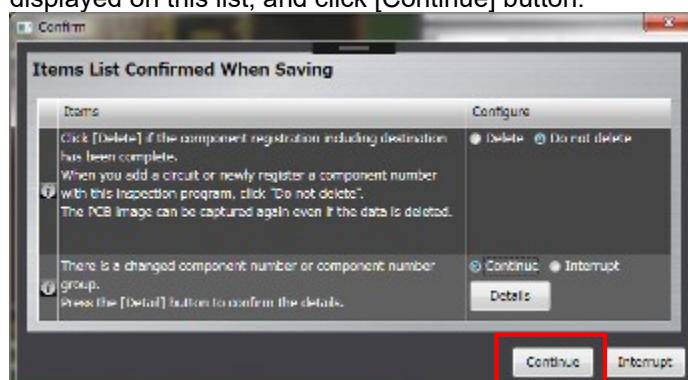
## 2.11.1 Saving an Inspection Program

Save an inspection program during the process of teaching.

- Operation▶ 1. Select [File] - [Save] in the menu bar.  
Or press [S] while holding down the [Ctrl] key on the keyboard.



2. If there is an item needing confirmation, for example, there is a changed component No. or component No. group, or an error occurs in the process of data verification, the Confirmation Item List for Saving screen is displayed.  
To continue the saving process, select Continue on all the items displayed on this list, and click [Continue] button.



If clicking [Abort], the software exits this screen without saving data.

### <Items displayed on the Confirmation Item List for Saving>

- Data verification error

Displayed if an error occurs in the process of data verification (adjustment or release).

[Continue]: The saving process is continued.

[Interrupt]: The saving process is aborted.

[Details]: The data verification result list is displayed.



For data verification, refer to section 2.19.8 "Verifying Inspection Program Data."

■ Incomplete data exist

Displayed if there are incomplete data (tentative component No.) (adjustment or release).

[Continue]: The saving process is continued.

[Interrupt]: The saving process is aborted.

 There is a tentative component number (with no model registration). If a tentative component number is inspected, it is always handled as an inspection fault. Is it OK?	<input checked="" type="radio"/> Continue <input type="radio"/> Interrupt
--	---

■ Deletion of unnecessary data

Displayed if unnecessary data exists. (adjustment, release)

If there is a possibility that a component is added for creating a destination, etc, select [Do not delete] and leave the height data.

[Delete] ... Deletes unnecessary data and continues saving.

[Do not delete] ... Does not delete unnecessary data and continues saving.

 Click [Delete] if the component registration including destination has been complete. When you add a circuit or newly register a component number with this inspection program, click "Do not delete". The PCB image can be captured again even if the data is deleted.	<input checked="" type="radio"/> Delete <input type="radio"/> Do not delete
--	---

**Memo** When height data are deleted, if adding a component, conduct teaching using the procedure below on the PCB image containing height data.

1. Use the inspection machine to capture an image in the imaging mode.
2. Go back to v-TS, select [Tools] - [PCB Image Management] screen. Then, set the newest image captured by step 1 as a master image.
3. Confirm the result. After the reference values are confirmed, select [File] - [Release] to release the inspection program.

■ Confirmation of change details

Displayed if there is a changed component No. or component No. group.

[Continue]: The saving process is continued.

[Interrupt]: The saving process is aborted.

[Details]: The change details confirmation screen is displayed.

 There is a changed component number or component number group. Press the [Detail] button to confirm the details.	<input checked="" type="radio"/> Continue <input type="radio"/> Interrupt
---	---

To confirm the change details, refer to section 2.12 "Confirming Change Details."

■ Change of visual field assignment

Displayed if visual field assignment has been changed since data was saved previous time.

[Continue]: The saving process is continued.

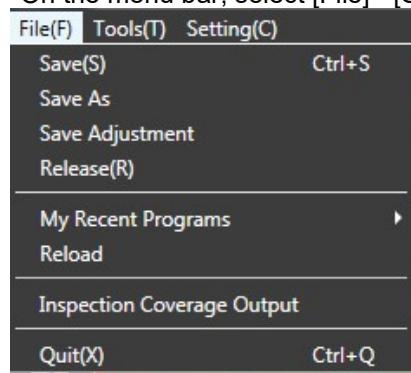
[Interrupt]: The saving process is aborted.

 Windows for capturing have been changed since the image was saved previous time.	<input checked="" type="radio"/> Continue <input type="radio"/> Interrupt
--	---

## 2.11.2 Saving an Inspection Program Under a New File Name

This section describes how to save an inspection program with a name during teaching.

- Operation▶ 1. On the menu bar, select [File] - [Save As].



11. The Save As dialog box appears.

Specify an inspection program name and a comment, and click [OK].



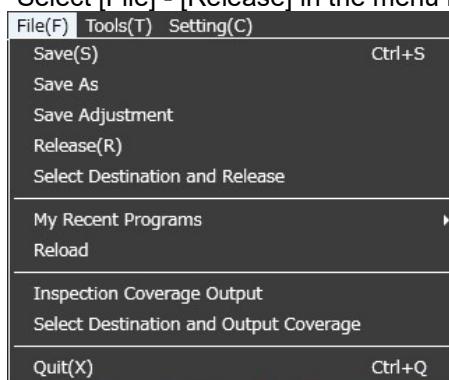
### 2.11.3 Releasing an Inspection Program

The following shows the procedure to release a completed inspection program. Once released, it is now available for the use on the PCB inspection system.

**Memo** The calculation and saving of the image capture route is performed when an inspection program is released, which requires a certain amount of time.

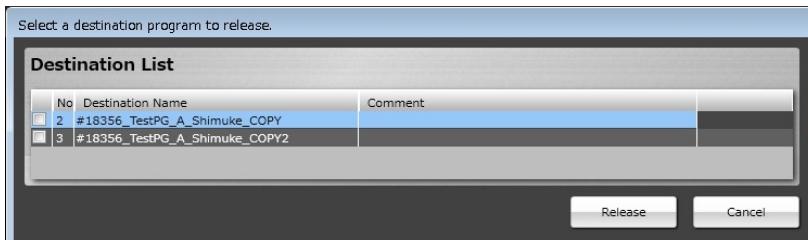
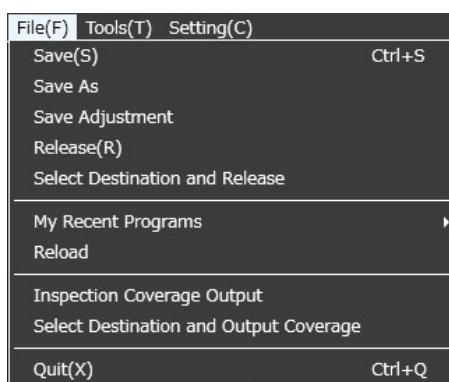
**Memo** After an inspection program is released, its status in the Inspection Program list in the Select PCB screen changes from "Teaching" to "Operating".

Operation▶ 1. Select [File] - [Release] in the menu bar.



**Memo** If there is setting of destination, the necessary destination can be released individually. By selecting only the necessary destinations, time to release the destinations not needed to release can be eliminated. On the menu bar, select [File]-[Select Destination and Release], and check a destination to be released to release the programs.

The checked destination programs are released, but the unchecked destination programs are saved normally.

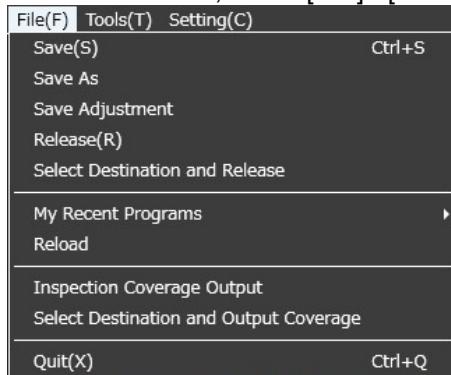


## 2.11.4 Adjusting and Saving an Inspection Program

This section describes the procedure to adjust and save an inspection program in teaching. By adjusting and saving an inspection program, the inspection program can be inspected by the PCB inspection system in the adjustment mode. The results of inspection in the adjustment mode can be selected as adjustment images in the phase of the board test.

**Memo** For the inspection program saved as adjustment, the status indication of the inspection program list on the board selection screen is changed from "In Teaching" to "In Adjustment."

||Operation▶ 1. On the menu bar, select [File] - [Save as Adjustment].

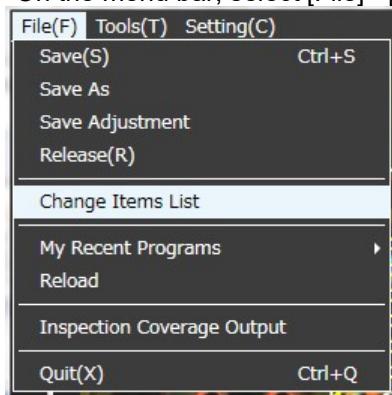


# 2.12 Confirming Change Details

## 2.12.1 Confirming Change Details

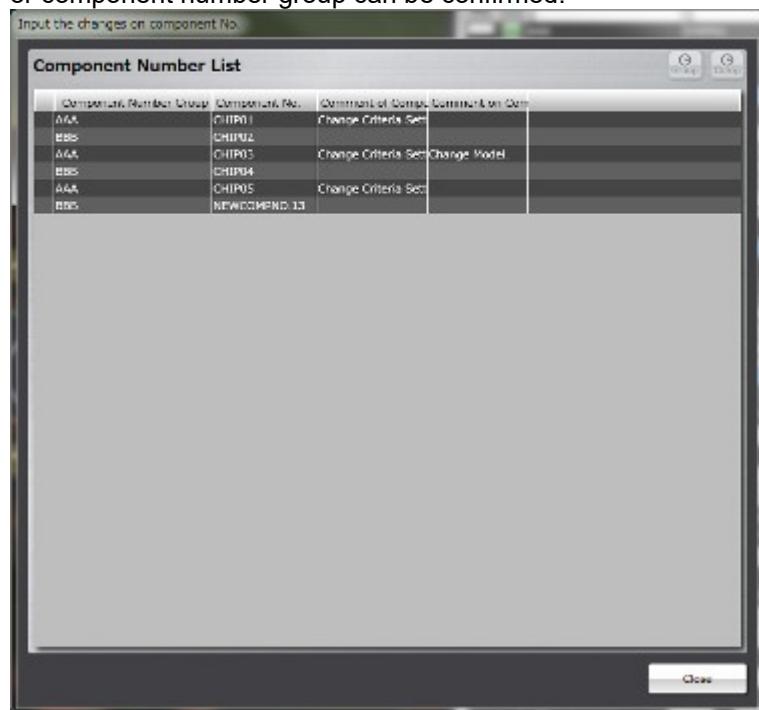
This section describes the procedure to confirm change details.

- Operation▶ 1. On the menu bar, select [File] - [Change Items List].



2. The [Change Items List] dialog is displayed.

Change details can be filled in and the history of component number or component number group can be confirmed.





For the method to fill in change details, refer to section 2.1.2 "Configuration of the Editing Screen." For the method to confirm component number history, refer to section 2.16.9 "Confirming Product Number History."



**Memo** Selection of component number can be switched on the component number list as the Component No. Change Details Entry dialog or the Component No. History screen is open.



**Memo** If [Use Deployment ON/OFF Setting Function] is set ON, [Deployment ON/OFF] is displayed.

Component Number List				
Component Number Group	Component No.	Comment of Compon...	Comment on Com...	Expansion Availability
AAA	CHIN01	Change Criteria Set	Change Model	<input checked="" type="radio"/> ON
BBB	CHIN02			<input type="radio"/> OFF
AAA	CHIN03	Change Criteria Set	Change Model	<input type="radio"/> OFF
BBB	CHIN04			<input checked="" type="radio"/> ON



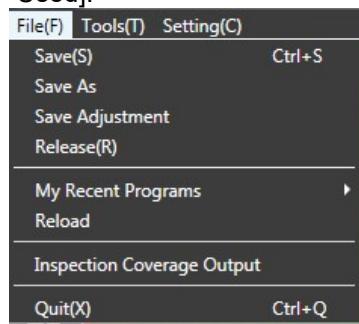
For the deployment ON/OFF setting function, refer to Section 3.6.3 "Making Component No. Settings."

# 2.13 Reloading an Inspection Program

## 2.13.1 Reloading an Inspection Program Recently Used

This section describes how to reload an inspection program recently used.

- Operation▶ 1. On the menu bar, select [File] - [Inspection Program Recently Used].



2. A list of recently-used inspection programs appears. Select an inspection program to edit.



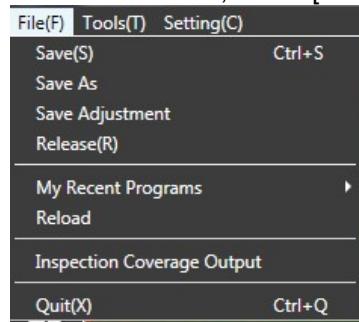
3. The Confirmation message appears. Check the message and click [OK].



## 2.13.2 Reloading Inspection Program Being Edited

This section describes how to reload the inspection program being edited.

- Operation▶ 1. On the menu bar, select [File] - [Reload].



2. The Confirmation message appears.  
Check the message and click [OK].



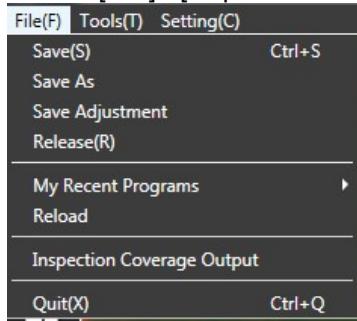
## 2.14 Outputting Inspection Coverage

This section describes the procedure to output setting details of individual inspection items for the inspection program in the process of editing.

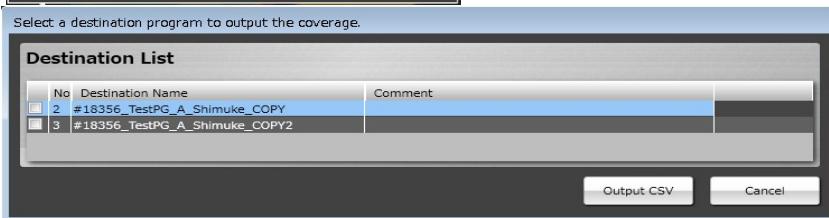
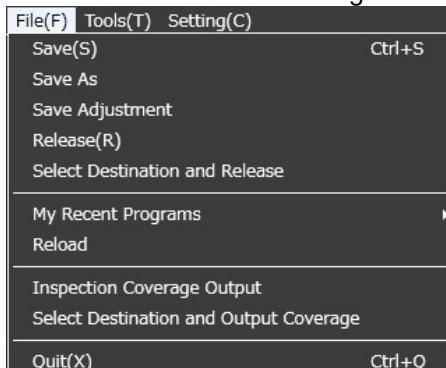
The setting details for individual component numbers and components are output in csv files.

**Memo** Component number information cannot be output if teaching is not complete for the component number.

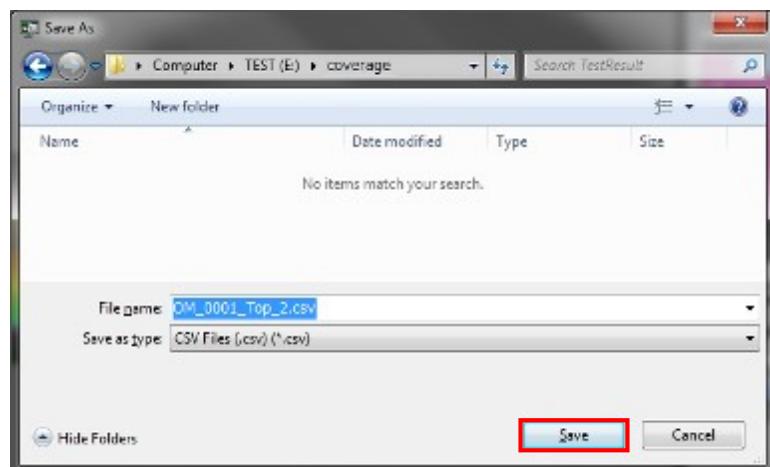
Operation▶ 1. Select [File] - [Inspection Coverage Output] in the menu bar.



**Memo** Inspection coverage can be output for each destination, so destinations can be managed using a CSV file. On the menu bar, select [File] - [Select Destination and Output Coverage], and select destinations on which coverage is output.

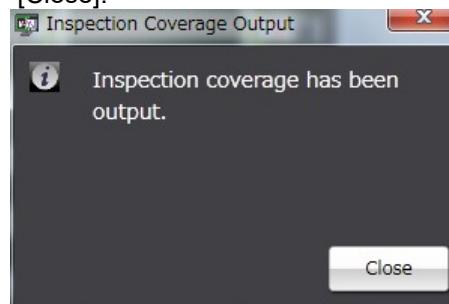


2. The "Save as" dialog is displayed.  
Specify the output location and file name, then, click [Save].



**Memo** The format of the default file name is "Inspection Program Name\_Top/Bottom\_Inspection Program Revision Description.csv".

3. When file output is complete, the following dialog appears. Click [Close].

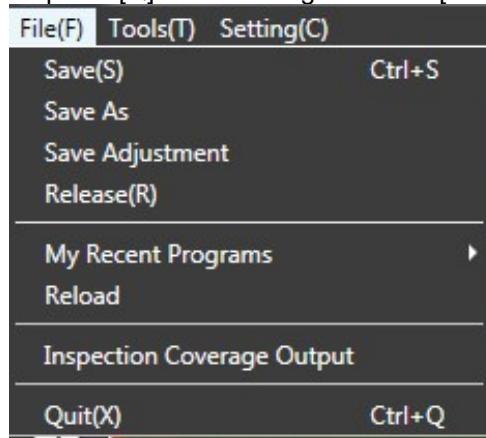


→ Refer to Appendix 12 "Inspection Coverage Output Format" for the details of output formats.

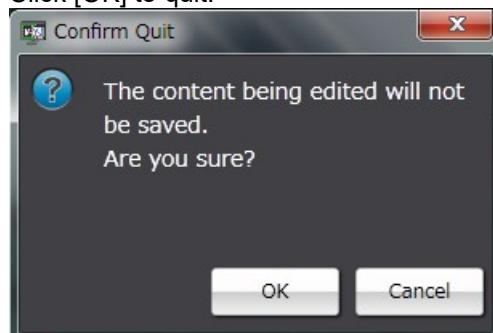
## 2.15 Quitting Program Editing

This section describes the procedure to quit Inspection Program Editing.

- Operation▶** 1. Select [File] - [Quit] in the menu bar.  
Or press [Q] while holding down the [Ctrl] key on the keyboard.

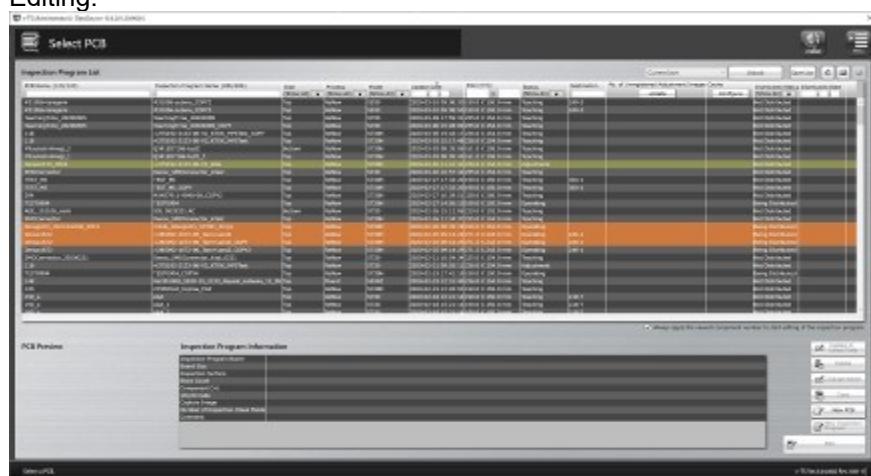


2. The confirmation dialog appears.  
Click [OK] to quit.



Click [Cancel] to return to the editing screen.

The Select PCB screen returns after exiting Inspection Program Editing.



# 2.16 Modifying an Inspection Program

This section explains the procedure to modify an inspection program.

## 2.16.1 Modifying an Inspection Window

The size or position of inspection windows cannot be changed in any screen: They can only be modified in a specific screen.

The table below shows the windows that can be modified in individual screens.

		Component Body Window		Electrode Window			Land Window	
		Move	Resize	Move	Resize	Inflection Point	Move	Resize
 Inspection Registration	Inspection Registration	Yes * 1	No	Yes * 1	No	No	Yes * 1	No
	Component Setting	Yes	Yes *2	Yes * 1	No	No	Yes *1	No
	Land Setting	No	No	No	No	No	Yes	Yes
	Electrode Group Setting	No	No	Yes *2	Yes *2	No	No	No
	Electrode Setting	No	No	No	No	Yes *2	No	No
 Extract Parameters (Auto)		Yes * 3	No	Yes * 3	No	No	Yes	Yes
 Criteria Setting (Product No.)		Yes * 3	No	Yes * 3	No	No	Yes	Yes
 Criteria Setting (Individual Component)		Yes * 3	No	Yes * 3	No	No	Yes	Yes
 PCB/Component Block Unit Setting		Yes * 4	No	Yes * 4	No	No	Yes *4	No
 Confirm Result		No	No	No	No	No	No	No

Yes: Can be edited / No: Cannot be edited

\*1: The component body window, electrode windows and land windows maintain their positions relative to one another.

\*2: The edited contents are reflected to all components of the same number in the inspection program (or all components of the component number group to which the edited target belongs) at the time of editing.

\*3: The component body window and electrode windows maintain their positions relative to one another.

\*4: Only moving by the unit of component block unit is possible through component block moving.



Refer to "Move a Component Block Unit" for the procedure to move a Component Block Unit.

Click the tabs shown above to access the individual screens.

The Inspection Registration tab includes multiple screens. Click [Next] at the bottom right of the screen to reach a desired screen.



Refer to "2.1.3 Image Display Area Operation" for the procedures to move or resize a window.

If the Component Window or Electrode Window protrudes from the model image after modifying the Component Window size, [x] appears in the model image and the image becomes unavailable.



When the Component Window/Electrode Window is moved back within the image, the model image becomes available.

• **Automatic Window Position Adjustment**

This function moves a Component/Electrode Window to an inspection standard position calculated from an auto-extracted Land Window.

On the menu bar of the edit screen, select [Tool] - [Move a component to inspection standard position].

**Memo** The criteria of component offset are the window position on the inspection program screen. So, if a component is changed or added after an inspection program is created completely, the position of component window can be moved to the default position of the displacement inspection criteria.

## 2.16.2 Changing Component and Electrode Information

This section explains the procedure to change component information and electrode information. When you change the information on component or electrode, these changes will be reflected to all the components of the same component number or component number group within the inspection program.

**Memo** When you make a change such as changing the angle or electrode group that affects the model, adjust the component color and electrode color on model editing.

**Memo** The Criteria Setting (Product No.) screen also can be used to only change the electrode height.

Refer to Step 5 on "2.6.1 Criteria Setting (Product No.)" for the procedure to change electrode height.

**Memo** The Criteria Setting (Product No.) screen also can be used to only change the component height.

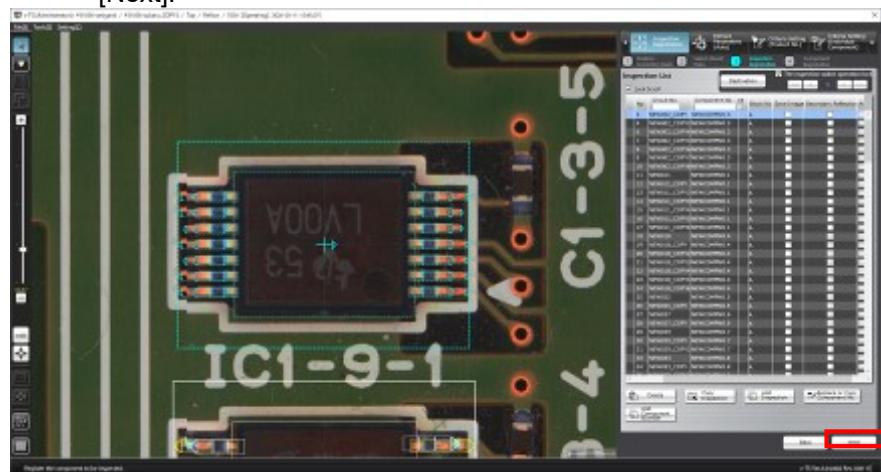
Refer to Step 5 on "2.6.1 Criteria Setting (Product No.)" for the procedure to change component height.

### Operation▶ 1. Select the [Inspection Registration] tab.



**Memo** If the [Inspection Registration] tab is hidden, click at the left to display it.

### 2. The display moves to the Inspection Registration screen. Click [Next].



- 3.** The Component Registration screen is displayed.  
Click the [R] (Read-only) button for the target component number to cancel the Read-Only mode. “R” disappears when canceling Read-Only mode.

	Component No.	Component Type	Component Size	Num. of Electrodes
R	1608R	Chip Resistor	1.47 X 0.84 mm	2
R	1608C	Chip Capacitor	1.46 X 0.72 mm	2
R	1SS355	2 Pin Mini Mold	1.53 X 1.22 mm	2

**Memo** If (Locked) is displayed, editing is not possible since other user is currently editing the component number.

	Component No.	Component Type	Component Size	Num. of Electrodes
L	1608R	Chip Resistor	1.47 X 0.84 mm	2
R	1608C	Chip Capacitor	1.46 X 0.72 mm	2
R	1SS355	2 Pin Mini Mold	1.53 X 1.22 mm	2

- 4.** Edit the component information.

Component Type		Chip Resistor	<input checked="" type="checkbox"/> Has Letters or Marks
<input checked="" type="checkbox"/> Inspect wrong component	<input type="checkbox"/> Inspect wrong polarity		
Component Angle (degree)	0		<input type="checkbox"/> Rotate All <input type="checkbox"/> Show Model
Component Size (mm)	X 3	Y 1.545	

Refer to "2.4.5.1 Component Setting" for the editing procedure.

- 5.** Click [Next] several times until the Electrode Setting screen appears.

- 6.** Specify electrode information for individual electrode groups.

Items	Configure
Electrode Type	
Electrode Height	0.5

Refer to "2.4.5.4 Electrode Setting" for the electrode setting procedure.

- 7.** Click [Component Number Registration] after all the groups are specified with the electrode information.

### 2.16.3 Editing a Model

The color information of the feature parameters auto specified by model calculation is registered in the color table in the library, which can be adjusted manually.

Feature Parameters Adjustable in Model Editing

Window Composition	Inspection Item	Feature Parameter	(Mask) Window
Component Body	Component Body Extraction	Component body top color + electrode color	Component extraction mask
	Missing Component	(PCB color + exposed land color + solder color) – Missing component excluded color	Missing mask
	Component Difference	Available if character/mark exists Shape (Brightness): Mask, Brightness Available if no character/mark exists Area (Color): Component Difference Color Always Available Shape (Color): Mask, Component Difference Color	-
	Polarity Difference	Available if character/mark exists Shape (Brightness): Mask, Brightness Always Available Shape (Color): Mask, Component Difference Color	-
	Polarity Difference - Height	None	Height window
	Reversed Top/Bottom	Component bottom color	Reversed Top/Bottom Mask
	Component Offset (PCB)	Component body top color + electrode color	-
	Component Offset (Component)	Component body top color + electrode color	
	Component Height	None	Lifted Window
	Lifted Component	None	Lifted Window
Electrode Group	Distance inspection	Component body top color + Luminous Body color	Luminous Body Window
	OCR	Mask	
	Electrode Horizontal Extraction	Component body top color + electrode color	
	Electrode Toe Extraction	Component body top color + electrode color	-
	Electrode Offset	Component body top color + electrode color	-
	Electrode Presence	Electrode Color	
	Electrode Posture - Lifted Electrode	Electrode Color	
	Electrode Posture - Coplanarity	Electrode Color	
Lead	Electrode Posture - Electrode Protrusion	Component body top color + electrode color	-
	Electrode Posture - Electrode Area	Component body top color + electrode color + electrode lift color	-
	Electrode Posture - Exposed Electrode Toe	Component body top color + electrode color	
	Electrode Posture - Electrode Variation	Component body top color + electrode color	



For the details of the feature parameters of each inspection item, refer to the inspection logic manual.

Window Composition	Inspection Item	Feature Parameter	(Mask) Window
Land	Fillet Inspection	Fillet excluded color + component body top color + lead color	
	Height (Designation)	Fillet excluded color + component body topside color + lead color, inspection area specification	-
	Land Exposure	Color of land exposure	-
	Foreign Material (Land)	Color of foreign material inside land	-
	Land Exposure (Oblique)	Land color (for oblique), position adjustment color (for oblique)	-
	Land Error	Color of land error, inspection area specification	
	Land Error (Oblique)	Color of land error, position adjustment color (for oblique)	
	Inter-pin Solder Ball	Color of solder ball	Solder ball/bridging mask
	Inter-pin Solder Bridge	Color of solder bridge Color of solder bridge (lead shoulder) (gull-wing only)	
Inspection Region	Solder Ball	Solder ball color	Solder ball/bridging mask
	Solder Bridge	Solder bridge color Solder bridge color (lead shoulder) (for gull wing only)	
	Foreign Material	PCB color (except resist, land, through-hole, silk or other normally appearing colors)	Peripheral foreign object mask
	Solder Ball (Oblique)	Solder ball/bridge color (for oblique), position adjustment color (for oblique)	-
	Solder Bridge (Oblique)	Solder ball/bridge color (for oblique), position adjustment color (for oblique)	-



Refer to the Inspection Logic Manual for the details on the feature parameters of the individual inspection items.

**Memo**

The characteristic parameter values are common within the ranges specified below:

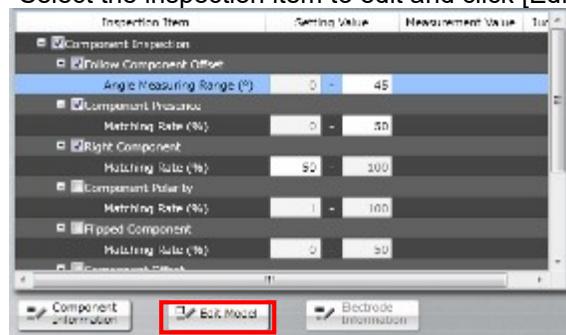
	Common with comp. No.	Common with PCB	Common with lead group
Component color	Yes		
Component extraction mask	Yes		
Component difference color	Yes		
Polarity difference color	Yes		
Component bottom side color	Yes		
Missing component excluded color	Yes		
Electrode color	Yes		
Lifted electrode color	Yes		
Electrode side bend color	Yes		
Electrode color (oblique)	Yes		
Land foreign object color	Yes		
Abnormal land color	Yes		
Abnormal land color (oblique)	Yes		
Luminous Body Window	Yes		
Missing component mask	Selectable		
Position adjustment color (oblique)	Selectable		
Fillet excluded color	Selectable		
Land exposed color	Selectable		
Solder ball/bridging mask	Selectable		
Peripheral foreign object mask	Selectable		
Land color (oblique)		Yes	
Solder color		Yes	
Solder bridge color	Selectable		Only inter-pin solder bridge is selectable
Solder bridge color (lead shoulder)	Selectable		Only inter-pin solder bridge is selectable
Solder ball color	Selectable		Only inter-pin solder bridge is selectable
PCB color		Yes	
Solder ball/bridge color (oblique)		Yes	
Position adjustment color		Yes	

The following description explains the model editing procedure.

- Operation▶ 1. Select the [Criteria Setting (Product No.)] or [Criteria Setting (Individual Component)] tab.



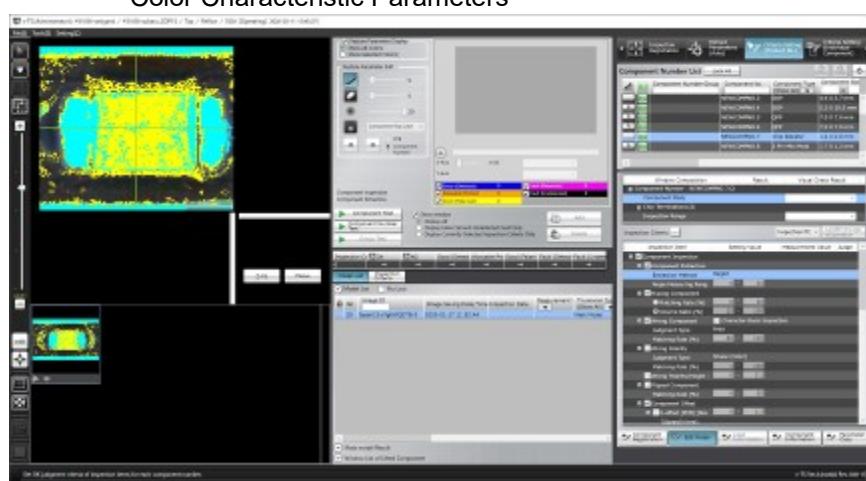
2. Select the inspection item to edit and click [Edit Model].

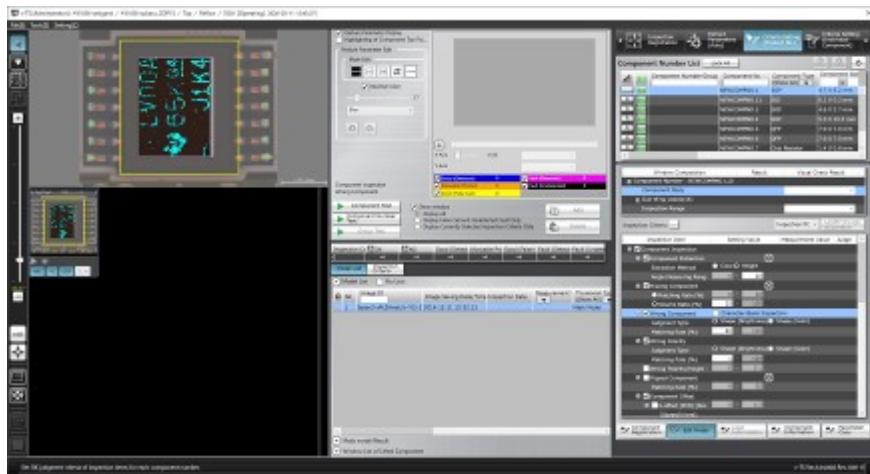


Refer to "2.6.1 Criteria Setting (Product No.)" for the procedure up to selecting the inspection item if [Criteria Setting (Product No.)] is selected, and "2.6.2 Criteria Setting (Individual Component)" for the same if [Criteria Setting (Individual Component)] is selected.

3. A different model editing screen is displayed depending on the characteristic parameter to edit.

▪ Color Characteristic Parameters



**• Mask Model Characteristic Parameters****4. Edit the characteristic parameters.**

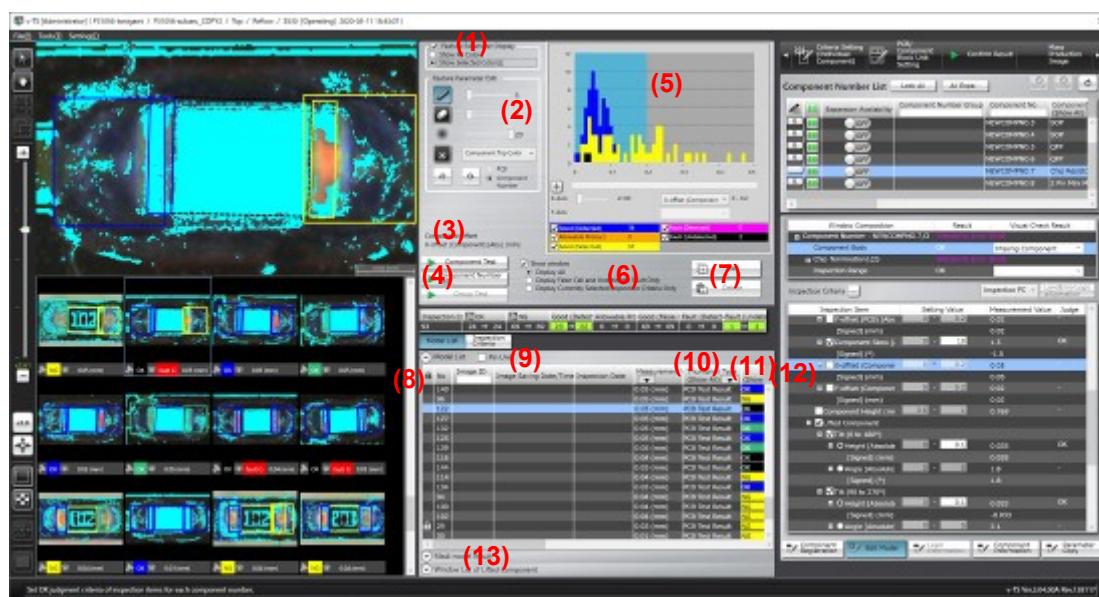
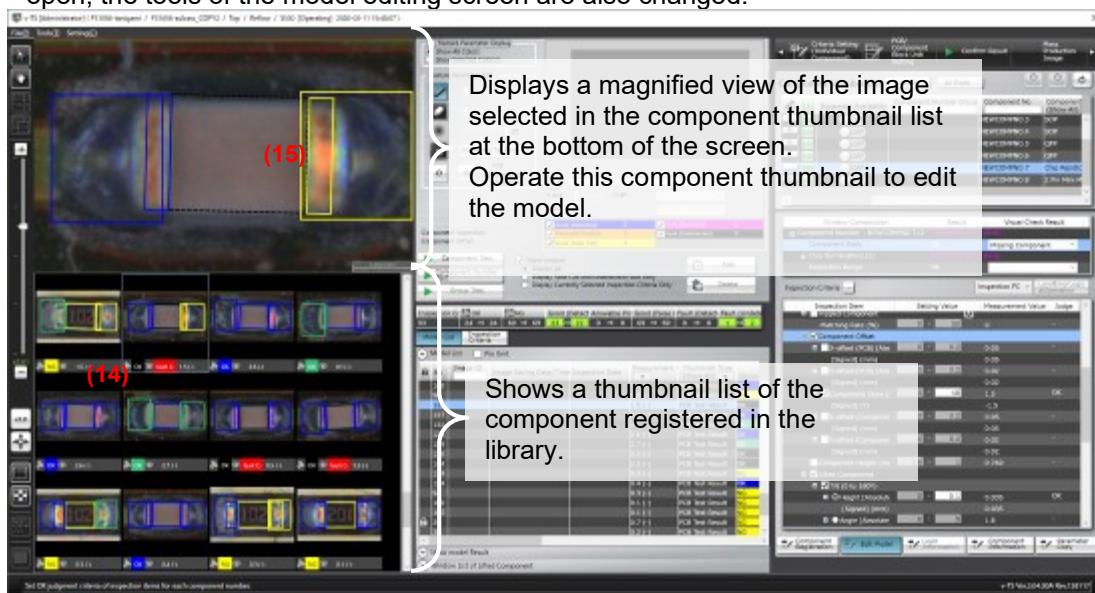
The operation method of the model editing screen is described on the next page.

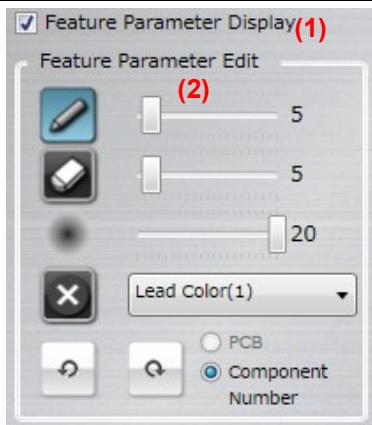
**5. To continue the editing of other characteristic parameters, click any of the inspection items allowed for model editing.**

The Model Editing screen closes if [Edit Model] is clicked.

## ■ Model Editing Screen Operation

When a logic selected on the inspection item column is changed with the model editing screen open, the tools of the model editing screen are also changed.





### (1) Feature Parameter Display

When this checkbox is selected, the component thumbnail image is binarized and the extracted pixels using the characteristic parameters are displayed in aqua color. For component extraction or component presence, two or more characteristic parameters can be displayed simultaneously. Select the display item from [Show All Colors] or [Show Selected Colors]. If [Show All Colors] is selected for component extraction, the component top color is displayed in yellow, and electrode color, in aqua.

**Memo** Binarization refers to the process of converting individual pixels into binary values based on a brightness threshold, in which pixels equal to or below the threshold value is represented in "0" and those above the threshold value, in "1". In TS, "0" values are displayed in aqua color.

**Memo** The checkbox is selected by default.

### (2) Feature Parameter Edit

Displays the characteristic parameters editing tool.

The tool is consisted the following two types:

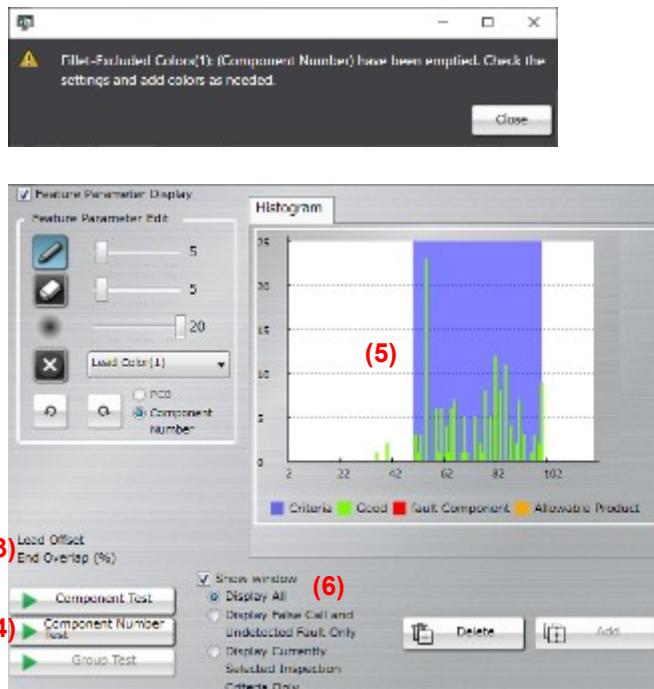
- Color Table Editing Tool ... For characteristic parameters other than character and mark colors
- Model Image Editing Tool ... For are (color), shape (brightness), and shape (color)

Refer to <Color Table Editing Tools> or <Model Image Editing Tools> of 2.16.3 “Editing a Model” of for the procedures to operate individual editing tools.

The [Synchronization between the electrode group] check box is displayed if there are more than one electrode groups. By setting this check box ON, all the electrode groups are synchronized with the characteristic parameters of the first electrode group. Once synchronized, even if the check box is set OFF, the characteristic parameters are not returned to those before synchronization is established. Keep this in mind. Synchronization is not established for each inspection item or characteristic parameter.



Set [Settings] - [Application Settings] - [Data Verification Settings] - [Verification When Characteristic Parameter Empty] ON. When the reference destination of a characteristic parameter (PCB, component number, or lead group) is switched, if the characteristic parameter is empty, it is displayed.



### (3) Inspection item

The inspection item on which the model is being edited currently is displayed.

### (4) Test

Test the component thumbnail images with the edited characteristic parameters. After testing, the measured value and judgement result for the individual component thumbnails, as well as the histogram of all the measured values are displayed.

[Component Test]: Test is performed only for the selected component.

[Component Number Test]: Test is performed for all images of the selected component number.

[Group Test]: Test is performed for all images of the component number group to which the selected component number belongs.

**Memo** The Model Editing screen shows the measured values, judgment result, and histogram of PCB testing when it is opened after the test. However, the result of oblique inspection is not displayed. Perform a test to check the result.

### (5) Histogram

When the test is executed, the measured values of the display target thumbnail are displayed as a histogram.

**Memo** The inspection criteria values which are currently set are displayed in the blue area.

**Memo** For OK products, a thumbnail meaning that the visual inspection result is not input yet (normal) is displayed. For NG products, a thumbnail meaning that the visual inspection result is already input (actual fault) is displayed. For permissible products, a thumbnail meaning that the permissible product is already input according to the visual inspection result is displayed.

**Memo** Measured values are displayed on the histogram only for the inspection items on which measured values are present.

**Memo** If the inspection criteria of wetting inspection, solder ball, foreign matter, or land error is selected, a scatter diagram is displayed.



A combination of X and Y axes can be selected using the combo box.  
The logic selected in the combo box of the X-axis is applicable to editing of the characteristic parameter.  
A histogram is displayed by selecting "Histogram" in the combo box of the Y-axis.

#### (6) Show Window

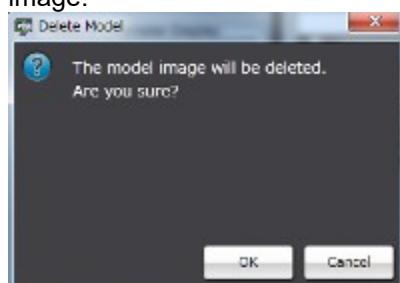
Switches the view of the detecting position of the window detected by the test.  
By unchecking the [Show Window] checkbox, the window is hidden. By checking this checkbox, it is allowed to select the type of the window displayed using radio buttons.

- Display All: All windows are displayed.
- Display False Call and Undetected Fault Only: Inspection result is displayed only in the case of false call or overlooking.
- Display Currently Selected Inspection Criteria Only: Only the inspection result of the inspection criteria being selected is displayed.



(7) Delete/Add

Deletes/Adds the model image selected in the component thumbnail list.  
Click the [Delete] button. The delete confirmation dialog appears. Click [OK] to delete the image.



**Memo** The [Delete] button is not effective if an image other than a model image is selected.

**Memo** The [Delete] button is also disabled when only one model image is in the component number.

Click the [Add] button to register the selected image as a model.

**Memo** The [Add] button is disabled if a model image or a mass-production image is selected.



(8) Sorting

By clicking the header of the list, thumbnail images are sorted for each item.

(9) By Pin No.

By checking the By Pin No. box on the model editing screen, inspection results can be displayed by pin number. This makes it possible to display inspection results not only by component number but also by pin number on the model editing screen.

---

(10) Thumbnail Type

Select the thumbnail type to display.

Click [(Display All)] to display all thumbnails regardless of type.

Click [Model] to display only the thumbnails registered as models using captured PCB images.

Click [Mask Model] to display only mask model thumbnail(s).

Click [PCB Test Result] to display only thumbnails created from the PCB test result.

Click [Mass Production Image] to display only thumbnails registered using mass production images.

Click [Mass Production Image (not registered)] to display only thumbnails for which a model has not been registered using mass production images.

(11) Inspection Result

Select the inspection result for the thumbnail to display.

Target	No. of items (source data)	No. of items (filtering)
<input checked="" type="checkbox"/> (Show All)	59	59
<input checked="" type="checkbox"/> OK	28	28
<input checked="" type="checkbox"/> Undetected Fault	3	3
<input checked="" type="checkbox"/> All NG	62	62
<input checked="" type="checkbox"/> False Call	62	62

Click [(Display All)] to display all thumbnails regardless of the inspection result.

Click [(Blank)] to display only thumbnail(s) without an inspection result.

Click [OK] to display only the thumbnails whose inspection result is "OK".

Click [NG] to display only the thumbnail that the selected inspection item is "NG".

Click [All NG] to display only the thumbnails whose inspection result for any of the inspection items is "NG".

Clicking [False Call] displays only a thumbnail of window without visual check result that is judged as defect in the inspection.

Clicking [Undetected Fault] displays only a thumbnail of window with its visual check result judged as OK in the inspection.

(12) Visual Check Result

Select the visual check result for the thumbnail to display.  
Click [(Display All)] to display all thumbnails regardless of the visual check result.  
Click [(Blank)] to display only thumbnail(s) without a visual check result.  
Click [None] to display only thumbnail(s) with the visual check result as None.  
Click [OK] to display only the thumbnails whose visual check result is "OK".  
Click [Acceptable] to display only the thumbnails whose visual check result is "Acceptable".  
Click [NG] to display only the thumbnail whose visual check result for any of the inspection items is "NG".

(1) Thumbnail Type

Select the thumbnail type to display.  
Click [(Display All)] to display all thumbnails regardless of type.  
Click [Model] to display only the thumbnails registered as models using captured PCB images.  
Click [Mask Model] to display only mask model thumbnail(s).  
Click [PCB Test Result] to display only thumbnails created from the PCB test result.  
Click [Mass Production Image] to display only thumbnails registered using mass production images.  
Click [Mass Production Image (not registered)] to display only thumbnails for which a model has not been registered using mass production images.

(2) Sort

Clicking the list header sorts the thumbnails for each item.

(3) Per-pin-No. basis

By checking "Per-pin-No. basis" on the model editing screen, inspection result can be displayed by pin No. This allows to display inspection result on the model editing screen not only by component number but also by pin number.



(13) Mask model result

List of the measured values per mask model is displayed.

No	Group No.	Right Component	Component Polarity	90°	180°	270°
83	1	78				

**Memo** The relation of measured values of multiple models in polarity inspection is explained as follows:

The measured value of wrong polarity means the measured value of zero degree, displayed according to 1) the calculation formula of wrong polarity measured values and 2) the matching rate of each revolved model.

No	Group No	Wrong Compo.	Wrong Polarity	90°	180°	270°
66	1	85	14	0	0	0
66	1	84	0	0	22	0

#### (1) Calculation formula of wrong polarity measured value

Measured value of 0° = [Matching rate of 0°] - [Maximum matching rate of other angles (90°, 180°, or 270°)]

Measured values are also displayed for each revolved model of other angles (90°, 180°, or 270°).

#### (2) Matching rate of each revolved model

When measured values are calculated, matching rate (%) is processed internally.

Examples of each revolved model (0°, 90°, 180°, or 270°) are as follows:

	Wrong polarity (0°)	90°	180°	270°
Model 1	85	39	71	45
Model 2	60	62	84	50

Measured values are calculated internally, and the ones of wrong polarity (enclosed with red frames) are displayed.

Measured values of model 1

	Wrong polarity (0°)	90°	180°	270°
Matching rate (ex.)	85	39	71	45
Measured value	$85 - 71 = 14$	$39 - 85 = -46$	$71 - 85 = -14$	$45 - 85 = -40$

Measured value of model 2

	Wrong polarity (0°)	90°	180°	270°
Matching rate (ex.)	60	62	84	50
Measured value	$60 - 84 = -24$	$62 - 84 = -22$	$84 - 62 = 22$	$50 - 84 = -34$

The measured values inside the red frames are displayed according to the calculation result from the above internal processing.

No	Group No	Wrong Compo.	Wrong Polarity	90°	180°	270°
66	1	85	14	0	0	0
66	1	84	-24	0	22	0

Out of models 1 and 2, model 1 which has a larger measured value (14) is adopted. As a result, model 1 is judged as OK if the measured value of 0° (14) is within the range of the settings of the inspection criteria.

## (14) Thumbnail

Test result and visual check result are displayed.



**Memo** Displays the inspection result.

- Blue: The inspection result is OK and the visual check result is OK or allowable.
- Green: The inspection result is changed to OK because of the setting of the logical expression and the visual check result is OK or allowable.
- Purple: The inspection result is NG and the visual check result is NG.
- Yellow: The inspection result is NG and the visual check result is OK.
- Black: The inspection result is OK and the visual check result is NG.

**Memo** Displays the visual check result.

- Gray: The visual check result is "OK".
- Red: The visual check result is "NG".
- Orange: The visual check result is "Acceptable".

**Memo** Displays the measured values.

- White: Displayed if test target.
- Black with gray background: Displayed if out of test target.

Displayed the component difference inspection result and the polarity difference inspection result.



**Memo** Displays the color coded results of matching/mismatching between the mask model and the inspected image in the component difference inspection and the polarity difference inspection.

- Pale blue: Binarized area is overlapping in the mask model and the inspected image
- Black: Non-binarized area is overlapping in the mask model and the inspected image
- Red: Binarized area is not overlapping in the mask model and the inspected image

(15) Window

Displays the inspection criteria and measured value of the selected window.

Memo

The window color varies depending on the inspection result.



Blue: The inspection result is "OK".



Green: The inspection result of the specified logical expression is "OK".



Yellow: The visual inspection result is not registered as fault, and the inspection result is "NG".



Red purple: The visual inspection result is registered as fault, and the inspection result for the selected inspection item is "NG".



Pink: The visual inspection result is registered as fault, and the inspection result for other than the selected inspection item is "NG".



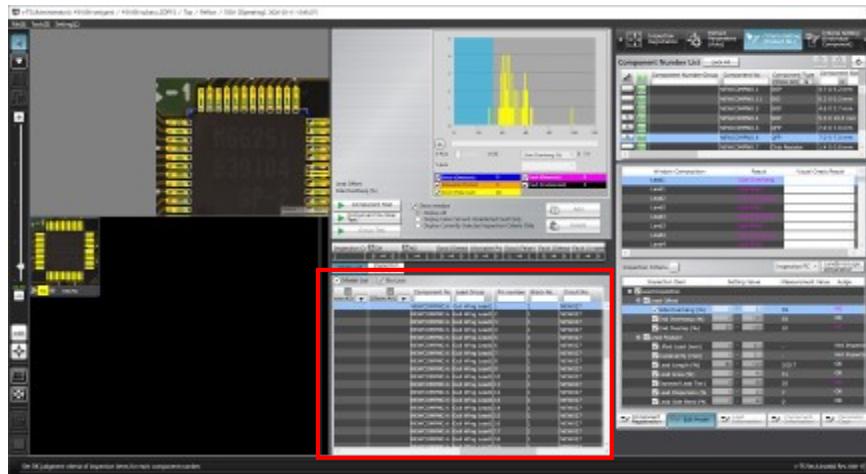
Black: The visual inspection result is registered as fault, and the inspection result is "OK".



Orange: The visual inspection result is registered as allowable.

## (16) Per-pin-No. basis

Model editing screen with the per-pin-No. basis item checked



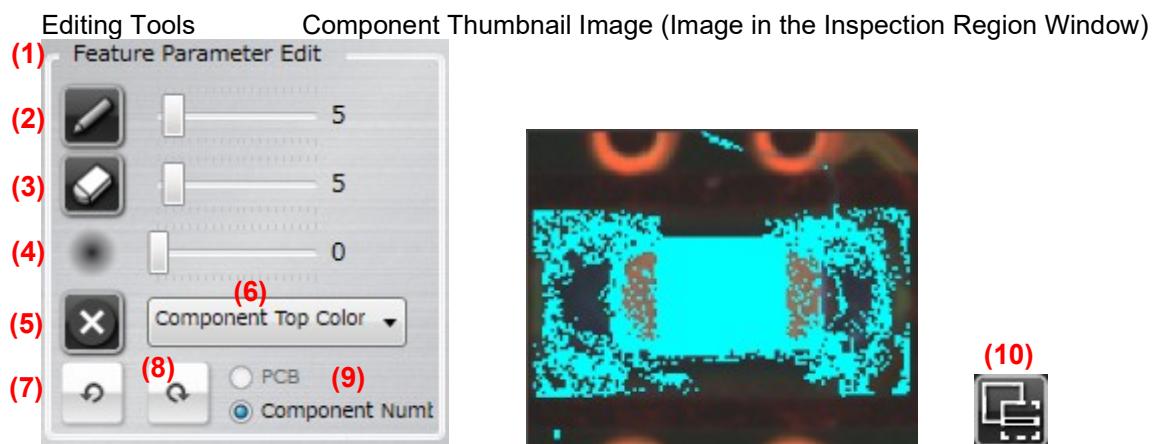
In addition, selecting a pin moves the screen so as to display the selected pin in the screen center.

Case: Switching pin numbers from 1 to 3



### <Color Table Editing Tools>

The color table editing tools are displayed when editing characteristic parameters other than characters or symbols.  
Use the tools to add or delete colors to/from the color table after checking the extracted colors in the component thumbnail image.



**(1) Displaying Characteristic Parameters**

Selecting/unselecting the check box switches between presence and absence of binarized display on the image.

**(2) Pen Tool**

Click the button to enable the pen tool.

Click the pixel to extract in the component thumbnail image. The color of the clicked pixel is added to the color table. The pen size can be adjusted with the slide bar.

**Memo** The pen size can be specified in the range of 1 to 41 pixels.



**(3) Eraser Tool**

Click the button to enable the eraser tool.

Click the extracted pixel (shown in aqua color) to erase in the component thumbnail. The color of the clicked pixel is removed from the color table. The eraser size can be adjusted with the slide bar.



**Memo** The eraser size can be specified in the range of 1 to 41 pixels.

**(4) Expansion Range Setting**

Specify the expansion size of the pixel selected by the pen or eraser tool, using the slide bar.

**Memo** The expansion size can be specified in the range of 0 to 20.

---

(5) Clear Button

Click the button to delete all the color settings from the color table.

(6) Feature Parameter

Display the feature parameter of the editing target. You can select from multiple feature parameters in the case of component extraction and missing component.

(7) UNDO Button

Click the button to undo the changes added to the color table. However, changes made prior to switching the feature parameter or component number menu item cannot be canceled.

(8) REDO Button

Click the button to redo the canceled changes to the color table. However, changes canceled prior to switching the feature parameter or component number menu item cannot be redone.

(9) Characteristic Parameter Radio Button

Clicking the radio button allows selection of a PCB or a component number that retains the characteristic parameters. You cannot select it if selection of a PCB or a component number is not available for the characteristic parameters.

**Memo** If inter-pin solder ball or inter-pin solder bridge is selected, a lead group can be selected.

(10) Mask Add Button

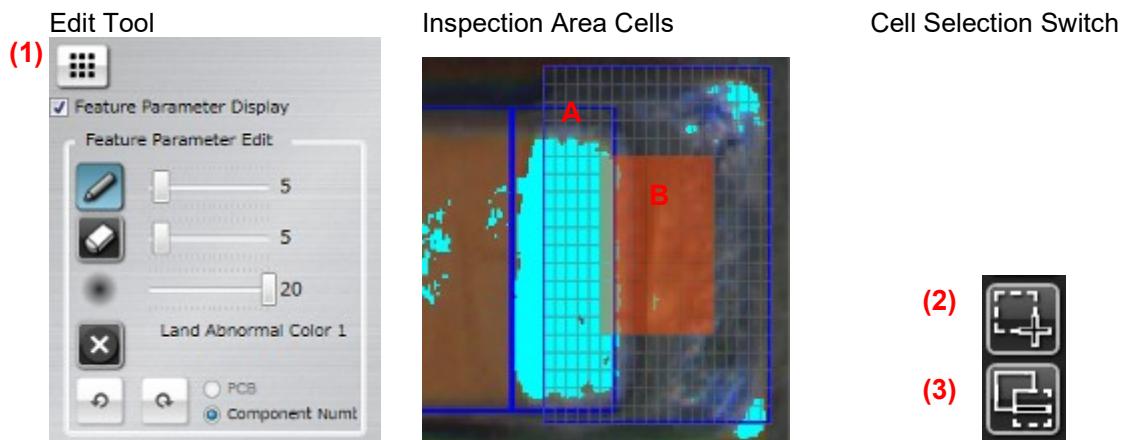
Click the button to add a mask. When it is not available, the button cannot be clicked. After selecting the added mask, it can be copied and deleted.

	Copy
	Delete

**<Inspection Area Edit Tool>**

Selecting an Abnormal Land or Abnormal Land (Oblique) logic displays the inspection area edit tool.

Specify an area to inspect in the Land Window.

**(1) Inspection Area Edit Toggle Button**

Clicking the button displays the inspection area cells in the Land Window.

**(2) Inspection Area Cell + Switch**

Clicking the button and dragging an invalid cell (A) enables the cell (B).

**(3)** Clicking the button and dragging a valid cell (B) disables the cell (A).

---

### <Model Image Editing Tools>

The model image edit tool is displayed when component difference/polarity difference inspection is selected.

Use the tools to edit the binarized areas or colors in the model image for character or symbol extraction. Model image can be judged in three ways:

Area (Color): Color is adjusted to judge component difference.

Shape (Brightness): Binarization area is specified and brightness is adjusted to judge the pattern.

Shape (Color): Binarization area is specified and color is adjusted to judge the pattern.

To judge a model image, check the display corresponding the setting of “Component has character pattern” of the component number:

Component has character pattern: ON

Select a judgment type for component difference/polarity difference inspection

Judgment Type	<input checked="" type="radio"/> Shape (Brightness)	<input type="radio"/> Shape (Color)
---------------	---	-------------------------------------

Component has character pattern: OFF

Select a judgment type for component difference inspection

Judgment Type	<input checked="" type="radio"/> Area	<input type="radio"/> Shape (Color)
---------------	---------------------------------------	-------------------------------------

Select a judgment type for polarity difference inspection

Judgment Type	<input checked="" type="radio"/> Shape (Color)
---------------	--

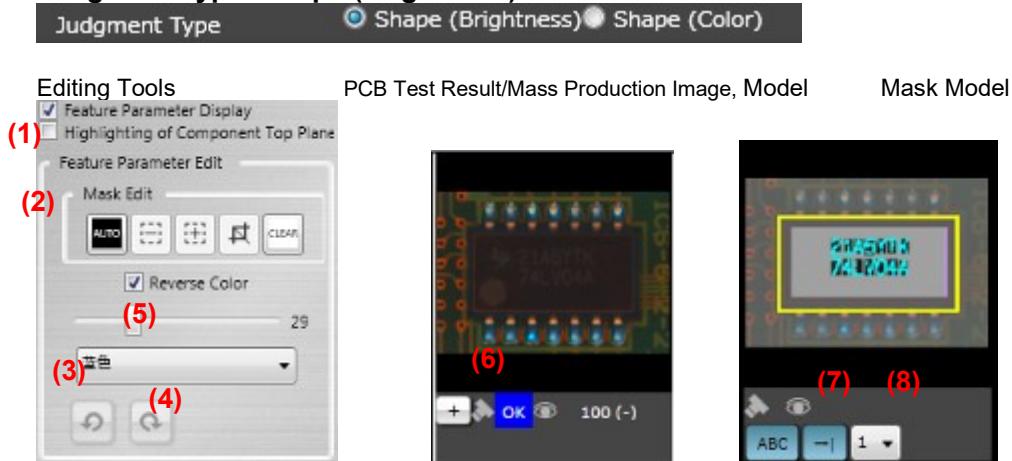
**Memo** For the polarity difference inspection, you cannot select [Area (Color)] as the matching rate is judged based on the model asymmetry.

**Memo** If color difference is small between the component body and character patterns, whether characters or patterns can be judged easily by enabling the “Component Top Highlight Display” option.

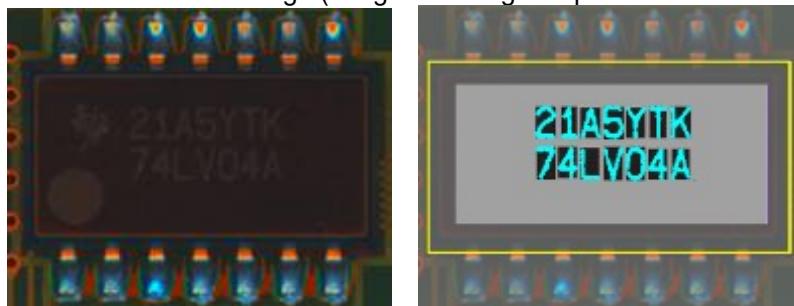
For calculation or measured value by character, enable  Character Unit Inspection to calculate the measured value per mask area and perform the component difference inspection. The measure value is calcurated with the condition that the mask area with no pixel to the left, right, top, or bottom side is regarded as a single unit.

**Memo** Shown below is an example.

Target	Model set 1					Model set 2			
	At registration of item	Wrong font	Wrong layout	Color of letter dimmed (Wrong binary threshold)	At registration of item	Wrong font	Wrong layout	Color of letter dimmed (Wrong binary threshold)	
Set masking so that the mask area is independent for each character by "inspection by character" ON									
Perform measurement by character, and regard the worst value in the model as a representative of the model									
	95 90 13 90	60 50 13 50	20 90 1 3 20	75 70 13 70	85 B 85	55 B 55	30 B 30	70 B 70	
Regard the best value in the model set as the representative of the model set									
90					85				
Regard the worst value as the representative of inspection between the model sets, and perform go/no-go judgment compared to the test specification.									

**Judgment Type: Shape (Brightness)**

Mask Model Image (Image including component and electrode).



## (1) Component upper surface highlighted display

By turning ON the checkbox of component upper surface highlighted display, the contrast of the component body upper surface is highlighted, so that the letters and marks can be identified easily.



## (2) Mask Area

Specify the area to mask in the model image.

Operation▶

1. Click  (Create Window) button in the Image Operation tool bar.

Drag and drop the cursor to form a rectangle in the model image.

2. Click either of the buttons below to specify the area to mask in the model image.

	Automatically set the mask per character and mark.
	Mask the area inside the drawn rectangle.
	Enables the area inside the drawn rectangle.
	Mask the area outside the drawn rectangle.

3. Repeat the above procedure to specify multiple areas to mask.  
To clear the masked areas, click .

## (3) Extraction Area Ratio

Specify the ratio (%) of the pixels to binarize (for extraction) to the entire unmasked area (100%). The pixels of the color specified in (3) are extracted starting from those with the lower brightness or saturation, until the specified extraction ratio is reached.

**Memo** The ratio can be specified in the range of 1 to 99.

## (4) Binarization Color

Select the color used for binarization from the options: Red / Green / Blue / Saturation.

## (5) Reverse Color

If this checkbox is selected, the pixels of the color specified in (3) are extracted starting from those with the higher brightness and saturation until the ratio specified in (2) is reached.

## (6) Add Model Button

Clicking the button creates a mask model based on the image.

## (7) Component Difference/Polarity Difference/OCR Inspection Switch

Setting the toggle button ON/OFF specifies the mask model to use for which inspection.

Memo

Button Status	Component Difference Inspection	Polarity Difference Inspection	OCR inspection
ABC → OCR	Not to be used	Not to be used	Not to be used
ABC → OCR	To be used	Not to be used	Not to be used
ABC → OCR	Not to be used	To be used	Not to be used
ABC → OCR	Not to be used	Not to be used	To be used
ABC → OCR	Not to be used	To be used	To be used
ABC → OCR	To be used	Not to be used	To be used
ABC → OCR	To be used	To be used	Not to be used
ABC → OCR	To be used	To be used	To be used

(8) Model Set Selection Combo box

Select a model set to belong from the combo box. Specify non-defective items with the same character/mark for one model set. The measured value closest to the non-defective item in the set is used for non-defective/fault judgment. If more than one model set is being specified, the value closest to the fault item between the sets is used for non-defective/fault judgment.

**Memo**

Shown below is an example. Non-defective/fault item images shown below are assumed.

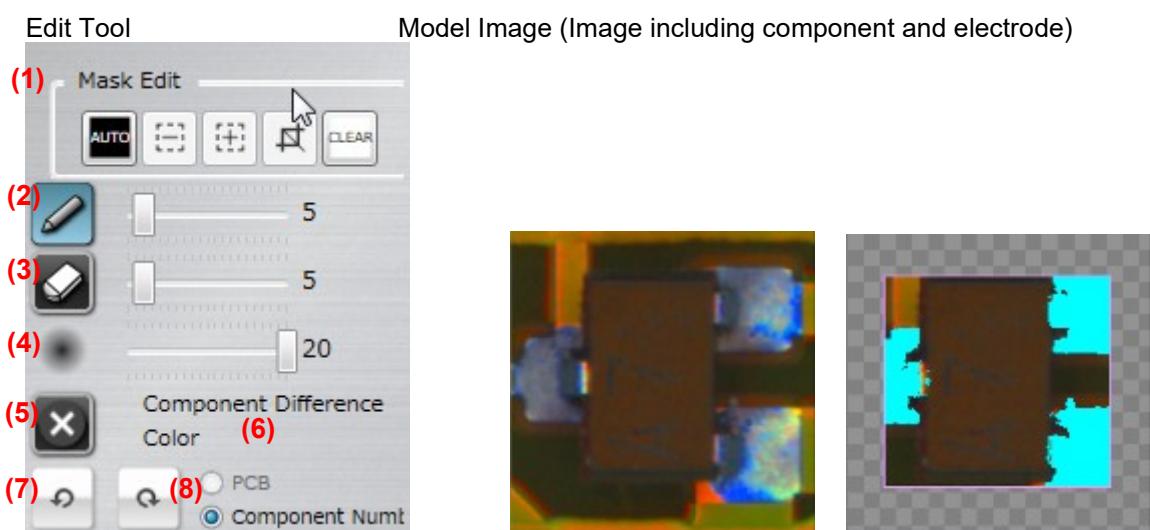
Non-Defective Image	Fault Image
	

Judgment results upon fault component image inspection when a good component image is registered as a mask model.

	Model Set 1		Model Set 2	
Mask Model				
Judgment result for each model	NG	NG	OK	NG
Judgment result for each set	NG		OK	
Component Judgment Result	NG			

**Judgment Type: Area (Color)**Judgment Type  Area  Shape (Color)

Refer to &lt;Color Table Editing Tools&gt;.

**Judgment Type: Shape (Color)**Judgment Type  Area  Shape (Color)

## (1) Mask Area

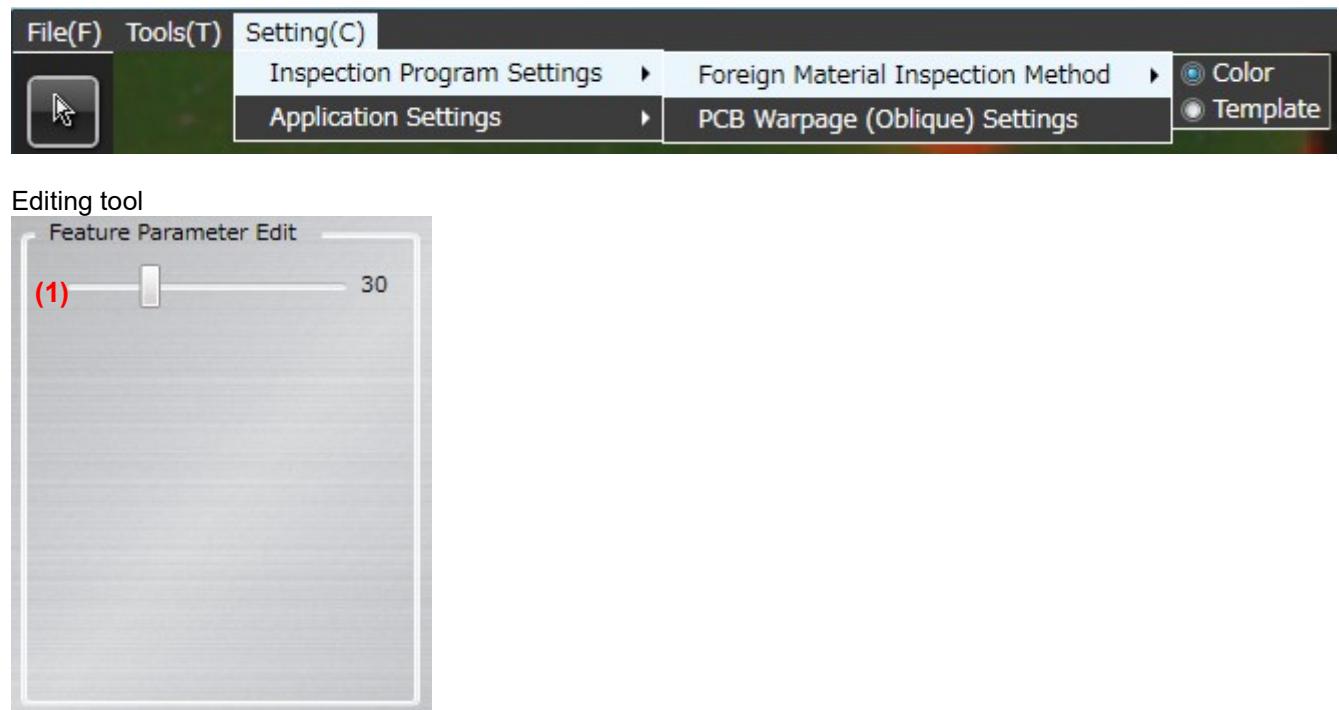
Specify an area to exclude from a model image. Judgment Type: Same operation as in **Judgment Type: Shape (Brightness)**, (1).

(2) - (8) Set a color to extract character pattern. Same operation as in <**Color Table Edit Tools**>.

### <Foreign Object Editing Tool>

The foreign object inspection editing tool is displayed when the template is selected and the foreign object inspection is selected on foreign object inspection method.

\* When the color is selected on the foreign object inspection method, the operation is the same as <Color Table Editing Tools>.



(1) Acceptable variation

Sets the acceptable variation in the range of 1 to 99. The default value is 30.

### <Component Number Deployment Tool>

You can deploy characteristic parameter and inspection criteria of the selected component number to other component number.

The screenshot displays the 'Component Number Deployment Tool' interface with several numbered callouts highlighting specific features:

- (1)** Inspection Item: A tree view showing categories like Electrode Type, Electrode Inspection, Electrode Offset, Electrode Orientation, Weld Inspection, Welding Angle, Land Metrics, and Component Welding.
- (2)** Expand Component Number Parameters: A dialog box titled 'List of Expanded Component Number Parameters' showing a grid of components with their details and deployment buttons.
- (3)** Feature Parameter: A dropdown menu listing various feature parameters such as Component Top Color, Component Bottom Color, Component Difference, Polarity Difference Color, Missing Exclusion Color, Solder Color, and Solder Ball Color.
- (4)** Component Inspection: A table showing inspection logic, lower limit, and upper limit for components like Follow Component CH0, Missing Component M0, Missing Component W25, Right Component, Component Polarity, Component Polarity/H0, Flipped Component, and X-offset (PCB) [Mod.].
- (5)** Feature Parameter: Another dropdown menu listing Land Abnormal Color 1 through Land Abnormal Color 9.
- (6)** Electrode Inspection: A table showing inspection logic, lower limit, and upper limit for Side Overhang (%), End Overhang (%), and End Overlap (%).
- (7)** Inspection Region: A table showing inspection logic, lower limit, and upper limit for Solder Ball, Solder Bridge, and Foreign Material.
- (8)** Wettability Inspection: A dropdown menu listing various wettability inspection parameters.
- (9)** Land Inspection: A table showing inspection logic, lower limit, and upper limit for Foreign Material (On Land), Land Error, Setting 1 (%), Setting 2 (%), Setting 3 (%), Setting 4 (%), and Setting 5 (%).
- (10)** Overall Inspection Criteria: Buttons for Select All, Clear All, Overall Inspection Criteria, Copy, and Close.

(1) Deploy Button

Clicking the button displays the component number parameter deployment screen.

(2) Component Number Parameter Deployment Target List

Displays a list of component numbers that have parameters which can be deployed.

(3) Apply Deployment Target Component Number Button

Use the Apply button to specify a component number that has parameters which you want to deploy. If the selected component number belongs to a component number group, the parameters are deployed to the component number group.

**Memo** The Apply button is blue  and white  when it is enabled and disabled, respectively.

(4) Apply Deployment Target Electrode Group Button

Use the Apply button to specify an electrode group that has the electrode inspection and land inspection settings which you want to deploy.

(5) Apply Characteristic Parameter Deployment Button

Use the Apply button to specify a characteristic parameter you want to deploy.

(6) Apply Component Inspection Setting Deployment Button

Use the Apply button to specify a component inspection setting you want to deploy.

(7) Apply Inspection Range Setting Deployment Button

Use the Apply button to specify an inspection range setting you want to deploy.

(8) Electrode Group Selection Radio Button

Select an electrode group you want to deploy.

**Memo** Clicking Copy deploys the parameter of the electrode group being selected upon clicking. The parameters of electrode groups not being selected are not deployed.

(9) Apply Electrode Group Characteristic Parameters Deployment Button

Set the characteristic parameters of the electrode group you wish to deploy by the Apply button.

(10) Apply Electrode Inspection Setting Deployment Button

Use the Apply button to specify an electrode inspection setting you want to deploy.

(11) Apply Land Inspection Setting Deployment Button

Use the Apply button to specify a land inspection setting you want to deploy.

(12) Wettability Inspection Setting Deployment Toggle Button

Use the toggle button if you want to deploy the wettability inspection setting.

**Memo** You cannot deploy the wettability inspection setting independently for inspection items. All wetting inspection settings are the deployment targets.

(13) Select All Button

Clicking this button sets ON the characteristic parameters and all the Apply buttons of the inspection criterion. If there are more than one electrode group, the Apply buttons of the electrode group which is not being selected are not changed.

---

(14) Clear All Button

Clicking this button sets OFF the characteristic parameters and all the Apply buttons of the inspection criterion. If there are more than one electrode group, the Apply buttons of the electrode group which is not being selected are not changed.

(15) Deploy All Inspection Criteria Button

When this button is clicked, all inspection settings are deployed to the component number and electrode group of the deployment destination being selected without respect to pressing the Apply button of the inspection setup section of the deployment source. Even the items not displayed on the deployment screen are deployed. If there are more than one electrode groups, criteria are deployed only for the effective electrode groups.

(16) Copy Button

Clicking this button deploys all the inspection settings with the Apply buttons being selected from the source to the selected deployment target component number and electrode group.

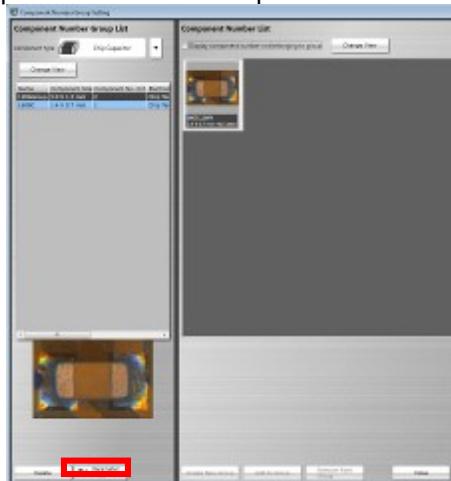
(17) Close Button

Clicking the button closes the component number parameter deployment screen.

### <Component Number Group Settings Deployment Tool>

The characteristic parameters and inspection criteria of the selected component number group can be deployed to another component number.

On the component number group settings screen, click the [Deploy] button to open the [Component Number Group Parameter Deployment] screen. The operation method of the screen is equal to that of the component number settings deployment tool.



**Component Number Group Parameter Deployment**

**Component Number Group Parameter Deployment List**

Component Number Group	Component Type	Update Date	Component Size	Electrode Type	Num. of Electrodes	Component No.
1206Group	Chip Capacitor	2016-08-02 14:24:03	3.0 X 1.5 mm	Apply Chip Termination1(2)	2	2

**Feature Parameter**

Apply	Feature Parameter
Apply	Component Top Color
Apply	Component Bottom Color
Apply	Component Difference
Apply	Polarity Difference Color
Apply	Missing Exclusion Color
Apply	Solder Color
Apply	Solder Ball Color

**Component Inspection**

Apply	Inspection Logic	Lower Limit	Upper Limit
Apply	Follow Component Off	20	20
Apply	Missing Component M0	20	20
Apply	Missing Component V25	100	100
Apply	Right Component	85	100
Apply	Component Polarity	1	100
Apply	Component Polarity/H0	0.1	0.1
Apply	Flipped Component	0	50
Apply	X-offset (PCB) [Med.]	0	0.2

**Inspection Region**

Apply	Inspection Logic	Lower Limit	Upper Limit
Apply	Solder Ball	0	0.05
Apply	Solder Bridge	0	0.05
Apply	Foreign Material	0	0.05

**Chip Termination1(2)**

**Electrode Inspection**

Apply	Inspection Logic	Lower Limit	Upper Limit
Apply	Follow Electrode Tie	0	25
Apply	Sidle Overhang (%)	0	100
Apply	End Overhang (%)	0	100
Apply	EndOverlap (%)	50	100
Apply	Electrode Lifting (Exp.)	0	0.1

**Land Inspection**

Apply	Inspection Logic	Lower Limit	Upper Limit
Apply	Foreign Material (On)	0	25
Apply	Land Error	0	25
Apply	Setting 1 (%)	0	25
Apply	Setting 2 (%)	0	25
Apply	Setting 3 (%)	0	75
Apply	Setting 4 (%)	0	75
Apply	Setting 5 (%)	0	75

**Wettability Inspection**

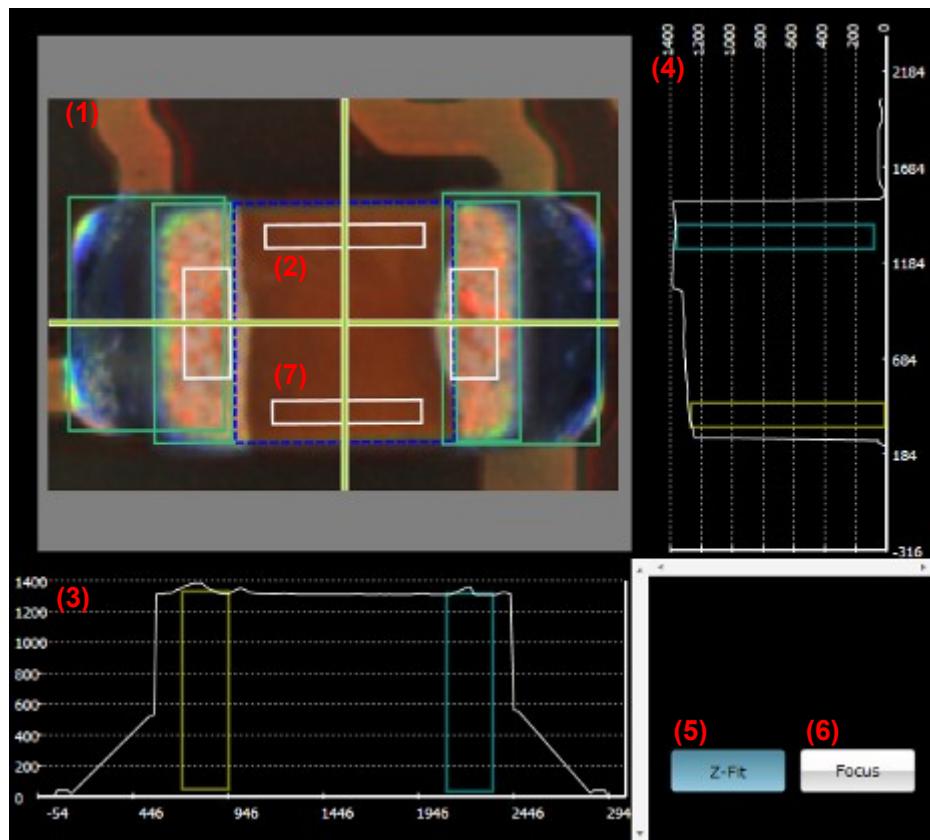
Wettability Inspection

---

### <Orthographic View>

If height measurement data is used for inspection, orthographic view appears.

Move the line profile to a location you want to check, and verify a component, component height, and a fillet shape.



(1) X-Y Diagram

Displays a component thumbnail image.

(2) Line Profile Position Specification Line

Shows a slice position to display on X-Z and Y-Z diagrams.

If is set ON, you can move this by mouse dragging, cursor keys on the keyboard, or left-clicking on the X-Y diagram while holding an Alt key.

The view is refreshed following the X-Y diagram view position and scaling.

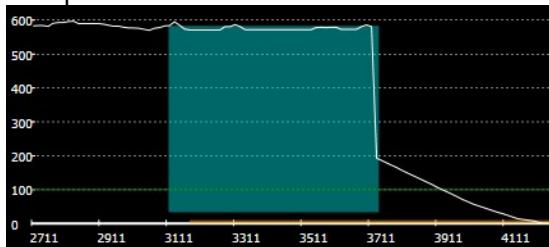
(3) X-Z Diagram

Displays the following slice information of X-Z.

Slice Height: White line

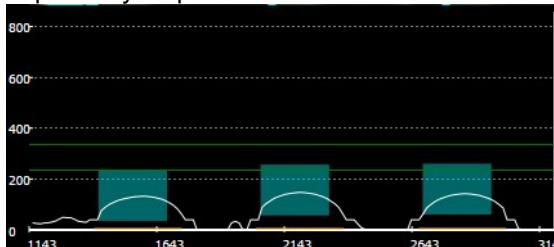
Electrode Position/Height: Light blue paint-out frame (displayed when fillet inspection, electrode lifting, or coplanarity is selected)

**Memo** If fillet inspection is selected, the electrode being selected is displayed as a light blue paint-out frame.



Lifted Component Inspection Criteria: Green line (displayed when component lifting or coplanarity is selected)

**Memo** If coplanarity is selected, all the electrodes belonging to the electrode group being selected are displayed as light blue paint-out frame. A green line is displayed at the height of the lowest electrode, and the other green line is displayed at the height which is the height of the inspection criterion above the former green line. The range of OK products for coplanarity inspection is between these two lines.



(4) Y-Z Diagram

Displays the slice information of Y-Z. The details are the same as that of X-Z diagram.

(5) Z Scale Adjustment Toggle Button

Setting the button ON scales the Z axis so as to fit in the screen.

Setting the button OFF displays the Z axis in the same scale as X and Y.

(6) Window Centering Button

Clicking the button adjust the position of the selected window to the center of the X-Y screen.

---

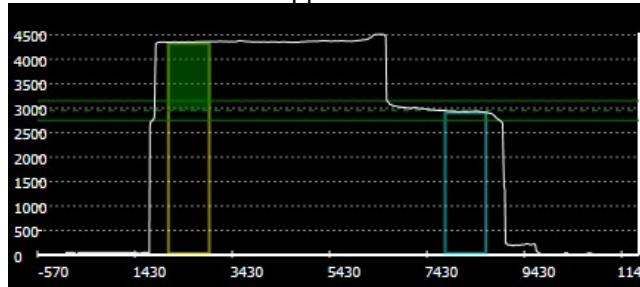
(7) Lifted Component Window

A window to inspect component height and lifted component is displayed on the X-Y diagram as a white frame.

A lifted component window area is displayed in the X-Z and Y-Z diagrams.

When an incline of 0-180° or 90-270° is selected, the yellow and light blue frames indicate the reference point and measurement point, respectively. If neither range is selected, the window is displayed in gray.

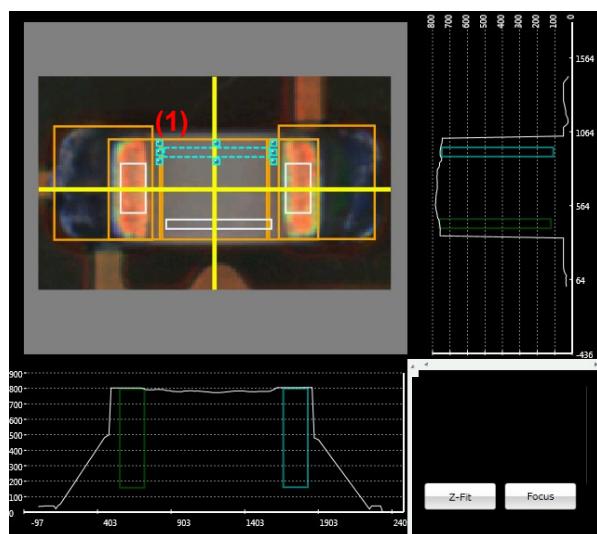
**Memo** To the yellow frame of the reference point, the height of the preset unevenness is displayed as a green paint-out frame. The green reference point is displayed in the position which is the height of the unevenness above the top of the yellow frame of the reference point. The green dotted line indicates the center of the reference, and the green solid line indicates the upper and lower limits of the inspection settings, respectively.



### <Lifted Component Inspection Editing Tools>

If the component height/lifted component inspection is being selected, the lifted component inspection editing tools are displayed.

If the component height or lifted component (average height) is being selected, the lifted component window is displayed in a white frame on top of the component. Inspect component height/lifting by editing the position and/or size of the lifted component window.



---

**(1) Lifted Component Window**

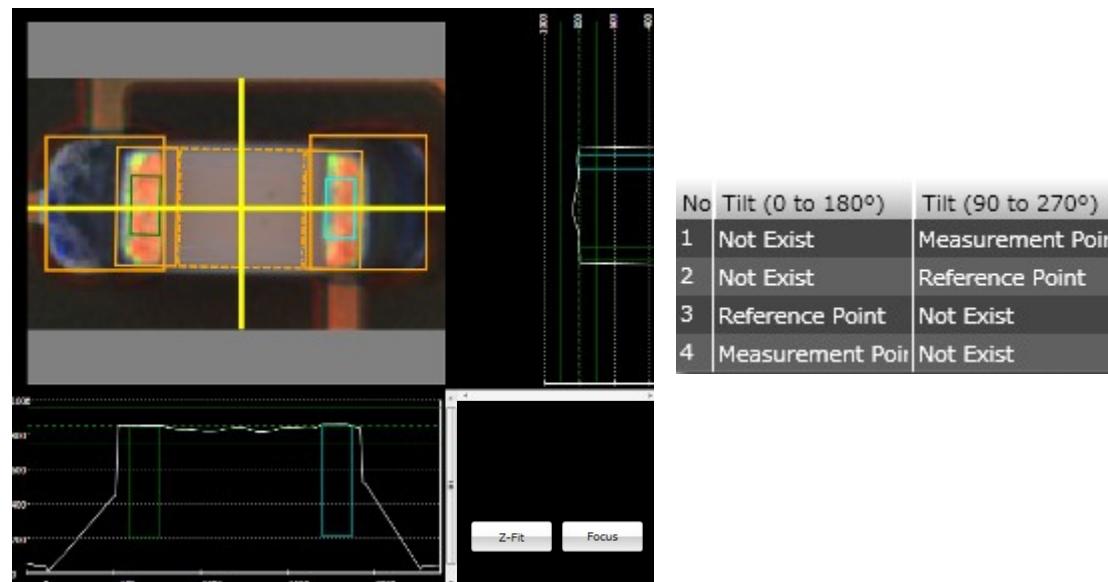
Specify a measurement range of height information used for the component height/lifted component inspection. Use the mouse to edit the window position and size.

If the component tilt (0-180)/(90-270) is being selected, the lifted component window is discriminated to reference point and measurement point. Described below are details.

**Reference Point:** Indicates a region as a height reference to measure the component tilt (framed in yellow).

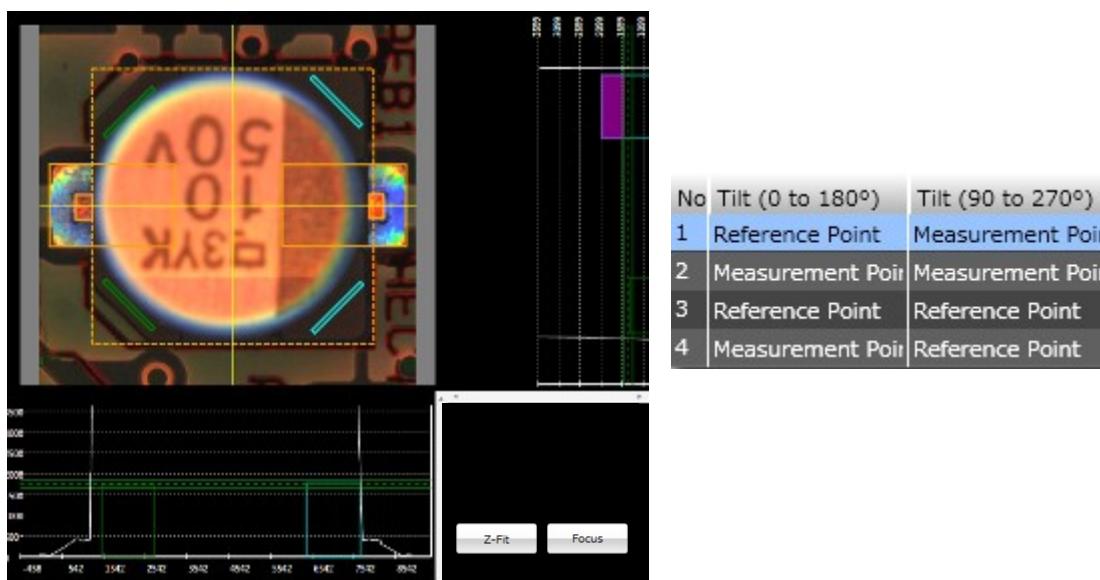
**Measurement Point:** Indicates a region to calculate a height from the reference point to measure the component tilt (framed in light blue).

To change the reference point/measurement point setting, use the lifted component window list.



If a component type is electrolytic capacitor, the lifted component window is configured as shown below.

**Memo** Two component tilts are calculated in horizontal and vertical directions, and averaged as inspection results.

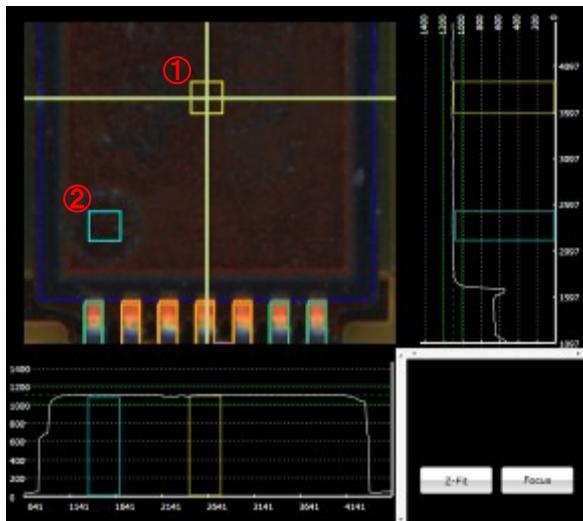


**Z-Fit** Expands the Z scale by the maximum height.

**Focus** Displays the selected window.

### <Wrong Polarity/Height Inspection Edit Tool>

If wrong polarity/height inspection is being selected, the comparison area (reference point: yellow) and polarity mark area (measurement point: light blue) are displayed in the wrong polarity/height inspection edit tool. You can edit a position and/or size of the comparison and/or polarity mark area to perform wrong polarity/height inspection.



**Z-Fit** : Z scale is extended based on the maximum height value.

**Focus** : The selected window is displayed.

### <Target Component (Recommended)>

#### - Other Chip:

An LED level difference is detected and the polarity inspection is performed.

- SOP, QFP, SOJ, QFJ, SON, QFN, connector, other lead component, other non-lead component, other bottom electrode component, CSP, BGA

An embossed mark is detected and the wrong polarity inspection is performed.

① Comparison area (reference point: yellow)

Specify a measurement range of height information used for the wrong polarity/height inspection. Use the mouse to edit the window position and size.

In X-Y, X-Z, and Y-Z diagrams, reference point window position (yellow rectangle) and measured value of the reference point height are indicated as dashed lines and upper and lower limits of the inspection criteria as continuous line.

② Polarity mark area (measurement point: light blue)

Specify a measurement range of height information used for the wrong polarity/height inspection. Use the mouse to edit the window position and size.

In X-Y, X-Z, and Y-Z diagrams, measurement point window position (light blue rectangle) is indicated.



For details of the inspection criteria and process, see Inspection Logic Manual, "3.4 Wrong Polarity/Height".

### <Height 3D Tool>

If you have selected Height Inspection, the Height 3D tool is displayed.  
 (Ver4.00.00A or later, only for devices equipped with a projector)

Image: Color HighLight Displays a color highlight image.

White Displays a white illuminated image. (S1080/S1040 only)

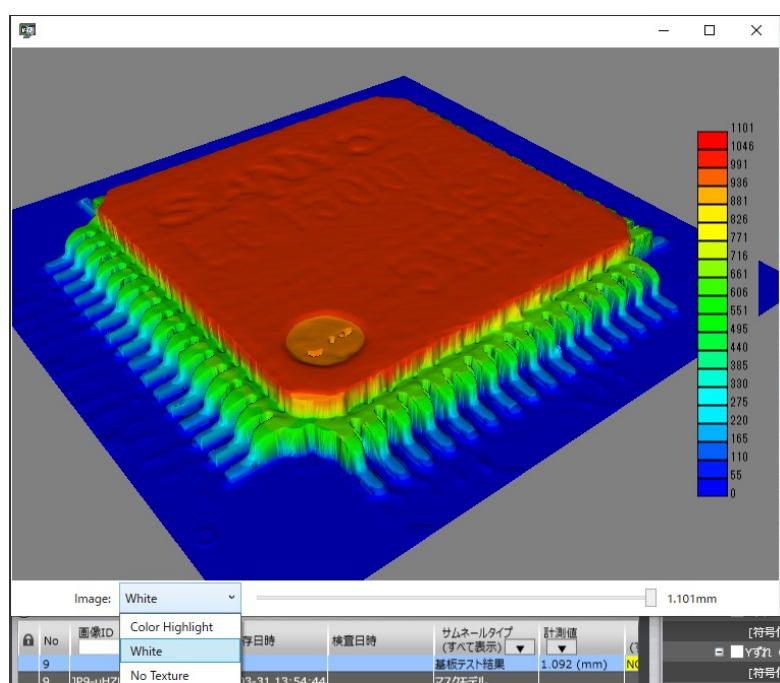
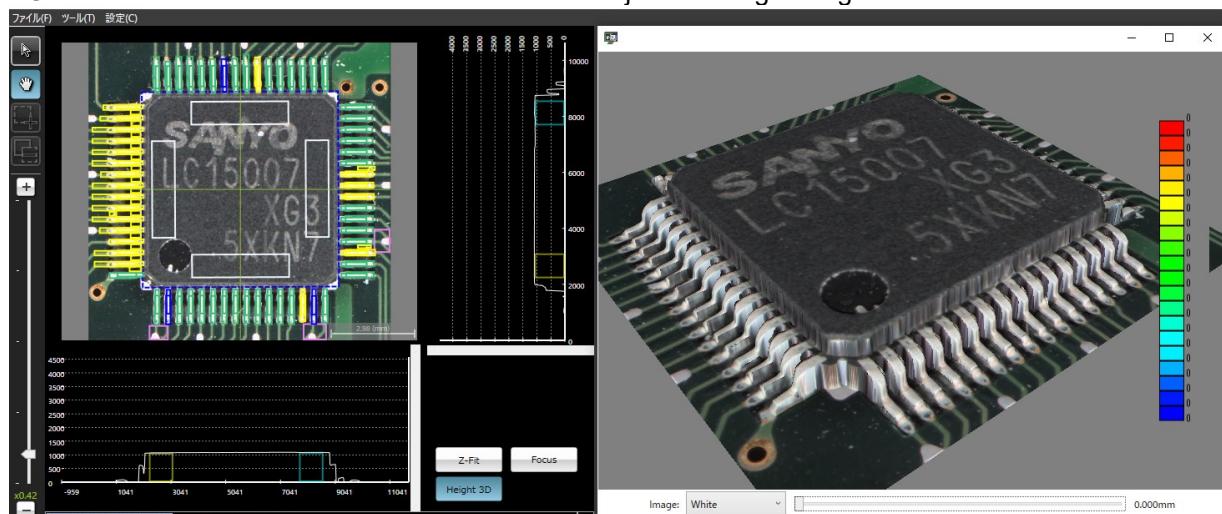
No Texture It does not perform texture mapping, but only displays height data.

Mouse control: Drag the left button to rotate the image.

Drag the right button to move the image.

Use the wheel button to zoom in and out of the image.

Use the scroll bar at the bottom of the screen to adjust the height range.



#### 2.16.4 Optimizing Boolean Expressions and Inspection Criterion Values

Inspection criterion values are optimized based on the visual check result information registered for each inspection window of model images. Optimization can reduce missing/excessive detection of errors.

Inspection items that can be optimized

Window Type	Inspection Item			Optimization
Component Body Window	Component Inspection	Component Extraction	Angle Measurement Range	×
		Missing Component	Match Percentage/Volume Ratio	○
		Component Difference	Match Percentage	○
		Polarity Difference	Match Percentage	○
		Polarity Difference - Height		○
		Upside Down Component	Match Percentage	○
		Component Offset	Offset X	○
			Offset Y	○
			Component Skew	○
		Component Height		○
		Lifted Component	Component Tilt (0-180 deg.) Height	○
			Component Tilt (0-180 deg.) Angle	○
			Component Tilt (90-270 deg.) Height	○
			Component Tilt (90-270 deg.) Angle	○
			Lift (Ave. Height)	○
Electrode Window	Electrode Inspection	Electrode Offset	Side Overhang	○
			End Overhang	○
			Overlapping Ends	○
		Electrode Offset (mm)	Offset X	○
			Offset Y	○
			Component Skew	○
		Lead Posture	Lifted Electrode	●
			Coplanarity	●
			Electrode Protrusion	●
			Electrode Area	●
			Exposed Electrode Toe	●
			Electrode Dispersion	●
			Electrode Side Bend	●
		Electrode Posture (Oblique)	Electrode Height (Oblique)	●
			Exposed Electrode Toe (Oblique)	●
			Electrode Dispersion (Oblique)	●

Window Type	Inspection Item				Optimization
Land Window	Fillet Inspection	Joint Wetting Angle	Land Wetting	Center of Toe	●
				Both Ends of Toe	●
			Component Wetting	Center of End	●
				Both Ends of End	●
				Center of Side	●
				Both Ends of Side	●
			Fillet Height	Joint Height	●
				Maximum Height	●
			Fillet Length		●
			Fillet Joint Length	End Joint Width	●
				Side Joint Length	●
			Exposed Land		●
			Land Error		✗
			Foreign Material (Land)		○
			Land Exposure (Oblique)		●
			Inter-pin Solder Ball		✗
			Inter-in Solder Bridge		✗
Inspection Region Window			Solder Ball		✗
			Solder Bridge		✗
			Foreign Material		✗
			Solder Ball (Oblique)		✗
			Solder Bridge (Oblique)		✗

○:Optimization possible

●:Optimization possible (Optimization taking the Boolean expressions into consideration)

✗:Optimization impossible

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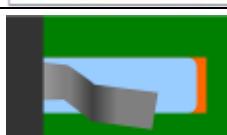
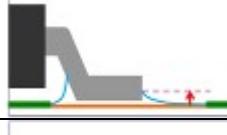
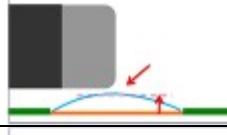
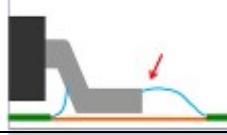
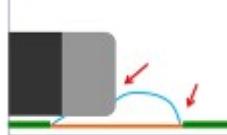
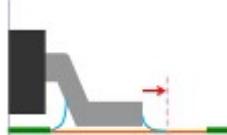
The logic expression allows a comprehensive evaluation for judgment through combination of the inspection result judgments for individual fillet and electrode posture inspection items, which can facilitate the reduction of false calls.

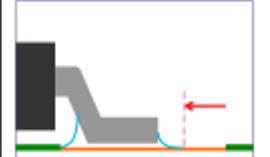
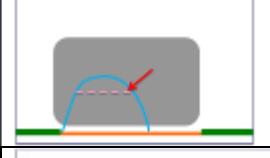
Inspection Items to Use a Boolean Expression

Land Window	Fillet Inspection	Wetting Angle	Land Wetting	Center
				Both Ends
			Electrode Wetting	Center Of Toe
				Both Ends Of Toe
				Center Of Side
		Fillet Height		Both Ends Of Side
			Joint Block Height	
			Maximum Height	
			Height (Designation)	
		Fillet Length		
Electrode Window	Electrode Inspection	Electrode Posture	Fillet Joint Width	End Joint Width
				Side Joint Length
			Exposed Land	
			Exposed Land (Oblique)	
			Lifted Electrode	
			Coplanarity	
			Electrode Protrusion	
			Electrode Area	
			Exposed Electrode Toe	
			Electrode Dispersion	

Select wettability inspection defined using multiple inspection items.

List of Inspection Names for Fault Image and Wettability Inspection

Fault Image	Inspection Name	Description
	Lifted Electrode	Judged faulty if the electrode lifts and its toe is higher.
	Electrode Protrusion	Judged faulty if the electrode bends upward and its diagonal length is longer.
	Electrode Vertical Bend	Judged faulty if the electrode bends upward or downward.
	Electrode Horizontal Bend	Judged faulty if the electrode bends in a horizontal direction.
	Electrode Wettability Height	Judged faulty if solder joint with the electrode is not sufficient.
	Electrode Wet	Judged as a fault if the solder wetting height is low and forms a flat surface around the electrode.
	Electrode Wet Convex	Judged faulty if solder forms a flat line in the proximity of the electrode.
	Solder Convex	Judged faulty if solder forms a convex shape between the solder tip and the electrode.
	Land Wettability Length	Judged faulty if solder does not spread sufficiently in the land length direction.

 A cross-sectional diagram showing a grey stepped land pad. A blue solder joint is visible on the right side, but there is a significant amount of exposed land surface above it. A red arrow points to the top edge of the land.	Exposed Land	Judged faulty if the solder wetting is insufficient.
 A cross-sectional diagram showing a grey rectangular electrode. A blue solder joint is on the left side, and the width of the solder joint is indicated by a red double-headed arrow. A red arrow points to the right edge of the electrode.	Electrode Wettability Width	Judged faulty if solder joint width with the electrode is not sufficient.
 A cross-sectional diagram showing a grey stepped land pad. A blue solder joint is on the right side, and the width of the solder joint is indicated by a red double-headed arrow. A red arrow points to the right edge of the land pad.	Electrode Side Wettability	Judged faulty if solder joint with the electrode sides is not sufficient.

The following shows the procedure to optimize the inspection criteria.

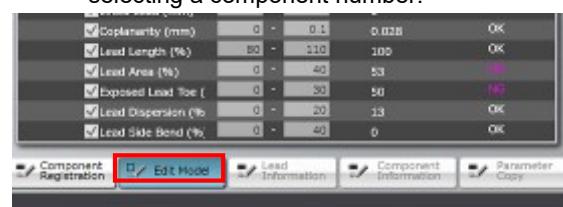
Operation▶

- Select the [Criteria Setting (Product No.)] tab.

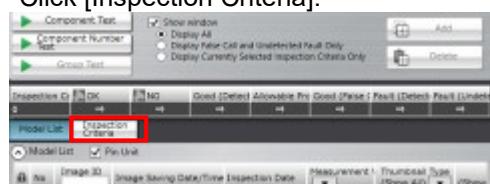


- Select a component number and click [Edit Model].

Refer to "2.6.1 Criteria Setting (Product No.)" for the procedure up to selecting a component number.

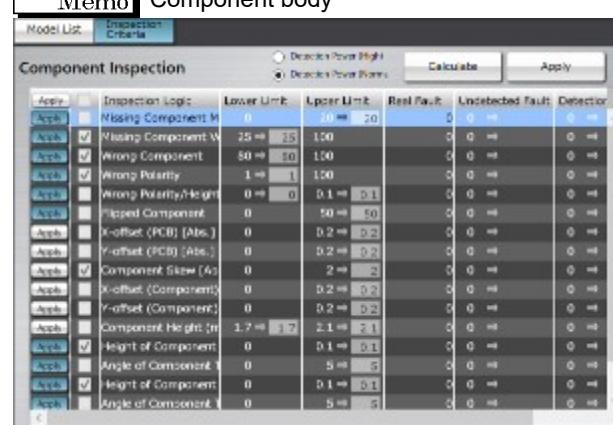


- Click [Inspection Criteria].

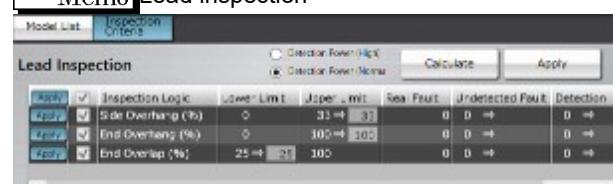


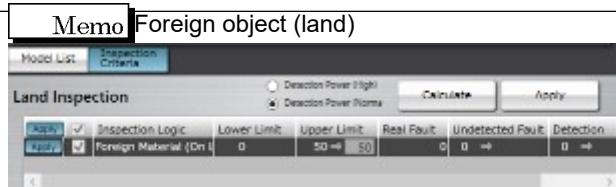
- The inspection criteria setting screen below is displayed according to the inspection criterion being selected.

Memo Component body



Memo Lead inspection





\*For wetting inspection , refer to the ● item of "Optimizable Inspection Items."

**Memo** Inspection is optimized to minimize false calls no matter which item is selected between "Detection Power (High)" and "Detection Power (Normal)." When the former is selected, inspection criteria become stricter if judgement is "Good" by a great margin. However, even if it is the case, inspection criteria do not become stricter when the latter is selected.

- By clicking [Calculate], the inspection reference value is set so that overlooking and false calls are minimized from the distribution of measured values.

**Memo** The items about which inspection criteria or the number of detected errors has been changed are highlighted.

Lead Protrusion      Lead Length (%)      Both Ends (°)      Exposed Lead Toe      0 => **1** => **0**

**Memo** Judgement results (OK/NG) are only displayed after PCB testing.



① The setting list of component inspection, electrode inspection, land inspection, and wettability error inspection are displayed.

Apply: If the [Apply] toggle button is ON, clicking the [Apply] button reflects the change.

Checkbox: Specify ON/OFF of inspection item.

Inspection Logic: Displays inspection item name.

Lower Limit/Upper Limit: Specify inspection setting values.

Real Fault: Displays the number of real faults registered in this inspection item.

Undetected Fault: Displays the number of the real faults which were registered with this inspection item and undetected.

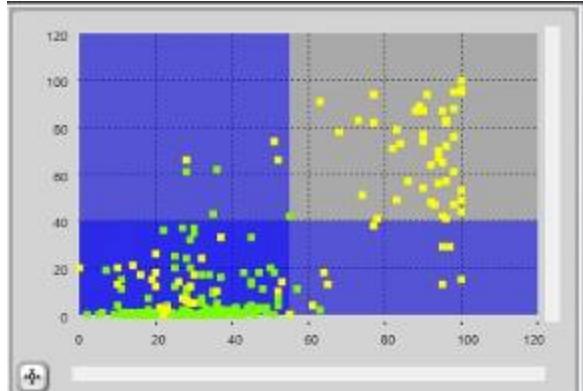
Detection: Displays the number of the real faults which were registered with this inspection item and detected.

False call: Displays the number of the OK products which were registered with this inspection item and detected as faults by mistake.

\*By switching the inspection criteria, the inspection criteria displayed on the optimization screen are also changed.

- ② A histogram is displayed.

**Memo** A scattered chart is displayed if a Boolean expression is selected.



**Memo** Use the combo box to switch between X and Y axes of the scatter chart.

X-Axis	x1.00	Setting 2 (%)	0 - 50
Y-Axis	x1.00	<input checked="" type="checkbox"/>	Setting 1 (%)

**Memo** Selecting/unselecting the check box switches between targets to show/hide in the scatter chart.

<input checked="" type="checkbox"/> Good (Detected) 0	<input checked="" type="checkbox"/> Fault (Detected) 0
<input checked="" type="checkbox"/> Allowable Product 0	<input checked="" type="checkbox"/> Fault (Undetected) 0
<input checked="" type="checkbox"/> Good (False Call) 0	

6. By clicking [Apply], the criteria of the inspection items with which the [Apply] toggle button is enabled are updated.

**Memo** If the inspection criteria have been changed manually, the numerical values are updated by clicking the [Update Result] button.

7. Click [Close] to exit the inspection criteria setting screen.

## 2.16.5 Registering Visual Check Results

Visual check results can be registered for each window of model images.

Visual check items that can be registered

Window	Item	S500 /S720	S720A	S530	S730/S730-H
Component Body Window	Missing Component	Yes	Yes	Yes	Yes
	Wrong Component	Yes	Yes	Yes	Yes
	Wrong Polarity	Yes	Yes	Yes	Yes
	Flipped Component	Yes	Yes	Yes	Yes
	X-offset (PCB)	Yes	Yes	Yes	Yes
	Y-offset (PCB)	Yes	Yes	Yes	Yes
	Component Skew	Yes	Yes	Yes	Yes
	Component Height High			Yes	Yes
	Component Height Low			Yes	Yes
	Distance Error	Yes	Yes	Yes	Yes
	Component Tilt (0-180 deg.)			Yes	Yes
	Component Tilt (90-270 deg.)			Yes	Yes
	Component Parallel Lift			Yes	Yes
	X-offset (Component)	Yes	Yes	Yes	Yes
	Y-offset (Component)	Yes	Yes	Yes	Yes
	Wrong Component (OCR)	Yes	Yes	Yes	Yes
Electrode Window	Wetting Error	Yes	Yes	Yes	Yes
	Side Overhang	Yes	Yes	Yes	Yes
	End Overhang	Yes	Yes	Yes	Yes
	End Overlap	Yes	Yes	Yes	Yes
	Lead Posture (Length)	Yes	Yes	Yes	Yes
	Lead Posture (Area)	Yes	Yes	Yes	Yes
	Lead Posture (Exposure)	Yes	Yes	Yes	Yes
	Lead Offset X	Yes	Yes	Yes	Yes
	Lead Offset Y	Yes	Yes	Yes	Yes
	Lead Component Skew	Yes	Yes	Yes	Yes
	Lead Absence (Area)	Yes	Yes	Yes	Yes
	Lead Absence (Center of Gravity)	Yes	Yes	Yes	Yes
	Lead Absence (Dispersion)	Yes	Yes	Yes	Yes
	Lead Bend	Yes	Yes	Yes	Yes
	Lead Posture (Dispersion)	Yes	Yes	Yes	Yes
	Lead Posture (Side Bend)	Yes	Yes	Yes	Yes
	Lead Posture (Oblique)		Yes		Yes
	Lifted Lead			Yes	Yes
	Lead Posture (Coplanarity)			Yes	Yes
	Lead Height High			Yes	Yes
	Lead Height Low			Yes	Yes
	Lead Posture (Exposure (Oblique))		Yes		Yes
	Lead Posture (Dispersion (Oblique))		Yes		Yes
	Side Overhang (Oblique)		Yes		Yes
	End Overhang (Oblique)		Yes		Yes
	End Overlap (Oblique)		Yes		Yes
	Lead Area (Oblique)		Yes		Yes

Land Window	Wetting Error	Yes	Yes	Yes	Yes
	Exposed Land	Yes	Yes	Yes	Yes
	Land Error	Yes	Yes	Yes	Yes
	Foreign Material (On Land)	Yes	Yes	Yes	Yes
	Exposed Land (Oblique)		Yes		Yes
	Land Error (Oblique)		Yes		Yes
	Solder Ball (Inter-Pin)	Yes	Yes	Yes	Yes
	Solder Bridge (Inter-Pin)	Yes	Yes	Yes	Yes
Inspection Range Window	Solder Ball	Yes	Yes	Yes	Yes
	Solder Bridge	Yes	Yes	Yes	Yes
	Foreign Material (Around Component)	Yes	Yes	Yes	Yes
	Solder Ball (Oblique)		Yes		Yes
	Solder Bridge (Oblique)		Yes		Yes
All window	Allowable	Yes	Yes	Yes	Yes

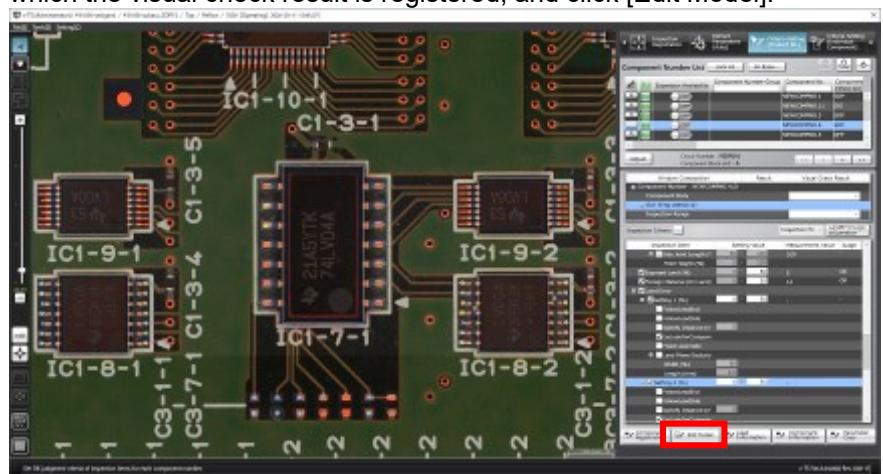
**Memo** Wetting Error shows the result of Boolean expressions set in the [Detailed Settings].

For the setting procedure, refer to "2.16.4 Optimizing Boolean Expressions and Inspection Criterion Values."

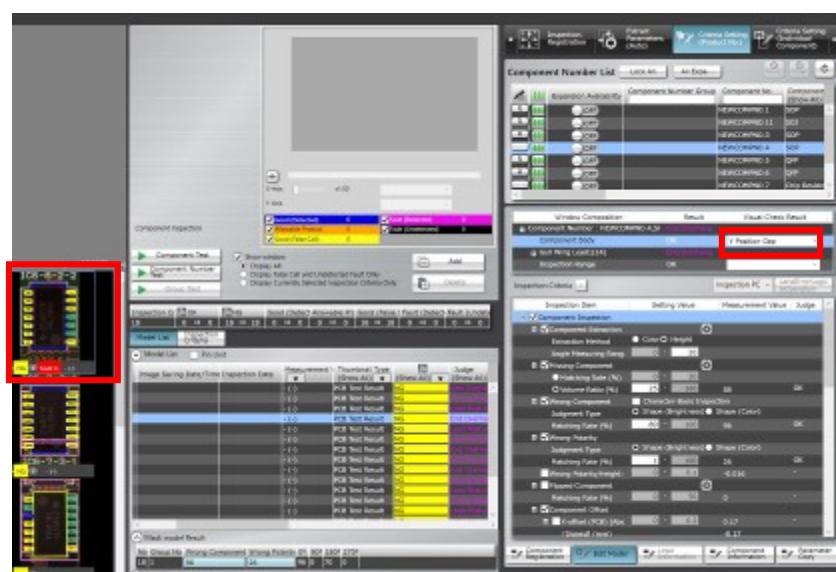
Operation▶ 1. Select the [Criteria Setting (Component Number)] tab.



2. In the component number list, select the component number for which the visual check result is registered, and click [Edit Model].



3. In the component thumbnail Image list, select the thumbnail for which the visual check result is to be entered, and select the visual check result in the pull-down menu of the visual check results in the Window composition. When multiple windows are selected, the same visual check result is entered for the selected windows of the same type.



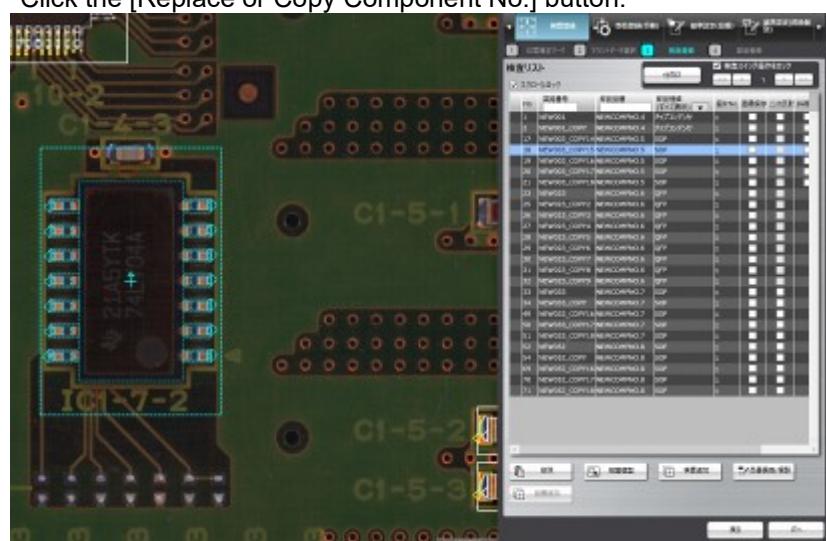
4. Repeat Step 3 if you want to continue entering the visual check result in other thumbnail.

## 2.16.6 Replacing the Component Number

The component number can be replaced.

### Operation▶

1. Select the [Inspection Registration] tab.
2. Select the desired circuit of the component number to be replaced.
3. Click the [Replace or Copy Component No.] button.

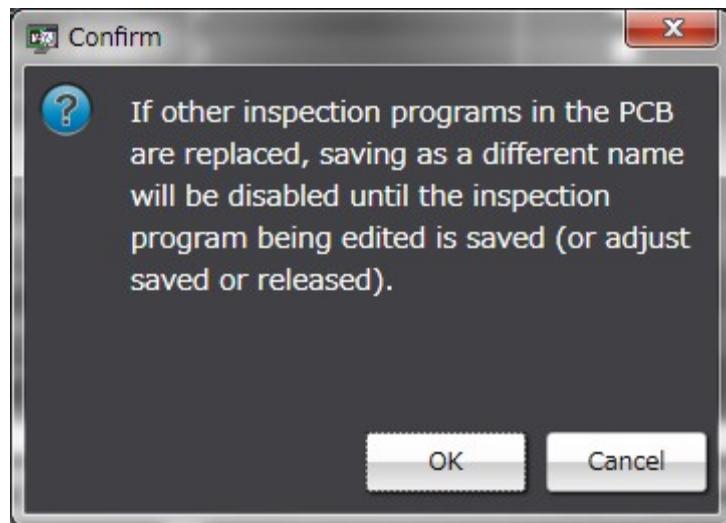


4. To replace to other component number, go to step 5. To copy the selected component number to replace as other component number, go to step 10.



5. Select [Replace the selected component number to another one.] radio button.
6. Select a component number from the component number list as the replacement target.
7. When only replacing the selected circuit, clear the check box [Replace all the circuits same as the selected component No. included in the inspection program.]. When replacing all other inspection programs within the PCB, select the check box [Replace all other inspection programs in the PCB as well.].
8. Click [Execute Replacement].

- 
9. The confirmation dialog appears only when the check box [Replace all other inspection programs in the PCB as well.] is selected. Click [OK] if there is no problem.



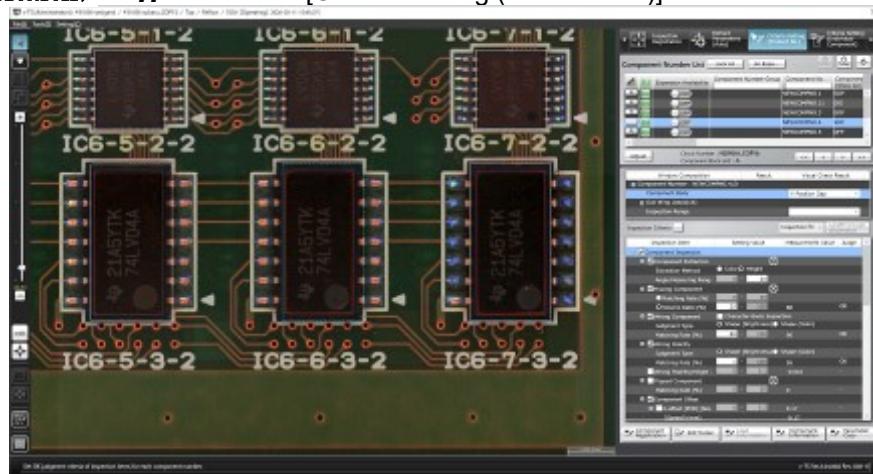
10. Select [Copy the selected circuit component number and replace it as another component number.] radio button.
11. The component number list shows the component number as original component number name + COPY.
12. Change the component number name as you wish if necessary. If the content has no problem, select a component number and click [Copy and Replace].

## 2.16.7 Changing the Component No. Name

The component number name can be changed.

**Memo** After the component number has been changed, the lock cannot be unlocked until the inspection program is saved.

||Operation▶ 1. Select the [Criteria Setting (Product No.)] tab.



2. After the component number to which you want to change the name is locked, double click [Component No]. The [Component No. Entry] dialog is displayed.



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3. Change the name to the new one.

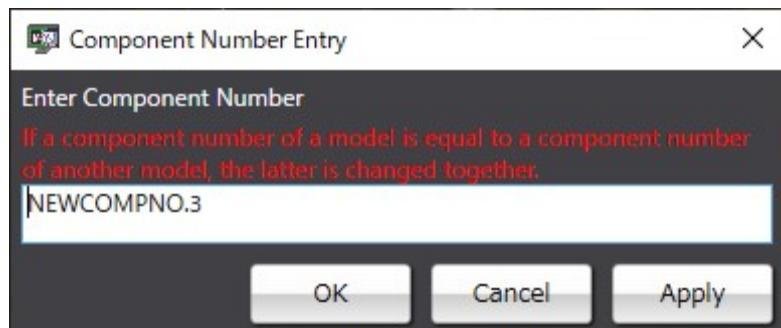
By clicking the text box, text can be entered.

[OK]: When clicked, the edited content is applied and the dialog is closed.

[Cancel]: When clicked, the edited content is discarded and the dialog is closed.

[Apply]: When clicked, the edited content is applied and the dialog is left open.

[Component No.][Component No. Group]: By selecting the component number, description on the component number can be entered. By selecting the component number group, description on the component number group can be entered.



**Memo** You can switch the selected component number on the component number list as keeping the [Component No. Entry] dialog open.

## 2.16.8 Setting up Destination

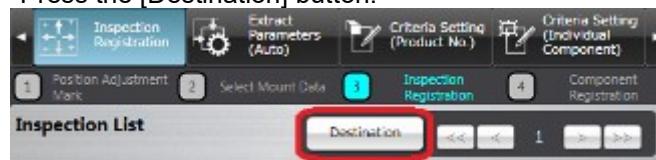
It is able to set up destination on the inspection program being edited.

**Memo** Execution result can be confirmed for each destination setting.  
Refer to Section 2.8.1 "Testing Using PCBs".

Operation▶

1. On the [Register Inspection] tab, click the [Next] button.

2. Press the [Destination] button.



3. By clicking the [Add] button, the destination can be added. In addition, by checking the checkbox of a destination on the destination list screen and clicking [Copy], the selected destination is copied.

Destination List			
No	Window Display	Destination Name	Comment
11	●	Shimuke Master	
20	●	Shimuke Asia	for Asia
23	●	Shimuke Euro	
26	●	Shimuke Ameria	

**Memo** The numbers on the destination list correspond to the numbers of headers of destinations on the inspection list.



4. By double-clicking a destination name on the [Destination Name] column, the name can be changed or set up. In addition, by double-clicking the [Comment] column, a comment can be entered.

Destination List			
No	Window Display	Destination Name	Comment
1	●	User-Test	
2	●	User-Test_COPY	
3	●	User-Test_sample	

5. Register destination for the necessary number by performing steps 3 and 4 above repeatedly.
6. Unnecessary destinations can be deleted by checking their checkboxes and clicking [Delete].

7. Only the effective components out of the destination components whose radio button on the window display column is ON are displayed.

No	Window Display	Destination Name	Comment
11	<input checked="" type="radio"/>	Shimuke Master	
20	<input type="radio"/>	Shimuke Asia	for Asia
23	<input type="radio"/>	Shimuke Euro	
26	<input type="radio"/>	Shimuke Ameria	

8. Press the [Close] button to return to the [Register Inspection] screen.

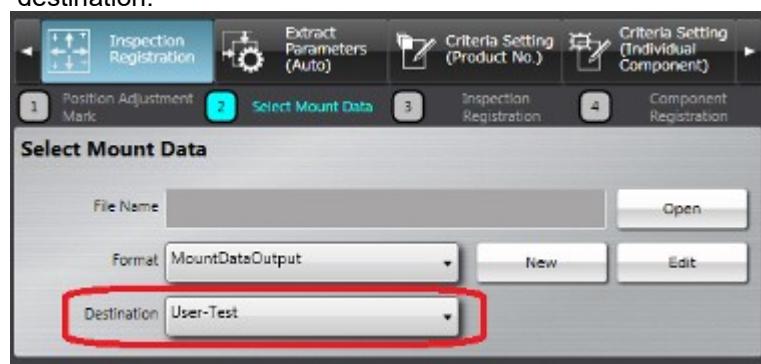
According to the mount data you have, set up destination on each component number or circuit by one of the following two methods.

Method 1: When there is mount data covering the circuits and component numbers for all destinations:

By this procedure, a master destination data including all circuits and component numbers is created. Then, each component number and circuit included in each destination is set up.

Operation▶

1. Press the [Return] button to return to the [Select Mount Data] screen.
2. Click the [Destination] pull-down menu to select a master destination.



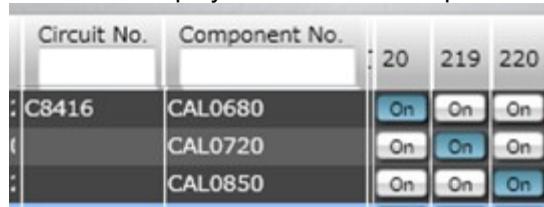
3. Read in the mount data to position it.

- 4.** When the [Next] button is clicked, software operates as follows:  
If the component is included in the mount data, the [ON] button is set ON for the component number included in each destination on the list. If the component is not included in the mount data, the [ON] button is set OFF.



The screenshot shows a software interface titled '検査リスト'. It displays a table with columns for 'No.', '回路番号' (Circuit No.), '部品品番' (Component No.), and 10 destination columns labeled 20 through 227. The '部品品番' column contains component numbers like CON25, CON254, and N1101. The destination columns contain 'On' or 'Off' status indicators for each component across the destinations.

- 5.** To add component numbers to a circuit manually as a destination, select the target circuit, and click [Add Component Number]. For the component numbers with the same circuit number, the circuit number is displayed for the first component number only.



The screenshot shows a software interface with a table. The columns are 'Circuit No.' and 'Component No.'. The 'Circuit No.' column has entries C8416 and three empty rows. The 'Component No.' column has entries CAL0680, CAL0720, and CAL0850. Below the table, there are three sets of buttons labeled 20, 219, and 220, each with 'On' or 'Off' status indicators.

Method 2: When there is mount data for each destination:

By this procedure, mount data corresponding to each destination is read in. Then, circuits and component numbers are set up.

Operation▶

- 1.** Press the [Return] button to return to the [Select Mount Data] screen.
- 2.** Click the [Destination] pull-down menu to select [New].



- 3.** Read in the mount data to position it.
- 4.** Execute steps 2 and 3 repeatedly for the number of necessary destinations.

## 2.16.9 Confirming Product Number History

The change history of product number can be confirmed.

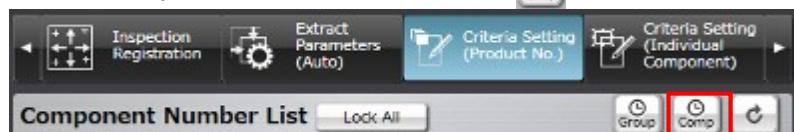
\* Please note that difference is detected from an item which has not been edited because of addition of inspection items or settings, conversion of inspection criteria, change of data structure, correction of problems.

**Memo** Up to ten past records are displayed as change history.

Operation▶ 1. Select the [Criteria Setting (Product No.)] tab.



2. Select a component number, and click the button.



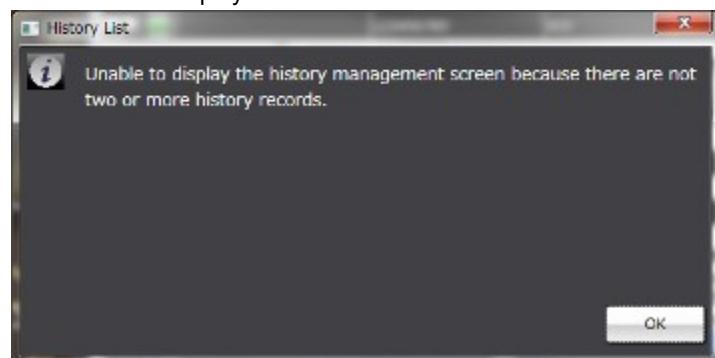
**Memo** If is active (locked state), click to unlock the component number (unlocked state).

**Memo** If model editing is in progress, close the model editing screen.

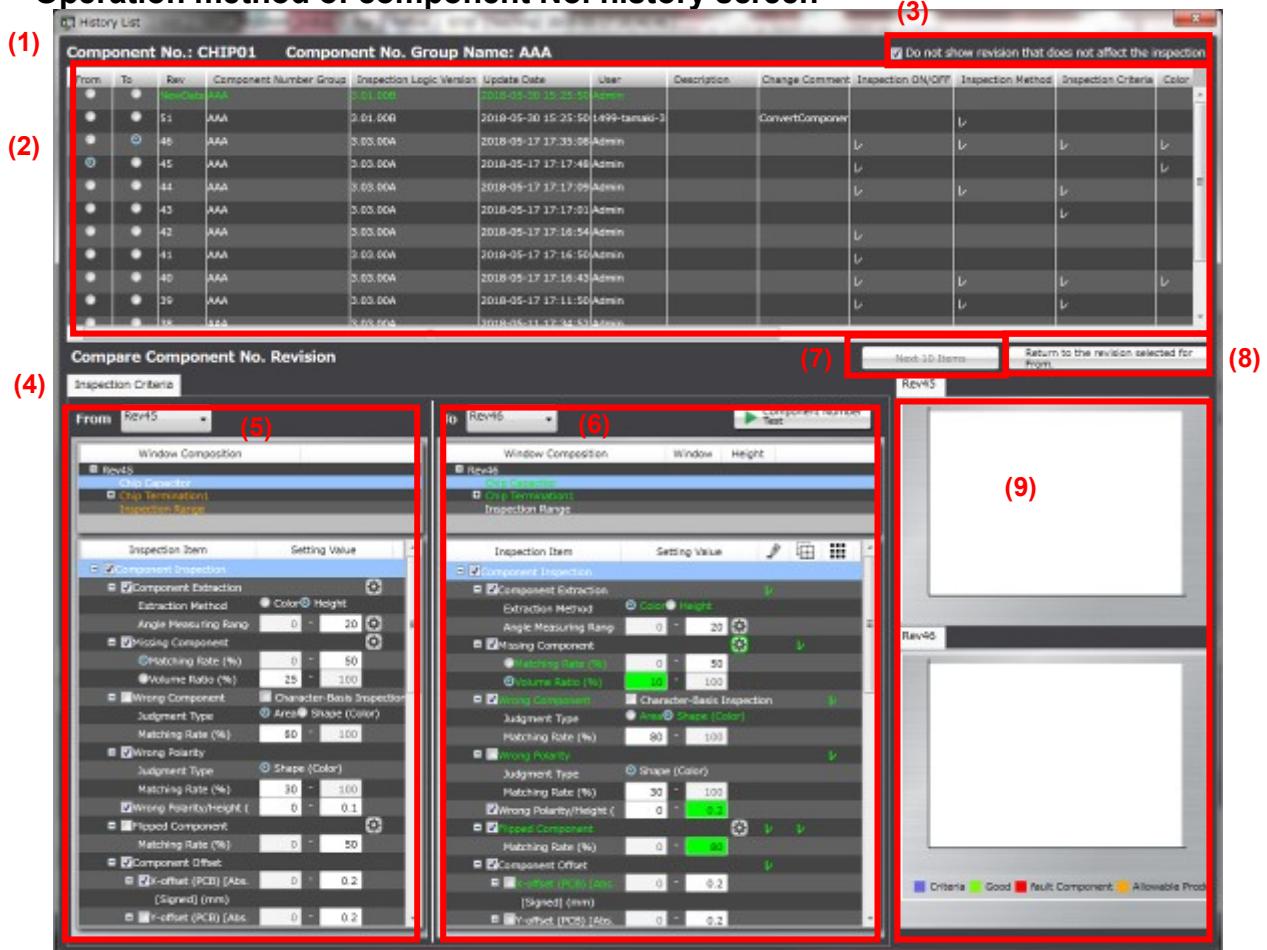
1. The component number history screen is displayed.

The operation method of this screen is described on the next page.

**Memo** If there are less than two change records, the component number history screen is not displayed but the following dialog is displayed.



## ■ Operation method of component No. history screen



(1) The component number and component number group are displayed.

**Memo** If the component number does not belong to any component number group, no group is displayed.

(2) A list of component number change history is displayed.

From	To	Rev	Component Number Group	Inspection Logic Version	Update Date	User	Description	Change Comment	Inspection ON/OFF	Inspection Method	Inspection Criteria	Color
		NewData	AAA	3.01.006	2018-05-30 15:25:50	Admin		ConvertComponent	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		31	AAA	3.03.006	2018-05-17 17:38:06	Admin			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		46	AAA	3.03.004	2018-05-17 17:17:48	Admin			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		45	AAA	3.03.004	2018-05-17 17:17:09	Admin			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		44	AAA	3.03.004	2018-05-17 17:17:01	Admin			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		43	AAA	3.03.004	2018-05-17 17:17:01	Admin			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		42	AAA	3.03.004	2018-05-17 17:16:54	Admin			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		41	AAA	3.03.004	2018-05-17 17:16:50	Admin			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		40	AAA	3.03.004	2018-05-17 17:16:45	Admin			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		39	AAA	3.03.004	2018-05-17 17:11:50	Admin			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		38	AAA	3.03.004	2018-05-11 17:17:47	Admin			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

[From] and [To]: Select the revision displayed on the [Compare Component No. Revision] window.

[Rev]: The revision number in the component number change history is displayed.

[Component Number Group]: The component No. group is displayed.

[Inspection Logic Version]: The inspection logic version is displayed.

[Update Date]: The update date & time is displayed.

[User]: The name of the user who updated the component number is displayed.

[Description of Component No.]: Description on the component number is displayed.

[Change Details]: Comment on the component number (change details etc.) is displayed.

[Inspection ON/OFF]: A check mark is displayed when it has been changed if the inspection criteria is effective or not.

[Inspection Method]: A check mark is displayed if the extraction or inspection method of inspection criteria has been changed.

[Inspection Criteria]: A check mark is displayed if a value of the inspection criteria has been changed.

[Color Parameter]: A check mark is displayed if a color parameter has been changed.

[Inspection Area]: A check mark is displayed if the inspection area has been changed.

[Mask Model]: A check mark is displayed if the mask model has been changed.

[Component Shape]: A check mark is displayed if the component shape has been changed.

[Height Imaging Setup]: A check mark is displayed if the imaging information has been changed.

[Image]: A check mark is displayed if the image has been changed.

[Other]: A check mark is displayed if information not influencing inspection has been changed.

[Software Ver]: The software version is displayed.

**Memo** If any revision is in editing, it is displayed at the top of the list. "NewData" is displayed in the Rev column.

**Memo** If [Use Deployment ON/OFF Setting Function] of system settings is set ON, [Deployment ON/OFF] is displayed.

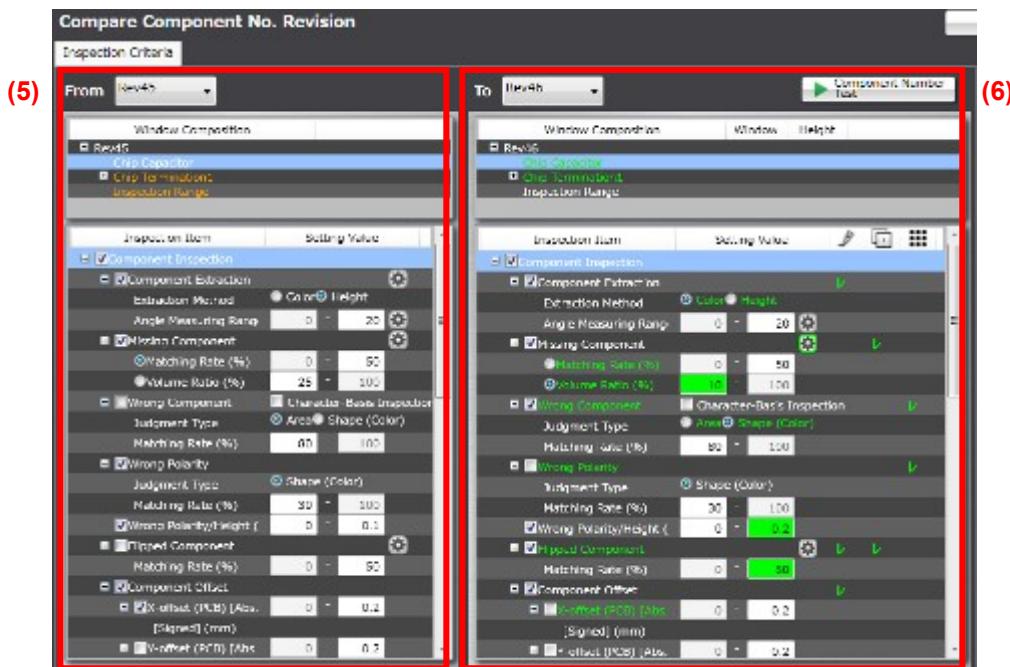
 For the deployment ON/OFF setting function, refer to Section 3.6.3 "Making Component No. Settings."

From	To	Rev	Component Number Group	Expansion Availability	Inspection Logic Version	Update Date
		NewData	DDD	<input checked="" type="radio"/> OFF	3.01.006	2018-05-26
		27	DDD	<input checked="" type="radio"/> ON	3.01.006	2018-05-26
		26	DDD	<input checked="" type="radio"/> ON	3.01.006	2018-05-26

(3) By checking the [Hide the revisions not influencing inspection] check box, the revision history records of the revisions not influencing inspection (the revisions with a check mark on the [Other] column only) are hidden. By unchecking this check box, the revision history records of all revisions are displayed.

- (4) Displays the comparison result of component number revisions.

[Inspection Criteria] tab: Displays the comparison result of inspection criteria.



- (5) The inspection criteria before change (From) is displayed.

Difference from the revision after change is displayed in orange color.

The revision displayed can be switched in the combo box.

**Memo** Any revision equal to or newer than the revision after change (To) cannot be selected.

- (6) The inspection criteria after change (To) is displayed.

Difference from the revision before change is displayed in green.

The revision displayed can be switched in the combo box.

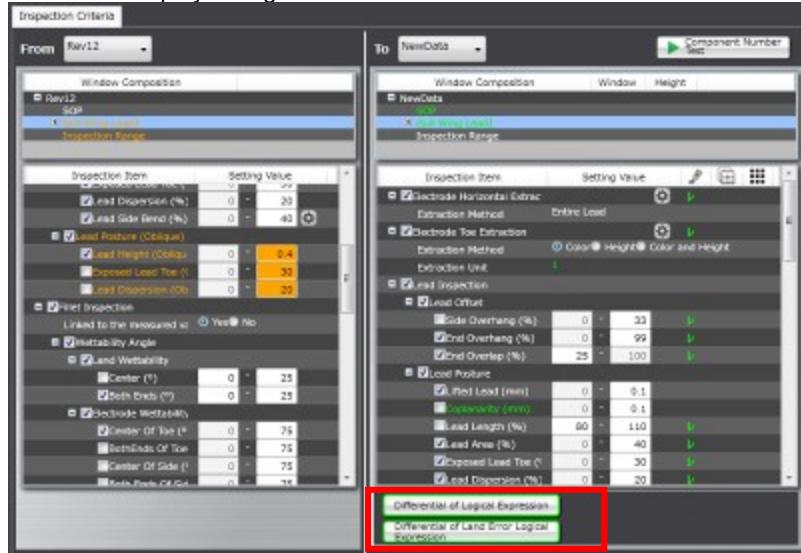
**Memo** Any revision equal to or older than the revision before change (From) cannot be selected.

**Memo** A component number test of the selected revision can be performed by pressing the "Component Number Test" button.

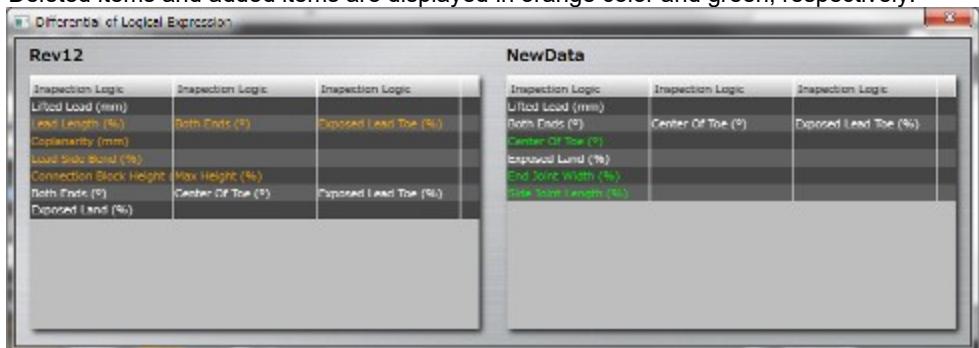
This button is enabled when the rollback to each revision selected with Before Change (From) and After Change (To) is possible. For the conditions, refer to (7).

When a component number test is performed, the measured value of the criteria being selected is displayed on the histogram (9).

**Memo** If an electrode group is being selected, the [Difference of Logical Expression] button and [Difference of Land Error Logical Expression] button are displayed in the lower area of After Change (To). If there is a difference from the revision before change (From), these items are displayed in green.



**Memo** The Difference of Logical Expression screen is displayed by pressing [Difference of Logical Expression] button.  
Deleted items and added items are displayed in orange color and green, respectively.



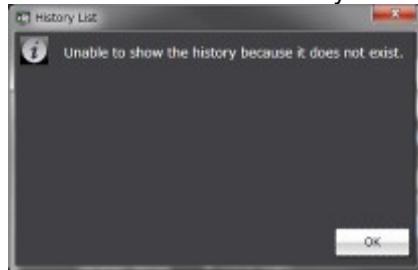
**Memo** The Difference of Land Error Logical Expression screen is displayed by pressing the [Difference of Land Error Logical Expression] button.  
Deleted items and added/changed items are displayed in orange color and green, respectively.



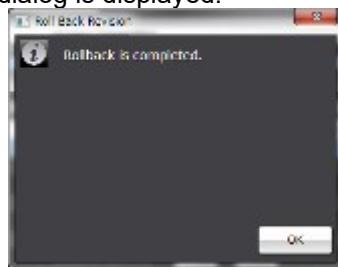
- (7) By pressing [Next 10 Records] button, additional 10 records of revision history are displayed.

If the [Hide the revisions not influencing inspection] check box is set ON, ten records of only the revision history influencing inspection are obtained and displayed.

If no record of revision history can be obtained, the following dialog is displayed.



- (8) The inspection program can be rolled back to the revision before change (From) by pressing the [Return to the revision selected as From] button. If this rollback succeeds, the following dialog is displayed.



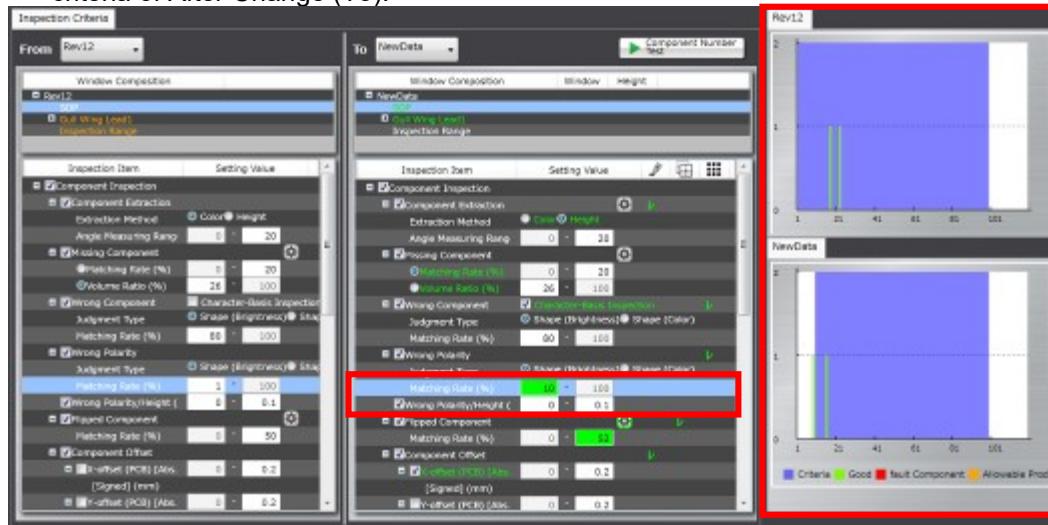
**Memo** If rolling back to the revision before the following change is made, a confirmation dialog is displayed. By clicking [OK] on the confirmation dialog, rollback is executed. By clicking [Cancel], rollback is cancelled.

- Component type is changed.
- Component size is changed beyond the allowable range specified in the setting file.
- Electrode type is changed.
- The configuration of an electrode group is changed.
- The number of electrodes per electrode angle is changed.
- The mask model no longer exists after rollback is executed because of deletion of the model which was used as a mask model.

**Memo** It is not impossible to roll back to the revision which has not been completed yet.

(9) The result of the component number test can be displayed on histogram.

The display of the histogram can be switched by changing the selection of the inspection criteria of After Change (To).



## 2.16.10 Confirming Revision History of Component No. Group

The revision history of product number group can be confirmed.

\* Please note that difference is detected from an item which has not been edited because of addition of inspection items or settings, conversion of inspection criteria, change of data structure, correction of problems.

- Operation▶ 1. Select the [Criteria Setting (Product No.)] tab.



2. Select a component number belonging to the component No. group, and click the button.



**Memo** If is active (locked state), click to unlock the component number (unlocked state).

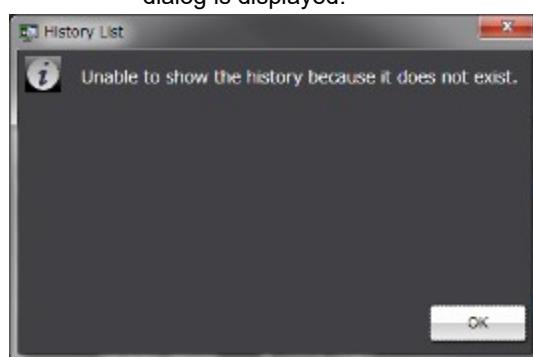
**Memo** If model editing is in progress, close the model editing screen.

**Memo** If a component number not belonging to a component number group is selected, it is unable to press the .

3. The component number group history screen is displayed.

The operation method of this screen is described on the next page.

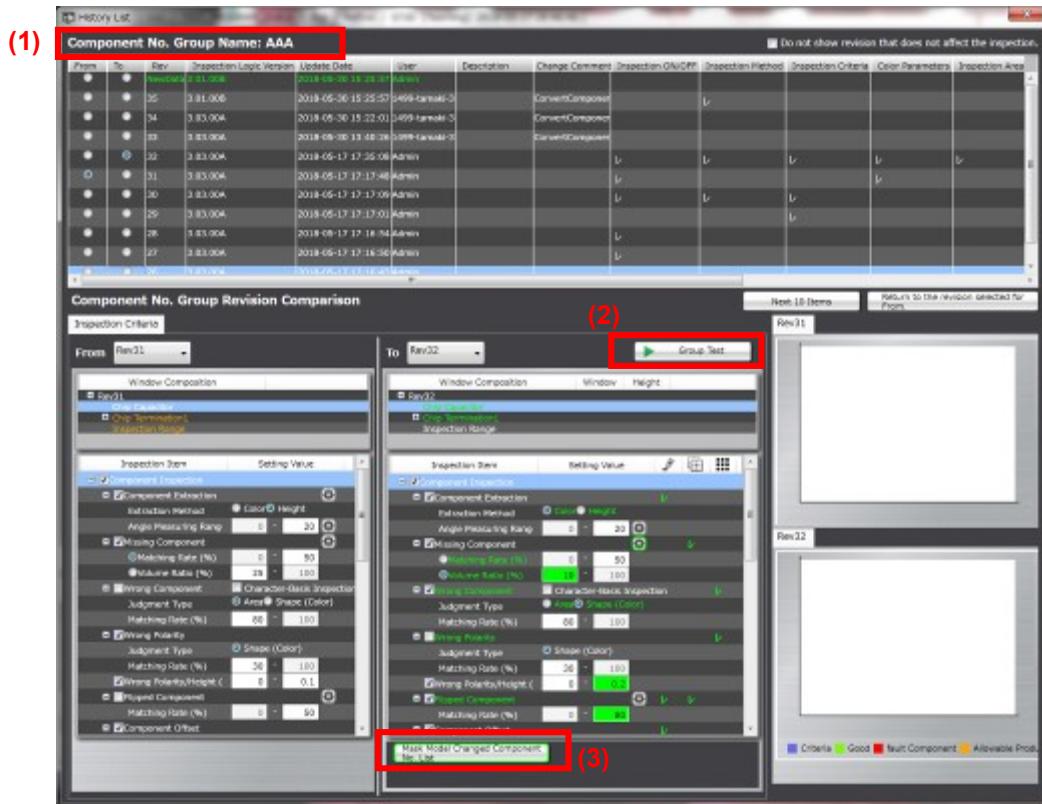
**Memo** If there are less than two change records, the component number group history screen is not displayed but the following dialog is displayed.



## ■ Operation method of component No. group history screen

 The basic operation method is the same as that of the component number history screen. (Refer to "Confirming Product Number History.")

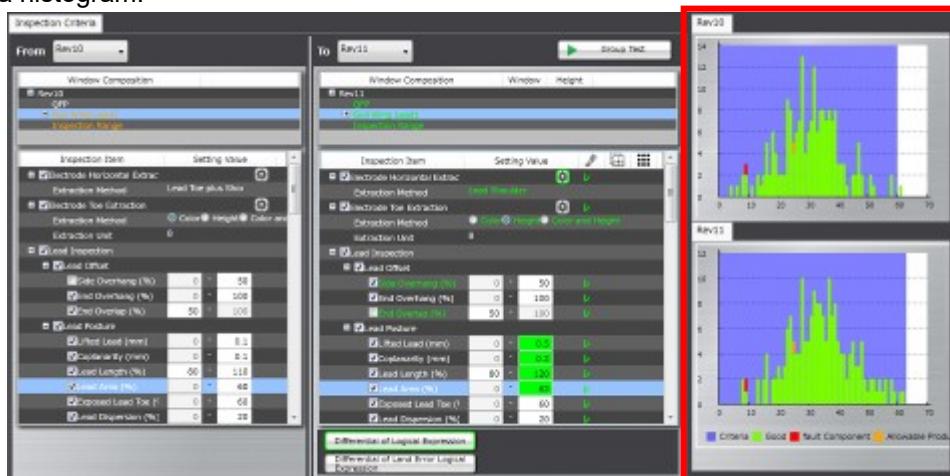
This section describes the function specific to the component number group history screen.



(1) The component number group name is displayed.

(2) The group test is implemented.

After this test is implemented, the measured values of the selected criteria are displayed as a histogram.



(3) By pressing the [Mask Model Changed Component No. List] button, the mask model changed component No. list screen is displayed.

If there is a difference from the revision before the change (From), this screen is displayed in green.

On this screen, the component numbers whose mask model has been changed are listed out of the component numbers belonging to the selected component number group.

A list of affiliated component numbers whose mask model was changed by upgrading from Rev10 to NewData						
Component No. Name	Component No. Rev.	Group Rev.	Wrong Comp.	Wrong Polarity	OCR	Number of M
QFP02	NewData	NewData	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
QFP01	26	13	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
QFP01	25	12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
QFP02	24	12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2

[Component No. Name]: The name of the component number is displayed.

[Component No. Rev.]: The revision of the component number when the mask model was changed is displayed.

[Group Rev.]: The revision of the component number group when the mask model was changed is displayed.

[Wrong Component]: If the mask of wrong component has been changed, a check mark is displayed.

[Wrong Polarity]: If the mask of wrong polarity has been changed, a check mark is displayed.

[OCR]: If the mask of OCR has been changed, a check mark is displayed.

[No. of Mask Models]: The number of the mask models registered in the component number is displayed.

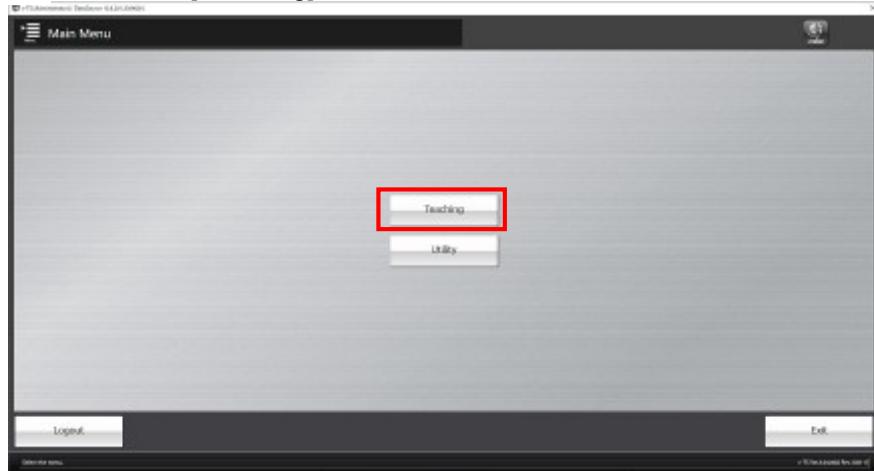
**Memo** If there is no component number whose mask model has been changed, it is unable to press the [Mask Model Changed Component No. List] button.

# 2.17 Managing PCB Images

The PCB Image Management screen is provided for the deletion of PCB images and model editing of position correction colors, solder colors, solder ball colors, solder bridge colors, land exposure colors, fillet exclusion colors, and PCB colors.

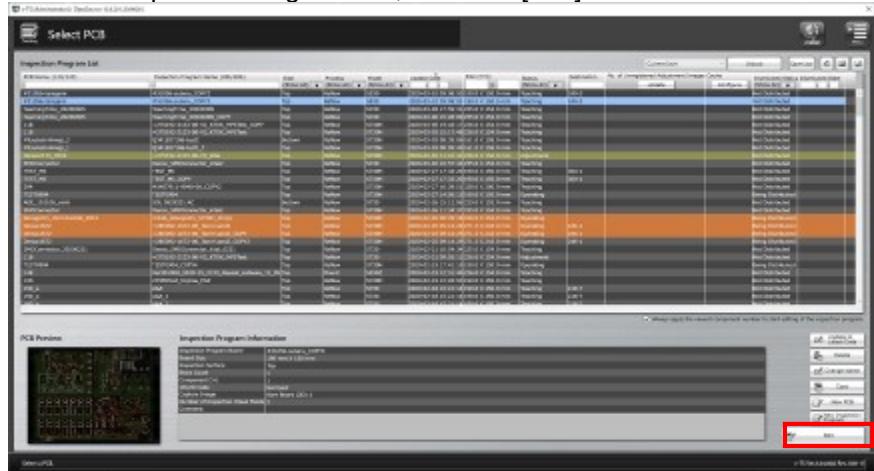
## 2.17.1 Accessing the PCB Image Management Screen

Operation▶ 1. Click [Teaching] in the Main menu.

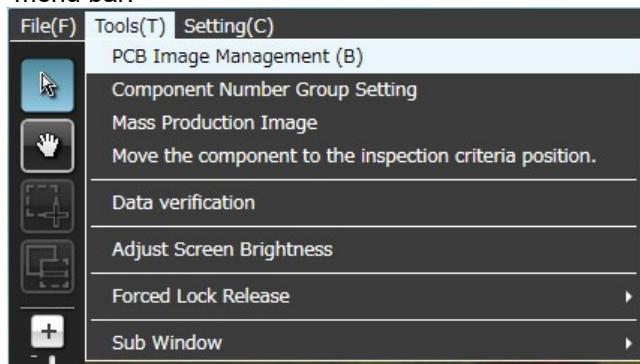


2. The Select PCB screen appears.

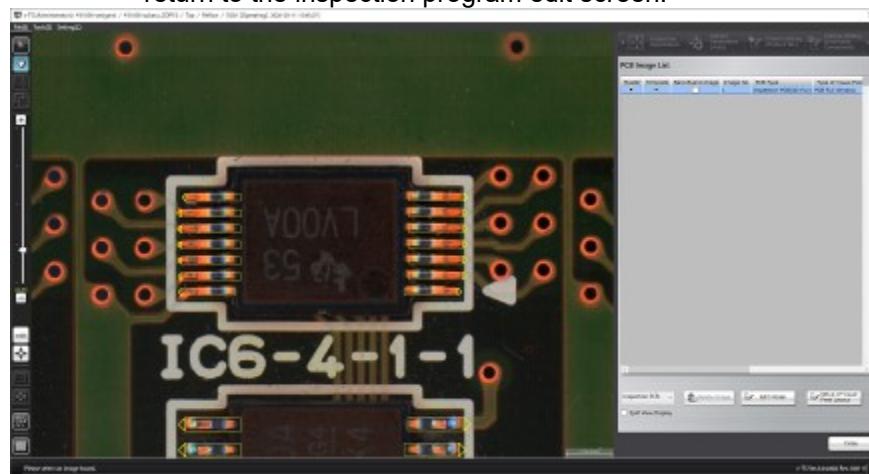
Select the inspection program to manage the images in the Inspection Program List, and click [Edit].



3. Select [Tool] - [PCB Image Management] in the editing screen menu bar.



The PCB Image Management screen is displayed.  
Click [Close] to close the PCB image management screen and return to the inspection program edit screen.



Master	Template	Bare Board Image	Image No.	PCB Type	Type of Visual
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	1	Inspection PCB(3D Full)	PCB Full Window
<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	9001	Adjusted Image (Oblique3D)	Component Periphery
<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	9002	Adjusted Image (Oblique3D)	Component Periphery

■ Master

Select a PCB image displayed on the canvas.

■ Template

Select a PCB image used as a template.

■ Bare Board Image

If the actually captured PCB image is a bare board, check this check box. Otherwise, uncheck this check box.

■ Image No.

Image numbers are displayed.

■ PCB Type

PCB types are displayed.

The PCB type of adjustment image varies depending on the details of inspection NG.

Condition 1	Condition 2	PCB type
Position correction mark NG	3D information N/A	Position correction NG
	3D information available	Position correction NG (3D)
Bad mark detection	3D information N/A	Bad mark detection
	3D information available	Bad mark detection (3D)
Whole surface foreign material NG detection	3D information N/A	Foreign material image
	3D information available	Foreign material image (3D)
Other inspection NG	3D information N/A	Inspection NG
	3D information available	Inspection NG (3D)

■ Type of Visual Field Layout

Visual field assignment types are displayed.

- Inspection PCB: whole surface of PCB
- Adjustment image: visual field assignment type in adjustment inspection (PCB whole surface or component periphery)

■ Inspection Machine

Inspection machine names are displayed.

■ Capturing Date

The date and time at which the image was captured is displayed.

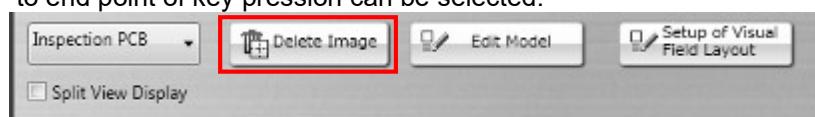
## 2.17.2 Deleting a PCB Image

This section explains the procedure to delete bare PCB and inspection PCB images, which are not required for teaching.

- ||Operation▶ 1. Select the image type (bare PCB image or inspection PCB image) to display in the PCB Image Management screen from the list.



2. Click to select the image to delete in the Board Image List, and click [Delete Image]. More than one images can be selected. The method to select them is as follows:
- 1) Ctrl Key + Select an image: Selection of the image corresponding to the key press can be set ON/OFF.
  - 2) Shift Key + Select an image: The entire area from the start point to end point of key press can be selected.



**Memo** All the images can also be selected by pressing Ctrl Key + A Key. However, it is necessary to leave at least one image in the raw board list and the inspection PCB list from the PCB image list, respectively. If only one image is left in the raw board list or the inspection PCB list from the PCB image list, the [Delete Image] button is not enabled.

3. The deletion confirmation dialog appears. Click [OK].

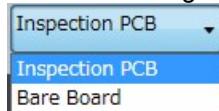


• Click [Cancel] to return to the PCB image management screen without deleting the PCB image.

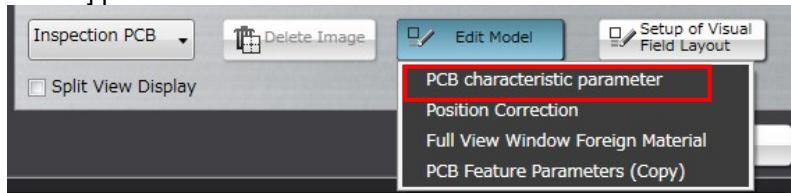
### 2.17.3 Editing Models by the Unit of PCB

This section describes a procedure to edit the model on a per PCB basis.

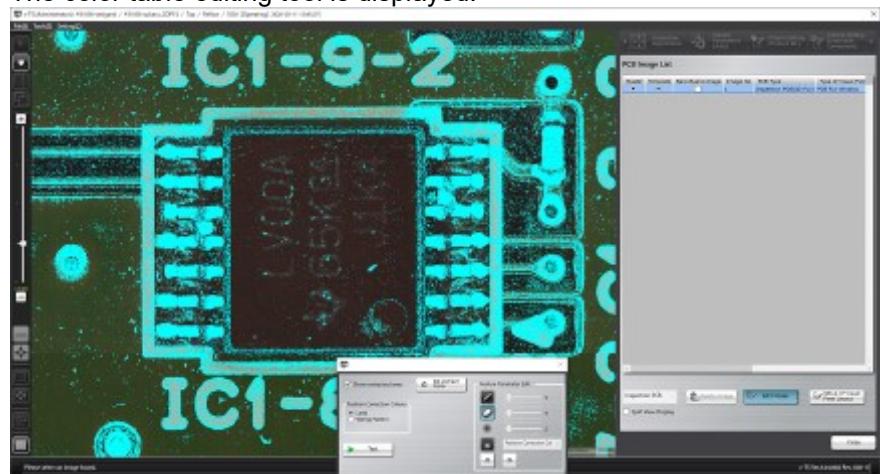
- Operation▶ 1. Select "Inspection PCB" in the PCB Image Management screen if the Board Image List contains bare board images.



2. Select an inspection PCB image to edit from the PCB image list by clicking. Then, click [PCB Characteristic Parameters] on the [Edit Model] pull-down menu.



The color table editing tool is displayed.



3. Select the characteristic parameter to edit from the options: Position Adjustment Color, Solder Color, Solder Ball Color, Solder Bridge Color, Solder Bridge Color (Lead Shoulder), Exposed Land Color, Land Color(Fillet-Excluded Colors), PCB Color, Land Extraction Color, and Criteria Mark Color. Edit the color table.

Position Correction Color
Solder Color
Solder Ball Color
Solder Bridging Color
Solder Bridging Color (Lead Shoulder)
Exposed Land Color
Land Color
PCB Color
Land extraction color
Criteria Mark Color

**Memo** Each characteristic parameter is used on the inspection items shown below.

- Position Adjustment Color ... Inspection Screen Position Adjustment
- Solder Color ... Component Presence
  - Solder Ball Color ... Solder Ball
  - Solder Bridge Color ... Solder Bridge
  - Solder Bridge Color(Lead Shoulder) ... Solder Bridge
- Exposed Land Color ... Exposed Basis Metal, Missing Component
- Land Color(Fillet-Excluded Colors) ... Fillet Inspection
- PCB Color ... Missing Component, Foreign Material
- Land Extract Color ... Land extraction when registering part numbers
- Criteria Mark Color ... PCB/Component Block Unit Setting Criteria Mark Color

 Refer to each inspection item in the Inspection Logic Manual for colors to be extracted.

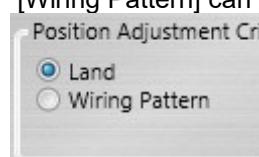
 Refer to "Model Editing Screen Operation" for the color table editing tool operation.

When you select the PCB Color or Position Adjustment Color, the [Re-extract Color] button is enabled and each color is automatically extracted and displayed.

The [Test] button is enabled only when you select the position adjustment color. When you click it the land window after position adjustment is displayed.

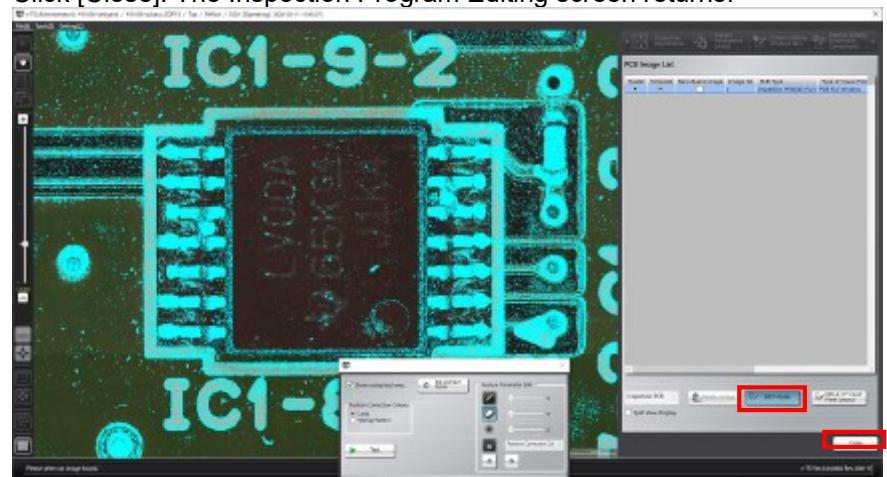
**Memo** Only the land window of the component displayed on the screen when [Test] was clicked.

4. As the criterion for screen position correction, either [Land] or [Wiring Pattern] can be selected.



**Memo** [Land] is selected by default. If post-mounting inspection is conducted and it is detected that solder paste extends beyond the land, or if a lot of bottom electrode components such as BGA are implemented and the land is not visible, select [Wiring Pattern].

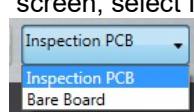
5. Clicking [Edit Model] again closes the color table editing toolbox. Click [Close]. The Inspection Program Editing screen returns.



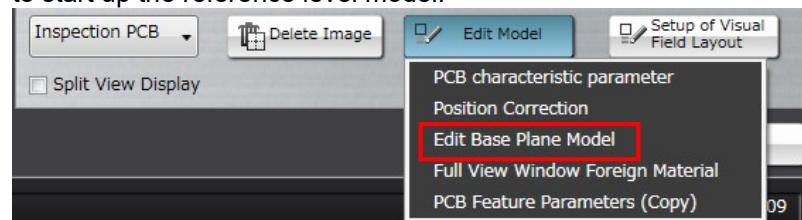
## 2.17.4 Editing a Reference Level Model

When conducting inspection or v-TS PCB tests by the system, if a measured component height is different from the height of the real component, use the reference level model editing tool to edit the reference level model. This section describes the operation procedure of this tool.

**Operation▶** 1. On the menu bar of the edit screen, select [Tool] - [PCB Image Management Screen]. If a bare board image is displayed on the screen, select Inspection PCB from the list.

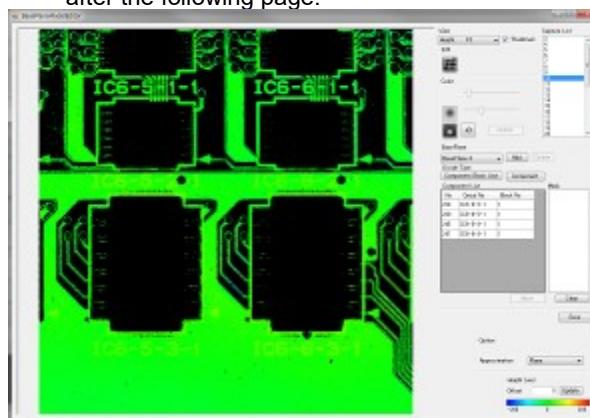


2. Select an inspection PCB image to edit (PCB type: adjustment image) from the PCB image list as a master by clicking. Then, click [Reference Level Model Editing] on the [Edit Model] pull-down menu to start up the reference level model.



3. Edit the reference level model.

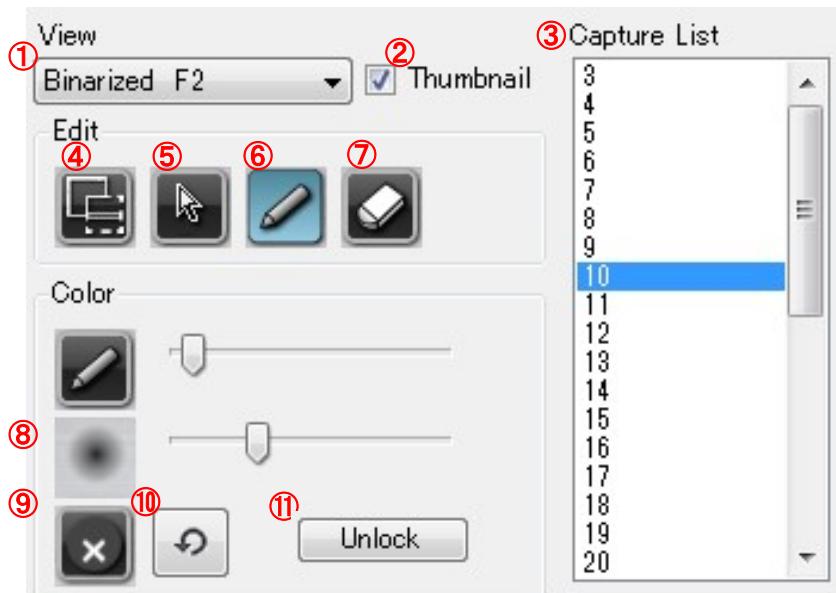
→ The usage of the reference level model editing tool is described in and after the following page.



---

■ Reference level model editing tool - Description on the screen functions

This section describes each function displayed in the right pane of the screen of the reference level model editing tool.



- ① View : Image selecting combo box.  
Source F1 : Displays the RGB image of the inspection FOV edited.  
Binarized F2 : Displays the image binarized from an RGB image by the color table.  
Height F3 : Displays the height image of the base plane.
- ② Thumbnail button : Use this button to display the thumbnail of an inspection FOV image. The FOV image can be displayed as a thumbnail by turning ON this button, and in the original FOV size by turning OFF this button.
- ③ Inspection FOV list : Displays the FOV of the inspection program.
- ④ Add mask button : A mask can be added by dragging a target area.
- ⑤ Select button : Use this button to select various areas on the screen, such as a component, mask, or base plane.
- ⑥ Pen tool : By clicking a pixel to be extracted on the PCB, the color of the pixel is added to the color table. Pen's thickness can be specified using the slide bar.  
**Memo** Pen's thickness can be specified in a range of 1-21 pixels.
- ⑦ Eraser tool : By clicking a pixel to be extracted from the PCB (area colored in cyan blue), the color of the pixel is deleted from the color table. Eraser's thickness can be specified using the slide bar.  
**Memo** Eraser's thickness can be specified in a range of 1-21 pixels.

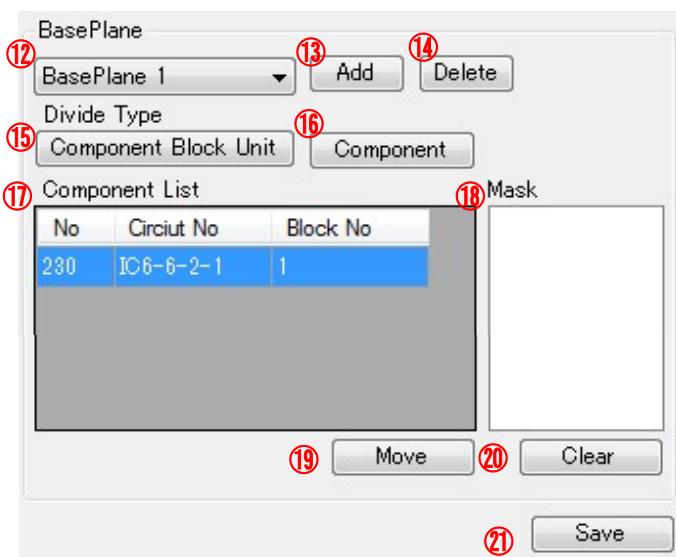
- ⑧ Extension range setting tool : Specify an extension range of the pixel selected by the pen or eraser tool using the slide bar.

**Memo** The extension range can be specified in a range of 0-20.

- ⑨ Clear button : Deletes all color settings from the color table.

- ⑩ Undo button : Cancels the edited data of the color table.

- ⑪ Unlock button : Unlocks and returns the settings of reference level model to the initial condition.



- ⑫ Base plane displaying combo box : Displays added base planes. BasePlane 0 is the original base plane, and the others are the added base planes.

- ⑬ Base plane adding button : Use this button when selecting an area or a component on the base plane partitioned to add base planes.

- ⑭ Base plane deleting button : Deletes the selected base plane.

- ⑮ Base plane per-block partitioning setup button : When component block unit is already set up by the inspection program, if this button is clicked, the base plane is partitioned on a component block unit basis in the overall FOV.

- ⑯ Base plane per-component partitioning setup button : Partitions the base plane on a component basis in the overall FOV.

- ⑰ Component list : Displays the components belonging to the base plane selected by [BasePlane] in the selected inspection FOV.

- ⑱ Mask list : Displays the masks of the base plane selected by [BasePlane] in the selected inspection FOV.

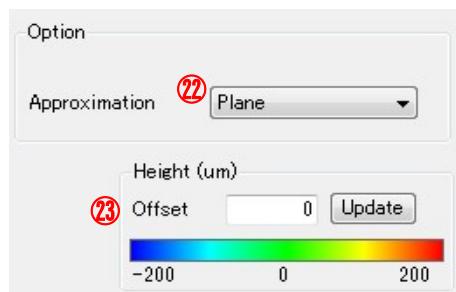
⑯ Component transfer button : Moves the components registered in base plane A to base plane B.

⑰ Delete all masks button : Deletes all masks.

**Memo**

To delete a mask, select the mask on the Mask list, and click the [Delete] button.

⑱ Save button : Saves the reference level model which has been edited completely.



⑲ Base plane approximation method selecting combo box : Specify a method to approximate the base plane as plane approximation (Plane) or curved face approximation (Curve2).

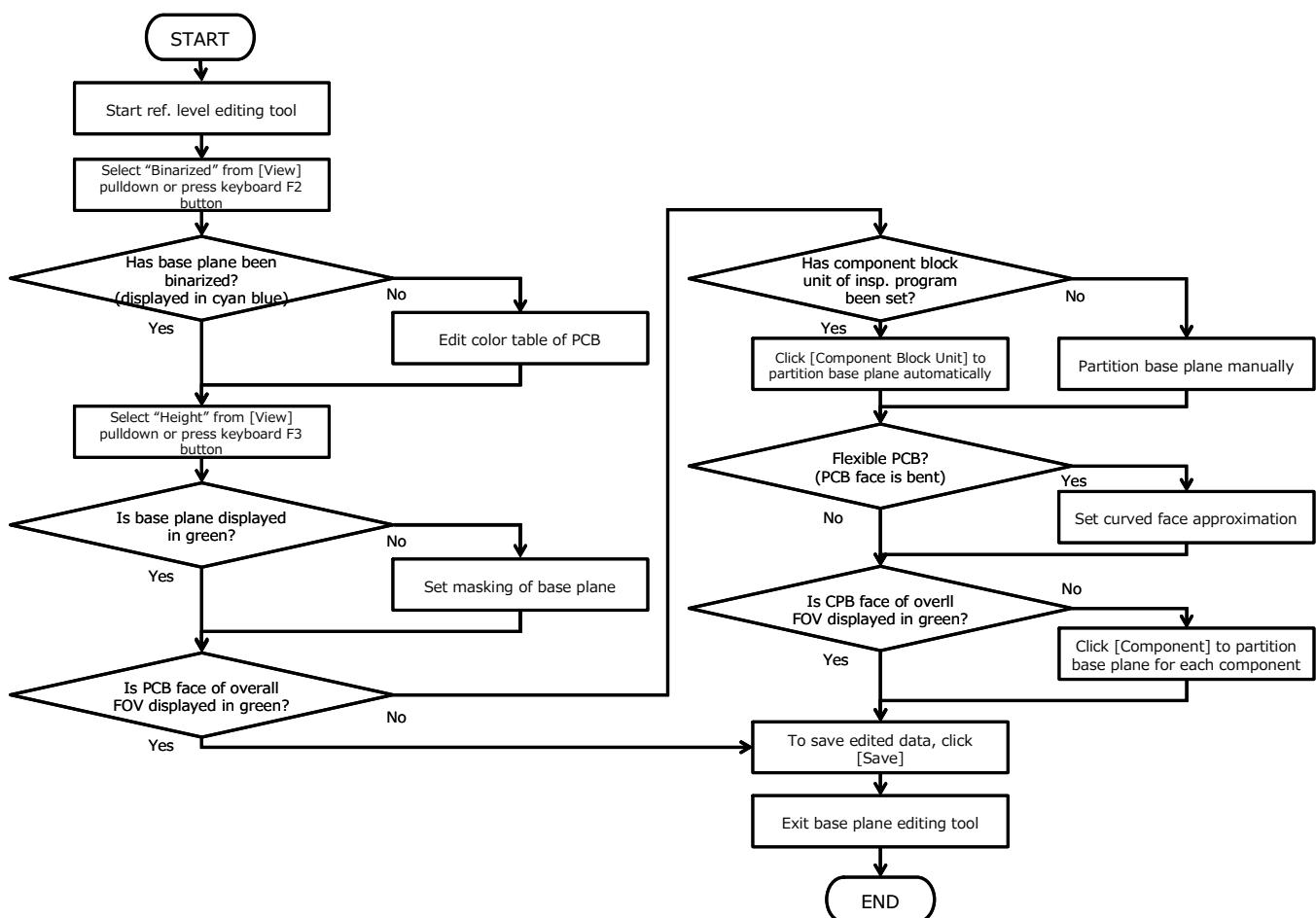
⑳ Change offset button : By entering a numerical number and clicking the [Update] button, the offset value can be changed.

**Memo**

The offset value is zero by default.

■ Description on reference level model editing flowchart

The flowchart of editing of a reference level model is as follows:



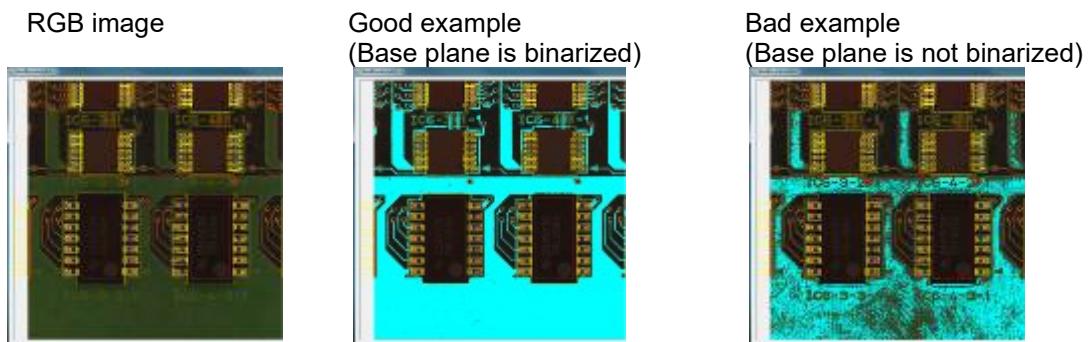
■ Various detailed editing methods of reference level models

This section explains various detailed editing methods of reference level models based on the above flowchart.

<Confirmation of base plane binarization and color table editing function>

If the base plane has not been binarized, use the ⑪ Unlock button to unlock the plane, and use the ⑥-⑩ tools to edit the color table of the base plane.

Hereafter, good and bad examples of base plane binarization are described.



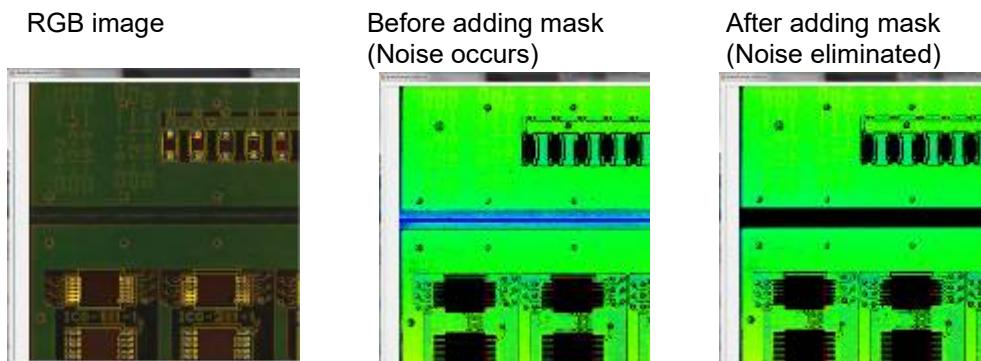
<Confirmation of base plane height image and mask adding function>

If the base plane of the overall FOV is not displayed in green, add a mask using the ④ Add mask button to set the base plane correctly.

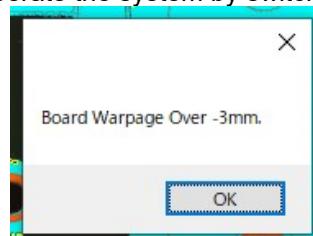
To add a mask, click the ④ Add mask button and drag an area to be masked. The added mask is displayed on the ⑯ mask list of the selected inspection FOV.

**Memo** To delete a mask, select the mask on the ⑯ list and click the [Delete] button. To delete all the masks, press the ㉐ [Delete All Masks] button.

Hereafter, a base plane height image before and after adding a mask is shown.



**Memo** If the warp of the board is larger than that defined in the system specification, a dialog like below appears. Operate the system by switching to 2D inspection.



---

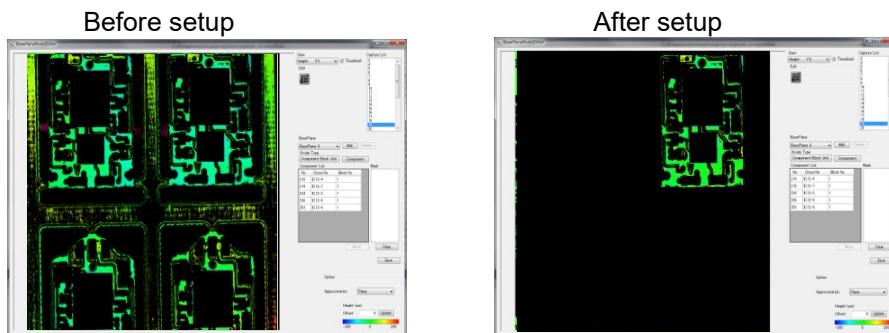
<Base plane per-block partitioning function>

This function sets up base planes automatically by partitioning them on a component block unit basis.

**Memo** To use this function, it is assumed that component block unit has been set up.

By clicking the ⑯ base plane per block partitioning button, the base plane is partitioned in the overall FOV on a component block unit basis.

Hereafter the effect of this function is shown.



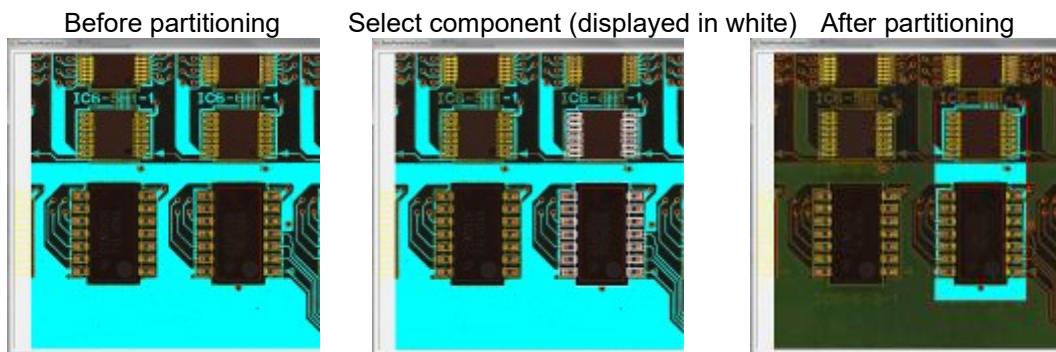
#### <Base plane manual partitioning function>

This function can generate more than one base plane in a FOV. Use this function when component block unit has not been set up yet and the base planes have different height. Use the ⑤ select button to select an area to be partitioned or use the ⑯ component list to select a component to be applied to base plane partitioning. By clicking the ⑬ add base plane button after selecting it, it is able to partition or add base planes.

**Memo** More than one component can be selected by selecting them as pressing and holding the Ctrl key on the ⑯ component list or on a binarized image.

**Memo** The added base planes can be resized by the ⑤ select button.

Hereafter, examples of base plane partitioning are shown.



For the settings of base plane, refer to “Base Plane Partitioning Setup” of Section 2.4 “Base Plane Setup” in the inspection logic manual.

<Curved face approximation setup function>

Use this function when the base plane in the inspection image cannot be approximated to a plane due to distortion of the base plane such as a flexible PCB.

Use the ⑫ base plane approximation method selecting combo box to set this function as curved face approximation (quadric).

 For the settings of base plane, refer to “Curved Face Approximation of Base Plane” of Section 2.4 “Base Plane Setup” in the inspection logic manual.

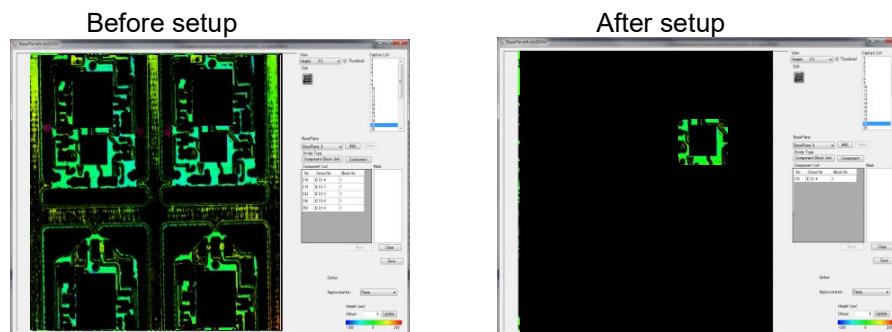
<Base plane per-component partitioning function>

This function partitions a base plane on a component basis and sets the partitioned ones automatically.

Use this function if the height of base planes does not become equal to each other even after using the ⑯ base plane per-block partitioning function or the ⑪ curved face approximation setup function. By clicking the ⑯ Component button, the base plane is partitioned in the overall FOV on a component basis.

**Memo** To use this function, it is assumed that component block unit has been set up.

Hereafter the effect of this function is shown.

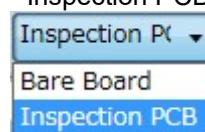


4. Finish editing of the reference level model. To save the edited data, click the ⑪ Save button, and click the Close (x) button in the upper right corner of the window to return to the base plane management image screen.

## 2.17.5 Editing a Position Correction Model

When conducting inspection on the machine or testing PCBs using v-TS, if the land extraction position is different from that of the actual PCB, edit the position correction model using the position correction model editing tool. This section describes the operation procedure of this tool.

- Operation▶ 1. On the menu bar of the editing screen, select [Tool] - [PCB Screen Management Screen]. If a raw board screen is displayed, select "Inspection PCB" from the list.

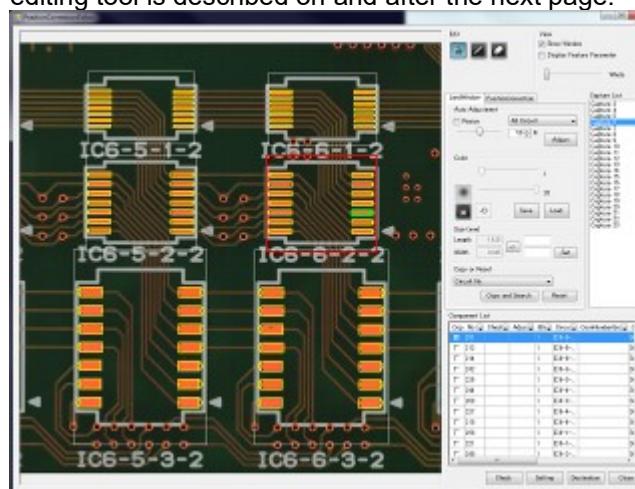


2. Select an inspection PCB image to edit (PCB type: adjustment image) from the PCB image list as a master by clicking. Then, click [Position Correction] on the [Edit Model] pull-down menu to start the position correction model.



3. Edit the position correction model.

The editing method using the position correction model editing tool is described on and after the next page.



### ■Position Correction Model Editing Tool: Explanation of Screen Functions

This section explains various functions displayed on the right side of the Reference Level Model Editing Tool .

Upper part of the tool



①Selection Button: Use when selecting a land on the screen. For the selected land, position and size can be edited.

**Memo** It is unable to move the position and size of the land out of the inspection range window.

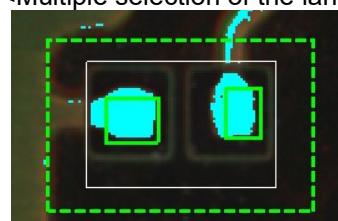
<Selection and movement of the land window>



Clicking the left button of the mouse within the land window turn the land window color to green (being selected).

The land window can be moved by holding the left button of the mouse and moving it.

<Multiple selection of the land window>



Moving the mouse cursor with the left button of the mouse held changes the frame to green dotted line. The framed land window is selected. When clicking the land window with the Ctrl key pressed, multiple land windows can be selected.

<Size editing of land window>



The land window size can be changed by moving the mouse with the land window selected (green line) and left button of the mouse pressed on the border of the land window frame.

②Pen Tool: When a pixel extracted on the PCB surface is clicked, the color of the pixel is added to the color table. Pen's thickness can be specified with the slide bar.

**Memo** Pen's thickness can be specified in a range of one to 21 pixels.

③Eraser Tool: When the extracted pixel on the PCB surface (cyan color portion) is clicked, the color of the pixel is deleted from the color table. Eraser's thickness can be specified with the slide bar.

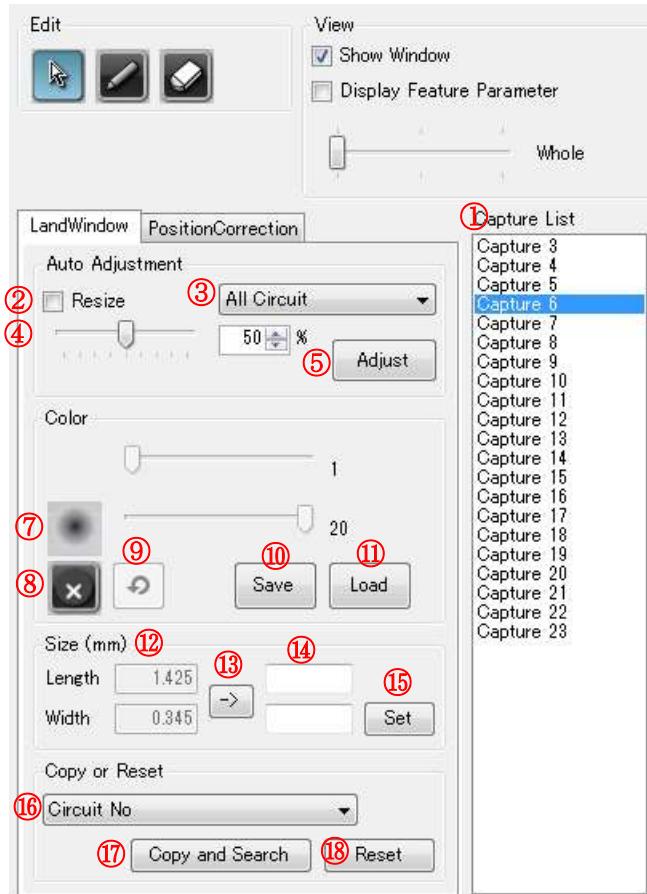
**Memo** Eraser's thickness can be specified in a range of one to 21 pixels.

④Window Display Switch: Displays the land window and range window.

⑤Display Feature Parameter Switch: Displays the extracted pixel on the PCB surface (cyan color portion).

⑥Display Magnification Slider: Display magnification can be changed.

The "LandWindow" tab in the middle of the tool is selected:



①CaptureList: Inspection visual field of the inspection program is displayed.

②Resize Switch: Automatically adjusts the land window size as well at the time of land window automatic adjustment.

③Auto Adjust Target Land Selection: Land for automatic adjustment can be selected.

Selected Lands: Only the currently selected land is auto-adjusted.

Uncopied Circuit: The land of component without check mark on "Copied" in the Component List is auto-adjusted.

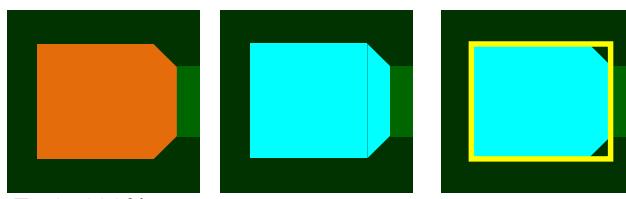
All Circuit: All components' land is auto-adjusted.

- ④ Width setting of resize function: Binalization width at the time of auto-adjustment of the land window size can be set.

Either text box or slider can be used to change settings.

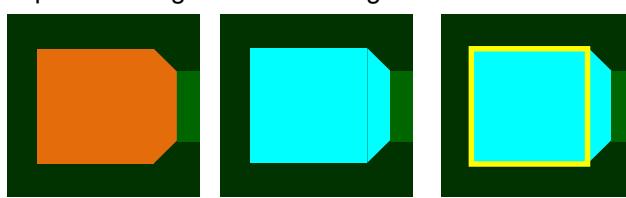
Ex.1: 50%

Inspection image   Binalized image   Land window



Ex.2: 100%

Inspection image   Binalized image   Land window



- ⑤Adjust button: Auto adjustment of the land window is performed.

**Memo** If the position adjustment of the land window was unsuccessful, turn ON the switch of Display Feature Parameter and edit the color table for land position auto adjustment.

- ⑥Pen & eraser size setting tool: The size of the pen and eraser tools can be specified with the slide bar.

- ⑦Extension Range Setup Tool: Specify the extension range of the color of the pixel selected by the pen/eraser tool with the slide bar.

**Memo** The extension range can be specified in a range of 0-20.

- ⑧Clear button: All colors are deleted from the color table.

- ⑨Undo button: The edited content of the color table can be cancelled.

- ⑩Save button: The currently specified color table can be saved as a file.

- ⑪Load button: The color table file that has been saved can be loaded.

- ⑫Size of selected land: The size of the selected land is displayed. The size is not displayed when multiple lands are selected.

- ⑬Land size copy button: The selected land size (⑫) is set to the land window size to be copied (⑭).

- ⑭Land size to be copied: The land window size to be copied is displayed.

- ⑮Set button: The land window size (⑭) is copied to the selected land.

- ⑯Selecting Copy or Reset target: The target function of "Copy or Search" or "Reset" is selected.

- ⑰Copy and Search button: The land window size is copied and search is performed.

Circuit No: All the land window sizes are copied to the same circuit name and position is searched.

Circuit No(Only same destination): All the land window sizes are copied to the same circuit name of the destination and the position is searched.

Component Number: All the land window sizes are copied to all the components of the same component number and the position is searched.

Component Number Group: All the land window sizes are copied to all the components of the same component number group and the position is searched.

Component Block Unit: All the land window sizes in the selected component block unit are copied to other component block unit and the position is searched.

⑯Reset button: The position and size of the land window are restored to the state in which the position correction tool has launched.

Circuit No: The size and position of all the land windows of the same circuit name are restored to the state in which the position correction tool has launched.

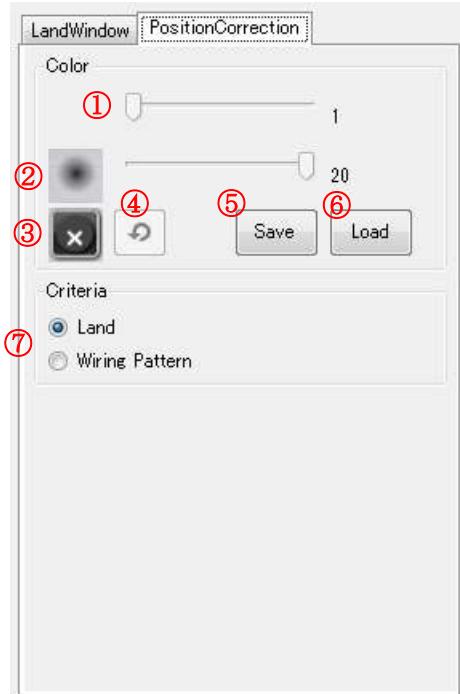
Circuit No(Only same destination): The size and position of all the land windows of the same circuit name component of the same destination are restored to the state in which the position correction tool has launched.

Component Number: The size and position of all the land windows of the same component of the same component number are restored to the state in which the position correction tool has launched.

Component Number Group: The size and position of all the land windows of the same component of the same component number group are restored to the state in which the position correction tool has launched.

Component Block Unit: The land window size and position of all the components are restored to the state in which the position correction tool has launched.

The "PositionCorrection" tab in the middle of the tool is selected:



①Pen & eraser size setting tool: The size of the pen and eraser tools can be specified with the slide bar.

②Extension Range Setup Tool: Specify the extension range of the color of the pixel selected by the pen/eraser tool with the slide bar.

**Memo** The extension range can be specified in a range of 0-20.

③Clear button: All colors are deleted from the color table.

④Undo button: The edited content of the color table can be cancelled.

⑤Save button: The currently specified color table can be saved as a file.

⑥Load button: The color table file that has been saved can be loaded.

⑦Position correction criteria selection: The criteria of the position correction model can be changed.

**Memo** If the solder paste is protruding the land on post-mount inspection or if the land cannot be seen on a PCB due to too many mounts of bottom lead components such as BGA, select [Wiring Pattern].

## Bottom of the tool

Component List							
① Cop	No	Check	Adjust	Bl	Circu	ComNumber	Grc
291				1	IC6-6...		S
212				1	IC6-5...		S
214				1	IC6-6...		S
242				1	IC6-3...		S
225				1	IC6-3...		S
244				1	IC6-4...		S
208				1	IC6-3...		S
227				1	IC6-4...		S
210				1	IC6-4...		S
238				1	IC6-1...		S
221				1	IC6-1...		S
240				1	IC6-2...		S

② Check    ③ Setting    ④ Destination    ⑤ Close

① Component List: Moved to the component when a line is selected. Refer to the displayed items below.

Copied: Check mark that indicates the completion of correction of land window size and position

No: Component ID

Check: Result of the current check function (priority: ①Size, ②Intersect, ③Pitch)

AdjustCheck: Result of check function when using adjust function (priority: same as Check)

BlockNo: Component block No.

CircuitNo: Circuit No.

ComNumberGroup: Component No. group name

ComNumber: Component No. name

Destination: Destination No. that is turned ON

ComType: Component type

CaptureNo: Inspection image visual field No.

NGCount: Number of NG lands of the current check function

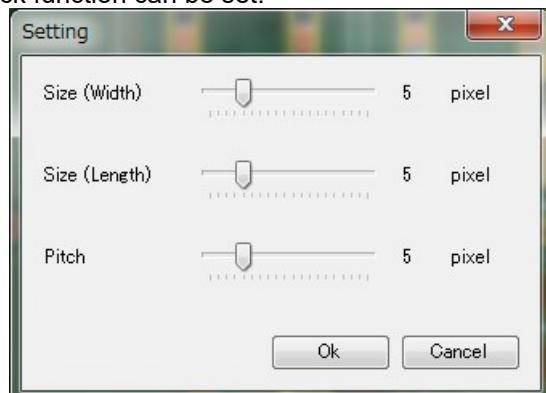
② Check button: The position and size of the land window are checked by using the threshold of the setting dialog.

Size: The size of the component of the other component block unit and the land window size differ on the same circuit name.

Pitch: The pitch of the right and left (or top and bottom) pins differs.

Intersect: Lands intersect.

③Setting button: The Setting dialog is displayed and the NG judgment threshold of the check function can be set.



Size(Width): Threshold of the land width of the check function is set.

Size(Length): Threshold of the land length of the check function is set.

Pitch: Threshold of the pitch width of the check funciton is set.

④Destination button: The Destination List dialog is displayed and the destination list is displayed.

⑤Close Button: The position correction model which has been edited completely is saved.

Click the [Close] button to exit the position correction model. To save the edited contents, click [Yes(Y)] or click [No(N)] for not saving it. Clicking the [Cancel] button returns to the position correction model edit screen.

4. Click the [Close] button to exit the position correction model. To save the edited contents, click [Yes(Y)] or click [No(N)] for not saving it. Clicking the [Cancel] button returns to the position correction model edit screen.

## 2.17.6 Setting full view foreign material inspection

For the full inspection view allocated on the PCB, foreign material inspection can be set. The foreign material inspection can be implemented with the template method or color method. In this section the setting procedure of full view foreign material inspection is described.

- Operation▶ 1. On the menu bar of the edit screen, go to [Tool] – [PCB Image Management Screen] – [Model Edit], and select [Full View Foreign Material].



Select the [Foreign Material] check box for the inspection criteria to enable the full view window foreign material inspection.

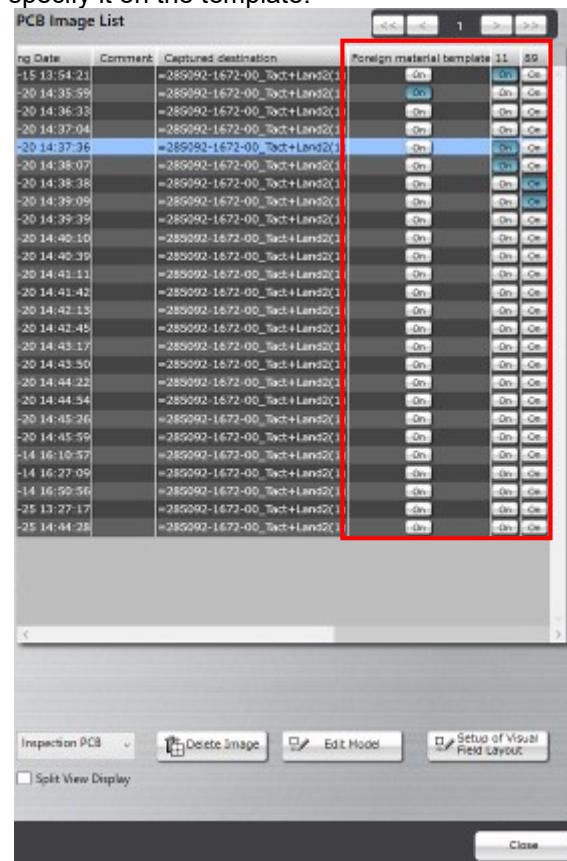
Inspection Item	Setting Value	Measurement Value	Judge
<input checked="" type="checkbox"/> Foreign Material	<input type="radio"/> Fixed <input checked="" type="radio"/> Fluctuating	Reg...	
Area (mm <sup>2</sup> )	0 - 0.015		
Length Diameter Ratio (%)	0 - 30		
Area Rate (%)	0 - 30		
<input checked="" type="checkbox"/> Height	<input type="radio"/> PCB <input checked="" type="radio"/> Model		
Height Criteria			

**Memo** "Height" is available for VT-S1080/S1040/S730-H/S730/S530.

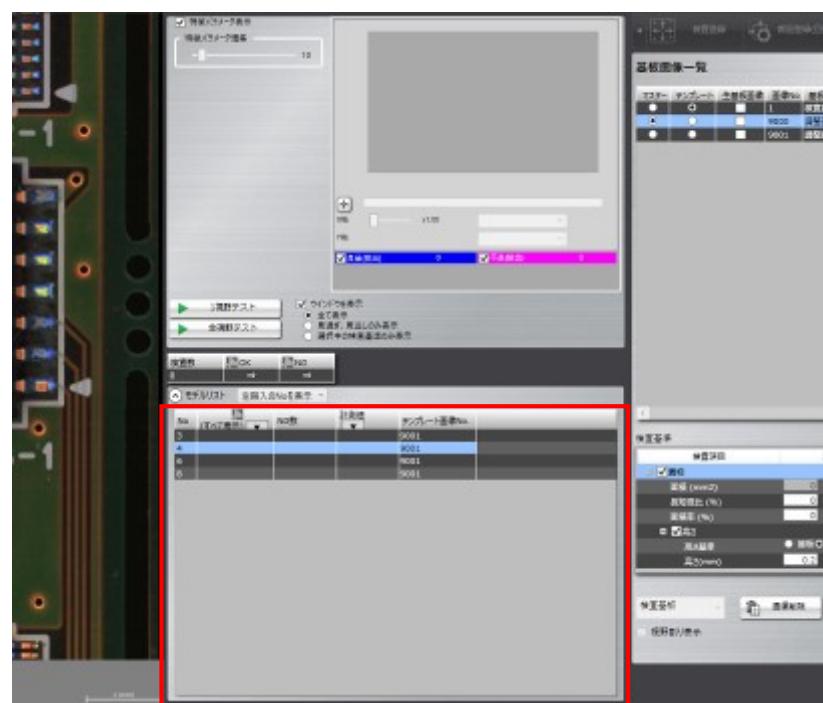
**Memo** Temporary operation (inspection program without part number registration completed)  
) can perform a full field of view foreign body inspection.  
Thousand. Be sure to inspect with all part numbers completed.

 For details on the setting value, see 6.5 Full View Window Foreign Material.

2. For each destination program displayed on the PCB image list, click the check button of the inspection PCB image to be adjusted to specify it on the template.

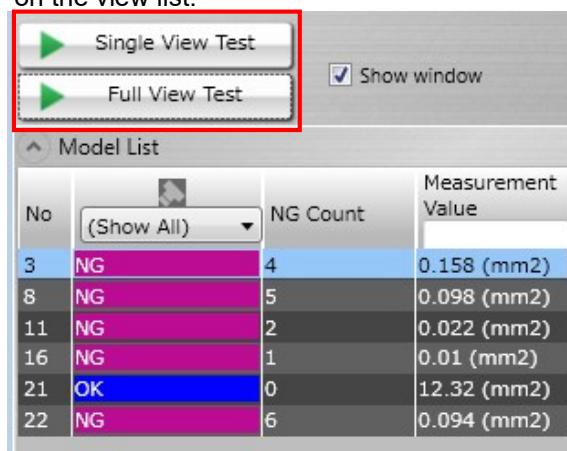


3. The view list of the PCB image is displayed on the model editing screen.



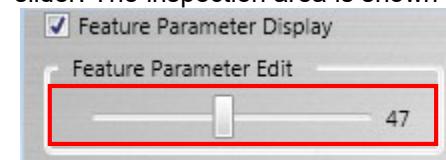
Memo View No.1 and 2 are not the subject of the full view window foreign material inspection because they are used for position correction.

5. Click [1 View Test] to perform simulation of foreign material inspection with the selected view. Click [Full View Test] to perform simulation of full view foreign material inspection. The detection count of foreign material for every view is displayed on the view list.

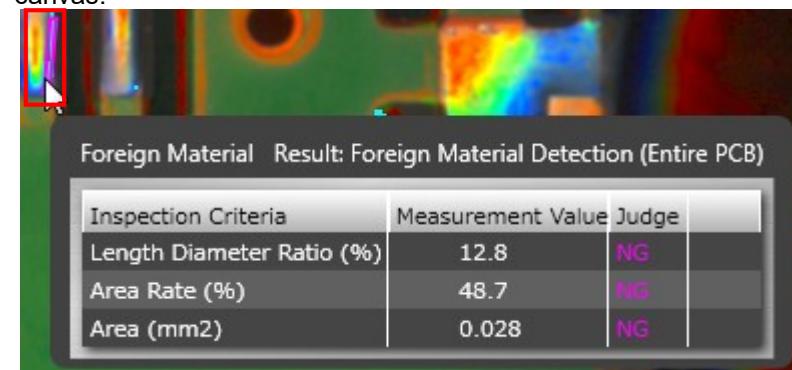


**Memo** The inspection result for every view is displayed as [OK] and [NG]. On the [NG Count] row, the foreign material count detected for every view is displayed. On the [Measured Value] row, the measured value of the inspection item selected on the inspection criteria is displayed.

6. The sensitivity of the foreign material inspection is adjusted with the slider. The inspection area is shown in blue on the view image.

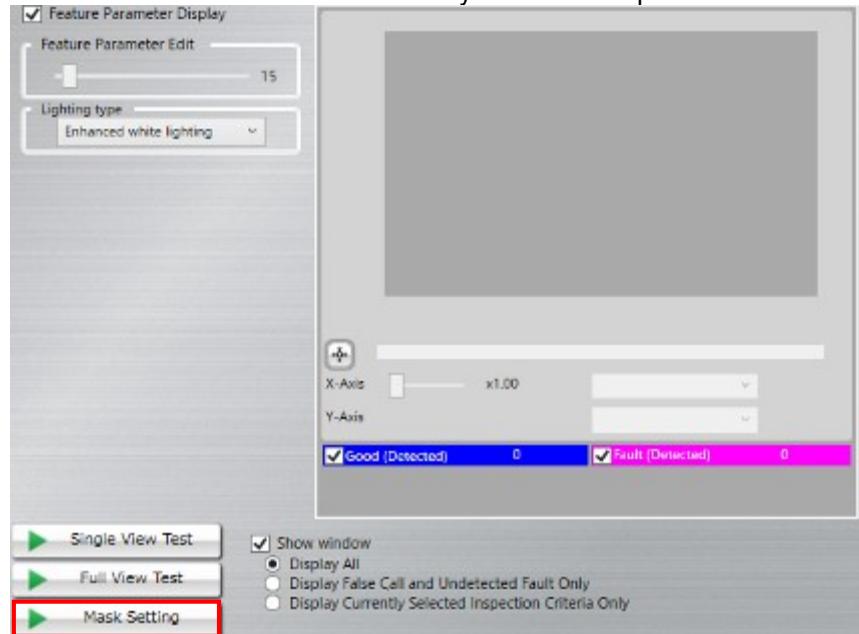


7. The area in which the foreign material was detected is shown as rectangular shape in purplish red color on the view screen of the canvas.

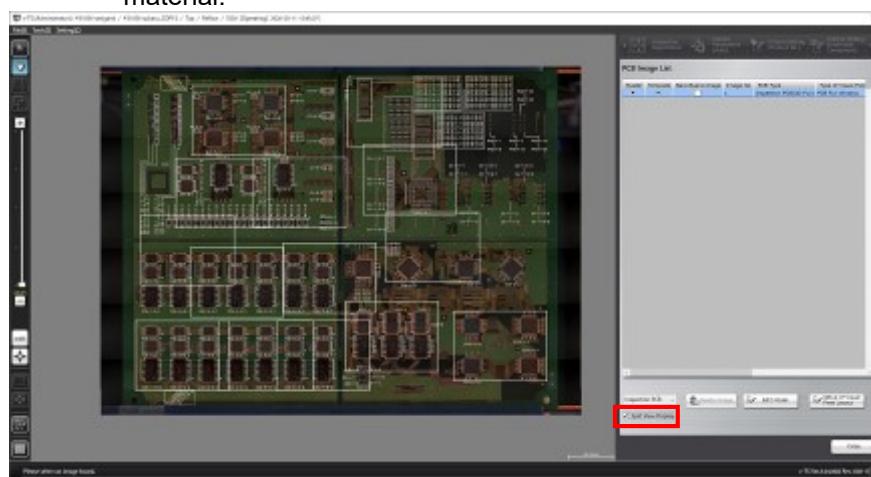


**Memo** When hovering the mouse over the detected foreign material, the measured value of the foreign material is displayed with the tool tip.

8. Configure the mask settings as needed. Click the [Mask Settings Button] to mask the currently extracted foreign matter area. If there are many mask setting areas, click the button once to set the mask, and then delete the mask of the area you want to inspect.



9. With the [Split View Display] check box ON, display the view split on the PCB and check the inspection area of the full view foreign material.



**Memo** Clicking the view split window makes the window translucent so that the view position can be checked.

## 2.17.7 Copying PCB Characteristic Parameters

PCB characteristic parameters can be copied from another inspection program. By doing so, it becomes no longer necessary to teach feature quantity of the PCB from scratch, so that work efficiency can be improved.

PCB feature quantity which can be copied

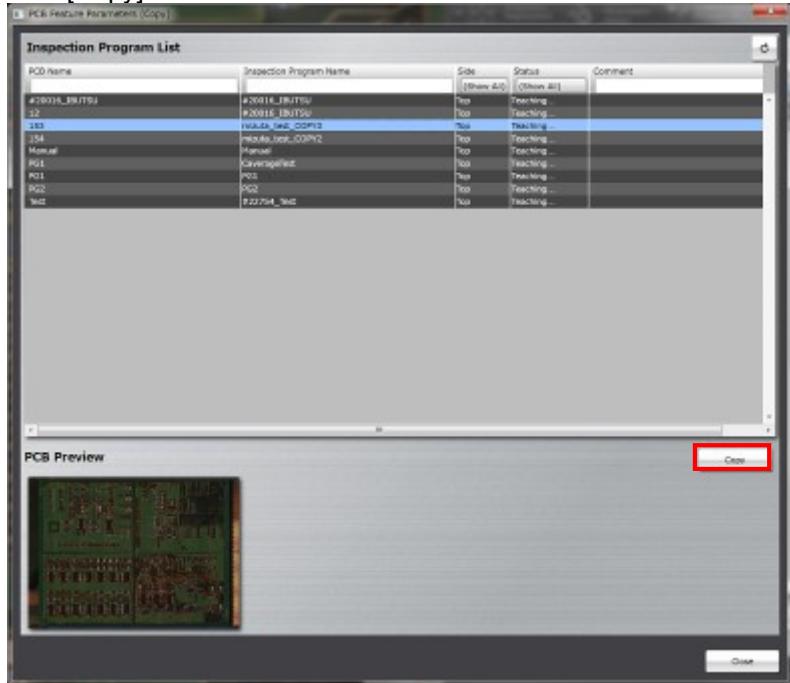
PCB feature quantity	Can be copied?
PCB color	○
Solder color	○
Solder ball color	○
Solder bridge color	○
solder bridge (lead shoulder) color	○
Land color	○
Land exposed color	○
Position correction color (wiring pattern)	○
Reference level color	○
Land/solder color for imaging position correction	○
Land color for teaching	○
θ correction mark color (fiducial mark color)	×
Bad mark color	○
PCB color (component block unit edge)	○
Reference mark color	○
Land color (for oblique view)	○
Solder ball color (for oblique view)	○
Solder bridge color (for oblique view)	○
Position correction color (for oblique view)	○
Top side - θ correction model	×
Back side - θ correction model	×

This section describes the copying procedure of PCB characteristic parameters below.

- Operation▶ 1. Select [Tool] - [PCB Image Management] from the menu bar on the Editing screen. Then, select [PCB Feature Parameters (Copy)] from the [Edit Model] pull-down menu to start up the PCB Feature Parameters (Copy) screen.



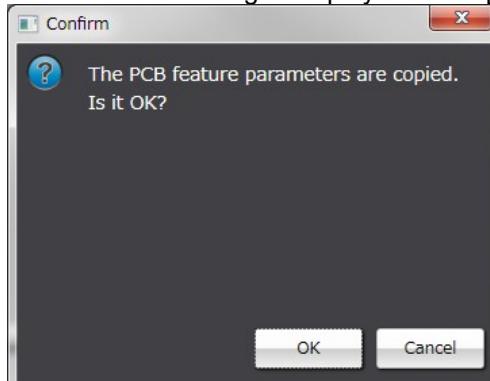
2. Select an inspection program from [Inspection Program List], and click [Copy].



**Memo** Only the PCB characteristic parameters of the inspection program satisfying all the following conditions can be copied.

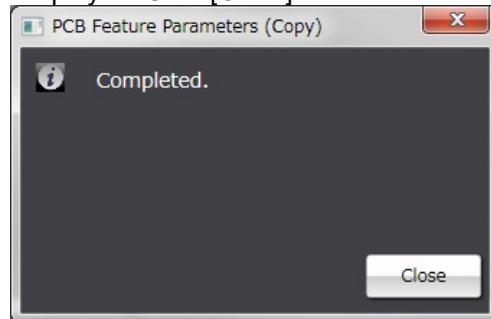
- The model and process are equal to those of the inspection program being edited.
- The status is other than new creation.
- Not applicable to destination (except master)

3. A confirmation dialog is displayed. Click [OK].

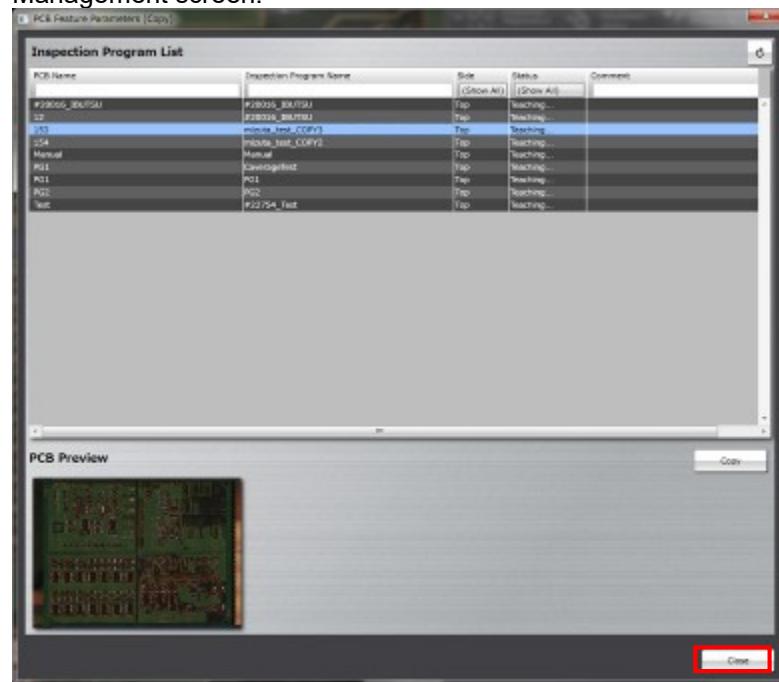


- If [Cancel] is clicked, the software returns to the PCB Feature Parameters (Copy) screen without copying the PCB feature parameters.

4. When the parameters are copied completely, a completion dialog is displayed. Click [Close].



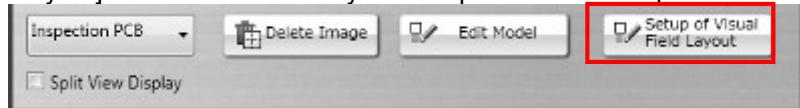
5. By clicking [Close] on the PCB Feature Parameters (Copy) screen, the software exits this screen and returns to the PCB Image Management screen.



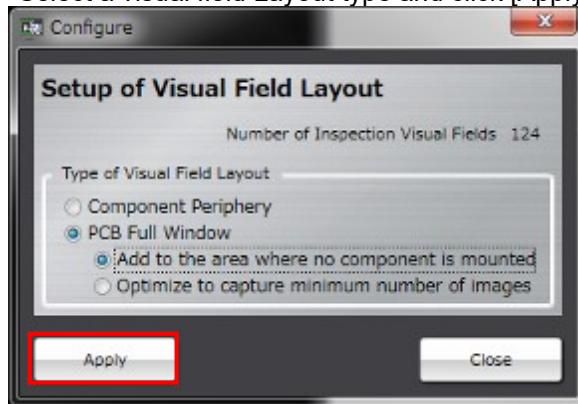
## 2.17.8 Setting up Visual Field Assignment

Visual field assignment can be set up. This section describes the procedure to set up visual field assignment.

- Operation▶ 1. On the PCB Image Management screen, click [Setup of Visual Field Layout]. The Visual Field Layout Setup screen starts up.



2. Select a visual field Layout type and click [Apply].



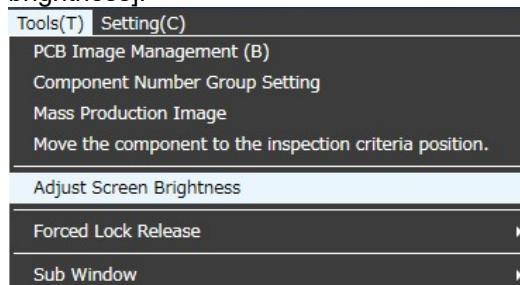
**Memo** [Apply] is enabled by changing the visual field layout type.

3. Click [Close] to exit the Visual Field Layout Setup screen and return to the PCB Image Management screen.

## 2.17.9 Changing Brightness of PCB Image

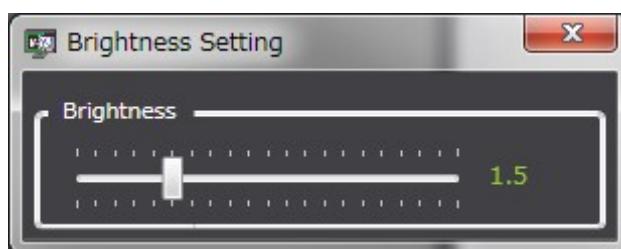
You can change brightness of a PCB image currently displayed.

- ||Operation▶ 1. On the menu bar of the edit screen, select [Tool] - [Adjust screen brightness].



2. On the [Brightness Setting] dialog box, move the slider right/left to adjust the brightness. To adjust screen brightness, use the [Brightness] slider.

The initial value has a brightness of 1.5.

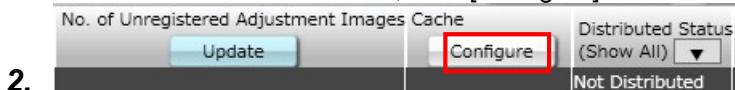


3. After adjustment, close the dialog box.

## 2.17.10 Cache Setting

The response with v-TS will be improved by saving the PCB image data on the network into a computer.

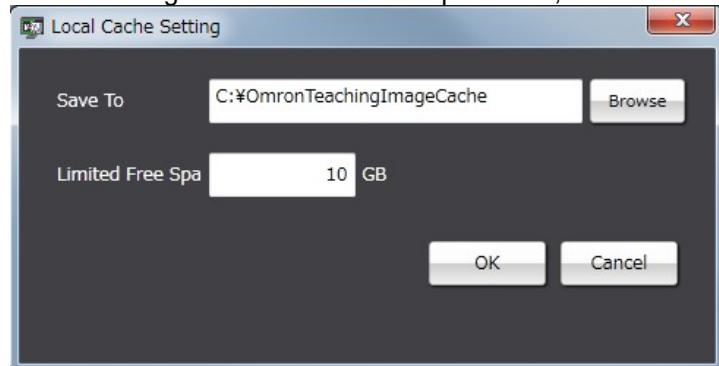
- ||Operation▶ 1. On the PCB selection screen, click [Configure] for Cache.



- 2.

3. The local cache setting dialog appears.

Set the saving destination and free space limit, and then click [OK].



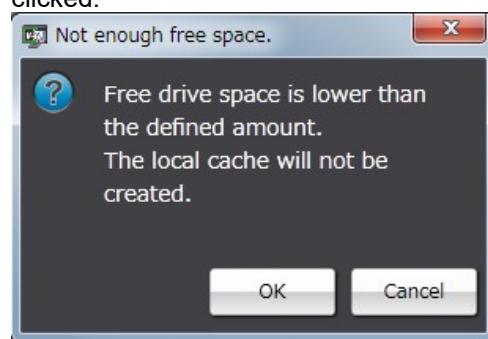
**Memo** The saving destination has been set to "C:\OmronTeachingImageCache" as default.

**Memo** A folder is automatically created, under the specified folder, with a folder name as the IP address of the server to connect.

**Memo** Set the free space limit between 10GB to 999GB.

While the local computer's free space is larger than the set value, PCB images will be saved into the local at the timing when the inspection program is opened.

When the local computer's free space becomes lower than the set value, the dialog shown below is displayed after the [Edit] button is clicked.



Clicking [OK] opens the inspection program without saving images into the local.

Clicking [Cancel] closes the dialog without opening the inspection program.

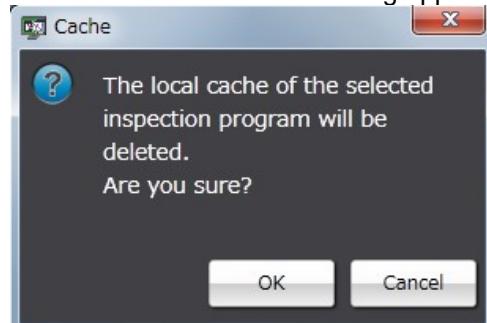
## 2.17.11 Deleting Cache

This section describes the procedure to delete PCB images saved in the local.

- Operation▶ 1. Click  of the target inspection program on the PCB selection screen.



2. The deletion confirmation dialog appears.



Clicking [OK] delete the image saved in the local, and the  button will disappear from the inspection program list.

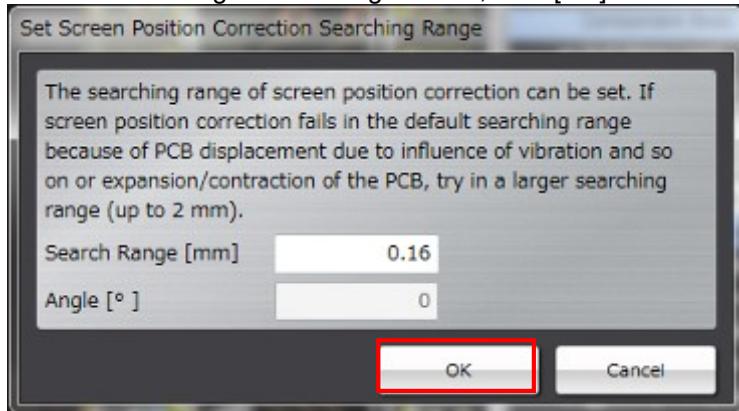
## 2.17.12 Setting up Screen Position Correction Search Range

If screen position correction fails in the default inspection range because of PCB shift caused by influence of vibration or PCB shrink, a screen position correction search range can be set for each inspection program. This section describes the procedure to set up a screen position correction search range.

- ||Operation▶ 1. Select [Settings] - [Inspection Program Settings] - [Set Screen Position Correction Searching Range] from the menu bar of the editing screen to start up the Screen Position Correction Searching Range screen.



2. Set a search range and an angle. Then, click [OK].



By clicking [Cancel], the software exits this screen without setting up a screen position correction search range.

**Memo** The angle parameter is effective when the position correction for each component block unit is set ON.

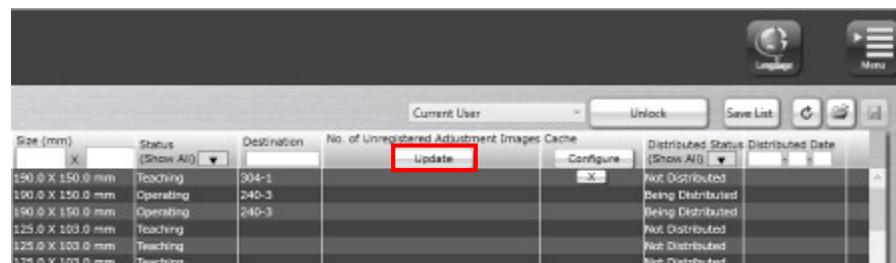
For the position correction for each component block unit, refer to section 2.2.

### 2.17.13 Confirming No. of Adjustment Images

On the PCB selection screen, the number of the adjustment images which have not been saved in the inspection program can be confirmed. By starting editing of the inspection program and saving that program, the number of the adjustment images becomes zero.

- Operation▶ 1. On the PCB selection screen, press the [Update] button in the “No. of Unregistered Adjustment Images” column.

The number of the adjustment images which have not been saved in the inspection program is displayed for each inspection program.

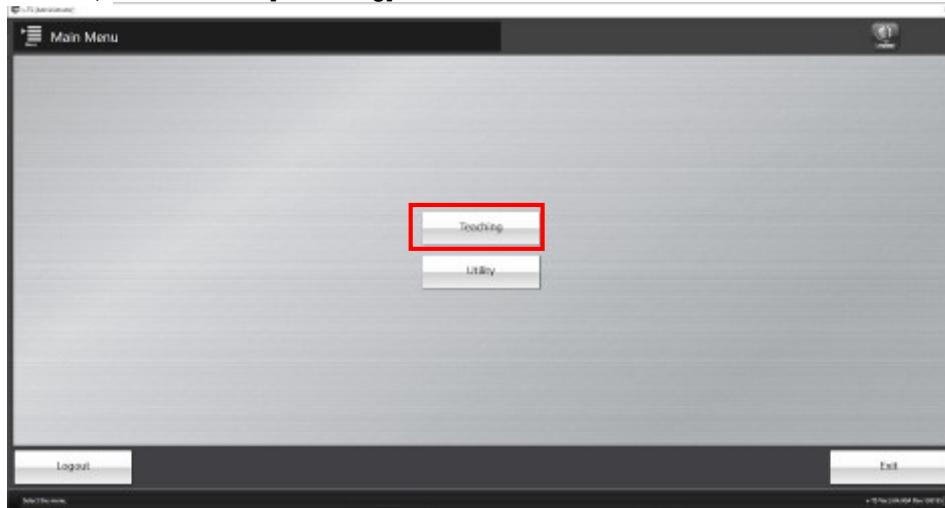


Size (mm)	Status	Destination	No. of Unregistered Adjustment Images Cache	Configure	Distributed	Status	Distributed Date
	(Show All)		Update		(Show All)	(Show All)	
190.0 X 150.0 mm	Teaching	304-1				Not Distributed	
190.0 X 150.0 mm	Operating	240-3				Being Distributed	
150.0 X 150.0 mm	Operating	240-3				Being Distributed	
125.0 X 103.0 mm	Teaching					Not Distributed	
125.0 X 103.0 mm	Teaching					Not Distributed	
125.0 X 103.0 mm	Teaching					Not Distributed	

# 2.18 Mass-Produced PCB Image

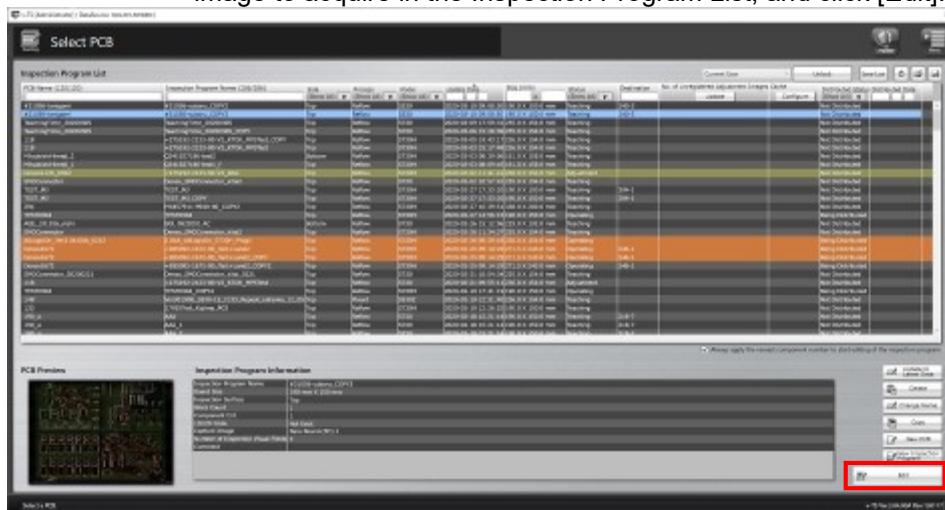
A mass-produced PCB image specified by Q-upNavi or the specified product image saving function can be acquired and registered in the library.

Operation▶ 1. Click [Teaching] in the main menu.

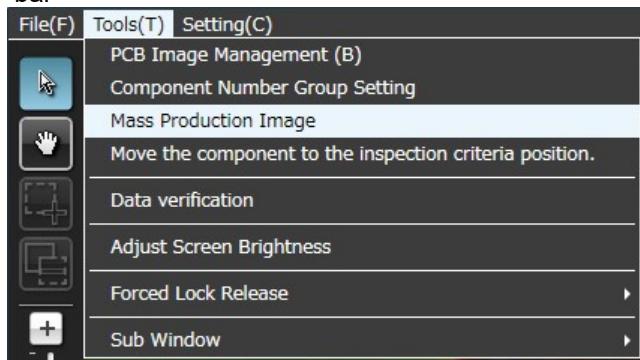


2. The Select PCB screen appears.

Click to select the inspection program whose mass-produced PCB image to acquire in the Inspection Program List, and click [Edit].



3. Select [Tool] – [Mass Production Image] in the editing screen menu bar



**Memo** Unless the component registration is completed, the item is shaded and cannot be selected.

Or select the [Mass Production Image] tab.



**Memo** If the [Mass Production Image] tab is hidden, click at the right to display it.

4. The mass production management screen appears.

To confirm the image registered by Q-upNavi, select the image management job and select the job with the [Mass Production Image] type. Select the component number to be registered in the component number list.

To confirm the image specified by the specified component image saving function, select a job whose type is [Mass Production Inspection OK Image] or [Inspection NG].

If the former item is selected, the image of inspection OK selected by the specified component image saving function is displayed. If [Inspection Ng] is selected, the image of the component judged as NG by the inspection is displayed.

When the machine executes inspection, one OK line and one NG line of the job of the [Mass Production Image] type increase. These lines (including both OK and NG) increase at 30-minute intervals, and the latest information is displayed at the top.

On the destination column, the destination name which was used for inspection is displayed.

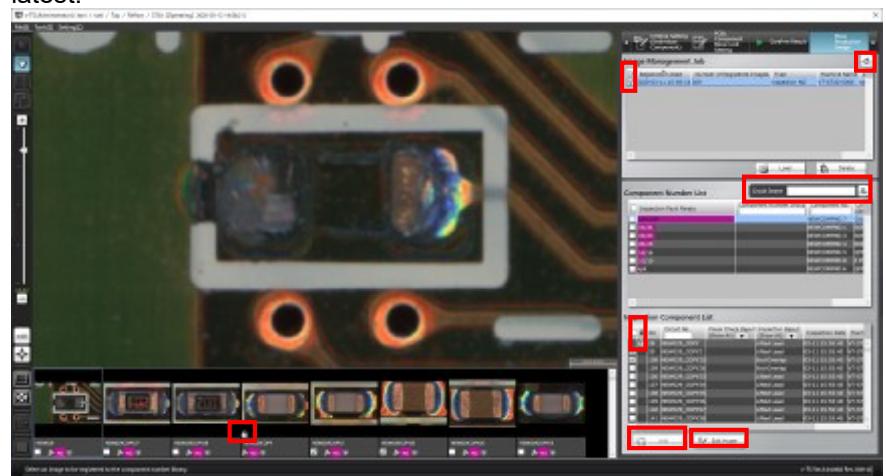
The component number list shows all the component numbers for which check boxes of image management job are selected ON. Enter the circuit number in the circuit search box, and click to display the image of the specified circuit number only.

On the component number group column, the component number group to which the component number belongs is displayed.

---

Click ON the check box of the image to be registered in the component thumbnail image list, the inspection component list or the component number list, and click [Add]. Click the check box to cancel the selected state.

Click [Model Edit] to go to the criteria setting screen. Click at the upper right of the screen if the list of image management jobs is not latest.



5. For the remaining component number/image management job, add an image.
6. When you select images from all the image management jobs, save this inspection program. To delete an image management job, select the management job to be deleted and click [Delete].

## 2.19 Inspection Program Maintenance

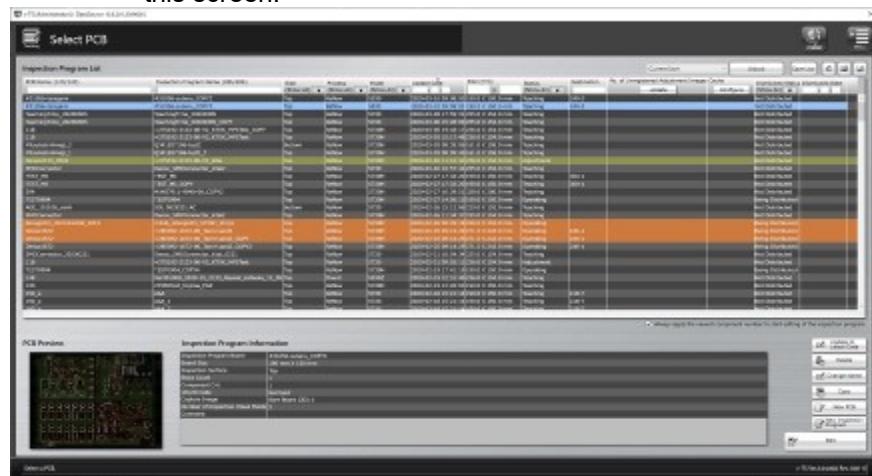
Use the Select PCB screen to save/read, update, delete, rename and copy an inspection program. Follow the procedure below to display the screen, and perform necessary maintenance operation, which is described in the subsequent sections.

Operation ► 1. Click [Teaching] in the main menu.



2. The Select PCB screen appears.

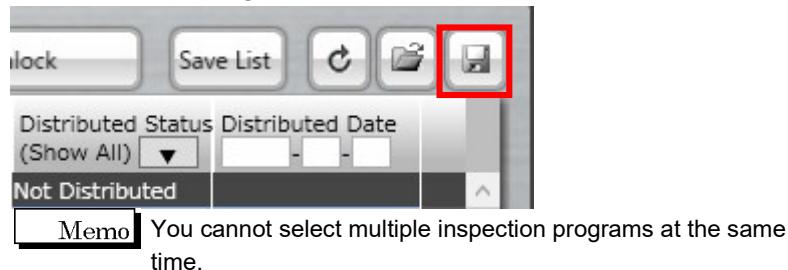
Access individual inspection program maintenance menu items from this screen.



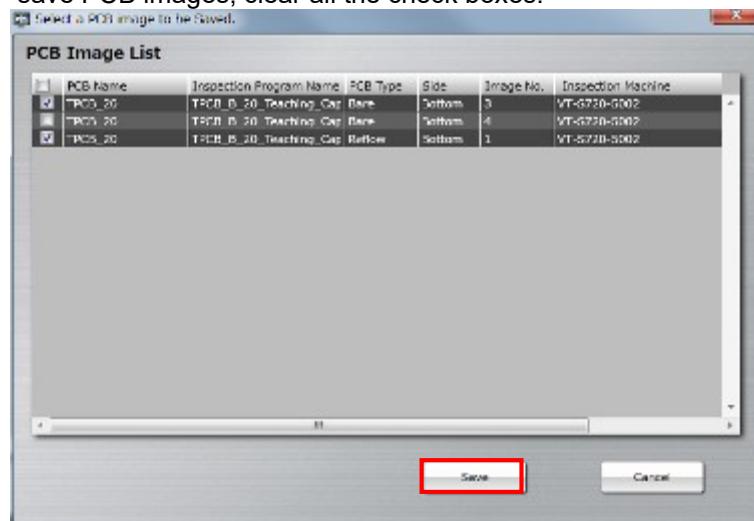
## 2.19.1 Exporting an Inspection Program

This section describes the procedure to save an inspection program.

- Operation▶ 1. Click the save button  at the right above the Inspection Program List in the Select PCB screen.

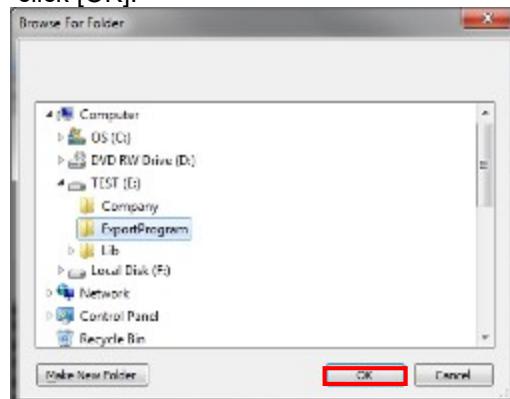


2. The file selection dialog is displayed. Select the file to import and click [Open]. When you also save PCB images, select the check box of the target PCB image and click [Save]. When you do not save PCB images, clear all the check boxes.

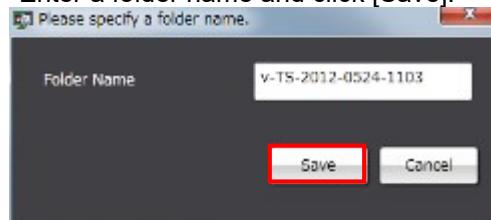


Memo It takes a while to save PCB images.

3. The folder reference dialog appears. Specify the destination and click [OK].



4. Enter a folder name and click [Save].

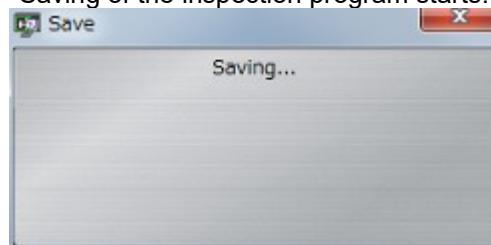


**Memo** The folder name can be entered within 32 single-byte alphanumeric characters and the symbols shown below:

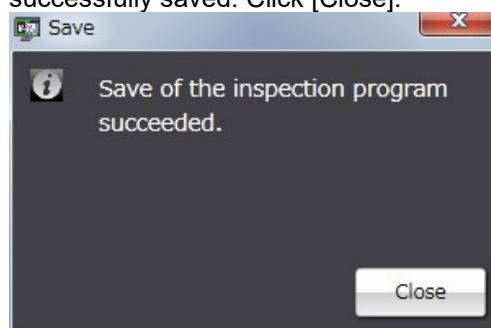
! # \$ % & ' ( ) - = ^ ~ @` [ { ; + } ] , . \_ \\_

**Memo** A folder name comprising "v-TS time/date (yyyy-mmdd-hhmm)" is displayed by default.

5. Saving of the inspection program starts.



The following dialog is displayed if the inspection program is successfully saved. Click [Close].

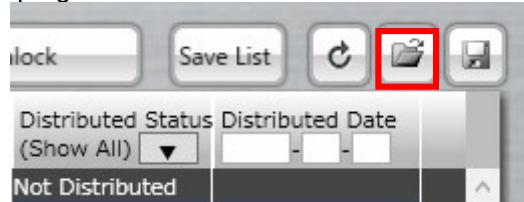


If the saving fails, an error dialog appears.

Close the dialog by clicking [Close], and check for a possible cause e.g. the disk space or restricted access to the saving destination folder.

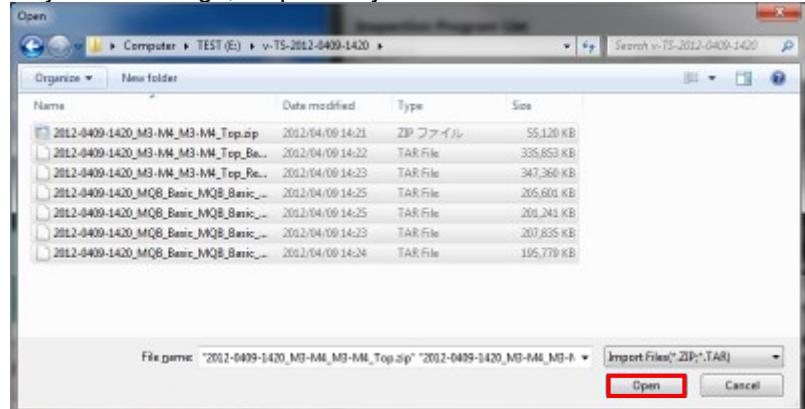
## 2.19.2 Importing an Inspection Program

- Operation▶ 1. To read the saved inspection program on the PCB selection screen, click the read button  at the upper right of the inspection program list.



2. The file selection dialog appears. Specify the saving destination of the reading target inspection program, select the file to be read and then click [Open].

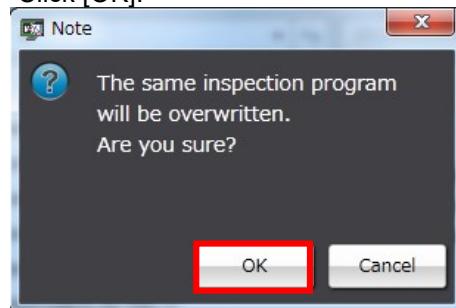
File names in which “Bare,” “Reflow,” and “adjust” are included are the data of a raw board image, an inspection PCB image, and an adjustment image, respectively.

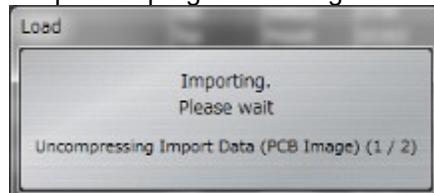


**Memo** The ZIP format file is data excluding PCB images, and TAR format file is data of one PCB image. When reading all the necessary data for inspection program teaching, select a ZIP file and TAR file for necessary images, and then click [Open].

**Memo** The component ID imported is equal to the component ID when the files are exported.

3. The inspection program overwrite confirmation dialog appears. Click [OK].

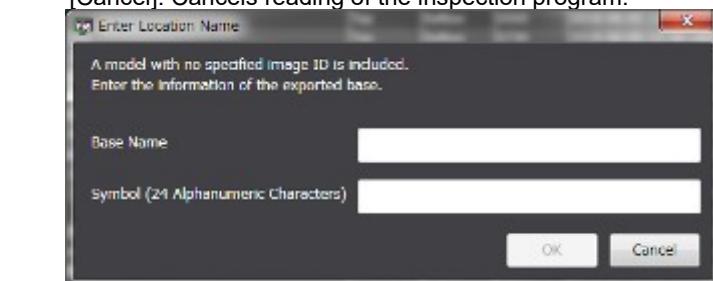


**4.** Inspection program reading starts.**5.** The following dialog is displayed if the file is successfully read. Click [Close].

If the reading fails, an error dialog appears.

When reading only the inspection program with the image captured without presence of a capture image, a data mismatch occurs, causing an error. Click [Close] to close the error dialog and select the image and read the file again.

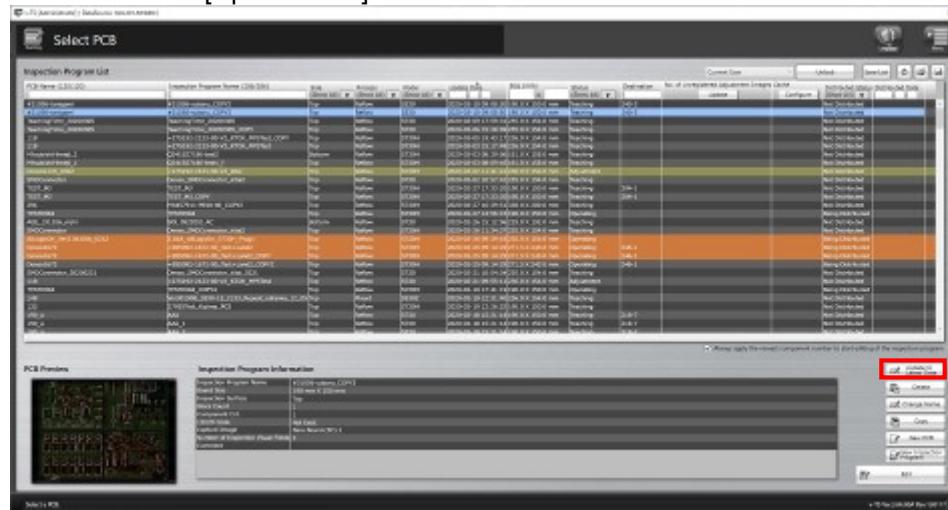
**Memo** If [Use Image ID] of system settings is set ON and a model that no image ID is set is included in the data imported, the source name entry dialog is displayed. Type the information on the export destination data source.  
 [OK]: Determines the entry and continues reading.  
 [Cancel]: Cancels reading of the inspection program.



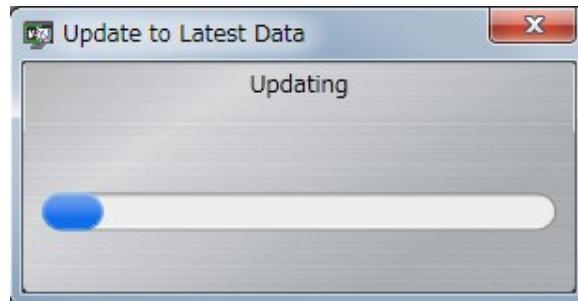
For source name entry, refer to Section 3.6.2 "Making Source Settings."

### 2.19.3 Updating Inspection Program

- Operation▶ 1. Select the inspection program in the Select PCB screen and click [Update Data].



2. The data update starts, and the progress is shown in the progress bar.



The dialog closes when the update is complete.  
Check that the update date and time of the inspection program is updated in the Inspection Program List.

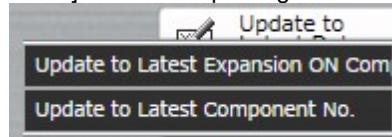
Refer to "2.3 Opening an Inspection Program" for the procedure when the inspection program is opened in a state not updated.

**Memo** If teaching of the latest product number is not completed when the operating inspection program is updated to the latest data, the status is shown by a pink band as follows.

番号	測定項目名	高さ	工具	端子	測定値	許容値(実寸)	OK-NG	NG-OK	NG
131TEST	C31137_1001	100-	ST20A	2010-13-03 21:24:45	90.00 mm X 120.00 mm	90.00 mm X 120.00 mm	OK	NG	NG
TEST_M	C31003_P09	100-	ST20A	2010-13-04 22:40:35	90.00 mm X 130.00 mm	90.00 mm X 130.00 mm	OK	NG	NG
TEST_A	C31003_P0902	100-	ST20A	2010-13-04 22:40:35	90.00 mm X 130.00 mm	90.00 mm X 130.00 mm	OK	NG	NG
TEST_Y12000	P08-40	100-	ST20A	2010-13-04 22:40:35	90.00 mm X 130.00 mm	90.00 mm X 130.00 mm	OK	NG	NG
TEST_C2100	A	100-	ST20A	2010-13-04 22:40:35	90.00 mm X 130.00 mm	90.00 mm X 130.00 mm	OK	NG	NG
TEST_C2100	TEST-ERROR	100-	ST20A	2010-13-04 22:40:35	90.00 mm X 130.00 mm	90.00 mm X 130.00 mm	OK	NG	NG
TEST_W	P09-40_COPY	100-	ST20A	2010-13-04 22:40:35	90.00 mm X 130.00 mm	90.00 mm X 130.00 mm	OK	NG	NG
TEST_W	P08-40_COPY	100-	ST20A	2010-13-04 22:40:35	90.00 mm X 130.00 mm	90.00 mm X 130.00 mm	OK	NG	NG
P08_TEST	P08-40	100-	ST20A	2010-13-04 22:40:35	90.00 mm X 130.00 mm	90.00 mm X 130.00 mm	OK	NG	NG

In this case, open the inspection program and release the program again after teaching of all the product numbers is completed.

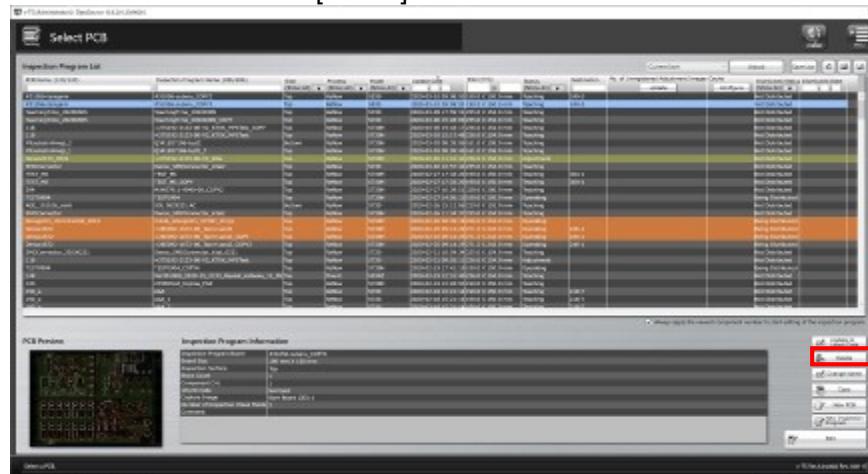
**Memo** If “Use deployment ON/OFF setting function” of system settings is set ON, the update menu is displayed by clicking [Update to Latest Data]. Select an updating method.



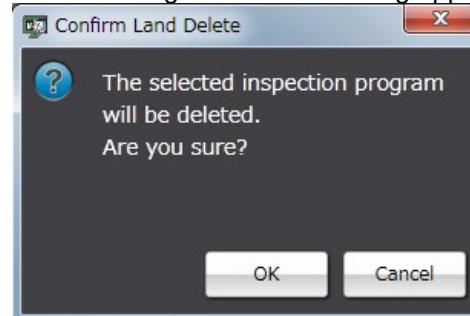
- Update to latest deploy-ON component number:  
Data are updated to the latest deploy-ON revision. If there is no deploy-ON revision, data are updated to the latest revision.
- Update to latest component number:  
Data are updated to the latest revision.

## 2.19.4 Deleting an Inspection Program

- Operation▶ 1. Select the inspection program to delete in the Select PCB screen and click [Delete].



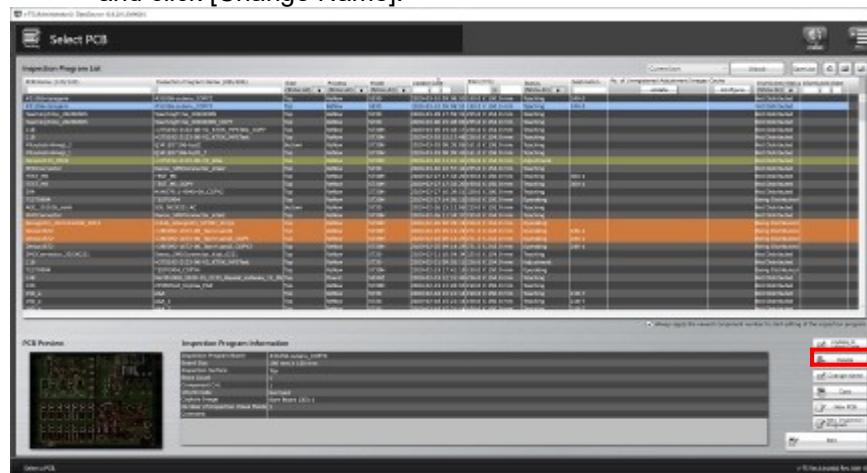
2. The following confirmation dialog appears. Click [OK].



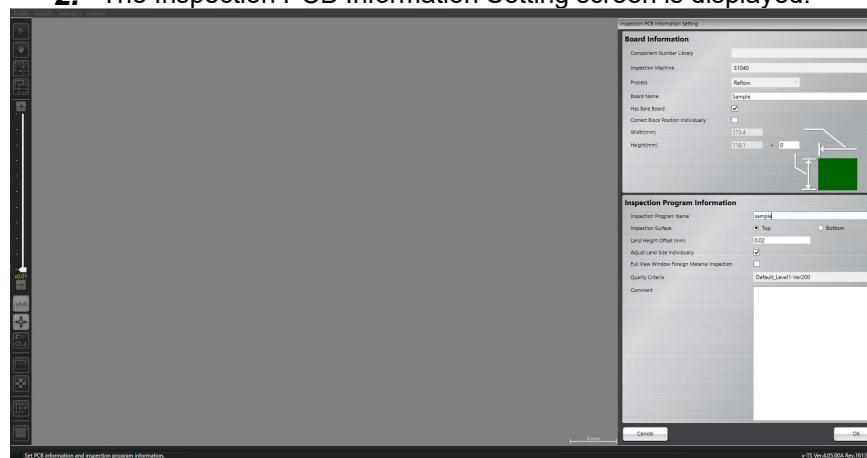
• Click [Cancel] to abort the deletion and close the dialog.

## 2.19.5 Renaming an Inspection Program

- Operation▶ 1. Select the inspection program to rename in the Select PCB screen and click [Change Name].



2. The Inspection PCB Information Setting screen is displayed.



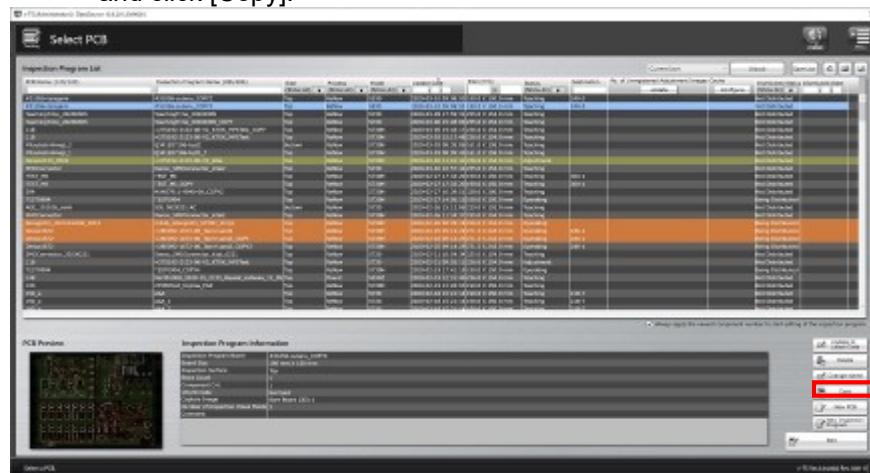
Change the name of the program and click [OK].

**Memo** Only the PCB name, presence of bare board, adjust block position individually, inspection program name, inspection surface, auto size adjustment for each land and comment can be edited.

Refer to "2.2 Creating a New Inspection Program" for the details on individual input items.

## 2.19.6 Copying an Inspection Program

- Operation▶ 1. Select the inspection program to copy in the Select PCB screen and click [Copy].



The inspection program is copied and copied program is displayed in the Inspection Program List.

PCB Name	Inspection Program Name
SAMPLE_PCB_0001	SAMPLE_PCB_0001
SAMPLE_PCB_0001	SAMPLE_PCB_0001_COPY
SAMPLE_PCB_0002	SAMPLE_PCB_0002

**Memo** Copying an inspection program requires a certain amount of time.

**Memo** The copied program is named with the default name "The name of the original inspection program\_COPY".

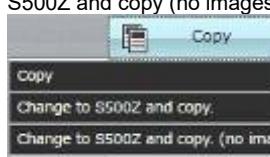
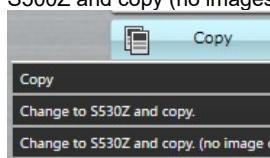
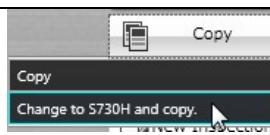
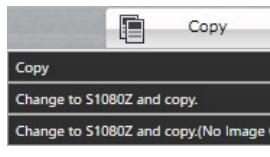
→ To rename the program name, refer to "2.19.5 Renaming an Inspection Program".

**Memo** If an inspection program with oblique images is copied, oblique images are deleted. The program can be used as an inspection PCB only including direct view images.

**Memo** Since oblique images cannot be diverted depending on the component location, they are deleted when an inspection program is copied.

**Memo** Status: If an inspection program in operation is copied, the copied inspection program is saved as the status: in teaching, not released automatically.

**Memo** By copying an inspection program of the inspection system for a particular model/process, an inspection program of another model/process can be created.  
The list of the models of the copy destination corresponding to the copy source is as follows.

Mode/Process	Corresponding Model/Process	Remarks
S500 Reflow process	S500 Mounting process	Whether images can be copied or not can also be selected. If copying the inspection program by selecting [Convert into S500Z and copy (no images are copied)], shoot the PCB. 
S530 Reflow process	S530 Mounting process	Whether images can be copied or not can also be selected. If copying the inspection program by selecting [Convert into S530Z and copy (no images are copied)], shoot the PCB. 
S730	S730H	
S730H	S730	
S1080(V2) Reflow/ Mount process S1040(V2) Reflow/ Mount process Z600(V2) Reflow/ Mount process	S1080(V2) Reflow/ Mount process S1040(V2) Reflow/ Mount process Z600(V2) Reflow/ Mount process	Whether images can be copied or not can also be selected. If copying the inspection program by selecting [Convert into S1080Z and copy (no images are copied)], shoot the PCB. 

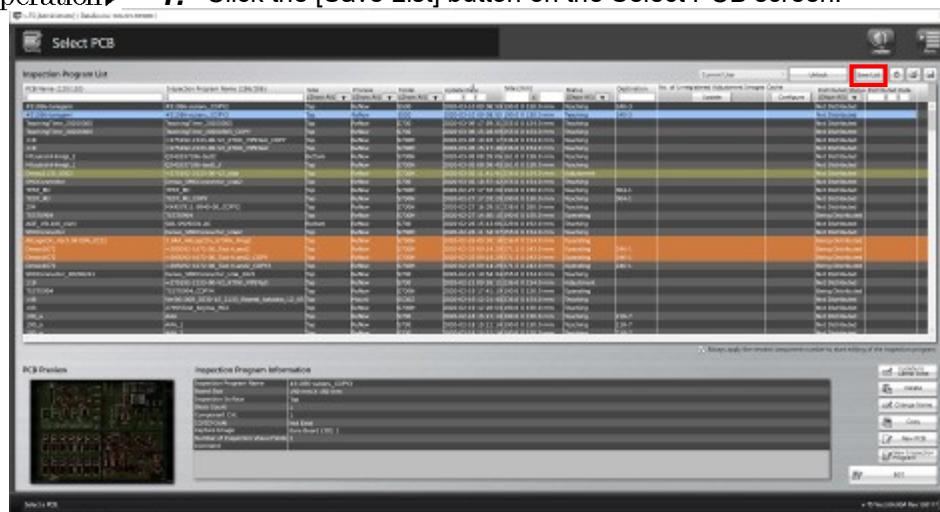
## 2.19.7 Outputting Content of Inspection Program List

This function outputs to a CSV file the content of an inspection program list, such as information on inspection programs, progress of the creation work of them, the number of images belonging to each inspection program, the number of inspection programs, the number of destinations, or version of the logic being used.

 When outputting a list of the component numbers used by inspection programs, refer to Section 3.4.3 “Outputting List of Component Numbers Used by Inspection Programs.”

This section describes the procedure to output the content of an inspection program list.

Operation▶ **1.** Click the [Save List] button on the Select PCB screen.



**2.** A dialog to browse folders is displayed.  
Specify a folder to save the file, and click [OK].



**Memo** The default file name is “(Date and Time)\\InspectionProgram.csv.”

3. After the finish screen of CSV output is displayed, click the [Close] button.

The CSV file is saved in the selected folder.  
To abort the file output, click [Cancel].



For details of the output format, refer to the following page.

## ■ Inspection program list output format

Column	Item	Output data
1	PCB name	Name of PCB
2	Inspection program name	Name of inspection program
3	Front/back	Front/back of PCB inspected by inspection program
4	Process	Name of inspection process
5	Model	Model name corresponding to inspection program
6	Update date and time	Date and time of update
7	Size (mm)	PCB size: horizontal size x vertical size (mm)
8	Status	Status of inspection program
9	Save FOV image(Inside information)	Setting ON/OFF of FOV image saving function for inspection
10	Destination	Presence/absence of destination
11	No. of component block units	No. of component block units
12	No. of components	No. of components
13	2D code	Presence/absence of 2D codes
14	No. of shot images (raw board)	No. of shot images of raw board
15	No. of shot 3D images (raw board)	No. of shot 3D images of raw board
16	No. of shot images (reflow)	No. of shot reflow images
17	No. of shot images (reflow 3D)	No. of shot reflow 3D images
18	No. of shot images (reflow 3D full)	No. of shot reflow 3D full images
19	No. of shot images (adjustment)	No. of shot adjustment images
20	No. of shot images (adjustment, oblique)	No. of shot oblique adjustment images
21	No. of shot images (adjustment, 3D)	No. of shot adjustment 3D images
22	No. of shot images (adjustment, 3D, oblique)	No. of shot oblique adjustment 3D images
23	No. of inspection FOV	No. of inspection FOV
24	No. of inspection FOV (oblique)	No. of oblique inspection FOV
25	Change release to teaching	Presence/absence of change
26	Comment	Content of comment
27	PJ-ID	System ID of PCB
28	PG-ID	System ID of inspection program
29	PJ-Revision	System revision of PCB
30	PG-Revision	System revision of inspection program
31	CompanyId	ID of component No. library

**Memo** If [Use Deployment ON/OFF Setting Function] of system settings is set ON, [Deployment OFF] is output.

- If there is a component number of deployment OFF: Applicable
- If there is no component number of deployment OFF: N/A



For the deployment ON/OFF setting function, refer to Section 3.6.3 "Making Component Number Settings."

## 2.19.8 Verifying Inspection Program Data

Data integrity of an inspection program is verified to prevent transmission of illegal data to be sent to an inspection machine.

Shown below are details of the primary data verification.

Verification is done if an inspection program can be used on an inspection machine or not.

Target Data		Checking Details
Inspection Program	Position Correction Mark 2D Code Bad Mark Component Block Unit Edge	Window positions, count, and sizes must be proper Inspection criteria must be proper Must have a model Must have a color Must have been painted(*1) Must belong to a PCB or a component block unit
	Component Block Unit	Must have a circuit The No. of circuits of component block units must be the same
	Image Capturing Route	A mark or circuit must have a view Must have a multi-screen component view Must have a single-screen component view
	Base Plane Model	Must have a base plane model corresponding to a view
	Pattern Position Correction Model	Must have a pattern position correction model corresponding to a view
	Characteristic Parameter	Must have a model Must have a color Must have been painted(*1)
Circuit	Inspection Range Window Inspection Range (Oblique) Window Component Window Electrode Window Land window	Window positions, count, and sizes must be proper Must have a pair window Must have the same angle as that of pair window
	Individual Setting	Sub-window position and size must be proper Inspection criteria must be proper Must have been painted
	Oblique View Setting Secondary Reflection Customer-Specific	Must satisfy valid conditions

Component Number	Component Type Item No. Name	Must have been configured
	Progress Signal	Window registration must have been done Must have a characteristic parameter
	Component Window Electrode Group Electrode Window Land window Sub-Window	Window positions, count, sizes, and angles must be proper Must have a pair window Must have the same angle as that of pair window Inspection criteria must be proper
	Height Information	A height of 0.1mm or higher must have been set A light intensity level must have been set A stripe size must have been set
	Characteristic Parameter	Must have a model Must have a mask model Must have a color Must have been painted(*1)
	Overlooking	Must have an overlooking
Component Number Group	Component Number List	Must have a component number list
	Characteristic Parameter	Must have a color

**Memo** \*1 For the operating method to switch ON/OFF of the color parameter checking function when data are verified, refer to the operating method of the model editing screen of Section 2.16.3 "Editing a Model."

#### ■ Data Verification

Data verification is automatically done in the following timings:

- When data is updated to the latest
- When an inspection program is released, adjustment saved.

\* Data verification upon release aims at component numbers and component number groups that have acquired locking

(All inspection programs and circuits will be verified)

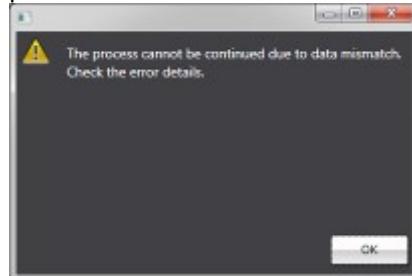
This section describes data verification which is automatically executed.

Operation▶ 1. Data verification is automatically done in given timings. If an error is detected in a data verification result, the data verification result list appears.



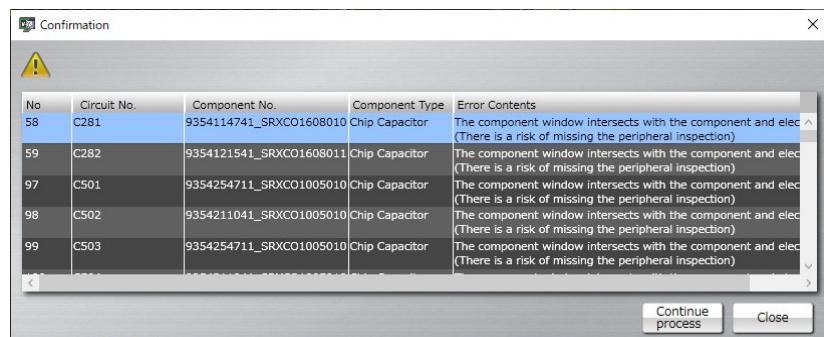
**Memo**

You can continue the processing without recovering data by pressing the [Continue Processing] button. If mismatching occurred in data required to proceed, however, a warning screen appears, preventing to proceed.

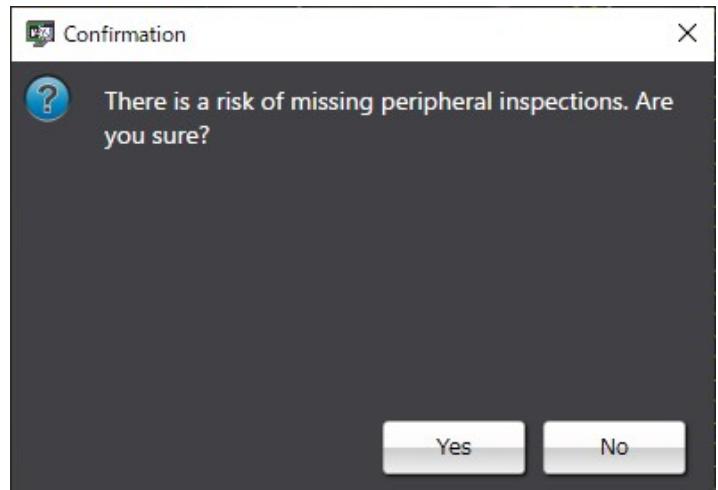


**Memo**

When the inspection program is adjusted, saved, or released, a warning is displayed when the component window intersects the component and electrode windows of other circuits. For details on how to fix it, please refer to Chapter 6 Peripheral Inspection of the Logic Manual "Notes on Overlapping Component Window with Other Parts".



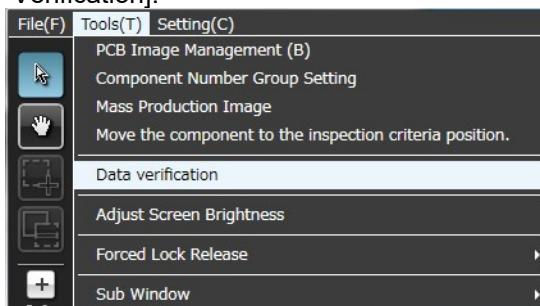
If you press the Continue Processing button, a message will be displayed warning you of the risk of missing a peripheral inspection. Select "No" and correct the data.



2. Recover the data based on the recovery steps. If the result error disappears, the data verification list does not appear and the process is continued.  
 For the recovering method, refer to "Data Recovery Flow" of Section 2.19.8 Verifying Inspection Program Data."

You can manually perform data verification at any timing.  
This section describes manual data verification steps.

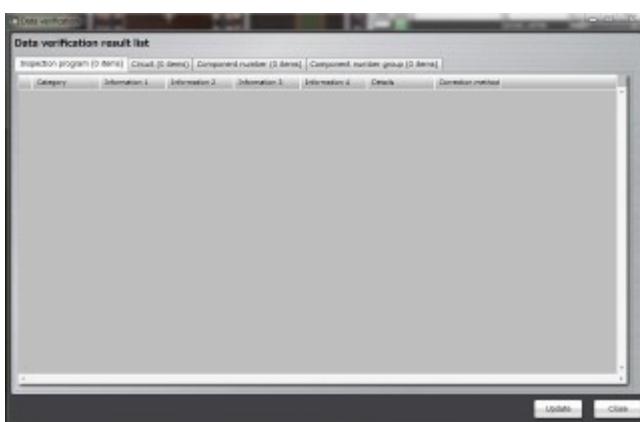
- ||Operation▶ 1. On the menu bar of the edit screen, select [Tool] - [Data Verification].



2. Data verification is performed and the data verification result list appears. If an error is detected in the data verification result list, recover the data based on the recovery steps.

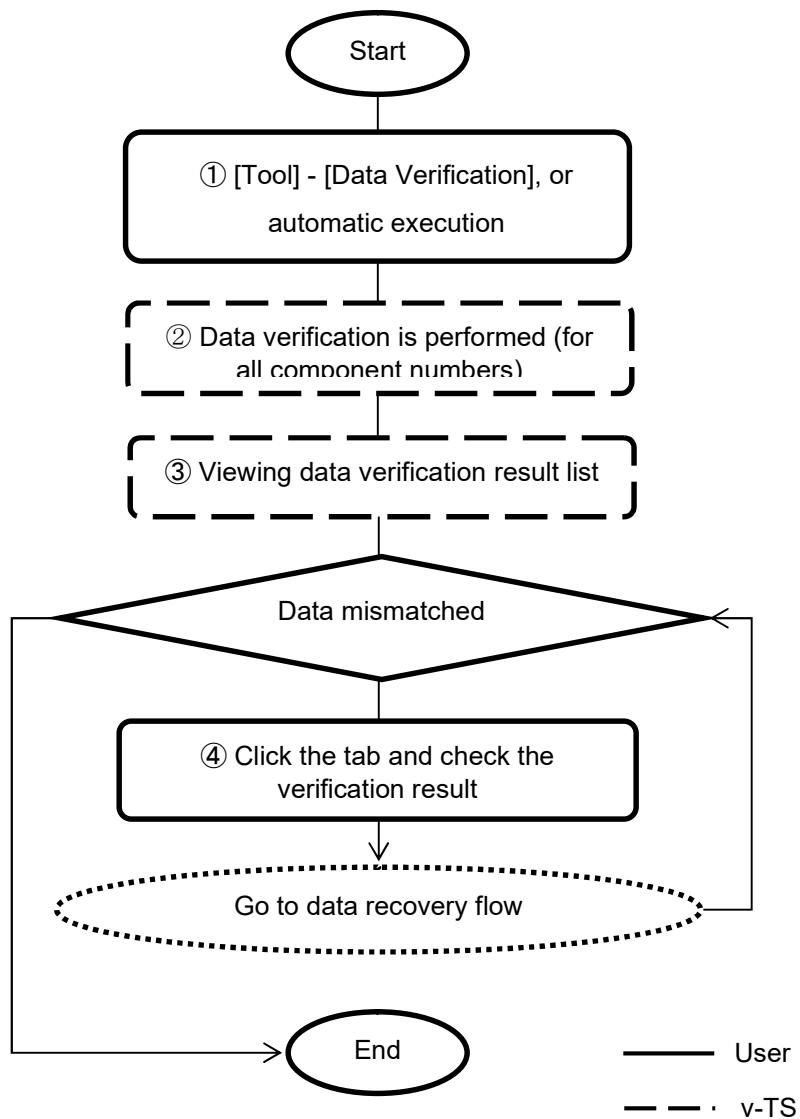


3. After data recovery, press the [Update] button and check for a result error in the data verification result list.



Shown below is the data verification flow:

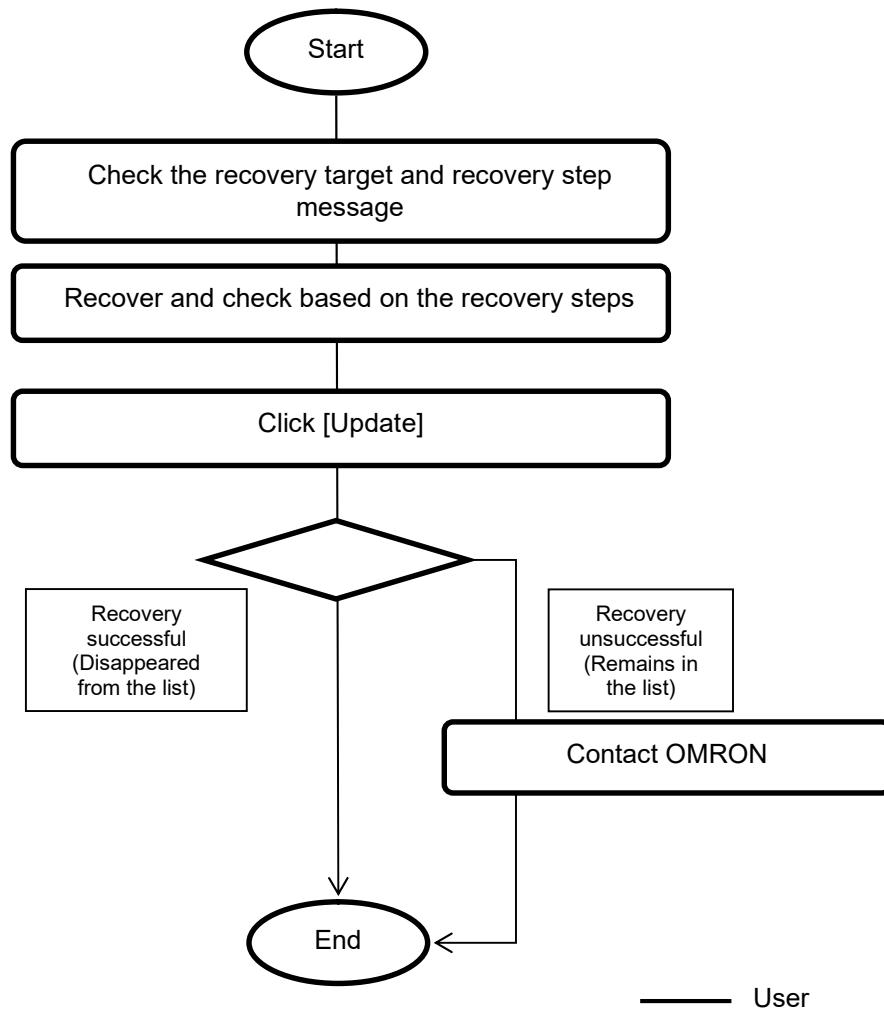
■ Data Verification Flow



If an error is detected as a result of data verification, recover the data based on the recovery steps.

Shown below is the data recovery flow:

■ Data Recovery Flow



## 2.20 Cross-Model Conversion of Inspection Programs

This section describes the procedure for converting inspection programs to the S10 series between models.

**【Applicable models(S5/S7⇒S10)】**

Model (Before Conversion)	Model (After Conversion)
S500	S1080 S1080V2
S530	S1040 S1040V2
S730	Z600 Z600V2
S730-H	

**【Applicable models(S10⇒S10)】**

Model (Before Conversion)	Model (After Conversion)
S1080	S1080V2
S1040	S1040V2
Z600	Z600V2
S1080V2	S1080
S1040V2	S1040
Z600V2	Z600

**【Convertible version】** Ver3.03, Ver3.04

**【Conversion target data】** Circuit information, thumbnail images, various types of inspection window information, inspection standards

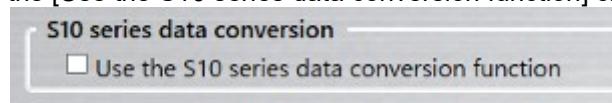
**【Not Conversion(S5/S7⇒S10)】** Model image, mass production registration image

**Memo**

You can't convert if:

- If the same part number (or part number group) already exists
- Unfinished part number

**|||Operation► 1.** From the v-TS Main Menu - Utilities, click System Settings. Select the [Use the S10 series data conversion function] checkbox.



**2.** In the v-TS Main Menu – Teaching - BoardSelection, Import the Inspection PG of an existing model(S730/S730-H/S530/S500).

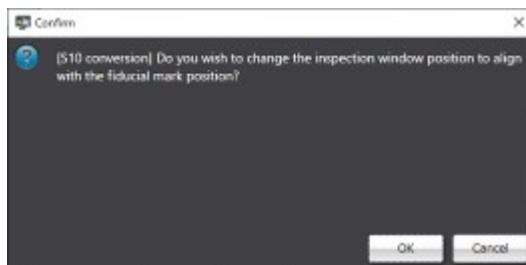
For the import the Inspection PG, refer to "Data Recovery Flow" of Section 2.19.82 Verifying Inspection Program Data."

**3.** Click the "Copy to S10 Series" button above the inspection program list or the copy button of the inspection program, and select the model of the copy destination. Convert inspection program.

**Memo** When converting multiple inspection programs, multiple inspection programs, click "Copy to S10 Series".

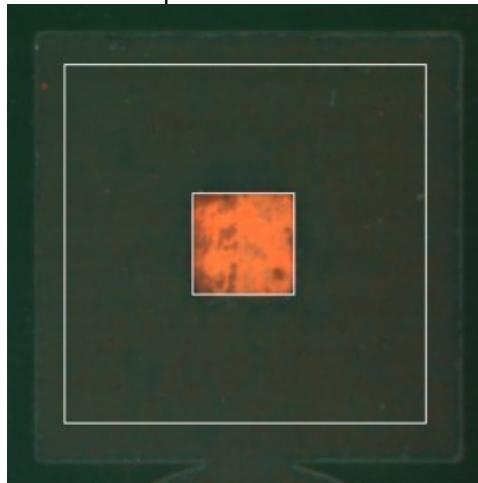
**4.** The status of the inspection program is copied in New. Capture the raw board and the inspection board with the inspection equipment.

**5.** Set the fiducial mark. After setting the window of the fiducial mark, the confirmation dialog for changing the position of the inspection window will be displayed, so click OK.

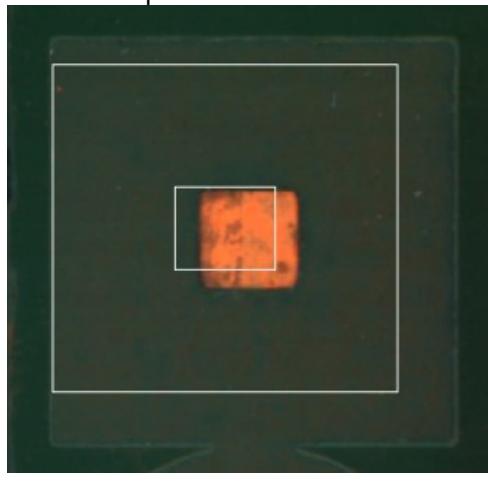


**Memo** Make sure you set the fiducial mark correctly.  
Transform the layout of the inspection window accordingly.

<Good Example>



<Bad Example>



6. On the Part Registration (Automatic) tab, click the Register All Part Number Model button.(Model registration, learn the feature parameters of the white image)  
This completes the cross-model conversion to the S10 series.

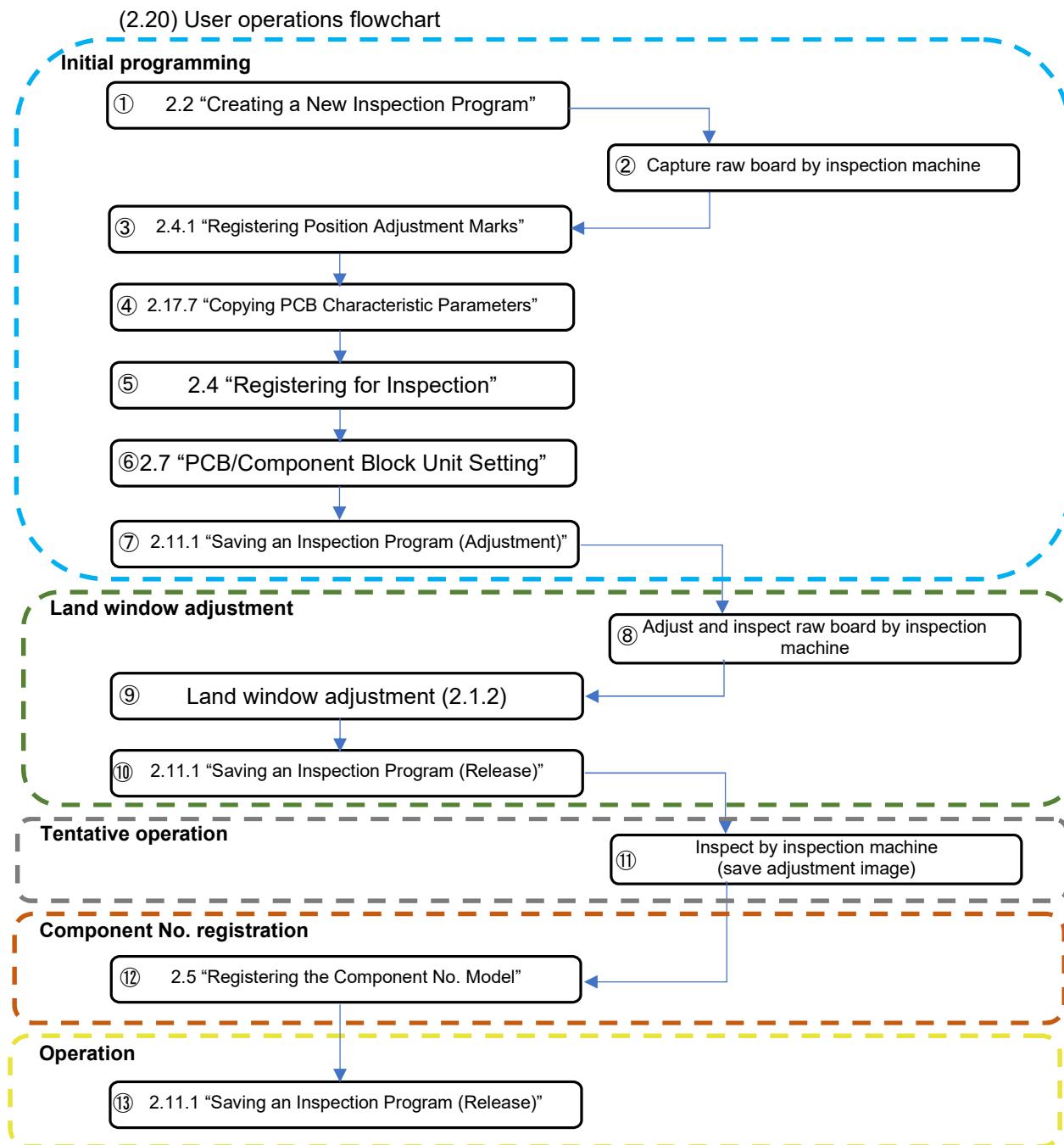
## 2.21 Initial Teaching using Raw Board Only

This section describes the flow of initial teaching using raw board only.

Operate the system according to the flowchart below.



For details of each user operation, refer to each section shown on the flowchart.



**Memo**

If there is no inspection PCB, use (display) a raw board for teaching.

**Memo**

Even if inspection registration (⑤) is completed, there is no inspection PCB. So, it is not allowed to transit to the Component Registration (Automatic) tab and Result Confirmation tab.

**Memo**

When there is no inspection PCB, if inspection registration (⑤) is performed and adjustment saving (⑦) or release (⑩) is done, a warning message is displayed.



Incomplete data mentioned in section 2.11.1 "Saving an Inspection Program."

**Memo**

When at least one incomplete component number (no model is present), adjustment saving (⑦) or release (⑩) is performed, the inspection program is saved as "(tentative)" is suffixed to the status.

Model	Update Date	Size (mm)	Status
S730	2017-08-31 13:39:36	190.0 X 150.0 mm	Adjustment(Tentative)
S730	2017-08-31 16:23:29	190.0 X 150.0 mm	Operating...(Tentative)

In addition, incomplete component number is saved as a tentative component number; so, inspection always results in a failure.

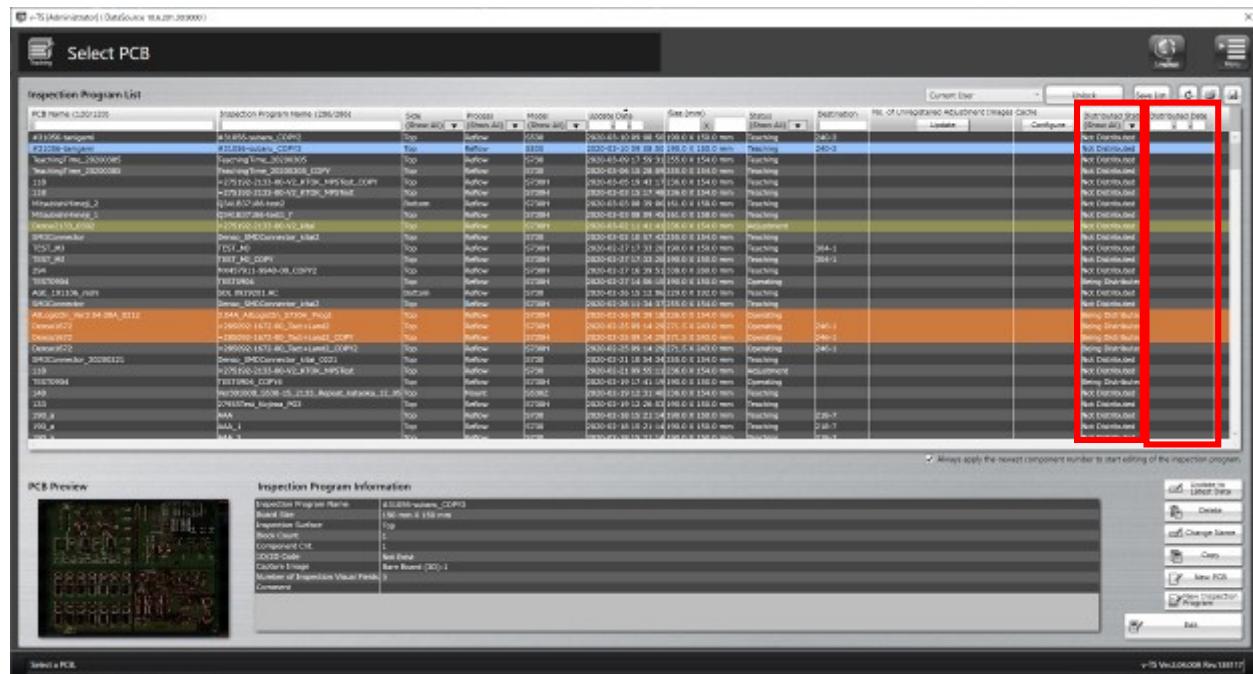
**Memo**

If a component number is not completed, no model is present; so, component number model cannot be edited. This is made possible after a component number model is registered (⑫).

# 2.22 Status Confirmation of Inspection Programs

## 2.22.1 Confirming Distribution Status of Inspection Programs

On the "Distribution Status" column on the inspection program list in the board selection screen, confirm the distribution status of inspection programs to each inspection machine.



**Memo** The inspection programs to be distributed are only the ones whose status is "In Operation."

**Memo** The status type displayed on the distribution status column is as follows:

- Not Distributed : Displayed when the status of the inspection program is other than In Operation.
- In Distribution : Displayed when the inspection program is being distributed to the inspection machine.
- Completed : Displayed when the inspection program has been distributed to the inspection machine completely.

**Memo** The date & time of distribution is updated by the date & time at which the inspection program is distributed to the machine completely. The date & time of distribution column is blank for any inspection programs not distributed.

# **Chapter 3**

## **Management Menu**

---

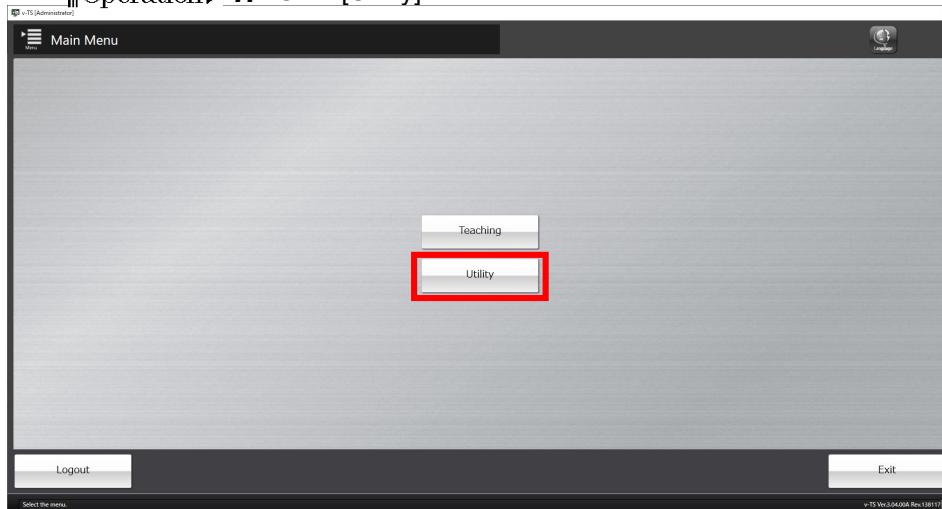
3.1	Opening Utility Menu .....	3-2
3.2	Checking Version Information.....	3-3
3.3	Configuring Quality Criteria Setting .....	3-4
3.4	Managing Component Number Libraries.....	3-11
3.5	Setting Model Codes .....	3-31
3.6	Making System Settings .....	3-33

## 3.1 Opening Utility Menu

---

Settings for operations of the teaching system are available on the utility menu.

Operation▶ 1. Click [Utility] on the main menu.



2. The utility menu will appear.

To return to the main menu, click the  button on the top-right screen.



## 3.2 Checking Version Information

Check the version of this software at the right bottom of the screen.



# 3.3 Configuring Quality Criteria Setting

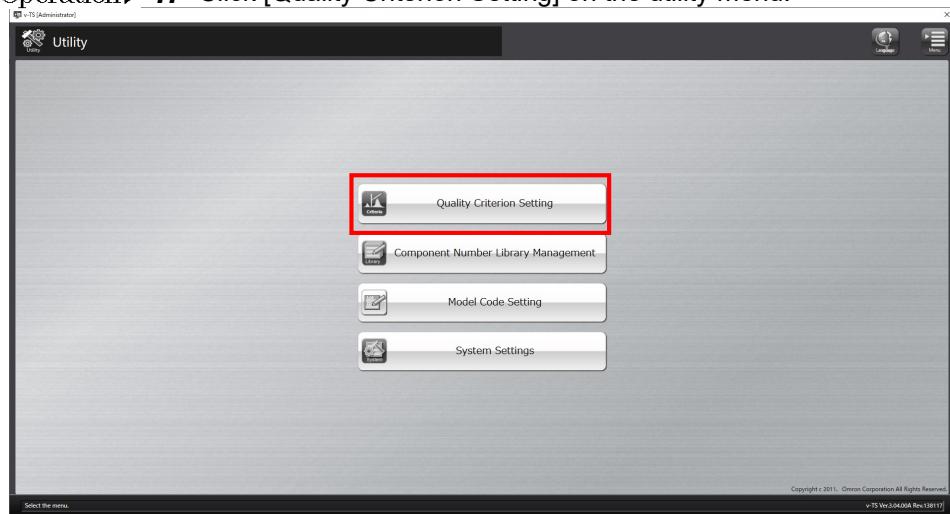
For each electrode type, initial settings for inspection criteria as well as peripheral inspection criteria are done in this section.

More than one setup details can be saved as criteria rulebooks.

 For how to specify a criteria rulebook, refer to "2.2 Creating a New Inspection Program."

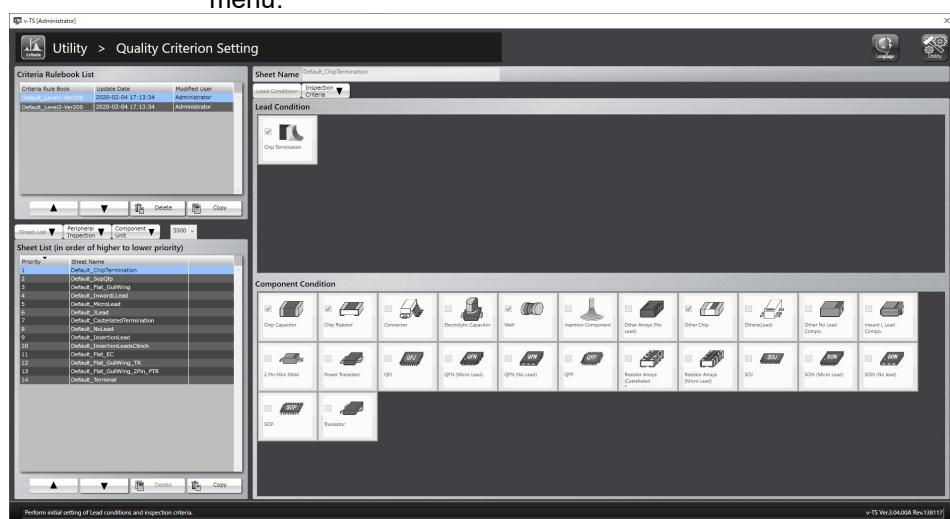
## 3.3.1 Opening Setup Screen

Operation▶ 1. Click [Quality Criterion Setting] on the utility menu.



3. The quality criterion setting screen will appear.

Click the  button on the top-right screen to return to the utility menu.

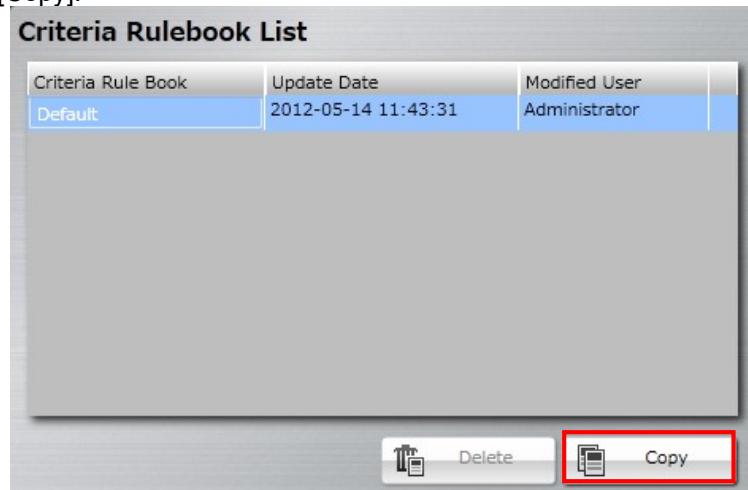


### 3.3.2 Managing Criteria Rulebook

### ■ Copying Criteria Rulebook

**Please Note** You will not be able to restore the default criteria rulebook if you directly edit it. If you want to keep the setup, copy it before editing.

**Operation ▶ 1.** Select a criteria rulebook from the criteria rulebook list, and click [Copy].



A file "original criteria rulebook name COPY" will be created.

Criteria Rule Book	Update Date	Modified User
Default	2012-05-14 11:43:31	Administrator
Default_COPY	2012-05-24 17:20:31	Administrator

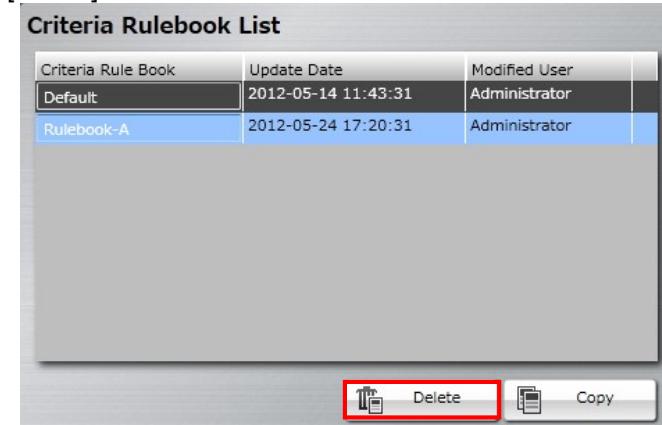
## ■ Changing Criteria Rulebook Name

**Operation ▶ 1.** Click the name of a criteria rulebook you want to change in the criteria rulebook list to edit, and enter a new name.

Criteria Rule Book	Update Date	Modified User
Default	2012-05-14 11:43:31	Administrator
Rulebook-A	2012-05-24 17:20:31	Administrator

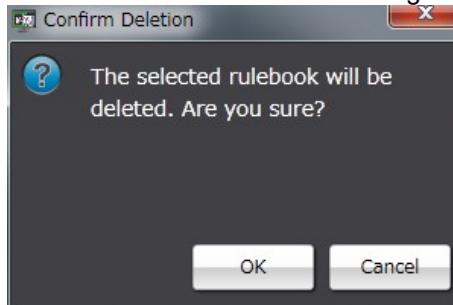
## ■ Deleting Criteria Rulebook

- Operation▶ 1. Select a criteria rulebook from the criteria rulebook list, and click [Delete].



Memo If there is only one criteria rulebook, [Delete] will be invalid.

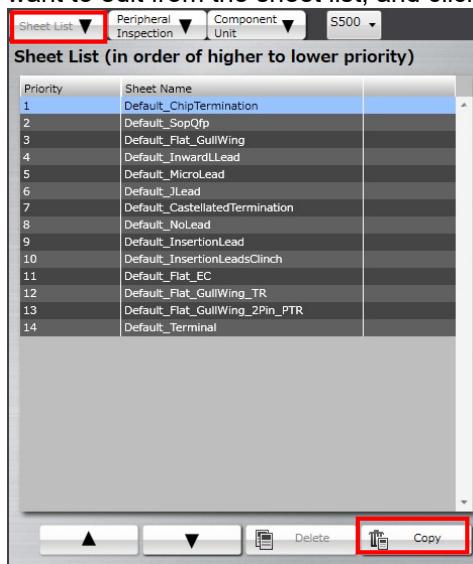
2. On the deletion confirmation dialog box, click [Yes].



### 3.3.3 Configuring Electrode Type Inspection Criteria

Initial settings of inspection criteria are done for each electrode type in this section. Setup details are managed in a sheet. If a lead type is defined in more than one sheet, the criteria in a sheet with higher priority are used for the initial setting.

- Operation▶ 1. Click the [Sheet List] tab, select a sheet of an electrode type you want to edit from the sheet list, and click [Copy].



**Memo** The default sheet cannot be edited.

**Memo** Shown below are electrode types and the corresponding sheets.

Electrode Type	Sheet Name
Chip Electrode	Default_ChipTermination
Flat Lead, Gull-Wing Lead	Default_Flat_GullWing
Flat Lead, Gull-Wing Lead (Transistor)	Default_FlatGullWing_TR
Flat Lead, Gull-Wing Lead (2-pin Minimold, Power Transistor)	Default_FlatGullWing_2Pin_PTR
Gull-Wing Lead (SOP, GFP)	Default_GullWingLead
Flat Lead (Electrolytic Capacitor)	Default_FlatLead
Inward L-Lead	Default_InwardLLead
Micro-Lead	Default_MicroLead
J-Lead	Default_JLead
Castellation Electrode	Default_CastellatedTermination
No Lead	Default_NoLead
Insertion Lead (Straight)	Default_InsertionLead
Insertion Lead (Clinch)	Default_InsertionLeadsCinch
Terminal	Default_Terminal

4. Click the sheet copied from the sheet list to select.

**Sheet List (in order of higher to lower priority)**

Priority	Sheet Name
1	Default_OtherTermination_COPY
2	Default_ChipTermination
3	Default_GullWingLead
4	Default_FlatLead
5	Default_OtherTermination
6	Default_CastellatedTermination
7	Default_NoLead

**Memo** The copied sheet is displayed as priority 1.

**Memo** To increase the priority, click . To decrease, click .

5. Click the text box of [Sheet Name] to edit the sheet name.

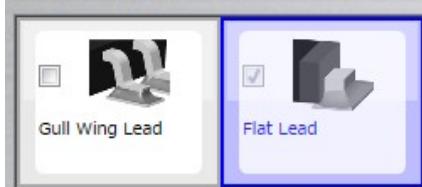
**Sheet Name** Default\_OtherTermination\_COPY

6. If an electrode condition is not displayed, click the [Electrode Condition] tab.

7. Set an electrode type for which you want to enable the inspection criteria of this sheet.

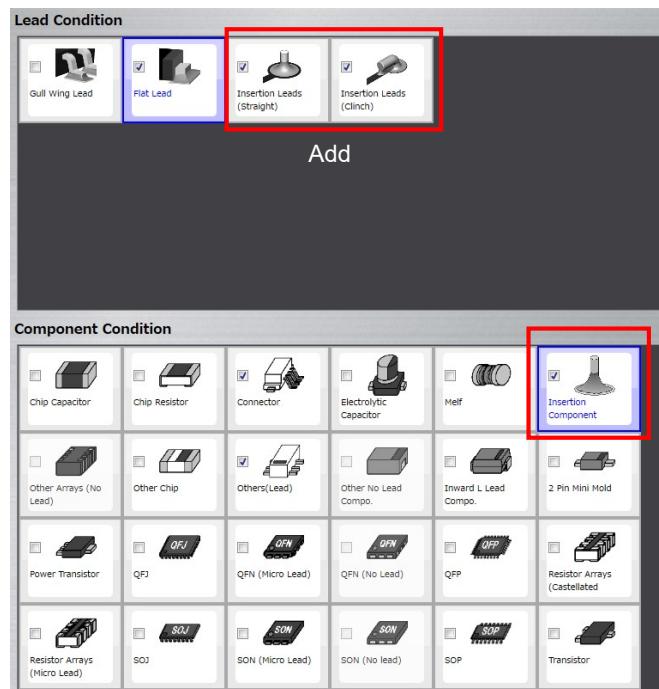
Click a check box for each electrode type in the electrode condition. Select the box to enable, or unselect it to disable.

**Lead Condition**



**Memo** On the component conditions, the check box is displayed as being selected for a component type corresponding to the enabled electrode type.

To add other electrode type than those displayed, select the check box of a component type corresponding to the electrode type in the component conditions.



For component types and the corresponding electrode types, see P2-7 "Component Types" and P2-8 "Electrode Types."

8. Click the [Inspection Criteria] tab to display the inspection criteria.

9. Edit the initial setting of the inspection criteria.

If the check box is being selected, inspection for the item will be performed. If not, it will not be performed.

For an inspection item with its check box being selected, set a reference value for OK judgment.

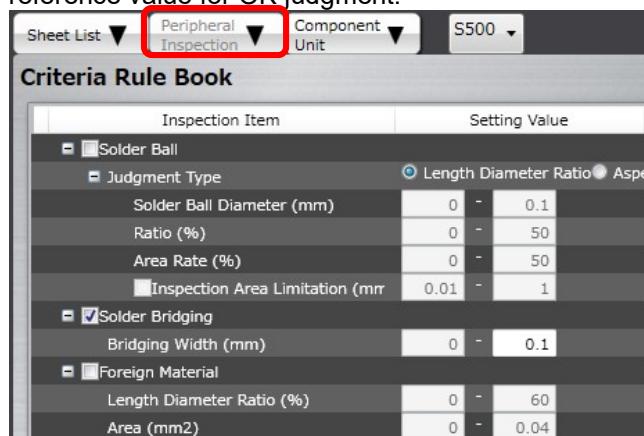
For details of inspection items, refer to the inspection logic manual.

### 3.3.4 Configuring Peripheral Inspection Criteria

Initial settings of peripheral inspection are done in this section.

||Operation▶ 1. Click the [Peripheral Inspection] tab.

- 10.** Edit the initial setting of the peripheral inspection criteria.  
 If the check box is being selected, inspection for the item will be performed. If not, it will not be performed.  
 For an inspection item with its check box being selected, set a reference value for OK judgment.



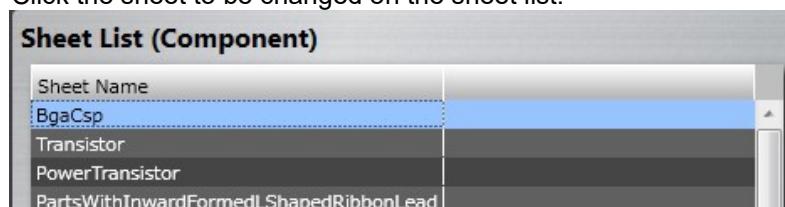
### 3.3.5 Configuring Component Unit Inspection Criteria

The inspection criterion values for component body inspection can be changed.

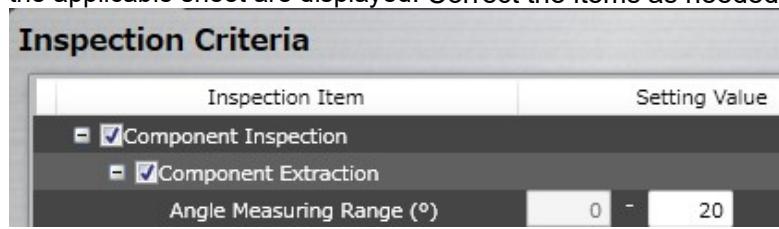
||Operation▶ 1. Click the [Component Unit] tab.



- 2.** Click the sheet to be changed on the sheet list.



- 3.** On the right-hand inspection criterion list, the inspection criteria of the applicable sheet are displayed. Correct the items as needed.



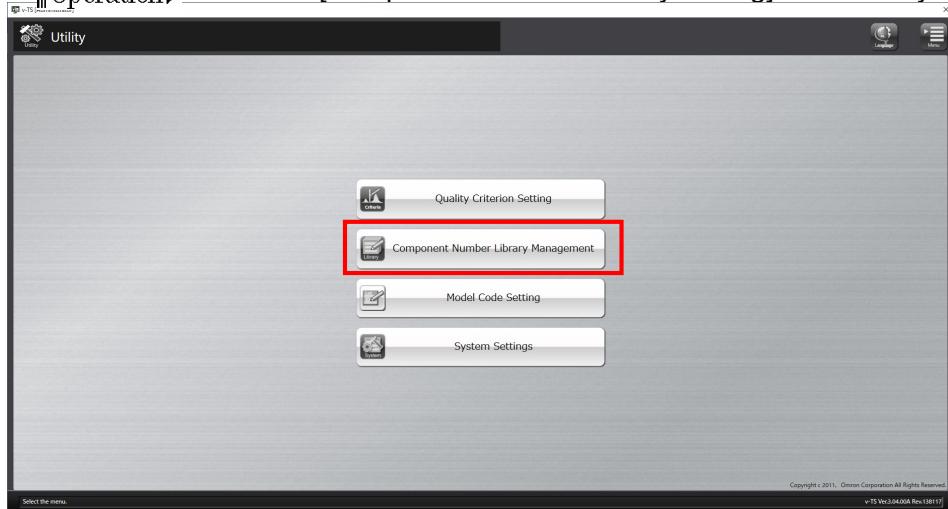
The meaning of Setting ON/OFF the checkboxes is the same as that of the peripheral inspection above.

# 3.4 Managing Component Number Libraries

## 3.4.1 Adding/Deleting Component Number Libraries

You can specify the component number library to use for each inspection project. Utilizing multiple component number libraries materializes separate management of required quality and component numbers.

**Operation** ▶ 1. Click [Component Number Library Manag] on the utility menu.

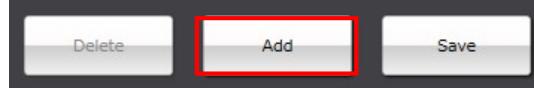


11. The component number library management screen appears.

To return to the utility menu, click button on the top-right screen.



- 
- 12.** To create a new component number library, click [Add].



A component number library is created and added to the list.  
For easier identification, enter a component number library name  
and a comment.

- 13.** To delete the component number library, select a component number library and click [Delete]. When you delete a component number library, delete inspection programs that use the library as the inspection programs that refer to the component number library will become unavailable.

- 14.** After completing the setting, click [Save] to save the change.

### 3.4.2 Copying Component Number Data and Component Number Group Data among Libraries

Any component number data or component number group data can be copied among component number libraries.

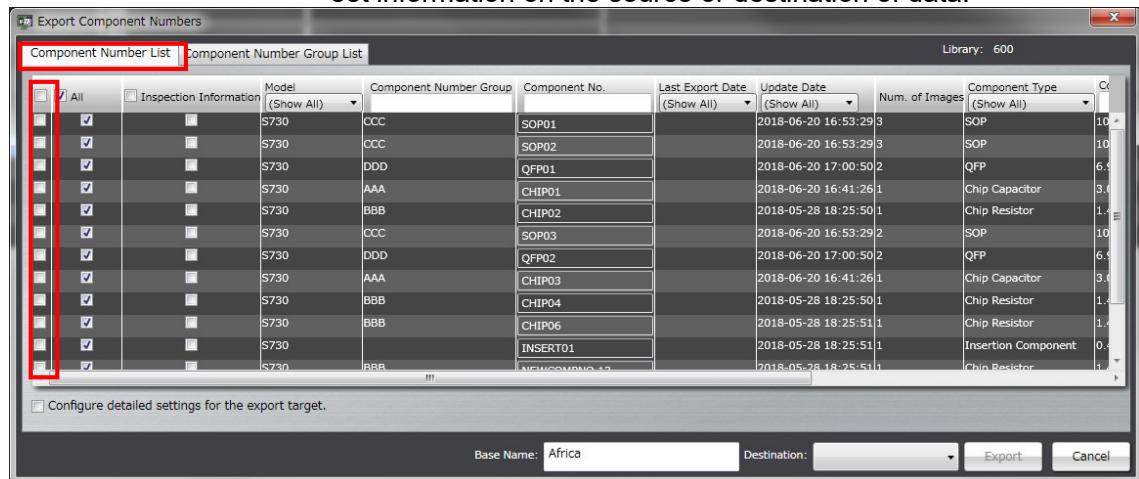
#### ■ Exporting component number data

Operation▶

1. Select a component number library from which you wish to output a component number data, and click [Export].

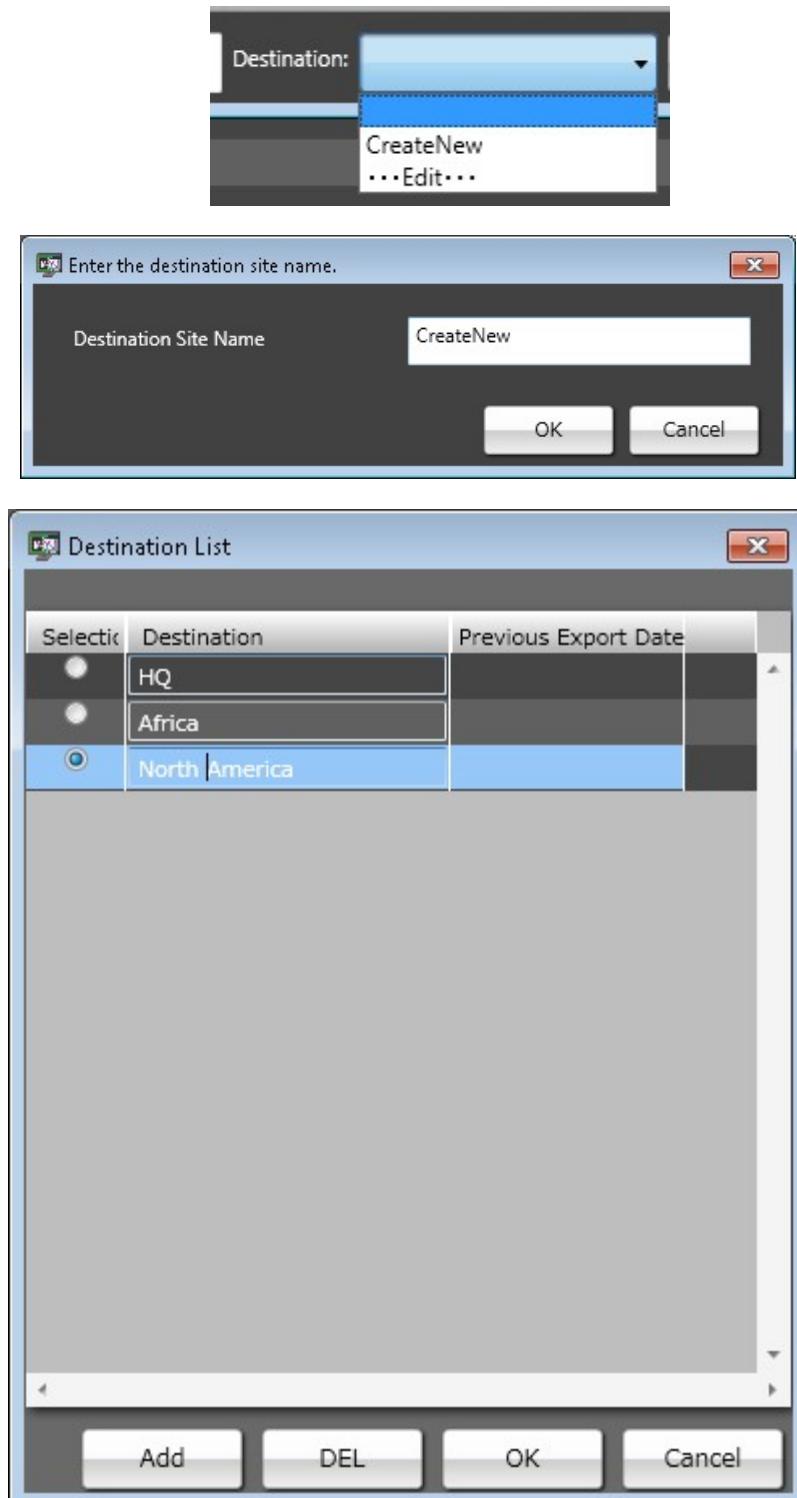


2. On the Export Component Numbers screen, click the [Component Number List] tab. It is able to select the component numbers you wish to export from the component number list, and set information on the source or destination of data.



3. In the [Source] text box, the data supply source name entered in the system settings screen is displayed. For [destination], by clicking [Create New] on the pull-down menu, a new destination can be registered. When editing an existing destination, click [Edit...]. Then, the destination list can be edited.

For the entry of data supply source name, see Section 3.6.2 “Setting Data Supply Source.”

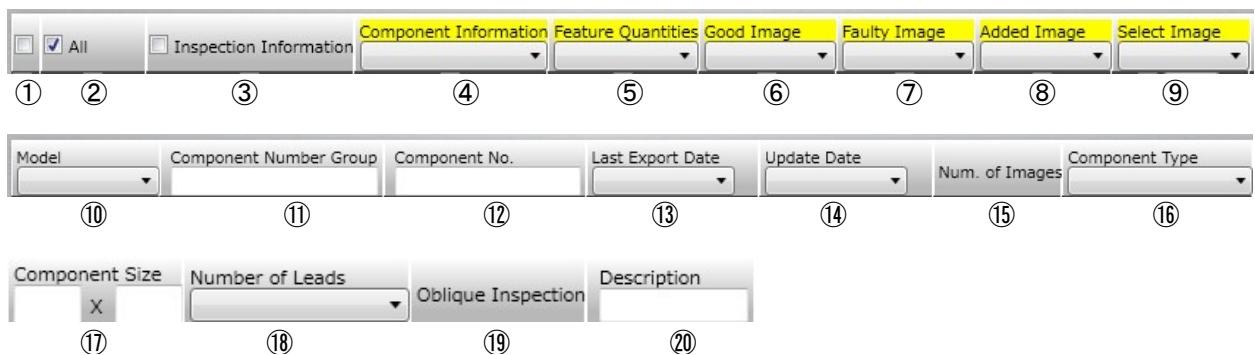


**Memo**

If it is needed to supply data to more than one site, register the destinations. Export information of the previous time is saved for each site; so, this information can be utilized when attaching additional images.

4. To set the content you wish to export in detail, turn ON the [Set content exported in detail] check box. When turned ON, items ④ to ⑨ below are displayed.

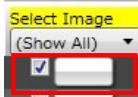
- ① Turn ON/OFF export execution
- ② Turn ON/OFF export execution of all (component information, feature quantity, affiliated component numbers, OK images, and NG images)
- ③ Turn ON/OFF export execution of inspection information (component information, feature quantity, and affiliated component numbers)
- ④ Turn ON/OFF export execution of component information data
- ⑤ Turn ON/OFF export execution of feature quantity data (color, mask information)
- ⑥ Turn ON/OFF export execution of OK images
- ⑦ Turn ON/OFF export execution of NG images
- ⑧ Turn ON/OFF export execution of only images added after previous export
- ⑨ Turn ON/OFF export execution of selected images
- ⑩ Display inspection machine model
- ⑪ Display component number group name
- ⑫ Display component number name
- ⑬ Display date & time of previous export
- ⑭ Display date & time of updating component numbers
- ⑮ Display number of images
- ⑯ Display component type
- ⑰ Display component size
- ⑱ Display number of electrodes
- ⑲ Display presence of oblique inspection settings
- ⑳ Display component number explanation



**Memo** If turning ON the checkbox of [Good Image], [Faulty Image], or [Added Image], the [Select Image] checkbox is turned OFF. If turning ON the checkbox of [Select Image], the checkboxes of [Good Image], [Faulty Image], and [Added Image] are turned OFF.

**Memo** If turning ON the checkbox of [Inspection Information] or [Feature Quantities], mask model images are also exported.

**Memo** By turning ON the checkbox of the [Select Image] column, any image can be exported. Select images on the target image selection screen displayed by clicking the button on the [Select Image] column.



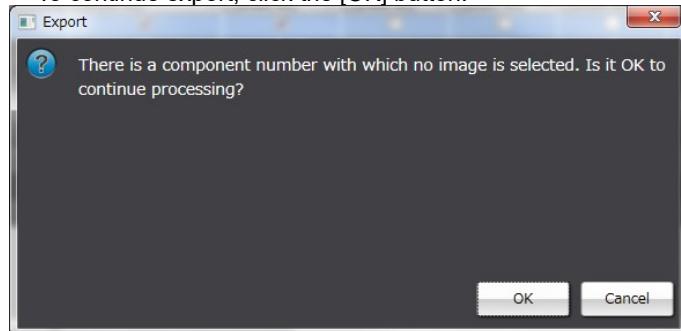
The target image selection screen is described on next page.

**Memo** If even one image is being selected, the button on the [Select Image] column is displayed in orange color.



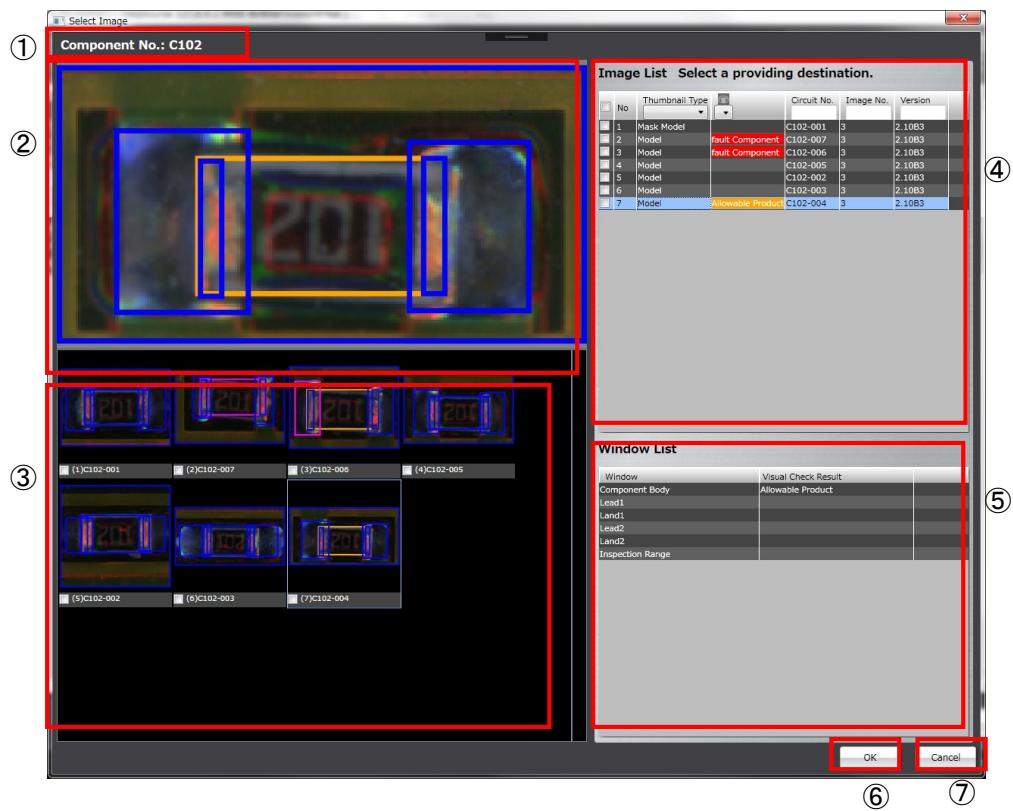
5. When the component numbers and content exported have been set, click [Export]. Select a folder to save the component number data.

**Memo** If the checkbox on the [Image Selection] column is ON but no image is being selected, the following message is displayed. To continue export, click the [OK] button.



## &lt;Target Image Selection Screen&gt;

- ① [Component No.]: The component No. name is displayed.
- ② [Component Thumbnail Image]: The image selected on the image list is enlarged.
- ③ [Component Thumbnail Image List]: The images registered in the component number are listed.
- ④ [Image List]: Information on the images registered with the component number is listed.
- ⑤ [Window List]: The windows of the images selected on the image list are listed.
- ⑥ [OK] button: The content selected on the image list is kept and the screen is closed.
- ⑦ [Cancel] button: The content selected on the image list is discarded and the screen is closed.



Images to be exported can be selected by turning ON the checkbox on [Component Thumbnail Image List] or [Image List] and clicking the [OK] button.

**Memo** The component display frame for thumbnail images is displayed in the color corresponding to the registration state of the fault.

- OK product: blue
- NG product: magenta
- Allowable product: orange color

**Memo** If [Use Image ID] of System Settings is set ON, [Image ID] is displayed.

No	Image ID	Image Saving Date/Time	Inspection Date
1	T7-qyEtofIt8-6	2018-05-17 15:54:17	

## ■ Importing component number data

- Operation▶ 1. Select a component number library you wish to input the component number data, and click [Importing].



2. Select the folder containing the component number data you wish to input.

**Memo** All the component number data in the folder are applicable to import. So, remove the component number data you don't wish to import from the folder in advance.

3. Display the “Import Component Number” screen. A list of existing component numbers is displayed in the upper portion of the screen. In the lower portion of the screen, the component numbers imported and the import type are displayed. By clicking the “Import Type” cell, whether to execute import or not can be set.

By clicking [Import], the component numbers are imported. If the same component number is present in an existing library, the existing component number is overwritten. If there is no same component number, the component number is added.

By clicking [Cancel], this screen is closed.

Component Number List							Library: Manual
Import Type	Model	Component Number Group	Component No.	Last Import Date	Update Date	Num. of Images	Co
Delete from Component Number Group	S730	SOP20L	21A5YTK	2017-09-01 19:50:57	1	SO	
Delete from Component Number Group	S730	QFP150M	LC15007	2017-09-01 18:55:57	1	QFP	
Overwrite	S730		KZZZ103	2017-09-01 18:55:58	1	Chi	
Delete from Component Number Group	S730	CT100L	C103	2017-09-01 18:55:57	1	Chi	
Overwrite	S730		CNON	2017-09-04 16:48:14	1	Chi	
Overwrite	S730		C102	2017-09-04 16:48:15	7	Chi	
Overwrite	S730		LV00A	2017-09-01 18:55:59	1	SO	
Overwrite	S730		JIK4	2017-09-01 18:56:00	1	SO	
	S730		C241	2017-09-04 13:40:31	0		
	S730		SSDE54534	2017-09-04 13:50:19	0		

Import Target Component Number List							Applicable Data: Source [ap] Destination [UC] EXP Date [2017-09-04 16:54:15]
Import Type	Component Information	Feature Quantities	Image	Select Image	Model	Component No.	Component
Delete from Component Number Group	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S730	21A5YTK	SOP
Overwrite	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S730	C102	Chip Resisto
Delete from Component Number Group	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S730	C103	Chip Resisto
Overwrite	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S730	CNON	Chip Resisto
Overwrite	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S730	JIK4	SOP
Overwrite	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S730	KZZZ103	Chip Resisto
Delete from Component Number Group	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S730	LC15007	QFP
Overwrite	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	S730	LV00A	SOP

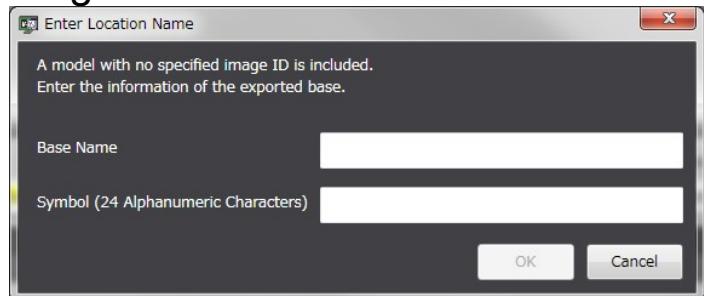
**Memo** One of the following types is displayed for each component number according to the software processing of importing.

- Overwrite: The existing component number is overwritten by importing. It can be selected which data are imported to the existing component number. For example, if adding images only, turn OFF the check boxes of Component Information and Feature Quantity, but turn ON the check box of Image. If overwriting inspection criteria only, conversely, turn ON Component Information only.
- Add: A new component number is added.
- Not Execute Import: If data are selected arbitrarily, or if there is no existing component number and feature quantity or images are not selected when data are exported, data are not sufficient. So, "Not execute import" is selected.

**Memo** Even when no image is selected before exporting data, if [Inspection Information] or [Feature Quantity] is being selected, the mask model image has been output. So, "Image" is checked when importing data.

**Memo** If [Use Source Name] of system settings is set ON and a model on which no image ID is set is included in the data imported, the source name entry dialog is displayed. Fill in the information on the source to which data were exported and click [OK]. By clicking [Cancel], the dialog is closed and importing of the component No. is cancelled.

For source name entry, refer to Section 3.6.2 "Making Source Settings."



**Memo** If [Use Deployment ON/OFF Setting Function] of system settings is set ON, [Deployment ON/OFF] is displayed on the component No. list.

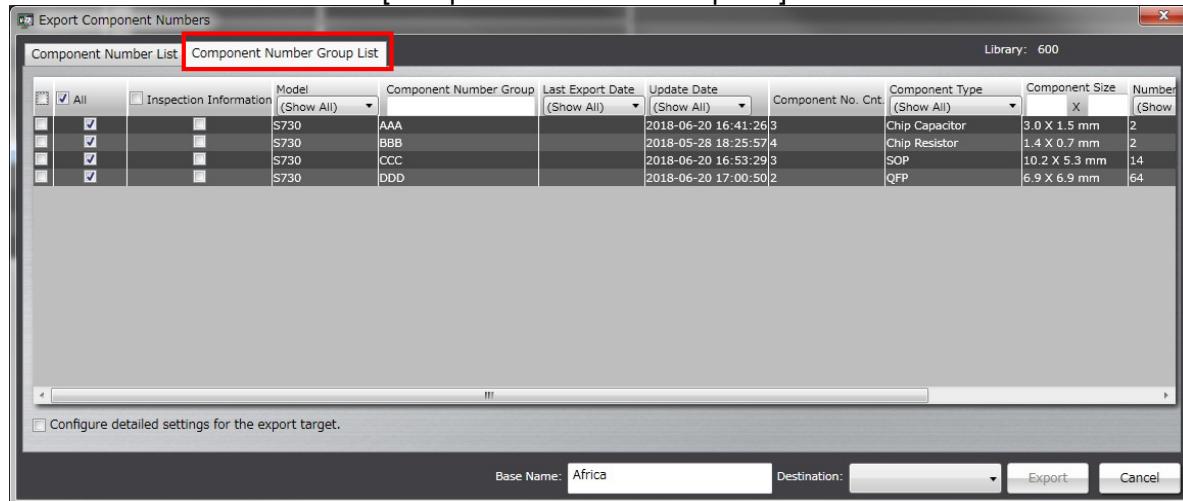
For deployment ON/OFF, refer to Section エラー! 参照元が見つかりません。"エラー! 参照元が見つかりません。Numbers."

Component Number List				
Import Type (Show All)	Model (Show All)	Component Number Group	Component No.	Expansion Availability
Overwrite	S730		COMP.22	<input type="radio"/> OFF
Overwrite	S730		COMP.21	<input type="radio"/> OFF

## ■ Exporting component number group data

Although there are several settings specific to component number group, user operations are basically equal to those for component number data.

Operation ► 1. On the Export Component Numbers screen, click the [Component Number Group List] tab.



- 2.** Set the Source and Destination items in the same way as applied to component number data. To set the content exported in details, turn ON the [Set the content exported in details] check box. The following items ⑯ and ⑰ are displayed in addition to component number data.

- ⑯ Turn ON/OFF export execution of the component number data belonging to the component number group  
 ⑰ Display the number of component numbers belonging to the component number group

**Memo** If turning ON the checkbox of [Inspection  
[Affiliated Component Number]], the mask  
exported.

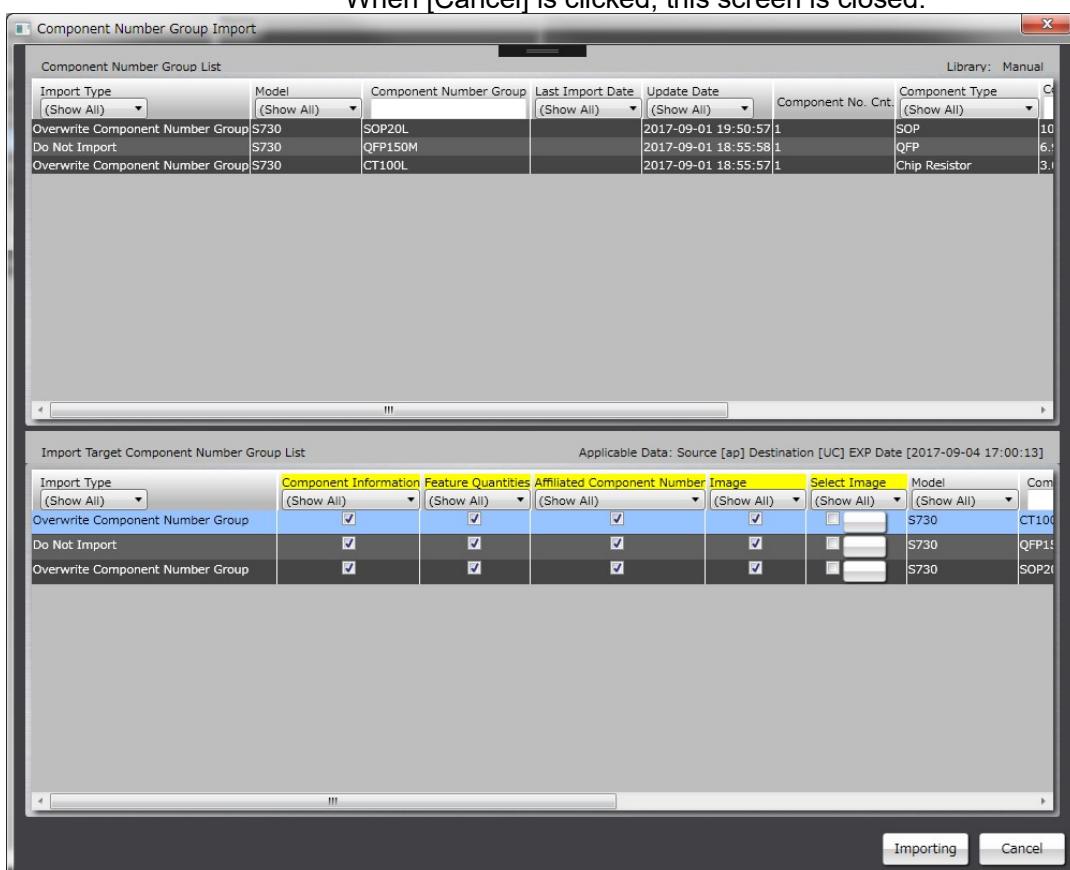
- When the component number group exported or its content has been set, click [Export]. Select a folder to save the component number group data.

## ■ Importing component number group data

User operations are equal to those for component number data until the data imported are selected.

- Operation▶ 1. Display the Import Component Number Group screen. A list of existing component number groups is displayed at the screen top. The component number group imported and import type are displayed at the screen bottom. By clicking the Import Type cell, whether to execute import or not can be set.

By clicking [Import], the component number group is imported. When [Cancel] is clicked, this screen is closed.



Memo One of the following types is displayed for each component number group according to the software processing of importing.

- Overwrite to Component Number Group: The existing component number group is overwritten by the component number group imported. It can be selected which data are imported to the existing component number group. For example, if adding images only, turn OFF the check boxes of Component Information and Feature Quantity, but turn ON the check box of Image. If overwriting inspection criteria only, conversely, turn ON Component Information only.
- Add: The component number group is added as a new one.
- Not Execute Import: If there is no existing component number group and feature quantity or images are not selected when data are exported, data are not sufficient, so they cannot be imported. It is also able not to execute import by changing the import type.

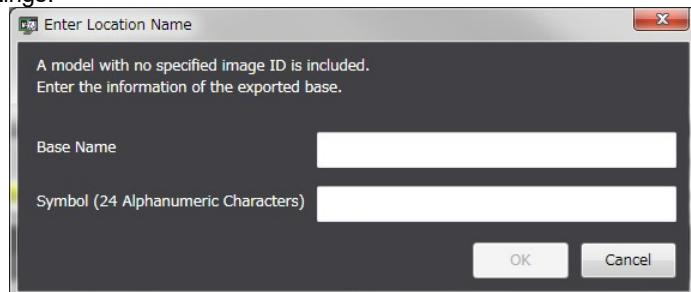
**Memo** When a component No. group is imported and an affiliated component No. is being selected, the software does not import the component numbers not becoming the inspection possible state when imported and overwritten to those in the existing library. The import result of the affiliated component number is displayed on the message box.

- When all component numbers are imported successfully:  
A message box saying "Import is completed." is displayed.
- When all component numbers are not imported:  
A message box saying "All affiliated component numbers are not imported because data necessary for inspection are not prepared." is displayed.
- When some component numbers are not imported:  
A message box saying "Some affiliated component numbers are not imported because data necessary for inspection are not prepared." is displayed.

**Memo** Even when no image was selected before exporting data, if [Inspection Information] or [Affiliated Component Number] is being selected, the mask model image has been output. So, "Image" is checked when data are imported.

**Memo** If [Use Source Name] of system settings is set ON and a model with which no image ID is set is included in the data imported, the source name entry dialog is displayed. Type the information on the data source of the export destination, and click[OK]. By clicking [Cancel], this dialog is closed and importing of the component number group is cancelled.

For source name entry, refer to Section 3.6.2 "Making Source Settings."



**Memo** If [Use Deployment ON/OFF Setting Function] is set ON, [Deployment ON/OFF] is displayed on the component number list.

For deployment ON/OFF, refer to Section エラー! 参照元が見つかりません。 "Making Source Settings."

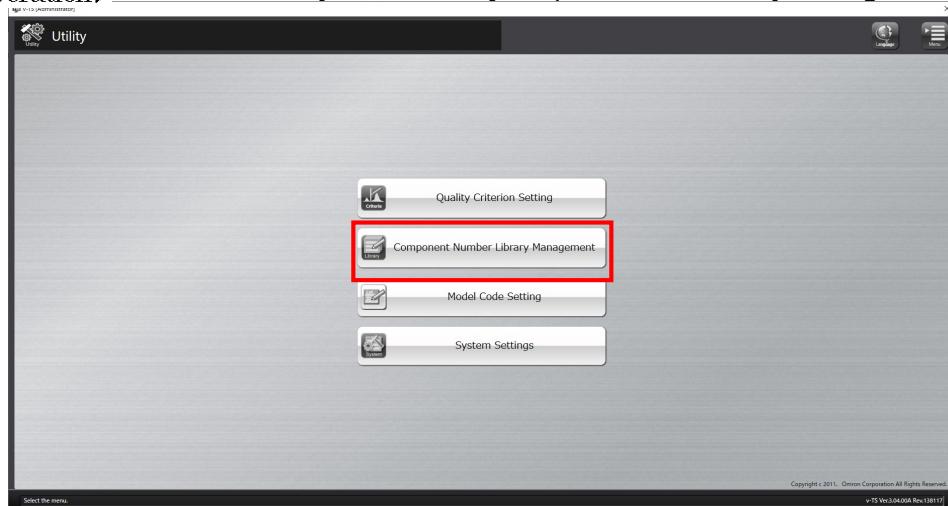
Component Number Group List			
Import Type (Show All)	Model (Show All)	Component Number Group	Expansion Availability
Add	S730	Chip.22	<input checked="" type="button"/> ON
Add	S730	Con.21	<input checked="" type="button"/> ON

### 3.4.3 Outputting List of Component Numbers Used by Inspection Programs

To simply grasp which component number is used for each inspection program, a list of the component numbers used by inspection programs can be output.

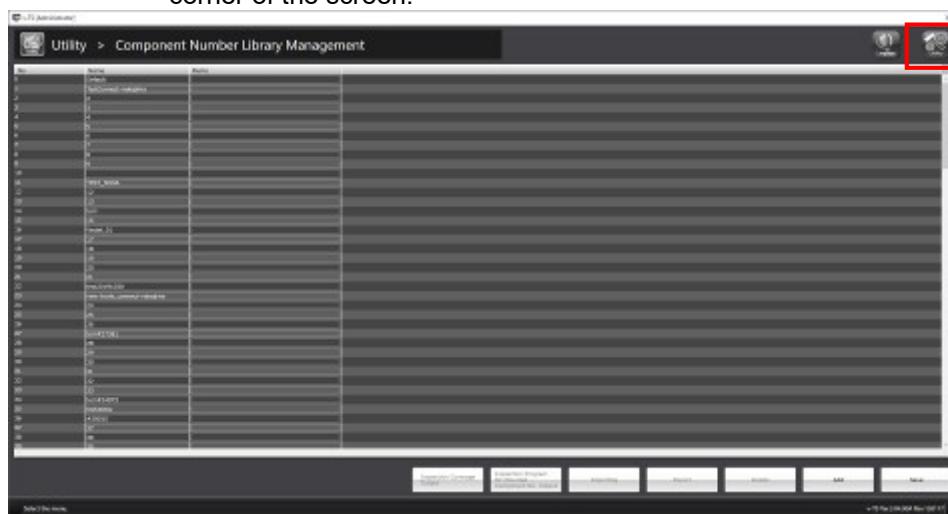
-  To output the content of the inspection program list, refer to Section 2.19.7 "Outputting Content of Inspection Program List."

||Operation▶ **1.** On the Utility menu, click [Component No. Library Management].

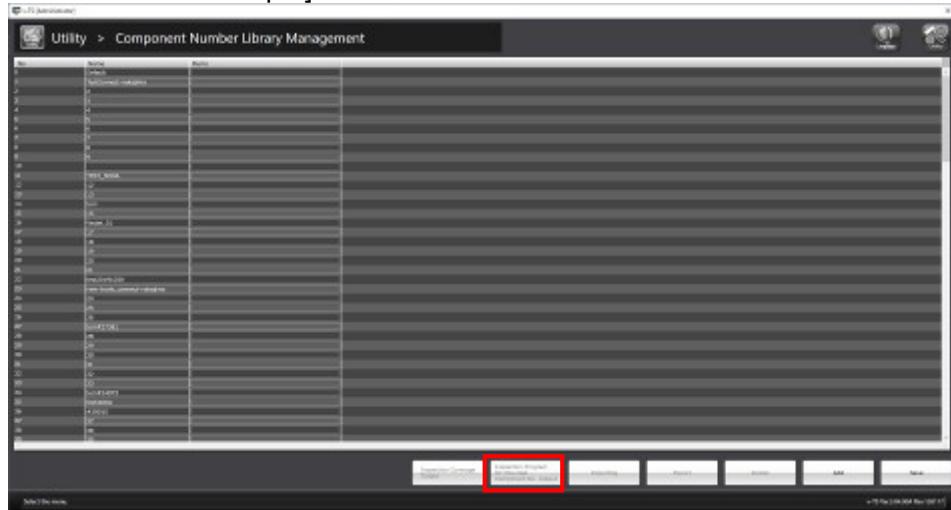


- 2.** The component No. library management screen is opened.

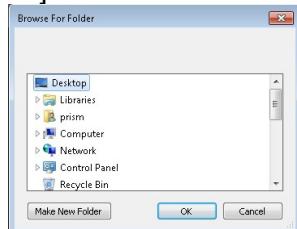
To return to the Utility menu, click the  button in the upper right corner of the screen.



3. Select a component No. library No. used by the inspection program, and click [Inspection Program for Mounted Component No. Output].



4. A file saving dialog is displayed. Select a folder to save, and click [OK].



5. When the finish screen is displayed after the CSV outputting screen appears, click the [Close] button.

A CSV output file is saved in the selected folder.  
To abort outputting the file, click [Cancel].



For details of the output format, refer to the following page.

■ **Output format of a list of the component numbers used by inspection programs**

Column	Item	Description
1	CompanyId	ID of component No. library
2	Model	Model name of inspection program
3	Component No. group ID	ID of component No. group
4	Component No. group revision	Revision of component No. group
5	Component No. group name	Name of component No. group
6	Component No. ID	ID of component No.
7	Component No. revision	Revision of component No.
8	Component No. name	Name of component No.
9	Component type	Type of component
10	Quality	Component number quality
11	Deployment ON/OFF	ON/OFF of deployment to inspection program
12	Update date and time (component No.)	Date and time of update of component No.
13	Inspection logic version	Version of inspection logic used by component No
14	PJ-ID	System ID of PCB
15	PG-ID	System ID of inspection program
16	PJ-Revision	System revision of PCB
17	PG-Revision	System revision of inspection program
18	PCB name	Name of PCB
19	Inspection program name	Name of inspection program
20	Front/back	Front/back of PCB inspected by inspection program
21	Process	Name of inspection process
22	Update date and time (inspection program)	Date and time of update of inspection program
23	Status	Status of inspection program
24	Component No. revision (inspection program)	Revision of component No. referred by inspection program
25	Comment	Content of comment

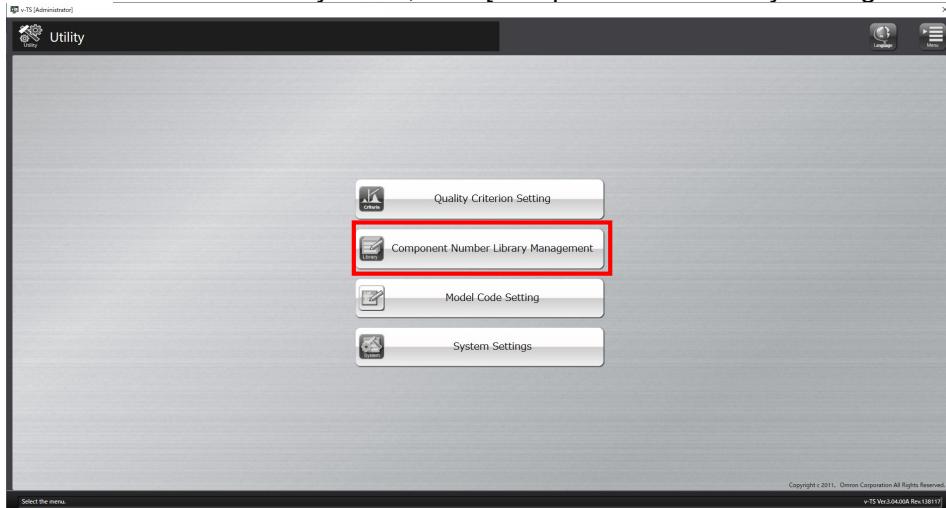
### 3.4.4 Outputting Inspection Coverage for Each Library

Inspection coverage was output for each inspection program. This time, it can be output for each library.



To output the content of the inspection program list, refer to Section 2.19.7 "Outputting Content of Inspection Program List."

Operation▶ 1. On the Utility menu, click [Component No. Library Management].

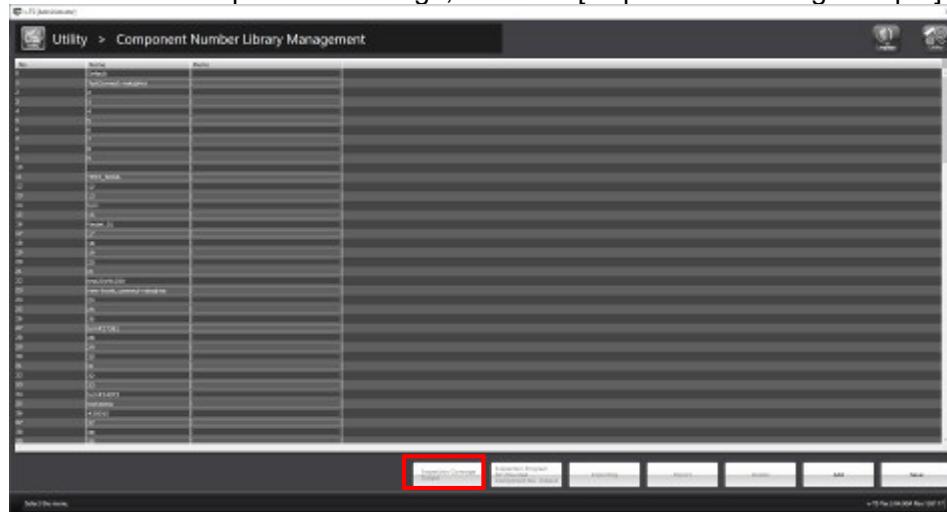


2. The component No. library management screen is opened.

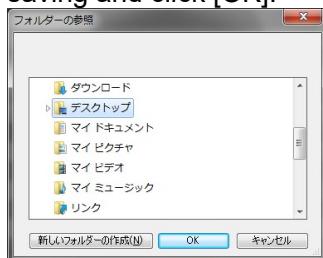
To return to the utility menu, click the button in the top right corner of the screen.



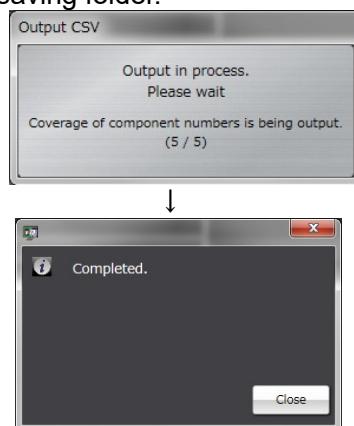
3. Select the target component No. library No. of outputting inspection coverage, and click [Inspection Coverage Output].



4. A file saving dialog is displayed. Select the destination folder of saving and click [OK].



5. After the CSV output screen and finish screen are displayed, click [Close] button. A CSV output file is saved in the selected saving folder.



For details of the output format, refer to the next page.

The output format on and after the inspection criteria is the same as that of [Inspection Coverage].

## ■ Inspection Coverage Output Format

Column	Item name	Description
1	CompanyId	ID of component No. library
2	Model	Model name corresponding to inspection program
3	Component No. Group ID	ID of component No. group
4	Component No. Group Revision	Revision of component No. group
5	Component No. Group Name	Name of Component No. Group
6	Component No. Group Description	Content of Component No. Group Comment
7	Component No. Group Change Details	Change details of latest revision of component No. group
8	Component No. ID	ID of component No.
9	Component No. Revision	Revision of component No.
10	Latest Revision Saving User	User of saving latest revision of component No.
11	Latest Revision PC Name	PC name of saving latest revision of component No.
12	Component No. Name	Name of component No.
13	Component Type	Type of component
14	Update Date & Time	Update date & time of component No.
15	Component No. Quality Level	Quality level of component No.
16	Deployment Possibility	Deployment possibility of component No.
17	No. of Models (OK)	No. of good models
18	No. of Models (NG)	No. of defective models
19	Light Intensity (Component)	Light intensity of component No.
20	Light Intensity (Lead)	Light intensity of lead group
21	Inspection Logic Ver	Inspection logic version used by the component No.
22	Component No. Description	Content of Component No. comment
23	Component No. Change Details	Change details of latest revision of component No.
24	Window	Name of inspection window

### 3.4.5 Converting component number library for S10 Series

You can convert the component number library of S730, S730-H, and S530 into that of S10 Series(VT-S1080/S1040/Z600).

**Memo** This function is available for the software of Ver. 4.02 or later.

**Memo** S730/S730-H, S1080/S1080V2, S1040/S1040V2, Z600/Z600V2 share library.

Operation▶ 1. In the utility menu, click [Component Number Library Management].



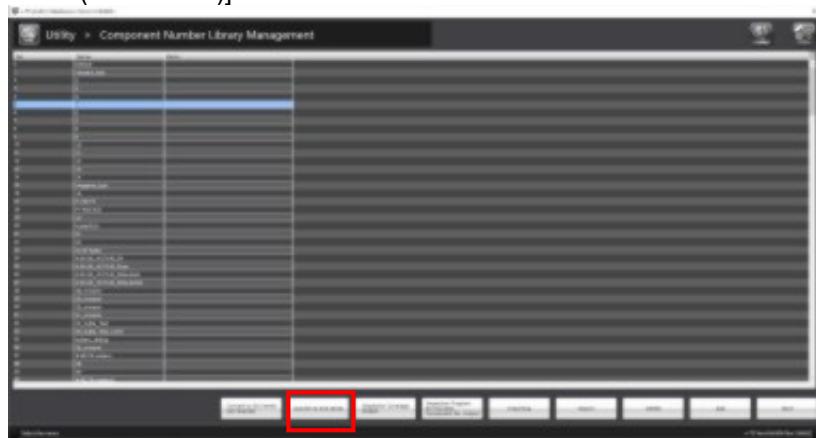
2. The component number library management screen appears.

To go back to the utility menu, click the top-right  button.

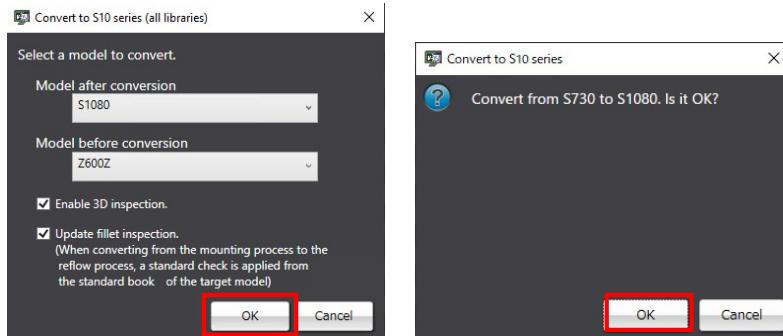


3. Select the component number library number to convert for S10 series and click the [Convert to S10 series] button.

**Memo** If you want to convert all libraries, click [Convert to S10 series(all libraries)].



4. Select a model to convert.



**Memo** When converting from a device without a projector to a projector-equipped device, display the [Enable 3D Inspection] checkbox. If you convert with the [Enable 3D Inspection] checkbox selected, the following inspection items will be adjusted to match the settings in the Criteria Rulebook.

Component Body Extraction  
Identification Method: "Color" or "Height"

Electrode Tip Extraction  
Extraction Method: "Color" , "Height" or "Color and Height"

**Memo** When converting from a post-mount inspection model to a post-reflow inspection model, display the [Update Fillet Inspection] checkbox. If you convert with the [Update Fillet Inspection] checkbox selected, all fillet inspections will be adjusted to match the settings in the Criteria Rulebook.

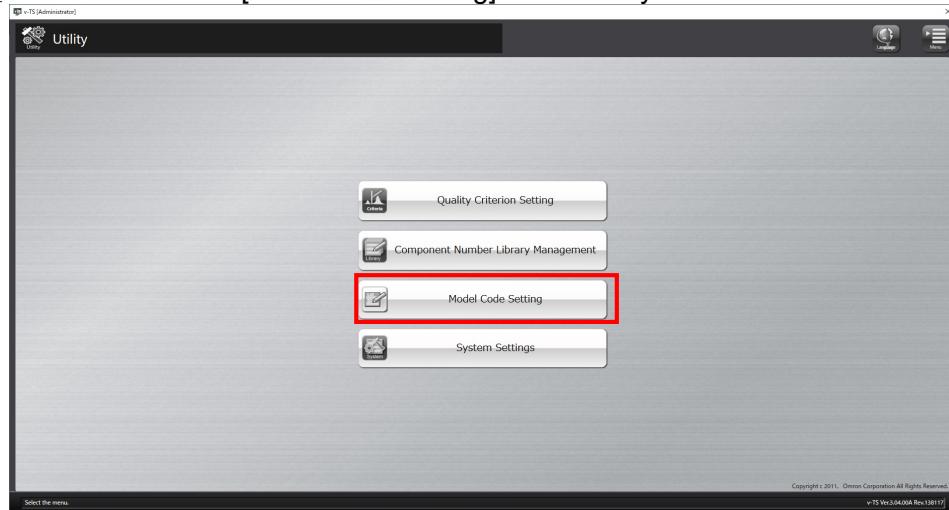
# 3.5 Setting Model Codes

Model codes are set for each inspection program in this section.

You can manage model code settings for each inspection program as a set and specify any set of model codes as a stage moving condition for a host link connection on a system.

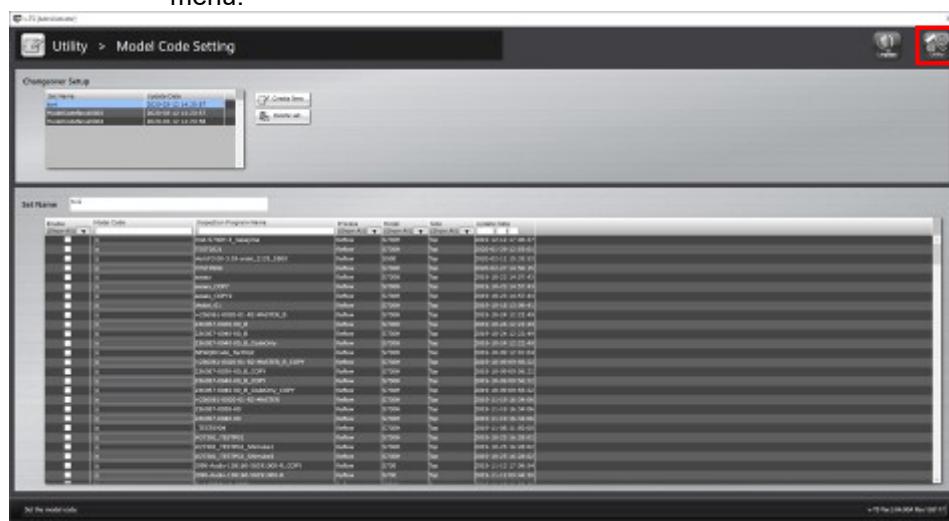
 For how to set an automatic stage moving condition for a host link connection, see Operation Manual of inspection machine, "4.8.2 Upper Link Setting".

||Operation▶ 1. Click [Mode Code Setting] on the utility menu.

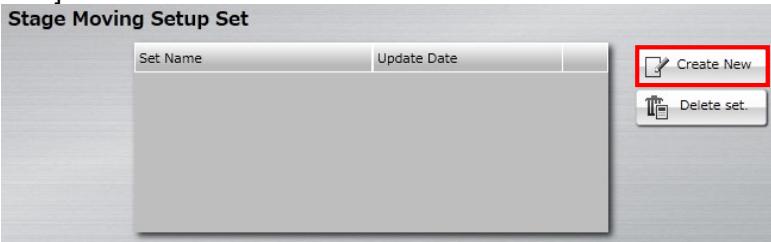


2. The model code setup screen will appear.

Click the  button on the top-right screen to return to the utility menu.



3. To create a new set of stage moving configurations, click [Create New].



A set of stage moving configurations is created and added to the list.

Set Name	Update Date
ModelCodeBook0001	2012-05-24 16:24:53

**Memo** It is created as a set name of "ModelCodeBook + 4-digit serial number" as a default.

4. Click a set of stage moving configurations from the list you want to configure, and specify a model code for each inspection program.

Set Name	Model Code	Inspection Program Name	Process	Model	Side	Update Date
	1111	TPCB_B_20_Teaching_Mount	Reflow	S720	Bottom	2012-05-09 15:05:17
	111	TPCB_T_20_Teaching_Mount	Reflow	S720	Top	2012-05-09 15:09:19

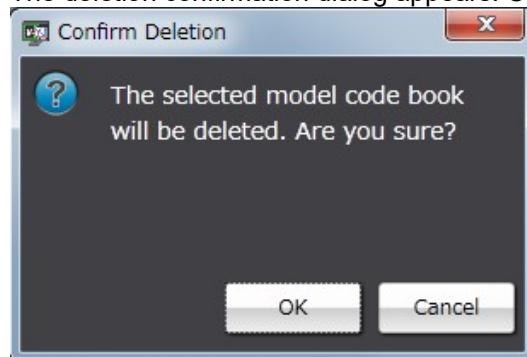
1. Click the text box of [Set Name] and enter a set name.  
**Memo** You cannot enter an existing set name.
2. Select the enabling check box of an inspection program for which a model code is configured to enable.
3. Click the model code field of the inspection program you enabled, and enter a model code.  
**Memo** You cannot edit a model code for an inspection program that is not enabled.

5. When you want to delete Stage Moving Setup Set, click Stage Moving Setup Set from the list and select [Delete set].

Set Name	Update Date
ModelCodeBook0001	2012-05-24 16:24:53
ModelCodeBook0004	2012-05-24 17:08:08

**Delete set.** A red box highlights the 'Delete set.' button at the bottom right.

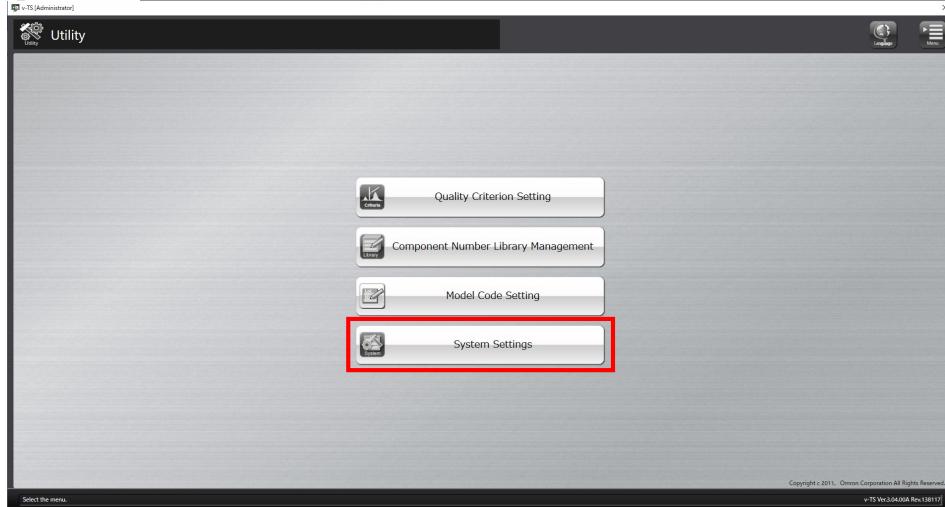
The deletion confirmation dialog appears. Click [OK].



# 3.6 Making System Settings

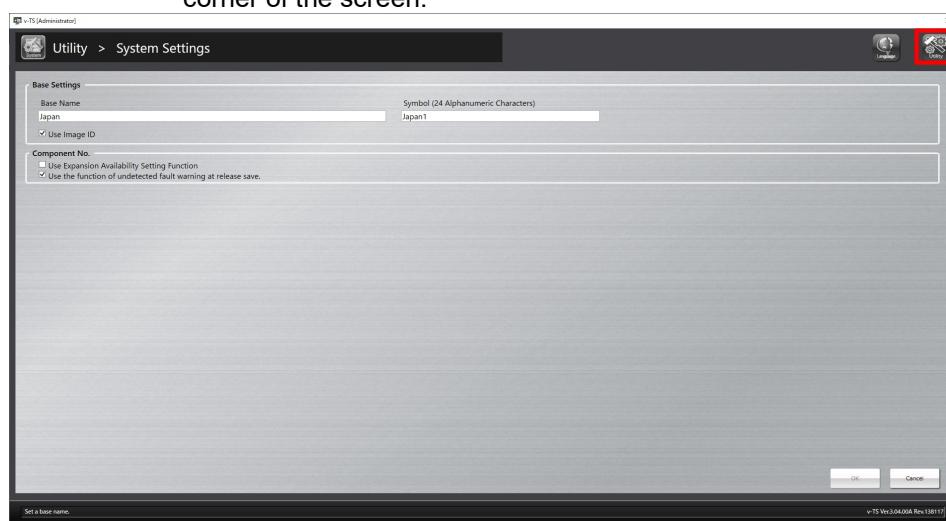
## 3.6.1 Opening Setup Screen

Operation▶ 1. On the utility menu screen, click [System Settings].



2. The system settings screen is opened.

To return to the utility menu, click the button in the top right corner of the screen.



## 3.6.2 Making Source Settings

Set up a data base name, symbol, and whether to use image ID.

Base Settings	
Base Name	Symbol (24 Alphanumeric Characters)
Africa	AF
<input type="checkbox"/> Use Image ID	

Operation▶ 1. Type a base name in up to 64 characters.

Base Name
Africa

2. Type a symbol in up to 24 single-byte alphanumeric characters.

Symbol (24 Alphanumeric Characters)
AF

3. If using an image ID, check the [Use Image ID] check box.

<input checked="" type="checkbox"/> Use Image ID
--

By checking [Use Image ID], the image ID is displayed on the following screens:

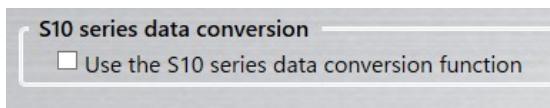
- Model editing screen
- Image selection screen used when exporting component numbers or component number groups.
- Image selection screen used when importing component numbers or component number groups.

No	Image ID	Image Saving Date/Time	Inspection Date	Thumbnail Type	Measurement Value
107	T7-qyEtoflt8-6	2018-05-17 15:54:17		(Show All)	
107	T7-qyGibXKSm-1D	2018-05-17 18:46:31		Mask Model	
107	T7-qyGibYpsu-6	2018-05-17 18:46:31		Model	
107	T7-qyGibZ42C-1z	2018-05-17 18:46:31		Model	

Image List Select a providing destination.					
No	Image ID	Image Saving Date/Time	Inspection Date	Thumbnail Type	Measurement Value
1	T7-qyEYEFKv-6	2018-05-17 16:42:02		(Show All)	Mask Model
2	T7-qyEZJ0YGy-	2018-05-17 16:43:40		Model	

### 3.6.3 Using Data Conversion to S10 Series

Set whether or not to use the S10 Series Data Conversion Function.



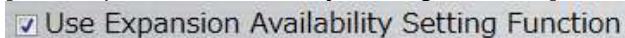
For details of the function, see 2.20 Cross-Model Conversion of Inspection Programs.

### 3.6.4 Making Component No. Settings

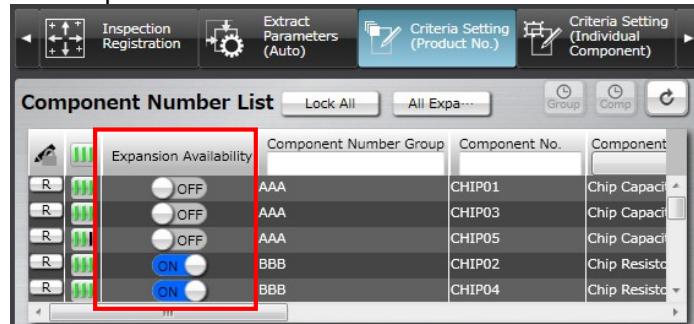
Set whether to use the deployment ON/OFF setting function.

By using this function, it is prevented that a component number whose quality has not been confirmed yet is accidentally applied to an inspection program released to mass-production.

- Operation▶ 1. When using the deployment ON/OFF setting function, check the [Use Expansion Availability Setting Function] check box.



By setting ON this check box, it is enabled to set whether to deploy the component number.



**Memo** If saving data with setting deployment ON/OFF to ON or additionally importing the component number or component number group of deployment ON, the current revision number is saved in the component number data as the revision of the last deployment ON. The saved revision number is discarded in the following case:

- When the configuration of a component number or a component number group is changed.

If the revision that is deployment ON lastly when an inspection program is saved, is displayed on the component number list on the change details confirmation screen. By moving the mouse cursor onto the icon, a tool tip is displayed.

Component Number List				
Component Number Group	Component No.	Comment of Component	Comment on Component	Comment on Component
DDD	QFP01			
AAA	CHIP01			

 For the change details confirmation screen, refer to Section 2.12 "Confirming Change Details."

**Memo** The revision of the component number data used for inspection is different depending on the setting status of deployment ON/OFF.

If deployment ON/OFF is ON:

The component is inspected using the data of the latest revision.  
If deployment ON/OFF is OFF and has not been set ON even once:

The component is inspected using the data of the latest revision.

If deployment ON/OFF is OFF and has ever been set ON:

The component is inspected using the data of the revision of the last deployment ON.

**Memo** When component number data are set to deployment OFF, if the user deploys the data explicitly to the inspection program and releases them, those data can be used for inspection.

 For the method to deploy and release data to the inspection program, refer to Section 4.1 "Deploying Component No. to Inspection Program."

### 3.6.5 Setting Overlooking Warning

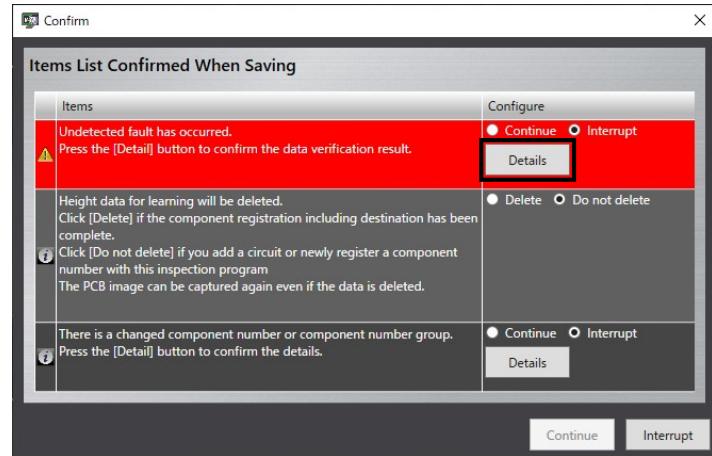
Set up whether to use the overlooking warning function when releasing and saving an inspection program.

By using this function, the test results of the model can be confirmed and display a warning if overlooking is detected.

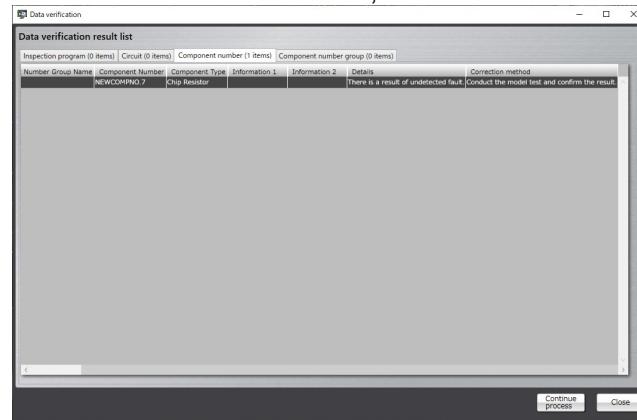
- Operation▶ 1. To use the overlooking warning function when releasing and saving an inspection program, check ON the [Use Overlooking Warning Function When Releasing & Saving] checkbox.

Use the function of undetected fault warning at release save.

By setting this function ON, a warning is displayed if overlooking is detected on the model registered when the inspection program was released and saved.



Press the Details button. Then, the screen below is displayed.



# **Chapter4**

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## **Component No. Menu**

4.1 Deploying Component No. to Inspection Program 4-2

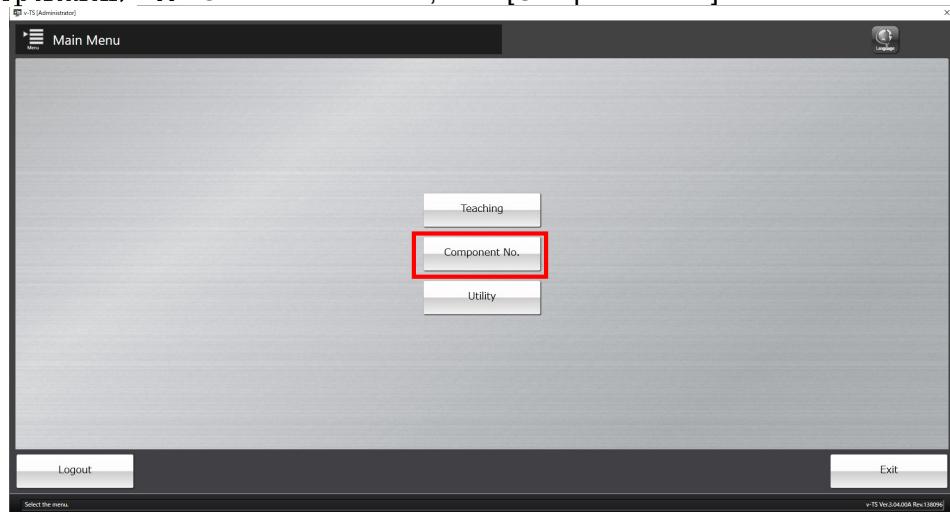
## 4.1 Deploying Component No. to Inspection Program

Deploy the component No. whose quality is confirmed completely and apply it to inspection. The component No. menu is displayed only if [Use Component No. Deployment ON/OFF Setting Function] is set ON.

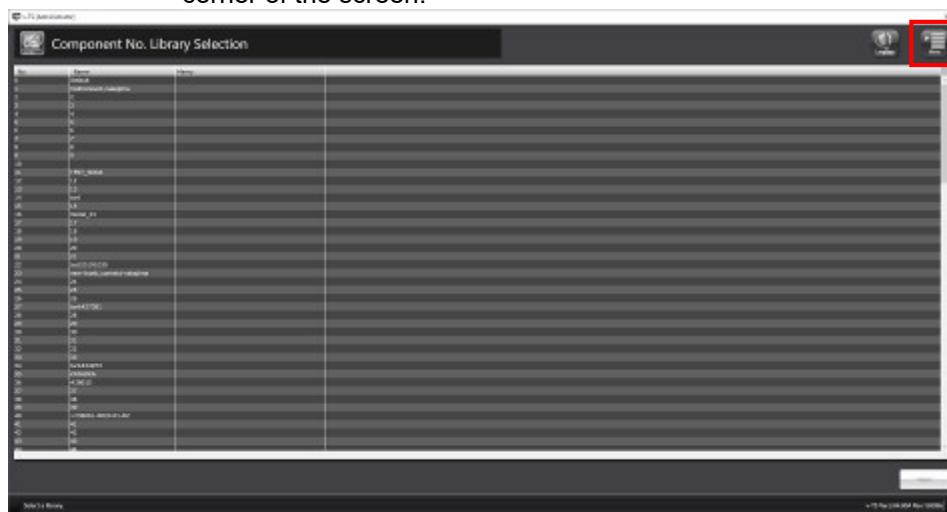
 For the Component No. Deployment ON/OFF Setting function, refer to Section 3.6.3 “Setting Component No.”

#### 4.1.1 Displaying Component No. List

Operation▶ **1.** On the main menu, click [Component No.].



**2.** The Component No. Library Selection screen is opened.  
To return to the main menu, click the  button in the top right corner of the screen.



**3. Select a component No. library and click [Open].**



**4. The component No. list screen is displayed. The component numbers registered in the selected library are displayed on the component No. list.**

Expansion Availability	Model	Component Number Group	Component No.	Update Date	Num. of Images	Component Type	Component	
							Component	Type
R	ON	S730	DDD	QFP01	2018-06-20 08:00:502	QFP	6.9 X 6	
R	ON	S730	DDD	QFP02	2018-06-20 08:00:502	QFP	6.9 X 6	
R	ON	S730	CCC	SOP01	2018-06-20 07:53:293	SOP	10.2 X	
R	ON	S730	CCC	SOP02	2018-06-20 07:53:293	SOP	10.2 X	
R	ON	S730	CCC	SOP03	2018-06-20 07:53:292	SOP	10.2 X	
R	OFF	S730	AAA	CHIP01	2018-06-20 07:41:261	Chip Capacitor	3.0 X 1	
R	ON	S730	AAA	CHIP03	2018-06-20 07:41:261	Chip Capacitor	3.0 X 1	
R	ON	S730	BBB	CHIP06	2018-05-28 09:25:511	Chip Resistor	1.4 X 0	
R	OFF	S730	BBB	INSERT01	2018-05-28 09:25:511	Insertion Component	0.4 X 0	
R	ON	S730	BBB	NEWCOMPNO.13	2018-05-28 09:25:511	Chip Resistor	1.4 X 0	
R	OFF	S730	AAA	2018-05-28 09:25:514	SOP	4.4 X 3		
R	ON	S730	OTHER01	2018-05-28 09:25:512	Connector	7.1 X 7		
R	ON	S730	BBB	CHIP02	2018-05-28 09:25:501	Chip Resistor	1.4 X 0	
R	ON	S730	BBB	CHIP04	2018-05-28 09:25:501	Chip Resistor	1.4 X 0	

**Memo** Any component numbers which have not been finished yet are not displayed.

### 4.1.2 Selecting Component No. to Deploy It To Inspection Program

Select a component No. to deploy it to an inspection program, applying it to inspection.

- Operation▶ 1. On the component No. list screen, click the [Component Number List] tab.

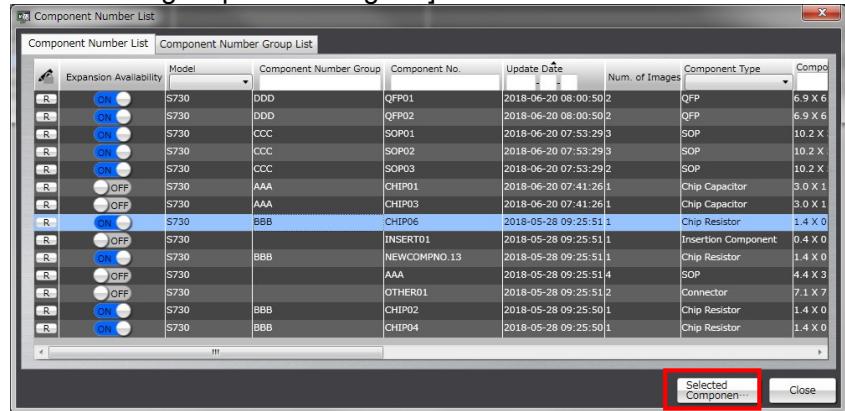
	Expansion Availability	Model	Component Number Group	Component No.	Update Date	Num. of Images	Component Type	Compo
R	ON	S730	DDD	QFP01	2018-06-20 08:00:50	2	QFP	6.9 X 6
R	ON	S730	DDD	QFP02	2018-06-20 08:00:50	2	QFP	6.9 X 6
R	ON	S730	CCC	SOP01	2018-06-20 07:53:29	3	SOP	10.2 X
R	ON	S730	CCC	SOP02	2018-06-20 07:53:29	3	SOP	10.2 X
R	ON	S730	CCC	SOP03	2018-06-20 07:53:29	2	SOP	10.2 X
R	OFF	S730	AAA	CHIP01	2018-06-20 07:41:26	1	Chip Capacitor	3.0 X 1
R	OFF	S730	AAA	CHIP03	2018-06-20 07:41:26	1	Chip Capacitor	3.0 X 1
R	ON	S730	BBB	CHIP06	2018-05-28 09:25:51	1	Chip Resistor	1.4 X 0
R	OFF	S730		INSERT01	2018-05-28 09:25:51	1	Insertion Component	0.4 X 0
R	ON	S730	BBB	NEWCOMPNO.13	2018-05-28 09:25:51	1	Chip Resistor	1.4 X 0
R	OFF	S730		AAA	2018-05-28 09:25:51	4	SOP	4.4 X 3
R	OFF	S730		OTHER01	2018-05-28 09:25:51	2	Connector	7.1 X 7
R	ON	S730	BBB	CHIP02	2018-05-28 09:25:50	1	Chip Resistor	1.4 X 0
R	ON	S730	BBB	CHIP04	2018-05-28 09:25:50	1	Chip Resistor	1.4 X 0

The component No. list displays the following information:

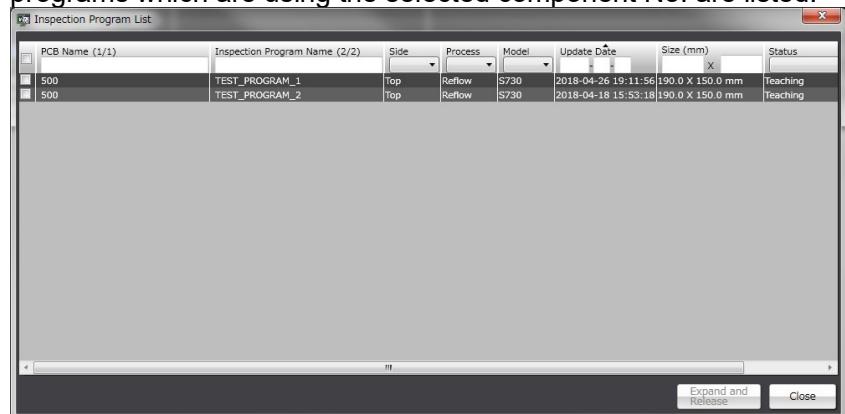
- ① Displays the locking state of the component No.
- ② Displays deployment ON/OFF of the component No.
- ③ Displays the inspection model.
- ④ Displays the component No. group name.
- ⑤ Displays the component No. name.
- ⑥ Displays the updating date & time of the component No.
- ⑦ Displays the number of images.
- ⑧ Displays the component type.
- ⑨ Displays the component size.
- ⑩ Displays the number of leads.
- ⑪ Displays whether to do oblique inspection.
- ⑫ Displays the details of the component No. change.
- ⑬ Displays the explanation of the component No.
- ⑭ Displays the details of the component No. group change.
- ⑮ Displays the explanation of the component No. group.

①	②	③	④	⑤	⑥	⑦
Expansion Availability	Model	Component Number Group	Component No.	Update Date	Num. of Images	
⑧	⑨	⑩	⑪	⑫	⑬	⑯
Component Type	Component Size	Number of Leads	Oblique Inspection	Comment on Component Number Change	Description of Component No.	
⑯	⑰	⑱	⑲	⑳	㉑	㉒
Comment of Component Number Group Change	Description about Component No. Group					
㉓	㉔					

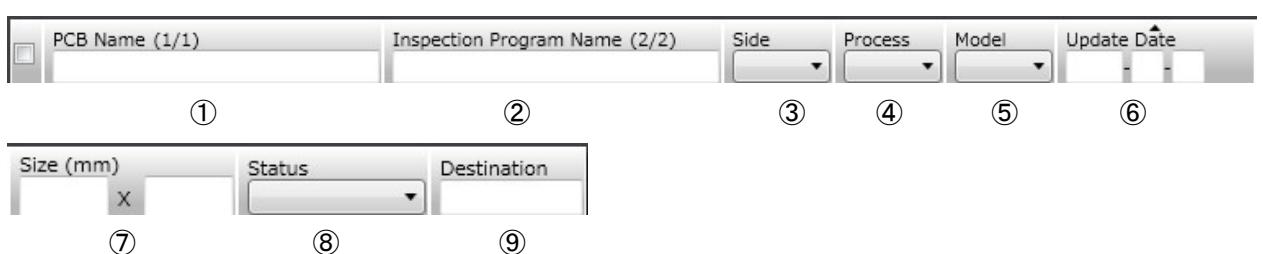
2. Select a component No. deployed and click [Selected Component No. Mounting Inspection Program].



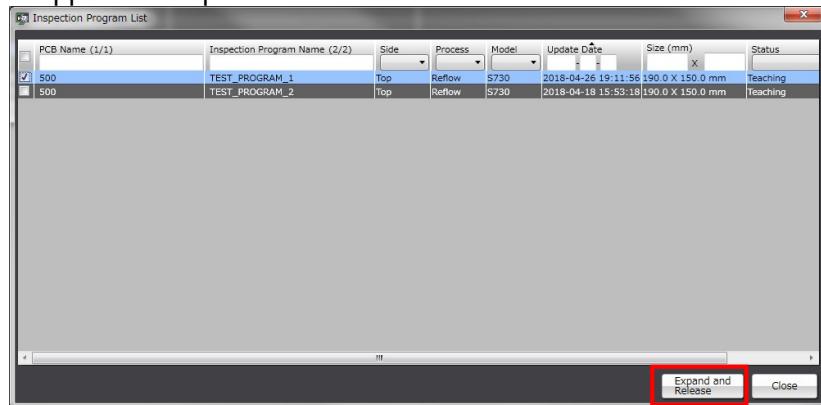
3. The inspection program list screen is opened, and the inspection programs which are using the selected component No. are listed.



- ① Displays the PCB name.
- ② Displays the inspection program name.
- ③ Displays the top/bottom of the PCB.
- ④ Display the process.
- ⑤ Displays the model inspected.
- ⑥ Displays the updating date & time of the inspection program.
- ⑦ Displays the PCB size.
- ⑧ Displays the current status.
- ⑨ Displays the destination.



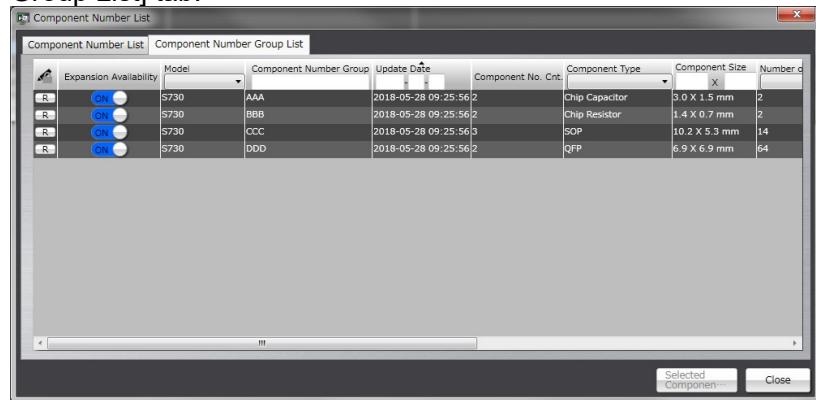
4. By selecting an inspection program to deploy the component No. and clicking [Expand and Release], the selected component No. is applied to inspection.



### 4.1.3 Selecting Component No. Group and Deploying It To Inspection Program

Select a component No. group to deploy it to an inspection program, applying it to inspection.

- Operation▶ 1. On the component No. list screen, click the [Component Number Group List] tab.



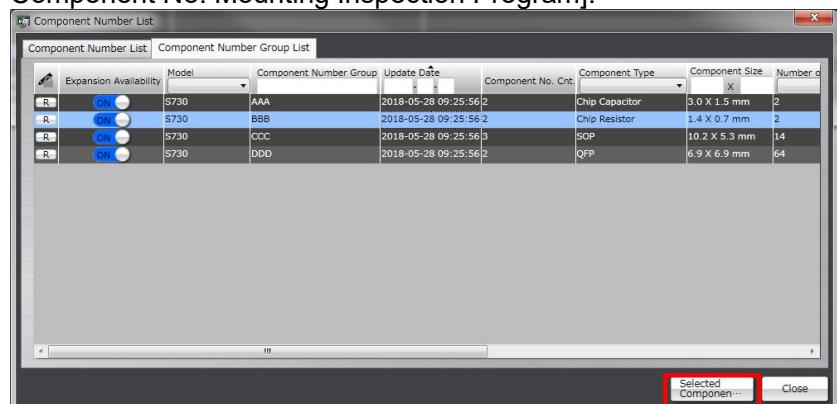
The component No. group list displays the following information in addition to the component No. data.

- ⑯ Displays the number of the component numbers belonging to the group.

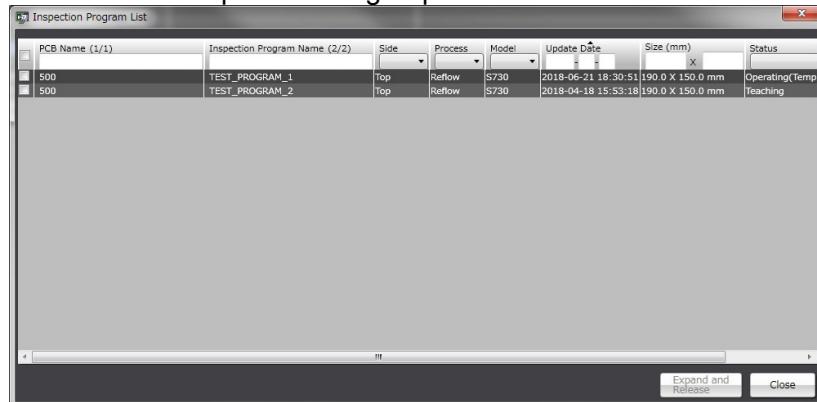
Component No. Cnt.

⑯

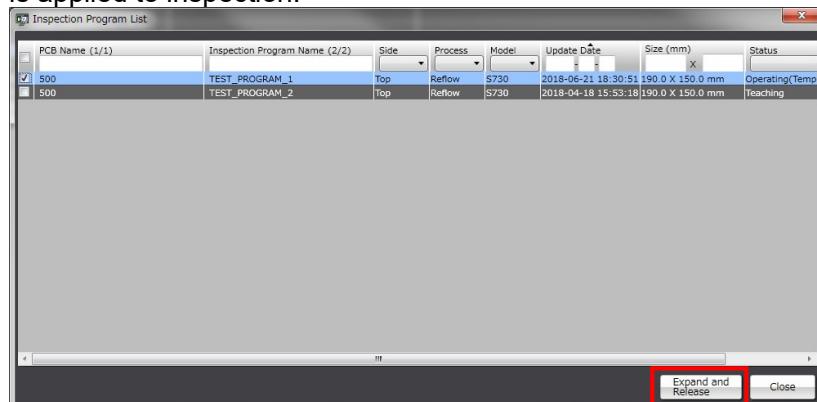
2. Select a component No. group deployed and click the [Selected Component No. Mounting Inspection Program].



3. The inspection program list screen is opened, and the inspection programs which are using the component numbers belonging to the selected component No. group are listed.



4. By selecting an inspection program to deploy the component No. and clicking [Expand and Release], the selected component No. is applied to inspection.

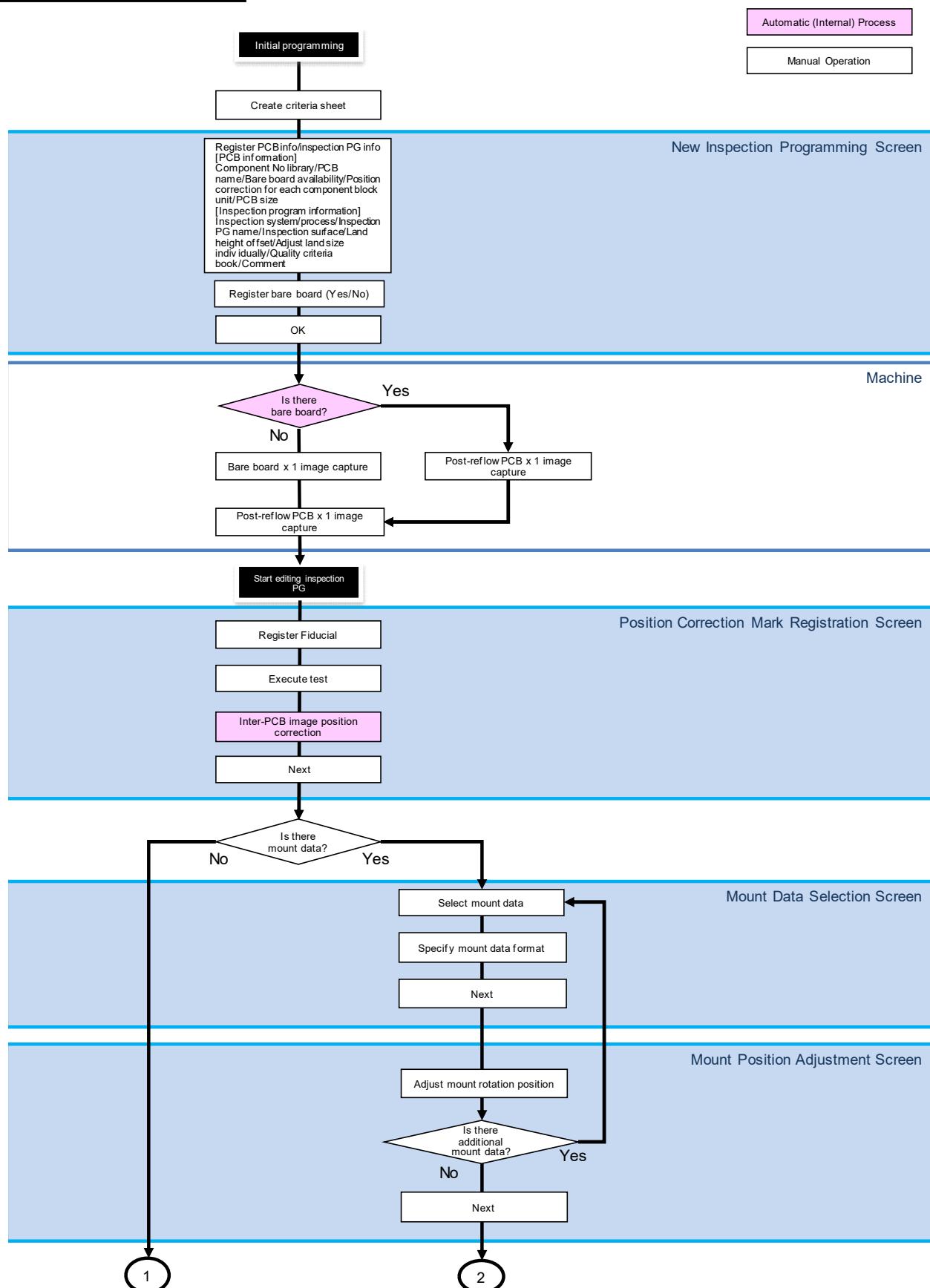


# Appendix Teaching Flow

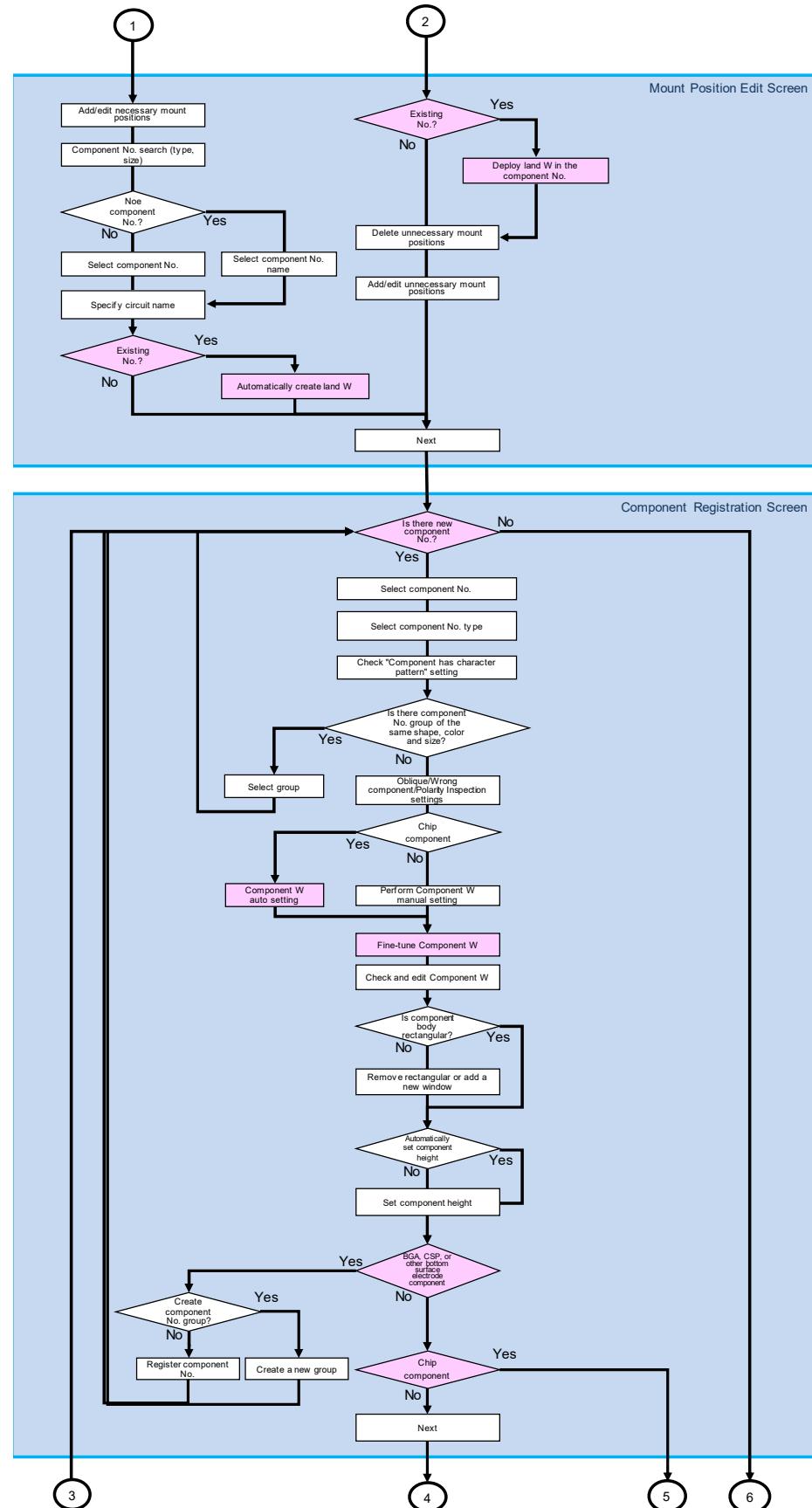
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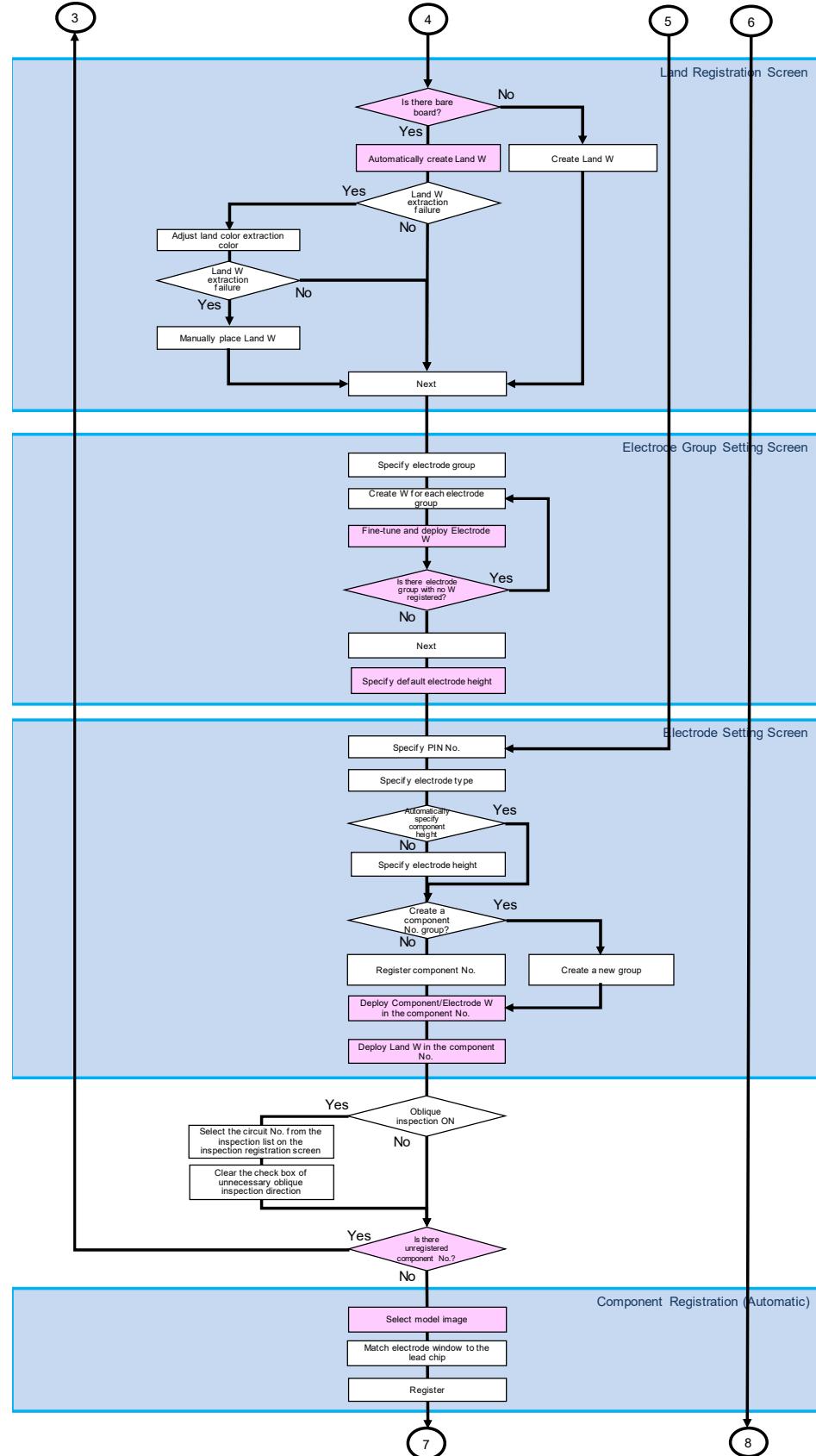
# Appendix 1. Initial Programming



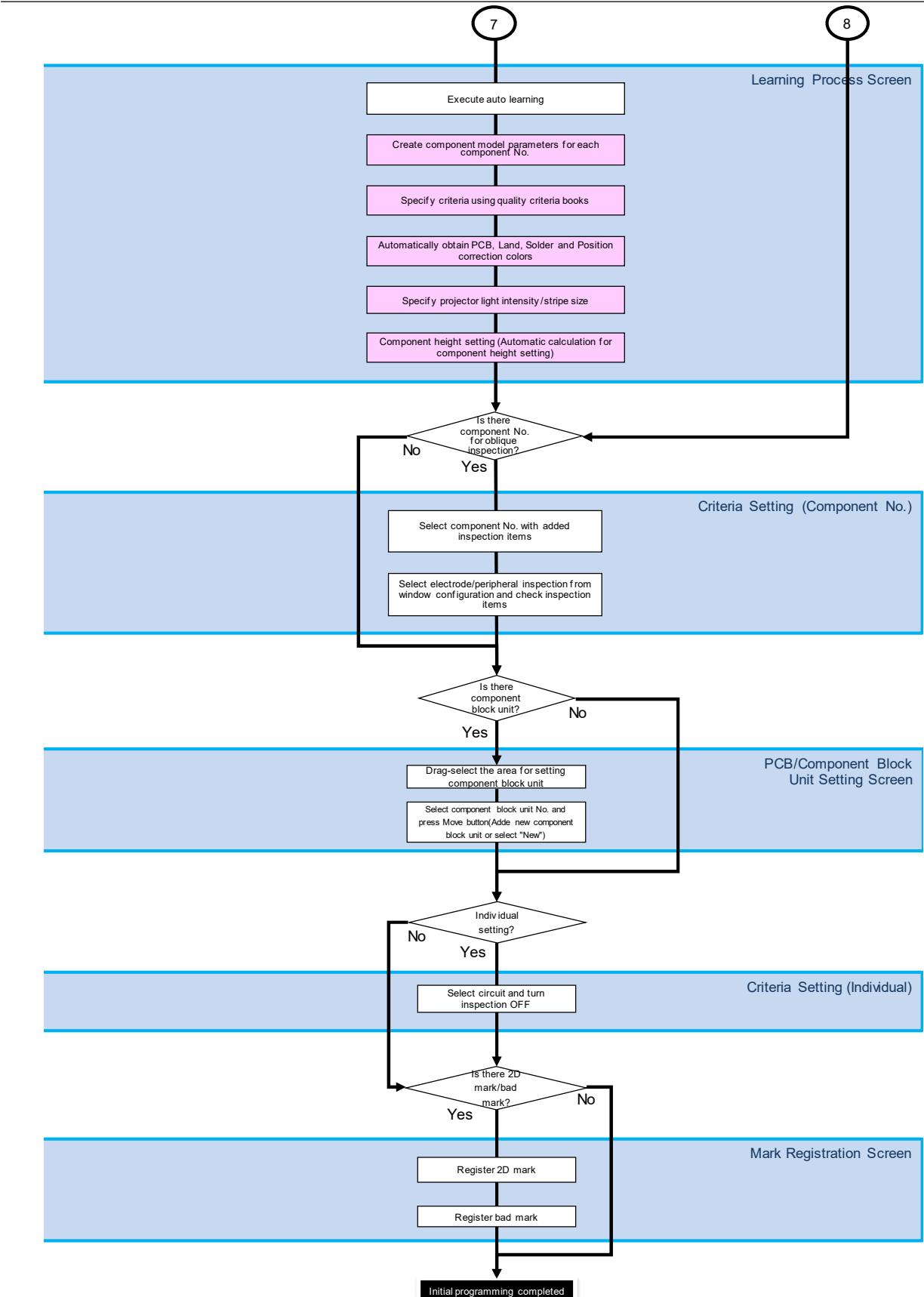
## Appendix 1. Initial Programming



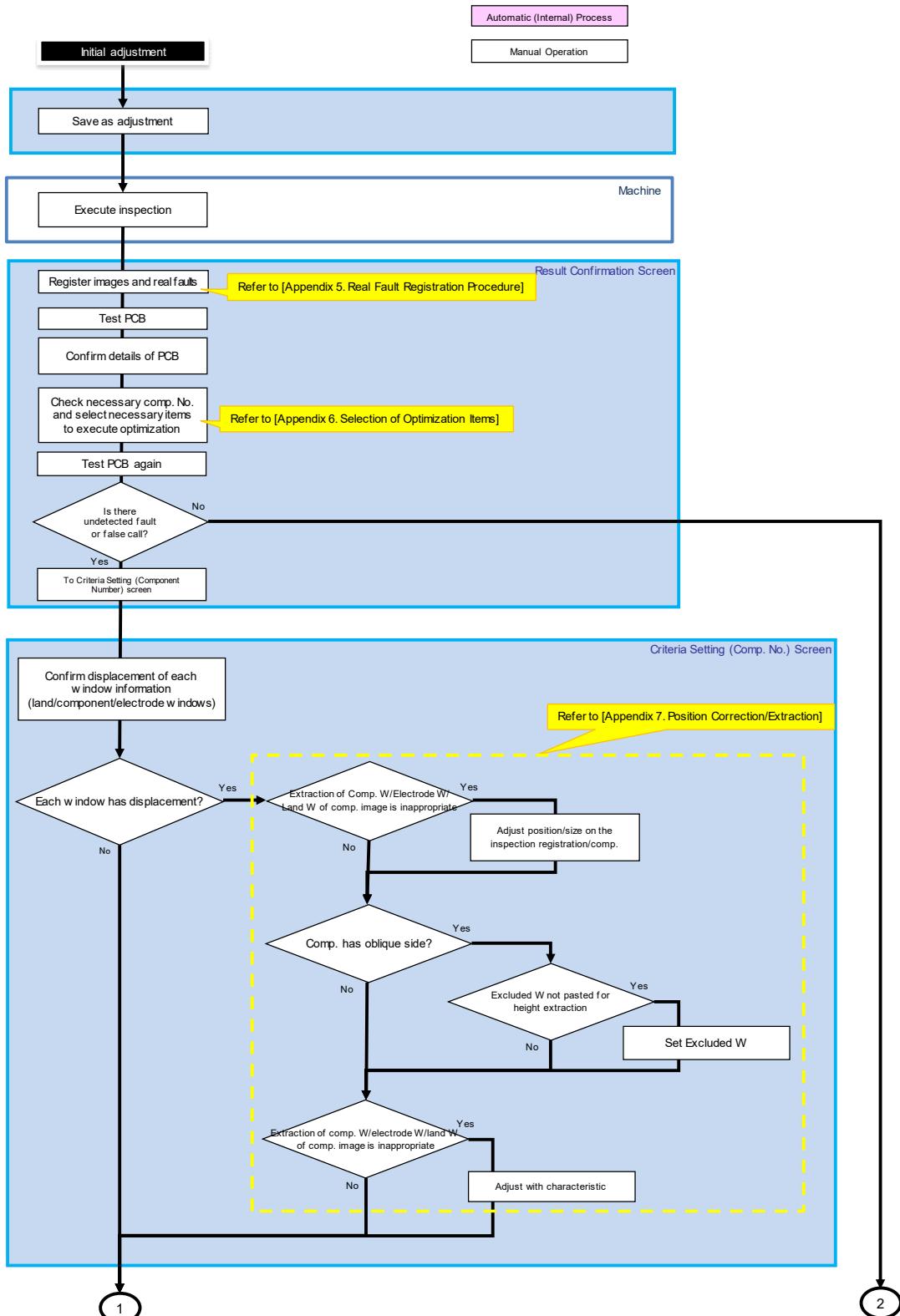
## Appendix 1. Initial Programming



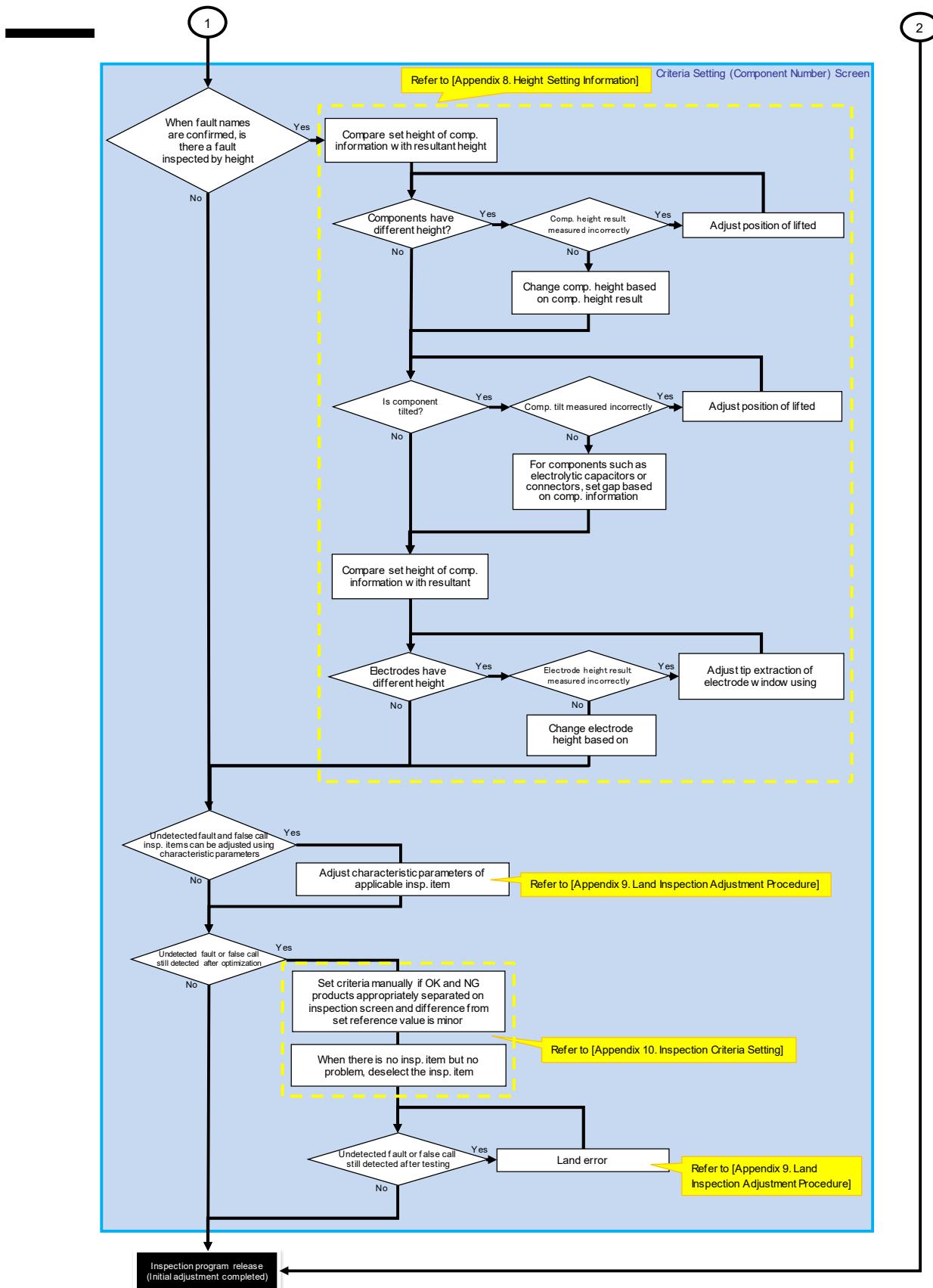
## Appendix 1. Initial Programming



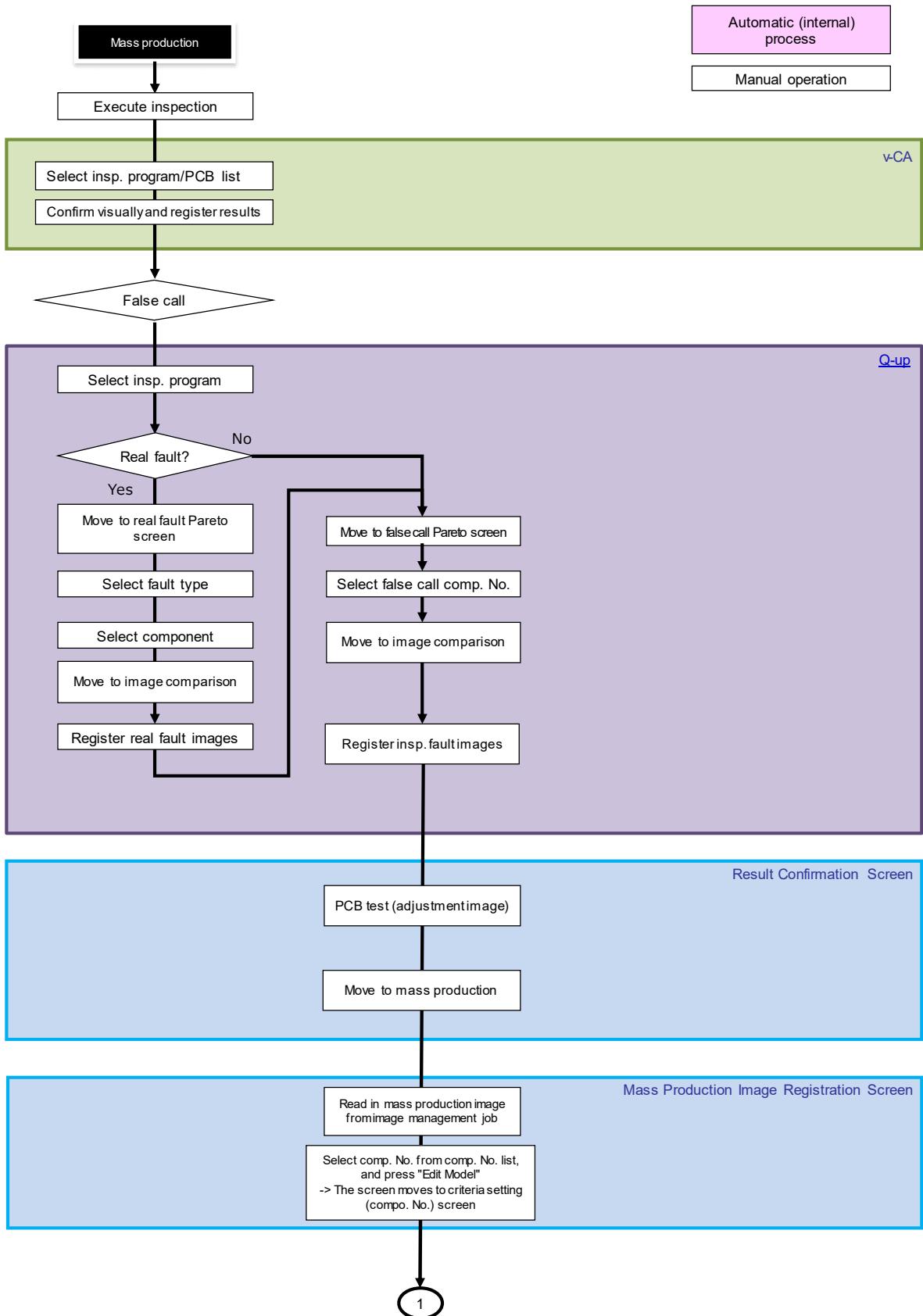
## Appendix 2. Initial Adjustment



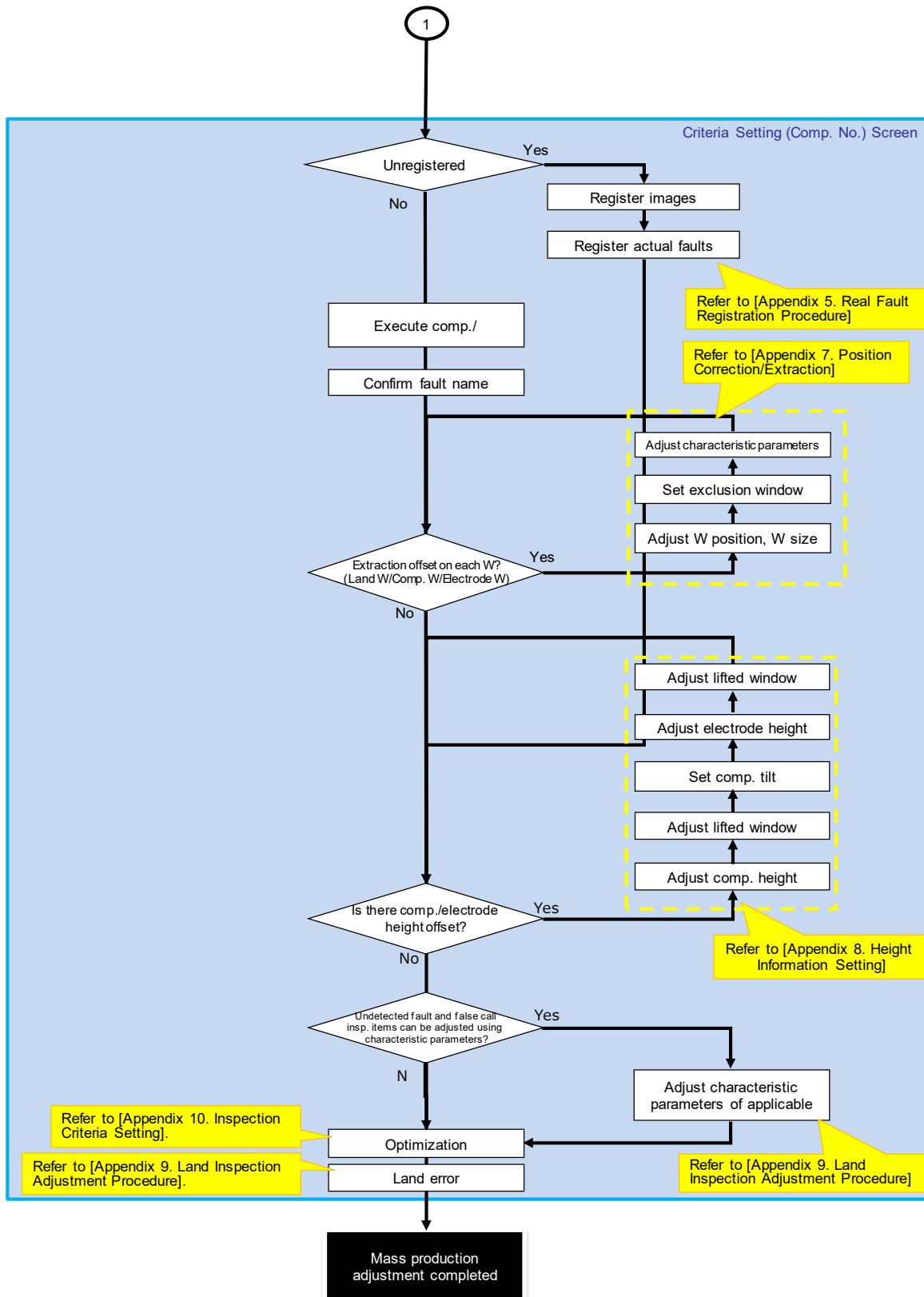
## Appendix 2. Initial Adjustment



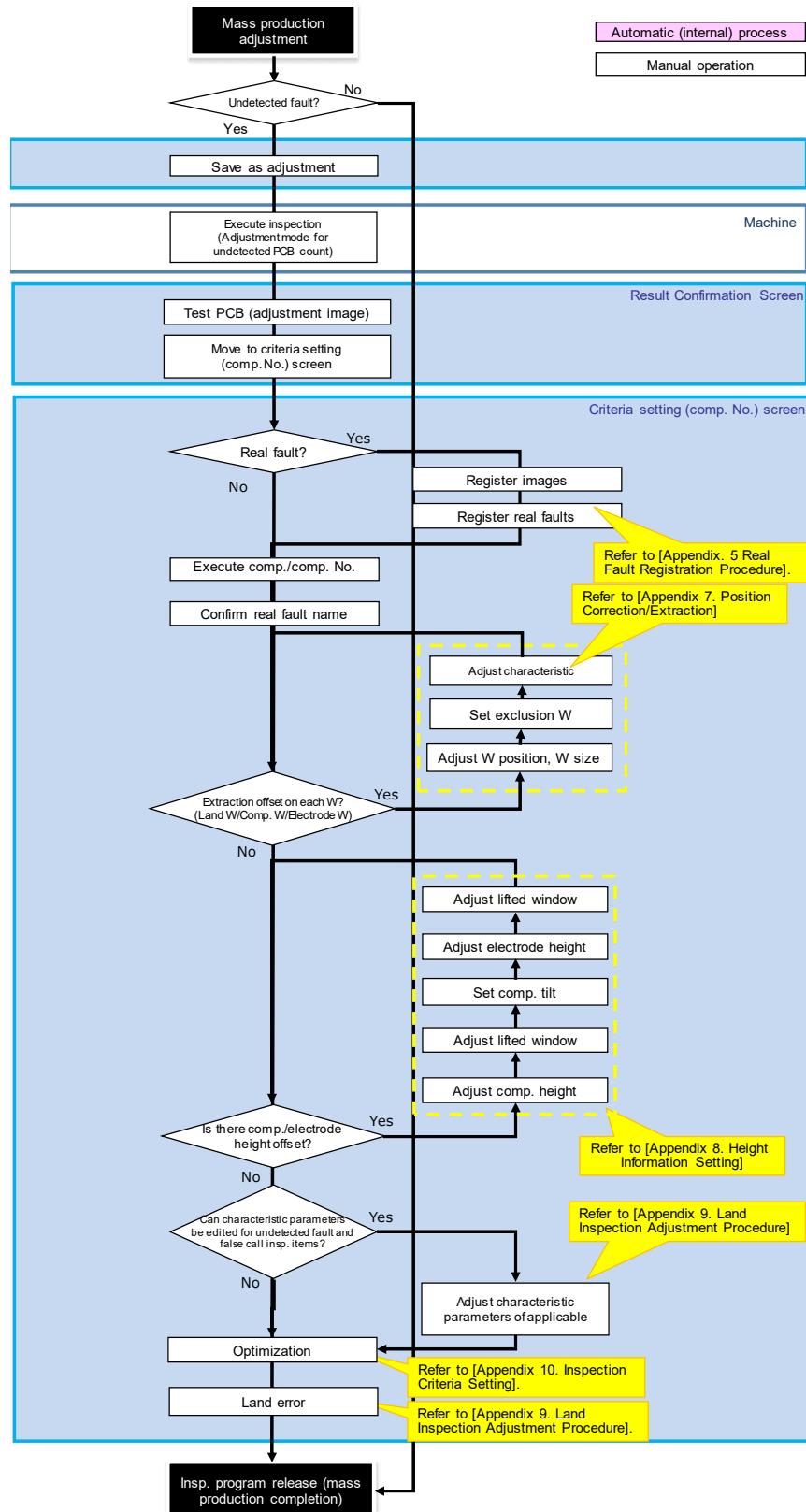
## Appendix 3. Mass Production Adjustment (false call minimization)



### Appendix 3. Mass Production Adjustment (false call minimization)



## Appendix 4. Mass Production Adjustment (undetected error zero)



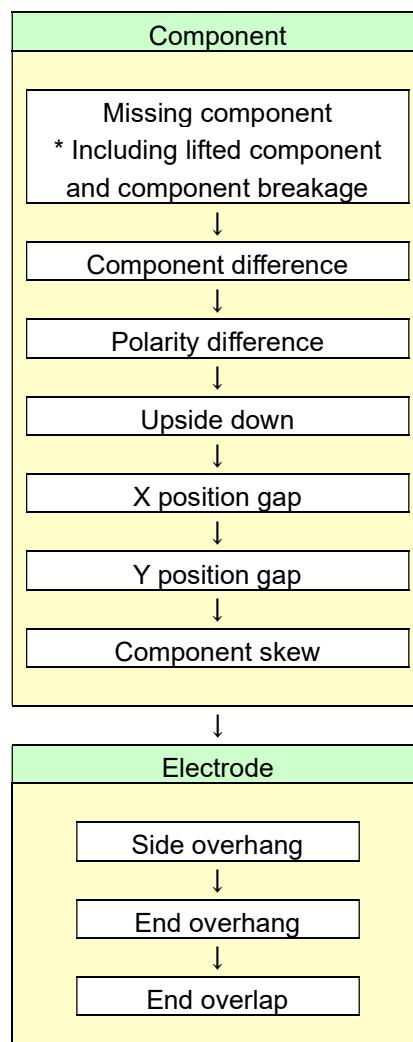
# Appendix 5. Real Fault Registration Procedure

Register real fault using the procedure below.

1. Select the “Criteria Setting (Component Number) ” tab.
2. Select a component number with which a visual inspection result is registered from the component number list, and click [Model Editing].
3. Select a thumbnail image with which you wish to enter a visual inspection result from the component thumbnail image list, and select a visual inspection result from the pull-down of visual inspection results of window configuration. If more than one window is selected, the same visual inspection result is registered in all the selected windows of the same type.
4. To go on to enter visual inspection results in the other thumbnail images, repeat step 3.

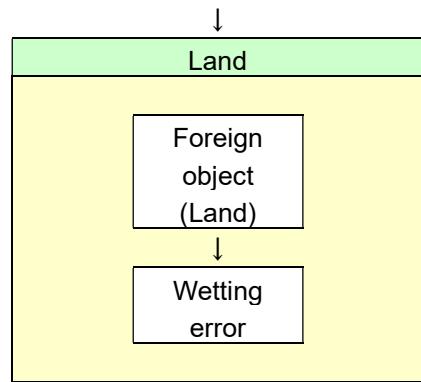
 For details of real fault registration, refer to P2-162 Section 2.16.5 “Registering Visual Check Results.”

In optimization, fault detection is made in order of priority: (1) component, (2) electrode and (3) land. In the case where both component and electrode are faulty, the system judges that the fault has been detected as long as the component is judged as fault so that it does not detect the electrode fault. If the electrode has been judged as fault, the visual inspection result is registered as the detected inspection item name if there is no problem on the judgment.



## Appendix 5. Real Fault Registration Procedure

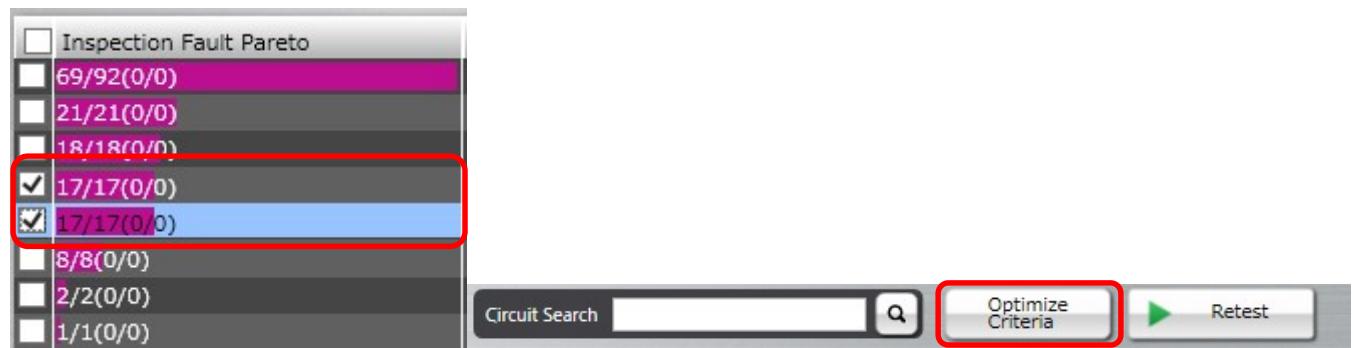
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# Appendix 6. Selection of Optimization Items

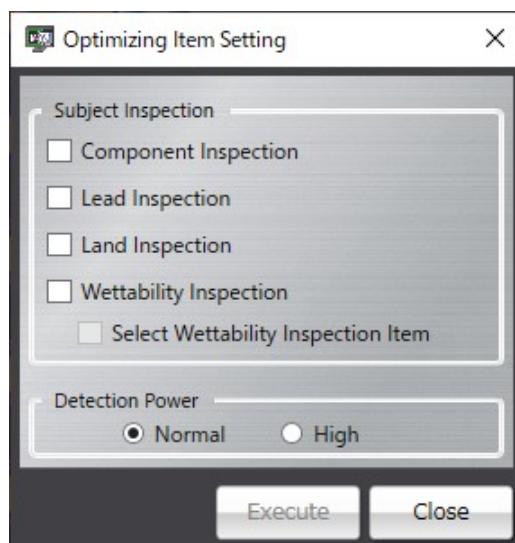
Optimization is a tool to automatically set a logical expression suitable for the component type and electrode type of the component number when inspection criteria are set up.

To use optimization, select a component number or a component number group to be optimized on the result confirmation screen as framed in red below, and press the Optimize Criteria button. Since reference values are changed to suitable values, if there is a component number and so on you don't wish to change, perform optimization without selecting it.



Then, options can be selected for the target inspection and inspecting ability items.

When optimization is performed, selecting all options of the target inspection item is recommended. However, if you don't wish to change the criteria of the inspection program, select necessary inspection options only, and perform optimization.



 For details of the optimization execution method, refer to P2-154 Section 2.16.4 "Optimizing Boolean Expressions and Inspection Criterion Values" of the Teaching Manual.

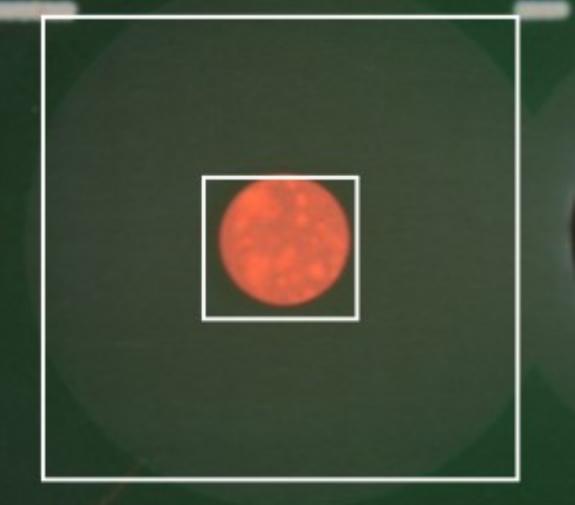
# Appendix 7. Position Correction/Extraction

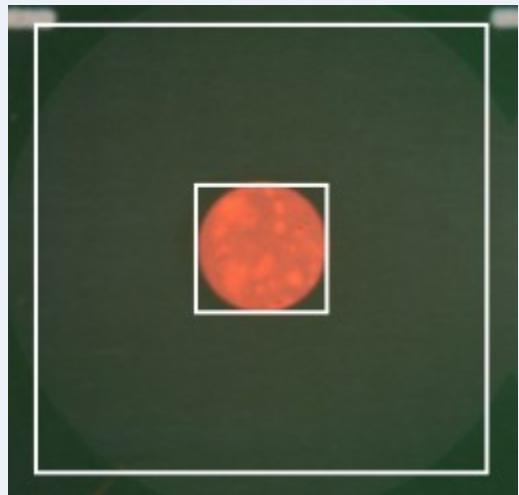
In this section, procedures to confirm position correction/extraction, which is a misjudgment factor common to each inspection, and repair errors.

## 1. Fiducial correction

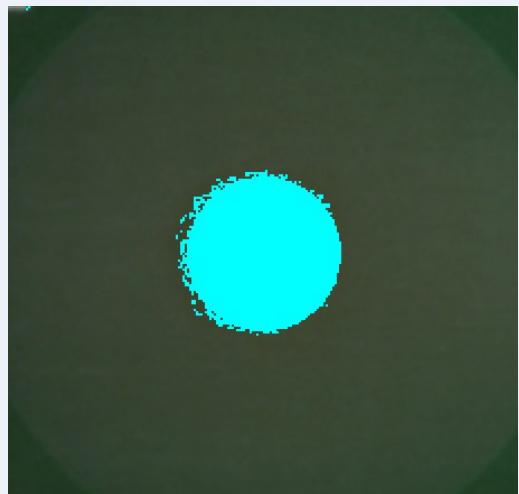
In the fiducial correction window, recognize PCB's fiducial mark, and correct the camera capturing position.

 For details of fiducial correction, refer to P2-2 Section 2.2 "Fiducial Correction" of the inspection logic manual.

Inspection result	Component image (PCB test)
N/A	N/A
Cause	<p>Confirmation and repair method</p> <p>1) Move to the "Inspection Registration" tab. 2) Click "Add Position Correction Mark" button. 3) Confirm the position and size of the fiducial window.</p>  <p>4) Change the position or size if not appropriate.</p>



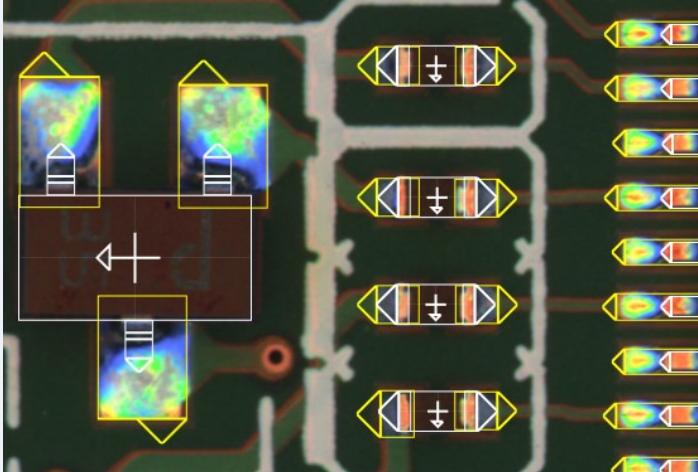
- 5) Click the [Model Editing] button to confirm that the fiducial color is set appropriately.

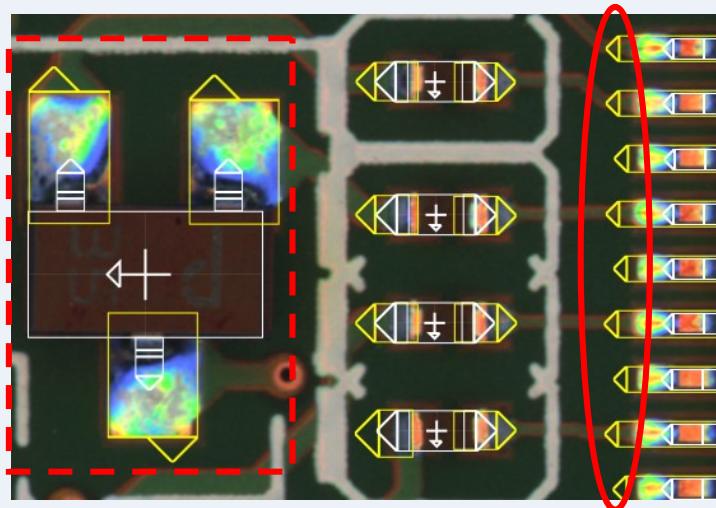


- 6) Change the color if not appropriate.

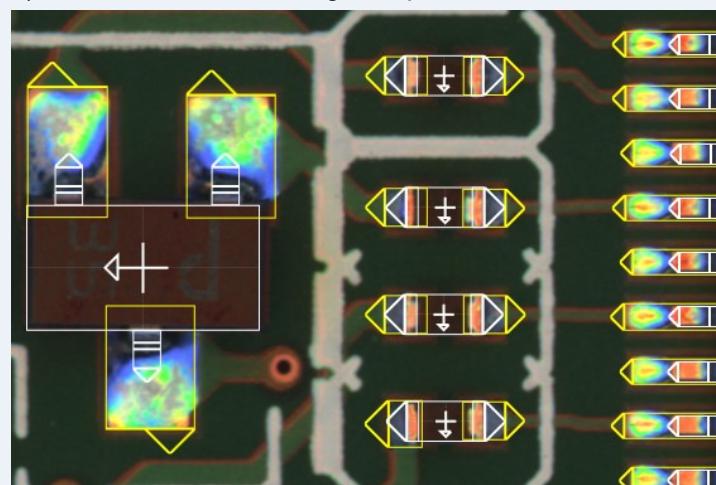
## 2. Inspection screen position correction

In the inspection screen, recognize the land, and correct the position of the entire captured inspection screen.

Inspection result	Component image (PCB test)
Cause	Confirmation and repair method
The position of the land window is not appropriate.	<p>1) Move to the “Criteria Setting” tab.</p> <p>2) Confirm that the position and size of the land window are consistent with those of the image.</p>  <p>3) If not consistent, change the position or size of the land window.</p> 

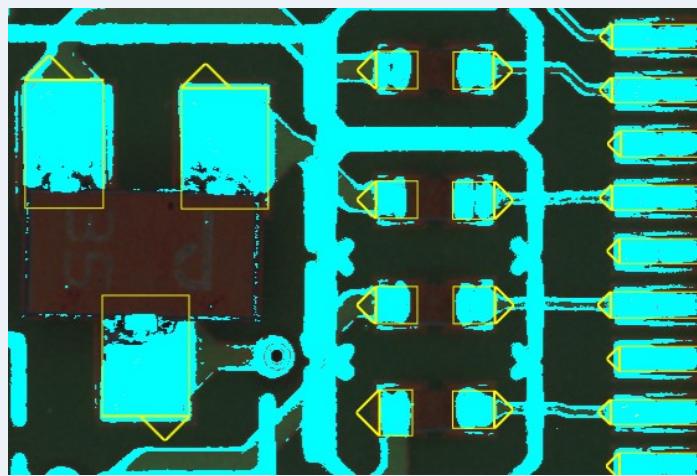


4) If not consistent, change the position or size of the land window.

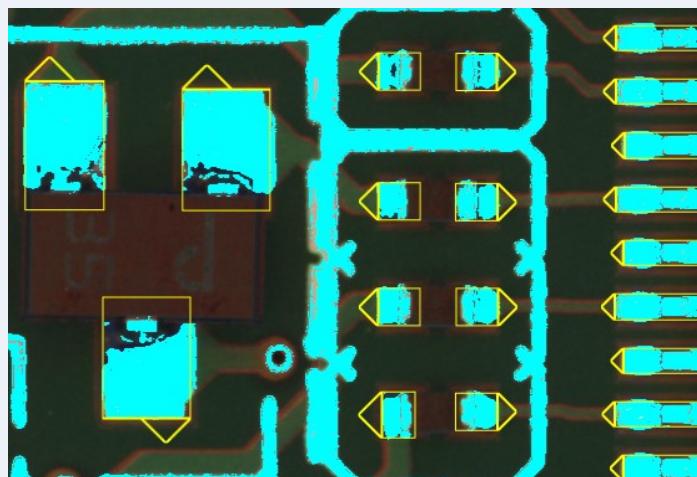


The position correction color is not appropriate.

- 1) Select "Tool" - "PCB Image Management."
- 2) Click the [Model Editing] button.
- 3) Confirm that the position correction color is set appropriately.



- 4) Change the color if not set appropriately.



### 3. Extraction offset confirmation procedure

After conducting a PCB test using an adjustment image, whether the extraction offset occurs or not on the component number (component number group) in which an inspection fault has occurred is verified based on the shape of the histogram of the model editing screen according to the following inspection items.

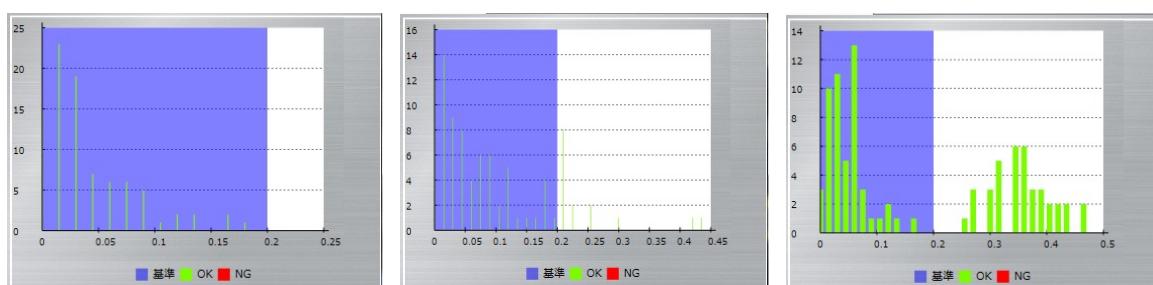


When the extraction offset occurs, refer to the component extraction procedure and the component tip extraction procedure of appendix section 5 and 7, respectively to adjust to eliminate extraction offset.

Comp. type	Condition	Inspection item to select	Judgment criteria for no skew
Chip component Electrode capacitor Transistor Powered transistor 2-pin mini mold Non-lead component Other component applicable to the conditions on the right	Component whose width is at least 120% or no electrode for the electrode width	For the component body window: - Component offset – Offset X [Absolute value] - Component offset – Offset Y [Absolute value]	All the measured values of good components must be within the default inspection criteria.
IC Connector  Resistor array	The width of the land for the electrode width is less than 120%.	Electrode window: - Side overhang - End overhang	The distribution width of the measured value of the good component must be 20% or less.

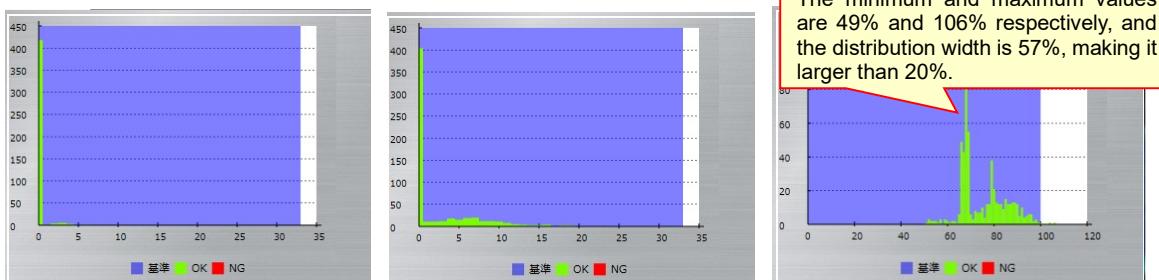
#### Example 1: Verifying extraction offset of 2-pin mini mold

On the left figure, the values are within the inspection criteria so it is judged as no offset. On the center and right figures the values are not within the inspection criteria so they are judged as offset.



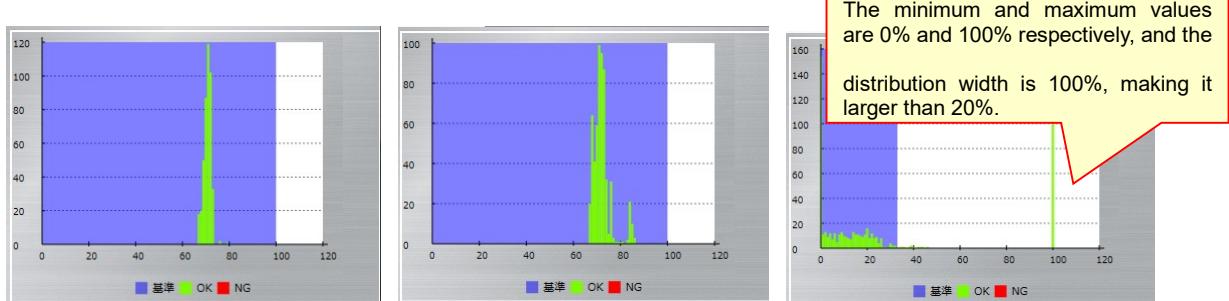
Example 2: Verifying extraction offset of QFP

On the left and center figures the distribution widths are within 20% so they are judged as no offset. On the right figure the distribution width is larger than 20% so it is judged as an offset.



Example 3: Verifying extraction offset of QFP

On the left and center figures the distribution widths are within 20% so they are judged as no offset. On the right figure the distribution width is larger than 20% so it is judged as an offset.



#### 4. Inspection items adjustable with characteristic parameters

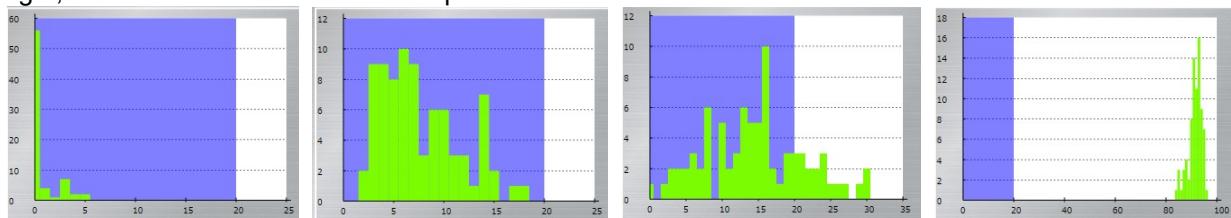
When false call or detection failure occurs and the characteristic parameters regarding the inspection items can be adjusted, characteristic parameters should be adjusted.

- 1) For a false call, adjust that the measurement value of the good component is within the inspection criteria.
- 2) For a detection failure, adjust that the good and fault can be separated using the histogram.

\* Adjust the good component so that the value is within the inspection criteria, as shown in (1).

	Component	Electrode	Land	Inspection range
Adjustable	Missing component Component difference Polarity difference Upside down component X position gap Y position gap Component skew	Side overhang End overhang End overlap Electrode length Electrode area Side bend Electrode height (oblique)	Exposed land Land error Foreign object (land) Exposed land (oblique)	Solder ball Solder bridging Foreign object Solder ball (oblique) Solder bridging (oblique)
Not adjustable	None	Exposed electrode tip (oblique) Electrode color deviation Exposed electrode tip (oblique) Electrode color deviation (oblique)	Fillet inspection (all)	None

In the two figures on the left, the values are within the inspection criteria, and in the two figures on the right, the values are not within the inspection criteria.

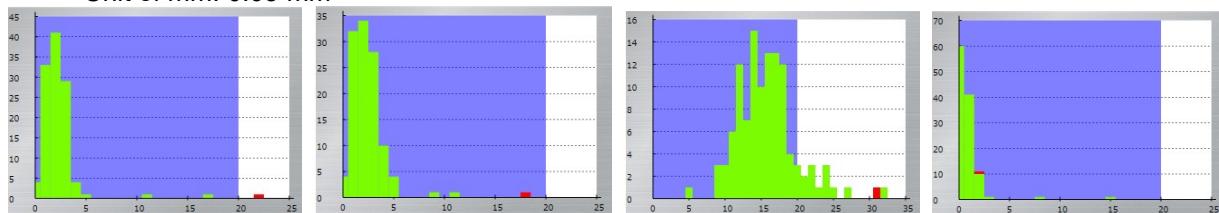


In the two figures on the left, the values are within the inspection criteria, and in the two figures on the right, the values are not within the inspection criteria. “The good and fault can be separated” means all the good components are within the inspection criteria, and faulty components are not. Even if faulty components are inside the inspection criteria, there is no problem if the interval between the measured value of the good component closest to the fault and the measured value of the fault is as follows:

Unit of %: 5%

Unit of angle: 1°

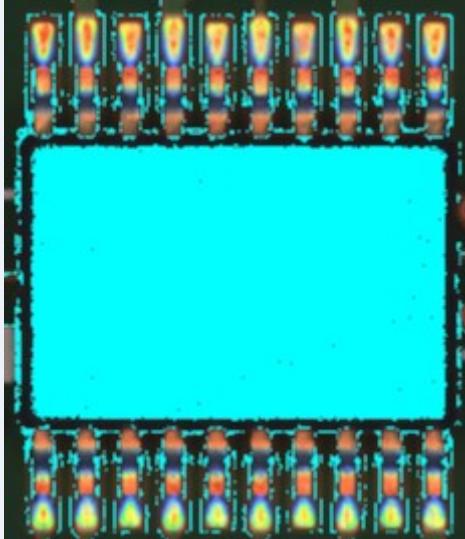
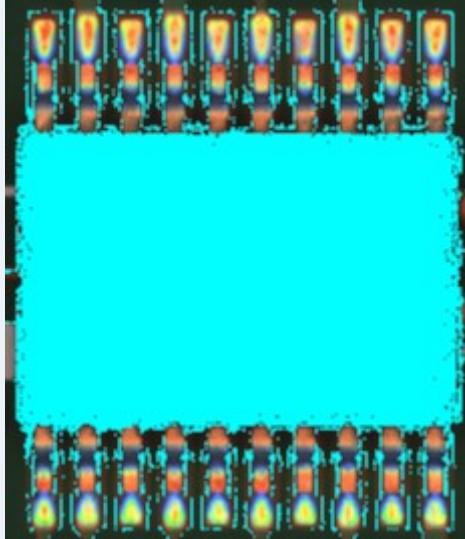
Unit of mm: 0.05 mm

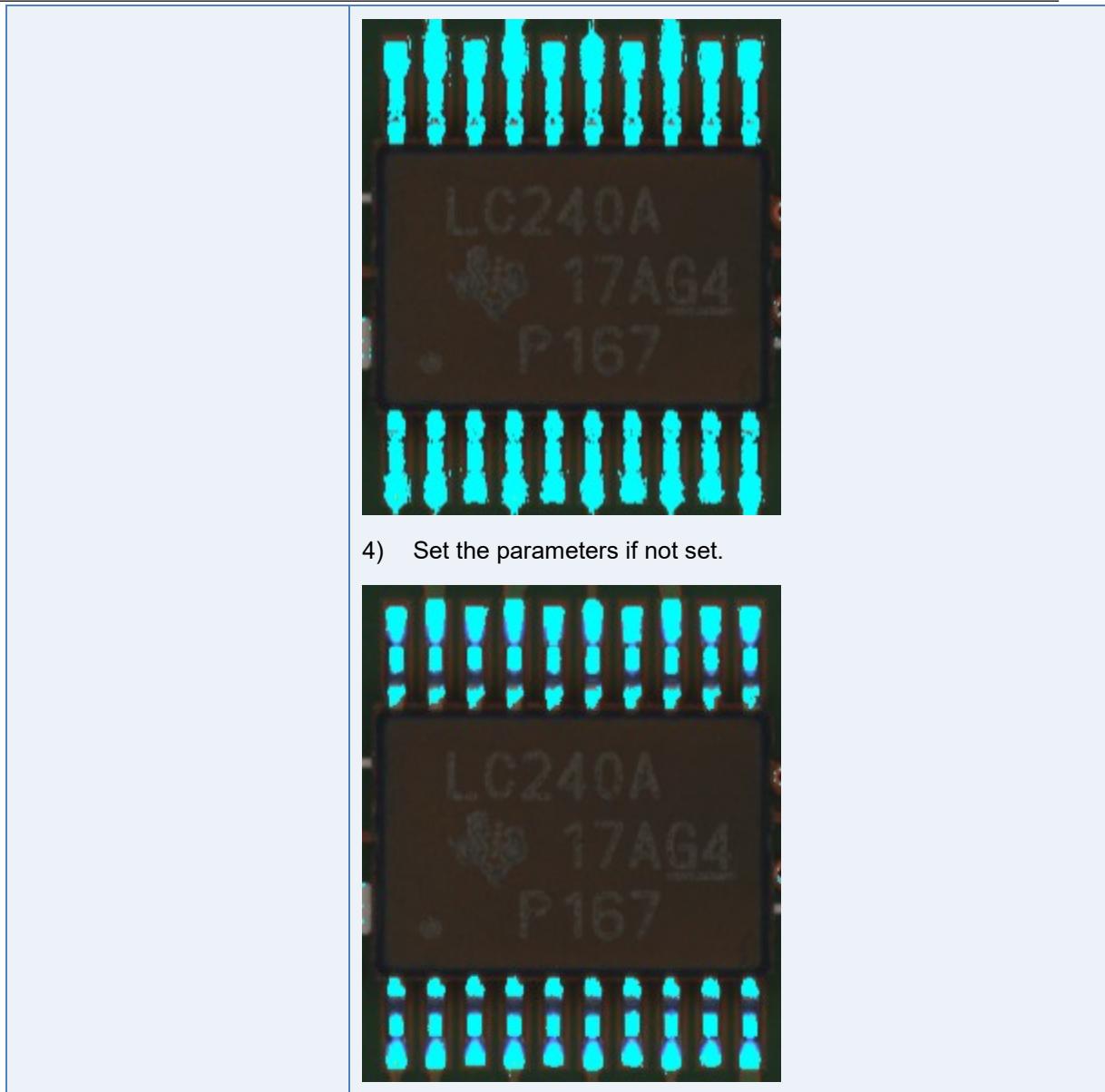


## 5. Component extraction

A component is extracted in the inspection range window, the positions of the component body window and electrode window are corrected and specified as the reference positions for the component body inspection and electrode inspection.

Inspection result	Component image (PCB test)
Cause	Confirmation and repair method
The component body window and electrode window are not sized appropriately.	<p>1) Move to the “Inspection Registration” tab.      2) Confirm that the component body window has an appropriate size.</p>  <p>3) If not appropriate, change the size/position of the component body window, and click the [Next] button.</p>  <p>4) Click the [Next] button.      5) Click the [Next] button.      6) Confirm that the electrode window has a size consistent with the image.      7) If not consistent, change the electrode window's size/position.</p>

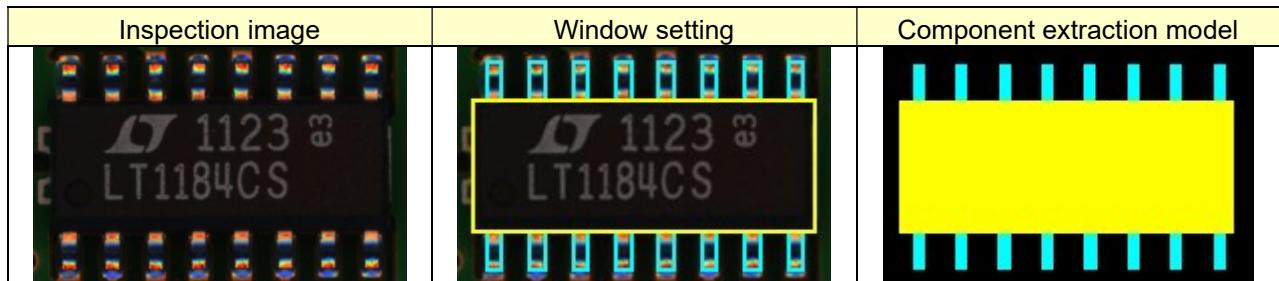
If the component has a tilted side	
Characteristic parameters are not set appropriately. (The component body color and electrode color are not being set sufficiently.)	<p></p> <p>1) Set the parameters if not set.</p> <p></p> <p>2) Select “Inspection Criteria” - “Extract Electrode Tip,” and click the [Model Editing] button.</p> <p>3) Confirm if the electrode color is being set.</p>



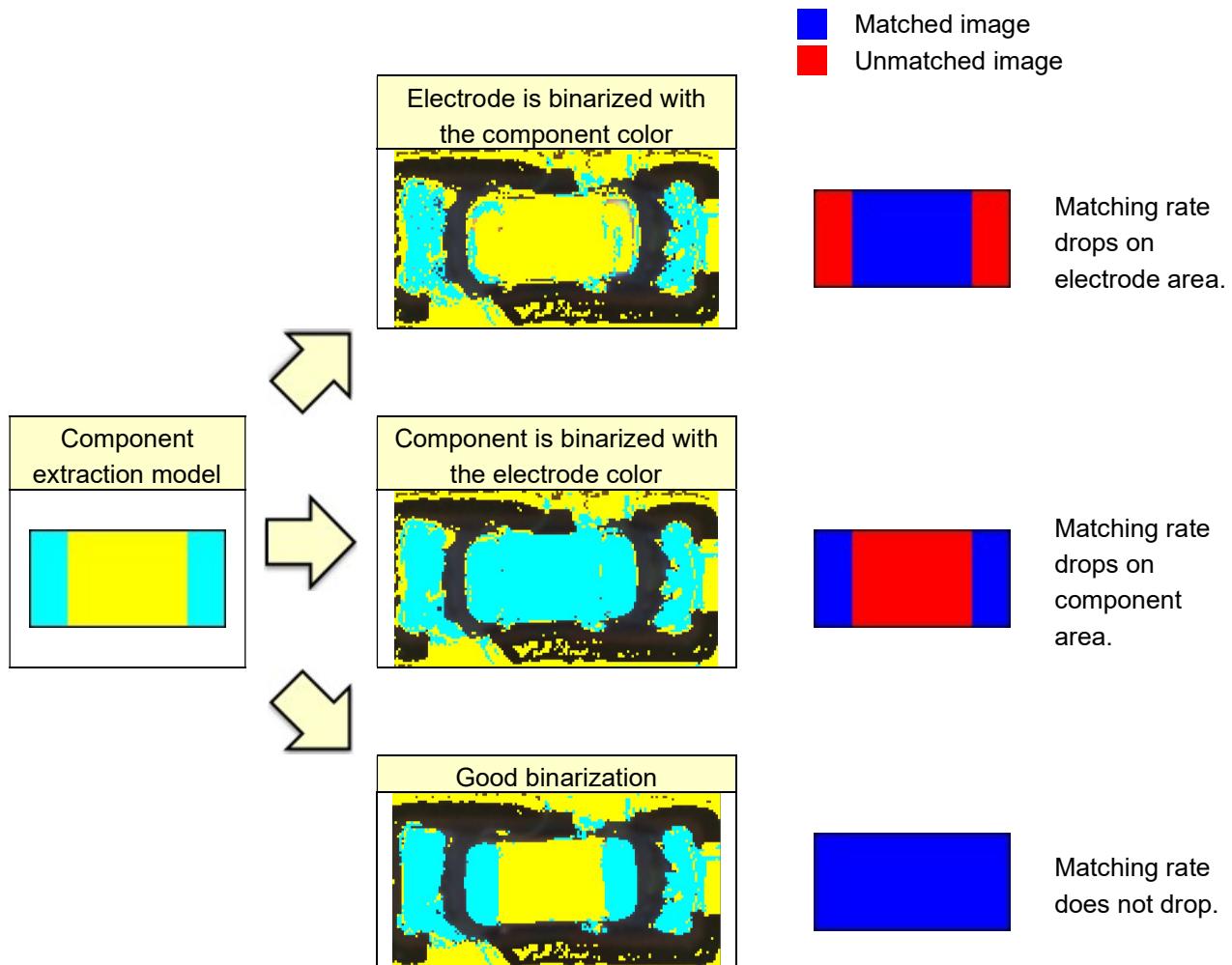
Details of the procedure to adjust component extraction using characteristic parameters are as follows:

The component extraction function extracts something similar to the component by template (model) matching. The component extraction model is created based on the window setting like the figure below.

Inspection image	Window setting	Component extraction model



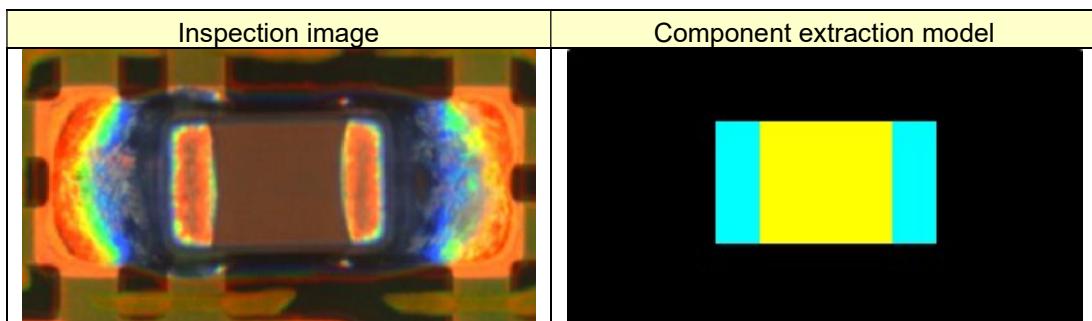
For stable component extraction, the characteristic parameters need to be configured so that the rate of matching between the component extraction model and binarized inspection image becomes higher. To close to the 100% matching rate, the component and electrode need to be binarized with each characteristic parameter.



The component extraction succeeds if the following five conditions are satisfied.

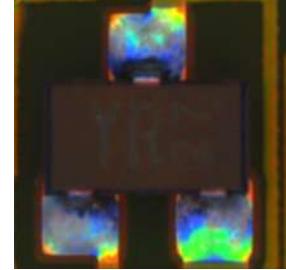
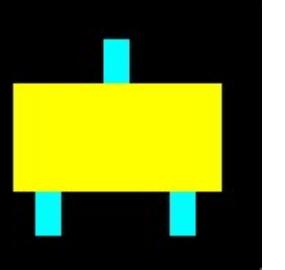
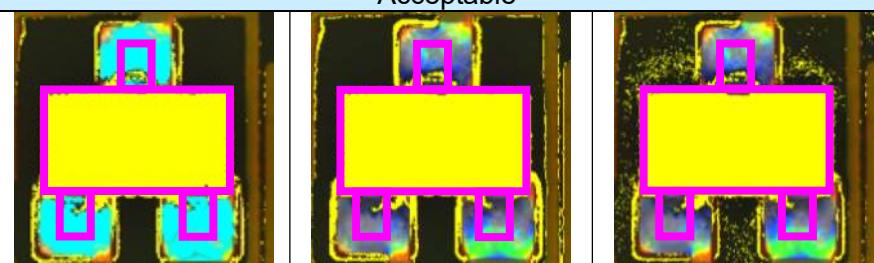
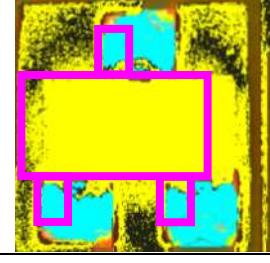
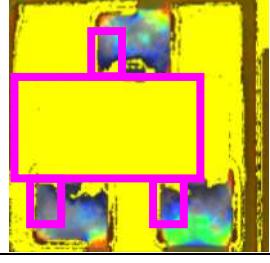
- (1) The component is binarized with the component color.
- (2) The electrode is binarized with the electrode color.
- (3) The PCB and silk close to the component are not binarized.
- (4) The solder close to the electrode is not binarized with the component and electrode colors.
- (5) The component is not binarized with the electrode color.

Example 1. Chip capacitor

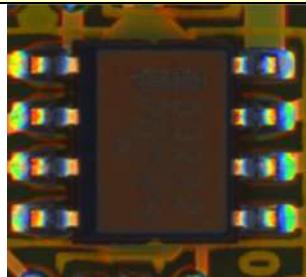
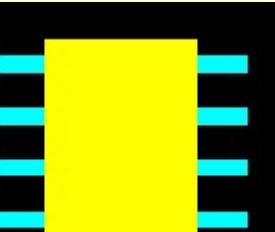
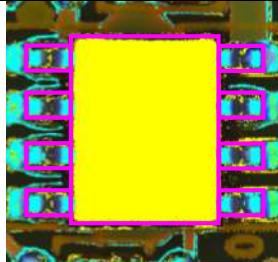
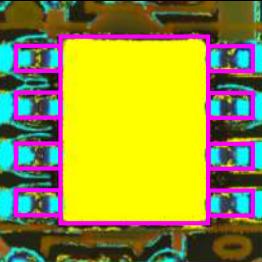
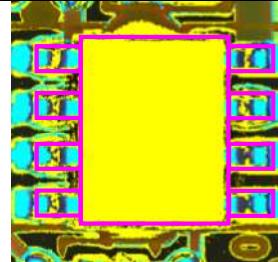
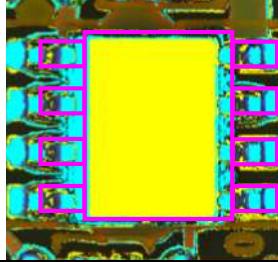
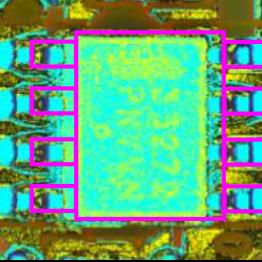
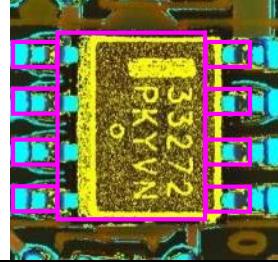


Acceptable		
All the conditions from (1) to (5) are satisfied and therefore component extraction succeeds.		
Unacceptable		
Component extraction fails because condition (5) is not satisfied.	Component extraction fails because conditions (4) and (5) are not satisfied.	Component extraction fails because conditions (1) and (4) are not satisfied.

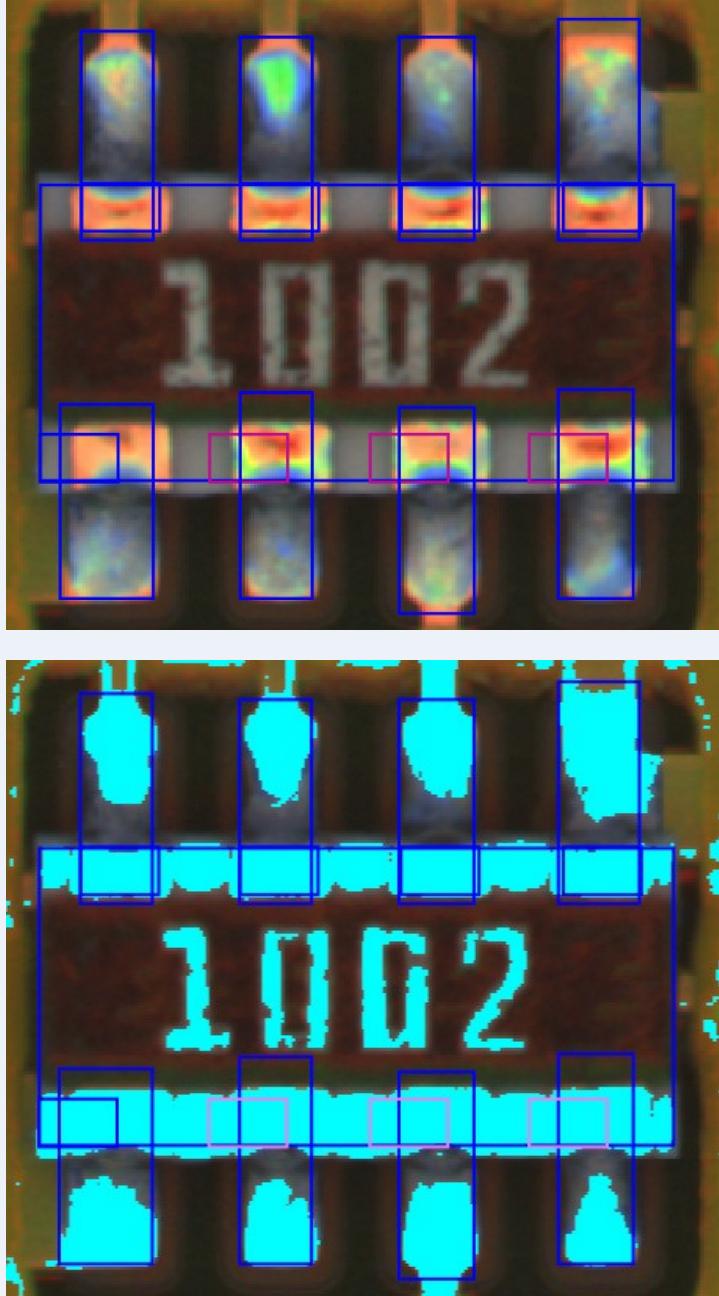
Example 2. Transistor

Inspection image	Component extraction model	
		
Acceptable		
 All the conditions from (1) to (5) are satisfied and therefore component extraction succeeds.		
Unacceptable		
		
Component extraction fails because conditions (3) and (4) are not satisfied.	Component extraction fails because condition (3) is not satisfied.	Component extraction fails because conditions (1) and (3) are not satisfied

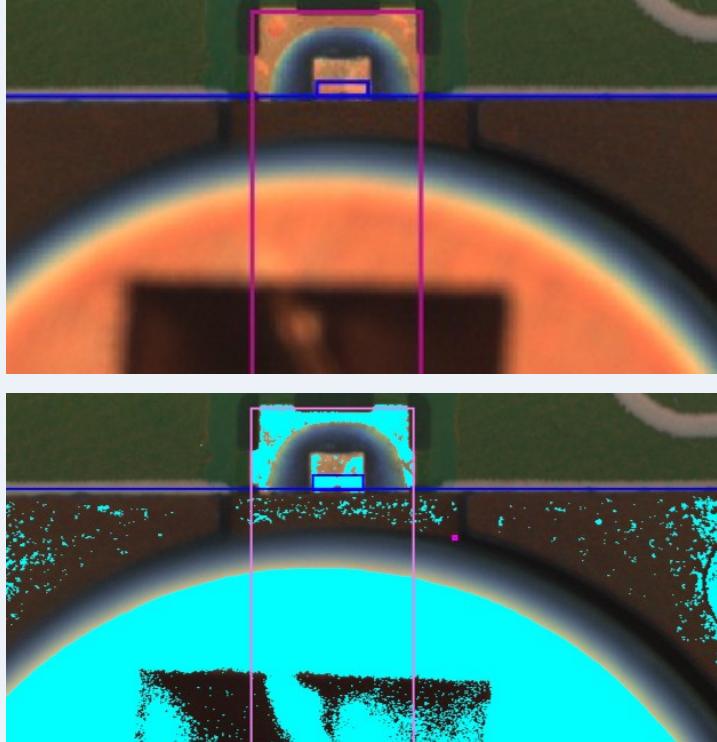
Example 3. SOP

Inspection image	Component extraction model	
		
<b>Acceptable</b>		
		
<p>All the conditions from (1) to (5) are satisfied and therefore component extraction succeeds.</p>		
<b>Unacceptable</b>		
		
Component extraction fails because condition (5) is not satisfied.	Component extraction fails because condition (1) is not satisfied	

**6. Electrode side extraction**

Inspection result	Component image (PCB test)
Electrode side extraction is not aligned.	<p>1) Move to the "Criteria Setting" tab. 2) Select "Inspection Criteria" - "Electrode Side Extraction," and click the [Model Editing] button. 3) Confirm if the electrode color is being set.</p>  <p>4) Set the electrode color if not being set.</p>

## 7. Electrode Tip Extraction

Inspection result	Component image (PCB test)
Electrode tip extraction is not aligned.	<p>1) Move to the "Criteria Setting" tab. 2) Select "Inspection Criteria" - "Electrode Tip Extraction," and click the [Model Editing] button. 3) Confirm if the electrode color is being set.</p>  <p>4) Set the electrode color if not being set. (*Image to be pasted)</p>

Details of the procedure to adjust electrode tip extraction using characteristic parameters are as follows:

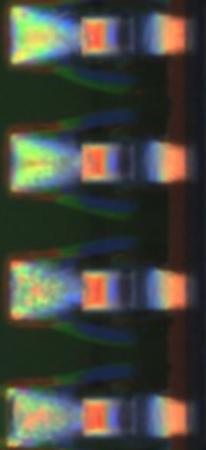
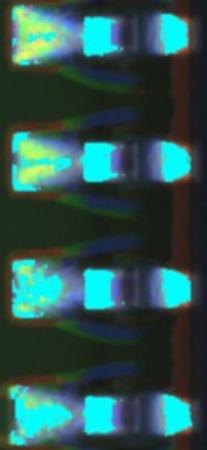
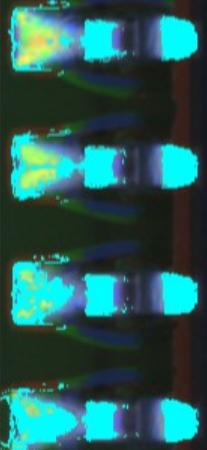
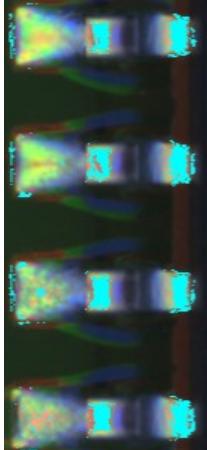
Electrode tip extraction succeeds if the following two conditions are satisfied.

- (1) Electrode binarization ... The electrode is binarized with the electrode color.
- (2) Solder binarization ... The solder close to the electrode is not binarized with the electrode color.

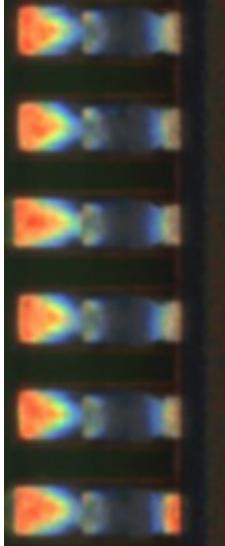
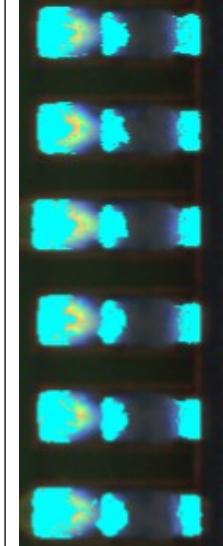
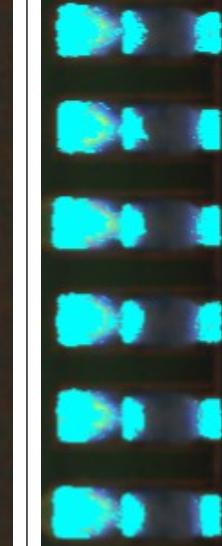
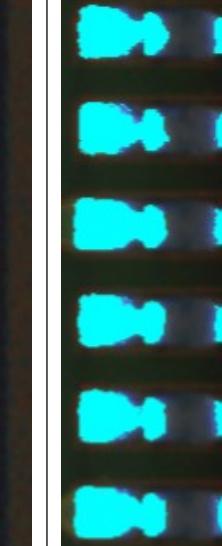
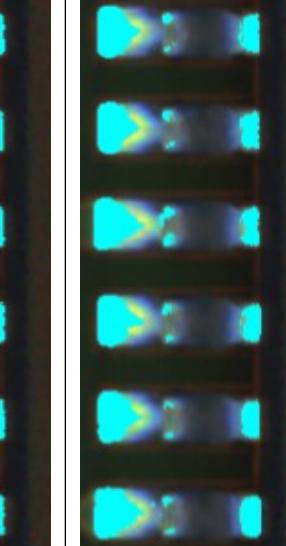
Example 1.

Capture image	Good	Acceptable	Unacceptable	
(1) Electrode binarization	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b> Electrode tip extraction fails because the electrode is not binarized.
(2) Solder binarization	<b>Yes</b>	<b>Fair</b> Electrode tip extraction may fail in the future because the electrode and solder are partly connected.	<b>No</b> Electrode tip extraction fails because the electrode and solder are connected.	<b>Yes</b>
Availability of electrode tip extraction	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>

Example 2.

Capture image	Good	Acceptable	Unacceptable	
				
(1) Electrode binarization	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b> Electrode tip extraction fails because the electrode is not binarized.
(2) Solder binarization	<b>Yes</b>	<b>Fair</b> Electrode tip extraction may fail in the future because the electrode and solder are partly connected.	<b>No</b> Electrode tip extraction fails because the electrode and solder are connected.	<b>Yes</b>
Availability of electrode tip extraction	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>

Example 3.

Capture image	Good	Acceptable	Unacceptable	
				
(1) Electrode binarization	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b> Electrode tip extraction fails because the electrode is not binarized.
(2) Solder binarization	<b>Yes</b>	<b>Fair</b> Electrode tip extraction may fail in the future because the electrode and solder are partly connected.	<b>No</b> Electrode tip extraction fails because the electrode and solder are connected.	<b>Yes</b>
Availability of electrode tip extraction	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>

Example 4.

Capture image	Good	Acceptable	Unacceptable	
(1) Electrode binarization	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b> Electrode tip extraction fails because the electrode is not binarized.
(2) Solder binarization	<b>Yes</b>	<b>Fair</b> Electrode tip extraction may fail in the future because the electrode and solder are partly connected.	<b>No</b> Electrode tip extraction fails because the electrode and solder are connected.	<b>Yes</b>
Availability of electrode tip extraction	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>

Example 5.

Capture image	Good	Acceptable	Unacceptable	
(1) Electrode binarization	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b> Electrode tip extraction fails because the electrode is not binarized.
(2) Solder binarization	<b>Yes</b>	<b>Fair</b> Electrode tip extraction may fail in the future because the electrode and solder are partly connected.	<b>No</b> Electrode tip extraction fails because the electrode and solder are connected.	<b>Yes</b>
Availability of electrode tip extraction	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>No</b>

# Appendix 8. Height Information Setting

## 1. Component height setting procedure

1. Move to the “Criteria Setting (Component Number) ” tab.
2. Select the “Component Height” inspection item, and confirm the measured value of the inspection result of OK component on the “Model Editing” screen.
3. Click the [Component Information] button at the screen bottom, and confirm the entered value of “Component Height.”
4. If the entered value of component height is different from the confirmed measured value of component height, change the entered value to the correctly measured value.
5. If false call or overlooking occurs, confirm if component height is measured correctly based on the resultant component height on the “Model Editing” screen again, and adjust the lifted window on the component image.
6. If component height is no problem, confirm adjustment of lifted/tilted components continuously. (Refer to 2. “Details of gap setting for component tilt” below.)

## 2. Details of gap setting for component tilt

Some capacitors and connectors are still judged as false call or overlooking when component tilt is 0-180° or 90-270°. This is because there is a case in which a gap is generated in the area where the lifting window is set and the gap is measured as component tilt by mistake. So, it is necessary to set component gap.

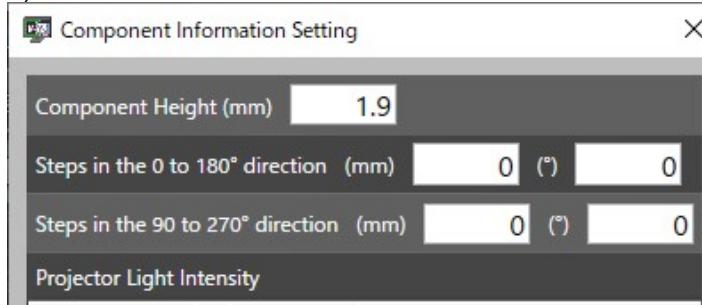
 For details of gap setting, refer to P3-13 Section 3.8 “Lifted Component” of the inspection logic manual.

The adjustment procedure is described hereafter.

### Operation procedure

1. First, on the criteria setting (component number) screen, compare 1) set value of component height with 2) measured value of component height. If component height is different, change the set value of 1) according to the measured value of 2) of OK product.

#### 1) Set value

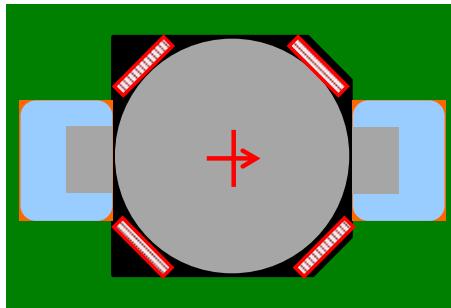


#### 2) Measured value

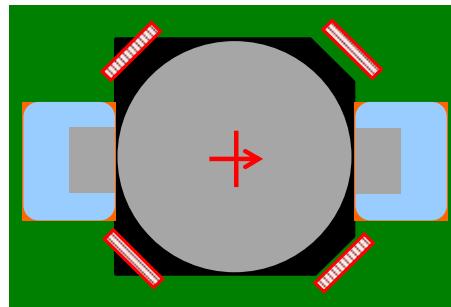
Inspection item	Setting	Measured value	Judgment
■ Component height		5.01	

2. When the measured value of 2) component height is not correct, if the component is an electrolytic capacitor, adjust positions of the lifted windows at four corners tilted at 45° (framed in red), and set them on the base. (Refer to [OK sample] below.) Adjust positions for each component, and change the measured value of 2) component height.

[OK sample]



[NG sample]



- After performing steps 1 and 2 appropriately, confirm the measured value of Component lifting - Tilt - Height [absolute value] (framed in red) on the inspection criteria screen.

[Inspection Criteria Screen]

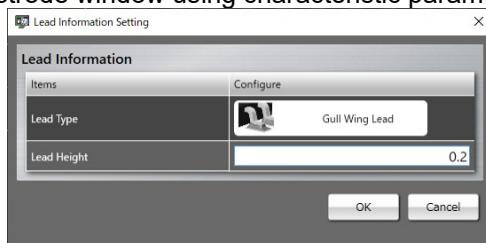
Inspection item	Setting	Measured value	Judgment
■ Component lifting			
■ Tilt (0-180°)			
<input checked="" type="radio"/> Height [absolute value] (mm) [Signed] (mm)	0	—	<input type="text"/>
<input type="radio"/> Angle [absolute value] (°) [Signed] (°)	0	—	<input type="text"/>
■ Tile (90-270°)			
<input checked="" type="radio"/> Height [absolute value] (mm) [Signed] (mm)	0	—	<input type="text"/>
<input type="radio"/> Angle [absolute value] (°) [Signed] (°)	0	—	<input type="text"/>
■ Lift (average height) (mm)			
	0	—	<input type="text"/>

- For the component tilt from which false call or overlooking occurred, fill in the area (framed in red) of gap in the applicable direction on the component information setting screen with the measured value of the height [absolute value] (mm) or angle [absolute value] (°) of that tilt, and conduct the test.

- If false call or overlooking of component tilt still remains even after the test is conducted, the setting of lifted window might not be aligned correctly. Adjust the lifted window again to minimize the difference of the component tilt [absolute value] which still remains as false call or overlooking before conducting the test again.

### 3. Electrode height setting procedure

1. Move to the "Criteria Setting (Component Number)" tab.
2. Select the "Component Lifting" inspection item, and confirm the measured value of the inspection result of OK electrode height on the "Model Editing" screen.
3. Click the [Electrode Information] button at the screen bottom, and confirm the entered value of "Electrode Height."
4. If the entered value of electrode information is different from the confirmed measured value of electrode height, change the entered value to the correctly measured value.
5. If false call or overlooking occurs, confirm if electrode height is measured correctly based on the resultant electrode height on the "Model Editing" screen again, and adjust the tip extraction of the electrode window using characteristic parameters.



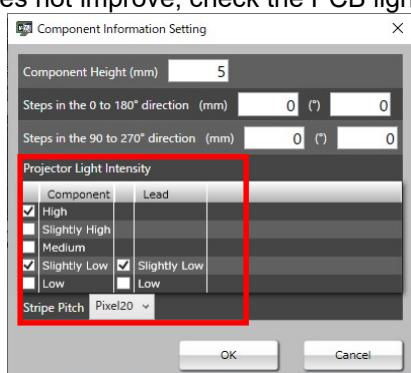
### 4. Projector light intensity/measurement range setting steps

1. Move to the [Criteria Setting (Product No.)] tab.
2. Click the [Component Information] button on the lower part of the window, and check the projector light intensity and Stripe Pitch (Pixel 20 for measuring components of approximately 10 mm or less; Pixel 50 for measuring tall components).
3. Example of changing light intensity:
  - If the measurement accuracy of the black components is bad, and "Slightly low" is selected as the projector light intensity, select "High".
  - If the measurement accuracy of the white components (high brightness) is bad, and "High" is selected as the projector light intensity, select "Low".

[Caution] Selection of multiple projector light intensity levels is available but it makes inspection time longer because frequency of projector ON increases during inspection. Select the minimum light intensity required.

Example of changing Stripe Pitch:

- If the measurement accuracy of the components with a height of 10mm or taller is bad, and "Pixel20" is selected for Stripe Pitch, select "Pixel50".
4. Save the adjusted inspection program and capture an adjustment image. (Not necessary if you have the inspection PCB (3DFull))
  5. Move to the Result Check tab, select the captured adjustment image (or inspection PCB (3DFull)), and click the [Test] button.
- Check whether the measurement result is improved or not.
6. If false call or undetected fault occurs, check again from [Edit Model] whether the height of components and leads is correctly measured, and adjust the projector light intensity. (If the measured value does not improve, check the PCB light intensity setting in the inspection program setting)



# Appendix 9. Land Inspection Adjustment Procedure

This chapter hereafter describes causes of false call or overlooking and the procedure to confirm and repair the fault when optimization is performed after the initial adjustment flow is executed and false call or overlooking still remains on the wetting items of the land inspection.



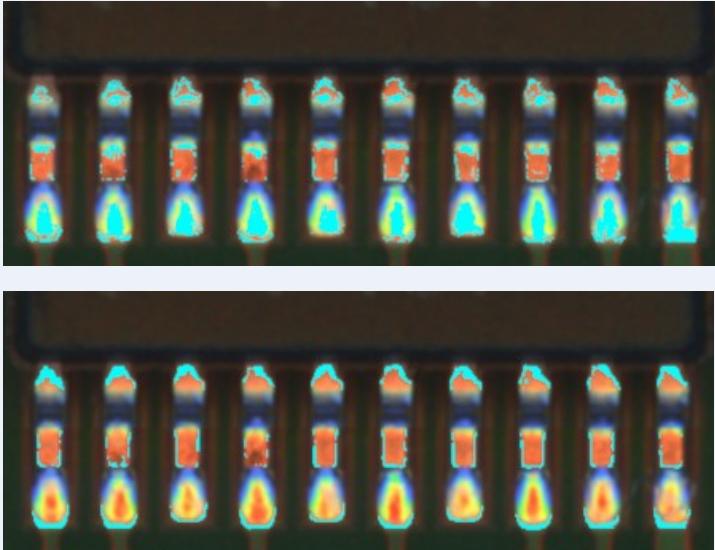
For details of the wetting items of the land inspection, refer to P5-1 section 5. "Land Inspection" of the inspection logic manual.

## Inspection item 1. Fillet - Connection wetting angle (land wetting)

Based on the solder color detected in the land window, inspect if the land is wet with solder. If false call or overlooking still remains in the inspection result, it is displayed as a wetting error (land side).

The inspection result image, cause, and repair method of wetting error (land side) are as follows:

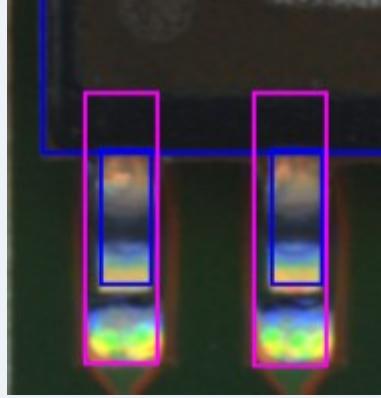
Inspection result	Image
Wetting error (land side)	
Cause	Confirmation/repair method
When position does not match between the land and land window:	
The land window is not positioned appropriately.	Refer to Appendix 7.2.
The land window in the vicinity of the applicable component is not positioned appropriately.	Refer to Appendix 7.2.
The fiducial correction is not appropriate.	Refer to Appendix 7.1.
The position correction color is not appropriate.	Refer to Appendix 7.2.

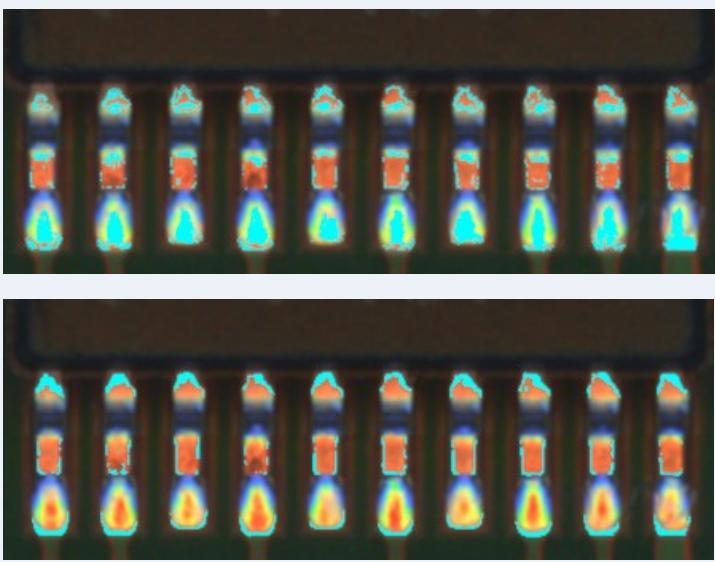
The fillet excluded color is not set appropriately.	<p>1) Move to the “Criteria Setting” tab. 2) Select “Inspection Criteria” - “Solder Top Center (Solder Tip Both Ends)”, and click the [Model Editing] button. 3) Edit characteristic parameters using the color table editing tool so that metal portion of the land (such as copper foil) is extracted.</p> 
The inspection criteria are not set appropriately.	Refer to “2.8.5 Modifying Inspection Criteria”.

**Inspection item 2. Fillet - Connection wetting angle (electrode wetting)**

Based on the solder color detected in the land window, inspect if the electrode is wet with solder. If false call or overlooking still remains in the inspection result, it is displayed as wetting error (electrode end side).

The inspection result image, cause, and repair method of wetting error (electrode end side) are as follows:

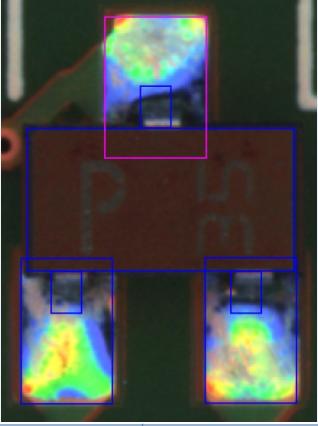
Inspection result	Image
Wetting error (electrode end side)	
Cause	Confirmation/repair method
When position does not match between the actual component (electrode) and extracted component (electrode) :	
The component is not extracted in an appropriate position.	Refer to Appendix 7.2.
The electrode tip is not extracted in an appropriate position.	Refer to Appendix 7.7.
The electrode side is not extracted in an appropriate position.	Refer to Appendix 7.6.
The electrode window is not sized appropriately.	Refer to Appendix 7.5.

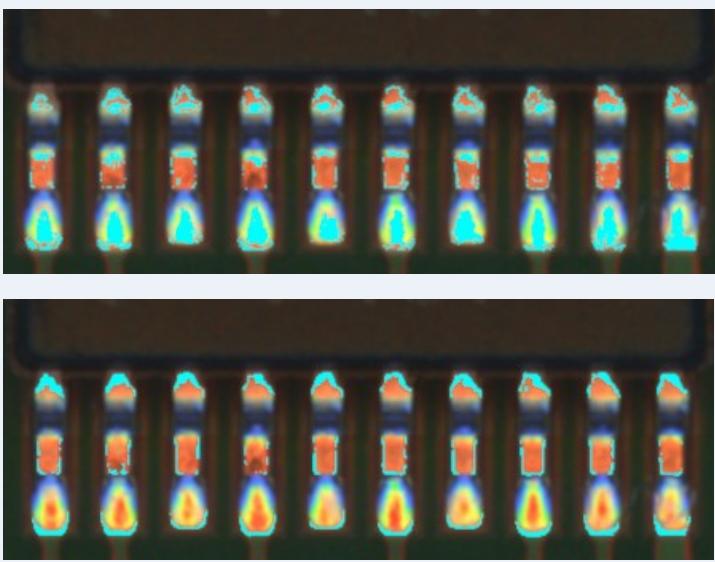
The fillet excluded color is not set appropriately.	<ol style="list-style-type: none"><li>1) Move to the “Criteria Setting” tab.</li><li>2) Select “Inspection Criteria” - “End Center (End Both Ends)”, and click the [Model Editing] button.</li><li>3) Edit characteristic parameters using the color table editing tool so that metal portion of the land (such as copper foil) is extracted.</li></ol> 
The inspection criteria are not set appropriately.	Refer to “2.8.5 Modifying Inspection Criteria”.

### Inspection item 3. Fillet - Fillet height

Based on the solder color detected in the land window, inspect if the fillet height is sufficient. If false call or overlooking still remains in the inspection result, "Fillet low" is displayed.

The inspection result image, cause, and repair method of fillet low are as follows:

Inspection result	Component image (PCB test)
Fillet low	
Cause	Confirmation/repair method
When position does not match between the actual land and extracted land:	
The land window is not positioned appropriately.	Refer to Appendix 7.2.
The land window of the peripheral components of the applicable component is not positioned appropriately.	Refer to Appendix 7.2.
The fiducial correction is not appropriate.	Refer to Appendix 7.1.
The position correction color is not appropriate.	Refer to Appendix 7.2.
When position does not match between the actual component (electrode) and extracted component (electrode) :	
The component is not extracted in an appropriate position.	Refer to Appendix 7.5.
The electrode tip is not extracted in an appropriate position.	Refer to Appendix 7.7.
The electrode side is not extracted in an appropriate position.	Refer to Appendix 7.6.
The electrode window is not sized appropriately.	Refer to Appendix 7.5.
The electrode height is not set appropriately.	
The electrode height is not set appropriately.	Refer to Appendix 8.3.

The fillet excluded color is not set appropriately.	<ol style="list-style-type: none"><li>1) Move to the “Criteria Setting” tab.</li><li>2) Select “Inspection Criteria” - “Connection Area Height (Maximum Height)”, and click the [Model Editing] button.</li><li>3) Edit characteristic parameters using the color table editing tool so that metal portion of the land (such as copper foil) is extracted.</li></ol> 
The inspection criteria are not set appropriately.	Refer to “2.8.5 Modifying Inspection Criteria”.

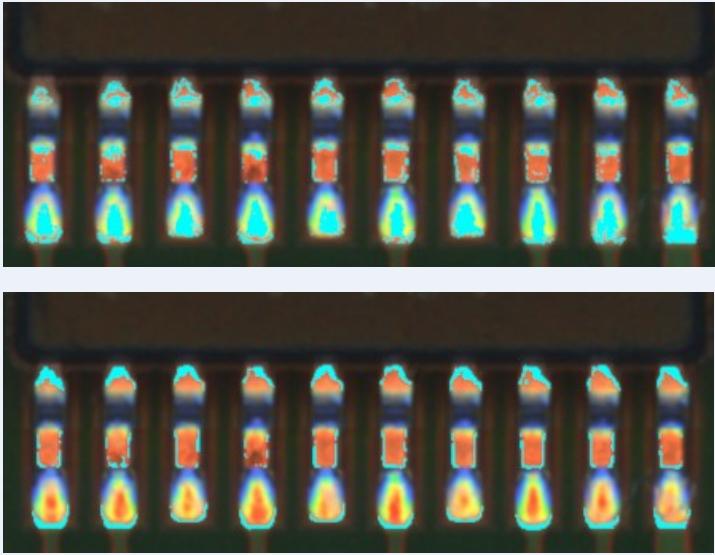
**Inspection item 4. Fillet - Fillet length**

Based on the solder color detected in the land window, inspect if the fillet length to the land length is sufficient.

If false call or overlooking still remains in the inspection result, "Fillet short" is displayed.

The inspection result image, cause, and repair method of fillet short are as follows:

Inspection result	Component image (PCB test)
Fillet short	
Cause	
When position does not match between the actual land and extracted land:	
The land window is not positioned appropriately.	Refer to Appendix 7.2.
The land window of the peripheral components of the applicable component is not positioned appropriately.	Refer to Appendix 7.2.
The fiducial correction is not appropriate.	Refer to Appendix 7.1.
The position correction color is not appropriate.	Refer to Appendix 7.2.
When position does not match between the actual component (electrode) and extracted component (electrode) :	
The component extraction is not positioned appropriately.	Refer to Appendix 7.5.
The electrode tip extraction is not positioned appropriately.	Refer to Appendix 7.7.
The electrode window size is not appropriate.	Refer to Appendix 7.5.

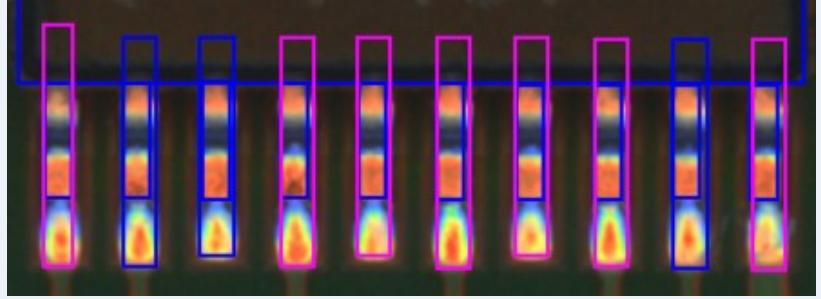
The fillet excluded color is not set appropriately.	<ol style="list-style-type: none"><li>1) Move to the “Criteria Setting” tab.</li><li>2) Select “Inspection Criteria” - “Fillet Length”, and click the [Model Editing] button.</li><li>3) Edit characteristic parameters using the color table editing tool so that metal portion of the land (such as copper foil) is extracted.</li></ol> 
The inspection criteria are not set appropriately.	Refer to “2.8.5 Modifying Inspection Criteria”..

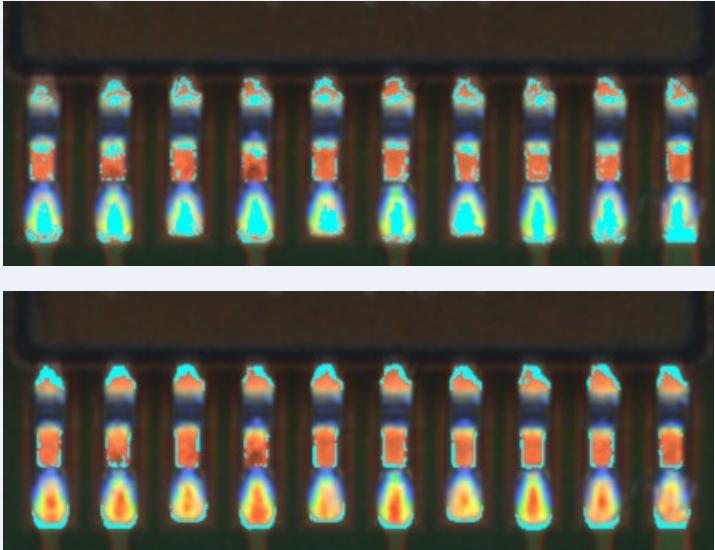
### Inspection item 5. Fillet - End connection width

Based on the solder color detected in the land window, inspect if the fillet connection length to the electrode end is sufficient.

If false call or overlooking still remains in the inspection result, "End connection width short" is displayed.

The inspection result image, cause, and repair method of end connection width short are as follows:

Inspection result	Component image (PCB test)
End connection width short	
Cause	Confirmation/repair method
When position does not match between the actual land and extracted land:	
The land window is not positioned appropriately.	Refer to Appendix 7.2.
The land window of the peripheral components of the applicable component is not positioned appropriately.	Refer to Appendix 7.2.
The fiducial correction is not appropriate.	Refer to Appendix 7.1.
The position correction color is not appropriate.	Refer to Appendix 7.2.
When position does not match between the actual component (electrode) and extracted component (electrode) :	
The component extraction is not positioned appropriately.	Refer to Appendix 7.5.
The electrode tip extraction is not positioned appropriately.	Refer to Appendix 7.7.
The electrode side is not extracted in an appropriate position.	Refer to Appendix 7.6.
The electrode window is not sized appropriately.	Refer to Appendix 7.5.
The electrode height is not set appropriately.	Refer to Appendix 8.3.

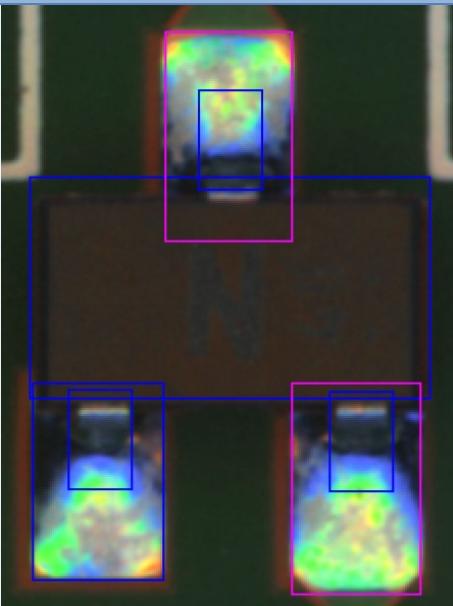
The fillet excluded color is not set appropriately.	<ol style="list-style-type: none"><li>1) Move to the “Criteria Setting” tab.</li><li>2) Select “Inspection Criteria” - “Connection Area Height (Maximum Height)”, and click the [Model Editing] button.</li><li>3) Edit characteristic parameters using the color table editing tool so that metal portion of the land (such as copper foil) is extracted.</li></ol> 
The inspection criteria are not set appropriately.	Refer to “2.8.5 Modifying Inspection Criteria”.

#### Inspection item 6. Fillet - Side connection length

Based on the solder color detected in the land window, inspect if the fillet connection length to the electrode side is sufficient.

If false call or overlooking still remains in the inspection result, "Side connection width short" is displayed.

The inspection result image, cause, and repair method of side connection width short are as follows:

Inspection result	Component image (PCB test)	
Side connection width short		
Cause	Confirmation/repair method	
When position does not match between the actual land (electrode) and extracted land (electrode) :		
The component extraction is not positioned appropriately.	Refer to Appendix 7.5.	
The electrode tip extraction is not positioned appropriately.	Refer to Appendix 7.7.	
The electrode side extraction is not positioned appropriately.	Refer to Appendix 7.6.	
The electrode window size is not appropriate.	Refer to Appendix 7.5.	
The electrode height is not set appropriately.		Refer to Appendix 8.3.
The inspection criteria are not set appropriately.		Refer to "2.8.5 Modifying Inspection Criteria".

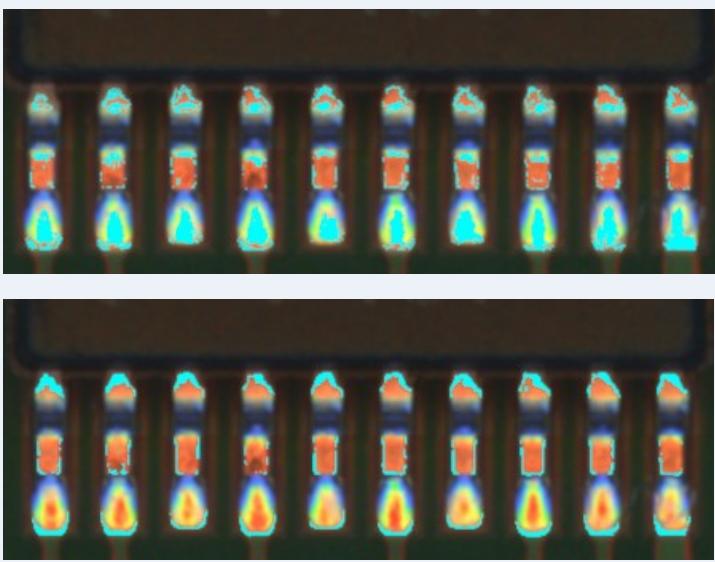
### **Inspection item 7. Land exposure**

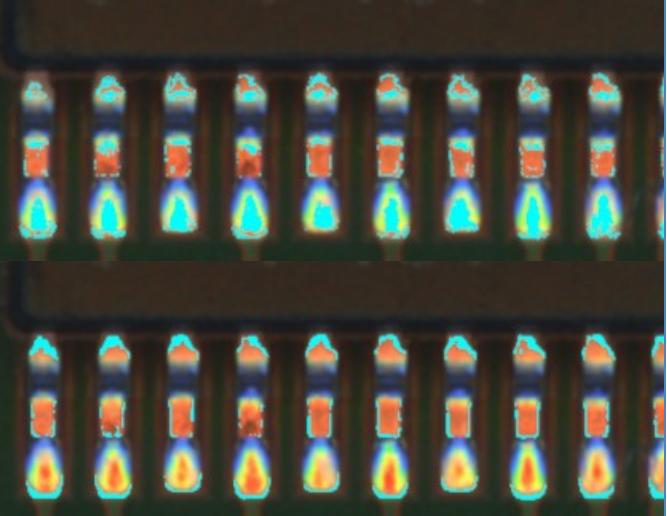
Based on the land color detected in the land window, inspect if land is being exposed.

If false call or overlooking still remains in the inspection result, "Land exposure" is displayed.

The inspection result image, cause, and repair method of land exposure are as follows:

Inspection result	Component image (PCB test)
Land exposure	
Cause	
When position does not match between the actual land and extracted land:	
The land window is not positioned appropriately.	Refer to Appendix 7.2.
The land window of the peripheral components of the applicable component is not positioned appropriately.	Refer to Appendix 7.2.
The fiducial correction is not appropriate.	Refer to Appendix 7.1.
The position correction color is not appropriate.	Refer to Appendix 7.2.
When position does not match between the actual component (electrode) and extracted component (electrode) :	
The component is not extracted in an appropriate position.	Refer to Appendix 7.5.
The electrode tip is not extracted in an appropriate position.	Refer to Appendix 7.7.
The electrode side is not extracted in an appropriate position.	Refer to Appendix 7.6.
The electrode window is not sized appropriately.	Refer to Appendix 7.5.

Characteristic parameters are not set appropriately.	<ol style="list-style-type: none"><li>1) Move to the “Criteria Setting” tab.</li><li>2) Select “Inspection Criteria” - “Land Exposure”, and click the [Model Editing] button.</li><li>3) Edit characteristic parameters using the color table editing tool so that metal portion of the land (such as copper foil) is extracted.</li></ol> 
The inspection criteria are not set appropriately.	Refer to “2.8.5 Modifying Inspection Criteria”.

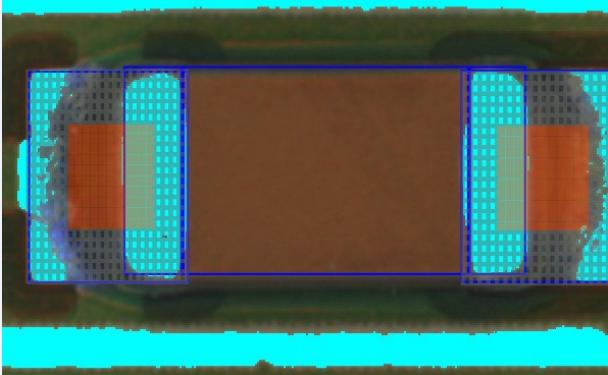
Inspection result	Component image (PCB test)
Normal (land exposure overlooked)	(*Image to be pasted)
Cause	Confirmation/repair method
When position does not match between the actual land and extracted land:	
The land window is not positioned appropriately.	Refer to Appendix 7.2.
The land window of the peripheral components of the applicable component is not positioned appropriately.	Refer to Appendix 7.2.
The fiducial correction is not appropriate.	Refer to Appendix 7.1.
The position correction color is not appropriate.	Refer to Appendix 7.2.
When position does not match between the actual component (electrode) and extracted component (electrode) :	
The component extraction is not positioned appropriately.	Refer to Appendix 7.5.
The electrode tip extraction is not positioned appropriately.	Refer to Appendix 7.7.
The electrode side is not extracted in an appropriate position.	Refer to Appendix 7.6.
The electrode window is not sized appropriately.	Refer to Appendix 7.5.
The land exposure color is not set appropriately.	<p>1) Move to the “Criteria Setting” tab.  2) Select “Inspection Criteria” - “Land Exposure”, and click the [Model Editing] button (*Image to be pasted).  3) Edit characteristic parameters using the color table editing tool so that metal portion of the land (such as copper foil) is extracted.</p> 
The inspection criteria are not set appropriately.	Refer to “2.8.5 Modifying Inspection Criteria”.

**Inspection item 8. Land error**

Based on the color which was detected in the land window and does not appear in normal cases, inspect if there is an error on the land.

If false call or overlooking still remains in the inspection result, "Land error" is displayed.

The inspection result image, cause, and repair method of land error are as follows:

Inspection result	Component image (PCB test)
Land error	
Cause	Confirmation/repair method
When position does not match between the actual land and extracted land:	
The land window is not positioned appropriately.	Refer to Appendix 7.2.
The land window of the peripheral components of the applicable component is not positioned appropriately.	Refer to Appendix 7.2.
The fiducial correction is not appropriate.	Refer to Appendix 7.1.
The position correction color is not appropriate.	Refer to Appendix 7.2.
When position does not match between the actual component (electrode) and extracted component (electrode) :	
The component extraction is not positioned appropriately.	Refer to Appendix 7.5.
The electrode tip extraction is not positioned appropriately.	Refer to Appendix 7.7.
The electrode side is not extracted in an appropriate position.	Refer to Appendix 7.6.
The electrode window is not sized appropriately.	Refer to Appendix 7.5.
The inspection area of land error is not appropriate.	<ol style="list-style-type: none"> <li>Move to the "Criteria Setting" tab.</li> <li>Select "Inspection Criteria" - "Land Exposure", and click the [Model Editing] button (*Image to be pasted).</li> <li>Edit characteristic parameters using the color table editing tool so that metal portion of the land (such as copper foil) is extracted.</li> </ol> 
The inspection criteria are not set appropriately.	Refer to "2.8.5 Modifying Inspection Criteria".

Inspection result	Component image (PCB test)
Normal (land error overlooked)	
Cause	Confirmation/repair method
When position does not match between the actual land and extracted land:	
The land window is not positioned appropriately.	Refer to Appendix 7.2.
The land window of the peripheral components of the applicable component is not positioned appropriately.	Refer to Appendix 7.2.
The fiducial correction is not appropriate.	Refer to Appendix 7.1.
The position correction color is not appropriate.	Refer to Appendix 7.2.
When position does not match between the actual component (electrode) and extracted component (electrode) :	
The component extraction is not positioned appropriately.	Refer to Appendix 7.5.
The electrode tip extraction is not positioned appropriately.	Refer to Appendix 7.7.
The electrode side is not extracted in an appropriate position.	Refer to Appendix 7.6.
The electrode window is not sized appropriately.	Refer to Appendix 7.5.
The inspection area of land error is not appropriate.	<ol style="list-style-type: none"> <li>1) Move to the "Criteria Setting" tab.</li> <li>2) Select "Inspection Criteria" - "Land Exposure", and click the [Model Editing] button (*Image to be pasted).</li> <li>3) Select the fault component, click the * button, and select the area in which the characteristic of the fault appears large.</li> <li>4) Click the * button, and select the area in which the characteristic of the fault does not appear (*Image to be pasted).</li> </ol>
The land error color is not set appropriately.	<ol style="list-style-type: none"> <li>1) Move to the "Criteria Setting" tab.</li> <li>2) Select "Inspection Criteria" - "Land Exposure", and click the [Model Editing] button (*Image to be pasted).</li> <li>3) Select the fault component and edit characteristic parameters using the color table editing tool so that the color of the fault is extracted (*Image to be pasted).</li> </ol>
The inspection criteria are not set appropriately.	Refer to "2.8.5 Modifying Inspection Criteria".

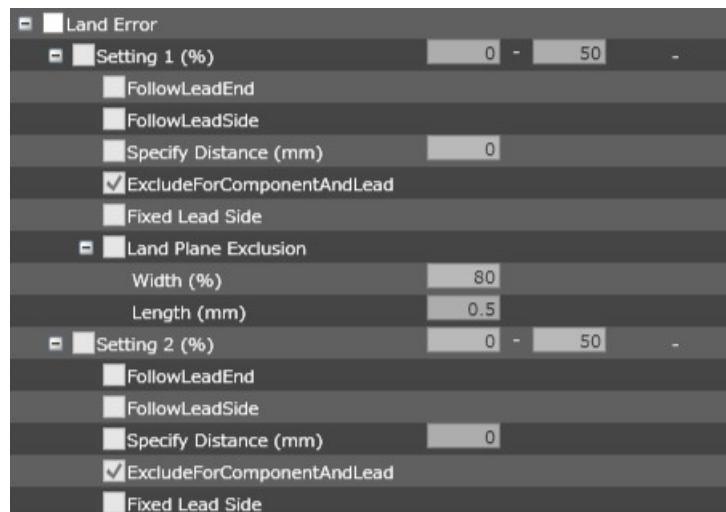
The details of the procedure for land error adjustment are as follows:

 For details of land error, refer to P5-17 section 5.10 “Land Error” of the inspection logic manual.

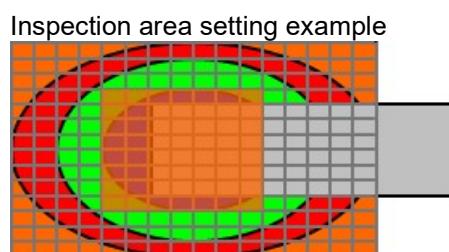
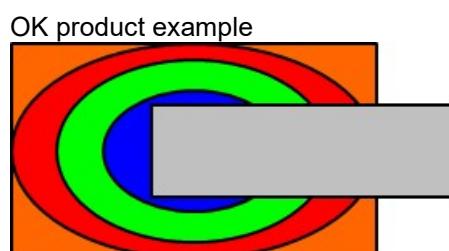
This section hereafter describes the adjustment procedure for false call minimization.

Operation procedure

1. Check the land error checkbox.
2. Select the check boxes of various functions as necessary..



3. Set the inspection area on the area where the characteristic of OK product appears.

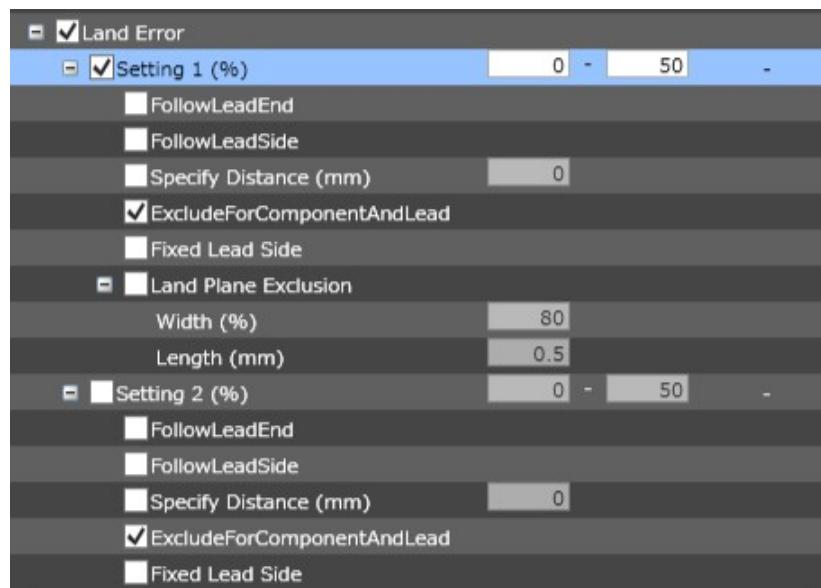


4. Add characteristic quantity of the area other than the inspection area using the pen tool .
- Exclude the characteristic quantity of the inspection area using the eraser tool .
5. Change the judgment criteria of land error so that false call is minimized.

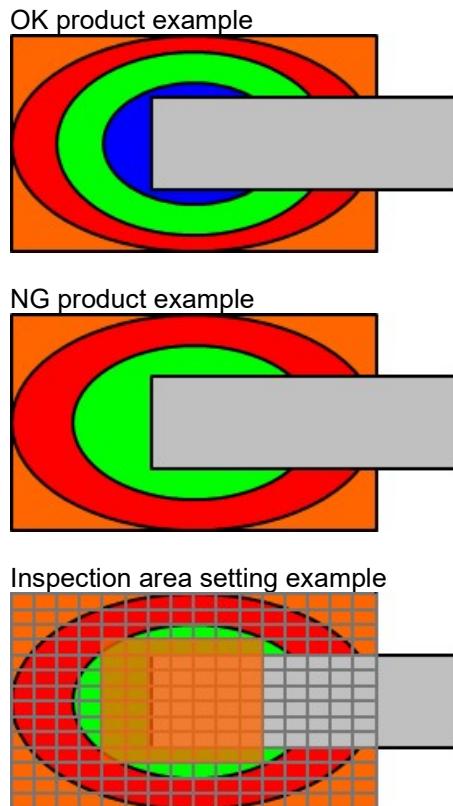
This section hereafter describes the adjustment procedure to eliminate overlooking.

#### Operation procedure

1. Check the land error inspection checkbox.



2. Set the inspection area where the characteristic of the NG product appears.



3. Add characteristic quantity of the inspection area of the NG product using the pen tool .

Exclude the characteristic quantity of the inspection area using the eraser tool .

4. Change the judgment criteria of land error so that overlooking is minimized.

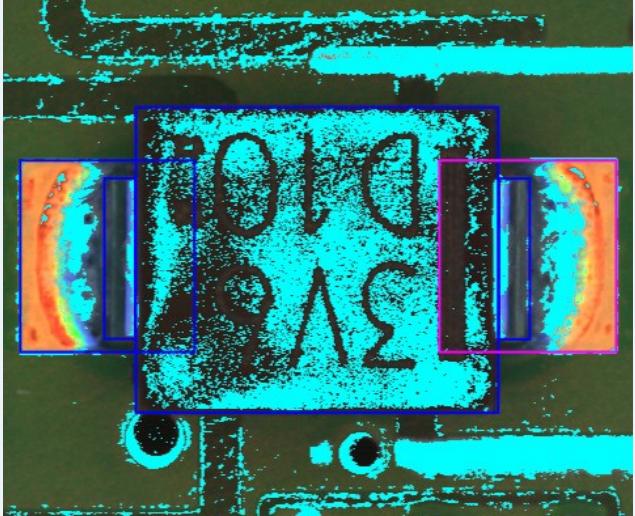
**Inspection item 9. Foreign object (land)**

Based on the foreign object color detected in the land window, inspect if any foreign objects are in the land.

If false call or overlooking still remains in the inspection result, "Foreign object (land)" is displayed.

The inspection result image, cause, and repair method of foreign object (land) are as follows:

Inspection result	Component image (PCB test)
Foreign object (land)	(*Image to be pasted)
Cause	Confirmation/repair method
When position does not match between the actual land and extracted land:	
The land window is not positioned appropriately.	Refer to Appendix 7.2.
The land window of the peripheral components of the applicable component is not positioned appropriately.	Refer to Appendix 7.2.
The fiducial correction is not appropriate.	Refer to Appendix 7.1.
The position correction color is not appropriate.	Refer to Appendix 7.2.
When position does not match between the actual component (electrode) and extracted component (electrode) :	
The component is not extracted in an appropriate position.	Refer to Appendix 7.5.
The electrode tip is not extracted in an appropriate position.	Refer to Appendix 7.7.
The electrode side is not extracted in an appropriate position.	Refer to Appendix 7.6.
The electrode window is not sized appropriately.	Refer to Appendix 7.5.

Characteristic parameters are not set appropriately.	<ol style="list-style-type: none"><li>1) Move to the “Criteria Setting” tab.</li><li>2) Select “Inspection Criteria” - “Foreign Object (Land)”, and click the [Model Editing] button.</li><li>3) Confirm if solder color is set as “land foreign object color.”</li></ol>  <ol style="list-style-type: none"><li>4) If solder color is set as “land foreign object color,” exclude solder color using the color table editing tool. (*Image to be pasted)</li></ol>
The inspection criteria are not set appropriately.	Refer to “2.8.5 Modifying Inspection Criteria”.

# Appendix 10. PCB Test Result Output Format

## 1. Overview

The PCB test result output function is used when all the measured values of the target component are output to analyze the inspection result and those measured values or when saving all the measured values of the PCB test result.

The inspection result of the PCB test is output in the following format on a component basis or on a pin basis.



For the method to output the PCB test result, refer to Section 2.8.3 "Saving Inspection Result."

## 2. Output list of board test results

Items that inspection result is outputted for each component have O, and the other ones X.

Column	Item	Description	Output of result for each component
1	BoardId	PCB ID	O
2	InspectionResultNo	No.	O
3	CircuitId	Circuit ID	O
4	ComponentNumberGroupName	Group name of component	X
5	ComponentNumberGroupId	Group ID of component	X
6	ComponentNumberName	Name of component No.	O
7	ComponentType	Type of component	O
8	ComponentResult	Inspection result of component	O
9	ComponentBlockUnitName	Component block unit name	O
10	ElectrodeGroupId	Electrode group ID	X
11	ElectrodeType	Electrode type	X
12	PinNumber	Pin No. of electrode	X
13	QualityIdentificationStatus	Component number quality level	O
14	IsExpansion	Existence of Expansion	O
15	ComponentWidthOrElectrodeLength	Component window's width/Electrode length [um]	O
16	ComponentHeightOrElectrodeWidth	Component window's height/Electrode width [um]	O
17	AngleFromComponent	Angle viewed from component [deg]	O
18	AngleFromBoard	Angle viewed from PCB [deg]	O
19	DeltaXorLength	$\Delta X/Length$ [um]. This means shift in the X-direction on the PCB in the case of component window, and variation of length in the case of electrode window, respectively.	O
20	DeltaYorSide	$\Delta Y/Side$ [um]. This means shift in the Y-direction on the PCB in the case of component window, and side shift in the case of electrode window, respectively.	O
21	DeltaAngleDegree	$\Delta Angle$ [deg]	O
22	VisualResultType	Result of visual inspection	O
23	ElectrodeLandResult	Inspection result of electrode and land	O

For the 24th column and after, the reference setting, measured value (Value) , judgment result (Result) , upper limit (UpperLimit) , lower limit (LowerLimit) , and judgment method (LogicMethodType) of each inspection item are output.

The output of Result is 0, 1, and a fault code, which mean OK judgment, not applicable to the inspection, and NG, respectively.The output item of the setting and description of it are shown on and after the following page.

**3. Display name list**

Item	Item name output by multilanguage support
ComponentPresenceUpperLimit	Component inspection/missing component/matching rate (%) upper limit
ComponentPresenceValue	Component inspection/missing component/matching rate (%) measured value
ComponentPresenceResult	Component inspection/missing component/matching rate (%) inspection result
ComponentPresenceVolumeRateLowerLimit	Component inspection/missing component/volume rate (%) lower limit
ComponentPresenceVolumeRateValue	Component inspection/missing component/volume rate (%) measured value
ComponentPresenceVolumeRateResult	Component inspection/missing component/volume rate (%) inspection result
RightComponentLogicMethodType	Component inspection/wrong component/matching rate (%) judgment method
RightComponentLowerLimit	Component inspection/wrong component/matching rate (%) lower limit
RightComponentValue	Component inspection/wrong component/matching rate (%) measured value
RightComponentResult	Component inspection/wrong component/matching rate (%) inspection result
ComponentPolarityLogicMethodType	Component inspection/wrong polarity/matching rate (%) judgment method
ComponentPolarityLowerLimit	Component inspection/wrong polarity/matching rate (%) lower limit
ComponentPolarityValue	Component inspection/wrong polarity/matching rate (%) measured value
ComponentPolarityResult	Component inspection/wrong polarity/matching rate (%) inspection result
ComponentPolarityHeightLowerLimit	Component inspection/wrong polarity - height (mm) lower limit
ComponentPolarityHeightUpperLimit	Component inspection/wrong polarity - height (mm) upper limit
ComponentPolarityHeightValue	Component inspection/wrong polarity - height (mm) measured value
ComponentPolarityHeightResult	Component inspection/wrong polarity - height (mm) inspection result
FlippedComponentUpperLimit	Component inspection/top-bottom inversion/matching rate (%) upper limit
FlippedComponentValue	Component inspection/top-bottom inversion/matching rate (%) measured value
FlippedComponentResult	Component inspection/top-bottom inversion/matching rate (%) inspection result
OffsetXUpperLimit	Component inspection/component shift/X-shift (PCB) [absolute value] (mm) upper limit
OffsetXValue	Component inspection/component shift/X-shift (PCB) [absolute value] (mm) measured value
OffsetXSignedValue	Component inspection/component shift/X-shift (PCB) [absolute value] (mm) measured value (signed)
OffsetXResult	Component inspection/component shift/X-shift (PCB) [absolute value] (mm) inspection result
OffsetYUpperLimit	Component inspection/component shift/Y-shift (PCB) [absolute value] (mm) upper limit
OffsetYValue	Component inspection/component shift/Y-shift (PCB) [absolute value] (mm) measured value
OffsetYSignedValue	Component inspection/component shift/Y-shift (PCB) [absolute value] (mm) measured value (signed)

OffsetYResult	Component inspection/component shift/Y-shift (PCB) [absolute value] (mm) inspection result
ComponentSkewUpperLimit	Component inspection/component shift/angle shift [absolute value] (°) upper limit
ComponentSkewValue	Component inspection/component shift/angle shift [absolute value] (°) measured value
ComponentSkewSignedValue	Component inspection/component shift/angle shift [absolute value] (°) measured value (signed)
ComponentSkewResult	Component inspection/component shift/angle shift [absolute value] (°) inspection result
OffsetXComponentUpperLimit	Upper limit of component inspection/component shift/X-shift (component) [absolute value] (mm)
OffsetXComponentValue	Component inspection/component shift/X-shift (component) [absolute value] (mm) measured value
OffsetXComponentSignedValue	Component inspection/component shift/X-shift (component) [absolute value] (mm) measured value (signed)
OffsetXComponentResult	Component inspection/component shift/X-shift (component) [absolute value] (mm) inspection result
OffsetYComponentUpperLimit	Component inspection/component shift/Y-shift (component) [absolute value] (mm) upper limit
OffsetYComponentValue	Component inspection/component shift/Y-shift (component) [absolute value] (mm) measured value
OffsetYComponentSignedValue	Component inspection/component shift/Y-shift (component) [absolute value] (mm) measured value (signed)
OffsetYComponentResult	Component inspection/component shift/Y-shift (component) [absolute value] (mm) inspection result
Distance1UpperLimit	Component inspection/distance inspection/distance 1 (mm) upper limit
Distance1Value	Component inspection/distance inspection/distance 1 (mm) measured value
Distance1Result	Component inspection/distance inspection/distance 1 (mm) inspection result
Distance2UpperLimit	Component inspection/distance inspection/distance 2 (mm) upper limit
Distance2Value	Component inspection/distance inspection/distance 2 (mm) measured value
Distance2Result	Component inspection/distance inspection/distance 2 (mm) inspection result
DistanceAUpperLimit	Component inspection/distance inspection/distance A (mm) upper limit
DistanceAValue	Component inspection/distance inspection/distance A (mm) measured value
DistanceAResult	Component inspection/distance inspection/distance A (mm) inspection result
DistanceBUpperLimit	Component inspection/distance inspection/distance B (mm) upper limit
DistanceBValue	Component inspection/distance inspection/distance B (mm) measured value
DistanceBResult	Component inspection/distance inspection/distance B (mm) inspection result
DistanceAngleUpperLimit	Component inspection/distance inspection/angle (°) upper limit
DistanceAngleValue	Component inspection/distance inspection/angle (°) measured value
DistanceAngleResult	Component inspection/distance inspection/angle (°) inspection result
ComponentHeightLowerLimit	Component inspection/component height (mm) lower limit
ComponentHeightUpperLimit	Component inspection/component height (mm) upper limit
ComponentHeightValue	Component inspection/component height (mm) measured value

ComponentHeightResult	Component inspection/component height (mm) inspection result
Inclination0HeightUpperLimit	Component inspection/component lifting/tilt (0-180°)/height [absolute value] (mm) upper limit
Inclination0HeightValue	Component inspection/component lifting/tilt (0-180°)/height [absolute value] (mm) measured value
Inclination0HeightSignedValue	Component inspection/component lifting/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
Inclination0HeightResult	Component inspection/component lifting/tilt (0-180°)/height [absolute value] (mm) inspection result
Inclination0AngleUpperLimit	Component inspection/component lifting/tilt (0-180°)/angle [absolute value] (°) upper limit
Inclination0AngleValue	Component inspection/component lifting/tilt (0-180°)/angle [absolute value] (°) measured value
Inclination0AngleSignedValue	Component inspection/component lifting/tilt (0-180°)/angle [absolute value] (°) measured value (signed)
Inclination0AngleResult	Component inspection/component lifting/tilt (0-180°)/angle [absolute value] (°) inspection result
Inclination90HeightUpperLimit	Component inspection/component lifting/tilt (90-270°)/height [absolute value] (mm) upper limit
Inclination90HeightValue	Component inspection/component lifting/tilt (90-270°)/height [absolute value] (mm) measured value
Inclination90HeightSignedValue	Component inspection/component lifting/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
Inclination90HeightResult	Component inspection/component lifting/tilt (90-270°)/height [absolute value] (mm) inspection result
Inclination90AngleUpperLimit	Component inspection/component lifting/tilt (90-270°)/angle [absolute value] (°) upper limit
Inclination90AngleValue	Component inspection/component lifting/tilt (90-270°)/angle [absolute value] (°) measured value
Inclination90AngleSignedValue	Component inspection/component lifting/tilt (90-270°)/angle [absolute value] (°) measured value (signed)
Inclination90AngleResult	Component inspection/component lifting/tilt (90-270°)/angle [absolute value] (°) inspection result
LiftAverageHeightUpperLimit	Component inspection/component lifting/lifting (average height) (mm) upper limit
LiftAverageHeightValue	Component inspection/component lifting/lifting (average height) (mm) measured value
LiftAverageHeightResult	Component inspection/component lifting/lifting (average height) (mm) inspection result
OcrString1	OCR/string 1
OcrString2	OCR/string 2
OcrString3	OCR/string 3
OcrResultValue	OCR measured value
OcrResult	OCR inspection result
ComponentCode2DResult	2D code (component) inspection result
ComponentCode2DValue	2D code (component) measured value
SolderBallDiameterLogicMethodType	Solder ball/diameter (mm) judgment method
SolderBallDiameterUpperLimit	Solder ball/diameter (mm) upper limit
SolderBallDiameterValue	Solder ball/diameter (mm) measured value
SolderBallDiameterResult	Solder ball/diameter (mm) inspection result
SolderBallRateUpperLimit	Solder ball/rate (%) upper limit
SolderBallRateValue	Solder ball/rate (%) measured value
SolderBallRateResult	Solder ball/rate (%) inspection result
SolderBallAreaRateUpperLimit	Solder ball/area rate (%) upper limit
SolderBallAreaRateValue	Solder ball/area rate (%) measured value
SolderBallAreaRateResult	Solder ball/area rate (%) inspection result
BridgeWidthUpperLimit	Solder bridge/width (mm) upper limit
BridgeWidthValue	Solder bridge/width (mm) measured value
BridgeWidthResult	Solder bridge/width (mm) inspection result

LengthDiameterRatioLowerLimit	Foreign material/diameter ratio (%) lower limit
LengthDiameterRatioUpperLimit	Foreign material/diameter ratio (%) upper limit
LengthDiameterRatioValue	Foreign material/diameter ratio (%) measured value
LengthDiameterRatioResult	Foreign material/diameter ratio (%) inspection result
ForeignMaterialAreaUpperLimit	Foreign material/area (mm <sup>2</sup> ) upper limit
ForeignMaterialAreaValue	Foreign material/area (mm <sup>2</sup> ) measured value
ForeignMaterialAreaResult	Foreign material/area (mm <sup>2</sup> ) inspection result
ObliqueSolderBallDiameterLogicMethodType	Solder ball (oblique)/diameter (mm) judgment method
ObliqueSolderBallDiameterUpperLimit	Solder ball (oblique)/diameter (mm) upper limit
ObliqueSolderBallDiameterValue	Solder ball (oblique)/diameter (mm) measured value
ObliqueSolderBallDiameterResult	Solder ball (oblique)/diameter (mm) inspection result
ObliqueSolderBallRateUpperLimit	Solder ball (oblique)/rate (%) upper limit
ObliqueSolderBallRateValue	Solder ball (oblique)/rate (%) measured value
ObliqueSolderBallRateResult	Solder ball (oblique)/rate (%) inspection result
ObliqueSolderBallAreaRateUpperLimit	Solder ball (oblique)/area rate (%) upper limit
ObliqueSolderBallAreaRateValue	Solder ball (oblique)/area rate (%) measured value
ObliqueSolderBallAreaRateResult	Solder ball (oblique)/area rate (%) inspection result
ObliqueBridgeWidthUpperLimit	Solder bridge (oblique)/width (mm) upper limit
ObliqueBridgeWidthValue	Solder bridge (oblique)/width (mm) measured value
ObliqueBridgeWidthResult	Solder bridge (oblique)/width (mm) inspection result
LandWettingCenterLowerLimit	Fillet inspection/connection wetting angle/land wetting/solder tip center (°) lower limit
LandWettingCenterUpperLimit	Fillet inspection/connection wetting angle/land wetting/solder tip center (°) upper limit
LandWettingCenterValue	Fillet inspection/connection wetting angle/land wetting/solder tip center (°) measured value
LandWettingCenterResult	Fillet inspection/connection wetting angle/land wetting/solder tip center (°) inspection result
LandWettingBothEndsLowerLimit	Fillet inspection/connection wetting angle/land wetting/solder tip both ends (°) lower limit
LandWettingBothEndsUpperLimit	Fillet inspection/connection wetting angle/land wetting/solder tip both ends (°) upper limit
LandWettingBothEndsValue	Fillet inspection/connection wetting angle/land wetting/solder tip both ends (°) measured value
LandWettingBothEndsResult	Fillet inspection/connection wetting angle/land wetting/solder tip both ends (°) inspection result
ComponentWettingCenterOfToeUpperLimit	Fillet inspection/connection wetting angle/lead wetting/toe center (°) upper limit
ComponentWettingCenterOfToeValue	Fillet inspection/connection wetting angle/lead wetting/toe center (°) measured value
ComponentWettingCenterOfToeResult	Fillet inspection/connection wetting angle/lead wetting/toe center (°) inspection result
ComponentWettingBothEndsOfToeUpperLimit	Fillet inspection/connection wetting angle/lead wetting/toe both ends (°) upper limit
ComponentWettingBothEndsOfToeValue	Fillet inspection/connection wetting angle/lead wetting/toe both ends (°) measured value
ComponentWettingBothEndsOfToeResult	Fillet inspection/connection wetting angle/lead wetting/toe both ends (°) inspection result
ComponentWettingCenterOfSideUpperLimit	Fillet inspection/connection wetting angle/lead wetting/side center (°) upper limit
ComponentWettingCenterOfSideValue	Fillet inspection/connection wetting angle/lead wetting/side center (°) measured value
ComponentWettingCenterOfSideResult	Fillet inspection/connection wetting angle/lead wetting/side center (°) inspection result
ComponentWettingBothEndsOfSideUpperLimit	Fillet inspection/connection wetting angle/lead wetting/side both ends (°) upper limit
ComponentWettingBothEndsOfSideValue	Fillet inspection/connection wetting angle/lead wetting/side both ends (°) measured value
ComponentWettingBothEndsOfSideResult	Fillet inspection/connection wetting angle/lead wetting/side both ends (°) inspection result

FilletJointHeightLowerLimit	Fillet inspection/fillet height/joint height (%) lower limit
FilletJointHeightUpperLimit	Fillet inspection/fillet height/joint height (%) upper limit
FilletJointHeightValue	Fillet inspection/fillet height/joint height (%) measured value
FilletJointHeightActualValue	Fillet inspection/fillet height/joint height (%) measured value
FilletJointHeightResult	Fillet inspection/fillet height/joint height (%) inspection result
FilletMaxHeightLowerLimit	Fillet inspection/fillet height/maximum height (%) lower limit
FilletMaxHeightUpperLimit	Fillet inspection/fillet height/maximum height (%) upper limit
FilletMaxHeightValue	Fillet inspection/fillet height/maximum height (%) measured value
FilletMaxHeightActualValue	Fillet inspection/fillet height/maximum height (%) measured value
FilletMaxHeightResult	Fillet inspection/fillet height/maximum height (%) inspection result
HeightRatioLowerLimit	Fillet inspection/fillet height/height specified part/height (%) lower limit
HeightRatioUpperLimit	Fillet inspection/fillet height/height specified part/height (%) upper limit
HeightRatioValue	Fillet inspection/fillet height/height specified part/height (%) measured value
HeightRatioResult	Fillet inspection/fillet height/height specified part/height (%) inspection result
HeightMillimetersLowerLimit	Fillet inspection/fillet height/height specified part/height (mm) lower limit
HeightMillimetersUpperLimit	Fillet inspection/fillet height/height specified part/height (mm) upper limit
HeightMillimetersValue	Fillet inspection/fillet height/height specified part/height (mm) measured value
HeightMillimetersResult	Fillet inspection/fillet height/height specified part/height (mm) inspection result
FilletLengthLowerLimit	Fillet inspection/fillet length (%) lower limit
FilletLengthValue	Fillet inspection/fillet length (%) measured value
FilletLengthActualValue	Fillet inspection/fillet length (%) measured value
FilletLengthResult	Fillet inspection/fillet length (%) inspection result
EndJointWidthLowerLimit	Fillet inspection/fillet joint width/end joint width (%) lower limit
EndJointWidthValue	Fillet inspection/fillet joint width/end joint width (%) measured value
EndJointWidthResult	Fillet inspection/fillet joint width/end joint width (%) inspection result
SideJointLengthLowerLimit	Fillet inspection/fillet joint width/side joint length (%) lower limit
SideJointLengthValue	Fillet inspection/fillet joint width/side joint length (%) measured value
SideJointLengthResult	Fillet inspection/fillet joint width/side joint length (%) inspection result
ExposedBasisMetalUpperLimit	Land exposure (%) upper limit
ExposedBasisMetalValue	Land exposure (%) measured value
ExposedBasisMetalResult	Land exposure (%) inspection result
BlowHoleDiameterUpperLimit	Blow hole/diameter (mm) upper limit
BlowHoleDiameterValue	Blow hole/diameter (mm) measured value
BlowHoleDiameterResult	Blow hole/diameter (mm) inspection result
BlowHoleRateUpperLimit	Blow hole/rate (%) upper limit
BlowHoleRateValue	Blow hole/rate (%) measured value
BlowHoleRateResult	Blow hole/rate (%) inspection result
BlowHoleAreaRateUpperLimit	Blow hole/area rate (%) upper limit
BlowHoleAreaRateValue	Blow hole/area rate (%) measured value
BlowHoleAreaRateResult	Blow hole/area rate (%) inspection result
LandErrorRegion1LowerLimit	Land error/setting 1 (%) lower limit
LandErrorRegion1UpperLimit	Land error/setting 1 (%) upper limit
LandErrorRegion1Value	Land error/setting 1 (%) measured value

LandErrorRegion1Result	Land error/setting 1 (%) inspection result
LandErrorRegion2LowerLimit	Land error/setting 2 (%) lower limit
LandErrorRegion2UpperLimit	Land error/setting 2 (%) upper limit
LandErrorRegion2Value	Land error/setting 2 (%) measured value
LandErrorRegion2Result	Land error/setting 2 (%) inspection result
LandErrorRegion3LowerLimit	Land error/setting 3 (%) lower limit
LandErrorRegion3UpperLimit	Land error/setting 3 (%) upper limit
LandErrorRegion3Value	Land error/setting 3 (%) measured value
LandErrorRegion3Result	Land error/setting 3 (%) inspection result
LandErrorRegion4LowerLimit	Land error/setting 4 (%) lower limit
LandErrorRegion4UpperLimit	Land error/setting 4 (%) upper limit
LandErrorRegion4Value	Land error/setting 4 (%) measured value
LandErrorRegion4Result	Land error/setting 4 (%) inspection result
LandErrorRegion5LowerLimit	Land error/setting 5 (%) lower limit
LandErrorRegion5UpperLimit	Land error/setting 5 (%) upper limit
LandErrorRegion5Value	Land error/setting 5 (%) measured value
LandErrorRegion5Result	Land error/setting 5 (%) inspection result
LandErrorRegion6LowerLimit	Land error/setting 6 (%) lower limit
LandErrorRegion6UpperLimit	Land error/setting 6 (%) upper limit
LandErrorRegion6Value	Land error/setting 6 (%) measured value
LandErrorRegion6Result	Land error/setting 6 (%) inspection result
LandErrorRegion7LowerLimit	Land error/setting 7 (%) lower limit
LandErrorRegion7UpperLimit	Land error/setting 7 (%) upper limit
LandErrorRegion7Value	Land error/setting 7 (%) measured value
LandErrorRegion7Result	Land error/setting 7 (%) inspection result
LandErrorRegion8LowerLimit	Land error/setting 8 (%) lower limit
LandErrorRegion8UpperLimit	Land error/setting 8 (%) upper limit
LandErrorRegion8Value	Land error/setting 8 (%) measured value
LandErrorRegion8Result	Land error/setting 8 (%) inspection result
LandErrorRegion9LowerLimit	Land error/setting 9 (%) lower limit
LandErrorRegion9UpperLimit	Land error/setting 9 (%) upper limit
LandErrorRegion9Value	Land error/setting 9 (%) measured value
LandErrorRegion9Result	Land error/setting 9 (%) inspection result
LandErrorRegion10LowerLimit	Land error/setting 10 (%) lower limit
LandErrorRegion10UpperLimit	Land error/setting 10 (%) upper limit
LandErrorRegion10Value	Land error/setting 10 (%) measured value
LandErrorRegion10Result	Land error/setting 10 (%) inspection result
ForeignMaterialOnLandUpperLimit	Foreign material (land) (%) upper limit
ForeignMaterialOnLandUpperValue	Foreign material (land) (%) measured value
ForeignMaterialOnLandUpperResult	Foreign material (land) (%) inspection result
LandSolderBallDiameterLogicMethodType	Inter-pin solder ball/diameter (mm) judgment method
LandSolderBallDiameterUpperLimit	Inter-pin solder ball/diameter (mm) upper limit
LandSolderBallDiameterValue	Inter-pin solder ball/diameter (mm) measured value
LandSolderBallDiameterResult	Inter-pin solder ball/diameter (mm) inspection result
LandSolderBallRateUpperLimit	Inter-pin solder ball/rate (%) upper limit
LandSolderBallRateValue	Inter-pin solder ball/rate (%) measured value
LandSolderBallRateResult	Inter-pin solder ball/rate (%) inspection result
LandSolderBallAreaRateUpperLimit	Inter-pin solder ball/area rate (%) upper limit
LandSolderBallAreaRateValue	Inter-pin solder ball/area rate (%) measured value
LandSolderBallAreaRateResult	Inter-pin solder ball/area rate (%) inspection result
LandBridgeWidthUpperLimit	Inter-pin solder bridge/width (mm) upper limit
LandBridgeWidthValue	Inter-pin solder bridge/width (mm) measured value
LandBridgeWidthResult	Inter-pin solder bridge/width (mm) inspection result
OblIQUEExposedBasisMetalUpperLimit	Land exposure (oblique) upper limit
OblIQUEExposedBasisMetalValue	Land exposure (oblique) measured value
OblIQUEExposedBasisMetalResult	Land exposure (oblique) inspection result
OblIQUELandErrorRegion1LowerLimit	Land Error (oblique)/setting 1 (oblique) (%) lower limit
OblIQUELandErrorRegion1UpperLimit	Land Error (oblique)/setting 1 (oblique) (%) upper limit
OblIQUELandErrorRegion1Value	Land Error (oblique)/setting 1 (oblique) (%) measured value

ObliqueLandErrorRegion1Result	Land Error (oblique)/setting 1 (oblique) (%) inspection result
ObliqueLandErrorRegion2LowerLimit	Land Error (oblique)/setting 2 (oblique) (%) lower limit
ObliqueLandErrorRegion2UpperLimit	Land Error (oblique)/setting 2 (oblique) (%) upper limit
ObliqueLandErrorRegion2Value	Land Error (oblique)/setting 2 (oblique) (%) measured value
ObliqueLandErrorRegion2Result	Land Error (oblique)/setting 2 (oblique) (%) inspection result
ObliqueLandErrorRegion3LowerLimit	Land Error (oblique)/setting 3 (oblique) (%) lower limit
ObliqueLandErrorRegion3UpperLimit	Land Error (oblique)/setting 3 (oblique) (%) upper limit
ObliqueLandErrorRegion3Value	Land Error (oblique)/setting 3 (oblique) (%) measured value
ObliqueLandErrorRegion3Result	Land Error (oblique)/setting 3 (oblique) (%) inspection result
ObliqueLandErrorRegion4LowerLimit	Land Error (oblique)/setting 4 (oblique) (%) lower limit
ObliqueLandErrorRegion4UpperLimit	Land Error (oblique)/setting 4 (oblique) (%) upper limit
ObliqueLandErrorRegion4Value	Land Error (oblique)/setting 4 (oblique) (%) measured value
ObliqueLandErrorRegion4Result	Land Error (oblique)/setting 4 (oblique) (%) inspection result
ObliqueLandErrorRegion5LowerLimit	Land Error (oblique)/setting 5 (oblique) (%) lower limit
ObliqueLandErrorRegion5UpperLimit	Land Error (oblique)/setting 5 (oblique) (%) upper limit
ObliqueLandErrorRegion5Value	Land Error (oblique)/setting 5 (oblique) (%) measured value
ObliqueLandErrorRegion5Result	Land Error (oblique)/setting 5 (oblique) (%) inspection result
ObliqueLandErrorRegion6LowerLimit	Land Error (oblique)/setting 6 (oblique) (%) lower limit
ObliqueLandErrorRegion6UpperLimit	Land Error (oblique)/setting 6 (oblique) (%) upper limit
ObliqueLandErrorRegion6Value	Land Error (oblique)/setting 6 (oblique) (%) measured value
ObliqueLandErrorRegion6Result	Land Error (oblique)/setting 6 (oblique) (%) inspection result
ObliqueLandErrorRegion7LowerLimit	Land Error (oblique)/setting 7 (oblique) (%) lower limit
ObliqueLandErrorRegion7UpperLimit	Land Error (oblique)/setting 7 (oblique) (%) upper limit
ObliqueLandErrorRegion7Value	Land Error (oblique)/setting 7 (oblique) (%) measured value
ObliqueLandErrorRegion7Result	Land Error (oblique)/setting 7 (oblique) (%) inspection result
ObliqueLandErrorRegion8LowerLimit	Land Error (oblique)/setting 8 (oblique) (%) lower limit
ObliqueLandErrorRegion8UpperLimit	Land Error (oblique)/setting 8 (oblique) (%) upper limit
ObliqueLandErrorRegion8Value	Land Error (oblique)/setting 8 (oblique) (%) measured value
ObliqueLandErrorRegion8Result	Land Error (oblique)/setting 8 (oblique) (%) inspection result
ObliqueLandErrorRegion9LowerLimit	Land Error (oblique)/setting 9 (oblique) (%) lower limit
ObliqueLandErrorRegion9UpperLimit	Land Error (oblique)/setting 9 (oblique) (%) upper limit
ObliqueLandErrorRegion9Value	Land Error (oblique)/setting 9 (oblique) (%) measured value
ObliqueLandErrorRegion9Result	Land Error (oblique)/setting 9 (oblique) (%) inspection result
ObliqueLandErrorRegion10LowerLimit	Land Error (oblique)/setting 10 (oblique) (%) lower limit
ObliqueLandErrorRegion10UpperLimit	Land Error (oblique)/setting 10 (oblique) (%) upper limit
ObliqueLandErrorRegion10Value	Land Error (oblique)/setting 10 (oblique) (%) measured value
ObliqueLandErrorRegion10Result	Land Error (oblique)/setting 10 (oblique) (%) inspection result
SideOverhangUpperLimit	Lead inspection/lead shift/side overhang (%) upper limit
SideOverhangValue	Lead inspection/lead shift/side overhang (%) measured value
SideOverhangResult	Lead inspection/lead shift/side overhang (%) inspection result
EndOverhangUpperLimit	Lead inspection/lead shift/end overhang (%) upper limit
EndOverhangValue	Lead inspection/lead shift/end overhang (%) measured value
EndOverhangResult	Lead inspection/lead shift/end overhang (%) inspection result
EndOverlapLowerLimit	Lead inspection/lead shift/end overlap (%) lower limit
EndOverlapValue	Lead inspection/lead shift/end overlap (%) measured value
EndOverlapResult	Lead inspection/lead shift/end overlap (%) inspection result
VerticallyLiftedElectrodeLowerLimit	Lead inspection/lead posture/lead lifting (mm) lower limit
VerticallyLiftedElectrodeUpperLimit	Lead inspection/lead posture/lead lifting (mm) upper limit
VerticallyLiftedElectrodeValue	Lead inspection/lead posture/lead lifting (mm) measured value
VerticallyLiftedElectrodeResult	Lead inspection/lead posture/lead lifting (mm) inspection result
CoplanarityUpperLimit	Lead inspection/lead posture/coplanarity (mm) upper limit
CoplanarityValue	Lead inspection/lead posture/coplanarity (mm) measured value
CoplanarityResult	Lead inspection/lead posture/coplanarity (mm) inspection result
ElectrodeLengthLowerLimit	Lead inspection/lead posture/lead protrusion (%) lower limit
ElectrodeLengthUpperLimit	Lead inspection/lead posture/lead protrusion (%) upper limit

ElectrodeLengthValue	Lead inspection/lead posture/lead protrusion (%) measured value
ElectrodeLengthResult	Lead inspection/lead posture/lead protrusion (%) inspection result
ElectrodeAreaUpperLimit	Lead inspection/lead posture/lead area (%) upper limit
ElectrodeAreaValue	Lead inspection/lead posture/lead area (%) measured value
ElectrodeAreaResult	Lead inspection/lead posture/lead area (%) inspection result
ExposedElectrodeToeUpperLimit	Lead inspection/lead posture/lead toe exposure (%) upper limit
ExposedElectrodeToeValue	Lead inspection/lead posture/lead toe exposure (%) measured value
ExposedElectrodeToeResult	Lead inspection/lead posture/lead toe exposure (%) inspection result
ElectrodeColorDispersionUpperLimit	Lead inspection/lead posture/lead dispersion (%) upper limit
ElectrodeColorDispersionValue	Lead inspection/lead posture/lead dispersion (%) measured value
ElectrodeColorDispersionResult	Lead inspection/lead posture/lead dispersion (%) inspection result
ElectrodeSideBendUpperLimit	Lead inspection/lead posture/lead side bend (%) upper limit
ElectrodeSideBendValue	Lead inspection/lead posture/lead side bend (%) measured value
ElectrodeSideBendResult	Lead inspection/lead posture/lead side bend (%) inspection result
ElectrodeOffsetXUpperLimit	Lead inspection/lead shift (mm)/X-shift [absolute value] (mm) upper limit
ElectrodeOffsetXValue	Lead inspection/lead shift (mm)/X-shift [absolute value] (mm) measured value
ElectrodeOffsetXSignedValue	Lead inspection/lead shift (mm)/X-shift [absolute value] (mm) measured value (signed)
ElectrodeOffsetXResult	Lead inspection/lead shift (mm)/X-shift [absolute value] (mm) inspection result
ElectrodeOffsetYUpperLimit	Lead inspection/lead shift (mm)/Y-shift [absolute value] (mm) upper limit
ElectrodeOffsetYValue	Lead inspection/lead shift (mm)/Y-shift [absolute value] (mm) measured value
ElectrodeOffsetYSignedValue	Lead inspection/lead shift (mm)/Y-shift [absolute value] (mm) measured value (signed)
ElectrodeOffsetYResult	Lead inspection/lead shift (mm)/Y-shift [absolute value] (mm) inspection result
ElectrodeSkewUpperLimit	Lead inspection/lead shift (mm)/angle shift [absolute value] (°) upper limit
ElectrodeSkewValue	Lead inspection/lead shift (mm)/angle shift [absolute value] (°) measured value
ElectrodeSkewSignedValue	Lead inspection/lead shift (mm)/angle shift [absolute value] (°) measured value (signed)
ElectrodeSkewResult	Lead inspection/lead shift (mm)/angle shift [absolute value] (°) inspection result
ElectrodeHeightLowerLimit	Lead inspection/lead height (mm) lower limit
ElectrodeHeightUpperLimit	Lead inspection/lead height (mm) upper limit
ElectrodeHeightValue	Lead inspection/lead height (mm) measured value
ElectrodeHeightResult	Lead inspection/lead height (mm) inspection result
ElectrodePresenceArealowerLimit	Lead inspection/lead presence (%)/area (%) lower limit
ElectrodePresenceAreaValue	Lead inspection/lead presence (%)/area (%) measured value
ElectrodePresenceAreaResult	Lead inspection/lead presence (%)/area (%) inspection result
ElectrodePresenceGravityLowerLimit	Lead inspection/lead presence (%)/gravity (%) lower limit
ElectrodePresenceGravityValue	Lead inspection/lead presence (%)/gravity (%) measured value
ElectrodePresenceGravityResult	Lead inspection/lead presence (%)/gravity (%) inspection result
ElectrodePresenceDispersionLowerLimit	Lead inspection/lead presence (%)/dispersion (%) lower limit

ElectrodePresenceDispersionUpperLimit	Lead inspection/lead presence (%)/dispersion (%) upper limit
ElectrodePresenceDispersionValue	Lead inspection/lead presence (%)/dispersion (%) measured value
ElectrodePresenceDispersionResult	Lead inspection/lead presence (%)/dispersion (%) inspection result
ElectrodeBendClinchDeflectionUpperLimit	Lead inspection/lead bend/direction [absolute value] (°) upper limit
ElectrodeBendClinchDeflectionValue	Lead inspection/lead bend/direction [absolute value] (°) measured value
ElectrodeBendClinchDeflectionSignedValue	Lead inspection/lead bend/direction [absolute value] (°) measured value (signed)
ElectrodeBendClinchDeflectionResult	Lead inspection/lead bend/direction [absolute value] (°) inspection result
ElectrodeBendClinchLengthLowerLimit	Lead inspection/lead bend/length (mm) lower limit
ElectrodeBendClinchLengthUpperLimit	Lead inspection/lead bend/length (mm) upper limit
ElectrodeBendClinchLengthValue	Lead inspection/lead bend/length (mm) measured value
ElectrodeBendClinchLengthResult	Lead inspection/lead bend/length (mm) inspection result
ElectrodeHeightObliqueUpperLimit	Lead inspection/lead posture (oblique)/lead height (oblique) (mm) upper limit
ElectrodeHeightObliqueValue	Lead inspection/lead posture (oblique)/lead height (oblique) (mm) measured value
ElectrodeHeightObliqueResult	Lead inspection/lead posture (oblique)/lead height (oblique) (mm) measured value
ElectrodeAreaObliqueUpperLimit	Lead inspection/lead posture (oblique)/lead area (oblique) (mm) upper limit
ElectrodeAreaObliqueValue	Lead inspection/lead posture (oblique)/lead area (oblique) (mm) measured value
ElectrodeAreaObliqueResult	Lead inspection/lead posture (oblique)/lead area (oblique) (mm) measured value
ExposedElectrodeToeObliqueUpperLimit	Lead inspection/lead posture (oblique)/lead toe exposure (oblique) (%) upper limit
ExposedElectrodeToeObliqueValue	Lead inspection/lead posture (oblique)/lead toe exposure (oblique) (%) measured value
ExposedElectrodeToeObliqueResult	Lead inspection/lead posture (oblique)/lead toe exposure (oblique) (%) inspection result
ElectrodeColorDispersionObliqueUpperLimit	Lead inspection/lead posture (oblique)/lead dispersion (oblique) (%) upper limit
ElectrodeColorDispersionObliqueValue	Lead inspection/lead posture (oblique)/lead dispersion (oblique) (%) measured value
ElectrodeColorDispersionObliqueResult	Lead inspection/lead posture (oblique)/lead dispersion (oblique) (%) inspection result
SideOverhangObliqueUpperLimit	Lead inspection/lead shift (oblique)/side overhang (oblique) (%) upper limit
SideOverhangObliqueValue	Lead inspection/lead shift (oblique)/side overhang (oblique) (%) measured value
SideOverhangObliqueResult	Lead inspection/lead shift (oblique)/side overhang (oblique) (%) inspection result
EndOverhangObliqueUpperLimit	Lead inspection/lead shift (oblique)/end overhang (oblique) (%) upper limit
EndOverhangObliqueValue	Lead inspection/lead shift (oblique)/end overhang (oblique) (%) measured value
EndOverhangObliqueResult	Lead inspection/lead shift (oblique)/end overhang (oblique) (%) inspection result
EndOverlapObliqueLowerLimit	Lead inspection/lead shift (oblique)/end overlap (oblique) (%) upper limit
EndOverlapObliqueValue	Lead inspection/lead shift (oblique)/end overlap (oblique) (%) measured value
EndOverlapObliqueResult	Lead inspection/lead shift (oblique)/end overlap (oblique) (%) inspection result

## Appendix 10 Inspection Coverage Output Format

## Appendix 10 Inspection Coverage Output Format

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AILandErrorMeasurement10Result	Land error measurement(AI)/setting 10(%) inspection result
AIMeasurement1UpperLimit	Wetting(AI)/setting 1(%) upper limit
AIMeasurement1Value	Wetting(AI)/setting 1(%) measured value
AIMeasurement1Result	Wetting(AI)/setting 1(%) inspection result
AIMeasurement2UpperLimit	Wetting(AI)/setting 2(%) upper limit
AIMeasurement2Value	Wetting(AI)/setting 2(%) measured value
AIMeasurement2Result	Wetting(AI)/setting 2(%) inspection result
AIMeasurement3UpperLimit	Wetting(AI)/setting 3(%) upper limit
AIMeasurement3Value	Wetting(AI)/setting 3(%) measured value
AIMeasurement3Result	Wetting(AI)/setting 3(%) inspection result
AIMeasurement4UpperLimit	Wetting(AI)/setting 4(%) upper limit
AIMeasurement4Value	Wetting(AI)/setting 4(%) measured value
AIMeasurement4Result	Wetting(AI)/setting 4(%) inspection result
AIMeasurement5UpperLimit	Wetting(AI)/setting 5(%) upper limit
AIMeasurement5Value	Wetting(AI)/setting 5(%) measured value
AIMeasurement5Result	Wetting(AI)/setting 5(%) inspection result
AIMeasurement6UpperLimit	Wetting(AI)/setting 6(%) upper limit
AIMeasurement6Value	Wetting(AI)/setting 6(%) measured value
AIMeasurement6Result	Wetting(AI)/setting 6(%) inspection result
AIMeasurement7UpperLimit	Wetting(AI)/setting 7(%) upper limit
AIMeasurement7Value	Wetting(AI)/setting 7(%) measured value
AIMeasurement7Result	Wetting(AI)/setting 7(%) inspection result
AIMeasurement8UpperLimit	Wetting(AI)/setting 8(%) upper limit
AIMeasurement8Value	Wetting(AI)/setting 8(%) measured value
AIMeasurement8Result	Wetting(AI)/setting 8(%) inspection result
AIMeasurement9UpperLimit	Wetting(AI)/setting 9(%) upper limit
AIMeasurement9Value	Wetting(AI)/setting 9(%) measured value
AIMeasurement9Result	Wetting(AI)/setting 9(%) inspection result
AIMeasurement10UpperLimit	Wetting(AI)/setting 10(%) upper limit
AIMeasurement10Value	Wetting(AI)/setting 10(%) measured value
AIMeasurement10Result	Wetting(AI)/setting 10(%) inspection result
AILandErrorObliqueMeasurement1UpperLimit	Land error measurement(AI)(oblique)/setting 1(%) upper limit
AILandErrorObliqueMeasurement1Value	Land error measurement(AI)(oblique)/setting 1(%) measured value
AILandErrorObliqueMeasurement1Result	Land error measurement(AI)(oblique)/setting 1(%) inspection result
AILandErrorObliqueMeasurement2UpperLimit	Land error measurement(AI)(oblique)/setting 2(%) upper limit
AILandErrorObliqueMeasurement2Value	Land error measurement(AI)(oblique)/setting 2(%) measured value
AILandErrorObliqueMeasurement2Result	Land error measurement(AI)(oblique)/setting 2(%) inspection result
AILandErrorObliqueMeasurement3UpperLimit	Land error measurement(AI)(oblique)/setting 3(%) upper limit
AILandErrorObliqueMeasurement3Value	Land error measurement(AI)(oblique)/setting 3(%) measured value
AILandErrorObliqueMeasurement3Result	Land error measurement(AI)(oblique)/setting 3(%) inspection result
AILandErrorObliqueMeasurement4UpperLimit	Land error measurement(AI)(oblique)/setting 4(%) upper limit
AILandErrorObliqueMeasurement4Value	Land error measurement(AI)(oblique)/setting 4(%) measured value
AILandErrorObliqueMeasurement4Result	Land error measurement(AI)(oblique)/setting 4(%) inspection result
AILandErrorObliqueMeasurement5UpperLimit	Land error measurement(AI)(oblique)/setting 5(%) upper limit
AILandErrorObliqueMeasurement5Value	Land error measurement(AI)(oblique)/setting 5(%) measured value

AILandErrorObliqueMeasurement5Result	Land error measurement(AI)(oblique)/setting 5(%) inspection result
AILandErrorObliqueMeasurement6UpperLimit	Land error measurement(AI)(oblique)/setting 6(%) upper limit
AILandErrorObliqueMeasurement6Value	Land error measurement(AI)(oblique)/setting 6(%) measured value
AILandErrorObliqueMeasurement6Result	Land error measurement(AI)(oblique)/setting 6(%) inspection result
AILandErrorObliqueMeasurement7UpperLimit	Land error measurement(AI)(oblique)/setting 7(%) upper limit
AILandErrorObliqueMeasurement7Value	Land error measurement(AI)(oblique)/setting 7(%) measured value
AILandErrorObliqueMeasurement7Result	Land error measurement(AI)(oblique)/setting 7(%) inspection result
AILandErrorObliqueMeasurement8UpperLimit	Land error measurement(AI)(oblique)/setting 8(%) upper limit
AILandErrorObliqueMeasurement8Value	Land error measurement(AI)(oblique)/setting 8(%) measured value
AILandErrorObliqueMeasurement8Result	Land error measurement(AI)(oblique)/setting 8(%) inspection result
AILandErrorObliqueMeasurement9UpperLimit	Land error measurement(AI)(oblique)/setting 9(%) upper limit
AILandErrorObliqueMeasurement9Value	Land error measurement(AI)(oblique)/setting 9(%) measured value
AILandErrorObliqueMeasurement9Result	Land error measurement(AI)(oblique)/setting 9(%) inspection result
AILandErrorObliqueMeasurement10UpperLimit	Land error measurement(AI)(oblique)/setting 10(%) upper limit
AILandErrorObliqueMeasurement10Value	Land error measurement(AI)(oblique)/setting 10(%) measured value
AILandErrorObliqueMeasurement10Result	Land error measurement(AI)(oblique)/setting 10(%) inspection result
CustomOffsetX1UpperLimit	Component inspection/component shift/setting 1/X-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetX1Value	Component inspection/component shift/setting 1/X-shift (PCB) [absolute value] (mm) measured value
CustomOffsetX1SignedValue	Component inspection/component shift/setting 1/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX1Result	Component inspection/component shift/setting 1/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY1UpperLimit	Component inspection/component shift/setting 1/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY1Value	Component inspection/component shift/setting 1/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY1SignedValue	Component inspection/component shift/setting 1/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY1Result	Component inspection/component shift/setting 1/Y-shift (PCB) [absolute value] (mm) inspection result
CustomComponentSkew1UpperLimit	Component inspection/component shift/setting 1/angle shift [absolute value] (°) upper limit
CustomComponentSkew1Value	Component inspection/component shift/setting 1/angle shift [absolute value] (°) measured value
CustomComponentSkew1SignedValue	Component inspection/component shift/setting 1/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew1Result	Component inspection/component shift/setting 1/angle shift [absolute value] (°) inspection result
CustomOffsetX1ComponentUpperLimit	Component inspection/component shift/setting 1/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX1ComponentValue	Component inspection/component shift/setting 1/X-shift (component) [absolute value] (mm) measured value

CustomOffsetX1ComponentSignedValue	Component inspection/component shift/setting 1/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX1ComponentResult	Component inspection/component shift/setting 1/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY1ComponentUpperLimit	Component inspection/component shift/setting 1/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY1ComponentValue	Component inspection/component shift/setting 1/Y-shift (component) [absolute value] (mm) measured value
CustomOffsetY1ComponentSignedValue	Component inspection/component shift/setting 1/Y-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetY1ComponentResult	Component inspection/component shift/setting 1/Y-shift (component) [absolute value] (mm) inspection result
CustomOffsetX2UpperLimit	Component inspection/component shift/setting 2/X-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetX2Value	Component inspection/component shift/setting 2/X-shift (PCB) [absolute value] (mm) measured value
CustomOffsetX2SignedValue	Component inspection/component shift/setting 2/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX2Result	Component inspection/component shift/setting 2/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY2UpperLimit	Component inspection/component shift/setting 2/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY2Value	Component inspection/component shift/setting 2/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY2SignedValue	Component inspection/component shift/setting 2/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY2Result	Component inspection/component shift/setting 2/Y-shift (PCB) [absolute value] (mm) inspection result
CustomComponentSkew2UpperLimit	Component inspection/component shift/setting 2/angle shift [absolute value] (°) upper limit
CustomComponentSkew2Value	Component inspection/component shift/setting 2/angle shift [absolute value] (°) measured value
CustomComponentSkew2SignedValue	Component inspection/component shift/setting 2/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew2Result	Component inspection/component shift/setting 2/angle shift [absolute value] (°) inspection result
CustomOffsetX2ComponentUpperLimit	Component inspection/component shift/setting 2/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX2ComponentValue	Component inspection/component shift/setting 2/X-shift (component) [absolute value] (mm) measured value
CustomOffsetX2ComponentSignedValue	Component inspection/component shift/setting 2/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX2ComponentResult	Component inspection/component shift/setting 2/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY2ComponentUpperLimit	Component inspection/component shift/setting 2/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY2ComponentValue	Component inspection/component shift/setting 2/Y-shift (component) [absolute value] (mm) measured value
CustomOffsetX2SignedValue	Component inspection/component shift/setting 2/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX2Result	Component inspection/component shift/setting 2/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY2UpperLimit	Component inspection/component shift/setting 2/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY2Value	Component inspection/component shift/setting 2/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY2SignedValue	Component inspection/component shift/setting 2/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY2Result	Component inspection/component shift/setting 2/Y-shift (PCB) [absolute value] (mm) inspection result

CustomComponentSkew2UpperLimit	Component inspection/component shift/setting 2/angle shift [absolute value] (°) upper limit
CustomComponentSkew2Value	Component inspection/component shift/setting 2/angle shift [absolute value] (°) measured value
CustomComponentSkew2SignedValue	Component inspection/component shift/setting 2/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew2Result	Component inspection/component shift/setting 2/angle shift [absolute value] (°) inspection result
CustomOffsetX2ComponentUpperLimit	Component inspection/component shift/setting 2/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX2ComponentValue	Component inspection/component shift/setting 2/X-shift (component) [absolute value] (mm) measured value
CustomOffsetX2ComponentSignedValue	Component inspection/component shift/setting 2/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX2ComponentResult	Component inspection/component shift/setting 2/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY2ComponentUpperLimit	Component inspection/component shift/setting 2/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY2ComponentValue	Component inspection/component shift/setting 2/Y-shift (component) [absolute value] (mm) measured value
CustomOffsetY2ComponentSignedValue	Component inspection/component shift/setting 2/Y-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetY2ComponentResult	Component inspection/component shift/setting 2/Y-shift (component) [absolute value] (mm) inspection result
CustomOffsetX3UpperLimit	Component inspection/component shift/setting 3/X-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetX3Value	Component inspection/component shift/setting 3/X-shift (PCB) [absolute value] (mm) measured value
CustomOffsetX3SignedValue	Component inspection/component shift/setting 3/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX3Result	Component inspection/component shift/setting 3/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY3UpperLimit	Component inspection/component shift/setting 3/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY3Value	Component inspection/component shift/setting 3/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY3SignedValue	Component inspection/component shift/setting 3/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY3Result	Component inspection/component shift/setting 3/Y-shift (PCB) [absolute value] (mm) inspection result
CustomComponentSkew3UpperLimit	Component inspection/component shift/setting 3/angle shift [absolute value] (°) upper limit
CustomComponentSkew3Value	Component inspection/component shift/setting 3/angle shift [absolute value] (°) measured value
CustomComponentSkew3SignedValue	Component inspection/component shift/setting 3/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew3Result	Component inspection/component shift/setting 3/angle shift [absolute value] (°) inspection result
CustomOffsetX3ComponentUpperLimit	Component inspection/component shift/setting 3/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX3ComponentValue	Component inspection/component shift/setting 3/X-shift (component) [absolute value] (mm) measured value
CustomOffsetX3ComponentSignedValue	Component inspection/component shift/setting 3/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX3ComponentResult	Component inspection/component shift/setting 3/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY3ComponentUpperLimit	Component inspection/component shift/setting 3/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY3ComponentValue	Component inspection/component shift/setting 3/Y-shift (component) [absolute value] (mm) measured value

CustomOffsetY3ComponentSignedValue	Component inspection/component shift/setting 3/Y-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetY3ComponentResult	Component inspection/component shift/setting 3/Y-shift (component) [absolute value] (mm) inspection result
CustomOffsetX4UpperLimit	Component inspection/component shift/setting 4/X-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetX4Value	Component inspection/component shift/setting 4/X-shift (PCB) [absolute value] (mm) measured value
CustomOffsetX4SignedValue	Component inspection/component shift/setting 4/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX4Result	Component inspection/component shift/setting 4/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY4UpperLimit	Component inspection/component shift/setting 4/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY4Value	Component inspection/component shift/setting 4/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY4SignedValue	Component inspection/component shift/setting 4/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY4Result	Component inspection/component shift/setting 4/Y-shift (PCB) [absolute value] (mm) inspection result
CustomComponentSkew4UpperLimit	Component inspection/component shift/setting 4/angle shift [absolute value] (°) upper limit
CustomComponentSkew4Value	Component inspection/component shift/setting 4/angle shift [absolute value] (°) measured value
CustomComponentSkew4SignedValue	Component inspection/component shift/setting 4/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew4Result	Component inspection/component shift/setting 4/angle shift [absolute value] (°) inspection result
CustomOffsetX4ComponentUpperLimit	Component inspection/component shift/setting 4/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX4ComponentValue	Component inspection/component shift/setting 4/X-shift (component) [absolute value] (mm) measured value
CustomOffsetX4ComponentSignedValue	Component inspection/component shift/setting 4/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX4ComponentResult	Component inspection/component shift/setting 4/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY4ComponentUpperLimit	Component inspection/component shift/setting 4/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY4ComponentValue	Component inspection/component shift/setting 4/Y-shift (component) [absolute value] (mm) measured value
CustomOffsetY4ComponentSignedValue	Component inspection/component shift/setting 4/Y-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetY4ComponentResult	Component inspection/component shift/setting 4/Y-shift (component) [absolute value] (mm) inspection result
CustomOffsetX5UpperLimit	Component inspection/component shift/setting 5/X-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetX5Value	Component inspection/component shift/setting 5/X-shift (PCB) [absolute value] (mm) measured value
CustomOffsetX5SignedValue	Component inspection/component shift/setting 5/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX5Result	Component inspection/component shift/setting 5/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY5UpperLimit	Component inspection/component shift/setting 5/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY5Value	Component inspection/component shift/setting 5/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY5SignedValue	Component inspection/component shift/setting 5/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY5Result	Component inspection/component shift/setting 5/Y-shift (PCB) [absolute value] (mm) inspection result

CustomComponentSkew5UpperLimit	Component inspection/component shift/setting 5/angle shift [absolute value] (°) upper limit
CustomComponentSkew5Value	Component inspection/component shift/setting 5/angle shift [absolute value] (°) measured value
CustomComponentSkew5SignedValue	Component inspection/component shift/setting 5/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew5Result	Component inspection/component shift/setting 5/angle shift [absolute value] (°) inspection result
CustomOffsetX5ComponentUpperLimit	Component inspection/component shift/setting 5/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX5ComponentValue	Component inspection/component shift/setting 5/X-shift (component) [absolute value] (mm) measured value
CustomOffsetX5ComponentSignedValue	Component inspection/component shift/setting 5/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX5ComponentResult	Component inspection/component shift/setting 5/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY5ComponentUpperLimit	Component inspection/component shift/setting 5/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY5ComponentValue	Component inspection/component shift/setting 5/Y-shift (component) [absolute value] (mm) measured value
CustomOffsetY5ComponentSignedValue	Component inspection/component shift/setting 5/Y-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetY5ComponentResult	Component inspection/component shift/setting 5/Y-shift (component) [absolute value] (mm) inspection result
CustomOffsetX6UpperLimit	Component inspection/component shift/setting 6/X-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetX6Value	Component inspection/component shift/setting 6/X-shift (PCB) [absolute value] (mm) measured value
CustomOffsetX6SignedValue	Component inspection/component shift/setting 6/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX6Result	Component inspection/component shift/setting 6/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY6UpperLimit	Component inspection/component shift/setting 6/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY6Value	Component inspection/component shift/setting 6/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY6SignedValue	Component inspection/component shift/setting 6/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY6Result	Component inspection/component shift/setting 6/Y-shift (PCB) [absolute value] (mm) inspection result
CustomComponentSkew6UpperLimit	Component inspection/component shift/setting 6/angle shift [absolute value] (°) upper limit
CustomComponentSkew6Value	Component inspection/component shift/setting 6/angle shift [absolute value] (°) measured value
CustomComponentSkew6SignedValue	Component inspection/component shift/setting 6/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew6Result	Component inspection/component shift/setting 6/angle shift [absolute value] (°) inspection result
CustomOffsetX6ComponentUpperLimit	Component inspection/component shift/setting 6/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX6ComponentValue	Component inspection/component shift/setting 6/X-shift (component) [absolute value] (mm) measured value
CustomOffsetX6ComponentSignedValue	Component inspection/component shift/setting 6/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX6ComponentResult	Component inspection/component shift/setting 6/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY6ComponentUpperLimit	Component inspection/component shift/setting 6/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY6ComponentValue	Component inspection/component shift/setting 6/Y-shift (component) [absolute value] (mm) measured value

CustomOffsetY6ComponentSignedValue	Component inspection/component shift/setting 6/Y-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetY6ComponentResult	Component inspection/component shift/setting 6/Y-shift (component) [absolute value] (mm) inspection result
CustomOffsetX7UpperLimit	Component inspection/component shift/setting 7/X-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetX7Value	Component inspection/component shift/setting 7/X-shift (PCB) [absolute value] (mm) measured value
CustomOffsetX7SignedValue	Component inspection/component shift/setting 7/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX7Result	Component inspection/component shift/setting 7/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY7UpperLimit	Component inspection/component shift/setting 7/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY7Value	Component inspection/component shift/setting 7/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY7SignedValue	Component inspection/component shift/setting 7/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY7Result	Component inspection/component shift/setting 7/Y-shift (PCB) [absolute value] (mm) inspection result
CustomComponentSkew7UpperLimit	Component inspection/component shift/setting 7/angle shift [absolute value] (°) upper limit
CustomComponentSkew7Value	Component inspection/component shift/setting 7/angle shift [absolute value] (°) measured value
CustomComponentSkew7SignedValue	Component inspection/component shift/setting 7/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew7Result	Component inspection/component shift/setting 7/angle shift [absolute value] (°) inspection result
CustomOffsetX7ComponentUpperLimit	Component inspection/component shift/setting 7/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX7ComponentValue	Component inspection/component shift/setting 7/X-shift (component) [absolute value] (mm) measured value
CustomOffsetX7ComponentSignedValue	Component inspection/component shift/setting 7/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX7ComponentResult	Component inspection/component shift/setting 7/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY7ComponentUpperLimit	Component inspection/component shift/setting 7/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY7ComponentValue	Component inspection/component shift/setting 7/Y-shift (component) [absolute value] (mm) measured value
CustomOffsetY7ComponentSignedValue	Component inspection/component shift/setting 7/Y-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetY7ComponentResult	Component inspection/component shift/setting 7/Y-shift (component) [absolute value] (mm) inspection result
CustomOffsetX8UpperLimit	Component inspection/component shift/setting 8/X-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetX8Value	Component inspection/component shift/setting 8/X-shift (PCB) [absolute value] (mm) measured value
CustomOffsetX8SignedValue	Component inspection/component shift/setting 8/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX8Result	Component inspection/component shift/setting 8/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY8UpperLimit	Component inspection/component shift/setting 8/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY8Value	Component inspection/component shift/setting 8/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY8SignedValue	Component inspection/component shift/setting 8/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY8Result	Component inspection/component shift/setting 8/Y-shift (PCB) [absolute value] (mm) inspection result

CustomComponentSkew8UpperLimit	Component inspection/component shift/setting 8/angle shift [absolute value] (°) upper limit
CustomComponentSkew8Value	Component inspection/component shift/setting 8/angle shift [absolute value] (°) measured value
CustomComponentSkew8SignedValue	Component inspection/component shift/setting 8/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew8Result	Component inspection/component shift/setting 8/angle shift [absolute value] (°) inspection result
CustomOffsetX8ComponentUpperLimit	Component inspection/component shift/setting 8/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX8ComponentValue	Component inspection/component shift/setting 8/X-shift (component) [absolute value] (mm) measured value
CustomOffsetX8ComponentSignedValue	Component inspection/component shift/setting 8/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX8ComponentResult	Component inspection/component shift/setting 8/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY8ComponentUpperLimit	Component inspection/component shift/setting 8/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY8ComponentValue	Component inspection/component shift/setting 8/Y-shift (component) [absolute value] (mm) measured value
CustomOffsetY8ComponentSignedValue	Component inspection/component shift/setting 8/Y-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetY8ComponentResult	Component inspection/component shift/setting 8/Y-shift (component) [absolute value] (mm) inspection result
CustomOffsetX9UpperLimit	Component inspection/component shift/setting 9/X-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetX9Value	Component inspection/component shift/setting 9/X-shift (PCB) [absolute value] (mm) measured value
CustomOffsetX9SignedValue	Component inspection/component shift/setting 9/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX9Result	Component inspection/component shift/setting 9/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY9UpperLimit	Component inspection/component shift/setting 9/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY9Value	Component inspection/component shift/setting 9/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY9SignedValue	Component inspection/component shift/setting 9/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY9Result	Component inspection/component shift/setting 9/Y-shift (PCB) [absolute value] (mm) inspection result
CustomComponentSkew9UpperLimit	Component inspection/component shift/setting 9/angle shift [absolute value] (°) upper limit
CustomComponentSkew9Value	Component inspection/component shift/setting 9/angle shift [absolute value] (°) measured value
CustomComponentSkew9SignedValue	Component inspection/component shift/setting 9/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew9Result	Component inspection/component shift/setting 9/angle shift [absolute value] (°) inspection result
CustomOffsetX9ComponentUpperLimit	Component inspection/component shift/setting 9/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX9ComponentValue	Component inspection/component shift/setting 9/X-shift (component) [absolute value] (mm) measured value
CustomOffsetX9ComponentSignedValue	Component inspection/component shift/setting 9/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX9ComponentResult	Component inspection/component shift/setting 9/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY9ComponentUpperLimit	Component inspection/component shift/setting 9/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY9ComponentValue	Component inspection/component shift/setting 9/Y-shift (component) [absolute value] (mm) measured value

CustomOffsetY9ComponentSignedValue	Component inspection/component shift/setting 9/Y-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetY9ComponentResult	Component inspection/component shift/setting 9/Y-shift (component) [absolute value] (mm) inspection result
CustomOffsetX10UpperLimit	Component inspection/component shift/setting 10/X-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetX10Value	Component inspection/component shift/setting 10/X-shift (PCB) [absolute value] (mm) measured value
CustomOffsetX10SignedValue	Component inspection/component shift/setting 10/X-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetX10Result	Component inspection/component shift/setting 10/X-shift (PCB) [absolute value] (mm) inspection result
CustomOffsetY10UpperLimit	Component inspection/component shift/setting 10/Y-shift (PCB) [absolute value] (mm) upper limit
CustomOffsetY10Value	Component inspection/component shift/setting 10/Y-shift (PCB) [absolute value] (mm) measured value
CustomOffsetY10SignedValue	Component inspection/component shift/setting 10/Y-shift (PCB) [absolute value] (mm) measured value (signed)
CustomOffsetY10Result	Component inspection/component shift/setting 10/Y-shift (PCB) [absolute value] (mm) inspection result
CustomComponentSkew10UpperLimit	Component inspection/component shift/setting 10/angle shift [absolute value] (°) upper limit
CustomComponentSkew10Value	Component inspection/component shift/setting 10/angle shift [absolute value] (°) measured value
CustomComponentSkew10SignedValue	Component inspection/component shift/setting 10/angle shift [absolute value] (°) measured value (signed)
CustomComponentSkew10Result	Component inspection/component shift/setting 10/angle shift [absolute value] (°) inspection result
CustomOffsetX10ComponentUpperLimit	Component inspection/component shift/setting 10/X-shift (component) [absolute value] (mm) upper limit
CustomOffsetX10ComponentValue	Component inspection/component shift/setting 10/X-shift (component) [absolute value] (mm) measured value
CustomOffsetX10ComponentSignedValue	Component inspection/component shift/setting 10/X-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetX10ComponentResult	Component inspection/component shift/setting 10/X-shift (component) [absolute value] (mm) inspection result
CustomOffsetY10ComponentUpperLimit	Component inspection/component shift/setting 10/Y-shift (component) [absolute value] (mm) upper limit
CustomOffsetY10ComponentValue	Component inspection/component shift/setting 10/Y-shift (component) [absolute value] (mm) measured value
CustomOffsetY10ComponentSignedValue	Component inspection/component shift/setting 10/Y-shift (component) [absolute value] (mm) measured value (signed)
CustomOffsetY10ComponentResult	Component inspection/component shift/setting 10/Y-shift (component) [absolute value] (mm) inspection result
CustomInclination0HeightUpperLimit1	Component inspection/component lifting/setting 1/tilt (0-180°)/height [absolute value] (mm) upper limit
CustomInclination0HeightValue1	Component inspection/component lifting/setting 1/tilt (0-180°)/height [absolute value] (mm) measured value
CustomInclination0HeightSignedValue1	Component inspection/component lifting/setting 1/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
CustomInclination0HeightResult1	Component inspection/component lifting/setting 1/tilt (0-180°)/height [absolute value] (mm) inspection result
CustomInclination0AngleUpperLimit1	Component inspection/component lifting/setting 1/tilt (0-180°)/angle [absolute value] (°) upper limit
CustomInclination0AngleValue1	Component inspection/component lifting/setting 1/tilt (0-180°)/angle [absolute value] (°) measured value
CustomInclination0AngleSignedValue1	Component inspection/component lifting/setting 1/tilt (0-180°)/angle [absolute value] (°) measured value (signed)

CustomInclination0AngleResult1	Component inspection/component lifting/setting 1/tilt (0-180°)/angle [absolute value] (°) inspection result
CustomInclination90HeightUpperLimit1	Component inspection/component lifting/setting 1/tilt (90-270°)/height [absolute value] (mm) upper limit
CustomInclination90HeightValue1	Component inspection/component lifting/setting 1/tilt (90-270°)/height [absolute value] (mm) measured value
CustomInclination90HeightSignedValue1	Component inspection/component lifting/setting 1/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
CustomInclination90HeightResult1	Component inspection/component lifting/setting 1/tilt (90-270°)/height [absolute value] (mm) inspection result
CustomInclination90AngleUpperLimit1	Component inspection/component lifting/setting 1/tilt (90-270°)/angle [absolute value] (°) upper limit
CustomInclination90AngleValue1	Component inspection/component lifting/setting 1/tilt (90-270°)/angle [absolute value] (°) measured value
CustomInclination90AngleSignedValue1	Component inspection/component lifting/setting 1/tilt (90-270°)/angle [absolute value] (°) measured value (signed)
CustomInclination90AngleResult1	Component inspection/component lifting/setting 1/tilt (90-270°)/angle [absolute value] (°) inspection result
CustomLiftAverageHeightUpperLimit1	Component inspection/component lifting/setting 1/lifting (average height) (mm) upper limit
CustomLiftAverageHeightValue1	Component inspection/component lifting/setting 1/lifting (average height) (mm) measured value
CustomLiftAverageHeightResult1	Component inspection/component lifting/setting 1/lifting (average height) (mm) inspection result
CustomInclination0HeightUpperLimit2	Component inspection/component lifting/setting 2/tilt (0-180°)/height [absolute value] (mm) upper limit
CustomInclination0HeightValue2	Component inspection/component lifting/setting 2/tilt (0-180°)/height [absolute value] (mm) measured value
CustomInclination0HeightSignedValue2	Component inspection/component lifting/setting 2/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
CustomInclination0HeightResult2	Component inspection/component lifting/setting 2/tilt (0-180°)/height [absolute value] (mm) inspection result
CustomInclination0AngleUpperLimit2	Component inspection/component lifting/setting 2/tilt (0-180°)/angle [absolute value] (°) upper limit
CustomInclination0AngleValue2	Component inspection/component lifting/setting 2/tilt (0-180°)/angle [absolute value] (°) measured value
CustomInclination0AngleSignedValue2	Component inspection/component lifting/setting 2/tilt (0-180°)/angle [absolute value] (°) measured value (signed)
CustomInclination0AngleResult2	Component inspection/component lifting/setting 2/tilt (0-180°)/angle [absolute value] (°) inspection result
CustomInclination90HeightUpperLimit2	Component inspection/component lifting/setting 2/tilt (90-270°)/height [absolute value] (mm) upper limit
CustomInclination90HeightValue2	Component inspection/component lifting/setting 2/tilt (90-270°)/height [absolute value] (mm) measured value
CustomInclination90HeightSignedValue2	Component inspection/component lifting/setting 2/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
CustomInclination90HeightResult2	Component inspection/component lifting/setting 2/tilt (90-270°)/height [absolute value] (mm) inspection result
CustomInclination90AngleUpperLimit2	Component inspection/component lifting/setting 2/tilt (90-270°)/angle [absolute value] (°) upper limit
CustomInclination90AngleValue2	Component inspection/component lifting/setting 2/tilt (90-270°)/angle [absolute value] (°) measured value
CustomInclination90AngleSignedValue2	Component inspection/component lifting/setting 2/tilt (90-270°)/angle [absolute value] (°) measured value (signed)
CustomInclination90AngleResult2	Component inspection/component lifting/setting 2/tilt (90-270°)/angle [absolute value] (°) inspection result

CustomLiftAverageHeightUpperLimit2	Component inspection/component lifting/setting 2/lifting (average height) (mm) upper limit
CustomLiftAverageHeightValue2	Component inspection/component lifting/setting 2/lifting (average height) (mm) measured value
CustomLiftAverageHeightResult2	Component inspection/component lifting/setting 2/lifting (average height) (mm) inspection result
CustomInclination0HeightUpperLimit3	Component inspection/component lifting/setting 3/tilt (0-180°)/height [absolute value] (mm) upper limit
CustomInclination0HeightValue3	Component inspection/component lifting/setting 3/tilt (0-180°)/height [absolute value] (mm) measured value
CustomInclination0HeightSignedValue3	Component inspection/component lifting/setting 3/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
CustomInclination0HeightResult3	Component inspection/component lifting/setting 3/tilt (0-180°)/height [absolute value] (mm) inspection result
CustomInclination0AngleUpperLimit3	Component inspection/component lifting/setting 3/tilt (0-180°)/angle [absolute value] (°) upper limit
CustomInclination0AngleValue3	Component inspection/component lifting/setting 3/tilt (0-180°)/angle [absolute value] (°) measured value
CustomInclination0AngleSignedValue3	Component inspection/component lifting/setting 3/tilt (0-180°)/angle [absolute value] (°) measured value (signed)
CustomInclination0AngleResult3	Component inspection/component lifting/setting 3/tilt (0-180°)/angle [absolute value] (°) inspection result
CustomInclination90HeightUpperLimit3	Component inspection/component lifting/setting 3/tilt (90-270°)/height [absolute value] (mm) upper limit
CustomInclination90HeightValue3	Component inspection/component lifting/setting 3/tilt (90-270°)/height [absolute value] (mm) measured value
CustomInclination90HeightSignedValue3	Component inspection/component lifting/setting 3/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
CustomInclination90HeightResult3	Component inspection/component lifting/setting 3/tilt (90-270°)/height [absolute value] (mm) inspection result
CustomInclination90AngleUpperLimit3	Component inspection/component lifting/setting 3/tilt (90-270°)/angle [absolute value] (°) upper limit
CustomInclination90AngleValue3	Component inspection/component lifting/setting 3/tilt (90-270°)/angle [absolute value] (°) measured value
CustomInclination90AngleSignedValue3	Component inspection/component lifting/setting 3/tilt (90-270°)/angle [absolute value] (°) measured value (signed)
CustomInclination90AngleResult3	Component inspection/component lifting/setting 3/tilt (90-270°)/angle [absolute value] (°) inspection result
CustomLiftAverageHeightUpperLimit3	Component inspection/component lifting/setting 3/lifting (average height) (mm) upper limit
CustomLiftAverageHeightValue3	Component inspection/component lifting/setting 3/lifting (average height) (mm) measured value
CustomLiftAverageHeightResult3	Component inspection/component lifting/setting 3/lifting (average height) (mm) inspection result
CustomInclination0HeightUpperLimit4	Component inspection/component lifting/setting 4/tilt (0-180°)/height [absolute value] (mm) upper limit
CustomInclination0HeightValue4	Component inspection/component lifting/setting 4/tilt (0-180°)/height [absolute value] (mm) measured value
CustomInclination0HeightSignedValue4	Component inspection/component lifting/setting 4/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
CustomInclination0HeightResult4	Component inspection/component lifting/setting 4/tilt (0-180°)/height [absolute value] (mm) inspection result
CustomInclination0AngleUpperLimit4	Component inspection/component lifting/setting 4/tilt (0-180°)/angle [absolute value] (°) upper limit
CustomInclination0AngleValue4	Component inspection/component lifting/setting 4/tilt (0-180°)/angle [absolute value] (°) measured value

CustomInclination0AngleSignedValue4	Component inspection/component lifting/setting 4/tilt (0-180°)/angle [absolute value] (°) measured value (signed)
CustomInclination0AngleResult4	Component inspection/component lifting/setting 4/tilt (0-180°)/angle [absolute value] (°) inspection result
CustomInclination90HeightUpperLimit4	Component inspection/component lifting/setting 4/tilt (90-270°)/height [absolute value] (mm) upper limit
CustomInclination90HeightValue4	Component inspection/component lifting/setting 4/tilt (90-270°)/height [absolute value] (mm) measured value
CustomInclination90HeightSignedValue4	Component inspection/component lifting/setting 4/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
CustomInclination90HeightResult4	Component inspection/component lifting/setting 4/tilt (90-270°)/height [absolute value] (mm) inspection result
CustomInclination90AngleUpperLimit4	Component inspection/component lifting/setting 4/tilt (90-270°)/angle [absolute value] (°) upper limit
CustomInclination90AngleValue4	Component inspection/component lifting/setting 4/tilt (90-270°)/angle [absolute value] (°) measured value
CustomInclination90AngleSignedValue4	Component inspection/component lifting/setting 4/tilt (90-270°)/angle [absolute value] (°) measured value (signed)
CustomInclination90AngleResult4	Component inspection/component lifting/setting 4/tilt (90-270°)/angle [absolute value] (°) inspection result
CustomLiftAverageHeightUpperLimit4	Component inspection/component lifting/setting 4/lifting (average height) (mm) upper limit
CustomLiftAverageHeightValue4	Component inspection/component lifting/setting 4/lifting (average height) (mm) measured value
CustomLiftAverageHeightResult4	Component inspection/component lifting/setting 4/lifting (average height) (mm) inspection result
CustomInclination0HeightUpperLimit5	Component inspection/component lifting/setting 5/tilt (0-180°)/height [absolute value] (mm) upper limit
CustomInclination0HeightValue5	Component inspection/component lifting/setting 5/tilt (0-180°)/height [absolute value] (mm) measured value
CustomInclination0HeightSignedValue5	Component inspection/component lifting/setting 5/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
CustomInclination0HeightResult5	Component inspection/component lifting/setting 5/tilt (0-180°)/height [absolute value] (mm) inspection result
CustomInclination0AngleUpperLimit5	Component inspection/component lifting/setting 5/tilt (0-180°)/angle [absolute value] (°) upper limit
CustomInclination0AngleValue5	Component inspection/component lifting/setting 5/tilt (0-180°)/angle [absolute value] (°) measured value
CustomInclination0AngleSignedValue5	Component inspection/component lifting/setting 5/tilt (0-180°)/angle [absolute value] (°) measured value (signed)
CustomInclination0AngleResult5	Component inspection/component lifting/setting 5/tilt (0-180°)/angle [absolute value] (°) inspection result
CustomInclination90HeightUpperLimit5	Component inspection/component lifting/setting 5/tilt (90-270°)/height [absolute value] (mm) upper limit
CustomInclination90HeightValue5	Component inspection/component lifting/setting 5/tilt (90-270°)/height [absolute value] (mm) measured value
CustomInclination90HeightSignedValue5	Component inspection/component lifting/setting 5/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
CustomInclination90HeightResult5	Component inspection/component lifting/setting 5/tilt (90-270°)/height [absolute value] (mm) inspection result
CustomInclination90AngleUpperLimit5	Component inspection/component lifting/setting 5/tilt (90-270°)/angle [absolute value] (°) upper limit
CustomInclination90AngleValue5	Component inspection/component lifting/setting 5/tilt (90-270°)/angle [absolute value] (°) measured value
CustomInclination90AngleSignedValue5	Component inspection/component lifting/setting 5/tilt (90-270°)/angle [absolute value] (°) measured value (signed)

CustomInclination90AngleResult5	Component inspection/component lifting/setting 5/tilt (90-270°)/angle [absolute value] (°) inspection result
CustomLiftAverageHeightUpperLimit5	Component inspection/component lifting/setting 5/lifting (average height) (mm) upper limit
CustomLiftAverageHeightValue5	Component inspection/component lifting/setting 5/lifting (average height) (mm) measured value
CustomLiftAverageHeightResult5	Component inspection/component lifting/setting 5/lifting (average height) (mm) inspection result
CustomInclination0HeightUpperLimit6	Component inspection/component lifting/setting 6/tilt (0-180°)/height [absolute value] (mm) upper limit
CustomInclination0HeightValue6	Component inspection/component lifting/setting 6/tilt (0-180°)/height [absolute value] (mm) measured value
CustomInclination0HeightSignedValue6	Component inspection/component lifting/setting 6/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
CustomInclination0HeightResult6	Component inspection/component lifting/setting 6/tilt (0-180°)/height [absolute value] (mm) inspection result
CustomInclination0AngleUpperLimit6	Component inspection/component lifting/setting 6/tilt (0-180°)/angle [absolute value] (°) upper limit
CustomInclination0AngleValue6	Component inspection/component lifting/setting 6/tilt (0-180°)/angle [absolute value] (°) measured value
CustomInclination0AngleSignedValue6	Component inspection/component lifting/setting 6/tilt (0-180°)/angle [absolute value] (°) measured value (signed)
CustomInclination0AngleResult6	Component inspection/component lifting/setting 6/tilt (0-180°)/angle [absolute value] (°) inspection result
CustomInclination90HeightUpperLimit6	Component inspection/component lifting/setting 6/tilt (90-270°)/height [absolute value] (mm) upper limit
CustomInclination90HeightValue6	Component inspection/component lifting/setting 6/tilt (90-270°)/height [absolute value] (mm) measured value
CustomInclination90HeightSignedValue6	Component inspection/component lifting/setting 6/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
CustomInclination90HeightResult6	Component inspection/component lifting/setting 6/tilt (90-270°)/height [absolute value] (mm) inspection result
CustomInclination90AngleUpperLimit6	Component inspection/component lifting/setting 6/tilt (90-270°)/angle [absolute value] (°) upper limit
CustomInclination90AngleValue6	Component inspection/component lifting/setting 6/tilt (90-270°)/angle [absolute value] (°) measured value
CustomInclination90AngleSignedValue6	Component inspection/component lifting/setting 6/tilt (90-270°)/angle [absolute value] (°) measured value (signed)
CustomInclination90AngleResult6	Component inspection/component lifting/setting 6/tilt (90-270°)/angle [absolute value] (°) inspection result
CustomLiftAverageHeightUpperLimit6	Component inspection/component lifting/setting 6/lifting (average height) (mm) upper limit
CustomLiftAverageHeightValue6	Component inspection/component lifting/setting 6/lifting (average height) (mm) measured value
CustomLiftAverageHeightResult6	Component inspection/component lifting/setting 6/lifting (average height) (mm) inspection result
CustomInclination0HeightUpperLimit7	Component inspection/component lifting/setting 7/tilt (0-180°)/height [absolute value] (mm) upper limit
CustomInclination0HeightValue7	Component inspection/component lifting/setting 7/tilt (0-180°)/height [absolute value] (mm) measured value
CustomInclination0HeightSignedValue7	Component inspection/component lifting/setting 7/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
CustomInclination0HeightResult7	Component inspection/component lifting/setting 7/tilt (0-180°)/height [absolute value] (mm) inspection result
CustomInclination0AngleUpperLimit7	Component inspection/component lifting/setting 7/tilt (0-180°)/angle [absolute value] (°) upper limit

CustomInclination0AngleValue7	Component inspection/component lifting/setting 7/tilt (0-180°)/angle [absolute value] (°) measured value
CustomInclination0AngleSignedValue7	Component inspection/component lifting/setting 7/tilt (0-180°)/angle [absolute value] (°) measured value (signed)
CustomInclination0AngleResult7	Component inspection/component lifting/setting 7/tilt (0-180°)/angle [absolute value] (°) inspection result
CustomInclination90HeightUpperLimit7	Component inspection/component lifting/setting 7/tilt (90-270°)/height [absolute value] (mm) upper limit
CustomInclination90HeightValue7	Component inspection/component lifting/setting 7/tilt (90-270°)/height [absolute value] (mm) measured value
CustomInclination90HeightSignedValue7	Component inspection/component lifting/setting 7/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
CustomInclination90HeightResult7	Component inspection/component lifting/setting 7/tilt (90-270°)/height [absolute value] (mm) inspection result
CustomInclination90AngleUpperLimit7	Component inspection/component lifting/setting 7/tilt (90-270°)/angle [absolute value] (°) upper limit
CustomInclination90AngleValue7	Component inspection/component lifting/setting 7/tilt (90-270°)/angle [absolute value] (°) measured value
CustomInclination90AngleSignedValue7	Component inspection/component lifting/setting 7/tilt (90-270°)/angle [absolute value] (°) measured value (signed)
CustomInclination90AngleResult7	Component inspection/component lifting/setting 7/tilt (90-270°)/angle [absolute value] (°) inspection result
CustomLiftAverageHeightUpperLimit7	Component inspection/component lifting/setting 7/lifting (average height) (mm) upper limit
CustomLiftAverageHeightValue7	Component inspection/component lifting/setting 7/lifting (average height) (mm) measured value
CustomLiftAverageHeightResult7	Component inspection/component lifting/setting 7/lifting (average height) (mm) inspection result
CustomInclination0HeightUpperLimit8	Component inspection/component lifting/setting 8/tilt (0-180°)/height [absolute value] (mm) upper limit
CustomInclination0HeightValue8	Component inspection/component lifting/setting 8/tilt (0-180°)/height [absolute value] (mm) measured value
CustomInclination0HeightSignedValue8	Component inspection/component lifting/setting 8/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
CustomInclination0HeightResult8	Component inspection/component lifting/setting 8/tilt (0-180°)/height [absolute value] (mm) inspection result
CustomInclination0AngleUpperLimit8	Component inspection/component lifting/setting 8/tilt (0-180°)/angle [absolute value] (°) upper limit
CustomInclination0AngleValue8	Component inspection/component lifting/setting 8/tilt (0-180°)/angle [absolute value] (°) measured value
CustomInclination0AngleSignedValue8	Component inspection/component lifting/setting 8/tilt (0-180°)/angle [absolute value] (°) measured value (signed)
CustomInclination0AngleResult8	Component inspection/component lifting/setting 8/tilt (0-180°)/angle [absolute value] (°) inspection result
CustomInclination90HeightUpperLimit8	Component inspection/component lifting/setting 8/tilt (90-270°)/height [absolute value] (mm) upper limit
CustomInclination90HeightValue8	Component inspection/component lifting/setting 8/tilt (90-270°)/height [absolute value] (mm) measured value
CustomInclination90HeightSignedValue8	Component inspection/component lifting/setting 8/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
CustomInclination90HeightResult8	Component inspection/component lifting/setting 8/tilt (90-270°)/height [absolute value] (mm) inspection result
CustomInclination90AngleUpperLimit8	Component inspection/component lifting/setting 8/tilt (90-270°)/angle [absolute value] (°) upper limit
CustomInclination90AngleValue8	Component inspection/component lifting/setting 8/tilt (90-270°)/angle [absolute value] (°) measured value

CustomInclination90AngleSignedValue8	Component inspection/component lifting/setting 8/tilt (90-270°)/angle [absolute value] (°) measured value (signed)
CustomInclination90AngleResult8	Component inspection/component lifting/setting 8/tilt (90-270°)/angle [absolute value] (°) inspection result
CustomLiftAverageHeightUpperLimit8	Component inspection/component lifting/setting 8/lifting (average height) (mm) upper limit
CustomLiftAverageHeightValue8	Component inspection/component lifting/setting 8/lifting (average height) (mm) measured value
CustomLiftAverageHeightResult8	Component inspection/component lifting/setting 8/lifting (average height) (mm) inspection result
CustomInclination0HeightUpperLimit9	Component inspection/component lifting/setting 9/tilt (0-180°)/height [absolute value] (mm) upper limit
CustomInclination0HeightValue9	Component inspection/component lifting/setting 9/tilt (0-180°)/height [absolute value] (mm) measured value
CustomInclination0HeightSignedValue9	Component inspection/component lifting/setting 9/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
CustomInclination0HeightResult9	Component inspection/component lifting/setting 9/tilt (0-180°)/height [absolute value] (mm) inspection result
CustomInclination0AngleUpperLimit9	Component inspection/component lifting/setting 9/tilt (0-180°)/angle [absolute value] (°) upper limit
CustomInclination0AngleValue9	Component inspection/component lifting/setting 9/tilt (0-180°)/angle [absolute value] (°) measured value
CustomInclination0AngleSignedValue9	Component inspection/component lifting/setting 9/tilt (0-180°)/angle [absolute value] (°) measured value (signed)
CustomInclination0AngleResult9	Component inspection/component lifting/setting 9/tilt (0-180°)/angle [absolute value] (°) inspection result
CustomInclination90HeightUpperLimit9	Component inspection/component lifting/setting 9/tilt (90-270°)/height [absolute value] (mm) upper limit
CustomInclination90HeightValue9	Component inspection/component lifting/setting 9/tilt (90-270°)/height [absolute value] (mm) measured value
CustomInclination90HeightSignedValue9	Component inspection/component lifting/setting 9/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
CustomInclination90HeightResult9	Component inspection/component lifting/setting 9/tilt (90-270°)/height [absolute value] (mm) inspection result
CustomInclination90AngleUpperLimit9	Component inspection/component lifting/setting 9/tilt (90-270°)/angle [absolute value] (°) upper limit
CustomInclination90AngleValue9	Component inspection/component lifting/setting 9/tilt (90-270°)/angle [absolute value] (°) measured value
CustomInclination90AngleSignedValue9	Component inspection/component lifting/setting 9/tilt (90-270°)/angle [absolute value] (°) measured value (signed)
CustomInclination90AngleResult9	Component inspection/component lifting/setting 9/tilt (90-270°)/angle [absolute value] (°) inspection result
CustomLiftAverageHeightUpperLimit9	Component inspection/component lifting/setting 9/lifting (average height) (mm) upper limit
CustomLiftAverageHeightValue9	Component inspection/component lifting/setting 9/lifting (average height) (mm) measured value
CustomLiftAverageHeightResult9	Component inspection/component lifting/setting 9/lifting (average height) (mm) inspection result
CustomInclination0HeightUpperLimit10	Component inspection/component lifting/setting 10/tilt (0-180°)/height [absolute value] (mm) upper limit
CustomInclination0HeightValue10	Component inspection/component lifting/setting 10/tilt (0-180°)/height [absolute value] (mm) measured value
CustomInclination0HeightSignedValue10	Component inspection/component lifting/setting 10/tilt (0-180°)/height [absolute value] (mm) measured value (signed)
CustomInclination0HeightResult10	Component inspection/component lifting/setting 10/tilt (0-180°)/height [absolute value] (mm) inspection result

CustomInclination0AngleUpperLimit10	Component inspection/component lifting/setting 10/tilt (0-180°)/angle [absolute value] (°) upper limit
CustomInclination0AngleValue10	Component inspection/component lifting/setting 10/tilt (0-180°)/angle [absolute value] (°) measured value
CustomInclination0AngleSignedValue10	Component inspection/component lifting/setting 10/tilt (0-180°)/angle [absolute value] (°) measured value (signed)
CustomInclination0AngleResult10	Component inspection/component lifting/setting 10/tilt (0-180°)/angle [absolute value] (°) inspection result
CustomInclination90HeightUpperLimit10	Component inspection/component lifting/setting 10/tilt (90-270°)/height [absolute value] (mm) upper limit
CustomInclination90HeightValue10	Component inspection/component lifting/setting 10/tilt (90-270°)/height [absolute value] (mm) measured value
CustomInclination90HeightSignedValue10	Component inspection/component lifting/setting 10/tilt (90-270°)/height [absolute value] (mm) measured value (signed)
CustomInclination90HeightResult10	Component inspection/component lifting/setting 10/tilt (90-270°)/height [absolute value] (mm) inspection result
CustomInclination90AngleUpperLimit10	Component inspection/component lifting/setting 10/tilt (90-270°)/angle [absolute value] (°) upper limit
CustomInclination90AngleValue10	Component inspection/component lifting/setting 10/tilt (90-270°)/angle [absolute value] (°) measured value
CustomInclination90AngleSignedValue10	Component inspection/component lifting/setting 10/tilt (90-270°)/angle [absolute value] (°) measured value (signed)
CustomInclination90AngleResult10	Component inspection/component lifting/setting 10/tilt (90-270°)/angle [absolute value] (°) inspection result
CustomLiftAverageHeightUpperLimit10	Component inspection/component lifting/setting 10/lifting (average height) (mm) upper limit
CustomLiftAverageHeightValue10	Component inspection/component lifting/setting 10/lifting (average height) (mm) measured value
CustomLiftAverageHeightResult10	Component inspection/component lifting/setting 10/lifting (average height) (mm) inspection result
CustomExposedBasisMetal1UpperLimit	Land exposure/setting 1/land exposure (%) upper limit
CustomExposedBasisMetal1Value	Land exposure/setting 1/land exposure (%) measured value
CustomExposedBasisMetal1Result	Land exposure/setting 1/land exposure (%) inspection result
CustomExposedBasisMetal2UpperLimit	Land exposure/setting 2/land exposure (%) upper limit
CustomExposedBasisMetal2Value	Land exposure/setting 2/land exposure (%) measured value
CustomExposedBasisMetal2Result	Land exposure/setting 2/land exposure (%) inspection result
CustomExposedBasisMetal3UpperLimit	Land exposure/setting 3/land exposure (%) upper limit
CustomExposedBasisMetal3Value	Land exposure/setting 3/land exposure (%) measured value
CustomExposedBasisMetal3Result	Land exposure/setting 3/land exposure (%) inspection result
CustomExposedBasisMetal4UpperLimit	Land exposure/setting 4/land exposure (%) upper limit
CustomExposedBasisMetal4Value	Land exposure/setting 4/land exposure (%) measured value
CustomExposedBasisMetal4Result	Land exposure/setting 4/land exposure (%) inspection result
CustomExposedBasisMetal5UpperLimit	Land exposure/setting 5/land exposure (%) upper limit
CustomExposedBasisMetal5Value	Land exposure/setting 5/land exposure (%) measured value
CustomExposedBasisMetal5Result	Land exposure/setting 5/land exposure (%) inspection result
CustomExposedBasisMetal6UpperLimit	Land exposure/setting 6/land exposure (%) upper limit
CustomExposedBasisMetal6Value	Land exposure/setting 6/land exposure (%) measured value
CustomExposedBasisMetal6Result	Land exposure/setting 6/land exposure (%) inspection result
CustomExposedBasisMetal7UpperLimit	Land exposure/setting 7/land exposure (%) upper limit
CustomExposedBasisMetal7Value	Land exposure/setting 7/land exposure (%) measured value
CustomExposedBasisMetal7Result	Land exposure/setting 7/land exposure (%) inspection result
CustomExposedBasisMetal8UpperLimit	Land exposure/setting 8/land exposure (%) upper limit
CustomExposedBasisMetal8Value	Land exposure/setting 8/land exposure (%) measured value
CustomExposedBasisMetal8Result	Land exposure/setting 8/land exposure (%) inspection result
CustomExposedBasisMetal9UpperLimit	Land exposure/setting 9/land exposure (%) upper limit
CustomExposedBasisMetal9Value	Land exposure/setting 9/land exposure (%) measured value
CustomExposedBasisMetal9Result	Land exposure/setting 9/land exposure (%) inspection result
CustomExposedBasisMetal10UpperLimit	Land exposure/setting 10/land exposure (%) upper limit

CustomExposedBasisMetal10Value	Land exposure/setting 10/land exposure (%) measured value
CustomExposedBasisMetal10Result	Land exposure/setting 10/land exposure (%) inspection result
CustomLandErrorRegion11LowerLimit	Land error/setting 11 (%) lower limit
CustomLandErrorRegion11UpperLimit	Land error/setting 11 (%) upper limit
CustomLandErrorRegion11Value	Land error/setting 11 (%) measured value
CustomLandErrorRegion11Result	Land error/setting 11 (%) inspection result
CustomLandErrorRegion12LowerLimit	Land error/setting 12 (%) lower limit
CustomLandErrorRegion12UpperLimit	Land error/setting 12 (%) upper limit
CustomLandErrorRegion12Value	Land error/setting 12 (%) measured value
CustomLandErrorRegion12Result	Land error/setting 12 (%) inspection result
CustomLandErrorRegion13LowerLimit	Land error/setting 13 (%) lower limit
CustomLandErrorRegion13UpperLimit	Land error/setting 13 (%) upper limit
CustomLandErrorRegion13Value	Land error/setting 13 (%) measured value
CustomLandErrorRegion13Result	Land error/setting 13 (%) inspection result
CustomLandErrorRegion14LowerLimit	Land error/setting 14 (%) lower limit
CustomLandErrorRegion14UpperLimit	Land error/setting 14 (%) upper limit
CustomLandErrorRegion14Value	Land error/setting 14 (%) measured value
CustomLandErrorRegion14Result	Land error/setting 14 (%) inspection result
CustomLandErrorRegion15LowerLimit	Land error/setting 15 (%) lower limit
CustomLandErrorRegion15UpperLimit	Land error/setting 15 (%) upper limit
CustomLandErrorRegion15Value	Land error/setting 15 (%) measured value
CustomLandErrorRegion15Result	Land error/setting 15 (%) inspection result
CustomLandErrorRegion16LowerLimit	Land error/setting 16 (%) lower limit
CustomLandErrorRegion16UpperLimit	Land error/setting 16 (%) upper limit
CustomLandErrorRegion16Value	Land error/setting 16 (%) measured value
CustomLandErrorRegion16Result	Land error/setting 16 (%) inspection result
CustomLandErrorRegion17LowerLimit	Land error/setting 17 (%) lower limit
CustomLandErrorRegion17UpperLimit	Land error/setting 17 (%) upper limit
CustomLandErrorRegion17Value	Land error/setting 17 (%) measured value
CustomLandErrorRegion17Result	Land error/setting 17 (%) inspection result
CustomLandErrorRegion18LowerLimit	Land error/setting 18 (%) lower limit
CustomLandErrorRegion18UpperLimit	Land error/setting 18 (%) upper limit
CustomLandErrorRegion18Value	Land error/setting 18 (%) measured value
CustomLandErrorRegion18Result	Land error/setting 18 (%) inspection result
CustomLandErrorRegion19LowerLimit	Land error/setting 19 (%) lower limit
CustomLandErrorRegion19UpperLimit	Land error/setting 19 (%) upper limit
CustomLandErrorRegion19Value	Land error/setting 19 (%) measured value
CustomLandErrorRegion19Result	Land error/setting 19 (%) inspection result
CustomLandErrorRegion20LowerLimit	Land error/setting 20 (%) lower limit
CustomLandErrorRegion20UpperLimit	Land error/setting 20 (%) upper limit
CustomLandErrorRegion20Value	Land error/setting 20 (%) measured value
CustomLandErrorRegion20Result	Land error/setting 20 (%) inspection result
CustomLandErrorObliqueRegion11LowerLimit	Land error(oblique) /setting 11 (%) lower limit
CustomLandErrorObliqueRegion11UpperLimit	Land error(oblique) /setting 11 (%) upper limit
CustomLandErrorObliqueRegion11Value	Land error(oblique) /setting 11 (%) measured value
CustomLandErrorObliqueRegion12LowerLimit	Land error(oblique) /setting 12 (%) lower limit
CustomLandErrorObliqueRegion12UpperLimit	Land error(oblique) /setting 12 (%) upper limit
CustomLandErrorObliqueRegion12Value	Land error(oblique) /setting 12 (%) measured value
CustomLandErrorObliqueRegion13LowerLimit	Land error(oblique) /setting 13 (%) lower limit
CustomLandErrorObliqueRegion13UpperLimit	Land error(oblique) /setting 13 (%) upper limit
CustomLandErrorObliqueRegion13Value	Land error(oblique) /setting 13 (%) measured value
CustomLandErrorObliqueRegion14LowerLimit	Land error(oblique) /setting 14 (%) lower limit
CustomLandErrorObliqueRegion14UpperLimit	Land error(oblique) /setting 14 (%) upper limit
CustomLandErrorObliqueRegion14Value	Land error(oblique) /setting 14 (%) measured value
CustomLandErrorObliqueRegion15LowerLimit	Land error(oblique) /setting 15 (%) lower limit
CustomLandErrorObliqueRegion15UpperLimit	Land error(oblique) /setting 15 (%) upper limit
CustomLandErrorObliqueRegion15Value	Land error(oblique) /setting 15 (%) measured value
CustomLandErrorObliqueRegion16LowerLimit	Land error(oblique) /setting 16 (%) lower limit
CustomLandErrorObliqueRegion16UpperLimit	Land error(oblique) /setting 16 (%) upper limit

CustomLandErrorObliqueRegion16Value	Land error(oblique) /setting 16 (%) measured value
CustomLandErrorObliqueRegion17LowerLimit	Land error(oblique) /setting 17 (%) lower limit
CustomLandErrorObliqueRegion17UpperLimit	Land error(oblique) /setting 17 (%) upper limit
CustomLandErrorObliqueRegion17Value	Land error(oblique) /setting 17 (%) measured value
CustomLandErrorObliqueRegion18LowerLimit	Land error(oblique) /setting 18 (%) lower limit
CustomLandErrorObliqueRegion18UpperLimit	Land error(oblique) /setting 18 (%) upper limit
CustomLandErrorObliqueRegion18Value	Land error(oblique) /setting 18 (%) measured value
CustomLandErrorObliqueRegion19LowerLimit	Land error(oblique) /setting 19 (%) lower limit
CustomLandErrorObliqueRegion19UpperLimit	Land error(oblique) /setting 19 (%) upper limit
CustomLandErrorObliqueRegion19Value	Land error(oblique) /setting 19 (%) measured value
CustomLandErrorObliqueRegion20LowerLimit	Land error(oblique) /setting 20 (%) lower limit
CustomLandErrorObliqueRegion20UpperLimit	Land error(oblique) /setting 20 (%) upper limit
CustomLandErrorObliqueRegion20Value	Land error(oblique) /setting 20 (%) measured value
CustomSolderToePosition1LowerLimit	Solder toe/setting 1/solder toe/position (%) lower limit
CustomSolderToePosition1UpperLimit	Solder toe/setting 1/solder toe/position (%) upper limit
CustomSolderToePosition1Value	Solder toe/setting 1/solder toe/position (%) measured value
CustomSolderToePosition1Result	Solder toe/setting 1/solder toe/position (%) inspection result
CustomSolderToeArea1LowerLimit	Solder toe/setting 1/solder toe/toe area/area rate (%) lower limit
CustomSolderToeArea1UpperLimit	Solder toe/setting 1/solder toe/toe area/area rate (%) upper limit
CustomSolderToeArea1Value	Solder toe/setting 1/solder toe/toe area/area rate (%) measured value
CustomSolderToeArea1Result	Solder toe/setting 1/solder toe/toe area/area rate (%) inspection result
CustomSolderToePosition2LowerLimit	Solder toe/setting 2/solder toe/position (%) lower limit
CustomSolderToePosition2UpperLimit	Solder toe/setting 2/solder toe/position (%) upper limit
CustomSolderToePosition2Value	Solder toe/setting 2/solder toe/position (%) measured value
CustomSolderToePosition2Result	Solder toe/setting 2/solder toe/position (%) inspection result
CustomSolderToeArea2LowerLimit	Solder toe/setting 2/solder toe/toe area/area rate (%) lower limit
CustomSolderToeArea2UpperLimit	Solder toe/setting 2/solder toe/toe area/area rate (%) upper limit
CustomSolderToeArea2Value	Solder toe/setting 2/solder toe/toe area/area rate (%) measured value
CustomSolderToeArea2Result	Solder toe/setting 2/solder toe/toe area/area rate (%) inspection result
CustomSolderToePosition3LowerLimit	Solder toe/setting 3/solder toe/position (%) lower limit
CustomSolderToePosition3UpperLimit	Solder toe/setting 3/solder toe/position (%) upper limit
CustomSolderToePosition3Value	Solder toe/setting 3/solder toe/position (%) measured value
CustomSolderToePosition3Result	Solder toe/setting 3/solder toe/position (%) inspection result
CustomSolderToeArea3LowerLimit	Solder toe/setting 3/solder toe/toe area/area rate (%) lower limit
CustomSolderToeArea3UpperLimit	Solder toe/setting 3/solder toe/toe area/area rate (%) upper limit
CustomSolderToeArea3Value	Solder toe/setting 3/solder toe/toe area/area rate (%) measured value
CustomSolderToeArea3Result	Solder toe/setting 3/solder toe/toe area/area rate (%) inspection result
CustomSolderToePosition4LowerLimit	Solder toe/setting 4/solder toe/position (%) lower limit
CustomSolderToePosition4UpperLimit	Solder toe/setting 4/solder toe/position (%) upper limit
CustomSolderToePosition4Value	Solder toe/setting 4/solder toe/position (%) measured value
CustomSolderToePosition4Result	Solder toe/setting 4/solder toe/position (%) inspection result
CustomSolderToeArea4LowerLimit	Solder toe/setting 4/solder toe/toe area/area rate (%) lower limit
CustomSolderToeArea4UpperLimit	Solder toe/setting 4/solder toe/toe area/area rate (%) upper limit
CustomSolderToeArea4Value	Solder toe/setting 4/solder toe/toe area/area rate (%) measured value

CustomSolderToeArea4Result	Solder toe/setting 4/solder toe/toe area/area rate (%) inspection result
CustomSolderToePosition5LowerLimit	Solder toe/setting 5/solder toe/position (%) lower limit
CustomSolderToePosition5UpperLimit	Solder toe/setting 5/solder toe/position (%) upper limit
CustomSolderToePosition5Value	Solder toe/setting 5/solder toe/position (%) measured value
CustomSolderToePosition5Result	Solder toe/setting 5/solder toe/position (%) inspection result
CustomSolderToeArea5LowerLimit	Solder toe/setting 5/solder toe/toe area/area rate (%) lower limit
CustomSolderToeArea5UpperLimit	Solder toe/setting 5/solder toe/toe area/area rate (%) upper limit
CustomSolderToeArea5Value	Solder toe/setting 5/solder toe/toe area/area rate (%) measured value
CustomSolderToeArea5Result	Solder toe/setting 5/solder toe/toe area/area rate (%) inspection result
CustomSolderToePosition6LowerLimit	Solder toe/setting 6/solder toe/position (%) lower limit
CustomSolderToePosition6UpperLimit	Solder toe/setting 6/solder toe/position (%) upper limit
CustomSolderToePosition6Value	Solder toe/setting 6/solder toe/position (%) measured value
CustomSolderToePosition6Result	Solder toe/setting 6/solder toe/position (%) inspection result
CustomSolderToeArea6LowerLimit	Solder toe/setting 6/solder toe/toe area/area rate (%) lower limit
CustomSolderToeArea6UpperLimit	Solder toe/setting 6/solder toe/toe area/area rate (%) upper limit
CustomSolderToeArea6Value	Solder toe/setting 6/solder toe/toe area/area rate (%) measured value
CustomSolderToeArea6Result	Solder toe/setting 6/solder toe/toe area/area rate (%) inspection result
CustomSolderToePosition7LowerLimit	Solder toe/setting 7/solder toe/position (%) lower limit
CustomSolderToePosition7UpperLimit	Solder toe/setting 7/solder toe/position (%) upper limit
CustomSolderToePosition7Value	Solder toe/setting 7/solder toe/position (%) measured value
CustomSolderToePosition7Result	Solder toe/setting 7/solder toe/position (%) inspection result
CustomSolderToeArea7LowerLimit	Solder toe/setting 7/solder toe/toe area/area rate (%) lower limit
CustomSolderToeArea7UpperLimit	Solder toe/setting 7/solder toe/toe area/area rate (%) upper limit
CustomSolderToeArea7Value	Solder toe/setting 7/solder toe/toe area/area rate (%) measured value
CustomSolderToeArea7Result	Solder toe/setting 7/solder toe/toe area/area rate (%) inspection result
CustomSolderToePosition8LowerLimit	Solder toe/setting 8/solder toe/position (%) lower limit
CustomSolderToePosition8UpperLimit	Solder toe/setting 8/solder toe/position (%) upper limit
CustomSolderToePosition8Value	Solder toe/setting 8/solder toe/position (%) measured value
CustomSolderToePosition8Result	Solder toe/setting 8/solder toe/position (%) inspection result
CustomSolderToeArea8LowerLimit	Solder toe/setting 8/solder toe/toe area/area rate (%) lower limit
CustomSolderToeArea8UpperLimit	Solder toe/setting 8/solder toe/toe area/area rate (%) upper limit
CustomSolderToeArea8Value	Solder toe/setting 8/solder toe/toe area/area rate (%) measured value
CustomSolderToeArea8Result	Solder toe/setting 8/solder toe/toe area/area rate (%) inspection result
CustomSolderToePosition9LowerLimit	Solder toe/setting 9/solder toe/position (%) lower limit
CustomSolderToePosition9UpperLimit	Solder toe/setting 9/solder toe/position (%) upper limit
CustomSolderToePosition9Value	Solder toe/setting 9/solder toe/position (%) measured value
CustomSolderToePosition9Result	Solder toe/setting 9/solder toe/position (%) inspection result
CustomSolderToeArea9LowerLimit	Solder toe/setting 9/solder toe/toe area/area rate (%) lower limit
CustomSolderToeArea9UpperLimit	Solder toe/setting 9/solder toe/toe area/area rate (%) upper limit

CustomSolderToeArea9Value	Solder toe/setting 9/solder toe/toe area/area rate (%) measured value
CustomSolderToeArea9Result	Solder toe/setting 9/solder toe/toe area/area rate (%) inspection result
CustomSolderToePosition10LowerLimit	Solder toe/setting 10/solder toe/position (%) lower limit
CustomSolderToePosition10UpperLimit	Solder toe/setting 10/solder toe/position (%) upper limit
CustomSolderToePosition10Value	Solder toe/setting 10/solder toe/position (%) measured value
CustomSolderToePosition10Result	Solder toe/setting 10/solder toe/position (%) inspection result
CustomSolderToeArea10LowerLimit	Solder toe/setting 10/solder toe/toe area/area rate (%) lower limit
CustomSolderToeArea10UpperLimit	Solder toe/setting 10/solder toe/toe area/area rate (%) upper limit
CustomSolderToeArea10Value	Solder toe/setting 10/solder toe/toe area/area rate (%) measured value
CustomSolderToeArea10Result	Solder toe/setting 10/solder toe/toe area/area rate (%) inspection result
CustomSolderCenterMeanWidth1LowerLimit	Solder center/setting 1/solder center/average width (%) lower limit
CustomSolderCenterMeanWidth1UpperLimit	Solder center/setting 1/solder center/average width (%) upper limit
CustomSolderCenterMeanWidth1Value	Solder center/setting 1/solder center/average width (%) measured value
CustomSolderCenterMeanWidth1Result	Solder center/setting 1/solder center/average width (%) inspection result
CustomSolderCenterMaxLength1LowerLimit	Solder center/setting 1/solder center/maximum length (%) lower limit
CustomSolderCenterMaxLength1UpperLimit	Solder center/setting 1/solder center/maximum length (%) upper limit
CustomSolderCenterMaxLength1Value	Solder center/setting 1/solder center/maximum length (%) measured value
CustomSolderCenterMaxLength1Result	Solder center/setting 1/solder center/maximum length (%) inspection result
CustomSolderCenterBreadthRate1LowerLimit	Solder center/setting 1/solder center/breadth rate (%) lower limit
CustomSolderCenterBreadthRate1UpperLimit	Solder center/setting 1/solder center/breadth rate (%) upper limit
CustomSolderCenterBreadthRate1Value	Solder center/setting 1/solder center/breadth rate (%) measured value
CustomSolderCenterBreadthRate1Result	Solder center/setting 1/solder center/breadth rate (%) inspection result
CustomSolderCenterToeCenterArea1LowerLimit	Solder center/setting 1/solder center/toe center Area (%) lower limit
CustomSolderCenterToeCenterArea1UpperLimit	Solder center/setting 1/solder center/toe center Area (%) upper limit
CustomSolderCenterToeCenterArea1Value	Solder center/setting 1/solder center/toe center Area (%) measured value
CustomSolderCenterToeCenterArea1Result	Solder center/setting 1/solder center/toe center Area (%) inspection result
CustomSolderCenterMeanWidth2LowerLimit	Solder center/setting 2/solder center/average width (%) lower limit
CustomSolderCenterMeanWidth2UpperLimit	Solder center/setting 2/solder center/average width (%) upper limit
CustomSolderCenterMeanWidth2Value	Solder center/setting 2/solder center/average width (%) measured value
CustomSolderCenterMeanWidth2Result	Solder center/setting 2/solder center/average width (%) inspection result
CustomSolderCenterMaxLength2LowerLimit	Solder center/setting 2/solder center/maximum length (%) lower limit

CustomSolderCenterMaxLength2UpperLimit	Solder center/setting 2/solder center/maximum length (%) upper limit
CustomSolderCenterMaxLength2Value	Solder center/setting 2/solder center/maximum length (%) measured value
CustomSolderCenterMaxLength2Result	Solder center/setting 2/solder center/maximum length (%) inspection result
CustomSolderCenterBreadthRate2LowerLimit	Solder center/setting 2/solder center/breadth rate (%) lower limit
CustomSolderCenterBreadthRate2UpperLimit	Solder center/setting 2/solder center/breadth rate (%) upper limit
CustomSolderCenterBreadthRate2Value	Solder center/setting 2/solder center/breadth rate (%) measured value
CustomSolderCenterBreadthRate2Result	Solder center/setting 2/solder center/breadth rate (%) inspection result
CustomSolderCenterToeCenterArea2LowerLimit	Solder center/setting 2/solder center/toe center Area (%) lower limit
CustomSolderCenterToeCenterArea2UpperLimit	Solder center/setting 2/solder center/toe center Area (%) upper limit
CustomSolderCenterToeCenterArea2Value	Solder center/setting 2/solder center/toe center Area (%) measured value
CustomSolderCenterToeCenterArea2Result	Solder center/setting 2/solder center/toe center Area (%) inspection result
CustomSolderCenterMeanWidth3LowerLimit	Solder center/setting 3/solder center/average width (%) lower limit
CustomSolderCenterMeanWidth3UpperLimit	Solder center/setting 3/solder center/average width (%) upper limit
CustomSolderCenterMeanWidth3Value	Solder center/setting 3/solder center/average width (%) measured value
CustomSolderCenterMeanWidth3Result	Solder center/setting 3/solder center/average width (%) inspection result
CustomSolderCenterMaxLength3LowerLimit	Solder center/setting 3/solder center/maximum length (%) lower limit
CustomSolderCenterMaxLength3UpperLimit	Solder center/setting 3/solder center/maximum length (%) upper limit
CustomSolderCenterMaxLength3Value	Solder center/setting 3/solder center/maximum length (%) measured value
CustomSolderCenterMaxLength3Result	Solder center/setting 3/solder center/maximum length (%) inspection result
CustomSolderCenterBreadthRate3LowerLimit	Solder center/setting 3/solder center/breadth rate (%) lower limit
CustomSolderCenterBreadthRate3UpperLimit	Solder center/setting 3/solder center/breadth rate (%) upper limit
CustomSolderCenterBreadthRate3Value	Solder center/setting 3/solder center/breadth rate (%) measured value
CustomSolderCenterBreadthRate3Result	Solder center/setting 3/solder center/breadth rate (%) inspection result
CustomSolderCenterToeCenterArea3LowerLimit	Solder center/setting 3/solder center/toe center Area (%) lower limit
CustomSolderCenterToeCenterArea3UpperLimit	Solder center/setting 3/solder center/toe center Area (%) upper limit
CustomSolderCenterToeCenterArea3Value	Solder center/setting 3/solder center/toe center Area (%) measured value
CustomSolderCenterToeCenterArea3Result	Solder center/setting 3/solder center/toe center Area (%) inspection result
CustomSolderCenterMeanWidth4LowerLimit	Solder center/setting 4/solder center/average width (%) lower limit
CustomSolderCenterMeanWidth4UpperLimit	Solder center/setting 4/solder center/average width (%) upper limit

CustomSolderCenterMeanWidth4Value	Solder center/setting 4/solder center/average width (%) measured value
CustomSolderCenterMeanWidth4Result	Solder center/setting 4/solder center/average width (%) inspection result
CustomSolderCenterMaxLength4LowerLimit	Solder center/setting 4/solder center/maximum length (%) lower limit
CustomSolderCenterMaxLength4UpperLimit	Solder center/setting 4/solder center/maximum length (%) upper limit
CustomSolderCenterMaxLength4Value	Solder center/setting 4/solder center/maximum length (%) measured value
CustomSolderCenterMaxLength4Result	Solder center/setting 4/solder center/maximum length (%) inspection result
CustomSolderCenterBreadthRate4LowerLimit	Solder center/setting 4/solder center/breadth rate (%) lower limit
CustomSolderCenterBreadthRate4UpperLimit	Solder center/setting 4/solder center/breadth rate (%) upper limit
CustomSolderCenterBreadthRate4Value	Solder center/setting 4/solder center/breadth rate (%) measured value
CustomSolderCenterBreadthRate4Result	Solder center/setting 4/solder center/breadth rate (%) inspection result
CustomSolderCenterToeCenterArea4LowerLimit	Solder center/setting 4/solder center/toe center Area (%) lower limit
CustomSolderCenterToeCenterArea4UpperLimit	Solder center/setting 4/solder center/toe center Area (%) upper limit
CustomSolderCenterToeCenterArea4Value	Solder center/setting 4/solder center/toe center Area (%) measured value
CustomSolderCenterToeCenterArea4Result	Solder center/setting 4/solder center/toe center Area (%) inspection result
CustomSolderCenterMeanWidth5LowerLimit	Solder center/setting 5/solder center/average width (%) lower limit
CustomSolderCenterMeanWidth5UpperLimit	Solder center/setting 5/solder center/average width (%) upper limit
CustomSolderCenterMeanWidth5Value	Solder center/setting 5/solder center/average width (%) measured value
CustomSolderCenterMeanWidth5Result	Solder center/setting 5/solder center/average width (%) inspection result
CustomSolderCenterMaxLength5LowerLimit	Solder center/setting 5/solder center/maximum length (%) lower limit
CustomSolderCenterMaxLength5UpperLimit	Solder center/setting 5/solder center/maximum length (%) upper limit
CustomSolderCenterMaxLength5Value	Solder center/setting 5/solder center/maximum length (%) measured value
CustomSolderCenterMaxLength5Result	Solder center/setting 5/solder center/maximum length (%) inspection result
CustomSolderCenterBreadthRate5LowerLimit	Solder center/setting 5/solder center/breadth rate (%) lower limit
CustomSolderCenterBreadthRate5UpperLimit	Solder center/setting 5/solder center/breadth rate (%) upper limit
CustomSolderCenterBreadthRate5Value	Solder center/setting 5/solder center/breadth rate (%) measured value
CustomSolderCenterBreadthRate5Result	Solder center/setting 5/solder center/breadth rate (%) inspection result
CustomSolderCenterToeCenterArea5LowerLimit	Solder center/setting 5/solder center/toe center Area (%) lower limit
CustomSolderCenterToeCenterArea5UpperLimit	Solder center/setting 5/solder center/toe center Area (%) upper limit
CustomSolderCenterToeCenterArea5Value	Solder center/setting 5/solder center/toe center Area (%) measured value

CustomSolderCenterToeCenterArea5Result	Solder center/setting 5/solder center/toe center Area (%) inspection result
CustomSolderCenterMeanWidth6LowerLimit	Solder center/setting 6/solder center/average width (%) lower limit
CustomSolderCenterMeanWidth6UpperLimit	Solder center/setting 6/solder center/average width (%) upper limit
CustomSolderCenterMeanWidth6Value	Solder center/setting 6/solder center/average width (%) measured value
CustomSolderCenterMeanWidth6Result	Solder center/setting 6/solder center/average width (%) inspection result
CustomSolderCenterMaxLength6LowerLimit	Solder center/setting 6/solder center/maximum length (%) lower limit
CustomSolderCenterMaxLength6UpperLimit	Solder center/setting 6/solder center/maximum length (%) upper limit
CustomSolderCenterMaxLength6Value	Solder center/setting 6/solder center/maximum length (%) measured value
CustomSolderCenterMaxLength6Result	Solder center/setting 6/solder center/maximum length (%) inspection result
CustomSolderCenterBreadthRate6LowerLimit	Solder center/setting 6/solder center/breadth rate (%) lower limit
CustomSolderCenterBreadthRate6UpperLimit	Solder center/setting 6/solder center/breadth rate (%) upper limit
CustomSolderCenterBreadthRate6Value	Solder center/setting 6/solder center/breadth rate (%) measured value
CustomSolderCenterBreadthRate6Result	Solder center/setting 6/solder center/breadth rate (%) inspection result
CustomSolderCenterToeCenterArea6LowerLimit	Solder center/setting 6/solder center/toe center Area (%) lower limit
CustomSolderCenterToeCenterArea6UpperLimit	Solder center/setting 6/solder center/toe center Area (%) upper limit
CustomSolderCenterToeCenterArea6Value	Solder center/setting 6/solder center/toe center Area (%) measured value
CustomSolderCenterToeCenterArea6Result	Solder center/setting 6/solder center/toe center Area (%) inspection result
CustomSolderCenterMeanWidth7LowerLimit	Solder center/setting 7/solder center/average width (%) lower limit
CustomSolderCenterMeanWidth7UpperLimit	Solder center/setting 7/solder center/average width (%) upper limit
CustomSolderCenterMeanWidth7Value	Solder center/setting 7/solder center/average width (%) measured value
CustomSolderCenterMeanWidth7Result	Solder center/setting 7/solder center/average width (%) inspection result
CustomSolderCenterMaxLength7LowerLimit	Solder center/setting 7/solder center/maximum length (%) lower limit
CustomSolderCenterMaxLength7UpperLimit	Solder center/setting 7/solder center/maximum length (%) upper limit
CustomSolderCenterMaxLength7Value	Solder center/setting 7/solder center/maximum length (%) measured value
CustomSolderCenterMaxLength7Result	Solder center/setting 7/solder center/maximum length (%) inspection result
CustomSolderCenterBreadthRate7LowerLimit	Solder center/setting 7/solder center/breadth rate (%) lower limit
CustomSolderCenterBreadthRate7UpperLimit	Solder center/setting 7/solder center/breadth rate (%) upper limit
CustomSolderCenterBreadthRate7Value	Solder center/setting 7/solder center/breadth rate (%) measured value
CustomSolderCenterBreadthRate7Result	Solder center/setting 7/solder center/breadth rate (%) inspection result

CustomSolderCenterToeCenterArea7LowerLimit	Solder center/setting 7/solder center/toe center Area (%) lower limit
CustomSolderCenterToeCenterArea7UpperLimit	Solder center/setting 7/solder center/toe center Area (%) upper limit
CustomSolderCenterToeCenterArea7Value	Solder center/setting 7/solder center/toe center Area (%) measured value
CustomSolderCenterToeCenterArea7Result	Solder center/setting 7/solder center/toe center Area (%) inspection result
CustomSolderCenterMeanWidth8LowerLimit	Solder center/setting 8/solder center/average width (%) lower limit
CustomSolderCenterMeanWidth8UpperLimit	Solder center/setting 8/solder center/average width (%) upper limit
CustomSolderCenterMeanWidth8Value	Solder center/setting 8/solder center/average width (%) measured value
CustomSolderCenterMeanWidth8Result	Solder center/setting 8/solder center/average width (%) inspection result
CustomSolderCenterMaxLength8LowerLimit	Solder center/setting 8/solder center/maximum length (%) lower limit
CustomSolderCenterMaxLength8UpperLimit	Solder center/setting 8/solder center/maximum length (%) upper limit
CustomSolderCenterMaxLength8Value	Solder center/setting 8/solder center/maximum length (%) measured value
CustomSolderCenterMaxLength8Result	Solder center/setting 8/solder center/maximum length (%) inspection result
CustomSolderCenterBreadthRate8LowerLimit	Solder center/setting 8/solder center/breadth rate (%) lower limit
CustomSolderCenterBreadthRate8UpperLimit	Solder center/setting 8/solder center/breadth rate (%) upper limit
CustomSolderCenterBreadthRate8Value	Solder center/setting 8/solder center/breadth rate (%) measured value
CustomSolderCenterBreadthRate8Result	Solder center/setting 8/solder center/breadth rate (%) inspection result
CustomSolderCenterToeCenterArea8LowerLimit	Solder center/setting 8/solder center/toe center Area (%) lower limit
CustomSolderCenterToeCenterArea8UpperLimit	Solder center/setting 8/solder center/toe center Area (%) upper limit
CustomSolderCenterToeCenterArea8Value	Solder center/setting 8/solder center/toe center Area (%) measured value
CustomSolderCenterToeCenterArea8Result	Solder center/setting 8/solder center/toe center Area (%) inspection result
CustomSolderCenterMeanWidth9LowerLimit	Solder center/setting 9/solder center/average width (%) lower limit
CustomSolderCenterMeanWidth9UpperLimit	Solder center/setting 9/solder center/average width (%) upper limit
CustomSolderCenterMeanWidth9Value	Solder center/setting 9/solder center/average width (%) measured value
CustomSolderCenterMeanWidth9Result	Solder center/setting 9/solder center/average width (%) inspection result
CustomSolderCenterMaxLength9LowerLimit	Solder center/setting 9/solder center/maximum length (%) lower limit
CustomSolderCenterMaxLength9UpperLimit	Solder center/setting 9/solder center/maximum length (%) upper limit
CustomSolderCenterMaxLength9Value	Solder center/setting 9/solder center/maximum length (%) measured value
CustomSolderCenterMaxLength9Result	Solder center/setting 9/solder center/maximum length (%) inspection result
CustomSolderCenterBreadthRate9LowerLimit	Solder center/setting 9/solder center/breadth rate (%) lower limit
CustomSolderCenterBreadthRate9UpperLimit	Solder center/setting 9/solder center/breadth rate (%) upper limit

CustomSolderCenterBreadthRate9Value	Solder center/setting 9/solder center/breadth rate (%) measured value
CustomSolderCenterBreadthRate9Result	Solder center/setting 9/solder center/breadth rate (%) inspection result
CustomSolderCenterToeCenterArea9LowerLimit	Solder center/setting 9/solder center/toe center Area (%) lower limit
CustomSolderCenterToeCenterArea9UpperLimit	Solder center/setting 9/solder center/toe center Area (%) upper limit
CustomSolderCenterToeCenterArea9Value	Solder center/setting 9/solder center/toe center Area (%) measured value
CustomSolderCenterToeCenterArea9Result	Solder center/setting 9/solder center/toe center Area (%) inspection result
CustomSolderCenterMeanWidth10LowerLimit	Solder center/setting 10/solder center/average width (%) lower limit
CustomSolderCenterMeanWidth10UpperLimit	Solder center/setting 10/solder center/average width (%) upper limit
CustomSolderCenterMeanWidth10Value	Solder center/setting 10/solder center/average width (%) measured value
CustomSolderCenterMeanWidth10Result	Solder center/setting 10/solder center/average width (%) inspection result
CustomSolderCenterMaxLength10LowerLimit	Solder center/setting 10/solder center/maximum length (%) lower limit
CustomSolderCenterMaxLength10UpperLimit	Solder center/setting 10/solder center/maximum length (%) upper limit
CustomSolderCenterMaxLength10Value	Solder center/setting 10/solder center/maximum length (%) measured value
CustomSolderCenterMaxLength10Result	Solder center/setting 10/solder center/maximum length (%) inspection result
CustomSolderCenterBreadthRate10LowerLimit	Solder center/setting 10/solder center/breadth rate (%) lower limit
CustomSolderCenterBreadthRate10UpperLimit	Solder center/setting 10/solder center/breadth rate (%) upper limit
CustomSolderCenterBreadthRate10Value	Solder center/setting 10/solder center/breadth rate (%) measured value
CustomSolderCenterBreadthRate10Result	Solder center/setting 10/solder center/breadth rate (%) inspection result
CustomSolderCenterToeCenterArea10LowerLimit	Solder center/setting 10/solder center/toe center Area (%) lower limit
CustomSolderCenterToeCenterArea10UpperLimit	Solder center/setting 10/solder center/toe center Area (%) upper limit
CustomSolderCenterToeCenterArea10Value	Solder center/setting 10/solder center/toe center Area (%) measured value
CustomSolderCenterToeCenterArea10Result	Solder center/setting 10/solder center/toe center Area (%) inspection result
CustomLandToeLength1LowerLimit	Land protrusion length/setting 1/land protrusion length (mm) lower limit
CustomLandToeLength1UpperLimit	Land protrusion length/setting 1/land protrusion length (mm) upper limit
CustomLandToeLength1Value	Land protrusion length/setting 1/land protrusion length (mm) measured value
CustomLandToeLength1Result	Land protrusion length/setting 1/land protrusion length (mm) inspection result
CustomLandToeLength2LowerLimit	Land protrusion length/setting 2/land protrusion length (mm) lower limit
CustomLandToeLength2UpperLimit	Land protrusion length/setting 2/land protrusion length (mm) upper limit
CustomLandToeLength2Value	Land protrusion length/setting 2/land protrusion length (mm) measured value

CustomLandToeLength2Result	Land protrusion length/setting 2/land protrusion length (mm) inspection result
CustomLandToeLength3LowerLimit	Land protrusion length/setting 3/land protrusion length (mm) lower limit
CustomLandToeLength3UpperLimit	Land protrusion length/setting 3/land protrusion length (mm) upper limit
CustomLandToeLength3Value	Land protrusion length/setting 3/land protrusion length (mm) measured value
CustomLandToeLength3Result	Land protrusion length/setting 3/land protrusion length (mm) inspection result
CustomLandToeLength4LowerLimit	Land protrusion length/setting 4/land protrusion length (mm) lower limit
CustomLandToeLength4UpperLimit	Land protrusion length/setting 4/land protrusion length (mm) upper limit
CustomLandToeLength4Value	Land protrusion length/setting 4/land protrusion length (mm) measured value
CustomLandToeLength4Result	Land protrusion length/setting 4/land protrusion length (mm) inspection result
CustomLandToeLength5LowerLimit	Land protrusion length/setting 5/land protrusion length (mm) lower limit
CustomLandToeLength5UpperLimit	Land protrusion length/setting 5/land protrusion length (mm) upper limit
CustomLandToeLength5Value	Land protrusion length/setting 5/land protrusion length (mm) measured value
CustomLandToeLength5Result	Land protrusion length/setting 5/land protrusion length (mm) inspection result
CustomLandToeLength6LowerLimit	Land protrusion length/setting 6/land protrusion length (mm) lower limit
CustomLandToeLength6UpperLimit	Land protrusion length/setting 6/land protrusion length (mm) upper limit
CustomLandToeLength6Value	Land protrusion length/setting 6/land protrusion length (mm) measured value
CustomLandToeLength6Result	Land protrusion length/setting 6/land protrusion length (mm) inspection result
CustomLandToeLength7LowerLimit	Land protrusion length/setting 7/land protrusion length (mm) lower limit
CustomLandToeLength7UpperLimit	Land protrusion length/setting 7/land protrusion length (mm) upper limit
CustomLandToeLength7Value	Land protrusion length/setting 7/land protrusion length (mm) measured value
CustomLandToeLength7Result	Land protrusion length/setting 7/land protrusion length (mm) inspection result
CustomLandToeLength8LowerLimit	Land protrusion length/setting 8/land protrusion length (mm) lower limit
CustomLandToeLength8UpperLimit	Land protrusion length/setting 8/land protrusion length (mm) upper limit
CustomLandToeLength8Value	Land protrusion length/setting 8/land protrusion length (mm) measured value
CustomLandToeLength8Result	Land protrusion length/setting 8/land protrusion length (mm) inspection result
CustomLandToeLength9LowerLimit	Land protrusion length/setting 9/land protrusion length (mm) lower limit
CustomLandToeLength9UpperLimit	Land protrusion length/setting 9/land protrusion length (mm) upper limit
CustomLandToeLength9Value	Land protrusion length/setting 9/land protrusion length (mm) measured value
CustomLandToeLength9Result	Land protrusion length/setting 9/land protrusion length (mm) inspection result

CustomLandToeLength10LowerLimit	Land protrusion length/setting 10/land protrusion length (mm) lower limit
CustomLandToeLength10UpperLimit	Land protrusion length/setting 10/land protrusion length (mm) upper limit
CustomLandToeLength10Value	Land protrusion length/setting 10/land protrusion length (mm) measured value
CustomLandToeLength10Result	Land protrusion length/setting 10/land protrusion length (mm) inspection result
CustomLeadToeArea1LowerLimit	Lead toe/setting 1/lead toe/area lower limit
CustomLeadToeArea1UpperLimit	Lead toe/setting 1/lead toe/area upper limit
CustomLeadToeArea1Value	Lead toe/setting 1/lead toe/area measured value
CustomLeadToeArea1Result	Lead toe/setting 1/lead toe/area inspection result
CustomLeadToeArea2LowerLimit	Lead toe/setting 2/lead toe/area lower limit
CustomLeadToeArea2UpperLimit	Lead toe/setting 2/lead toe/area upper limit
CustomLeadToeArea2Value	Lead toe/setting 2/lead toe/area measured value
CustomLeadToeArea2Result	Lead toe/setting 2/lead toe/area inspection result
CustomLeadToeArea3LowerLimit	Lead toe/setting 3/lead toe/area lower limit
CustomLeadToeArea3UpperLimit	Lead toe/setting 3/lead toe/area upper limit
CustomLeadToeArea3Value	Lead toe/setting 3/lead toe/area measured value
CustomLeadToeArea3Result	Lead toe/setting 3/lead toe/area inspection result
CustomLeadToeArea4LowerLimit	Lead toe/setting 4/lead toe/area lower limit
CustomLeadToeArea4UpperLimit	Lead toe/setting 4/lead toe/area upper limit
CustomLeadToeArea4Value	Lead toe/setting 4/lead toe/area measured value
CustomLeadToeArea4Result	Lead toe/setting 4/lead toe/area inspection result
CustomLeadToeArea5LowerLimit	Lead toe/setting 5/lead toe/area lower limit
CustomLeadToeArea5UpperLimit	Lead toe/setting 5/lead toe/area upper limit
CustomLeadToeArea5Value	Lead toe/setting 5/lead toe/area measured value
CustomLeadToeArea5Result	Lead toe/setting 5/lead toe/area inspection result
CustomLeadToeArea6LowerLimit	Lead toe/setting 6/lead toe/area lower limit
CustomLeadToeArea6UpperLimit	Lead toe/setting 6/lead toe/area upper limit
CustomLeadToeArea6Value	Lead toe/setting 6/lead toe/area measured value
CustomLeadToeArea6Result	Lead toe/setting 6/lead toe/area inspection result
CustomLeadToeArea7LowerLimit	Lead toe/setting 7/lead toe/area lower limit
CustomLeadToeArea7UpperLimit	Lead toe/setting 7/lead toe/area upper limit
CustomLeadToeArea7Value	Lead toe/setting 7/lead toe/area measured value
CustomLeadToeArea7Result	Lead toe/setting 7/lead toe/area inspection result
CustomLeadToeArea8LowerLimit	Lead toe/setting 8/lead toe/area lower limit
CustomLeadToeArea8UpperLimit	Lead toe/setting 8/lead toe/area upper limit
CustomLeadToeArea8Value	Lead toe/setting 8/lead toe/area measured value
CustomLeadToeArea8Result	Lead toe/setting 8/lead toe/area inspection result
CustomLeadToeArea9LowerLimit	Lead toe/setting 9/lead toe/area lower limit
CustomLeadToeArea9UpperLimit	Lead toe/setting 9/lead toe/area upper limit
CustomLeadToeArea9Value	Lead toe/setting 9/lead toe/area measured value
CustomLeadToeArea9Result	Lead toe/setting 9/lead toe/area inspection result
CustomLeadToeArea10LowerLimit	Lead toe/setting 10/lead toe/area lower limit
CustomLeadToeArea10UpperLimit	Lead toe/setting 10/lead toe/area upper limit
CustomLeadToeArea10Value	Lead toe/setting 10/lead toe/area measured value
CustomLeadToeArea10Result	Lead toe/setting 10/lead toe/area inspection result
CustomSideOverhang1UpperLimit	Lead inspection/lead shift/setting 1/side overhang (%) upper limit
CustomSideOverhang1Value	Lead inspection/lead shift/setting 1/side overhang (%) measured value
CustomSideOverhang1Result	Lead inspection/lead shift/setting 1/side overhang (%) inspection result
CustomEndOverhang1UpperLimit	Lead inspection/lead shift/setting 1/end overhang (%) upper limit
CustomEndOverhang1Value	Lead inspection/lead shift/setting 1/end overhang (%) measured value

CustomEndOverhang1Result	Lead inspection/lead shift/setting 1/end overhang (%) inspection result
CustomEndOverlap1LowerLimit	Lead inspection/lead shift/setting 1/end overlap (%) lower limit
CustomEndOverlap1Value	Lead inspection/lead shift/setting 1/end overlap (%) measured value
CustomEndOverlap1Result	Lead inspection/lead shift/setting 1/end overlap (%) inspection result
CustomSideOverhang2UpperLimit	Lead inspection/lead shift/setting 2/side overhang (%) upper limit
CustomSideOverhang2Value	Lead inspection/lead shift/setting 2/side overhang (%) measured value
CustomSideOverhang2Result	Lead inspection/lead shift/setting 2/side overhang (%) inspection result
CustomEndOverhang2UpperLimit	Lead inspection/lead shift/setting 2/end overhang (%) upper limit
CustomEndOverhang2Value	Lead inspection/lead shift/setting 2/end overhang (%) measured value
CustomEndOverhang2Result	Lead inspection/lead shift/setting 2/end overhang (%) inspection result
CustomEndOverlap2LowerLimit	Lead inspection/lead shift/setting 2/end overlap (%) lower limit
CustomEndOverlap2Value	Lead inspection/lead shift/setting 2/end overlap (%) measured value
CustomEndOverlap2Result	Lead inspection/lead shift/setting 2/end overlap (%) inspection result
CustomSideOverhang3UpperLimit	Lead inspection/lead shift/setting 3/side overhang (%) upper limit
CustomSideOverhang3Value	Lead inspection/lead shift/setting 3/side overhang (%) measured value
CustomSideOverhang3Result	Lead inspection/lead shift/setting 3/side overhang (%) inspection result
CustomEndOverhang3UpperLimit	Lead inspection/lead shift/setting 3/end overhang (%) upper limit
CustomEndOverhang3Value	Lead inspection/lead shift/setting 3/end overhang (%) measured value
CustomEndOverhang3Result	Lead inspection/lead shift/setting 3/end overhang (%) inspection result
CustomEndOverlap3LowerLimit	Lead inspection/lead shift/setting 3/end overlap (%) lower limit
CustomEndOverlap3Value	Lead inspection/lead shift/setting 3/end overlap (%) measured value
CustomEndOverlap3Result	Lead inspection/lead shift/setting 3/end overlap (%) inspection result
CustomSideOverhang4UpperLimit	Lead inspection/lead shift/setting 4/side overhang (%) upper limit
CustomSideOverhang4Value	Lead inspection/lead shift/setting 4/side overhang (%) measured value
CustomSideOverhang4Result	Lead inspection/lead shift/setting 4/side overhang (%) inspection result
CustomEndOverhang4UpperLimit	Lead inspection/lead shift/setting 4/end overhang (%) upper limit
CustomEndOverhang4Value	Lead inspection/lead shift/setting 4/end overhang (%) measured value
CustomEndOverhang4Result	Lead inspection/lead shift/setting 4/end overhang (%) inspection result
CustomEndOverlap4LowerLimit	Lead inspection/lead shift/setting 4/end overlap (%) lower limit
CustomEndOverlap4Value	Lead inspection/lead shift/setting 4/end overlap (%) measured value

CustomEndOverlap4Result	Lead inspection/lead shift/setting 4/end overlap (%) inspection result
CustomSideOverhang5UpperLimit	Lead inspection/lead shift/setting 5/side overhang (%) upper limit
CustomSideOverhang5Value	Lead inspection/lead shift/setting 5/side overhang (%) measured value
CustomSideOverhang5Result	Lead inspection/lead shift/setting 5/side overhang (%) inspection result
CustomEndOverhang5UpperLimit	Lead inspection/lead shift/setting 5/end overhang (%) upper limit
CustomEndOverhang5Value	Lead inspection/lead shift/setting 5/end overhang (%) measured value
CustomEndOverhang5Result	Lead inspection/lead shift/setting 5/end overhang (%) inspection result
CustomEndOverlap5LowerLimit	Lead inspection/lead shift/setting 5/end overlap (%) lower limit
CustomEndOverlap5Value	Lead inspection/lead shift/setting 5/end overlap (%) measured value
CustomEndOverlap5Result	Lead inspection/lead shift/setting 5/end overlap (%) inspection result
CustomSideOverhang6UpperLimit	Lead inspection/lead shift/setting 6/side overhang (%) upper limit
CustomSideOverhang6Value	Lead inspection/lead shift/setting 6/side overhang (%) measured value
CustomSideOverhang6Result	Lead inspection/lead shift/setting 6/side overhang (%) inspection result
CustomEndOverhang6UpperLimit	Lead inspection/lead shift/setting 6/end overhang (%) upper limit
CustomEndOverhang6Value	Lead inspection/lead shift/setting 6/end overhang (%) measured value
CustomEndOverhang6Result	Lead inspection/lead shift/setting 6/end overhang (%) inspection result
CustomEndOverlap6LowerLimit	Lead inspection/lead shift/setting 6/end overlap (%) lower limit
CustomEndOverlap6Value	Lead inspection/lead shift/setting 6/end overlap (%) measured value
CustomEndOverlap6Result	Lead inspection/lead shift/setting 6/end overlap (%) inspection result
CustomSideOverhang7UpperLimit	Lead inspection/lead shift/setting 7/side overhang (%) upper limit
CustomSideOverhang7Value	Lead inspection/lead shift/setting 7/side overhang (%) measured value
CustomSideOverhang7Result	Lead inspection/lead shift/setting 7/side overhang (%) inspection result
CustomEndOverhang7UpperLimit	Lead inspection/lead shift/setting 7/end overhang (%) upper limit
CustomEndOverhang7Value	Lead inspection/lead shift/setting 7/end overhang (%) measured value
CustomEndOverhang7Result	Lead inspection/lead shift/setting 7/end overhang (%) inspection result
CustomEndOverlap7LowerLimit	Lead inspection/lead shift/setting 7/end overlap (%) lower limit
CustomEndOverlap7Value	Lead inspection/lead shift/setting 7/end overlap (%) measured value
CustomEndOverlap7Result	Lead inspection/lead shift/setting 7/end overlap (%) inspection result
CustomSideOverhang8UpperLimit	Lead inspection/lead shift/setting 8/side overhang (%) upper limit
CustomSideOverhang8Value	Lead inspection/lead shift/setting 8/side overhang (%) measured value

CustomSideOverhang8Result	Lead inspection/lead shift/setting 8/side overhang (%) inspection result
CustomEndOverhang8UpperLimit	Lead inspection/lead shift/setting 8/end overhang (%) upper limit
CustomEndOverhang8Value	Lead inspection/lead shift/setting 8/end overhang (%) measured value
CustomEndOverhang8Result	Lead inspection/lead shift/setting 8/end overhang (%) inspection result
CustomEndOverlap8LowerLimit	Lead inspection/lead shift/setting 8/end overlap (%) lower limit
CustomEndOverlap8Value	Lead inspection/lead shift/setting 8/end overlap (%) measured value
CustomEndOverlap8Result	Lead inspection/lead shift/setting 8/end overlap (%) inspection result
CustomSideOverhang9UpperLimit	Lead inspection/lead shift/setting 9/side overhang (%) upper limit
CustomSideOverhang9Value	Lead inspection/lead shift/setting 9/side overhang (%) measured value
CustomSideOverhang9Result	Lead inspection/lead shift/setting 9/side overhang (%) inspection result
CustomEndOverhang9UpperLimit	Lead inspection/lead shift/setting 9/end overhang (%) upper limit
CustomEndOverhang9Value	Lead inspection/lead shift/setting 9/end overhang (%) measured value
CustomEndOverhang9Result	Lead inspection/lead shift/setting 9/end overhang (%) inspection result
CustomEndOverlap9LowerLimit	Lead inspection/lead shift/setting 9/end overlap (%) lower limit
CustomEndOverlap9Value	Lead inspection/lead shift/setting 9/end overlap (%) measured value
CustomEndOverlap9Result	Lead inspection/lead shift/setting 9/end overlap (%) inspection result
CustomSideOverhang10UpperLimit	Lead inspection/lead shift/setting 10/side overhang (%) upper limit
CustomSideOverhang10Value	Lead inspection/lead shift/setting 10/side overhang (%) measured value
CustomSideOverhang10Result	Lead inspection/lead shift/setting 10/side overhang (%) inspection result
CustomEndOverhang10UpperLimit	Lead inspection/lead shift/setting 10/end overhang (%) upper limit
CustomEndOverhang10Value	Lead inspection/lead shift/setting 10/end overhang (%) measured value
CustomEndOverhang10Result	Lead inspection/lead shift/setting 10/end overhang (%) inspection result
CustomEndOverlap10LowerLimit	Lead inspection/lead shift/setting 10/end overlap (%) lower limit
CustomEndOverlap10Value	Lead inspection/lead shift/setting 10/end overlap (%) measured value
CustomEndOverlap10Result	Lead inspection/lead shift/setting 10/end overlap (%) inspection result
CustomSideOverhangOblique1UpperLimit	Lead inspection/lead shift (oblique)/setting 1/side overhang (oblique) (%) upper limit
CustomSideOverhangOblique1Value	Lead inspection/lead shift (oblique)/setting 1/side overhang (oblique) (%) measured value
CustomSideOverhangOblique1Result	Lead inspection/lead shift (oblique)/setting 1/side overhang (oblique) (%) inspection result
CustomEndOverhangOblique1UpperLimit	Lead inspection/lead shift (oblique)/setting 1/end overhang (oblique) (%) upper limit
CustomEndOverhangOblique1Value	Lead inspection/lead shift (oblique)/setting 1/end overhang (oblique) (%) measured value

CustomEndOverhangOblique1Result	Lead inspection/lead shift (oblique)/setting 1/end overhang (oblique) (%) inspection result
CustomEndOverlapOblique1LowerLimit	Lead inspection/lead shift (oblique)/setting 1/end overlap (oblique) (%) upper limit
CustomEndOverlapOblique1Value	Lead inspection/lead shift (oblique)/setting 1/end overlap (oblique) (%) measured value
CustomEndOverlapOblique1Result	Lead inspection/lead shift (oblique)/setting 1/end overlap (oblique) (%) inspection result
CustomSideOverhangOblique2UpperLimit	Lead inspection/lead shift (oblique)/setting 2/side overhang (oblique) (%) upper limit
CustomSideOverhangOblique2Value	Lead inspection/lead shift (oblique)/setting 2/side overhang (oblique) (%) measured value
CustomSideOverhangOblique2Result	Lead inspection/lead shift (oblique)/setting 2/side overhang (oblique) (%) inspection result
CustomEndOverhangOblique2UpperLimit	Lead inspection/lead shift (oblique)/setting 2/end overhang (oblique) (%) upper limit
CustomEndOverhangOblique2Value	Lead inspection/lead shift (oblique)/setting 2/end overhang (oblique) (%) measured value
CustomEndOverhangOblique2Result	Lead inspection/lead shift (oblique)/setting 2/end overhang (oblique) (%) inspection result
CustomEndOverlapOblique2LowerLimit	Lead inspection/lead shift (oblique)/setting 2/end overlap (oblique) (%) upper limit
CustomEndOverlapOblique2Value	Lead inspection/lead shift (oblique)/setting 2/end overlap (oblique) (%) measured value
CustomEndOverlapOblique2Result	Lead inspection/lead shift (oblique)/setting 2/end overlap (oblique) (%) inspection result
CustomSideOverhangOblique3UpperLimit	Lead inspection/lead shift (oblique)/setting 3/side overhang (oblique) (%) upper limit
CustomSideOverhangOblique3Value	Lead inspection/lead shift (oblique)/setting 3/side overhang (oblique) (%) measured value
CustomSideOverhangOblique3Result	Lead inspection/lead shift (oblique)/setting 3/side overhang (oblique) (%) inspection result
CustomEndOverhangOblique3UpperLimit	Lead inspection/lead shift (oblique)/setting 3/end overhang (oblique) (%) upper limit
CustomEndOverhangOblique3Value	Lead inspection/lead shift (oblique)/setting 3/end overhang (oblique) (%) measured value
CustomEndOverhangOblique3Result	Lead inspection/lead shift (oblique)/setting 3/end overhang (oblique) (%) inspection result
CustomEndOverlapOblique3LowerLimit	Lead inspection/lead shift (oblique)/setting 3/end overlap (oblique) (%) upper limit
CustomEndOverlapOblique3Value	Lead inspection/lead shift (oblique)/setting 3/end overlap (oblique) (%) measured value
CustomEndOverlapOblique3Result	Lead inspection/lead shift (oblique)/setting 3/end overlap (oblique) (%) inspection result
CustomSideOverhangOblique4UpperLimit	Lead inspection/lead shift (oblique)/setting 4/side overhang (oblique) (%) upper limit
CustomSideOverhangOblique4Value	Lead inspection/lead shift (oblique)/setting 4/side overhang (oblique) (%) measured value
CustomSideOverhangOblique4Result	Lead inspection/lead shift (oblique)/setting 4/side overhang (oblique) (%) inspection result
CustomEndOverhangOblique4UpperLimit	Lead inspection/lead shift (oblique)/setting 4/end overhang (oblique) (%) upper limit
CustomEndOverhangOblique4Value	Lead inspection/lead shift (oblique)/setting 4/end overhang (oblique) (%) measured value
CustomEndOverhangOblique4Result	Lead inspection/lead shift (oblique)/setting 4/end overhang (oblique) (%) inspection result
CustomEndOverlapOblique4LowerLimit	Lead inspection/lead shift (oblique)/setting 4/end overlap (oblique) (%) upper limit
CustomEndOverlapOblique4Value	Lead inspection/lead shift (oblique)/setting 4/end overlap (oblique) (%) measured value

CustomEndOverlapOblique4Result	Lead inspection/lead shift (oblique)/setting 4/end overlap (oblique) (%) inspection result
CustomSideOverhangOblique5UpperLimit	Lead inspection/lead shift (oblique)/setting 5/side overhang (oblique) (%) upper limit
CustomSideOverhangOblique5Value	Lead inspection/lead shift (oblique)/setting 5/side overhang (oblique) (%) measured value
CustomSideOverhangOblique5Result	Lead inspection/lead shift (oblique)/setting 5/side overhang (oblique) (%) inspection result
CustomEndOverhangOblique5UpperLimit	Lead inspection/lead shift (oblique)/setting 5/end overhang (oblique) (%) upper limit
CustomEndOverhangOblique5Value	Lead inspection/lead shift (oblique)/setting 5/end overhang (oblique) (%) measured value
CustomEndOverhangOblique5Result	Lead inspection/lead shift (oblique)/setting 5/end overhang (oblique) (%) inspection result
CustomEndOverlapOblique5LowerLimit	Lead inspection/lead shift (oblique)/setting 5/end overlap (oblique) (%) upper limit
CustomEndOverlapOblique5Value	Lead inspection/lead shift (oblique)/setting 5/end overlap (oblique) (%) measured value
CustomEndOverlapOblique5Result	Lead inspection/lead shift (oblique)/setting 5/end overlap (oblique) (%) inspection result
CustomSideOverhangOblique6UpperLimit	Lead inspection/lead shift (oblique)/setting 6/side overhang (oblique) (%) upper limit
CustomSideOverhangOblique6Value	Lead inspection/lead shift (oblique)/setting 6/side overhang (oblique) (%) measured value
CustomSideOverhangOblique6Result	Lead inspection/lead shift (oblique)/setting 6/side overhang (oblique) (%) inspection result
CustomEndOverhangOblique6UpperLimit	Lead inspection/lead shift (oblique)/setting 6/end overhang (oblique) (%) upper limit
CustomEndOverhangOblique6Value	Lead inspection/lead shift (oblique)/setting 6/end overhang (oblique) (%) measured value
CustomEndOverhangOblique6Result	Lead inspection/lead shift (oblique)/setting 6/end overhang (oblique) (%) inspection result
CustomEndOverlapOblique6LowerLimit	Lead inspection/lead shift (oblique)/setting 6/end overlap (oblique) (%) upper limit
CustomEndOverlapOblique6Value	Lead inspection/lead shift (oblique)/setting 6/end overlap (oblique) (%) measured value
CustomEndOverlapOblique6Result	Lead inspection/lead shift (oblique)/setting 6/end overlap (oblique) (%) inspection result
CustomSideOverhangOblique7UpperLimit	Lead inspection/lead shift (oblique)/setting 7/side overhang (oblique) (%) upper limit
CustomSideOverhangOblique7Value	Lead inspection/lead shift (oblique)/setting 7/side overhang (oblique) (%) measured value
CustomSideOverhangOblique7Result	Lead inspection/lead shift (oblique)/setting 7/side overhang (oblique) (%) inspection result
CustomEndOverhangOblique7UpperLimit	Lead inspection/lead shift (oblique)/setting 7/end overhang (oblique) (%) upper limit
CustomEndOverhangOblique7Value	Lead inspection/lead shift (oblique)/setting 7/end overhang (oblique) (%) measured value
CustomEndOverhangOblique7Result	Lead inspection/lead shift (oblique)/setting 7/end overhang (oblique) (%) inspection result
CustomEndOverlapOblique7LowerLimit	Lead inspection/lead shift (oblique)/setting 7/end overlap (oblique) (%) upper limit
CustomEndOverlapOblique7Value	Lead inspection/lead shift (oblique)/setting 7/end overlap (oblique) (%) measured value
CustomEndOverlapOblique7Result	Lead inspection/lead shift (oblique)/setting 7/end overlap (oblique) (%) inspection result
CustomSideOverhangOblique8UpperLimit	Lead inspection/lead shift (oblique)/setting 8/side overhang (oblique) (%) upper limit
CustomSideOverhangOblique8Value	Lead inspection/lead shift (oblique)/setting 8/side overhang (oblique) (%) measured value

CustomSideOverhangOblique8Result	Lead inspection/lead shift (oblique)/setting 8/side overhang (oblique) (%) inspection result
CustomEndOverhangOblique8UpperLimit	Lead inspection/lead shift (oblique)/setting 8/end overhang (oblique) (%) upper limit
CustomEndOverhangOblique8Value	Lead inspection/lead shift (oblique)/setting 8/end overhang (oblique) (%) measured value
CustomEndOverhangOblique8Result	Lead inspection/lead shift (oblique)/setting 8/end overhang (oblique) (%) inspection result
CustomEndOverlapOblique8LowerLimit	Lead inspection/lead shift (oblique)/setting 8/end overlap (oblique) (%) upper limit
CustomEndOverlapOblique8Value	Lead inspection/lead shift (oblique)/setting 8/end overlap (oblique) (%) measured value
CustomEndOverlapOblique8Result	Lead inspection/lead shift (oblique)/setting 8/end overlap (oblique) (%) inspection result
CustomSideOverhangOblique9UpperLimit	Lead inspection/lead shift (oblique)/setting 9/side overhang (oblique) (%) upper limit
CustomSideOverhangOblique9Value	Lead inspection/lead shift (oblique)/setting 9/side overhang (oblique) (%) measured value
CustomSideOverhangOblique9Result	Lead inspection/lead shift (oblique)/setting 9/side overhang (oblique) (%) inspection result
CustomEndOverhangOblique9UpperLimit	Lead inspection/lead shift (oblique)/setting 9/end overhang (oblique) (%) upper limit
CustomEndOverhangOblique9Value	Lead inspection/lead shift (oblique)/setting 9/end overhang (oblique) (%) measured value
CustomEndOverhangOblique9Result	Lead inspection/lead shift (oblique)/setting 9/end overhang (oblique) (%) inspection result
CustomEndOverlapOblique9LowerLimit	Lead inspection/lead shift (oblique)/setting 9/end overlap (oblique) (%) upper limit
CustomEndOverlapOblique9Value	Lead inspection/lead shift (oblique)/setting 9/end overlap (oblique) (%) measured value
CustomEndOverlapOblique9Result	Lead inspection/lead shift (oblique)/setting 9/end overlap (oblique) (%) inspection result
CustomSideOverhangOblique10UpperLimit	Lead inspection/lead shift (oblique)/setting 10/side overhang (oblique) (%) upper limit
CustomSideOverhangOblique10Value	Lead inspection/lead shift (oblique)/setting 10/side overhang (oblique) (%) measured value
CustomSideOverhangOblique10Result	Lead inspection/lead shift (oblique)/setting 10/side overhang (oblique) (%) inspection result
CustomEndOverhangOblique10UpperLimit	Lead inspection/lead shift (oblique)/setting 10/end overhang (oblique) (%) upper limit
CustomEndOverhangOblique10Value	Lead inspection/lead shift (oblique)/setting 10/end overhang (oblique) (%) measured value
CustomEndOverhangOblique10Result	Lead inspection/lead shift (oblique)/setting 10/end overhang (oblique) (%) inspection result
CustomEndOverlapOblique10LowerLimit	Lead inspection/lead shift (oblique)/setting 10/end overlap (oblique) (%) upper limit
CustomEndOverlapOblique10Value	Lead inspection/lead shift (oblique)/setting 10/end overlap (oblique) (%) measured value
CustomEndOverlapOblique10Result	Lead inspection/lead shift (oblique)/setting 10/end overlap (oblique) (%) inspection result
CustomVerticallyLiftedElectrode1LowerLimit	Lead inspection/lead posture/lead lifting/setting 1/lead lifting (mm) lower limit
CustomVerticallyLiftedElectrode1UpperLimit	Lead inspection/lead posture/lead lifting/setting 1/lead lifting (mm) upper limit
CustomVerticallyLiftedElectrode1Value	Lead inspection/lead posture/lead lifting/setting 1/lead lifting (mm) measured value
CustomVerticallyLiftedElectrode1Result	Lead inspection/lead posture/lead lifting/setting 1/lead lifting (mm) inspection result



CustomVerticallyLiftedElectrode9UpperLimit	Lead inspection/lead posture/lead lifting/setting 9/lead lifting (mm) upper limit
CustomVerticallyLiftedElectrode9Value	Lead inspection/lead posture/lead lifting/setting 9/lead lifting (mm) measured value
CustomVerticallyLiftedElectrode9Result	Lead inspection/lead posture/lead lifting/setting 9/lead lifting (mm) inspection result
CustomVerticallyLiftedElectrode10LowerLimit	Lead inspection/lead posture/lead lifting/setting 10/lead lifting (mm) lower limit
CustomVerticallyLiftedElectrode10UpperLimit	Lead inspection/lead posture/lead lifting/setting 10/lead lifting (mm) upper limit
CustomVerticallyLiftedElectrode10Value	Lead inspection/lead posture/lead lifting/setting 10/lead lifting (mm) measured value
CustomVerticallyLiftedElectrode10Result	Lead inspection/lead posture/lead lifting/setting 10/lead lifting (mm) inspection result
CustomElectrodeLength1LowerLimit	Lead inspection/lead posture/lead protrusion/setting 1/lead protrusion (%) lower limit
CustomElectrodeLength1UpperLimit	Lead inspection/lead posture/lead protrusion/setting 1/lead protrusion (%) upper limit
CustomElectrodeLength1Value	Lead inspection/lead posture/lead protrusion/setting 1/lead protrusion (%) measured value
CustomElectrodeLength1Result	Lead inspection/lead posture/lead protrusion/setting 1/lead protrusion (%) inspection result
CustomElectrodeLength2LowerLimit	Lead inspection/lead posture/lead protrusion/setting 2/lead protrusion (%) lower limit
CustomElectrodeLength2UpperLimit	Lead inspection/lead posture/lead protrusion/setting 2/lead protrusion (%) upper limit
CustomElectrodeLength2Value	Lead inspection/lead posture/lead protrusion/setting 2/lead protrusion (%) measured value
CustomElectrodeLength2Result	Lead inspection/lead posture/lead protrusion/setting 2/lead protrusion (%) inspection result
CustomElectrodeLength3LowerLimit	Lead inspection/lead posture/lead protrusion/setting 3/lead protrusion (%) lower limit
CustomElectrodeLength3UpperLimit	Lead inspection/lead posture/lead protrusion/setting 3/lead protrusion (%) upper limit
CustomElectrodeLength3Value	Lead inspection/lead posture/lead protrusion/setting 3/lead protrusion (%) measured value
CustomElectrodeLength3Result	Lead inspection/lead posture/lead protrusion/setting 3/lead protrusion (%) inspection result
CustomElectrodeLength4LowerLimit	Lead inspection/lead posture/lead protrusion/setting 4/lead protrusion (%) lower limit
CustomElectrodeLength4UpperLimit	Lead inspection/lead posture/lead protrusion/setting 4/lead protrusion (%) upper limit
CustomElectrodeLength4Value	Lead inspection/lead posture/lead protrusion/setting 4/lead protrusion (%) measured value
CustomElectrodeLength4Result	Lead inspection/lead posture/lead protrusion/setting 4/lead protrusion (%) inspection result
CustomElectrodeLength5LowerLimit	Lead inspection/lead posture/lead protrusion/setting 5/lead protrusion (%) lower limit
CustomElectrodeLength5UpperLimit	Lead inspection/lead posture/lead protrusion/setting 5/lead protrusion (%) upper limit
CustomElectrodeLength5Value	Lead inspection/lead posture/lead protrusion/setting 5/lead protrusion (%) measured value
CustomElectrodeLength5Result	Lead inspection/lead posture/lead protrusion/setting 5/lead protrusion (%) inspection result
CustomElectrodeLength6LowerLimit	Lead inspection/lead posture/lead protrusion/setting 6/lead protrusion (%) lower limit
CustomElectrodeLength6UpperLimit	Lead inspection/lead posture/lead protrusion/setting 6/lead protrusion (%) upper limit

CustomElectrodeLength6Value	Lead inspection/lead posture/lead protrusion/setting 6/lead protrusion (%) measured value
CustomElectrodeLength6Result	Lead inspection/lead posture/lead protrusion/setting 6/lead protrusion (%) inspection result
CustomElectrodeLength7LowerLimit	Lead inspection/lead posture/lead protrusion/setting 7/lead protrusion (%) lower limit
CustomElectrodeLength7UpperLimit	Lead inspection/lead posture/lead protrusion/setting 7/lead protrusion (%) upper limit
CustomElectrodeLength7Value	Lead inspection/lead posture/lead protrusion/setting 7/lead protrusion (%) measured value
CustomElectrodeLength7Result	Lead inspection/lead posture/lead protrusion/setting 7/lead protrusion (%) inspection result
CustomElectrodeLength8LowerLimit	Lead inspection/lead posture/lead protrusion/setting 8/lead protrusion (%) lower limit
CustomElectrodeLength8UpperLimit	Lead inspection/lead posture/lead protrusion/setting 8/lead protrusion (%) upper limit
CustomElectrodeLength8Value	Lead inspection/lead posture/lead protrusion/setting 8/lead protrusion (%) measured value
CustomElectrodeLength8Result	Lead inspection/lead posture/lead protrusion/setting 8/lead protrusion (%) inspection result
CustomElectrodeLength9LowerLimit	Lead inspection/lead posture/lead protrusion/setting 9/lead protrusion (%) lower limit
CustomElectrodeLength9UpperLimit	Lead inspection/lead posture/lead protrusion/setting 9/lead protrusion (%) upper limit
CustomElectrodeLength9Value	Lead inspection/lead posture/lead protrusion/setting 9/lead protrusion (%) measured value
CustomElectrodeLength9Result	Lead inspection/lead posture/lead protrusion/setting 9/lead protrusion (%) inspection result
CustomElectrodeLength10LowerLimit	Lead inspection/lead posture/lead protrusion/setting 10/lead protrusion (%) lower limit
CustomElectrodeLength10UpperLimit	Lead inspection/lead posture/lead protrusion/setting 10/lead protrusion (%) upper limit
CustomElectrodeLength10Value	Lead inspection/lead posture/lead protrusion/setting 10/lead protrusion (%) measured value
CustomElectrodeLength10Result	Lead inspection/lead posture/lead protrusion/setting 10/lead protrusion (%) inspection result

# Appendix 11. Inspection Coverage Output Format

Use the inspection coverage output function to output the set data of each inspection item for each inspection program being edited or company ID.



For the method to output inspection coverage, refer to Section 2.14 "Outputting Inspection Coverage."

The following data are output for each component. For component number, nothing is output for the information specific to the component.

## ■ Header items of inspection coverage ofr inspection program

Column	Items output in multiple languages	Items output in existing formats	Description	Presence when component No. information is output
1	No	No	Component D	×
2	Circuit ID	CircuitId	Circuit No.	×
3	Component No. group name	ComponentNumberGroup Name	Component No. group name	○
4	Component No. Group ID	ComponentNumberGroupI d	Component No. group ID	○
5	Component No. Name	ComponentNumberName	Component No. name	○
6	Revision	Revision	Revision of component No.	○
7	Component Type	ComponentType	Component type	○
8	Component Block Unit Name	ComponentBlockUnitName	Component block unit name	×
9	Quality Level of Component No.	QualityIdentificationStatus	Quality level of component No.	○
10	Expansion Availability	IsExpansion	Availability of expansion	×
11	Window	IsChangeWindow	Name of inspection window	×
12	Individual	Individual	Individual setting (True: present, False: absent)	×

## ■ Header items of inspection coverage of utility

Column	Items output in multiple languages	Column	Description
1	Company ID	13	Component Type
2	Model	14	Update Date & Time (Component No.)
3	Component No. Group ID	15	Quality Level of Component No.
4	Component No. Group Revision	16	Expansion Availability
5	Component No. Group Name	17	No. of Models (OK Products)
6	Component No. Group Description	18	No. of Models (NG Products)
7	Component No. Group Change Description	19	Light Intensity (Component)
8	Component No. ID	20	Light Intensity (Lead)
9	Component No. Revision	21	Inspection Logic Version
10	Saving User of Newest Revision	22	Component No. Description
11	PC Name of Newest Revision	23	Component No. Change Description
12	Component No. Name	24	Window

The columns described hereafter are about the set data of each inspection item.

**Memo** In the "Setting item ON/OFF" column on the table, the ON/OFF state of checking is output only for the circled item.

Item output in multiple languages	Item output in existing format	Setting item ON/OFF
Component Inspection	ComponentInspection	<input type="radio"/>
Component Inspection/Component Extraction	FollowComponentOffset	<input type="radio"/>
Component Inspection/Component Extraction/Extraction Method	LogicMethodType	
Component Inspection/Component Extraction/Angle Measuring Range (°)	AngleMesuringRange	
Component Inspection/Component Extraction/Angle Measuring Range (°) Lower Limit	LowerLimit	
Component Inspection/Component Extraction/Angle Measuring Range (°) Upper Limit	UpperLimit	
Component Inspection/Missing Component	ComponentPresence	<input type="radio"/>
Component Inspection/Missing Component/Matching Rate (%)	MatchingRate	<input type="radio"/>
Component Inspection/Missing Component/Matching Rate (%) Lower Limit	LowerLimit	
Component Inspection/Missing Component/Matching Rate (%) Upper Limit	UpperLimit	
Component Inspection/Missing Component/Volume Ratio (%)	VolumeRate	<input type="radio"/>
Component Inspection/Missing Component/Volume Ratio (%) Lower Limit	LowerLimit	
Component Inspection/Missing Component/Volume Ratio (%) Upper Limit	UpperLimit	
Component Inspection/Wrong Component	RightComponent	<input type="radio"/>
Component Inspection/Wrong Component/Character-Basis Inspection	SingleCharacterInspection	
Component Inspection/Wrong Component/Judgment Type	LogicMethodType	
Component Inspection/Wrong Component/Matching Rate (%)	MatchingRate	
Component Inspection/Wrong Component/Matching Rate (%) Lower Limit	LowerLimit	
Component Inspection/Wrong Component/Matching Rate (%) Upper Limit	UpperLimit	
Component Inspection/Wrong Polarity	ComponentPolarity	<input type="radio"/>
Component Inspection/Wrong Polarity Judgment Type	LogicMethodType	
Component Inspection/Wrong Polarity/Matching Rate (%)	MatchingRate	
Component Inspection/Wrong Polarity/Matching Rate (%) Lower Limit	LowerLimit	
Component Inspection/Wrong Polarity/Matching Rate (%) Upper Limit	UpperLimit	
Component Inspection/Wrong Polarity-Height (mm)	ComponentPolarityHeight	<input type="radio"/>
Component Inspection/Wrong Polarity-Height (mm) Lower Limit	LowerLimit	
Component Inspection/Wrong Polarity-Height (mm) Upper Limit	UpperLimit	
Component Inspection/Flipped Component	FlippedComponent	<input type="radio"/>
Component Inspection/Flipped Component/Matching Rate (%)	MatchingRate	
Component Inspection/Flipped Component/Matching Rate (%) Lower Limit	LowerLimit	
Component Inspection/Flipped Component/Matching Rate (%) Upper Limit	UpperLimit	
Component Inspection/Component Offset	ComponentOffset	<input type="radio"/>
Component Inspection/Component Offset/X-offset (PCB) [Abs.] (mm)	OffsetX	<input type="radio"/>
Component Inspection/Component Offset/X-offset (PCB) [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Component Offset/X-offset (PCB) [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Component Offset/Y-offset (PCB) [Abs.] (mm)	OffsetY	<input type="radio"/>
Component Inspection/Component Offset/Y-offset (PCB) [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Component Offset/Y-offset (PCB) [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Component Offset/Component Skew [Abs.] (°)	ComponentSkew	<input type="radio"/>
Component Inspection/Component Offset/Component Skew [Abs.] (°) Lower Limit	LowerLimit	
Component Inspection/Component Offset/Component Skew [Abs.] (°) Upper Limit	UpperLimit	
Component Inspection/Component Offset/X-offset (Component) [Abs.] (mm)	OffsetXComponent	<input type="radio"/>

## Appendix 12. Inspection Coverage Output Format

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	Component Inspection/Component Offset/X-offset (Component) [Abs.] (mm) Lower Limit	LowerLimit	
	Component Inspection/Component Offset/X-offset (Component) [Abs.] (mm) Upper Limit	UpperLimit	
	Component Inspection/Component Offset/Y-offset (Component) [Abs.] (mm)	OffsetYComponent	○
	Component Inspection/Component Offset/Y-offset (Component) [Abs.] (mm) Lower Limit	LowerLimit	
	Component Inspection/Component Offset/Y-offset (Component) [Abs.] (mm) Upper Limit	UpperLimit	
S530	Component Inspection/Component Height (mm)	ComponentHeight	○
	Component Inspection/Component Height (mm) Lower Limit	LowerLimit	
	Component Inspection/Component Height (mm) Upper Limit	UpperLimit	
S530	Component Inspection/Lifted Component	LiftedComponent	○
S530	Component Inspection/Lifted Component/Tilt (0-180°)	Inclination0	○
	Component Inspection/Lifted Component/Tilt (0-180°)/Height [Abs.] (mm)	InclinationHeight0	○
	Component Inspection/Lifted Component/Tilt (0-180°)/Height [Abs.] (mm) Lower Limit	LowerLimit	
	Component Inspection/Lifted Component/Tilt (0-180°)/Height [Abs.] (mm) Upper Limit	UpperLimit	
	Component Inspection/Lifted Component/Tilt (0-180°)/Angle [Abs.] (°)	InclinationAngle0	○
	Component Inspection/Lifted Component/Tilt (0-180°)/Angle [Abs.] (°) Lower Limit	LowerLimit	
	Component Inspection/Lifted Component/Tilt (0-180°)/Angle [Abs.] (°) Upper Limit	UpperLimit	
S530	Component Inspection/Lifted Component/Tilt (90-270°)	Inclination90	○
	Component Inspection/Lifted Component/Tilt (90-270°)/Height [Abs.] (mm)	InclinationHeight90	○
	Component Inspection/Lifted Component/Tilt (90-270°)/Height [Abs.] (mm) Lower Limit	LowerLimit	
	Component Inspection/Lifted Component/Tilt (90-270°)/Height [Abs.] (mm) Upper Limit	UpperLimit	
	Component Inspection/Lifted Component/Tilt (90-270°)/Angle [Abs.] (°)	InclinationAngle90	○
	Component Inspection/Lifted Component/Tilt (90-270°)/Angle [Abs.] (°) Lower Limit	LowerLimit	
	Component Inspection/Lifted Component/Tilt (90-270°)/Angle [Abs.] (°) Upper Limit	UpperLimit	
S530	Component Inspection/Lifted Component/Lift (Average Height) (mm)	LiftAverageHeight	○
	Component Inspection/Lifted Component/Lift (Average Height) (mm) Lower Limit	LowerLimit	
	Component Inspection/Lifted Component/Lift (Average Height) (mm) Upper Limit	UpperLimit	
	Component Inspection/Distance Inspection	InspectionDistance	○
	Component Inspection/Distance Inspection/Distance1 (mm)	Distance1	
	Component Inspection/Distance Inspection/Distance1 (mm) Lower Limit	LowerLimit	
	Component Inspection/Distance Inspection/Distance1 (mm) Upper Limit	UpperLimit	
	Component Inspection/Distance Inspection/Distance2 (mm)	Distance2	
	Component Inspection/Distance Inspection/Distance2 (mm) Lower Limit	LowerLimit	
	Component Inspection/Distance Inspection/Distance2 (mm) Upper Limit	UpperLimit	
	Component Inspection/Distance Inspection/Distance A (mm)	Distance A	
	Component Inspection/Distance Inspection/Distance A (mm) Lower Limit	LowerLimit	
	Component Inspection/Distance Inspection/Distance A (mm) Upper Limit	UpperLimit	
	Component Inspection/Distance Inspection/Distance B (mm)	DistanceB	
	Component Inspection/Distance Inspection/Distance B (mm) Lower Limit	LowerLimit	
	Component Inspection/Distance Inspection/Distance B (mm) Upper Limit	UpperLimit	
	Component Inspection/Distance Inspection/Angle (°)	DistanceAngle	
	Component Inspection/Distance Inspection/Angle (°) Lower Limit	LowerLimit	
	Component Inspection/Distance Inspection/Angle (°) Upper Limit	UpperLimit	
	OCR	RightComponentOcr	○
	OCR/String1	InspectionString1	
	OCR/String2	InspectionString2	
	OCR/String3	InspectionString3	

## Appendix 12. Inspection Coverage Output Format

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1D/2D code (Component)	ComponentCode2D	<input type="radio"/>
Component Inspection/Distance Inspection/Angle (°)	ComponentInspection	<input type="radio"/>
Component Inspection/Distance Inspection/Angle (°) Lower Limit	FollowComponentOffset	
Component Inspection/Distance Inspection/Angle (°) Upper Limit	LogicMethodType	<input type="radio"/>
OCR	AngleMesuringRange	
OCR/String1	LowerLimit	
OCR/String2	UpperLimit	<input type="radio"/>
OCR/String3	ComponentPresence	<input type="radio"/>
1D/2D code (Component)	MatchingRate	<input type="radio"/>
Lead Horizontal Extraction	FollowElectrodeOffset	
Lead Horizontal Extraction/Extraction Method	ExtractionMethodType	
Lead Toe Extraction	FollowElectrodeToe	<input type="radio"/>
Lead Toe Extraction/Extraction Method	LogicMethodType	
Lead Toe Extraction/Extraction Unit	ExtractionMethodType	
Lead Inspection	ElectrodeInspection	<input type="radio"/>
Lead Inspection/Lead Offset	ElectrodeOffset	
Lead Inspection/Lead Offset/Side Overhang (%)	SideOverhang	
Lead Inspection/Lead Offset/Side Overhang (%) Lower Limit	LowerLimit	<input type="radio"/>
Lead Inspection/Lead Offset/Side Overhang (%) Upper Limit	UpperLimit	<input type="radio"/>
Lead Inspection/Lead Offset/End Overhang (%)	EndOverhang	
Lead Inspection/Lead Offset/End Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/End Overhang (%) Upper Limit	UpperLimit	<input type="radio"/>
Lead Inspection/Lead Offset/End Overlap (%)	EndOverlap	
Lead Inspection/Lead Offset/End Overlap (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/End Overlap (%) Upper Limit	UpperLimit	<input type="radio"/>
Lead Inspection/Lead Posture	LiftedElectrode	
Lead Inspection/Lead Posture/Lifted Lead (mm)	VerticallyLiftedElectrode	
Lead Inspection/Lead Posture/Lifted Lead (mm) Lower Limit	LowerLimit	<input type="radio"/>
Lead Inspection/Lead Posture/Lifted Lead (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Coplanarity (mm)	Coplanarity	
Lead Inspection/Lead Posture/Coplanarity (mm) Lower Limit	LowerLimit	<input type="radio"/>
Lead Inspection/Lead Posture/Coplanarity (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Lead Length (%)	ElectrodeLength	
Lead Inspection/Lead Posture/Lead Length (%) Lower Limit	LowerLimit	<input type="radio"/>
Lead Inspection/Lead Posture/Lead Length (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Lead Area (%)	ElectrodeArea	
Lead Inspection/Lead Posture/Lead Area (%) Lower Limit	LowerLimit	<input type="radio"/>
Lead Inspection/Lead Posture/Lead Area (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Exposed Lead Toe (%)	ExposedElectrodeToe	
Lead Inspection/Lead Posture/Exposed Lead Toe (%) Lower Limit	LowerLimit	<input type="radio"/>
Lead Inspection/Lead Posture/Exposed Lead Toe (%) Upper Limit	UpperLimit	<input type="radio"/>
Lead Inspection/Lead Posture/Lead Dispersion (%)	ElectrodeColorDispersion	
Lead Inspection/Lead Posture/Lead Dispersion (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Posture/Lead Dispersion (%) Upper Limit	UpperLimit	<input type="radio"/>
Lead Inspection/Lead Posture/Lead Side Bend (%)	ElectrodeSideBend	
Lead Inspection/Lead Posture/Lead Side Bend (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Posture/Lead Side Bend (%) Upper Limit	UpperLimit	<input type="radio"/>
Lead Inspection/Lead Posture (Oblique)	LiftedElectrodeOblique	

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S530

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## Appendix 12. Inspection Coverage Output Format

Lead Inspection/Lead Posture (Oblique)/Lead Height (Oblique) (mm)	ElectrodeHeightOblique	
Lead Inspection/Lead Posture (Oblique)/Lead Height (Oblique) (mm) Lower Limit	LowerLimit	○
Lead Inspection/Lead Posture (Oblique)/Lead Height (Oblique) (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture (Oblique)/Exposed Lead Toe (Oblique) (%)	ExposedElectrodeToeOblique	○
Lead Inspection/Lead Posture (Oblique)/Exposed Lead Toe (Oblique) (%) Lower Limit	LowerLimit	○
Lead Inspection/Lead Posture (Oblique)/Exposed Lead Toe (Oblique) (%) Upper Limit	UpperLimit	○
Lead Inspection/Lead Posture (Oblique)/Lead Dispersion (Oblique) (%)	ElectrodeColorDispersionOblique	
Lead Inspection/Lead Posture (Oblique)/Lead Dispersion (Oblique) (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Posture (Oblique)/Lead Dispersion (Oblique) (%) Upper Limit	UpperLimit	○
Fillet Inspection	FilletInspection	
Fillet Inspection/Linked to the measured values of component/Lead height	LogicMethodType	
Fillet Inspection/Wettability Angle	WettingAngle	○
Fillet Inspection/Wettability Angle/Land Wettability	LandWetting	○
Fillet Inspection/Wettability Angle/Land Wettability/Center (°)	Center	
Fillet Inspection/Wettability Angle/Land Wettability/Center (°) Lower Limit	LowerLimit	
Fillet Inspection/Wettability Angle/Land Wettability/Center (°) Upper Limit	UpperLimit	○
Fillet Inspection/Wettability Angle/Land Wettability/Both Ends (°)	BothEnds	
Fillet Inspection/Wettability Angle/Land Wettability/Both Ends (°) Lower Limit	LowerLimit	
Fillet Inspection/Wettability Angle/Land Wettability/Both Ends (°) Upper Limit	UpperLimit	○
Fillet Inspection/Wettability Angle/Lead Wettability	ComponentWetting	
Fillet Inspection/Wettability Angle/Lead Wettability/Center of Toe (°)	CenterOfToe	
Fillet Inspection/Wettability Angle/Lead Wettability/Center of Toe (°) Lower Limit	LowerLimit	○
Fillet Inspection/Wettability Angle/Lead Wettability/Center of Toe (°) Upper Limit	UpperLimit	
Fillet Inspection/Wettability Angle/Lead Wettability/Both Ends of Toe (°)	BothEndsOfToe	
Fillet Inspection/Wettability Angle/Lead Wettability/Both Ends of Toe (°) Lower Limit	LowerLimit	○
Fillet Inspection/Wettability Angle/Lead Wettability/Both Ends of Toe (°) Upper Limit	UpperLimit	○
Fillet Inspection/Wettability Angle/Lead Wettability/Center of Side (°)	CenterOfSide	
Fillet Inspection/Wettability Angle/Lead Wettability/Center of Side (°) Lower Limit	LowerLimit	
Fillet Inspection/Wettability Angle/Lead Wettability/Center of Side (°) Upper Limit	UpperLimit	○
Fillet Inspection/Wettability Angle/Lead Wettability/Both Ends of Side (°)	BothEndsOfSide	
Fillet Inspection/Wettability Angle/Lead Wettability/Both Ends of Side (°) Lower Limit	LowerLimit	
Fillet Inspection/Wettability Angle/Lead Wettability/Both Ends of Side (°) Upper Limit	UpperLimit	○
Fillet Inspection/Fillet Height	FilletHeight	
Fillet Inspection/Fillet Height/Connection Block Height (%)	FilletJointHeight	○
Fillet Inspection/Fillet Height/Connection Block Height (%) Lower Limit	LowerLimit	
Fillet Inspection/Fillet Height/Connection Block Height (%) Upper Limit	UpperLimit	
Fillet Inspection/Fillet Height/Max. Height (%)	FilletMaxHeight	○
Fillet Inspection/Fillet Height/Max. Height (%) Lower Limit	LowerLimit	
Fillet Inspection/Fillet Height/Max. Height (%) Upper Limit	UpperLimit	
Fillet Inspection/Fillet Height/Height Specified Region	HeightDesignation	
Fillet Inspection/Fillet Height/Height Specified Region Type	LogicMethodType	
Fillet Inspection/Fillet Height/Height Specified Region/Height (%)	HeightRatio	
Fillet Inspection/Fillet Height/Height Specified Region/Height (%) Lower Limit	LowerLimit	○

## Appendix 12. Inspection Coverage Output Format

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Fillet Inspection/Fillet Height/Height Specified Region/Height (%) Upper Limit	UpperLimit	<input type="radio"/>
Fillet Inspection/Fillet Height/Height Specified Region/Height (mm)	HeightMillimeters	<input type="radio"/>
Fillet Inspection/Fillet Height/Height Specified Region/Height (mm) Lower Limit	LowerLimit	
Fillet Inspection/Fillet Height/Height Specified Region/Height (mm) Upper Limit	UpperLimit	
Fillet Inspection/Fillet Height/Height Specified Region/Inspection Area (Size)	InspectionDomainSize	<input type="radio"/>
Fillet Inspection/Fillet Height/Height Specified Region/Inspection Area (Size) Unit	LogicMethodType	<input type="radio"/>
Fillet Inspection/Fillet Height/Height Specified Region/Inspection Area (Position)	InspectionDomainPoint	
Fillet Inspection/Fillet Height/Height Specified Region/Follow Lead End	FollowElectrodeEnd	
Fillet Inspection/Fillet Height/Height Specified Region/Follow Lead Side	FollowElectrodeSide	
Fillet Inspection/Fillet Length (%)	FilletLength	
Fillet Inspection/Fillet Length (%) Lower Limit	LowerLimit	
Fillet Inspection/Fillet Length (%) Upper Limit	UpperLimit	<input type="radio"/>
Fillet Inspection/Fillet Joint Length	FilletJointLength	
Fillet Inspection/Fillet Joint Length/End Joint Width (%)	EndJointWidth	
Fillet Inspection/Fillet Joint Length/End Joint Width (%) Lower Limit	LowerLimit	
Fillet Inspection/Fillet Joint Length/End Joint Width (%) Upper Limit	UpperLimit	
Fillet Inspection/Fillet Joint Length/End Joint Width (%)/Fillet Height (%)	FilletHeightWithUnit	
Fillet Inspection/Fillet Joint Length/End Joint Width (%)/Fillet Height (%) Lower Limit	LowerLimit	<input type="radio"/>
Fillet Inspection/Fillet Joint Length/End Joint Width (%)/Fillet Height (%) Upper Limit	UpperLimit	
Fillet Inspection/Fillet Joint Length/Side Joint Length (%)	SideJointLength	
Fillet Inspection/Fillet Joint Length/Side Joint Length (%) Lower Limit	LowerLimit	<input type="radio"/>
Fillet Inspection/Fillet Joint Length/Side Joint Length (%) Upper Limit	UpperLimit	
Fillet Inspection/Fillet Joint Length/Side Joint Length (%)/Fillet Height (%)	FilletHeightWithUnit	
Fillet Inspection/Fillet Joint Length/Side Joint Length (%)/Fillet Height (%) Lower Limit	LowerLimit	<input type="radio"/>
Fillet Inspection/Fillet Joint Length/Side Joint Length (%)/Fillet Height (%) Upper Limit	UpperLimit	
Exposed Land (%)	ExposedBasisMetal	
Exposed Land (%) Lower Limit	LowerLimit	<input type="radio"/>
Exposed Land (%) Upper Limit	UpperLimit	<input type="radio"/>
Foreign Material (on Land) (%)	ForeignMaterialOnLand	
Foreign Material (on Land) (%) Lower Limit	LowerLimit	
Foreign Material (on Land) (%) Upper Limit	UpperLimit	<input type="radio"/>
Exposed Land (Oblique)	ExposedBasisMetalOblique	<input type="radio"/>
Exposed Land (Oblique) Lower Limit	LowerLimit	<input type="radio"/>
Exposed Land (Oblique) Upper Limit	UpperLimit	
Exposed Land (%)	ExposedBasisMetal	
Exposed Land (%) Lower Limit	LowerLimit	<input type="radio"/>
Exposed Land (%) Upper Limit	UpperLimit	<input type="radio"/>
Foreign Material (on Land) (%)	ForeignMaterialOnLand	<input type="radio"/>
Foreign Material (on Land) (%) Lower Limit	LowerLimit	
Foreign Material (on Land) (%) Upper Limit	UpperLimit	
Foreign Material (on Land) (%)	ForeignMaterialOnLand	<input type="radio"/>
Foreign Material (on Land) (%) Lower Limit	LowerLimit	<input type="radio"/>

S730

S720A

## Appendix 12. Inspection Coverage Output Format

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S730 S720A

Foreign Material (on Land) (%) Upper Limit	UpperLimit	<input type="radio"/>
Exposed Land (Oblique)	ExposedBasisMetalOblique	
Exposed Land (Oblique) Lower Limit	LowerLimit	
Exposed Land (Oblique) Upper Limit	UpperLimit	<input type="radio"/>
Land Error	LandError	<input type="radio"/>
Land Error/Setting1 (%)	Region1	<input type="radio"/>
Land Error/Setting1 (%) Lower Limit	LowerLimit	
Land Error/Setting1 (%) Upper Limit	UpperLimit	
Land Error/Setting1 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting1 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting1 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting1 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting1 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting1 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting1 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting2 (%)	Region2	<input type="radio"/>
Land Error/Setting2 (%) Lower Limit	LowerLimit	
Land Error/Setting2 (%) Upper Limit	UpperLimit	
Land Error/Setting2 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting2 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting2 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting2 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting2 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting2 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting2 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting3 (%)	Region3	<input type="radio"/>
Land Error/Setting3 (%) Lower Limit	LowerLimit	
Land Error/Setting3 (%) Upper Limit	UpperLimit	
Land Error/Setting3 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting3 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting3 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting3 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting3 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting3 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting3 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting4 (%)	Region4	<input type="radio"/>
Land Error/Setting4 (%) Lower Limit	LowerLimit	
Land Error/Setting4 (%) Upper Limit	UpperLimit	
Land Error/Setting4 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting4 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting4 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting4 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting4 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting4 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting4 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>

## Appendix 12. Inspection Coverage Output Format

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Land Error/Setting5 (%)	Region5	<input type="radio"/>
Land Error/Setting5 (%) Lower Limit	LowerLimit	
Land Error/Setting5 (%) Upper Limit	UpperLimit	
Land Error/Setting5 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting5 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting5 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting5 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting5 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting5 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting5 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting6 (%)	Region6	<input type="radio"/>
Land Error/Setting6 (%) Lower Limit	LowerLimit	
Land Error/Setting6 (%) Upper Limit	UpperLimit	
Land Error/Setting6 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting6 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting6 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting6 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting6 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting6 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting6 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting7 (%)	Region7	<input type="radio"/>
Land Error/Setting7 (%) Lower Limit	LowerLimit	
Land Error/Setting7 (%) Upper Limit	UpperLimit	
Land Error/Setting7 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting7 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting7 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting7 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting7 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting7 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting7 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting8 (%)	Region8	<input type="radio"/>
Land Error/Setting8 (%) Lower Limit	LowerLimit	
Land Error/Setting8 (%) Upper Limit	UpperLimit	
Land Error/Setting8 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting8 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting8 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting8 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting8 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting8 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting8 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting9 (%)	Region9	<input type="radio"/>
Land Error/Setting9 (%) Lower Limit	LowerLimit	<input type="radio"/>
Land Error/Setting9 (%) Upper Limit	UpperLimit	
Land Error/Setting9 (%)/Follow Lead End	FollowElectrodeEnd	
Land Error/Setting9 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>

## Appendix 12. Inspection Coverage Output Format

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Land Error/Setting9 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting9 (%)/Specify Distance (mm) Lower Limit	LowerLimit	<input type="radio"/>
Land Error/Setting9 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting9 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	
Land Error/Setting9 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting10 (%)	Region10	<input type="radio"/>
Land Error/Setting10 (%) Lower Limit	LowerLimit	<input type="radio"/>
Land Error/Setting10 (%) Upper Limit	UpperLimit	
Land Error/Setting10 (%)/Follow Lead End	FollowElectrodeEnd	
Land Error/Setting10 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting10 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting10 (%)/Specify Distance (mm) Lower Limit	LowerLimit	<input type="radio"/>
Land Error/Setting10 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting10 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	
Land Error/Setting10 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error (Oblique)	LandErrorOblique	<input type="radio"/>
Land Error (Oblique)/Setting1 (Oblique) (%)	RegionOblique1	<input type="radio"/>
Land Error (Oblique)/Setting1 (Oblique) (%) Lower Limit	LowerLimit	
Land Error (Oblique)/Setting1 (Oblique) (%) Upper Limit	UpperLimit	
Land Error (Oblique)/Setting1 (Oblique) (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error (Oblique)/Setting1 (Oblique) (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error (Oblique)/Setting1 (Oblique) (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error (Oblique)/Setting1 (Oblique) (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error (Oblique)/Setting1 (Oblique) (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error (Oblique)/Setting1 (Oblique) (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error (Oblique)/Setting1 (Oblique) (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error (Oblique)/Setting2 (Oblique) (%)	RegionOblique2	<input type="radio"/>
Land Error (Oblique)/Setting2 (Oblique) (%) Lower Limit	LowerLimit	
Land Error (Oblique)/Setting2 (Oblique) (%) Upper Limit	UpperLimit	
Land Error (Oblique)/Setting2 (Oblique) (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error (Oblique)/Setting2 (Oblique) (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error (Oblique)/Setting2 (Oblique) (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error (Oblique)/Setting2 (Oblique) (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error (Oblique)/Setting2 (Oblique) (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error (Oblique)/Setting2 (Oblique) (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error (Oblique)/Setting2 (Oblique) (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error (Oblique)/Setting3 (Oblique) (%)	RegionOblique3	<input type="radio"/>
Land Error (Oblique)/Setting3 (Oblique) (%) Lower Limit	LowerLimit	
Land Error (Oblique)/Setting3 (Oblique) (%) Upper Limit	UpperLimit	
Land Error (Oblique)/Setting3 (Oblique) (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error (Oblique)/Setting3 (Oblique) (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error (Oblique)/Setting3 (Oblique) (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error (Oblique)/Setting3 (Oblique) (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error (Oblique)/Setting3 (Oblique) (%)/Specify Distance (mm) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Land Error (Oblique)/Setting3 (Oblique) (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error (Oblique)/Setting3 (Oblique) (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error (Oblique)/Setting4 (Oblique) (%)	RegionOblique4	<input type="radio"/>
Land Error (Oblique)/Setting4 (Oblique) (%) Lower Limit	LowerLimit	
Land Error (Oblique)/Setting4 (Oblique) (%) Upper Limit	UpperLimit	
Land Error (Oblique)/Setting4 (Oblique) (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error (Oblique)/Setting4 (Oblique) (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error (Oblique)/Setting4 (Oblique) (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error (Oblique)/Setting4 (Oblique) (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error (Oblique)/Setting4 (Oblique) (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error (Oblique)/Setting4 (Oblique) (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error (Oblique)/Setting4 (Oblique) (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error (Oblique)/Setting5 (Oblique) (%)	RegionOblique5	<input type="radio"/>
Land Error (Oblique)/Setting5 (Oblique) (%) Lower Limit	LowerLimit	
Land Error (Oblique)/Setting5 (Oblique) (%) Upper Limit	UpperLimit	
Land Error (Oblique)/Setting5 (Oblique) (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error (Oblique)/Setting5 (Oblique) (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error (Oblique)/Setting5 (Oblique) (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error (Oblique)/Setting5 (Oblique) (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error (Oblique)/Setting5 (Oblique) (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error (Oblique)/Setting5 (Oblique) (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error (Oblique)/Setting5 (Oblique) (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Inter-pin Solder Ball	LandSolderBall	<input type="radio"/>
Inter-pin Solder Ball Judgment Type	LogicMethodType	
Inter-pin Solder Ball/Solder Ball Diameter (mm)	SolderBallDiameter	
Inter-pin Solder Ball/Solder Ball Diameter (mm) Lower Limit	LowerLimit	
Inter-pin Solder Ball/Solder Ball Diameter (mm) Upper Limit	UpperLimit	
Inter-pin Solder Ball/Ratio (%)	Rate	
Inter-pin Solder Ball/Ratio (%) Lower Limit	LowerLimit	
Inter-pin Solder Ball/Ratio (%) Upper Limit	UpperLimit	
Inter-pin Solder Ball/Area Rate (%)	AreaRate	
Inter-pin Solder Ball/Area Rate (%) Lower Limit	LowerLimit	
Inter-pin Solder Ball/Area Rate (%) Upper Limit	UpperLimit	
Inter-pin Solder Ball/Excluded Area (Component Side) (mm)	ComponentExclusionArea	
Inter-pin Solder Ball/Excluded Area (Component Side) (mm) Lower Limit	LowerLimit	
Inter-pin Solder Ball/Excluded Area (Component Side) (mm) Upper Limit	UpperLimit	
Inter-pin Solder Ball/Excluded Area (Land Side) (mm)	LandExclusionArea	
Inter-pin Solder Ball/Excluded Area (Land Side) (mm) Lower Limit	LowerLimit	
Inter-pin Solder Ball/Excluded Area (Land Side) (mm) Upper Limit	UpperLimit	
Inter-pin Solder Bridge	LandSolderBridge	<input type="radio"/>
Inter-pin Solder Bridge/Bridging Width (mm)	BridgeWidth	
Inter-pin Solder Bridge/Bridging Width (mm) Lower Limit	LowerLimit	
Inter-pin Solder Bridge/Bridging Width (mm) Upper Limit	UpperLimit	
Inter-pin Solder Bridge/Excluded Area (Component Side) (mm)	ComponentExclusionArea	
Inter-pin Solder Bridge/Excluded Area (Component Side) (mm) Lower Limit	LowerLimit	

## Appendix 12. Inspection Coverage Output Format

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Inter-pin Solder Bridge/Excluded Area (Component Side) (mm) Upper Limit	UpperLimit	
Inter-pin Solder Bridge/Excluded Area (Land Side) (mm)	LandExclusionArea	
Inter-pin Solder Bridge/Excluded Area (Land Side) (mm) Lower Limit	LowerLimit	
Inter-pin Solder Bridge/Excluded Area (Land Side) (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Height (mm)	ElectrodeHeight	○
Lead Inspection/Lead Height (mm) Lower Limit	LowerLimit	
Lead Inspection/Lead Height (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Presence (%)	ElectrodePresence	○
Lead Inspection/Lead Presence (%)/Area (%)	ElectrodePresenceArea	○
Lead Inspection/Lead Presence (%)/Area (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Presence (%)/Area (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Presence (%)/Center of Gravity (%)	ElectrodePresenceGravity	○
Lead Inspection/Lead Presence (%)/Center of Gravity (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Presence (%)/Center of Gravity (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Presence (%)/Dispersion (%)	ElectrodePresenceDispersio	○
Lead Inspection/Lead Presence (%)/Dispersion (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Presence (%)/Dispersion (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Bend	ElectrodeBendClinch	○
Lead Inspection/Lead Bend/Direction [Abs.] (°)	Deflection	
Lead Inspection/Lead Bend/Direction [Abs.] (°) Lower Limit	LowerLimit	
Lead Inspection/Lead Bend/Direction [Abs.] (°) Upper Limit	UpperLimit	
Lead Inspection/Lead Bend/Length (mm)	Length	
Lead Inspection/Lead Bend/Length (mm) Lower Limit	LowerLimit	
Lead Inspection/Lead Bend/Length (mm) Upper Limit	UpperLimit	
Blow Hole	BlowHole	○
Blow Hole/Diameter (mm)	Diameter	
Blow Hole/Diameter (mm) Lower Limit	LowerLimit	
Blow Hole/Diameter (mm) Upper Limit	UpperLimit	
Blow Hole/Ratio (%)	Rate	
Blow Hole/Ratio (%) Lower Limit	LowerLimit	
Blow Hole/Ratio (%) Upper Limit	UpperLimit	
Blow Hole/Area Rate (%)	AreaRate	
Blow Hole/Area Rate (%) Lower Limit	LowerLimit	
Blow Hole/Area Rate (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset (mm)	ElectrodeOffsetMillimeter	○
Lead Inspection/Lead Offset (mm)/X-offset [Abs.] (mm)	ElectrodeOffsetX	○
Lead Inspection/Lead Offset (mm)/X-offset [Abs.] (mm) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset (mm)/X-offset [Abs.] (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset (mm)/Y-offset [Abs.] (mm)	ElectrodeOffsetY	○
Lead Inspection/Lead Offset (mm)/Y-offset [Abs.] (mm) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset (mm)/Y-offset [Abs.] (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset (mm)/Component Skew [Abs.] (°)	ElectrodeSkew	
Lead Inspection/Lead Offset (mm)/Component Skew [Abs.] (°) Lower Limit	LowerLimit	○
Lead Inspection/Lead Offset (mm)/Component Skew [Abs.] (°) Upper Limit	UpperLimit	
Solder Ball	SolderBall	○
Solder Ball Judgment Type	LogicMethodType	
Solder Ball/Solder Ball Diameter (mm)	SolderBallDiameter	
Solder Ball/Solder Ball Diameter (mm) Lower Limit	LowerLimit	

## Appendix 12. Inspection Coverage Output Format

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Solder Ball/Solder Ball Diameter (mm) Upper Limit	UpperLimit	
Solder Ball/Ratio (%)	Rate	
Solder Ball/Ratio (%) Lower Limit	LowerLimit	
Solder Ball/Ratio (%) Upper Limit	UpperLimit	
Solder Ball/Area Rate (%)	AreaRate	
Solder Ball/Area Rate (%) Lower Limit	LowerLimit	
Solder Ball/Area Rate (%) Upper Limit	UpperLimit	
Solder Ball/Inspection Area Limitation (mm)	RegionLimit	○
Solder Ball/Inspection Area Limitation (mm) Lower Limit	LowerLimit	
Solder Ball/Inspection Area Limitation (mm) Upper Limit	UpperLimit	
Solder Bridge	SolderBridge	○
Solder Bridge/Bridging Width (mm)	BridgeWidth	
Solder Bridge/Bridging Width (mm) Lower Limit	LowerLimit	
Solder Bridge/Bridging Width (mm) Upper Limit	UpperLimit	
Foreign Material	ForeignMaterial	○
Foreign Material/Length Diameter Ratio (%)	LengthDiameterRatio	
Foreign Material/Length Diameter Ratio (%) Lower Limit	LowerLimit	
Foreign Material/Length Diameter Ratio (%) Upper Limit	UpperLimit	
Foreign Material/Area (mm <sup>2</sup> )	Area	
Foreign Material/Area (mm <sup>2</sup> ) Lower Limit	LowerLimit	
Foreign Material/Area (mm <sup>2</sup> ) Upper Limit	UpperLimit	
Solder Ball (Oblique)	SolderBallOblique	○
Solder Ball (Oblique) Judgment Type	LogicMethodType	
Solder Ball (Oblique)/Solder Ball Diameter (mm)	SolderBallDiameter	
Solder Ball (Oblique)/Solder Ball Diameter (mm) Lower Limit	LowerLimit	
Solder Ball (Oblique)/Solder Ball Diameter (mm) Upper Limit	UpperLimit	
Solder Ball (Oblique)/Ratio (%)	Rate	
Solder Ball (Oblique)/Ratio (%) Lower Limit	LowerLimit	
Solder Ball (Oblique)/Ratio (%) Upper Limit	UpperLimit	
Solder Ball (Oblique)/Area Rate (%)	AreaRate	
Solder Ball (Oblique)/Area Rate (%) Lower Limit	LowerLimit	
Solder Ball (Oblique)/Area Rate (%) Upper Limit	UpperLimit	
Solder Ball (Oblique)/Inspection Area Limitation (mm)	RegionLimit	○
Solder Ball (Oblique)/Inspection Area Limitation (mm) Lower Limit	LowerLimit	
Solder Ball (Oblique)/Inspection Area Limitation (mm) Upper Limit	UpperLimit	
Solder Bridge (Oblique)	SolderBridgeOblique	○
Solder Bridge (Oblique)/Bridging Width (mm)	BridgeWidth	
Solder Bridge (Oblique)/Bridging Width (mm) Lower Limit	LowerLimit	
Solder Bridge (Oblique)/Bridging Width (mm) Upper Limit	UpperLimit	
Component Error (AI) / Setting1	AISetting1	○
Component Error (AI) / Setting1/AIComponentMeasurement(%)	AIComponentMeasuremen	○
Component Error (AI) / Setting1/AIComponentMeasurement(%) Lower Limit	LowerLimit	
Component Error (AI) / Setting1/AIComponentMeasurement(%) Upper Limit	UpperLimit	
Component Error (AI) / Setting2	AISetting2	○
Component Error (AI) / Setting2/AIComponentMeasurement(%)	AIComponentMeasuremen	○
Component Error (AI) / Setting2/AIComponentMeasurement(%) Lower Limit	LowerLimit	
Component Error (AI) / Setting2/AIComponentMeasurement(%) Upper Limit	UpperLimit	
Component Error (AI) / Setting3	AISetting3	○

## Appendix 12. Inspection Coverage Output Format

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Component Error (AI) / Setting3/AIComponentMeasurement(%)	AIComponentMeasuremen	<input type="radio"/>
Component Error (AI) / Setting3/AIComponentMeasurement(%) Lower Limit	LowerLimit	
Component Error (AI) / Setting3/AIComponentMeasurement(%) Upper Limit	UpperLimit	
Component Error (AI) / Setting4	AISetting4	<input type="radio"/>
Component Error (AI) / Setting4/AIComponentMeasurement(%)	AIComponentMeasuremen	<input type="radio"/>
Component Error (AI) / Setting4/AIComponentMeasurement(%) Lower Limit	LowerLimit	
Component Error (AI) / Setting4/AIComponentMeasurement(%) Upper Limit	UpperLimit	
Component Error (AI) / Setting5	AISetting5	<input type="radio"/>
Component Error (AI) / Setting5/AIComponentMeasurement(%)	AIComponentMeasuremen	<input type="radio"/>
Component Error (AI) / Setting5/AIComponentMeasurement(%) Lower Limit	LowerLimit	
Component Error (AI) / Setting5/AIComponentMeasurement(%) Upper Limit	UpperLimit	
Component Error (AI) / Setting6	AISetting6	<input type="radio"/>
Component Error (AI) / Setting6/AIComponentMeasurement(%)	AIComponentMeasuremen	<input type="radio"/>
Component Error (AI) / Setting6/AIComponentMeasurement(%) Lower Limit	LowerLimit	
Component Error (AI) / Setting6/AIComponentMeasurement(%) Upper Limit	UpperLimit	
Component Error (AI) / Setting7	AISetting7	<input type="radio"/>
Component Error (AI) / Setting7/AIComponentMeasurement(%)	AIComponentMeasuremen	<input type="radio"/>
Component Error (AI) / Setting7/AIComponentMeasurement(%) Lower Limit	LowerLimit	
Component Error (AI) / Setting7/AIComponentMeasurement(%) Upper Limit	UpperLimit	
Component Error (AI) / Setting8	AISetting8	<input type="radio"/>
Component Error (AI) / Setting8/AIComponentMeasurement(%)	AIComponentMeasuremen	<input type="radio"/>
Component Error (AI) / Setting8/AIComponentMeasurement(%) Lower Limit	LowerLimit	
Component Error (AI) / Setting8/AIComponentMeasurement(%) Upper Limit	UpperLimit	
Component Error (AI) / Setting9	AISetting9	<input type="radio"/>
Component Error (AI) / Setting9/AIComponentMeasurement(%)	AIComponentMeasuremen	<input type="radio"/>
Component Error (AI) / Setting9/AIComponentMeasurement(%) Lower Limit	LowerLimit	
Component Error (AI) / Setting9/AIComponentMeasurement(%) Upper Limit	UpperLimit	
Component Error (AI) / Setting10	AISetting10	<input type="radio"/>
Component Error (AI) / Setting10/AIComponentMeasurement(%)	AIComponentMeasuremen	<input type="radio"/>
Component Error (AI) / Setting10/AIComponentMeasurement(%) Lower Limit	LowerLimit	
Component Error (AI) / Setting10/AIComponentMeasurement(%) Upper Limit	UpperLimit	
Wettability (AI) / Setting1	AISetting1	<input type="radio"/>
Wettability (AI) / Setting1 / AIMeasurement(%)	AIMeasurement	<input type="radio"/>
Wettability (AI) / Setting1 / AIMeasurement(%) Lower Limit	LowerLimit	
Wettability (AI) / Setting1 / AIMeasurement(%) Upper Limit	UpperLimit	
Wettability (AI) / Setting2	AISetting2	<input type="radio"/>
Wettability (AI) / Setting2 / AIMeasurement(%)	AIMeasurement	<input type="radio"/>
Wettability (AI) / Setting2 / AIMeasurement(%) Lower Limit	LowerLimit	
Wettability (AI) / Setting2 / AIMeasurement(%) Upper Limit	UpperLimit	
Wettability (AI) / Setting3	AISetting3	<input type="radio"/>
Wettability (AI) / Setting3 / AIMeasurement(%)	AIMeasurement	<input type="radio"/>
Wettability (AI) / Setting3 / AIMeasurement(%) Lower Limit	LowerLimit	
Wettability (AI) / Setting3 / AIMeasurement(%) Upper Limit	UpperLimit	
Wettability (AI) / Setting4	AISetting4	<input type="radio"/>
Wettability (AI) / Setting4 / AIMeasurement(%)	AIMeasurement	<input type="radio"/>
Wettability (AI) / Setting4 / AIMeasurement(%) Lower Limit	LowerLimit	
Wettability (AI) / Setting4 / AIMeasurement(%) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Wettability (AI) / Setting5	AISetting5	<input type="radio"/>
Wettability (AI) / Setting5 / AIMeasurement(%)	AIMeasurement	<input type="radio"/>
Wettability (AI) / Setting5 / AIMeasurement(%) Lower Limit	LowerLimit	
Wettability (AI) / Setting5 / AIMeasurement(%) Upper Limit	UpperLimit	
Wettability (AI) / Setting6	AISetting6	<input type="radio"/>
Wettability (AI) / Setting6 / AIMeasurement(%)	AIMeasurement	<input type="radio"/>
Wettability (AI) / Setting6 / AIMeasurement(%) Lower Limit	LowerLimit	
Wettability (AI) / Setting6 / AIMeasurement(%) Upper Limit	UpperLimit	
Wettability (AI) / Setting7	AISetting7	<input type="radio"/>
Wettability (AI) / Setting7 / AIMeasurement(%)	AIMeasurement	<input type="radio"/>
Wettability (AI) / Setting7 / AIMeasurement(%) Lower Limit	LowerLimit	
Wettability (AI) / Setting7 / AIMeasurement(%) Upper Limit	UpperLimit	
Wettability (AI) / Setting8	AISetting8	<input type="radio"/>
Wettability (AI) / Setting8 / AIMeasurement(%)	AIMeasurement	<input type="radio"/>
Wettability (AI) / Setting8 / AIMeasurement(%) Lower Limit	LowerLimit	
Wettability (AI) / Setting8 / AIMeasurement(%) Upper Limit	UpperLimit	
Wettability (AI) / Setting9	AISetting9	<input type="radio"/>
Wettability (AI) / Setting9 / AIMeasurement(%)	AIMeasurement	<input type="radio"/>
Wettability (AI) / Setting9 / AIMeasurement(%) Lower Limit	LowerLimit	
Wettability (AI) / Setting9 / AIMeasurement(%) Upper Limit	UpperLimit	
Wettability (AI) / Setting10	AISetting10	<input type="radio"/>
Wettability (AI) / Setting10 / AIMeasurement(%)	AIMeasurement	<input type="radio"/>
Wettability (AI) / Setting10 / AIMeasurement(%) Lower Limit	LowerLimit	
Wettability (AI) / Setting10 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) / Setting1	AISetting1	<input type="radio"/>
Land Error (AI) / Setting1 / AIMeasurement(%)	AILandErrorMeasurement	<input type="radio"/>
Land Error (AI) / Setting1 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) / Setting1 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) / Setting2	AISetting2	<input type="radio"/>
Land Error (AI) / Setting2 / AIMeasurement(%)	AILandErrorMeasurement	<input type="radio"/>
Land Error (AI) / Setting2 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) / Setting2 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) / Setting3	AISetting3	<input type="radio"/>
Land Error (AI) / Setting3 / AIMeasurement(%)	AILandErrorMeasurement	<input type="radio"/>
Land Error (AI) / Setting3 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) / Setting3 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) / Setting4	AISetting4	<input type="radio"/>
Land Error (AI) / Setting4 / AIMeasurement(%)	AILandErrorMeasurement	<input type="radio"/>
Land Error (AI) / Setting4 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) / Setting4 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) / Setting5	AISetting5	<input type="radio"/>
Land Error (AI) / Setting5 / AIMeasurement(%)	AILandErrorMeasurement	<input type="radio"/>
Land Error (AI) / Setting5 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) / Setting5 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) / Setting6	AISetting6	<input type="radio"/>
Land Error (AI) / Setting6 / AIMeasurement(%)	AILandErrorMeasurement	<input type="radio"/>
Land Error (AI) / Setting6 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) / Setting6 / AIMeasurement(%) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Land Error (AI) / Setting7	AISetting7	<input type="radio"/>
Land Error (AI) / Setting7 / AIMeasurement(%)	AILandErrorMeasurement	<input type="radio"/>
Land Error (AI) / Setting7 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) / Setting7 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) / Setting8	AISetting8	<input type="radio"/>
Land Error (AI) / Setting8 / AIMeasurement(%)	AILandErrorMeasurement	<input type="radio"/>
Land Error (AI) / Setting8 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) / Setting8 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) / Setting9	AISetting9	<input type="radio"/>
Land Error (AI) / Setting9 / AIMeasurement(%)	AILandErrorMeasurement	<input type="radio"/>
Land Error (AI) / Setting9 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) / Setting9 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) / Setting10	AISetting10	<input type="radio"/>
Land Error (AI) / Setting10 / AIMeasurement(%)	AILandErrorMeasurement	<input type="radio"/>
Land Error (AI) / Setting10 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) / Setting10 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) (Oblique) / Setting1	AISetting1	<input type="radio"/>
Land Error (AI) (Oblique) / Setting1 / AIMeasurement(%)	AILandErrorObliqueMeasure	<input type="radio"/>
Land Error (AI) (Oblique) / Setting1 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) (Oblique) / Setting1 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) (Oblique) / Setting2	AISetting2	<input type="radio"/>
Land Error (AI) (Oblique) / Setting2 / AIMeasurement(%)	AILandErrorObliqueMeasure	<input type="radio"/>
Land Error (AI) (Oblique) / Setting2 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) (Oblique) / Setting2 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) (Oblique) / Setting3	AISetting3	<input type="radio"/>
Land Error (AI) (Oblique) / Setting3 / AIMeasurement(%)	AILandErrorObliqueMeasure	<input type="radio"/>
Land Error (AI) (Oblique) / Setting3 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) (Oblique) / Setting3 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) (Oblique) / Setting4	AISetting4	<input type="radio"/>
Land Error (AI) (Oblique) / Setting4 / AIMeasurement(%)	AILandErrorObliqueMeasure	<input type="radio"/>
Land Error (AI) (Oblique) / Setting4 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) (Oblique) / Setting4 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) (Oblique) / Setting5	AISetting5	<input type="radio"/>
Land Error (AI) (Oblique) / Setting5 / AIMeasurement(%)	AILandErrorObliqueMeasure	<input type="radio"/>
Land Error (AI) (Oblique) / Setting5 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) (Oblique) / Setting5 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) (Oblique) / Setting6	AISetting6	<input type="radio"/>
Land Error (AI) (Oblique) / Setting6 / AIMeasurement(%)	AILandErrorObliqueMeasure	<input type="radio"/>
Land Error (AI) (Oblique) / Setting6 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) (Oblique) / Setting6 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) (Oblique) / Setting7	AISetting7	<input type="radio"/>
Land Error (AI) (Oblique) / Setting7 / AIMeasurement(%)	AILandErrorObliqueMeasure	<input type="radio"/>
Land Error (AI) (Oblique) / Setting7 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) (Oblique) / Setting7 / AIMeasurement(%) Upper Limit	UpperLimit	
Land Error (AI) (Oblique) / Setting8	AISetting8	<input type="radio"/>
Land Error (AI) (Oblique) / Setting8 / AIMeasurement(%)	AILandErrorObliqueMeasure	<input type="radio"/>
Land Error (AI) (Oblique) / Setting8 / AIMeasurement(%) Lower Limit	LowerLimit	
Land Error (AI) (Oblique) / Setting8 / AIMeasurement(%) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Component Inspection/Component Offset/Setting9/Component Skew [Abs.] (°) Lower Limit	LowerLimit	
Component Inspection/Component Offset/Setting9/Component Skew [Abs.] (°) Upper Limit	UpperLimit	
Component Inspection/Component Offset/Setting9/X-offset (Component) [Abs.] (mm)	OffsetXComponent	○
Component Inspection/Component Offset/Setting9/X-offset (Component) [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Component Offset/Setting9/X-offset (Component) [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Component Offset/Setting9/Y-offset (Component) [Abs.] (mm)	OffsetYComponent	○
Component Inspection/Component Offset/Setting9/Y-offset (Component) [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Component Offset/Setting9/Y-offset (Component) [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Component Offset/Setting10	CustomSetting10	○
Component Inspection/Component Offset/Setting10/X-offset (PCB) [Abs.] (mm)	OffsetX	○
Component Inspection/Component Offset/Setting10/X-offset (PCB) [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Component Offset/Setting10/X-offset (PCB) [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Component Offset/Setting10/Y-offset (PCB) [Abs.] (mm)	OffsetY	○
Component Inspection/Component Offset/Setting10/Y-offset (PCB) [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Component Offset/Setting10/Y-offset (PCB) [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Component Offset/Setting10/Component Skew [Abs.] (°)	ComponentSkew	○
Component Inspection/Component Offset/Setting10/Component Skew [Abs.] (°) Lower Limit	LowerLimit	
Component Inspection/Component Offset/Setting10/Component Skew [Abs.] (°) Upper Limit	UpperLimit	
Component Inspection/Component Offset/Setting10/X-offset (Component) [Abs.] (mm)	OffsetXComponent	○
Component Inspection/Component Offset/Setting10/X-offset (Component) [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Component Offset/Setting10/X-offset (Component) [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Component Offset/Setting10/Y-offset (Component) [Abs.] (mm)	OffsetYComponent	○
Component Inspection/Component Offset/Setting10/Y-offset (Component) [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Component Offset/Setting10/Y-offset (Component) [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting1	CustomSetting1	○
Component Inspection/Lifted Component/Setting1/Tilt (0-180°)	Custom1Inclination0	○
Component Inspection/Lifted Component/Setting1/Tilt (0-180°)/Height [Abs.] (mm)	InclinationHeight0	○
Component Inspection/Lifted Component/Setting1/Tilt (0-180°)/Height [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Lifted Component/Setting1/Tilt (0-180°)/Height [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting1/Tilt (0-180°)/Angle [Abs.] (°)	InclinationAngle0	○
Component Inspection/Lifted Component/Setting1/Tilt (0-180°)/Angle [Abs.] (°) Lower Limit	LowerLimit	
Component Inspection/Lifted Component/Setting1/Tilt (0-180°)/Angle [Abs.] (°) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting1/Tilt (90-270°)	Custom1Inclination90	○
Component Inspection/Lifted Component/Setting1/Tilt (90-270°)/Height [Abs.] (mm)	InclinationHeight90	○
Component Inspection/Lifted Component/Setting1/Tilt (90-270°)/Height [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Lifted Component/Setting1/Tilt (90-270°)/Height [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting1/Tilt (90-270°)/Angle [Abs.] (°)	InclinationAngle90	○
Component Inspection/Lifted Component/Setting1/Tilt (90-270°)/Angle [Abs.] (°) Lower Limit	LowerLimit	
Component Inspection/Lifted Component/Setting1/Tilt (90-270°)/Angle [Abs.] (°) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting1/Lift (Average Height) (mm)	LiftAverageHeight	○
Component Inspection/Lifted Component/Setting1/Lift (Average Height) (mm) Lower Limit	LowerLimit	
Component Inspection/Lifted Component/Setting1/Lift (Average Height) (mm) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting2	CustomSetting2	○
Component Inspection/Lifted Component/Setting2/Tilt (0-180°)	Custom2Inclination0	○
Component Inspection/Lifted Component/Setting2/Tilt (0-180°)/Height [Abs.] (mm)	InclinationHeight0	○
Component Inspection/Lifted Component/Setting2/Tilt (0-180°)/Height [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Lifted Component/Setting2/Tilt (0-180°)/Height [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting2/Tilt (0-180°)/Angle [Abs.] (°)	InclinationAngle0	○

## Appendix 12. Inspection Coverage Output Format

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Component Inspection/Lifted Component/Setting10/Tilt (0-180°)/Height [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting10/Tilt (0-180°)/Angle [Abs.] (°)	InclinationAngle0	○
Component Inspection/Lifted Component/Setting10/Tilt (0-180°)/Angle [Abs.] (°) Lower Limit	LowerLimit	
Component Inspection/Lifted Component/Setting10/Tilt (0-180°)/Angle [Abs.] (°) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting10/Tilt (90-270°)	Custom10Inclination90	○
Component Inspection/Lifted Component/Setting10/Tilt (90-270°)/Height [Abs.] (mm)	InclinationHeight90	○
Component Inspection/Lifted Component/Setting10/Tilt (90-270°)/Height [Abs.] (mm) Lower Limit	LowerLimit	
Component Inspection/Lifted Component/Setting10/Tilt (90-270°)/Height [Abs.] (mm) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting10/Tilt (90-270°)/Angle [Abs.] (°)	InclinationAngle90	○
Component Inspection/Lifted Component/Setting10/Tilt (90-270°)/Angle [Abs.] (°) Lower Limit	LowerLimit	
Component Inspection/Lifted Component/Setting10/Tilt (90-270°)/Angle [Abs.] (°) Upper Limit	UpperLimit	
Component Inspection/Lifted Component/Setting10/Lift (Average Height) (mm)	LiftAverageHeight	○
Component Inspection/Lifted Component/Setting10/Lift (Average Height) (mm) Lower Limit	LowerLimit	
Component Inspection/Lifted Component/Setting10/Lift (Average Height) (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting1	CustomSetting1	○
Lead Inspection/Lead Offset/Setting1/Side Overhang (%)	SideOverhang	○
Lead Inspection/Lead Offset/Setting1/Side Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting1/Side Overhang (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting1/End Overhang (%)	EndOverhang	○
Lead Inspection/Lead Offset/Setting1/End Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting1/End Overhang (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting1/End Overlap (%)	EndOverlap	○
Lead Inspection/Lead Offset/Setting1/End Overlap (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting1/End Overlap (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting2	CustomSetting2	○
Lead Inspection/Lead Offset/Setting2/Side Overhang (%)	SideOverhang	○
Lead Inspection/Lead Offset/Setting2/Side Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting2/Side Overhang (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting2/End Overhang (%)	EndOverhang	○
Lead Inspection/Lead Offset/Setting2/End Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting2/End Overhang (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting2/End Overlap (%)	EndOverlap	○
Lead Inspection/Lead Offset/Setting2/End Overlap (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting2/End Overlap (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting3	CustomSetting3	○
Lead Inspection/Lead Offset/Setting3/Side Overhang (%)	SideOverhang	○
Lead Inspection/Lead Offset/Setting3/Side Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting3/Side Overhang (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting3/End Overhang (%)	EndOverhang	○
Lead Inspection/Lead Offset/Setting3/End Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting3/End Overhang (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting3/End Overlap (%)	EndOverlap	○
Lead Inspection/Lead Offset/Setting3/End Overlap (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting3/End Overlap (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting4	CustomSetting4	○

## Appendix 12. Inspection Coverage Output Format

## Appendix 12. Inspection Coverage Output Format

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Lead Inspection/Lead Offset/Setting8/End Overlap (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting9	CustomSetting9	○
Lead Inspection/Lead Offset/Setting9/Side Overhang (%)	SideOverhang	○
Lead Inspection/Lead Offset/Setting9/Side Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting9/Side Overhang (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting9/End Overhang (%)	EndOverhang	○
Lead Inspection/Lead Offset/Setting9/End Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting9/End Overhang (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting9/End Overlap (%)	EndOverlap	○
Lead Inspection/Lead Offset/Setting9/End Overlap (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting9/End Overlap (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting10	CustomSetting10	○
Lead Inspection/Lead Offset/Setting10/Side Overhang (%)	SideOverhang	○
Lead Inspection/Lead Offset/Setting10/Side Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting10/Side Overhang (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting10/End Overhang (%)	EndOverhang	○
Lead Inspection/Lead Offset/Setting10/End Overhang (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting10/End Overhang (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Offset/Setting10/End Overlap (%)	EndOverlap	○
Lead Inspection/Lead Offset/Setting10/End Overlap (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Offset/Setting10/End Overlap (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting1	CustomSetting1	○
Lead Inspection/Lead Posture/Lifted Lead/Setting1/Lifted Lead (mm)	VerticallyLiftedElectrode	○
Lead Inspection/Lead Posture/Lifted Lead/Setting1/Lifted Lead (mm) Lower Limit	LowerLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting1/Lifted Lead (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting2	CustomSetting2	○
Lead Inspection/Lead Posture/Lifted Lead/Setting2/Lifted Lead (mm)	VerticallyLiftedElectrode	○
Lead Inspection/Lead Posture/Lifted Lead/Setting2/Lifted Lead (mm) Lower Limit	LowerLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting2/Lifted Lead (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting3	CustomSetting3	○
Lead Inspection/Lead Posture/Lifted Lead/Setting3/Lifted Lead (mm)	VerticallyLiftedElectrode	○
Lead Inspection/Lead Posture/Lifted Lead/Setting3/Lifted Lead (mm) Lower Limit	LowerLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting3/Lifted Lead (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting4	CustomSetting4	○
Lead Inspection/Lead Posture/Lifted Lead/Setting4/Lifted Lead (mm)	VerticallyLiftedElectrode	○
Lead Inspection/Lead Posture/Lifted Lead/Setting4/Lifted Lead (mm) Lower Limit	LowerLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting4/Lifted Lead (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting5	CustomSetting5	○
Lead Inspection/Lead Posture/Lifted Lead/Setting5/Lifted Lead (mm)	VerticallyLiftedElectrode	○
Lead Inspection/Lead Posture/Lifted Lead/Setting5/Lifted Lead (mm) Lower Limit	LowerLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting5/Lifted Lead (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting6	CustomSetting6	○
Lead Inspection/Lead Posture/Lifted Lead/Setting6/Lifted Lead (mm)	VerticallyLiftedElectrode	○
Lead Inspection/Lead Posture/Lifted Lead/Setting6/Lifted Lead (mm) Lower Limit	LowerLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting6/Lifted Lead (mm) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Lifted Lead/Setting7	CustomSetting7	○
Lead Inspection/Lead Posture/Lifted Lead/Setting7/Lifted Lead (mm)	VerticallyLiftedElectrode	○
Lead Inspection/Lead Posture/Lifted Lead/Setting7/Lifted Lead (mm) Lower Limit	LowerLimit	

## Appendix 12. Inspection Coverage Output Format

## Appendix 12. Inspection Coverage Output Format

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Lead Inspection/Lead Posture/Lead Length/Setting9/Lead Length (%) Upper Limit	UpperLimit	
Lead Inspection/Lead Posture/Lead Length/Setting10	CustomSetting10	○
Lead Inspection/Lead Posture/Lead Length/Setting10/Lead Length (%)	ElectrodeLength	○
Lead Inspection/Lead Posture/Lead Length/Setting10/Lead Length (%) Lower Limit	LowerLimit	
Lead Inspection/Lead Posture/Lead Length/Setting10/Lead Length (%) Upper Limit	UpperLimit	
Exposed Land/Setting1	CustomSetting1	○
Exposed Land/Setting1/Exposed Land (%)	ExposedBasisMetal	○
Exposed Land/Setting1/Exposed Land (%) Lower Limit	LowerLimit	
Exposed Land/Setting1/Exposed Land (%) Upper Limit	UpperLimit	
Exposed Land/Setting2	CustomSetting2	○
Exposed Land/Setting2/Exposed Land (%)	ExposedBasisMetal	○
Exposed Land/Setting2/Exposed Land (%) Lower Limit	LowerLimit	
Exposed Land/Setting2/Exposed Land (%) Upper Limit	UpperLimit	
Exposed Land/Setting3	CustomSetting3	○
Exposed Land/Setting3/Exposed Land (%)	ExposedBasisMetal	○
Exposed Land/Setting3/Exposed Land (%) Lower Limit	LowerLimit	
Exposed Land/Setting3/Exposed Land (%) Upper Limit	UpperLimit	
Exposed Land/Setting4	CustomSetting4	○
Exposed Land/Setting4/Exposed Land (%)	ExposedBasisMetal	○
Exposed Land/Setting4/Exposed Land (%) Lower Limit	LowerLimit	
Exposed Land/Setting4/Exposed Land (%) Upper Limit	UpperLimit	
Exposed Land/Setting5	CustomSetting5	○
Exposed Land/Setting5/Exposed Land (%)	ExposedBasisMetal	○
Exposed Land/Setting5/Exposed Land (%) Lower Limit	LowerLimit	
Exposed Land/Setting5/Exposed Land (%) Upper Limit	UpperLimit	
Exposed Land/Setting6	CustomSetting6	○
Exposed Land/Setting6/Exposed Land (%)	ExposedBasisMetal	○
Exposed Land/Setting6/Exposed Land (%) Lower Limit	LowerLimit	
Exposed Land/Setting6/Exposed Land (%) Upper Limit	UpperLimit	
Exposed Land/Setting7	CustomSetting7	○
Exposed Land/Setting7/Exposed Land (%)	ExposedBasisMetal	○
Exposed Land/Setting7/Exposed Land (%) Lower Limit	LowerLimit	
Exposed Land/Setting7/Exposed Land (%) Upper Limit	UpperLimit	
Exposed Land/Setting8	CustomSetting8	○
Exposed Land/Setting8/Exposed Land (%)	ExposedBasisMetal	○
Exposed Land/Setting8/Exposed Land (%) Lower Limit	LowerLimit	
Exposed Land/Setting8/Exposed Land (%) Upper Limit	UpperLimit	
Exposed Land/Setting9	CustomSetting9	○
Exposed Land/Setting9/Exposed Land (%)	ExposedBasisMetal	○
Exposed Land/Setting9/Exposed Land (%) Lower Limit	LowerLimit	
Exposed Land/Setting9/Exposed Land (%) Upper Limit	UpperLimit	
Exposed Land/Setting10	CustomSetting10	○
Exposed Land/Setting10/Exposed Land (%)	ExposedBasisMetal	○
Exposed Land/Setting10/Exposed Land (%) Lower Limit	LowerLimit	
Exposed Land/Setting10/Exposed Land (%) Upper Limit	UpperLimit	
Solder Toe/Setting1	CustomSetting1	○
Solder Toe/Setting1/Solder Toe	SolderToe	○
Solder Toe/Setting1/Solder Toe/Width (%)	WidthRate1	○

## Appendix 12. Inspection Coverage Output Format

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Solder Toe/Setting1/Solder Toe/Width (%) Lower Limit	LowerLimit	
Solder Toe/Setting1/Solder Toe/Width (%) Upper Limit	UpperLimit	
Solder Toe/Setting1/Solder Toe/Position (%)	ToePositionRate1	○
Solder Toe/Setting1/Solder Toe/Position (%) Lower Limit	LowerLimit	
Solder Toe/Setting1/Solder Toe/Position (%) Upper Limit	UpperLimit	
Solder Toe/Setting1/Solder Toe/Toe Area	ToeArea1	○
Solder Toe/Setting1/Solder Toe/Toe Area/Inspection Area (%)	InspectionRegionRate	○
Solder Toe/Setting1/Solder Toe/Toe Area/Inspection Area (%) Lower Limit	LowerLimit	
Solder Toe/Setting1/Solder Toe/Toe Area/Inspection Area (%) Upper Limit	UpperLimit	
Solder Toe/Setting1/Solder Toe/Toe Area/Area Rate (%)	AreaRate	
Solder Toe/Setting1/Solder Toe/Toe Area/Area Rate (%) Lower Limit	LowerLimit	
Solder Toe/Setting1/Solder Toe/Toe Area/Area Rate (%) Upper Limit	UpperLimit	
Solder Toe/Setting2	CustomSetting2	○
Solder Toe/Setting2/Solder Toe	SolderToe	○
Solder Toe/Setting2/Solder Toe/Width (%)	WidthRate2	○
Solder Toe/Setting2/Solder Toe/Width (%) Lower Limit	LowerLimit	
Solder Toe/Setting2/Solder Toe/Width (%) Upper Limit	UpperLimit	
Solder Toe/Setting2/Solder Toe/Position (%)	ToePositionRate2	○
Solder Toe/Setting2/Solder Toe/Position (%) Lower Limit	LowerLimit	
Solder Toe/Setting2/Solder Toe/Position (%) Upper Limit	UpperLimit	
Solder Toe/Setting2/Solder Toe/Toe Area	ToeArea2	○
Solder Toe/Setting2/Solder Toe/Toe Area/Inspection Area (%)	InspectionRegionRate	○
Solder Toe/Setting2/Solder Toe/Toe Area/Inspection Area (%) Lower Limit	LowerLimit	
Solder Toe/Setting2/Solder Toe/Toe Area/Inspection Area (%) Upper Limit	UpperLimit	
Solder Toe/Setting2/Solder Toe/Toe Area/Area Rate (%)	AreaRate	
Solder Toe/Setting2/Solder Toe/Toe Area/Area Rate (%) Lower Limit	LowerLimit	
Solder Toe/Setting2/Solder Toe/Toe Area/Area Rate (%) Upper Limit	UpperLimit	
Solder Toe/Setting3	CustomSetting3	○
Solder Toe/Setting3/Solder Toe	SolderToe	○
Solder Toe/Setting3/Solder Toe/Width (%)	WidthRate3	○
Solder Toe/Setting3/Solder Toe/Width (%) Lower Limit	LowerLimit	
Solder Toe/Setting3/Solder Toe/Width (%) Upper Limit	UpperLimit	
Solder Toe/Setting3/Solder Toe/Position (%)	ToePositionRate3	○
Solder Toe/Setting3/Solder Toe/Position (%) Lower Limit	LowerLimit	
Solder Toe/Setting3/Solder Toe/Position (%) Upper Limit	UpperLimit	
Solder Toe/Setting3/Solder Toe/Toe Area	ToeArea3	○
Solder Toe/Setting3/Solder Toe/Toe Area/Inspection Area (%)	InspectionRegionRate	○
Solder Toe/Setting3/Solder Toe/Toe Area/Inspection Area (%) Lower Limit	LowerLimit	
Solder Toe/Setting3/Solder Toe/Toe Area/Inspection Area (%) Upper Limit	UpperLimit	
Solder Toe/Setting3/Solder Toe/Toe Area/Area Rate (%)	AreaRate	
Solder Toe/Setting3/Solder Toe/Toe Area/Area Rate (%) Lower Limit	LowerLimit	
Solder Toe/Setting3/Solder Toe/Toe Area/Area Rate (%) Upper Limit	UpperLimit	
Solder Toe/Setting4	CustomSetting4	○
Solder Toe/Setting4/Solder Toe	SolderToe	○
Solder Toe/Setting4/Solder Toe/Width (%)	WidthRate4	○
Solder Toe/Setting4/Solder Toe/Width (%) Lower Limit	LowerLimit	
Solder Toe/Setting4/Solder Toe/Width (%) Upper Limit	UpperLimit	
Solder Toe/Setting4/Solder Toe/Position (%)	ToePositionRate4	○

## Appendix 12. Inspection Coverage Output Format

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Solder Toe/Setting4/Solder Toe/Position (%) Lower Limit	LowerLimit	
Solder Toe/Setting4/Solder Toe/Position (%) Upper Limit	UpperLimit	
Solder Toe/Setting4/Solder Toe/Toe Area	ToeArea4	○
Solder Toe/Setting4/Solder Toe/Toe Area/Inspection Area (%)	InspectionRegionRate	○
Solder Toe/Setting4/Solder Toe/Toe Area/Inspection Area (%) Lower Limit	LowerLimit	
Solder Toe/Setting4/Solder Toe/Toe Area/Inspection Area (%) Upper Limit	UpperLimit	
Solder Toe/Setting4/Solder Toe/Toe Area/Area Rate (%)	AreaRate	
Solder Toe/Setting4/Solder Toe/Toe Area/Area Rate (%) Lower Limit	LowerLimit	
Solder Toe/Setting4/Solder Toe/Toe Area/Area Rate (%) Upper Limit	UpperLimit	
Solder Toe/Setting5	CustomSetting5	○
Solder Toe/Setting5/Solder Toe	SolderToe	○
Solder Toe/Setting5/Solder Toe/Width (%)	WidthRate5	○
Solder Toe/Setting5/Solder Toe/Width (%) Lower Limit	LowerLimit	
Solder Toe/Setting5/Solder Toe/Width (%) Upper Limit	UpperLimit	
Solder Toe/Setting5/Solder Toe/Position (%)	ToePositionRate5	○
Solder Toe/Setting5/Solder Toe/Position (%) Lower Limit	LowerLimit	
Solder Toe/Setting5/Solder Toe/Position (%) Upper Limit	UpperLimit	
Solder Toe/Setting5/Solder Toe/Toe Area	ToeArea5	○
Solder Toe/Setting5/Solder Toe/Toe Area/Inspection Area (%)	InspectionRegionRate	○
Solder Toe/Setting5/Solder Toe/Toe Area/Inspection Area (%) Lower Limit	LowerLimit	
Solder Toe/Setting5/Solder Toe/Toe Area/Inspection Area (%) Upper Limit	UpperLimit	
Solder Toe/Setting5/Solder Toe/Area Rate (%)	AreaRate	
Solder Toe/Setting5/Solder Toe/Toe Area/Area Rate (%) Lower Limit	LowerLimit	
Solder Toe/Setting5/Solder Toe/Toe Area/Area Rate (%) Upper Limit	UpperLimit	
Solder Toe/Setting6	CustomSetting6	○
Solder Toe/Setting6/Solder Toe	SolderToe	○
Solder Toe/Setting6/Solder Toe/Width (%)	WidthRate6	○
Solder Toe/Setting6/Solder Toe/Width (%) Lower Limit	LowerLimit	
Solder Toe/Setting6/Solder Toe/Width (%) Upper Limit	UpperLimit	
Solder Toe/Setting6/Solder Toe/Position (%)	ToePositionRate6	○
Solder Toe/Setting6/Solder Toe/Position (%) Lower Limit	LowerLimit	
Solder Toe/Setting6/Solder Toe/Position (%) Upper Limit	UpperLimit	
Solder Toe/Setting6/Solder Toe/Toe Area	ToeArea6	○
Solder Toe/Setting6/Solder Toe/Toe Area/Inspection Area (%)	InspectionRegionRate	○
Solder Toe/Setting6/Solder Toe/Toe Area/Inspection Area (%) Lower Limit	LowerLimit	
Solder Toe/Setting6/Solder Toe/Toe Area/Inspection Area (%) Upper Limit	UpperLimit	
Solder Toe/Setting6/Solder Toe/Area Rate (%)	AreaRate	
Solder Toe/Setting6/Solder Toe/Toe Area/Area Rate (%) Lower Limit	LowerLimit	
Solder Toe/Setting6/Solder Toe/Toe Area/Area Rate (%) Upper Limit	UpperLimit	
Solder Toe/Setting7	CustomSetting7	○
Solder Toe/Setting7/Solder Toe	SolderToe	○
Solder Toe/Setting7/Solder Toe/Width (%)	WidthRate7	○
Solder Toe/Setting7/Solder Toe/Width (%) Lower Limit	LowerLimit	
Solder Toe/Setting7/Solder Toe/Width (%) Upper Limit	UpperLimit	
Solder Toe/Setting7/Solder Toe/Position (%)	ToePositionRate7	○
Solder Toe/Setting7/Solder Toe/Position (%) Lower Limit	LowerLimit	
Solder Toe/Setting7/Solder Toe/Position (%) Upper Limit	UpperLimit	
Solder Toe/Setting7/Solder Toe/Toe Area	ToeArea7	○

## Appendix 12. Inspection Coverage Output Format

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Solder Toe/Setting7/Solder Toe/Toe Area/Inspection Area (%)	InspectionRegionRate	<input type="radio"/>
Solder Toe/Setting7/Solder Toe/Toe Area/Inspection Area (%) Lower Limit	LowerLimit	
Solder Toe/Setting7/Solder Toe/Toe Area/Inspection Area (%) Upper Limit	UpperLimit	
Solder Toe/Setting7/Solder Toe/Toe Area/Area Rate (%)	AreaRate	
Solder Toe/Setting7/Solder Toe/Toe Area/Area Rate (%) Lower Limit	LowerLimit	
Solder Toe/Setting7/Solder Toe/Toe Area/Area Rate (%) Upper Limit	UpperLimit	
Solder Toe/Setting8	CustomSetting8	<input type="radio"/>
Solder Toe/Setting8/Solder Toe	SolderToe	<input type="radio"/>
Solder Toe/Setting8/Solder Toe/Width (%)	WidthRate8	<input type="radio"/>
Solder Toe/Setting8/Solder Toe/Width (%) Lower Limit	LowerLimit	
Solder Toe/Setting8/Solder Toe/Width (%) Upper Limit	UpperLimit	
Solder Toe/Setting8/Solder Toe/Position (%)	ToePositionRate8	<input type="radio"/>
Solder Toe/Setting8/Solder Toe/Position (%) Lower Limit	LowerLimit	
Solder Toe/Setting8/Solder Toe/Position (%) Upper Limit	UpperLimit	
Solder Toe/Setting8/Solder Toe/Toe Area	ToeArea8	<input type="radio"/>
Solder Toe/Setting8/Solder Toe/Toe Area/Inspection Area (%)	InspectionRegionRate	<input type="radio"/>
Solder Toe/Setting8/Solder Toe/Toe Area/Inspection Area (%) Lower Limit	LowerLimit	
Solder Toe/Setting8/Solder Toe/Toe Area/Inspection Area (%) Upper Limit	UpperLimit	
Solder Toe/Setting8/Solder Toe/Toe Area/Area Rate (%)	AreaRate	
Solder Toe/Setting8/Solder Toe/Toe Area/Area Rate (%) Lower Limit	LowerLimit	
Solder Toe/Setting8/Solder Toe/Toe Area/Area Rate (%) Upper Limit	UpperLimit	
Solder Toe/Setting9	CustomSetting9	<input type="radio"/>
Solder Toe/Setting9/Solder Toe	SolderToe	<input type="radio"/>
Solder Toe/Setting9/Solder Toe/Width (%)	WidthRate9	<input type="radio"/>
Solder Toe/Setting9/Solder Toe/Width (%) Lower Limit	LowerLimit	
Solder Toe/Setting9/Solder Toe/Width (%) Upper Limit	UpperLimit	
Solder Toe/Setting9/Solder Toe/Position (%)	ToePositionRate9	<input type="radio"/>
Solder Toe/Setting9/Solder Toe/Position (%) Lower Limit	LowerLimit	
Solder Toe/Setting9/Solder Toe/Position (%) Upper Limit	UpperLimit	
Solder Toe/Setting9/Solder Toe/Toe Area	ToeArea9	<input type="radio"/>
Solder Toe/Setting9/Solder Toe/Toe Area/Inspection Area (%)	InspectionRegionRate	<input type="radio"/>
Solder Toe/Setting9/Solder Toe/Toe Area/Inspection Area (%) Lower Limit	LowerLimit	
Solder Toe/Setting9/Solder Toe/Toe Area/Inspection Area (%) Upper Limit	UpperLimit	
Solder Toe/Setting9/Solder Toe/Toe Area/Area Rate (%)	AreaRate	
Solder Toe/Setting9/Solder Toe/Toe Area/Area Rate (%) Lower Limit	LowerLimit	
Solder Toe/Setting9/Solder Toe/Toe Area/Area Rate (%) Upper Limit	UpperLimit	
Solder Toe/Setting10	CustomSetting10	<input type="radio"/>
Solder Toe/Setting10/Solder Toe	SolderToe	<input type="radio"/>
Solder Toe/Setting10/Solder Toe/Width (%)	WidthRate10	<input type="radio"/>
Solder Toe/Setting10/Solder Toe/Width (%) Lower Limit	LowerLimit	
Solder Toe/Setting10/Solder Toe/Width (%) Upper Limit	UpperLimit	
Solder Toe/Setting10/Solder Toe/Position (%)	ToePositionRate10	<input type="radio"/>
Solder Toe/Setting10/Solder Toe/Position (%) Lower Limit	LowerLimit	
Solder Toe/Setting10/Solder Toe/Position (%) Upper Limit	UpperLimit	
Solder Toe/Setting10/Solder Toe/Toe Area	ToeArea10	<input type="radio"/>
Solder Toe/Setting10/Solder Toe/Toe Area/Inspection Area (%)	InspectionRegionRate	<input type="radio"/>
Solder Toe/Setting10/Solder Toe/Toe Area/Inspection Area (%) Lower Limit	LowerLimit	
Solder Toe/Setting10/Solder Toe/Toe Area/Inspection Area (%) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Solder Toe/Setting10/Solder Toe/Toe Area/Area Rate (%)	AreaRate	
Solder Toe/Setting10/Solder Toe/Toe Area/Area Rate (%) Lower Limit	LowerLimit	
Solder Toe/Setting10/Solder Toe/Toe Area/Area Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting1	CustomSetting1	○
Solder Center/Setting1/Solder Center	SolderCenter	○
Solder Center/Setting1/Solder Center/Land Plane Exclusion	LandExclusionPlane1	○
Solder Center/Setting1/Solder Center/Land Plane Exclusion/Width (%)	WidthRate	○
Solder Center/Setting1/Solder Center/Land Plane Exclusion/Width (%) Lower Limit	LowerLimit	
Solder Center/Setting1/Solder Center/Land Plane Exclusion/Width (%) Upper Limit	UpperLimit	
Solder Center/Setting1/Solder Center/Land Plane Exclusion/Length (mm)	Length	○
Solder Center/Setting1/Solder Center/Land Plane Exclusion/Length (mm) Lower Limit	LowerLimit	
Solder Center/Setting1/Solder Center/Land Plane Exclusion/Length (mm) Upper Limit	UpperLimit	
Solder Center/Setting1/Solder Center/Average Width (%)	MeanWidthRate1	○
Solder Center/Setting1/Solder Center/Average Width (%) Lower Limit	LowerLimit	
Solder Center/Setting1/Solder Center/Average Width (%) Upper Limit	UpperLimit	
Solder Center/Setting1/Solder Center/Max. Length (%)	MaxLengthRate1	○
Solder Center/Setting1/Solder Center/Max. Length (%) Lower Limit	LowerLimit	
Solder Center/Setting1/Solder Center/Max. Length (%) Upper Limit	UpperLimit	
Solder Center/Setting1/Solder Center/Breadth Rate (%)	BreadthRate1	○
Solder Center/Setting1/Solder Center/Breadth Rate (%) Lower Limit	LowerLimit	
Solder Center/Setting1/Solder Center/Breadth Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting1/Solder Center/Breadth Rate (%)/Length (%)	LengthRate	○
Solder Center/Setting1/Solder Center/Breadth Rate (%)/Length (%) Lower Limit	LowerLimit	
Solder Center/Setting1/Solder Center/Breadth Rate (%)/Length (%) Upper Limit	UpperLimit	
Solder Center/Setting1/Solder Center/Toe Center Area (%)	ToeCenterArea1	○
Solder Center/Setting1/Solder Center/Toe Center Area (%) Lower Limit	LowerLimit	
Solder Center/Setting1/Solder Center/Toe Center Area (%) Upper Limit	UpperLimit	
Solder Center/Setting2	CustomSetting2	○
Solder Center/Setting2/Solder Center	SolderCenter	○
Solder Center/Setting2/Solder Center/Land Plane Exclusion	LandExclusionPlane2	○
Solder Center/Setting2/Solder Center/Land Plane Exclusion/Width (%)	WidthRate	○
Solder Center/Setting2/Solder Center/Land Plane Exclusion/Width (%) Lower Limit	LowerLimit	
Solder Center/Setting2/Solder Center/Land Plane Exclusion/Width (%) Upper Limit	UpperLimit	
Solder Center/Setting2/Solder Center/Land Plane Exclusion/Length (mm)	Length	○
Solder Center/Setting2/Solder Center/Land Plane Exclusion/Length (mm) Lower Limit	LowerLimit	
Solder Center/Setting2/Solder Center/Land Plane Exclusion/Length (mm) Upper Limit	UpperLimit	
Solder Center/Setting2/Solder Center/Average Width (%)	MeanWidthRate2	○
Solder Center/Setting2/Solder Center/Average Width (%) Lower Limit	LowerLimit	
Solder Center/Setting2/Solder Center/Average Width (%) Upper Limit	UpperLimit	
Solder Center/Setting2/Solder Center/Max. Length (%)	MaxLengthRate2	○
Solder Center/Setting2/Solder Center/Max. Length (%) Lower Limit	LowerLimit	
Solder Center/Setting2/Solder Center/Max. Length (%) Upper Limit	UpperLimit	
Solder Center/Setting2/Solder Center/Breadth Rate (%)	BreadthRate2	○
Solder Center/Setting2/Solder Center/Breadth Rate (%) Lower Limit	LowerLimit	
Solder Center/Setting2/Solder Center/Breadth Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting2/Solder Center/Breadth Rate (%)/Length (%)	LengthRate	○
Solder Center/Setting2/Solder Center/Breadth Rate (%)/Length (%) Lower Limit	LowerLimit	
Solder Center/Setting2/Solder Center/Breadth Rate (%)/Length (%) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Solder Center/Setting2/Solder Center/Toe Center Area (%)	ToeCenterArea2	<input type="radio"/>
Solder Center/Setting2/Solder Center/Toe Center Area (%) Lower Limit	LowerLimit	
Solder Center/Setting2/Solder Center/Toe Center Area (%) Upper Limit	UpperLimit	
Solder Center/Setting3	CustomSetting3	<input type="radio"/>
Solder Center/Setting3/Solder Center	SolderCenter	<input type="radio"/>
Solder Center/Setting3/Solder Center/Land Plane Exclusion	LandExclusionPlane3	<input type="radio"/>
Solder Center/Setting3/Solder Center/Land Plane Exclusion/Width (%)	WidthRate	<input type="radio"/>
Solder Center/Setting3/Solder Center/Land Plane Exclusion/Width (%) Lower Limit	LowerLimit	
Solder Center/Setting3/Solder Center/Land Plane Exclusion/Width (%) Upper Limit	UpperLimit	
Solder Center/Setting3/Solder Center/Land Plane Exclusion/Length (mm)	Length	<input type="radio"/>
Solder Center/Setting3/Solder Center/Land Plane Exclusion/Length (mm) Lower Limit	LowerLimit	
Solder Center/Setting3/Solder Center/Land Plane Exclusion/Length (mm) Upper Limit	UpperLimit	
Solder Center/Setting3/Solder Center/Average Width (%)	MeanWidthRate3	<input type="radio"/>
Solder Center/Setting3/Solder Center/Average Width (%) Lower Limit	LowerLimit	
Solder Center/Setting3/Solder Center/Average Width (%) Upper Limit	UpperLimit	
Solder Center/Setting3/Solder Center/Max. Length (%)	MaxLengthRate3	<input type="radio"/>
Solder Center/Setting3/Solder Center/Max. Length (%) Lower Limit	LowerLimit	
Solder Center/Setting3/Solder Center/Max. Length (%) Upper Limit	UpperLimit	
Solder Center/Setting3/Solder Center/Breadth Rate (%)	BreadthRate3	<input type="radio"/>
Solder Center/Setting3/Solder Center/Breadth Rate (%) Lower Limit	LowerLimit	
Solder Center/Setting3/Solder Center/Breadth Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting3/Solder Center/Breadth Rate (%)/Length (%)	LengthRate	<input type="radio"/>
Solder Center/Setting3/Solder Center/Breadth Rate (%)/Length (%) Lower Limit	LowerLimit	
Solder Center/Setting3/Solder Center/Breadth Rate (%)/Length (%) Upper Limit	UpperLimit	
Solder Center/Setting3/Solder Center/Toe Center Area (%)	ToeCenterArea3	<input type="radio"/>
Solder Center/Setting3/Solder Center/Toe Center Area (%) Lower Limit	LowerLimit	
Solder Center/Setting3/Solder Center/Toe Center Area (%) Upper Limit	UpperLimit	
Solder Center/Setting4	CustomSetting4	<input type="radio"/>
Solder Center/Setting4/Solder Center	SolderCenter	<input type="radio"/>
Solder Center/Setting4/Solder Center/Land Plane Exclusion	LandExclusionPlane4	<input type="radio"/>
Solder Center/Setting4/Solder Center/Land Plane Exclusion/Width (%)	WidthRate	<input type="radio"/>
Solder Center/Setting4/Solder Center/Land Plane Exclusion/Width (%) Lower Limit	LowerLimit	
Solder Center/Setting4/Solder Center/Land Plane Exclusion/Width (%) Upper Limit	UpperLimit	
Solder Center/Setting4/Solder Center/Land Plane Exclusion/Length (mm)	Length	<input type="radio"/>
Solder Center/Setting4/Solder Center/Land Plane Exclusion/Length (mm) Lower Limit	LowerLimit	
Solder Center/Setting4/Solder Center/Land Plane Exclusion/Length (mm) Upper Limit	UpperLimit	
Solder Center/Setting4/Solder Center/Average Width (%)	MeanWidthRate4	<input type="radio"/>
Solder Center/Setting4/Solder Center/Average Width (%) Lower Limit	LowerLimit	
Solder Center/Setting4/Solder Center/Average Width (%) Upper Limit	UpperLimit	
Solder Center/Setting4/Solder Center/Max. Length (%)	MaxLengthRate4	<input type="radio"/>
Solder Center/Setting4/Solder Center/Max. Length (%) Lower Limit	LowerLimit	
Solder Center/Setting4/Solder Center/Max. Length (%) Upper Limit	UpperLimit	
Solder Center/Setting4/Solder Center/Breadth Rate (%)	BreadthRate4	<input type="radio"/>
Solder Center/Setting4/Solder Center/Breadth Rate (%) Lower Limit	LowerLimit	
Solder Center/Setting4/Solder Center/Breadth Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting4/Solder Center/Breadth Rate (%)/Length (%)	LengthRate	<input type="radio"/>
Solder Center/Setting4/Solder Center/Breadth Rate (%)/Length (%) Lower Limit	LowerLimit	
Solder Center/Setting4/Solder Center/Breadth Rate (%)/Length (%) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Solder Center/Setting4/Solder Center/Toe Center Area (%)	ToeCenterArea4	<input type="radio"/>
Solder Center/Setting4/Solder Center/Toe Center Area (%) Lower Limit	LowerLimit	
Solder Center/Setting4/Solder Center/Toe Center Area (%) Upper Limit	UpperLimit	
Solder Center/Setting5	CustomSetting5	<input type="radio"/>
Solder Center/Setting5/Solder Center	SolderCenter	<input type="radio"/>
Solder Center/Setting5/Solder Center/Land Plane Exclusion	LandExclusionPlane5	<input type="radio"/>
Solder Center/Setting5/Solder Center/Land Plane Exclusion/Width (%)	WidthRate	<input type="radio"/>
Solder Center/Setting5/Solder Center/Land Plane Exclusion/Width (%) Lower Limit	LowerLimit	
Solder Center/Setting5/Solder Center/Land Plane Exclusion/Width (%) Upper Limit	UpperLimit	
Solder Center/Setting5/Solder Center/Land Plane Exclusion/Length (mm)	Length	<input type="radio"/>
Solder Center/Setting5/Solder Center/Land Plane Exclusion/Length (mm) Lower Limit	LowerLimit	
Solder Center/Setting5/Solder Center/Land Plane Exclusion/Length (mm) Upper Limit	UpperLimit	
Solder Center/Setting5/Solder Center/Average Width (%)	MeanWidthRate5	<input type="radio"/>
Solder Center/Setting5/Solder Center/Average Width (%) Lower Limit	LowerLimit	
Solder Center/Setting5/Solder Center/Average Width (%) Upper Limit	UpperLimit	
Solder Center/Setting5/Solder Center/Max. Length (%)	MaxLengthRate5	<input type="radio"/>
Solder Center/Setting5/Solder Center/Max. Length (%) Lower Limit	LowerLimit	
Solder Center/Setting5/Solder Center/Max. Length (%) Upper Limit	UpperLimit	
Solder Center/Setting5/Solder Center/Breadth Rate (%)	BreadthRate5	<input type="radio"/>
Solder Center/Setting5/Solder Center/Breadth Rate (%) Lower Limit	LowerLimit	
Solder Center/Setting5/Solder Center/Breadth Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting5/Solder Center/Breadth Rate (%)/Length (%)	LengthRate	<input type="radio"/>
Solder Center/Setting5/Solder Center/Breadth Rate (%)/Length (%) Lower Limit	LowerLimit	
Solder Center/Setting5/Solder Center/Breadth Rate (%)/Length (%) Upper Limit	UpperLimit	
Solder Center/Setting5/Solder Center/Toe Center Area (%)	ToeCenterArea5	<input type="radio"/>
Solder Center/Setting5/Solder Center/Toe Center Area (%) Lower Limit	LowerLimit	
Solder Center/Setting5/Solder Center/Toe Center Area (%) Upper Limit	UpperLimit	
Solder Center/Setting6	CustomSetting6	<input type="radio"/>
Solder Center/Setting6/Solder Center	SolderCenter	<input type="radio"/>
Solder Center/Setting6/Solder Center/Land Plane Exclusion	LandExclusionPlane6	<input type="radio"/>
Solder Center/Setting6/Solder Center/Land Plane Exclusion/Width (%)	WidthRate	<input type="radio"/>
Solder Center/Setting6/Solder Center/Land Plane Exclusion/Width (%) Lower Limit	LowerLimit	
Solder Center/Setting6/Solder Center/Land Plane Exclusion/Width (%) Upper Limit	UpperLimit	
Solder Center/Setting6/Solder Center/Land Plane Exclusion/Length (mm)	Length	<input type="radio"/>
Solder Center/Setting6/Solder Center/Land Plane Exclusion/Length (mm) Lower Limit	LowerLimit	
Solder Center/Setting6/Solder Center/Land Plane Exclusion/Length (mm) Upper Limit	UpperLimit	
Solder Center/Setting6/Solder Center/Average Width (%)	MeanWidthRate6	<input type="radio"/>
Solder Center/Setting6/Solder Center/Average Width (%) Lower Limit	LowerLimit	
Solder Center/Setting6/Solder Center/Average Width (%) Upper Limit	UpperLimit	
Solder Center/Setting6/Solder Center/Max. Length (%)	MaxLengthRate6	<input type="radio"/>
Solder Center/Setting6/Solder Center/Max. Length (%) Lower Limit	LowerLimit	
Solder Center/Setting6/Solder Center/Max. Length (%) Upper Limit	UpperLimit	
Solder Center/Setting6/Solder Center/Breadth Rate (%)	BreadthRate6	<input type="radio"/>
Solder Center/Setting6/Solder Center/Breadth Rate (%) Lower Limit	LowerLimit	
Solder Center/Setting6/Solder Center/Breadth Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting6/Solder Center/Breadth Rate (%)/Length (%)	LengthRate	<input type="radio"/>
Solder Center/Setting6/Solder Center/Breadth Rate (%)/Length (%) Lower Limit	LowerLimit	
Solder Center/Setting6/Solder Center/Breadth Rate (%)/Length (%) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Solder Center/Setting6/Solder Center/Toe Center Area (%)	ToeCenterArea6	<input type="radio"/>
Solder Center/Setting6/Solder Center/Toe Center Area (%) Lower Limit	LowerLimit	
Solder Center/Setting6/Solder Center/Toe Center Area (%) Upper Limit	UpperLimit	
Solder Center/Setting7	CustomSetting7	<input type="radio"/>
Solder Center/Setting7/Solder Center	SolderCenter	<input type="radio"/>
Solder Center/Setting7/Solder Center/Land Plane Exclusion	LandExclusionPlane7	<input type="radio"/>
Solder Center/Setting7/Solder Center/Land Plane Exclusion/Width (%)	WidthRate	<input type="radio"/>
Solder Center/Setting7/Solder Center/Land Plane Exclusion/Width (%) Lower Limit	LowerLimit	
Solder Center/Setting7/Solder Center/Land Plane Exclusion/Width (%) Upper Limit	UpperLimit	
Solder Center/Setting7/Solder Center/Land Plane Exclusion/Length (mm)	Length	<input type="radio"/>
Solder Center/Setting7/Solder Center/Land Plane Exclusion/Length (mm) Lower Limit	LowerLimit	
Solder Center/Setting7/Solder Center/Land Plane Exclusion/Length (mm) Upper Limit	UpperLimit	
Solder Center/Setting7/Solder Center/Average Width (%)	MeanWidthRate7	<input type="radio"/>
Solder Center/Setting7/Solder Center/Average Width (%) Lower Limit	LowerLimit	
Solder Center/Setting7/Solder Center/Average Width (%) Upper Limit	UpperLimit	
Solder Center/Setting7/Solder Center/Max. Length (%)	MaxLengthRate7	<input type="radio"/>
Solder Center/Setting7/Solder Center/Max. Length (%) Lower Limit	LowerLimit	
Solder Center/Setting7/Solder Center/Max. Length (%) Upper Limit	UpperLimit	
Solder Center/Setting7/Solder Center/Breadth Rate (%)	BreadthRate7	<input type="radio"/>
Solder Center/Setting7/Solder Center/Breadth Rate (%) Lower Limit	LowerLimit	
Solder Center/Setting7/Solder Center/Breadth Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting7/Solder Center/Breadth Rate (%)/Length (%)	LengthRate	<input type="radio"/>
Solder Center/Setting7/Solder Center/Breadth Rate (%)/Length (%) Lower Limit	LowerLimit	
Solder Center/Setting7/Solder Center/Breadth Rate (%)/Length (%) Upper Limit	UpperLimit	
Solder Center/Setting7/Solder Center/Toe Center Area (%)	ToeCenterArea7	<input type="radio"/>
Solder Center/Setting7/Solder Center/Toe Center Area (%) Lower Limit	LowerLimit	
Solder Center/Setting7/Solder Center/Toe Center Area (%) Upper Limit	UpperLimit	
Solder Center/Setting8	CustomSetting8	<input type="radio"/>
Solder Center/Setting8/Solder Center	SolderCenter	<input type="radio"/>
Solder Center/Setting8/Solder Center/Land Plane Exclusion	LandExclusionPlane8	<input type="radio"/>
Solder Center/Setting8/Solder Center/Land Plane Exclusion/Width (%)	WidthRate	<input type="radio"/>
Solder Center/Setting8/Solder Center/Land Plane Exclusion/Width (%) Lower Limit	LowerLimit	
Solder Center/Setting8/Solder Center/Land Plane Exclusion/Width (%) Upper Limit	UpperLimit	
Solder Center/Setting8/Solder Center/Land Plane Exclusion/Length (mm)	Length	<input type="radio"/>
Solder Center/Setting8/Solder Center/Land Plane Exclusion/Length (mm) Lower Limit	LowerLimit	
Solder Center/Setting8/Solder Center/Land Plane Exclusion/Length (mm) Upper Limit	UpperLimit	
Solder Center/Setting8/Solder Center/Average Width (%)	MeanWidthRate8	<input type="radio"/>
Solder Center/Setting8/Solder Center/Average Width (%) Lower Limit	LowerLimit	
Solder Center/Setting8/Solder Center/Average Width (%) Upper Limit	UpperLimit	
Solder Center/Setting8/Solder Center/Max. Length (%)	MaxLengthRate8	<input type="radio"/>
Solder Center/Setting8/Solder Center/Max. Length (%) Lower Limit	LowerLimit	
Solder Center/Setting8/Solder Center/Max. Length (%) Upper Limit	UpperLimit	
Solder Center/Setting8/Solder Center/Breadth Rate (%)	BreadthRate8	<input type="radio"/>
Solder Center/Setting8/Solder Center/Breadth Rate (%) Lower Limit	LowerLimit	
Solder Center/Setting8/Solder Center/Breadth Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting8/Solder Center/Breadth Rate (%)/Length (%)	LengthRate	<input type="radio"/>
Solder Center/Setting8/Solder Center/Breadth Rate (%)/Length (%) Lower Limit	LowerLimit	
Solder Center/Setting8/Solder Center/Breadth Rate (%)/Length (%) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Solder Center/Setting8/Solder Center/Toe Center Area (%)	ToeCenterArea8	<input type="radio"/>
Solder Center/Setting8/Solder Center/Toe Center Area (%) Lower Limit	LowerLimit	
Solder Center/Setting8/Solder Center/Toe Center Area (%) Upper Limit	UpperLimit	
Solder Center/Setting9	CustomSetting9	<input type="radio"/>
Solder Center/Setting9/Solder Center	SolderCenter	<input type="radio"/>
Solder Center/Setting9/Solder Center/Land Plane Exclusion	LandExclusionPlane9	<input type="radio"/>
Solder Center/Setting9/Solder Center/Land Plane Exclusion/Width (%)	WidthRate	<input type="radio"/>
Solder Center/Setting9/Solder Center/Land Plane Exclusion/Width (%) Lower Limit	LowerLimit	
Solder Center/Setting9/Solder Center/Land Plane Exclusion/Width (%) Upper Limit	UpperLimit	
Solder Center/Setting9/Solder Center/Land Plane Exclusion/Length (mm)	Length	<input type="radio"/>
Solder Center/Setting9/Solder Center/Land Plane Exclusion/Length (mm) Lower Limit	LowerLimit	
Solder Center/Setting9/Solder Center/Land Plane Exclusion/Length (mm) Upper Limit	UpperLimit	
Solder Center/Setting9/Solder Center/Average Width (%)	MeanWidthRate9	<input type="radio"/>
Solder Center/Setting9/Solder Center/Average Width (%) Lower Limit	LowerLimit	
Solder Center/Setting9/Solder Center/Average Width (%) Upper Limit	UpperLimit	
Solder Center/Setting9/Solder Center/Max. Length (%)	MaxLengthRate9	<input type="radio"/>
Solder Center/Setting9/Solder Center/Max. Length (%) Lower Limit	LowerLimit	
Solder Center/Setting9/Solder Center/Max. Length (%) Upper Limit	UpperLimit	
Solder Center/Setting9/Solder Center/Breadth Rate (%)	BreadthRate9	<input type="radio"/>
Solder Center/Setting9/Solder Center/Breadth Rate (%) Lower Limit	LowerLimit	
Solder Center/Setting9/Solder Center/Breadth Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting9/Solder Center/Breadth Rate (%)/Length (%)	LengthRate	<input type="radio"/>
Solder Center/Setting9/Solder Center/Breadth Rate (%)/Length (%) Lower Limit	LowerLimit	
Solder Center/Setting9/Solder Center/Breadth Rate (%)/Length (%) Upper Limit	UpperLimit	
Solder Center/Setting9/Solder Center/Toe Center Area (%)	ToeCenterArea9	<input type="radio"/>
Solder Center/Setting9/Solder Center/Toe Center Area (%) Lower Limit	LowerLimit	
Solder Center/Setting9/Solder Center/Toe Center Area (%) Upper Limit	UpperLimit	
Solder Center/Setting10	CustomSetting10	<input type="radio"/>
Solder Center/Setting10/Solder Center	SolderCenter	<input type="radio"/>
Solder Center/Setting10/Solder Center/Land Plane Exclusion	LandExclusionPlane10	<input type="radio"/>
Solder Center/Setting10/Solder Center/Land Plane Exclusion/Width (%)	WidthRate	<input type="radio"/>
Solder Center/Setting10/Solder Center/Land Plane Exclusion/Width (%) Lower Limit	LowerLimit	
Solder Center/Setting10/Solder Center/Land Plane Exclusion/Width (%) Upper Limit	UpperLimit	
Solder Center/Setting10/Solder Center/Land Plane Exclusion/Length (mm)	Length	<input type="radio"/>
Solder Center/Setting10/Solder Center/Land Plane Exclusion/Length (mm) Lower Limit	LowerLimit	
Solder Center/Setting10/Solder Center/Land Plane Exclusion/Length (mm) Upper Limit	UpperLimit	
Solder Center/Setting10/Solder Center/Average Width (%)	MeanWidthRate10	<input type="radio"/>
Solder Center/Setting10/Solder Center/Average Width (%) Lower Limit	LowerLimit	
Solder Center/Setting10/Solder Center/Average Width (%) Upper Limit	UpperLimit	
Solder Center/Setting10/Solder Center/Max. Length (%)	MaxLengthRate10	<input type="radio"/>
Solder Center/Setting10/Solder Center/Max. Length (%) Lower Limit	LowerLimit	
Solder Center/Setting10/Solder Center/Max. Length (%) Upper Limit	UpperLimit	
Solder Center/Setting10/Solder Center/Breadth Rate (%)	BreadthRate10	<input type="radio"/>
Solder Center/Setting10/Solder Center/Breadth Rate (%) Lower Limit	LowerLimit	
Solder Center/Setting10/Solder Center/Breadth Rate (%) Upper Limit	UpperLimit	
Solder Center/Setting10/Solder Center/Breadth Rate (%)/Length (%)	LengthRate	<input type="radio"/>
Solder Center/Setting10/Solder Center/Breadth Rate (%)/Length (%) Lower Limit	LowerLimit	
Solder Center/Setting10/Solder Center/Breadth Rate (%)/Length (%) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Solder Center/Setting10/Solder Center/Toe Center Area (%)	ToeCenterArea10	<input type="radio"/>
Solder Center/Setting10/Solder Center/Toe Center Area (%) Lower Limit	LowerLimit	
Solder Center/Setting10/Solder Center/Toe Center Area (%) Upper Limit	UpperLimit	
Land Toe Length/Setting1	CustomSetting1	<input type="radio"/>
Land Toe Length/Setting1/Land Toe Length (mm)	LandToeLength	<input type="radio"/>
Land Toe Length/Setting1/Land Toe Length (mm) Lower Limit	LowerLimit	
Land Toe Length/Setting1/Land Toe Length (mm) Upper Limit	UpperLimit	
Land Toe Length/Setting2	CustomSetting2	<input type="radio"/>
Land Toe Length/Setting2/Land Toe Length (mm)	LandToeLength	<input type="radio"/>
Land Toe Length/Setting2/Land Toe Length (mm) Lower Limit	LowerLimit	
Land Toe Length/Setting2/Land Toe Length (mm) Upper Limit	UpperLimit	
Land Toe Length/Setting3	CustomSetting3	<input type="radio"/>
Land Toe Length/Setting3/Land Toe Length (mm)	LandToeLength	<input type="radio"/>
Land Toe Length/Setting3/Land Toe Length (mm) Lower Limit	LowerLimit	
Land Toe Length/Setting3/Land Toe Length (mm) Upper Limit	UpperLimit	
Land Toe Length/Setting4	CustomSetting4	<input type="radio"/>
Land Toe Length/Setting4/Land Toe Length (mm)	LandToeLength	<input type="radio"/>
Land Toe Length/Setting4/Land Toe Length (mm) Lower Limit	LowerLimit	
Land Toe Length/Setting4/Land Toe Length (mm) Upper Limit	UpperLimit	
Land Toe Length/Setting5	CustomSetting5	<input type="radio"/>
Land Toe Length/Setting5/Land Toe Length (mm)	LandToeLength	<input type="radio"/>
Land Toe Length/Setting5/Land Toe Length (mm) Lower Limit	LowerLimit	
Land Toe Length/Setting5/Land Toe Length (mm) Upper Limit	UpperLimit	
Land Toe Length/Setting6	CustomSetting6	<input type="radio"/>
Land Toe Length/Setting6/Land Toe Length (mm)	LandToeLength	<input type="radio"/>
Land Toe Length/Setting6/Land Toe Length (mm) Lower Limit	LowerLimit	
Land Toe Length/Setting6/Land Toe Length (mm) Upper Limit	UpperLimit	
Land Toe Length/Setting7	CustomSetting7	<input type="radio"/>
Land Toe Length/Setting7/Land Toe Length (mm)	LandToeLength	<input type="radio"/>
Land Toe Length/Setting7/Land Toe Length (mm) Lower Limit	LowerLimit	
Land Toe Length/Setting7/Land Toe Length (mm) Upper Limit	UpperLimit	
Land Toe Length/Setting8	CustomSetting8	<input type="radio"/>
Land Toe Length/Setting8/Land Toe Length (mm)	LandToeLength	<input type="radio"/>
Land Toe Length/Setting8/Land Toe Length (mm) Lower Limit	LowerLimit	
Land Toe Length/Setting8/Land Toe Length (mm) Upper Limit	UpperLimit	
Land Toe Length/Setting9	CustomSetting9	<input type="radio"/>
Land Toe Length/Setting9/Land Toe Length (mm)	LandToeLength	<input type="radio"/>
Land Toe Length/Setting9/Land Toe Length (mm) Lower Limit	LowerLimit	
Land Toe Length/Setting9/Land Toe Length (mm) Upper Limit	UpperLimit	
Land Toe Length/Setting10	CustomSetting10	<input type="radio"/>
Land Toe Length/Setting10/Land Toe Length (mm)	LandToeLength	<input type="radio"/>
Land Toe Length/Setting10/Land Toe Length (mm) Lower Limit	LowerLimit	
Land Toe Length/Setting10/Land Toe Length (mm) Upper Limit	UpperLimit	
Lead Toe/Setting1	CustomSetting1	<input type="radio"/>
Lead Toe/Setting1/Lead Toe	LeadToe	<input type="radio"/>
Lead Toe/Setting1/Lead Toe Start Position	LogicMethodType	
Lead Toe/Setting1/Lead Toe/Area	LeadToeArea1	<input type="radio"/>
Lead Toe/Setting1/Lead Toe/Area Lower Limit	LowerLimit	

## Appendix 12. Inspection Coverage Output Format

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Lead Toe/Setting1/Lead Toe/Area Upper Limit	UpperLimit	
Lead Toe/Setting1/Lead Toe/Inspection Area	InspectionRegion1	O
Lead Toe/Setting1/Lead Toe/Inspection Area/Inspection Area - Vertical (mm)	VerticalInspectionRegion	O
Lead Toe/Setting1/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting1/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting1/Lead Toe/Inspection Area/Excluded Area - Vertical (mm)	VerticalExcisionRegion	O
Lead Toe/Setting1/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting1/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting1/Lead Toe/Inspection Area/Excluded Area - Right (mm)	RightExcisionRegion	O
Lead Toe/Setting1/Lead Toe/Inspection Area/Excluded Area - Right (mm) Lower Limit	LowerLimit	
Lead Toe/Setting1/Lead Toe/Inspection Area/Excluded Area - Right (mm) Upper Limit	UpperLimit	
Lead Toe/Setting1/Lead Toe/Inspection Area/Excluded Area - Lift (mm)	LeftExcisionRegion	O
Lead Toe/Setting1/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Lower Limit	LowerLimit	
Lead Toe/Setting1/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Upper Limit	UpperLimit	
Lead Toe/Setting2	CustomSetting2	O
Lead Toe/Setting2/Lead Toe	LeadToe	O
Lead Toe/Setting2/Lead Toe Start Position	LogicMethodType	
Lead Toe/Setting2/Lead Toe/Area	LeadToeArea2	O
Lead Toe/Setting2/Lead Toe/Area Lower Limit	LowerLimit	
Lead Toe/Setting2/Lead Toe/Area Upper Limit	UpperLimit	
Lead Toe/Setting2/Lead Toe/Inspection Area	InspectionRegion2	O
Lead Toe/Setting2/Lead Toe/Inspection Area/Inspection Area - Vertical (mm)	VerticalInspectionRegion	O
Lead Toe/Setting2/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting2/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting2/Lead Toe/Inspection Area/Excluded Area - Vertical (mm)	VerticalExcisionRegion	O
Lead Toe/Setting2/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting2/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting2/Lead Toe/Inspection Area/Excluded Area - Right (mm)	RightExcisionRegion	O
Lead Toe/Setting2/Lead Toe/Inspection Area/Excluded Area - Right (mm) Lower Limit	LowerLimit	
Lead Toe/Setting2/Lead Toe/Inspection Area/Excluded Area - Right (mm) Upper Limit	UpperLimit	
Lead Toe/Setting2/Lead Toe/Inspection Area/Excluded Area - Lift (mm)	LeftExcisionRegion	O
Lead Toe/Setting2/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Lower Limit	LowerLimit	
Lead Toe/Setting2/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Upper Limit	UpperLimit	
Lead Toe/Setting3	CustomSetting3	O
Lead Toe/Setting3/Lead Toe	LeadToe	O
Lead Toe/Setting3/Lead Toe Start Position	LogicMethodType	
Lead Toe/Setting3/Lead Toe/Area	LeadToeArea3	O
Lead Toe/Setting3/Lead Toe/Area Lower Limit	LowerLimit	
Lead Toe/Setting3/Lead Toe/Area Upper Limit	UpperLimit	
Lead Toe/Setting3/Lead Toe/Inspection Area	InspectionRegion3	O
Lead Toe/Setting3/Lead Toe/Inspection Area/Inspection Area - Vertical (mm)	VerticalInspectionRegion	O
Lead Toe/Setting3/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting3/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting3/Lead Toe/Inspection Area/Excluded Area - Vertical (mm)	VerticalExcisionRegion	O
Lead Toe/Setting3/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting3/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting3/Lead Toe/Inspection Area/Excluded Area - Right (mm)	RightExcisionRegion	O
Lead Toe/Setting3/Lead Toe/Inspection Area/Excluded Area - Right (mm) Lower Limit	LowerLimit	

## Appendix 12. Inspection Coverage Output Format

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Lead Toe/Setting3/Lead Toe/Inspection Area/Excluded Area - Right (mm) Upper Limit	UpperLimit	
Lead Toe/Setting3/Lead Toe/Inspection Area/Excluded Area - Lift (mm)	LeftExcisionRegion	○
Lead Toe/Setting3/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Lower Limit	LowerLimit	
Lead Toe/Setting3/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Upper Limit	UpperLimit	
Lead Toe/Setting4	CustomSetting4	○
Lead Toe/Setting4/Lead Toe	LeadToe	○
Lead Toe/Setting4/Lead Toe Start Position	LogicMethodType	
Lead Toe/Setting4/Lead Toe/Area	LeadToeArea4	○
Lead Toe/Setting4/Lead Toe/Area Lower Limit	LowerLimit	
Lead Toe/Setting4/Lead Toe/Area Upper Limit	UpperLimit	
Lead Toe/Setting4/Lead Toe/Inspection Area	InspectionRegion4	○
Lead Toe/Setting4/Lead Toe/Inspection Area/Inspection Area - Vertical (mm)	VerticalInspectionRegion	○
Lead Toe/Setting4/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting4/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting4/Lead Toe/Inspection Area/Excluded Area - Vertical (mm)	VerticalExcisionRegion	○
Lead Toe/Setting4/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting4/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting4/Lead Toe/Inspection Area/Excluded Area - Right (mm)	RightExcisionRegion	○
Lead Toe/Setting4/Lead Toe/Inspection Area/Excluded Area - Right (mm) Lower Limit	LowerLimit	
Lead Toe/Setting4/Lead Toe/Inspection Area/Excluded Area - Right (mm) Upper Limit	UpperLimit	
Lead Toe/Setting4/Lead Toe/Inspection Area/Excluded Area - Lift (mm)	LeftExcisionRegion	○
Lead Toe/Setting4/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Lower Limit	LowerLimit	
Lead Toe/Setting4/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Upper Limit	UpperLimit	
Lead Toe/Setting5	CustomSetting5	○
Lead Toe/Setting5/Lead Toe	LeadToe	○
Lead Toe/Setting5/Lead Toe Start Position	LogicMethodType	
Lead Toe/Setting5/Lead Toe/Area	LeadToeArea5	○
Lead Toe/Setting5/Lead Toe/Area Lower Limit	LowerLimit	
Lead Toe/Setting5/Lead Toe/Area Upper Limit	UpperLimit	
Lead Toe/Setting5/Lead Toe/Inspection Area	InspectionRegion5	○
Lead Toe/Setting5/Lead Toe/Inspection Area/Inspection Area - Vertical (mm)	VerticalInspectionRegion	○
Lead Toe/Setting5/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting5/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting5/Lead Toe/Inspection Area/Excluded Area - Vertical (mm)	VerticalExcisionRegion	○
Lead Toe/Setting5/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting5/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting5/Lead Toe/Inspection Area/Excluded Area - Right (mm)	RightExcisionRegion	○
Lead Toe/Setting5/Lead Toe/Inspection Area/Excluded Area - Right (mm) Lower Limit	LowerLimit	
Lead Toe/Setting5/Lead Toe/Inspection Area/Excluded Area - Right (mm) Upper Limit	UpperLimit	
Lead Toe/Setting5/Lead Toe/Inspection Area/Excluded Area - Lift (mm)	LeftExcisionRegion	○
Lead Toe/Setting5/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Lower Limit	LowerLimit	
Lead Toe/Setting5/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Upper Limit	UpperLimit	
Lead Toe/Setting6	CustomSetting6	○
Lead Toe/Setting6/Lead Toe	LeadToe	○
Lead Toe/Setting6/Lead Toe Start Position	LogicMethodType	
Lead Toe/Setting6/Lead Toe/Area	LeadToeArea6	○
Lead Toe/Setting6/Lead Toe/Area Lower Limit	LowerLimit	
Lead Toe/Setting6/Lead Toe/Area Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Lead Toe/Setting6/Lead Toe/Inspection Area	InspectionRegion6	<input type="radio"/>
Lead Toe/Setting6/Lead Toe/Inspection Area/Inspection Area - Vertical (mm)	VerticalInspectionRegion	<input type="radio"/>
Lead Toe/Setting6/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting6/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting6/Lead Toe/Inspection Area/Excluded Area - Vertical (mm)	VerticalExcusionRegion	<input type="radio"/>
Lead Toe/Setting6/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting6/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting6/Lead Toe/Inspection Area/Excluded Area - Right (mm)	RightExcusionRegion	<input type="radio"/>
Lead Toe/Setting6/Lead Toe/Inspection Area/Excluded Area - Right (mm) Lower Limit	LowerLimit	
Lead Toe/Setting6/Lead Toe/Inspection Area/Excluded Area - Right (mm) Upper Limit	UpperLimit	
Lead Toe/Setting6/Lead Toe/Inspection Area/Excluded Area - Lift (mm)	LeftExcusionRegion	<input type="radio"/>
Lead Toe/Setting6/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Lower Limit	LowerLimit	
Lead Toe/Setting6/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Upper Limit	UpperLimit	
Lead Toe/Setting7	CustomSetting7	<input type="radio"/>
Lead Toe/Setting7/Lead Toe	LeadToe	<input type="radio"/>
Lead Toe/Setting7/Lead Toe Start Position	LogicMethodType	
Lead Toe/Setting7/Lead Toe/Area	LeadToeArea7	<input type="radio"/>
Lead Toe/Setting7/Lead Toe/Area Lower Limit	LowerLimit	
Lead Toe/Setting7/Lead Toe/Area Upper Limit	UpperLimit	
Lead Toe/Setting7/Lead Toe/Inspection Area	InspectionRegion7	<input type="radio"/>
Lead Toe/Setting7/Lead Toe/Inspection Area/Inspection Area - Vertical (mm)	VerticalInspectionRegion	<input type="radio"/>
Lead Toe/Setting7/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting7/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting7/Lead Toe/Inspection Area/Excluded Area - Vertical (mm)	VerticalExcusionRegion	<input type="radio"/>
Lead Toe/Setting7/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting7/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting7/Lead Toe/Inspection Area/Excluded Area - Right (mm)	RightExcusionRegion	<input type="radio"/>
Lead Toe/Setting7/Lead Toe/Inspection Area/Excluded Area - Right (mm) Lower Limit	LowerLimit	
Lead Toe/Setting7/Lead Toe/Inspection Area/Excluded Area - Right (mm) Upper Limit	UpperLimit	
Lead Toe/Setting7/Lead Toe/Inspection Area/Excluded Area - Lift (mm)	LeftExcusionRegion	<input type="radio"/>
Lead Toe/Setting7/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Lower Limit	LowerLimit	
Lead Toe/Setting7/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Upper Limit	UpperLimit	
Lead Toe/Setting8	CustomSetting8	<input type="radio"/>
Lead Toe/Setting8/Lead Toe	LeadToe	<input type="radio"/>
Lead Toe/Setting8/Lead Toe Start Position	LogicMethodType	
Lead Toe/Setting8/Lead Toe/Area	LeadToeArea8	<input type="radio"/>
Lead Toe/Setting8/Lead Toe/Area Lower Limit	LowerLimit	
Lead Toe/Setting8/Lead Toe/Area Upper Limit	UpperLimit	
Lead Toe/Setting8/Lead Toe/Inspection Area	InspectionRegion8	<input type="radio"/>
Lead Toe/Setting8/Lead Toe/Inspection Area/Inspection Area - Vertical (mm)	VerticalInspectionRegion	<input type="radio"/>
Lead Toe/Setting8/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting8/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting8/Lead Toe/Inspection Area/Excluded Area - Vertical (mm)	VerticalExcusionRegion	<input type="radio"/>
Lead Toe/Setting8/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting8/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting8/Lead Toe/Inspection Area/Excluded Area - Right (mm)	RightExcusionRegion	<input type="radio"/>
Lead Toe/Setting8/Lead Toe/Inspection Area/Excluded Area - Right (mm) Lower Limit	LowerLimit	
Lead Toe/Setting8/Lead Toe/Inspection Area/Excluded Area - Right (mm) Upper Limit	UpperLimit	

## Appendix 12. Inspection Coverage Output Format

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Lead Toe/Setting8/Lead Toe/Inspection Area/Excluded Area - Lift (mm)	LeftExcusionRegion	<input type="radio"/>
Lead Toe/Setting8/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Lower Limit	LowerLimit	
Lead Toe/Setting8/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Upper Limit	UpperLimit	
Lead Toe/Setting9	CustomSetting9	<input type="radio"/>
Lead Toe/Setting9/Lead Toe	LeadToe	<input type="radio"/>
Lead Toe/Setting9/Lead Toe Start Position	LogicMethodType	
Lead Toe/Setting9/Lead Toe/Area	LeadToeArea9	<input type="radio"/>
Lead Toe/Setting9/Lead Toe/Area Lower Limit	LowerLimit	
Lead Toe/Setting9/Lead Toe/Area Upper Limit	UpperLimit	
Lead Toe/Setting9/Lead Toe/Inspection Area	InspectionRegion9	<input type="radio"/>
Lead Toe/Setting9/Lead Toe/Inspection Area/Inspection Area - Vertical (mm)	VerticalInspectionRegion	<input type="radio"/>
Lead Toe/Setting9/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting9/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting9/Lead Toe/Inspection Area/Excluded Area - Vertical (mm)	VerticalExcusionRegion	<input type="radio"/>
Lead Toe/Setting9/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting9/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting9/Lead Toe/Inspection Area/Excluded Area - Right (mm)	RightExcusionRegion	<input type="radio"/>
Lead Toe/Setting9/Lead Toe/Inspection Area/Excluded Area - Right (mm) Lower Limit	LowerLimit	
Lead Toe/Setting9/Lead Toe/Inspection Area/Excluded Area - Right (mm) Upper Limit	UpperLimit	
Lead Toe/Setting9/Lead Toe/Inspection Area/Excluded Area - Lift (mm)	LeftExcusionRegion	<input type="radio"/>
Lead Toe/Setting9/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Lower Limit	LowerLimit	
Lead Toe/Setting9/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Upper Limit	UpperLimit	
Lead Toe/Setting10	CustomSetting10	<input type="radio"/>
Lead Toe/Setting10/Lead Toe	LeadToe	<input type="radio"/>
Lead Toe/Setting10/Lead Toe Start Position	LogicMethodType	
Lead Toe/Setting10/Lead Toe/Area	LeadToeArea10	<input type="radio"/>
Lead Toe/Setting10/Lead Toe/Area Lower Limit	LowerLimit	
Lead Toe/Setting10/Lead Toe/Area Upper Limit	UpperLimit	
Lead Toe/Setting10/Lead Toe/Inspection Area	InspectionRegion10	<input type="radio"/>
Lead Toe/Setting10/Lead Toe/Inspection Area/Inspection Area - Vertical (mm)	VerticalInspectionRegion	<input type="radio"/>
Lead Toe/Setting10/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting10/Lead Toe/Inspection Area/Inspection Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting10/Lead Toe/Inspection Area/Excluded Area - Vertical (mm)	VerticalExcusionRegion	<input type="radio"/>
Lead Toe/Setting10/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Lower Limit	LowerLimit	
Lead Toe/Setting10/Lead Toe/Inspection Area/Excluded Area - Vertical (mm) Upper Limit	UpperLimit	
Lead Toe/Setting10/Lead Toe/Inspection Area/Excluded Area - Right (mm)	RightExcusionRegion	<input type="radio"/>
Lead Toe/Setting10/Lead Toe/Inspection Area/Excluded Area - Right (mm) Lower Limit	LowerLimit	
Lead Toe/Setting10/Lead Toe/Inspection Area/Excluded Area - Right (mm) Upper Limit	UpperLimit	
Lead Toe/Setting10/Lead Toe/Inspection Area/Excluded Area - Lift (mm)	LeftExcusionRegion	<input type="radio"/>
Lead Toe/Setting10/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Lower Limit	LowerLimit	
Lead Toe/Setting10/Lead Toe/Inspection Area/Excluded Area - Lift (mm) Upper Limit	UpperLimit	
Land Error/Setting11 (%)	Region11	<input type="radio"/>
Land Error/Setting11 (%) Lower Limit	LowerLimit	
Land Error/Setting11 (%) Upper Limit	UpperLimit	
Land Error/Setting11 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting11 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting11 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting11 (%)/Specify Distance (mm) Lower Limit	LowerLimit	

## Appendix 12. Inspection Coverage Output Format

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Land Error/Setting11 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting11 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting11 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting12 (%)	Region12	<input type="radio"/>
Land Error/Setting12 (%) Lower Limit	LowerLimit	
Land Error/Setting12 (%) Upper Limit	UpperLimit	
Land Error/Setting12 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting12 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting12 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting12 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting12 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting12 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting12 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting13 (%)	Region13	<input type="radio"/>
Land Error/Setting13 (%) Lower Limit	LowerLimit	
Land Error/Setting13 (%) Upper Limit	UpperLimit	
Land Error/Setting13 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting13 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting13 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting13 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting13 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting13 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting13 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting14 (%)	Region14	<input type="radio"/>
Land Error/Setting14 (%) Lower Limit	LowerLimit	
Land Error/Setting14 (%) Upper Limit	UpperLimit	
Land Error/Setting14 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting14 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting14 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting14 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting14 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting14 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting14 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting15 (%)	Region15	<input type="radio"/>
Land Error/Setting15 (%) Lower Limit	LowerLimit	
Land Error/Setting15 (%) Upper Limit	UpperLimit	
Land Error/Setting15 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting15 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting15 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting15 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting15 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting15 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting15 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>

## Appendix 12. Inspection Coverage Output Format

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Land Error/Setting16 (%)	Region16	<input type="radio"/>
Land Error/Setting16 (%) Lower Limit	LowerLimit	
Land Error/Setting16 (%) Upper Limit	UpperLimit	
Land Error/Setting16 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting16 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting16 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting16 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting16 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting16 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting16 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting17 (%)	Region17	<input type="radio"/>
Land Error/Setting17 (%) Lower Limit	LowerLimit	
Land Error/Setting17 (%) Upper Limit	UpperLimit	
Land Error/Setting17 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting17 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting17 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting17 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting17 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting17 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting17 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting18 (%)	Region18	<input type="radio"/>
Land Error/Setting18 (%) Lower Limit	LowerLimit	
Land Error/Setting18 (%) Upper Limit	UpperLimit	
Land Error/Setting18 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting18 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting18 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting18 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting18 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting18 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting18 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting19 (%)	Region19	<input type="radio"/>
Land Error/Setting19 (%) Lower Limit	LowerLimit	
Land Error/Setting19 (%) Upper Limit	UpperLimit	
Land Error/Setting19 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting19 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>
Land Error/Setting19 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting19 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting19 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting19 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting19 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Land Error/Setting20 (%)	Region20	<input type="radio"/>
Land Error/Setting20 (%) Lower Limit	LowerLimit	
Land Error/Setting20 (%) Upper Limit	UpperLimit	
Land Error/Setting20 (%)/Follow Lead End	FollowElectrodeEnd	<input type="radio"/>
Land Error/Setting20 (%)/Follow Lead Side	FollowElectrodeSide	<input type="radio"/>

## Appendix 12. Inspection Coverage Output Format

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Land Error/Setting20 (%)/Specify Distance (mm)	DistanceDesignation	<input type="radio"/>
Land Error/Setting20 (%)/Specify Distance (mm) Lower Limit	LowerLimit	
Land Error/Setting20 (%)/Specify Distance (mm) Upper Limit	UpperLimit	
Land Error/Setting20 (%)/Exclude Component and Lead	ExcludeForComponentAndElectrode	<input type="radio"/>
Land Error/Setting20 (%)/Fixed Lead Side	FixedElectrodeSide	<input type="radio"/>
Wetting Logical Expression	WettingLogicalOperation	
Land Error Logical Expression	LandErrorLogicalOperation	

For wetting logical expression and land error logical expression, the logical expression to judge inspection results is output.

For the logical expression, the information set for each electrode group is output as it is in order from the top.

 For the logical expression to judge inspection results, refer to Section 2.16.4 "Optimizing Boolean Expressions and Inspection Criterion Values."

An output example of inspection coverage is shown below.

No	CircuitID	Component	Revision	ComponentType	Compo	Window	Individual	Component	FollowCom	AngleMeasu	LowerLimit	UpperLimit
	1005R		5	ChipResister		Component		True	True		0	7
	1005R		5	ChipResister		ChipTermination1						
	1005R		5	ChipResister		InspectionRange					0	7
62	C1-3-1	1005R	5	ChipResister	1	Component	False	True	True			
62	C1-3-1	1005R	5	ChipResister	1	ChipTermination1	False					
62	C1-3-1	1005R	5	ChipResister	1	Electrode1	False					
62	C1-3-1	1005R	5	ChipResister	1	Land1	False					
62	C1-3-1	1005R	5	ChipResister	1	Electrode2	False					
62	C1-3-1	1005R	5	ChipResister	1	Land2	False					
62	C1-3-1	1005R	5	ChipResister	1	InspectionRange	False					

# Version History

The system you have just purchased may have new features or improvements. Changes will be added to the manual as they occur. All versions have listed a version code that indicates the version history and a version history section that indicates new changes and content.

## ● About the Version Code

The manual's version code is marked in the bottom right corner of the cover following the letters "No."

No. 8800381-5 □

Version Code

## ● Version History

Version Code	Dates	Revisions	
A	April 2014	First edition	
B	May 2014	P2-113 P2-124 P2-125 to 127	Added the peripheral foreign object mask Added description of the inspection by one character Updated description of the mask model edit tool
C	August	P2-47 P2-77 P2-80  P2-94  P2-137  P2-140  P2-143 P2-146  P2-155	Added description on component height setup Added description on height learning Added description on component information confirmation/change Added description on results confirmation method Added description on component lift inspection tool Added description on component number setup deployment tool Added description on orthographic view Added description on height inspection to logical expressions and inspection criteria Added description on component number replacement
D	September	Overall  Overall  P9  P2-13 P2-43  P2-149  P2-165	Included VT-S500, VT-S720A, and VT-S730 as applicable models of this manual Added icons to description applicable to VT-S720A or VT-S730 only Added description on icons indicating S720A and S730 in "How To Read This Manual" section Added description on inter-system copy function Added description on specified component saving function Added description on visual inspection result which can be registered for each model Added description on display method of images selected by specified image saving function
E	March	Overall  P2-102  P2-156	Typographical errors and description were corrected. Description on the secondary reflection countermeasure function was added. Description on the destination customization setup function was added.

		P2-163 P3-10 P3-13	Description on the Reference Level Model was added. Description on the component body inspection criteria setup function was added. Description on the copy function of component number data was added.
F	October	Overall P2-12 P2-13 P2-21 P2-26 P2-34 P2-31 P2-48 P2-78 P2-85 P2-95 P2-96 P2-99 P2-97 P2-117 P2-126 P2-136 P2-153 P2-154 P2-173 P2-176 P2-190 P2-195 P2-198	Typographical errors, description, and image display were corrected. Component number list names: Description added Description on the progress status of component number teaching was changed. Description on the emergence condition of multiple window selection was added. Position correction on a component block unit basis: Description added Description on the unlocking operation of inspection program was added. Section 2.4.6 "Component Number Group Setting" was added to the flowchart. Circuit name change for customer-specific program: Description added Description on height calculation was added. Individual setting judgment for mass production image: Description added Criteria optimization: Description added Description on the number of detected faults, the number of actual faults, and overlooking was added. Upper/lower limits of wrong polarity/height: Added Description on the detailed result dialog was added. Wrong polarity/height: Added Wrong polarity/height: Added Model edit screen operation steps: Description of ⑯ Pin-by-Pin added Wrong polarity/height inspection edit tool: Description added Wrong polarity/height: Added Description on the enabling condition of the [Delete Image] button was added. Base plane model edit tool: Description added Description on the import destination of component ID was added. Why oblique images are deleted when an inspection program is copied was described. Data verification for inspection program: Description added
G	February	P2-27 P2-47 P2-81 P2-83 P2-97 P2-138 P2-182 P2-186 P2-209 P2-213	Description on the operation of position correction for each component block unit was added. Description on the operation of the right/left and upper/lower reverse buttons after the mount data are read in was added. Description on the reference face automatic learning button was added. Description on a function to set up height inspection according to a component No. The specification of PCB test when a bad mark is detected was changed. Description on the measured values of polarity inspection was added. Description on the deletion method of multiple PCB images was added. Description on the reference face model editing tool was added. Description on a function to output the content of an inspection program list was added. The specification was changed so that data are not verified when a PCB test is performed.

		P3-14 Appendix	Description on a function to output a list of the component numbers used by inspection programs was added. Appendix 11. Description on PCB Test Result Output Format was added.
H	April 2016	P2-79  P2-119  P2-122	Description on the software operation when a component number model is registered and destination PCB images are being selected was added. Description on the function by which destination can be selected individually and released was added. Description on the function by which destination can be selected individually and inspection coverage can be output was added.
I	August	P2-6  P2-11  P2-13  P2-44  P2-125 P2-134  P2-136  P2-157  P2-160  P2-190  P2-201  P2-209  P3-12	Description on component number library was changed. Description on window was added. Description on image display area and model list was added. Description on the function capable of keeping description for each component number was added. Description on the data separation of component number description was added to the mount data format definition function. Description on inspection coverage was added. Description on the list of feature parameters adjustable in model editing was added. Description on the common range of feature parameters was added. Description on the Deploy All Inspection Criteria button was added. Description on the Component Number Group Settings Deployment tool was added. Description on the screen position correction method was added. Description on the positon correction model editing function was added. The destination column and component number group column were added to the list by the image management job. Description on the function capable of copying component number group data among libraries was added.
J	September	Overall  Preface P-7 Preface P-9  P1-2  P2-29  P2-170	VT-S730-H was added for the target machine in this manual. Manual description about VT-S730-H was added. VT-S730 was added to the description about inspection program. VT-S730-H was added to the system configuration table. VT-S730-H was added to the target for reference level model editing. VT-S730-H was added to the table of registrable visual check result item.
K	October	P2-77  P2-149  P2-197  P2-224	Description about the number of applicable images was added. Description about the highlight display of component upper surface was added. Description about the full view foreign material inspection was added. Description of the inspection program copy between S730 and S730H was added.
K2	February	P1-10  P2-13  P2-14  P2-14	The following text was added: "Manage the user's password used for login appropriately." Component number comment was added to the list of <Name>. Description about the component number comment entry dialog was added. Description about confirming that edited content is discarded when unlocked.

		P2-15 P2-45 P2-113 P2-136 P2-138 P2-148 P2-150 P2-181 P2-191 P2-234	Description about the conversion function of CAD data in the ODB++ format was added. Description about entry of component number comment when an inspection program is saved was added. The check box of a function to synchronize among electrode groups was described additionally. Description about histogram was changed ("Allowable" was added and the image was changed). Description about the thumbnails was changed. (The color of overlooking was changed to yellow, the image of overlooking was changed, and "allowable" was added to the condition of OK.) Description about the window was changed (The color of overlooking was changed to yellow, and "allowable" was added). "Allowable" was added to visual check result registration. Section 2.15.9 "Managing Component No. History" was added. Description about the S500 reflow process and copying of S720A inspection programs was added.
K3	April 2017	P2-196	Description about the function that can perform histogram comparison for the measured values between revisions of the component number.
M	September	P2-10  P2-13 to 14  P2-31  P2-55 P2-60, 63, 64, 148  P2-65 to 70, 72, 73  P2-71  P2-82  P2-99 to 101  P2-128 to 129  P2-131  P2-132, 133  P2-140, 141  P2-148 P2-168 P2-185 P2-201  P2-202  P2-203, 204	[Change Details List] and [PCB Settings] were added. [Save as] was added because it had not been included. [Component No. Group Description] and [Component No. Group Change Details] were added. A setup function of position correction for each component block unit was added. [Deploy Component Block Unit] was added. [Component Height] was changed to [Component Size].  The [Size] parameter of extraction land list was separated to [Length] and [Width].  Section 2.4.5.2 "Land Duplication (Pitch)" was added. It was described additionally that OCR and 2D code (component) are not shared in component number group. The component block unit duplication screen was changed. The confirmation item list for saving screen was added. The component No. comment entry confirmation dialog was deleted. Description about height data deletion was moved to section 2.11.1. Section 2.12 "Confirming Change Details" was added. Height Designation was added. Solder Ball and Solder Ball (Oblique) were changed. OCR and Height (Designation) were added. OCR was added. Height (Designation) was added. The image of the component No. history button was replaced. The image of the component No. history screen was replaced. [Inspection ON/OFF], [Inspection Method], [Inspection Area], [Component Shape], [Phase]

		P2-204  P2-205 P2-208, 209  P2-210, 226  P2-211, 213, 217, 225 P2-213  P2-229 to 230  P2-232  P2-236  P2-259 to 260	Imaging Information], and [Image] were added. The position to display New Data was changed from the bottom to the top. Description about the difference of From (displayed in orange color) was added. The columns of Window and Height were added to the window configuration. The specifications of difference of logical expression and difference of land error logical expression were changed. The name of the rollback button was changed. [PCB Type] and [Visual Field Assignment Type] were added. Description about each item on the PCB image list was added. The [Visual Field Assignment Setup] button was added. [Edit Model] was changed to a pull-down menu. [Solder Ball Color] and [Solder Bridge Color] were added. Section 2.17.7 "Copying PCB Characteristic Parameters" was added. Section 2.17.8 "Setting up Visual Field Assignment" was added. Section 2.17.12 "Setting up Screen Position Correction Search Range" was added. Section 2.20 "Initial Teaching using Raw Board Only" was added.
		P3-12, 14-16, 19  P3-17  P3-20  P3-21  P3-14, 19  P3-18, 22  a-65 to 68	[All], [Inspection Information], and [Image Selection] were added. The [Image Selection] screen was added. The image of the component No. import screen was replaced. The image of the component No. group export screen was replaced. The image of the component No. group import screen was replaced. It was described additionally that mask model image is included in feature quantity. It was described additionally that image is set ON when [Inspection Information] or [Affiliated Component No.] is selected.  [OCR], 2D code (component) and height designation were added. [Solder Ball] was changed.
N	Oct. 2017	Cover, P-7  P1-2 P1-3 P2-108 to 117 P2-232  P2-232,233,23  P2-239	VT-S530's relevant manuals were added. VT-S530 was added. PC specification for v-TS was updated. Section 2.7.3 "Distance Inspection" was added. "Template method only" was changed to "Both color and template can be selected." The image of the visual field full window foreign object screen was replaced. The image of the visual field assignment setting screen was replaced.
O	Dec.2017	Overall  Preface P-9  P2-149 to 151 Appendix	S530 icons were added to the description regarding VT-S530. VT-S530 was added to the description regarding the inspection program. Updated the inspection coverage output format. Updated Appendix 11 PCB Test Result Output Format.
P	Apr. 2018	P0-4	Warranty and Limitations of Liability "7. Disposal" was added.
Q	Jul. 2018	P1-13 P2-8,9	"Component No. menu" was added. [Insertion Terminal (Clinch)] and [Terminal] were added to lead types. [Insertion Terminal] was changed to [Insertion

		P2-12  P2-12,3-17  P2-13  P2-15,218, 3-15  P2-15,116,218, 266,3-19,22,25  P2-40  P2-85  P2-118  P2-162,163,196  P2-178  P2-196,207  P2-218  P2-221  P2-228  P2-264, 3-19,22  P2-273  P3-2,3,4,11,23,26  P3-7  P3-13  P3-24  P-28 to 30 Appendix	Terminal (Straight)]. [Image Saving Date & Time], [Inspection Date & Time], [PCB Name], [Program Name], [Source Name], and [Model Description] were added. [Image No.] was changed to [PCB ID]. It was added that column display order can be changed. Description on [Image ID] was added. Description on the model description fill-in dialog was added. [Description] was changed to [Component No. Description]. [Deployment ON/OFF] was added.  Description on [Applying Component No. of Deployment ON to Start Editing Program] was added.  Description on land information was added. Description on [Window Display] was added. [Solder Bass (Land)] and [Solder Bridge (Land)] were added.  The [Lead Group] radio button was added. [Lead Shift (mm)] was added. [Phase Imaging Setting] was changed to [Height Imaging Setting]. [Other] and [Software Ver.] were added. [Hide Revisions Not Influencing Inspection] was added.  [Next 10 Records] was added. Description on rollback was changed. Note about difference display was added. Note about difference display was added. Description on [Source Name Entry] was added. [Deployment OFF] was added. [System Settings] was added. The correspondence between lead types and default sheets was updated.  [Supply Source] was changed to [Source Name]. [CSV Output] was changed to [Output Component No. Mounted on Inspection Program]. Section 3.6 "Making System Settings" was added. The PCB test result output format in Appendix 11 was updated.
R	Dec., 2018	P2-52  P2-49,51,55  P2-53  P2-60	Section 2.4.2.2 "Reading in CAD Data" was added. Images of the mount data selection screen were replaced. ODB data selection was changed to CAD data selection. It was additionally described that deployment to component block unit is not possible when mount data are read in by CAD data selection.
S	Feb. 2020	Overall  P2-4 P2-5 P2-102  P2-128 & 150 P2-132 P2-145 to 145  P2-168 to 172  P2-203 to 206  P2-238 P2-249  P2-264	Screen images were replaced totally because wide display was introduced. A flowchart was added. The flowchart was revised. Description on the component information of criteria setting (component number) was corrected. Description on adjusting and saving was added. Description on visual registration was added. The function of secondary reflection inspection was described additionally. Description on the model editing screen was changed in association with layout change. Description on the optimization procedure was changed in association with layout change. Description on PCB warp was added. Description on entire visual field foreign matter inspection was changed. Wording was changed from "Saving/Reading an Inspection Program" to "Exportin/Importing..."

		P2-276 P3-35 Appendix Appendix	The copy conversion table of inspection program was replaced. Description on overlooking warning setting was added. Appendix 11 The PCB test result output format was updated. Appendix 12 The inspection coverage output format was updated.
T	April 2021	P1-2 P1-3 P2-24  P2-126 P2-127 P2-139  P2-145  P2-165  P2-169  P2-198 P2-226  P2-236  P2-277  P2-286 P3-28  P3-34  Appendix	Added VT-S1080 Added computer specifications for S1080 v-TS Added description of color highlight/white illumination display switching  Added description of PCB light intensity setting Added description of projector capturing setting Added description of S1080 oblique inspection warning  Added description of MPS to secondary reflection inspection setting  Added description of illumination type of characteristic parameters  Added description of illumination type of model editing screen  Added description of Height 3D tool Added description that component number history management function is not available for Ver. 4.00 Replaced explanatory image of base place model editing tool  Added description of copying inspection program (S1080)  Added description of S1080 data conversion Added description of component number library S1080 data conversion  Added S1080 data conversion function Added Appendix 8 Projector light intensity/measurement range setting steps Updated Appendix 12 Inspection coverage output format
U	Jan. 2022	P1-2 P1-3 P2-258	Added Q-up Auto Updated computer specifications for S1080 v-TS Deleted the description of multiple template functions for full view foreign material inspection.
V	Sep. 2022	Cover, P-5 Cover, P-6 P1-2 P1-3 P2-79  P2-100  P2-284  P2-296  P3-28  P3-34 Appendix	Added Meaning of Signal Words, Alert Symbols. Added Alert statements in this Manual. Added VT-S1040, VT-Z600, Q-up Opti Added VT-S1040, VT-Z600 Added explanation of lighting type switching in Land extraction setting. Deleted Height Inspection ON/OFF from Component Number List Updated the copy conversion correspondence table of the verification program Update 2.20 Cross-Model Conversion of Inspection Programs Update 3.4.5 Converting component number library for S10 Series Update 3.6.3 Using Data Conversion to S10 Series Updated 11. PCB Test Result Output Format Updated 12. Inspection Coverage Output Format
W	Feb. 2023	P2-284  P6	Removed errors related to copies of inspection programs. Fixed warning display mark
X	Jun. 2023	P2-34  P2-37 P2-256	Updated the inspection program information screen Added description of check box for the full view foreign material inspection. Updated the inspection program information screen Added that it is not possible to perform a full field of view foreign matter inspection in temporary operation.

		P2-260	Added Mask setting for the full view foreign material inspection.
Y	Oct. 2023	P2-283 P2-292 P3-29	Updated the copy conversion correspondence table of the verification program Added S10V2 Series in Cross-Model Conversion of Inspection Programs Update 3.4.5 Converting component number library for S10 Series
Z	Jun. 2024	P1-2  P2-9 P2-55 P2-144 P2-202 P2-289 P3-25 Appendix a-56,57	1.1.3 Added Windows 11 to PC specification OS for v-TS  Updated electrode type Correcting an error in the diagram Revised the description to "Save Adjustment" Corrected some descriptions of the Height3D tool. Corrected some descriptions of data validation. Updated part number list output format Removed the description of relief for wetting inspection in Appendix 9
AA	Nov. 2024	P3,4 P2-6  P2-12 P2-19,20 P2-30,34 P-35,71,72  P2-44  P2-64 to 65  P2-70 P2-78 to 79  P2-88,89 P2-119 to 120  P2-125 to 126  P2-128 to 129  P2-131  P2-133  P2-139 P2-144 P2-169  P2-171  P2-279  P3-30 Appendix a-75,76 Appendix a-122,123	Updated Terms and Conditions Agreement (Distance inspection) Added Luminous Body Window description.  Updated the description of the model list. Updated the land window adjustment function. Updated of the board program information screen. Removal of references to solder leveler due to functionality improvements.  Added recommendation and reference for detailed fiducial settings. (Distance inspection) Added Luminous Body Window description.  Added Automatic Registration Feature Updated the Extraction Editing Due to Land Extraction Specification Changes  Added a Note on Extraction Methods. (Distance inspection) Added Distance inspection Settings.  (Distance inspection) Updated the image and description.  (Distance inspection) Added samples that 3 Reference Points and Rotate 2 Reference Points.  (Distance inspection) Updated the image and description.  Added an explanation of computational errors due to PC specifications. Corrected menu display text. Revised the description to "Save Adjustment". (Distance inspection) Added Distance inspection description.  (Distance inspection) Added Luminous Body color description.  Revised the description or the method for adding mass production images. Added settings for the conversion feature. Updated 10. PCB Test Result Output Format Updated 11. Inspection Coverage Output Format

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