Saki AOI Training :
Basic Programming Course

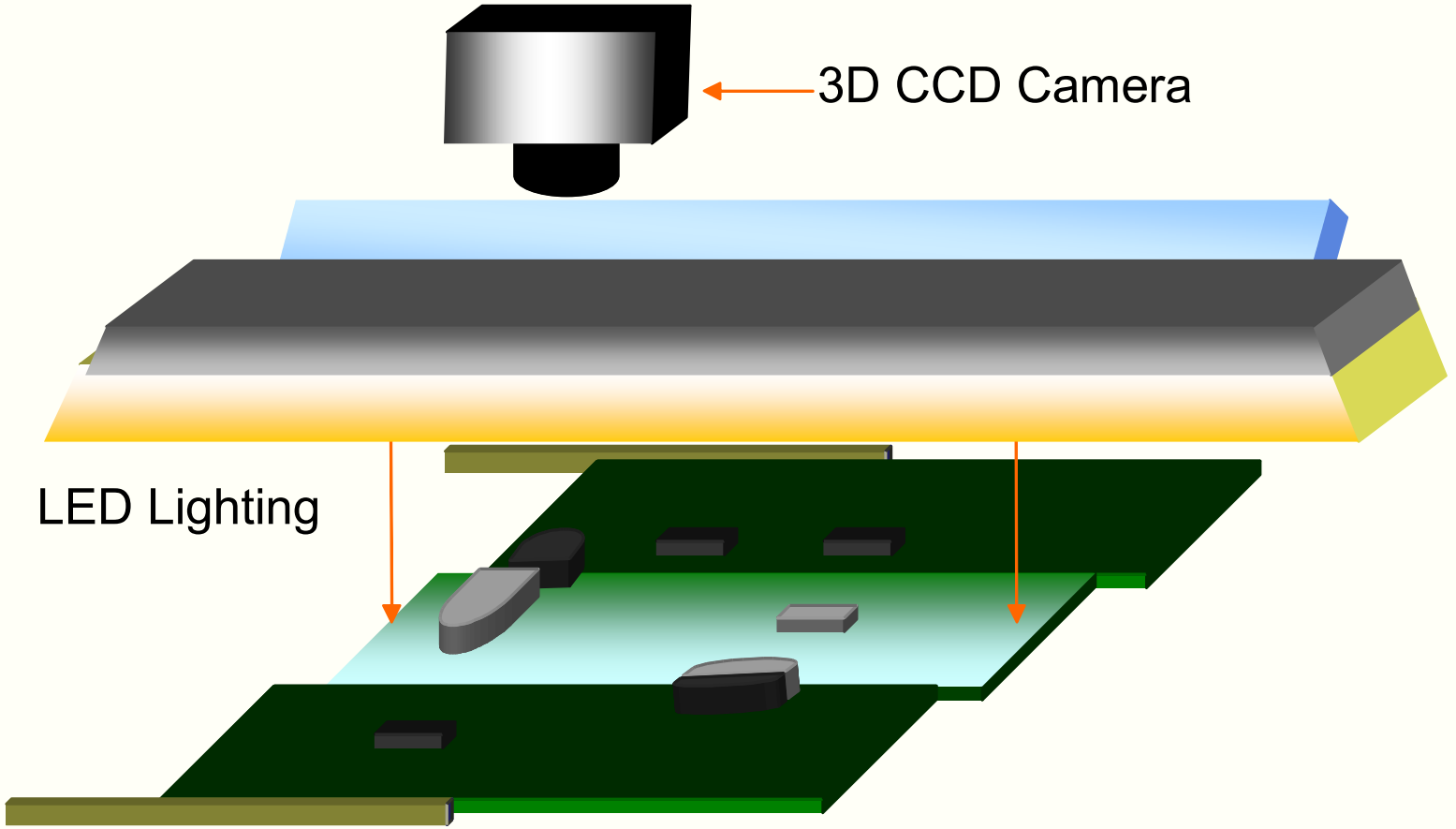
Rev.5

Text Content

- Saki Technology Introduction…….....P3-P11
  - Line Scanning Technology ……..P3-5
  - Basic Inspection approach ……P6
  - Coaxial TOP Light ……P7
  - 3-stage LED Light ……P8-9
  - Data Structure in PC / Windows Login Password ……P10
  - Data Edit Dialog……...P11
- Data making ……P12-52
  - CAD data import ……P13-26
  - Fiducial Marks……P27-31
  - Chip component inspection data ……P32-41
  - IC/Connector inspection data ……P42-51
  - Debug ……P52
- Useful Functions ……P53-58
- System Functions / Toolbar……..P59-70

Single Line Scanning Technology

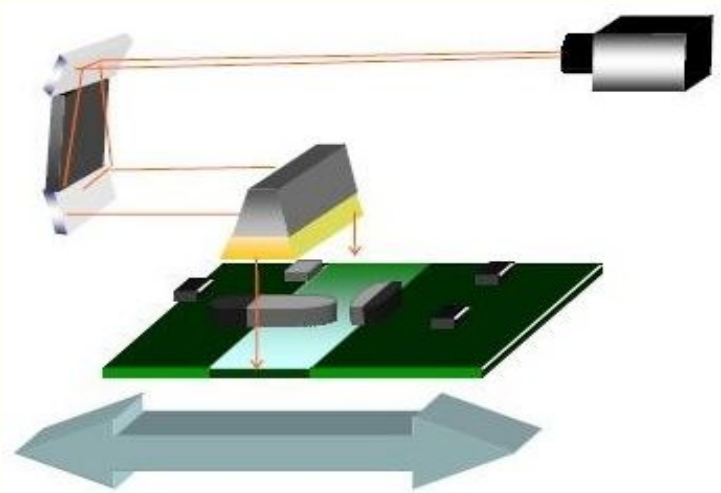
- Captures Entire PCB Image by High Speed
- Full Memory Function to hold an entire PCB Image on screen

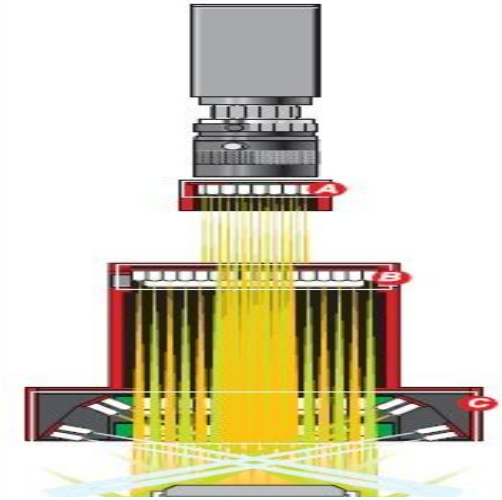


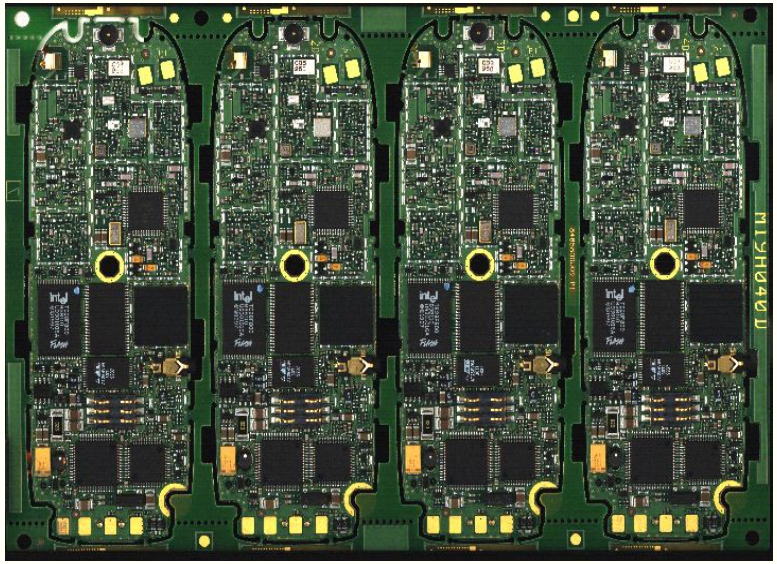
High Speed, Smooth Scanning, Still = Less Wear and Tear

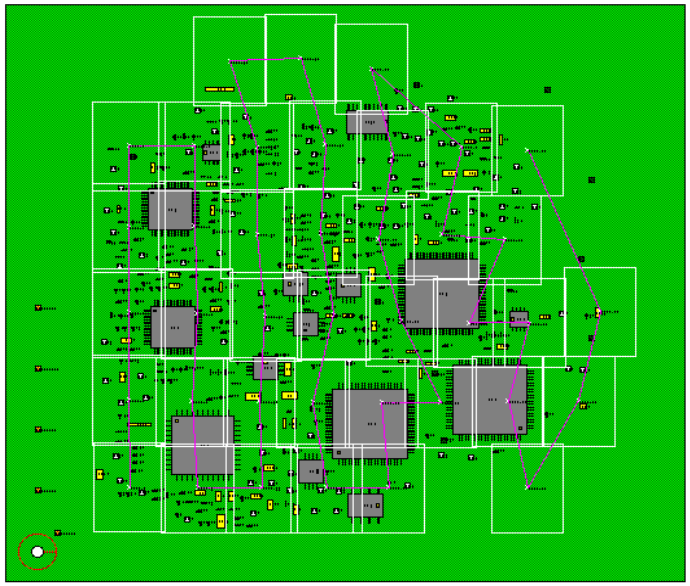
Scanning Method-(1)

Single Line Scanning ***vs.*** ***Multi field of view Scanning***





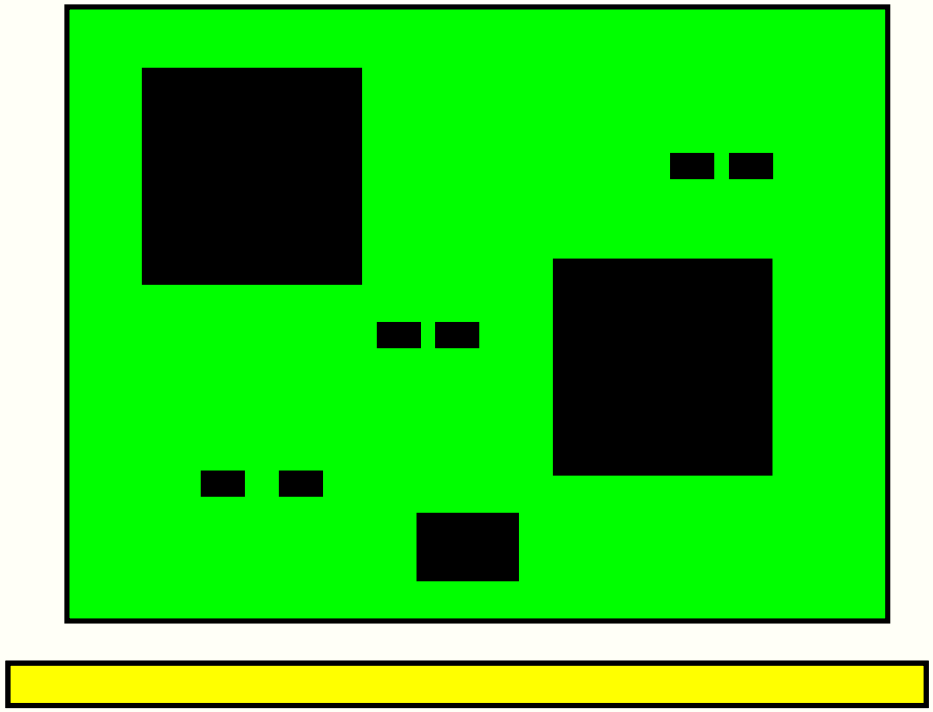




Scanning Method-(2)

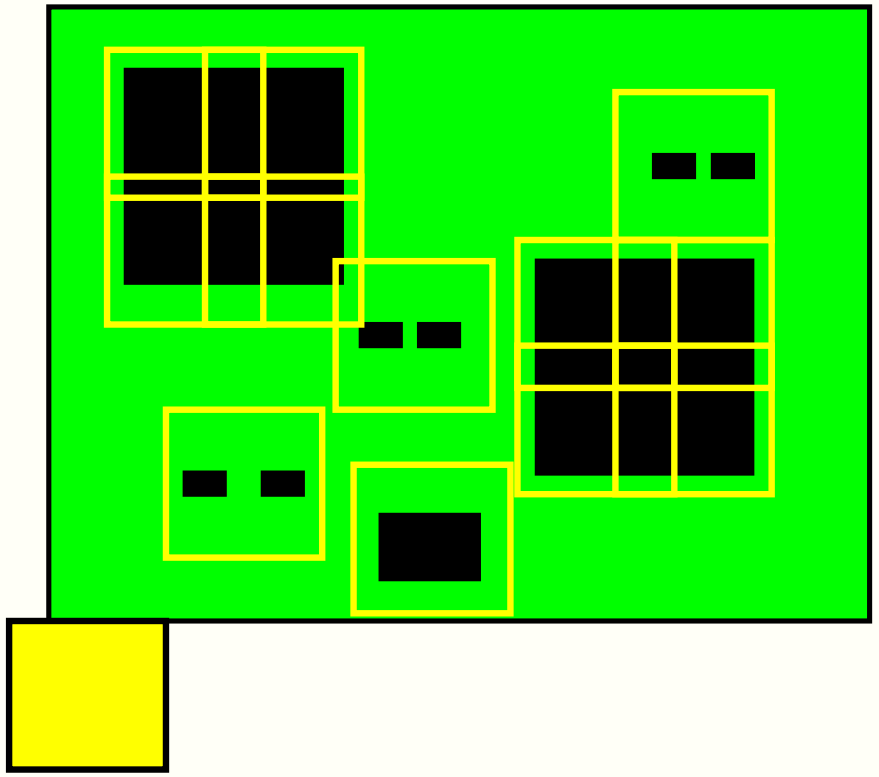
Inspection completed

Line scanning



Inspection completed

Field of View Scanning



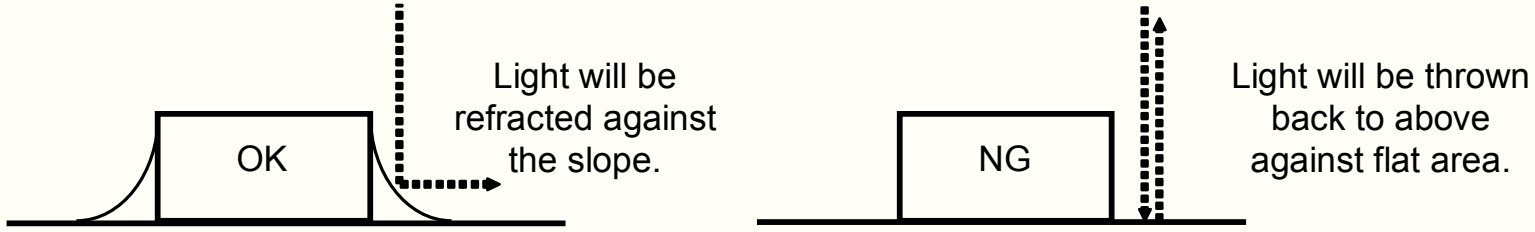
- ***Faster inspection Tact time***
- ***Easy to add inspection data at design change***

Basic Inspection Method

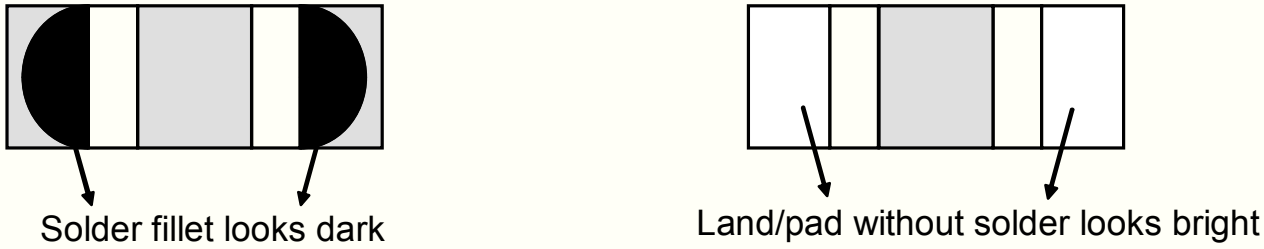
Go/No-go judgment will be made by giving numerical value to each pixel's brightness on scanned image.

➔ Brightness Level = 255-0

Example: Solder Inspection (Black/White)



<Image by TOP Light>

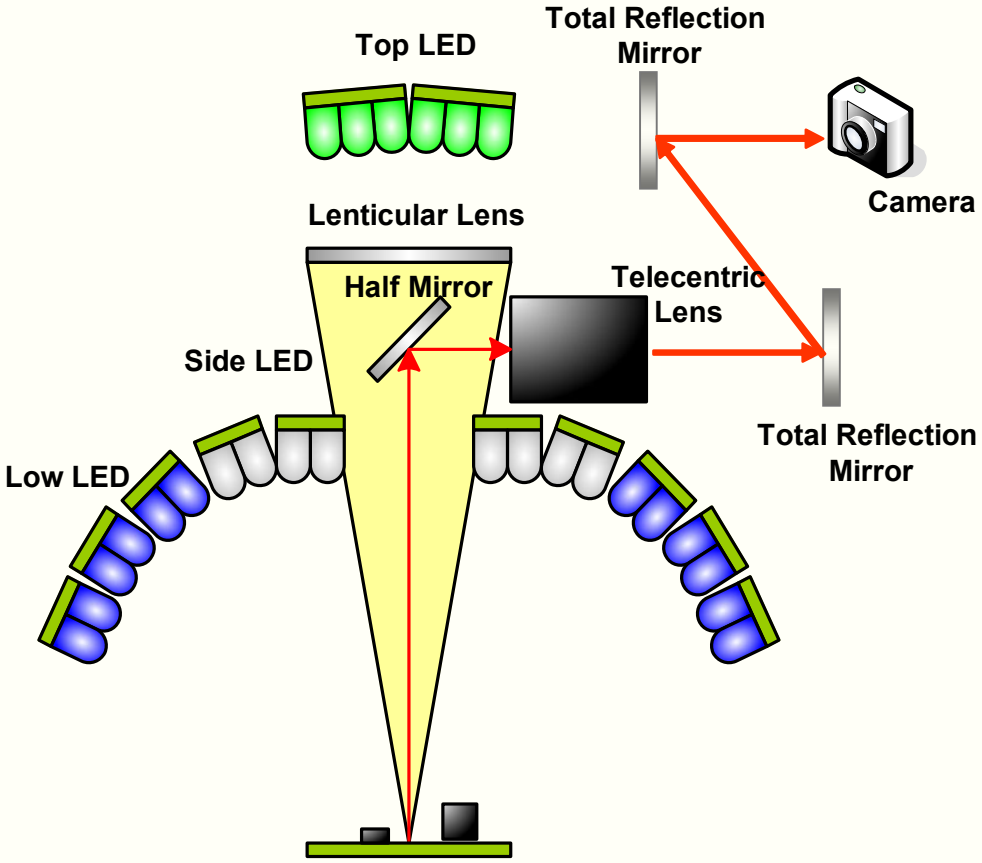


Coaxial TOP Light

Saki products realize an inspection using a complete overhead lighting.

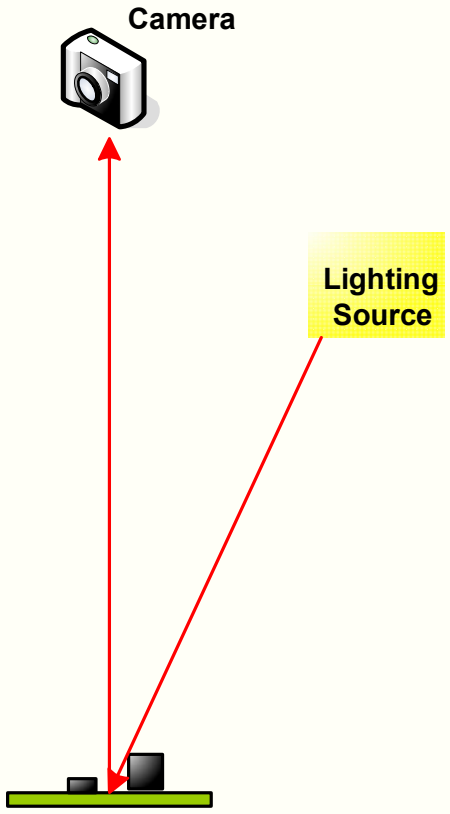
Coaxial Overhead Light

Saki's overhead TOP light will not throw a shadow over component (s).

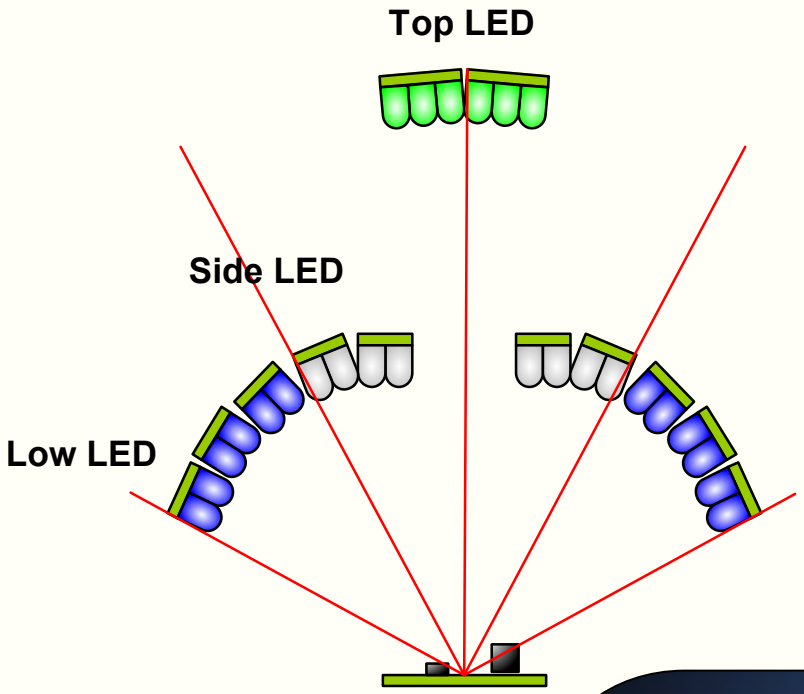


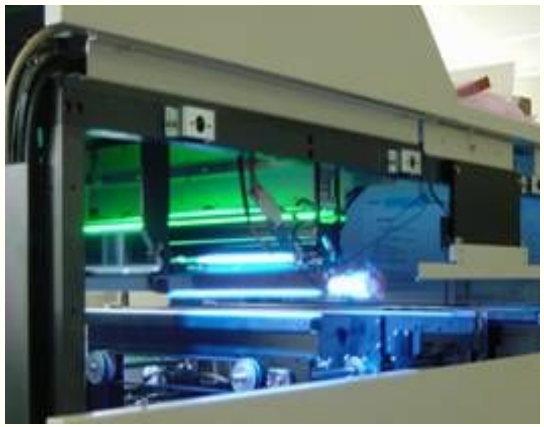
Conventional Lighting Method

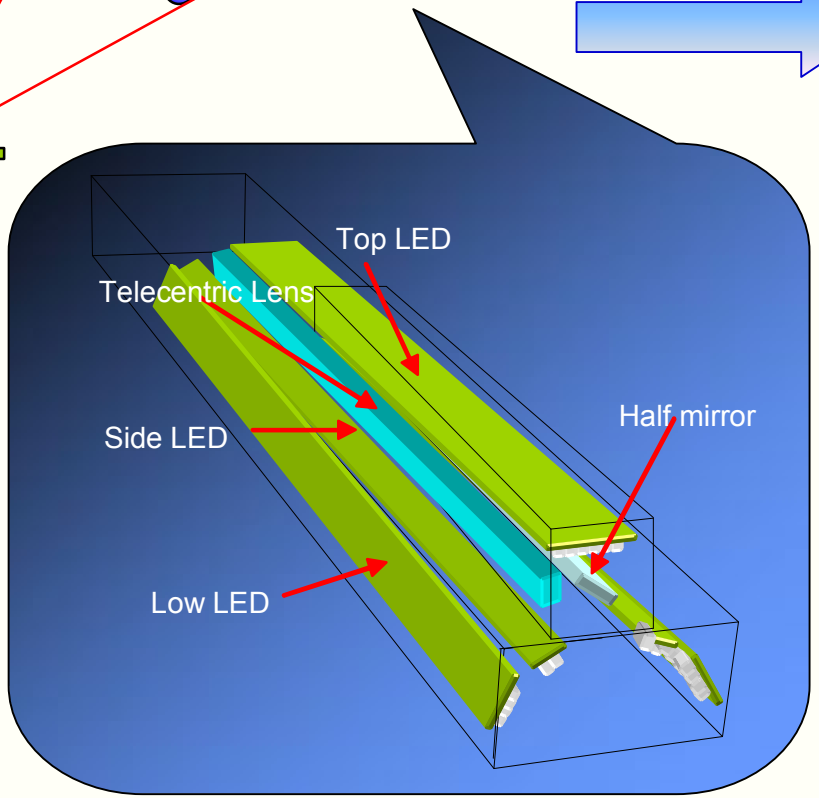
Parts next to taller components are shaded by the lighting. Inspection data needs to be adjusted.



3-stage LED Light (1)

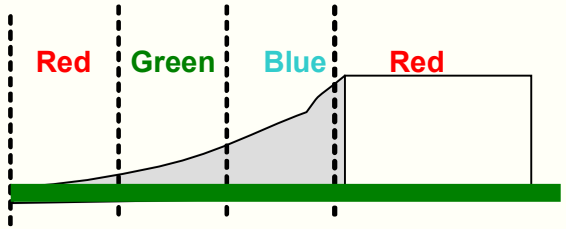


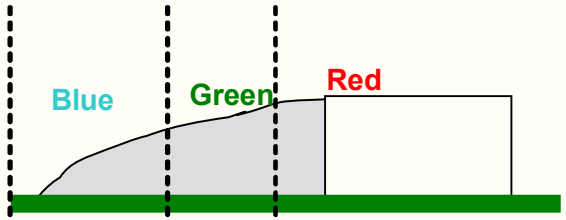




■ Multi-lighting (MLT):

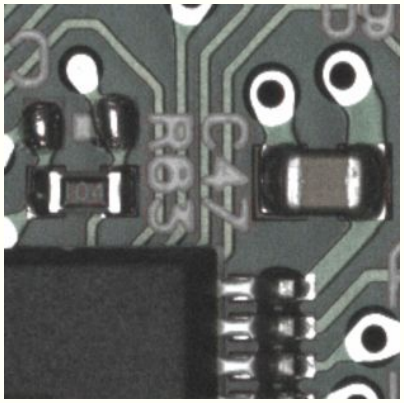
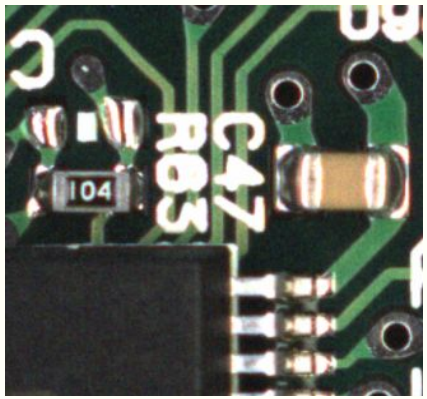
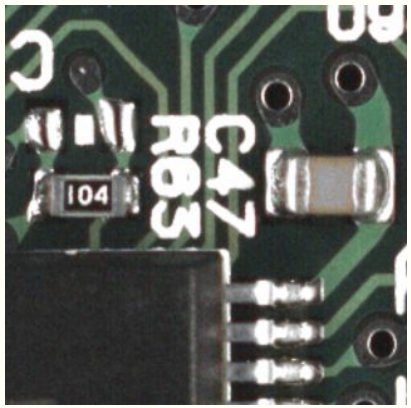
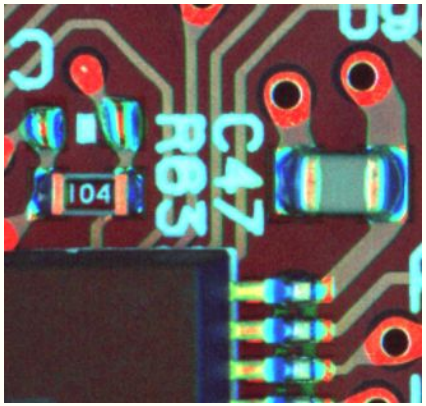
Created by combining Top, Side and Low light image. MLT can defect fillet shapes accurately.





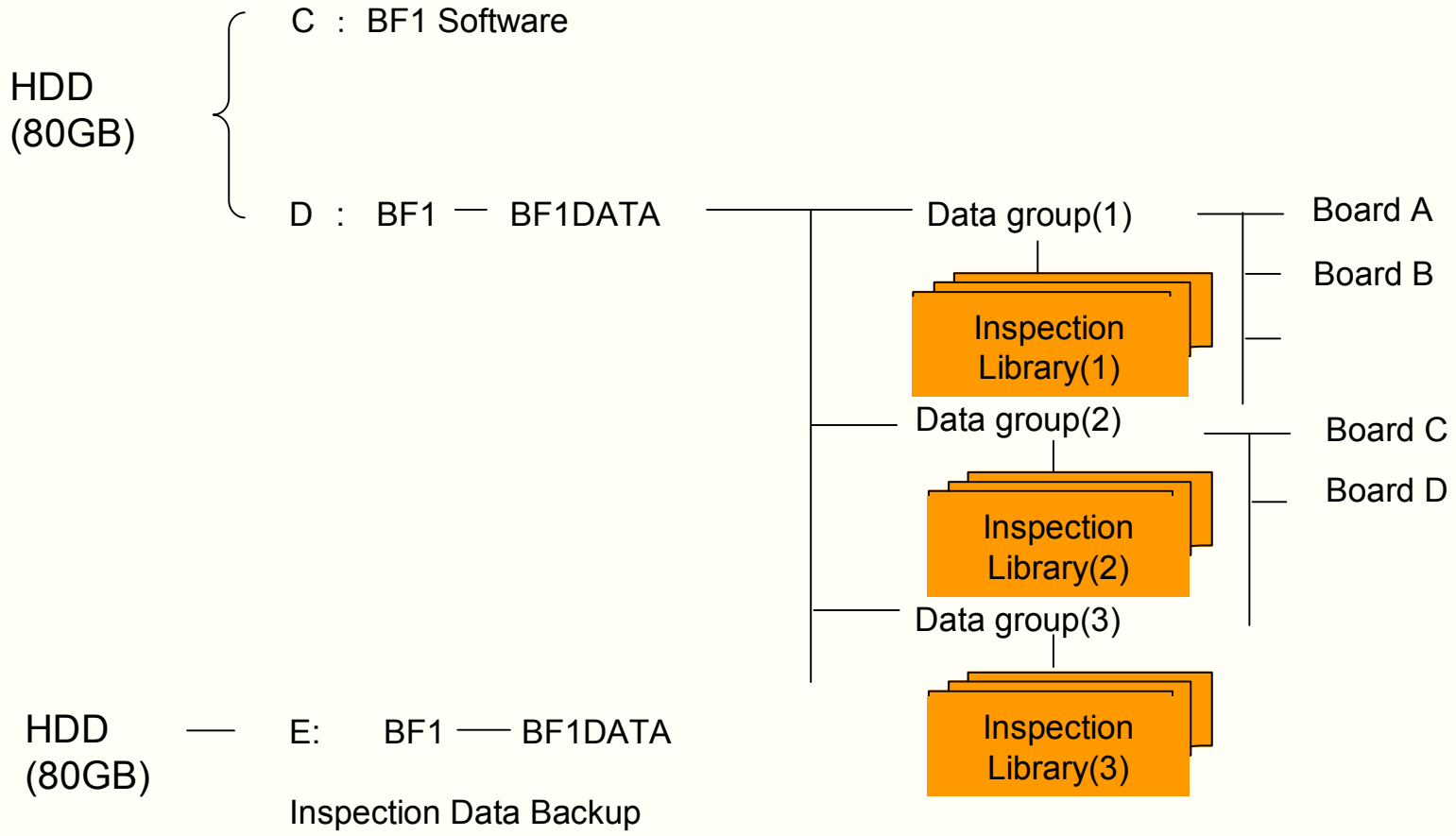
	Fillet angle
Red	<25°
Green	25～45°
Blue	45～75°

3-stage LED Light (2)

	Top Light	Side Light	Low Light	MLT Light
				
Features	- Effective for solder and polarity inspections - Convex & concave sensitive - Monochrome screen (detect dark/bright contrast) - Inspect tall components (no effect by adjacent components)	- Full color display - Color inspection (for Missing, red-eye inspection) - Image nearest to the human eye sight	- Can extract an image that has high level of visibility - OCR recognition - Reduce shiny flux's influence (= Effective for bridge inspection)	- Combine Top, Side, and Low light images - Solder fillet inspection, lifted lead inspection

- Approximately 20 different lightings are available today, by adjusting Top, Side, and Low lights flexibly by software.

Data/Folder Structure



■ Login password to Windows

Windows XP

Username: Sakicorp
Password : sakicorp

Contents: Inspection data making

Importing CAD data……P12-25

Fiducial marks……P26-31

Inspection data making

Typical inspection for chip components……P32-41

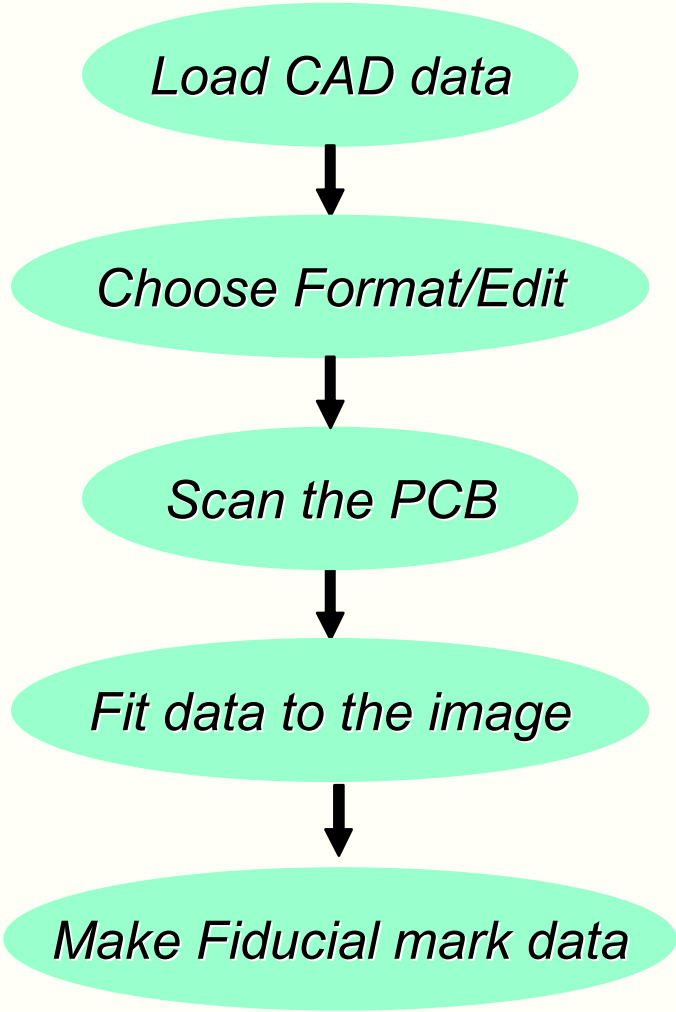
Typical inspection for QFP / SOP ……P42-51

Debug operation……P52

Importing CAD data

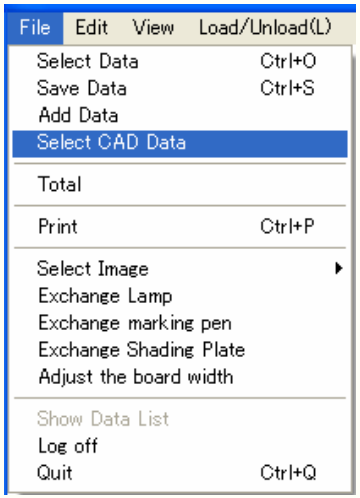
- CAD data
  - ✓ Text data / CSV file

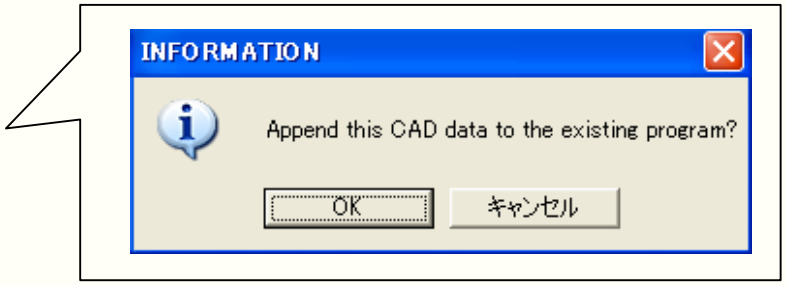
  Cautions）Delete unnecessary text and empty boxes/lines
    - X coordinate
    - Y coordinate
    - Angle（θ）
    - Component name（＝Reference）
    - Reel No （＝Macro）
    - Library (Optional)
      When library does not exist in CAD data,
      Reel No can be used instead.
- NC data / Mount data



Importing CAD data

1）Choose “Select CAD Data” in the file menu

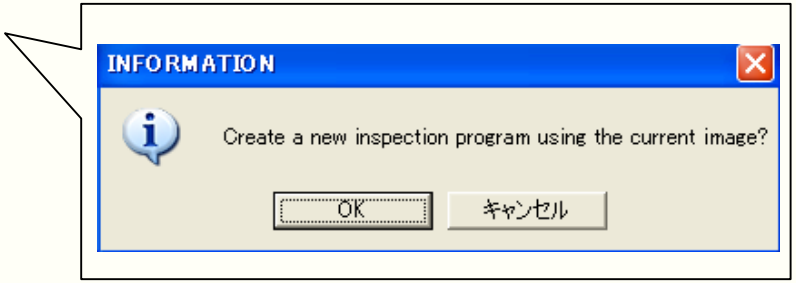




Choose cancel when you want to just open a new CAD data

【Cautions!】

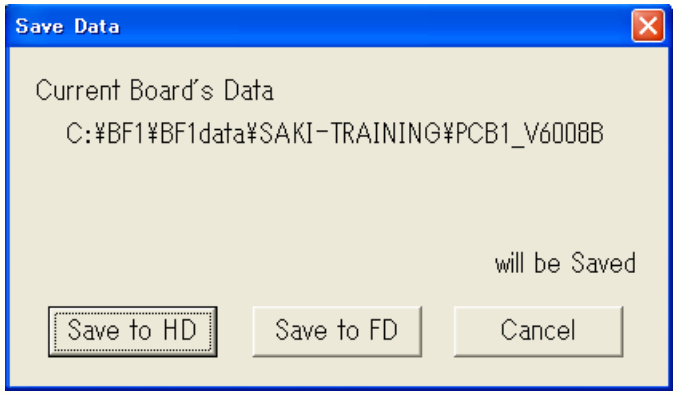
Please choose OK when you have several NC data to make a PCB inspection recipe or double-side data.



※This message will show up When there is an image on the screen.

Select either OK or Cancel.

※”Save to HD”

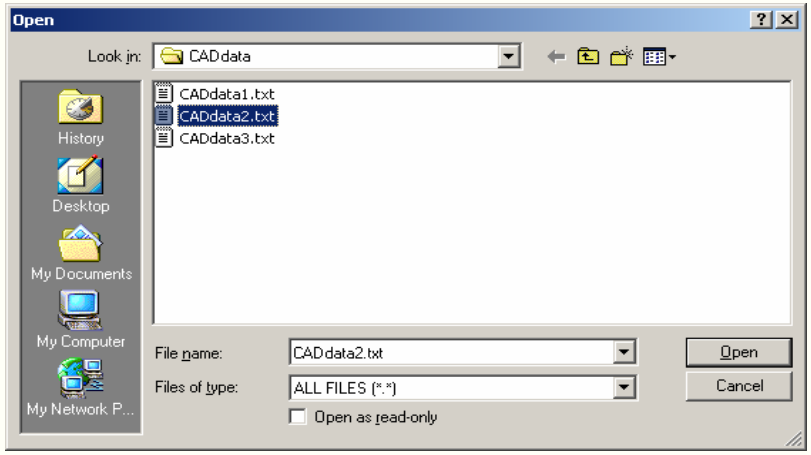


※If there is any inspection data on the screen, You will be asked whether you wish to save the data or not.

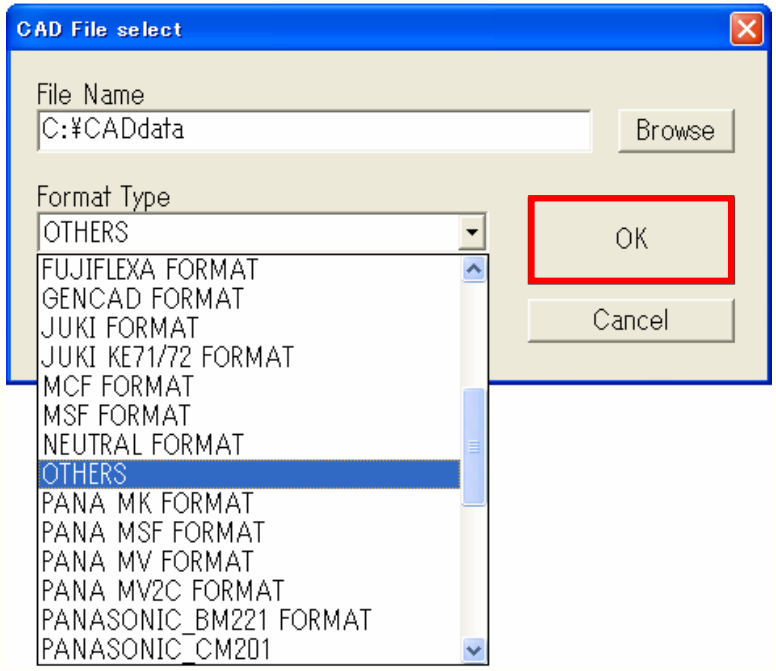
“Save to HD” if necessary.

Importing CAD data

2) Select the file



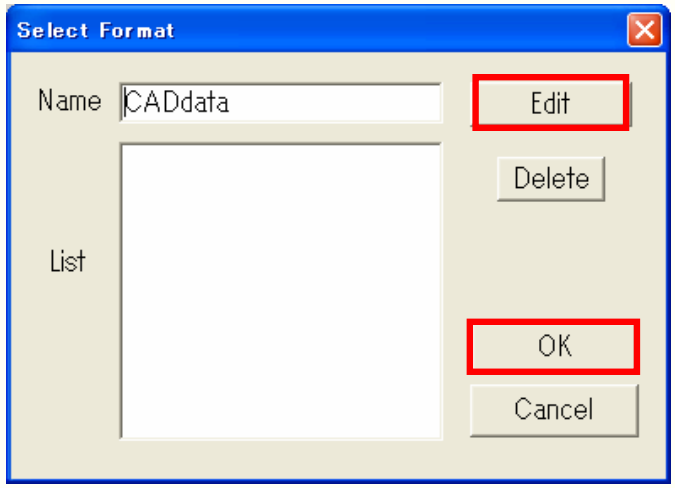
3) Select "OTHERS" for CAD text format and choose OK



※ Select appropriate data format for NC data.

Importing CAD data

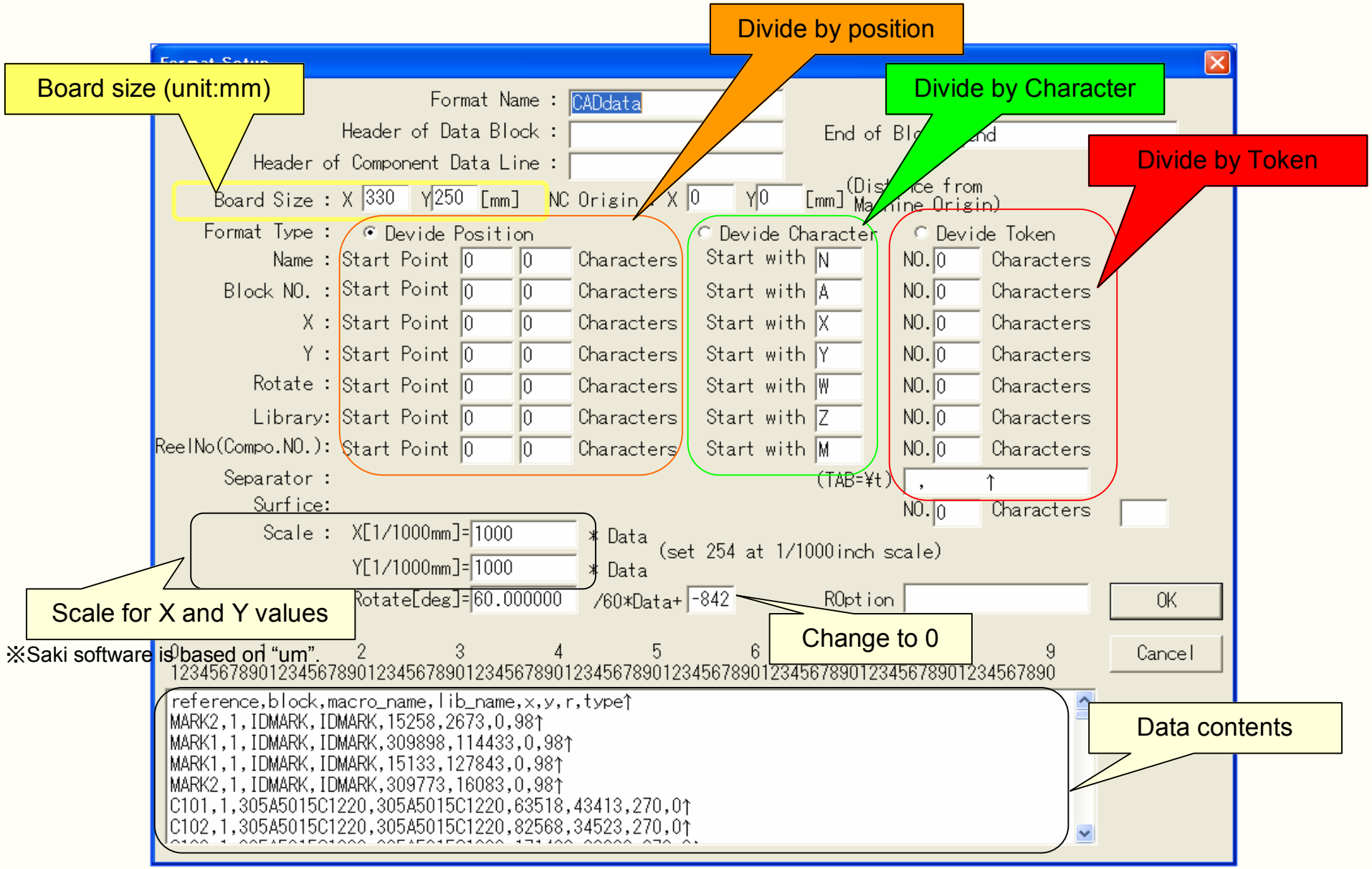
4) Input the name of the format to be defined, and Click Edit



Type in the name of the format when importing a new data.
In case there is an existing format, choose appropriate format.

Importing CAD data

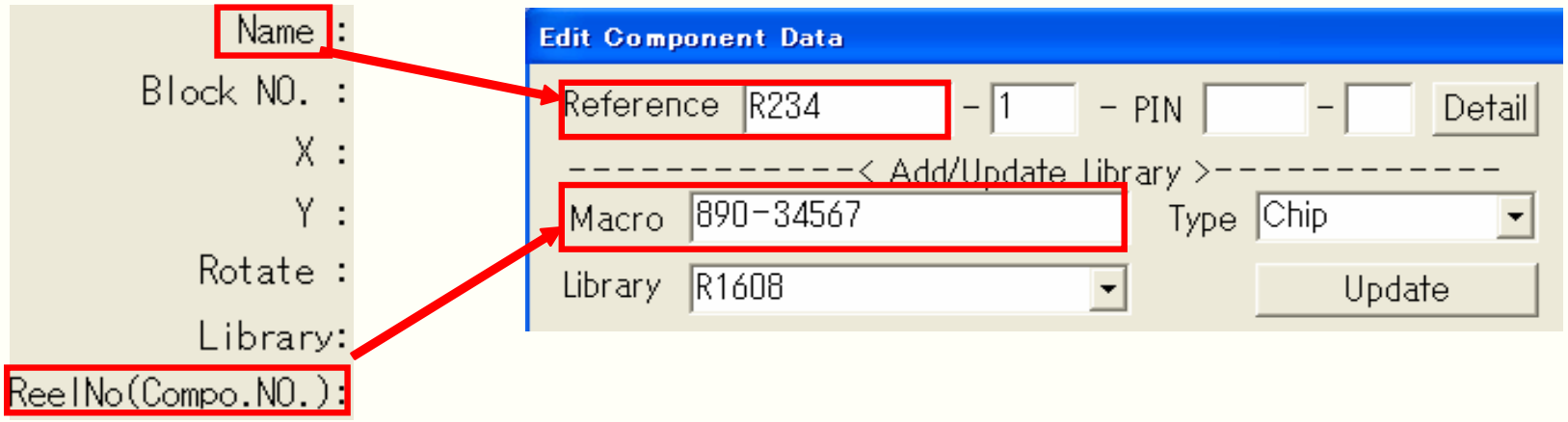
5) Set up the format to read the CAD data in one of the three ways.

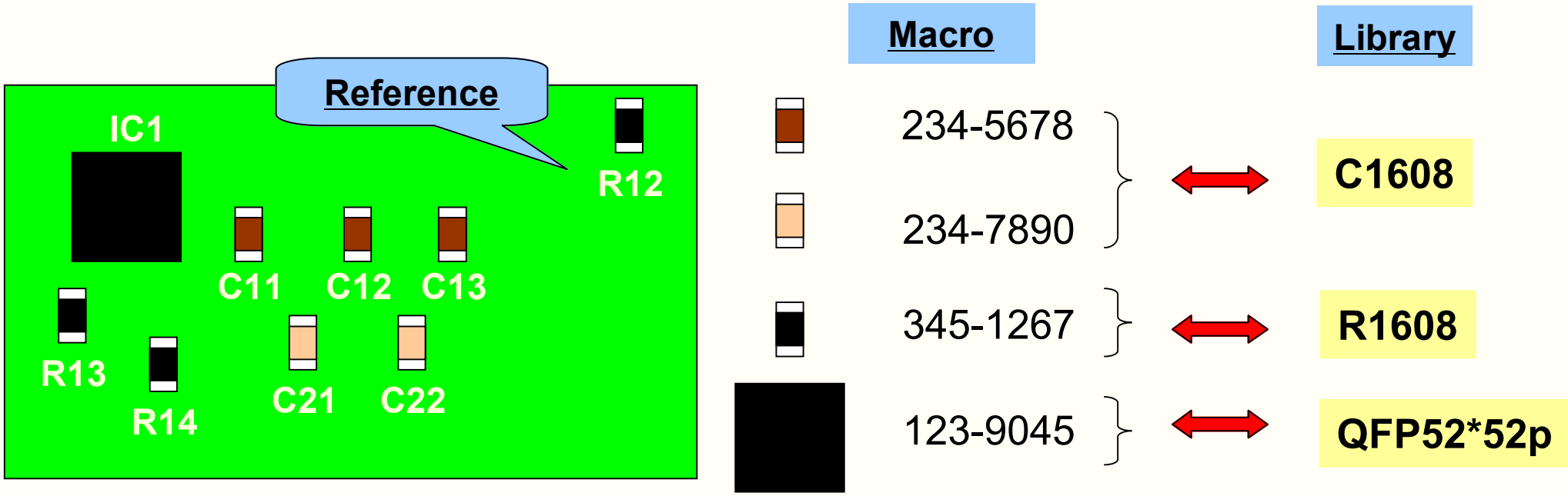


※Saki software is based on “um”.

Importing CAD data

■ Reference, Macro & Library





Importing CAD data

Three Choices to define the reading format :

1. Divide Position
2. Divide Character
3. Divide Token

Name: C101
X: 63518
Y: 43413
Rotate: 270
Reel No: AAAA

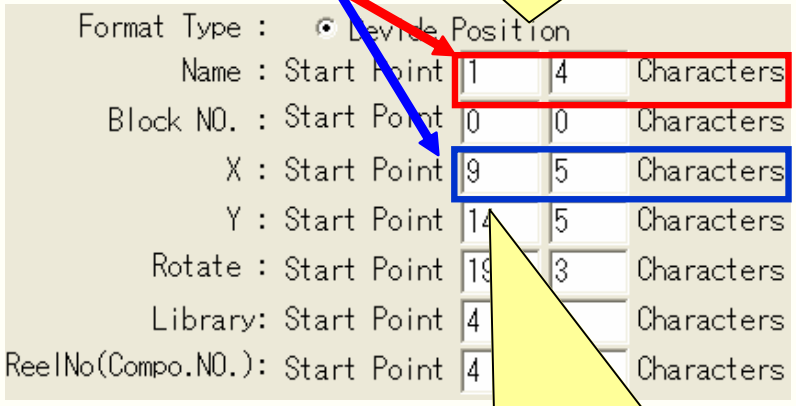
1. Divide Position

= by the position and the length of the characters

e.g.)

C101AAAA63518 43413270

Name is defined by 4 characters from the 1st one



X coordinate is defined by 5 characters from the 9th one

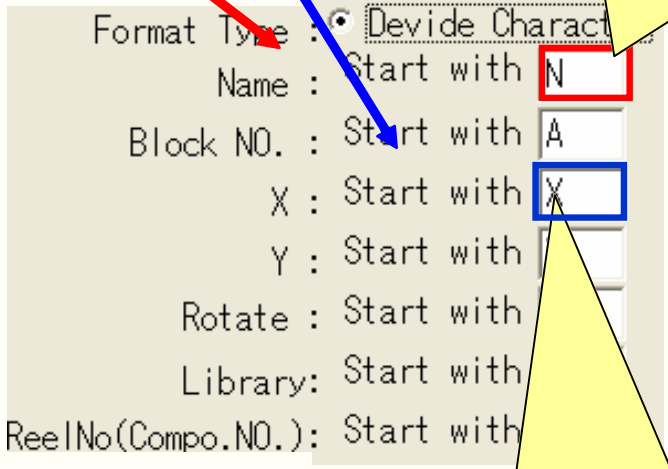
2. Divide character

= by the specific characters to be started with

e.g.)

NC101MAAAAX63518Y43413W270

Name is defined by the characters after N



X coordinate is defined by the characters after X

Importing CAD data

Three Choices to define the reading format :

1. Divide Position
2. Divide Character
3. Divide Token

Name: C101
X: 63518
Y: 43413
Rotate: 270
Reel No: AAAA

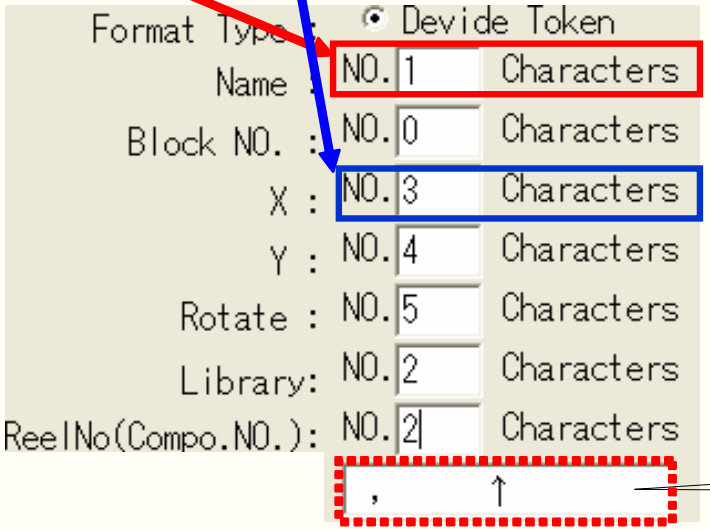
3. Divide Token

= the number of the order

e.g.)

C101, AAAA, 63518, 43413, 270

1 2 3 4 5



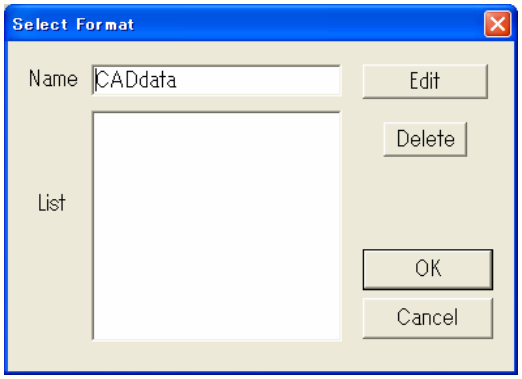
Name is defined by the 1st data portion

X coordinate is defined by the 3rd data portion

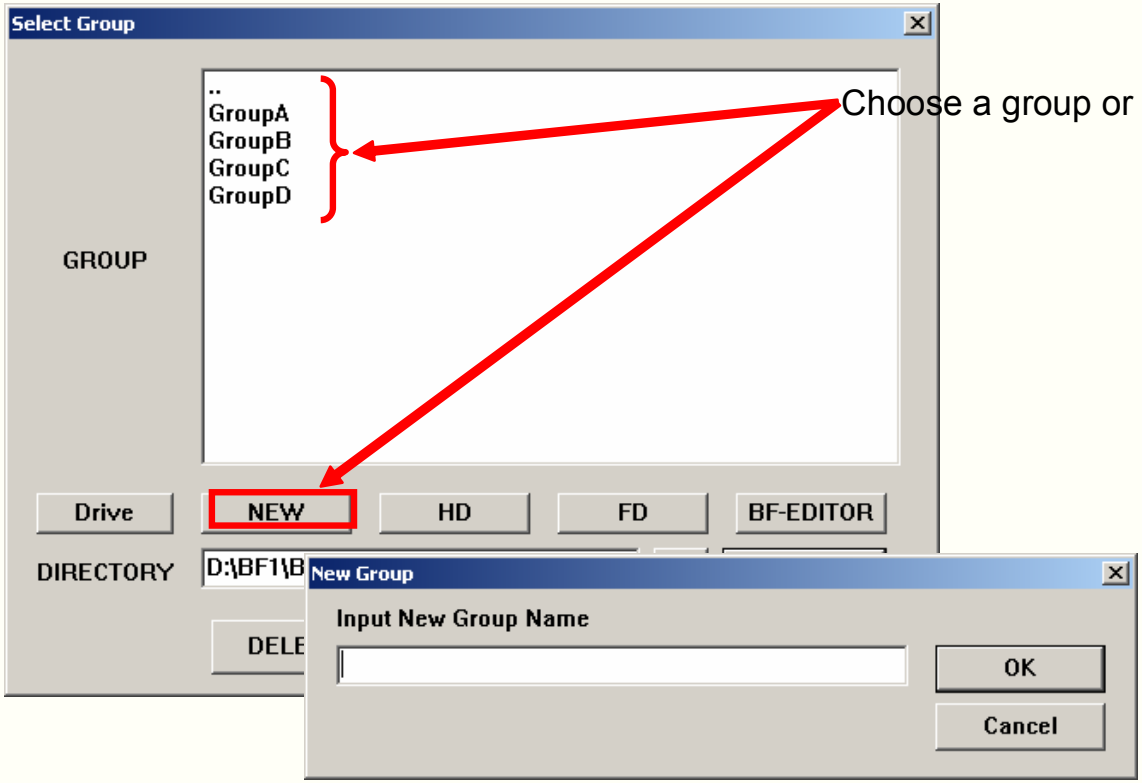
Symbols to divide the data content
(Automatic search by software)

Importing CAD data

6) Choose or Create a group to put the data into



Going back to the previous Select Format dialog,
Click OK after confirming the appropriate format is selected.



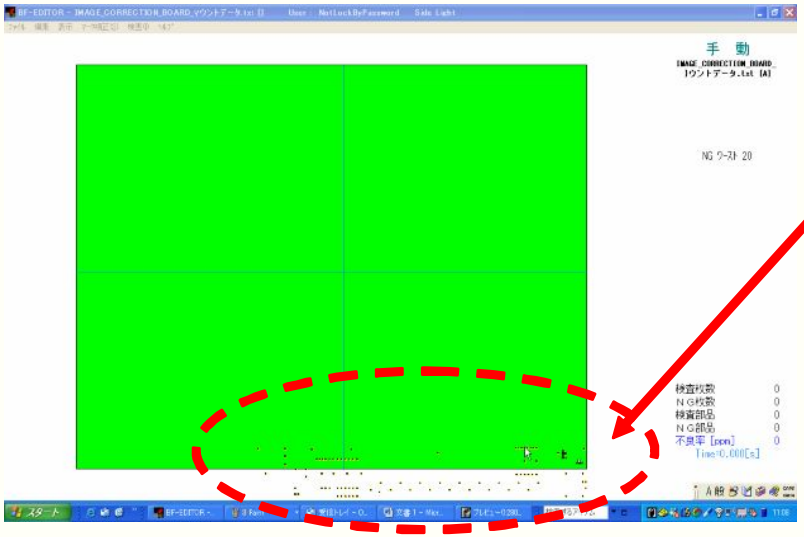
Choose a group or create a new group

Cautions!

A blank space or slash "/" should not be used for group name and board name.

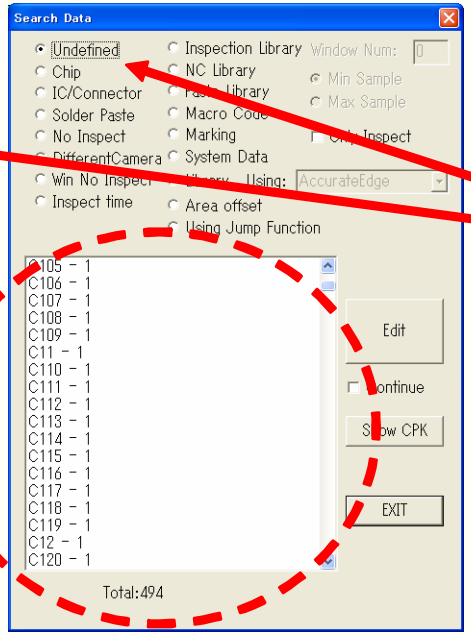
Importing CAD data

7) Confirm if the CAD data is properly imported



CAD data appears on the full screen.

■When origin is out of alignment：

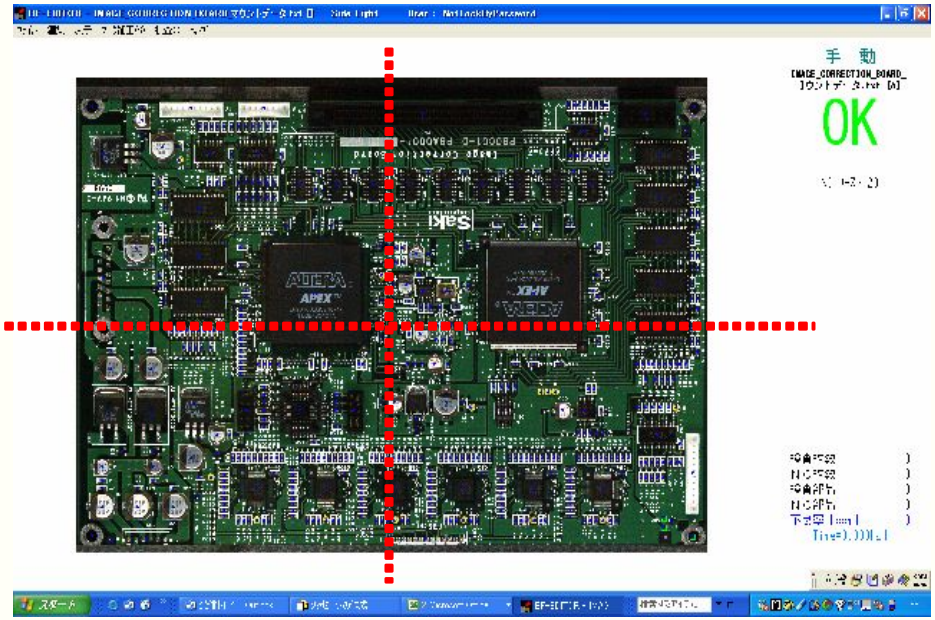


When the origin is off, CAD data can be completely out of the board on the screen.

Go to “Edit” →”Search”
Please check if the data exists in the list box under “Undefined”. If the data exists, that means CAD data is properly imported.

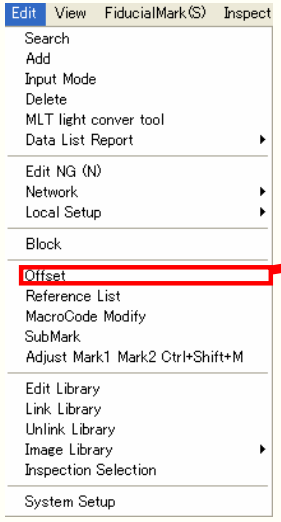
Importing CAD data

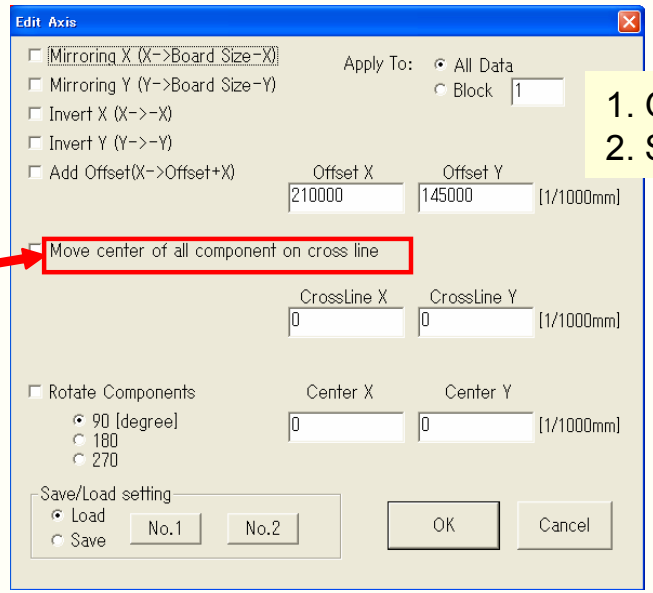
8) Scan the image and fit the window position



Click the center of the board image and move a white cross line to the center.

【Screen operation】
- The image can be enlarged by click.
- Click at right-hand index area to go back to a full screen.



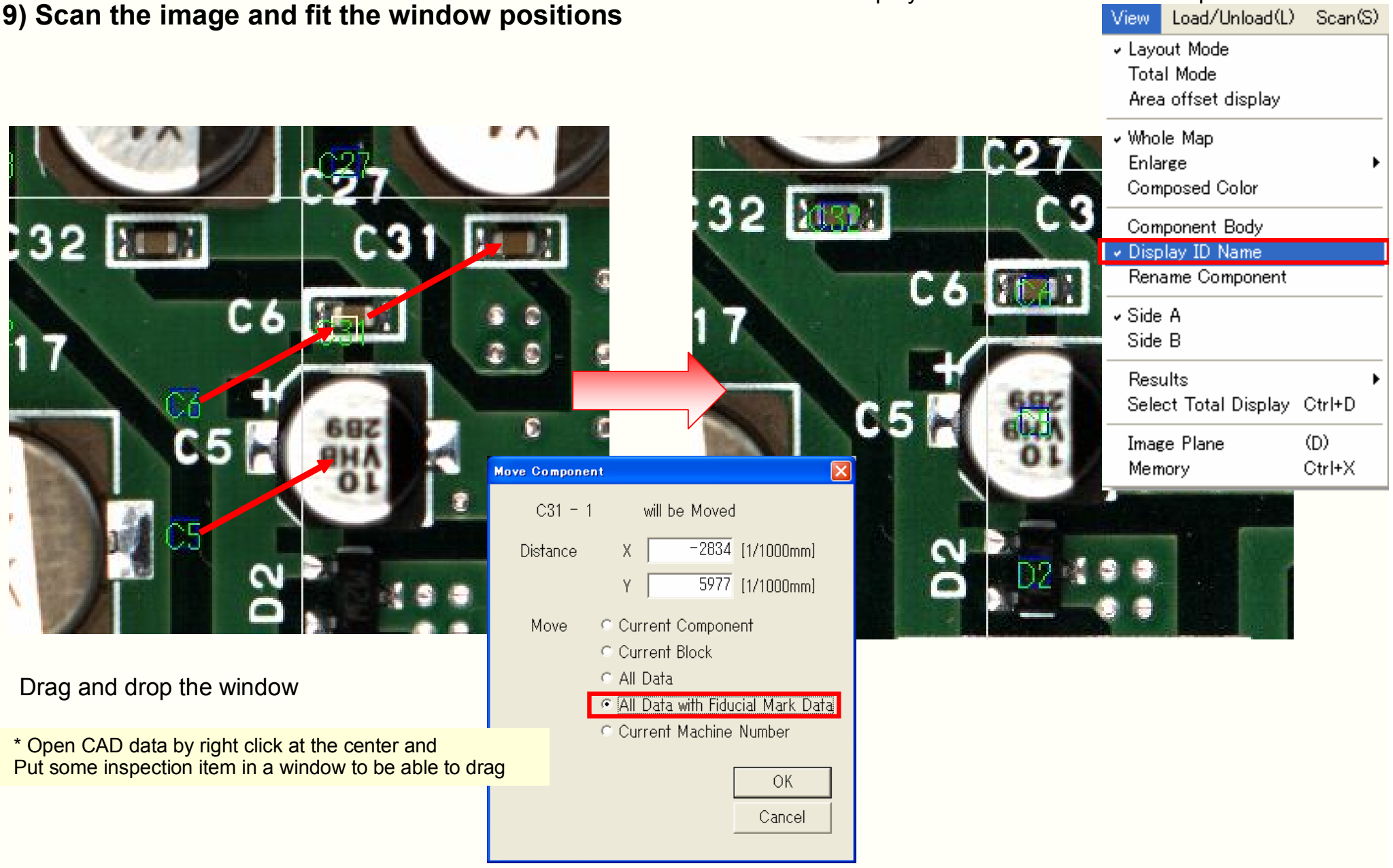


1. Go to “Edit” →”Offset”
2. Select “Move center of all component on cross line”

Importing CAD data

* Use “Display ID name to show the components’ name

9) Scan the image and fit the window positions

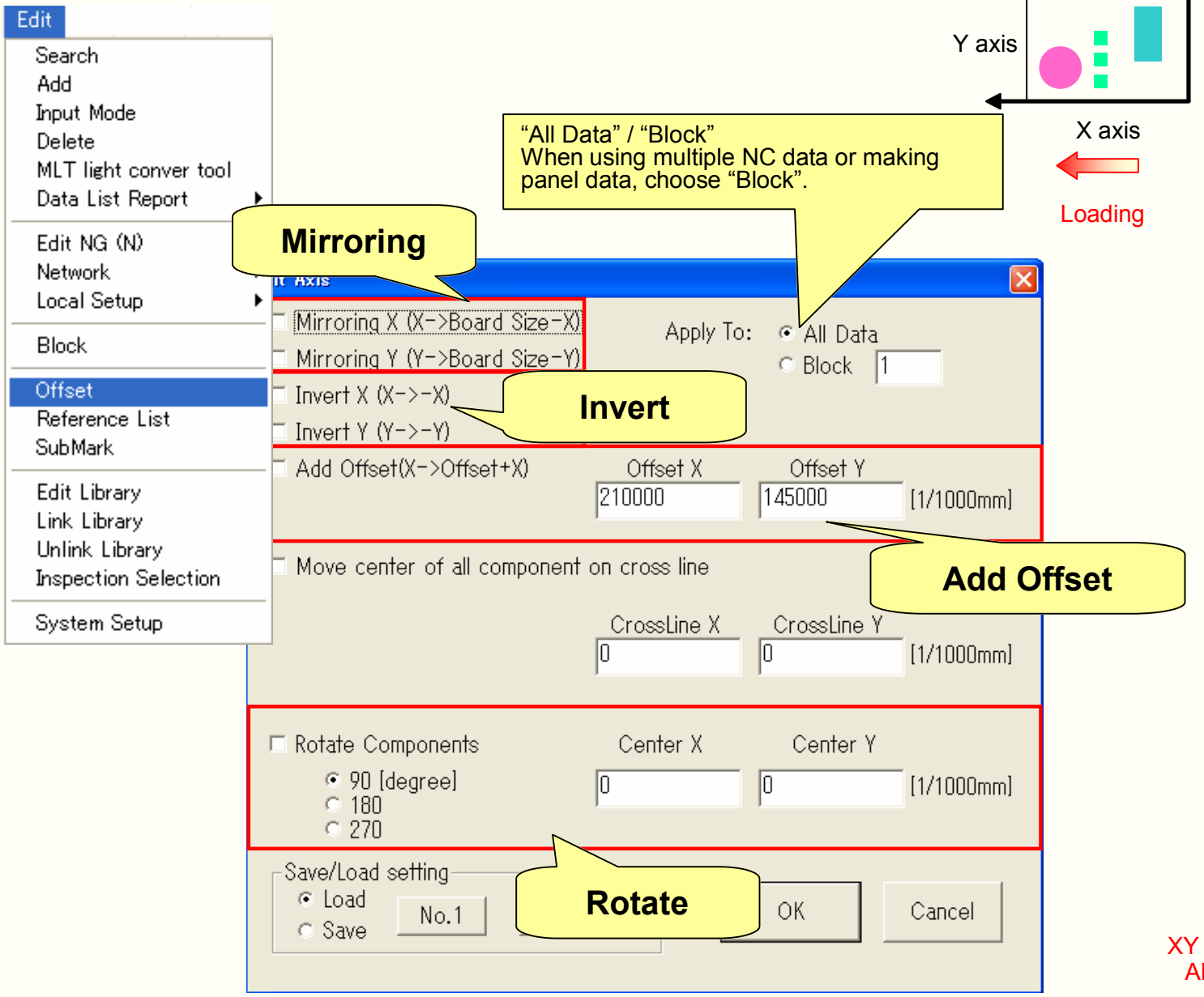


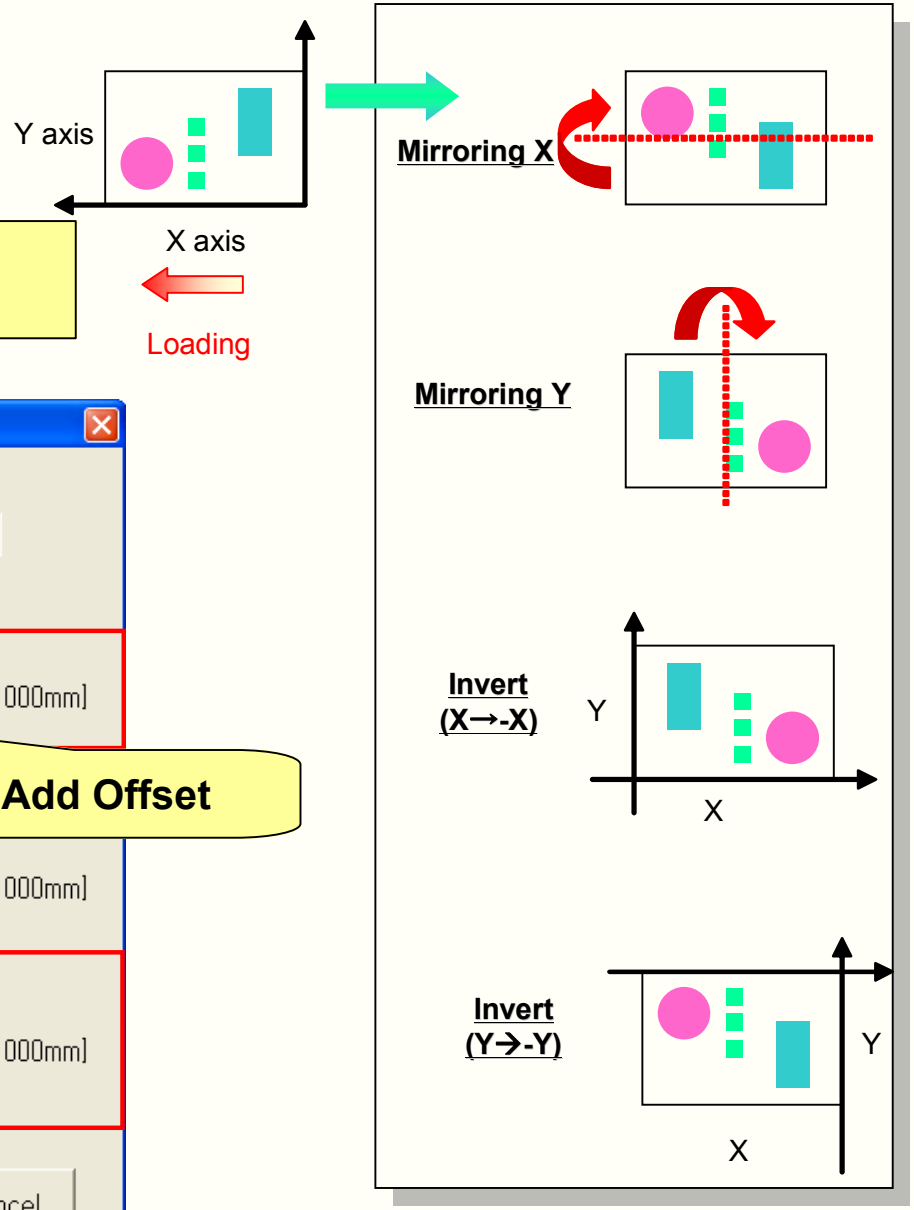
Drag and drop the window

* Open CAD data by right click at the center and
Put some inspection item in a window to be able to drag

Importing CAD data

※Use “Offset” for further adjustment ※





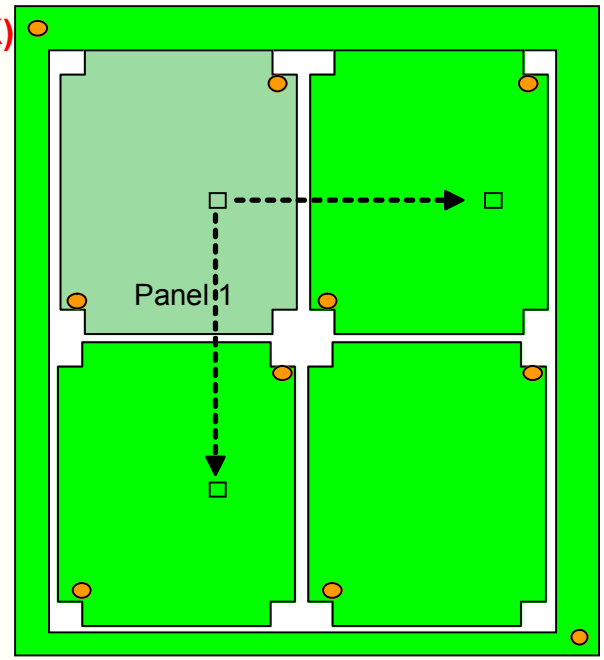
XY orientation is different per machine.
Above is referring to Planet X case.

Importing CAD data

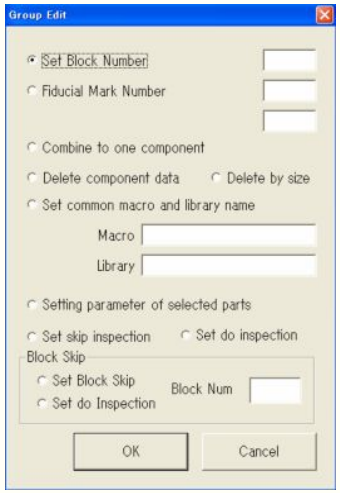
10) Use “Block” to copy the CAD data to other blocks

“Edit” →”Block”

MARK1 (IDMARK)

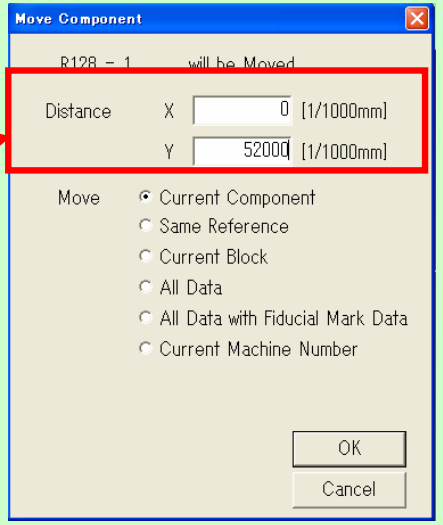


MARK2 (IDMARK)

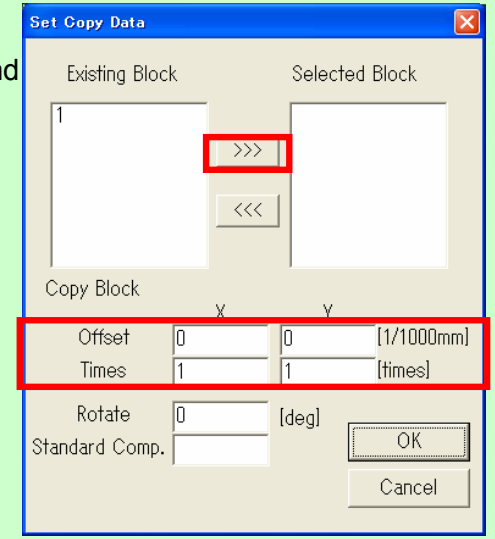


■ Task : Copy panel1 to other 3 blocks

1. Measure Offset distance.
   =Choose one CAD data and
   move it to the position to be copied



2. **“Edit” → “Block”**
   Select the block to be copied.
   Enter the distance to the next block and the number of times to be copied for each direction（Ex: X=2, Y=2）
   →Press OK



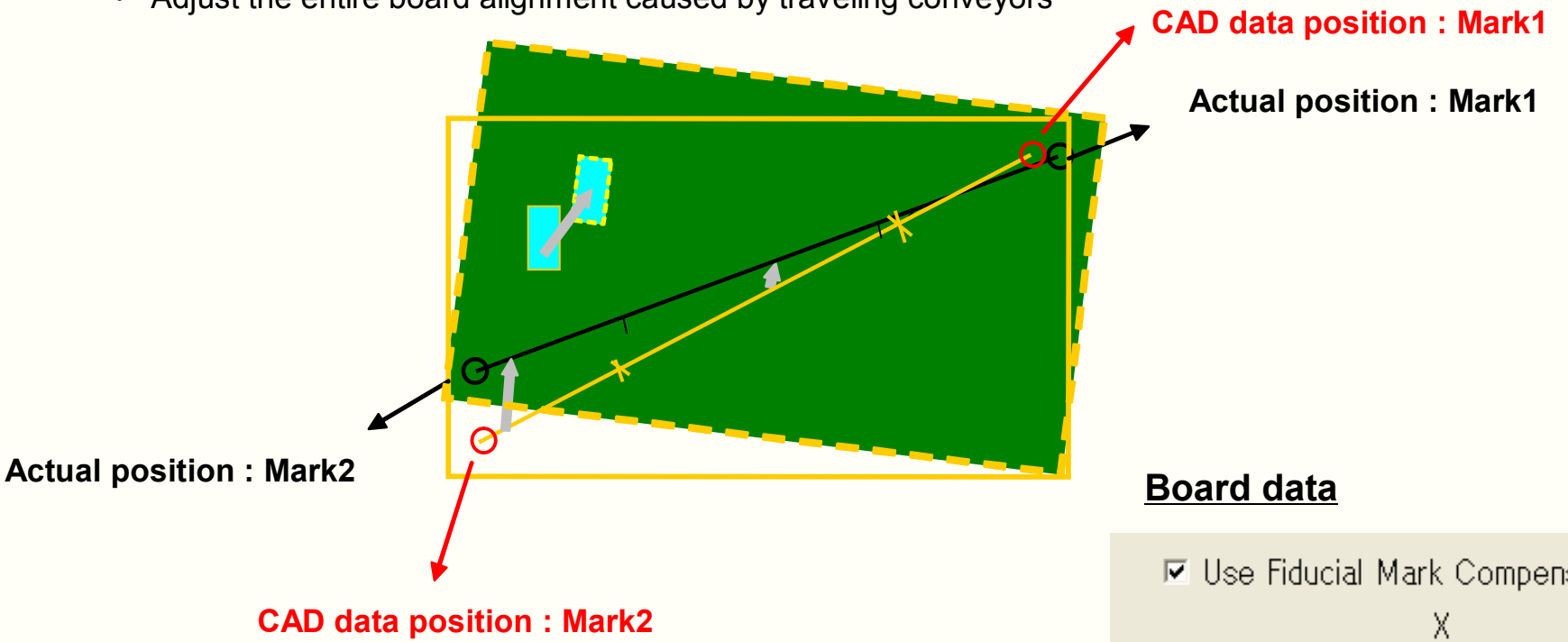
3. Fit the position window per panel
   →Move “Current block” only

※Copy Multiple panels → Set block number
※Adjustment per panel → Use Submark (Submark setting = “Fiducial mark Number”)

Fiducial Marks

Fiducial Mark adjustment

- **Purpose**
  - When fiducial marks can not be found, inspection will not start（= Mark Error)
  - Adjust the entire board alignment caused by traveling conveyors



Board data

Use Fiducial Mark Compensation

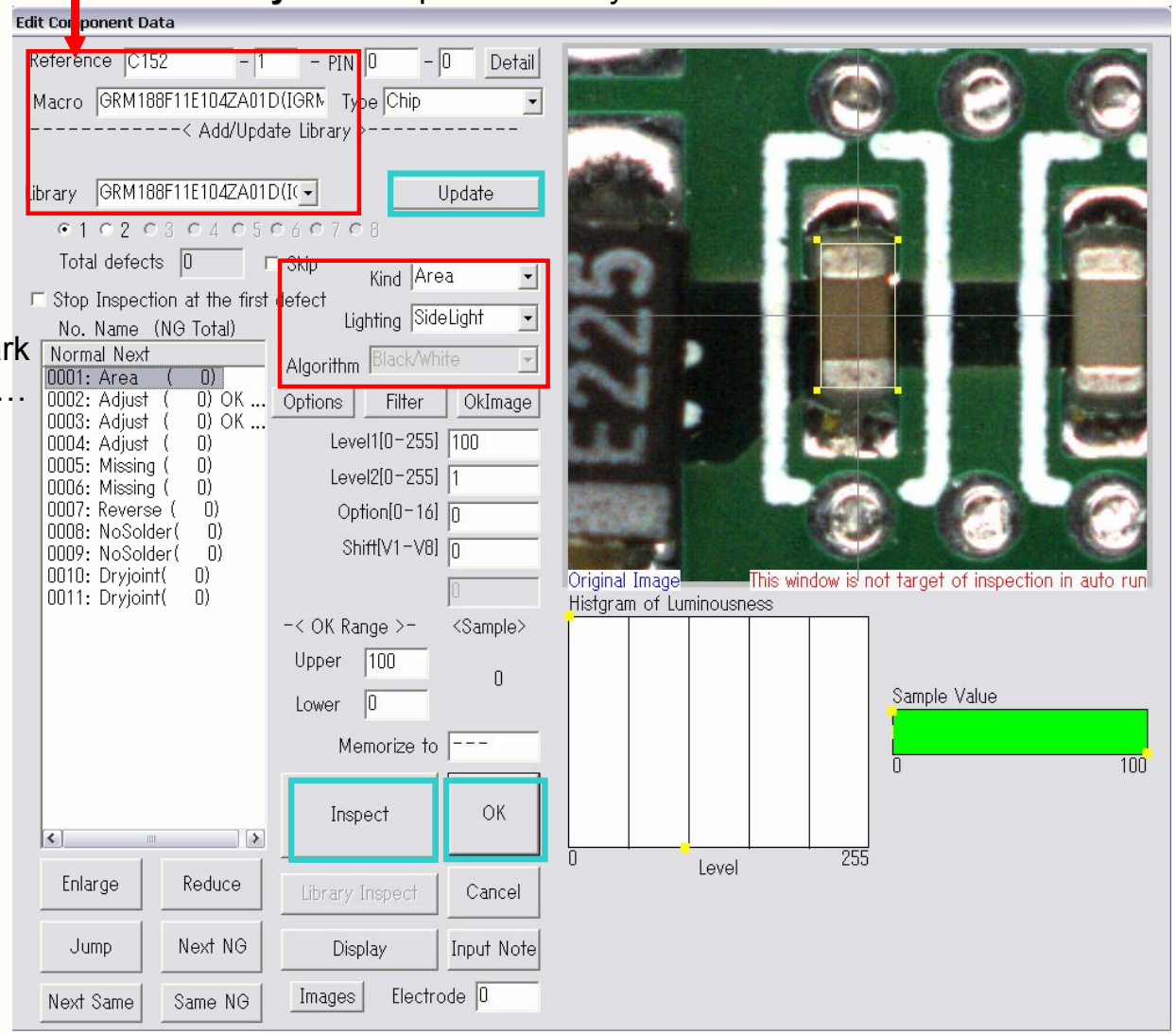
	X	Y
MARK1	2222355	-3630
Actual Position	222564	-3318
MARK2	1495	-174667
Actual Position	1774	-174323

Data Edit Diglog

3 Main Boxes

Reference = "Name" – "Panel #" – "Pin #" –"inspection item # per pin"
Macro = Reel No. / Component spec
Library = inspection library name

"**Library** " =
A series of inspection data for each components, which can be applied to all same components based on Reel No.



Key Select Item

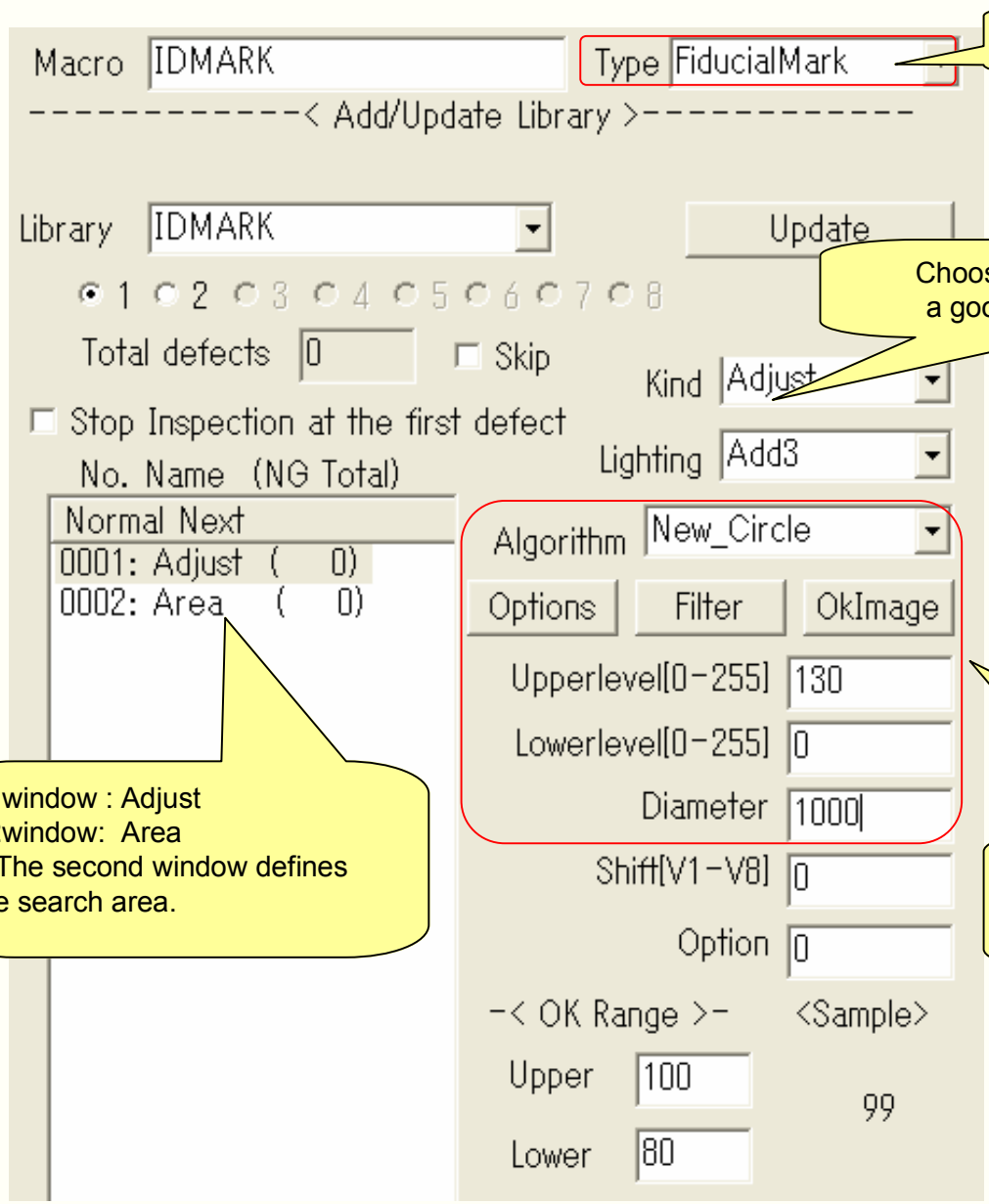
Type : Chip, IC/connector, Fudicial mark
Kind : Area, Adjust, missing, Reverse…
Lighting : Toplight, Side light,….
Algorithm: …..

3 STEPS

[Inspect] *Update inspection data*
↓
[Update] *Update library*
↓
[OK] *Close edit dialog*

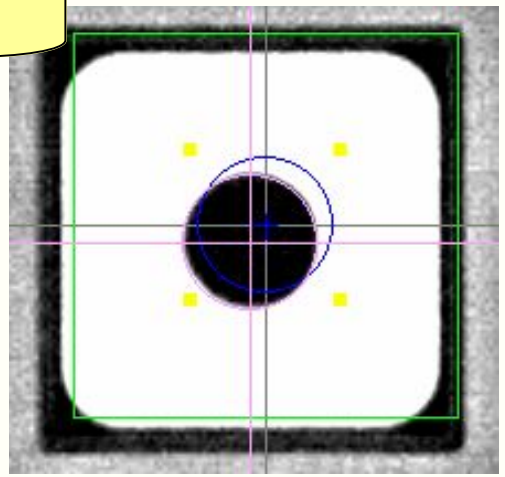
Fiducial Marks

1)-1 : Circular Mark ● ➔ "New Circle"



Choose "Fiducial Mark" for Type

Choose the lighting which has a good contrast for the mark

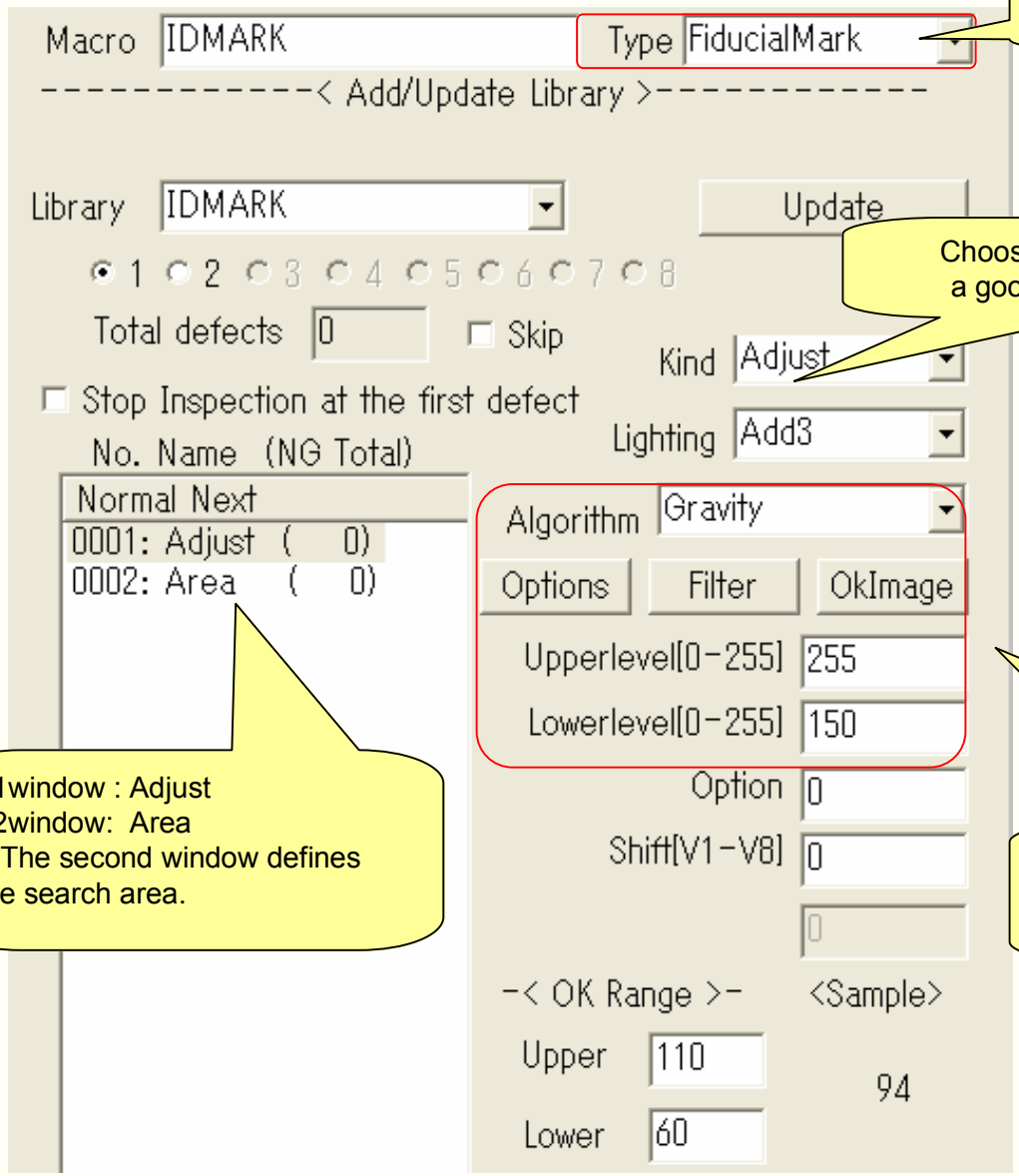


#1window : Adjust
#2window: Area
= The second window defines the search area.

"New_Circle" looks for the center of the designated brightness circle.
(←Brightness setting = (130, 0)

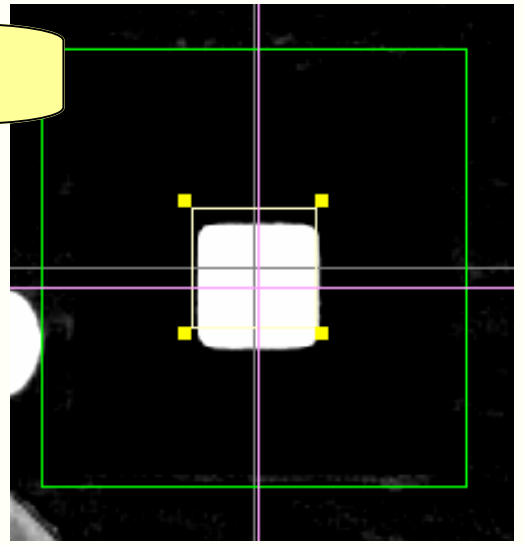
Fiducial Marks

1)-2: Square mark ■ ➔ "Gravity"



Choose "Fiducial Mark" for Type

Choose the lighting which has a good contrast for the mark



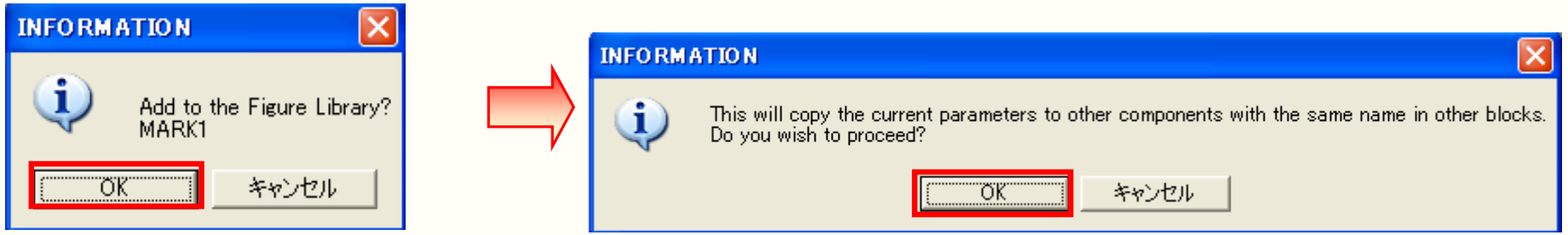
#1window : Adjust
#2window: Area
= The second window defines the search area.

"Gravity" looks for the center of gravity on the designated brightness area.
(← Brightness setting = 255, 150)

Fiducial Marks

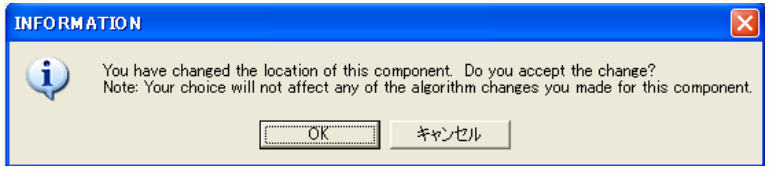
2) Update Fiducial marks coordinate

- Press “Inspect” ➔ Confirm if pink cross line is located at the center of fiducial marks
- Press “Update” ➔ To update the fiducial mark library data



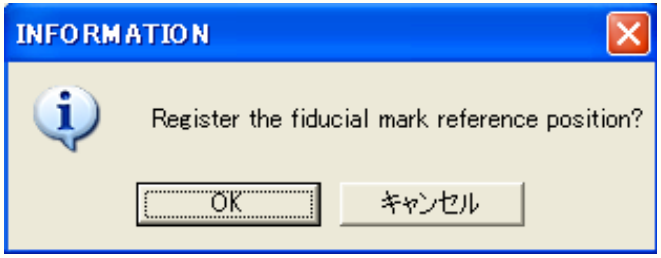
- Press “OK” to update fiducial mark coordinate.

Important



1. Move the location?
- CAD has fiducial marks → Cancel
- CAD has no fiducial marks→OK

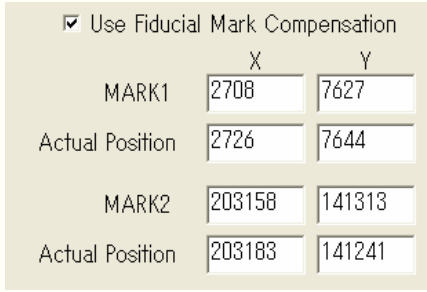
2. Update Fiducial mark coordinate
→OK



3. Register the fidicial mark reference position?
- CAD has fiducial marks →OK
- CAD has no fiduail marks →Cancel

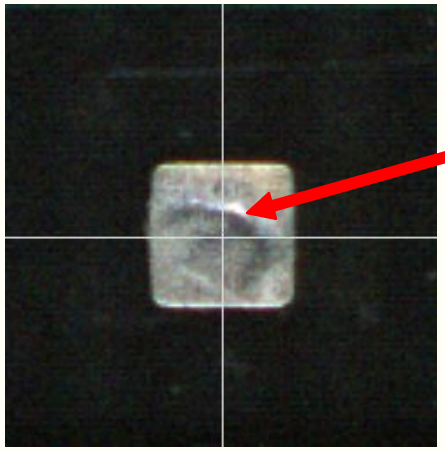
- Check point

Check to confirm fuducial marks coordinates are properly entered on the board data



Fiducial Marks

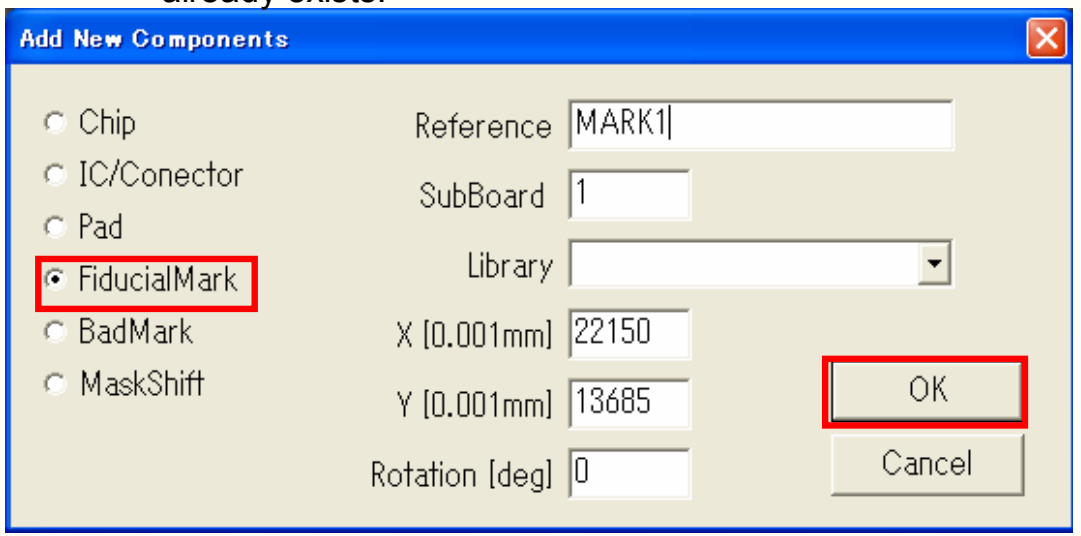
■ When CAD data does not have Fiducial mark coordinate ;



1) Click on the Fiducial mark center on the captured image and move a white cross line at the center.

2) “Edit” → “Add”

3) Choose “Fiducial mark” and press OK
Choose “Library” when there is appropriate library data already exists.

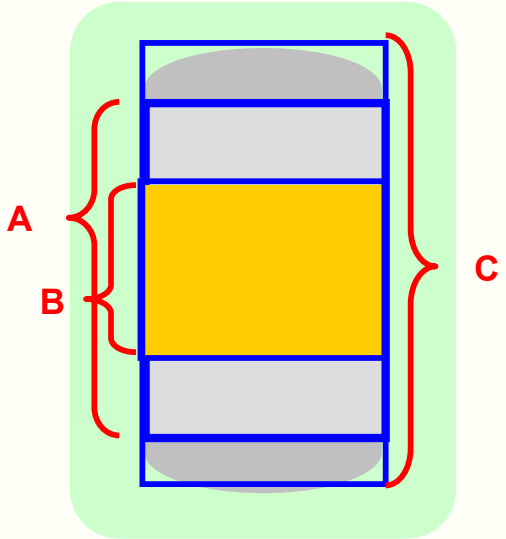


“Edit dialog” will appear to make library data.

Chip components Inspections

- Average……P34
- Color XY……P35
- Color-Channel ……P36
- Black / White……P37
- New ASC……P38
- L/W tracking……P39
- ChipMissing3/Chip……P40
- Color L/W tracking……P41

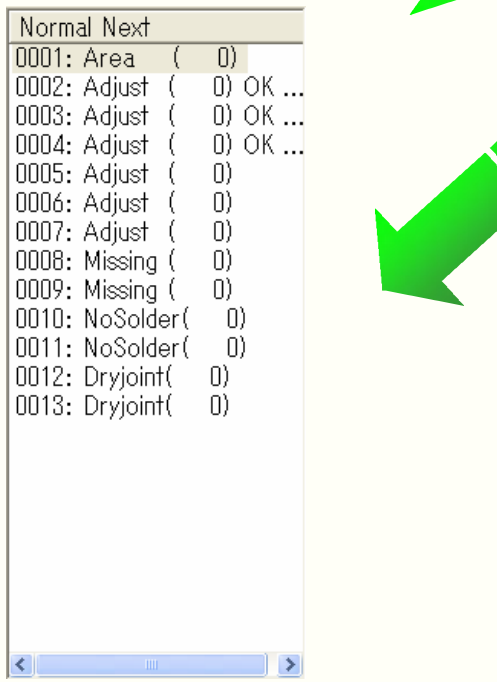
Automatic Data generation for Chip Components

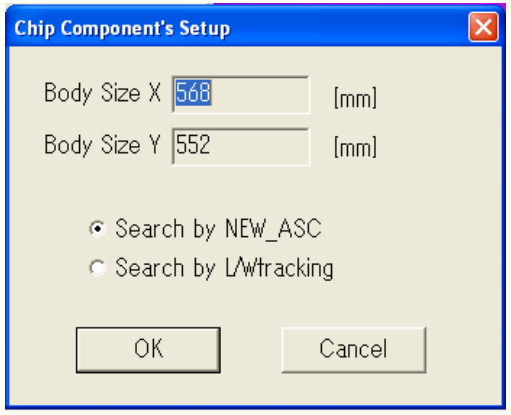


By setting 3 windows, a standard Chip inspection data can be generated.

Window A = Select the body including the electrodes
Window B = Select the body without the electrodes
Window C = Enlarge the window to include the pads

Select “Chip” as Type and the following window will be displayed.



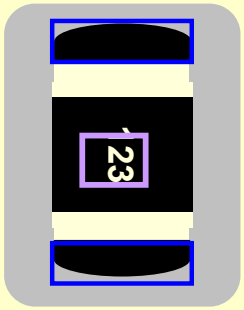


Select algorithm for “Adjust”
(New ASC or L/W Tracking)

Click “OK” to generates a series of inspection windows.

Average

Brightness average value within the window



Example

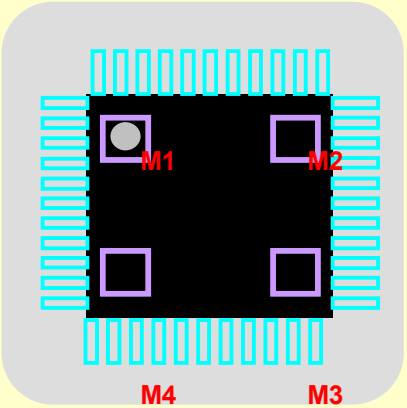
Reverse check of resistance chip.

When the chip is reversed, a backside of the component is white, (Sample value : above 150 = NG)

NG type	Reverse
Lighting	Optional
Shift [V1-V8]	V3
<OK Range>	
Upper	150
Lower	0

Memo

Application : Polarity Inspection



Example

NG Type	Polarity
Lighting	Optional
Algorithm	Average + Memory1 – Memory2

■Procedures (For QFP)

1. Put inspection window on polarity mark (Use circle window by “option” button as necessary)
2. Select “Polarity”, appropriate Lighting and “Average”
3. Put V1 or V3 at “Shift” box
4. Register the data as “M1”
   →Memorize to: M1

Point1:

This window is to register numeric values, not to inspect.
Therefore, set “OK range” as below.

Upper: 255
Lower: 0

5. Register M2, M3, M4 by copying M1 window.
6. Using Algorithm “M1-M2” to calculates the following:
   M1-M2
   M1-M3
   M1-M4

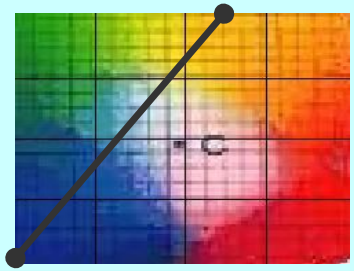
Point2

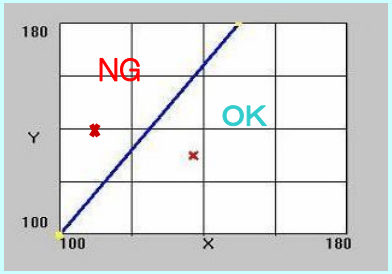
Sample value should be constantly either plus or minus value.
Set OK range accordingly.

Plus ➔		Minus➔
Upper:	255	-1
Lower:	1	-255

Color XY

Judge OK/NG based on color average





Example

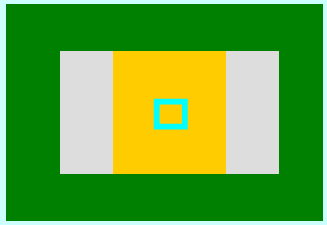
NG Type Missing
Lighting Side

Point

Sample value ＝Distance from blue sample border
A Judgment is made based on whether mapping dot is located on upper or lower of the sample border.

Set “OK range” using “Plus” are “Minus” value divided by the sample border.

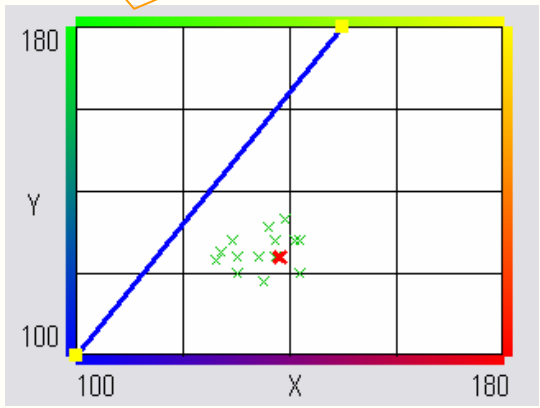
Upper (255 or 0)
Lower (0 or -255)



e.g.: When a component is missing, PCB surface resist will come into the inspection window. Color mapping location will get to green area in case of NG whereas it is supposed to locate towards yellow/red boundary.

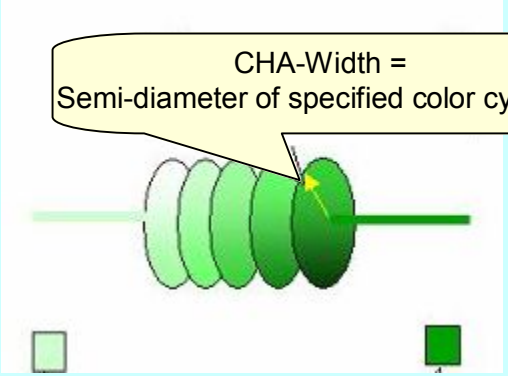
Memo

Same library components’ mapping are displayed by green as a reference.



Color Channel

Judge OK/NG by % of the specified color, by extracting 2 colors in 3D space of RGB



Example

NG Type Missing
Lighting Side
Shift [V1-V8] V3
CHA-Width **30 (= default)**
<OK Range>
Upper 30
Lower **0**

By adjusting CHA-Width value upward, machine will inspect based on wider range per extracted color.

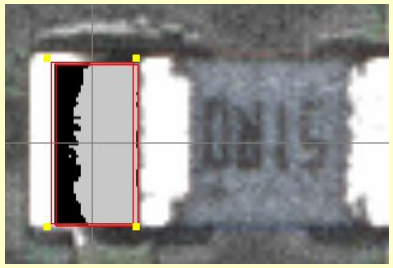
2 colors can be extracted by “Ctrl＋click” and “Alt＋click”

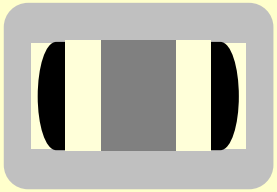
Point
Color XY is the approach to capture a rough color pattern and average, while Color Channel is to conduct color inspection based on specified color.

Memo

Black/White

Judge OK/NG based on occupied % of the specified range of brightness within the window





Example

NG Type No Solder

Lighting Top light in case of solder inspection
(Optional for other inspections)

<Specified brightness>

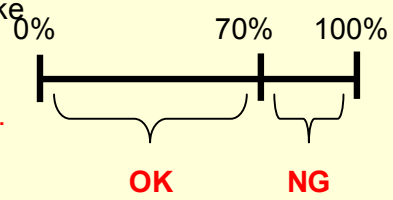
Level1	**100**
Level2	**0**

<OK Range>

Upper	**100**	**(%)**
Lower	**70**	

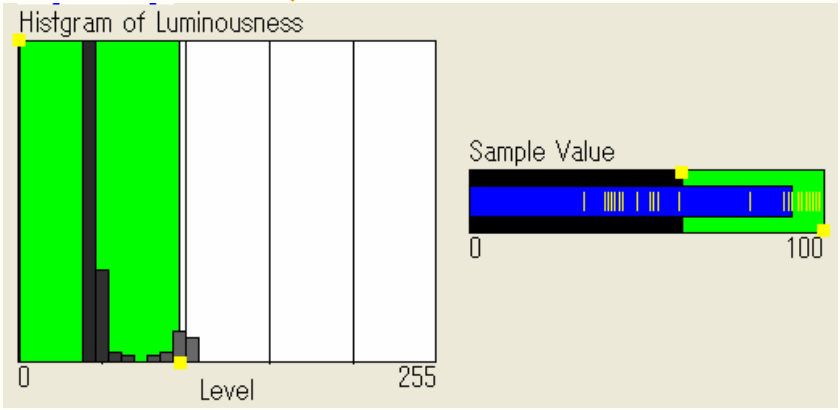
Point

Setting the black / white algorithm is like cutting the world into two; bright and dark. Therefore, either Level1 or 2 should be always have either 255 or 0.
For OK Range, either Upper or Lower should always have either 100 or 0.



Memo

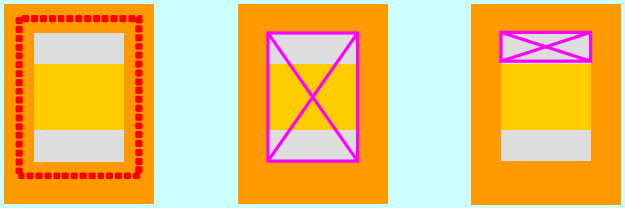
-Distribution of brightness value within the window
-Level1-Level2 range can be adjusted on the graph
(Caution! Level1 should be always bigger than Level2)
-Use "Display" to see the gray area counted in the sample %



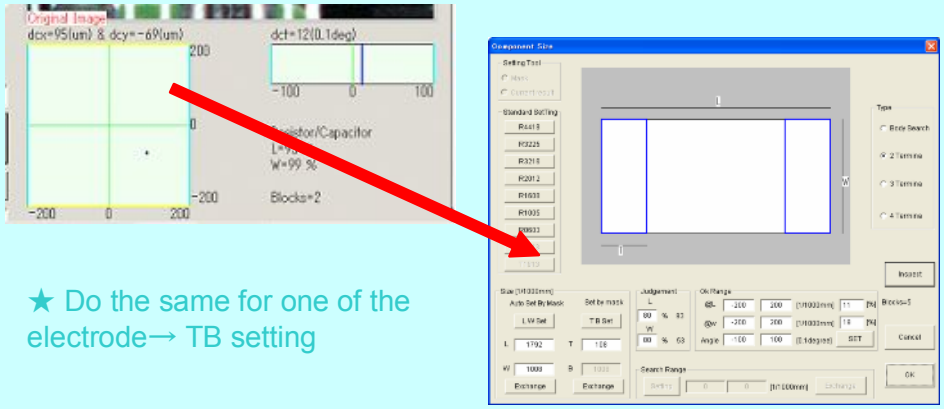
New ASC

Auto-search based on bright area.
Shift amount are quantifiable based on X, Y, and θ.

■ 2 Terminal components



1. Set a 1.2-times-bigger window on subject component
2. Click “Mask” and cover entire body.
   By double clicking “Using Mask”, mask window becomes editable. (=“Editing Mask”)
3. Right-click on green cross down below and measure the size for entire body. (= LW setting).



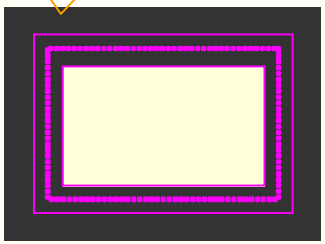
★ Do the same for one of the electrode→ TB setting

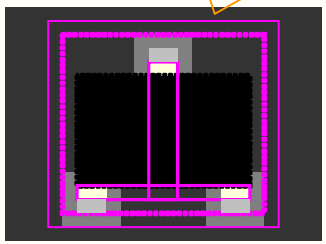
4. Remove Mask by clicking “Mask” and Inspect
   * Inspection should be done without Mask.

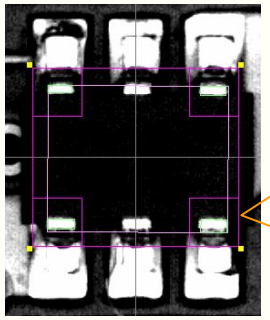
   Pink window will show up when the search is successful.
5. Memorize shift value as V1.

- Valid for “Shift” inspection other Position “Adjust”.
- In case that adjust can’t be done well, check by “**Display**” button to fine-tune the specified luminance.

Memo



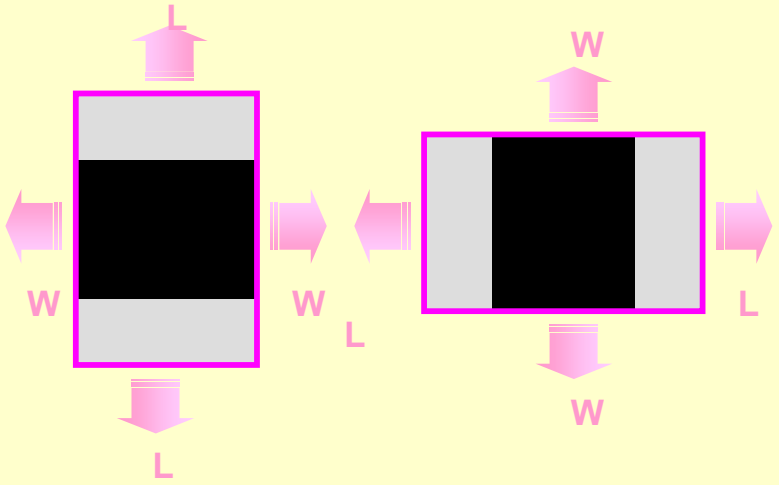


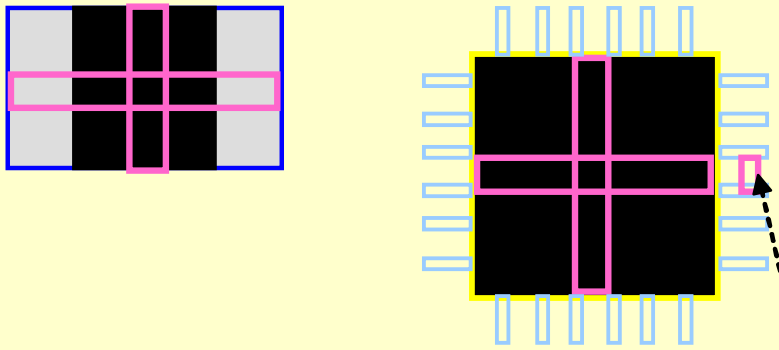


4 Terminal component
Measure the lead’ shoulders
Caution：
Search range needs to be set for 4 terminal components.

L/W Tracking

Adjust components' location by brightness
V1 + V2 = V3





- Be careful to select L or W.

Against the inspection window,
if the direction to be compensated is the longer direction, you should select "L", if the direction is shorter, you should select "W".

Memo

Points

1. The window needs to be set to catches the bright/dark edge.
2. Brightness setting (255, 255) or (0, 0)

* Set based on whether the search components is darker or brighter than the peripheral area.

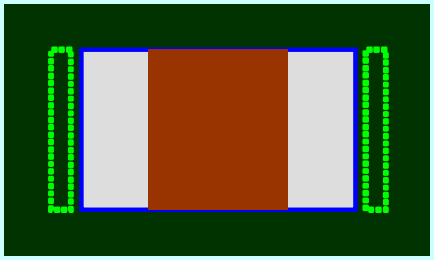
3. #001 window becomes the center of the following #002 and #003 windows. They should have the same center coordinate.

* By right-clicking on the inspection list, the center alignment can be checked.
➔ When it is widely off, go back to the #001 window and review the position.

* However, when it's difficult to set the windows right for large ICs, windows can be arranged on leads as an exception.

Chip Missing3/ Chip

Missing inspection for chip based on solder condition

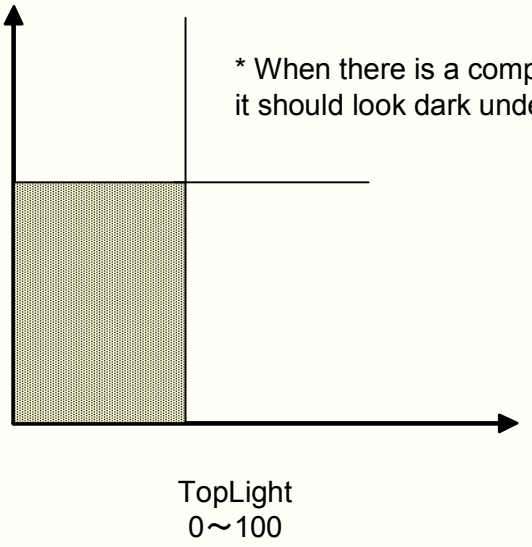


Example

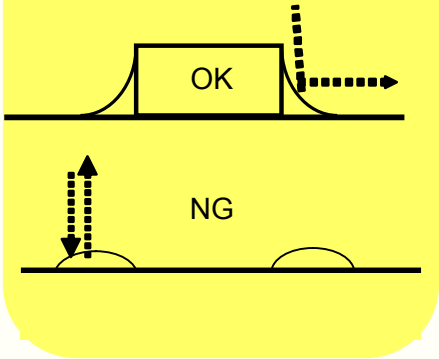
Kind	Missing
Lighting	Side (Fixed)
PAD Side Max	Max of the brightness range by SIDE
PAD Top Max	Max of the brightness range by TOP
Search(0-30)	Search range
Shift [V1-V8]	V1～V3
PAD Length	40～50
<OK Range>	
Upper	100
Lower	40

* "ChipMissing3" makes a judgment using the worse value of the left-and-right, or up-and-down inspection Windows, while "Chip" makes a judgment using the average of both sides.

Memo

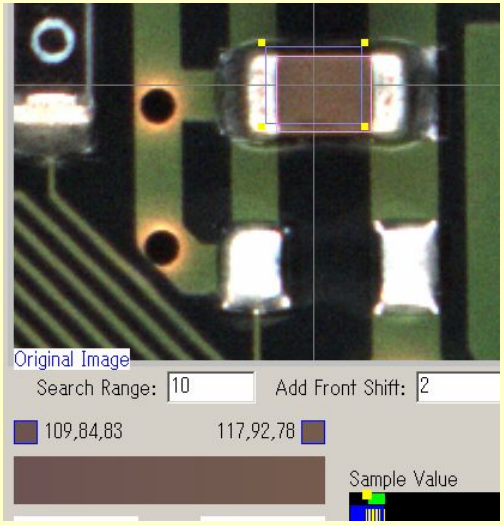


* When there is a component,
it should look dark under both TOP and SIDE light.



Color L/W Tracking

Search the component using the specified color



Extract colors by clicking two points, using Ctrl＋Click, Alt＋Click.

Example

Kind Adjust

Lighting Side

<OK range>

Upper 10

Lower -10

Search Range 10

- Two Set-up points :

(1) Search Range

Be sure to set the same values in the OK Range (+/-).

(2) Add Front Shift / Area Ratio

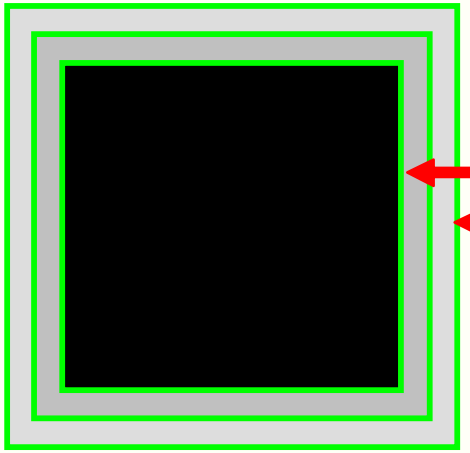
0/1 (one direction), 2(two directions)

Memo

Typical inspection for QFP / SOP

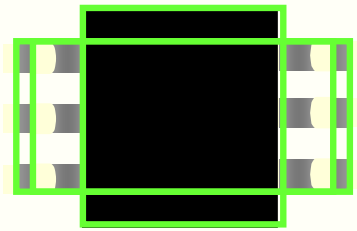
- Max/Min P45
- Range/Peak.....P46
- New OCR.....P47
- ImageMatchEX.....P48
- LiftedLead P49
- Distribution.....P50
- ASpinsolder/pinsolder.....P51
- ASleadlength.....P51

Auto Programming for QFP/SOP



Make 3 Windows

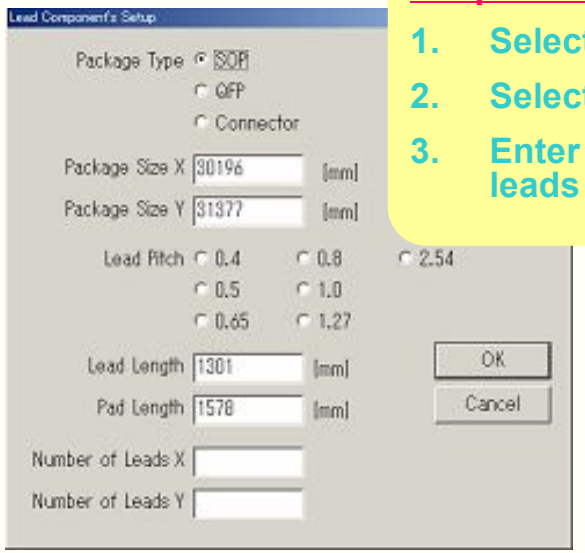
1. Cover the whole body
2. Cover the lead tip
3. Cover the pad end



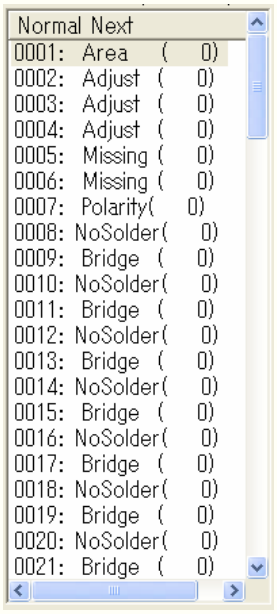
Select "IC/Connector" as Type

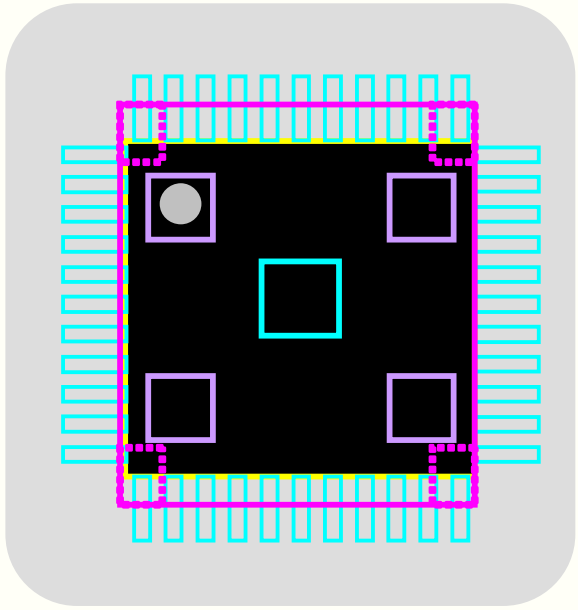
Set parameters

1. Select component type
2. Select lead pitch
3. Enter the number of leads (per side)



Auto-generation of inspection windows





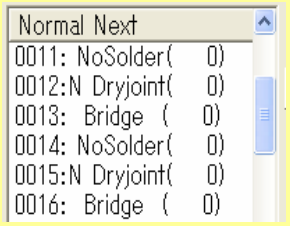
Tips for Editing data:

Inspection library { Figure Library

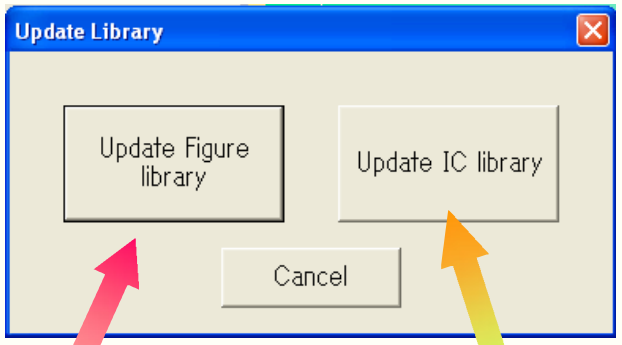
IC Library ➔ Only for IC/Connectors

Edit Examples:

- When changing the **size of window,** all windows under same "kinds" of same line are adjusted at the same time.
- **"Jump"** can move to the pins at corners. (=location adjustment)
- **"Next Same"** can check pins one by one.
- **"Next NG"** can lead to all existing NGs one by one.
- Parameters can be modified at any pin. Then, select **parameter copy** (P-Copy) to adjust other pins parameters to the same.
- Select the first window edited and select "**Copy lead settings to other**"to copy the same window setting to other pins.

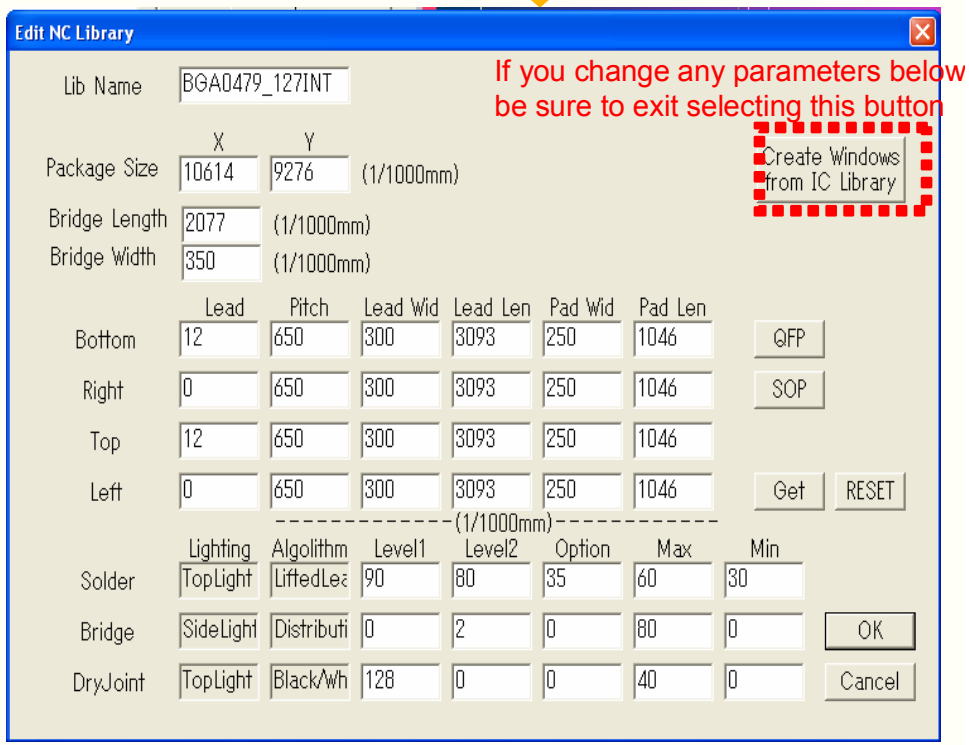


Adding or deleting inspection items should be always done under the NoSolder.
＝Don't delete "NoSolder" window.



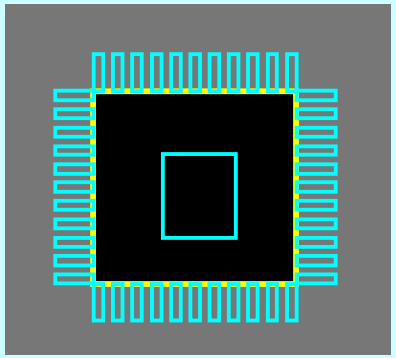
Update library

Modify/adjust pitch, number of leads, etc



Max / Min

Check Max/ Min brightness value within the window



Example

Kind Foreign object

Lighting Optional

Averaging X [dot] 2

Averaging Y [dot] 2

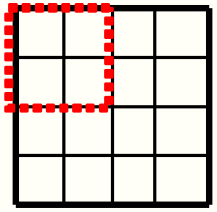
<OK Range>

Upper 50

Lower 0

Memo

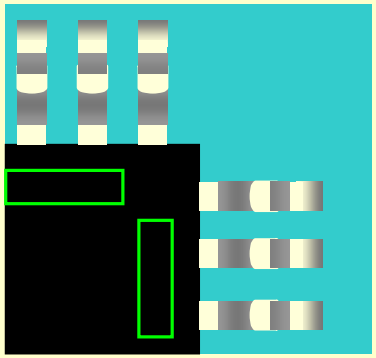
Averaging X=2
Averaging Y=2
Software considers 2x2=4 pixels as one unit.



Important knowledge for debug operation
When you wish to get rid of false calls caused by small dirts/dust,
Raise these values (Ex. to X=4, Y=4)

Range

Calculate “Max – Min” within the window



Put windows at corners.

Then, when the component is shifted, brihg lead area will come into the window, resulting to raise sample value significantly.

Inspection example

Kind Shift

Lighting Optional

Averaging X [dot] 2

Averaging Y [dot] 2

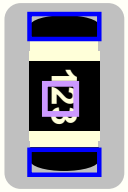
<OK Range>

Upper 50

Lower 0

*Use X/Y copy to make the same window on the four sides.

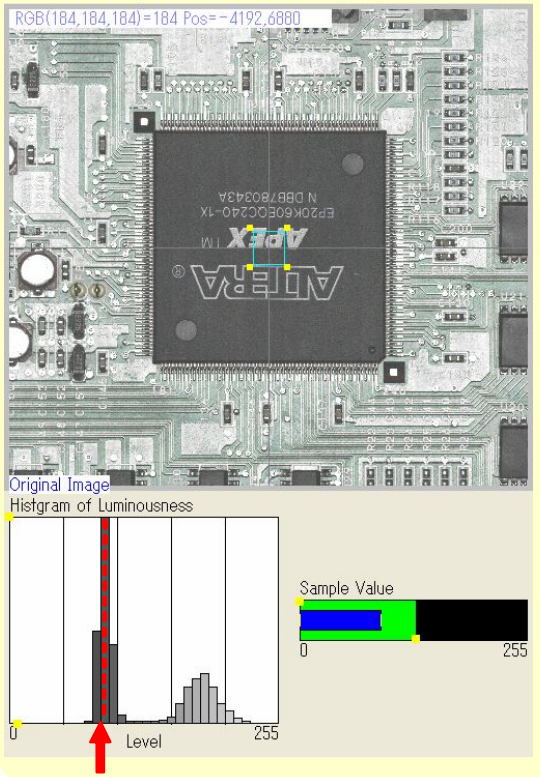
“P copy” can be used to copy the parameter for the same “Kind”.



Application:
When resistance chip has a clear print on the surface, Range can be one of the approach for missing inspection.

Peak

Peak value of brightness within the window



Example

Kind : Missing

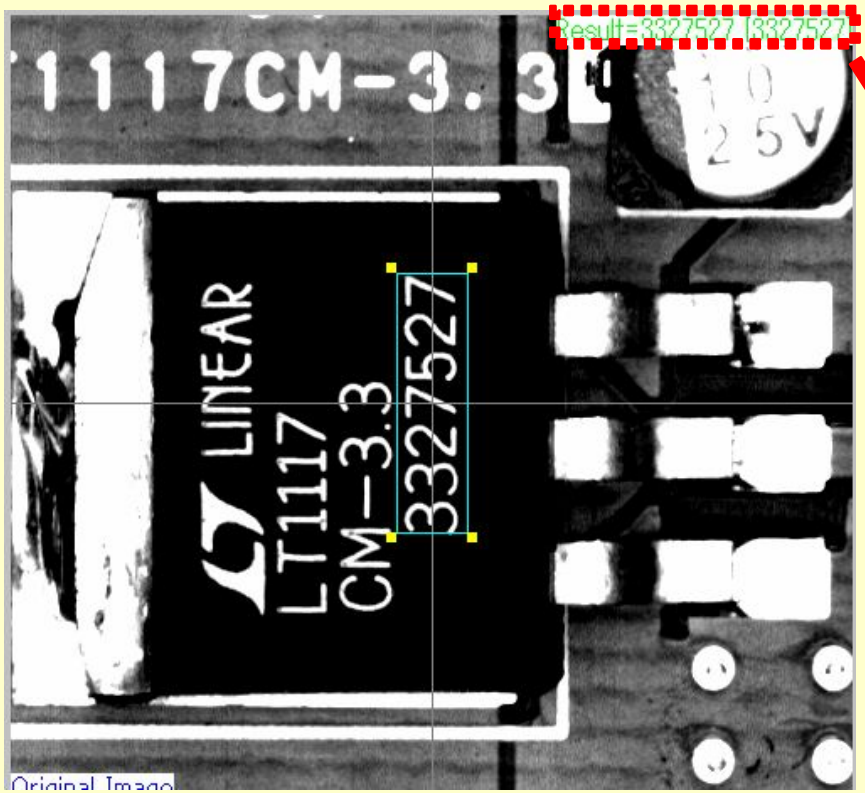
On the component, sample is 108.
Resist will come into the window, which makes the samples of 205.

Memo

New OCR

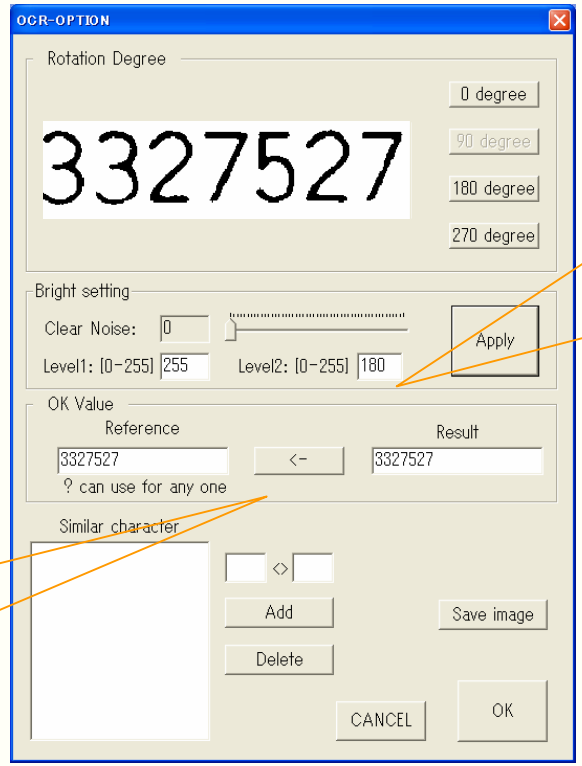
OCR recognition algorithm

Right click the characters in the upper-right of the image,
to go to the edit screen



Memo

Adjust by rotating so that it can be read from the front



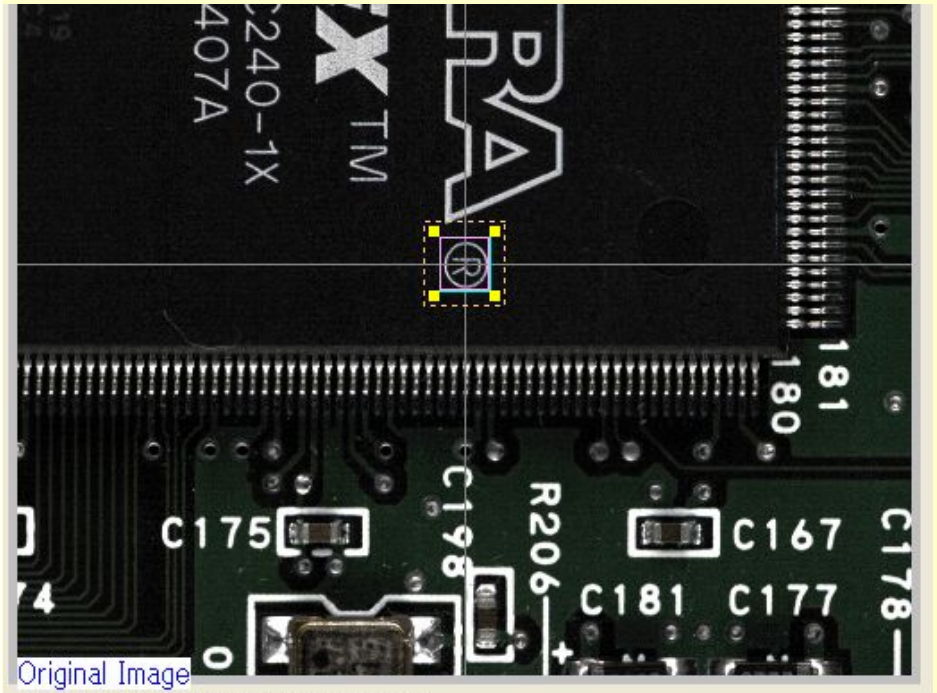
・Angle adjustment
・Noise setting: Pulling to the right can reduce the noise.
・Brightness setting:
Search for the characters based on the specified Level1-Level2. (Ex: 255-200)

・Result "→" Reference
・Also possible to set similar characters that are easy to recognize wrong

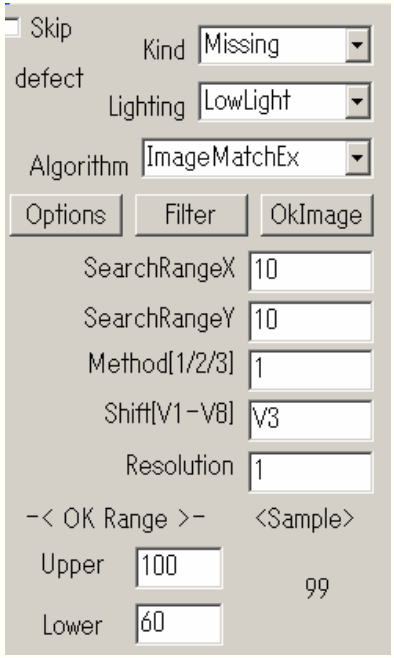
<Caution>Don't forget to put shift (Ex. V1, V3).

ImageMatchEX

Image pattern recognition algorithm



Memo



- Mouse-select the pattern to be recognized
  then press “Add” to capture its image
- Specify the Search Range (range shown by dotted line) using X and Y.

- ImageMatchEX is also effective for shift inspection,
  by setting XY for OK range area in the green map.

<Caution>ImageMatchEX and NewOCR is comparatively time-consuming. !

Liftedlead

Black/white at 2 points =
Lead tip and the pad edge

- Step1：Black/white at the lead tip
  - 0-30% = Since there is no/little bright area, OK→ Inspection completed!
  - 30-60% = Unclear inspection result → go to Pad inspection
  - 60-100% = Since solder does not exist, NG→ Inspection completed!

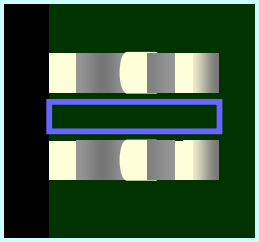
- Step2：Black/white at the Pad
  - If the dark area is 35% or less, OK

Memo

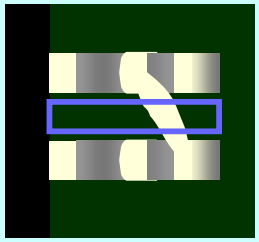
Point
Make sure to put V3 or V1 to “Shift”.
Location adjustment is important to avoid false calls.

Distribution

Check brightness unevenness within the window.
= Effective for bridge inspection



ex., sample value=45



sample value=238

Example

Kind Bridge

Lighting Side/Low light
(Select "Low" to reduce flux influence)

<OK Range>

Upper 80

Lower 0

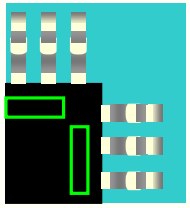
Point

Software calculation :

Step 1: Range (=Max-Min) calculation along the long-way direction

Step 2: Pick up the minimum value (⇒ Sample value)

= When the bright material cross across the shorter direction of the window, the sample value will rise.
When it doesn't cross, the sample value will not rise.

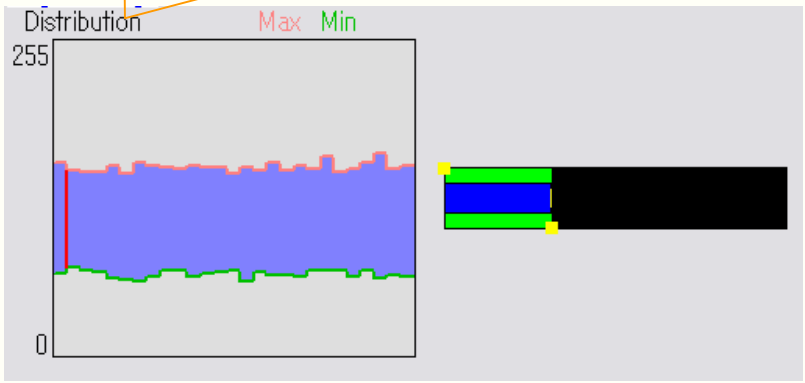


Application :

Distribution can be used for shift inspection.

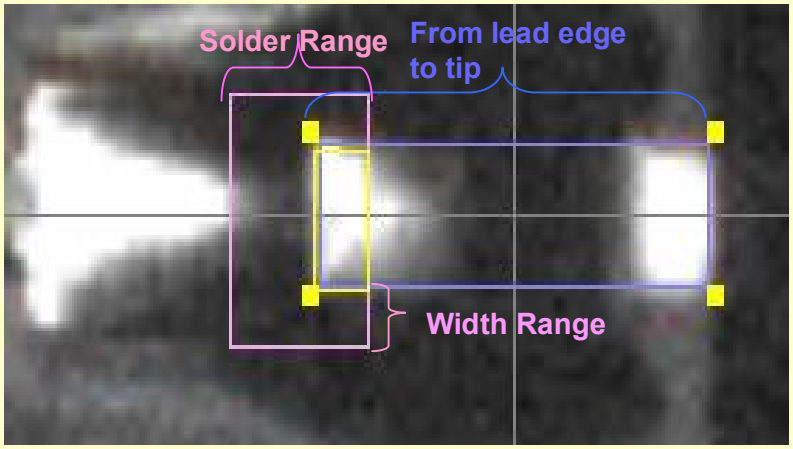
Memo

- Chart shows the Range calculation result (Max-Min)
- Red line shows the point where the sample value is extracted.



PinSolder/ASPinSolder

Automatically search the lead, and then check black/white within U-shaped Window.



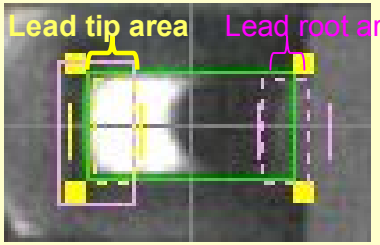
Solder Brightness 100

* Equivalent to Level1 of “Black/white”. Level2 is omitted

LeadWtrack 5 or 10 (auto-search the lead - shorter direction)

＜OK Range＞ Black/white within U-shaped Window

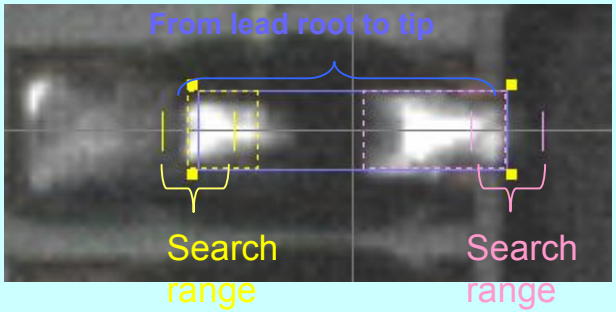
100
60



- Merit
- Highly reliable inspection using auto-search, when lead has a good contrast
- Side fillet can be check by U-shaped Window (=mask is unnecessary)

AS Lead Length

Judge by lead length



For lifted lead, the lead length will be shorter or longer than the normal value.

Sample Measured length (Unit: dot)

<OK Range>

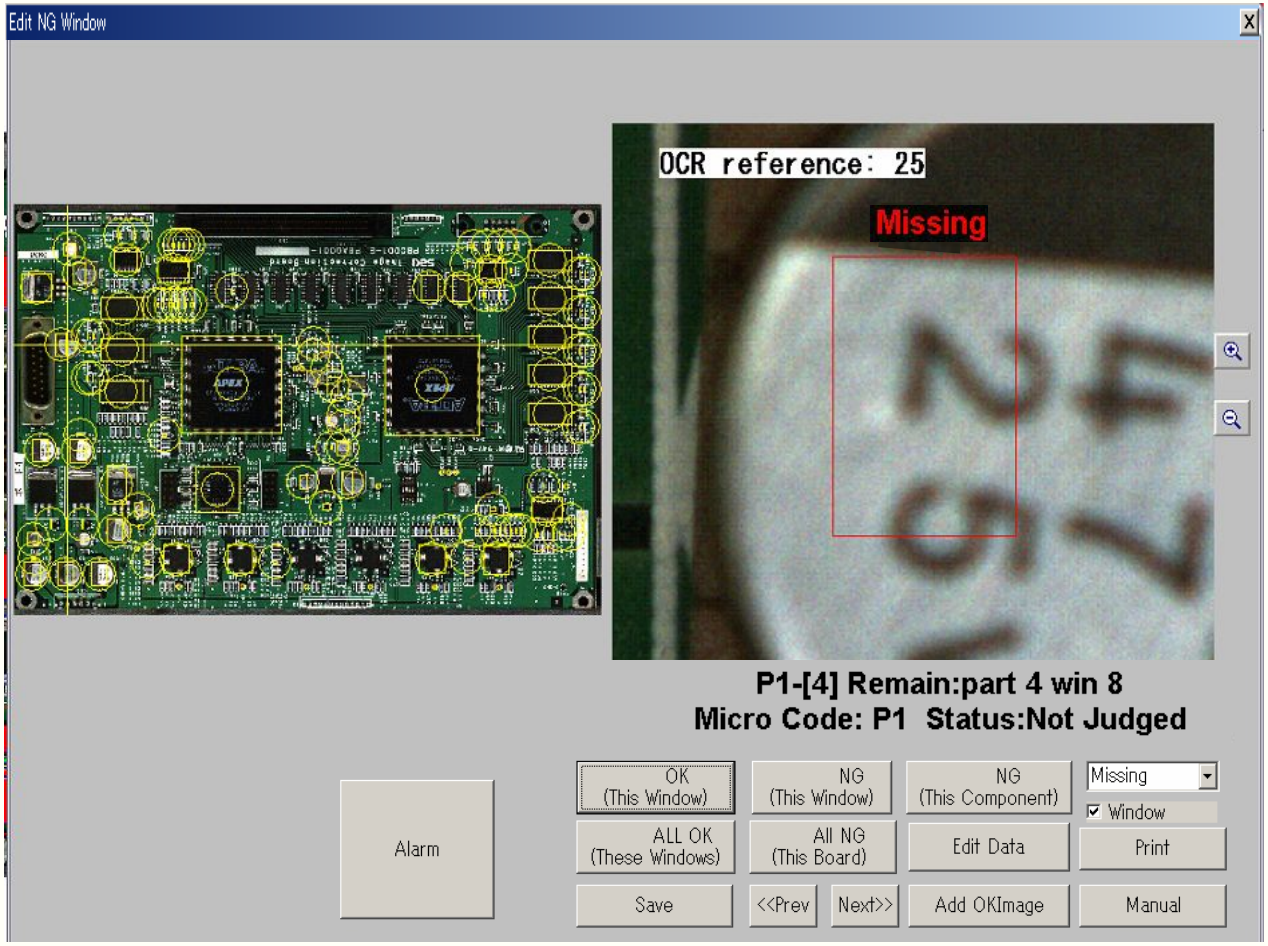
Allowable range for lead length
(Normally, +/-20 for sample value)

Memo

Debug operation

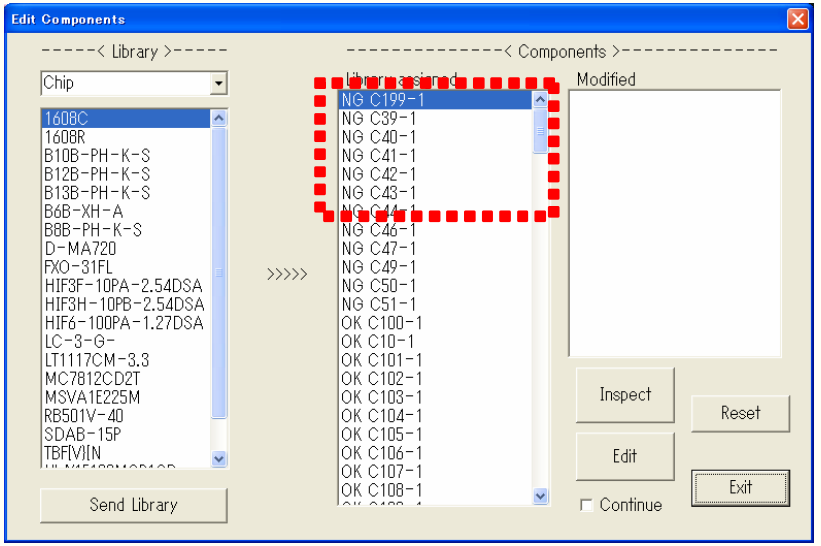
DEBUG mode screen

Select “Auto(A)” → “Edit NG data”.
Edit dialog will show up by pressing [Edit Data] button.



“Edit”→”Edit NG” or Keyboard “N”

Double-click on each component
to edit inspection data.



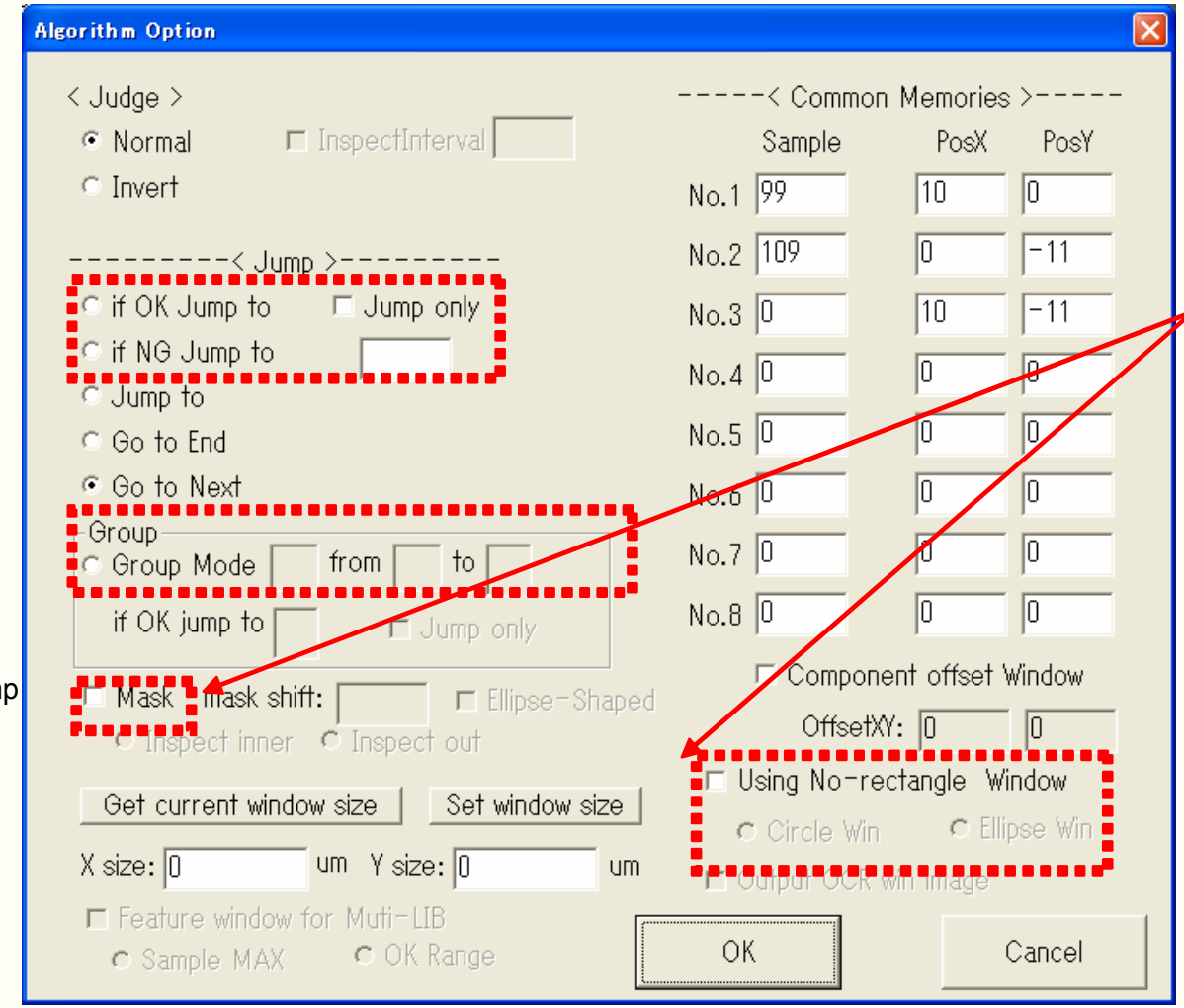
Optional setting

OK jump function

Ex. If any one of 3 NewASC inspection is successful, jump to #005 inspection.

Normal OKJump 5 JOnly
0001: Area (0)
0002: Adjust (0) OK ...
0003: Adjust (0) OK ...
0004: Adjust (0)
0005: Missing (0)
0006: NoSolder(0)
0007: NoSolder(0)
0008: Dryjoint(0)
0009: Dryjoint(0)
0010: Dryjoint(0)

•When you want to reset OK jump Setting, tick “Go to Next”.



Using MASK

SQ and Circular mask windows are available.

* When double-clicking “Using MASK” in the upper right of the Image, mask becomes editable. (=Editing MASK)

Group mode

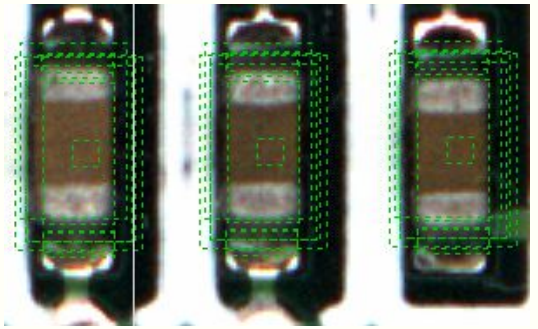
Ex. If two inspections are OK out of 5, 6, and 7, jump to 8

→ 2 5 to 7 8

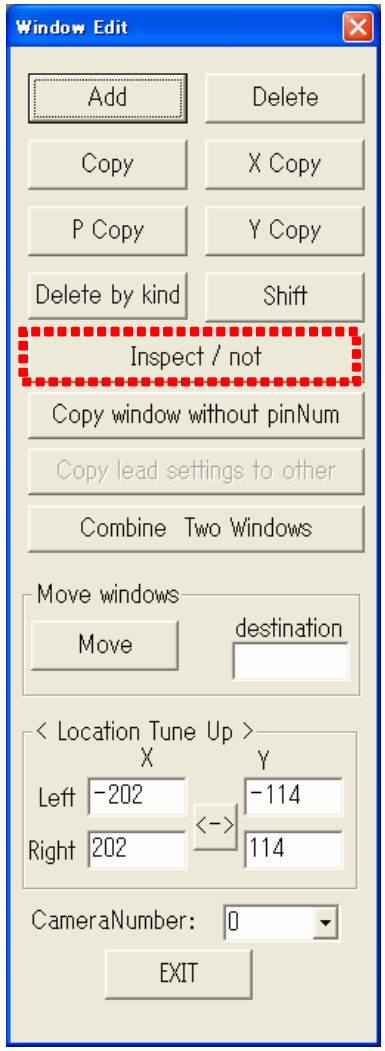
“Skip inspection”

Inspection item

Right click on inspection item →Click ”Inspect / not”
When you want to RESET:
Right click on the inspection item again→Click ”Inspect / not” again

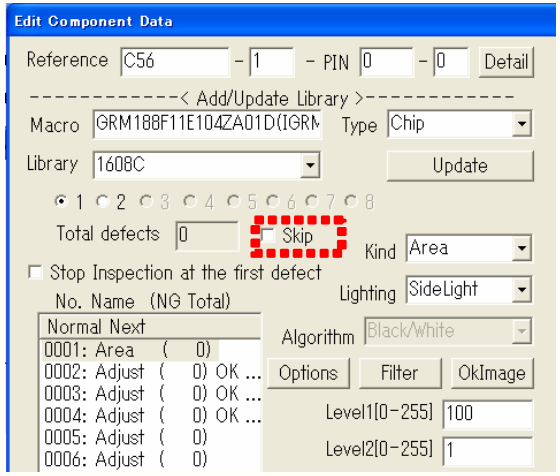


•Not-inspected component is are displayed in green dotted line.



Component

Tick “Skip” on the Edit dialog
RESET→Un-check “Skip”

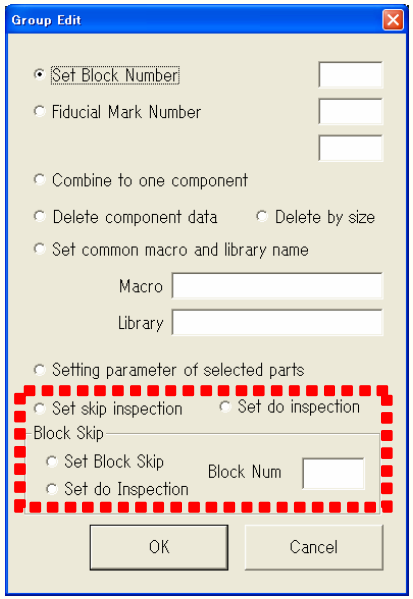


Selected area

Drag a mouse to select components
Display “Group Edit” dialog and tick “Set skip inspection”.
RESET→ Tick "Set do inspection”

Sub-board / Panel

Tick “Set Block Skip” and specify block#.
RESET→ Tick “Set do inspection” in Block Skip window.



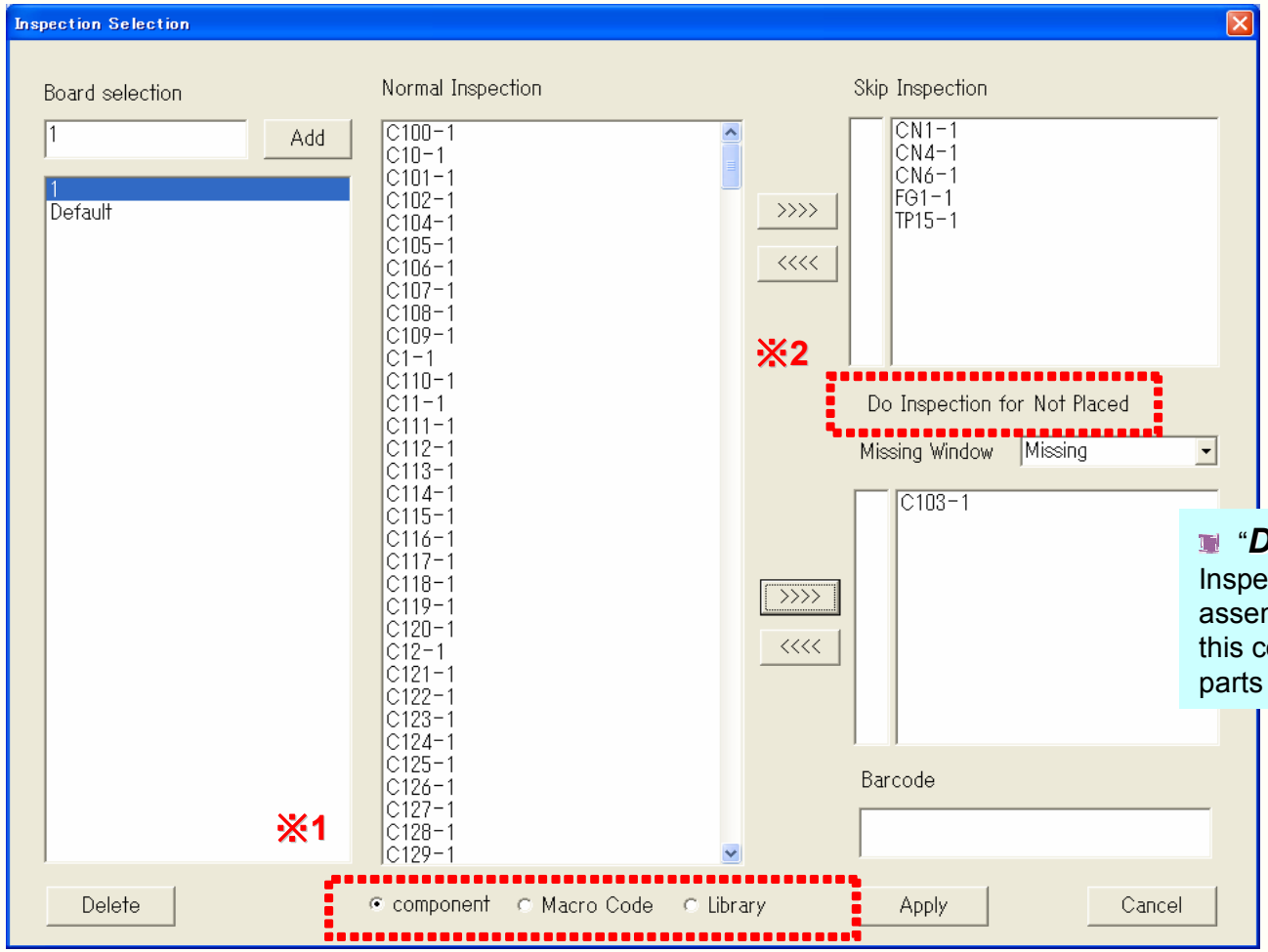
Block Number assignment

Drag a mouse to select entire panel.
Display “Group Edit” dialog and tick Set Block Number, assigning a specific Number.

Multiple Settings for same PCB

Component / Library / Macro

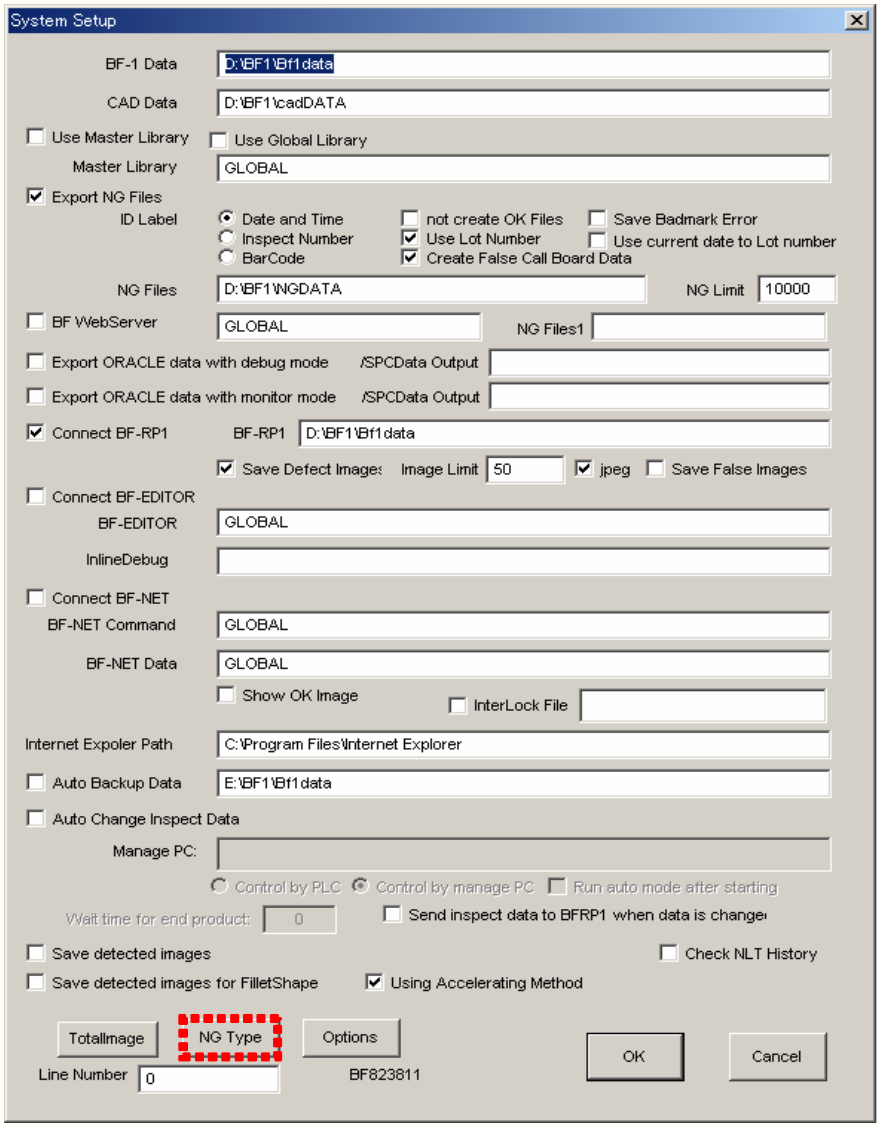
1. Control + Alt + “I” → Below edit dialog will be displayed
2. Add a new board name ex. 1 (Default=current board)
2. Select “Component / Macro Code or Library” (→*1)
3. Select a subject item from “Normal inspection” window, and move it to “Skip Inspection” by “>>>”.



“***Do Inspection for Not Placed”*** (→*2)
Inspection for components that are not supposed to be assembled. When a standard inspection data is moved to this column, inspection is carried out to detect NG when a parts is assembled by mistake.

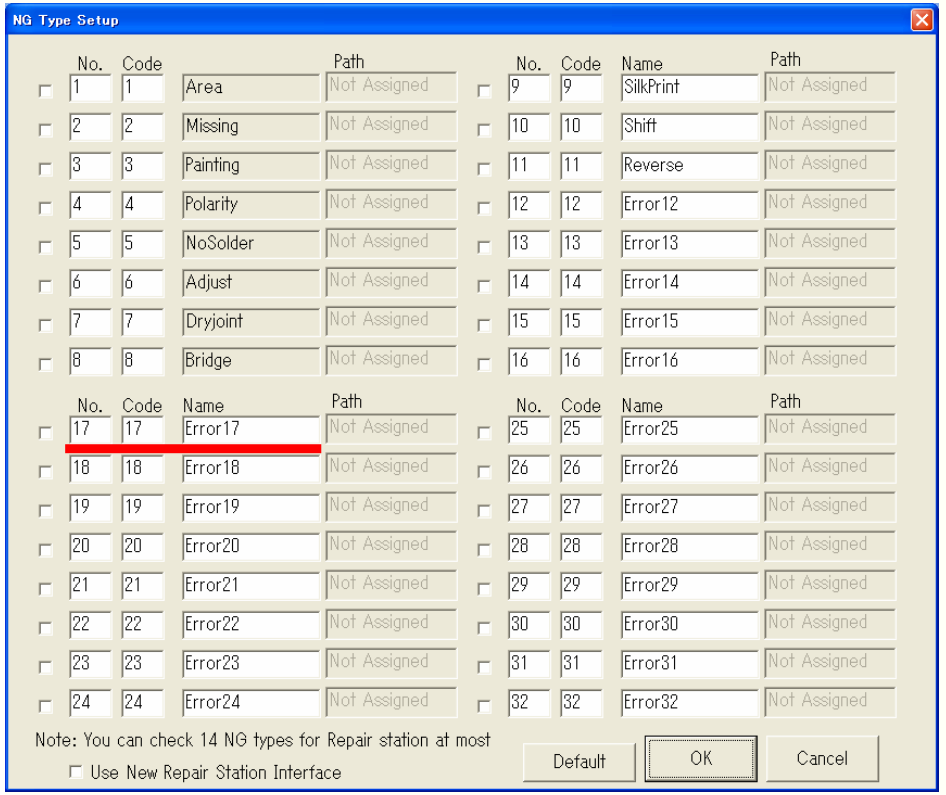
Edit NG Type

Name of NG type can be customized.



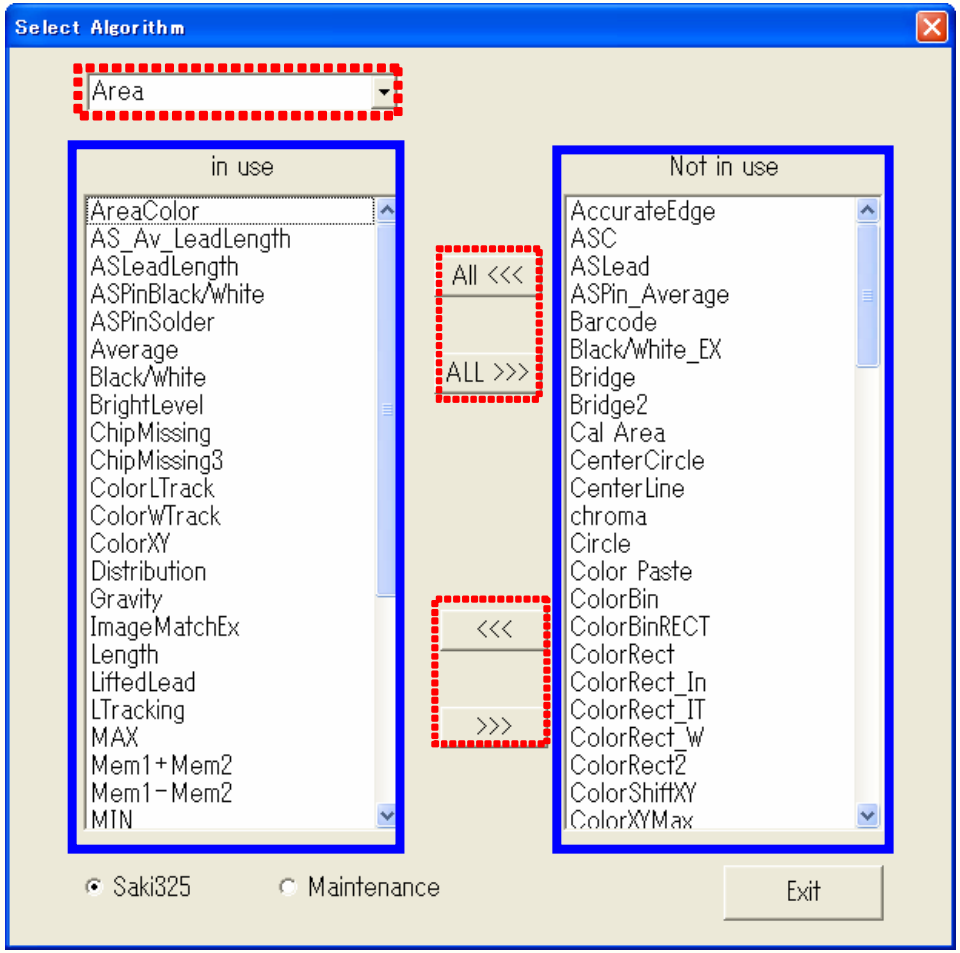
Procedures

1. Select “Edit”→”System Setup” →”System Setting”→”NG Type”
2. “NG Type Setup” window will be displayed.
   “Error XX” parts are all user-definable.



Edit Algorithm

A list of Algorithm can be organized per NG type.



Procedures

1. **Ctrl＋Alt＋A→**
   "Select Algorithm" edit dialog will be displayed.
   * Algorithm "in use" and hidden algorithm ("Not in use") are shown.

2-1. Select algorithm you wish to use from "Not in use" column
→Click "<<<" to move the algorithm to "in use" column.

2-2. The other way around, Select algorithm you don't need from " in use" column → Click ">>>" to move the algorithm to "Not in use"

* Setting needs to be modified per NG type.
If you want to reflect the change to all NG types, use "All<<<"or "ALL>>>".

Useful Shortcut keys

S — **Load image**

I — **Inspect**

A — **Start auto running**

D — **Update screen**
Change screen lighting

Ctrl + Alt + A — **Edit Algorithm**

Ctrl + Alt + F — **Search component (s)**

Ctrl + Copy — **Copy diagonally**

N — **Edit NG**

Double click CAD data — **Rotate a single component**

Ctrl + Double click CAD data — **Rotate all components / a panel**

For Inline machines

L — **Loading**

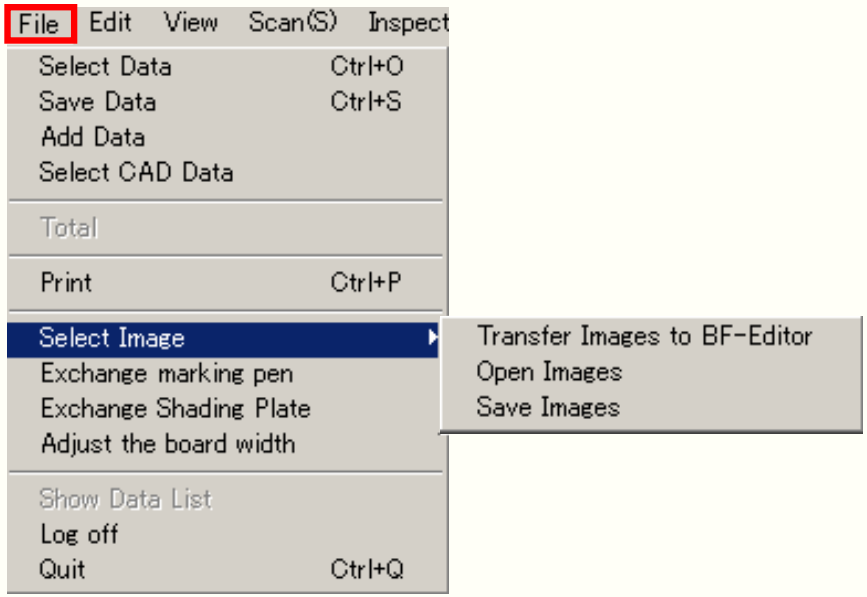
Ctrl + U — **Stopper Up/down**

Ctrl + B — **Back-up Up/down**

System Functions / Toolbar

- 【File】……P60
- 【Edit】……P61
  - Search……P62
  - Add……P63
  - Input Mode……P64
  - Delete……P65
  - Edit NG……P66
  - Edit Library……P67-68
- 【View】……P69
- 【Inspect, Help】……P70

Toolbar 【File】

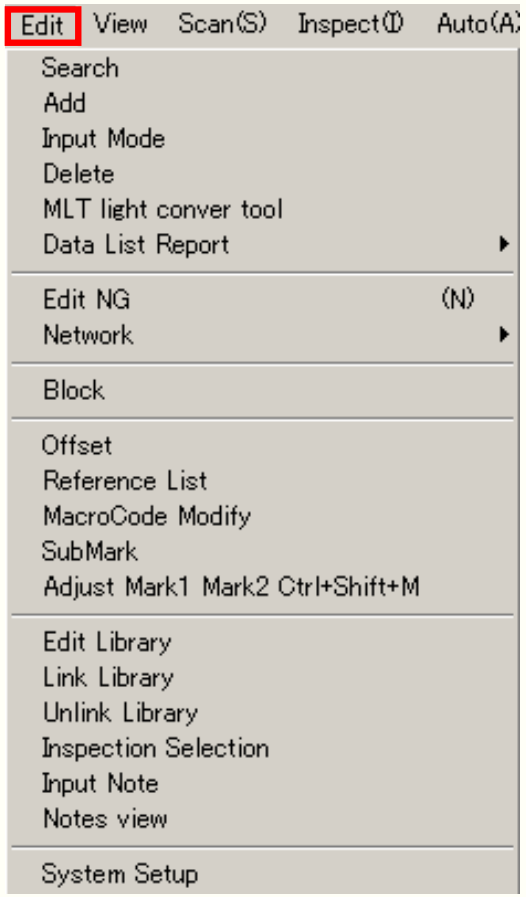


1. **Select Data**
   Open inspection data
2. **Save Data**
   Save inspection data
3. **Add Data**
   Combine two separate data
   (ex. combine Chip data and IC data that are separately generated)
4. **Select CAD Data**
   Import CAD data.
5. **Select Image**
   "Transfer Images to BF-Editor" = transfer the image and data from main system to BF-Editor.
   " Open Images" = Open saved image data.
   " Save Images" = Save image.
6. **Quit**
   Exit BF software

■ ***Point***

Image File
1,At main systems, scanned image should not be saved during regular operation.
2.An image file name must be kept always as "TOPLIGHT.bmp"
Please save TOPLIGHT.bmp in a separate PCB folder in order to distinguish each image without changing the file name.
(BF system can recognize the image only saved as TOPLIGHT.)

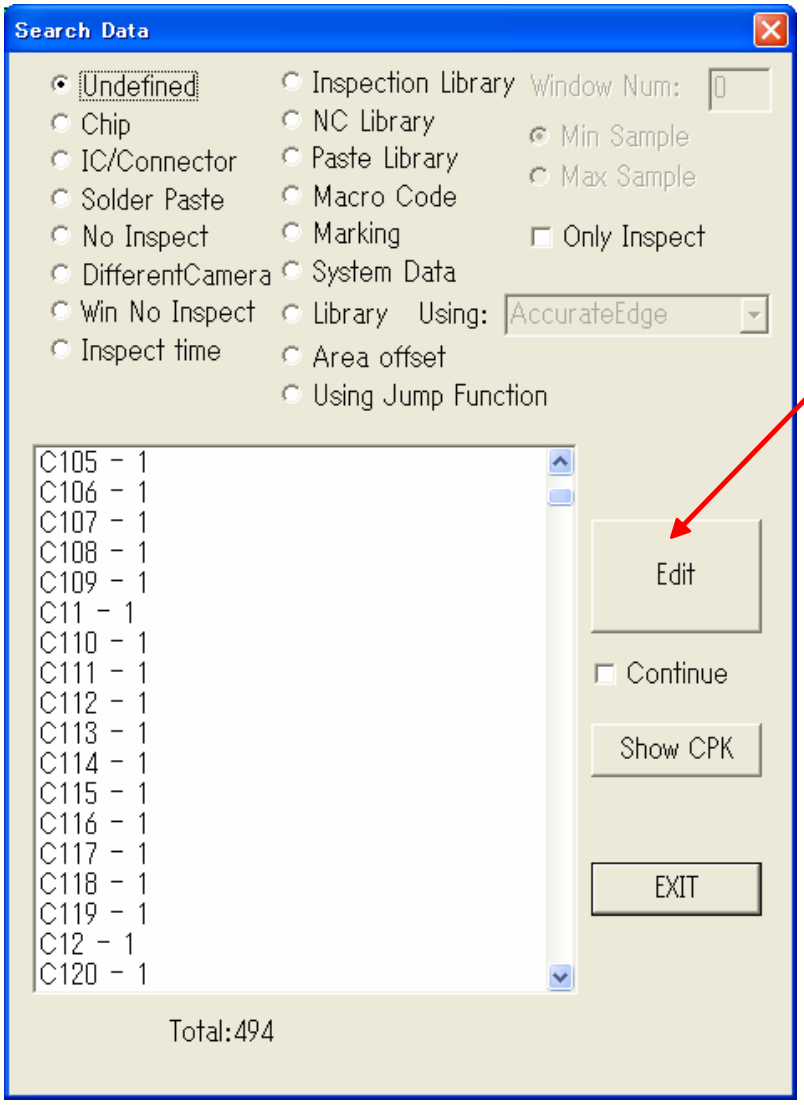
Toolbar 【Edit】



1. **Search**
   Data can be searched from various perspectives.
   (ex. Undefined, Chip, IC/Connector, Inspection Library, System data, etc.)
2. **Add**
   Data can be added even without CAD data coordinate.
3. **Input Mode**
   A data can be consecutively pasted like copying.
4. **Delete**
   Delete data by various perspectives.
5. **Block**
   Copy multiple panel data from original penal.
6. **Offset**
   Move / reverse / rotate CAD data
7. **Sub-mark**
   Check and change sub-mark coordinate
8. **Adjust Mark1 Mark2**
   Data can be rotated or moved to XY axis direction, per fiducial mark.
   ◆ Select [Edit]→[Adjust Mark1Mark2], then adjust shifted data.
   Shift amount can be adjusted by value.
   Use either “Rotate mark1” or “Move mark1 and mark2”
9. **Edit Library**
   Copy existing inspection library data between different data groups.
10. **Link Library**
    Link latest libraries to all components
11. **Unlink Library**
    Display an original CAD data
12. **System Setup**
    Open system setting dialog for various system set-up

Search

Data can be searched based on the various categories. [Edit] button will lead to Edit dialog.



Edit→Search

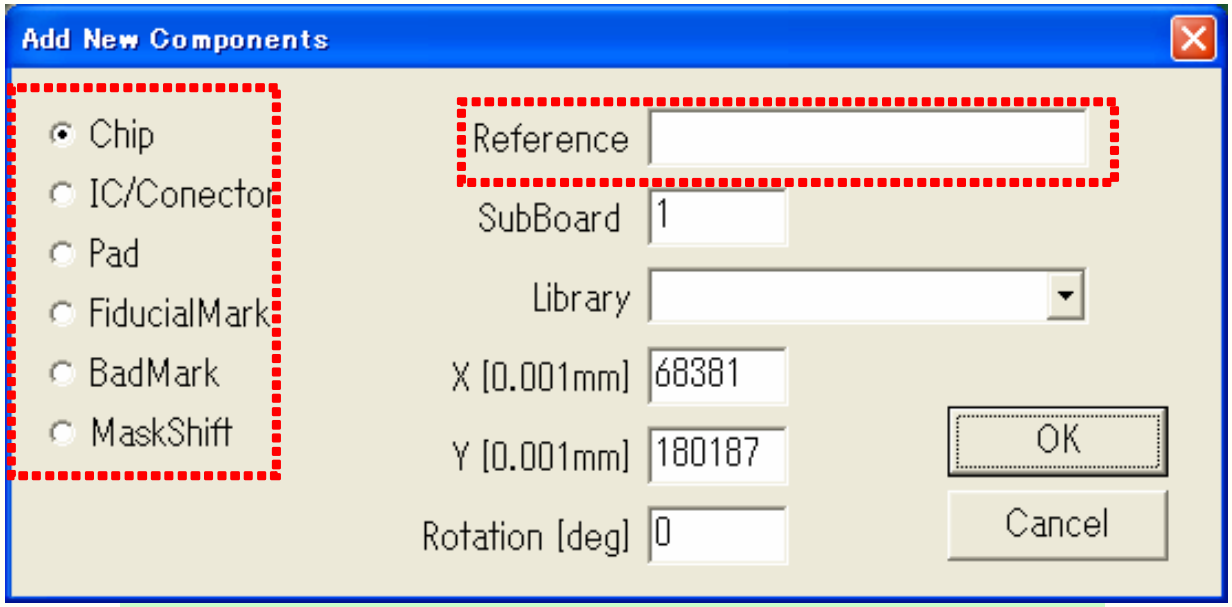
- **Undefined**
  Component that has no inspection data yet
- **Chip / IC/Connector**
  Component per registered type
- **No Inspect**
  Component that is set to skip inspection
- **Inspect time**
  Inspection time per component is displayed in order of required time (from shorter to longer)
- **Inspection Library**
  All registered inspection libraries
- **NC Library**
  Figure libraries for IC/Connector, or Pad Library
- **System Data**
  Including fiducial marks, submarks, SideCheck data
- **Library**
  Library using specified algorithm
- **Using Jump Function**
  Inspection library with OK Jump function setting

◆ **Edit button**
Clicking “Edit” can lead to Edit dialog.
*Tick "Continue”→ when data edit is finished for one component, a next component or library will be selected automatically.

* “-1” of the above “component name-1” means sub-board/panel number.

Add data

Data can be added freely even though there is no CAD data.



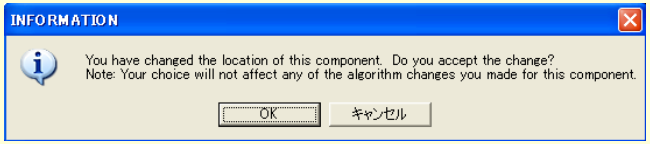
Procedures

1. Click a location where you want to add an inspection data.
   Select “Edit” →”Add”
   “Add New Components” dialog will show up.
2. Select a type of component
3. Type in a reference.
4. Select an appropriate library if it has been registered already
5. Click OK to edit the date as usual.

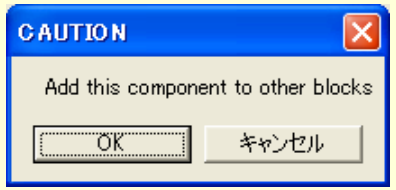
■ Attention!

After adding inspection data,
be careful of the following messages!

1.The below sentence means
” Do you want to move the component location?”
As there is no CAD data, press OK.



2. When there are other panels, below
Message will show up.



Select OK or Cancel depending on the situation
Ex. Mark1/Mark2 fiducial mark→Cancel
Single component→OK

Input Mode

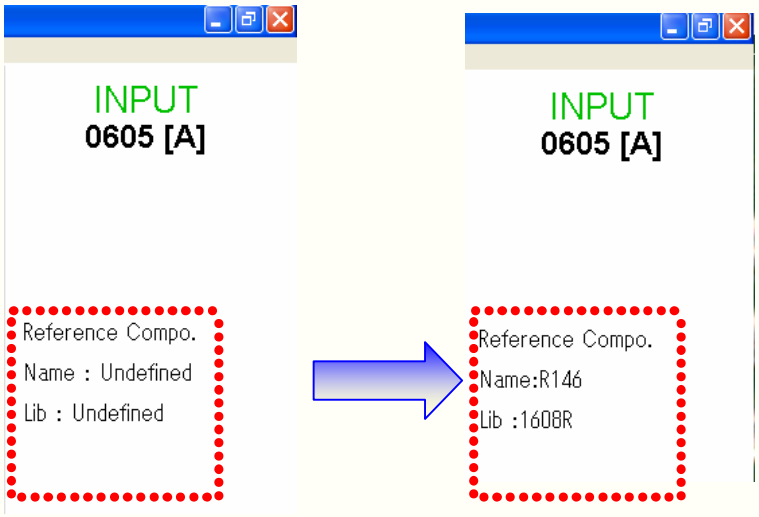
A selected inspection data can be pasted easily by mouse click.

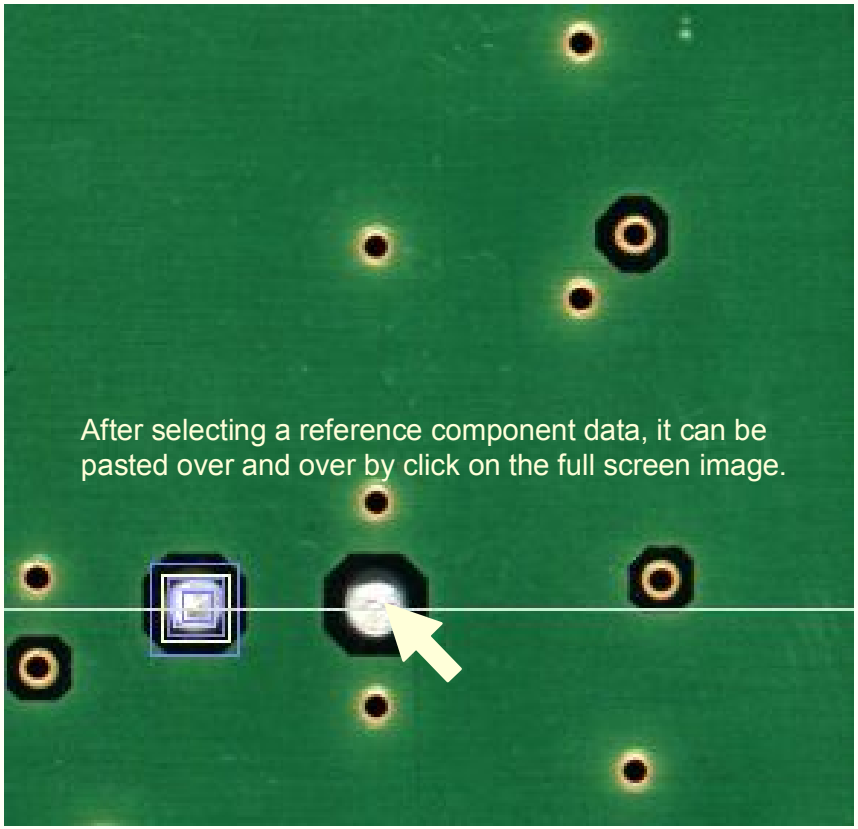
* Useful for component inspection without CAD data such as DIP pad solder inspection.

Procedures

1. Select "**Edit"→"Input Mode"**.
   ("INPUT" is displayed on the screen)
2. Right-click a component to copy.

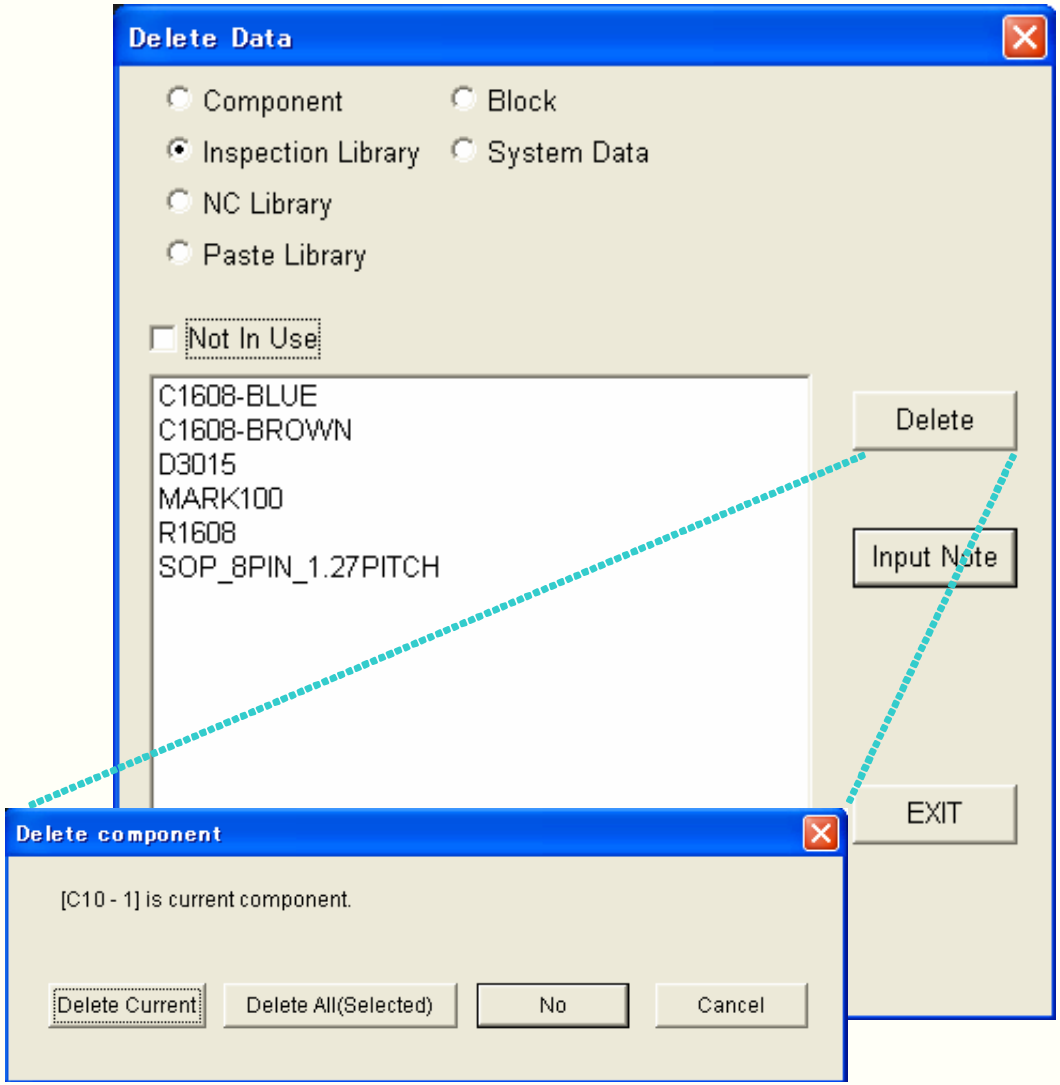
   Open its edit dialog once and close.
   ("Name" and "Lib" are referred on screen index)
3. When clicking a place where you want to paste the data, the data will be pasted.





Delete

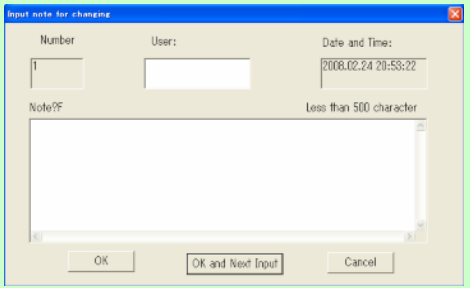
Delete data from various perspectives



- **Components**
  All existing components data on PCB
  (both CAD data and inspection data)
- **Inspection library**
  All inspection data in use (Chip/IC/Connector)
- **NC library**
  IC library data in use (Only IC/Connectors)
- **Paste library**
  Pad library in use
- **Block**
  Panel data
- **System data**
  Fiducial mark, Sub-mark, Side-Check, board data
- **Not in Use**
  Library data that are not used

◆ **Input Note**

※All data modification history can be put (ex. Who has deleted the data, date, reason….)

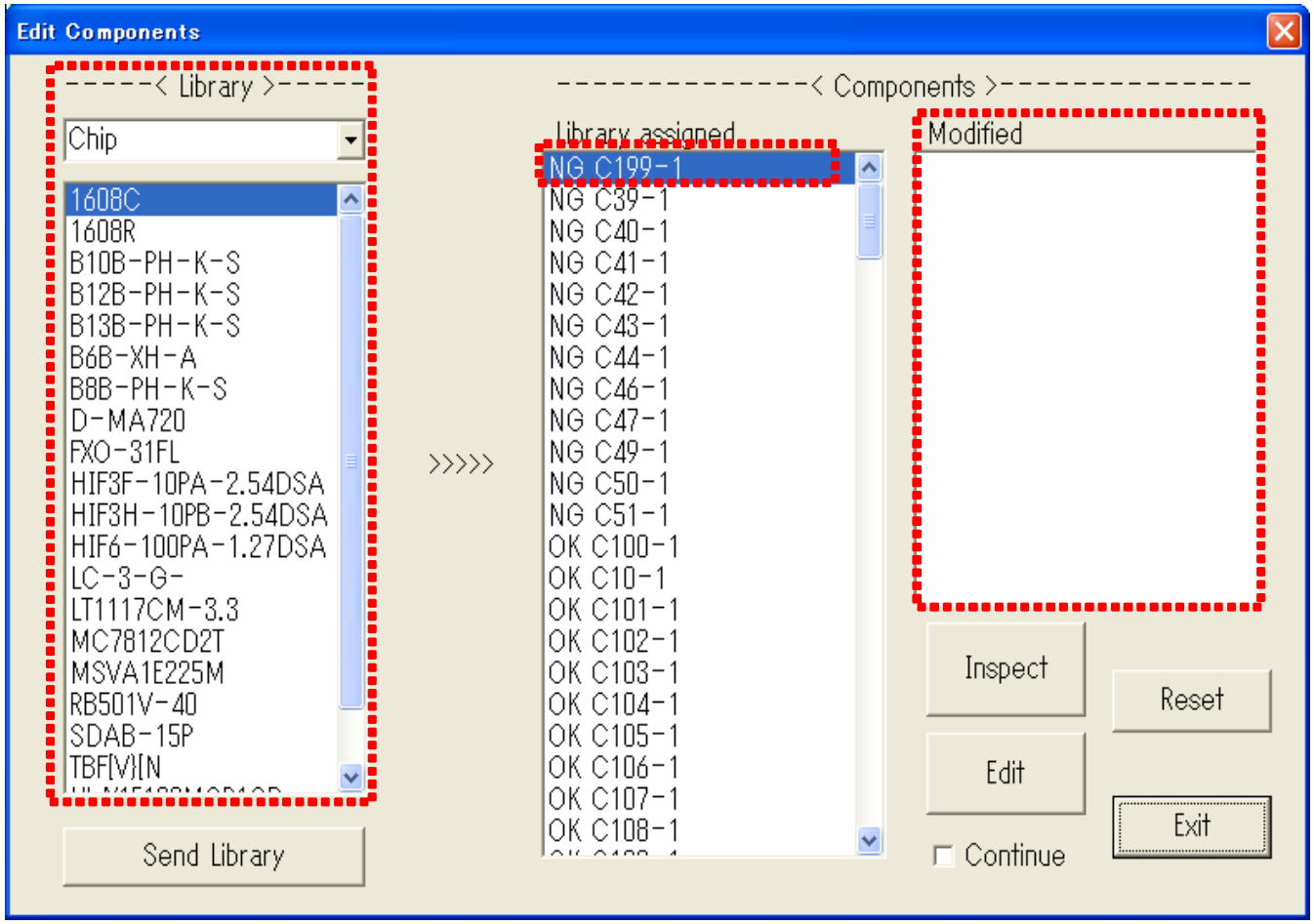


■ ***Cautions!***

When deleting some inspection library data, please do the same For NC library in case of IC/Connector/Pad data.

Edit NG

NG component data can be displayed on the top of the list.



- **"Edit"→"Edit NG" (=Shortcut key "N")**

1. Select a component type to list up library data.
2. Select subject library to edit.
3. Under "Library assigned", components sharing the selected library will be displayed. NG components are displayed on the top.
4. Double click a NG component, or click "Edit" to open its edit dialog.
5. Edit data as usual.

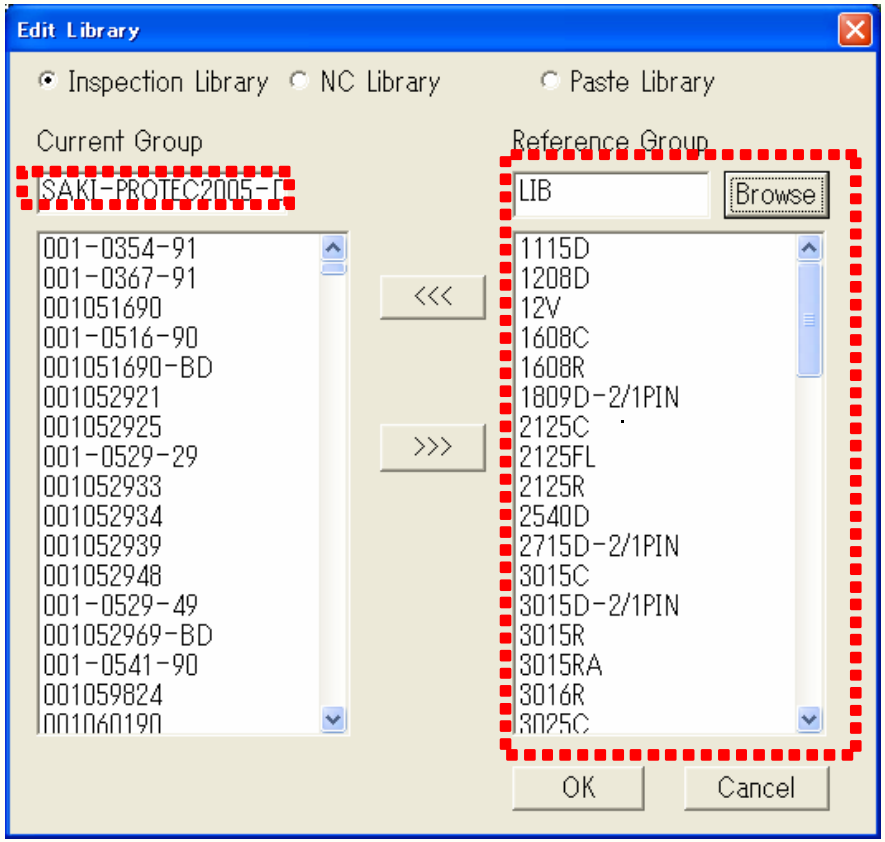
- **Modified**

When you do NOT "update" library data after data edit, that individual data will move to "modified" column.
If you wish to update the data including that individual data, click "Reset"

■ Point
Modified component can be used when changing only one component data out of the group of the specified components temporarily. If you want to change the inspection setting eventually, please change the library name.

Edit Library-（1）

Existing inspection libraries can be copied between the different data groups.



Procedures

1. Select "Edit"→"Edit Library" to open the **Edit Library** window.
2. Click "Browse" and select the data group to be copied.→Inspection library detail is displayed in the right Box.
3. Select the library to be copied and copy it to the **current group** by "**<<<<**" .

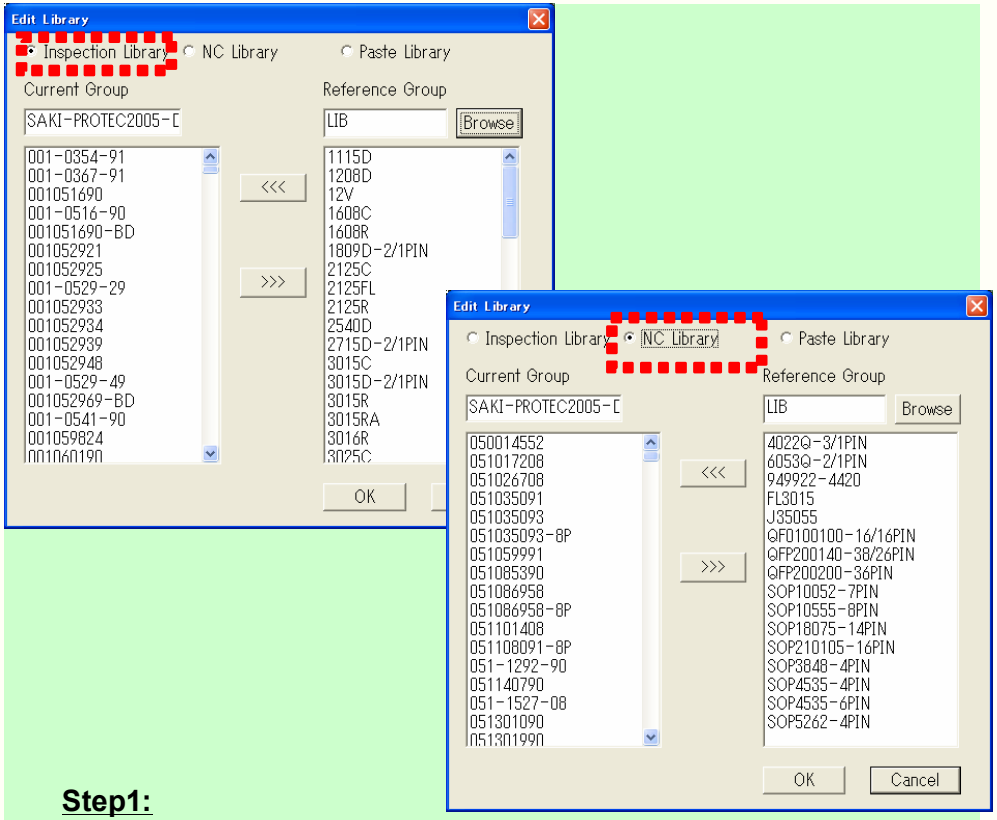
Data can also be copied to the Reference Group using ">>>" based on the Current Group.

Point

Library editing operation is just copying operation.
So the original data will not be deleted nor moved.

Edit Library - (2)

Point1 : Inspection Library+NC Library

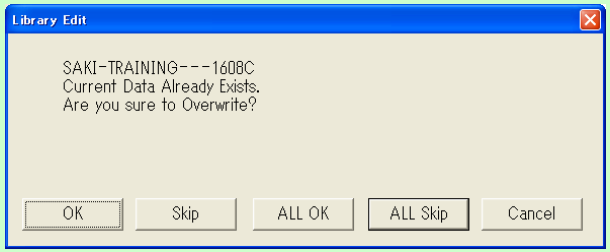


Step1:
First, Copy the normal inspection library

Step2:
Make sure to repeat the same for NC library.

Copying libraries for IC/connector/pad data can be completed only by taking these 2 steps.

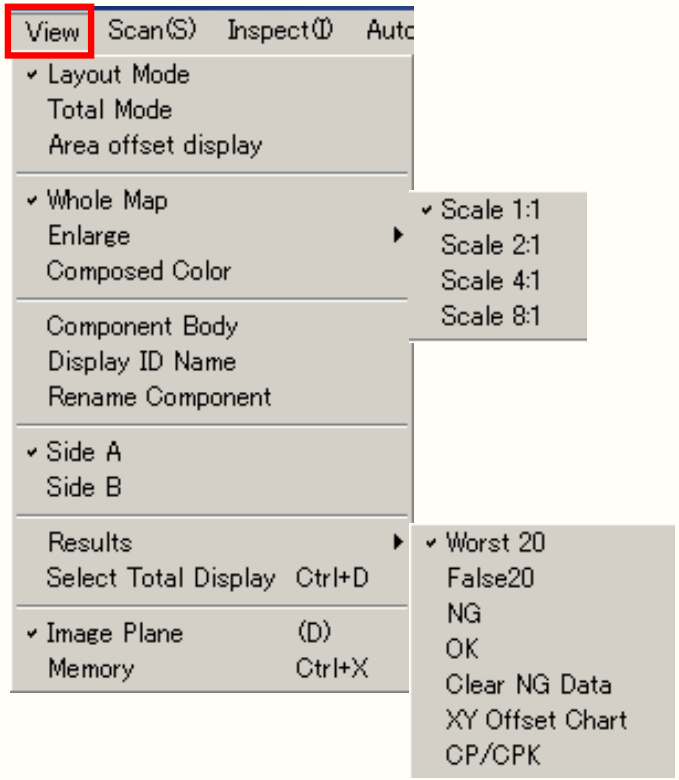
Point 2 : Data overwrite



When the same library exists in the copied folder,
the above confirmation window for overwrite will be displayed.

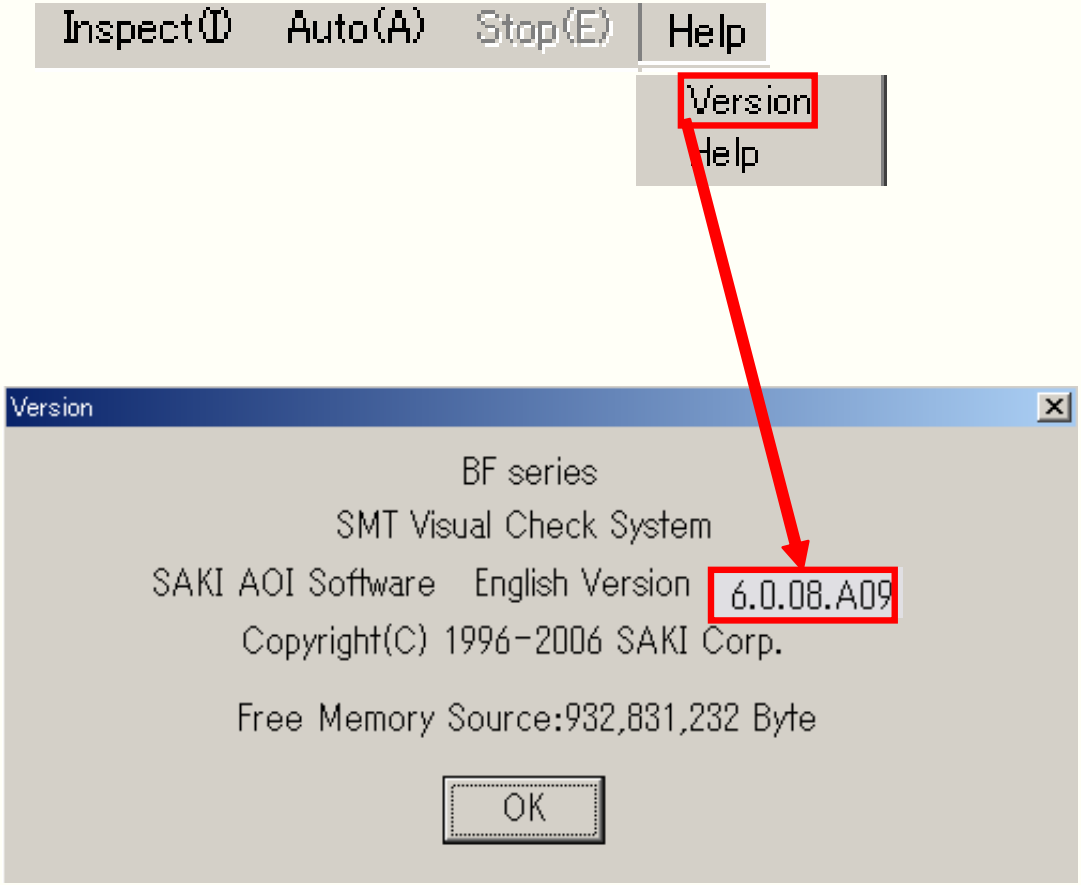
When you want to update all based on the referenced data,
Press “ALL OK” button to overwrite them all.

Toolbar [View]



1. **Layout Mode**
   Display the board image.
2. **Total Mode**
   Display the total result in graph.
3. **Enlarge**
   Change the display size on the screen.
4. **Component Body**
   Only the “Area” window is displayed.
5. **Display ID Name**
   Component name and reference are displayed.
6. **Rename Component**
   Editing the component name can be done on the image.
   ◆[View]→[Rename Component]→right-click the component center→rename the component
7. **Side A, Side B**
   For double-sided boards, data can be switched between Side A and B.
8. **Results**
   Configure the display setting of the inspection result.

Toolbar 【Inspect, Help】



Inspect (I)

1. Start the inspection.
   NG components will be displayed in red.
   * Inspection also can be started by using keyboard “I”.

Help

1. **Version**
   Software version can be confirmed.
2. **Help**
   Display the Programming Manual.