Manual Update Notice

The following manual has been revised and released:

Manual title:	NXT Programming Manual
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In accordance with NXT version V3.41, changes have made as follows.

Chapter, Section	Summary of changes
4.3.2 Shape Process Tab	New data item has been added.
4.3 4 Shape Process Details	Detailed explanation has been added.
4.6.2 NXT Vision Types	Added vision type 181 to table and detailed explanation section.
4.7.2 Vision type compatibility table for the NXT	Added vision type 181. Changed table font size.
6. Editing Jobs on the Machine	Added new section “6.6 Testing Pickup Positions”.
	Minor changes and corrections have also been made at various locations throughout manual.

Note:

For a copy of the entire manual, contact your nearest Fuji sales representative or send an e-mail request to the address below.

E-mail: intnetqst@fuji.co.jp

Fuji Scalable Placement Platform

NXT

Programming Manual

QD004-05

FUJI® Machine Mfg.Co.,Ltd.

NXT

Consult Fuji beforehand if you are considering selling this equipment to a third party after it has been installed.

Fuji Scalable Placement Platform

NXT

Programming Manual

The manuals listed below are shipped with the NXT machine.

NXT Setup Manual

NXT System Reference

NXT Mechanical Reference

FUJI Intelligent Feeder Manual

NXT Programming Manual

In order to operate this machine in the safest and most efficient manner, please read the provided manuals thoroughly and observe all instructions and warnings.

Keep these manuals in an accessible location near the machine.

QD004-05

FUJI® Machine Mfg.Co.,Ltd.

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- Improper use of Fuji equipment.

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Contents

1. Introduction

The aim of this manual is to provide procedural explanations of how to perform functions in Fuji Flexa, Fujitrax, and provide detailed knowledge about part data settings for the NXT machine. The procedures outlined are to help the NXT user perform various operations in Fuji Flexa and Fujitrax, and help the user create part data for the NXT. This manual is designed for users who already have a basic understanding of Fuji Flexa.

1.1 Notation Conventions Used in the Manual

The notation conventions employed in this manual are described below

General Notation

Notation sample	Explanation
[File] menu	Menu names and commands are enclosed in square brackets [ ].
[Open Job] window	Window and dialog box names which appear in the title bar are enclosed in square brackets [ ].
[OK]	The names of toolbar buttons and command buttons that appear inside a window or dialog box are enclosed in square brackets [ ].
Enter key	Key names are printed in bold Arial font.

Mouse-related Notation

Notation	Explanation
Click	Press and quickly release the left mouse button.
Double-click	Click the left mouse button twice in rapid succession
Right-click	Press and quickly release the right mouse button.
Drag	Move icons, dialog boxes and windows or adjust windows by clicking and shifting the object in question while holding down the left mouse button.
Drop	Release the left mouse button once an object has been dragged to the desired position.

MEMO:

2. Fuji Flexa and the NXT

2.1 Introduction

The NXT represents a new concept in the SMT field and is very different from previous Fuji machines. Due to these differences, there some different procedures when programming for the NXT in Fuji Flexa. A brief listing of the major differences is included below.

- The line configuration for NXT machines.
- The machine configuration for the NXT
- Line balancing is simplified
- Optimization has been improved
- Jobs are sent to the machine, not recipes
- New vision types

It is important to point out that while there are some new procedures and options in Fuji Flexa for the NXT, that most of the settings and procedures have remained unchanged. Even in some cases, an existing process has been simplified or is easier to use.

The next chapter, Job Builder, covers the general programming procedures for creating jobs and the unique or special procedures for the NXT. The next chapter covers the part data settings required for the NXT in detail. Transmission is covered in the following chapter. In the following chapters, information about Fujitrax Verifier is provided.

MEMO:

3. Job Builder

3.1 Introduction

Job Builder is used to create and edit jobs. Most of the procedures for the NXT are the same as previous Fuji machines. This chapter lists the general steps for creating jobs for the various data types. The Job Builder procedures that are different or unique for the NXT are also provided in this chapter. Part data settings for the NXT are covered in detail in the next chapter.

3.2 General Steps to Creating NXT Jobs

This section provides a basic roadmap of procedures for creating jobs for the NXT based upon the different methods of entering data in the job.

These roadmaps listed are only for general reference and are only designed to help in the job creation process. There are cases when more or less steps are required depending on the situation.

The details for performing the unique NXT steps listed in the following procedures are in the following sections. The name in the steps that are marked (NXT) are based on the name of that item in this manual. For details on procedures that are not marked (NXT), refer to the Fuji Flexa User Manual, Chapter 2. The procedure can be determined based upon the name of the corresponding step.

3.2.1 Starting by changing an existing job

Follow the steps below when changing a job that is currently complete for other machine types into a job with an NXT line. Generating recipes is not necessary for the NXT unless one wants to view reports. Because this job was already completed using other machines, panelizing, and importing data is not required.

1. Open the existing job.
2. Change the current line to the new NXT line. (NXT)
3. Enter the machine configuration and process data. (NXT)
4. Enter auto backup pin data. (NXT, only for equipped machines)
5. Change certain part data for the NXT. (NXT)
6. Assign marks to machines.
7. Line balance the work load. (NXT)
8. Optimize the job. (NXT)
9. Generate reports. (NXT)

3.2.2 Starting by manually entering sequence data

If no outside data files are available, it is possible to create a job completely through data entry. Follow the roadmap below to create a basic job through manual data entry. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job manually.
2. Add a line to the job.
3. Enter the machine configuration and process data. (NXT)
4. Enter auto backup pin data. (NXT, only for equipped machines)
5. Import part data into the job or create part data in the job. (NXT)
6. Add parts.
7. Import mark data into the job or create mark data in the job.
8. Create mark sequences.

9. Assign marks to machines.
10. Panelize the panel (Panel Management).
11. Line balance the work load. (NXT)
12. Optimize the job. (NXT)
13. Generate reports. (NXT)

3.2.3 Starting by importing centroid CAD data

Follow the roadmap below to create a basic job by importing centroid CAD data. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job manually.
2. Import the centroid CAD data.
3. Import the BOM file.
4. Import any existing part data into the job.
5. Create any missing part data. (NXT)
6. Import mark data into the job.
7. Add a line to the job.
8. Enter the machine configuration and process data. (NXT)
9. Enter auto backup pin data. (NXT, only for equipped machines)
10. Panelize the panel (Panel Management).
11. Assign marks to machines.
12. Line balance the work load. (NXT)
13. Optimize the job. (NXT)
14. Generate reports. (NXT)

3.2.4 Starting by importing CCIMF files with part data

It is possible to create a job completely through importing generated CCIMF files with part data. Follow the roadmap below to create a job by importing CCIMF files with part data. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job by importing CCIMF data.
2. Change the current line to the new NXT line. (NXT)
3. Enter the machine configuration and process data. (NXT)
4. Enter auto backup pin data. (NXT, only for equipped machines)
5. Change certain part data for the NXT. (NXT)
6. Panelize the panel (Panel Management).
7. Assign marks to machines.
8. Line balance the work load. (NXT)

9. Optimize the job. (NXT)
10. Generate reports. (NXT)

3.2.5 Starting by importing MCSIMF files

It is possible to create a job completely through importing generated MCSIMF program and part data files. Follow the roadmap below to create a job by importing MCSIMF files. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job by importing MCSIMF data.
2. Import the MCS part data into the job (only necessary if part data was not imported in step 1).
3. Change the current line to the new NXT line. (NXT)
4. Enter the machine configuration and process data. (NXT)
5. Enter auto backup pin data. (NXT, only for equipped machines)
6. Change certain part data for the NXT. (NXT)
7. Panelize the panel (Panel Management).
8. Assign marks to machines.
9. Line balance the work load. (NXT)
10. Optimize the job. (NXT)
11. Generate reports. (NXT)

3.2.6 Starting by importing Allegro CAD data

Follow the roadmap below to create a basic job by importing Allegro CAD data. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job manually.
2. Import the Allegro CAD data.
3. Import the BOM file.
4. Import any existing part data into the job.
5. Create any missing part data. (NXT)
6. Import mark data into the job.
7. Perform a verify check
8. Add a line to the job.
9. Enter the machine configuration and process data. (NXT)
10. Enter auto backup pin data. (NXT, only for equipped machines)
11. Panelize the panel (Panel Management).
12. Assign marks to machines.
13. Line balance the work load. (NXT)

14. Optimize the job. (NXT)
15. Generate reports. (NXT)

3.2.7 Starting by importing Mentor CAD data

Follow the roadmap below to create a basic job by importing Mentor CAD data. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job manually.
2. Import the Mentor CAD data.
3. Import the BOM file.
4. Import any existing part data into the job.
5. Create any missing part data. (NXT)
6. Import mark data into the job.
7. Perform a verify check
8. Add a line to the job.
9. Enter the machine configuration and process data. (NXT)
10. Enter auto backup pin data. (NXT, only for equipped machines)
11. Panelize the panel (Panel Management).
12. Assign marks to machines.
13. Line balance the work load. (NXT)
14. Optimize the job. (NXT)
15. Generate reports. (NXT)

3.2.8 Starting by importing CR5000 (PWS/Board Designer) CAD data

Follow the roadmap below to create a basic job by importing CR5000 CAD data. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job manually.
2. Import the CR5000 CAD data.
3. Import the BOM file.
4. Import any existing part data into the job.
5. Create any missing part data. (NXT)
6. Import mark data into the job.
7. Perform a verify check
8. Add a line to the job.
9. Enter the machine configuration and process data. (NXT)
10. Enter auto backup pin data. (NXT, only for equipped machines)

11. Panelize the panel (Panel Management).
12. Assign marks to machines.
13. Line balance the work load. (NXT)
14. Optimize the job. (NXT)
15. Generate reports. (NXT)

3.2.9 Starting by importing OrCAD CAD data

Follow the roadmap below to create a basic job by importing OrCAD CAD data. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job manually.
2. Import the OrCAD CAD data.
3. Import the BOM file.
4. Import any existing part data into the job.
5. Create any missing part data. (NXT)
6. Import mark data into the job.
7. Perform a verify check
8. Add a line to the job.
9. Enter the machine configuration and process data. (NXT)
10. Enter auto backup pin data. (NXT, only for equipped machines)
11. Panelize the panel (Panel Management).
12. Assign marks to machines.
13. Line balance the work load. (NXT)
14. Optimize the job. (NXT)
15. Generate reports. (NXT)

3.2.10 Starting by importing SFX-J1 CAD data

Follow the roadmap below to create a basic job by importing SFX-J1 CAD data. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job manually.
2. Import the SFX-J1 CAD data.
3. Import the BOM file.
4. Import any existing part data into the job.
5. Create any missing part data. (NXT)
6. Import mark data into the job.
7. Perform a verify check

8. Add a line to the job.
9. Enter the machine configuration and process data. (NXT)
10. Enter auto backup pin data. (NXT, only for equipped machines)
11. Panelize the panel (Panel Management).
12. Assign marks to machines.
13. Line balance the work load. (NXT)
14. Optimize the job. (NXT)
15. Generate reports. (NXT)

3.2.11 Starting by importing Specctra CAD data

Follow the roadmap below to create a basic job by importing Specctra CAD data. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job manually.
2. Import the Specctra CAD data.
3. Import the BOM file.
4. Import any existing part data into the job.
5. Create any missing part data. (NXT)
6. Import mark data into the job.
7. Perform a verify check
8. Add a line to the job.
9. Enter the machine configuration and process data. (NXT)
10. Enter auto backup pin data. (NXT, only for equipped machines)
11. Panelize the panel (Panel Management).
12. Assign marks to machines.
13. Line balance the work load. (NXT)
14. Optimize the job. (NXT)
15. Generate reports. (NXT)

3.2.12 Starting by importing PowerPCB CAD data

Follow the roadmap below to create a basic job by importing PowerPCB CAD data. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job manually.
2. Import the PowerPCB CAD data.
3. Import the BOM file.
4. Import any existing part data into the job.

5. Create any missing part data. (NXT)
6. Import mark data into the job.
7. Perform a verify check
8. Add a line to the job.
9. Enter the machine configuration and process data. (NXT)
10. Enter auto backup pin data. (NXT, only for equipped machines)
11. Panelize the panel (Panel Management).
12. Assign marks to machines.
13. Line balance the work load. (NXT)
14. Optimize the job. (NXT)
15. Generate reports. (NXT)

3.2.13 Starting by importing PanaCAD data

Follow the roadmap below to create a basic job by importing PanaCAD data. Generating recipes is not necessary for the NXT unless one wants to view reports.

1. Create a job manually.
2. Import the PanaCAD data.
3. Import the BOM file.
4. Import any existing part data into the job.
5. Create any missing part data. (NXT)
6. Import mark data into the job.
7. Add a line to the job.
8. Enter the machine configuration and process data. (NXT)
9. Enter auto backup pin data. (NXT, only for equipped machines)
10. Panelize the panel (Panel Management).
11. Assign marks to machines.
12. Line balance the work load. (NXT)
13. Optimize the job. (NXT)
14. Generate reports. (NXT)

3.3 NXT Machine Setting Procedures

3.3.1 Changing the current line to a NXT line

It is easy to change any current line in a job to a new line. This step is required when making jobs for the NXT by importing CCIMF or MCSIMF files into a job in Flexa or when changing an existing job for other machines to a job for the NXT. When adding the line, a line that has been previously setup for transmission is used. This makes adding lines easier and more error free, because the basic NXT data already exists and the NXT in the job will match the NXT for transmission. If the NXT lines have not been setup for transmission, then this must be done before adding an NXT line to the job is possible.

Changing the line for the top side of the panel.

1. Select the [Top] tab from the job information bar.
2. Right-click in the data area for [Top] and select [Select line…] from the shortcut menu. The [Select Line] dialog box displays.
3. Select the factory for the desired line and select the desired NXT line from the list that displays and click [OK]. The dialog box closes and the machines from the selected line are added to the job.

Note: If there are no other Fuji machines in the line, then there most likely will only be one NXT machine. For further details, refer to the chapter about setting up an NXT line in the NXT Setup Manual.

When the line is added, the default machine data for each machine is also brought into the job.

Changing the line for the bottom side of the panel.

1. Select [Flip Panel] from the [View] menu and then select the [Bottom] tab from the job information bar.
2. Right-click in the data area for [Bottom] and select [Select line…] from the shortcut menu. The [Select Line] dialog box displays.
3. Select the factory for the desired line and select the desired line from the list that displays and click [OK]. The dialog box closes and the machines from the selected line are added to the job.

Note: If there are no other Fuji machines in the line, then there most likely will only be one NXT machine. For further details, refer to the chapter about setting up an NXT line in the NXT Setup Manual.

When the line is added, the default machine data for each machine is also brought into the job.

3.3.2 Adding an NXT line to a job

It is easy to add any current line to a job. This step is required with making new jobs for the NXT. When adding the line, a line that has been previously setup for transmission is used. This makes adding lines easier and more error free, because the basic NXT data already exists and the NXT in the job will match the NXT for transmission. If the NXT lines have not been setup for transmission, then this must be done before adding an NXT line to the job is possible.

Adding the NXT line for the top side of the panel.

1. Select the [Top] tab from the job information bar.

2. Right-click in the data area for [Top] and select [Select line…] from the shortcut menu. The [Select Line] dialog box displays.
3. Select the factory for the desired line and select the desired NXT line from the list that displays and click [OK]. The dialog box closes and the machines from the selected line are added to the job.

Note: If there are no other Fuji machines in the line, then there most likely will only be one NXT machine. For further details, refer to the chapter about setting up an NXT line in the NXT Setup Manual.

When the line is added, the default machine data for each machine is also brought into the job.

Adding the NXT line for the bottom side of the panel.

1. Select [Flip Panel] from the [View] menu and then select the [Bottom] tab from the job information bar.
2. Right-click in the data area for [Bottom] and select [Select line…] from the shortcut menu. The [Select Line] dialog box displays.
3. Select the factory for the desired line and select the desired line from the list that displays and click [OK]. The dialog box closes and the machines from the selected line are added to the job.

Note: If there are no other Fuji machines in the line, then there most likely will only be one NXT machine. For further details, refer to the chapter about setting up an NXT line in the NXT Setup Manual.

When the line is added, the default machine data for each machine is also brought into the job.

3.3.3 Configuring an NXT machine

Data about the configuration of the NXT must be entered. When an NXT machine with a certain name is added for the first time, the default information is used. This data must be checked and edited if it does not match the actual machine with that name.

Entering NXT configuration data

1. Select the [Top] or [Bottom] tab from the job information bar depending on which side of the panel the machine is located for which the configuration data needs to be edited.
2. Double-click the name of the line to display the machines in that line.
3. Double-click the name of the NXT machine to set the configuration file for to display the items for that machine.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. There are several tabs at the bottom of the [Machine Configuration] pane. The first tab is [General] and this is the location where the machine configuration data is set. There are two groupings of data. Data in the [Machine Setup] affect the conveyor system, and the settings in the [Optimization] affect the optimization of the NXT machine. Refer to the tables below for information on the settings.

Machine Setup

Setting	Description
Fix Rail	This specifies whether or not the reference rail for the second lane can move to different positions. If this is set to “Yes” the reference rail cannot move to different positions and a setting must be specified for [Rail Width]. This is the location that the refence rail for lane 2 will be positioned.
Rail Width	This setting only displays when the setting for [Fix Rail] is “Yes”. This setting specifies the location at which the reference rail for lane 2 will be fixed.
Board Flow	This specifies the direction in which the panels flow through the machine. This settings does not actually control the direction in the machine but is used for job related processing in Fuji Flexa.

Optimization

Setting	Description
Mark Reset	This specifies whether or not the fiducial marks for the sequences are cleared and reassigned. If this is set to “<n/c>”, only sequences at have no fiducial mark assignment at all, have fiducial marks assigned. If this is set to “Reset” then all fiducial mark assignments are cleared for all sequences and then they are reasigned.
Mark Compensation Count	This specifies how many marks are to be used for aligning the sequences when assigning fiducial marks. If this setting is changed then only marks that have no fiducial assignments are affected or all sequences are affected only if the [Mark Reset] setting is “Reset”.
Feeder Duplication	This specifies whether or not parts with many placements will be broken up into multiple feeders and set into different modules. If this is set to “Yes”, parts with many placements will be set in multiple feeders and placed on multiple modules.
Use Current Feeder Setup	When the [Allocate Feeders] option is selected for optimization, this specifies whether or not the current feeder setup will be changed or not. If the is set to “No” and the [Allocate Feeders] option is selected for optimiztion, then the current feeder positions and settings are completely ignored and all feeders are redistributed. If there are variable status feeders that are not being used in the current job in the feeder setup, these feeders are removed.
Conveyor Mode	This settings specifies the panel conveyance mode to be used for production for determining optimization.
Target Conveyor	This specifies the target lane on which the job will be optimized. If set to “Lane 1”, then the job is optimized with the premise that the panels are to be loaded on lane 1.

Setting	Description
Optimizer Type	This setting specifies the level of optimization to be performed. “Speed” performs optimization with a priority on achieving a relatively fast cycle time and processing is performed quickly. “Optimal” performs optimization with a priority on achieving the fastest cycle time and processing takes longer. “Time Limit” performs processing the same as “Optimal” but within a specified time limit.
Time Limit	This only displays if [Optimizer Type] is set to “Time Limit”. This specifies the time limit in minutes that the optimizer has to complete processing.
Optimize For Single Module Production	This specifies whether or not paired module production is used for panels between 250 and 305 in length. This setting has no bearing for panels outside of this range. When setting to "No" and the panel size is within the range, the M3 modules are automatically paired for paired production. If set to "Yes" and the panel size is within the range, the M3 modules are not paired. For panels smaller than the range, M3 modules are never paired. For panels larger than the range, M3 modules are always paired.
Optimize Insert Order Only	When this setting is set to “No”, insert order, feeders, head setup, nozzle stations and other items can be optimized/ changed during optimization. Only the insert order is changed during optimization when this setting is “Yes”.
Optimize Panel Stopping Position Offset	This specifies whether or not the panel stopping position is optimized for paired module production. This is only for M3 modules when they are performing paired module production.
Allocate parts to M6 modules	This specifies whether or not to allocate parts that are in the head interference area during paired module production to M6 modules if possible. By setting this to “Yes”, head waiting time during paired module production is reduced. However, more parts are assigned to the M6 module.
Used feeder type	Specify the whether of not reel holders are on the feeders. If set to “Reel holder”, the optimizer positions feeders in the feeder setup considering that the feeders have reel holders. If this is set to “Reel holder-E”, the optimizer positions feeders in the feeder setup considering that feeders have no reel holders and a bucket type feeder pallet is used.
Optimize Nozzle Station	This specifies whether the nozzle allocation should be optimized or not. If this is set to “Yes” the nozzles in the nozzle station will be changed to be “optimized” for production. If this is set to “No” then optimization is performed without changing the nozzle setup.
Nozzle station nozzle allocation method	Specify the nozzle station nozzle arrangement method. "Minimum" arranges for the minimum number nozzles required by the head. "Maximum" arranges for the maximum number of nozzles allowable in the station.

The new settings will take effect the next time the job is transmitted to the machine or optimization is performed.

Distributing the same part to multiple modules

1. Select the [Top] or [Bottom] tab from the job information bar depending on the side of the panel the machine data to be edited is located.
2. Double-click the name of the line to display the machines in that line.
3. Double-click the name of the machine to display the items for that machine.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. Select the [General] tab found in the bottom of the [Machine Configuration] Pane.
6. Double-click the data cell for [Feeder Duplication] located near the bottom of the available options to display a drop-down list.
7. Select “Yes” to distribute high part count parts to multiple modules.
8. Optimize the job for the changes to take effect. Parts that can be placed on more than one module are distributed to modules with a compatible configuration.

Specifying the modules for an NXT

After adding the NXT line, it is very important to configure the modules to match the modules in the current machine. Since items and modules are easily interchanged, always be sure to check the current module configuration.

1. Select the [Top] or [Bottom] tab from the job information bar depending on which side of the panel the machine is located for which the configuration data needs to be edited.
2. Double-click the name of the line to display the machines in that line.
3. Double-click the name of the NXT machine to set the configuration file for to display the items for that machine.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. There are several tabs at the bottom of the [Machine Configuration] pane. The second tab is [Modules] and this is the location where the modules are set. Click this tab.
6. Click [Select] from the [Module Edit] group. A small dialog box displays with a representation of the current NXT module configuration. Click a module in this dialog box to jump to the information for that module. By using this dialog box, it is easy to navigate and understand the current module configuration. In addition, this dialog box can be used to jump to different modules on other tabs such as [Nozzle Changer Setup], and [Feeder Setup].
7. Check the current modules. If the number and type of modules is correct then proceed to step 16.
8. If the number of modules is incorrect, click [Add] and in the dialog box that displays, specify the position for the new module. Once the desired position has been specified, click [OK] and the module is added to the specified position using the default module settings. Continue adding modules until the number of modules is correct for the NXT

machine.

Note: The NXT "machine" in Fuji Flexa is comprised of multiple bases that are next to each other. One NXT machine can be created with up to 32 modules in this manner (e.g., eight 4M bases with 4 M3 modules on each base). In this module configuration, the NXT machine will have the number of modules that all of the bases put together have regardless of the fact that the bases are different. For details on making the line configuration settings for the NXT, refer to the "Setting Up a Line with a NXT" chapter in the NXT Setup Manual.

Note: Do not use [Copy] to add a new module. Copy only will replace the settings of an existing module with the settings from the copied module. This is a convenient feature to use after adding new modules to apply the same settings to the new modules.

9. Once all of the necessary modules are present, select the first module and check the module configuration.

10. If the confguration needs to be changed, click the [...] button to the right of the module name title. A dialog box displays with the possible module type and stage type configurations.

Note: It is possible to change the individual values for the different fields. However, if a invalid setting is selected, the text for the settings turns red to indicate that the selected values are incorrect.

11. Click the button that has the correct module type and stage configuration for the selected module. The selected settings are applied to the selected module and the possible choices for the selected option then are displayed. There are no more options if a conveyor unit is selected so the dialog box is closed.

12. Click the button that has the correct head type for the selected module. The selected settings are applied to the selected module and the possible choices for the selected option then are displayed. There are no more options if a glue head is selected so the dialog box is closed.

13. Click the button that has the correct nozzle station for the selected module. The selected settings are applied to the selected module and the dialog box is closed.

14. Specify any of the other settings that have a white background for the value cells as necessary. Refer to the table below for information.

Setting	Description
Coplanarity	This specifies whether or not the module is equipped with coplanarity measuring unit. This is a NXT option.
Camera Position	This setting only displays when for M6 modules and is used to specify the position of the camera. Only if a M6 has a feeder pallet is this setting valid.
Actual Cycle Time Difference	Make a setting here when a difference between the projected cycle time and actual production cycle time exists for the module. Specify the difference between these two cycle times.

15. Repeat steps 10 to 14, while selecting the next module in the machine until all of the modules in the machine have the correct configuration.

16. If any pairs of M3 modules are to perform paired production, display the modules and change the setting [Perform Paired Module Production] to "Yes" for both modules. Specify any required stopping position offset. Repeat until all M3 modules that are to perform paired module production have the correct setting.

Note: Paired module production is when two M3 modules clamp a single panel across the conveyors for the modules and place parts on the same panel. Paired production can only be performed between set

pairs of M3 modules. For example, modules 1 and 2 can share production together, however, modules 2 and 3 cannot.

17. If the created module configuration is the standard setup for the selected NXT machine, right-click the grey area outside of the setting area in the [Modules] tab and select [Save as the Default Machine Configuration] to save the current module configuration as the standard configuration. When the same machine is brought into a job from this point, the module configuration will be the same as that just specified.

Specifying NXT machine processing options

Data about the processing of the job for the NXT machine must be entered. When a machine with a certain name is added for the first time, the default process options are used. This data must be checked and edited if it is not the correct processing options for that machine.

1. Select the [Top] or [Bottom] tab from the job information bar depending on which side of the panel the machine is located for which the process options need to be edited.
2. Double-click the name of the line to display the machines in that line.
3. Double-click the name of the machine to set the processing options for to display the items for that machine.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. There are several tabs at the bottom of the [Machine Configuration] pane. Select the [Process Options] tab to display the available process options for the machine
6. Enter the appropriate process settings for the machine. The process options above the [Panel Stopping Position Correction] settings are the same as the process options for standard Fuji machines.
7. Enter the appropriate panel stopping position correction settings process settings for the machine if the panel stopping position correction function is turned on. Refer to the table below for information on these settings.

Setting	Description
Scan Area X/Y	This specifies the size of the area in the X- and Y-direction checked for the panel edge when correcting the panel stopping position.
Shutter Speed	This setting specifies the shutter speed used by the mark camera when checking for the panel edge. The larger the value, the slower the shutter speed and the image becomes brighter.
Color	Specify which lighting should be used to check for the panel edge. Different settings will be required depending on the color of the panel.
Pattern	Specify which lights should be used to check for the panel edge. Different settings will be required depending on the color of the panel.

The new settings will take effect the next time the job is transmitted to the machine or optimization is performed.

Specifying the head setup for an NXT

Making settings in the [Head Setup] tab is not normally necessary. The head setup will be automatically reconfigured based upon the nozzles in the nozzle changer during optimization.

1. Select the [Top] or [Bottom] tab from the job information bar depending on which side of the panel the machine is located for which the configuration data needs to be edited.
2. Double-click the name of the line to display the machines in that line.
3. Double-click the name of the NXT machine to set the configuration file for to display the items for that machine.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. There are several tabs at the bottom of the [Machine Configuration] pane. Select the [Head Setup] tab.
6. Use the [Module] drop-down list to select the desired module to display.
7. Click the position data field and then the arrow to display a drop-down list of the available nozzles. Click to select the desired nozzle for that position.

Note: It is possible to specify nozzles for multiple positions at a time. Select the multiple nozzle positions for the head and then right-click in the window. Select [Select Nozzles] and then select the desired nozzle for the selected positions from the drop-down list and click [OK].

8. Repeat the previous step until all of the desired nozzles for the positions have been set.
9. If any other heads need to have nozzles set, return to step 6 and select the new module on which the next head is set.

Specifying the nozzle changer setup for an NXT

Making settings in the [Nozzle Changer Setup] tab is necessary if the nozzles in the machine do not match the nozzles currently in this tab or if different nozzles are to be used during production.

1. Select the [Top] or [Bottom] tab from the job information bar depending on which side of the panel the machine is located for which the configuration data needs to be edited.
2. Double-click the name of the line to display the machines in that line.
3. Double-click the name of the NXT machine to set the configuration file for to display the items for that machine.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. There are several tabs at the bottom of the [Machine Configuration] pane. Select the [Nozzle Changer Setup] tab.
6. Use the [Module] drop-down list to select the desired module for which to set the nozzles.
7. Click the position data field and then the arrow to display a drop-down list of the available nozzles. Click to select the desired nozzle for that position.

Note: It is possible to specify nozzles for multiple positions at a time. Select the multiple nozzle positions for the changer and then right-click in the window. Select [Select Nozzles] and then select the desired

nozzle for the selected positions from the drop-down list and click [OK].

8. Repeat the previous step until all of the desired nozzles for the positions on the nozzle changer have been set.
9. If any other nozzle changers need to have nozzles set, return to step 6 and select the new module on which the next nozzle changer is set.

Specifying the available nozzles for a machine

By setting which nozzles are available for the NXT machine, only the nozzles specified as being available display when a user is selecting a nozzle for a position. This ensures that a nozzle is not accidentally selected that is not available and reduces the amount of choices in the nozzles drop-down list, thus allowing easier selection.

1. Select the [Top] or [Bottom] tab from the job information bar depending on the side of the panel the machine to be edited is located.
2. Double-click the name of the line to display the machines in that line.
3. Double-click the name of the machine to set the available nozzles for to display the items for that machine.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. There are several tabs at the bottom of the [Machine Configuration] pane. Select the [Nozzle Available] tab and the available nozzles for the machine display.
6. Double-click in the data cell under [Available] that is on the row for the desired nozzle and a drop-down list box displays. Select “Yes” if that nozzle is available for that machine, or “No” if the nozzle is not available for that machine. Repeat until all of the available and unavailable nozzles have been specified.

Specifying the available feeders for a machine

By setting which feeders are available for the NXT machine, an unavailable feeder will not be selected when optimization is performed.

1. Select the [Top] or [Bottom] tab from the job information bar depending on the side of the panel the machine to be edited is located.
2. Double-click the name of the line to display the machines in that line.

3. Double-click the name of the machine to set the available feeders for to display the items for that machine.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. There are several tabs at the bottom of the [Machine Configuration] pane. Select the [Feeder Available] tab and the available feeders for the machine display.
6. Double-click in the data cell under [Available] that is on the row for the desired feeder and a drop-down list displays. Select the “Yes” if that feeder is available for that machine, or “No” if the feeder is not available for that machine. Repeat until all of the available and unavailable feeders have been specified.

The new settings will take effect the next time optimization is performed.

3.3.4 Setting auto backup pins (from NXT V3.10 and higher)

This is used with the optional automatic backup pin function on the NXT. It is necessary to have Fuji Flexa V1.5.4 or higher and NXT control software V3.10 or higher in order to use this function. In addition, if the NXT does not have this option, then any settings made regarding this are ignored by the machine.

1. Select the [Top] or [Bottom] tab from the job information bar depending on the side of the panel the machine to be edited is located.
2. Double-click the name of the line to display the machines in that line.
3. Double-click the name of the machine for which to set the auto backup pins.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. There are several tabs at the bottom of the [Machine Configuration] pane. Select the [Process Options] tab and the process options for the machine display.
6. Select “Yes” from the drop-down list from the [Use Auto Backup Pin] setting in the [Backup Plate] group.

Note: If a special backup plate is required, enter the name of the required backup plate in the [Backup Plate Name] field on this page.

7. Double-click [Backup Pin] in the [Top]/[Bottom] tab in the job information bar.
8. Select [Display] from the [Format] menu and click the [Backup Pin] tab.
9. Set the desired colors for the top and bottom parts in order to distinquish between them better in the view and click [OK].

10. In the first empty row, double-click in that row's cell in the [Level] column and a drop-down list displays. Select the level for the backup pin. Refer to the table below for details.

Setting	Description
Global	When this is selected, the backup pin is placed at the specified position in all modules. This is the default setting.
Local	When this is selected, the backup pin is placed at the specified position only in the module placing a specified part. When this setting is selected, the related part reference number must be specified in the [Edit Part Info] dialog box for that backup pin.

11. Click the data cell in the [Ref] column for that row to select that item.
12. Enter a unique reference designator for the backup pin. It is possible to use the default name, as long as it is not used anywhere else in the job as a reference designator.
13. Click the data cell in the [Pos X] column for that row to select it.
14. Enter the X-coordinate for the backup pin to be set. This coordinate is based on the panel origin position.

Note: If the coordinate position is not known, click in the view and move the pointer to the position to set the backup pin. Note the coordinates that display in the left side of the status bar. These are the values that should be entered as the X- and Y-coordinates for the backup pin.

15. Click the data cell in the [Pos Y] column for that row to select it.
16. Enter the Y-coordinate for the backup pin to be set. This coordinate is based on the panel origin position.
17. If the [Level] setting for the backup pin is "Local", then select that row by clicking the gray box to the left of the row. Right-click and select [Edit Part Info]. Click to button to the right of the [Ref. list] display and select the reference designator for the part that the backup pin is to be linked with from the displayed list. Click [OK] and then [OK] in the [Edit Part Info] dialog box. The backup pin is then linked to the specified part and will be set in the module that places that part.

Note: It is possible to select multiple parts in the displayed list.

18. Repeat steps 10 to 17 until all of the desired backup pins have been specified for that side of the panel.
19. Repeat these procedures to make backup pin settings for the other side of the board.

3.3.5 Specifying a panel edge sequence (from NXT V3.10 and higher)

This is used for checking the panel stopping position when the panel stopping position function is being used on the NXT. It is necessary to have a compatible version of Fuji Flexa and NXT control software V3.10 or higher in order to use this function and the panel stopping position correction function must be enabled in the machine configuration. In addition, if the panel stopping position correction function is turned off in the machine configuration, then any settings made regarding this are ignored by the machine.

Making machine configuration settings

The following procedures are used to turn on the panel stopping position correction function

for the machine.

1. Double-click the [Internet Explorer] icon on the desktop.
2. Enter the address (URL) "http://<NXT accessory software server name>/fujiweb" and then press **Enter**. If the server computer is located and the server is running, a loading page displays. Once the necessary items have been loaded, the [Home] page displays. This page provides basic production information for the NXTs.
3. From Floor Monitor, click the machine or module number for the NXT for which Machine Accessories is to be used. The Machine Accessories log on page is displayed
4. Enter or select a user ID from the drop-down list.
5. Enter the password for the user and click [Log on]. Once connected to the machine, the top diagram of the picture will match the machine that was selected. In the lower left side, the menu for possible actions displays. In the lower right side, the details for the selected item displays.
6. Click [Machine Configuration] from [Menu]. Accessory Software connects to the machine and receives the machine information. When completed, the settings page displays.
7. Select [Loader Settings] from the [Category] drop-down list. When a category has been selected the settings shown under the list automatically change to the selected category.
8. Select the [ON (Panel Edge)] option for [Panel position correction].
9. Once the settings have been completed, click [Send to Machine] to send the new setting to the machine. During transmission to the machine, the operation panel will change to the transmission display. When sending the new setting is complete, a page displays with that message.
10. Once all changed settings have been sent to the machine, click [Close].

Making a panel edge check sequence in Fuji Flexa

1. Select the [Top] or [Bottom] tab from the job information bar depending on the side of the panel the panel edge sequence is to be added.
2. Double-click [Coordinate] to display the “All” window.
3. There are several tabs at the bottom of the [Coordinate] pane. Select the [Mark] tab and the mark sequences are displayed.
4. Scroll to the bottom of the sequences until the last blank line is visible.
5. Click in the blank data cell for “Board” and select the “0” from the drop-down list.
6. Press **Tab** to move to the type data cell, and select “Panel Edge” from the drop-down list.
7. Press **Tab** to move to the level data cell, and select “Panel” from the drop-down list.
8. Press **Tab** to move to the reference data cell, and enter a unique reference number.
9. Press **Tab** to move to the X-position data cell, and enter the X-position for the panel edge to be checked. This position must be inside of the panel. Refer to the “Cautions regarding panel edge position” section below for information about the panel edge checking position.

10. Press **Tab** to move to the Y-position data cell, and enter the Y-position for the panel edge to be checked. Generally, this position will be 12 mm and is the Y-position that the felt paper is usually applied on the backup plate. This position must be inside of the panel. Refer to the “Cautions regarding the panel edge check position” section below for information about the panel edge checking position.

11. Press **Tab** to move to the mark name data cell, leave this field blank.

12. Enter any other information as necessary.

Note: It is not possible to make 2 or more panel edge check sequences for a panel.

Cautions regarding the panel edge check position

Be sure to note the following caution points about the panel edge check position.

- The X- and Y-position must be inside of the panel, but very close to the edge position to be checked (within the scanning area).
- Always specify a section with a straight line of the panel edge. Do not include a cut-out section in the scan area as panel play may affect positioning.
- When panel rotation is specified, set the coordinates based on the panel orientation at the time of transportation on the conveyor.
- Specify a location that does not contain any bright objects such as backup pins, for times when there is no panel on the conveyor. Nor place any bright items in the specified area (such as backup pins, soiled/grease areas, soft backup pin tips).

Making job machine configuration settings in Fuji Flexa

Generally the machine configuration settings for the panel edge will be appropriate and do not need to be changed. Follow the prodecures below if the settings need to be changed.

1. Select the [Top] or [Bottom] tab from the job information bar depending on the side of the panel the machine to be edited is located.
2. Double-click the name of the line to display the machines in that line.
3. Double-click the name of the machine for which to set the auto backup pins.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. There are several tabs at the bottom of the [Machine Configuration] pane. Select the [Process Options] tab and the process options for the machine display.
6. Enter the appropriate panel stopping position correction settings process settings for the machine if the panel stopping position correction function is turned on. Refer to the table below for information on these settings.

Setting	Description
Scan Area X/Y	This specifies the size of the area in the X- and Y-direction checked for the panel edge when correcting the panel stopping position.

Setting	Description
Shutter Speed	This setting specifies the shutter speed used by the mark camera when checking for the panel edge. The larger the value, the slower the shutter speed and the image becomes brighter. Generally, the default setting is appropriate.
Color	Specify which lighting should be used to check for the panel edge. Different settings will be required depending on the color of the panel. Generally, the default setting is appropriate.
Pattern	Specify which lights should be used to check for the panel edge. Different settings will be required depending on the color of the panel. Generally, the default setting is appropriate.

3.3.6 Assigning an alternate feeder

The method for assigning a fixed alternate feeder for an NXT is different than other machines. For other machines an alternate feeder loop has to be created while for the NXT an extra feeder with the part is just added to the module and the NXT will automatically use this extra feeder as an alternate feeder and a loop does not have to be created. It is not possible to specify which feeder is to be used next for the NXT if there are two or more alternate feeders as this is decided by the machine. If using Fujitrax Verifier, use the dynamic alternate feeder function.

1. Select the [Top] or [Bottom] tab from the job information bar depending on which side of the panel the machine is located for which the configuration data needs to be edited.
2. Double-click the name of the line to display the machines in that line.
3. Double-click the name of the NXT machine to set the configuration file for to display the items for that machine.
4. Double-click [Configuration] under the machines name and a window displays in the data area.
5. There are several tabs at the bottom of the [Machine Configuration] pane. Click the [Feeder Setup] tab.
6. Select the module for which the alternate feeder is to be added.
7. Select the feeder position in which to add the alternate feeder by selecting the gray extreme left cell of that row for the feeder.
8. Right-click and select [Add Feeder] from the shortcut menu and the [Add Feeder] dialog box is displayed.
9. Select the part for which this feeder is to be the alternate feeder from the drop-down list and click [OK]. The extra feeder is added and the NXT will use this extra feeder as an alternate feeder.

3.4 Line Balancing

Line balance is performed to balance the workload of each machine as much as possible. Due to the unique nature of putting multiple NXT bases together to create one large NXT machine, the concept of line balancing has greatly changed for lines with only NXT bases. For line with only NXT bases made up into one NXT machine, all parts will be simply assigned to the NXT machine. This will still be an important step for lines with multiple machines though.

Note: This means that if a NXT machine is the only machine in a line then the assign part command can be used to simply assign all of the parts to the NXT machine.

1. Select [Line Balance...] from the [Tools] menu and the [Line Balancer Options] dialog box displays.
2. Select the appropriate option and click [Start] to start the line balancing process and the [Line Balancer] dialog box displays with the current status of the balancing process. If the option “Do not use current feeder allocation” is used, then all of the parts are assigned to the different machine without considering any parts already set in the feeder setups. If the option “Use current feeder allocation” is selected, then parts are assigned to machines while considering any parts already present in the feeder setup. This means that if a part is already in the feeder setup for a machine, then the matching part is possibly assigned to that machine.
3. If there are any errors, click [Error Details…] to view the errors. Once completed, click [Close] to close the dialog box. If there were errors, note what the errors were and correct them and then rebalance the line again.

3.5 Optimizing

After balancing the line, the parts need to be distributed to the different modules and the sequences for each module need to be arranged in the optimum order to minimize cycle time. The optimizer is used to arrange the sequences in the best order. In addition to the optimizer within Job Builder, there is another optional optimizer for optimizing different jobs or sides. NXT Dual Production Optimizer is capable of optimizing two different jobs to run on different lanes or two sides of a panel using two different lanes. For procedures on using this optimizer, refer to the section Dual job optimizing.

3.5.1 Optimizing in Job Builder

The following procedures are used for optimizing one job only.

1. Select [Optimize...] from the [Tools] menu to display the [Optimize Options] dialog box.
2. To optimize the feeder arrangement, select the [Allocate feeders] option. After specifying the desired settings, click [OK] to display the [Select Machine] dialog box.
3. Select the desired machines, and click [OK].
4. Click [Yes] in the confirmation dialog box to confirm that optimization is to be performed for the selected machines.
5. The [Optimize] dialog box displays. In this dialog box, the status of the optimization process displays along with any errors. If any errors occur, click [Error Details] to display further details. Click [Close] when the optimization process is complete.

Note: Once the job has been optimized, it can be transmitted to the NXT machine. It is not necessary to generate recipes for the NXT.

3.5.2 Dual job optimizing

In order to perform dual job optimization, it is necessary to have the optional software, NXT Dual Production Optimizer, installed on the computer.

1. Ensure that both jobs for which optimization is to be performed are complete in the terms that they can be used to produce panels.
2. Click the [Start] button, point to [Programs] > [Fuji Flexa] and then click [NXT Dual Production Optimizer]. The first step of the wizard displays.
3. Specify whether optimization to to be performed between two different jobs or for both panel sides for one job by selecting the appropriate option.
4. After selecting the desired job option, click the button with the three periods to the right of the job text box for lane 1. A dialog box displays the available jobs.
5. Select the desired job to be produced using lane 1 and click [OK]. The name of the job then displays in the job text box.

Note: If an error occurs about not being able to open the job, ensure that the job is not currently opened. Opened jobs cannot be selected.

6. Specify the panel side for the selected job by using the drop-down list to the left of the button.
7. If two separate jobs are to be optimized, then repeat steps 4 to 6 for Lane 2.
8. Click [Next].

9. Select the machine to be optimized,
10. Select any desired optimization options and clear any unwanted options.
11. Click [Next] and the optimization process begins. The current status of the optimization process displays in a message box. When the optimization processing is completed, the final step of the wizard displays with the cycle time for each module.
12. To view a text file with a breakdown of the cycle times, click [Report]. To save the optimization processing back to the jobs, click [Save]. When [Save] is clicked, the results are saved. If the optimization results are not to be used, proceed to the next step without clicking [Save].
13. Click [Cancel] and the wizard is closed.

3.6 Generating Reports

With the NXT, it is not necessary to generate recipes in order to transmit the job to the machine. Reports are only generated during the recipe generation process. Therefore, in order to view reports, it is necessary to generate recipes. If data in the job has been changed that needs to be reflected in a report, then recipes need to be regenerated for the change to be reflected (e.g., feeder position has been moved, part has been added).

3.6.1 Manually generating reports

1. Select [Generate Recipes...] from the [Tools] menu to display the [Select Machine] dialog box.
2. Select the NXT machine, and click [OK] to generate recipes.
3. Click [Yes] in the message to confirm that recipes for the selected machines are to be generated.
4. The [Generate Recipes] dialog box displays. In this dialog box, the status of the recipe generation process displays along with any errors. If any errors occur, click [Error Details] to display further details. Click [Close] when all of the recipes have been generated.

Note: Reports for the selected machines are automatically generated when recipes are generated. To display the available reports, double-click [Report] found in the page for the [Top] or [Bottom] tab.

3.6.2 Automatically generating reports when the job is saved

When this option is used, reports and recipes for all machines are automatically generated every time the job is saved. This does increase the amount of time it takes to save a job.

1. Select [Options…] from the [Tools] menu and the [Options] dialog box displays.
2. Select the [Recipe Creation] tab.
3. To generate recipes and reports every time a job is saved, select the check box for [Generate recipes on save] and click [OK]

Note: To display the available reports, double-click [Report] found in the page for the [Top] or [Bottom] tab.

To stop Fuji Flexa from generating recipes and reports every time a job is saved, perform the above procedures, but clear the check box for [Generate recipes on save].

4. Part Data Settings

4.1 Introduction

The NXT requires part data the same as other Fuji machines and the most of part data settings are the same as other Fuji machines. One of the major areas where part data settings are different for the NXT machine versus other Fuji machines is the vision related settings. This chapter lists the part data settings used by the NXT and provides details on the settings that are different from other Fuji machines. For details on theThis is a machine control setting. settings that are the same as other machines, refer to the Fuji Flexa Reference Manual or the Fuji Flexa online help file (select the data item to check in the editor and then push F1 on the keyboard, and the help file displays the information about that item). The part data settings in this are broken down into three groups that correspond to the way the settings are grouped when using relational mode for part data in Fuji Flexa.

Part data is created and edited with Part Editor or if the part data is using relational mode, Part Number Editor, Shape Editor, and Package Editor. In addition, part templates are created and edited with Template Editor. Part data can be created manually, by importing data, or by using the New Part Wizard. For procedures on using these items, refer to the Fuji Flexa User Manual.

4.2 Part Data

The following list is the part data settings used by the NXT for part data.

Name	Comments	Chg
Part Shape		X
Package Name		X
Polarized		X
Direction	This is a vision related setting.	O
Barcode Label	This setting is required when using Fujitrax Verifier. If Fujitrax Verifier is not used, then this setting is not required.	X
Part Comment		X
Allow Multiple Slots	Used during line balancing and optimization only.	X
Limit Target Machines	Used during line balancing only.	X
Target Machine List	Only displays if [Limit Target Machine] is “Yes”.	X

The settings for items with an O in the “Chg” column can be changed in MEdit. The settings for items with an X in this column cannot be changed in MEdit.

4.2.1 Part data details

Part shape

Specify the shape data that is used for the part.

Package Name

Specify the package data that is used for the part.

Polarized

Specify whether or not the part has polarity. A part is considered to have polarity when the part is not symmetrical, electrically and/or physically. If the part has no polarity, then a placement of 180 degrees opposite to the specified angle does not affect the board.

Direction

Specify how the part is oriented in the package compared to the direction the part was created in the shape library and zero orientation.

This is used by the placing machines for vision processing and placement.

Barcode Label

Specify the barcode label for the feeder verification check if Fujitrax Verifier is used.

Part Comment

Enter a part comment.

Allow Multiple Slots

Specify whether or not to allocate the same part to multiple machines and feeders during line balancing and optimization.

Setting	Description
Yes	Specifies that it is possible to divide the part among multiple machines during line balancing. During optimization it is also possible that the part will be divided into multiple feeders during optimization.\
No	Line balancer and Optimizer do not divide the part among multiple machines and feeders.

Note: The setting [Feeder Duplication] (NXT) has priority in optimization over [Allow Multiple Slots].

Limit Target Machines

Specify whether or not to limit this part to specific machines. If this setting is “No”, then the part can be allocated to any machine that can place the part. If this setting is “Yes”, then the part can only be allocated to one of the machines specified in the [Target Machine List]. The [Target Machine List] only displays if this setting is “Yes”.

Target Machine List

When the part is to be limited to specific machines only by changing the [Limit Target Machines] setting to “Yes”, then this setting is displayed and then machines to which the part can be allocated to must be specified here. Click the value cell for this setting twice and a [Select Machine Model] dialog box is displayed. Select the machines to which the part can be allocated and then click [OK].

4.3 Shape Data

The following list is the part data settings used by the NXT for shape data.

4.3.1 Shape Information tab

Section	Name	Comments	Chg
Body	Length (X)	This is a vision related setting.	O
	Width (Y)	This is a vision related setting.	O
	Length Tolerance (X)	This is a vision related setting.	O
	Width Tolerance (Y)	This is a vision related setting.	O
	Height	This is a machine control setting.	O
	Color	This is a vision related setting.	O
Lead	Pitch Tolerance	This is a vision related setting.	O
	Element Information	If the part has elements, then they must be specified in this location. All settings in this area are vision related settings.	O
Lead - Element Information	Side	This is a vision related setting.	O
	Position X	This is a vision related setting.	O
	Position Y	This is a vision related setting.	O
	Quantity	This is a vision related setting.	O
	Pitch	This is a vision related setting.	O
	Width	This is a vision related setting.	O
	Width Tolerance	This is a vision related setting.	O
	Length	This is a vision related setting.	O
	Length Tolerance	This is a vision related setting.	O
	Center Tolerance	This is a vision related setting.	O
	Result	This is a vision related setting.	O
	P_pattern	This is a vision related setting.	O

The settings for items with an O in the “Chg” column can be changed in MEdit. The settings for items with an X in this column cannot be changed in MEdit.

4.3.2 Shape Process tab

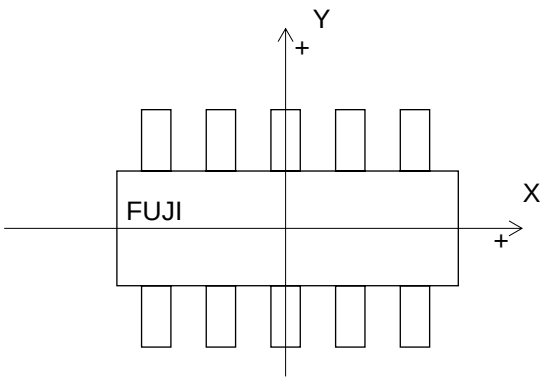
Section	Name	Comments	Chg
Body	Location Pin Length	This is a machine control setting.	O
Lead	Check Point	This is a vision related setting.	O
	Quantity Check Limit	This is a vision related setting.	O
	Lead Brightness	This is a vision related setting.	O
Process - Nozzle	Minimum Diameter	This is a machine control setting.	O
	Maximum Diameter	This is a machine control setting.	O
	Name	This is a machine control setting.	O
Process - Pick	Do Auto Offset	This is a machine control setting.	O
	Offset X	This is a machine control setting.	O
	Offset Y	This is a machine control setting.	O
	Offset Z	This is a machine control setting.	O
	Tray Pick Offset Z	This is a machine control setting.	O
	Soft Pick Speed	This is a machine control setting.	O
	Enable Pressure Sensor	This is a machine control setting.	O
	Offset Q	This is a machine control setting.	X
Process - Pick - Tolerance Check	Tolerance X	This is a machine control setting.	O
	Tolerance Y	This is a machine control setting.	O
	Tolerance Q	This is a machine control setting.	O
Process - Pick - MTU	Shuttle Speed	This is a machine control setting.	O
	Magazine Speed	This is a machine control setting.	O
Process - Place	Offset Z	This is a machine control setting.	O
	Pressure	This is a machine control setting.	O
	Transport Speed	This is a machine control setting.	O
	Transport Speed Z	This is a machine control setting.	O
	Transport Speed Q	This is a machine control setting.	O
	Soft Place Speed	This is a machine control setting.	O
	Place Motion Selection	This is a machine control setting.	O
	Placing Thrust Pressure	This is a machine control setting.	O
	Placement Wait Time	This is a machine control setting.	O

Section	Name	Comments	Chg
Process - Error	Alt Feeder Trigger	This setting is not used from the part data. This setting for the NXT is set through Accessory Software.	NA
	Dump Position	This is a machine control setting.	O
	Forcing Recovery Times As 0	This is a machine control setting.	O
	Recovery Times	This is a machine control setting.	O
Vision	Vision Type	Refer to Vision Type Details for information.	O
	Vision Area Offset X	This is an OF head setting.	X
	Vision Area Offset Y	This is an OF head setting.	X
Pin Check	Pin Check Mode	This is a vision related setting.	X
	Is Bottom Mark Present	This is a vision related setting.	X
	Is Bump Present	This is a vision related setting.	X
	Upper Left X	This is a vision related setting.	X
	Upper Left Y	This is a vision related setting.	X
	Lower Right X	This is a vision related setting.	X
	Lower Right Y	This is a vision related setting.	X
Coplanarity	Not Supported Yet		X

The settings for items with an O in the “Chg” column can be changed in MEdit. The settings for items with an X in this column cannot be changed in MEdit. NA means that this part data setting is not set at the machine so any changes here are not reflected at the machine.

Entering part dimensions and positions

The dimensions and positions for the part are entered in the X- and Y-directions when viewed from above.



XY-coordinates (part upper surface)

4.3.3 Shape information details

Body

Length (X)

Specify X-direction length of the part's body size.

Width (Y)

Specify Y-direction length of the part's body size.

Length Tolerance (X)

Specify the part's X-direction length tolerance.

Width Tolerance (Y)

Specify the part's Y-direction length tolerance.

Height

Specify the part's height.

Height Tolerance

Specify the part's height tolerance.

Color

For the NXT, this is used for vision processing of parts. Parts that are using the body detection vision types must have the color specified as “White”.

The vision type that this setting must be “White” are: 60, 61, 62, 63, 65, 71, 74, 80, 153, 160, and 252.

Parts using these vision type that do not appear “white” in the images (the body is completly black with no leads), cannot be vision processed using these vision types.

Lead

Pitch Tolerance

It is the tolerance allowed for the deviation from the pitch as a percentage of the lead pitch length. If no setting is made here, processing is carried out using a default value of 30%.

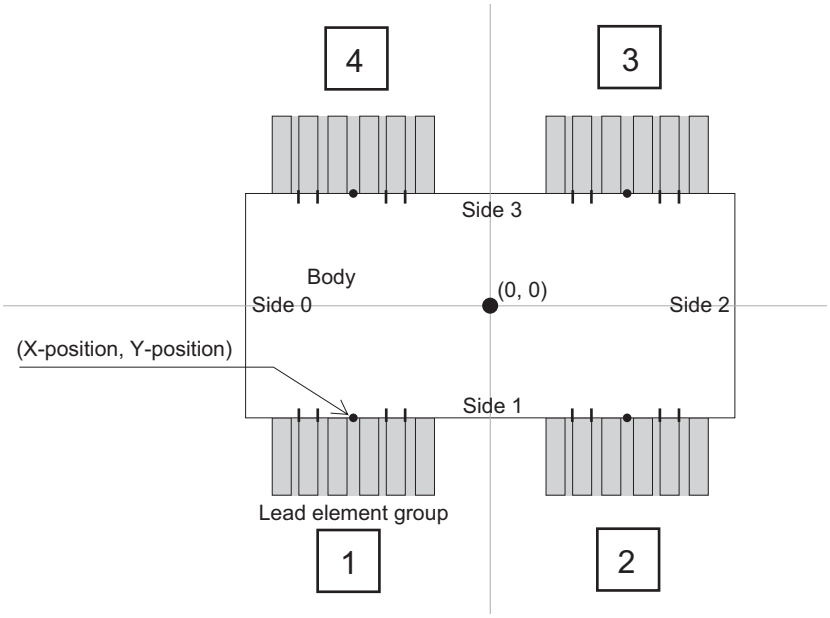
Element Information

Set element related data. An element is a group of leads on the same side of a part which have the same length, width, and pitch. As there may be several elements on a part, numbers are assigned to the elements for identification purposes.

Double-click the data cell for this field and the [Element Information] dialog box displays.

Position X, Y

This expresses the X- and Y-coordinates from the center of the part to the point on the side of the part that is central with the element. (Refer to the figure below)



Side

Specify the side on which the element is located. Side numbers should always be assigned as shown in the above figure (at direction 0).

P_pattern

Specify how the leads appear to the vision processing system. Select the P Pattern from the choices that matches the lead image.

Refer to section 3.5 P_pattern Details for details on settings for this item. The table below lists the common P_pattern settings for the NXT.

Part Type	P Pattern Number
SOIC, SOT	4
QFP (leads on 4 sides)	14
SOJ	4
PLCC	12
BGA (White body)	1
BGA (Black body)	2

Result

Specify the type of check which will be performed on the leads in the element. Normally, this is set to [Inspect]. The check items are described below.

Group	Setting	Description
Vision Processing Options	Inspect	Specifies the usual vision processing inspection without special checks. This setting is specified for standard parts which do not have special shapes.
	Don't inspect	The element is not inspected.
	Virtual lead	This setting is used to define virtual leads. When the part is inspected, the vision processing system verifies that there are no leads in the virtual lead area. This function is useful for polarity checks.
	Matrix	Use this for BGAs and flip chips. Because the leads are defined as a two dimensional array on these parts, two records are necessary to define one element. Result is set to “Inspect” in the first element and in the second element result is set to "Matrix." The "Matrix" setting alerts the vision processing system that this is a grid-type part and that two consecutive element records describe one element.
Check Items	No length tolerance check	Select this item to disable the lead length tolerance check. This setting is used when there is a wide variation in the length of the leads.
	No width tolerance check	Select this item to disable the lead width tolerance check. This setting is used when there is a wide variation in the width of the leads.
	First pin check	Use this to check that there is no lead to the left of the very first lead detected (leads are inspected from left to right).
	Last pin check	Select this item to enable the last pin check function. In left to right vision processing of leads, this function verifies that there is no lead to the right of the last detected lead. In top to bottom vision processing of leads, it verifies that there is no lead below the last detected lead.
	No center length tolerance check	Not supported
	No center width tolerance check	Not supported

Quantity

Specify the number of leads in the element.

Pitch

Specify the pitch of the element leads.

Width

Specify the width of element leads.

Width Tolerance

Specify the width tolerance of element leads.

Length

Specify the length of the element leads.

Length Tolerance

Specify the length tolerance of the element leads.

Center Tolerance

Specify the bend tolerance for the element leads.

4.3.4 Shape process details

Body

Location Pin Length

Specify the length in mm of any locating pins on the shape if they are present. This setting is especially required if using the insertion pressure function.

Lead

Check Point

Specify the point on the leads (measured from the end of the lead) that is checked. If 0 is specified, the check occurs at the lead's 30% position. The following settings represent general guidelines for various parts.

Part Type	Setting
SOP / QPF	10 to 90% (standard setting: 30%)
PLCCs / SOJ	50 to 70% (standard setting: 60%)
BGA / Flip Chip	50%

Quantity Check Limit

Specify the number of leads on leaded parts which must be detected for the part to pass inspection. If this is set to 100%, all the leads must be detected; if set to 90%, 90% of the leads must be detected. This is normally set to 100%.

Lead Brightness

This sets the brightness level for leads (bumps) that is used when automatic determination of lead brightness is difficult. Correspondingly larger values should be specified for brighter leads. When set to 0, brightness is determined automatically.

Process - Nozzle

Minimum Diameter

Specify the minimum nozzle diameter which can be used to pick up the part with the shape.

Maximum Diameter

Specify the maximum nozzle diameter which can be used to pick up the part with the shape.

Name

Set this parameter for special nozzles. Although a nozzle is normally identified by the size of its circular pickup area, a name is specified for special non-circular nozzles.

Process - Pick

Do Auto Offset

Specify whether automatic compensation is performed for pick-up offsets. When No is specified, the center of the part is used as the part pick-up position. However, pick-up at the part center may not be possible for various reasons. To counter this, the amount of offset is calculated by vision processing and this information can be fed back to the pick-up position so that the part can be picked up at its center.

If parts are not being correctly picked up at their centers and "Do Auto Offset" is set to Yes, the offset between the nozzle center and the part center is calculated and fed back to the control software so that subsequent parts can be correctly picked at their centers.

Offset X, Y

Normally, parts are picked up at the center of their bodies. However, for some odd shaped parts this is not possible. If necessary, specify an offset from the center of the packaging cavity to the pickup point on the body for the part to pick-up such parts. If 0 is entered, the pickup point is the center of the packaging cavity. The value specified in Offset X, Y are the point at which the part is picked up, and the center of the camera field of view is aligned with the center of the nozzle during vision processing.

Offset Z

Specify an up or down offset for the pickup position of the part in a feeder cavity.

Tray Pick Offset Z

Specify an up or down offset for the pick-up point of the part in a tray cavity.

Soft Pick Speed

Specify the percentage of the maximum possible Z-axis speed at which the part is carried after pick-up.

Enable Pressure Sensor

This specifies whether or not the part using the shape data is picked with 220 gf when using the H01 head. If set to "Yes" the part is picked using pressure conrol, while if the setting is "No" the pressure control is not used when the part is picked. This setting is only applicable for the H01 head on the NXT. This setting has priority over soft pick-up settings.

Tolerance X / Tolerance Y

This sets the tolerance for misalignment of the nozzle center and part center. The machine rejects the part if these tolerances are exceeded.

Tolerance Q

Specify the tolerance for misalignments between the nozzle and part centers in the Q direction. Generally, 30 degrees is entered for Tolerance Q. For parts with a body dimension larger than 20 mm, input 15 degrees.

Shuttle Speed

Specify the shuttle speed at which an MTU tray is loaded into the machine. A setting of 4

is the fastest speed, while a setting of 1 is the slowest.

Magazine Speed

Specify the acceleration/deceleration rate used when raising and lowering trays in the MTU.

Process - Place

Offset Z

Specify an offset value for part placement height.

Pressure

Specify the force to be used to place a part using this shape when placed using a H01 head. The valid range for the NXT is 220 gf to 1020 gf. If "0" is specified here, the part is placed using no pressure control. When settings less than the minimum are specified, the part is placed using the minimum pressure. When settings more than maximum are specified, the part is placed using the maximum pressure. This setting is only applicable for H01 heads on the NXT. This setting has priority over soft placement settings.

Transport Speed

Specify, as a percentage of the maximum transport speed, the speed at which the placing head carries the part from the pick-up position to the placing position.

Transport Speed Z

Specify the maximum speed at which the nozzle moves along the Z axis while transporting a part (i.e., from pickup to placement).

Transport Speed Q

Specify the maximum speed at which the nozzle rotates while transporting a part (I.e., from pickup to placement).

Soft Place Speed

This sets the Z-axis transport speed. This is the speed at which the part is lowered to the surface of the board. If this speed is too high, the part will spring back when the nozzle retracts, resulting in a misalignment.

Place Motion Selection (from NXT V3.10)

Specify the pressure (torque) method to be used for insertation pressure. This can be used with the H01 head. In order to use this function, Fuji Flexa V2.2.0 or higher must be used. The default setting of "0" disables this function. Enter a value between 1 to 4 to enable insertion pressure placing. If 5 is entered, insertion pressure is not used but if a claw is used to pick the part, the margin between the top of the part and the ledge on the claw will be 0 mm (normally there is a clearance of 0.5 mm).

Setting	Description
0	Insertion pressure is not used and the part is picked up and placed normally.
1 to 4	Any setting in this range is treated the same. Insertion pressure is used for placement. The part is picked up normally and during placement, the torque amount specified in [Placing Thrust Pressure] is used. If the torque is not reached in the proper placing height range, an error occurs and the part is not placed. (Operation is different for these settings for older machines. In order to preserve compatibility with older machines, this is used no matter what setting is specified.)
5	Insertion pressure is not used and the part is picked up and placed normally.

Note: Always ensure to use backup pins underneath the panel when using insertion pressure.

Note: When an insertion error occurs and the user then clears the error, the machine determines that the part has been placed and proceeds to the next placement sequence when production is resumed. (Recovery is not performed)

Placing Thrust Pressure

Specify the force between 39.2 N to 98 N to be used to insert the part in newtons when insertion pressure is to be used (a setting of 1 to 4 is set for [Place Motion Selection]).

Placement Wait Time

Specify the time that the axis stops at the lower Z-axis limit for the placement. If a value shorter than the default time specified for the head type is specified, then the time specified in this setting is ignored and the time for the head type is used instead.

Process - Error

Alt Feeder Trigger

This setting is not used from the part data, but is set for the NXT through Accessory Software.

Dump Position

Specify the location where parts are dumped when an error occurs.

Setting	Description
Conveyor	Parts are dumped on the reject parts conveyor.
Box	Parts are dumped into the reject parts box.
Tray	This setting is not supported for the NXT.

Forcing Recovery Times As 0 (from NXT V3.10)

Specify whether to force the number of recovery times to be zero (0) or to use the recovery times set in the shape/machine data. In order to use this function, Fuji Flexa V2.2.0 or higher must be used.

Setting	Description
Yes	The recovery times for parts using this shape data is zero (0) no matter what is set in the other recovery settings.
No	The recovery times specified in the shape data is used. However, if the recovery times setting in the shape data is zero, then the machine configuration recovery times setting is used.

Recovery Times

Specify the number of times a recovery is attempted when an error occurs. If no setting is specified here, the Recovery Count value in the configuration data is used.

Vision - Vision Type

Refer to section 3.6 Vision Type Details for details on settings for this item.

Process - Pin Check

Pin Check Mode

Specify the type of check to be performed to check the direction of the part. The checks “Bottom Mark” and “Bump” are supported on the NXT. If a mode other than those two are specified, then the NXT ignores the pin check modes settings and a direction check is not performed. If the part matches the specified conditions, then the part direction is considered to be correct and normal vision processing is performed. If the part does not match the specified conditions, then the direction is considered to be incorrect and an error occurs.

Setting	Description
Bottom Mark	This is used to check for the presence or absence of a mark on the bottom of a part in a specified location. This check can be performed for all vision types.
Bump	This is used to check for the presence or absence of a bump (ball lead) on the bottom of a part in a specified location. This check can only be performed for vision types that are for parts with bumps.

Is Bottom Mark Present

This setting only displays if “Bottom Mark” is specified for the pin check. Specify whether or not a bottom mark should be present in the specified area for orientation to be judged as being correct.

Is Bump Present

This setting only displays if “Bump” is specified for the pin check. Specify whether or not a bump should be present in the specified area for orientation to be judged as being correct.

Upper Left X

Specify the upper left X-coordinate of the check range in millimeters. The reference point is the center of the body with the part oriented in the zero direction.

Upper Left Y

Specify the upper left Y-coordinate of the check range in millimeters. The reference point is the center of the body with the part oriented in the zero direction.

Lower Right X

Specify the lower right X-coordinate of the check range in millimeters. The reference point is the center of the body with the part oriented in the zero direction.

Lower Right Y

Specify the lower right Y-coordinate of the check range in millimeters. The reference point is the center of the body with the part oriented in the zero direction.

4.4 Package Data

The following list is the part data settings used by the NXT for package data.

4.4.1 Package Information tab

Package Type	Name	Comments	Chg
All	Packaging Type	This is a machine control setting.	X
Tape	Tape Width	This is a machine control setting.	X
	Feed Pitch	This is a machine control setting.	X
Stick	Tape Width	This is a machine control setting.	X
	Tape Depth	This is a machine control setting.	X
Tray	Tray Length (X)	This is a machine control setting.	O
	Tray Width (Y)	This is a machine control setting.	O
	Tray Thickness	This is a machine control setting.	O
	First Pick Position X	This is a machine control setting.	O
	First Pick Position Y	This is a machine control setting.	O
	Column Pitch	This is a machine control setting.	O
	Row Pitch	This is a machine control setting.	O
	Column Quantity	This is a machine control setting.	X
	Row Quantity	This is a machine control setting.	X

The settings for items with an O in the “Chg” column can be changed in MEdit. The settings for items with an X in this column cannot be changed in MEdit.

4.4.2 Package Process tab

Package Type	Name	Comments	Chg
Tape	All settings	NXT does not use any of the package process settings available for tape.	X
Tray	Tray Type	Some tray types cannot be used.	O
	Tray Cavity Information	This is a machine control setting.	O

The settings for items with an O in the “Chg” column can be changed in MEdit. The settings for items with an X in this column cannot be changed in MEdit.

4.4.3 Package information details

Tape

Tape Width

Specify the width of the tape.

Feed Pitch

Specify the distance in millimeters from one cavity center to the next cavity center.

Stick

Tape Width

Specify the width of the stick feeder. Select “16mm” for the 1S and 1L type stick feeders (used for 18 mm wide or less sticks). Select “32mm” for the 2S and 2L type stick feeders (used for 36 mm wide or less sticks).

Tape Depth

Set this to “0”. This value is fixed.

Tray

Tray Length (X)

Specify the tray size in the X-dimension.

Tray Width (Y)

Specify the tray size in the Y-dimension.

Tray Thickness

Specify the tray thickness.

First Pickup Position X

Specify the X-position at which the machine should pick up the first part from the lower right corner of the tray.

First Pickup Position Y

Specify the Y-position at which the machine should pick up the first part from the lower right corner of the tray.

Column Pitch

Specify the pitch between the columns for the tray.

Row Pitch

Specify the pitch between the rows for the tray.

Column Quantity

Specify the number of columns for the tray.

Row Quantity

Specify the number of rows for the tray.

4.4.4 Package process details

Tape

None of the process settings that display when tape packaging is selected are used by the NXT.

Tray

Tray Type

Specify the type of tray being used.

Setting	Description
Matrix-Dump	Not yet supported.
No Matrix-Dump	Cannot be used for the NXT
No Matrix	Automatic discharge of the tray is not performed. Aluminum or other customer-specific trays that are heavier than normal cannot be lifted by the remover's vacuum pad. Instead, this mode is selected and the tray is changed by hand. If the machine fails to pick-up a part, it will attempt to pick up the part from the same position the specified number of recovery times. If pick-up is still unsuccessful, the machine proceeds to pick up parts from the next pick-up position.
Ref Cavity Info-Dump	Not supported yet.
Ref Cavity Info	Specify this item to have settings made at Tray Cavity Information used for pick-up information. The tray is removed by hand (as is the case when "No Matrix" is selected), when parts run out.

Tray Cavity Information

Specify the cavity information (I.e. which cavities have parts and which do not) for trays.

4.5 P_pattern Details

The p_pattern specifies the way the lead appears to the vision processing system and how the processing of the lead information for the part is to be performed. In addition, it is necessary to be aware that the placing position is affected by the specified p_pattern.

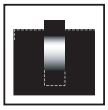
4.5.1 P_patterns used for the NXT

The following p_patterns are valid for use on the NXT with the frontlight system.

P_pattern	Example Part	Details	Lead Appearance
1	Bump parts	White body parts	
2	Bump parts Column parts	Black body parts	
4	SOIC	Lead tip and width detection is performed. The results are used for positioning information. Lead length is not used for positioning information with p_pattern types 12 and 14.	
	SOJ	The lead ends do not display well, but lead length is used for acquiring position information. Lead length is not used for acquiring positioning information with p_pattern type 12.	
6	LCC	Leads point into the body and the lead tips and width are detected. These results are used for positioning information.	
12	PLCC	Because the lead ends do not display well, lead width only is used for acquiring position information. In some cases, processing is more stable when using p_pattern type 14.	
14	QFP	Lead tip and width detection is performed. Because the lead width direction positioning is only required for determining the positioning, only the lead width direction results are used for positioning information.	
16	LCC	Leads extend into the body and the lead tips and width are detected. These results are used for positioning information. Because the lead width direction positioning is only required for determining the positioning, only the lead width direction results are used for positioning information.	

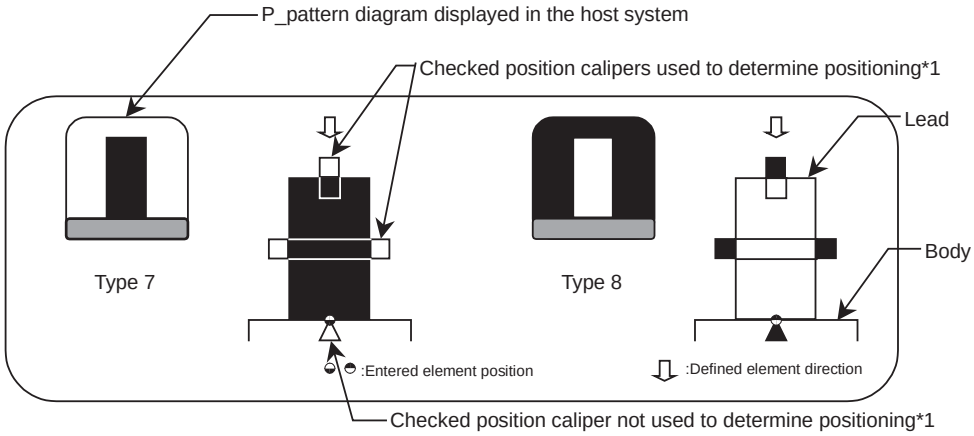
4.5.2 P_patterns not supported by the NXT

The following p_patterns are not valid for the NXT due to background conditions and/or the use of backlighting.

P_ pattern	Example Part	Details	Lead Appearance
24	SOJ	Used only with a white background. Lead tip and width detection is performed. The results are used for positioning information. Lead length is not used for positioning information with p_pattern type 34.	
34	PLCC	Used only with a white background. Lead tip and width detection is performed. Because the lead width direction positioning is only required for determining the positioning, only the lead width direction results are used for positioning information.	
3	SOIC	Used only with backlighting. Lead tip and width detection is performed. The results are used for positioning information. Lead length is not used for positioning information with p_pattern types 11 and 13.	
	SOT	Used only with backlighting. Lead tip and width detection is performed. The results are used for positioning information. Lead length is not used for positioning information with p_pattern types 11 and 13.	
5	PLCC Socket	Used only with backlighting. The leads point towards the inside of the body. Lead tip and width detection is performed. The results are used for positioning information.	
11	TAB	Used only with backlighting. Because the lead tip and base are both connected to the body, only the lead width is use for positioning information.	
13	QFP	Used only with backlighting. Lead tip and width detection is performed. Because the lead width direction positioning is only required for determining the positioning, only the lead width direction results are used for positioning information.	

4.5.3 P_pattern explanations

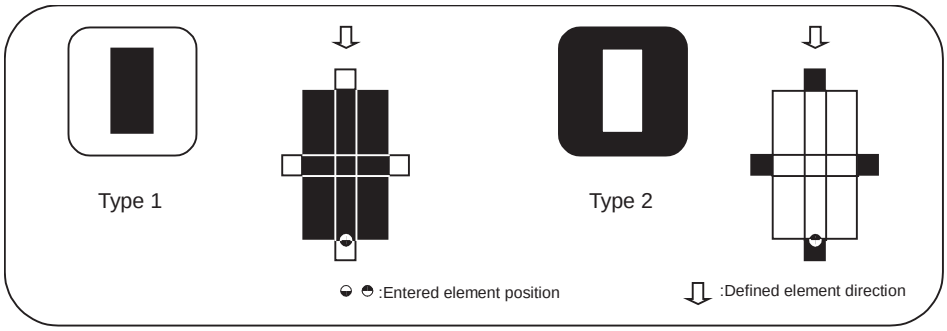
P_pattern diagram explanation



*1 The caliper is a vision processing tool used for detecting the boundary between light and dark.

NXTVPP012E

P_pattern 1, 2



NXTVPP013E

Because the lead and body boundary is clearly defined, all four sides of the leads are checked and the results are used to determine the part positioning.

- Type 1: The leads appear black and the outside circumference is white.
- Type 2: The leads appear white and the outside circumference is black

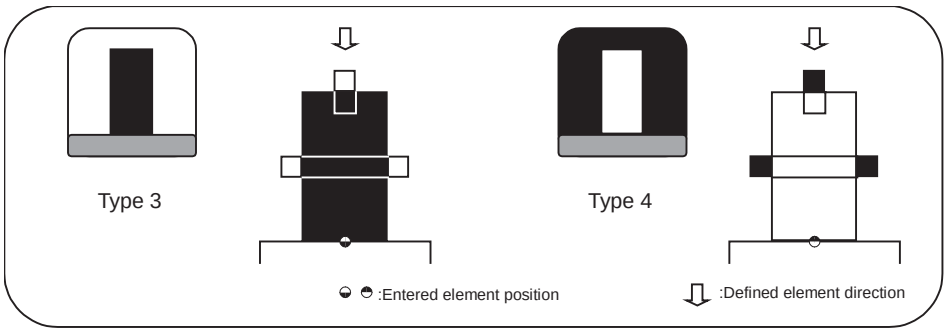
These are primarily used for parts with bumps.

Example Target Parts

Type 1: White body bumped parts processed with frontlighting.

Type 2: Black body bumped parts or CCGAs processed with frontlighting.

P_pattern 3, 4



NXTVPP014E

The leads extend out from the body of the part and are attached to the body at the base of the lead. Due to this, the base cannot be checked with a caliper. The lead tips and widths are checked and the results are used to determine the part positioning.

- Type 3: The lead appears black and the outside circumference is white.
- Type 4: The lead appears white and the outside circumference is black.

These are primarily used for parts with leads on one side or two opposing sides.

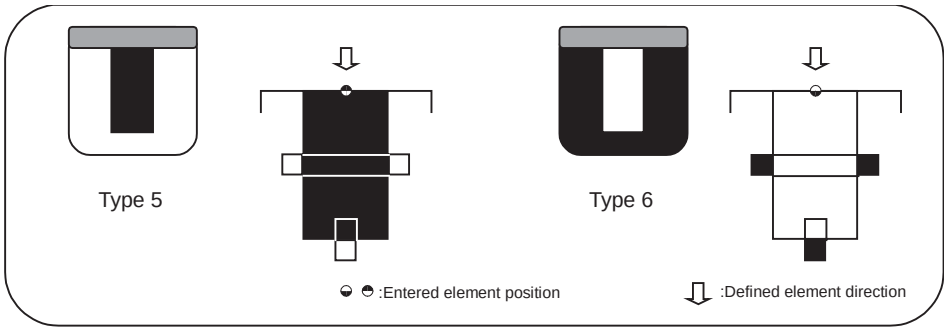
With parts that have leads on two perpendicular sides or more, the lead width direction is only required for determining the positioning, therefore it is recommended to select a different p_pattern (type: 11, 12, 13, 14) that matches the processing conditions.

Example Target Parts

Type 3: SOP parts processed with backlighting.

Type 4: Black background and body SOP/SOJ parts processed with frontlighting.

P_pattern 5, 6



NXTVPP015E

The leads point towards the inside of the body of the part (opposite from types 3 and 4) and are attached to the body at the base of the lead. Due to this, the base cannot be checked with a caliper. The lead tips and widths are checked and the results are used to determine the part positioning.

- Type 5: The lead appears black and the outside circumference is white.
- Type 6: The lead appears white and the outside circumference is black.

These are primarily used for parts with leads on one side or two opposing sides.

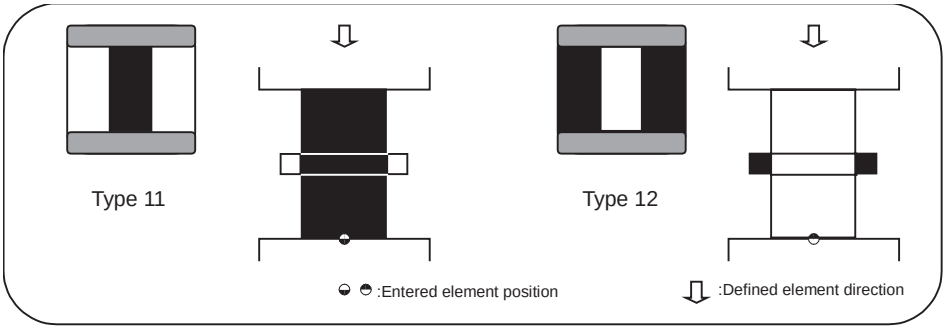
With parts that have leads on two perpendicular sides or more, the lead width direction is only required for determining the positioning, therefore it is recommended to select a different p_pattern (type: 11, 12, 15, 16) that matches the processing conditions.

Example Target Parts

Type 5: PLCC socket parts processed with backlighting.

Type 6: Parts with leads pointing towards inside of the body and has a black background and body and is processed with frontlighting.

P_pattern 11, 12



NXTVPP016E

These are used for parts with leads that are attached to the body at both ends of the leads and whose lead detection is not stable. The lead widths are checked and the results are used to determine the part positioning.

- Type 11: The lead appears black and the outside circumference is white.
- Type 12: The lead appears white and the outside circumference is black.

Except for parts using vision type 151 and picked up by a mechanical chuck in the Y-direction, these p_patterns can only be used for parts that have leads on two perpendicular sides or more. However, if it is possible to detect either end of the lead in a stable manner, it is recommended to select a different p_pattern (type: 13, 14, 15, 16) that matches the processing conditions.

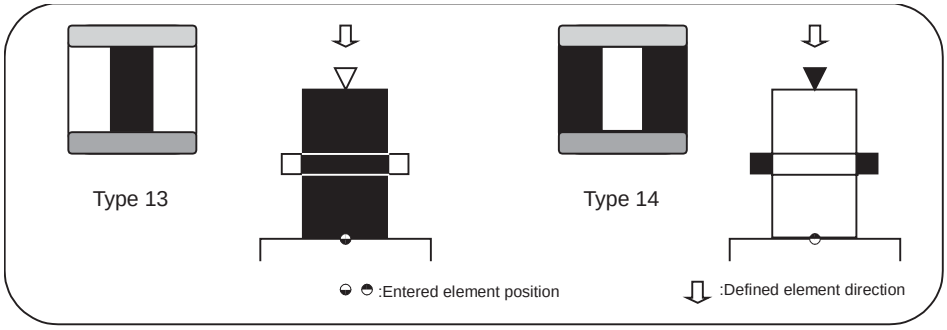
Furthermore, the information for the part positioning using the lead length is not acquired so these types cannot be used for parts with leads on one side or two opposing sides only.

Example Target Parts

Type 11: TAB parts processed with backlighting.

Type 12: Parts with lead tips that poorly reflect using vision type 151 and a mechanical chuck to pick the part in the Y-direction processed with frontlighting.

P_pattern 13, 14



NXTVPP017E

Basically, these are the same as p_pattern types 3 and 4. The major difference is that with these p_patterns, the outward pointing lead tip is not used for determining the part positioning. The lead width detection results only are used to determine the part positioning. The lead tip detection results are used only as reference data for internal vision processing items.

- Type 13: The lead appears black and the outside circumference is white.
- Type 14: The lead appears white and the outside circumference is black.

It is only possible to use this for parts that have leads that are to be detected on two perpendicular sides or more.

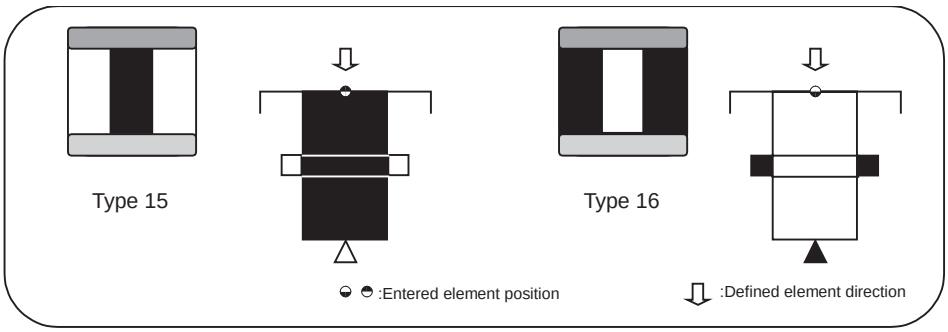
Furthermore, the information for the part positioning using the lead length is not acquired so these types cannot be used for parts with leads on one side or two opposing sides only.

Example Target Parts

Type 13: QFP parts processed with backlighting.

Type 14: Black background and body parts (e.g., QFP) processed with frontlighting.

P_pattern 15, 16



NXTVPP018E

Basically, these are the same as p_pattern types 5 and 6. The major difference is that with these p_patterns, the inward pointing lead tip is not used for determining the part positioning. The lead width detection results only are used to determine the part positioning. The lead tip detection results are used only as reference data for internal vision processing items.

- Type 15: The lead appears black and the outside circumference is white.
- Type 16: The lead appears white and the outside circumference is black.

It is only possible to use this for parts that have leads that are to be detected on two perpendicular sides or more.

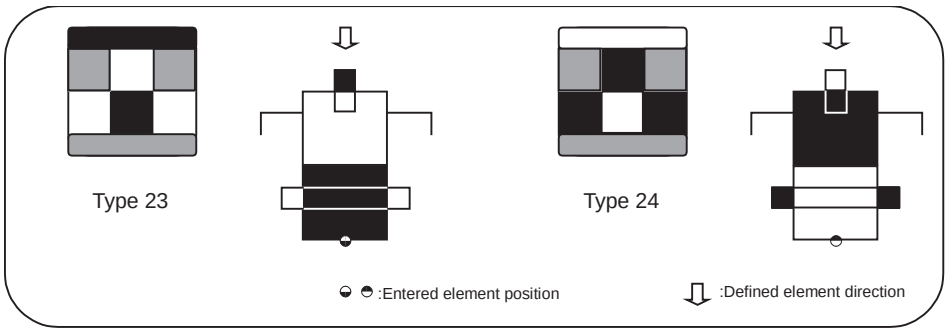
Furthermore, the information for the part positioning using the lead length is not acquired so these types cannot be used for parts with leads on one side or two opposing sides only.

Example Target Parts

Type 15:Currently no example target part exists.

Type 16:Black background and body parts with orthogonal leads in the body (e.g., LCC) processed with frontlighting.

P_pattern 23, 24



NXTVPP019E

These cannot be used on the NXT. The lead tip and width are detected and the results are used to determine the part position similar to p_pattern types 3 and 4. The major difference is that with these p_patterns, the color of the points on the lead at which the lead tip and lead width are detected are opposite.

- Type 23: The lead tip appears white, while the lead body appears black. The lead tip half of the outside circumference is black, while the body half is white.
- Type 24: The lead tip appears black, while the lead body appears white. The lead tip half of the outside circumference is white, while the body half is black.

These are primarily used for parts with J-leads on one side or two opposing sides.

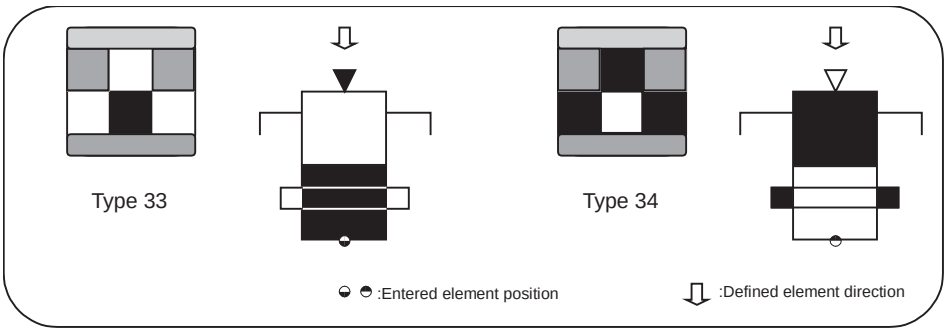
With parts that have J-leads on two perpendicular sides or more, the lead width direction is only required for determining the positioning, therefore it is recommended to select a different p_pattern (type: 33, 34) that matches the processing conditions.

Example Target Parts

Type 23: Currently no example target part exists.

Type 24: SOJ parts processed with frontlighting with a white background.

P_pattern 33, 34



NXTVPP020E

These cannot be used on the NXT. Basically, these types are the same as the types 23 and 24. The major difference is that with these p_patterns, the lead tip is not used for determining the part positioning. The lead width detection results only are used to determine the part positioning. The lead tip detection results are used only as reference data for internal vision processing items.

- Type 33: The lead tip appears white, while the lead body appears black. The lead tip half of the outside circumference is black, while the body half is white.
- Type 34: The lead tip appears black, while the lead body appears white. The lead tip half of the outside circumference is white, while the body half is black.

It is only possible to use this for parts that have leads that are to be detected on two perpendicular sides or more.

Furthermore, the information for the part positioning using the lead length is not acquired so these types cannot be used for parts with leads on one side or two opposing sides only.

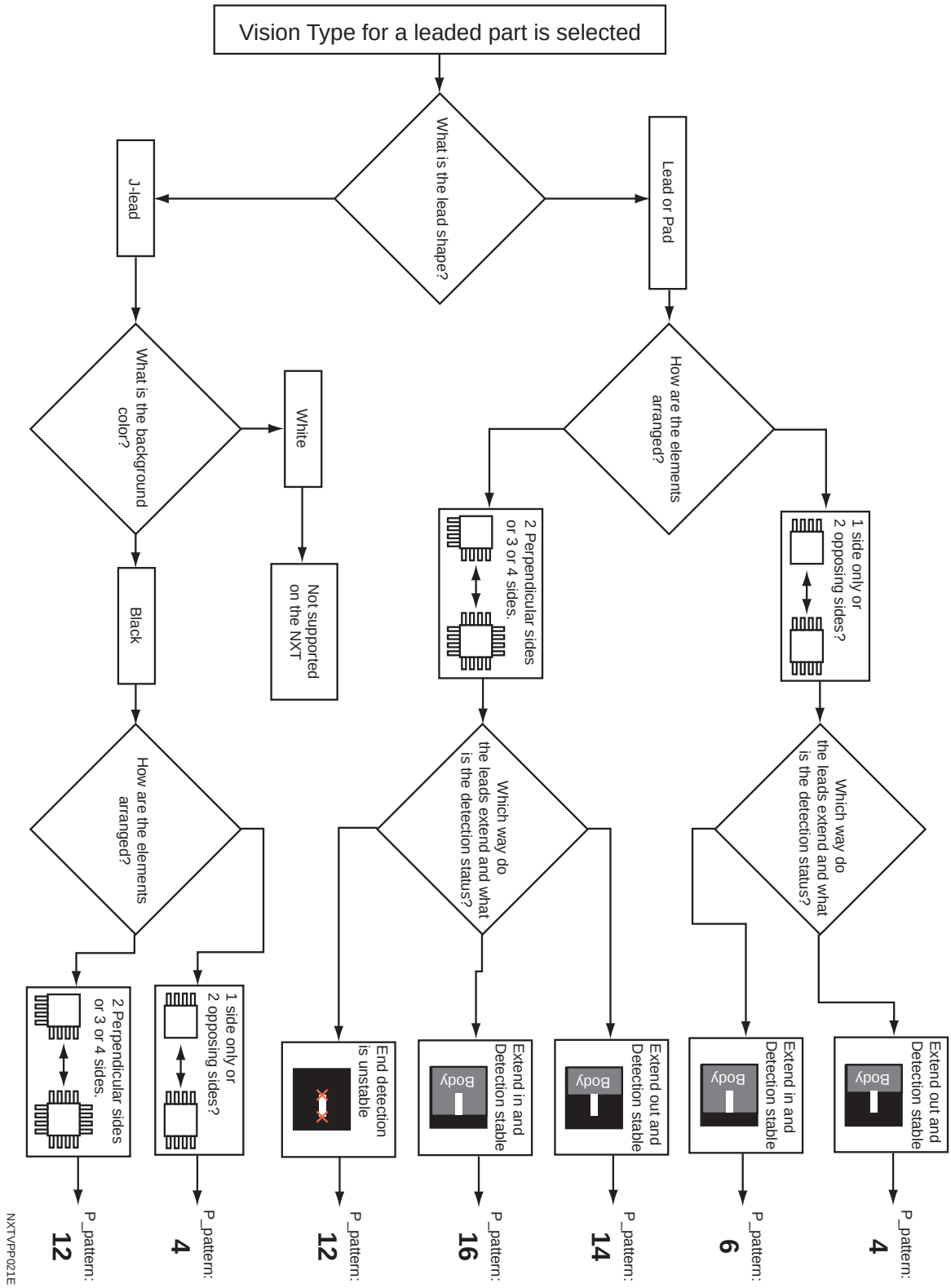
Example Target Parts

Type 33: Currently no example target part exists.

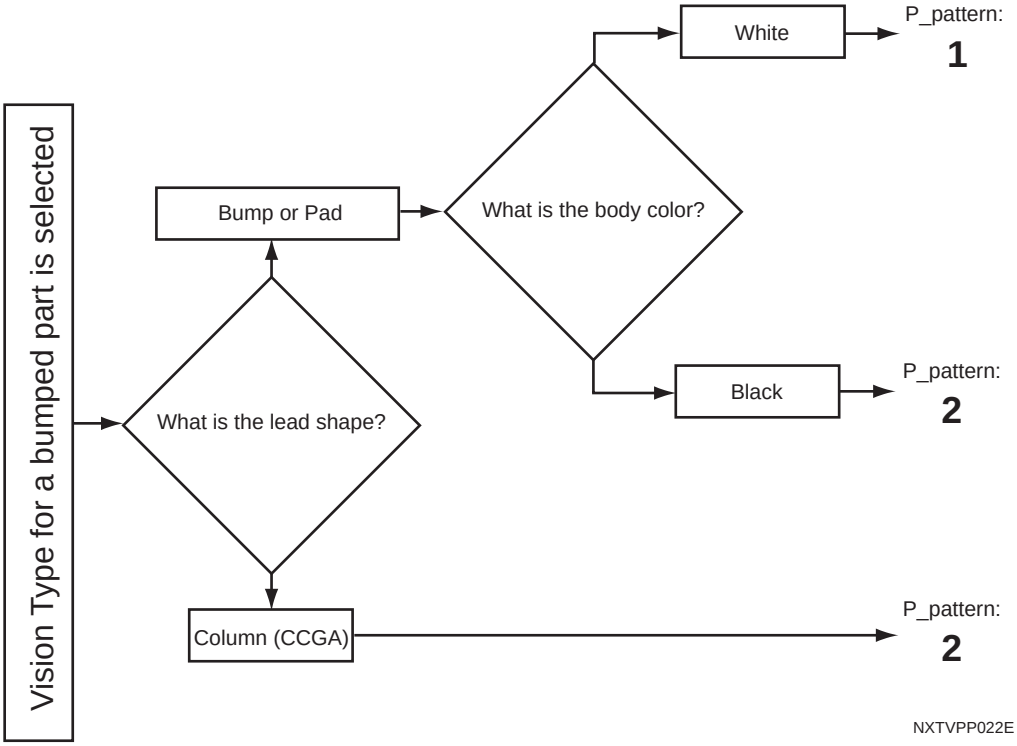
Type 34: PLCC parts processed with frontlighting with a white background.

4.5.4 Selecting a p_pattern flowcharts

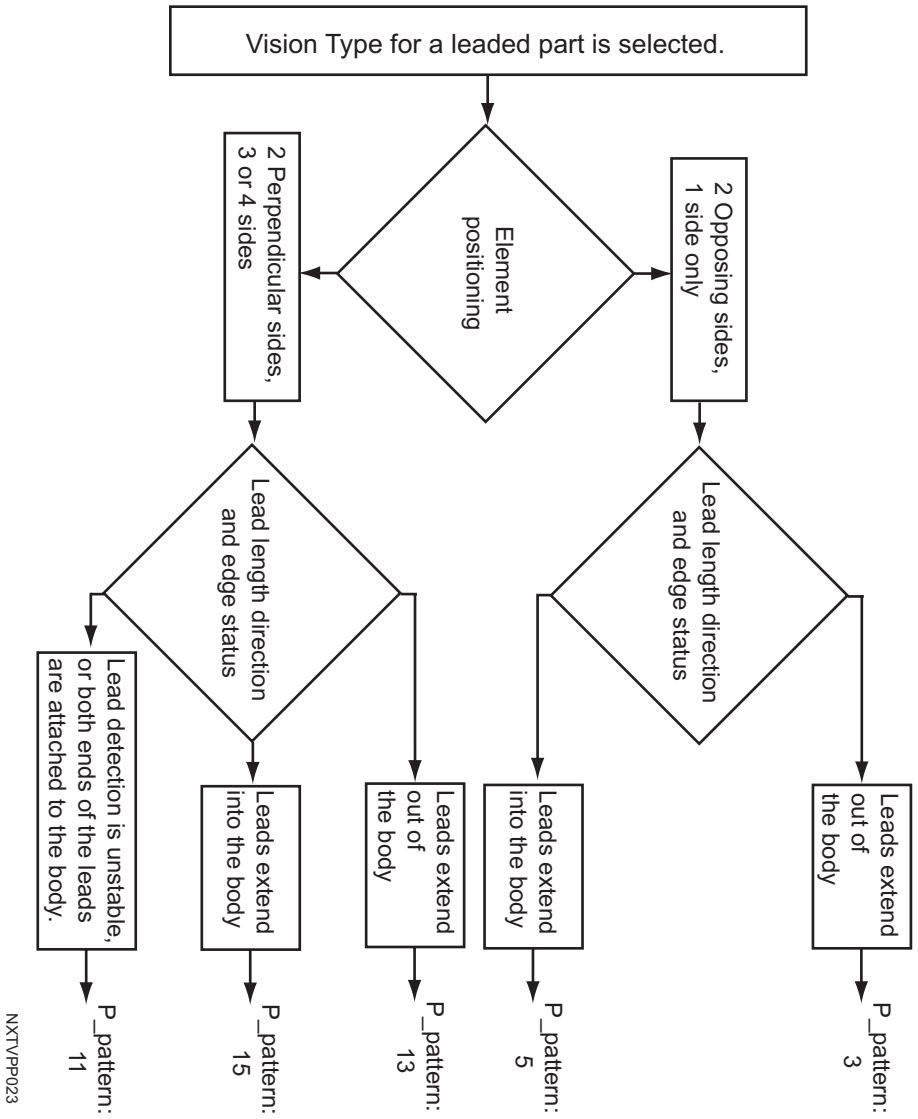
For frontlight leaded parts



For frontlight bumped (ball leaded) or columned parts



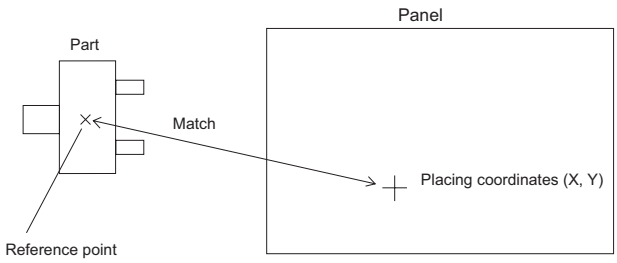
For backlight leaded parts (not supported by the NXT)



4.6 Vision Type Details

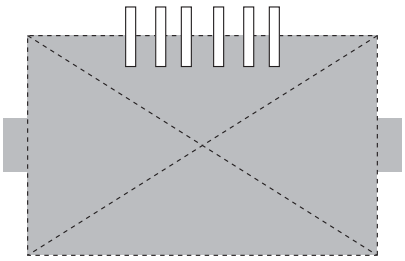
4.6.1 Part reference point

The part reference point is defined as the point on the part that is aligned with the placing coordinates on the panel when the part is placed.



Body center

The center is taken from the outer-most points of the body; top, bottom, left, and right.

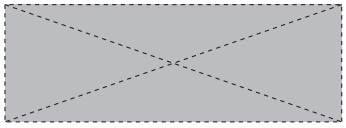


Part center

The part center is defined as follows.

- Part center of non-leaded parts

The part center is taken from the outer-most points; top, bottom, left, and right.



- Part center of parts with leads (ball grids)

The part center is calculated from the coordinates of the lead ends or from the center coordinates of the ball grid taken from the outer-most points; top, bottom, left, and right. The point of intersection of the center line from the outer-most points top to bottom and the center line from the outer-most points left to right yields the part center. However, if there are leads or a ball grid on only one side, a theoretical part center is defined based on the part data.

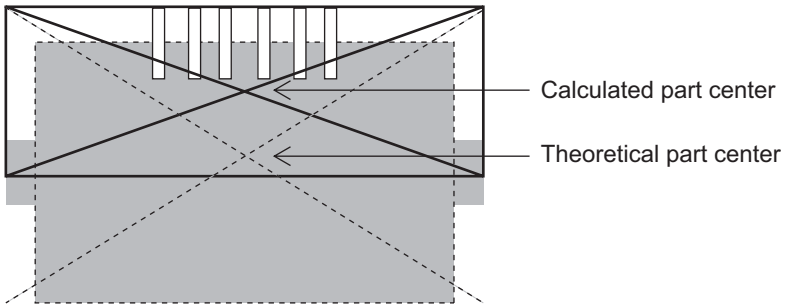
The following combinations are possible based on the lead positions.

- Leads on only one side
- Leads on two opposite sides
- Leads on two adjacent sides
- Leads on three sides
- Leads on four sides

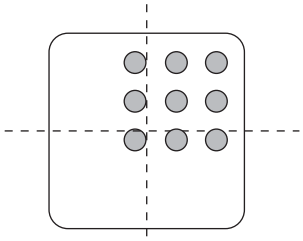
The center moves depending on the lead positions, lead lengths, and lead widths.

Note: If there are leads on three sides, the theoretical part center and the calculated part center will differ as shown in the following example.

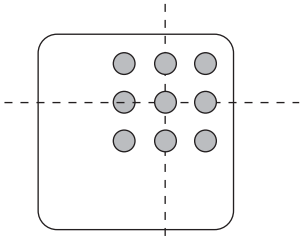
For parts with leads on three sides, the part center is defined as the point of intersection of the center line from the outer-most points top to bottom and the center line from the outer-most points left to right. As a result, the part center required for placement differs from the actual placing position.



Ball grid body center and part center



Part reference point: body center



Part reference point: part center

4.6.2 NXT vision types

This section provides a list of the vision types for the NXT and an explanation of the processing method used for each type. It is possible to use older vision types for other Fuji machines in some cases. When making part data, if the parts are to be shared between the NXT and other Fuji machines, use the old vision types in the “generic” section and enter overrides for the NXT vision type when necessary. Refer to 4.7 "Compatibility with Existing Part Data" for details.

Select the appropriate vision type from the following list of algorithms.

Vision Type	Part Types	Note
60	Rectangular chips	
61	Tantalum spragues	
62	Resistor networks, MELFs	
63	Tantalum spragues	Polarity check performed
65	Aluminum electrolytic capacitors	
70 (75)	Power transistors	
71	Trimmer resisters, trimmer capacitors	
72	HEMT	Supplied at 0 degrees
73	HEMT	Supplied at 45 degrees
74	Trimmer resisters, trimmer capacitors	Polarity check performed
80	Round shaped parts (no polarity)	
123 (128)	IC-type leaded parts	Supports multiframe
124 (129)	J-leaded parts	
140 (145)	Flip-chips (see note)	
141 (146)	White bodied parts with irregular bump patterns (see note)	Under development
142 (147)	Black bodied parts with irregular bump patterns (see note)	Under development
143 (148)	CCGA parts	Supports multiframe
144 (149)	LGA parts	Supports multiframe
151 (156)	Black connectors placed using mechanical chuck	
152 (157)	Black bodied connectors	Supports multiframe
153 (158)	White bodied connectors	Supports multiframe
160 (165)	Body detection (frontlight)	

Vision Type	Part Types	Note
170	Mechanical chuck part existence check	
180 (185)	Tantulams, condensers, SOT-type parts	Up to 8 leads
181	Coil parts	2 Leads at 45 degrees
230 (235)	Black bodied BGAs	Supports multiframe
231 (236)	White bodied BGAs	Supports multiframe
233 (238)	Black bodied CSPs	
234 (239)	White bodied CSPs	
240	VPDplus (MPA)	From NXT V3.0. Supports multiframe
252	White bodied parts	Supports multiframe

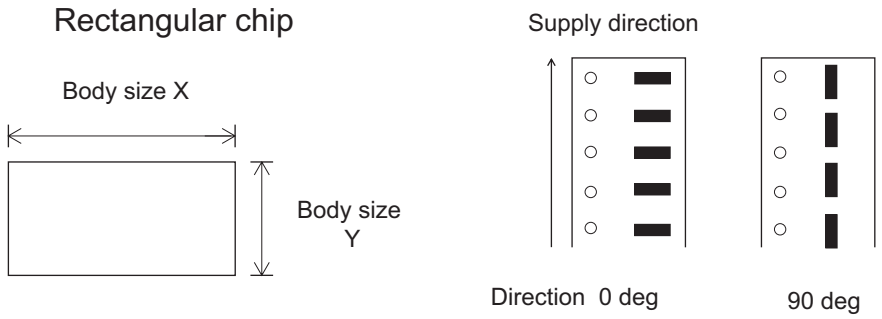
Note: The vision types in parentheses use the part center.

Vision type number details

The following section provides an explanation of the processing method for each vision type.

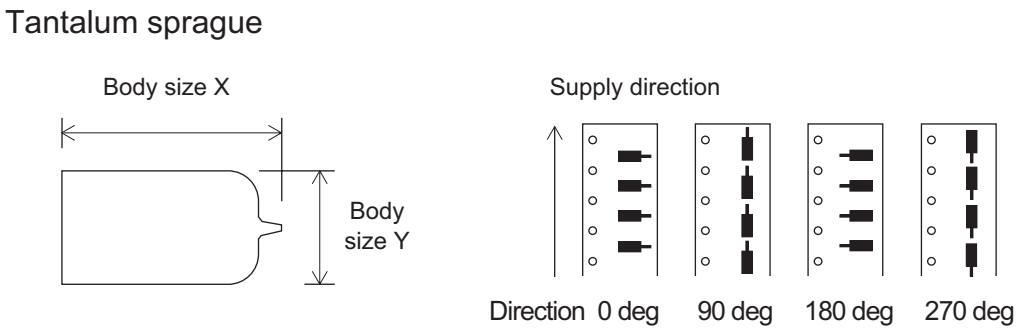
Vision Type 60 Rectangular Chips

Enter the body size in part data. There is no need to enter element information. The reference point for the part is the part center.



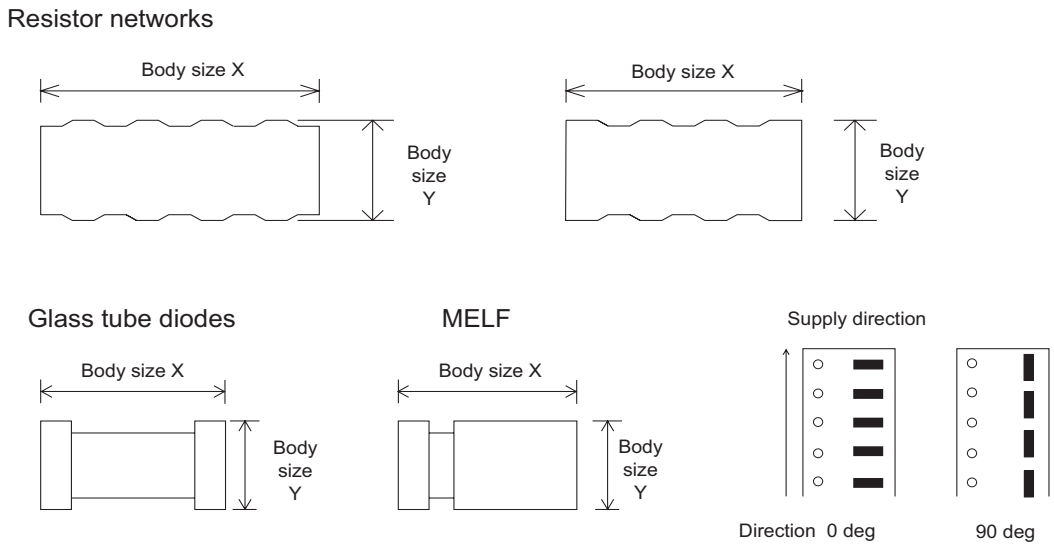
Vision Type 61 Tantalum Spragues
Vision Type 63 Tantalum Spragues (polarity check performed)

Enter the body size in part data. There is no need to enter element information. The projection of the tantalum sprague must be included in the body size. The reference point for the part is the part center. To perform a polarity check, the direction of supply must be correctly specified in part data.



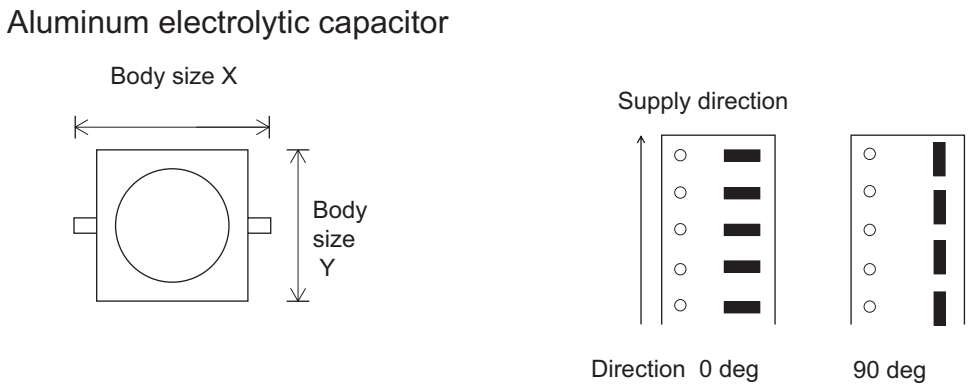
Vision Type 62 Resistors networks, MELFs

Enter the body size in part data. There is no need to enter element information. The reference point for the part is the part center.



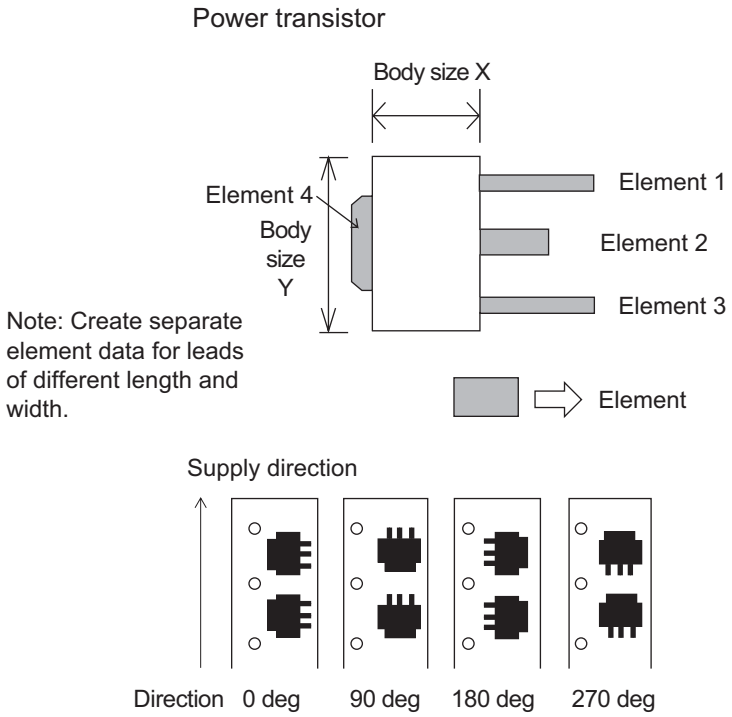
Vision Type 65 Aluminum electrolytic capacitors

Enter the body size in part data. There is no need to enter element information. Be sure to include projections such as leads in the body size. The reference point for the part is the part center.



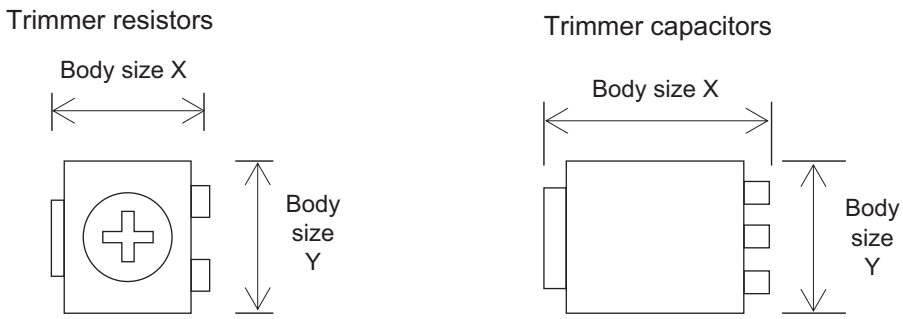
Vision Type 70 (75) Power transistors

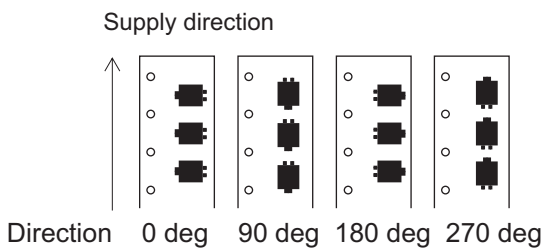
It is necessary to enter the body size and element information in part data. The reference point is the body center with vision type 70, while the reference point is the part center with vision type 75. Create separate element data for leads of different length and width. If the leads have a large cuts at the corners then it is necessary to select the [Don't inspect] option for the [Result] group for that element.



Vision Type 71 Trimmer resistors, trimmer capacitors

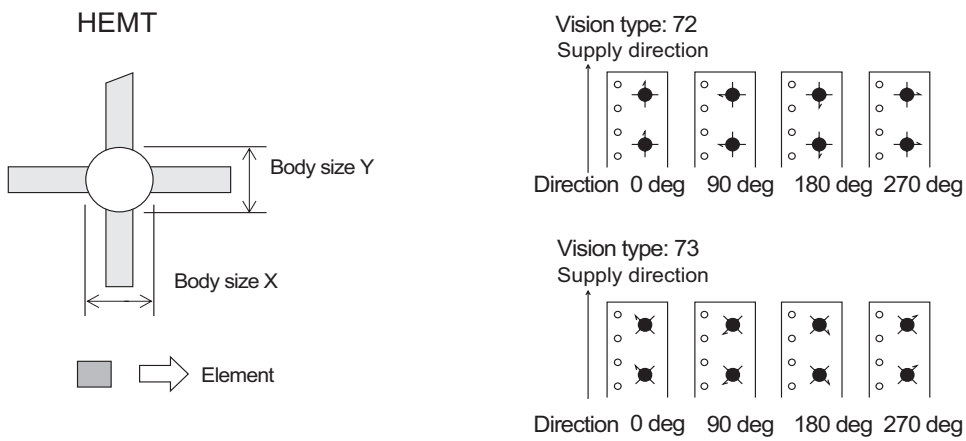
Enter the body size in part data. There is no need to enter element information. Note that projections such as leads are included in the body size. The reference point for the part is the part center.





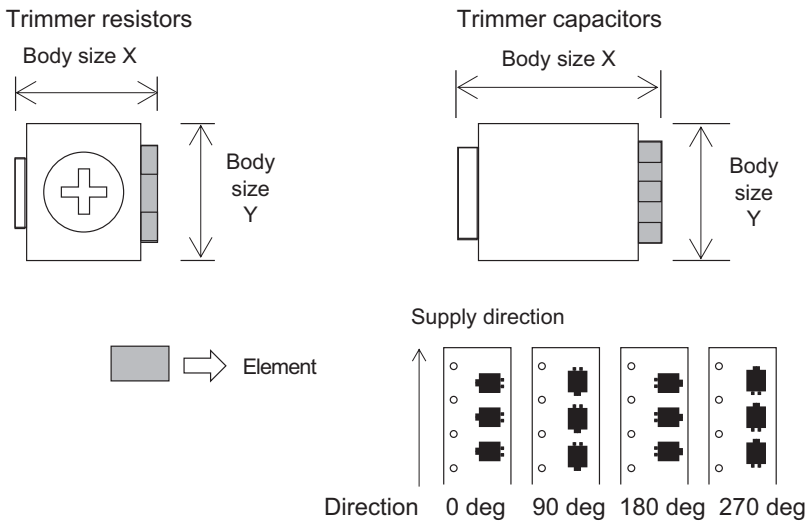
Vision Type 72 HEMT (Supplied at 0 degrees)
Vision Type 73 HEMT (Supplied at 45 degrees)

It is necessary to enter the body size and element information in part data. The reference point for the part is the part center. If the tip of a lead is not square by design then this information must be set in part data so that it is not detected as a defect. Note that polarity inspection cannot be performed.



Vision Type 74 Trimmer resistors, trimmer capacitors (Polarity check performed)

It is necessary to enter the body size and element information in part data.



Enter the lead quantity (2 or 3), lead width and length, and width tolerance.

First, the part position is determined using the vision type 71 processing method, and then, direction inspection is performed based on the detection of one lead. However, the detected lead is not used for positioning. The reference point for the part is the part center.

It is important to note the following points.

- Direction inspection is possible only if there are 2 or 3 leads on only one side.
- Direction inspection cannot be performed if diagonally across from the detected lead there is a protrusion of the same shape as the lead (Fig. 1)
- Using a two pin setting, detection of three pins of the same shape is not possible. (Fig. 2)
- Only enter one element into the element information. If 2 or more elements are entered, an 0xD62A error (element data is incorrect) occurs when the parts are being registered..

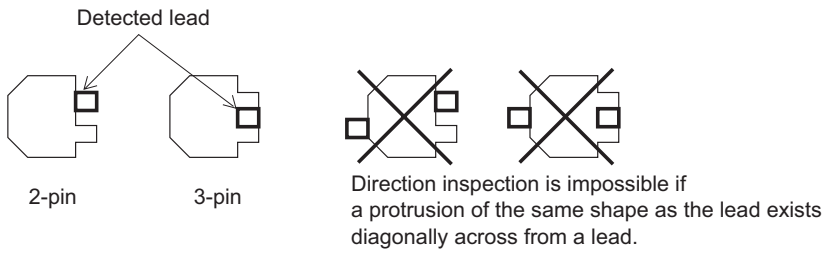


Fig. 1 Detected lead position when performing direction inspection

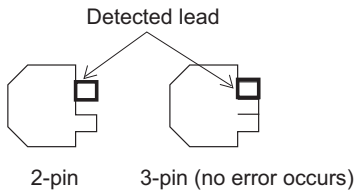
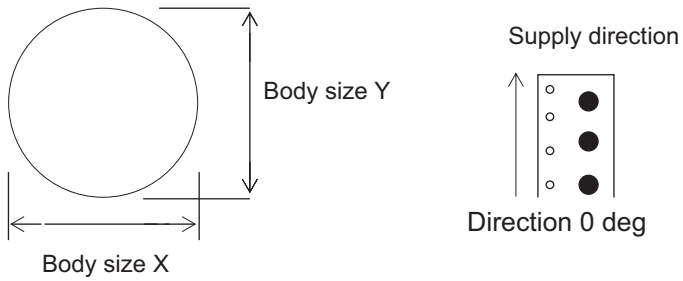


Fig 2. Set as 2-pin part in part data

Vision Type 80 Round shaped parts

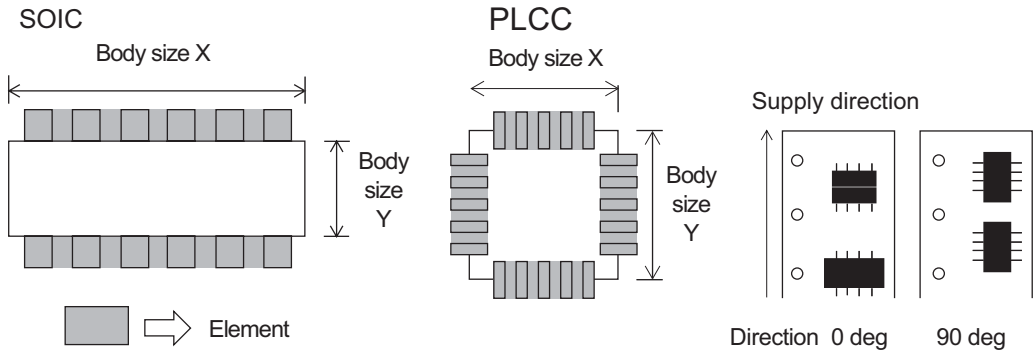
Enter only the body size in part data. There is no need to enter element information. The reference point for the part is the part center.

Round shaped part



Vision Type 123 (128) IC- type leaded parts
Vision Type 124 (129) J-leaded parts

Enter the body size and element information in part data. Due to the use of frontlighting, there are cases where the acquired image may vary depending on the shape of the leads and the lighting conditions. In such cases, it may be necessary to make adjustments to the position, length and width of the lead information in element information. Vision types 123, 124 use the body center while vision types 128, 129 use the part center.



Vision Type 140 (145) Flip-chips

Enter the body size and element information in part data. Vision type 140 uses the body center while vision type 145 uses the part center.

Due to the use of frontlighting, there are cases where the image of the ball grid may vary depending on the shape of the leads and the lighting conditions. In such cases, it may be necessary to make adjustments to the ball grid position, length and width of the lead information in element information.

Inspection of certain parts may not be possible due to variations in the body color and the and the image of the ball grid.

Flip chip

Vision Type 141 (146) White bodied parts with irregular bump patterns (under development)
Vision Type 142 (147) Black bodied parts with irregular bump patterns (under development)

Select either of these vision types for bump leaded parts with irregular bump patterns. Enter the body size and element information in part data. Vision types 141, 142 use the body center while vision types 146, 147 use the part center.

The following conditions apply to bump leads:

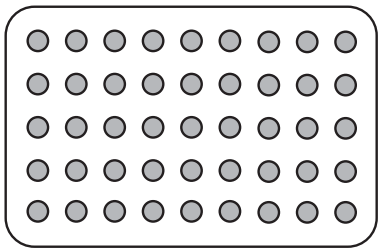
- There must be two or more bumps on the part.
- All bumps must be located at least the distance of the bump diameter from the edge of the part.
- The pitch must be equal or greater to two times the bump diameter. However, for parts with only two bumps, the pitch must be greater or equal to one sixth (1/6) of the average body size in all directions.

Vision Type 143 (148) Ceramic column grid array (CCGA) parts

Enter the body size and element information in part data. Vision type 143 uses the body center while vision type 148 uses the part center.

Due to the use of frontlighting, there are cases where the image of the ball grid may vary depending on the shape of the leads and the lighting conditions. In such cases, it may be necessary to make adjustments to the ball grid position, length and width of the lead information in element information.

CCGA



Vision Type 144 (149) Land grid array (LGA) parts

Enter the body size and element information in part data. Vision type 144 uses the body center while vision type 149 uses the part center.

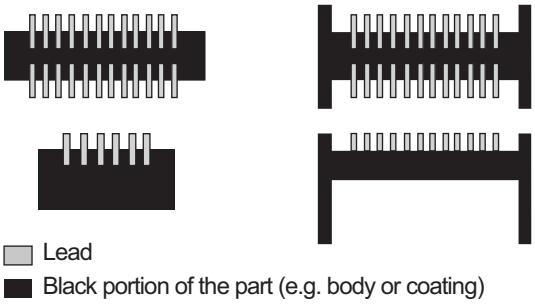
Vision Type 151 (156) Black connectors placed using a mechanical chuck

Enter the body size and element information in part data. It is necessary to create separate element information for leads of different width and length. Vision type 151 uses the body center while vision type 156 uses the part center.

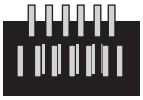
Vision Type 152 (157) Black bodied connectors

Enter the body size and element information in part data. It is necessary to create separate element information for leads of different width and length. Vision type 152 uses the body center while vision type 157 uses the part center.

<Examples of parts that can be inspected>



<Examples of parts that cannot be inspected>

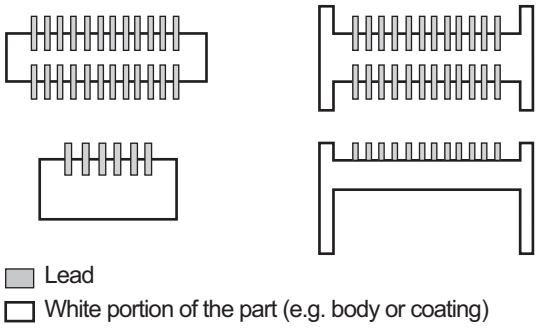


The parts cannot be correctly inspected if any metal that reflects light similarly to leads exists within the body of the part.

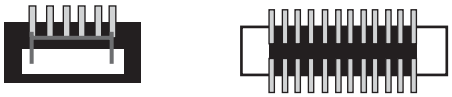
Vision Type 153 (158) White bodied connectors

Enter the body size and element information in part data. It is necessary to create separate element information for leads of different width and length. Vision type 153 uses the body center while vision type 158 uses the part center.

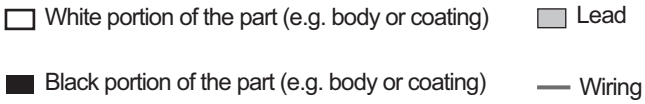
<Examples of parts that can be inspected>



<Examples of parts that cannot be inspected>



The outer form of the part is used to determine the rough positioning of the part. Therefore inspection of the part is not possible if the outer form of the part cannot be determined.



Vision Type 160 (165) White connector body detection

Enter the body size and element information for leads or projections. Vision type 160 uses the body center while vision type 165 uses the part center. Element inspection is not performed if the [Result] option for that element is set to "Don't inspect".

The body inspection points are automatically determined based on the data for leads and projections specified in the element information. When detection positions cannot be properly determined automatically, up to two elements per side can be specified in the element information for the body inspection points. To specify body detection points, specify the side and then enter the coordinates for the points to be inspected in [X] and [Y] items for the position group and enter "0" for all other items for each "detection" element in the element information.

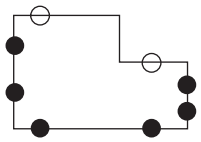
Note: It is necessary to define leads in element information regardless of whether lead inspection is to be performed for those leads or not.

Note: When the body detection option is specified, data should be specified such that there is a minimum of one side where two points can be detected and a minimum of two sides where one point can be detected. If there are an insufficient number of detection points, an error occurs when data is registered.

Note: If the edges of the body of a part are not clearly projected, this may result in an error or a drop in the placing accuracy.

Note: Correct processing cannot be performed if the nozzle protrudes over the edge of the part.

Note: If the straight line obtained from the specified detection points for the same line is not parallel nor perpendicular to the straight line obtained from the detection points of another side, then processing cannot be performed.



● : Points which can be used to define the part body.

○ : Points which cannot be used to define the part body.

Vision Type 170 Mechanical chuck part existence check

Use this vision type when part recognition is not possible using any other vision type. In the shape data, set the vision type to 170, specify a setting for [Lead Brightness] and specify the check area and select either 1 or 2 for the p_pattern in the element information. Based on this data, if it is determined that the part has been picked, then the part is placed without performing any correction based on vision. The part is positioned mechanically.

When vision processing is performed, the average greyscale of the area specified in the element data is determined. This average is compared to the lead brightness setting and based on the p_pattern setting it is determined whether or not the part is present.

If the p_pattern setting is 1 (dark) and the average greyscale value is higher than the lead brightness setting, it is determined that the part is present. If the average grayscale is lower than the lead brightness setting, then it is determined that the part is not present.

If the p_pattern setting is 2 (light) and the average greyscale value is lower than the lead brightness setting, it is determined that the part is present. If the average grayscale is higher than the lead brightness setting, then it is determined that the part is not present.

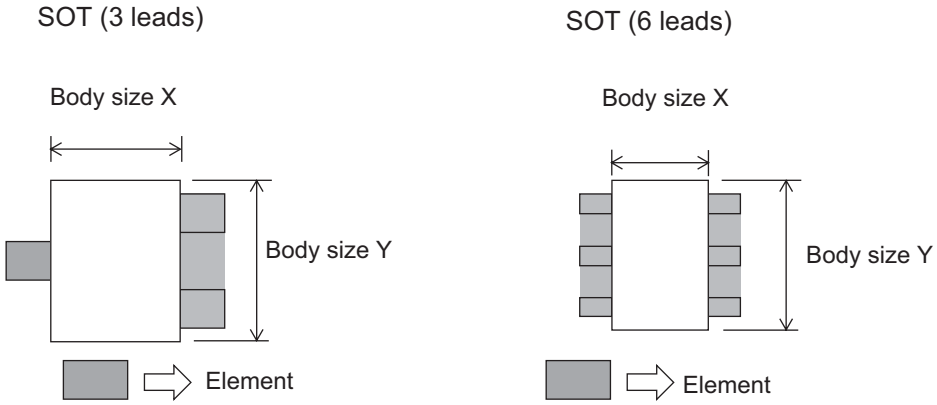
Note: Use a chuck with four claws when using this vision type.

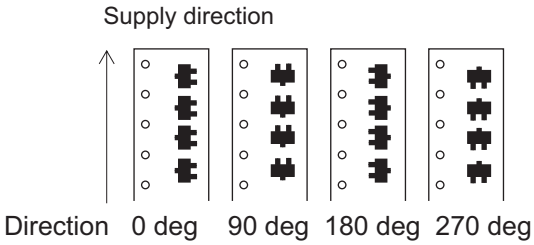
Vision Type 180 (185) SOT-type parts

Use this vision type for parts with between 2 and 6 leads where the body color is black and only the leads are visible during vision processing. Enter the body size and element information in part data. Vision type 180 uses the body center while vision type 185 uses the part center

Note: This vision type can be used for parts with up to six leads. Vision processing is not possible for parts with 7 leads or more.

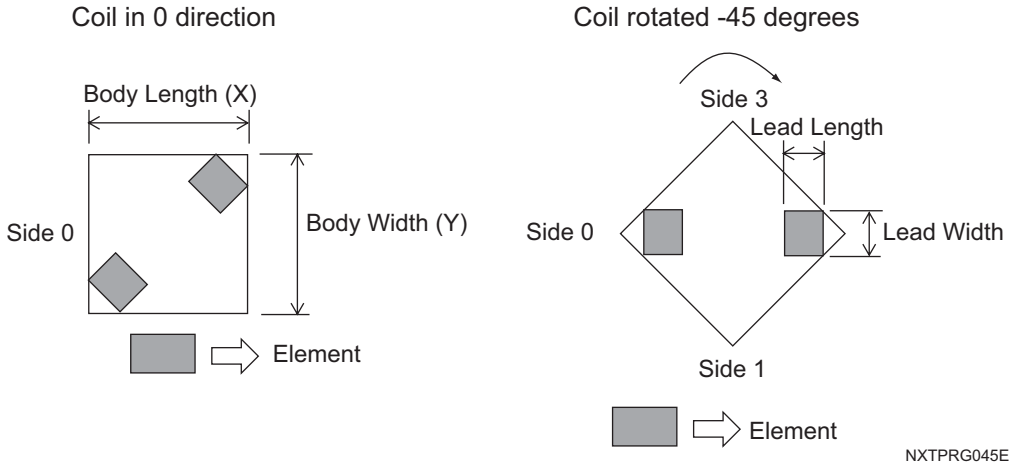
Note: Vision processing maynot be performed if the lighting is unevenly reflected by leads.





Vision Type 181 Coil parts with two leads at 45 degree angles

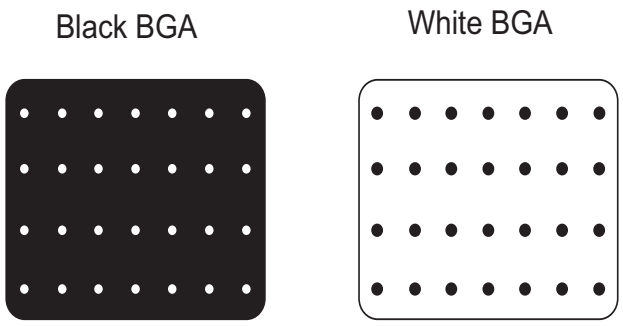
Use this vision type for coil parts with 2 leads that are at 45 degree angles from the x-axis (as shown below). The body color is black and only the leads are visible during vision processing. Enter the body size and element information in part data based on the information below.



Vision Type 230 (235) Black bodied BGAs
Vision Type 231 (236) White bodied BGAs
Vision Type 233 (238) Black bodied CSPs
Vision Type 234 (239) White bodied CSPs

Enter the part body size and element information in part data. Vision types 230, 231, 233, and 234 use the body center while vision types 235, 236, 237, and 238 use the part center.

Due to the use of frontlighting, there are cases where the image of the ball grid may vary depending on the shape of the leads and the lighting conditions. In such cases, it may be necessary to make adjustments to the ball grid position, length and width of the lead information in element information. The reference point for the part is the part center.



Vision Type 252 White bodied parts

This vision type is used for those parts with a white or gold colored body, and processes only the part outline.

It is necessary to enter the body size in part data. The body size should be measured from edge to edge. Positioning is performed using the outer-most points on the upper and lower, and left and right part edges.

4.6.3 Selecting a Vision Type flowcharts (leaded parts)

Case 1: Entire body color is black or a dark color (black, blue, green or yellow green)

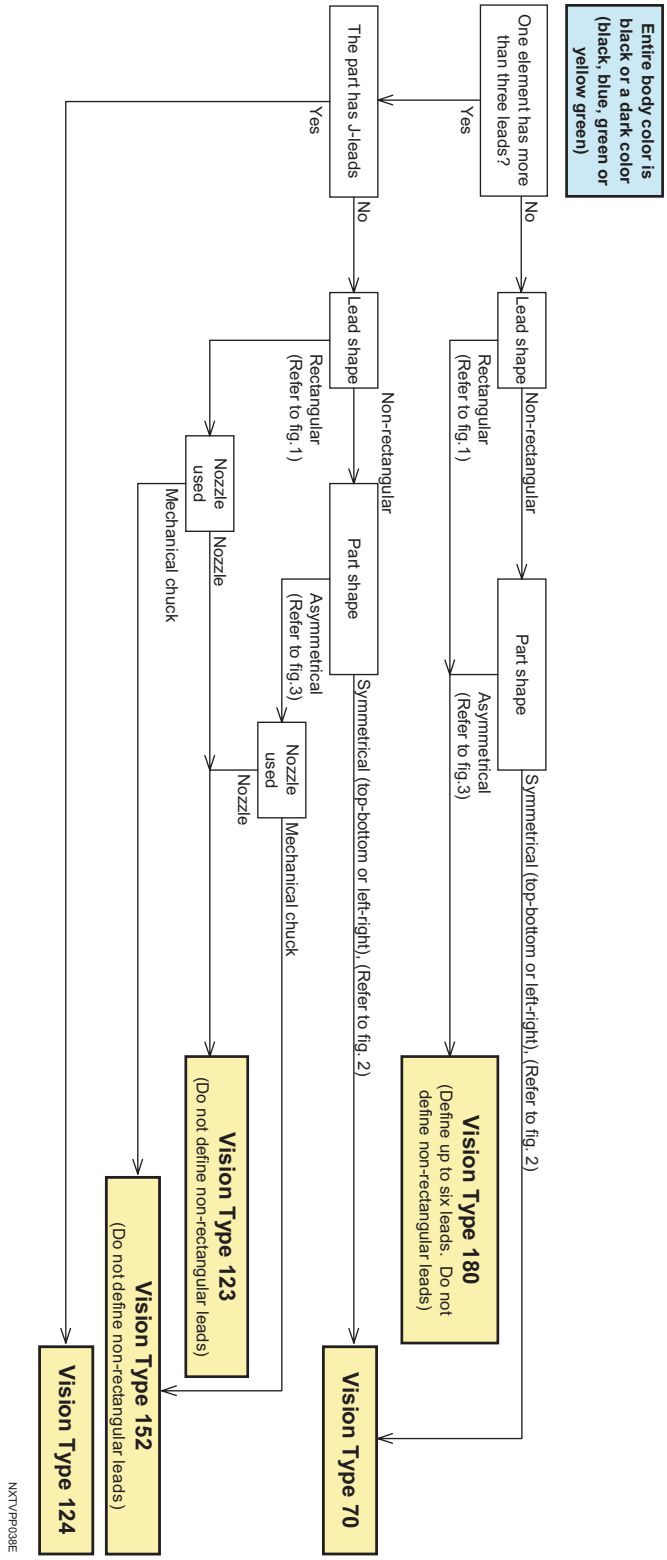
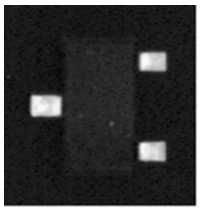
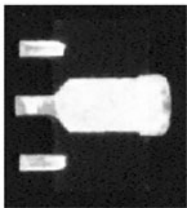


Figure 1 Example of rectangular shaped leads Example of non-rectangular shaped lead





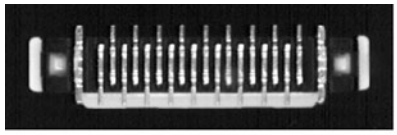
The defined lead area and actual captured image is substantially different, distinguish by the rectangular and non-rectangular lead shapes

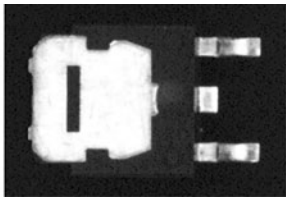
For example, if the center thinner leadwidth is defined, a vision processing will occur when using vision type 180.

NXTVPP024E

Figure 2

Example of left to right symmetrical part. Top to bottom symmetrical part



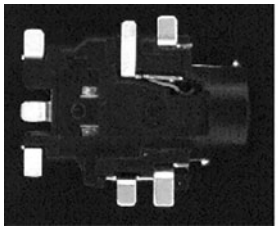


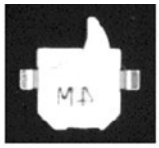
Detemine the symmetry by considering all white items that can be seen (lead or other metal items)

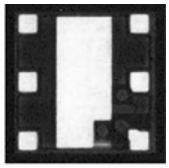
NXTVPP025E

Figure 3

Examples of asymmetrical parts







Detemine the asymmetry by considering all white items that can be seen (lead or other metal items)

NXTVPP026E

Case: 2 Entire body color is white or light color (white, red, orange, brown, yellow)

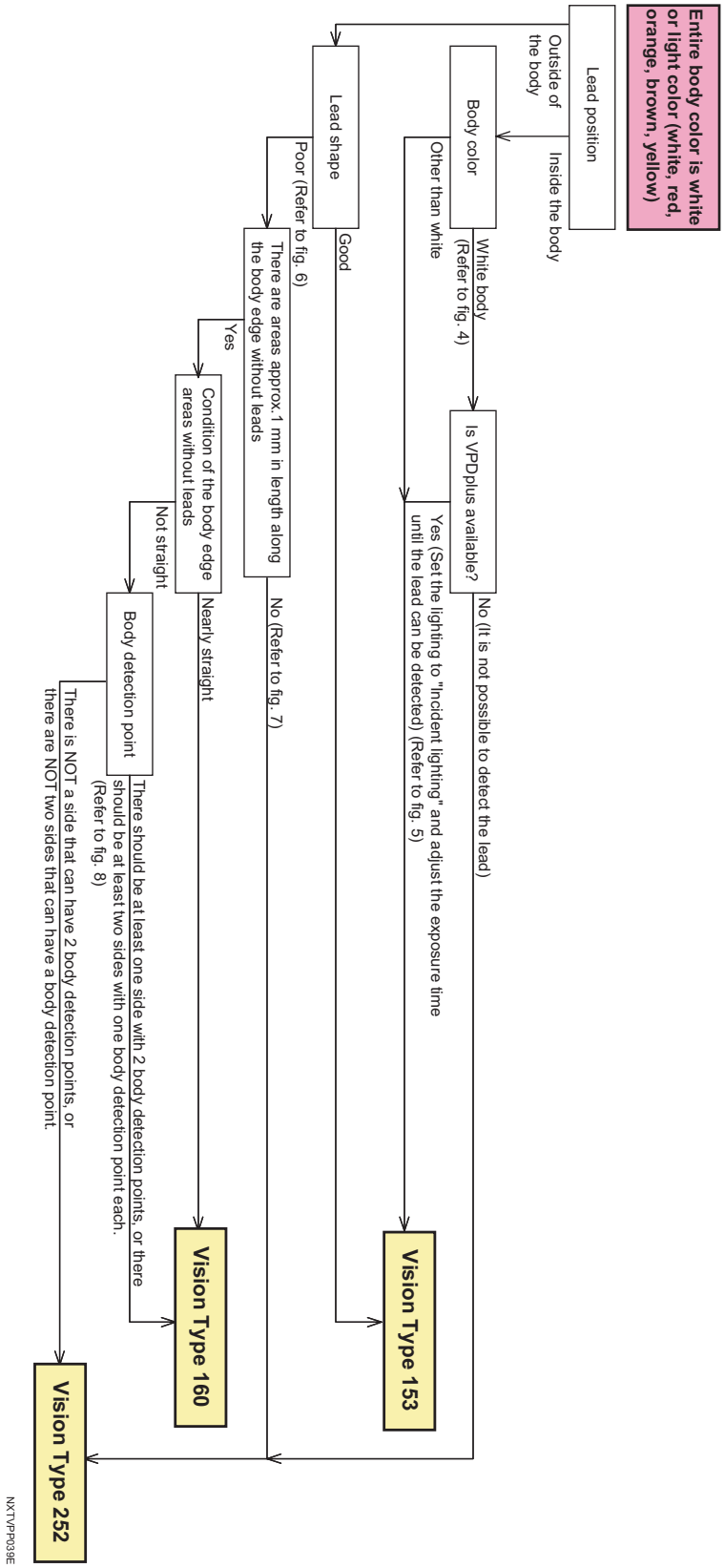
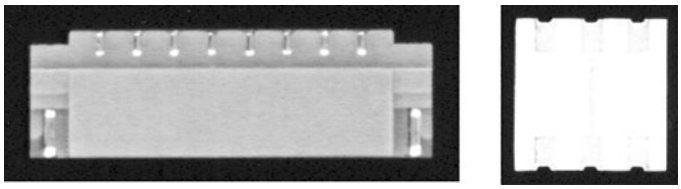


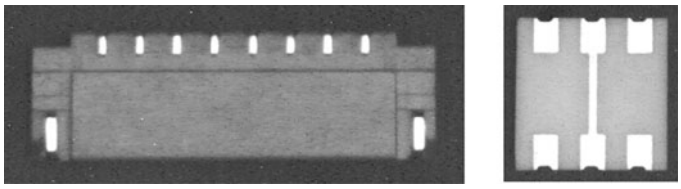
Figure 4 Parts that have leads in the white body area.



NXTVPP027E

Figure 5

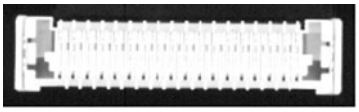
Used the parts from #4. Used VPDPlus and set the lighting to "Incident" and exposure time to "170ms".



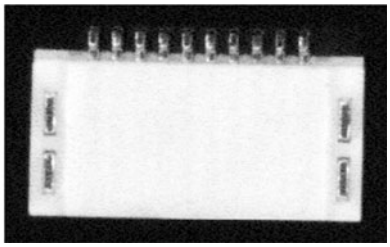
NXTVPP028E

Figure 6

Poor lead shape (The leads are too short)



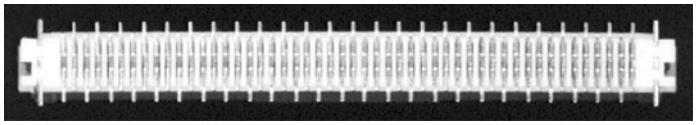
Including parts with leads that have poor lead image definition.



NXTVPP029E

Figure 7

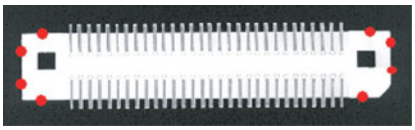
There is no more than 1mm of body edge with no leads or other items



NXTVPP030E

Figure 8

There should be at least one side with 2 body detection points, or there should be at least two sides with one body detection point each.
(This part has 4 sides with 2 detection points each.)



NXTVPP031E

Case 3: Black body with partial white or there is a metal part in addition to the lead

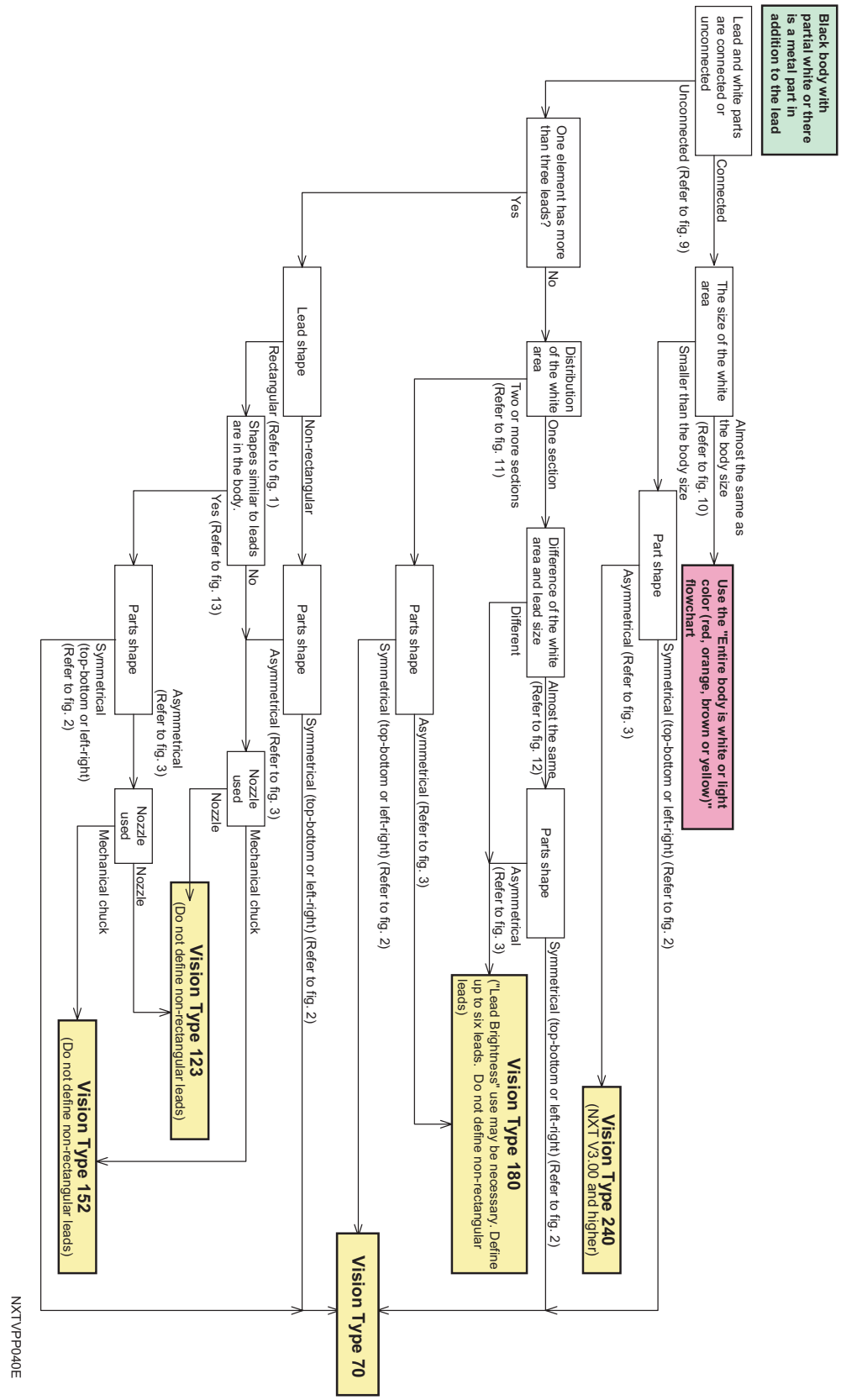
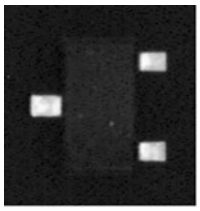
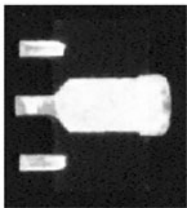


Figure 1 Example of rectangular shaped leads Example of non-rectangular shaped lead





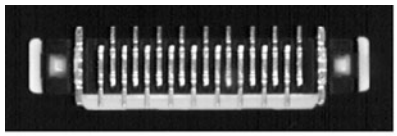
The defined lead area and actual captured image is substantially different, distinguish by the rectangular and non-rectangular lead shapes

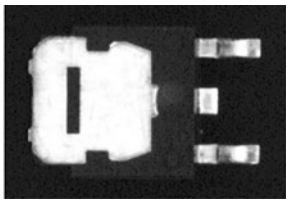
For example, if the center thinner leadwidth is defined, a vision processing will occur when using vision type 180.

NXTVPP024E

Figure 2

Example of left to right symmetrical part. Top to bottom symmetrical part



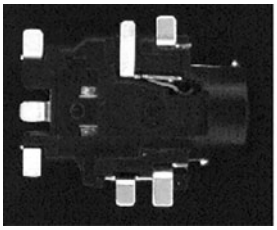


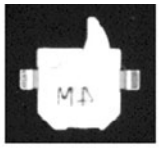
Detemine the symmetry by considering all white items that can be seen (lead or other metal items)

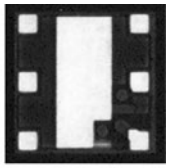
NXTVPP025E

Figure 3

Examples of asymmetrical parts





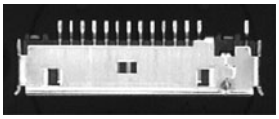


Detemine the asymmetry by considering all white items that can be seen (lead or other metal items)

NXTVPP026E

Figure 9

Leads are not connected to white areas

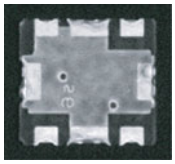


To determine whether or not the leads and white area are connected, observe the part and imagine how the lead will be seen by the parts camera. Refer to the picture on the left. The gull-wing leads made shadows around the lead bases. We see the leads and white area as being separated. The gold leads are bright and easily seen. The gull wing angle or lead width makes the lead base appear dark. If VPDPlus and the camera stand are available, use that to acquire an image of the part. That is the easiest way to see how the machine will see the part.

NXTVPP032E

Figure 10

For example, the size of the white area is nearly the same size as the body size.

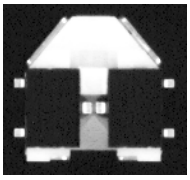


The size, not the area.

NXTVPP033E

Figure 11

Distribution of the white area. There are more than two sections of white area.

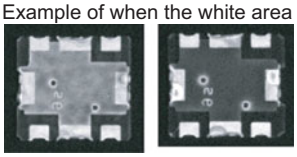


This part is like two three-pin minimolds facing each other in a white body.
The leads that must be detected are the two on each left and right side. (The center lead has poor contrast so these leads should not be checked.)
However, the white area is not stable and there are some white blocks. These may be detected as leads and cause errors.

NXTVPP034E

Figure 12

Example of when the white area and lead size are different and nearly same.



For these type of parts, the white area of the image can be different depending on the lot. Therefore, the surface of the part may appear bright or dark in the image. In order to be able to correctly vision process in both cases, it is necessary to define three leads (the right top, left bottm and right bottom leads).
In a case of the bright parts, the center of the bright area can be detected as one big white area. The center will not be wrongly detected because when this area and the lead sizes are compared, the sizes are completely different.
However, in a case of the dark parts, the vision processing system has problems determining the leads because
there are apporoximately eight areas the same size and shape in the image.

NXTVPP035E

Figure 13

Example of when lead-like shapes are in body of the part.

NXTVPP036E

Case 4: White body but partly black

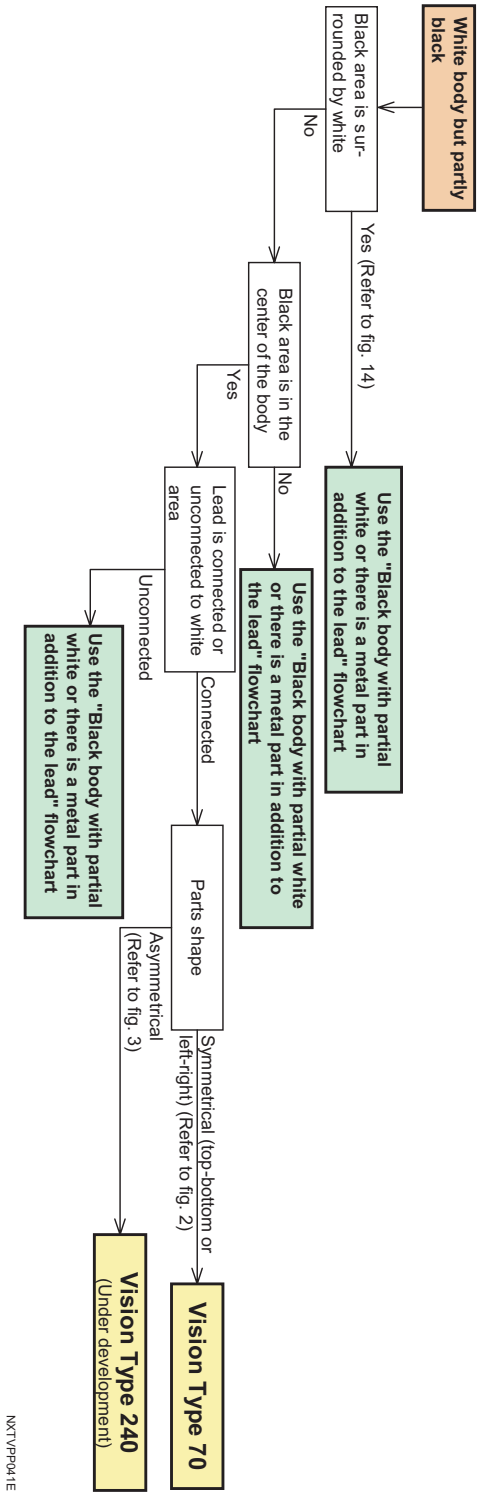
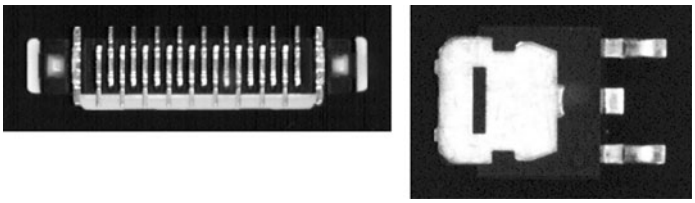


Figure 2

Example of left to right symmetrical part. Top to bottom symmetrical part

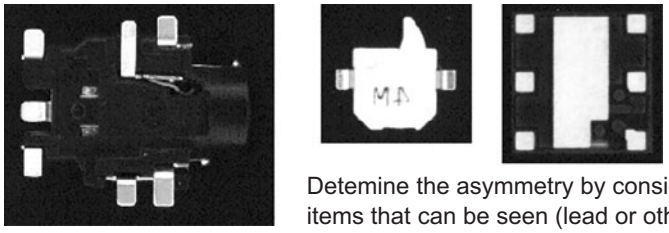


Detemine the symmetry by considering all white items that can be seen (lead or other metal items)

NXTVPP025E

Figure 3

Examples of asymmetrical parts

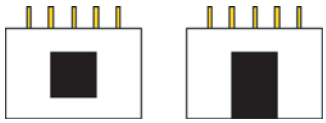


Detemine the asymmetry by considering all white items that can be seen (lead or other metal items)

NXTVPP026E

Figure 14

Examples of when the black area is surrounded by white body.



NXTVPP037E

4.7 Compatibility with Existing Part Data

4.7.1 Background

Existing Fuji machines support both backlight and frontlight systems, however, the newly developed NXT machines support frontlight only. As a result, it is necessary to convert existing part data created for used with a backlight system to enable the part to be processed using a frontlight system. The NXT machines are equipped with a feature that enables automatic conversion of part data created for backlight systems, however, there are cases whereby it is necessary to make a setting at the "Override" field in Fuji Flexa for the part data of certain parts. This section provides a compatibility table for the part data of existing machines and the NXT machines, as well as details of limitations relating to the part data conversion process.

It is important to point out that when making new part data, use the old vision type and p patterns if the data is to be used on other Fuji machines. If the data is never to be used on older Fuji machines (only NXTs are present), then use the NXT vision types and the frontlight p_patterns.

4.7.2 Vision type compatibility table for the NXT

Vision Types		New P Pattern	Part Type	Notes
Old	NXT			
10	60		Rectangular chips	Select an appropriate vision type based on part shape. Override required (Note 1)
	65		Aluminum electrolytic capacitors	
	180		Tantalum capacitors	
	123/124/144		Leaded parts	
11	61		Tantalum spragues	
12	62		Resistor networks, MELFs	
13	63		Tantalum spragues (Polarity check performed)	
20	180	(Old P Pattern) +1*	Tantalum capacitors, SOTs	Select an appropriate vision type based on part shape. Override input required (Note 2)
	75	(Old P Pattern) +1*	Power transistors	
21	71		Trimmer resistors/trimmer capacitors	
22	72	(Old P Pattern) +1*	HEMT (0 degree)	
23	73	(Old P Pattern) +1*	HEMT (supplied at 45 degrees)	
24	74	(Old P Pattern) +1*	Trimmer resistors/trimmer capacitors (Polarity check performed)	
30	80		Round shaped parts	
40	160	(Old P Pattern) +1*	White body detection	Select an appropriate vision type based on part shape. Override required (Note 3)
	60/123/124/152/153/180/252	(Old P Pattern) +1*	Leaded part / part outline	
100 (105)	123 (128)	(Old P Pattern) +1*	IC-type leaded parts	
120 (125)	124 (129)	24->4, 34->14* (Conversion not required for others)	J-leaded parts	
121 (126)	124 (129)	As above	J-leaded parts	
122 (127)	124 (129)	As above	J-leaded parts	
123 (128)	123 (128)	As above	IC-leaded parts	
124 (129)	124 (129)	As above	J-leaded parts	
130 (135)	230 (235)	Conversion not required	Black bodied BGA	
131 (136)	231 (236)	As above	White bodied BGA	
140 (145)	140 (145)	As above	Flip-chips	
141 (146)	-		White bodied irregular bump parts	Under development

Vision Types		New P Pattern	Part Type	Notes
Old	NXT			
142 (147)	-		Black bodied irregular bump parts	Under development
	143 (148)		CCGA	
	144 (149)		LGA	
150 (155)	153	(Old P Pattern) +1*	White bodied connector	Select an appropriate vision type based on part color and image quality. Override required (Note 4)
	152	(Old P Pattern) +1*	Black bodied connector	
151 (156)	151 (156)	Conversion not required	Mechanical chuck connectors	
152 (157)	152 (157)	As above	Black bodied connector	
153 (158)	153 (158)	As above	White bodied connector	
160 (165)	160 (165)	As above	White bodied connector detection	
170	170	As above	Mechanical chuck part presence check	
180 (185)	180 (185)	Conversion not required	Tantalum capacitors, SOTs	
	181		Coil parts	2 leads at 45 degrees angles
230 (235)	230 (235)	As above	Black BGA	
231 (236)	231 (236)	As above	White BGAs	
232 (237)	230 (235)	As above	TBGA	
233 (238)	233 (238)	As above	Black CSPs	
234 (239)	234 (239)	As above	White CSPs	
240	240		VPDplus (MPA)	NXT V3.0 and higher
249	252		Diagonal cut shield parts	No longer used. Certain parts supported by 252.
252	252		Multi-purpose vision type (part outline)	
254	252		Odd-form parts	Select an appropriate vision type based on part shape. Override required (Note 5)

Note: The p pattern is automatically converted if the old vision type is in the "generic" section.

Note: The shaded areas represent the vision types for which automatic conversion is not supported by the NXT machines. All other vision types are supported and therefore require no additional data entry.

Note 1

Previously, it was possible to perform vision processing for all rectangular chips using vision type 10, however, when using frontlighting, due to the influence of leads and so forth on the body of the part, it is necessary to separate those parts previously supported by vision type 10 into four types as detailed in the table below.

Vision type for existing machines	Vision type for NXT	Part type	Explanation
10	60	Rectangular chips	Automatically converted to 60 if no vision type value is specified in the NXT override section
	65	Aluminum electrolytic capacitors	Element data not required
	180	Tantalum capacitors	Element data reguired
	*1	Leaded parts	Element data required

*1: There are cases where none of the vision types in the above table are applicable. Some examples of such parts are rectangular parts other than rectangular chips, tantalum capacitors, or aluminum electrolytic capacitors with multiple leads inside the edge of the part body. In this case, select an appropriate vision type from 123, 124, 144, or 180 and enter element information for the leads based on the shape of the part.

Note: Vision type 10 is automatically converted to 60, however, if another value has been specified in the override vision type value for the NXT, this value will be used.

Note: Refer to 4.6.2 "NXT vision types" for details on how to create lead data.

Note 2

Vision type 20 is used on existing machines to process SOT-type parts with few leads, however, on the NXT machines, vision type 180 is used. A custom vision type is used for power transistors.

Vision type for existing machines	Vision type for NXT	Part type	Explanation
20	180	Tantalum capacitors, SOTs	Automatically converted to 180 if no vision type value has been specified in the NXT override section.
	75	Power transistors	P_pattern automatically converted

Note: Vision type 20 is automatically converted to 180, however, if another value has been specified in the override vision type value for the NXT, this value will be used.

Note 3

Vision type 40 is used on existing machines to process parts with backlighting, using the calculated body position as the placing reference point. The NXT machine, however, can use either the body center or part center for the leaded (bumped) type parts. As a result, there is no need to select a custom vision type. Select the appropriate vision type from the following table based on the part type.

Vision type for existing Machines	Vision type for NXT	Part type	Explanation
40	160	White bodied connector detection	Automatically converted to 160 if no vision type value has been specified in the NXT override section.
	60	Rectangluar chips	
	252	Multi-purpose (part outline)	
	*2	Leaded parts	P_pattern automatically converted

*2: Use the appropriate vision type (123, 124, 152, 153, or 180) depending on the leads and the lead quantity.

Note: Vision type 40 is automatically converted to 160, however, if another value has been specified in the override vision type value for the NXT, this value will be used.

Note 4

Vision type 150 is used on existing machines to process connectors with backlighting, however, this vision type has now been separated as shown in the table below based on body color.

Vision type for existing Machines	Vision type for NXT	Part type	Explanation
150	153	White bodied connectors	Automatically converted to 153 if no vision type value has been specified in the NXT override section.
	152	Black bodied connectors	P_pattern automatically converted

Note: Vision type 150 is automatically converted to 153, however, if another value has been specified in the override vision type value for the NXT, this value will be used.

Note 5

Vision type 254 is used on existing machines to place odd-form parts using backlight. On NXT machines, this vision type has been changed as shown in the table below.

Vision type for existing machines	Vision type for NXT	Part type	Explanation
254	252	Multi-purpose (part outline)	Automatically converted to 252 if no vision type value has been specified in the NXT override section.
	*3		Element data required

*3: On existing machines, vision type 254 uses backlighting to place parts that cannot be placed using other vision types, however, as NXT machines use only frontlighting, it is necessary to choose the most appropriate vision type available. Select vision type 252 when placing white bodied parts with no leads. Vision type 252 can also be used for white bodies parts with leads that are part of the body. If using a different vision type, element data will be required depending on the selected vision type.

Note: Vision type 254 is automatically converted to 252, however, if another value has been specified in the override vision type value for the NXT, this value will be used.

4.7.3 Entering overrides in part data

Procedure

1. Open the shape data (or part data if using non-relational mode) for the part data for which input is required in Fuji Flexa.
2. Refer to Vision Type Compatibility Table for Existing and NXT Machines and enter the new vision type in the NXT override [Vision Type] data field.
3. Refer to Vision Type Compatibility Table for Existing and NXT Machines and enter any new element information in the NXT override [Element Information] setting.
4. Save the data and exit. If the data was changed in the job, save the job.

Note: If the shape data was changed in the global library, the same shape data in any jobs for the NXT must be updated. Use the [Update in Jobs] command from the editor to perform this function. If the data was changed in the job and the data is to be used in the future, it is possible to export the changed shape data back into the shape library.

MEMO:

5. Transmission

5.1 Introduction

Transmission is used to send data between Fuji Flexa and the NXT machines. The most common use of Transmission is to send jobs to the modules on the NXT. Transmission for the NXT does not require outside communication programs such as an NTCC or SECS/GEM host server. From NXT control software V2.70, a basic data check of the job is performed during transmission.

The NXT is different from previous Fuji machines in that the job is sent to the modules, not recipes. In addition, there is only two positions for jobs, current job and next job. On NXT machines with double conveyors, there is an additional set of separate positions for jobs for the second lane. It is possible to run the machine with two different jobs, one for lane 1 and the other for lane 2.

The NXT does not have any calibration data or spec data like previous Fuji machines. Special NXT data and configuration settings is received, managed, and transmitted to the machine through Accessory Software. Refer to the Accessory Software Operation Manual for more details on this subject.

5.2 Transmitting

5.2.1 Transmitting a job from Job Builder

Follow the procedures below to transmit a currently opened global job to the NXT from within Job Builder. Be sure to save the job before transmitting.

1. Select [Transmit] from the [Tools] menu.

Note: The currently opened job can only be transmitted to the line that is used in the job.

2. The [Transmit Options] dialog box displays. Select the desired options and click [OK].
3. Select the machine to which to transmit and click [Start].
4. During transmission, the [Transmit] dialog box displays. This dialog box displays the transmission status. If any errors occur, click [Error Details] to display further information about the errors. Click [Close] to close the dialog box when transmission is completed.

Note: The lane to which the job is transmitted is determined by the lane for which the job was optimized for the NXT machine.

Note: The job name displays in the list of programs at the machine with the job name and a T for the top side and B for the bottom side and the revision displays before these items.

5.2.2 Dragging and dropping jobs to transmit

Follow the procedures below to transmit a job to the NXT by dragging and dropping the job in the Transmission Control view.

1. With the Transmission Control window displayed, drag the desired job from the global directory in the job pane and drop it on either the NXT line, machine, or lane in the Factory/Line pane.

Note: If the job is dropped on a lane, then that line, machine, and lane are automatically selected in the [Transmit Job] dialog box. If the job was just dropped on the NXT machine, then both lanes for the NXT are automatically selected.

2. The [Transmit Job] dialog box displays. In [Job:], the selected job is automatically selected. Select the side of the panel to transmit.
3. The line and machine the job was dropped on is automatically selected. The machines to which can transmitted have a small panel icon to the left of the machine nickname. The machines for which the job is not ready to be transmitted or jobs that are from the local job directory have small panel icon with a red X across it.

Note: A job from the local job directory cannot be transmitted to any NXT machines. Only jobs from the global job directory can be transmitted.

4. Select the lanes to which to send the job from the [Lane] drop-down list. If the job was dropped on a lane, then that lane is automatically selected.
5. Select any desired options from the bottom of the dialog box and click [Send] to transmit.

6. During transmission, the [Transmission Status] dialog box displays. This dialog box displays the job and machines. The transmission status is displayed to the right of the machine nickname. If any errors occur, click [Error Details] to display further information about the errors. Click [Close] to close the dialog box when transmission is completed.

Note: The job name displays in the list of programs at the machine with the job name and a T for the top side and B for the bottom side and the revision displays before these items.

5.2.3 Using [Transmit] to transmit

Follow the procedures below to transmit a job from within Director using the [Transmit] command.

1. Select [Transmit] - [Job…] from the [Tools] menu in Director.
2. The [Transmit Job] dialog box displays. Next to [Job:] displays the job to be transmitted. If a job does not display or the job is incorrect, click [Browse] to display the [Select Data] dialog box. Select the job to transmit and click [Open]. Select the side of the panel to transmit.
3. Select the name of the line to transmit to from the [Line:] drop-down list. When a line is selected, the machines to which can transmitted have a small panel icon to the left of the machine nickname. The machines for which the job is not ready to be transmitted or jobs that are from the local job directory have small panel icon with a red X across it.

Note: A job from the local job directory cannot be transmitted to any NXT machines. Only jobs from the global job directory can be transmitted.

4. Select the lanes to which to send the job from the [Lane] drop-down list.
5. Select the target machines for transmission. The machines with a red X across the panel icon cannot be selected.
6. After selecting the target machines for transmission, select any desired options from the bottom of the dialog box and click [Send] to transmit.
7. During transmission, the [Transmission Status] dialog box displays. This dialog box displays the job and machines. The transmission status is displayed to the right of the machine nickname. If any errors occur, click [Error Details] to display further information about the errors. Click [Close] to close the dialog box when transmission is completed.

Note: The job name displays in the list of programs at the machine with the job name and a T for the top side and B for the bottom side and the revision displays before these items.

5.3 General Procedures

5.3.1 Changing the current job

The current job is the job that is used when production is started. The other job for the selected lane is considered to be the next job. Follow the procedures below to change the next job into the current job, however the machine must be at the main page for this operation to be successful. If any other page is selected, then an error occurs when performing the following procedures. The job can also be switched at the modules.

1. Double-click the factory folder from [Transmission Control] to display the target line, and then double-click the line to display the machines in that line.
2. Double-click the machine name to display the lanes for that machine.
3. Double-click the lane for which to change the job and the current job and next job display in a list.
4. Right-click the job name to be changed and select [Switch Recipe] from the shortcut menu.
5. A dialog box displays with the status of the change. Click [OK] to close the dialog box.

5.3.2 Deleting a job from a machine

1. Double-click the factory folder from [Transmission Control] to display the target line, and then double-click the line to display the machines in that line.
2. Double-click the machine name to display the lanes for that machine.
3. Double-click the lane for which to delete the job and the current job and next job display in a list.
4. Right-click the job to be deleted and select [Delete] from the shortcut menu.
5. A dialog box displays with the status of the command. Click [OK] to close the dialog box.

6. Editing Jobs on the Machine

6.1 Introduction

If panels are in a NXT machine, it is not possible to edit the job and then transmit the edited job back to the foreground in the machine using Fuji Flexa. Instead, MEdit is used to edit jobs that are on machines. The job data that can be edited in MEdit is “safe” to change while there are panels in the machine. If Fuji Flexa is used to edit the job, data that can cause problems for partially produced panels can be changed and when the job is sent to the machine, production problems occur. For example, if a job is reoptimized, it is possible that the feeder setup and insert order across modules will be changed. If a partially produced panel is in the machine, parts that were previously placed might be placed again on the panel or there may be missing parts. MEdit limits the things that can be changed to prevent these sort of problems from happening. In addition, MEdit also provides some specialized functions for working with the NXT such as the skip functions and the job test function.

In addition to MEdit, VPDplus can also be used to edit vision data for parts. The NXT application CD has a special limited-function free version of VPDplus that allows some of the basic VPDplus editing functions to be used if a VPDplus license is not available. Do not use this version if licensed “normal” VPDplus software is on the computer already.

There is one point about MEdit that should be understood. When the current job that is in the machine is opened in MEdit, the actual data from the machine is not being accessed. MEdit checks what job is in the machine and then opens the matching job in the global directory.

The procedures provided in this chapter are basic procedures for MEdit. For details on MEdit and using it, refer to the MEdit Operation Manual.

6.2 Skipping Items on the NXT

6.2.1 Skipping boards (NXT V3.10 and higher)

If always a particular board in a panel production lot needs to be skipped for some reason, it is easy to specify a skip for this board for the production lot. There are a few important points that should be addressed when using this function.

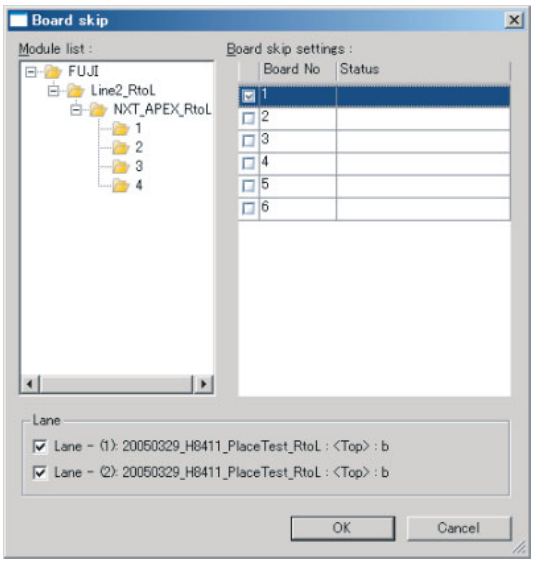
- When the board to be skipped is specified for the first module, that board is skipped in all modules after the first module.
- The skip setting is only applied to new panels which means that the setting is not applied to any panels already loaded.
- Job board skip settings and board skips due to skip marks cannot be overridden by this function.
- Machine configuration settings must be made for this function to be enabled and panel conveyance time in increased (around 300 ms) when this setting is enabled.
- If a certain board is to always be skipped for all production lots, then skip the board in the job with Fuji Flexa.
- If the boards to be skipped are not set (changes from panel to panel), then use skip marks to skip the required boards.

Specifying the machine configuration setting to enable this function.

1. Start Accessory Software and click the name of the machine for which to change the setting in Floor Monitor.
2. If necessary, specify a user ID from the drop-down list and enter a password for the specified user and click [Log on]. The machine accessories page is displayed.
3. Click [Machine Configuration] in the [Menu] pane. Accessory Software connects to the machine and receives the machine information. When completed, the settings page is displayed.
4. Select [Skip boards at the machine setting] from the [Category] drop-down list. The settings for this category are then displayed.
5. Select the [ON] option for the [Skip boards at the machine] setting.
6. Click [Send to Machine] to send the new setting to the machine. The setting is enabled once the completed message is displayed.

Skipping a board at the machine.

1. Before loading the panel belonging to the lot for which board skipping is to be performed, verify that no panels exist inside the first module, and push CYCLE STOP to stop production.
2. Start MEdit and select [Board skip] from the [Tool] menu. The [Board skip] dialog box is displayed.
3. Select the factory, line, NXT machine and then first module in the [Module list]. A list of the available boards and lanes is displayed in the [Board skip settings] list.



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4. Select the checkboxes for the lane and boards to be skipped.
5. Click [OK] to apply the skip settings and then close MEdit.

Note: The new skip setting is only applied to panels that are loaded in the module after this setting is made.

6. Begin production and load the panels for which the board skip is to be applied.

When boards are specified to be skipped, the skipped boards are displayed in the operation panels on the modules. Confirm that the boards to be skipped are correct. Be sure to remove the skip setting when switching to a production lot in which the previously skipped board is to be produced.

6.2.2 Skipping feeders (NXT V2.95 and higher)

Use this function to skip all the parts from a feeder. This allows production to be completed for panels when parts are no longer available for the parts that have run out. It is important to note the following points about this function.

- When parts are skipped, the panel is completed without placing the skipped parts.
- This function should only be used if it absolutely necessary to skip a part to complete production such as when a certain part runs out and will be placed on the panel at a later time once new parts are received.
- This function is designed to be used by line management personnel.
- Be careful when using this function.

Skipping a feeder on a module.

1. As soon as a part supply runs out during production, the machine waits for the parts to be supplied in a "recovery up" status. Perform the following steps only if parts are not available to be resupplied.
2. Push CYCLE STOP at the module in question to stop production for that module.

3. Start MEdit and select [Feeder skip] from the [Tool] menu. The [Feeder skip] dialog box is displayed.
4. Select the factory, line, NXT machine, and the module in the [Module list]. A list of the available feeders is displayed in the [Feeder skip settings] list.
5. Select the checkbox for the feeder with the parts to be skipped.
6. Click [Set] to apply the skip setting and then close MEdit.

Note: If a place before setting is set for a skipped part, the place before setting is disabled. Simultaneously skip the 2 related feeders for the "place before" setting.

7. Push START at the module in question to restart production. Production is continued without placing parts from the skipped feeder position.

Note: It is not necessary to have a feeder in the skipped position in order to continue production. However, it is necessary to have an empty drawer set in the skip position if a tray part is skipped on a tray unit-L.

All of the LEDs for the feeder position are on for skipped feeder positions. For tray parts, skipped positions have a white numbers and the part comment text is grey in the parts out guidance screen.

Clearing the skip setting for a feeder on a module.

1. Push CYCLE STOP at the module before the module with the skipped part (this prevents any new panels from being loaded into the next module).
2. Wait until all panels are unloaded from the module with the feeder skip and then push CYCLE STOP on that module.
3. Start MEdit and select [Feeder skip] from the [Tool] menu. The [Feeder skip] dialog box is displayed.
4. Select the factory, line, NXT machine, and the module with the skipped feeder in the [Module list]. A list of the available feeders is displayed in the [Feeder skip settings] list.
5. Clear the checkbox for the feeder with the parts that are being skipped.
6. Click [Set] to apply the cleared skip setting and then close MEdit.

Note: If a place before setting is set, be sure to clear the skip settings simultaneously for the 2 related feeders with the "place before" setting.

7. Set the new parts in the module in the specified position.
8. Push START at the module in question to restart production. Production is continued and the newly supplied parts are placed.

6.2.3 Skipping holders (NXT V3.00 and higher)

Use this function to skip using a holder for a head on a module. This function makes it possible to not use a specified holder in order to avoid using a holder at which frequent errors occur during production or for which air leakage or clogging problems prevent normal use. In addition, the holder skip function serves as a calibration information backup measure. It is important to note the following points about this function.

- A holder skip status is canceled when a head change occurs.
- A holder for which calibration using a jig nozzle has not been completed cannot be skipped.
- The holder skip function cannot be used for the H01 head, or in cases where a skip would leave no remaining nozzles for production.
- The holder skip function cannot be used in cases where the Q-axis and/or R-axis are not operating normally or in cases such as mechanical valve failure, in which other holders remain unaffected.
- Recovery processing occurs for parts that were supposed to be placed by the skipped holder. Therefore, the skip function reduces throughput.
- When skipping a holder due to a holder failure, verify that the other holders are operating normally.
- The nozzle in the skipped holder is returned to the nozzle station. If the nozzle cannot be returned to the station due to some failure, remove the nozzle by hand.
- It is possible that an accuracy deviation may occur using a head after a failed holder has been skipped.

Skipping a holder on a head.

1. If START has not yet been pushed and the main screen is displayed after turning on the power, push START to turn on the power to the head. Then stop the machine.
2. Ensure that the main screen is displayed at the module.
3. Start MEdit and select [Holder skip] from the [Tool] menu. The [Holder skip] dialog box is displayed.
4. Select the factory, line, NXT machine, and the module in the [Module list]. A list of the available holders on the head is displayed in the [Holder lists].
5. Select the checkbox for the holder to be skipped.
6. Click [Set] to apply the skip setting and then close MEdit.
7. Push START at the module in question to restart production. Production is continued without using the skipped holder.

Note: If the skipped holder is holding a part, discard it. Return the nozzle to the nozzle station if necessary.

When holders are specified to be skipped, the skipped holders are displayed in the operation panel on the module. Confirm that the holder to be skipped is correct.

Clearing a holder skip setting for a head.

1. Push CYCLE STOP at the module with the skipped holder to stop production.
2. Ensure that the main screen is displayed at the module.
3. Start MEdit and select [Holder skip] from the [Tool] menu. The [Holder skip] dialog box is displayed.
4. Select the factory, line, NXT machine, and the module in the [Module list]. A list of the available holders on the head is displayed in the [Holder lists].
5. Clear the checkbox for the holder being skipped to clear to skip setting.
6. Click [Set] to apply the cleared skip setting and then close MEdit.
7. Push START at the module in question to restart production. Production is continued using the previously skipped holder.

6.3 Correcting Vision Errors Sent from the NXT

From NXT V2.81 and higher, it is possible to make settings that if a vision error occurs for a particular feeder position, then the vision error image will automatically be sent to the Accessory Software Server. In Accessory Software, the image can then be opened with VPDplus and used to check the error condtion and make any corrections as necessary. The data is then sent back to the job in the global server. Once it has been saved back in the job, MEdit is then used to retransmited the edited job back to the machine. This function is very useful to help troubleshoot vision data issues with parts that have intermediate vision errors.

Note: It is not recommended to make settings so that any vision error is set to the Accessory Software Server for all slots. This is due to the fact that when a vision error occurs and the image is to be saved to the Accessory Software Server, the module pauses production while the image is being sent to Accessory Software. If many vision errors occur, then production can be delayed while waiting for the images to be sent to the server. This is mainly designed to be a troubleshooting tool only.

6.3.1 Specifying vision error images to be saved for certain positions (NXT V2.81 and higher)

If a particular part has frequent vision errors during production, it is possible to specify that vision error images for that part to be sent to the Accessory Software Server. There are a few important points that should be addressed when using this function.

- A maximum of 10 images can be saved at the Accessory Software Server.
- The module pauses production while error images are being sent and saved to the Accessory Software Server.

1. Start Accessory Software and select the module for the machine from which to save vision error images in Floor Monitor.
2. With the module in question selected, click the vision processing error analysis icon (the green icon with the picture of a part) for the machine from which to receive vision error images. The [Vision processing error analysis] screen is displayed.
3. Click [Vision processing setting] at the top right of the [Vision processing error analysis] screen. A list of used feeder positions in the selected module is displayed.
4. Select the checkboxes for the positions for which to save vision error images.

Note: If [Detailed Settings] is clicked, it is possible to make special settings for which error images and under what conditions are images sent to Accessory Software for positions. It is even possible to specify that only certain errors are to be sent.

5. Click [Apply] to enable the settings.

Note: If the power to the machine is turned off or a new job is transmitted, these settings are cleared.

Note: When a vision processing error occurs at an alternate feeder, the image is saved based on the settings specified for the original feeder.

6.3.2 Viewing saved vision error images

Once an error image has been sent to Accessory Software, it can be displayed in any client accessing Accessory Software. The details of the error and the image are displayed by following the procedures below.

1. From Floor Monitor, select the module from which to view error images and then click the vision processing error analysis icon for that machine. The [Vision processing error analysis] screen is displayed with information for all of the saved images for the selected module.

   - Click [Enlarge] below a image to display that image larger.
   - Click the blue text for the error code to display details about that error code.
   - If there are more pictures than can fit on one page, multiple page numbers are displayed at the bottom of the page. Click the other page number to display the images for that page.
   - The image can be opened/saved by clicking on it. If VPDplus and VPDplus launcher have been installed on the computer, then the image is opened in VPDplus and the vision data can be edited.

6.3.3 Opening and editing vision data using saved images

If VPDplus and VPDplus Launcher have been installed on the computer accessing the Accessory Software, then it is possible to open and edit the vision data for the part using VPDplus and then reflect any changes back to the job in the server. It is important to note the following two points.

- VPDplus must be installed on the computer. If the limited-function free version is installed, then only the functions available from that version can be used. If the licensed version of VPDplus is installed and the license is present, then those functions for that version can be used (such as fit and vision test). Refer to the VPDplus Installation Manual for details on installing VPDplus.
- VPDplus Launcher must be installed on the computer. This software links the images to the shape data and to VPDplus. This software is available from the download section of the Accessory Software website. If not installed, then download and install it before attempting to open an image.

1. From Floor Monitor, select the module from which to view error images and then click the vision processing error analysis icon for that machine. The [Vision processing error analysis] screen is displayed with information for all of the saved images for the selected module.
2. Display the image of the part to be edited with VPDplus.
3. Click the image and a [File Download] dialog box is displayed.
4. Select [Open] and the image is opened using VPDplus.
5. Edit the data as necessary. For details on editing items in VPDplus, refer to the VPDplus Operation Manual or online help.

Note: If using a licensed version of VPDplus, be sure to perform a vision test of the edited settings before saving them back to the job and restarting production.

6. Once editing is completed, select [Update Shape Data] from the [File] menu. A confirmation message box is displayed.
7. Click [Yes] and the edited vision data is saved to the job.
8. Close VPDplus.

6.3.4 Sending edited vision data back to the machine

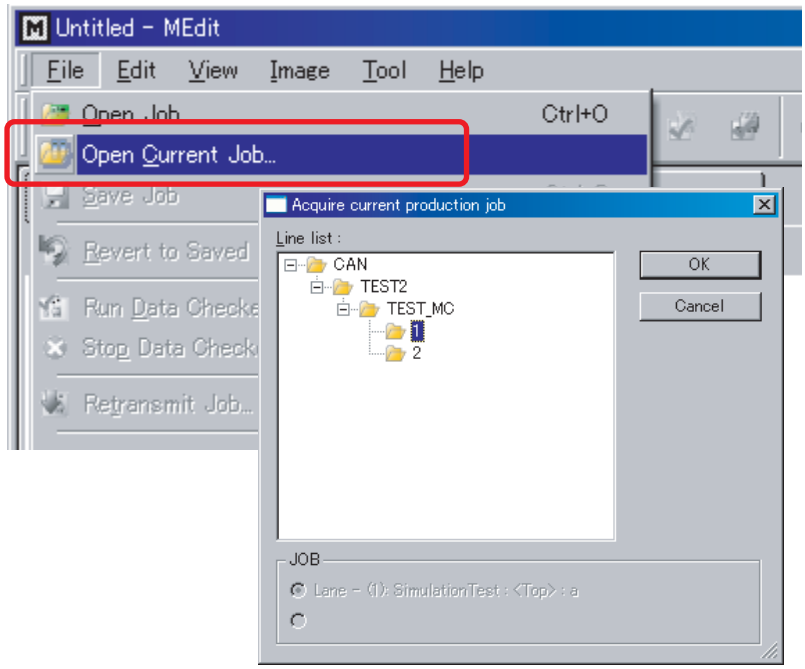
The edited data was saved to the job in the global job directory by using the Update Shape Data command in VPDplus. In order to use this newly edited vision data at the machine, it must be sent to the machine. Use MEdit to open the current job for the module with the part and then retransmit the job back to the module in question. Refer to the sections in this chapter for procedures on opening the current job in the machine and for retransmitting the job back to the machine.

6.4 Opening a Job that is in the Machine

By following the procedures below, the job in the global directory that matches the job that is currently in the machine is opened. When this is performed, changes made to the job can be sent to the machine as well as being saved in the global job.

Note: It is possible to open the same job with the [Open Job] command but if this command is used, then changes cannot be sent to the machine.

1. Click [Start] and then point to [Programs] - [Fuji NXT Accessory] and then click [MEdit]. MEdit is started and the MEdit window displays.



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2. Click [Open Current Job] from the [File] menu. The [Acquire current production job] dialog box displays.
3. Select the line with the machine for the job to be edited in the left pane and then select machine in the right pane. The name of the selected job is automatically displayed in the [Job Name] dialog box.
4. Select the side of the panel to be edited and then specify the module from which to edit the data.
5. Click [OK] and the specified data from the job is opened.

Note: Use the [Open Job] command to open a job that is not in a machine. It is not possible to transmit a job opened this way to a machine from MEdit.

Once the job is opened, it can be edited or tested. For procedure on editing items in MEdit, refer to the MEdit Operation Manual. The procedures for testing a job are provided in the next section. Once the job has been edited/tested, retransmit the changes back to the machine in order for the machine to be able to use the edited data.

6.5 Testing Jobs (NXT V3.10 and higher)

6.5.1 Introduction

The job test function enables users to view and edit jobs on the machine prior to starting production. By doing this, errors that occur during the beginning of production for a new job can be greatly reduced. There are two job test modes and the items checked by each mode are different. Information about these two modes are provided below.

Simulation

The placement position for a specified sequence is captured using the mark camera and the panel pattern is compared graphically with the part image (wire frame) in MEdit. This allows the operator to check for any placement position deviations and problems with the placing angle. In addition, it is possible to confirm that the part type is roughly correct by comparing the wire frame of the part graphic to the actual pad arrangement. If there are any calculated placing deviations, they can be corrected easily in MEdit and be reflected back to the job.

The main items checked by this mode are fiducials, placement position, orientation, and part types compared to the pads. Actual parts are not required to perform this test, just an actual panel is required. If any problems with these items are located, corrections can be made and checked again.

Place & Check

Parts are picked, vision processed and placed on the panel. Once a part is placed, the mark camera takes an image of the position and that image is then displayed in MEdit with a part graphic overlay in MEdit. This allows the operator to check for pickup errors, vision errors, actual placement position deviations and problems with the placing angle. If there are any errors, they can be corrected in MEdit and be reflected back to the job.

The main items checked by this mode are fiducials, feeding, feeding direction, vision data, placing data, actual placement position, and orientation. Actual parts are required to perform this test as well as an actual panel. If any problems with these items are located, corrections can be made and checked again.

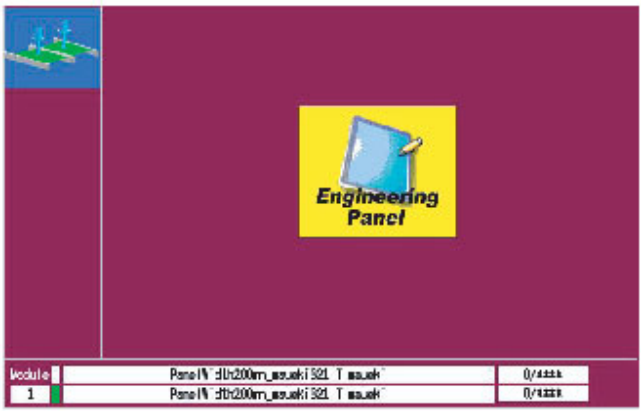
6.5.2 Testing a job using simulation mode

Use this mode to perform a basic check of the part types, placing positions and orientation.

Starting simulation mode.

1. Transmit the job to be tested to the machine and wait for the main screen to display on all of the operation panels for the modules.
2. Start MEdit and log on if necessary.
3. Click [Open Current Job] from the [File] menu. The [Acquire current production job] dialog box displays.
4. Select the line with the machine for the job to be tested in the left pane and then select machine in the right pane. The name of the selected job is automatically displayed in the [Job Name] dialog box.
5. Select the side of the panel to be tested and then specify the module from which to test the data.

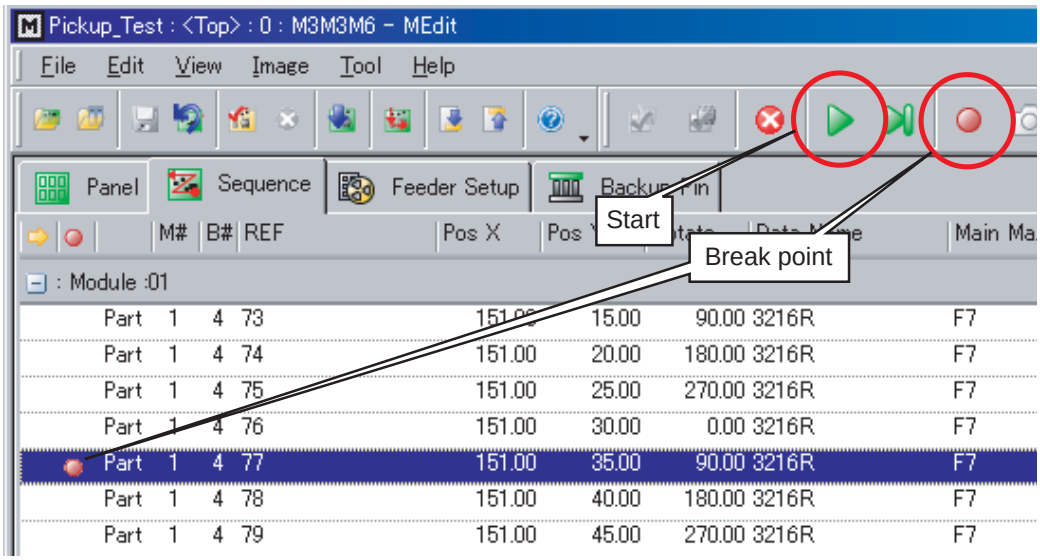
6. Click [OK] and the specified data from the job is opened.



NXTEJM007

7. Select [Job Test] - [Simulation] from the [Tool] menu. The background color of the operation panel for the module in question turns violet to indicate that that module is in a test mode. There are several conditions in which the module cannot be changed to simulation mode and an error occurs.

Checking part positions and direction.



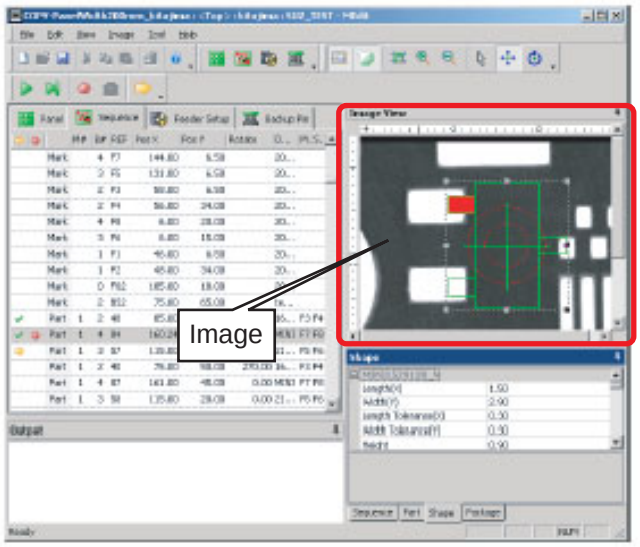
NXTEJM003

8. Select the sequence to be checked from the list in MEdit and click the break point button (the round red button). This designates that the sequence is to be checked and the sequence gets a red circle icon in the beginning column of that sequence.

Note: It is possible to specify multiple break points. The sequences with the break points are stopped at and the captured image is sent to MEdit to be checked. The images for non-break point sequences are not set to MEdit to be checked, unless the next sequence command is being used.

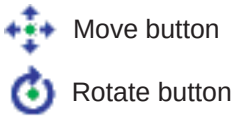
9. If desired, specify a starting sequence for the check by selecting the sequence to start the machine from and then click the start sequence button (the yellow arrow button). When the check is started, this will be the sequence at which the check will start.

10. Click the start button (the green triangle button pointing to the right) to start the check. The machine starts the conveyor and once a panel is loaded, clamps it and starts the check from the designated sequence. The machine uses the mark camera to acquire images of the placing positions and these display on the operation panel. Once a break sequence is reached, the machine acquires that position image, stops, and transmits the image to MEdit. This image is then displayed in MEdit with a part graphic overlay.



NXTEJM005

11. Check the coordinates and angle of the part graphic in relation to the pads on the panel. If it is necessary to change the X- or Y-position of the part, the coordinates can be directly edited or click the positioning button (the button with the four arrows) and then click and drag the graphic until it is positioned correctly. The direction can be changed by clicking the rotation button (the button with the arrow shaped as a circle).



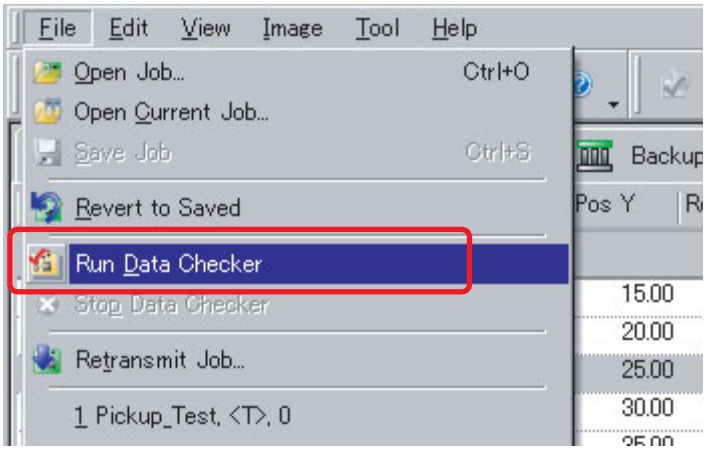
NXTEJM012E

12. Once completed with any necessary adjustments for the displayed position, click the start button to continue until the next break point or click the step button (the button with the triangle pointing at the line) to check the next sequence (even if it does not have a break point set).

13. Continue checking sequences until all desired sequences have been checked.

Note: There are times in which MEdit will ask if the changed job should be retransmitted back to the machine. If the job has been retransmitted and there have been no further changes to the job, then proceed to step 18. This is because the most current data is already in the machine so it is not necessary to retransmit the job again. If not sure whether or not the changes to the job have already been sent to the machine then, proceed to the next step. There are no problems if the job is retransmitted to ensure that the current data is in the machine.

Sending changes back to the module.



NXTEJM008

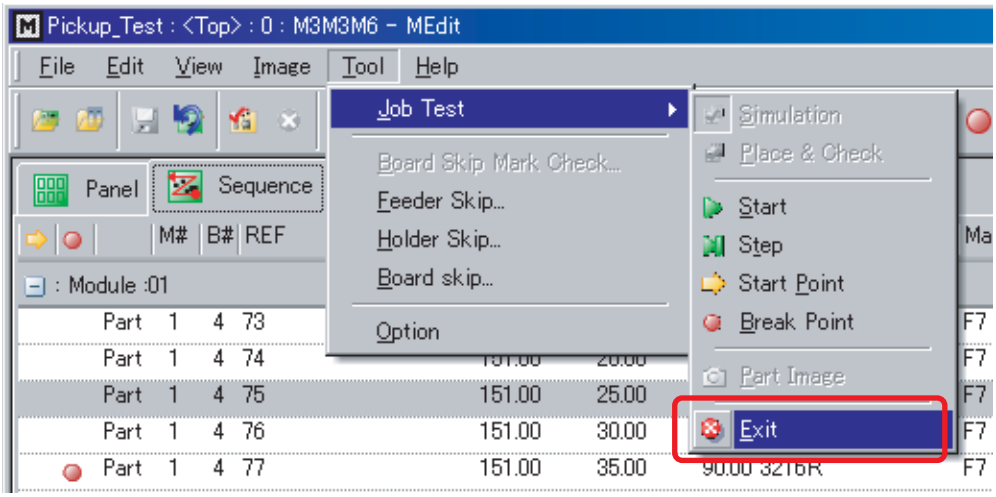
14. Once the sequences have been checked, click [Run Data Checker] from the [File] menu to check the job for any problems. Once the data checker has completed checking the job, retransmit the data back to the module.

15. Select [Retransmit Job] from the [File] menu to send the changes back to the module.

Note: It is possible to transmit the job to the module when the yellow engineering pictogram is displayed on the operation panel of the module.

16. Recheck any changes to sequences if necessary.

Exiting simulation test mode.



NXTEJM009

17. Once all testing for simulation mode has been completed, select [Job Test] - [Exit] from the [Tool] menu.

That completes the testing of the job on the specified module with simulation mode..

6.5.3 Testing a job using place & check mode

Use this mode to perform a check of the pickup data, vision data, carrying data, part types, placing data, actual placing conditions, and orientation.

Starting place & check mode.

1. Transmit the job to be tested to the machine and wait for the main screen to display on all of the operation panels for the modules.
2. Start MEdit and log on if necessary.
3. Click [Open Current Job] from the [File] menu. The [Acquire current production job] dialog box displays.
4. Select the line with the machine for the job to be tested and then select the machine.
5. Select the side of the panel to be tested and then specify the module from which to test the data.
6. Click [OK] and the specified data from the job is opened.
7. Select [Job Test] - [Place & Check] from the [Tool] menu. The background color of the operation panel for the module in question turns violet to indicate that that module is in a test mode. There are several conditions in which the module cannot be changed to place & check mode and an error occurs.

Checking part positions and direction.

8. Select the sequence to be checked from the list in MEdit and click the break point button (the round red button). This designates that the sequence is to be checked and the sequence gets a red circle icon in the beginning column of that sequence.

Note: It is possible to specify multiple break points. The sequences with the break points are stopped at and the captured image is sent to MEdit to be checked. The images for non-break point sequences are not set to MEdit to be checked, unless the next sequence command is being used.

Note: It is not possible to specify a starting sequence for place & check mode. If the module is stopped during production and then switched to this mode, the beginning sequence is the sequence at which production was stopped.

9. Click the start button (the green triangle button pointing to the right) to start the check. The machine starts the conveyor and once a panel is loaded, clamps it and starts the check from the first/stopped sequence. The machine picks parts, vision processes them and then places them and then the mark camera acquires an image of the placed part and position and this displays on the operation panel. Once a break sequence is reached, the machine acquires that position image, stops, and transmits the image to MEdit. This image is then displayed in MEdit with a part graphic overlay.

Note: It is necessary to have feeders set in the module to be tested when using place & check mode because parts are picked from the feeder.

10. Check the coordinates and angle of the part and graphic in relation to the pads on the panel. If it is necessary to change the X- or Y-position of the part, the cooridnates can be directly edited or click the positioning button (the button with the four arrows) and then click and drag the graphic until it is positioned correctly. The direction can be changed by clicking the rotation button (the button with the arrow shaped as a circle).

11. Once completed with any necessary adjustments for the displayed position, click the start button to continue until the next break point or click the step button (the button with the triangle pointing at the line) to check the next sequence (even if it does not have a break point set).

12. Continue checking sequences until all desired sequences have been placed & checked.

Note: There are times in which MEdit will ask if the changed job should be retransmitted back to the machine. If the job has been retransmitted and there have been no further changes to the job, then proceed to step 16. This is because the most current data is already in the machine so it is not necessary to retransmit the job again. If not sure whether or not the changes to the job have already been sent to the machine then, proceed to the next step. There are no problems if the job is retransmitted to ensure that the current data is in the machine.

Sending changes back to the module.

13. Once the sequences have been checked, click [Run Data Checker] from the [File] menu to check the job for any problems. Once the data checker has completed checking the job, retransmit the data back to the module.

14. Select [Retransmit Job] from the [File] menu to send the changes back to the module.

Note: It is possible to transmit the job to the module when the yellow engineering pictogram is displayed on the operation panel of the module.

15. Recheck any changes to sequences if necessary.

Exiting place & check test mode.

16. Once all testing for place & check mode has been completed, select [Job Test] - [Exit] from the [Tool] menu.

That completes the testing of the job on the specified module with place & check mode..

6.6 Testing Pickup Positions (NXT V3.20 and higher)

6.6.1 Introduction

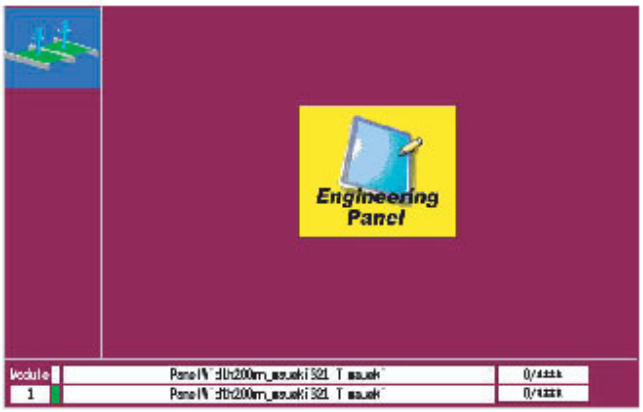
The pickup test function enables users to check and edit pickup positions in jobs on the machine prior to starting production. By doing this, pickup errors that occur during the beginning of production can be greatly reduced. There are two pickup items that can be tested. The pickup X- and Y-positions can be checked and edited from NXT V3.20 and later. The pickup height can be tested and edited from NXT V3.40 and later. Both of these items can be used for parts in feeders or trays. Tray pickup data such as the pickup position and pitch data can also be edited by using this function for trays.

6.6.2 Testing pickup positions in a feeder

Use this to check and edit the X-, Y-, and Z-positions for picking parts in feeders.

Starting the pickup test.

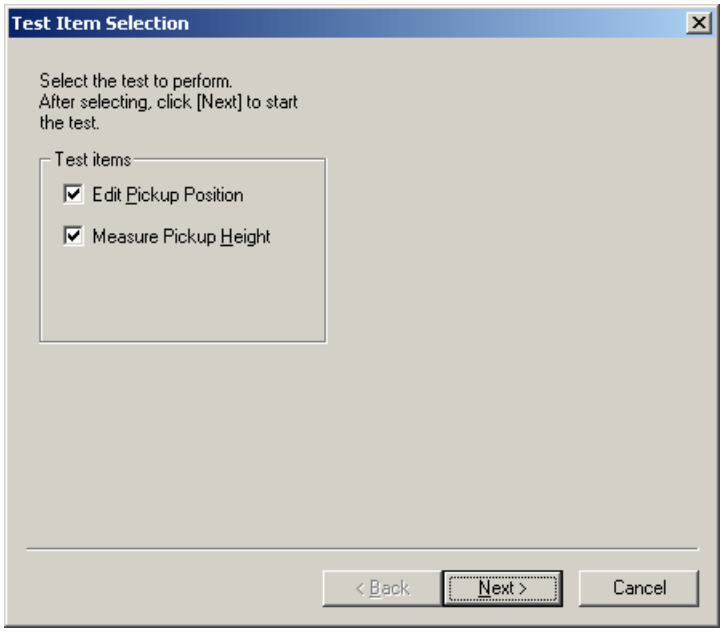
1. Transmit the job with the pickup position to be tested to the machine and wait for the main screen to display on all of the operation panels for the modules.
2. Start MEdit and log on if necessary.
3. Click [Open Current Job] from the [File] menu. The [Acquire current production job] dialog box displays.
4. Select the line with the machine for the pickup positions to be tested in the left pane and then select machine in the right pane. The name of the selected job is automatically displayed in the [Job Name] dialog box.
5. Specify the module from which to test the pickup position data.
6. Select the [Feeder Setup] tab.
7. Select the slot for which the pickup test is to be performed.



NXTEJM007

8. Select [Pickup Check] from the [Tool] menu. The background color of the operation panel for the module in question turns violet to indicate that that module is in a test mode. There are several conditions in which the module cannot be changed to this mode and an error occurs.

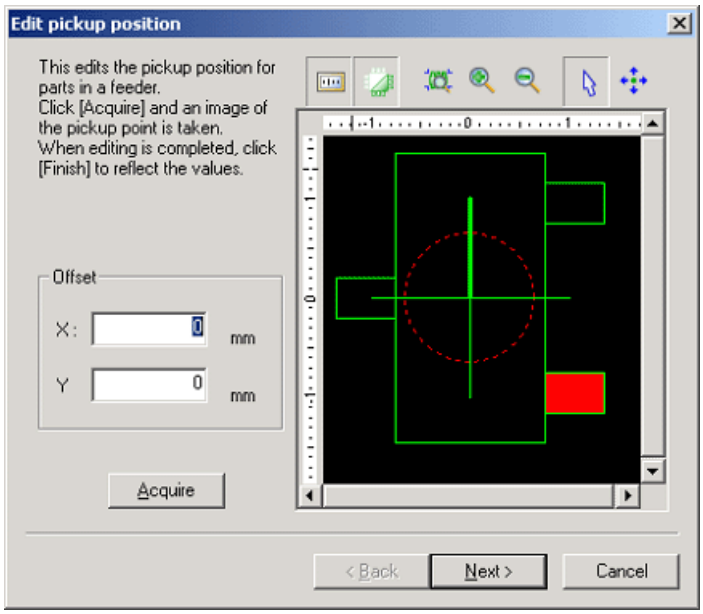
Note: Indexing is not performed automatically for feeders on which a pickup position test is performed. Manually feed the parts to the pickup position. Furthermore, the feed count differs depending on the feeder. Refer to section "6.6.4 Feeder index count and tape return method for pickup tests" for further details.



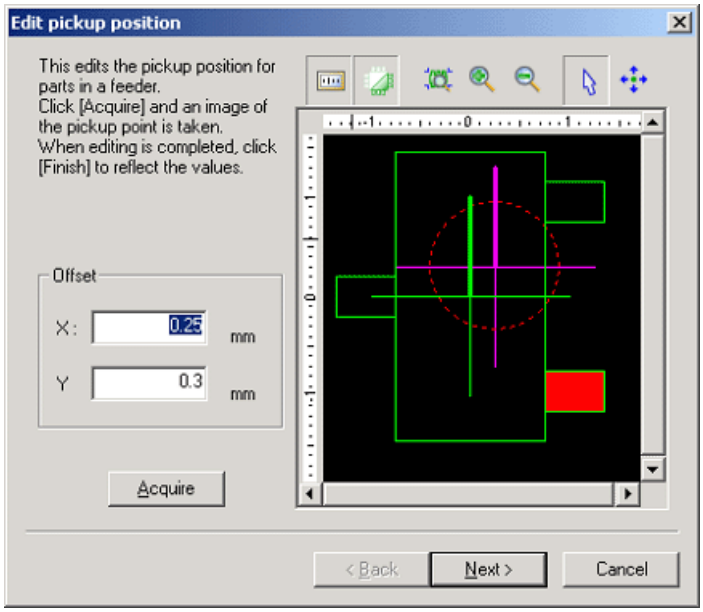
9. Select the type of tests which are to be performed in the dialog box that is displayed. If the [Edit Pickup Position] option is selected, proceed to the next step. If the [Measure Pickup Height] option only is selected, then proceed to step 13.

Note: Because the pickup height measurement uses pickup pressure control, the height measurement test is not possible using heads which have no pressure check sensor. In such cases, the "Measure pickup Height" item cannot be selected. Only the H01 and FO4 heads can be used to perform this test.

Checking and editing the X- and Y-positions in the feeder.



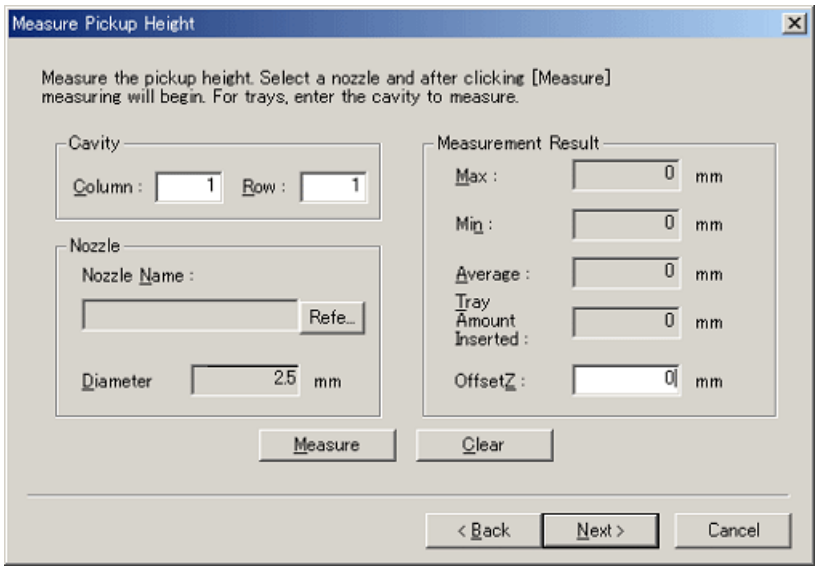
10. The [Edit pickup position] step is displayed. Ensure that the part has been advanced to the proper position (refer to section "6.6.4 Feeder index count and tape return method for pickup tests") then click [Acquire] to take a picture of the part in the feeder. A picture of the part is taken and displayed.



11. Check the pickup position in the X- and Y-direction using the displayed image. To move the pickup position, click the positioning button (the button with the four arrows) and then click in the image where the pickup should be performed.

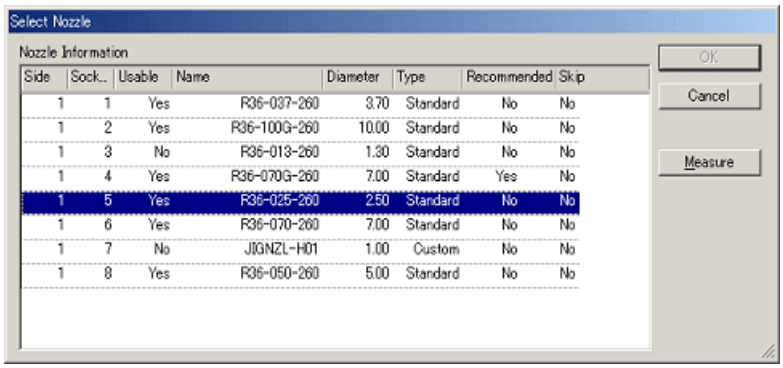
12. When the pickup position for the part is correct, click [Next]. If the pickup height test is not being performed, go to step 18.

Checking and editing the pickup height for a feeder.



13. The [Measure Pickup Height] step is displayed. Ensure that the part has been advanced to the proper position (refer to section "6.6.4 Feeder index count and tape return method for pickup tests") then click [Ref.] to specify which nozzle to use for the test.

Note: The machine knows which nozzles are present in the module (if a check has been performed by the machine). In cases where the job-specified nozzle can be used for the height measurement, that nozzle is automatically selected.

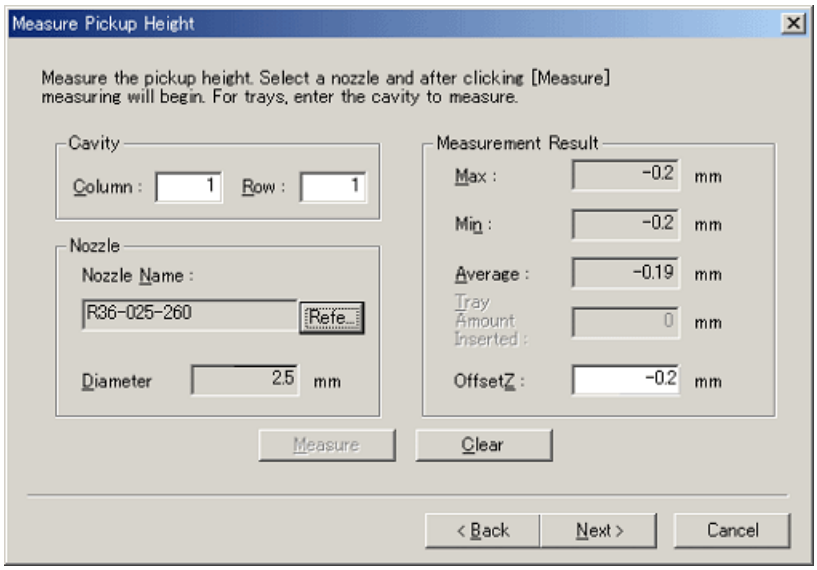


Side	Sock...	Usable	Name	Diameter	Type	Recommended	Skip
1	1	Yes	R36-037-260	3.70	Standard	No	No
1	2	Yes	R36-100G-260	10.00	Standard	No	No
1	3	No	R36-013-260	1.30	Standard	No	No
1	4	Yes	R36-070G-260	7.00	Standard	Yes	No
1	5	Yes	R36-025-260	2.50	Standard	No	No
1	6	Yes	R36-070-260	7.00	Standard	No	No
1	7	No	JIGNZL-H01	1.00	Custom	No	No
1	8	Yes	R36-050-260	5.00	Standard	No	No

14. Select the nozzle to be used for the measurement in the dialog box that is displayed and then click [OK].

Note: If the module has not yet performed calibration and does not know what nozzles are present in the nozzle station, click [Measure] to have the module check which nozzles are present.

15. Click [Measure] to begin the pickup height test.

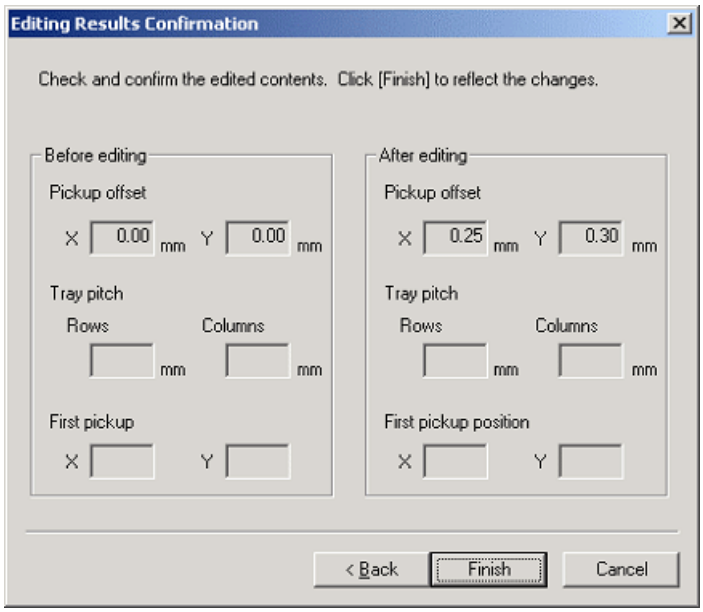


16. The results of the test are displayed and the Z offset is automatically determined. It is possible to manually edit this value.

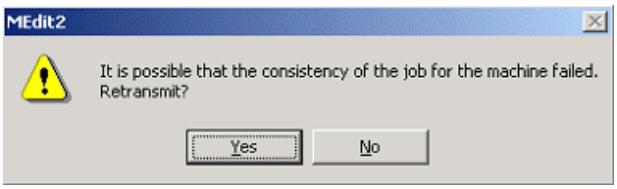
Note: A dialog box is displayed when a stroke error occurs. Click [Yes] in this dialog box to try moving the head down an extra 1 mm and measure again. The same error occurs if there is no part in the pickup position. If unsure if a part is present or not, check the part status in the feeder.

17. Once the Z offset has been determined and the results are acceptable, click [Next].

Sending changes back to the module.



18. The offset results for the pickup position test are displayed. Check the results and if the results are acceptable, click [Finish]. It is possible to click [Back] to return to previous steps of the pickup test.



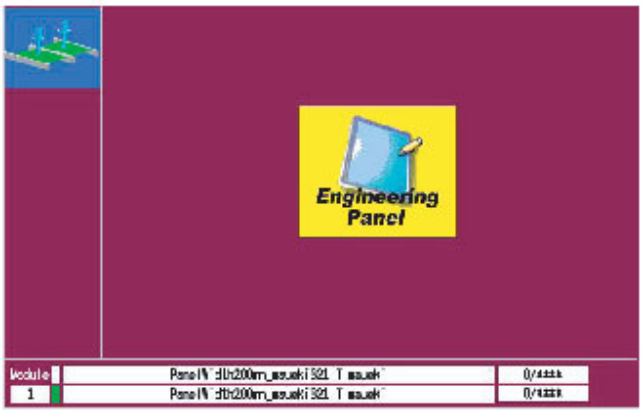
19. A dialog box is displayed asking if the results should be sent back to the module. Click [Yes] to send the new offset data back to the module.
20. A dialog box is displayed asking if Data Checker should be run or not. Click [Yes] to check the job data with data checker.
21. Select the modules to which to sent the changes to the job data back and then click [OK]. Note that is the same part is present in multiple modules, that it is important to select all of the modules that have the same part.

6.6.3 Testing pickup positions in a tray

Use this to check and edit the pitch, X-, Y-, and Z-positions for picking parts in feeders.

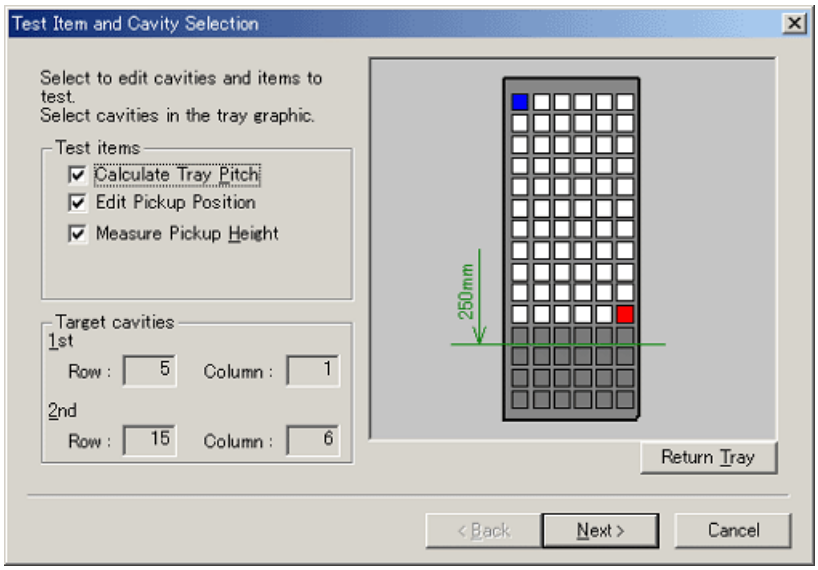
Starting the pickup test.

1. Transmit the job with the pickup positions to be tested to the machine and wait for the main screen to display on all of the operation panels for the modules.
2. Start MEdit and log on if necessary.
3. Click [Open Current Job] from the [File] menu. The [Acquire current production job] dialog box displays.
4. Select the line with the machine for the pickup positions to be tested in the left pane and then select machine in the right pane. The name of the selected job is automatically displayed in the [Job Name] dialog box.
5. Specify the module from which to test the tray pickup position data.
6. Select the [Feeder Setup] tab.
7. Select the slot for which the pickup test is to be performed.



NXTEJM007

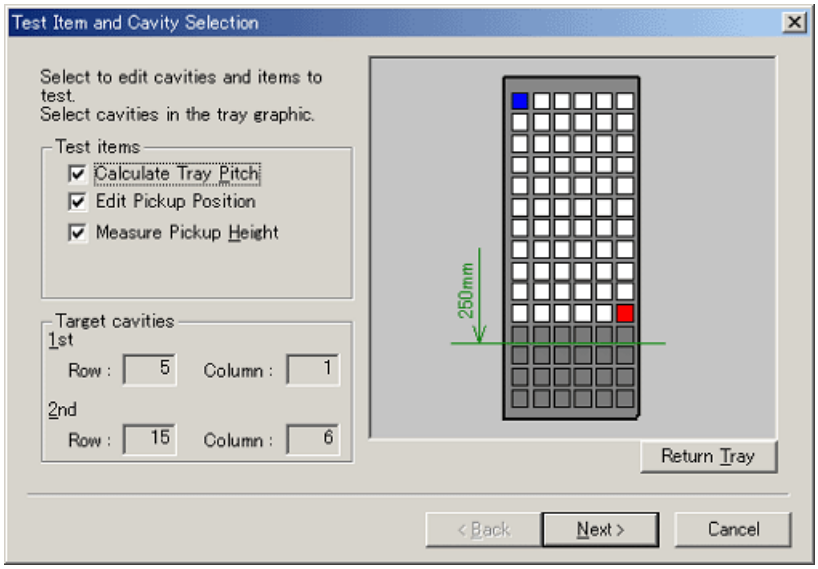
8. Select [Pickup Check] from the [Tool] menu. The background color of the operation panel for the module in question turns violet to indicate that that module is in a test mode. There are several conditions in which the module cannot be changed to this mode and an error occurs.



9. Select the type of tests which are to be performed in the dialog box that is displayed. If the [Calculate Tray Pitch] or [Edit Pickup Position] options are selected, proceed to the next step. If the [Measure Pickup Height] option only is selected, then go to step 18.

Note: Because the pickup height measurement uses pickup pressure control, the height measurement test is not possible using heads which have no pressure check sensor. In such cases, the "Measure pickup Height" item cannot be selected. Only the H01 and FO4 heads can be used to perform this test.

Checking and editing the tray pitch and X- and Y-positions.

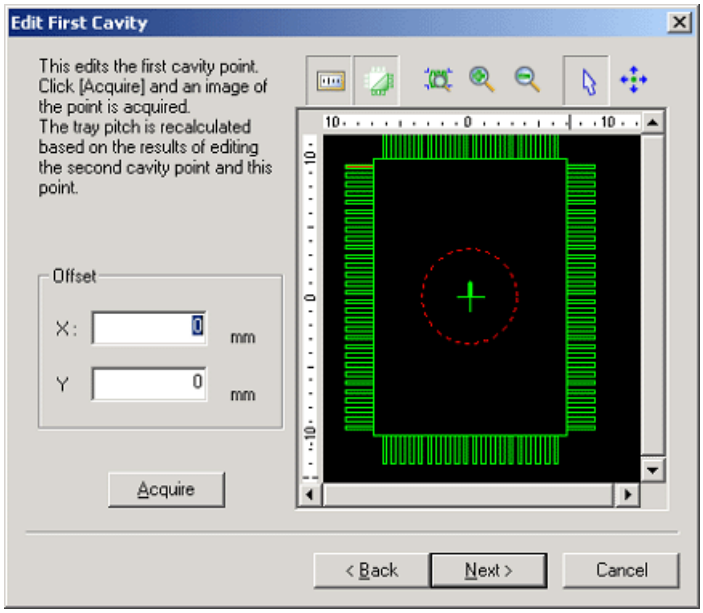


10. If the [Calculate Tray Pitch] option is selected, then specify two possible pick positions in the tray. If the [Edit Pickup Position] is only selected, then select only one pickup position. [Next] is not available until the required positions have been selected.

Note: It is not necessary to select the first and last pickup positions. Any position in the tray can be selected. However, if measuring the tray pitch, the measured results will be better if the two selected cavities are the furtherest from each other. Tray positions past the top 250 mm of the tray cannot be selected due to restrictions in the travel range of the mark camera.

11. Click [Next] and the [Edit First Cavity] step is displayed.

12. Click [Acquire] to take a picture of the part in the first specified slot in the tray. A picture of the part is taken and displayed.



13. Check the pickup position in the X- and Y-direction using the displayed image. If the pickup position needs to be moved, click the positioning button (the button with the four arrows) and then click in the image of the graphic at which the pickup should be performed (the [Offset] values are automatically changed).

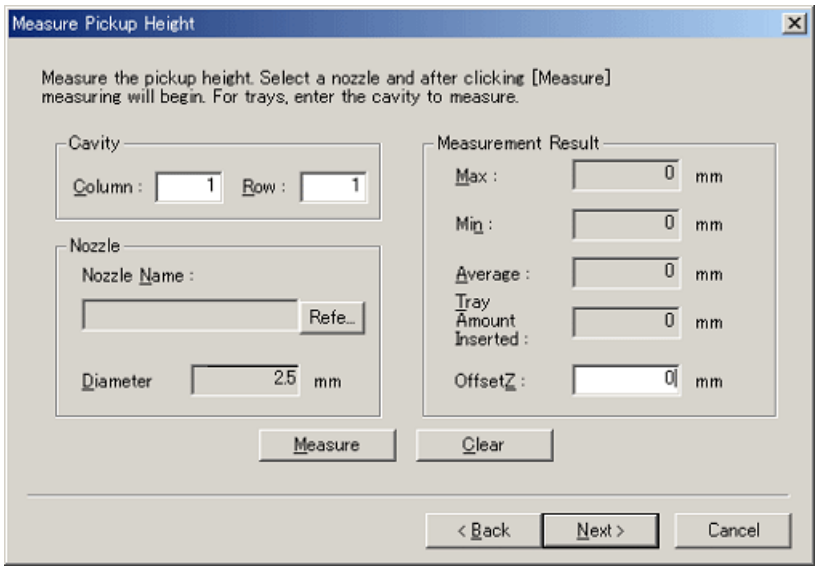
14. When the pickup position for the part is correct, click [Next]. If the tray pitch test is not being performed, then go to step 18.

15. The step for the second specified cavity is displayed (if tray pitch is being measured). Click [Acquire] to take a picture of the part in the second specified slot in the tray. A picture of the part is taken and displayed.

16. Check the second pickup position in the X- and Y-direction using the displayed image. If the pickup position needs to be moved, click the positioning button (the button with the four arrows) and then click in the image of the graphic at which the pickup should be performed (the [Offset] values are automatically changed).

17. When the pickup position for the part is correct, click [Next]. If the pickup height test is not being performed, go to step 24.

Checking and editing the pickup height for a tray.

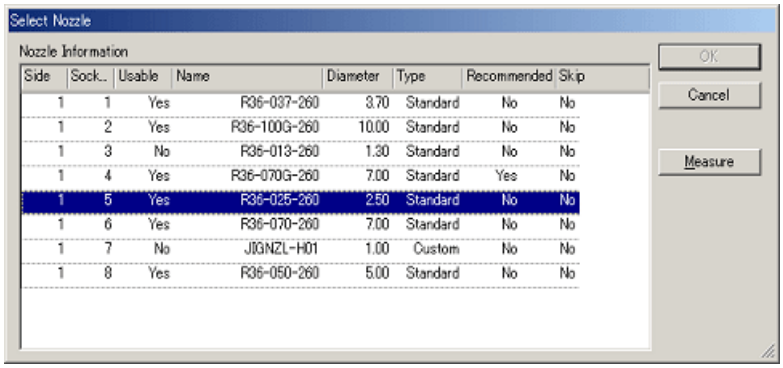


18. The [Measure Pickup Height] step is displayed. Specify the cavity position on which to perform the pickup test (a part must be present in the cavity) in the [Cavity] group.

Note: Trays have a certain amount of warp. Therefore, the measurement should be performed at multiple cavities to determine the optimum pickup height. (Fuji recommends measuring the center cavity and the 4 corner cavities.)

19. Click [Ref.] to specify which nozzle to use for the test.

Note: The machine knows which nozzles are present in the module (if a check has been performed by the machine). In cases where the job-specified nozzle can be used for the height measurement, that nozzle is automatically selected.

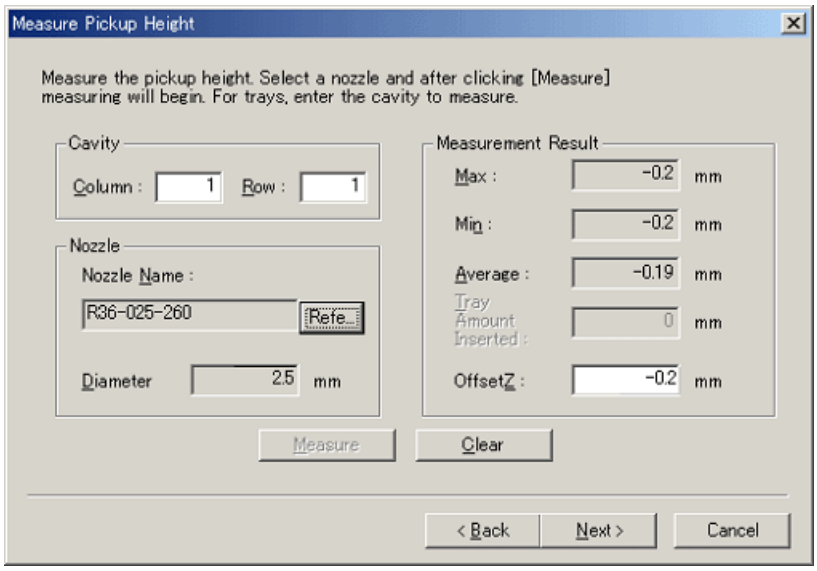


Side	Sock...	Usable	Name	Diameter	Type	Recommended	Skip
1	1	Yes	R36-037-260	3.70	Standard	No	No
1	2	Yes	R36-100G-260	10.00	Standard	No	No
1	3	No	R36-013-260	1.30	Standard	No	No
1	4	Yes	R36-070G-260	7.00	Standard	Yes	No
1	5	Yes	R36-025-260	2.50	Standard	No	No
1	6	Yes	R36-070-260	7.00	Standard	No	No
1	7	No	JIGNZL-H01	1.00	Custom	No	No
1	8	Yes	R36-050-260	5.00	Standard	No	No

20. Select the nozzle to be used for the measurement in the dialog box that is displayed and then click [OK].

Note: If the module has not yet performed calibration and does not know what nozzles are present in the nozzle station, click [Measure] to have the module check which nozzles are present.

21. Click [Measure] to begin the pickup height test.

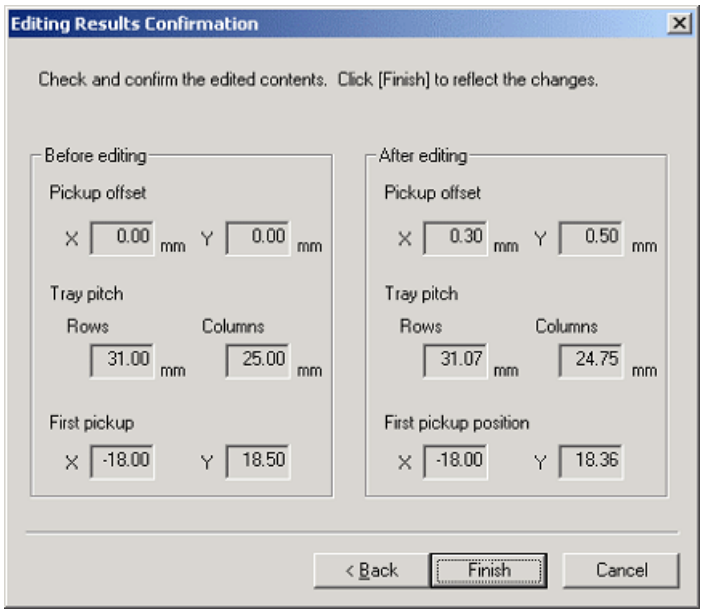


22. The results of the test are displayed and the Z offset is automatically determined. It is possible to manually edit this value.

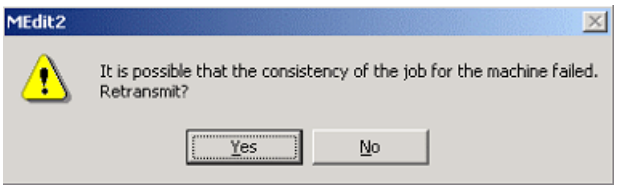
Note: A dialog box is displayed when a stroke error occurs. Click [Yes] in this dialog box to try moving the head down an extra 1 mm and measure again. The same error occurs if there is no part in the pickup position. If unsure if a part is present or not, check the part status in the feeder.

23. Once the Z offset has been determined and the results are acceptable, click [Next].

Sending changes back to the module.



24. The offset and pitch results for the pickup position test are displayed. Check the results and if the results are acceptable, click [Finish]. It is possible to click [Back] to return to previous steps of the pickup test.



25. A dialog box is displayed asking if the results should be sent back to the module. Click [Yes] to send the new offset data back to the module.

26. A dialog box is displayed asking if Data Checker should be run or not. Click [Yes] to check the job data with data checker.

27. Select the modules to which to sent the changes to the job data back and then click [OK]. Note that is the same part is present in multiple modules, that it is important to select all of the modules that have the same part.

6.6.4 Feeder index count and tape return method for pickup tests

When performing a pickup test, it is necessary to index the parts because the test does not automatically index them and there are certain cases in which indexing must be performed a certain number of times, depending on the feeder. The feed count list is shown below.

Index count based upon feeder type and pitch table

Tape Feeders

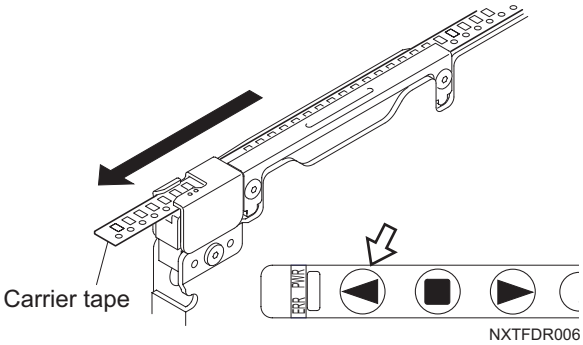
	W08	W12	W16	W24	W32	W44	W56
Pitch	Index amount	Index amount	Index amount	Index amount	Index amount	Index amount	Index amount
1	1	X	X	X	X	X	X
2	1	X	X	X	X	X	X
4	1	3 (1)	3 (1)	4	4	4	4
8		2 (1)	2 (1)	3	3	3	3
12		2 (1)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)
16				2 (1)	2 (1)	2 (1)	2 (1)
20				2 (1)	2 (1)	2 (1)	2 (1)
24				2 (1)	2 (1)	2 (1)	2 (1)
28					(1)	(1)	(1)
32					(1)	(1)	(1)
36						(1)	(1)
40						(1)	(1)
44							(1)
48							(1)
52							(1)
56							(1)

Stick Feeders

Feeder Width	Type	Chute Type	Index Amount
24 mm	1S	Top	(1)
24 mm	1S	Bottom	X
24 mm	1L	Top	X
24 mm	1L	Bottom	X
48 mm	2S	Top	(1)
48 mm	2S	Bottom	X
48 mm	2L	Top	X
48 mm	2L	Bottom	X

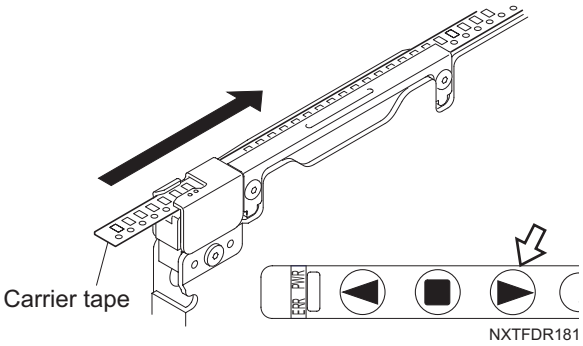
Note: Items in the () indicate that it might be possible to use that amount to index the part for the pickup test. However, there are times when a Y-axis movement tolerance error occurs and the pickup test cannot be performed because the pickup position will change based on calibration compensation or any pickup offset values (part size or smaller) and therefore the pickup position will be outside the valid movement range.

Indexing the tape

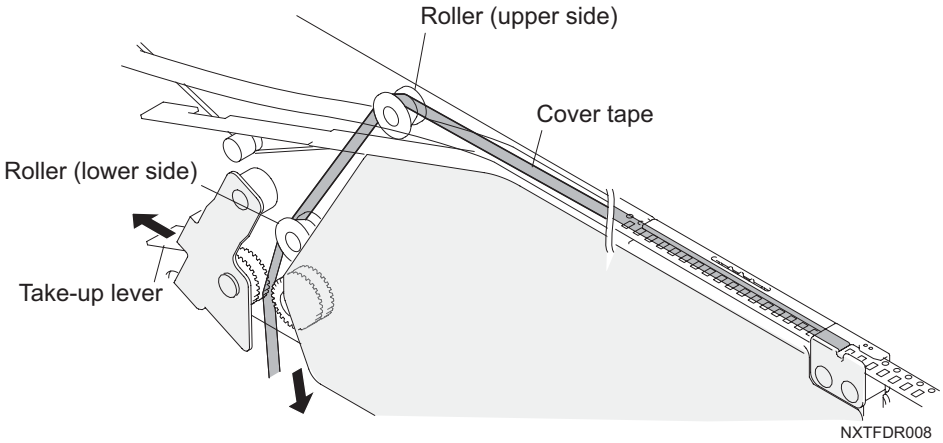


1. Check the chart and push the index button the number of times required to index the part forward.

Returning the tape



1. Check the part and index the part back the number of times it was indexed forward by pushing the back button the same number of times.

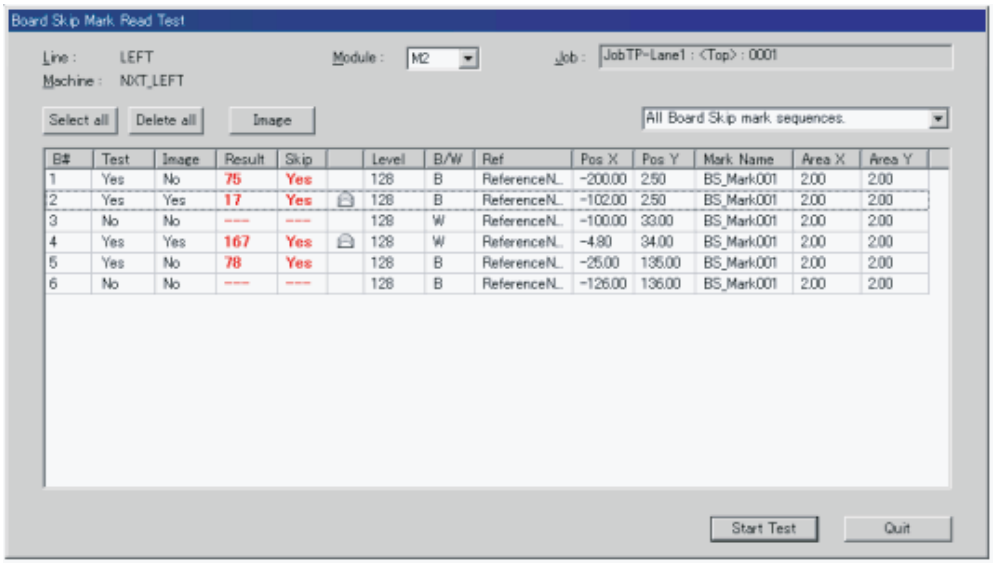


Note: The take-up lever is designed to prevent looseness in the top film when rotated correctly (i.e., the tape is indexed forward). When rotated in the opposite direction, looseness in the top film develops. Eliminate this looseness manually by opening the take-up lever and gently pulling on the top film and then returning the take-up lever.

6.7 Testing Skip Mark Data in the Job

It is possible to test the skip mark data in a job for board skip marks and global skip marks. It is important to test the data because the skip mark read level that is used to determine if a skip mark is present or not must be manually set. Due to color and reflective differences between panels for jobs, a level that is good for one job might not be good for another job. Thus it is important to test the data to ensure that the marks are correctly detected and there are no false detections.

1. Click [Start] and then point to [Programs] - [Fuji NXT Accessory] and then click [MEdit]. MEdit is started and the MEdit window displays.
2. Select [Open Current Job] from the [File] menu. The [Acquire current production job] dialog box displays.
3. Select the line with the machine for the job to be edited and then select the machine. The name of the selected job is automatically displayed in the [Job Name] dialog box.
4. Select the side of the panel to be edited and specify the machine for which to edit the data from the drop-down list.
5. Click [Open] and the specified data from the job is opened.
6. Load the panel to be tested into the module to be used.
7. Push MANUAL on the operation panel of the module to be tested to change to manual mode. The module must be in manual mode or the following steps cannot be performed.
8. Select [Board Skip Mark Read Test] from the [Tools] menu. The [Board Skip Mark Read Test] dialog box opens and the skip mark data in the job is displayed



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9. Specify the module to perform the the read test on from the drop-down list.
10. Change the [Test] setting to "Yes" for the data that is to be tested. If an image is also to be displayed, change the [Image] setting to "Yes".
11. Click [Start Test] and the results of the test display in red.

12. If skip marks are misidentified, check the result number and then click [Quit] to close the dialog box and then edit the data in MEdit based on the test results.
13. Retransmit the job back to the machine and then run the test read again. Repeat until the skip marks are correctly identified.

7. Fujitrax and the NXT

7.1 Introduction

The NXT is designed to support Fujitrax Verifier functionality with no special hardware modifications being required. This allows the extra protection provided by Fujitrax Verifier to be added to the factory with a minimum of fuss and trouble while providing a high level of feeder verification and potential to reduce downtime. There are two main functions for Fujitrax Verifier that is covered in this manual. There are many other functions available in the software that are covered in detail in the Fujitrax Verifier Operation Manual. The two main functions covered in this manual is feeder/part verification and low parts management.

It is important to point out that Fujitrax procedures have not really been changed for the NXT. The biggest change was the line configuration setup for the NXT in Verfier. The main difference on the machine side for the NXT regarding Fujitrax is the ease of feeder checks and feeder detection.

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8. Fujitrax Verifier

8.1 Introduction

Fujitrax Verifier is used to perform two main functions. The first main function is feeder/part verification. The other major function is parts management. There are many other functions available through Fujitrax Verifier, however these will not be covered in this manual because they are not different for the NXT machine. For information on these functions and details on the items here, refer to the Fujitrax Verifier Operation Manual.

The feeder/part verification function is basically the same for the NXT from the software side, however the checking of the feeder set on the machine is different from most Fuji machines. This change enables feeder changover to be checked quicker and with less operator intervention.

Parts management informs the operators when parts are going to run out. One of the biggest changes in regards to resupply is that the machine does not need to be stopped when feeders are replaced. This allows an operator to prepare a new feeder with parts before the parts run out and as soon as they run out, the feeder can be switched without stopping the machine. Another feature due to the feeder system, is the support for splicing with Fujitrax. Fujitrax will inform the operator that a certain feeder needs to be spliced. The operator gets the new parts and brings it to the correct feeder position. Before splicing, a splicing verification check is performed to ensure the part is correct and then the new reel is spliced to the old reel and placed on the feeder.

8.2 Required Items

In order to use Fujitrax Verifier with the NXT, there are several required items.

- Fujitrax Verifier Central Server must be installed and running on the computer with the Kit Server.
- The NXT must be added to the line configuration for the computer with the Kit Server.
- The NXT Fujitrax configuration setting must be turned on.
- The NXT user must be added to the Kit Handy Settings when using Kit Handy.

Follow the procedures below to perform these actions.

8.2.1 Installing and setting up the Central Server

The Central Server requires no special installation steps when installing the Kit Server. This software is automatically installed when a compatible Kit Server version is installed on a computer. In addition, this software should always be running whenever the computer is on because it is a service. A few configuration settings must be specified.

1. Open the Fuji Central Server Settings program by using the shortcut in the start up menu. When selected, the [Fuji Central Server Settings] dialog box is displayed.
2. Enter “FUJIADMIN” in the [User ID] text box and then enter the appropriate password for this user ID.
3. Enter service name for the Verifier Database.

4. Specify the maximum desired log size for the Central Server from the [Log Size] drop-down list.
5. Leave the default setting for [Miss Prevention Timer].
6. Specify the desired setting regarding quick verification.

Setting	Description
Every time of removed feeder	This specifies that a quick verify check of a feeder and the parts must be performed before the feeder is set in the machine. This is required even if an ID (relationship) between the feeder and parts already exists.
Normal	This specifies that a quick verify is not required before a feeder is set in the machine, however an ID (relationship) between the feeder and parts set on the feeder must exist.

7. Specify the name of the computer running the Fuji Flexa User Server in the [Flexa PC Hostname] text box.
8. Click [OK] and the dialog box closes.
9. Reboot the computer to enable the new settings.

8.2.2 Adding the NXT to the Fujitrax line configuration

Follow the steps below when adding the NXT to the Fujitrax Verifier line configuration.

1. Open the Kit Line Configuration program by using the shortcut in the start up menu.
2. Enter “FUJIADMIN” as the user ID and then enter the appropriate password and service name for the master database.
3. Click [OK] and the [Kit Line Configuration] window displays.
4. Select the Factory from the left pane and select [Add Line] from the [Edit] menu.
5. Specify the name of the NXT line in the [Line Name] data field and then specify the name of the computer running the central server for the NXT in the [KITServer Hostname] data field.
6. Click the new line in the left pane and the field updates to display the specified name.
7. Click [Add Machine] from the [Edit] menu. The right pane changes to display the data fields for the new machine.
8. In the [Machine Nickname] field, specify the name of the NXT machine. The name should match that used by Fuji Flexa for the machine.
9. Select [NXT] from the [Machine Type] drop-down list.
10. In the [Recipe Name, Top] and [Recipe Name, Bottom] fields enter the name of the base. It does not matter that these settings are the same, because the NXT does not use these settings. However, some value must be entered in these fields or an error will occur when trying to save the line configuration.
11. Specify the board flow direction and the parts out settings in the appropriate fields.
12. Enter the name of the computer running the Central Server for this base in the [Central

Server Name] field. This should match the name used for the Kit Server for the line.

13. Specify whether dynamic alternate feeders are to be used or if splicing is to be performed for replenishing parts in the [Dynamic Alternate Feeder] field.

Setting	Description
OFF	The dynamic alternate feeder function is not used and splicing is possible.
ON (Look For Removable)	The dynamic alternate feeder function is used and when the original feeder is removed, the alternate feeder should be placed in the original position when the machine indicates that it should be moved.
ON (Keep Alt Feeder)	The dynamic alternate feeder function is used, but the alternate feeder is not moved when the original feeder is removed.

14. That completes the settings for the machine items for Verifier. Click the new machine in the left pane and the machine name updates to display the specified name.
15. Click [Add Base] from the [Edit] menu. The right pane changes to display the data fields for the new base.
16. In the [Base Name] field, specify the name of the first NXT base for the machine. The name should match that used by Fuji Flexa for the base.
17. Specify the base type using the [Base Type] drop-down list.
18. Click the new base in the left pane and the base name updates to display the specified name.
19. Click [Add Module] from the [Edit] menu. The right pane changes to display the data fields for the new module.
20. Specify the module type by using the [Module Type] drop-down list. Leave the other setting as is.
21. Click the new module in the left pane and the module name updates to display the specified module type.
22. Repeat steps 19 to 21 until all of the modules for that base have been specified.
23. Click the base, and if the NXT machine is comprised of multiple bases, click [Add Base] from the [Edit] menu. The right pane changes to display the data fields for the new base.
24. Repeat steps 15 to 23 until all bases for the NXT machine have been specified.
25. If there are any other NXT machines on the same line then select the new NXT machine and repeat steps 7 to 24 until all NXT machines in the line have been specified.
26. If there are any other lines for this Kit Server with NXT machines, add the machines at this time.
27. Select [Save] from the [File] menu and then [OK], and the file is saved to the database and computers.
28. Select [Exit] from the [File] menu to quit Kit Line Configuration Editor.

8.2.3 Setting the NXT Fujitrax configuration settings

Follow the steps below to change the setting on the NXT machine to work with the Fujitrax Verifier system..

1. Double-click the [Internet Explorer] icon on the desktop.
2. Enter the address (URL) "http://<NXT accessory software server name>/fujiweb" and then press **Enter**. If the server computer is located and the server is running, a loading page displays. Once the necessary items have been loaded, the [Home] page displays. This page provides basic production information for the NXTs.
3. From Floor Monitor, click the machine or module number for the NXT for which Machine Accessories is to be used. The Machine Accessories log on page is displayed
4. Enter or select a user ID from the drop-down list.
5. Enter the password for the user and click [Log on]. Once connected to the machine, the top diagram of the picture will match the machine that was selected. In the lower left side, the menu for possible actions displays. In the lower right side, the details for the selected item displays.
6. Click [Machine Configuration] from [Menu]. Accessory Software connects to the machine and receives the machine information. When completed, the settings page displays.
7. Select [Fujitrax Settings] from the [Category] drop-down list. When a category has been selected the settings shown under the list automatically change to the selected category.
8. Select the [ON] option for the [Use Verifier] setting.
9. Leave the other settings with their default settings unless special settings are required. For details on the settings, refer to the NXT Accessory Software Operation Manual.
10. Once the settings have been completed, click [Send to Machine] to send the new setting to the machine. During transmission to the machine, the operation panel will change to the transmission display. When sending the new setting is complete, a page displays with that message. If any other changes need to be made, use the drop-down list to select the category for the setting.
11. Once all changed settings have been sent to the machine, click [Close].

8.2.4 Registering users for Kit Handy access

Follow the steps below to allow the registered users to access the NXT information through Kit Handy.

1. Open Kit Manger by using the shortcut in the start up menu.
2. Enter “FUJIADMIN” as the user ID and then enter the appropriate password and service name for the master database. It is necessary to log on with this ID to change the Kit Handy settings.
3. Click [OK] and Kit Manager starts.
4. Double-click the factory from the left pane and the lines for that factory display.
5. Double-click the line to display the machines for that line.
6. Select the NXT machine and then right-click. A shortcut menu displays.
7. Select [Handy User Settings] from the shortcut menu. The [Handy User Settings] dialog box for the selected machine displays.
8. Enter the user ID to be registered in the [User ID] text box.
9. Click [Add] and the entered user ID displays in the list.
10. Continue repeating steps 8 to 9 until all of the user IDs for that NXT have been registered.
11. Click [Close] to complete the user ID registration process. The registered user IDs are now capable of accessing the information screens for that NXT.
12. Log off Kit Manager by selecting [Exit] from the [File] menu.

8.3 Working With AVL Data

AVL data is a data type that is available in Fuji Flexa V2.0.1 and higher. By using this data, it is possible to use parts that have the same function but come from different vendors and might have different part numbers, supply direction, and shapes without having to edit the job in production. AVL stands for “Approved Vendor List”.

Each different part should be assigned a unique part number when there is a difference in the parts such as vendors, type of part, function, or shapes. Due to this, there will be parts that perform the same function and maybe even have the same shape information but come from a diffferent vendor so the part number is different. Previously, when a different part number that has the same function is to be used in production, the job had to be manually edited to change the old part number to the different part number. This is due to the fact that to one slot and set of related sequences, one part number is assigned.

By making AVL data that groups the approved part numbers, it is possible to quickly change the part to be used in a job that is using AVL data when not using Verifier. This basically changes the job so that one feeder position and the related set of sequences can use multiple part numbers. When Verifier is not being used for the NXT, the part number with the priority setting is the one that is to be used for production.

When Verifier is being used with NXT V3.10 and higher, the true power of the AVL data is realized. When Verifier is used in confunction with AVL data on the NXT, the part number that can be used is not limited to the part number with the priority setting, but any part number within the AVL data. This makes it possible to use any of the parts numbers for each AVL as parts for that job without having to edit the job*. In addition, the possible parts that can be used are also list in the parts supply guidance. During production it is even possible to verify and switch the parts used when the original runs out*.

Note: Refer to the Compatible items and limitations section for details on these items.

The procedures for when using AVL data have been added to the instructions in the following sections if any special procedure or point is required.

8.3.1 Required items

The following items are required in other to use AVL data with the NXT and fujitrax.

- NXT using machine software V3.10 or higher
- Fuji Flexa version V2.0.1 or higher
- Fujitrax Verifier V3.03 or higher
- The AVL option turned on in Fuji Flexa in the Fuji Flexa Server Setup.
- AVL data registered in the AVL library for the items in the jobs.
- AVL data specified for the sequences in the job.

8.3.2 Compatible items and limitations

The following table lists the current compatibility of AVL data.

Item	AVL Comp.	Description
Fuji Flexa	Yes	Fuji Flexa V2.0.1 or higher is required.
Fujitrax Verifier	Conditions exist	Fujitrax V3.03 and higher supports AVL. However, a quick verification cannot be used when changing the part number. This is planned to be supportd in the future.
Dynamic Alternate Feeder	Yes	Cannot perform a quick verify for parts that are using a different part number.
Splicing	Conditions exist	Splicing can be performed when the original parts and new parts are using the same part number. When the part number is changed, splicing cannot be performed. The original parts have to run out and then switch the feeder with a new feeder with the different parts.
Dual Lane Production	Yes	
Fujitrax Profiler	Yes	
Tray Unit-L	No	
Stick Feeder	No	
MEdit	No	
Automatic Changeover Function	Yes	

The following is a list of the current limitations.

- It is possible to use any of the parts in the AVL data, but only the part that has the priority setting can be used when performing a quick verification. If other part numbers are to be used, it is not possible to currently quick verify those parts but a ID will have to be made for the relationship between the feeder and part.
- It is not possible to quick verify the parts for the dynamic alternate feeder function when changing to a different part number during production. An ID has to be created and then the feeder is set in the machine. If the setting that a quick verify is required for all feeders, then the dynamic alternate feeder function cannot be used (unless this setting is turned off) for parts with different part numbers. If the same part number is being used to replenish parts then it is possible to use quick verify for the dynamic alternate feeder function.
- It is not possible to use splicing to splice together two different part numbers during production. The operator simply replaces the feeder with a new feeder with the different parts on it (after creating an ID) in the machine when the original parts run out. If the same part number is being used to replenish parts

then it is possible to splice them together.

- It is not possible to use this AVL function for tray parts or stick parts.
- It is not possible to use MEdit to edit AVL data.
- If the NXT is not using machine software V3.10 or higher, the only parts that can be used in production are the parts with the priority settings.

8.4 Creating Relationships Between Feeders and Reels

It is essential to create IDs or to perform a quick verify before setting parts on a machine. Creating IDs and performing a quick verify create relationships between reels and feeders. Before performing this, the parts DID and feeder barcodes must already be registered in the Fujitrax Verifier database or an error will occur while making an ID or performing a quick verify.

8.4.1 Creating IDs

This is used to just create an relationship between the part and the feder in which the part is set. An ID can be created between a part and a feeder at any time. When an ID is created, this simply creates a relationship and performs no other checks such as if the part is actually the desired part or not. If the Central Server option is set in which a quick verification is required before a feeder can be set on the machine, use the quick verify method instead for jobs in the foreground or use external changeover for setting up feeders for jobs not in the machine.

If AVL data is being used and a different part to the one that has the priority setting is being used, the relationship between the feeder and reel has to be made this way at this time.

Using Kit Manager

1. Open Kit Manger by using the shortcut in the start up menu.
2. Enter a user ID and then enter the appropriate password and service name for the Verifier database.
3. Click [OK] and Kit Manager starts.
4. Double-click [Database] in the left pane. The items for this group display.
5. Click the [ID] folder to make it active.
6. Scan the DID barcode for the part. The [ID] dialog box displays with the scanned DID in the [DID] text box.
7. Scan the barcode on the feeder. The data is entered into the [FIDL] text box and if no errors occur, the dialog box is automatically closed. The new ID relationship displays.
8. Continue registering IDs until relationships between all feeders and parts for the job have been completed.

Using Kit Handy

1. Start the Fuji Information Terminal and tap the Windows mark to display the [Start Menu]. Tap [Kit Handy] to display the [Log on] screen.
2. Enter or scan the user ID and tap [OK]. The Kit Handy menu displays.
3. Tap [ID] and the ID creation screen displays.
4. Scan the DID of the part on the feeder. The scanned DID displays in the [DID] text box.
5. Scan the feeder barcode and the result is entered in [FIDL] text box. If no errors occur, the dialog box automatically closes.
6. Repeat these procedures as necessary for the other feeders.

8.4.2 Performing a quick verify

This can only be performed for feeders that are in the current job. This cannot be performed for feeders to be used in the next job or jobs not in the machine. To set up feeders for such jobs, use External Changeover. This creates a relationship between the feeder and the part, and checks to ensure that the scanned part is the correct part for that position. This currently cannot be used if AVL data is being used and the part number being used is not the part number in the AVL data with the priority setting.

Using Kit Manager

1. Open Kit Manger by using the shortcut in the start up menu.
2. Enter a user ID and then enter the appropriate password and service name for the master database.
3. Click [OK] and Kit Manager starts.
4. Double-click the factory folder in the left pane. The lines for this factory display.
5. Double-click the line with the NXT to be set. The machines for that line display.
6. Select the NXT machine on which to perform the Quick Verify.
7. Select [Quick Verify Mode] from the [Command] menu.
8. Select the feeder position for which to perform the quick verify.
9. Scan the DID of the part on the feeder that is for the selected position. The [Quick Verify] dialog box displays with the scanned DID in the [DID] text box.
10. Scan the feeder barcode and the result is entered in [FIDL] text box. If no errors occur, the dialog box automatically closes and a blue round icon displays in front of that feeder position.
11. Repeat these procedures for the other feeders.

Using Kit Handy

1. Start the Fuji Information Terminal and tap the Windows mark to display the [Start Menu]. Tap [Kit Handy] to display the [Log on] screen.
2. Enter the user ID and tap [OK]. It is possible to also scan the user ID. The Kit Handy menu displays.
3. Tap [Device Check] and the machine specification screen displays.
4. Enter or scan the name of the NXT machine for which to perform the device check and tap [OK].
5. Tap [Mode] from near the top of the display and then tap [Quick Verify].
6. Tap the device for which to perform the quick verify to select that device.
7. Scan the DID of the part on the feeder that is for the selected position. The screen changes to display the scanned DID in the [DID] text box.
8. Scan the feeder barcode and the result is entered in [FIDL] text box. If no errors occur, the dialog box automatically closes and a blue icon displays for that feeder position.
9. Repeat these procedures for the other feeders.

8.5 Performing a Device Check

If there is a vision error or pick up errors for a feeder, a device check is required for that position before production can be resumed. Follow the procedures below to perform a device check.

8.5.1 Using Kit Handy

1. Start the Fuji Information Terminal and tap the Windows mark to display the [Start Menu]. Tap [Kit Handy] to display the [Log on] screen.
2. Enter the user ID and tap [OK]. It is possible to also scan the user ID. The Kit Handy menu displays.
3. Tap [Device Check] and the machine specification screen displays.
4. Enter or scan the name of the NXT machine for which to perform the device check and tap [OK].
5. Tap [Mode] from near the top of the display and then tap [Device Check].
6. Tap the device for which to perform the device check to select that device. This position should have an error icon and be a different color due to the error condition.
7. Scan the DID of the part on the feeder that is for the selected position. The screen changes to display the scanned DID in the [DID] text box.
8. Scan the feeder barcode and the result is entered in [FIDL] text box. If no errors occur, the dialog box automatically closes and the error status is cleared. Production can resume using this feeder.

8.6 Checking the Device Statuses

From Kit Manager or Kit Handy, it is possible to check the current condition of the devices on the machine. Follow the procedures below to check the devices on the machine.

8.6.1 Using Kit Manager

1. Open Kit Manger by using the shortcut in the start up menu.
2. Enter a user ID and then enter the appropriate password and service name for the master database.
3. Click [OK] and Kit Manager starts.
4. Double-click the factory folder in the left pane. The lines for this factory display.
5. Double-click the line with the NXT to be checked. The machines for that line display.
6. Select the NXT machine for which to check. The right pane changes to display the devices for the machine. Scroll through the devices to check the different positions. It is also possible to sort the devices based upon a heading by double-clicking that heading.

8.6.2 Using Kit Handy

By following the procedures below, all of the feeders for the selected machine displays. In addition, if a parts out warning occurs, these warnings are also displayed in the Parts Status screen for all machines for which the user is registered.

1. Start the Fuji Information Terminal and tap the Windows mark to display the [Start Menu]. Tap [Kit Handy] to display the [Log on] screen.
2. Enter the user ID and tap [OK]. It is possible to also scan the user ID. The Kit Handy menu displays. The bottom of the screen will display special icons if any parts warnings or machine errors have occurred on the machines for which the user logged in is registered.
3. Tap [Device Check] and the machine specification screen displays.
4. Enter or scan the name of the NXT machine for which to check and tap [OK]. The screen changes to display the condtions of the current devices. Scroll through the list to check the different positions.

8.7 Resupplying Parts During Production

There are several methods for resupplying parts during production. The first uses dynamic alternate feeders to resupply parts for feeder. The second method is to splice the new tape and old tape together before the feeder runs out of parts. The third method available for feeders is simply waiting for the feeder to run out of parts and then replace the feeder with another feeder already set with the same part. For trays, there is a method for resupplying parts without stopping production.

8.7.1 Replacing feeders using dynamic alternate feeders

Fujitrax Verfier issues parts out warnings based upon the user specified settings. When a parts out warning occurs, the operator has time to get a new reel, set it on a feeder, and perform a quick verify. Once these steps are performed, the feeder is set in the module in which the warning was issued and the machine checks that feeder position and automatically converts that feeder into a alternate feeder. When the original parts have run out, parts are then picked from the alternate feeder and the original feeder is removed. From this point, there are two different procedures performed depending on the dynamic alternate feeder setting specified in the Kit line configuration. Splicing and dynamic alternate feeders cannot be used at the same time on the machine.

If AVL data is being used, quick verify for the dynamic alternate feeder function can only be used to replenish parts have the same part number as the original parts. If the parts have different part numbers, then an ID is made, but if the Central Server setting that a quick verify is required for all parts is on, then this setting needs to be turned off or different part numbers cannot be supplied using the dynamic alternate feeder function.

1. A parts out warning is issued and seen from one of the various locations, the NXT operation panel, from one of the Kit Manager status displays, or from the Kit Handy Parts Status or Device Check screens.
2. Obtain a new reel of matching parts and set on a new feeder.
3. Quick verify the parts and feeder using Kit Manager or Kit Handy. Due to this step, when the feeder is set on the machine, the machine will be able to determine the part loaded on the feeder. If the part number is different then create an ID.
4. Set the feeder in an empty slot in the module with the parts on which the parts out warning occurred. If the set green and orange LEDs light, verification was successful and the feeder status was changed into an alternate feeder.
5. Once the original feeder runs completely out of parts and the machine starts picking from the alternate feeder. The original feeder set LED turns red.
6. Remove the orignal feeder after the red set LED is lit. The actions that occur next depend on the settings in the Kit line configuration for Alternate Feeder.

Note: When removing feeders, it is essential that the clamp lever is raised all of the way and kept in that condition when the feeder is pulled out. If the clamp lever is not completely raised, it is possible that the power to the feeder is not disconnected. If the feeder is removed with power still being supplied, the connector can become bad and the internal feeder board can be damaged.

Note: The machine does not need to be stopped to remove a tape feeder.

If the alternate feeder setting is “ON (Look for removable)”

1. When the original feeder is removed, the LED for that position begins to blink and the LED for the alternate feeder changes to red and the feeder must be removed (it becomes a "removeable feeder"). Once the alternate feeder LED turns red, remove the alternate feeder.

Note: If multiple dynamic alternate feeders are set for the same part, the status of all of the set feeders becomes "removeable".

Note: When removing feeders, it is essential that the clamp lever is raised all of the way and kept in that condition when the feeder is pulled out. If the clamp lever is not completely raised, it is possible that the power to the feeder is not disconnected. If the feeder is removed with power still being supplied, the connector can become bad and the internal feeder board can be damaged.

2. Quickly place the alternate feeder in the original feeder slot within the “miss preventation timer” setting time limit in the Central Server (default: 40 seconds). If the feeder is set properly in the original slot within that time limit, the set LED turns green and the feeder can be used. If it is not set within that time frame, quick verify the feeder again and set it in the original feeder’s slot. Resupply is complete.

Note: When there are multiple alternate feeders, only remove one of the alternate feeders. If two or more feeders are removed, the feeder guidance will not display correctly.

If the alternate feeder setting is “ON (Keep Alt Feeder)”

The alternate feeder is continued to be used as is until a feeder is set back in the original feeder’s slot. When parts are set back in the original slot. the machine then picks parts from the original slot. This means that the alternate feeder is only used as long as there is no feeder in the original slot.

8.7.2 Splicing tape

Fujitrax Verfier issues parts out warnings based upon the user specified settings. When a parts out warning occurs and splicing is to be performed, the operator has time to get a new reel and splice it to the old reel before the parts run out. During splicing, a check is performed to ensure that the parts are correct. If the parts are correct, then the feeder status is automatically changed.

When using AVL data, splicing can be performed as long as the new tape being spliced to the old reel has the same part number as the original reel. If a different part is to be supplied, then the procedures for the next section 7.7.3 have to be followed so that the original feeder runs out of the parts and then the feeder is removed and a new feeder with the different parts is supplied.

1. A parts out warning is issued and seen from one of the various locations, the NXT operation panel, from one of the Kit Manager status displays, or from the Kit Handy Parts Status or Device Check screens.
2. Obtain a new reel of matching parts.
3. Start the Fuji Information Terminal and tap the Windows mark to display the [Start Menu]. Tap [Kit Handy] to display the [Log on] screen.
4. Enter the user ID and tap [OK]. It is possible to also scan the user ID. The Kit Handy menu displays.
5. Tap [Device Check] and the machine specification screen displays.
6. Enter or scan the name of the NXT machine on which to perform the splicing and tap [OK].

7. Tap [Mode] from near the top of the display and then tap [Splicing].
8. Tap the device to which to splice the new reel to select that device. This position should have an error icon and be a different color due to the error condition.

Note: If using 2 point verification mode on the Kit Handy, first scan the DID of the reel that the new parts are to be supplied to instead of selecting the splicing position from the screen.

9. Scan the DID of the new reel to be spliced. A check is performed and if the part is correct, a message box displays asking if splicing has been completed. From this point, splice the tape together. If an error occurs, the part is not correct and a different reel is needed.
10. Splice the tape together and wrap up the old tape on the new reel and set in the feeder. For details on performing the actual splicing operation, refer to the NXT Operator Manual.
11. Tap [Yes] and the message box closes. The feeder status automatically changes.

8.7.3 Replacing feeders

Fujitrax Verfier issues parts out warnings based upon the user specified settings. When a parts out warning occurs and the feeder is to be replaced, the operator has time to get a new reel, set it on the replacement feeder, and create an ID or perform a quick verify. Once these steps are performed, when the NXT machine announces that the parts have run out, the feeder can be quickly replaced. The machine checks to ensure that the parts are correct and if they are, the feeder status is automatically changed and the feeder can be used.

When using AVL data, this is the method that must be currently used for splicing if the replenishment part has a different part number to the original part.

1. A parts out warning is issued and seen from one of the various locations, the NXT operation panel, from one of the Kit Manager status displays, or from the Kit Handy Parts Status or Device Check screens.
2. Obtain a new reel of matching parts and load them on a new feeder.
3. Create an ID using Kit Manager or Kit Handy (an ID must be created if using AVL data and the part number is different than the original part) or quick verify the parts and feeder using Kit Manager or Kit Handy. Due to this step, when the feeder is set on the machine, the machine will be able to determine the part loaded on the feeder.
4. Set the feeder near the machine.
5. The old feeder runs completely out of parts and warnings are issued on the NXT operation panel, Kit Manager, or Kit Handy. Once the set OK LED for the old feeder changes to red, remove the old feeder.

Note: When removing feeders, it is essential that the clamp lever is raised all of the way and kept in that condition when the feeder is pulled out. If the clamp lever is not completely raised, it is possible that the power to the feeder is not disconnected. If the feeder is removed with power still being supplied, the connector can become bad and the internal feeder board can be damaged.

Note: The machine does not need to be stopped to remove a tape feeder.

6. Set the new feeder that had the ID created with the parts already loaded in the old feeder slot. If the parts are correct, the feeder status automatically changes and the feeder can be used.

8.7.4 Replacing trays with non-stop tray resupply (from NXT V3.10)

Fujitrax Verfier issues parts out warnings for the tray unit-L based upon the user specified settings. When a parts out warning occurs for a tray, the operator has time to get a new tray, set it in a replacement drawer, verify it, and set it in the parts supply drawer. Once the drawer with the original tray runs out of parts, that drawer is moved to the parts removal area and the drawer set in the parts supply area is moved to the original drawer position without stopping production.

AVL data cannot be used for trays.

Required items

The following items are required in other to use the non-stop tray resupply function to resupply trays during production.

- NXT using machine software V3.10 or higher
- Fujitrax Verifier V3.04 or higher
- The NXT machine configuration options, [Use Verifier] and [Perform tray verification] must both be set to “ON”.
- The [Tray Supply] option for the NXT module configuration for the module with the tray unit-L must be set to “Use tray removal area”.
- In the Kit line configuration, verification is being used for the module with the tray unit-L.

Tray arrangement

While it is possible to put two different trays in one drawer, Fuji recommends arranging trays in a 1-tray-per-drawer format in order to ensure that trays are used in an efficient manner (so trays that are still in use are not unloaded), and to ensure that accurate part replenishment guidance messages are sent for resupplying parts when using the non-stop tray resupply function.

If alternate trays are to be used, put the alternate tray in the same drawer as the original tray (see 3.3.6 in this manual for information about making alternate positions in Fuji Flexa). If the alternate tray is set in another drawer, the parts out guidance messages will not be correct, because the parts out warning time is calculated based on the total number of parts in the original and alternate trays. Be sure to also set new alternate trays when resupplying trays in spare drawers.

Resupplying trays during production

1. A parts out warning is issued and seen from one of the various locations, the NXT operation panel, from one of the Kit Manager status displays, or from the Kit Handy Parts Status or Device Check screens.
2. Obtain a new tray of matching parts and position it in a spare drawer.

Note: If using an alternate tray, be sure to also set that tray before continuing on to the next step.

3. Start the Fuji Information Terminal and tap the Windows mark to display the [Start Menu]. Tap [Kit Handy] to display the [Log on] screen.
4. Enter the user ID and tap [OK]. It is possible to also scan the user ID. The Kit Handy menu displays.

5. Tap [Device Check] and the machine specification screen displays.
6. Enter or scan the name of the NXT machine on which to perform the splicing and tap [OK].
7. Tap [Mode] from near the top of the display and then tap [Splicing].
8. Tap the tray position for which the warning was issued to select that position. This position should have an * and error icon and have a "PartsE" or "PartsOutWarning" status and be a different color. The tray being resupplied should be the part that is going to run out the quickest.

Note: The non-stop tray resupply function cannot be used to resupply trays for errors other than parts out, such as pickup miss. In such a case, it is necessary to stop production and open the door to check trays and perform other tray operations.

9. Scan the part number of the new tray set in the spare drawer. A check is performed and if the part is correct, the dialog box is closed. If an error occurs, the part is not correct and a different tray is needed.

Note: If using alternate trays, be sure to also verify that tray before continuing on to the next step.

10. Open the part supply drawer and set the spare drawer with the verified trays in it.

Note: Ensure that the set drawer is properly set in the parts resupply drawer, and be sure to gently close the part supply drawer. Closing the drawer in an abrupt manner can scatter the parts.

11. Gently close the parts supply drawer and the machine picks up the drawer and checks the height of the trays. If the height check has no errors, then resupply of that drawer is complete. If an error occurs, the drawer is returned to the parts supply drawer. Recheck and verify the trays again.
12. Production continues until all of the parts in the original tray have been used. Once all of these parts have been used, the drawer in which the part are set is moved to the tray removal area and the new drawer is pulled out on the shuttle. Once the pulled out drawer is finished being used, it will be moved to the original drawer position in the tray unit. Remove the drawer with the empty trays from the tray removal area.

Note: If a drawer is in position 21 (the position that trays picked from the parts supply drawer are kept until the original parts run out) and this drawer needs to be removed from the machine for some reason, use the panel removal command from the manual mode commands. When this command is started, any drawers in position 21 are returned to the parts supply drawer (if it is empty). It is not necessary to actually remove the tray unit and pull forward the module, just push CANCEL to cancel the rest of the command.

Precautions

Be sure to note the following points when using non-stop tray resupply.

- Do not transmit a different job to the machine when a drawer is in slot 21. If the machine is changed to a different job while a drawer is present in Slot 21, use the panel removal command from manual mode to unload the slot 21 drawer to the parts supply drawer and then remove the drawer.
- The supply and removal area doors are locked when the magazine is in their vicinity. The parts supply drawer is also locked when a drawer is present in Slot 21. The parts removal area door is locked if there are no drawers in the removal area.

- If a height check error occurs for parts replenished to the parts supply drawer, the drawer is returned to the parts supply drawer, but "SetOK" remains displayed on Kit Handy. Check the tray height, and verify the parts again with Kit Handy.
- The non-stop tray resupply function cannot be used to resupply trays for errors other than parts out. In such a case, it is necessary to stop production and open the door to check trays and perform other tray operations.

Glossary

A

alternate feeder

An empty slot on a feeder table can be readied with the same part that is being supplied from another feeder position. When the original feeder runs out of parts, the pick-up position changes to this alternate feeder. Multiple alternate feeders can be specified. When an alternate feeder runs out of parts the next alternate feeder in the loop is used. If the feeder is the last feeder in the loop then the original feeder is used again.

assign

This is found in the coordinate data in the job and specifies which machine is to use the mark or place the part/glue dot.

B

background

An portion of the machine's memory used to stores recipes that aren't being used. A "background" recipe is a recipe at a Conversely, active recipes are referred to as "foreground" recipes.

board

The smallest independent unit of a printed circuit board on which electronic components are placed

BOM file

An acronym for "Bill Of Materials". The BOM file containes data such as part numbers for each location that corresponds to a reference designator on the board. this file may contain extra fields to add to the job's part data.

C

C/C

Networking software that facilitates communication between Fuji Flexa and placing machines. Text data transmitted by the Transmission Server application is passed to the C/C, which converts the text data into binary data that can be transmitted to machines. The C/C also converts binary data received from machines into text data

CAD file

A file which is output from a CAD system. This file generally contains the reference designators, X,Y coordinates, and angles, etc., for each location on the board.

calibration data

Machine-specific data that is required for a machine to operate. An example of calibration data would be the data that defines the spatial relationships between various machine components.

CCIMF format

An intermediary file format. F4G programs and part data translated by Port Wizard are output as CCIMF files. Recipes from FujiCam are in CCIMF format.

centroid CAD

This is a text file that has the coordinates and reference designators for parts. Each line in the file has data for one part only. Sometimes other data is present such as the part number, panel side.

coordinate data

Data that displays in Job Builder, that has the position data and other necessary settings for each part, mark, and glue dot.

D

Director

The Fuji Flexa component that is used for data management, transmission, and managing factory lines and machines. In addition, this provides easy access to many of the other Flexa components

E

element

A group of leads on the same side of a part which have the same length, width, and pitch.

F

fiducial mark

A mark that is used to adjust the positioning when parts are placed on a board. Fiducial marks are printed onto the substrate together with the circuit pattern, thereby creating a constant indicator of the pattern's present location. There are 3 types of fiducial marks: part fiducials, board fiducials, and panel fiducials.

Fuji Flexa

This a production line host system for creating, editing, transmitting recipes to Fuji SMT machines. In addition to the recipe management functions, the system is used for monitoring the production status of the machines and managing machine specific data.

G

global job

A job that is saved on the Job Server and is accessible to all users of that User Server

glue mark

These are for glue machines only. At the beginning of production, trial check glue dots can be produced by the machine to ensure that the glue volume is correct. The data for glue mark is used to check the size of the trial check glue dots. If the trial check glue dots are not the correct size, the glue application air pressure is adjusted.

I

Icon Bar

By default this displays to the left of the Director screen below the toolbar. The icon bar is divided into groups, each is opened by clicking the group name on the gray button. By clicking an item in the icon bar, it is possible to change the Director display, perform an action, or open a program

J

job

All the data that is required for the production of a single panel, stored in a single group.

job builder

The Fuji Flexa component that is used to create and edit jobs.

job information bar

By default, this is positioned at the left side of the window. This organizes the data in a job into an easy to use format. The information in the bar is split into groups: General, Part Data, Mark Data, and Top. If relational mode is enabled then the tabs, Shape Data and Package Data also display. Data within a tab is arranged in a hierarchical format.

job server

This is a server ran on a computer and specifies the location of the global jobs and manages access to those jobs. This server retrieves jobs for users and also locks jobs so that no other user can alter a job while it is opened by the first user.

L

line balance

A process whereby tasks are distributed among the machines on a production line. This is performed to attempt to make the working time for each machine on the line to be as close as possible

line configuration

Data describing the types of machines that make up lines and their special settings. This also describes all of the lines for the factories and the their order.

Line Editor

The Fuji Flexa component used to create and edit the line configuration.

Line Monitor

The Fuji Flexa component used to monitor the real time production performance of entire lines and individual machines in the line configuration.

Line Reporter

The Fuji Flexa component used to generate production reports according to specified settings. Reports can be prepared for obtained production data up to 7 days (i.e., 168 hours) prior to the time of report generation.

line server

This is a server ran on a computer and specifies the location of the line configuration files and manages access to these files.

local job

A job that is stored on a local computer . This job is not managed by the Job Server and is not accessible to any other users.

M

machine configuration

A file that specifies the configuration, process options, available nozzles and feeders for a machine. Each machine in the line must have a configuration with the specific parameters for that machine.

macro

Sets of instructions that are automatically performed when activated.

Macro Manager

The Fuji Flexa component used to create, modify, save, and run macros

mark data

There are five different types of mark data. They are fiducial marks, skip marks, glue marks, mask marks, and panel ID marks

Mark Editor

The Fuji Flexa component used to create and edit mark data.

mark library

The library in which mark data is stored. The part data server manages access to this library.

mask mark

These are marks used by printing machines to align the printing stencil with the board. The printing machine inspects the fiducial marks on the board and mask marks on the stencil and then adjusts the stencil position to compensate for any misalignment between the two.

MCSIMF format

An intermediary file format. MCS programs and part data translated by Port Wizard are output as MCSIMF files.

menu bar

This displays below the title bar for programs. Commands are organized into groups and these group names display on the menu bar. By clicking a name, the menu with the commands for that group displays. Click an item to perform that command.

Model name

The Model name is a generic machine name that is used when using multiple lines with

identical line and machine configurations (including nozzles, parts supply unit etc.). This allows users to use the same recipe from machine to machine when producing identical panels on multiple lines.

N

non-relational mode

This is a mode used for part data. When this mode is used the "Part Number", "Shape Name" and "package Name" data is all saved under the one file name. there is no interlinking between the different part data this mode prevents user from accidentally editing package and shape data for various part at one time and is similar to Fuji's previous host system, MCS. This mode is specified in Flexa Server Setup in the [System settings] dialog box on the computer running the user server.

Nozzle Mapper

The Fuji Flexa component that is a conversion tool designed to convert the nozzle settings for part data when importing Port Wizard translated CCIMF or MCSIMF data from F4G or MCS into Job Builder.

O

optimization

The process where machine instructions are reordered so that the machine operates optimally. Normally, the processing sequence and feeder positions are rearranged in a manner that minimizes the machineís working time.

P

package data

Data that describes packaging used for parts. The packageís type. dimensions, pitch, and other parameters that a machine needs to process that package for the part that uses that data. This data is comprised of two groups of data, package information, and package process.

Package Editor

The Fuji Flexa component that is used to create and edit package data. This editor is only available if relational mode is enabled from the Flexa Server Setup.

package information

Data that has the settings that are used to describe the package. The package's pitch, dimensions, and type are examples of settings found in package information. This is one of the groups of data that makes up package data.

package library

The library in which package data is stored. This library is only accessible if relational mode is enabled in Flexa Server Setup. The part data server manages access to this library.

package process

Data that has the settings on how the packaging using that data is to be processed by the

machine. Feeder options, reel diameter, and do advanced vacuum are examples of settings found in package process. This is one of the groups of data that makes up package data.

panel

The entire printed circuit board (PCB) upon which electronic components are placed. A panel may be composed of one or more actual boards.

part data

All part data items. This refers to data for the part number, shape data, and package data if relational mode is enabled. If it is not enabled, then shape data and package data is not displayed.

part data server

This is a server ran on a computer and specifies the location of the part data files and manages access to these files.

Part Editor

The Fuji Flexa component that is used to create and edit part data. If relational mode is enabled from the Flexa Server Setup, this editor is used to create and edit part number data. If non-relational mode is used, this editor is used to create and edit all part data

part library

The library in which part data is stored. The part data server manages access to this library

part templates

These are sections of part data that have been created to be used for future part data creation. Part templates can be imported into part data reducing the amount of data input necessary when creating new data. After importing the template, only the data that differs from the template needs to be edited. Templates can be created for "Shape Information", "Shape Process", "Package Information" and "Package Process" data.

Part Template Editor

The Fuji Flexa component that is used to create and edit part templates.

R

recipe

Operation instructions for individual machines, created after the completion of line balancing and optimization processing. In the past, Fuji has referred to recipes as "Production programs".

relational mode

This is a mode used for part data. This mode allows a "Part number" to be alinked to a shared "Shape" and "package". The relational mode allows multiple "part number" records to use the same shape data record and/or package data, thus minimizing the size of the libralies. in addtion, by editing a packageing or shape record that is accessed by multiple part numbers, all the part data for all the part numbers are updated at one time. This is similar to Fuji's previous host system, FujiCam. When this mode is active, three

components are used to create and edit the different data. This mode is specified in Flexa Server Setup in the [System settings] dialog box on the computer running the user server

S

Schedule Assembler

The Fuji Flexa component that is used to associate schedule tables and ID code tables with production lines, viewing the current tables, and changing the next recipe to be used from a schedule table for HELPS machines.

Schedule Builder

The Fuji Flexa component that is used to create and edit schedule and/or ID code tables for HELPS machines

Schedule Viewer

The Fuji Flexa component that is used to display the schedule and ID code tables associated with HELPS lines and machines.

SECS/GEM

Networking software that facilitates communication between Fuji Flexa and placing machines. Communication is performed over an Ethernet cable.

shape data

Data that describes a part's dimensions, the quantity and size of pins (leads), and other parameters that a machine needs to process a part that uses that data. This data is comprised of two groups of data, shape process and shape information.

Shape Editor

The Fuji Flexa component that is used to create and edit shape data. This editor is only available if relational mode is enabled from the Flexa Server Setup.

shape information

Data that has the settings that are used to describe the part. The part's dimensions, the quantity and size of pins (leads), and element information are examples of settings found in shape information. This is one of the groups of data that makes up shape data.

shape library

The library in which shape data is stored. This library is only accessible if relational mode is enabled in Flexa Server Setup. The part data server manages access to this library.

shape process

Data that has the settings on how a part using that data is to be processed by the machine. Lead process data, vision type, pick-up offsets are examples of settings found in shape process. This is one of the groups of data that makes up shape data.

skip

This is a setting found in the coordinate data. When this is set to "Yes" for a record, the park or glue dot for that record will not be placed. If this is for a mark, the machines will not use that mark.

skip mark

A mark that is placed on a multi-board panel to prevent a machine from processing one of the boards on the panel. When a job includes an instruction to read a skip mark, the fiducial mark camera takes an image of the specified coordinates and looks for a mark made using a pen or a sticker. If a mark is detected, the machine does not process that board. The panel is ejected from the machine once any other boards have been completed. If the mark is for a panel and it is determined that the mark is present then the skip marks for the boards on the panel are checked. If the panel skip mark is determined to not be present then the machine skips reading any other skip marks and proceeds with reading fiducial marks.

status data

Data that determines how the machine will function in the event of an error and specifies the state of communications between the machine and the host computer.

Spec Keeper

The Fuji Flexa component that is used for creating, merging, and editing spec data.

spec data

This is data about the specifications of feeders, needles, nozzles, and nozzle stations.

T

title bar

This displays at the very top of all windows. The program and/or item's name displays here and buttons to minimize, resize, and close the window are available in the title bar.

toolbar

Many Flexa components have bars with buttons that display below the menu bar. Common commands can be performed by clicking the appropriate button on a toolbar.

Trace Viewer

The Fuji Flexa component that displays log, and replay data generated by Fuji Flexa. It also provides the ability to "peplay" certain events and to "package" a replayable event into a file that then can be used on another computer.

transmission

The process of sending recipes, calibration data, and other items to the machines.

U

user server

This is a server ran on a computer and is responsible for checking the Fuji Flexa licenses and for managing security. In addition, the user server specifies which computers are running the three data servers. For each license group there is only one user server. Data between different user server groups cannot not be shared except by exporting the data from one group and then importing it into the other group.

V

verify check

This is performed when the outline of the parts is available from Gerber CAD data or from the original CAD data. When this is performed a dialog box displays with the outline of the part or pads from the CAD data and the part from Fuji Flexa superimposed. If the positioning or rotation of the part from Fuji Flexa does not match the image from the CAD data then the positioning of the part can be adjusted until it matches

view mode

This indicates what data is being displayed in the window. Director has seven different view modes. The different view modes are used to perform different actions.

view mode bar

This displays between the toolbar and the data display panes in Director. The left side of the bar indicates which of the view modes is active, and the right side of the bar displays the user ID of the current user.

virtual line

This is a line than does not actually exist in the local factory. This line is used to create programs for a remote (unconnected) line, or for future line configurations that do not currently exist. Virtual Line is the same as "Offline Descripter" in MCS

MEMO:

FUJI Internet

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NXT Programming Manual

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