Model ID		NPM-GH						
PCB dimensions		Single-lane mode	L 50 mm × W50 mm to L 510 mm × W 590 mm *1					
		Dual-lane mode	L 50 mm × W50 mm to L 510 mm × W 300 mm *1					
PCB exchange time		2.3 s (L 350 mm or less) 5.0 s (L 350 mm or over to L 510 mm or less) May differ depending on PCB specifications.						
Electric source		3-phase AC 200 , 220 , 380 , 400 , 420 , 480 V 2.1 kVA						
Pneumatic source*2		Min.0.5 MPa to Max. 0.8 MPa、100 L / min (A.N.R.)						
Dimensions*3		W 975 mm × D 2 473 mm × H 1 444 mm*4 / W 975 mm × D 2 315 mm × H 1 444 mm*5						
Mass		2 330 kg*4 / 2 300 kg*5						
Placement head		FC16 head (Per head)			FC08 head (Per head)		FC03 head (Per head)	
		High production mode	High-accuracy mode 1	High-accuracy mode 2*6	High production mode	High-accuracy mode 1	High production mode	High-accuracy mode 1
Max. speed *7		51 500 cph (0.070 s / chip)	41 000 cph (0.088 s / chip)	9 200 cph (0.391 s / chip)	25 500 cph (0.141 s / chip)	20 500 cph (0.176 s / chip)	10 100 cph (0.357 s / chip) 7 840 cph (0.459 s / QFP)	9 000 cph (0.4 s / chip)
Placement accuracy (Cpk≧1) *7		±25 μm / chip	±15 μm / chip*8	±10 μm / chip*8	±25 μm / chip	±15 μm / chip*8	±25 μm / chip ±20 μm / QFP*9	±15 μm / chip*8
Component dimensions (mm)		0201 chip*10*11 / 03015 chip*10 to L 10 × W 10 × T 3			0402 chip*10 to L 45 × W 45 or L 100 × W 40 × T 12		0603 chip to L 120 × W 90 or L 150 × W 25 × T 30	
Component supply	Taping	Tape: 4 / 8 / 12 / 16 / 24 / 32 / 44 / 56 mm			Tape: 4 to 56 / 72 mm		Tape: 4 to 56 / 72 / 88 / 104 mm	
		Max. 80 (4、8 mm tape)						
	Stick	—			Max. 10 (SF3*12)			
	Tray	—			Max. 24			

Please refer to the specification booklet for details.

*1 : L > 350 mm is optional.
*2 : Only for main body
*3 : Excluding the monitor and signal tower
*4 : Machine dimensions and mass for standard configuration (NPM-GH and ITF*13 cart (17-slot) x 2). They differ depending on the optional configuration.
*5 : Dimensions and mass of the machine and two ASF*14 carts (34-slot). They differ depending on the optional configuration.
*6 : High accuracy mode 2 is applicable only when ASF*14 is used.
*7 : Values such as the maximum takt time and placement accuracy may differ slightly depending on conditions.
*8 : Accuracy valid for components 6 mm square or smaller.
*9 : The placement angle recognition setting needs to be enabled.
*10 : 0201 / 03015 / 0402 component requires a specific nozzle / tape feeder.
*11 : 0201 component placement is optional. (Under conditions specified by Panasonic)
*12 : Stick Feeder 3-slot
*13 : Intelligent Tape Feeder
*14 : Auto Setting Feeder

⚠ Safety Cautions

●Please read the User's Manual carefully to familiarize yourself with safe and effective usage procedures.
●To ensure safety when using this equipment, all work should be performed according to that as stated in the supplied Operating Instructions. Read your operating instruction manual thoroughly.

Panasonic Group products are built with the environment in mind. For details here Panasonic GREEN IMPACT

Inquiries…

Panasonic Connect Co., Ltd.
Process Automation Business Division

3-1-1 Inazu-cho, Toyonaka City, Osaka
561-0854, Japan

All data as of May 31, 2024

Ver.May 31, 2024

●Changes in specifications and appearance may be made without notice for product improvement.
●Please contact us via our website at **https://industrial.panasonic.com/ww/r/fw**

Panasonic CONNECT

2024

Electronics Assembly System

Modular Placement Machine

Catalogue

Model ID

NPM-GH

Model No.
NM-EJM8E

NPM G

CE

*It may not conform to Machinery Directive and EMC Directive in case of optional configuration and custom-made specification.

"Autonomous Factory" Concept *

A factory that immediately responds to every situation and continues to evolve autonomously

Ensuring the production of non-defective items through the integrated control of autonomous uninterrupted mounting lines and floors independent of any human intervention and judgment

*Under development toward the realization of the concept

Plan Formulation AI
5M management

Plan preparation / Resource* planning
Suggestion for maximization of profits with minimum resources*

Resource* plan
Shipment plan

Production capacity
Resource* usage

Project optimization / Resource* allocation
Giving instructions to maximize production volume with specified existing resources*

Production plan
Maintenance plan
Operating instructions

Production result
Degree of variation in 5M

Production Implementing AI
5M process control

Production Implementing
Executing manufacturing operations as planned

Management

Maximize
Decision Quality

-Maximize decision quality in investments that directly impact ROI-

With the goal of maximizing management effects with minimum investment, the plan development AI calculates the resources* that you need to accomplish the goal.It visualizes the differences between the goal and the reality of your current situation, which can contribute to your business decision making.
Thus, it helps you to improve daily management figures, as well as to efficiently judge whether to receive any orders from new customers.

Entire factory

Maximize
Resource Efficiency

-Maximize resource* efficiency to reduce TCO-

With the objective of making maximum use of the resources* charged into your factory floor, the plan development AI monitors and manages the conditions of floor resources* relative to emerging floor variation factors, such as operational errors, machine problems or defective materials, and thereby minimizes such variations.
In addition, it also seeks to reduce TCO by providing the floor operators with on-target instructions, according to its optimal plan, for addressing daily variations.

Line / floor

Maximize
O.E.E

-Maximize O.E.E to be confident in achieving production plans-

With the aim of maximizing O.E.E, the hardware automatically collects mounting quality information, as well as the sign of any error or change in resource*, and then Production Implementing AI autonomously corrects the error or change on a line-wide level or notifies the operator of it.
By using the outcomes that it has learnt, the AI will automatically identify responsible factors and make fine tuning of equipment, accordingly, which have so far belonged to the realm of Takumi know-how alone.

Resource*: Human / Machine / Material

Automation / Labor-saving Solution + Intelligent system Solution to Achieve Manufacturing That Is Further in Line with Production Plan

iLNB-based "Seamless SMT Line" Control

iLNB

One of the industry's largest alliance network

Machines from 130* partners are connectable.

*According to a survey by us as of April. 2024

Automation Labor-saving

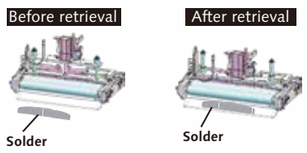
Intelligent system

Print Automated supply

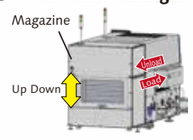
Screen printer

Fully automated printing process to ensure increased production time and production of non-defective items and, by means of that, to maximize O.E.E.

●**Solder transfer**



●**Metal Mask changer**

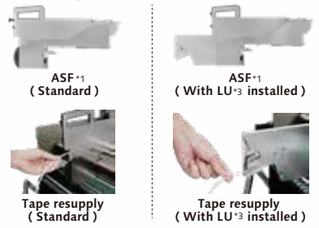


*NPM-GP/L option

Mount Automated supply

ASF *1

- Paper and embossed tapes of all widths can be used.*2
- Automated loading of new component tapes requires no special skills.
- LU*3 enables component tapes to be resupplied automatically without need for splicing.



·Tapes can be loaded with a single button press, streamlining work processes to resupply components.
·Components can be resupplied at any time in a skill-less manner.

*1 : Auto Setting Feeder
*2 : ASF for 4 ㎜ tape currently under development
*3 : Loading Unit

Mount Labor-saving supply

Tray stocker

- Replacing / refilling with tray magazines without having to stop the machine.
- Labor-saving by reducing the frequency of refilling of magazines.

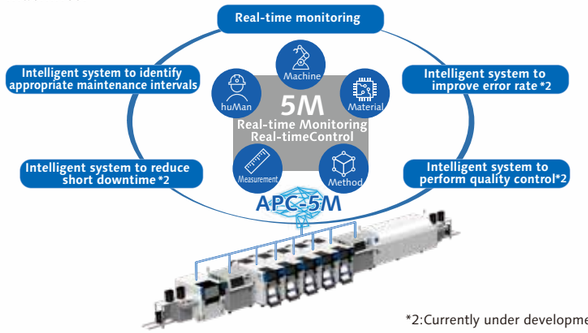
Tray stocker specifications : Max.72

*NPM-WX option

Line Intelligent system

Process control APC-5M *1

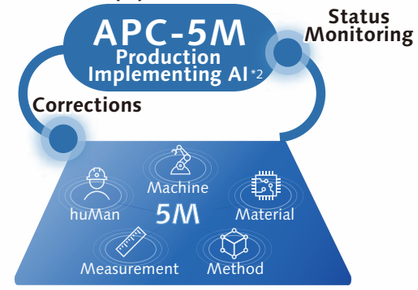
By monitoring real-time "5M conditions" and "machine operating conditions," the AI detects any variations or changes in 5M for a line and performs more intelligent 5M process control and predictive maintenance of the line and, by that, realizes production of non-defective items and stable operation of in-line machines.



*2:Currently under development

*1:5M (huMan / Machine / Material / Method / Measurement)

Maximizing O.E.E
(Overall Equipment Effectiveness)



APC-5M responds to problems quickly, checks outcomes, repeats self-verification / learning, accumulates experiences and thereby improves its problem-solving skills.

Realization of Autonomous Mounting Line

NPM-GH　Aiming for Actualization of Autonomous Factory

NPM-GH's features

New platform to realize “Autonomous Factory”

NPM-GH

1 The industry’s top-class edge device

2 Autonomous control of variations in 5Ms

3 Departure from skill-based operations

1 The industry’s top-class edge device

Increased productivity / quality

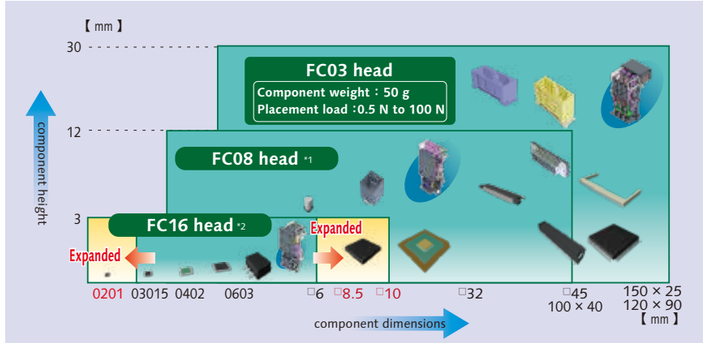
【 High production mode 】
Max.speed : 103 000 cph *1
IPC9850 (1608) : 74 000 cph *1
Placement accuracy : ±25 µm

【 High-accuracy mode 1 】
Max.speed : 82 000 cph *1
IPC9850 (1608) : 57 000 cph *1
Placement accuracy : ±15 µm

【 High-accuracy mode 2 】 *2
Max.speed : 18 400 cph *1
IPC9850 (1608) : 15 200 cph *1
Placement accuracy : ±10 µm

*1 : Tact time for the machine with FC16 x 2 heads
*2 : Hight accuracy mode 2 is applicable only when ASF (Auto Setting Feeder) is used.

Improved ability to support components

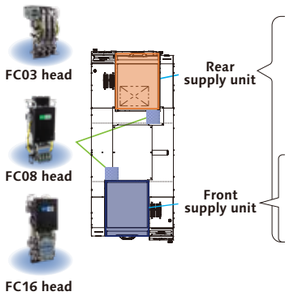


*1:High-speed head placement constant load control option enables to support a placement load of 1.0 N.
*2:High-speed head placement constant load control option enables to support a placement load of 0.5 N and 1.0 N.

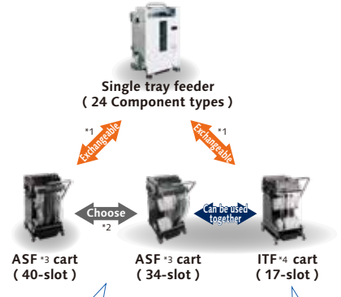
Plug & play unit layout

Head : You can choose from three different types of heads.
Supply unit : The availability of three different types of supply units allows for various supply unit layouts.

Machine configuration



Supply unit



Supply unit layout

Layout 1	Layout 2	Layout 3	Layout 4
8 mm taping : 68 Tray : 0	8 mm taping : 80 Tray : 0	8 mm taping : 34 Tray : 24	8 mm taping : 40 Tray : 24
ASF *3 cart (34-slot) ITF *4 cart (17-slot)	ASF *3 cart (40-slot)	Tray feeder	Tray feeder
ASF *3 cart (34-slot) ITF *4 cart (17-slot)	ASF *3 cart (40-slot)	ASF *3 cart (34-slot) ITF *4 cart (17-slot)	ASF *3 cart (40-slot)

Compatible with ASF *3 cart

Compatible with ITF *4 cart

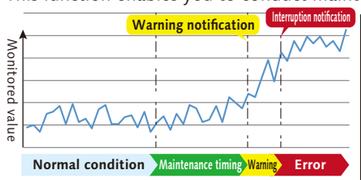
*1 : Switchover between tray feeder / cart is available as an option. *2 : ASF *3 cart (40-slot) cannot be used together, or mixed, with ASF *3 cart (34-slot) or ITF *4 cart (17-slot).
*3 : Auto Setting Feeder *4 : Intelligent Tape Feeder *5 : Loading Unit *6 : Stick Feeder 3-slot *7 : Dipping Unit

2 Autonomous control of variations in 5Ms

APC system

APC-5M: Real-time unit monitoring

APC-5M monitors the conditions of target units in real time and provides notification of the timing of maintenance of each unit or any error condition that could interrupt production, depending on variations in monitored unit values.
This function enables you to conduct maintenance at optimal times.



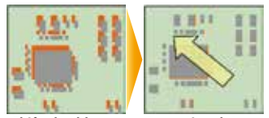
●Target unit
Head: Filter clogging
Nozzle holder sliding
Nozzle: Nozzle clogging
Nozzle tip condition
Feeder: Feed accuracy

Machine screen

LPC screen

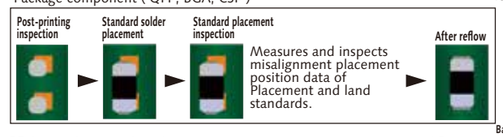
APC-FB *1 Feedback to the printing machine

・Based on the analyzed measurement data from solder inspections, it corrects printing positions. (X , Y , θ)



APC-FF *1 Feedforward to the placement machine

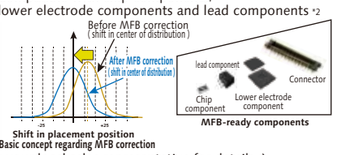
・It analyzes solder position measurement data , and corrects component placement positions (X , Y , θ) accordingly.
Chip components (0402C / R ～)
Package component (QFP, BGA, CSP)



APC-MFB2 Feedforward to AOI / Feedback to the placement machine

・Inspects part location based on APC offset correction position.

・The system analyzes AOI component position measurement data , corrects placement position (X , Y , θ) , and thereby maintains placement accuracy.
Compatible with chip components, lower electrode components and lead components *2



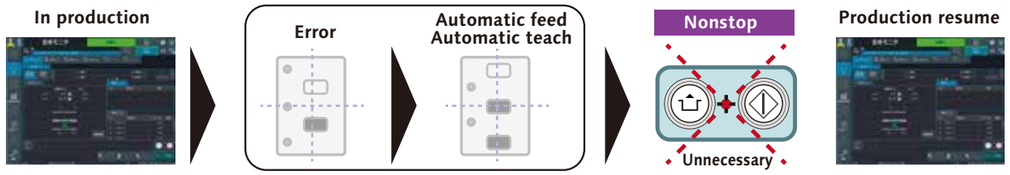
*1 : APC-FB (feedback) / FF (feedforward) : 3D inspection machine of another company can be also connected. (Please ask your local sales representative for details.)
*2 : APC-MFB2 (mounter feedback2) : Applicable component types vary from one AOI vendor to another. (Please ask your local sales representative for details.)

Automatic recovery option

Pickup position automatic teach in case of an error

When pickup / recognition error occurred, the machine automatically corrects the pickup position without stopping, and resumes production. That improves machine operation rate.
(Components : 4 mm embossed (black) / 8 mm paper / embossed (black) tape component. *Embossed tape (transparency) is not supported.)

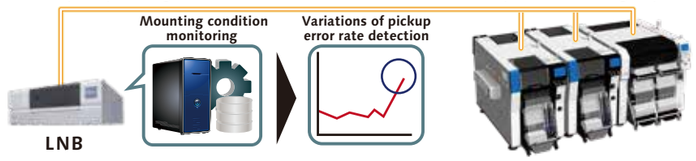
【 Automatically resume production after pickup position teach 】



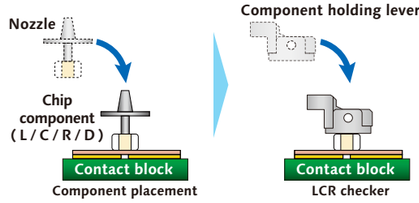
Evolved automatic recovery (predicted control)

LNB automatically analyzes the variation of pickup / recognition error rate and instructs the machine to perform teaching to prevent machine error stop.

Automatic trend analysis
↓
Automatic recovery / teach



LCR checker



An LCR check is performed on mounted components at the start of production, or during component supply or product changeover.
It helps detect wrong reels loaded and defective components.
In addition, because verified data is output to a file on LNB (FA PC) , the data can also be used for trace management.

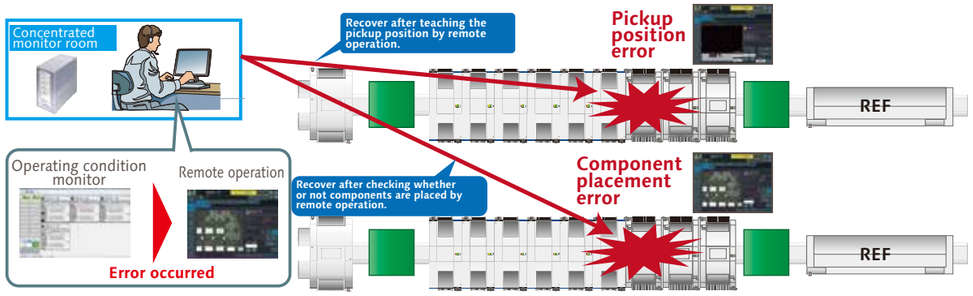
Component size	0402 to □6 mm
Component	Resistance , Capacitor , Inductor , Diode

NPM-GH Automation / Labor-saving Solution + Intelligent system

3 Departure from skill-based operations

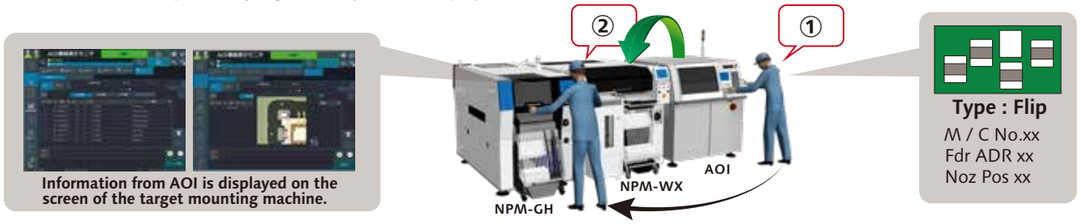
Remote operation option

Recovery by remote operation is available for the error of which recovery can be made based on human judgment alone. This enables concentrated on-the-floor monitoring, eliminating the time lost for the operator to detect error and take appropriate action, reducing the error recovery time, and thus achieving labor saving and improved operating rate.



AOI Info Display option

Information on components judged NG by AOI is displayed both on AOI and NPM.



①AOI is used to pinpoint target NPM.
②The target NPM is put in a warning state, and information from AOI is displayed on the screen.

Feeder setup navigator option

It is a support tool to navigate efficient setup procedure. The tool factors in the amount of time it takes to perform and complete setup operations when estimating the time required for production and providing the operator with setup instructions. This will visualize and streamline setup operations during setup for a production line.

Parts supply navigator option

It is a parts supply support tool to present an efficient sequence of parts supply. Taking into account the length of time before parts shortage occurs and the least time-wasting moving path possible, the tool provides the operator with instructions for parts supply. This makes parts supply more efficient.

Placement head maintenance

Good use is made of the machine's self-diagnosis function to automatically detect the maintenance timing of the placement head. In addition, the maintenance unit can be used to keep the placement head in working condition without requiring skills.

Load checker

Measures the "indentation load" imposed by placemen head and has the machine and LNB displayed the measurement result (possible to measure even a low load of 0.5 N as well).

Head mentenance unit

To automate the inspection and maintenance of the placement head.

*1 : Intelligent Tape Feeder
*2 : Auto Setting Feeder

Head diagnosis function

Checks the pneumatic circuit condition.

Blow error detection

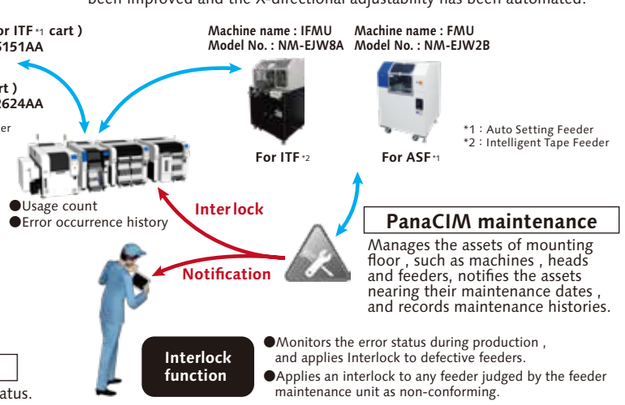
Checks the placement blow status.

Feeder maintenance

Independent of operator skill, the feeder maintenance unit automatically performs feeder performance inspections and calibrations. Its combined use with the PanaCIM maintenance module can automatically prevent the inclusion of non-conforming feeders into production.

Feeder maintenance unit

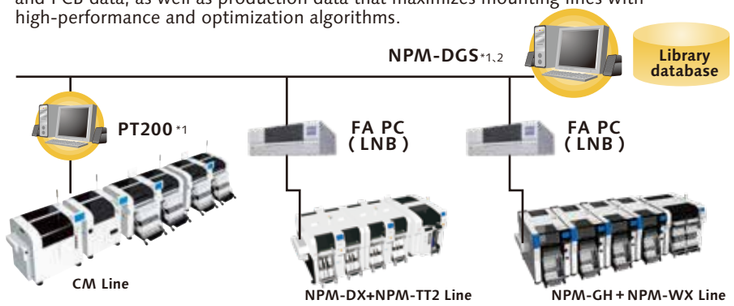
It automates an inspection of major parts affecting the feeder's performance and calibrates the pickup position to prevent short-time stoppages and maintain quality. For FMU (exclusive to ASF *1), the judgment accuracy has been improved and the X-directional adjustability has been automated.



Comprehensive control using system software

Data Creation System NPM-DGS (Model No.NM-EJS9A)

This is a software package that provides integrated management of component library and PCB data, as well as production data that maximizes mounting lines with high-performance and optimization algorithms.



*1 : A computer must be purchased separately.
*2 : NPM-DGS has two management functions of floor and line level.

CAD import

Allows you to import CAD data and check polarity, etc., on the screen.

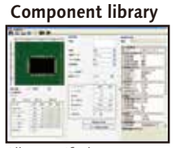
Optimization

Realizes high productivity and also allows you to create common arrays.

PPD editor

Update production data on PC during production to reduce the loss of time.

Component library



Allows unified management of the component library including mounting, inspection and dispensing.

Offline Camera unit V2

New component data can be created offline without relying on an individual operator's skill and proficiency, thus contributing to quality improvement and O.E.E maximization.

Thanks to adoption of a new component recognition camera and a wider variety of dedicated software functions, it now enables you to create component data more efficiently.

Offline Camera unit V2

DGS Automation option

Automated manual routine tasks reduce operation errors and data creation time.
Manual routine tasks can be automated.
By collaborating with the customer system, the routine tasks for creating data can be reduced, so it contributes to a significant reduction in production preparation time.
It also includes the function to automatically correct the coordinates and angle of the mounting point (Virtual AOI).

Example of entire system image:

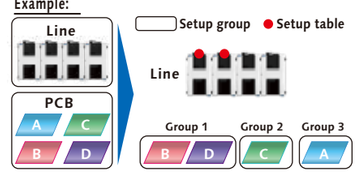
Automated tasks (excerpt)

- CAD import
- Offset mark setting
- PCB chamfering
- Mounting point misalignment correction
- Job creation
- Optimization
- PPD output
- Download

Optimization of setup option

In production involving multiple models , setup workloads are taken into account and optimized.
For more than one PCB sharing common component placement, multiple setups may be required due to a shortage of suppy units. In order to reduce the required setup workloads in such a case, this option divides PCBs into similar component placement groups, selects a table (s) for setup and thus automates component placement operation. It contributes to improving setup performance and reducing production preparation time for customer manufacturing various kinds of products in small quantities.

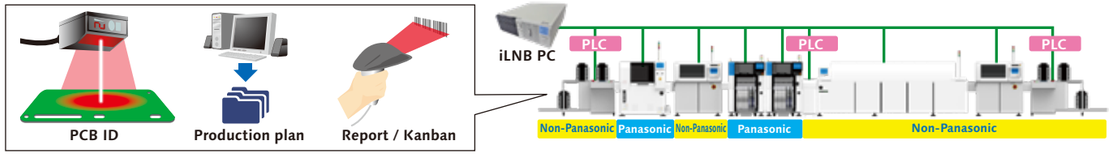
Example:



Changeover ability Automatic changeover option

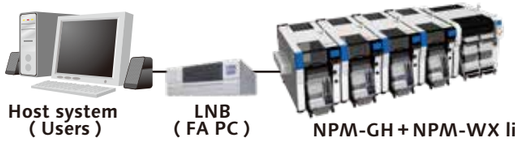
All machines, including NPM, in SMT line are connected via iLNB, which allows automatic changeovers to be performed sequentially, starting from the first machine in the line.

●**Trigger for changeover**
You can select from among the following three methods : PCB ID reading using an external scanner, Production plan, and Report / Kanban reading.



Open interface Host communication option

Able to standardize the interfacing with your systems currently used. Provides data communication with our standard interfaces.



●**Events**
Outputs a real-time event of equipment.

●**Other company's component verification**
Communicates with your component verification systems.

●**Component management data**
- Component remaining quantity data: Outputs component remaining quantity data.
- Trace data: Outputs data linked with component information* and PCB information.

*Entry of component information with PanaCIM material verification or other company's component verification (this option) is required.