Model ID		NPM-DX					
PCB dimensions *When the long spec. conveyor is selected		Single-lane mode	L 50 mm × W 50 mm to L 510 mm × W 590 mm				
		Dual-lane mode	L 50 mm × W 50 mm to L 510 mm × W 300 mm				
PCB exchange time *When the short spec. conveyor is selected		2.1 s (L 275 mm or less) 4.8 s (L 275 mm or over to L 460 mm or less) *May differ depending on PCB specifications.					
Electric source		3-phase AC 200 , 220 , 380 , 400 , 420 , 480 V 5.0 kVA					
Pneumatic source *1		Min.0.5 MPa , 200 L / min (A.N.R.)					
Dimensions *2		W 1 665 mm × D 2 570 mm × H 1 444 mm *3 / W 1 665 mm × D 2 294 mm × H 1 444 mm *4					
Mass		4 040 kg *3 / 3 980 kg *4					
Placement head		Lightweight 16-nozzle head V3A (Per head)		Lightweight 8-nozzle head (Per head)		4-nozzle head (Per head)	
		High-accuracy mode 「OFF」	High-accuracy mode 「ON」	High-accuracy mode 「OFF」	High-accuracy mode 「ON」	High-accuracy mode 「OFF」	High-accuracy mode 「ON」
Placement speed * at optimum conditions		49 000 cph (0.073 s / chip)	35 000 cph (0.103 s / chip)	24 000 cph (0.150 s / chip)	18 000 cph (0.200 s / chip)	8 500 cph (0.424 s / chip) 8 000 cph (0.450 s / QFP)	6 500 cph (0.554 s / chip)
Placement accuracy (Cpk ≧ 1) * at optimum conditions		± 25 μm / chip	± 15 μm / chip *5	± 25 μm / chip ± 25 μm / QFP *6	± 15 μm / chip *5	± 25 μm / chip ± 20 μm / QFP	± 15 μm / chip *5
Component dimensions (mm)		0201 chip *7 *8 / 03015 chip *7 0402 chip *7 to L 8.5 × W 8.5 × T 3 / T 6 *9		0402 chip *7 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 / 88 / 104 mm	
		Max.136 (4、8 mm tape)					
	Stick	———		Max.32 (Single stick feeder)			

Please refer to the specification booklet for details.

*1 : Only for main body
*2 : Excluding the monitor , signal tower and ceiling fan cover
*3 : Machine dimensions and mass for standard configuration (NPM-DX and ITF *10 cart (17-slot) x 4). They differ depending on the optional configuration.
*4 : Dimensions and mass of the machine and four ASF *11 carts (34-slot). They differ depending on the optional configuration.
*5 : Accuracy valid for components 6 mm square or smaller.
* 6 : The placement angle recognition setting needs to be enabled.
* 7 : 0201 / 03015 / 0402 component requires a specific nozzle / tape feeder.
* 8 : 0201 component placement is optional. (Under conditions specified by Panasonic)
* 9 : T 6 needs dedicated short nozzles and is □6.5 mm or less.
*10 : Intelligent Tape Feeder
*11 : 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 IMP**ACT**

Inquiries···

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All data as of May 31, 2024

Ver.May 31, 2024

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●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-DX

Model No.

NM-EJM8D

NPM X

*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

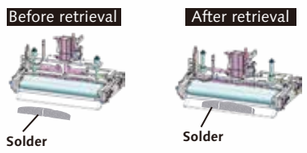
Intelligent system

Print Automated supply

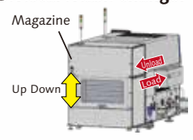
Screen printer

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**

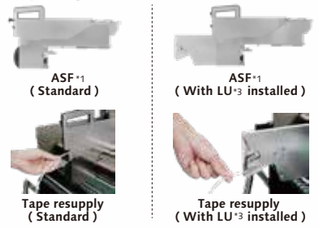


*NPM-GP/L option

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.

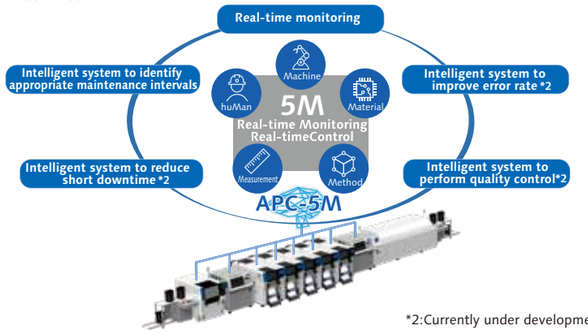
Tray stocker specifications : Max.72

*NPM-WX option

Line Intelligent system

Process control APC-5M *1

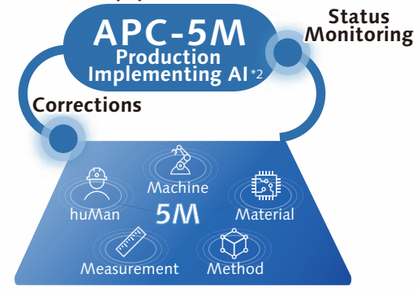
By monitoring real-time "5M conditions" and "machine operating conditions," the AI detects any variations or changes in 5M for a line and performs more intelligent 5M process control and predictive maintenance of the line and, by that, realizes production of non-defective items and stable operation of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

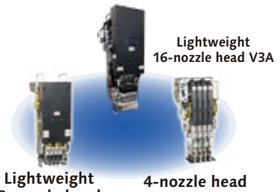
NPM-DX's features
New platform to realize Smart Manufacturing

NPM-DX

1 Evolved basic performance

2 Maximized actual throughput

3 Minimization of human-dependent work



1 Evolved basic performance

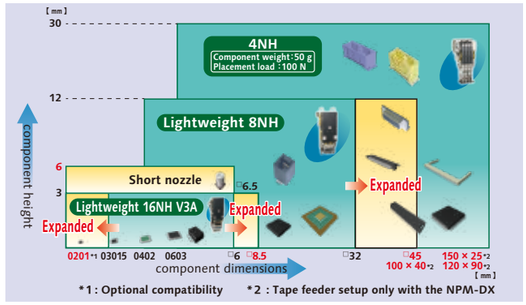
Increased productivity / quality

【 High-accuracy mode OFF 】
Max.speed : 196 000 cph *
IPC9850 (1608) : 140 000 cph *
Placement accuracy : ±25 μm

【 High-accuracy mode ON 】
Max.speed : 140 000 cph *
IPC9850 (1608) : 96 000 cph *
Placement accuracy : ±15 μm

*Tact for 16NH V3A × 4 head

Improved ability to support components



*1 : Optional compatibility *2 : Tape feeder setup only with the NPM-DX

Standard installation of new functions for better workability (reduced labor needs)

Changeover	· Short-cut screen for changeover operation · Instruction of non-teaching components before starting operation
Component supply	· Pitch misalignment automatic correction · Warning of component exhaust rush occurrence
Error recovery	· Standardization of recovery operation for feeder related error · Modification of non-stop data

Inclusion of more functions useful to reduce operator's workload as standard.

Instruction of teaching component before starting operation

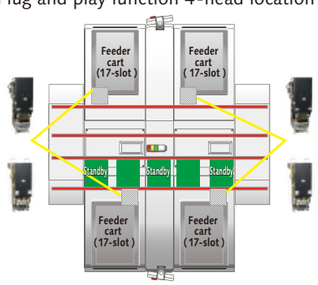
Extracts components on which automatic teach cannot perform though self-diagnosis at the stat of production and displays the start-up support screen after changeover.

Warning of component exhaust rush occurrence

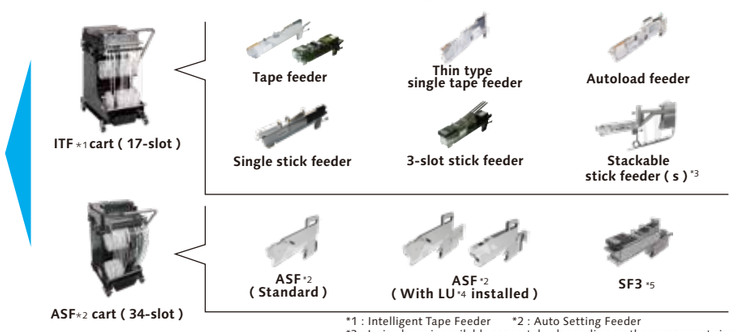
Predicts simultaneous exhaustion of different components (rush) and notifies the operator of such rush (warning: support request).
Normally , displays the length of time before the next component exhaustion takes place on the screen.

Taking the concept and compatibility of NPM series

Dual lane and multi-production
Plug and play function 4-head location free



Data creation, IFT *1 cart (17-slot) , ASF *2 cart (34-slot) and nozzle are compatible with NPM series.
Taking the concept of NPM series line, connecting with NPM-D and NPM-TT is possible.



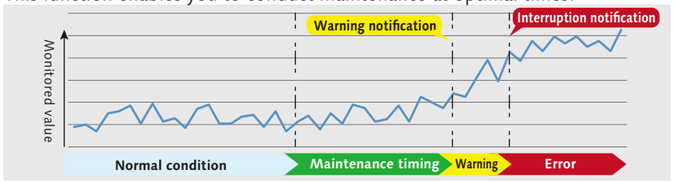
*1 : Intelligent Tape Feeder *2 : Auto Setting Feeder
*3 : L-sized one is available separately, depending on the component size.
*4 : Loading Unit *5 : Stick Feeder 3-slot

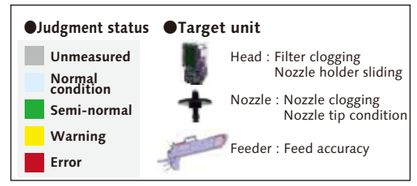
2 Maximized actual throughput

APC system

APC-5M: Real-time unit monitoring

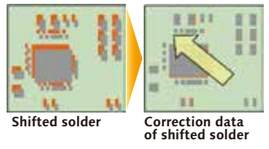
APC-5M monitors the conditions of target units in real time and provides notification of the timing of maintenance of each unit or any error condition that could interrupt production, depending on variations in monitored unit values.
This function enables you to conduct maintenance at optimal times.





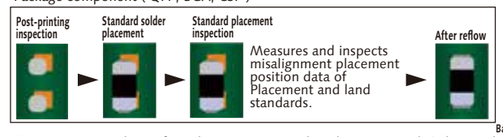
APC-FB *1
Feedback to the printing machine

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



APC-FF *1
Feedforward to the placement machine

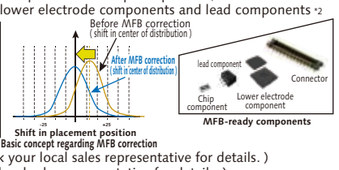
· It analyzes solder position measurement data , and corrects component placement positions (X , Y , θ) accordingly.
Chip components (0402C / R ～)
Package component (QFP, BGA, CSP)



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

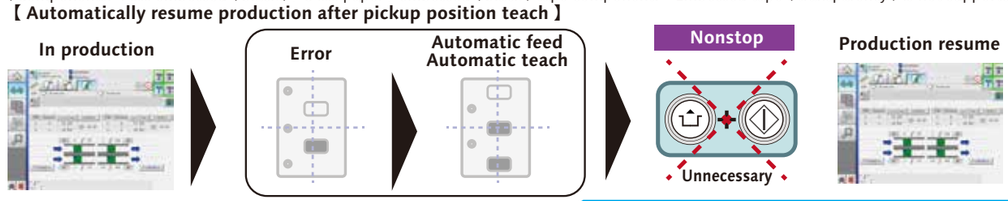


*1 : APC-FB (feedback) / FF (feedforward) : 3D inspection machine of another company can be also connected. (Please ask your local sales representative for details.)
*2 : APC-MFB2 (mounter feedback2) : Applicable component types vary from one AOI vendor to another. (Please ask your local sales representative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

Automatic recovery option

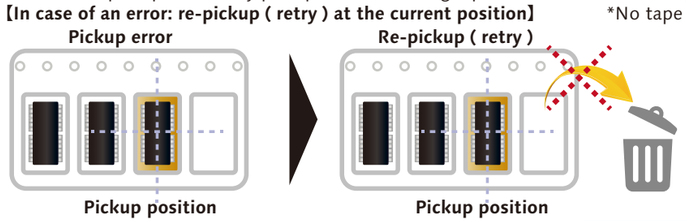
Pickup position automatic teach in case of an error

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 】



Re-pickup of error component (retry)

In case of a pickup error, retry pickup without feeding tape. It reduces discard components.
【In case of an error: re-pickup (retry) at the current position】 *No tape feed



No discard component because tape is not fed.*

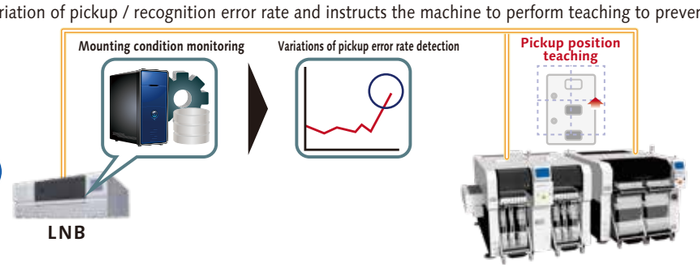
☐ When re-pickup (retry) is succeeded, the error is not counted.
☐ The number of re-pick (retry) counts can be set.

* : When re-pickup (retry) is succeeded.

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

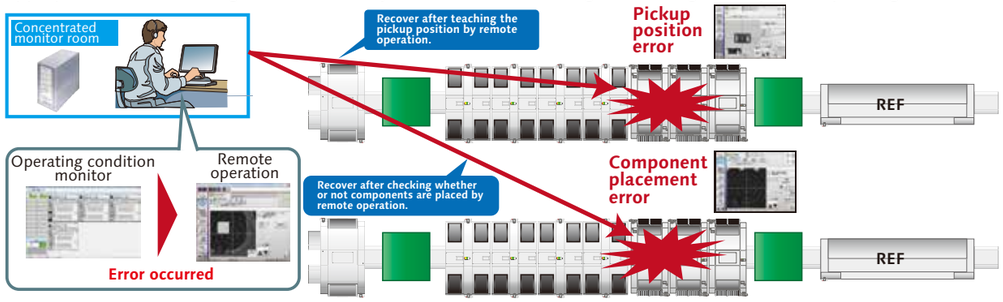


Comprehensive control using system software

3 Minimization of human-dependent work

Remote operation option

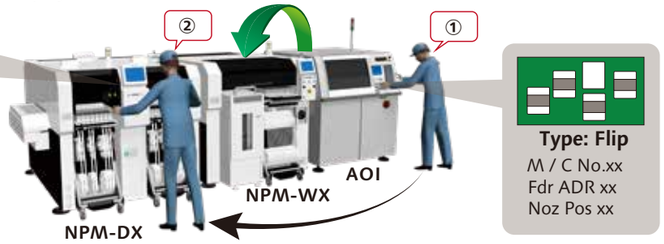
Recovery by remote operation is available for the error of which recovery can be made based on human judgment alone. This enables concentrated on-the-floor monitoring, eliminating the time lost for the operator to detect error and take appropriate action, reducing the error recovery time, and thus achieving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



AOI Info Display option

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

Information from AOI is displayed on the screen of the target mounting machine.



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.

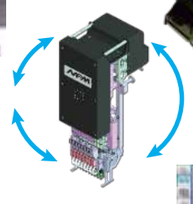
Load checker V2

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.

Machine name: HMU
Model No.: N610154798AA
*Excluding the feeder cart.



Head diagnosis function

Checks the pneumatic circuit condition.

Blow error detection *1

Checks the placement blow status.

*1 : This function comes standard with the machine.

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.

Machine name : IFMU
Model No. : NM-EJW8A
For ITF *2

Machine name : FMU
Model No. : NM-EJW2B
For ASF *1

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

●Usage count
●Error occurrence history

Interlock

Notification

PanaCIM maintenance

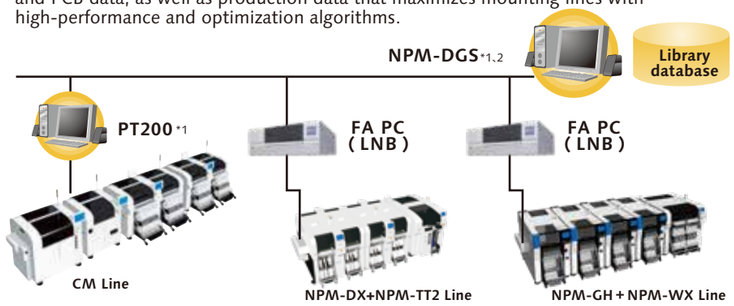
Manages the assets of mounting floor , such as machines , heads and feeders, notifies the assets nearing their maintenance dates , and records maintenance histories.

Interlock function

●Monitors the error status during production , and applies Interlock to defective feeders.
●Applies an interlock to any feeder judged by the feeder maintenance unit as non-conforming.

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.

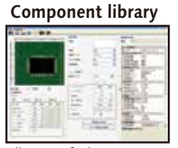
Optimization

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.

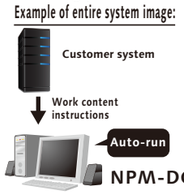
Thanks to adoption of a new component recognition camera and a wider variety of dedicated software functions, it now enables you to create component data more efficiently.

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:

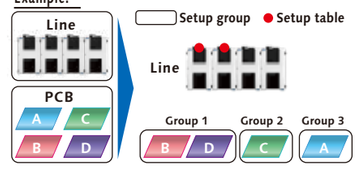


Automated tasks (excerpt)
- CAD import
- Offset mark setting
- PCB chamfering
- Mounting point misalignment correction
- Job creation
- Optimization
- PPD output
- Download

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.

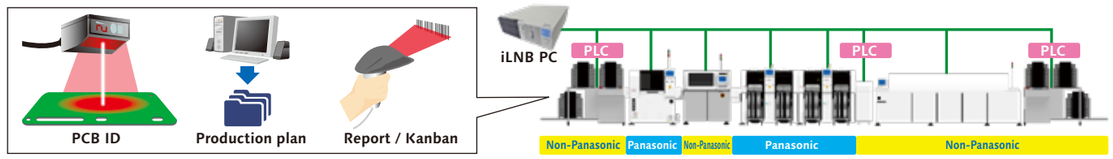
Example:



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.