



Model ID	NPM-DX					
PCB dimensions <small>*When the long spec. conveyor is selected</small>	Single-lane mode	L 50 mm × W 50 mm ~ L 510 mm × W 590 mm				
	Dual-lane mode	L 50 mm × W 50 mm ~ L 510 mm × W 300 mm				
PCB exchange time <small>*When the short spec. conveyor is selected</small>	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	W 1 665 mm ^{*2} × D 2 570 mm ^{*3} × H 1 444 mm ^{*4}					
Mass	3 600 kg (Only for main body:This differs depending on the option configuration.)					
Placement head	Lightweight 16-nozzle head V2 (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]
Max. speed	46 200 cph (0.078 s / chip)	27 000 cph (0.133 s / chip)	24 000 cph (0.150 s / chip)	14 000 cph (0.257 s / chip)	8 500 cph (0.424 s / chip)	5 000 cph (0.720 s / chip)
					8 000 cph (0.450 s / QFP)	
Placement accuracy(Cpk ≥ 1)	±25 μm/chip	±15 μm/chip ^{*5}	±25 μm/ chip ±40 μm/ QFP □12 mm Under ±25 μm/ QFP □12 mm ~ □32 mm	±15 μm/ chip ^{*5}	±25 μm/ chip ±20 μm/ QFP	±15 μm/chip ^{*5}
Component dimensions (mm)	0201 chip ^{*6} / 03015 chip ^{*6} 0402 chip ^{*6} to L 6 × W 6 × T 3		0402 chip ^{*6} ~ L 45 × W 45 or L 100 × W 40 × T 12		0603 chip ~ L 120 × W 90 or L 150 × W 25 × T 30	
	Tape : 4 / 8 / 12 / 16 / 24 / 32 / 44 / 56 mm				Tape : 4 ~ 56 / 72 / 88 / 104 mm	
Component supply	Taping	4, 8 mm tape: Max. 136				
	Stick	Max. 32(Single stick feeder)				

*Placement tact time and accuracy values may differ slightly depending on conditions.
 *Please refer to the specification booklet for details.

*1: Only for main body
 *2: 2 265 mm in width if extension conveyors (300 mm) are placed on both sides.
 *3: Dimension D including feeder cart

*4: Excluding the monitor, signal tower and ceiling fan cover.
 *5: Accuracy valid for components 6 mm square or smaller.
 *6: 0201/03015/0402 component requires a specific nozzle/tape feeder.
 *7: 0201 component placement is optional. (Under conditions specified by Panasonic)

⚠ 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. [Please check the homepage for the details. panasonic.com/global/corporate/sustainability](http://panasonic.com/global/corporate/sustainability)

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NPM X



Model Name **NPM-DX**
 Model No. NM-EJM8D



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

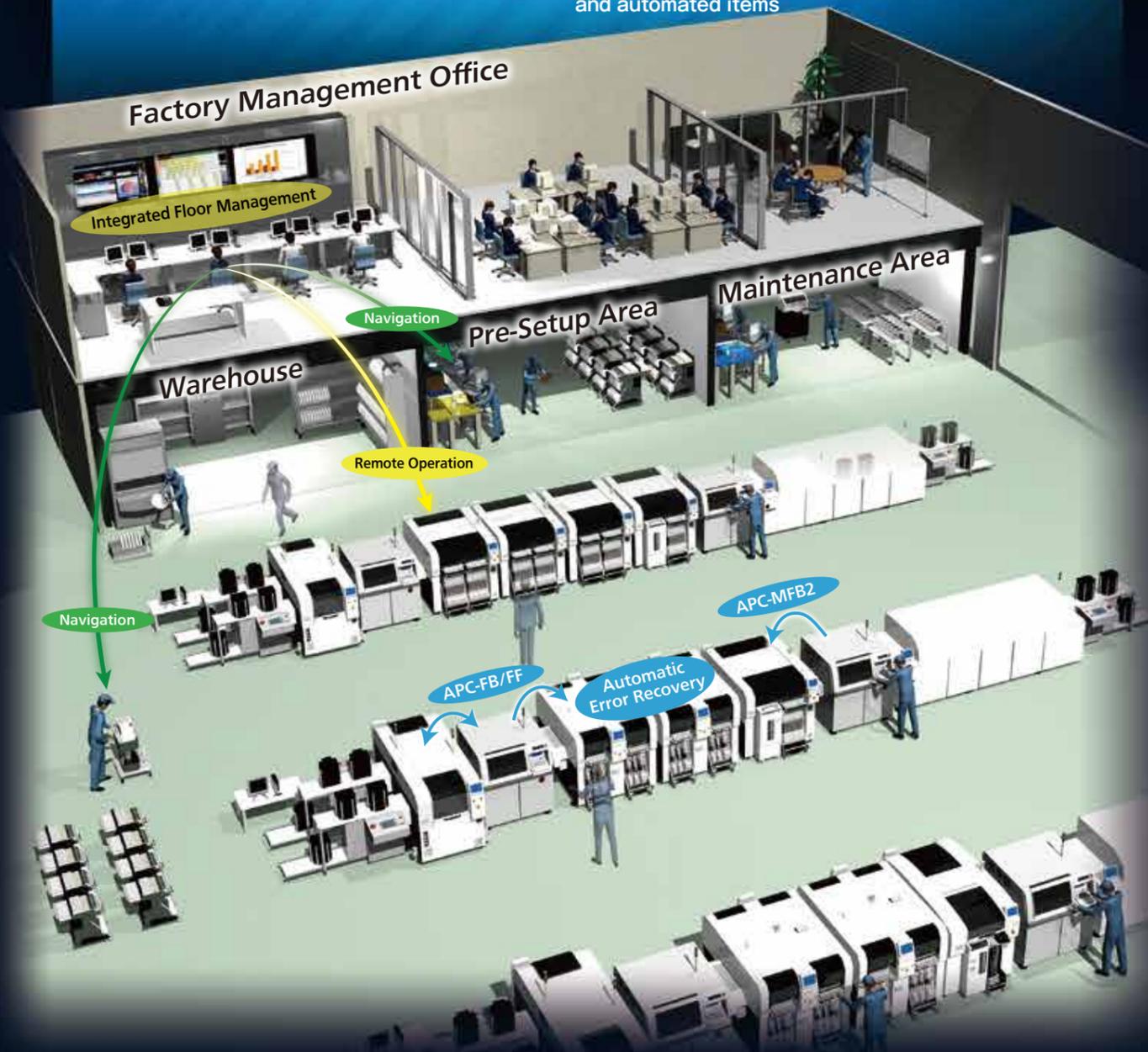
NPM X Developing high-quality, high-throughput unmanned floor

[1] Panasonic's next generation of mounting production (X series) concept

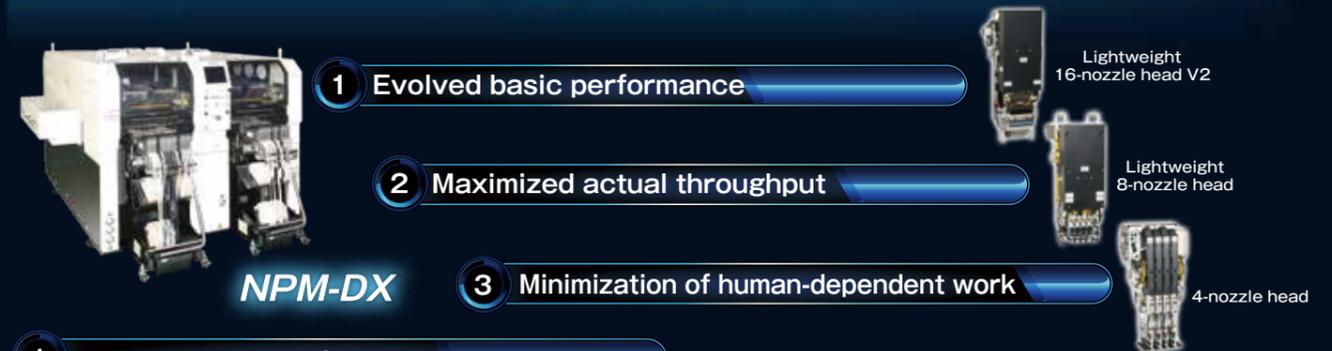
"Smart manufacturing"

More line throughput, better quality and lower cost with fully automated mounting system floor

- | | |
|---|---|
| 1 Stable operation based on the autonomic function | Autonomous line control
APC system and automatic recovery option |
| 2 Labor-saving, improved utilization | Concentrated control
Floor management system and remote operation option |
| 3 Reduced work variations | Navigation/automated items
Feeder setup navigation, component supply navigation and automated items |



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



1 Evolved basic performance

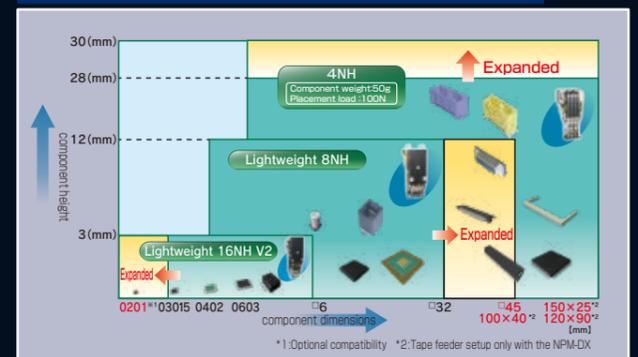
Increased productivity/quality

[High-accuracy mode OFF]
Max.speed : 184 800cph*
IPC9850(1608) : 130 000cph*
Placement accuracy : ±25 μm

[High-accuracy mode ON]
Max.speed : 108 000cph*
IPC9850(1608) : 76 000cph*
Placement accuracy : ±15 μm

*Tact for 16NH × 4 head

Improved ability to support components



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

Changeover	<ul style="list-style-type: none"> Short-cut screen for changeover operation Instruction of non-teaching components before starting operation
Component supply	<ul style="list-style-type: none"> Pitch misalignment automatic correction Warning of component exhaust rush occurrence
Error recovery	<ul style="list-style-type: none"> 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 start of production and displays the start-up support screen after changeover.

Warning of component exhaust rush occurrence

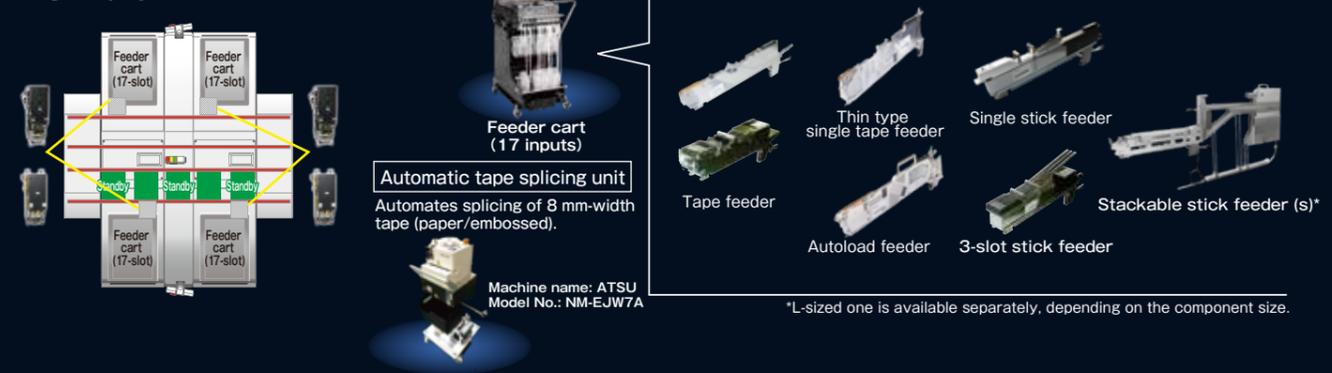


Predicts simultaneous exhaustion of different components (rush) and notifies the operator of such rush (warning: support request). Normally, displays the length of time before the next component exhaustion takes place on the screen.

Taking the concept and compatibility of NPM series

Data creation, the feeder cart (17-slot), tape feeder and nozzle are compatible with NPM series. Taking the concept of NPM series Line connection with NPM-D and NPM-TT series is enabled.

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



*L-sized one is available separately, depending on the component size.

2 Maximized actual throughput

Taking the concept and compatibility of NPM series

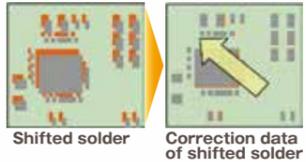


- NPM-DGS Data Creation System
- APC system
- Automatic recovery option
- Remote operation option
- Automatic changeover option
- iLNB
- PCB information communication function
- AOI information display option
- Host communication option

APC system

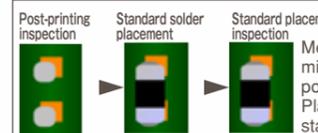
APC-FB^{*1} Feedback to the printing machine

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



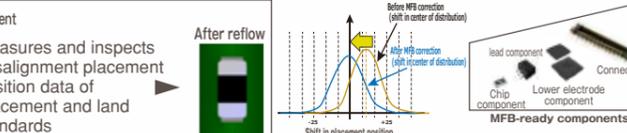
APC-FF^{*1} Feedforward to the placement machine

* 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

* Position inspection on APC offset 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}

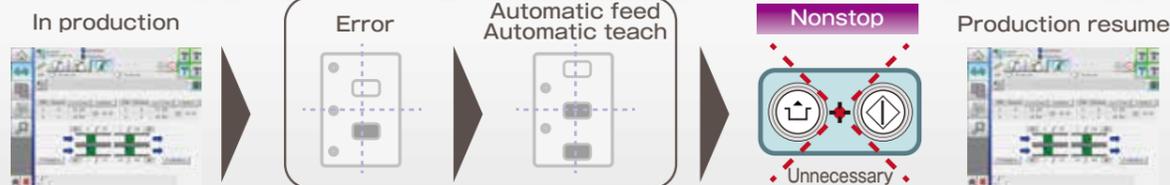


*1: APC-FB (feedback)/FF (feedforward): 3D inspection machine of another company can be also connected. (Please ask your local sales representative for details.)
*2: APC-MFB2 (mounter feedback2): Applicable component types vary from one AOI vendor to another. (Please ask your local sales representative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

Automatic recovery option

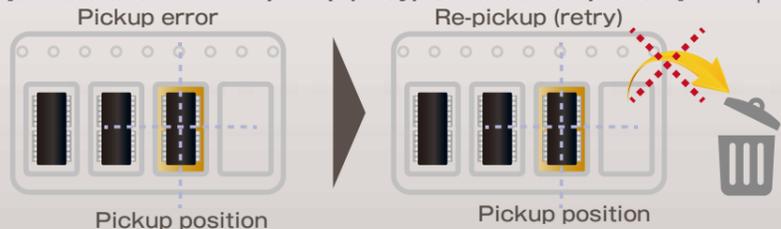
Pickup position automatic teach in case of an error

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

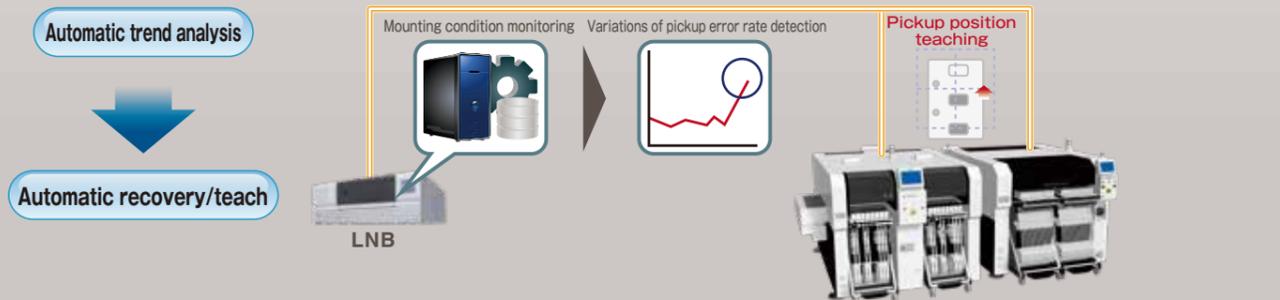


No discard component because tape is not fed.*

- 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)

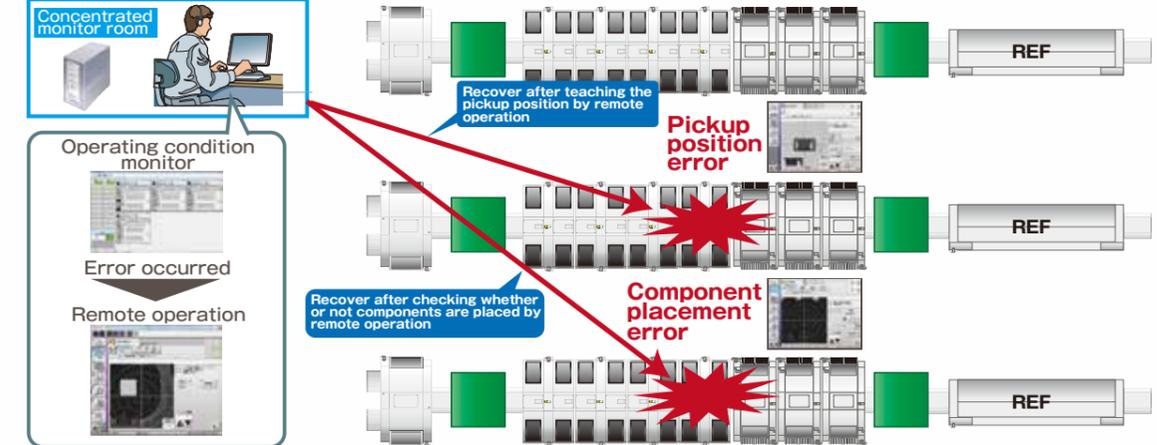
LNB automatically analyzes the variation of pickup/recognition error rate and instructs the machine to perform teaching to prevent machine error stop.



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.



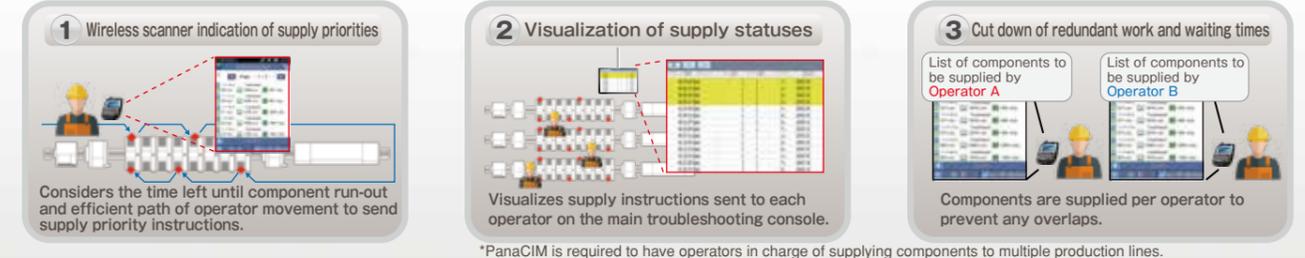
Navigation

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.

Component supply navigator option

A component supply support tool that navigates efficient component supply priorities. It considers the time left until component run-out and efficient path of operator movement to send component supply instructions to each operator. This achieves more efficient component supply.



Placement head maintenance

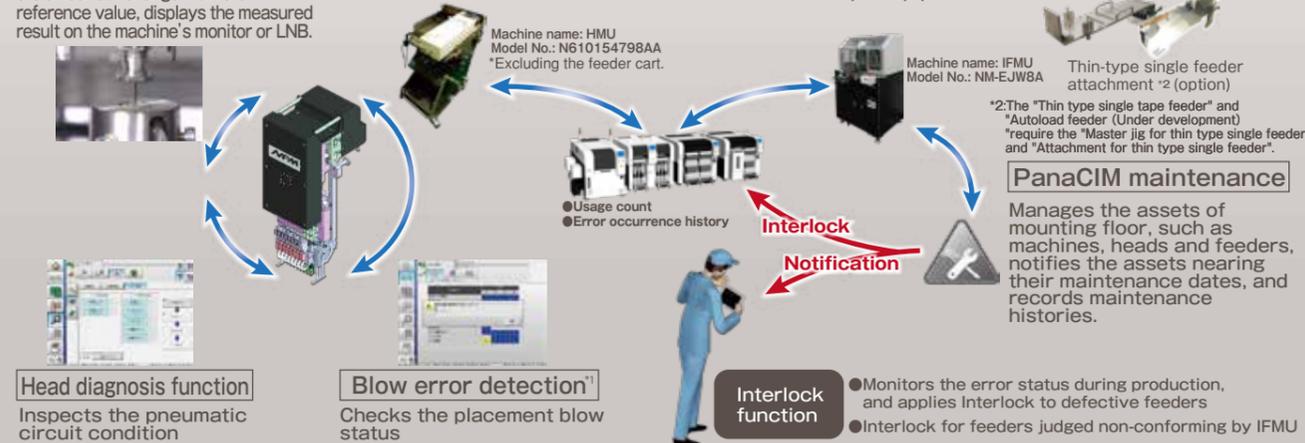
Good use is made of the machine's self-diagnosis function to automatically detect the maintenance timing of the placement head. In addition, the maintenance unit can be used to keep the placement head in working condition without requiring skills.

Load checker (Under development)

Measures the "indentation load" imposed by the placement head, and, as the amount of change from the reference value, displays the measured result on the machine's monitor or LNB.

Head maintenance unit

To automate the inspection and maintenance of the placement head.



Head diagnosis function
Inspects the pneumatic circuit condition

Blow error detection¹
Checks the placement blow status

Interlock function
● Monitors the error status during production, and applies Interlock to defective feeders
● Interlock for feeders judged non-conforming by IFMU

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

Automates the inspection of major parts which affect the feeder performance and the calibration of the pickup position.



Thin-type single feeder attachment *2 (option)

*2: The "Thin type single tape feeder" and "Autoload feeder (Under development)" require the "Master jig for thin type single feeder" and "Attachment for thin type single feeder".

PanaCIM maintenance

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

NPM X Comprehensive control using system software

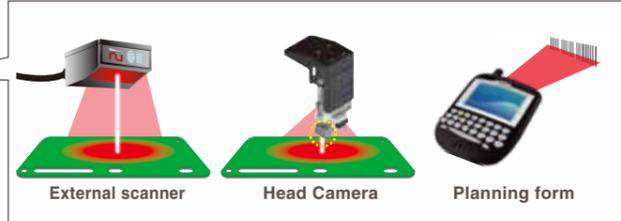
Changeover ability

Supporting changeover (production data and rail width adjustment) can minimize time loss



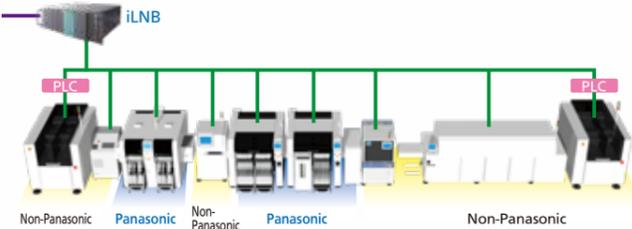
Automatic changeover option

●PCB ID read-in type
PCB ID read-in function is selectable from among 3 types of external scanner, head camera or planning form



M2M

Collective control of your line composed not only of Panasonic's machines but of third vendors' through a single PC provides support for your actual production, quality control and processing. Panasonic is ready to take on the interface between its machines and third vendors'.



Item	Panasonic	Non-Panasonic
Information collection/display	○	○
Automatic changeover	○	○

For details, refer to the catalogue or specification for the integrated line management system iLNB.

iLNB* (Model No.NM-EJS5B)

Function list

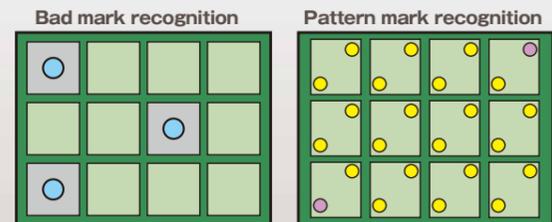
Function	Details
①Automatic changeover	①Registration of automatic changeover recipe ②Line automatic changeover ③Automatic changeover monitoring ④Line operation monitoring
②E-Link(Information input)	①Download / edit of schedule
③E-Link(Information output)	①Operation information output ②Trace information output ③Machine status output
④E-Link(Machine control)	①Machine interlock, Production start control
⑤E-Link(Feeder write)	①Writing of component data by an external system
⑥Communication function (GEM-PLC)	①SECS2/GEM communication ②OPC communication ③IO/RS-232C communication

※The iLNB comprises software and a computer (iLNB PC). PLC PC, communication conversion PLC, and other devices should be prepared by customers.

PCB Info Communication Function AOI Info Display Option

NPM at the line head recognizes marks, and forwards mark information to downstream NPMs. That eliminates the need for the downstream NPMs to recognize the marks.

[Subject for communication]

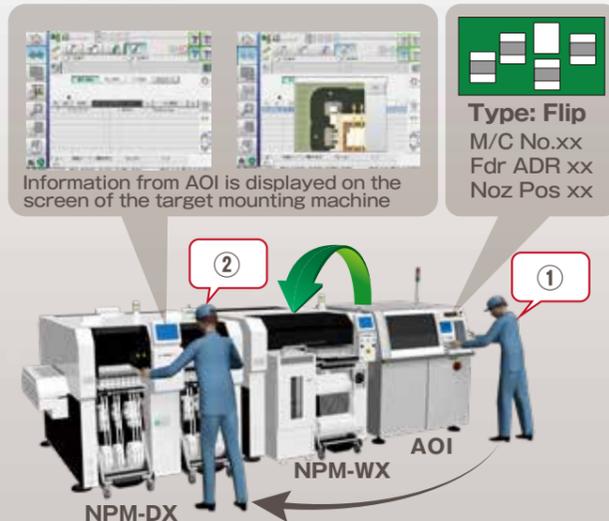


□ Good □ Bad
Bad mark is scanned at the first machine.

○ Master mark
All marks are recognized at the first machine and downstream machines only recognize master marks.

*Please refer to "Specification" booklet for details.

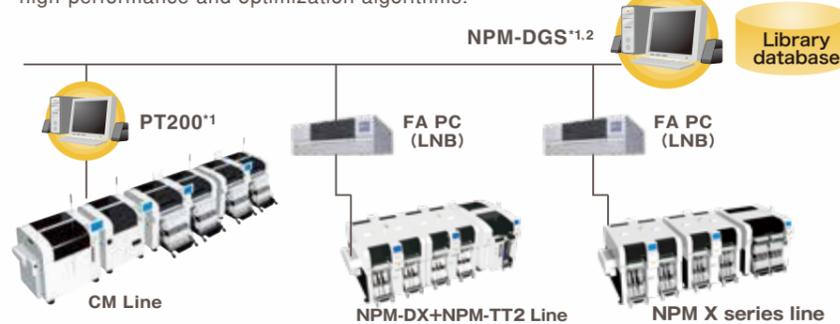
Information on components judged NG by AOI is displayed both on AOI and NPM.



- 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

Data Creation System

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.

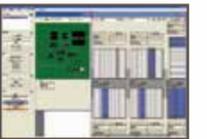
NPM-DGS (Model No.NM-EJS9A)

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(option)

Component data can be created offline even while the machine is in operation.
Use the line camera to create component data. Lighting conditions and recognition speed can be confirmed in advance, so it contributes to the improvement of productivity and quality.

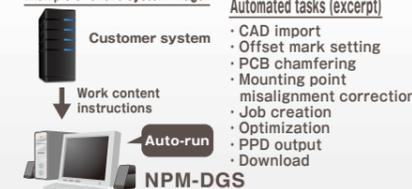


Offline Camera Unit

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:



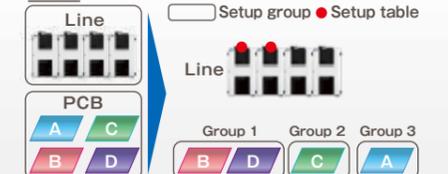
Automated tasks (excerpt)

- 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 supply 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:



Component Verification option

Prevents setup errors during changeover Provides an increase of production efficiency through easy operation



*Wireless scanners and other accessories to be provided by customer

- Preemptively deters component misplacement
Prevents misplacement by verifying production data with the barcode information on changeover components.
- Automatic setup data synching function
The machine itself does the verification, eliminating the need to select separate setup data.
- Interlock function
Any problems or lapses in verification will stop the machine.
- Navigation function
A navigation function to make the verification process more readily understandable.

Off-line setup support station

With the support stations, offline feeder cart setup is possible even outside of the manufacturing floor.

●Two types of Support Stations are available.

- ①Power Supply Station:
Batch Exchange Cart Setup – Provides power to all feeders in cart. Feeder Setup – provides power to individual feeders.



- ②Component Verification Station:
Additional to the power supply station, Component Verification feature is added to this model. The station will navigate you to the location where feeders need exchange.



Open interface

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



Host system (Users)

LNB (FA PC)

NPM X series line

Host communication option

- 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 (*1) and PCB information (*2)

(*1) Requires input of component information with a component verification option or an other company's component verification system I/F

(*2) Requires input of PCB information with automatic changeover option