Machine configuration

NPM-WX

Rear camera
Mounting head
Front camera

NPM-WXS

(Option)

Supply unit layout

	Layout 1	Layout 2	Layout 3	Layout 4	Layout 5
	8 mm taping : 120 Tray : 0	8 mm taping : 136 Tray : 0	8 mm taping : 94 Tray : 24	8 mm taping : 102 Tray : 24	8 mm taping : 68 Tray : 48
	TF30	TF17 TF17	TF17 Tray	TF17 Tray	TF17 Tray
	TF30	TF17 TF17	TF30	TF17 TF17	Tray TF17

Model ID		NPM-WX	NPM-WXS
Model No.		NM-EJM9D	NM-EJM2E
PCB dimensions	Single-lane mode	Batch mounting : L 50 mm × W 50 mm ～ L 750 mm × W 610 mm	2 position mounting : L 50 mm × W 50 mm ～ L 350 mm × W 610 mm
	Dual-lane mode	Dual transfer(Batch): L 50 mm × W 50 mm ～ L 750 mm × W 300 mm	Dual transfer(2 position): L50 mm × W 50 mm ～ L 350 mm × W 300 mm
		Single transfer(Batch): L 50 mm × W 50 mm ～ L 750 mm × W 590 mm	Single transfer(2 position): L50 mm × W 50 mm ～ L 350 mm × W 590 mm
Electric source		3-phase AC 200, 220, 380, 400, 420, 480 V 3.0 kVA	3-phase AC 200, 220, 380, 400, 420, 480 V 2.1 kVA
Pneumatic source *1		Min.0.5 MPa, 200 L /min (A.N.R.)	
Dimensions		W 1 410 mm *2 × D 2 570 mm *3 × H 1 444 mm *4	
Mass		2 740 kg(Only for main body:This differs depending on the option configuration.)	2 660kg(Only for main body:This differs depending on the option configuration.)
Placement head		1 head on each side (front, rear)	1 head (rear camera is optional)
Component supply	Taping	Tape : 4 ～ 56 / 72 / 88 / 104 mm	
		Front rear 17-slot feeder cart specifications: Max. 136 product types (4, 8 mm tape)	
	Stick	Front rear 17-slot feeder cart specifications: Max. 32 product types (single stick feeder)	Front rear 17-slot feeder cart specifications: Max. 16 product types *5 (single stick feeder)
	Tray	One side tray specifications : Max.24、Front-rear tray specifications : Max.48	

Placement head	Lightweight 16-nozzle head V2 (Per head)	Lightweight 8-nozzle head (Per head)	4-nozzle head (Per head)	3-nozzle head V2 (Per head)
Max. speed	43 000 cph (0.084 s / chip)	23 000 cph(0.155 s / chip)	8 400 cph(0.429 s / chip) 7 800 cph (0.462 s / QFP feeder) 7 100 cph (0.507 s / QFP tray) *8	9 400 cph(0.383 s / chip) 7 300 cph (0.493 s / QFP feeder) 6 350 cph (0.567 s / QFP tray) *9
Placement accuracy(Cpk≧1)	±25 μm/ chip	±25 μm/ chip ±40 μm/QFP ☐12 mm Under ±25 μm/QFP ☐12 mm ～ ☐32 mm	±20 μm/ QFP	±20 μm/ QFP
Component dimensions (mm)	0201 chip *6 *7 / 03015 chip *6 0402 chip *6 ～ L 6 × W 6 × T 3	0402 chip *6 ～ L 45 × W 45 × T 12 or L 100 × W 40 × T 12	0603 chip ～ L 120 × W 90 × T 40 or L 150 × W 25 × T 40	0603 chip ～ L 120 × W 90 × T 40 or L 150 × W 25 × T 40

*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: 2 010 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: Stick feeders cannot be used on the rear feeder cart of NPM-WXS.

*6: 0201/03015/0402 component requires a specific nozzle/tape feeder.
*7: 0201 component placement is optional. (Under conditions specified by Panasonic)
*8: For any QFP ☐20 mm or less in size
*9: For any QFP ☐28 mm or less in size

⚠ 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.
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Inquiries…

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● Homepage industrial.panasonic.com/ww/fa-jisso

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BUSINESS

Electronics Assembly System
catalog
Modular Placement Machine

NPM X

Model Name **NPM-WX, WXS**

Model No. **NM-EJM9D/NM-EJM2E**

*Photograph is NM-EJM9D

CE

*It may not conform to Machinery Directive and EMC Directive in case of optional configuration and custom-made specification.
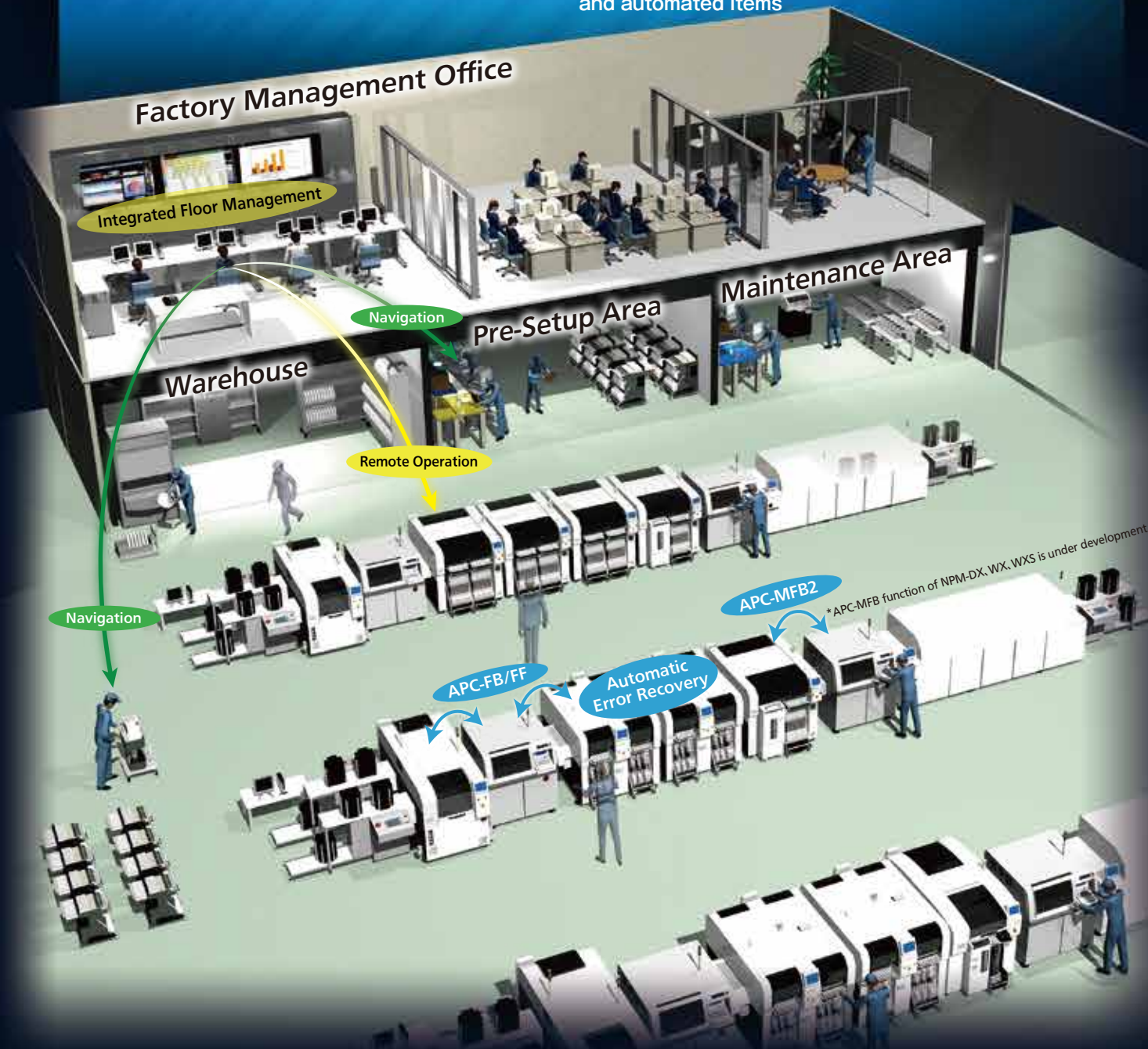
NPM X Developing high-quality, high-throughput unmanned floor

[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

Factory Management Office
Integrated Floor Management
Maintenance Area
Pre-Setup Area
Warehouse
Navigation
Remote Operation
Navigation

APC-MFB2
*APC-MFB function of NPM-DX,WX,WXS is under development.
APC-FB/FF
Automatic Error Recovery

[2] NPM-WX、WXS's features
New platform to realize Smart Manufacturing

1 Evolved basic performance

2 Maximized actual throughput
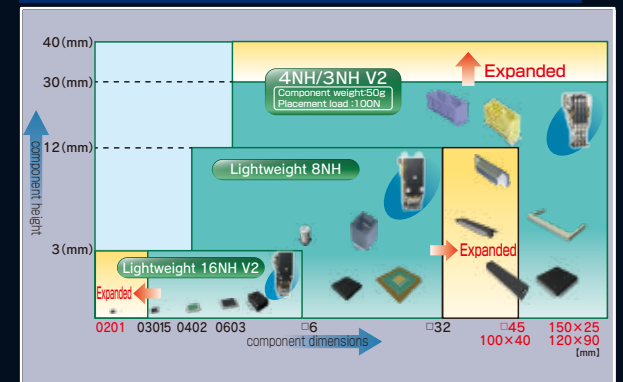
NPM-WX,WXS

3 Minimization of human-dependent work

1 Evolved basic performance

Increased productivity/quality
Max.speed : 86 000cph*
IPC9850(1608) : 64 500cph*
Placement accuracy : ±25μm

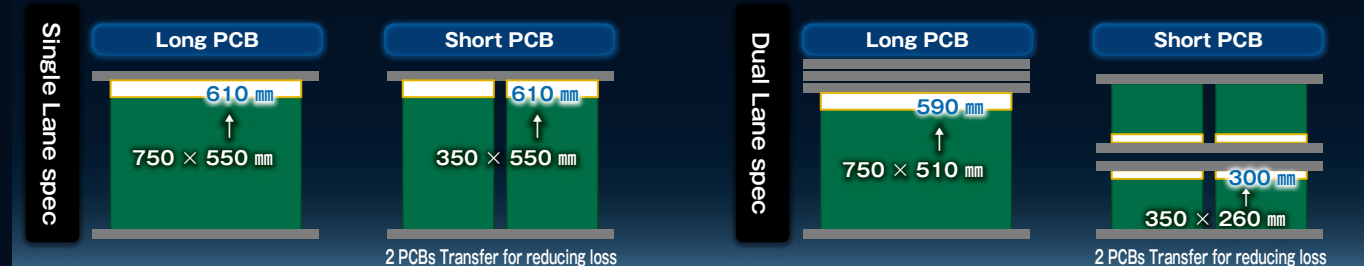Lightweight 16-nozzle head V2
Lightweight 8-nozzle head
3-nozzle head V2
4-nozzle head

* : NPM-WX (Tact for Lightweight 16NH V2 × 2 head)

Improved ability to support components

4NH/3NH V2
Component weight 50g
Placement load :100N
Expanded
Lightweight 8NH
Lightweight 16NH V2
Expanded
Expanded

0201 03015 0402 0603 □6 □32 □45 150×25 100×40 120×90 [mm]
component dimension

Increased PCB adaptability
Increase in transportable PCB size (The following figures show increases compared to NPM-W2.)

Single Lane spec

Long PCB
610 mm
750 × 550 mm

Short PCB
610 mm
350 × 550 mm

Dual Lane spec

Long PCB
590 mm
750 × 510 mm

Short PCB
300 mm
350 × 260 mm
2 PCBs Transfer for reducing loss

2 PCBs Transfer for reducing loss

Greater versatility in supply units
The feeder carts of both the NPM-W (30-input) and the NPM-D (17-input) series are now installable; in addition to that, the interchangeability between a feeder cart (17-input) and newly developed single tray feeder (24-product type) allows you to replace them by each other on your own.

Feeder cart (30 inputs)
Feeder cart (17 inputs)
Interchangeable
Single tray feeder (24 Component types)

Automatic tape splicing unit
Automates splicing of 8 mm-width tape (paper/embossed).
Machine name: ATSU
Model No.: NM-EJW7A

Attachable to 30-/17-input feeder carts
Tape feeder
Thin type single tape feeder
Autoload feeder
Single stick feeder
3-slot stick feeder
Stackable stick feeder (s)*
Multi-functional transfer unit

*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

SPV-DC NPM-DX NPM-WX

APC system

APC-FB *1
Feedback to the printing machine

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

Shifted solder Correction data of shifted solder
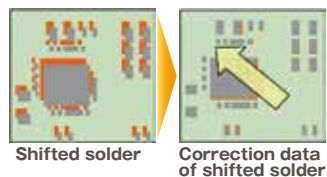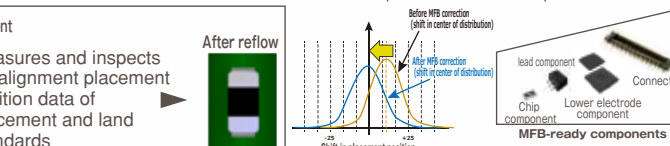
APC-FF *1
Feedforward to the placement machine

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

Post-printing inspection → Standard solder placement → Standard placement inspection → After reflow

Measures and inspects misalignment placement position data of Placement and land standards
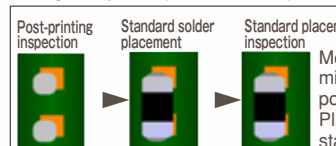
APC-MFB2
Feedforward to AOI / Feedback to the placement machine

· 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

Before MFB correction (shift in center of distribution)
After MFB correction (shift in center of distribution)
Shift in placement position

lead component Connector
Chip component Lower electrode component

MFB-ready components

Basic concept regarding MFB correction

*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 】

In production → Error → Automatic feed Automatic teach → Production resume

Nonstop
Unnecessary
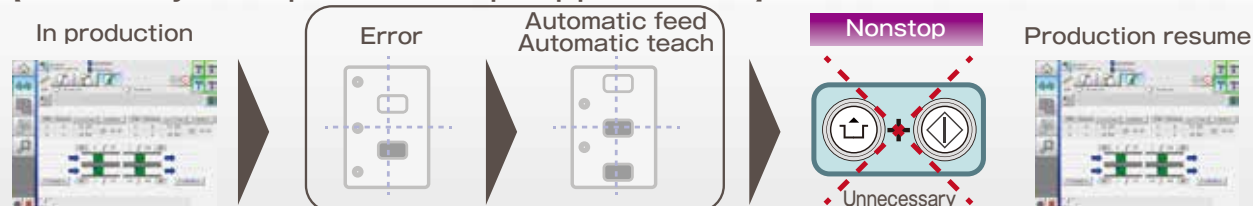
Re-pickup of error component (retry)

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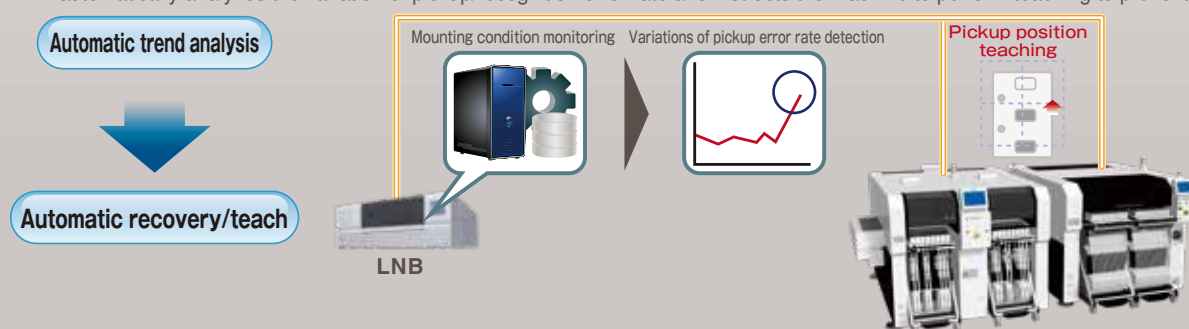【In case of an error: re-pickup (retry) at the current position】 *No tape feed

Pickup error Pickup position
Re-pickup (retry) Pickup position
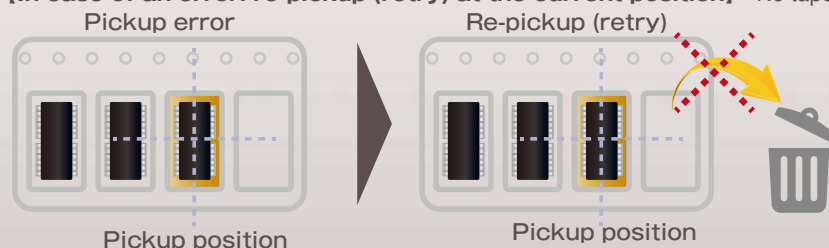
No discard component because tape is not fed.*

☐ 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.

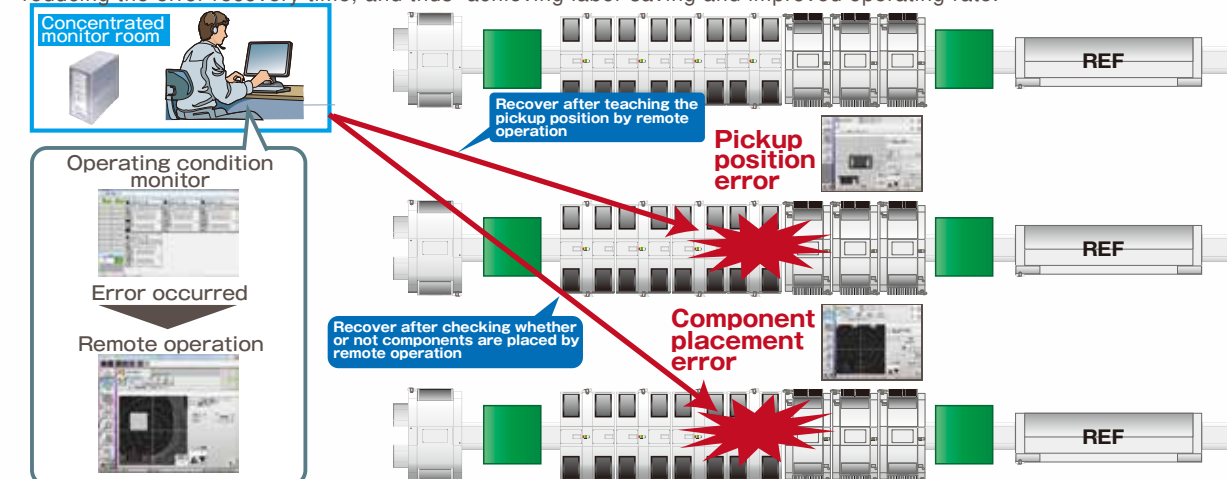### Evolved automatic recovery (predicted control)

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

Mounting condition monitoring Variations of pickup error rate detection Pickup position teaching

Automatic recovery/teach

LNB

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.

Concentrated monitor room

Operating condition monitor

Error occurred

Remote operation

REF

Recover after teaching the pickup position by remote operation

Pickup position error

REF

Recover after checking whether or not components are placed by remote operation

Component placement error

REF

Component supply 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.
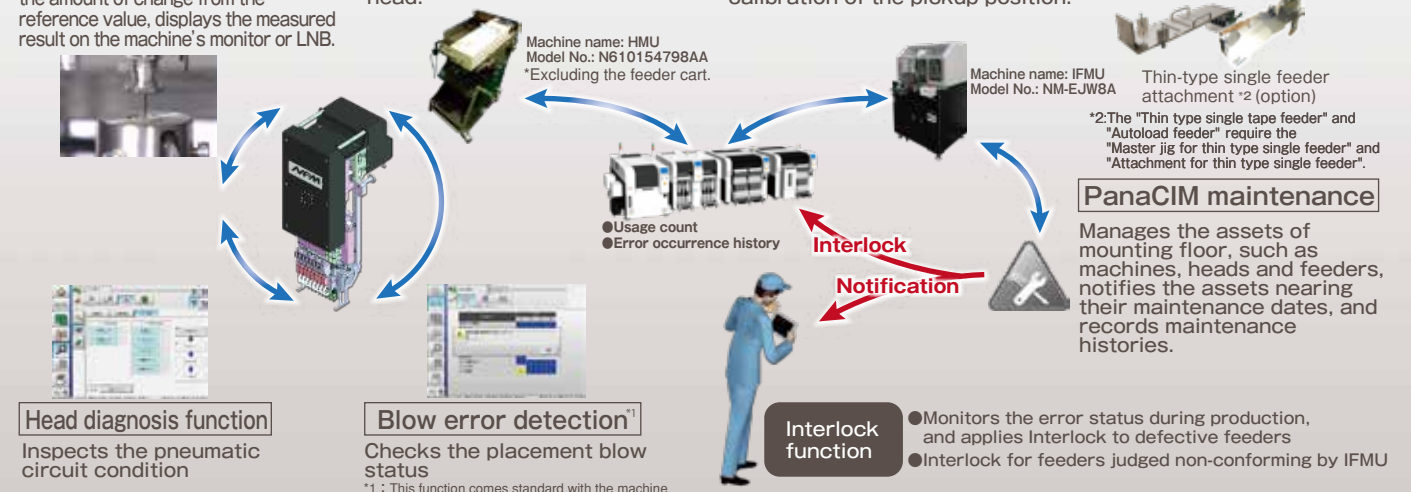
Placement head maintenance

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.

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.

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.

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

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

Machine name: IFMU
Model No.: NM-EJW8A

Thin-type single feeder attachment *2 (option)

*2:The "Thin type single tape feeder" and "Autoload feeder" require the "Master jig for thin type single feeder" and "Attachment for thin type single 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

Head diagnosis function
Inspects the pneumatic circuit condition

Blow error detection*1
Checks the placement blow status
*1 : This function comes standard with the machine

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

Inspection option before pick-up

Inspect tray or reel components before pick-up to prevent misplacement.
①Polarity inspection ⇒ Detects wrong component orientation   ②Component number inspection ⇒ Detects wrong components, traces components

Average luminance
Pattern matching
Chamfering inspection
Text recognition (lot number text)
2D code recognition (lot number text)

Changeover ability / Automatic changeover option

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

NPM-DGS LNB (FA PC) NPM X series line
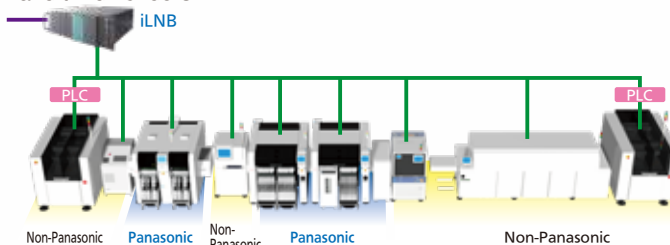
●PCB ID read-in type
PCB ID read-in function is selectable from among 3 types of external scanner, head camera or planning form

External scanner Head Camera Planning form

M2M / iLNB* (Model No.NM-EJS5B)
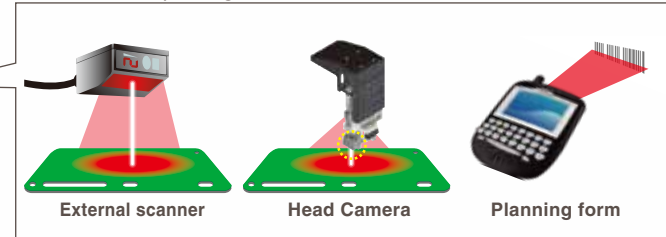
Collective control of your line composed not only of Panasonic's machines but of third vendors' through a single PC provides support for your actual production, quality control and processing. Panasonic is ready to take on the interface between its machines and third vendors'.

iLNB

PLC PLC

Non-Panasonic Panasonic Non-Panasonic Panasonic Non-Panasonic

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

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

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

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

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.
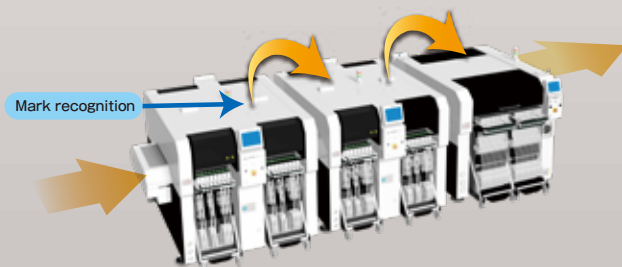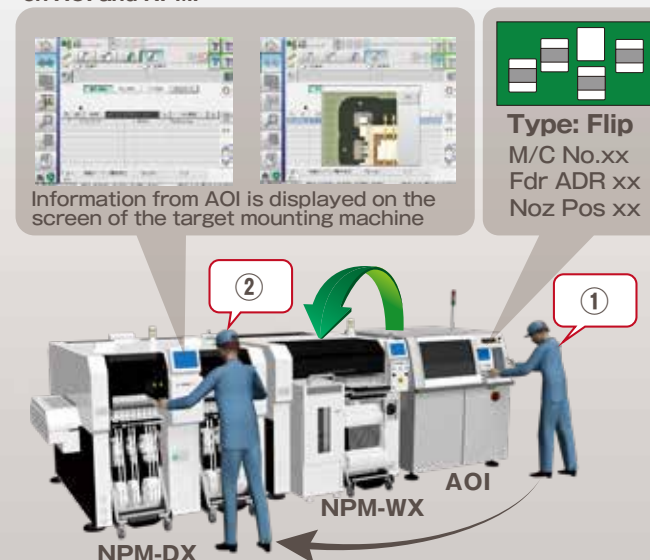
[Subject for communication]
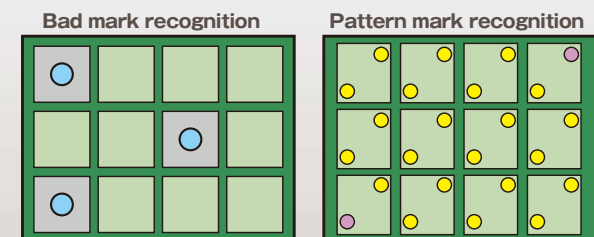
Bad mark recognition
□Good □Bad
Bad mark is scanned at the first machine.

Pattern mark recognition
●Master mark
All marks are recognized at the first machine and downstream machines only recognize master marks.
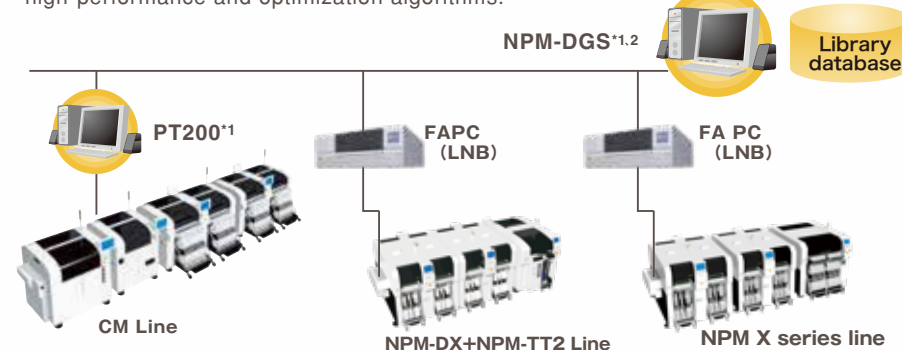
*Please refer to "Specification" booklet for details.

Mark recognition

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

Type: Flip
M/C No.xx
Fdr ADR xx
Noz Pos xx

② ①

NPM-WX
NPM-DX
AOI

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 / 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.

NPM-DGS*1.2
Library database

PT200*1 FAPC (LNB) FA PC (LNB)

CM Line NPM-DX+NPM-TT2 Line NPM X series line

*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.
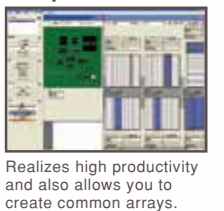
Offline Camera(option)

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:

Customer system

Work content instructions

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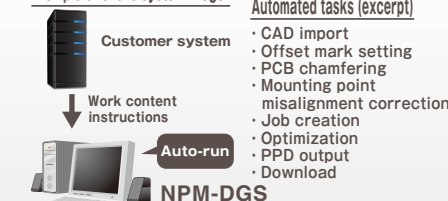
Automated tasks (excerpt)
· CAD import
· Offset mark setting
· PCB chamfering
· Mounting point misalignment correction
· Job creation
· Optimization
· PPD output
· Download

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:
☐Setup group ●Setup table

Line Line PCB

	A	C
	B	D

Group 1 Group 2 Group 3

B	D	C	A
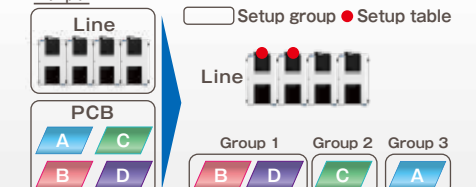
Component Verification option / Off-line setup support station

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

●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.

*Wireless scanners and other accessories to be provided by customer

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 / Host communication option

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

●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