Panasonic
INDUSTRY

2019

Electronics Assembly System catalog

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NPM
NEXT PRODUCTION MODULAR

Manufacturing Process Innovation

Model Name **NPM-W2**

Model No.NM-EJM7D
Model No.NM-EJM7D-MD
Model No.NM-EJM7D-MA
Model No.NM-EJM7D-D
Model No.NM-EJM7D-A

*Photograph is NM-EJM7D

CE

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

NPM
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System evolution according to

1 Higher productivity and quality with printing, placement and inspection process integration

Depending on the PCB you produce, you can select High-speed mode or High-accuracy mode.

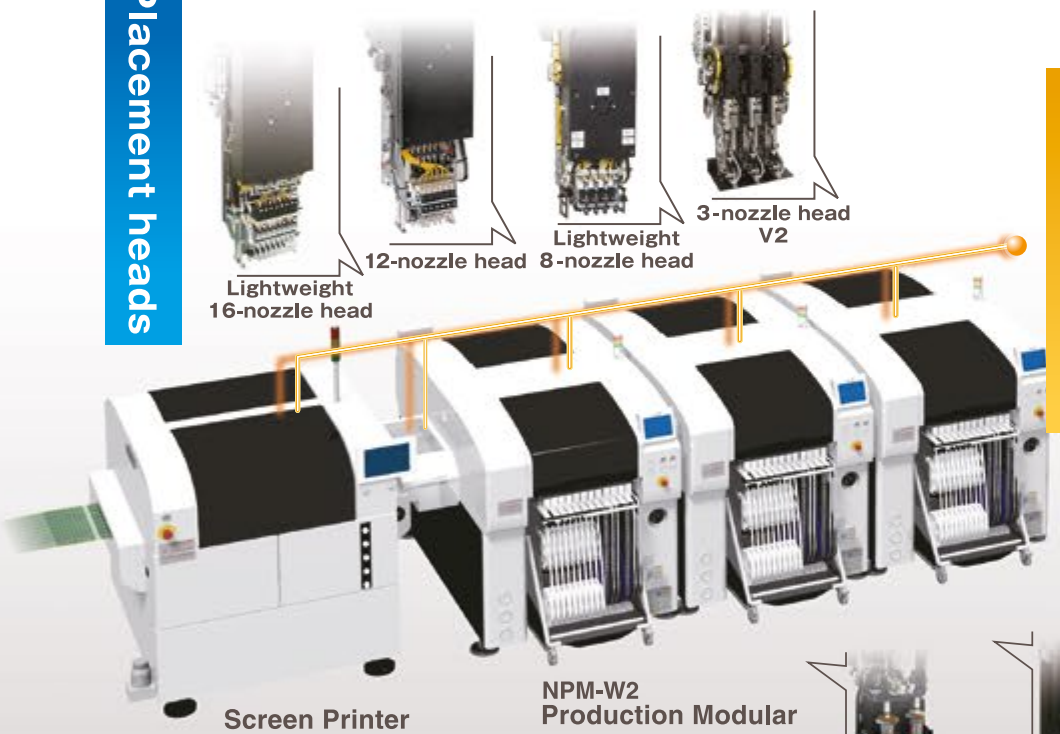
2 For larger boards and larger components

PCBs up to a size of 750 × 550 ㎜ with component range up to L150 × W25× T30 ㎜

3 Higher area productivity through dual lane placement

Depending on the PCB you produce, you can select an optimal placement mode – “Independent” “Alternate” or “Hybrid”

Placement heads

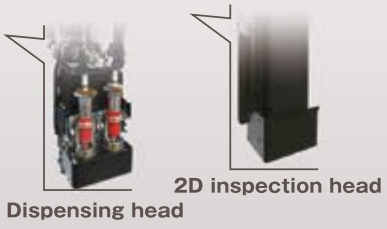


System software

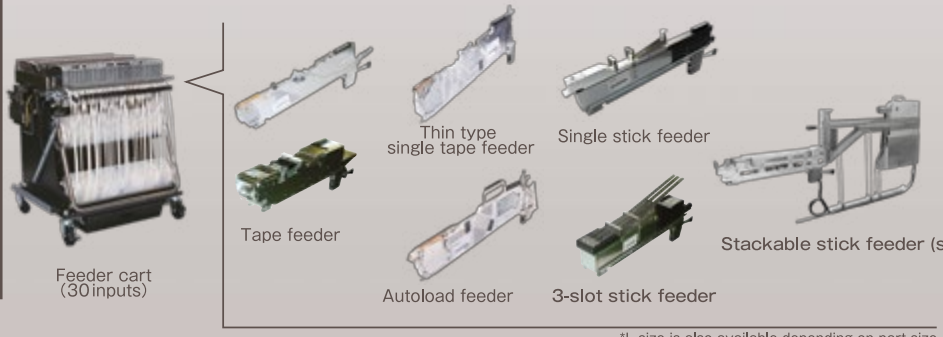
- Parts Supply Navigator option
- Placement height control system
- Feeder Setup Navigator option
- APC system
- Component Verificaton option
- Automatic changeover option
- Host communication option

●NPM–DGS
Data Creation System

Process units



Supply units



*L size is also available depending on part size

mounting changes NEW CONCEPT MACHINE

Features

Simultaneous realization of high area productivity and high-accuracy placement

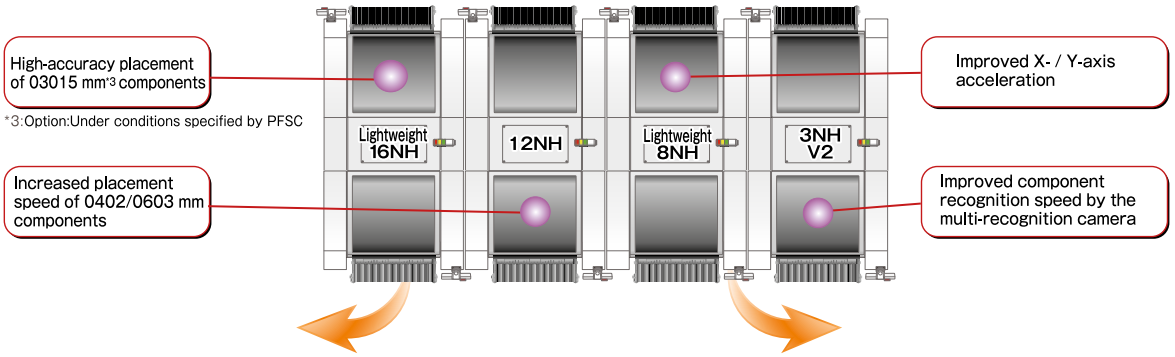
◆**High production mode** (High production mode: ON)

Max. speed: 77 000 cph[*1] **(IPC9850 (1608) : 59 200cph**[*1]**) / Placement accuracy: ±40 μm**

◆**High accuracy mode** (High production mode : OFF)

Max. speed: 70 000 cph[*1]**/ Placement accuracy: ±30 μm (Option : ±25 μm**[*2]**)**

*1:Tact for 16NH × 2 head
*2:Under conditions specified by PFSC

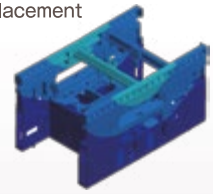


New placement head

・lightweight 16-nozzle head

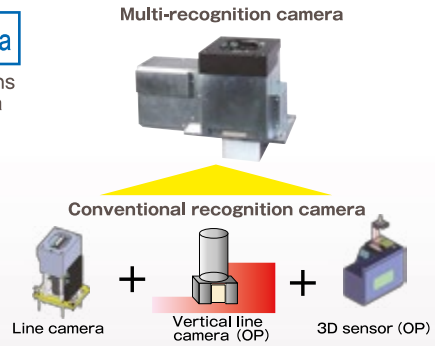
New high-rigidity base

・High rigidity base supporting high-speed / accuracy placement



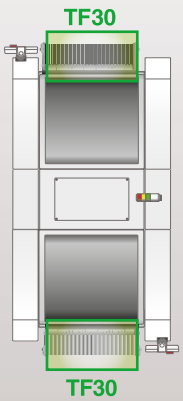
Multi-recognition camera

・Three recognition functions combined into one camera
・Faster recognition scan including components height detection
・Upgradable from 2D to 3D specifications



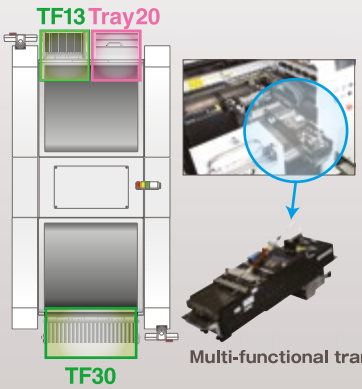
Machine Configuration

Rear & Front Feeder Layout



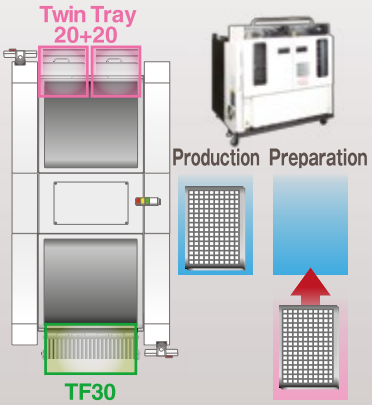
60 different components can be mounted from 16mm tape feeders.

Single Tray Layout



13 fixed feeder slots are available. PoP tray mounting is possible via a transfer unit.

Twin Tray Layout



While one tray is used for production, the other tray can simultaneously be used to setup the next production in advance.

Automation units

Automatic tape splicing unit

Feeder maintenance unit

*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".

Head maintenance unit

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Higher area productivity through dual lane placement
Placement Heads

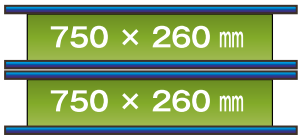
Multi-functionality

Large Board

Single-lane specifications(Selection spec.)

Large Board up to 750 × 550 ㎜ can be handled

Dual-lane specifications(Selection spec.)

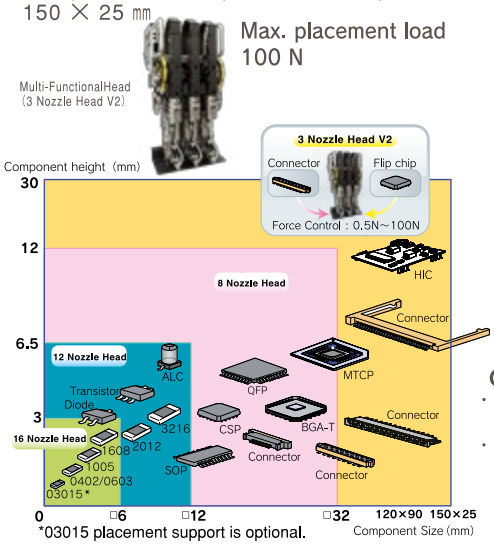


Large boards(750 × 260 ㎜) can be handled collectively.
Boards(up to a size of 750 × 510 ㎜) can be handled collectively during single transfer.

Large Components

Compatible to component sizes up to 150 × 25 ㎜

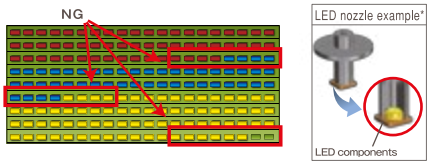
Max. placement load 100 N



*03015 placement support is optional.

LED Placement

Brightness Binning



Avoid mixing of brightness and minimizes component and block disposal.
Monitors remaining component count to avoid component exhaust during operation.

*Please ask us for nozzles that support LED components of various shapes

Other functions

- Global bad mark recognition function
  Reduces in travel/recognition time to recognize bad marks
- PCB standby between machines
  (with the extension conveyor attached)
  Minimizes the PCB(750 mm)change time

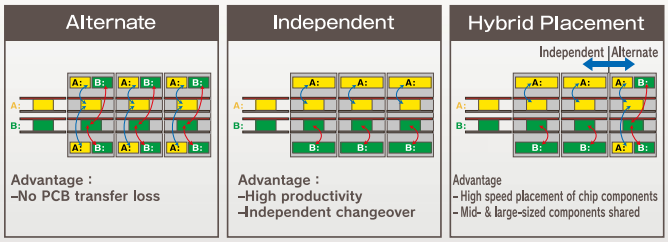
High productivity

Employs dual mounting method

Alternate,Independent & Hybrid Placement

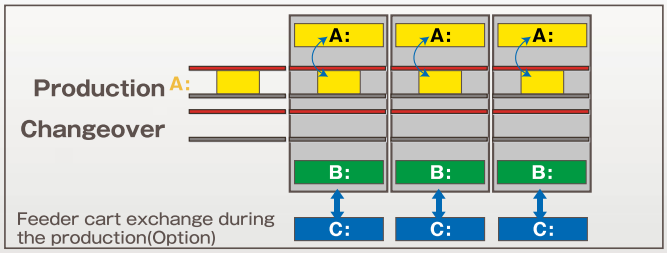
Selectable "Alternate" and "Independent" dual placement method allows you to make good use of each advantage.

- Alternate:Front and rear heads execute placement on PCBs in front and rear lanes alternately.
- Independent:Front head executes placement on PCB in front lane and rear head execute placement on rear lane.



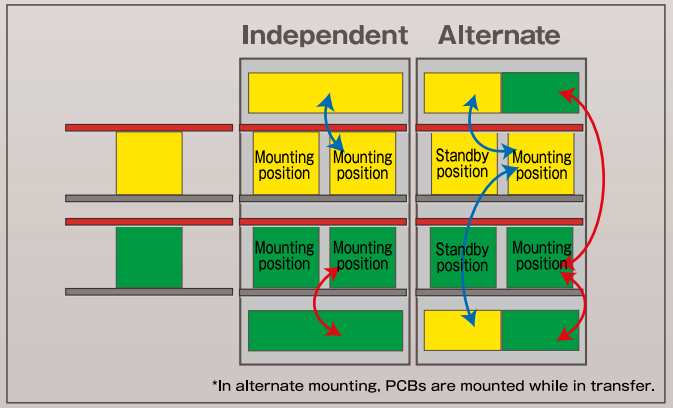
Independent changeover

In the independent mode, you can conduct a changeover on one lane while production continues on the other lane.You can exchange the feeder cart during the production also with Independent changeover unit (option). It supports automatic support pin replacement (option) and an automatic changeover (option) so that it provides the best changeover for your production type.



PCB exchange time reduction

Two PCBs can be clamped on one stage (PCB length: 350 mm or less).And Higher productivity can be realized by reducing PCB exchange time.



*In alternate mounting, PCBs are mounted while in transfer.

Automatic replacement of support pins (option)

Automate position change of support pins to enable non-stop changeover and help save man-power and operation errors.

Quality improvement

Placement height control function

Based on PCB warpage condition data and thickness data of each of the components to be placed, the control of placement height is optimized to improve mounting quality .

Operating rate improvement

Feeder location free

Within same table, feeders can be set anywhere.
Alternate allocation as well as setting of new feeders for next production can be done while the machine is in operation.

Feeders will require off-line data input by support station (option).

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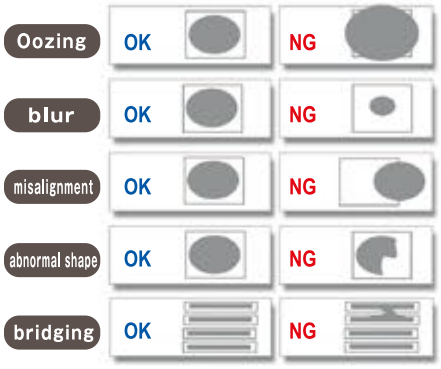
In-line dispensing, inspection achieve high-quality mounting
Dispense & Inspection Head

Solder Inspection (SPI) · Component Inspection (AOI) / Inspection head

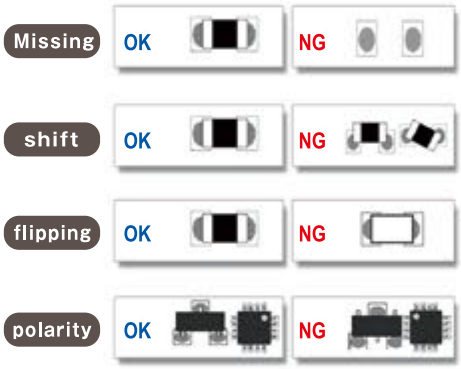
Solder Inspection

・Solder appearance inspection



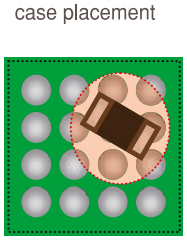
Mounted component Inspection

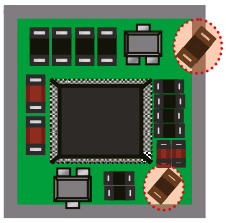
・Appearance inspection of mounted components



Pre-mounting foreign object*1 inspection

・Pre-mounting foreign object inspection of BGAs
・Foreign object inspection right before sealed case placement

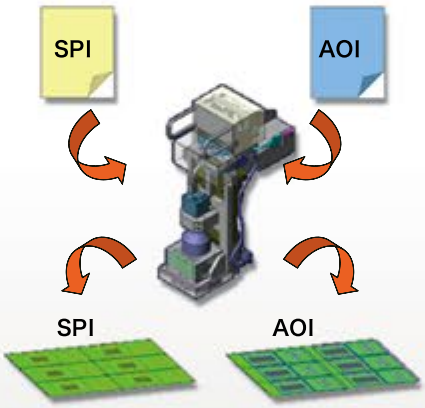

BGA mounting surface


Sealed case mounting surface

*1: Foreign object is available to chip components.

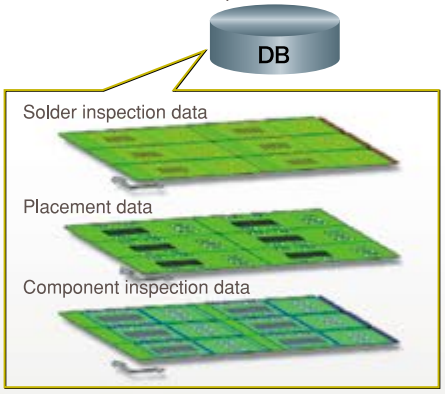
SPI and AOI automatic switching

・Solder and component inspection is switched automatically according to production data.



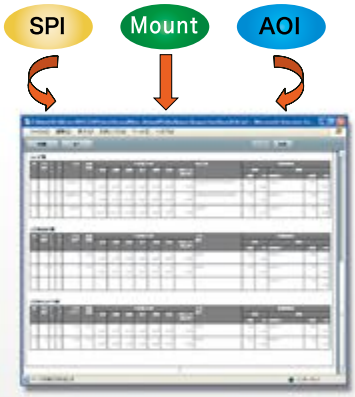
Unification of inspection and placement data

・Centrally managed component library or coordinate data does not require two data maintenance of each process.



Automatic link to quality information

・Automatically linked quality information of each process assists your defect cause analysis.

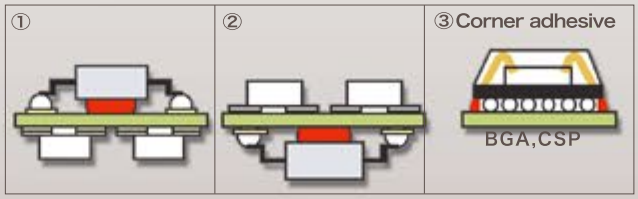


Adhesive Dispensing / Dispensing head

Screw-type discharge mechanism

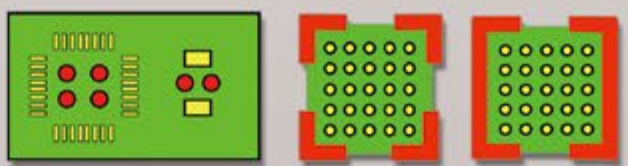
・Panasonic's NPM has the conventional HDF discharge mechanism, which ensures the high-quality dispensing.

①Misalignment prevention of the large-sized component at board transferring
②Drop prevention of the back side component at reflowing
③Adhesive reinforcement of BGA and CSP*



* Pre-demonstration is required.

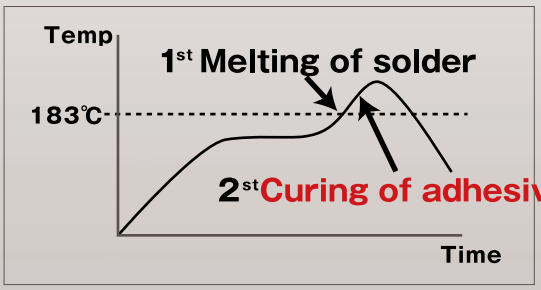
Supports various dot/drawing dispensing patterns



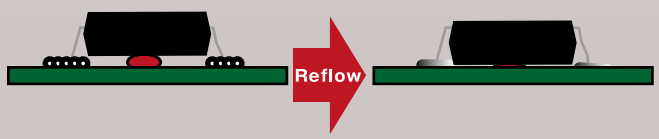
・High accuracy sensor (option) measures local PCB height to calibrate dispensing height, which allows for non-contact dispensing on PCB.

Self-Alignment Adhesive

Our ADE 400D series is a high-temperature curing SMD adhesive with good component self-alignment effect.
This adhesive is also suitable for use in SMT lines to fix bigger components.



After the solder melts, self-alignment and component sinking occurs.



NPM
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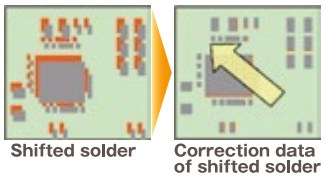
Total management by system software
System Software

High-quality placement / APC system

Controls variations in PCBs and components, etc. on a line basis to achieve quality production.

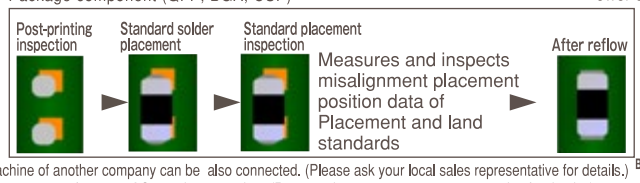
APC-FB*1
Feedback to the printing machine

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



APC-FF *1
Feedforward to the placement machine

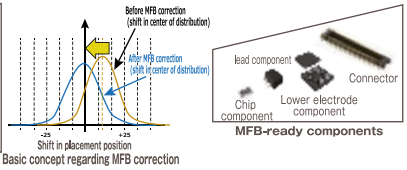
・It analyzes solder position measurement data, and corrects component placement positions (X, Y, θ) accordingly.
Chip components(0402C/R ～)
Package component (QFP, BGA, CSP)



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

・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.)

Component Verification option / Off-line setup support station

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.

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

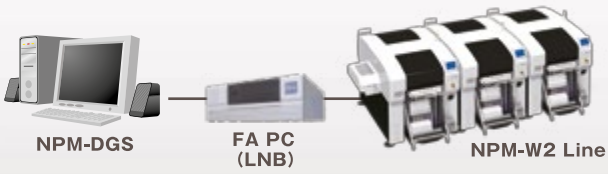
●**Two types of Support Stations are available.**

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

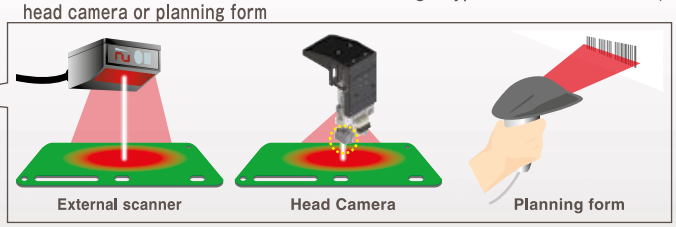
②Component Verification Station:
Additional to the power supply station, Component Verification feature is added to this model. The station will navigate you to the location where feeders need exchange.

Changeover ability / Automatic changeover option

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



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



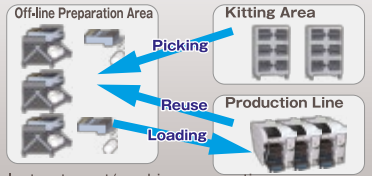
Feeder setup navigator option

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.

1 Gross Production Time Estimate

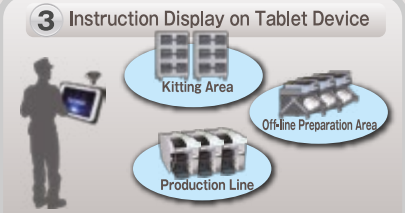
Production completion time is estimated based on setup time and available human resource

2 Feeder preparation process instructions



Instructs cart/machine preparation process in three steps: load, remove, and relocate

3 Instruction Display on Tablet Device



Instructions can be checked from anywhere

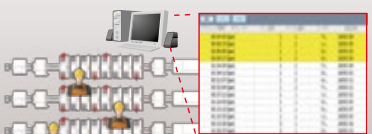
Operating rate improvement / Parts supply navigator option

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.

1 Wireless scanner indication of supply priorities

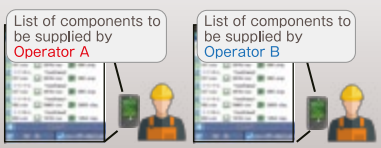
Considers the time left until component run-out and efficient path of operator movement to send supply priority instructions.

2 Visualization of supply statuses



Visualizes supply instructions sent to each operator on the main troubleshooting console.

3 Cut down of redundant work and waiting times



Components are supplied per operator to prevent any overlaps.

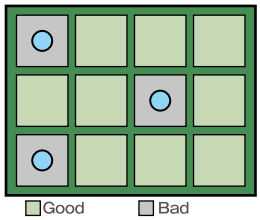
*PanaCIM is required to have operators in charge of supplying components to multiple production lines.

PCB information communication function

Information of mark recognitions done on first NPM machine in line is passed on to downstream NPM machines.
Which can reduce cycle time utilizing the transferred information.

[Subject for communication]

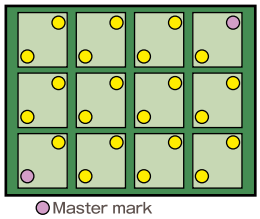
Bad mark recognition



Bad mark is scanned at the first machine.

*Please refer to "Specification" booklet for details.

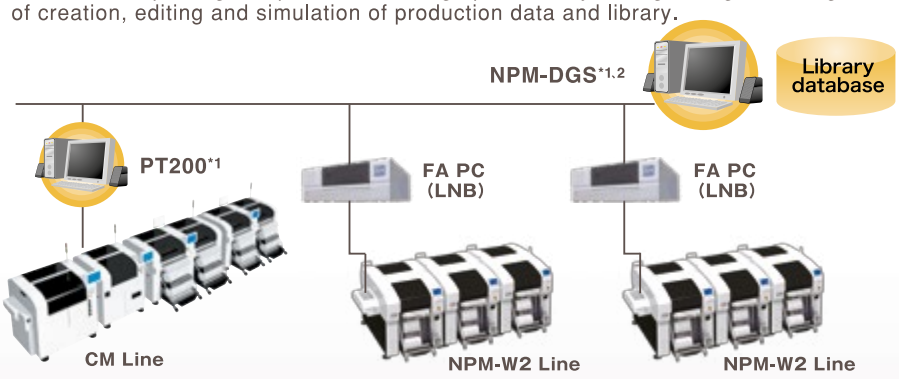
Pattern mark recognition



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

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

The software package helps to achieve high productivity through integral management of creation, editing and simulation of production data and library.



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

Multi-CAD import

Almost all CAD data can be retrieved by macro definition registration. Properties, such as polarity,also can be confirmed on screen in advance.

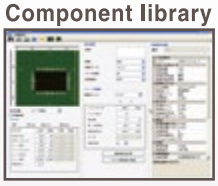
Simulation

Tact simulation can be confirmed on screen in advance so that line total operation ratio can increase.

PPD editor

With quickly and easily compiling placement and inspection head data on the PC display during operation, time loss can be minimized

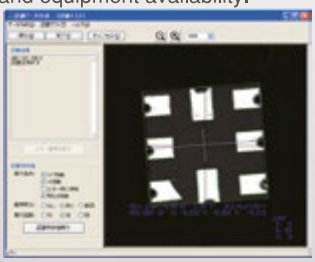
Component library



A component library of all placement machines including the CM series on floor can be registered to unify data management.

Offline Camera Unit (option)

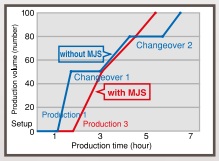
Minimizes time on machine for parts library programming and assists equipment availability and quality.
Parts library data is generated using the line camera
Conditions not possible on a scanner such as Illumination conditions, and recognition speeds, can be checked offline assuring quality enhancements and equipment availability.



Recognition test/Evaluation screen

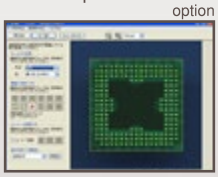
Offline Camera Unit

Mix Job Setter (MJS)



Production data optimization allows the NPM-D2 to commonly arrange feeders.Feeder replacement time reduction for changeover can improve productivity

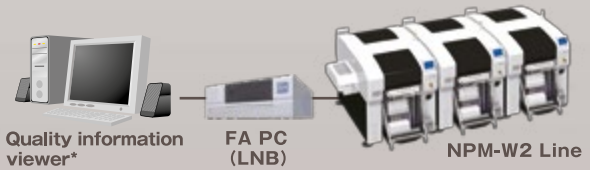
Off-line component data creation option



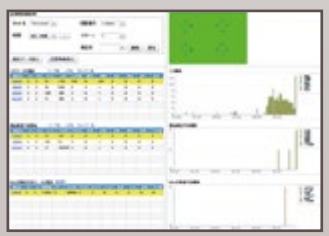
With creating off-line component data using a store-bought scanner,productivity and quality can be improved.

Quality improvement　Quality information viewer

This is software designed to support a grasp of changing points and analysis of defect factors through the display of quality-related information (e.g., feeder positions used, recognition offset values and parts data) per PCB or placement point. In case of our inspection head introduced, the defect locations can be displayed in association with quality-related information



*PC is required for every line.



Quality information viewer window

Example of use of quality information viewer

Identifies a feeder used for mounting of defect circuit boards. And if, for example, you have many misalignments after splicing, the defect factors can be assumed to be due to;
1) splicing errors (pitch deviation is revealed by recognition offset values)
2) changes in component shape (wrong reel lots or venders)
So you can take quick action to the misalignment correction.

Model ID		NPM-W2					
Front head \ Rear head		Lightweight 16-nozzle head	12-nozzle head	Lightweight 8-nozzle head	3-nozzle head V2	Dispensing head	No head
Lightweight 16-nozzle head		NM-EJM7D				NM-EJM7D-MD	NM-EJM7D
12-nozzle head							
Lightweight 8-nozzle head							
3-nozzle head V2							
Dispensing head		NM-EJM7D-MD				———	NM-EJM7D-D
Inspection head		NM-EJM7D-MA					NM-EJM7D-A
No head		NM-EJM7D				NM-EJM7D-D	———
PCB dimensions	Single-lane *1	Batch mounting	L 50 mm × W 50 mm ～ L 750 mm × W 550 mm		2-positin mounting	L 50 mm × W 50 mm ～ L 350 mm × W 550 mm	
	Dual-lane *1	Dual transfer (Batch)	L 50 mm × W 50 mm ～ L 750 mm × W 260 mm		Dual transfer (2-positin)	L 50 mm × W 50 mm ～ L 350 mm × W 260 mm	
		Single transfer (Batch)	L 50 mm × W 50 mm ～ L 750 mm × W 510 mm		Single transfer (2-positin)	L 50 mm × W 50 mm ～ L 350 mm × W 510 mm	
Electric source		3-phase AC 200、220、380、400、420、480 V 2.8 kVA					
Pneumatic source *2		0.5 MPa、200 L /min (A.N.R.)					
Dimensions *2		W 1 280 mm *3 × D 2 332 mm *4 × H 1 444 mm *5					
Mass		2 470 kg (Only for main body:This differs depending on the option configuration.)					

Placement head	Lightweight 16-nozzle head (Per head)		12-nozzle head (Per head)		Lightweight 8-nozzle head (Per head)	3-nozzle head V2 (Per head)
	High production mode[ON]	High production mode[OFF]	High production mode[ON]	High production mode[OFF]		
Max. speed	38 500cph(0.094 s/ chip)	35 000cph(0.103 s/ chip)	32 250cph(0.112 s/ chip)	31 250cph (0.115 s/ chip)	20 800cph(0.173 s/ chip)	8 320cph(0.433 s/ chip) 6 500cph(0.554 s/ QFP)
Placement accuracy (Cpk≧1)	±40 μm / chip	±30 μm / chip (±25 μm / chip*6)	±40 μm / chip	±30 μm / chip	±30 μm/ chip ±30 μm/QFP □12 mm ～ □32 mm ±50 μm/QFP □12 mm Under	± 30 μm /QFP
Component dimensions (mm)	0402*7 chip ～ L 6 x W 6 x T 3	03015*7 *8/0402*7 chip ～ L 6 x W 6 x T 3	0402*7 chip ～ L 12 x W 12 x T 6.5		0402*7 chip ～ L 32 x W 32 x T 12	0603 chip to L 150 x W 25 (diagonal152) x T 30
Component supply: Taping	Tape : 4 / 8 / 12 / 16 / 24 / 32 / 44 / 56 mm				Tape : 4 to 56 mm	Tape : 4 to 56 / 72 / 88 / 104 mm
	Max.120(Tape: 4、8 mm)				Front/rear feeder cart specifications : Max.120 (Tape width and feeder are subject to the conditions on the left) Single tray specifications : Max.86 (Tape width and feeder are subject to the conditions on the left) Twin tray specifications : Max.60 (Tape width and feeder are subject to the conditions on the left)	
Component supply: Stick	———				Front/rear feeder cart specifications : Max.30 (Single stick feeder) Single tray specifications : Max.21 (Single stick feeder) Twin tray specifications : Max.15 (Single stick feeder)	
Component supply: Tray	———				Single tray specifications : Max.20 Twin tray specifications : Max.40	

Dispensing head	Dot dispensing	Draw dispensing
Dispensing speed	0.16 s/dot (Condition : XY=10 mm, Z=less than 4 mm movement, No θ rotation)	4.25 s/component (Condition: 30 mm x 30 mm corner dispensing) *9
Adhesive position accuracy (Cpk≧1)	± 75 μm/dot	± 100 μm/component
Applicable components	1608 chip to SOP,PLCC,QFP,Connector,BGA,CSP	BGA、CSP

Inspection head		2D inspection head(A)	2D inspection head(B)
Resolution		18 μm	9 μm
View size		44.4 mm × 37.2 mm	21.1 mm × 17.6 mm
Inspection processing time	Solder Inspection *10	0.35s/ View size	
	Component Inspection *10	0.5s/ View size	
Inspection object	Solder Inspection *10	Chip component : 100 μm × 150 μm or more (0603 or more) Package component : φ150 μm or more	Chip component : 80 μm × 120 μm or more (0402 or more) Package component : φ120 μm or more
	Component Inspection *10	Square chip (0603 or more), SOP, QFP (a pitch of 0.4 mm or more), CSP, BGA,Aluminum electrolysis capacitor, Volume, Trimmer, Coil, Connector *11	Square chip (0402 or more), SOP, QFP (a pitch of 0.3 mm or more), CSP, BGA,Aluminum electrolysis capacitor, Volume, Trimmer, Coil, Connector *11
Inspection items	Solder Inspection *10	Oozing, blur, misalignment, abnormal shape, bridging	
	Component Inspection *10	Missing, shift, flipping, polarity, foreign object inspection *12	
Inspection position accuracy (Cpk≧1) *13		± 20 μm	± 10 μm
No. of inspection	Solder Inspection *10	Max. 30 000 pcs./machine (No. of components : Max. 10 000 pcs./machine)	
	Component Inspection *10	Max. 10 000 pcs./machine	

*Placement tact time,inspection time and accuracy values may differ slightly depending on conditions
*Please refer to the specification booklet for details.
*1 : Please consult us separately should you connect it to NPM-D3/D2/D. It cannot be connected to NPM-TT and NPM.
*2 : Only for main body
*3 : 1 880 mm in width if extension conveyors (300 mm) are placed on both sides.
*4 : Dimension D including tray feeder : 2 570 mm
Dimension D including feeder cart : 2 465 mm
*5 : Excluding the monitor, signal tower and ceiling fan cover.
*6 : ±25 μm placement support option. (Under conditions specified by Panasonic)
*7 : The 03015/0402 chip requires a specific nozzle/feeder.
*8 : Support for 03015 mm chip placement is optional.
(Under conditions specified by Panasonic : Placement accuracy ±30 μm / chip)
* 9 : A PCB height measurement time of 0.5s is included.
*10 : One head cannot handle solder inspection and component inspection at the same time.
*11 : Please refer to the specification booklet for details.
*12 : Foreign object is available to chip components. (Excluding 03015 mm chip)
*13 : This is the solder inspection position accuracy measured by our reference using our glass PCB for plane calibration. It may be affected by sudden change of ambient temperature.

⚠ 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.

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ISO 14001 Panasonic Group builds Environmental Management System in the factories of the world and acquires the International Environmental Standard ISO 14001.

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