Our Solutions, Your Value

Model ID		NPM-W2					
Front head	Rear head	Lightweight 16-nozzle head	12-nozzle head	8-nozzle head	3-nozzle head	Dispensing head	No head
Lightweight 16-nozzle head		NM-EJM7D				NM-EJM7D-MD	NM-EJM7D
12-nozzle head							
8-nozzle head							
3-nozzle head							
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	Single transfer	L 50 mm × W 50 mm ~ L 750 mm × W 510 mm	Dual transfer	L 50 mm × W 50 mm ~ L 750 mm × W 260 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 (With Dual Heads)		12-nozzle head (With Dual Heads)		8-nozzle head (With Dual Heads)	3-nozzle head (With Dual Heads)
		High production mode[ON]	High production mode[OFF]	High production mode[ON]	High production mode[OFF]		
Placement speed	Max. speed	77 000cph (0.047 s/ chip)	70 000cph (0.051 s/ chip)	64 500cph (0.056 s/ chip)	62 500cph (0.058 s/ chip)	40 000cph (0.090 s/ chip)	16 000cph (0.225 s/ chip) / 12 500cph (0.288 s/ QFP)
	IPC9850 (1608)	59 200cph *6	56 000cph *6	49 500cph *6	48 000cph *6		
Placement accuracy(Cpk≧1)		±40 μm / chip	±30 μm / chip (±25 μm / chip) ※7	±40 μm / chip	±30 μm / chip	±30 μm/ chip / ±30 μm/QFP □12 m ~ □32 m / ±50 μm/QFP □12 m Under	±30 μm /QFP
Component dimensions (mm)		0402~8 chip ~ L 6 x W 6 x T 3	03015~8 chip/0402~8 chip ~ L 6 x W 6 x T 3	0402~8 chip ~ L 12 x W 12 x T 6.5		0402~8 chip ~ L 32 x W 32 x T 12	(0201*)0603 chip to L 150 x W 25 (diagonal152) x T 30

Component supply	Taping	Tape : 8 / 12 / 16 / 24 / 32 / 44 / 56 mm Max.120 8 mm tape : Max. 68 (8 mm thin type single feeder, double tape feeder, small reel)		Tape : 8 to 56 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)
	Stick	———		Front/rear feeder cart specifications : Max.14 Single tray specifications : Max.10 Twin tray specifications : Max.7
	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) *10
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 *11	0.35s/ View size	
	Component Inspection *11	0.5s/ View size	
Inspection object	Solder Inspection *11	Chip component : 100 μm × 150 μm or more (0603 / 0201* or more) Package component : φ150 μm or more	Chip component : 80 μm × 120 μm or more (0402 / 01005* or more) Package component : φ120 μm or more
	Component Inspection *11	Square chip (0603 / 0201* or more), SOP, QFP (a pitch of 0.4mm or more), CSP, BGA,Aluminum electrolysis capacitor, Volume, Trimmer, Coil, Connector *12	Square chip (0603 / 0201* or more), SOP, QFP (a pitch of 0.4mm or more), CSP, BGA,Aluminum electrolysis capacitor, Volume, Trimmer, Coil, Connector *12
Inspection items	Solder Inspection *11	Oozing, blur, misalignment, abnormal shape, bridging	
	Component Inspection *11	Missing, shift, flipping, polarity, foreign object inspection *13	
Inspection position accuracy (Cpk≧1) *14		± 20 μm	± 10 μm
No. of inspection	Solder Inspection *11	Max. 30 000 pcs./machine (No. of components : Max. 10 000 pcs./machine)	
	Component Inspection *11	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 m) are placed on both sides.

*4 : Dimension D including tray feeder : 2 570 mm Dimension D including feeder cart : 2 465 mm
*5 : Excluding monitor and signal tower
*6 : It is the reference value of the tact time by the IPC9850 conformity. (The independent mode)
*7 : ±25 μm placement support option. (Under conditions specified by PFSC)
*8 : The 03015/0402 chip requires a specific nozzle/feeder.
*9 : Support for 03015 mm chip placement is optional. (Under conditions specified by PSFC : Placement accuracy ±30 μm / chip)

*10 : A PCB height measurement time of 0.5s is included.
*11 : One head cannot handle solder inspection and component inspection at the same time.
*12 : Please refer to the specification booklet for details.
*13 : Foreign object is available to chip components. (Excluding 03015 mm chip)
*14 : 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.

● Changes in specifications and appearance may be made without notice for product improvement. ● Recycled paper is used this Catalog.
● Homepage http://www.panasonic.com/jp/company/pfsc/en.html

Panasonic

2015

Panasonic

Electronics Assembly System catalog
PRODUCTION MODULAR

NPM
NEXT PRODUCTION MODULAR

Manufacturing Process Innovation

Model Name **NPM-W2**

Model No.NM-EJM7D
Model No.NM-EJM7D-MD   *Model No.NM-EJM7D-D*
Model No.NM-EJM7D-MA   *Model No.NM-EJM7D-A*
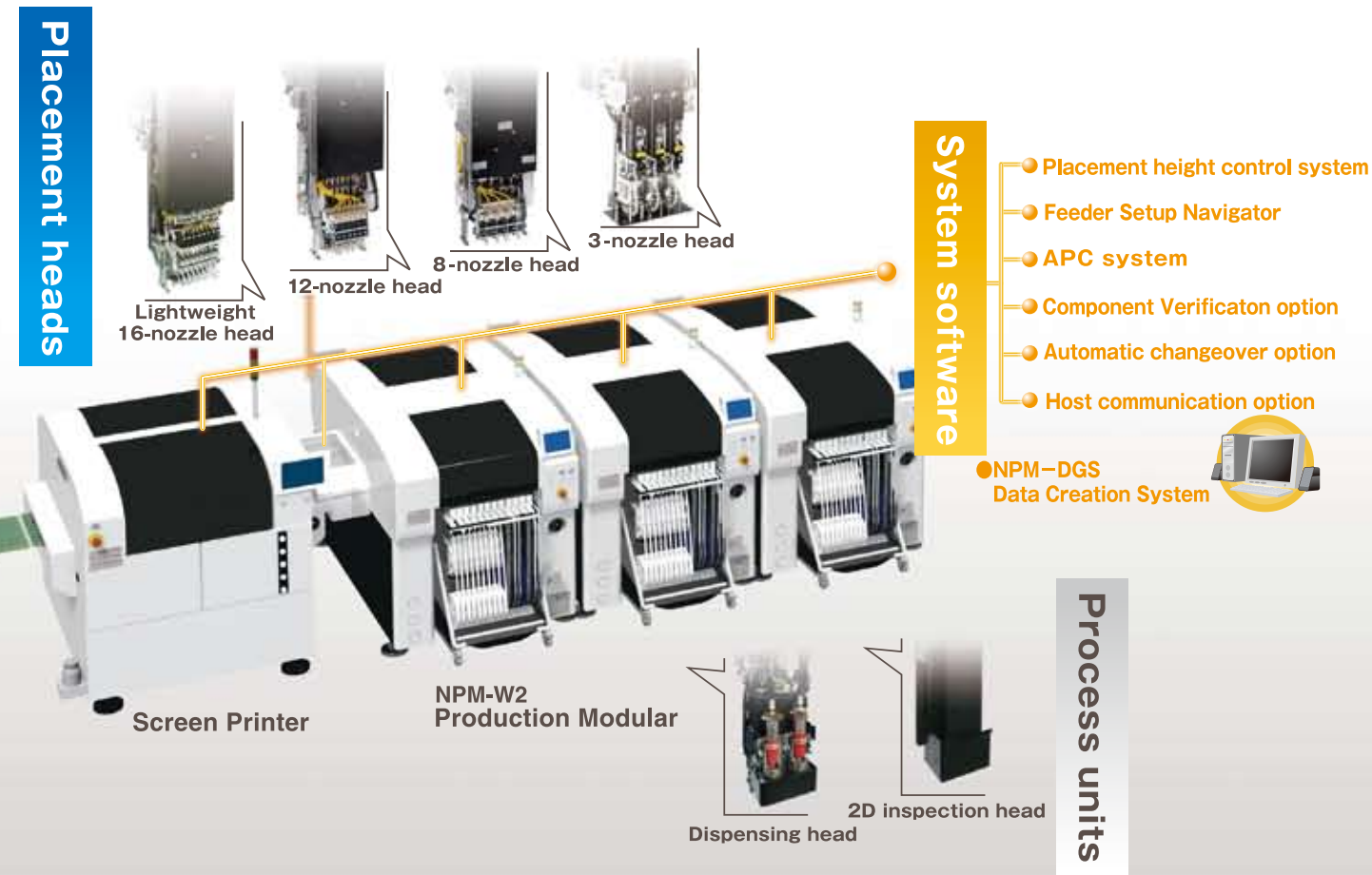
*Photograph is NM-EJM7D

CE

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

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

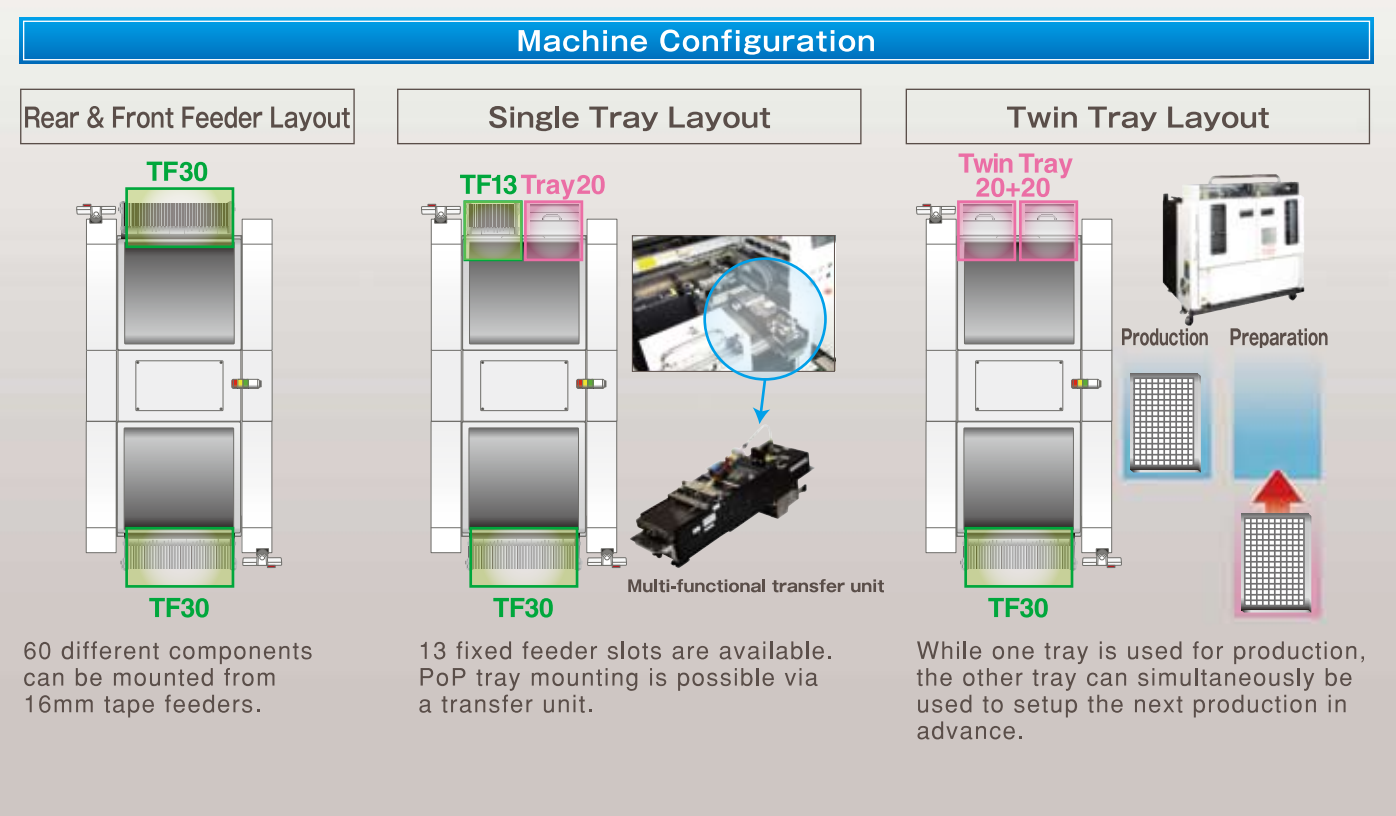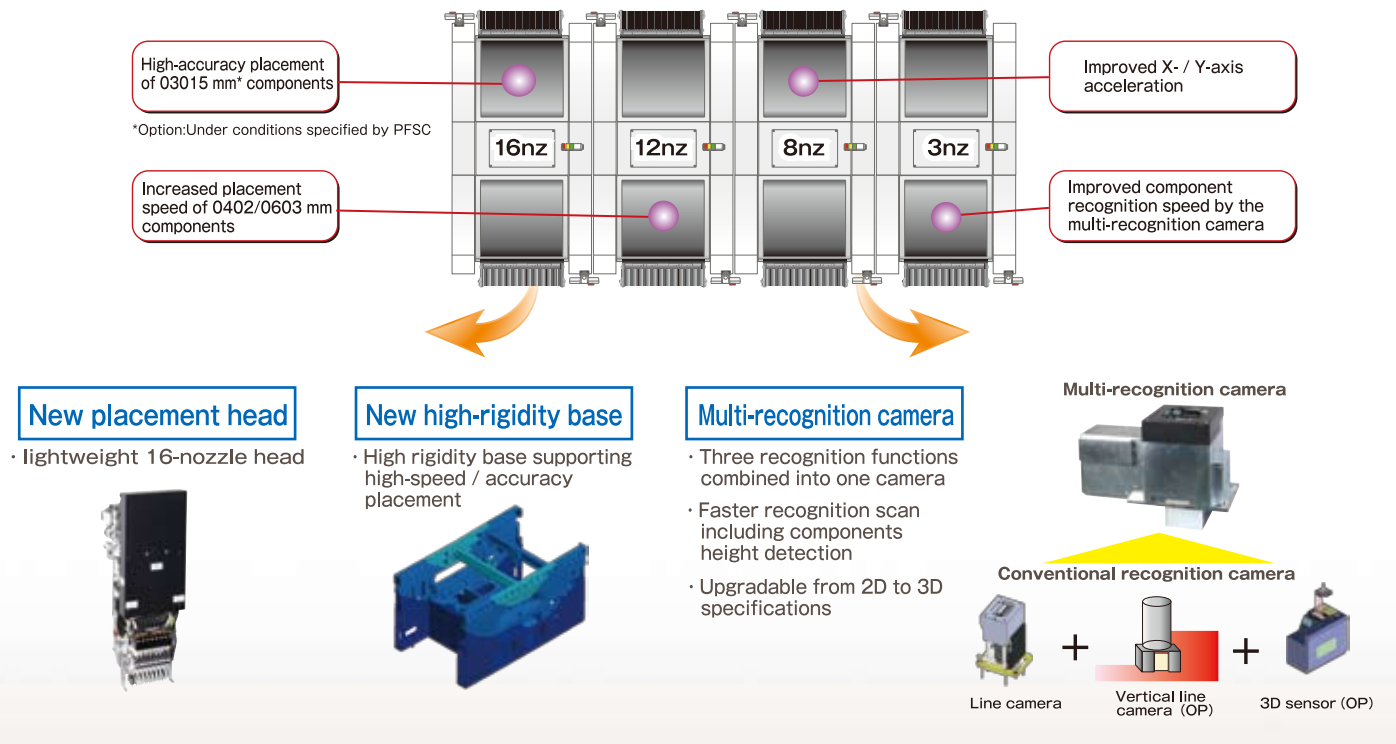Depending on the PCB you produce, you can select High-speed mode or High-accuracy mode.

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

- Lightweight 16-nozzle head
- 12-nozzle head
- 8-nozzle head
- 3-nozzle head

System software

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

● NPM－DGS Data Creation System

Process units

- Screen Printer
- NPM-W2 Production Modular
- Dispensing head
- 2D inspection head

Supply units

- Feeder cart (30 inputs)
- Single Tray feeder (20 Component types)
- Twin Tray feeder (40 Component types)
- 8mm thin type single tape feeder
- deeper-flute feeder (Boss depth Max 26mm) Tape width : 24,32,44,56mm

*required feeder cart modification in case of boss depth over 21mm

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Features

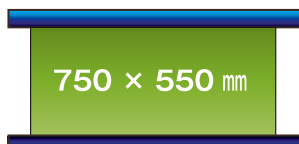Simultaneous realization of high area productivity and high-accuracy placement

◆ **High production mode :** **10 % increase in productivity / equal placement accuracy** (as compared to NPM-W)
(High production mode: ON) Max. speed: 77 000 cph / Placement accuracy: ±40 μm (Cpk ≧ 1)

◆ **High accuracy mode :** **25% increase in placement accuracy / eequal productivity** (as compared to NPM-W)
(High production mode : OFF) Max. speed: 70 000 cph / Placement accuracy: ±30 μm

- High-accuracy placement of 03015 mm* components
  *Option:Under conditions specified by PFSC
- Increased placement speed of 0402/0603 mm components

16nz   12nz   8nz   3nz

- Improved X- / Y-axis acceleration
- Improved component recognition speed by the multi-recognition camera

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

Multi-recognition camera

Conventional recognition camera

Line camera + Vertical line camera (OP) + 3D sensor (OP)

Machine Configuration

Rear & Front Feeder Layout	Single Tray Layout	Twin Tray Layout
TF30	TF13 Tray20	Twin Tray 20+20
		Production Preparation
TF30	TF30 Multi-functional transfer unit	TF30
60 different components can be mounted from 16mm tape feeders.	13 fixed feeder slots are available. PoP tray mounting is possible via a transfer unit.	While one tray is used for production, the other tray can simultaneously be used to setup the next production in advance.

Multi-functionality

Large Board

Single-lane specifications(Selection spec.)

750 × 550 mm

Large Board up to 750 × 550 mm can be handled

Dual-lane specifications(Selection spec.)
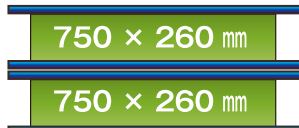
750 × 260 mm
750 × 260 mm

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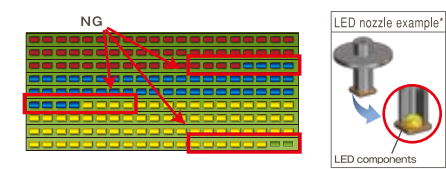Boards(up to a size of 750 × 510 mm)can be handled collectively during single transfer.

Large Components

Compatible to component sizes up to 150 × 25 mm

0603
~120×90 mm
~150×25 mm
(Opposing Corners152 mm)

Multi-FunctionalHead
(3 Nozzle Head)

Component height (mm)
30
12
6.5
3

3 Nozzle Head
Connector   Flip chip
Force Control : 0.5N~50N

8 Nozzle Head

12 Nozzle Head
Transistor
Diode
3216
16 Nozzle Head
1608/2012
1005
0402/0603
03015

ALC
QFP
CSP   BGA-T
SO
HIC
Connector
MTCP
Connector
Connector
Connector

0   □6   □12   □32   120×90 150×25
Component Size (mm)

LED Placement

Brightness Binning

NG

LED nozzle example*

LED components

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.
· A l t e r n a t e :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.

Alternate	Independent	Hybrid Placement
		Independent Alternate
Advantage : –No PCB transfer loss	Advantage : –High productivity –Independent changeover	Advantage : –High speed placement of chip components –Mid- & large-sized components shared
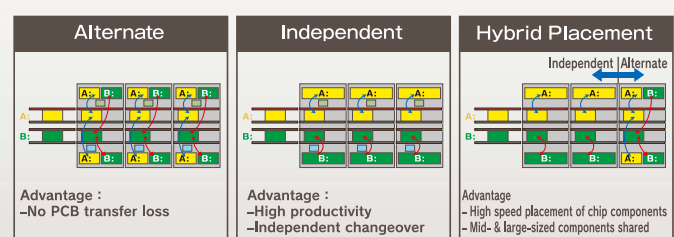
Independent changeover

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.

Production A:
Changeover

A: A: A:
B: B: B:
C: C: C:

Feeder cart exchange during the production(Option)
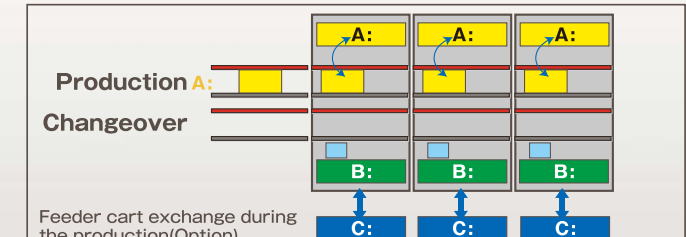
PCB exchange time reduction

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.

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).

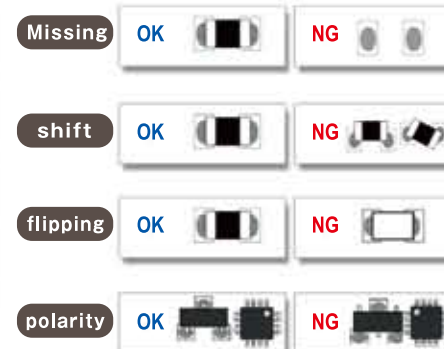## Solder Inspection (SPI)·Component Inspection(AOI) / Inspection head
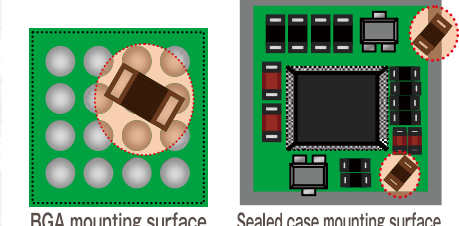
Solder Inspection

· Solder appearance inspection

Oozing	OK	NG
blur	OK	NG
misalignment	OK	NG
abnormal shape	OK	NG
bridging	OK	NG

Mounted component Inspection

· Appearance inspection of mounted components

Missing	OK	NG
shift	OK	NG
flipping	OK	NG
polarity	OK	NG

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.

SPI   AOI
SPI   AOI
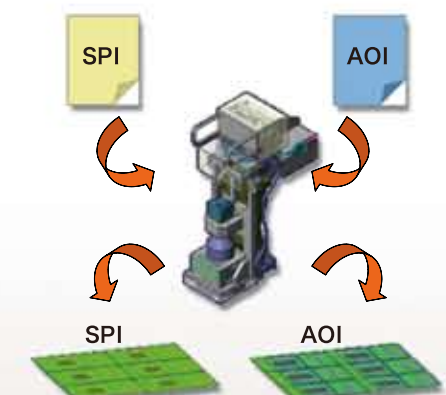
Unification of inspection and placement data

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

DB
Solder inspection data
Placement data
Component inspection data
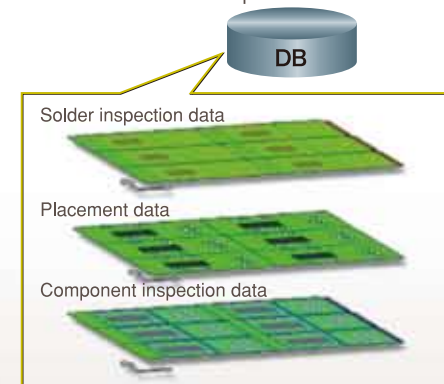
Automatic link to quality information

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

SPI   Mount   AOI
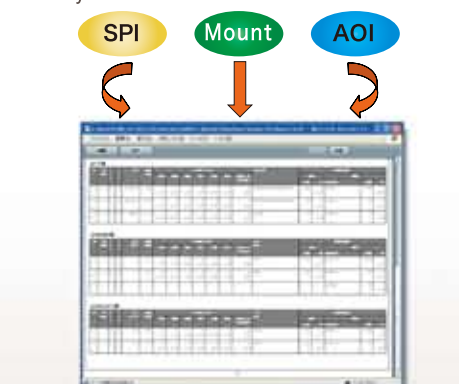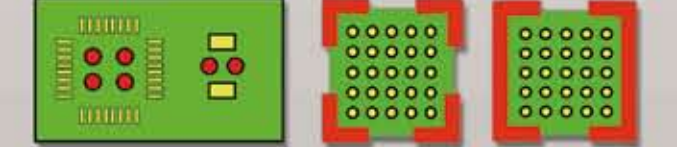

Adhesive Dispensing / Dispensing head

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*

①   ②   ③Corner adhesive
BGA,CSP

* Pre-demonstration is required.
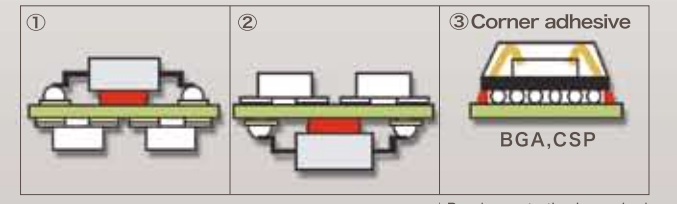
**Supports various dot/drawing dispensing patterns**

· 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.

Temp
1st Melting of solder
183℃
2st Curing of adhesive
Time
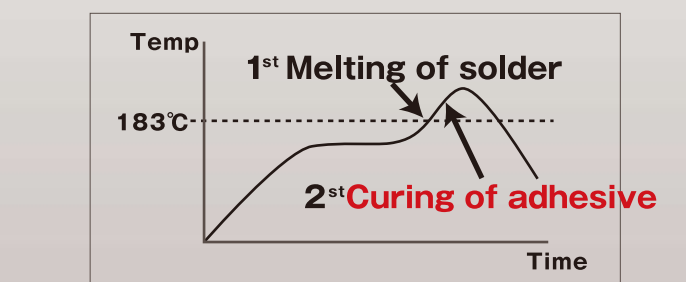
After the solder melts, self-alignment and component sinking occurs.
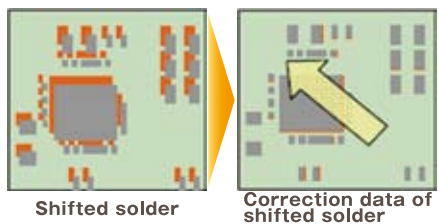
Reflow
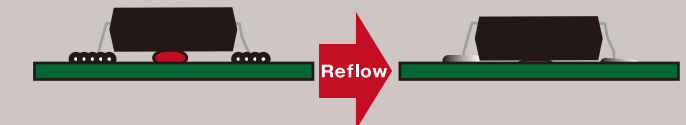
High-quality mounting / APC system*
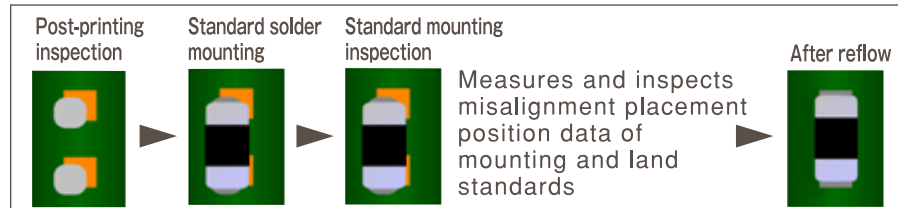
Feedback to the printing machine
・Based on the analyzed measurement data from solder inspections, it corrects printing positions.（X,Y,θ）

Shifted solder | Correction data of shifted solder

*3D inspection equipment of another company can be also connected. Please inquire with your sales representative for more details.

Feedforward to mounting heads
・Solder position measurement and feedforward Chip components(0402C/R 〜) Package component (QFP, BGA, CSP)

Post-printing inspection | Standard solder mounting | Standard mounting inspection | After reflow

Measures and inspects misalignment placement position data of mounting and land standards
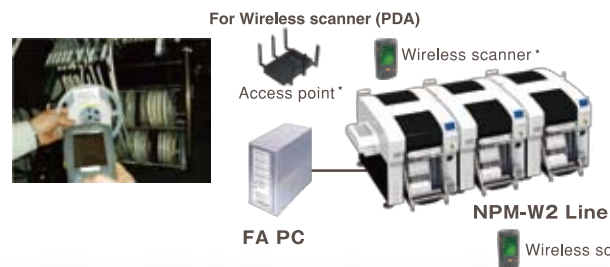
Feedforward to AOI
・Position inspection on APC offset position

Component Verification option

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

●Component setup error prevention
Prevents setup errors through verifying the NPM-W2 downloaded production data and component barcode data
●Array data activesync function
There's no need to select array data; data is verified with the NPM-W2
●Interlock function
Equipment stops when it has an incorrect and/or incomplete verification
●Navigation function
Clearly provide a verification task with data display and Intelligent feeder performance in sync
●Scanner selection
Users can choose either a wired or wireless scanner (PDA)

For Wireless scanner (PDA)

Wireless scanner *
Access point *
NPM-W2 Line
FA PC
Wireless scanner *

*Please prepare a wireless scanner and related accessories by yourself

High productivity / 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

NPM-DGS | FA PC | NPM-W2 Line

External scanner | Head Camera | Planning form
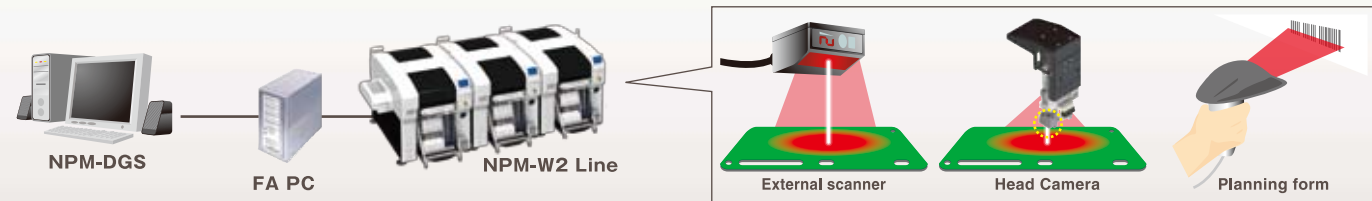
Off-line setup support station

With the support stations, offline feeder cart setup is possible anywhere 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.

Feeder Setup Navigator

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 Decision making support for production sequence
・Estimate production time

② 3 Guidance 「set」「out」「move」

| No	作業	照合	部品名	現状	⇒	次
1	外し	ー	1005Parts-A	1-10L	⇒	Reuse
2	外し	ー	1005Parts-A	2-12L	⇒	Reuse
3	外し	ー	1005Parts-A	2-12R	⇒	Reuse
4	付け	ー	1005Parts-B	新規	⇒	1-10L
5	付け	ー	1005Parts-C	新規	⇒	1-9L
6	付け	ー	1005Parts-C	新規	⇒	1-9R
7	付け	ー	SingleParts-C	新規	⇒	1-24S
8	付け	ー	1005Parts-B	新規	⇒	2-12L
9	付け	ー	1005Parts-B	新規	⇒	2-12R

③ Change-over process
・Follow the instructions
・Efficient change-over

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.

NPM-DGS*1.2
Library database

PT200*1

FA PC *3 | FA PC *3

CM Line | NPM-W2 Line | NPM-W2 Line
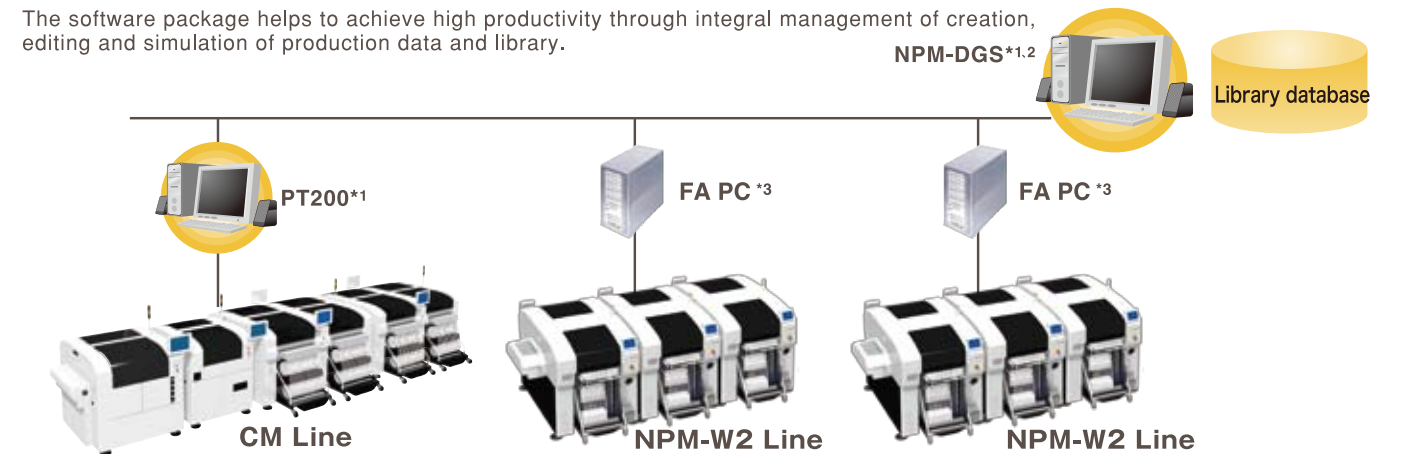
*1：A computer must be purchased separately.
*2：NPM-DGS has two management functions of floor and line level.
*3：LNB (Line Network Box) used to connect the machine to NPM-DGS will be installed in FA PC

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.
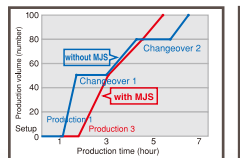
PPD／LWS Editor
With quickly and easily compiling placement and inspection head data on the PC display during operation, time loss can be minimized
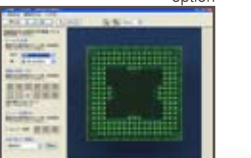
Component library
A component library of all placement machines including the CM series on floor can be registered to unify data management.

Mix Job Setter（MJS）
Production data optimization allows the NPM-D 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.

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 for NPM-W2.
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

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

Quality information viewer * | FA PC | NPM-W2 Line

*PC is required for every line. It cannot be shared with the NPM-DGS.

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.

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) | FA PC | NPM-W2 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