| Model ID | | NPM-W2 | | | | | |
|---|---|---|---|---|---|---|---|
| Front head \ Rear head | | Lightweight 16-nozzle head V3A | 12-nozzle head | Lightweight 8-nozzle head | 3-nozzle head V2 | Dispensing head | No head |
| Lightweight 16-nozzle head V3A | | 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 × W50 mm to L 750 mm × W 550 mm | 2-positin mounting | L 50 mm × W50 mm to L 350 mm × W 550 mm |
| | Dual-lane *1 | Dual transfer ( Batch ) | L 50 mm × W50 mm to L 750 mm × W 260 mm | Dual transfer ( 2-positin ) | L 50 mm × W50 mm to L 350 mm × W 260 mm |
| | | Single transfer ( Batch ) | L 50 mm × W50 mm to L 750 mm × W 510 mm | Single transfer ( 2-positin ) | L 50 mm × W50 mm to 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 *3 | | W 1 280 mm × D 2 465 mm × H 1 444 mm *4 / W 1 280 mm × D 2 323 mm × H 1 444 mm *5 | | | |
| Mass | | 2 850 kg *4 / 2 780 kg *5 | | | |

| Placement head | Lightweight 16-nozzle head V3A ( 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 ] | | |
| Placement speed *at optimum conditions | 42 000 cph ( 0.086 s / chip ) | 35 000 cph ( 0.103 s / chip ) | 32 250 cph ( 0.112 s / chip ) | 31 250 cph ( 0.115 s / chip ) | 20 800 cph ( 0.173 s / chip ) | 8 320 cph ( 0.433 s / chip )<br>6 500 cph ( 0.554 s / QFP ) |
| Placement accuracy ( Cpk≧1 ) *at optimum conditions | ± 40 μm / chip | ± 30 μm / chip<br>( ± 25 μm / chip *6 ) | ± 40 μm / chip | ± 30 μm / chip | ± 30 μm / chip<br>± 30 μm / QFP *7 | ± 30 μm / QFP |
| Component dimensions ( m ) | 0402 *8 chip<br>to L 8.5 × W 8.5 × T 3 / T 6 *10 | 03015 *8 *9 / 0402 *8 chip<br>to L 8.5 × W 8.5 × T 3 / T 6 *10 | 0402 *8 chip to L 12 × W 12 × T 6.5 | | 0402 *8 chip<br>to L 45 × W 45 × T 12 or<br>L 100 × W 40 × T 12 | 0603 chip<br>to L 120 × W 90 × T 30 / T 40 *11<br>or L 150 × W 25 × T 30 / T 40 *11<br>or L 135 × W 135 × T 13 *12 |
| Component supply — Taping | Tape : 4 / 8 / 12 / 16 / 24 / 32 / 44 / 56 mm<br>Max.120 ( 4 , 8 mm tape ) | | | | Tape : 4 to 56 / 72 mm | Tape : 4 to 56 / 72 / 88 / 104 mm |
| Component supply — Stick | —— | | | | Max.30 ( Single stick feeder ) | |
| Component supply — Tray | —— | | | | Max.40 ( Twin tray feeder ) | |

| Dispensing head | Dot dispensing | Draw dispensing |
|---|---|---|
| Dispensing speed *13 | 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 ) *14 |
| Adhesive position accuracy ( Cpk≧1 ) *13 | ± 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 *15 | Solder Inspection *16 | 0.35 s / View size | |
| | Component Inspection *16 | 0.5 s / View size | |
| Inspection object | Solder Inspection *16 | Chip component : 100 μm × 150 μm or more ( 0603 or more )<br>Package component : φ150 μm or more | Chip component : 80 μm × 120 μm or more ( 0402 or more )<br>Package component : φ120 μm or more |
| | Component Inspection *16 | Square chip ( 0603 or more ) , SOP , QFP ( a pitch of 0.4 mm or more ) ,<br>CSP , BGA , Aluminum electrolysis capacitor , Volume , Trimmer , Coil , Connector *17 | Square chip ( 0402 or more ) , SOP , QFP ( a pitch of 0.3 mm or more ) ,<br>CSP , BGA , Aluminum electrolysis capacitor , Volume , Trimmer , Coil , Connector *17 |
| Inspection items | Solder Inspection *16 | Oozing , blur , misalignment , abnormal shape, bridging | |
| | Component Inspection *16 | Missing , shift , flipping , polarity , foreign object inspection *18 | |
| Inspection position accuracy ( Cpk≧1 ) *19 * at optimum conditions | | ± 20 μm | ± 10 μm |
| No. of inspection | Solder Inspection *16 | Max. 30 000 pcs. / machine ( No. of components : Max. 10 000 pcs. / machine ) | |
| | Component Inspection *16 | Max. 10 000 pcs. / machine | |

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 : Excluding the monitor, signal tower and ceiling fan cover
*4 : Machine dimensions and mass for standard configuration ( NPM-W2 and ITF*20 cart ( 30-slot ) x 2 ). They differ depending on the optional configuration.
*5 : Dimensions and mass of the machine and two ASF*21 carts ( 60-slot ). They differ depending on the optional configuration.
*6 : ± 25 μm placement support option. ( Under conditions specified by Panasonic )
*7 : The placement angle recognition setting needs to be enabled.
*8 : The 03015 / 0402 chip requires a specific nozzle / feeder.
*9 : Support for 03015 mm chip placement is optional. ( Under conditions specified by Panasonic : Placement accuracy ± 30 μm / chip )
*10 : T 6 needs dedicated short nozzles and is □6.5 mm or less.
*11 : T 40 is option. ( PCB thickness + Max component height ≦ T48; so, for T40, the max PCB thickness is 8.0 mm )
*12 : □135 mm is option.
*13 : The values such as tact time and accuracy are varied depending on conditions ( e.g. adhesive ) .
*14 : A PCB height measurement time of 0.5 seconds is included.
*15 : The inspection process time differs depending on inspection.
*16 : One head cannot handle solder inspection and component inspection at the same time.
*17 : Please refer to the specification booklet for details.
*18 : Foreign object is available to chip components. ( Excluding 03015 mm chip )
*19 : 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.
*20 : Intelligent Tape Feeder
*21 : Auto Setting Feeder

## ⚠ Safety Cautions

●Please read the User's Manual carefully to familiarize yourself with safe and effective usage procedures.
●To ensure safety when using this equipment, all work should be performed according to that as stated in the supplied Operating Instructions. Read your operating instruction manual thoroughly.

**Panasonic Group products are built with the environment in mind.** For details here Panasonic GREEN IMPACT

Inquiries…

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561-0854, Japan

**All data as of May 31, 2024**

Ver.May 31, 2024



●Changes in specifications and appearance may be made without notice for product improvement.
●Please contact us via our website at **https://industrial.panasonic.com/ww/r/fw**

Panasonic CONNECT

2024

# Electronics Assembly System

Production Modular
**Catalogue**

Model ID
# NPM-W2

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

NPM NEXT PRODUCTION MODULAR

***Photograph is NM-EJM7D**

CE

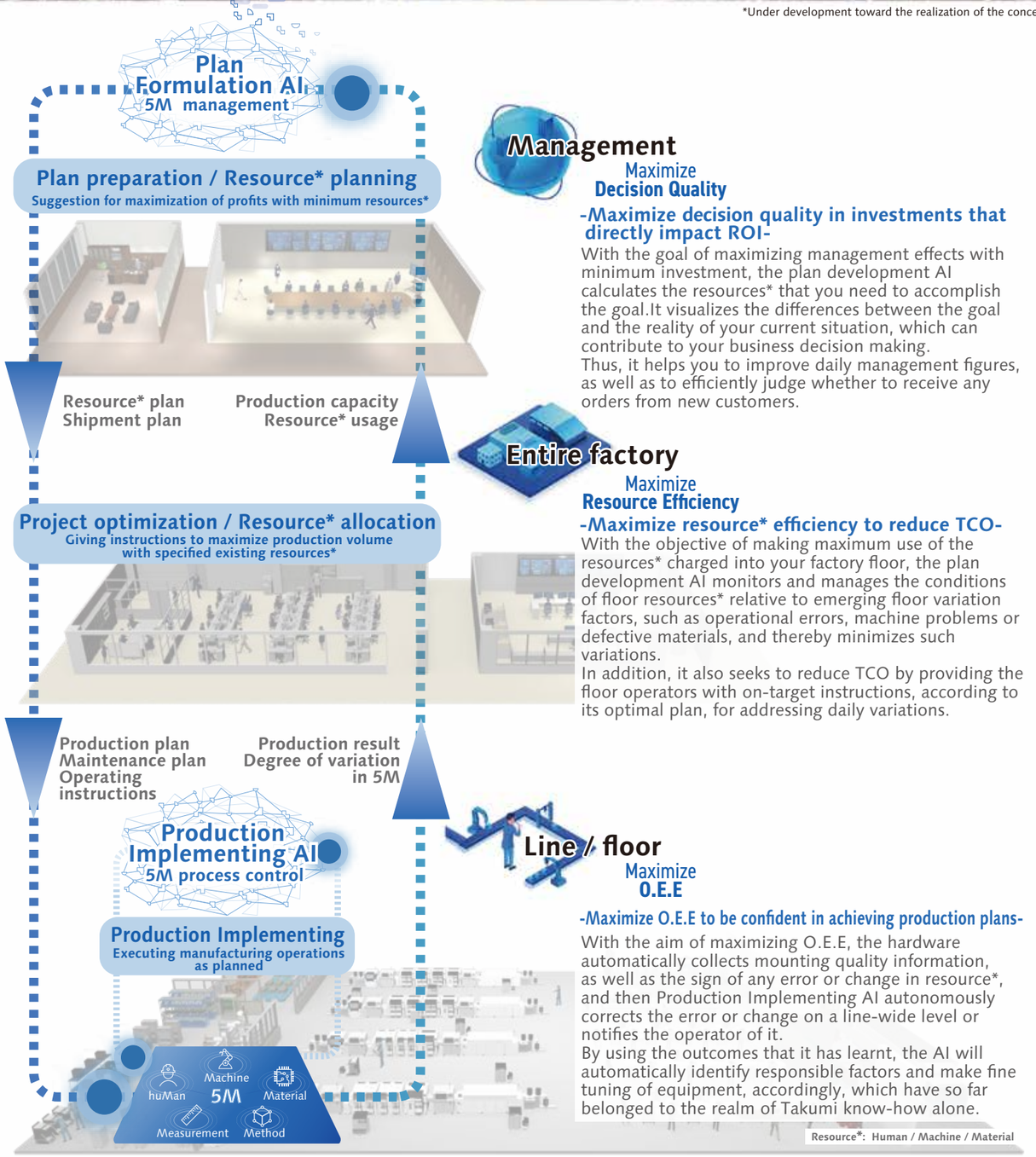
*It may not conform to Machinery Directive and EMC Directive in case of optional configuration and custom-made specification.

# "Autonomous Factory" Concept *

A factory that immediately responds to every situation and continues to evolve autonomously

Ensuring the production of non-defective items through the integrated control of autonomous uninterrupted mounting lines and floors independent of any human intervention and judgment


*Under development toward the realization of the concept




## Management

Maximize
**Decision Quality**

**-Maximize decision quality in investments that directly impact ROI-**

With the goal of maximizing management effects with minimum investment, the plan development AI calculates the resources* that you need to accomplish the goal.It visualizes the differences between the goal and the reality of your current situation, which can contribute to your business decision making.
Thus, it helps you to improve daily management figures, as well as to efficiently judge whether to receive any orders from new customers.

## Entire factory

Maximize
**Resource Efficiency**

**-Maximize resource* efficiency to reduce TCO-**

With the objective of making maximum use of the resources* charged into your factory floor, the plan development AI monitors and manages the conditions of floor resources* relative to emerging floor variation factors, such as operational errors, machine problems or defective materials, and thereby minimizes such variations.
In addition, it also seeks to reduce TCO by providing the floor operators with on-target instructions, according to its optimal plan, for addressing daily variations.

## Line / floor

Maximize
**O.E.E**

**-Maximize O.E.E to be confident in achieving production plans-**

With the aim of maximizing O.E.E, the hardware automatically collects mounting quality information, as well as the sign of any error or change in resource*, and then Production Implementing AI autonomously corrects the error or change on a line-wide level or notifies the operator of it.
By using the outcomes that it has learnt, the AI will automatically identify responsible factors and make fine tuning of equipment, accordingly, which have so far belonged to the realm of Takumi know-how alone.

Resource*: Human / Machine / Material

NPM NEXT PRODUCTION MODULAR

# System evolution according to mounting changes Production Modular

## 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.

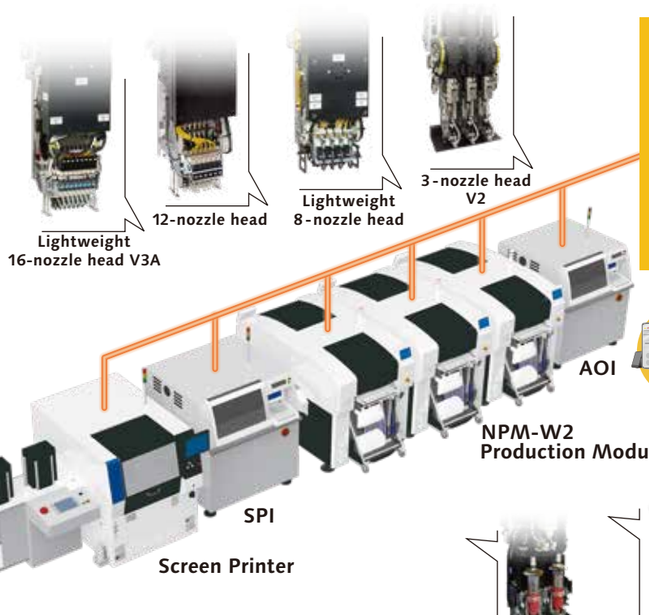
## 2 For larger boards and larger components

PCBs up to a size of 750 × 550 mm with component range up to L 150 × W 25 × T 30 mm
The range of available components can be further broadened optionally.

## 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**

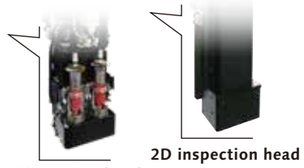



**System software**

- APC system
- LCR checker option
- Component Verification option
- Automatic changeover option
- Feeder Setup Navigator option
- Parts Supply Navigator option
- PCB information communication function
- Offline Camera option
- DGS Automation option
- Optimization of setup option

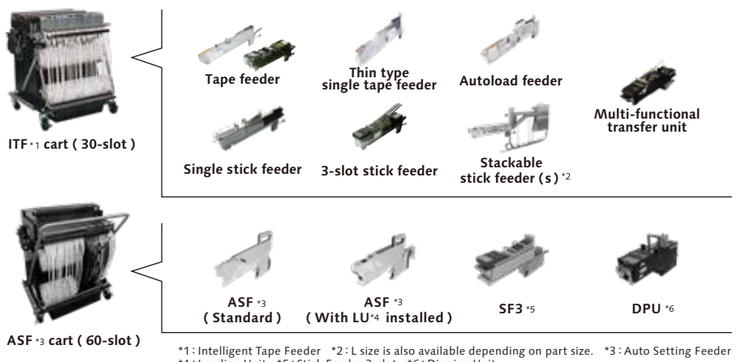
●NPM–DGS Data Creation System

**Process units**




*For details of the process unit, refer to the specification booklet.

**Supply units**




*1 : Intelligent Tape Feeder *2 : L size is also available depending on part size. *3 : Auto Setting Feeder
*4 : Loading Unit *5 : Stick Feeder 3-slot *6 : Dipping Unit

# Highly-versatile head & wide platform
# Placement Heads

## Features

### Simultaneous realization of high area productivity and high-accuracy placement

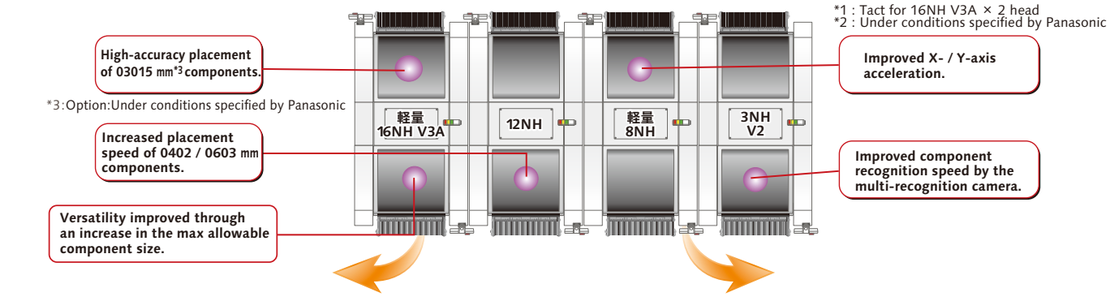
◆**High production mode** ( High production mode : ON )

**Max. speed : 84 000 cph***1 **( IPC9850 ( 1608 ) : 61 200 cph** *1 **) / Placement accuracy : ±40 µm**

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

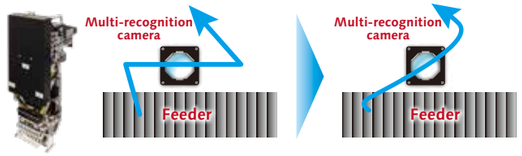
**Max. speed : 70 000 cph** *1 **/ Placement accuracy : ±30 µm ( Option : ±25 µm***2 **)**

*1 : Tact for 16NH V3A × 2 head
*2 : Under conditions specified by Panasonic



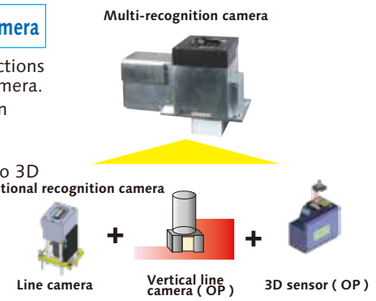

### Lightweight 16NH V3A

The introduction of lightweight 16NH V3A allows the X- and Y-axes to be driven simultaneously during parts recognition , thus improving placement takt through optimal routing.



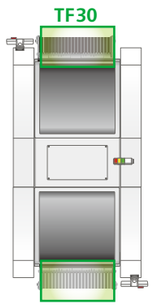

### Multi-recognition camera

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



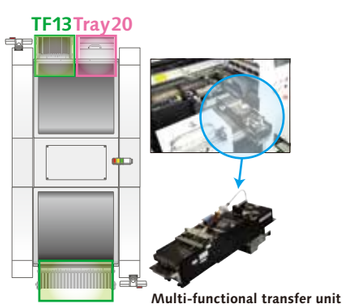

## Machine Configuration

### Rear & Front Feeder Layout



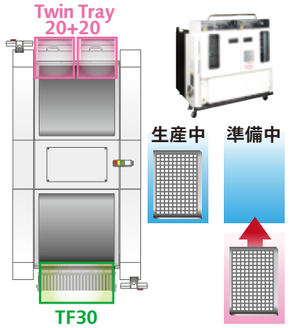

60 different components can be mounted from 16 mm tape feeders.

### 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

**IFMU***1 **( For ITF***2 **)**

**FMU ( For ASF***3 **)**

**Feeder maintenance unit**

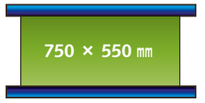
**Head maintenance unit**

*1 : 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".
*2 : Intelligent Tape Feeder *3 Auto Setting Feeder

## Versatility

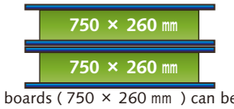
### Large Board

**Single-lane specifications** ( Selection spec. )




Large Board up to 750 × 550 mm can be handled.

**Dual-lane specifications** ( Selection spec. )



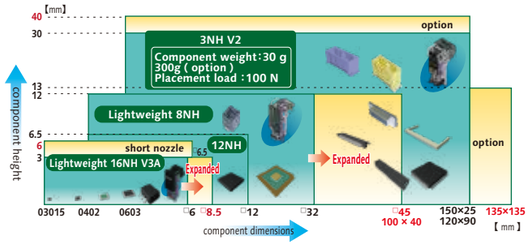

Large boards ( 750 × 260 mm ) can be handled collectively.
Boards ( up to a size of 750 × 510 mm ) can be handled collectively during single transfer.

### Large Components

**Compatible to component sizes up to 135 × 135 mm. ( option )**

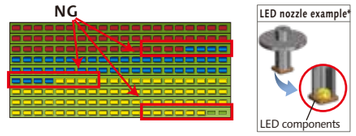
**Max. placement load 100 N**

**Multi-FunctionalHead ( 3 Nozzle Head V2 )**




## 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

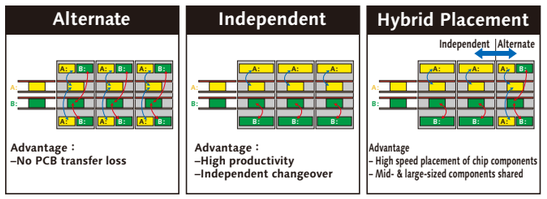
- Global bad mark recognition function
  Reduces in travel / recognition time to recognize bad marks.
- PCB standby between machines
  ( with the extension conveyor attached )
  Minimizes the PCB ( 750 mm ) change time.

## High productivity

### Alternate,Independent & Hybrid Placement

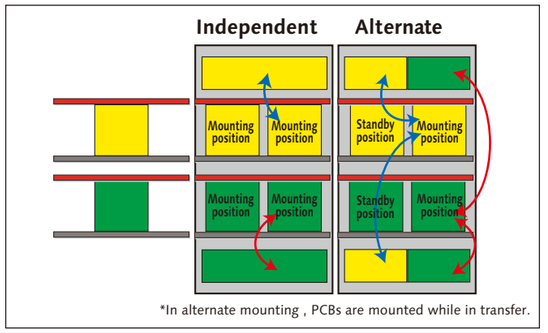
Selectable "Alternate" and "Independent" dual placement method allows you to make good use of each advantage.

- 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.




### 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.

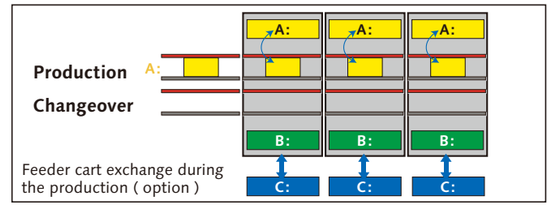



*In alternate mounting , PCBs are mounted while in transfer.

## Employs dual mounting method

### 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.




### 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.

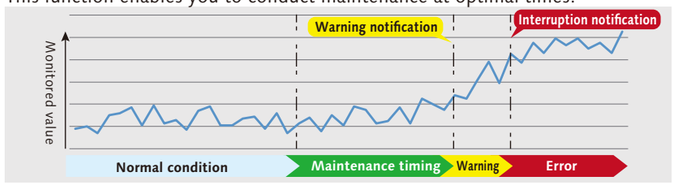
*Feeders will require off-line data input by support station ( option ) .

# Total management by system software
# System Software

## High-quality placement　APC system

### APC-5M: Real-time unit monitoring

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

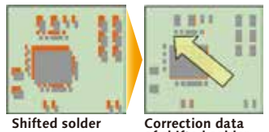



●Judgment status
Unmeasured
Normal condition
Semi-normal
Warning
Error

●Target unit
Head: Filter clogging
Nozzle holder sliding
Nozzle: Nozzle clogging
Nozzle tip condition
Feeder: Feed accuracy

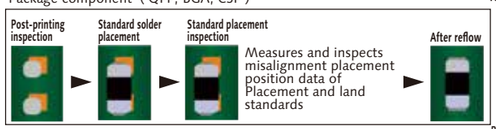
### APC-FB *1
**Feedback to the printing machine**

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




### APC-FF *1
**Feedforward to the placement machine**

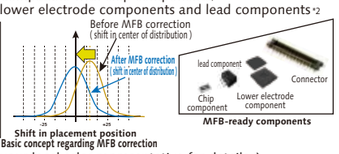
・It analyzes solder position measurement data , and corrects component placement positions ( X , Y , θ ) accordingly.
Chip components ( 0402C / R ～ )
Package component ( QFP, BGA, CSP )




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

・Inspects part location based on APC offset correction position.

・The system analyzes AOI component position measurement data , corrects placement position ( X , Y , θ ) , and thereby maintains placement accuracy.
Compatible with chip components, lower electrode components and lead components *2




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

## Misplacement prevention

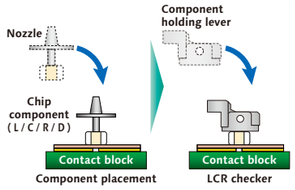
### Component Verification option

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

Prevents misplacement by verifying production data with the barcode information on changeover components. Because the machine makes verification, you do not need to select target data, separately. If wrong component is set, or verification has yet to be mad, the machine is brought to a stop.

*Wireless scanners and other accessories to be provided by customer.

### LCR checker



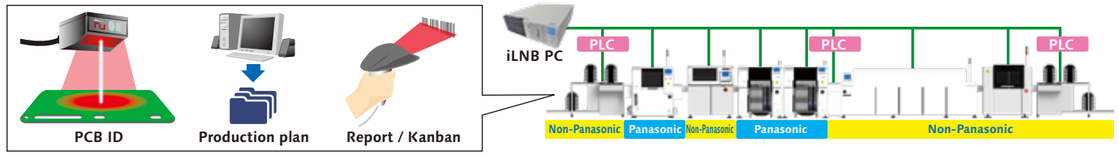

An LCR check is performed on mounted components at the start of production, or during component supply or product changeover.
It helps detect wrong reels loaded and defective components.
In addition, because verified data is output to a file on LNB ( FA PC ) , the data can also be used for trace management.

| | |
|---|---|
| Component size | 0402 ～ □6 mm |
| Component | Resistance , Capacitor , Inductor, Diode |

## Changeover ability　Automatic changeover option

All machines, including NPM, in SMT line are connected via iLNB, which allows automatic changeovers to be performed sequentially, starting from the first machine in the line.

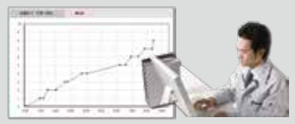
●**Trigger for changeover**
**You can select from among the following three methods: PCB ID reading using an external scanner, Production plan, and Report / Kanban reading.**




## Feeder setup navigator option

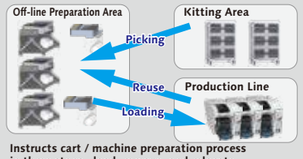
It is a support tool to navigate efficient setup procedure. The tool factors in the amount of time it takes to perform and complete setup operations when estimating the time required for production and providing the operator with setup instructions.
This will visualize and streamline setup operations 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.

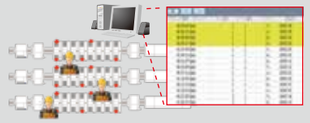
## Operating rate improvement　Parts supply navigator option

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**

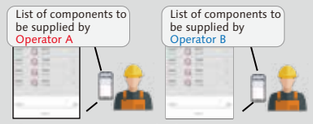
Considers the time left until component run-out and efficient path of operator movement to send supply priority instructions.

**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.

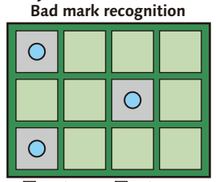
*PanaCIM is required to have operators in charge of supplying components to multiple production lines.

## 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.
The machine can also obtain bad mark information from its upstream third-party machine as well. ( option )

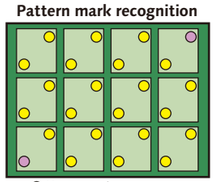
**[ Subject for communication ]**

**Bad mark recognition**




Bad mark is scanned at the first machine.

**Pattern mark recognition**

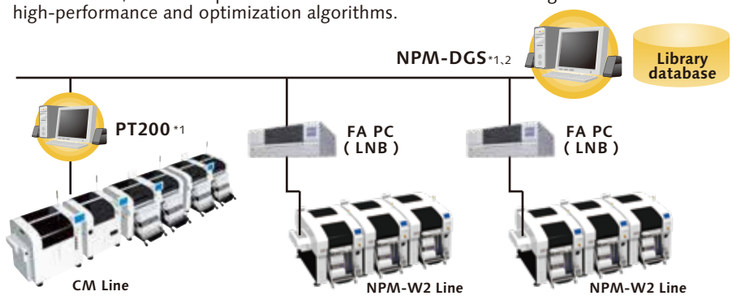



All marks are recognized at the first machine and downstream machines only recognize master marks.


*Please refer to"Specification"booklet for details.

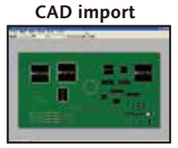
## Data Creation System　NPM-DGS ( Model No.NM-EJS9A )

This is a software package that provides integrated management of component library and PCB data, as well as production data that maximizes mounting lines with high-performance and optimization algorithms.



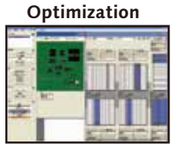

*1 : A computer must be purchased separately.
*2 : NPM-DGS has two management functions of floor and line level.

**CAD import**



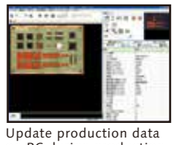
Allows you to import CAD data and check polarity, etc., on the screen.

**Optimization**



Realizes high productivity and also allows you to create common arrays.

**PPD editor**



Update production data on PC during production to reduce the loss of time.

**Component library**

Allows unified management of the component library including mounting, inspection and dispensing.

## Offline Camera unit V2

**New component data can be created offline without relying on an individual operator's skill and proficiency, thus contributing to quality improvement and O.E.E maximization.**

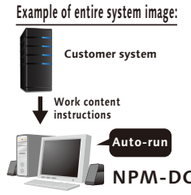
Thanks to adoption of a new component recognition camera and a wider variety of dedicated software functions, it now enables you to create component data more efficiently.

Offline Camera unit V2

## DGS Automation option

**Automated manual routine tasks reduce operation errors and data creation time.**
Manual routine tasks can be automated.
By collaborating with the customer system, the routine tasks for creating data can be reduced, so it contributes to a significant reduction in production preparation time.
It also includes the function to automatically correct the coordinates and angle of the mounting point ( Virtual AOI ).

Example of entire system image:




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

## Optimization of setup option

**In production involving multiple models , setup workloads are taken into account and optimized.**
For more than one PCB sharing common component placement, multiple setups may be required due to a shortage of suppy units. In order to reduce the required setup workloads in such a case, this option divides PCBs into similar component placement groups, selects a table ( s ) for setup and thus automates component placement operation. It contributes to improving setup performance and reducing production preparation time for customer manufacturing various kinds of products in small quantities.

Example: