

Panasonic

Any-mix manufacturing
solution for evolving
assembly needs



NPM Series

Smart Factory Solutions for
any mix
any volume

World-class, award-winning
manufacturing platform

NPM-Series

Design concept

The global acceptance of the award-winning NPM platform is based on its inherent flexibility. Each is a completely integrated, single-platform solution that can expand and evolve with your manufacturing needs. When requirements change, simply swap heads to add new functionality and provide investment protection.

As always, manufacturers can scale NPM lines to meet production needs now and add new technologies later. Plug & Play heads spanning from high speed to multifunction placement, dispense and inspection can be reconfigured in approximately 15 minutes – maximizing flexibility and ROI. It also enables leveraging existing feeders, carts and nozzles to minimize investment.

Over 50 years of exceeding customer needs with proven industry excellence... and over 100,000 solutions installed

Operational advantages



SCALABLE

- Match line capacity to production needs
- Integrate software modules when business dictates
- Single-line facilities to multi-nationals



INTEGRATED

- For any machine platform or business system
- Communicates with numerous peripheral systems
- Multi-level traceability throughout the SMT process



EFFICIENT

- Asset utilization optimized minimal changeover
- Offline set-up, teach and changeover tools
- Highly-accurate inventory management

NPM-W2

With dual-gantry functionality

The broader capacity dual-beam NPM-W2 amplifies the NPM-W with a 10% throughput and 25% accuracy improvement and integrates our award-winning Multi Recognition Camera. Combined, these features extend the component range from 03015mm microchips to 6" long connectors up to 40mm tall.



Features and benefits

- Combine various new light-weight version high-speed and flexible multi-function head options to handle nearly any application, including large, odd-form parts like snap-fit connectors requiring upwards of 100N placement force
- Setup multiple products with 120 reels on quick-change feeder carts
- Award-winning camera technology merges component alignment, chip thickness and 3D coplanarity inspection into a single pass to ensure high productivity and quality

Application solutions

With additional feeder capacity and a larger board size, the inherent capabilities and superior flexibility of the NPM-W2 position it as an advanced solution for any level manufacturing.

NPM-W2S

With single-gantry functionality

The new highly flexible single-beam NPM-W2S is an ideal placement solution for manufacturers who value reduced setup and changeover time over volume... At a time when your lot sizes are getting smaller, customers need to tighten control of work in process, schedule more efficiently and expand feeder capacity. This need is the premise behind the NPM-W2S.



Features and benefits

- Shares overlapping capabilities of the NPM-W2, with one of the two beams removed
- High output of up to 38.5k CPH, as well as odd-form capability with stackable stick feed support, 100N placement force and Pin-in-Paste lighting
- Efficient 3.5-minute Changeovers capability per module through automated functions
- Track and trace from workorder level to reference level to complete route control
- Award-winning camera technology merges component alignment, chip thickness and 3D coplanarity inspection into a single pass to ensure high productivity and quality

Application solutions

The lower cost NPM-W2S enables customer to afford more platforms per line to increase available feeder capacity for common setups and reduced changeover. The NPM-W2S also makes an affordable line booster at the beginning or end of an existing NPM line.

NPM-D3

With multi-recognition camera

The compact, dual-beam NPM-D3 offers a reinforced frame, advanced head and award-winning multi-recognition camera improve placement accuracy by 25%, while boosting IPC-9850 throughput 30% to 38,078 CPH per square meter.

Features and benefits

- Flexible board handling system converts to support single and multiple dual-lane operation modes
- Compact footprint and dual-side operation maximizes factory floor space utilization and scalability
- Integrates the industry's only field-scalable multi-recognition camera that combines alignment, thickness and 3D coplanarity into one time-saving, process-improving step



Application solutions

The NPM-D3 is an industry standard building block in high-speed, high-volume applications ranging from automotive to industrial to medical. In fact, the vast majority of automotive EMS providers choose Panasonic solutions.

NPM-TT2

With dual-gantry functionality

The NPM-TT2 complements the NPM platform with front and rear tray towers plus feeder slots for tape reels. Its twin tray configuration enables independent mode, dual-lane production. Additionally, its dual-lane board handling allows increased production of one or more products simultaneously; yet, easily converts to single-lane mode for larger board sizes.

Features and benefits

- Extended component range is ideal for end-of-line applications
- Interchangeable, 20-input, tray magazines maximize product changeover efficiency and afford offline setup
- Easily replace tray tower carts with tape feeder carts as production setups change to maximize asset utilization
- Excellent companion to the NPM-D3 or W2, especially when operating in a high volume, dual-lane production environment



Application solutions

Capability and versatility position this as a high-volume, odd-form mounter for components from tape- or tray-fed parts. By automating certain end-of-line components, the NPM-TT can help manufacturers further reduce costs by eliminating pre-reflow or pre-wave solder manual part insertion.

Process capability

Electronics assembly includes several processes to ensure high-quality, which historically meant investing in standalone equipment for placement, dispensing and inspection. Today, our NPM Series provides multiple assembly processes. More than a placement machine, you can configure the platform with heads for component placement and material dispensing – even combinations. In one single platform, it is a true lean solution – doing more with less and improving your return on investment.

Placement heads

An array of component placement head variations are available. With its linear motor, dual-gantry system, manufacturers can configure two heads on each machine to maximize line throughput, amplify line flexibility, or a blend for superior production versatility.

16-nozzle head ultra high-speed chip

- 42,000 CPH per head
- 03015 to 6x6mm
- Up to 3mm tall
- 30 micron accuracy



12-nozzle head high-speed chip

- 34,500 CPH per head
- 01005 to 12x12mm
- Up to 6.5mm tall
- 30 micron accuracy



8-nozzle head versatility

- 21,500 CPH per head
- 01005 to 32x32mm
- Up to 12mm tall
- 30 micron accuracy



3-nozzle head multi-function

- 8,000 CPH per head
- 0201 to 150mm long
- Up to 40mm tall
- 100N placement force



Dispense head

The NPM is more than a mounter, it is a process solution. By simply swapping a placement head with the dispense head, one can convert an NPM into a multi-functional machine with the ability to mount and dispense. This is especially suitable when handling large or oversized components, processing double-sided reflow boards, or corner-bonding CSPs.

- Auger-valve ensures stable, high-speed dispensing
- Support patterns like dots or lines, as well as adhesives and solders
- Non-contact dispensing enabled with board height sensor



NPM-Series award-winning features

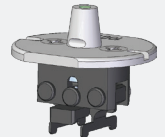
Nozzles

- Long-life ceramic design
- Integrated 2D barcode for Nozzle Anywhere setup
- Compatible with quick-change, high-capacity nozzle holder
- Locally designed nozzles and grippers available



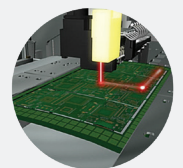
Gripper nozzles

- Pneumatic, adjustable stroke
- Standard and custom grippers available
- Compatible with nozzle holder for on-the-fly changes



Board-warp mapping

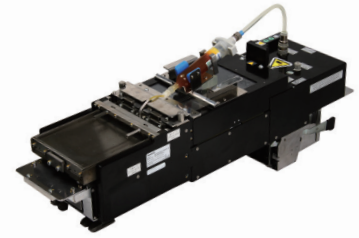
- Head-mounted laser system measures board topography
- Controls part placement height
- Shares measurement data downstream



Package on package

As part of our industry-leading patent list, we continuously pioneer new technologies and techniques. Panasonic helped establish the PoP assembly process over a decade ago. Since then, PoP has matured and many designers are adopting it to drive miniaturization, lower costs and improve performance. Panasonic has the ability to guide the industry with manufacturing best practices gleaned from being a global manufacturing leader.

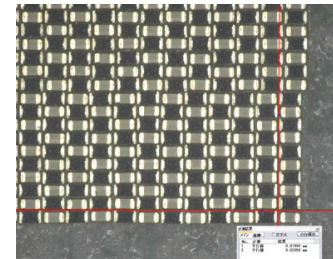
- 3D component and feature inspection boosts production yields
- Plug-and-play Multi-function Transfer Unit (MTFU) installs in minutes
- Auto flux refill with servo linear slide and programmable squeegee gap



Next-generation microchips

For years, Panasonic has been helping manufacturers mount the continually shrinking chip. Today, the tradition continues as we publish techniques and develop processes to ensure manufacturers successfully adopt next generation microchips like the 03015mm and 0201mm, which are upwards of 60% smaller than the 0402mm (01005). Not only does Panasonic understand the technology to mount these microchips, our company is developing these microchips for manufacturing implementation. From parts to process, Panasonic is positioned to help manufacturers address challenges.

- “Active Calibration” ensures accurate placement at production speeds
- Industry’s only multi-recognition 3D vision system increases output and reduces defects
- Patented Advanced Process Control (APC) inspection further minimizes DPMO



20 micron interspaced capacitors and resistors

Advanced Process Control (APC)

Numerous studies detail how solder reflow affects component placement, especially if the component is off pad. However, shrinking component dimensions and pitch are opening doors to explore how APC can improve yields in high-density placements. APC collects, analyzes and applies SPI data so parts are placed onto solder rather than onto pads. This self-aligning process increases yield and reduces defects even when a printing process exceeds set limits.



Feeding solutions

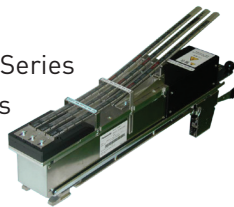
Intelligent tape feeders

- Common with the AM, CM and NPM Series
- Adjustable-width feeders reduce investment
- Auto-calibration technology
- Closed-loop splice detection
- Hot-swappable during production
- Up to 104mm tape width including thin 8mm and 4mm
- Auto-loading, splice-free 8mm paper tape feeder*
- Deep pocket and large reel options



Intelligent stick feeder

- Common with the AM, CM and NPM Series
- Configurable from one to three sticks
- Locally designed, custom guide blocks



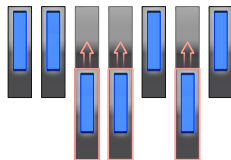
Tray tower

- Twin and single tray tower options
- Quick-exchange magazine
- On-the-fly replenishment
- JEDEC® and vacuum-formed trays
- Front, rear and twin tray configurations



Intelligent feeder anywhere

- Hot-swap feeders on-the-fly during production as an alternative to splicing
- Simply install feeders in available slots – program auto-adjusts, hastening changeover



Support station box

- Guides operator through setup
- Reduces changeover time with off-line feeder cart setup
- Combine with PanaCIM Material Verification for accurate setup



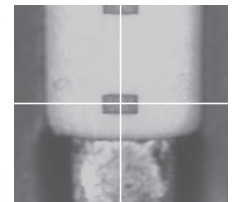
LCR meter station

- Validate electrical values of passive devices
- Closed-loop integration with PanaCIM Material Control and Material Verification



Automatic feeder teach

- Auto-aligns first pick position
- Adjusts orientation and index speed
- Accommodates tape pocket variation
- Compatible with tape, stick, and tray



Feeder carts

- Cordless, quick-exchange operation
- Automatic, precise registration
- Integrated tape cutter/waste management



The vast majority of top smartphone manufacturers and automotive EMS providers choose Panasonic solutions

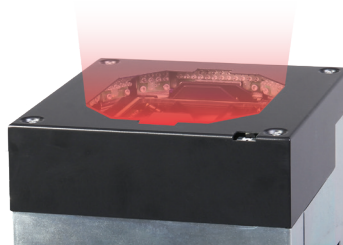
*Contact us for supported part sizes

Vision capabilities

New, evolutionary, multi-recognition camera is the first field-scalable system to combine three unique imaging capabilities – complete with fast, accurate, 3D coplanarity measurement.

Vision-based NPI tools

Competitive pressures, cost challenges and increased customer expectations are driving improvements in the way manufacturers develop and introduce products to the market. Whether cultivating internally-born ideas as an OEM or responding to customer requirements as an EMS, the new product introduction process is mission-critical to speed up time-to-market and your company's success. Panasonic solutions provide the following capabilities that are essential for effective execution of new product introduction:



Off-line component teach

- Create parts library off-line on the same system as machine
- Minimize machine idle time
- Uses the same vision recognition system as the machine
- Retrieve failed vision files from machine and modify without consuming line productivity

On-line component teach

- Automatically teach basic or complex component shapes
- Retrieve component images and adjust with “digital calipers”
- Accepted changes sync to master database library

Fiducial adjustment

- Lighting automatically adjusts for fiducial recognition
- Change shape, colors, dimensions, or location
- Accepted changes sync to master database library



AWARD WINNER

Circuits Assembly
NPI Award
Production Solution

+ High-speed, high-precision, digital image recognition solution includes:

- 2D and 3D alignment and inspection
- Component thickness
- Pick-up irregularity
- Flipped component

+ 3D CMOS sensor detects:

- Lifted fine-pitch IC leads
- BGA or CSP coplanarity
- Missing or deformed solder balls

Labor-saving features

Panasonic not only focuses on increased CPH but also output per shift while reducing labor costs.

Automatic recovery

Automatic recovery enables the machine to take corrective action by monitoring its own performance and adjusting automatically to improve performance when required.

Remote recovery

When a machine in production mode stops and displays an error, Remote Recovery enables users to take control of the machine from their desk.

Guided recovery

When automatic or remote recoveries are unable to resolve a machine error, user's can be guided through Android-based smart devices directly to the machine that is in error efficiently.

In development.

Board-handling capabilities

Single-lane board handling

Innovation beyond traditional board handling brings additional features, including multi-board staging for smaller boards and board shuffling for LED luminaries nearly 48" long.



Automated board support

- Programming data automatically positions support pins
- Eliminates manual pin placement errors
- Reduces changeover time

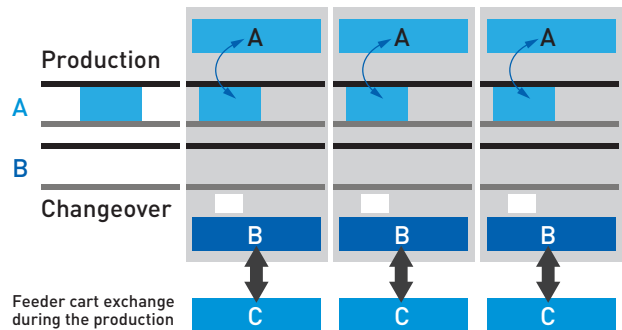


Long-board handling

- Process 1,200mm long LED panels without sacrificing ability to handle smaller boards

Independent changeover

Previously, changeover required that all production be completed before an operator could begin a changeover process. In a dual lane environment, this effort is less of a burden. In Independent-mode, each lane is building producing two products simultaneously. When a changeover is required on either lane, the operator can begin to exchange all the feeder carts on one lane while production continues uninterrupted on the other. Besides exchanging feeders and carts, the system automatically repositions board width, support pins and changes nozzles. Our thorough set of features eliminate product changeover burdens and provide rail the ideal changeover process.



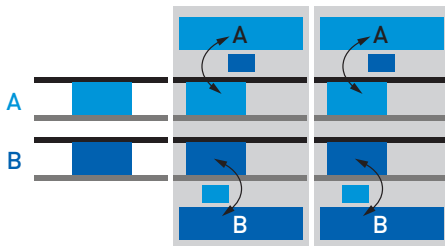
Dual-lane board handling

The core of our board handling begins with a versatile system incorporating programmable, adjustable position rails which quickly convert from single-lane to dual-lane mode based on the product program. When running in a single lane, several rails are "parked" to ensure maximum

panel size. Yet, when production needs change, so can board-handling. Based on optimized production feedback from our DGS programming software, the system will automatically convert into Shared-, Independent-, or Hybrid placement modes to maximize production efficiency.

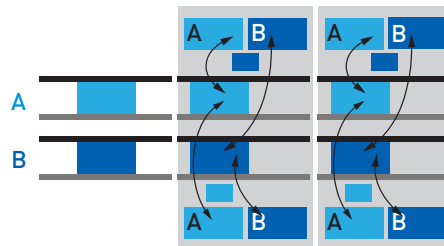
Independent mode

- Heads only populate board in closest lane
- Maximizes throughput and promotes on-the-fly product and cart changeover



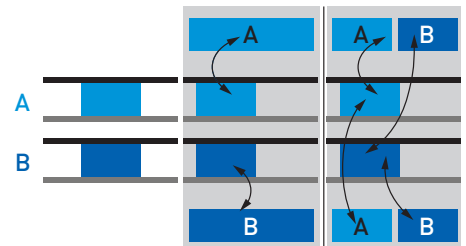
Shared mode

- Both heads populate same board, same lane
- Eliminates PCB transfer time
- Maximizes feeder slot utilization



Hybrid mode

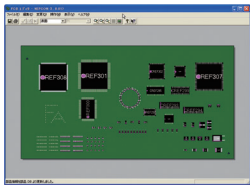
- Blends Shared- and Independent-modes within a line to maximize efficiency
- Maximizes asset utilization and minimizes capital investment



Software and programming

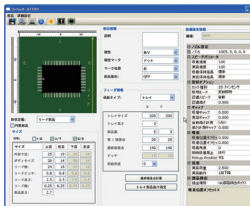
Data Generation System

DGS (Data Generation System) is our intuitive, PC-based programming software. Taking line balance into consideration, it assigns parts from CAD data, optimizes them and then creates the line placement program.



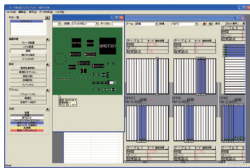
Multi-CAD import

- Retrieves data and allows properties like polarity and position to be verified on-screen



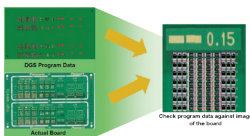
Component library

- Registers and unifies component mount data
- Large library of standard component definitions available



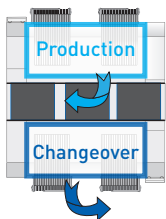
Simulator

- Provides on-screen confirmation in advance of production



Virtual PCB inspection

- Overlays program data on board image to validate or adjust component alignment and rotation



Changeover mode

- Continuous production on one side of the machine while changing over the opposite side

Complete MES software solutions
for digital manufacturing...
developed in the US,
deployed globally

AWARD WINNER



Circuits Assembly
NPI Award
Production Solution

Global SMT & Pkg
Technology Award
Best Product, Americas



PanaCIM
Enterprise Edition

PanaCIM® Enterprise Edition

PanaCIM integrates cooperating software modules to solve key production problems by addressing the top objectives for successful manufacturing.

Customizable

The PanaCIM modules were developed based on user feedback to provide a complete assembly software suite. Select the best modules for your current situation and easily add others as needed.

Cloud level	Seamless integration of business systems
Enterprise level	Connect all departments to schedule and analyze production and integrate with MRP/ERP systems
Facility level	Ensure visibility to track WIP, dispatch operators and take proactive measures
Line level	Manage OEE through traceability, WIP tracking and automated changeover
Machine level	Machine-to-machine communication to assure yield, materials and quality

Solutions

Printing solutions

The rapid growth of electronic devices is driving manufacturers to expand and update facilities or assets, implementing new processes and reducing costs. A balance between costs and output must be struck while maintaining quality. A trending option is low-cost printing material; however, process stability is key.

- Twice the positional accuracy of competitive offerings, 5 microns at 6σ ($\pm 3\sigma$) ≥ 2.0 Cpk
- Robust to use low-cost materials and consumables, while delivering high yield
- Dual-lane is not only for high volume, it's ideal for any mix any volume production



Providing world-class solutions for industrial, communications, automotive and more...regardless of company size

Total solutions

Many suppliers claim to provide total solutions, but for Panasonic the notion of "Total Solutions" carries a very meaningful and powerful connotation. As a leading electronics manufacturer with a deep and practical understanding of printed circuit board assembly, we have the distinctive ability to provide total solutions beyond the production line. While we can provide best-in-class hardware and software tools from our own portfolio, we also partner with nearly 40 complementary technology partners, which allows us to provide turn-key solutions.

Factory of the future

Across the globe, the "Smart Factory" has been highlighted in many national initiatives. Regardless of the name, "Industry 4.0", "Advanced Manufacturing" or "Smart Factory", all efforts focus on transforming the manufacturing process from isolated silos to a "lean, agile and integrated" ecosystem underpinned by the Internet of Things. Since our humble beginnings, Panasonic founder Konosuke Matsushita focused on manufacturing innovation. In fact, we have been connecting "things" throughout our 100 year history. PanaCIM MES software is already enabling the connected factory and offering value beyond operational cost savings. It offers compelling solutions to collect and analyze disparate data, in real-time and across time, to transform your business.



NPM-Series specifications

Model Name (Number)		NPM-D3 (NM-EJM6D)	NPM-W2 (NM-EJM7D)	NPM-TT2 (NM-EJM-1E)	NPM-W2S (NM-EJM5E)
Concept		Dual-gantry, multi-head, process-driven module	Dual-gantry, multi-head, process-driven module	Dual-gantry, multi-head, process-driven module	Single-gantry, multi-head, process-driven module
Drive system		High-accuracy, low-maintenance, linear-motor driven gantry(s) system			
Component alignment		Multi-recognition digital camera			
Head design options		Inline array of 16, 12, 8, 3 and 2(D3) nozzle heads			
Applicable heads		16, 12, 8, 2	16, 12, 8, 3	8, 3	16, 12, 8, 3
Board dimensions (Single lane)		L 510mm x W 590mm	L 750mm x W 550mm 1200mm long PCB opt	L 510mm x W 590mm	L 750mm x W 550mm 1200mm long PCB opt
Board dimensions (Dual lane)		L 510mm x W 300mm L 510mm x W 550mm [1]	L 750mm x W 260mm L 750mm x W 510mm [2] [3]	L 510mm x W 300mm L 510mm x W 550mm [1]	L 750mm x W 260mm L 750mm x W 260mm [1] [2]
Placement accuracy	Chip	±25µ Cpk ≥ 1.0 [4]	±25µ Cpk ≥ 1.0 [4]	±40µ Cpk ≥ 1.0	±25µ Cpk ≥ 1.0 [4]
	QFP	±30µ Cpk ≥ 1.0	±30µ Cpk ≥ 1.0	±30µ Cpk ≥ 1.0	±30µ Cpk ≥ 1.0
Throughput	Ideal	Up to 84,000 CPH	Up to 77,000 CPH	Up to 36,000 CPH	Up to 38,500 CPH
	IPC9850	63,300 CPH (1608C) [3]	59,200 CPH (1608C) [3]	8,300 CPH (208 QFP) [3]	30,000 CPH (1608C) [3]
Component range	Min	03015 microchip [4]	03015 microchip [4]	0402 microchip	03015 microchip [2]
	Max	100mm x 90mm	150mm x 25mm	150mm x 25mm	150mm x 25mm
	Height	28mm	30mm	30mm	30mm
	Special height		40mm		40mm
	Insertion force	.5N ~ 50N	.5N ~ 100N	.5N ~ 100N	.5N ~ 100N
Feeder capacity	Reels w/ no tray feeder	68	120	120	120
	Reels w/ tray tower	24	86	86	86
	Reels w/ twin tower	N/A	60	N/A	60
	Reels w/ 2 tray towers	N/A	N/A	52	N/A
	Trays w/ tray tower	20	20	20	20
	Trays w/ twin or 2 tray towers	N/A	40	40	40
Facilities	Electric	Voltage: 3 Phase AC 200/220 ±10V; AC 380 400 420 480V ±20V Frequency: 50/60 Hz			
		2.7KVA	2.8KVA	2.5KVA	2.0KVA
		Peak current 30A @ 200V	Peak current 40A @ 200V	Peak current 38A @ 200V	Peak Current 22A @ 200V
	Pneumatic	.5 ~ .8MPa, 100L/min	.5 ~ .8MPa, 200L/min	.5 ~ .8MPa, 200L/min	.5 ~ .8MPa, 200L/min
	Mass	1900kg w/ 2 carts	2850kg w/ 2 carts	3090kg w/ 2 carts	2850kg w/ 2 carts
Dimension	832mm x 2729mm	1280mm x 2570mm	1300mm x 2570mm	1280mm x 2618mm	

*Placement tact time and accuracy values may differ slightly depending on conditions.

*Please refer to the specification booklet for details.

[1] Single-lane mode

[2] 1200mm long-board option

[3] With High Production Mode active

[4] For 03015 and 0201 metric placement: High Accuracy Mode and special calibration required.

Panasonic

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