

*Providing flexible, low cost automation solutions for semiconductor testing*



## ***The EM 1 is a unique new product***

*It is the first ever Test Handler Emulator, a highly flexible, low cost, easy to use tool that accurately emulates many mechanical features, such as test site geometries and plunge mechanisms, of expensive production test handlers.*

*The EM 1 is particularly suited for low volume automated testing requirements such as those at semiconductor design centers.*

*In spite of its small size, the EM 1 is a fully automated tri-temperature pick-and-place type automatic test handler. It is ideally suited for many "traditional" test handling applications such as low volume, small lot, or long test time*

## **Features**

*Low cost. About 1/4 the price of a "production" test handler*

*One to Four test sites*

*Tri-Temperature capable using an external thermal forcing system*

*Can emulate Delta Design, Seiko-Epson, Synax, Multitest, Rasco and others*

*Can utilize the same interface, docking hardware, load-boards and test contactors as the handler being emulated*

*Can use actual conversion kit parts from many emulated handlers*

**Architecture**

- Up to Quad site, pick and place, with a placement accuracy of .001" (25 microns)
- Test Head mounting underneath, with an unobstructed tester interface plane capable of accommodating a large test head of up to 48" high (Teradyne Tiger e.g.)

**Emulation Capability**

- The EM 1 Can be configured to emulate the test site geometry, such as number of test sites, site to site pitch and site configuration (1x4, 2x2, etc.), of most pick and place and gravity feed test handlers (up to 4 sites).
- Configuration is accomplished through the use of a low cost, patented hardware kit called an EM Kit.
- In some cases, EM Kits can be designed to accept actual customer conversion kits.
- EM Kits available to emulate many Seiko-Epson, Synax, Delta Design, Multitest, Rasco and Advantest Pick and place and gravity feed machines. For other handler types, and for the EM Kits currently available, consult Northwave.

**Packages Handled**

- QFN, BGA, QFP, SOIC, TSSOP, SSOP, and many others.
- Typically 3mm x 3mm to 40mm x 40mm
- For smaller or larger packages please consult Northwave for more information.

**I/O**

- Standard Configuration is three JEDEC type trays, manually loaded and unloaded. Trays can be software configured.
- Software tray mapping standard. Unlimited bin categories.
- Optional Tube to Tube I/O available. Four tube input, four tube output.
- Conversion between tray and tube I/O takes under 45 minutes.
- 90 degree DUT rotation available.

**Thermal**

- Ambient and Tri-Temp models available.
- Temperature provided via a Temptronic, or equivalent, customer supplied, thermal forcing system. Thermal chamber and associated control hardware and software provided by Northwave.
- Temperature range
  - Standard, Ambient
  - Optional Temp, -55 deg. C to +150 deg. C.
- Accuracy +/- 2 deg. C in thermal chamber.
- Temperature sweep (optional) software allows device characterization automatically over a wide range of temperatures.

**Tester Interface**

- Standard parallel interface
- Optional GPIB (IEEE 488) and RS232, (requires tester driver)

**Contacting**

- 1 to 4 test sites, customer supplied contactor
- Contacting force of up to 200 lbs.
- Programmable plunge depth with 0.0004" (10 micron) resolution
- Plunge to board capable up to 0.7" below plane of bottom of machine
- Re-probe and retest capability

**Facility Requirements**

- Compressed air, 90psi, 20SCFM
- Dry air, dew point -90deg. C (for cold operation below 0 deg. C only)
- 208 VAC single phase, 50/60Hz, 20 amp service
- Size, 41" wide x 55" deep x 69" high.

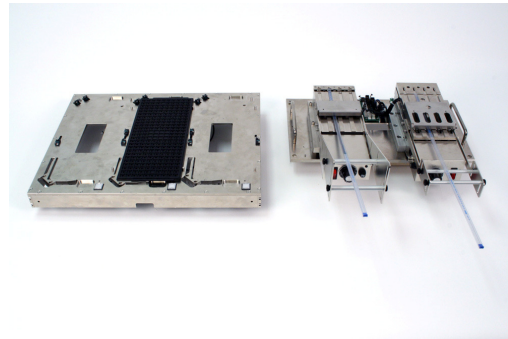
**Performance**

- Throughput at zero test time excluding thermal soak time
  - Single site, 200 UPH
  - Dual site, 360 UPH
  - Quad Site, 500 UPH

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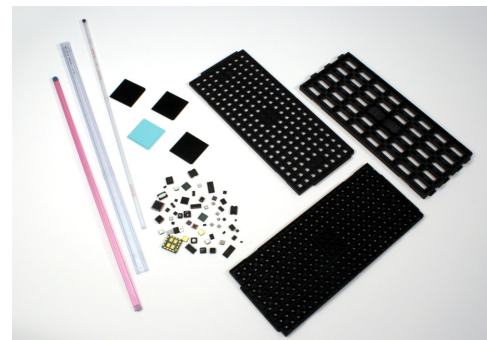
*Package Conversion Kit*



*Modular Tray and Tube I/O Modules*



*EM Kit and Contactor Mounting Plate*



*The EM 1 can handle many types of packages and I/O*