Grid-Lok™ Automatic Substrate Support System

Ovation's Grid-Lok automatic substrate support technology is the premiere reconfigurable tooling system for today's modern electronics production environments. Recognized worldwide for its ease of use and robust performance, Grid-Lok offers electronics assembly specialists a breakthrough technology that significantly reduces board support-related production errors and ensures proper substrate handling and stability, thus delivering higher yields and machine uptime.

Designed to accommodate assemblies of all types – from basic SMT through to high-density, highly miniaturized products – Grid-Lok is the ideal support mechanism for the entire assembly process from screen printing to component placement to inspection. With a set up time of less than 20 seconds, minimal operator intervention required and system control handled independently of the host machine, Grid-Lok is the simple, fast solution for advanced board support.

How it Works

When operated in Stealth mode, Grid-Lok takes your existing equipment to a whole new level. Grid-Lok Stealth enables your machine to "tool up" for every PCB that passes through the line – all with absolutely no operator intervention. Once the substrate is loaded, Grid-Lok does the rest. The pneumatically controlled pins raise automatically, instinctively conform to the board topography and lock into place. Once set, the pins maintain their configuration until they independently re-set for the next board. Though typically set up to run automatically in Stealth mode, the flexibility of the Grid-Lok system also allows for manual mode operation if required.

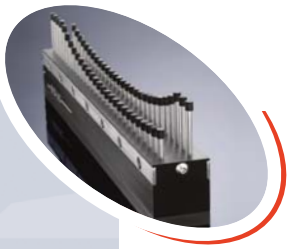
The Grid-Lok Portfolio

Standard Grid-Lok

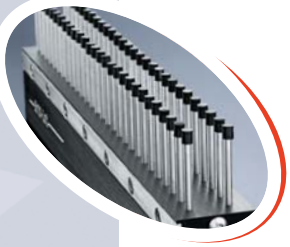
Depending on the application, assembly specialists can select the amount of modules required. One Standard Grid-Lok module will effectively support a device up to 50 mm wide, while six modules will enable board stability for products as wide as 510mm. Standard Grid-Lok technology is well-suited for applications where extreme amounts of pressure across the entire area of the board are not the norm. For applications, such as screen printing, where pressure over the entire substrate can be very high, HD Grid-Lok is recommended. For other processes, such as component placement and inspection, standard Grid-Lok is the preferred technology.

HD Grid-Lok

HD Grid-Lok was designed specifically to address the requirements of higher densities, miniaturized devices and applications such as screen printing, where pressures are higher and more support across the entire substrate is critical. HD Grid-Lok functions precisely like Standard Grid-Lok, but offers a finer pitch pin spacing. With a selection of 12mm pin pitch modules, HD Grid-Lok has been engineered to deliver outstanding support to even the most densely populated boards under the most extreme process conditions and is available in a range of module lengths.



Pneumatically controlled pins conform to the board topography for maximum support.



Modules can be configured to accommodate any board size variation.

Guaranteed safety of underside components with Grid-Lok's patented release vent.

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OVATION PRODUCTS

Technical Advantages and Cost-Efficiency

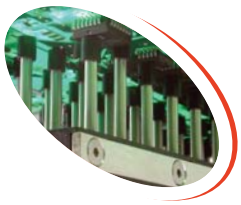
A one-time investment in Grid-Lok eliminates the need to source costly and often problematic dedicated fixture plates. While dedicated tooling can be effective for certain applications, the robustness of its performance is completely dependent on the tooling fabricator. One slight misstep in plate routing and substrate support is compromised and yield likely lowered. Plus, for high-mix environments, several plates must be manufactured – a costly proposition to say the least – and tooling changeovers can negatively impact throughput and yield. Grid-Lok, on the other hand, alleviates all of these issues, offering a single system that re-sets in mere seconds and can be used over and over again for an infinite number of products of varying degrees of density.

In addition to the yield advantages delivered by Grid-Lok, product changeover is exponentially faster and more simple than with other support mechanisms. In short, more line utilization equals more profit.

Here's just one example of the ROI realized with Grid-Lok:

Changeover Time Saved per Line	=	**10 minutes**
Changeovers per day	=	**3**
Line Utilization Rate (assumed profit generated per line per hour)	=	**$800 per hour**
Total Savings per Day (1/6 hour x 3 x $800)	=	**$400**
Grid-Lok cost on Line (1 printer plus 2 Placement machines)	=	**$28,000**

Payback in just 70 days!



Technical Specifications

System Components:

- Control box to provide module(s)-machine interface
- Hand controller to set operating mode
- Up to 6 Grid-Lok modules
- Field installation kit
- Manifold used to support up to 6 modules
- Machine-specific fitting tools
- Machine-specific interface (sensor or pneumatic input to start the pin raise and clamp cycle)
- All interconnecting hardware
- Standard Grid-Lok system carton size 53x42x30cm, approximately 12Kg

System Requirements:

- Air pressure: 5.5 bar to 7 bar
- Air quality: 2.3.3 where 2 (dirt) = 1 micron, 3 (water) = -20°C pressure dew point and 3 (oil) = 1mg/m^3.
- 120-240AC supply to provide 24VDC to power control box

Module Specifications:

Depending on the specific machine application the modules have the following specifications:

- Available tooling heights 39mm to 159mm,
- Available module lengths 153mm to 457mm
- Pin count
  - HD modules (available in heights from 58mm through 123mm)
    305mm -- 46 pins configured in 2 rows on a 12x18mm pitch
    457mm -- 70 pins configured in 2 rows on a 12x18mm pitch
  - Standard modules (available in heights from 39mm through to 139mm)
    1 row of pins on a 25.4mm pitch (12 for 305mm or 18 for 457mm)
- Pin setting force – 5 grams per pin
- Pin cap – electrically conductive silicone rubber compound

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