



Velocity. Versatility. Value.

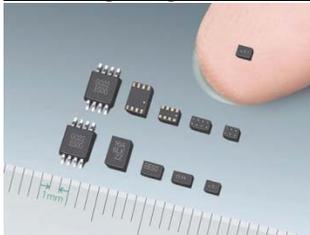
Leadership in Handling Small Parts

The Data I/O Team introduces the ultimate automated programming system, the PSV7000, designed to reliably handle the smallest programmable parts including SOT packaging and smaller. The PSV7000 small parts handling capabilities utilize state-of-the-art laser alignment, motion control and pick-and-place technology all built around a stable platform to deliver the best small parts performance.

We partnered with the world's leader in laser sensor technology to co-develop the industry's first alignment on-the-fly vision system using dual probes. In fact we have demonstrated parts handling as small as 0603 (1.5 x 0.8mm), and the laser system itself has successfully been tested with parts as small as 0.2mm x 0.4mm. The PSV7000 is the world's first automated programming system using industry proven H-Bot gantry technology. Light and simple in design, the weight of the PnP assembly is carried on linear guides and not by X-Y drives resulting in less wear while delivering superior positional repeatability and accuracy at $\pm 0.030\text{mm}$. Linear X-Y encoders with resolution of 1 micron (1 μM) provide real position of the PnP. Compliant pick-and-place nozzles, similar to those used on flexible high-speed SMT placement machines are available to support the smallest programmable device.

We designed the PSV7000 to handle the smallest programmable devices on the market now and in the future. We may update our specs as smaller programmable devices are available to test.

Shrinking Programmable IC's



Data I/O's new PSV7000 is designed to handle the smallest programmable devices on the market, (1.5mm x 1.5mm)

The system supports all the latest small package types including SOT, SON, MLF and TDFN.

Alignment on-the-fly



Dual-alignment-on-the-fly is done with a head-mounted laser-align system originally designed for SMT placement machines

Features	PSV7000			Alternative Systems	
	Alignment on-the-fly	Upward Camera	Mechanical Precisors		
Dual alignment on-the-fly	Yes	No	No		
Head-mounted sensor	Yes	No	No		
Impact on throughput	Positive	Negative	Negative		
Risk of lead damage	No	No	Yes		
*Rotational Resolution	0.07°	Variable	None		

*Rotation encoder resolution capabilities at 0.005° to 0.020° translates to a minimum component width of 0.175mm (tested down to 0.2mm x 0.4mm)

PSV7000 H-Bot Gantry



The servo-driven H-bot gantry, coupled with dual-loop encoders and kinematic algorithm achieves the highest accuracy and throughput

Features	H-Bot Gantry	X-Y Drives
No moving motors for reduced load and inertia	Yes	No
Simple design: single belt drive system	Yes	No
Superior positional repeatability	$\pm 0.030\text{mm}$	Variable
Low profile	Yes	No
Fixed motors for simplified cable management	Yes	No
Single stainless steel reinforced belt	Yes	No



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Linear X-Y Encoder System



Linear encoders achieve the highest precision placement and repeatability

The PSV7000 features non-contact X-Y linear encoders with a resolution of 1 micron (1 μ M) to provide the real position of the pick and place locations, not an inferred position as supplied by rotary encoders on the X-Y drive motors used on many alternative systems. The PSV7000 motion system is optimized for superior resolution and repeatability required to accurately pick and place small parts.

PSV7000 Compliant Nozzles



0603 1.6mm x 0.8mm
SOT23-6 3.1mm x 1.5mm

PSV7000 probe tips were originally designed for SMT placement machines

PSV7000 supports compliant PnP nozzles to support device handling of components that range in size from 1.5 x 1.5mm to 32 x 32mm. Reconfigurable probes accommodate the following three nozzle sizes (Outside diameter/Inside diameter)

- 1.5/1.0mm (Small)
- 5.0/3.2mm (Medium)
- 9.5/8.0mm (Large)

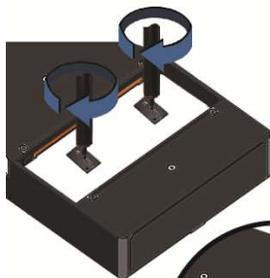
PSV7000 Ultra -Rigid Frame



The PSV7000 frame provides extreme stability

The PSV7000 features a high-quality welded steel frame for a strong and rigid structural design with excellent anti-vibration characteristics. The highly durable unibody frame construction supports the high-speed pick and place handling and assures the accuracy and repeatability required for handling small packages.

PSV7000 supports alignment on-the-fly of two components simultaneously. The system picks two devices and captures multiple views of each component by rotating them 360° degrees through the laser to achieve a full outline of each component. The PSV7000 Laser Alignment accurately measures the component center dimensions and angular correction all in a single sweep. The compact optical design provides high reliability for a wide range of device packages including parts smaller than 1.5mm x 1.5mm.



The PSV7000's dual alignment on-the-fly accurately measures component centers, dimensions and angular corrections all in a single sweep.

