

Galvo Laser Scan Head Linear Drive **Automation1 GL4**

High-Performance Laser Scanning Solution with Advanced Features

The Automation1 GL4 is a high-performance, closed loop 2-axis linear servo drive for controlling our AGV laser scan heads. With effective 26-bit scanning resolution and advanced features like Infinite Field of View (IFOV) and Position Synchronized Output (PSO), the GL4 stands out as a superior scan head drive solution for your most demanding high-precision applications.

Automation1

The GL4 is a part of the user-friendly Automation1 motion control platform, which includes the following:

- ◆ **Development Software**
- ◆ **Controls**
- ◆ **Motor Drives**
- ◆ **Fiber-Optic HyperWire® Communication Bus**

KEY FEATURES:

- ◆ **200 KHZ FULL SERVO RATE*** control eliminates speed-related part distortion such as necking on circles & rounding of corners
- ◆ Industry-leading **26-BIT SCANNING RESOLUTION** with Enhanced Tracking Control (ETC) software for minimizing point-to-point settling times & tracking errors
- ◆ On-board **REAL-TIME 2D CALIBRATION** for planar distortion correction
- ◆ An **EXTERNAL CLOCK INPUT** for synchronization with mode-locked lasers
- ◆ **INFINITE FIELD OF VIEW (IFOV)** combines standard linear & rotary motion to produce scanner trajectories with single-digit micron accuracy over most work area sizes
- ◆ PSO allows for commanded **LASER PULSES AT UP TO 12.5 MHZ** & latencies as low as 80 nanoseconds, enabling real spatial domain pulse control

*200 kHz full servo rate possible with Automation1 controllers; A3200 v6.04 & newer are limited to 192 kHz servo rate

AUTOMATION1 GL4 GENERAL SPECIFICATIONS

FEATURE	DESCRIPTION
Motor Style	±40 VDC max
Control Supply	85-240 VAC; 50-60 Hz
Digital Inputs	Four optically isolated
Digital Outputs	Four optically isolated
Analog Inputs	One 16-bit differential; ±10 V
Analog Outputs	Two 16-bit single-ended; ±10 V
Laser Outputs	Three Optically Isolated; 3 TTL
Emergency Stop Sense Input (ESTOP)	Standard; 24 V opto-isolated
Position Synchronized Output (PSO) ⁽¹⁾	Standard: Three-axis PSO, Three-axis Part-Speed PSO
Interpolated Feedback Output	Yes
Communication Bus	HyperWire® fiber-optic interface
Operating Temperature	0 to 50°C
Storage Temperature	-30 to 85°C
Weight	2.9 kg
Servo Loop Rate	200 kHz
Compliance	CE approved, NRTL safety certification, EU 2015/863 RoHS 3 directive

Note:

1. Three-axis PSO is only available with Automation1 V2.4.0 and later. For V2.3.2 and older, including all A3200 controllers, Two-axis PSO is standard.



AUTOMATION1 GL4 ORDERING OPTIONS

GL4 Series (Required)

GL4 Single-phase linear amplifier

Current (Required)

-20 20 A peak; 5 A continuous

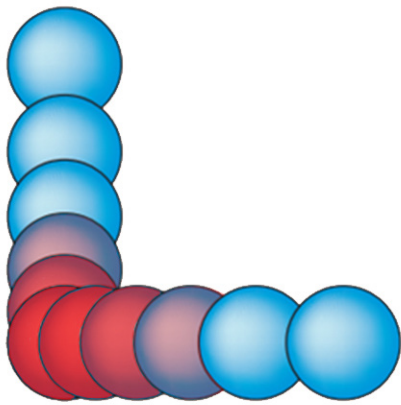


Figure 1. Laser spot placement without PSO. Notice the uneven overlap evident when changing direction which causes inconsistent energy delivery to the workpiece resulting in poor part quality.

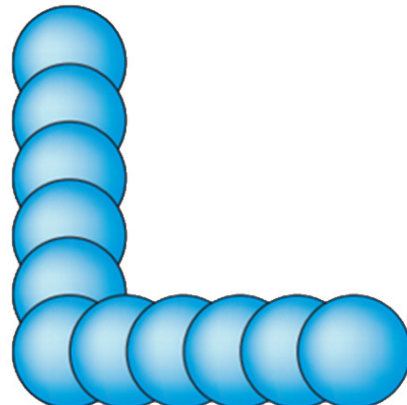


Figure 2. Laser spot placement with PSO. Notice the even overlap, even when changing direction, when Aerotech's PSO is applied. This results in consistent energy delivery and better part quality.

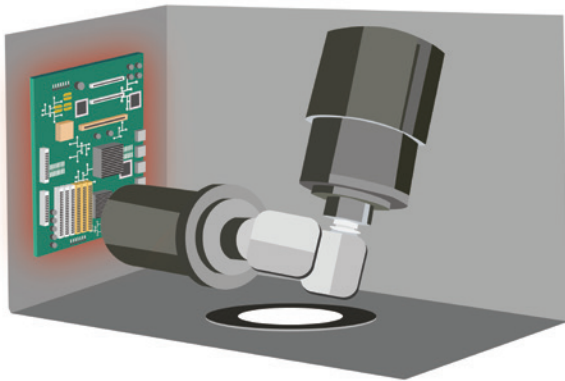


Figure 3. Competitive Galvo Scanner where the heat-dissipating electronics are placed in close proximity to the scanner mechanics. This packaging design creates thermal stability problems due to the power dissipated by the control electronics.

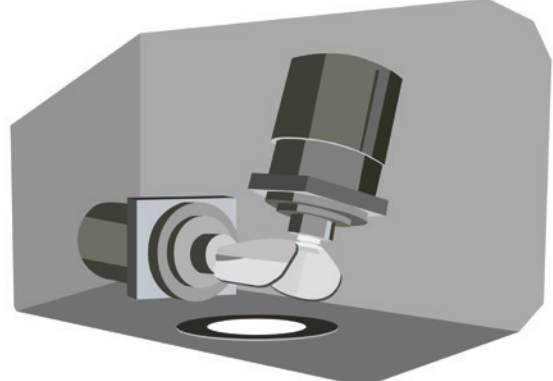


Figure 4. Aerotech's AGV Galvo Scanner where heat-dissipating electronics are removed from the scanner allowing for better thermal stability and higher-precision motion.

AUTOMATION1 GL4 DIMENSIONS

