

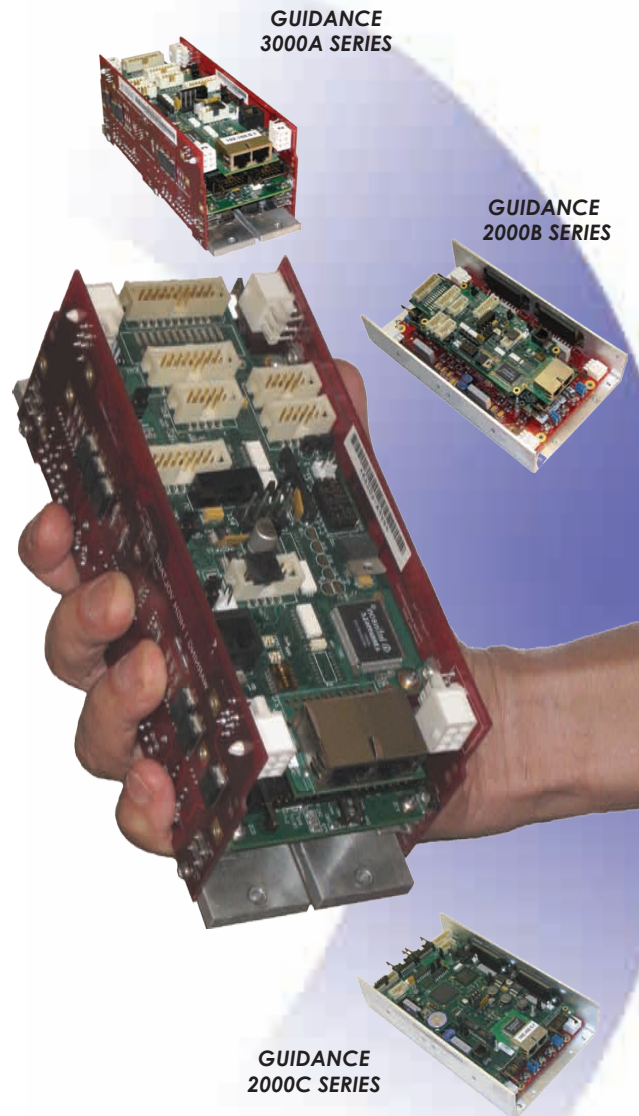
GUIDANCE CONTROLLERS

Can a 4-axis vision-guided motion controller with built-in drives fit in the palm of your hand?

Precise Automation makes it possible. Guidance Controllers feature multi-axis coordinated motion, integrated servo motor drives, network communications, a web interface for local/remote support via a host computer or a tablet, a powerful, yet easy-to-use programming language, machine vision and more. All of these features are available in a design small enough to fit in your hand, yet powerful enough to drive room size gantries.

The small size enables the controller to fit inside a robot's structure, eliminating the need for controller cabinets, long and expensive cables and costly connectors. Multiple controllers can be connected over Ethernet to allow for 32 axes of coordinated motion and control of nearly any robot configuration.

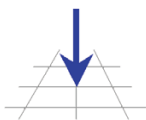
Combined with Precise's powerful programming language and multi-axis kinematics library, Guidance Controllers are ideal for a wide range of industries and applications.



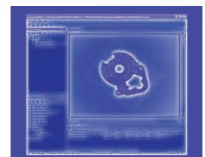
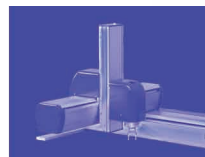
GUIDANCE
3000A SERIES

GUIDANCE
2000B SERIES

GUIDANCE
2000C SERIES



PRECISE
AUTOMATION



General Specifications	Range & Features
Computational Hardware	
CPU and Dynamic Memory	400Mhz high performance, low-power CPU with a minimum of 8MB of dynamic RAM
Nonvolatile Memory	Flash disk with a minimum of 16MB of storage for OS, firmware and user program and data storage
NVRAM	8 KBytes of NVRAM for storing key dynamic status and state information including error logs (2000C version only)
Software	
Motion control	<p>Continuous path following, straight-line and circular motions, torque and velocity control, s-curve profiling. Control of up to 32 axes via networked distributed control organized into up to 12 multi-axis robots. Distributed control network can consist of up to 16 controllers.</p> <p>AVAILABLE UPGRADES</p> <p><i>Kinematic Licenses</i> – Control complex machines (including articulated, parallel and redundant axis robots) with simple Cartesian control.</p> <p><i>Advanced Kinematic License</i> – For three and four axis robots.</p> <p><i>Complex Kinematic License</i> – For six and unusual geometry robots.</p> <p>(Custom or additional Kinematic modules available subject to an NRE charge).</p> <p><i>Conveyor Tracking Software License</i> – Allows controller to be integrated with conveyor belts and permits a robot to automatically adapt to varying belt speeds.</p> <p><i>Advanced Controls License</i> – Enables enhanced motion control modes including: high-speed position latching, real time trajectory modification, analog output controlled by robot speed, and support for EtherNet/IP.</p>
Operator interface	Web based operator interface supports local or remote control via a browser executed on a host computer or tablet that connects to an embedded web server.
Programming interface	Three methods available: DIO MotionBlocks (PLC), embedded Guidance Programming Language (standalone, modeled after Visual Basic.Net), PC controlled over Ethernet using TCP/IP
Machine vision (optional)	Provides controller with a complete set of image-processing, measurement, inspection and finder tools. A powerful, patented Object Locator finds parts in any orientation and at different scales within milliseconds.
Motion Control	
Motor Drives	<p>Up to four integrated motor drives compatible with a wide range of motors.</p> <p>10A option: 10A peak per channel, 5.5A RMS, 3.5A stall per channel.</p> <p>20A option: 20A peak per channel, 10A RMS, 6.5A stall per channel.</p> <p>30A option: 30A peak per channel, 15A RMS, 10A stall per channel.</p> <p>Four, two or no integrated drives can be provided with the controller.</p> <p>Maximum electrical power per motor: Amplifiers up to 30 amps peak at 320 VDC.</p> <p>Additional two 10A/20A drives (for a total of six drives) available via Guidance Slave Amplifiers.</p>
Position Sensor Interface	Four differential digital encoder interfaces and four configurable single-ended digital encoder interfaces. Support for selected absolute encoders (may require "enhanced" controller option). Support for analog incremental encoders with interpolation for increased resolution (requires "enhanced" controller option).
Control signals	Configurable limit stop, home, and hall-effect signals. Signal lines shared among several functions.
Brake signals	Up to 1A at 24V available for releasing motor brakes.
Single-Axis Slave Amplifiers (optional)	Multiple Guidance Slave Boards (GSBs) may be daisy-chained via RS-485 to control up to 200W low voltage servo motors equipped with incremental or absolute encoders.
3 rd party amplifiers (optional)	Four or six +/- 10VDC 16-bit DAC channels optionally available for controlling external amplifiers
Communication Interfaces	
General communications	RS-232 port with hardware flow control, two 10/100 Mbps Ethernet ports, remote front panel interface with second RS-232 port (no hardware flow control), compliant with IEC Category 3 safety standards.
Digital input channels	12 general purpose optically isolated inputs, configurable in groups of four as sinking or sourcing. 5 VDC to 24 VDC for logic high if sinking, 24 VDC supplied for logic high if sourcing. Additional remote I/O available via Precise RIO or compact GIO modules or 3 rd party MODBUS/TCP devices.
Digital output channels	8 general purpose optically isolated outputs, individually configurable as sinking or sourcing. 24 VDC maximum pull up if sinking. 24 VDC supplied if sourcing. 100 mA maximum per channel for channels 2-7, 500 mA maximum for channel 1. Additional remote I/O available via Precise RIO or compact GIO modules or 3 rd party MODBUS/TCP devices.
Analog I/O Channels	Four, two or no analog +/- 10 VDC 12-bit inputs. Six, four or no 16-bit analog outputs.
Multi-Drop Serial I/O	RS-485 multi-drop serial communications
Non-user accessible IO	I2C multi-drop serial communications available



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