



## Guidance™ 3000/2000 Motion/Vision/Drive System

*Precise Automation, Inc.*

The Precise Guidance™ 3000/2000 Series of Motion/Vision Controllers integrate motion control, drives, IO, network communications and machine vision in an extremely compact package that can be scaled to support up to 4 axes. The controller is based on a distributed architecture implemented over Ethernet. This permits multiple controllers to be networked together to control up to 32 axes. The result is a scalable architecture that allows drives to be placed at the point of use and can eliminate hundreds of wires and large, expensive controller cabinets.

These controllers provide the complete functionality necessary to control multi-axis, articulated machines in the electronics assembly, semiconductor, robotics, packaging, and material handling industries, at a fraction of the size and cost of current controllers.



### Features

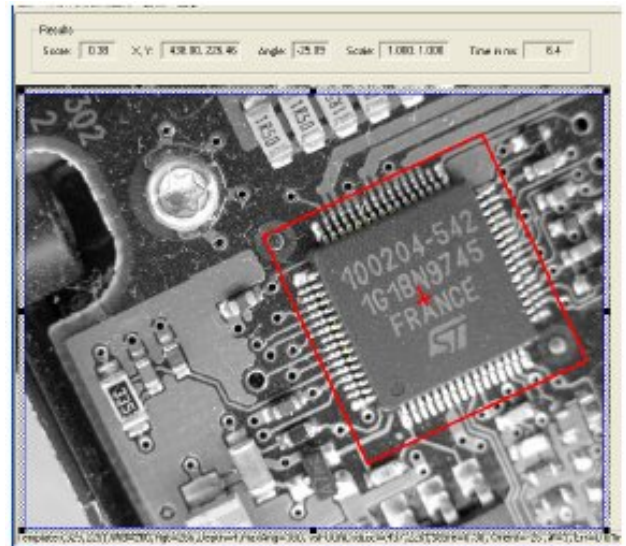
- Robotic machine controller
- Distributed Motion Architecture
- 1-4 integrated motor drives operated at 24VDC to 320VDC, up to 2 KW power
- Motion, I/O, Vision, Communications
- Web browser based GUI
- Standalone operation or PC controlled

### Target Mechanisms and Applications

- Articulated mechanisms with up to 32 axes where cost and space are critical
  - Controller with drives can be hidden in the structure of the machine
  - Uncompromising performance with high-level resident intelligence
  - Ideal for semiconductor wafer handling, material handling, packaging or assembly robots
- Semiconductor tools requiring integrated motion, vision and peripherals
- Packaging and material handling machines
- Custom X/Y/Z/θ mechanisms where reduced cost and simple wiring are important
- Vision guided motion control applications including conveyor belt tracking with optical parts finding
- General motion control applications including electronic gearing

## Scalable Motion Controller

- Single module contains up to 6 drives
  - Drive voltages from 24 VDC to 320 VDC, 5A continuous current, 10A peak
  - Supports absolute encoders and incremental encoders with analog interpolation for increased resolution
  - Controls AC, DC, linear, and induction motors
  - Multiple Series 3000 modules can be networked for high-speed remote coordinated motion
  - Guidance Series 3100 3KW single axis drives can be integrated with Series 3200, 3400, 3600 modules
- Extremely Compact – 4 axis controller in 80mm x 180mm x 70mm footprint
- Includes Category 3 safety circuits



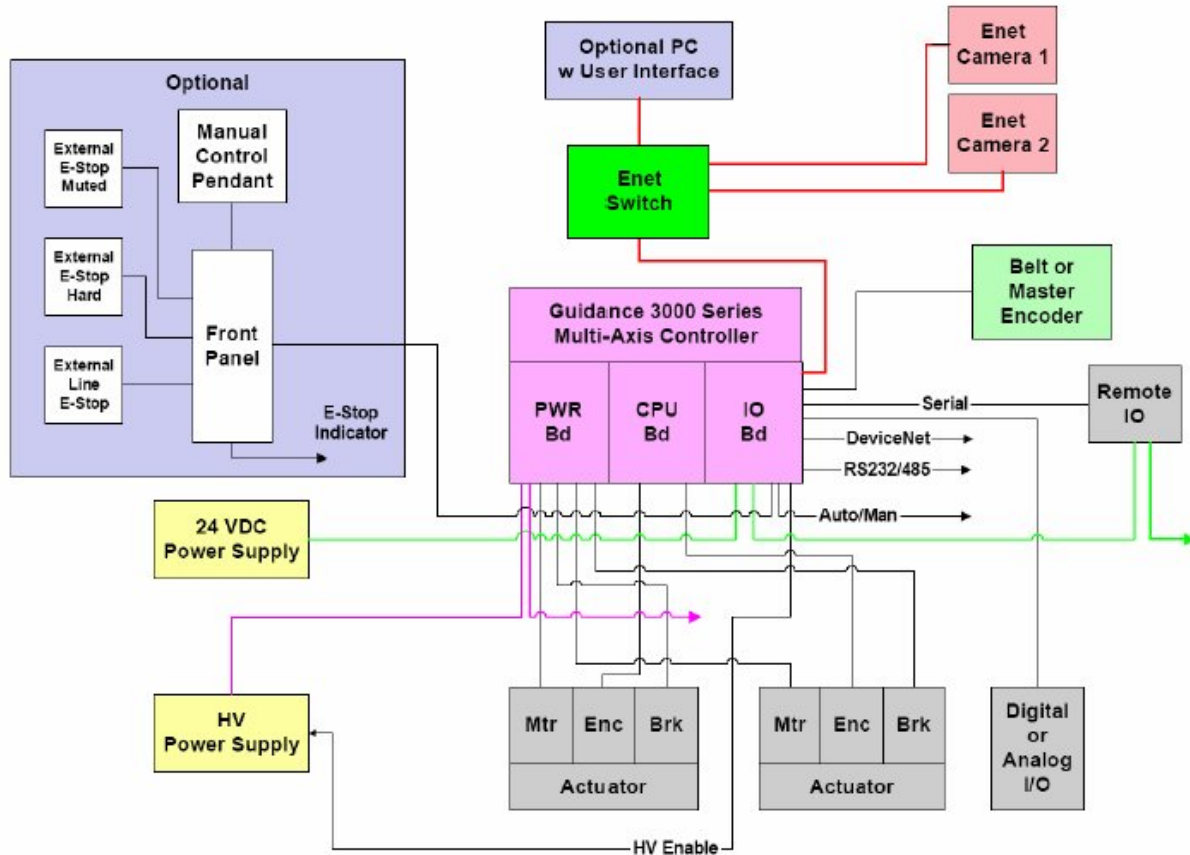
## Powerful Software

- Embedded Web Server provides local or remote user interface
- Multi-tasking operating system with 32 simultaneous tasks integrates I/O with motion
- Powerful on board programming language for embedded applications
  - Object oriented language with math functions, data objects and control structures based on Visual Basic .NET syntax
  - Motion features: continuous path, vision guidance, pallet coordinates, conveyor tracking, velocity control, s-curve profiling, real-time path generation
  - Kinematics Library allows Cartesian control of complex machines, including articulated, parallel, and redundant axes robots
  - Machine calibration for improved accuracy
- PC Integration for PC system applications
  - ActiveX support and Ethernet allow high speed integration with PC environment
  - Application programs can be written in any standard PC language such as Visual Basic .NET, C#, etc.
- RS-232 for simple serial interfaces
- 10/100 Mbit Ethernet with TCP/IP for ease of integration to PC's and other equipment
- Digital and analog I/O control
  - Base system includes 12 digital inputs and 8 digital outputs, 2 analog inputs, PWM output on digital outputs for pseudo analog output
  - I/O can be expanded through DeviceNet, CANopen, additional I/O expansion modules
  - 2 high-speed position latches with 1µsec response

## PreciseVision Machine Vision Option

- Can run in motion controller or PC
- Complete set of image-processing, measurement, inspection and finder tools: convolutions, morphologic operators, projections, caliper, line and arc finders, blob finder, pixel counter, correlator, etc.
- Powerful patented Object Locator finds gray-scale patterns in any orientation and at different scales in milliseconds
- Supports flexible part feeding, vision guidance of machines
- Vision-motion integration allows flyover image capture with strobe and position latch

# Guidance 3000 Motion/Vision System Controller



## Configurations

Model 3200 – 2 axis controller  
 Model 3400 – 4 axis controller  
 Model 3600 – 6 axis controller

## Dimensions

80mm x 200mm x 70mm  
 80mm x 200mm x 70mm  
 120mm x 200mm x 100mm

## Rated Power

1.5 KW  
 2 KW  
 3 KW

## Planned Options

HVDC Power Supply -- 90-240VAC single phase input  
 Front Panel with CE Category 3 safety interlocks  
 Remote DIO Expansion Module  
 Manual Control Pendant

## Agency Certifications (planned)

TUV  
 UL  
 CSA  
 ANSI/RIA R15.06 Safety Standard

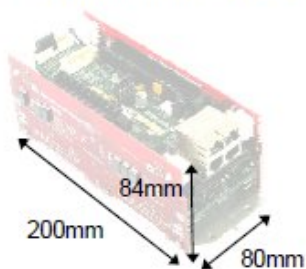
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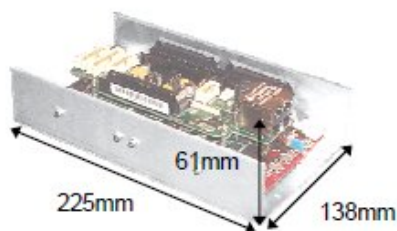
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	<i><b>GUIDANCE 3000A SERIES</b></i>	<i><b>GUIDANCE 2000B SERIES</b></i>	<i><b>GUIDANCE 2000C SERIES</b></i>
Motor Drives	Up to four integrated motor drives, bus voltage 24VDC to 340VDC, up to 30A peak/15A RMS/10A stall per motor	Up to four integrated motor drives, bus voltage 24VDC to 340VDC, up to 20A peak/9.5A RMS/6.5A stall per motor	Up to four integrated motor drives, bus voltage 24VDC to 340VDC, up to 20A peak/9.5A RMS/6.5A stall per motor
Four or six +/- 10VDC 16-bit DAC channels optionally available for controlling external amplifiers	Yes	Yes	No
Optional support for analog incremental encoders with interpolation for increased resolution	Yes	Yes	No
10/100 Mbps Ethernet ports	4	4	2
2 or 4 analog +/- 10VDC 12-bit input I/O channels. 4 or 6 analog outputs optionally available	Yes	Yes	No
I2C multi-drop serial communications	Yes	Yes	No

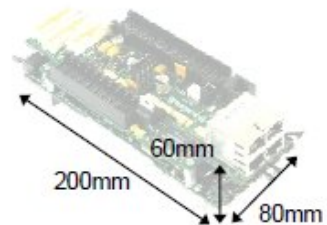
Guidance 3000 Series



Guidance 2000 Series



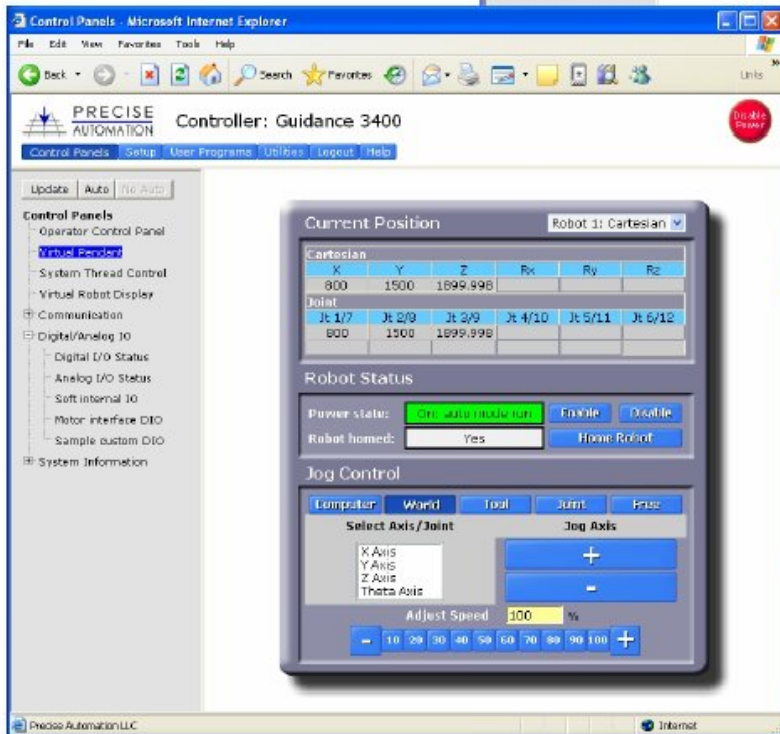
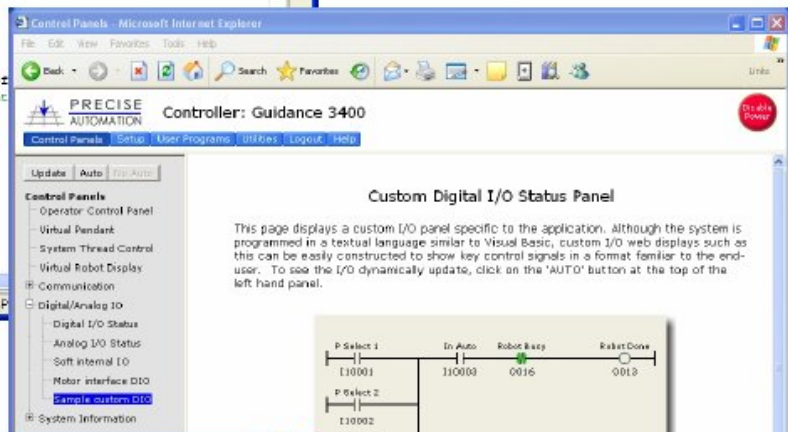
Guidance 0006/0004



## Sample Web Browser and Editor Screen Shots

```

1: #Region " Main Robot Application "
2:
3: ' <summary>
4: ' Example robot pick and place
5: ' </summary>
6: Sub subMain()
7:
8:     ' create application objects
9:     Dim pick as New GPL.MotionBlock
10:    Dim place as New GPL.MotionBlock
11:    Dim motion as New GPL.Move
12:
13:    ' set up pickup point
14:    pick.DestinationTrans = New GPL.Transform(10,10,100)
15:    pick.Zplane = 200 ' height robot moves above destination
16:    pick.MotionSpeed = 50 ' set accel and decel profile
17:
18:    ' move to pickup point
19:    motion.MoveTo(pick)
20:
21:    ' set up place point
22:    place.DestinationTrans = New GPL.Transform(10,10,100)
23:    place.Zplane = 200 ' height
24:    place.MotionSpeed = 50
25:    place.MotionAccel = 20
26:
27:    ' move to place point
28:    motion.MoveTo(place)
29:
30: End Sub
31:
32: #End Region
  
```



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