# Motion & Servo Controller
# Automation1 iXI4


## Phenomenal Control Power

Take full control of your machine or motion system with the Automation1-iXI4 motion and servo controller. The iXI4 can concurrently control up to four servo control loops and run the complete Automation1-iSMC intelligent software-based motion controller. Designed to control analog transconductance amplifiers, the iXI4 can apply servo control to any motion control driver with an analog input control option. Add industrial Ethernet support via the iSMC configuration to enable additional I/O via the device's standard industrial Ethernet ports.

Each axis of control includes encoder and axis feedback signals and an independent 20 kHz servo control loop.

## Automation1

The iXI4 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:

- Unlocks the full **MOTION CONTROL** power of our Automation1-iSMC intelligent software-based motion controller
- Features **COMPLETE CONFIGURATION & PERFORMANCE** capability of the XI4 servo controller
- **ELIMINATES THE PC** from your control scheme
- Enables up to **12 AXES OF CONTROL** when more Automation1 drives are connected over the HyperWire fiber-optic bus
- Includes up to four **SINGLE CONNECTOR** axis interface connectors
- Features up to four axes of **20 kHz CLOSED-LOOP SERVO** control

## AUTOMATION1 iXI4 CONTROLLER SPECIFICATIONS

| SPECIFICATION | DESCRIPTION |
|---|---|
| **Motion Controller**[1] | Aerotech's Automation1-iSMC Intelligent Software-Based Motion Controller (version 2.2 and above) |
| **Maximum Axes of Control**[1] | Up to 12 axes |
| **I/O Points**[1] | See "Digital I/O Connector" specifications below. Note: Controller can control I/O from connected devices. |
| **Programming Language**[1] | AeroScript, RS-274 G-code |
| **APIs**[1] | • .NET (cross-platform Linux support)<br>• C (cross-platform Linux support)<br>• EPICS (cross-platform Linux support) see EPICS.anl.gov |
| **Programming Tasks**[1] | 4 user tasks (standard) / 9 user tasks (optional)<br>1 reserved task |
| **Position Modes** | Absolute, incremental, dynamic trajectory correction |
| **Motion Types**[1] | • Linear motion<br>• Clockwise & counterclockwise<br>• Jogging<br>• Homing<br>• Rapid<br>• Freerun<br>• Many more |
| **Acceleration Profiles** | • Linear (time & rate based)<br>• Sine (time & rate based)<br>• S-curve (time & rate based) |
| **Velocity Profiling**[1] | Yes |
| **Safe Zones**[1] | Yes |
| **Advanced Features**[1] | • Corner rounding<br>• Tool normalcy control<br>• Cutter compensation<br>• Programmable fixture offsets[2]<br>• Rotation, mirroring & translation transformations<br>• Part profile scaling<br>• Polar & cylindrical transformations[2]<br>• Orthogonality correction<br>• Electronic gearing<br>• EasyTune® & classical tuning<br>• Backlash compensation<br>• Spindle motion<br>• High-speed registration<br>• Multi-dimensional error mapping |
| **Access Control** | No |
| **Controller File System** | Yes (5 GB) |
| **Supported HyperWire Drives** | • Automation1-XC6e[3][4]<br>• Automation1-XC4e[3][4]<br>• Automation1-XC2e[3][4]<br>• Automation1-XC4[3][4]<br>• Automation1-XC2[3][4]<br>• Automation1-XR3[3]<br>• Automation1-XL5e[3][4]<br>• Automation1-XL2e[3][4]<br>• Automation1-SI4[3]<br>• Automation1-XI4[3] |
| **Communication/ Configuration Connection** | • Ethernet<br>• USB |

Note:
1. See the Automation1-iSMC controller page for more information.
2. May require advanced programming.
3. Contains I/O on base drive.
4. Drive I/O expansion board option available.

## AUTOMATION1 iXI4 GENERAL SPECIFICATIONS

| CATEGORY | SPECIFICATION |
|---|---|
| **HyperWire Communication** | 1x HyperWire small form-factor pluggable (SFP) ports |
| **Control Output**[1] | Supports two or four axes of current command (±10 V) or clock & direction control |
| **Control Supply** | Voltage: 24 VDC<br>Current, one-axis unit: 2 A max, 0.45 A typical<br>Current, four-axis unit 2 A max, 0.6 A typical |
| **User Power Supply Output** | 5 VDC |
| **Modes of Operation** | Open loop<br>Closed loop |
| **Protective Features** | Output short circuit<br>Control power supply undervoltage |
| **Position Synchronized Output (PSO)** | Standard:<br>One-axis PSO (includes one-axis part-speed PSO)<br><br>Optional:<br>Two-axis PSO (includes two-axis part-speed PSO)<br>Three-axis PSO (includes three-axis part-speed PSO)<br>Three-axis part-speed PSO only |
| **25-Pin Axis Connector** | Servo current commands / stepper clock & direction output<br>High-speed differential inputs (encoder sin, cos & marker)<br>Absolute encoder interface (support optional)<br>CW & CCW limits<br>5 VDC power supply<br>Amplifier enable & fault |
| **Multiplier Options** | MX0 Option:<br>Primary Encoder: 40 million counts-per-second square-wave input<br>Auxiliary Encoder: 40 million counts-per-second square-wave input<br><br>MX1 Option:<br>Primary Encoder: 450 kHz sine-wave input, encoder multiplier up to x4,096*<br>Auxiliary Encoder: 40 million counts per second square-wave input<br><br>*Encoders multiplied with this input cannot be echoed out |
| **Digital I/O Connector** | 8x optically isolated digital inputs (externally powered, 5-24 VDC)<br>8x optically isolated digital outputs (externally powered, 5-24 VDC)<br>1x optically isolated high-speed input<br>1x PSO TTL output<br>1x 5 VDC power supply |
| **Drive Array Memory** | 67.1 MB (16,777,216 32-bit elements) |
| **High Speed Data Capture** | Yes (50 ns latency) |
| **Automatic Brake Control** | Assignable digital output |
| **E-Stop Sense Input** | Assignable digital input |
| **Absolute Encoder (Optional)** | BiSS C unidirectional; EnDat 2.1; EnDat 2.2 |
| **Position Command Update Rate** | 20 kHz |
| **Operating Temperature** | 0 to 40 °C |
| **Storage Temperature** | -30 to 85 °C |
| **Weight** | 0.59 kg (1.30 lb) |
| **Compliance** | CE approved, follows EU 2015/863 RoHS 3 directive |

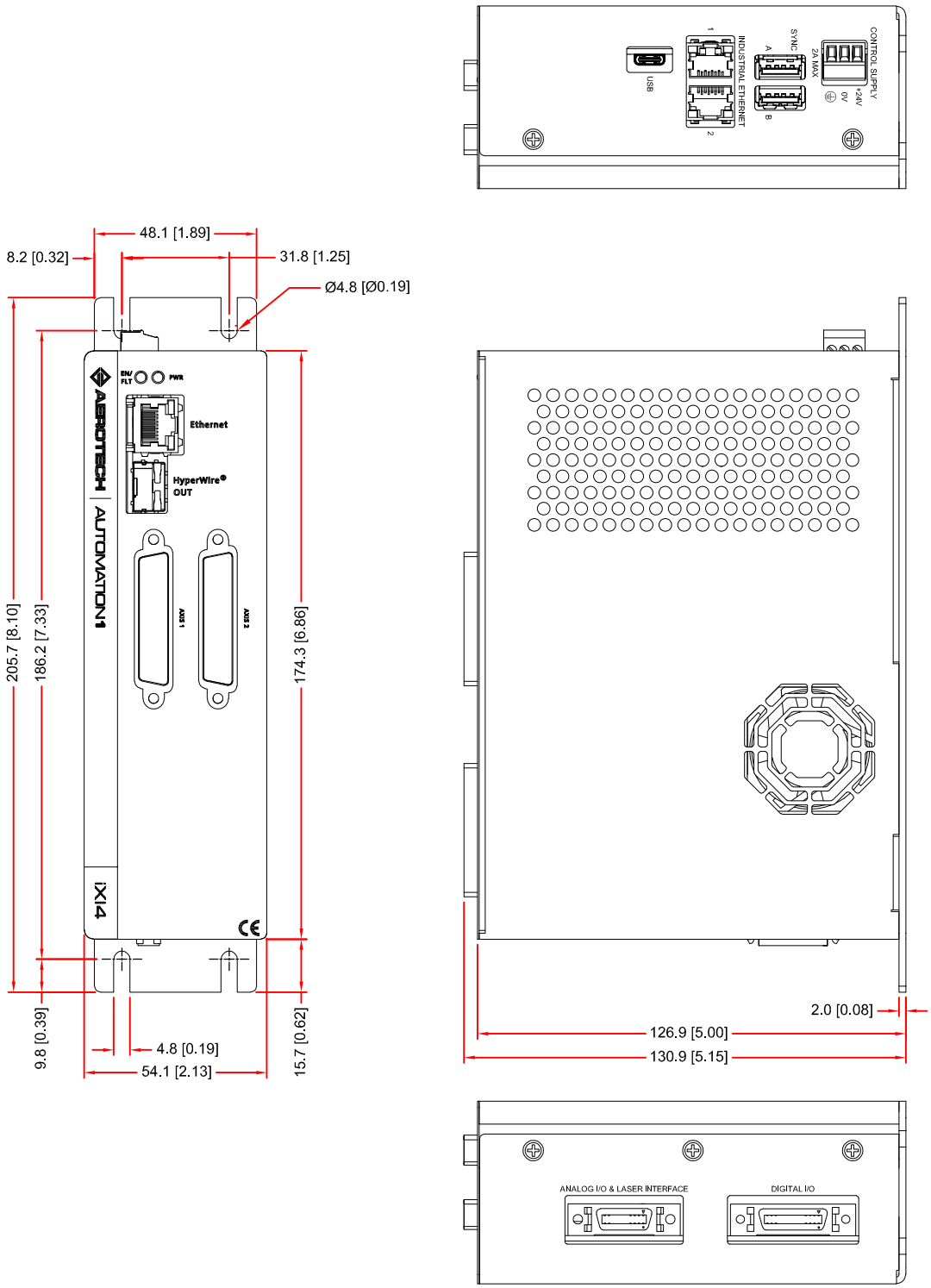
1. Single or two-phase current command output signals are available.

## AUTOMATION1 iXI4 ORDERING OPTIONS

| | |
|---|---|
| **Automation1-iXI4** | |
| **Automation1-iXI4** | Automation1-iXI4 Motion and Servo Controller |
| **Configuration** | |
| **-2P1** | Two axes of control, standard packaging |
| **-2P2** | Two axes of control, OEM packaging |
| **-4P1** | Four axes of control, standard packaging |
| **-4P2** | Four axes of control, OEM packaging |
| **Multiplier** | |
| **-MX0** | No Encoder Multiplier (default) |
| **-MX1** | x4096 Multiplier (Primary), No Multiplier (Auxiliary) |
| **Absolute Encoder** | |
| **-A0** | No absolute encoder support (default) |
| **-A1** | Absolute encoder support |
| **PSO** | |
| **-PSO1** | One-axis PSO (includes one-axis part-speed PSO) (default) |
| **-PSO2** | Two-axis PSO (includes two-axis part-speed PSO) |
| **-PSO3** | Three-axis PSO (includes three-axis part-speed PSO) |
| **-PSO6** | Three-axis part-speed PSO |

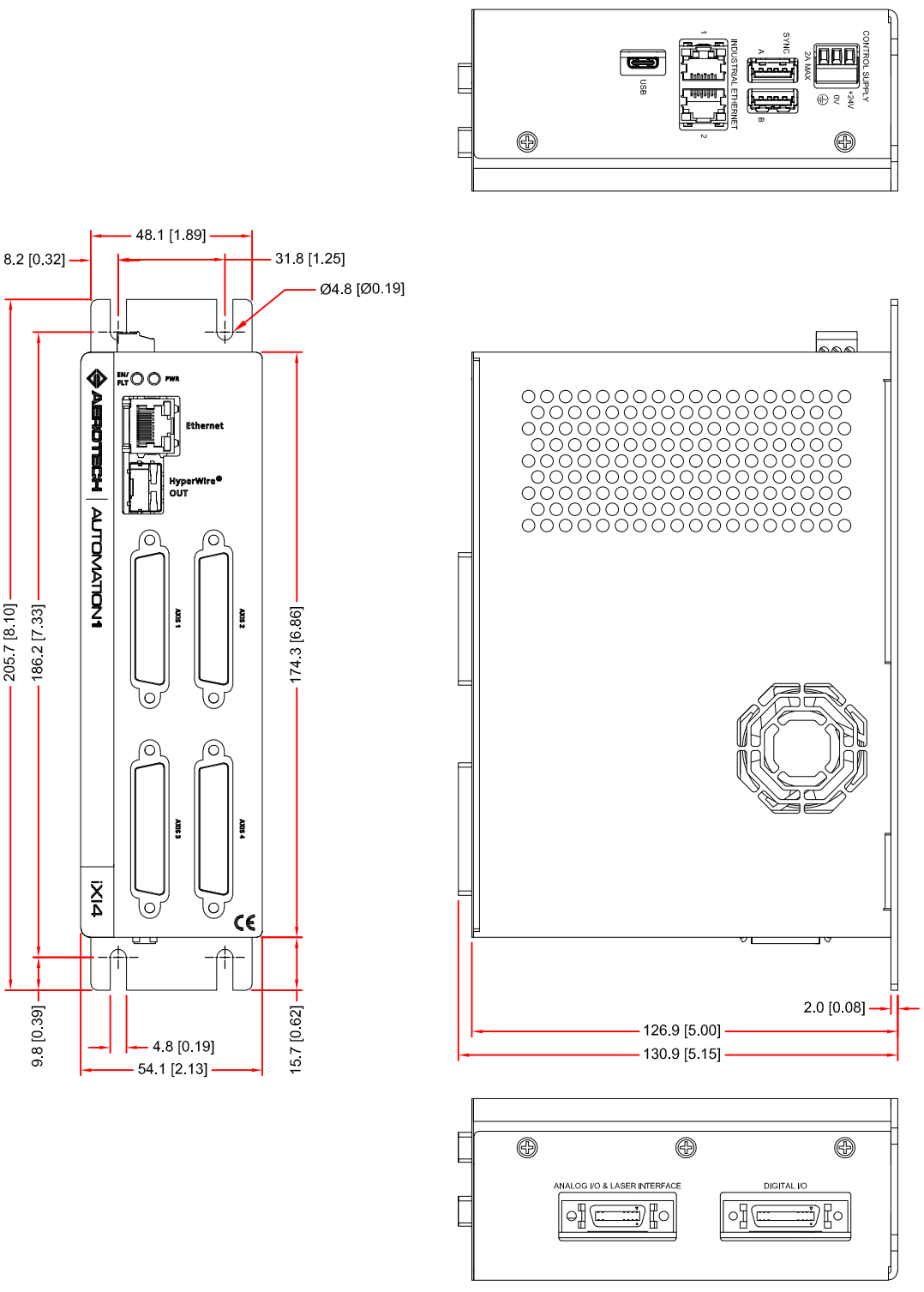
## AUTOMATION1 iXI4 DIMENSIONS

AUTOMATION1-iXI4-2P1



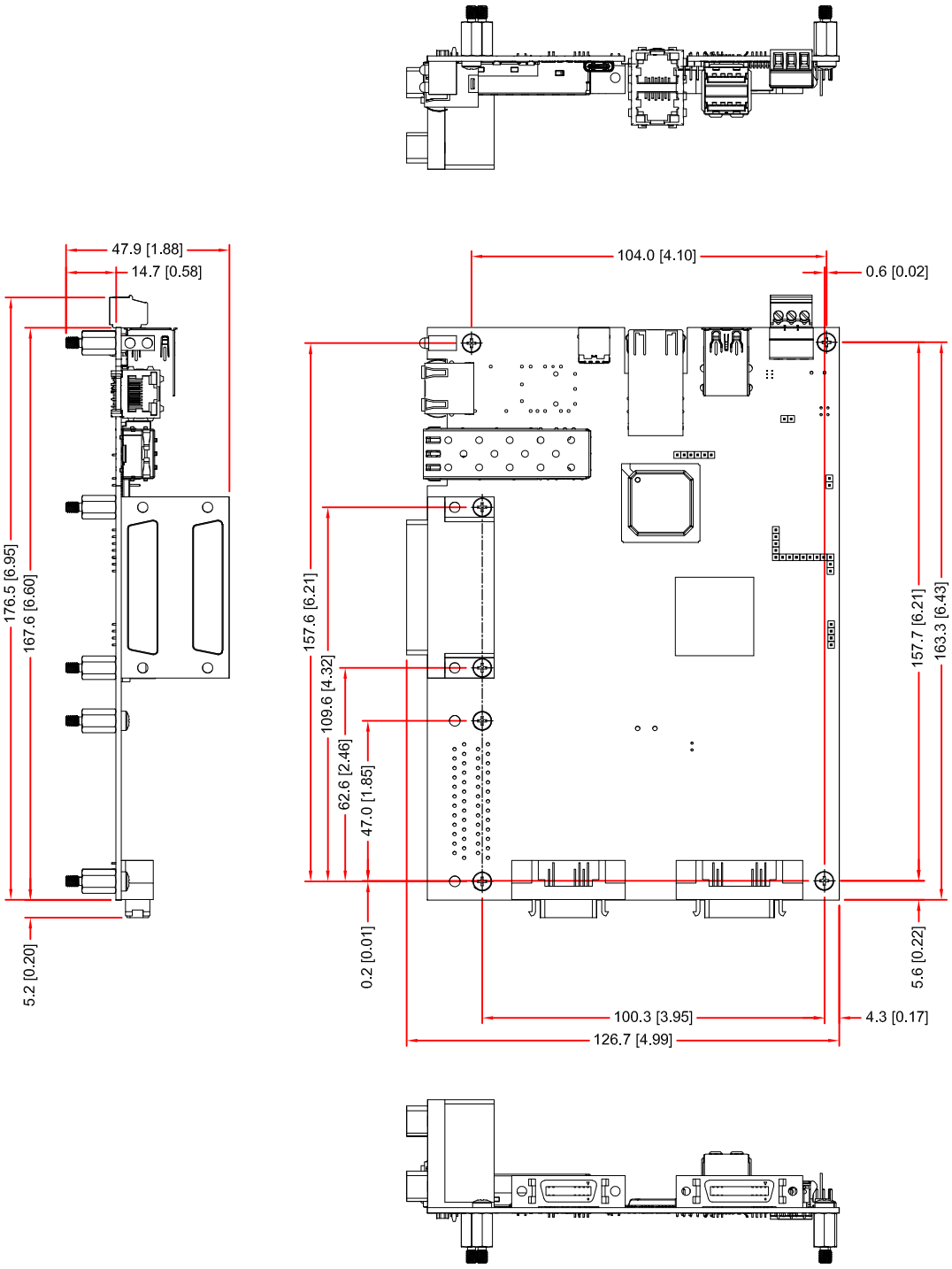
## AUTOMATION1 iXI4 DIMENSIONS

AUTOMATION1-iXI4-4P1



## AUTOMATION1 iXI4 DIMENSIONS

AUTOMATION1-iXI4-2P2



## AUTOMATION1 iXI4 DIMENSIONS

AUTOMATION1-iXI4-4P2