

AEROTECH AUTOMATION1

1- or 2-Axis PWM Servo Drive with Motion Controller **Automation1 iXA4**

Take Control of Your Motion

Take full control of your industrial and research systems with the iXA4 PWM Servo Drive with HyperWire Motion Controller—the most user-friendly and complete Automation1 solution for motion system control. Build more cost-effective and compact motion systems faster using this streamlined multi-axis hardware design with embedded controller.

The iXA4 brings Automation1's precision to multiple axes of motion, reduces machine footprint and eliminates the need for an industrial PC. Control 12 HyperWire® axes of motion and run up to nine user tasks on the embedded Automation1 controller. As a drive, the iXA4 supports multiple feedback device types and includes on-board memory for high-speed data capture and process control.

Automation1

The iXA4 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:

- ◆ Full **iSMC MOTION CONTROLLER**
- ◆ Connects to other **HYPERWIRE DRIVES**
- ◆ **COMPACT TWO-AXIS** design
- ◆ Available **SINGLE-AXIS** version
- ◆ **AC MOTOR SUPPLY** for up to 340 VDC bus power
- ◆ **ALL AXES' SIGNALS** included in the feedback connector
- ◆ **MINIMIZES PANEL SPACE** for multi-axis systems
- ◆ **SAFE TORQUE OFF (STO)** standard; **POSITION SYNCHRONIZED OUTPUT (PSO)** available

AUTOMATION1 iXA4 CONTROLLER SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Motion Controller⁽¹⁾	Aerotech's Automation1-iSMC Intelligent Software-Based Motion Controller (version 2.7 & above)
Maximum Axes of Control⁽¹⁾	Up to 12 axes
I/O Points⁽¹⁾	See General Specifications below. Note: Controller can control I/O from connected devices.
Programming Language⁽¹⁾	AeroScript, RS-274 G-code
APIs⁽¹⁾	<ul style="list-style-type: none"> • .NET (cross-platform Linux support) • C (cross-platform Linux support) • Python (cross-platform Linux support) • LabVIEW • EPICS (cross-platform Linux support) see EPICS & TANGO Drivers – Aerotech US • TANGO; see EPICS & TANGO Drivers – Aerotech US
Programming Tasks⁽¹⁾	4 user tasks (standard) / 9 user tasks (optional) 1 reserved task
Position Modes	Absolute, incremental, dynamic trajectory correction
Motion Types⁽¹⁾	<ul style="list-style-type: none"> <li style="width: 50%;">• Linear motion <li style="width: 50%;">• Rapid <li style="width: 50%;">• Clockwise & counterclockwise <li style="width: 50%;">• Freerun <li style="width: 50%;">• Jogging <li style="width: 50%;">• Many more <li style="width: 50%;">• Homing
Acceleration Profiles	<ul style="list-style-type: none"> • Linear (time & rate based) • Sine (time & rate based) • S-curve (time & rate based)
Velocity Profiling⁽¹⁾	Yes
Safe Zones⁽¹⁾	Yes
Advanced Features⁽¹⁾	<ul style="list-style-type: none"> <li style="width: 50%;">• Corner rounding <li style="width: 50%;">• Orthogonality correction <li style="width: 50%;">• Tool normalcy control <li style="width: 50%;">• Electronic gearing <li style="width: 50%;">• Cutter compensation <li style="width: 50%;">• EasyTune® & classical tuning <li style="width: 50%;">• Programmable fixture offsets⁽²⁾ <li style="width: 50%;">• Backlash compensation <li style="width: 50%;">• Rotation, mirroring & translation transformations <li style="width: 50%;">• Spindle motion <li style="width: 50%;">• Part profile scaling <li style="width: 50%;">• High-speed registration <li style="width: 50%;">• Polar & cylindrical transformations⁽²⁾ <li style="width: 50%;">• Multi-dimensional error mapping
Access Control	No
Controller File System	Yes (5 GB)
Supported HyperWire Drives	<ul style="list-style-type: none"> <li style="width: 50%;">• Automation1-XC6e⁽³⁾⁽⁴⁾ <li style="width: 50%;">• Automation1-XR3⁽³⁾ <li style="width: 50%;">• Automation1-XC4e⁽³⁾⁽⁴⁾ <li style="width: 50%;">• Automation1-XL5e⁽³⁾⁽⁴⁾ <li style="width: 50%;">• Automation1-XC2e⁽⁴⁾ <li style="width: 50%;">• Automation1-XL2e⁽⁴⁾ <li style="width: 50%;">• Automation1-XC4⁽³⁾⁽⁴⁾ <li style="width: 50%;">• Automation1-SI4⁽³⁾ <li style="width: 50%;">• Automation1-XC2⁽⁴⁾ <li style="width: 50%;">• Automation1-XI4⁽³⁾ <li style="width: 50%;">• Automation1-XA4⁽³⁾⁽⁴⁾
Industrial Ethernet Communication⁽⁵⁾	EtherCAT (optional, requires Automation1-iSMC, -IE2 option) Modbus (standard, 1 server, 1 client connection; optional, up to 16 client connections with Automation1-iSMC, -CP1 option)
Ethernet Communication⁽⁶⁾	Socket (standard, TCP client and TCP server)
Communication/ Configuration Connection	<ul style="list-style-type: none"> • Ethernet • USB

Notes:

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.
5. Modbus and EtherCAT cannot be used concurrently. Requires the -IE1 configuration option.
6. Socket interface can be used concurrently with industrial ethernet.

AUTOMATION1 iXA4 GENERAL SPECIFICATIONS

CATEGORY	iXA4-AX1-10	iXA4-AX1-20	iXA4-AX2-10	iXA4-AX2-20
Number of Axes	1		2	
Motor Style	Brush, brushless, voice coil, stepper ⁽¹⁾			
Motor Supply	Single-phase 0-240 VAC; 50/60 Hz			
Control Supply	24 VDC			
Bus Voltage⁽²⁾	0-340 VDC			
Peak Output Current (1 sec)⁽³⁾⁽⁴⁾	10 A _{pk}	20 A _{pk}	10 A _{pk}	20 A _{pk}
Continuous Output Current⁽³⁾⁽⁵⁾	5 A	10 A	5 A	5 A
Position Synchronized Output (PSO)	Standard • No PSO Support Optional: • Three-axis part-speed PSO. (Includes One-axis PSO)			
25-Pin Motor Feedback Connector	High-speed differential inputs (encoder sin, cos and marker) CW and CCW limits Hall effect sensor inputs (A, B and C) Analog motor temperature input (accepts digital) Brake output			
Multiplier Options	• MX0 option Primary encoder (axis 1): 40 million counts per second square-wave input		• MX0 option Primary encoder (axes 1 and 2): 40 million counts per second square-wave input • MX1 option Primary encoder (axes 1 and 2): 450 kHz sine-wave input, encoder multiplier up to 4,096	
Drive Array Memory	16.8 MB (4,194,304 32-bit elements)			
High Speed Data Capture	Yes (50 ns latency)			
Safe Torque Off (STO)	Yes, SIL3/PLe/Cat 4 (certification pending)			
HyperWire Connections	1x HyperWire small form-factor pluggable (SFP) ports			
Automatic Brake Control	Standard (24 V at 1.0 A), axis 1		Standard (24 V at 1.0 A), axes 1 and 2	
Absolute Encoder	BiSS C Unidirectional; EnDat 2.1; EnDat 2.2; SSI			
Current Loop Update Rate	20 kHz			
Servo Loop Update Rate	10 kHz			
Operating Temperature	0 to 40 °C			
Storage Temperature	-30 to 85 °C			
Weight	1 kg (2.2 lb)			
Compliance	CE approved, NRTL safety certification, EU 2015/863 RoHS 3 directive			

1. For stepper motors only, one-half of bus voltage is applied across the motor (e.g 80 VDC supply results in 40 VDC across stepper motor).
2. Output voltage depends on input voltage.
3. Peak value of the sine wave; rms current for AC motors is 0.707 A_{pk}.
4. This specification is for both axes combined.
5. This specification is per axis.

AUTOMATION1 iXA4 ORDERING OPTIONS

Automation1-iXA4

Automation1-iXA4 1- or 2- Axis PWM Servo Drive with Motion Controller

Motor Supply Voltage

-AC 240 VAC Rated Motor Supply (10 or 20 A Peak Versions)

Axes

-AX1 Single-axis servo motor drive

-AX2 Two-axis servo motor drive

Current, Axes 1 & 2*

-10 10 A Peak, 5 A Cont. Current (default)

-20 20 A Peak, 10 A Cont. Current

**Note: When configured with -AX2, axes 1 and 2 are configured with the same current ratings.*

Multiplier, Axes 1 & 2

-MX0 No Encoder Multiplier (default)

-MX1* x4096 Encoder Multiplier

**Note: MX1 multiplier is only available when configured with -AX2, and applies to both axes.*

Industrial Ethernet

-IE0 Does not include industrial Ethernet ports

-IE1* Includes industrial Ethernet ports

**Note: When configured with -AX2, industrial ethernet port option -IE1 must be selected.*

PSO

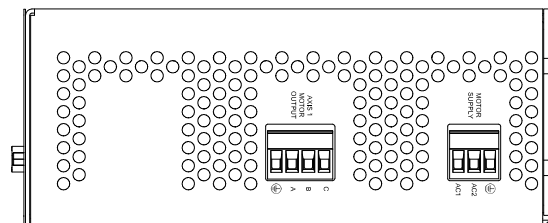
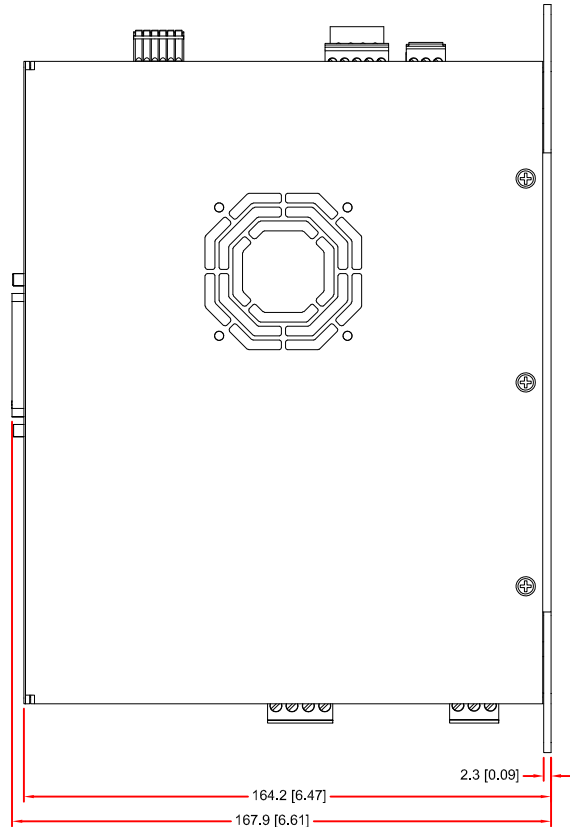
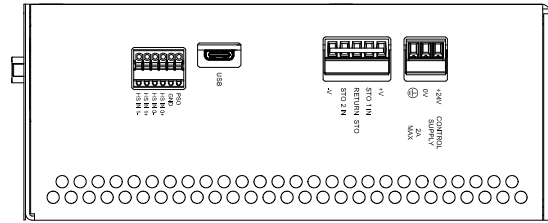
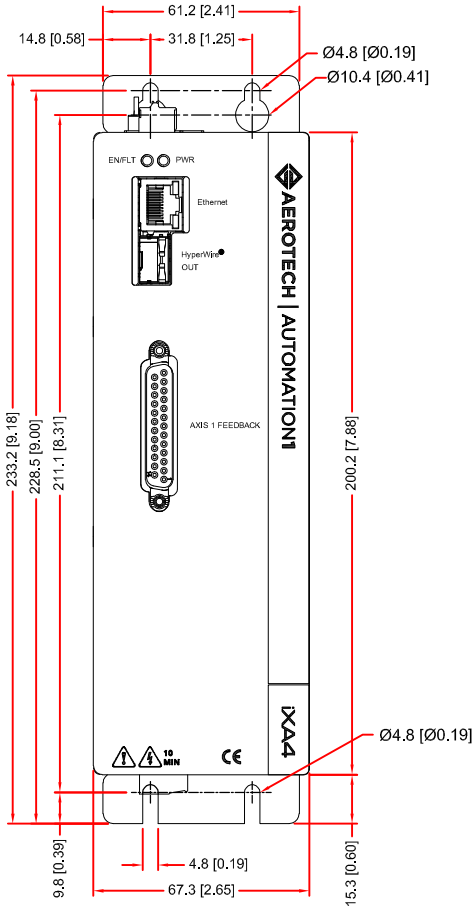
-PSO0 No PSO firing (default)

-PSO6 Three-axis Part-Speed PSO



AUTOMATION1 iXA4 DIMENSIONS

AUTOMATION1-iXA4-AC-AX1 WITH -IE0 OPTION



AUTOMATION1 iXA4 DIMENSIONS

AUTOMATION1-iXA4-AC-AX1 WITH -IE1 OPTION

