PWM Servo Drive with
Motion Controller

Automation1 iXC2

Compact PWM Drive & Full Motion Controller

Our compact Automation1 iXC2 PWM servo motor drive with integrated motion controller is two solutions in one: it's capable of complete machine control and provides sub-nanometer levels of position control to linear or rotary servo motors, voice coil motors, stepper motors or any precision linear or rotary stage driven by one of these motor types. The powerful Automation1-iSMC motion controller is loaded directly onto the same hardware that runs the drive, which in turn manages the trajectory of up to 12 axes of control over the HyperWire motion bus.

Automation1

The iXC2 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 XC2 PWM servo drive
- Includes local drive with **100 VDC BUS** motor power & up to **10 AMPS PEAK** output.
- **ELIMINATES THE PC** from your control scheme
- Allows for up to **12 AXES OF CONTROL** when more Automation1 drives are connected over the HyperWire fiber-optic bus
- Includes **SAFE TORQUE OFF (STO)** functional safety

AUTOMATION1 iXC2 CONTROLLER SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Motion Controller[1]	Aerotech's Automation1-iSMC Intelligent Software-Based Motion Controller (version 2.2 & above)
Maximum Axes of Control[1]	Up to 12 axes
I/O Points[1]	See "I/O Expansion Board (-EB1)" 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) • C (cross-platform Linux support) • Python (cross-platform Linux support) • EPICS (cross-platform Linux support) see EPICS.anl.gov
Programming Tasks[1]	4 user tasks (standard) / 9 user tasks (optional) 1 reserved task
Position Modes	Absolute, incremental, dynamic trajectory correction
Motion Types[1]	• Linear motion • Clockwise & counterclockwise • Jogging • Homing • Rapid • Freerun • Many more
Acceleration Profiles	• Linear (time & rate based) • Sine (time & rate based) • S-curve (time & rate based)
Velocity Profiling[1]	Yes
Safe Zones[1]	Yes
Advanced Features[1]	• Corner rounding • Tool normalcy control • Cutter compensation • Programmable fixture offsets[2] • Rotation, mirroring & translation transformations • Part profile scaling • Polar & cylindrical transformations[2] • Orthogonality correction • Electronic gearing • EasyTune® & classical tuning • Backlash compensation • Spindle motion • High-speed registration • Multi-dimensional error mapping
Access Control	No
Controller File System	Yes (5 GB)
Supported HyperWire Drives	• Automation1-XC6e[3][4] • Automation1-XC4e[3][4] • Automation1-XC2e[3][4] • Automation1-XC4[3][4] • Automation1-XC2[3][4] • Automation1-XR3[3] • Automation1-XL5e[3][4] • Automation1-XL2e[3][4] • Automation1-SI4[3] • Automation1-XI4[3]
Industrial Ethernet Communication	EtherCAT (Optional)
Communication/Configuration Connection	• Ethernet • 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 iXC2 GENERAL SPECIFICATIONS

CATEGORY	SPECIFICATION
Motor Style	Brush, brushless, voice coil, stepper[1]
Control Supply	24 VDC
Motor Supply	15-100 VDC
Bus Voltage[2]	15-100 VDC
PWM Frequency	20 kHz
Peak Output Current (1 sec)[3]	10 A_{pk}
Continuous Output Current[3]	5 A
Position Synchronized Output (PSO)	One-axis PSO (includes one-axis Part-Speed PSO)* *Requires adding an expansion board to the drive to output PSO pulses via a physical connection.
25-Pin Motor Feedback Connector	High-speed differential inputs (encoder sin, cos & marker) CW & CCW limits Hall effect sensor inputs (A, B & C) Analog motor temperature input (accepts digital) Brake output
Multiplier Options	MX0 option: Primary encoder: 40 million counts per second square-wave input Auxiliary encoder: 40 million counts per second square-wave input MX1 option: Primary encoder: 200 kHz sine-wave input, encoder multiplier up to x16,3844* Auxiliary encoder: 40 million counts per second square-wave input *Encoders multiplied with this input cannot be echoed out
I/O Expansion Board (-EB1)	• PSO output connector with up to 12.5 MHz output rate • Auxiliary Encoder Port • 1x 16-bit differential, ±10 V analog input • 1x 16-bit single-ended, ±10 V analog input • 8x optically isolated digital inputs • 8x optically isolated digital outputs
I/O Expansion Board (-EB2)	• PSO output connector with up to 12.5 MHz output rate • Auxiliary Encoder Port • 2x Industrial Ethernet Ports
Drive Array Memory	16.7 MB (4,194,304 32-bit elements)
High Speed Data Capture	Yes (50 ns latency)
Safe Torque Off (STO)	Yes (SIL3/PLe/Cat 4)
HyperWire Connections	1x HyperWire small form-factor pluggable (SFP) port
Automatic Brake Control	Standard (24 V at 0.5 A)
Absolute Encoder	Renishaw Resolute BiSS; EnDat 2.1; EnDat 2.2, SSI

Chart continued on next page

AUTOMATION1 iXC2 GENERAL SPECIFICATIONS

CATEGORY	SPECIFICATION
Current Loop Update Rate	20 kHz
Servo Loop Update Rate	20 kHz
Power Amplifier Bandwidth	2500 Hz maximum (software selectable)
Power Amplifier Efficiency	85-95%(4)
Minimum Load Inductance	0.1 mH
Operating Temperature	0 to 40 °C
Storage Temperature	-30 to 85 °C
Weight	0.54 kg (1.20 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 dependent upon input voltage.
3. Peak value of the sine wave; RMS current for AC motors is 0.707 A_{pk}.
4. Dependent on total output power: efficiency increases with increasing output power.

AUTOMATION1 iXC2 ORDERING OPTIONS

Automation1-iXC2	
Automation1-iXC2	Automation1-iXC2 - Compact PWM Servo Drive with Motion Controller
Peak Current	
-10	10 A peak, 5 A cont. current (default)
Expansion Board	
-EB0	No expansion board (default)
-EB1	Expansion board with analog/digital I/O
-EB2	Expansion board with industrial Ethernet ports
Multiplier	
-MX0	No encoder multiplier (default)
-MX1	x16384 multiplier (primary), no multiplier (auxiliary)
PSO[1,2]	
-PSO1	One-axis PSO (includes one-axis Part-Speed PSO) (default)

1. PSO functionality is included in the base iXC2. The -EB1 board is required to use PSO logic to generate an output signal.

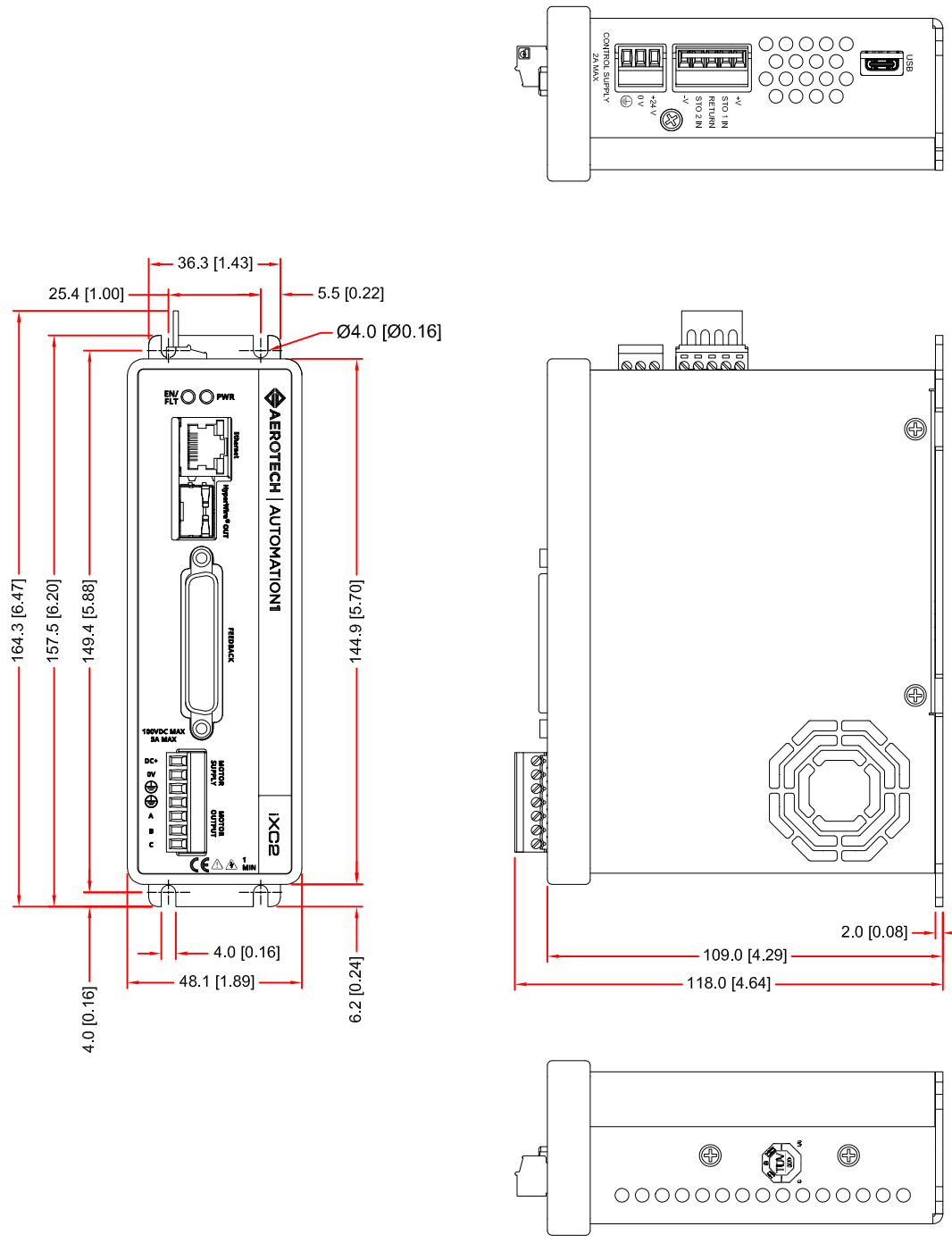
2. Encoder feedback-based PSO requires the -MX0 multiplier option.

AUTOMATION1 PS2 DIN RAIL POWER SUPPLY ORDERING OPTIONS

Automation1-PS2	
Automation1 PS2	Automation1-PS2 - Din-rail mounted power supply for 1 to 4 compact servo drives
Drive Type (Required)	
-D1	PS2 for XC2, XC2e drives & iXC2e, iXC2 drive-based controllers
-D2	PS2 for XL2e drives & iXL2e drive-based controllers
Power Output (Required)	
-P1	240 watts at 24 VDC
-P2	240 watts at 48 VDC
-P3	480 watts at 48 VDC
-P4	480 watts at 96 VDC
-P5	240 watts at +/-12 VDC (10A)
-P6	240 watts at +/-24 VDC (5A)
-P7	480 watts at +/-48 VDC (5A)
Number of Axes (Required)	
-AX01	1 axis of wiring
-AX02	2 axes of wiring
-AX03	3 axes of wiring
-AX04	4 axes of wiring

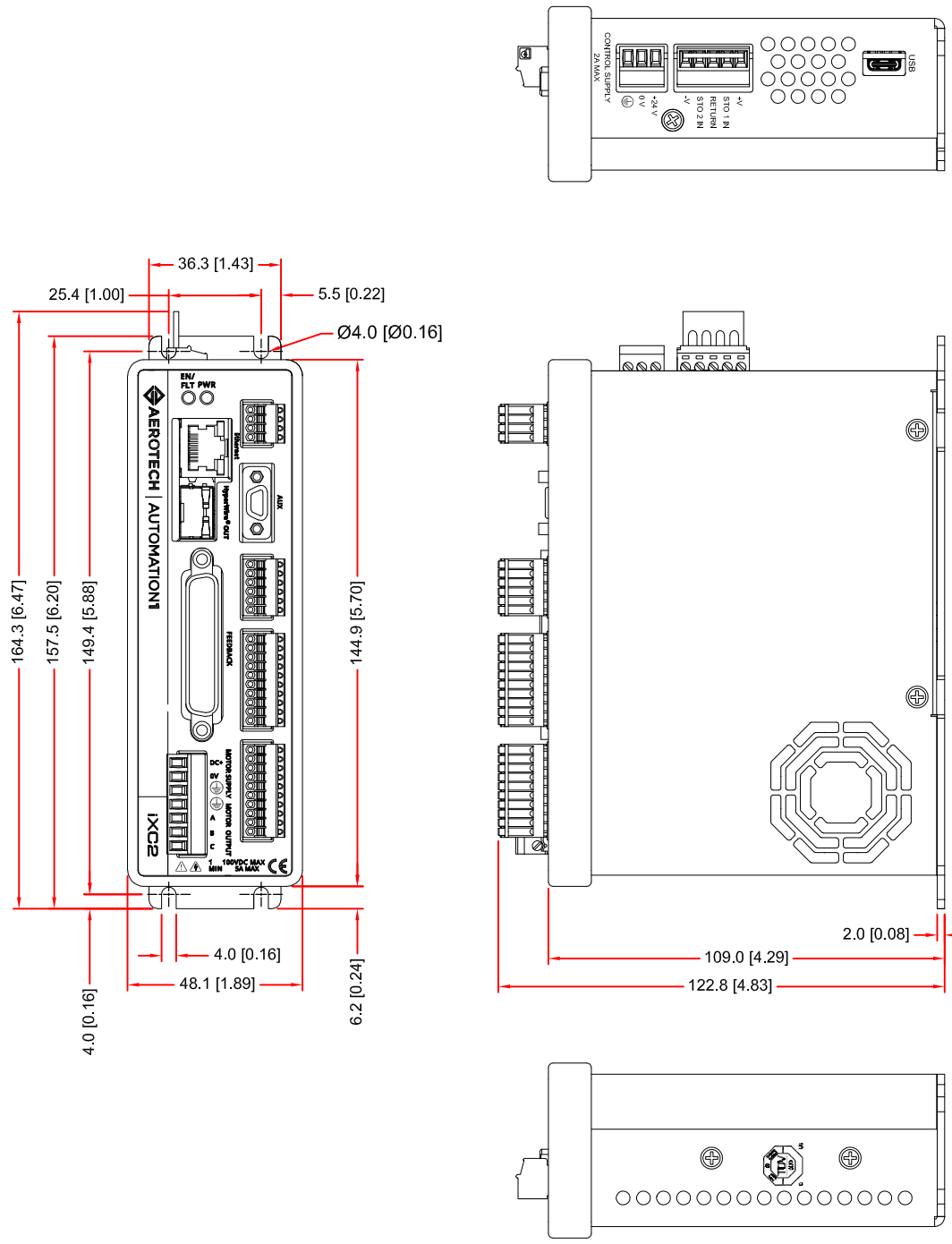
AUTOMATION1 iXC2 DIMENSIONS

AUTOMATION1 iXC2, -EB0 OPTION



AUTOMATION1 iXC2 DIMENSIONS

AUTOMATION1 iXC2, -EB1 OPTION



AUTOMATION1 iXC2 DIMENSIONS

AUTOMATION1 iXC2, -EB2 OPTION