

# AEROTECH AUTOMATION1



## PWM Servo Motor Drives **Automation1 XC2e**

### Compact, Enhanced & Mighty

The Automation1 XC2e pulse-width modulation (PWM) servo motor drive is our smallest panel-mount drive. It's also packed with standard features—including safe torque off (STO), a data array of more than 16 million 32-bit elements and an enhanced current sense device—and options for adding an I/O expansion board, multi-axis position synchronized output (PSO) and a feedback multiplier.

Using silicon carbide (SiC) power amplifiers with ultra-precise PWM switching, the XC2e offers excellent in-position, move-and-settle and contouring motion control performance. Digital and analog outputs are set and inputs are collected at 20 kHz, allowing for ultra-tight process control.

### Automation1

The XC2e 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:

- ◆ Connects through the HyperWire® fiber-optic bus, which has **20 TIMES THE BANDWIDTH** of 100BASE-T Ethernet buses
- ◆ Includes **SAFE TORQUE OFF (STO)** safety circuit
- ◆ Generates **100 VDC BUS** motor power & up to **10 AMPS PEAK** output
- ◆ Features drive array with **MORE THAN 67 MB** of memory
- ◆ Collects analog sensor or position data **UP TO 320 kHz** (triggered by axis position)
- ◆ Offers many optional features, including Multi-axis Position Synchronized Output (PSO) & I/O expansion board

## AUTOMATION1 XC2e GENERAL SPECIFICATIONS

| CATEGORY                                   | SPECIFICATION   |
|--|---|
| Motor Style                                | Brush, brushless, voice coil, stepper <sup>(1)</sup>  |
| Control Supply                             | 24 VDC  |
| Motor Supply                               | 15-100 VDC  |
| Bus Voltage <sup>(2)</sup>                 | 15-100 VDC  |
| PWM Frequency                              | 20 kHz  |
| Peak Output Current (1 sec) <sup>(3)</sup> | 10 A <sub>pk</sub>  |
| Continuous Output Current <sup>(3)</sup>   | 5 A   |
| Position Synchronized Output (PSO)         | <p>Standard:<br/>One-axis PSO (includes one-axis part-speed PSO)*</p> <p>Optional:<br/>Two-axis PSO (includes two-axis part-speed PSO)*<br/>Two-axis part-speed PSO only*<br/>Three-axis part-speed PSO only*</p> <p>*Requires adding an expansion board to the drive to output PSO pulses via a physical connection.</p>   |
| 25-Pin Motor Feedback Connector            | <p>High-speed differential inputs (encoder sin, cos and marker)</p> <p>CW and CCW limits</p> <p>Hall effect sensor inputs (A, B and C)</p> <p>Analog motor temperature input (accepts digital)</p> <p>Brake output</p>  |
| Multiplier Options                         | <p>MX0 option:<br/>Primary encoder: 40 million counts per second square-wave input<br/>Auxiliary encoder: 40 million counts per second square-wave input</p> <p>MX2 option:<br/>Primary encoder: 2 MHz/450 kHz (bandwidth selectable) sine-wave input, encoder multiplier up to 65,536<br/>Auxiliary encoder: 40 million counts per second square-wave input</p> <p>MX3 option:<br/>Primary encoder: 2 MHz/450 kHz (bandwidth selectable) sine-wave input, encoder multiplier up to 65,536<br/>Auxiliary encoder: 450 kHz sine-wave input, encoder multiplier up to x16,384*</p> <p>*Encoders multiplied with this input cannot be echoed out</p> |
| I/O Expansion Board (-EB1)                 | <p>PSO output connector with up to 12.5 MHz output rate</p> <p>Auxiliary Encoder Port</p> <p>1x 16-bit differential, ±10 V analog input</p> <p>1x 16-bit single-ended, ±10 V analog output</p> <p>8x optically isolated digital inputs</p> <p>8x optically isolated digital outputs</p>   |

Chart continued on next page

## AUTOMATION1 XC2e CONTROLLER SPECIFICATIONS

| CATEGORY                          | SPECIFICATION  |
|-----------------------------------|--|
| <b>Drive Array Memory</b>         | 67.1 MB (16,777,216 32-bit elements)                                 |
| <b>High Speed Data Capture</b>    | Yes (50 ns latency)  |
| <b>Safe Torque Off (STO)</b>      | Yes (SIL3/PLe/Cat 4)   |
| <b>HyperWire Connections</b>      | 2x HyperWire small form-factor pluggable (SFP) ports                 |
| <b>Automatic Brake Control</b>    | Standard (24 V at 0.5 A)   |
| <b>Absolute Encoder</b>           | Renishaw Resolute BiSS; EnDat 2.1; EnDat 2.2, and SSI                |
| <b>Current Loop Update Rate</b>   | 20 kHz   |
| <b>Servo Loop Update Rate</b>     | 20 kHz   |
| <b>Power Amplifier Bandwidth</b>  | 2500 Hz maximum (software selectable)                                |
| <b>Power Amplifier Efficiency</b> | 85-95% <sup>(4)</sup>  |
| <b>Minimum Load Inductance</b>    | 0.1 mH   |
| <b>Operating Temperature</b>      | 0 to 40 °C   |
| <b>Storage Temperature</b>        | -30 to 85 °C   |
| <b>Weight</b>                     | 0.54 kg (1.20 lb.)   |
| <b>Compliance</b>                 | 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 XC2e ORDERING OPTIONS

### Automation1-XC2e

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**Automation1-XC2e** Automation1-XC2e - Enhanced, Compact PWM Servo Drive

### Peak Current

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**-10** 10 A peak, 5 A cont. current (default)

### Expansion Board

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**-EB0** No expansion board (default)

**-EB1** IO expansion board

### Multiplier

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**-MX0** No encoder multiplier (default)

**-MX2** x65536 multiplier (primary), no multiplier (auxiliary)

**-MX3** x65536 multiplier (primary), x16384 multiplier (auxiliary)

### PSO<sup>(1,2)</sup>

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**-PSO1** One-axis PSO (includes one-axis part-speed PSO) (default)

**-PSO2** Two-axis PSO (includes three-axis part-speed PSO)

**-PSO5** Two-axis part-speed PSO

**-PSO6** Three-axis part-speed PSO

1. PSO functionality is included in the base XC2e. 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

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**Automation1 PS2** Automation1-PS2 - Din-rail mounted power supply for 1 to 4 compact servo drives

### Drive Type (Required)

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**-D1** PS2 for XC2, XC2e drives and iXC2e & iXC2 drive-based controllers

**-D2** PS2 for XL2e drives and iXL2e drive-based controllers

### Power Output (Required)

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**-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)

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**-AX01** 1 axis of wiring

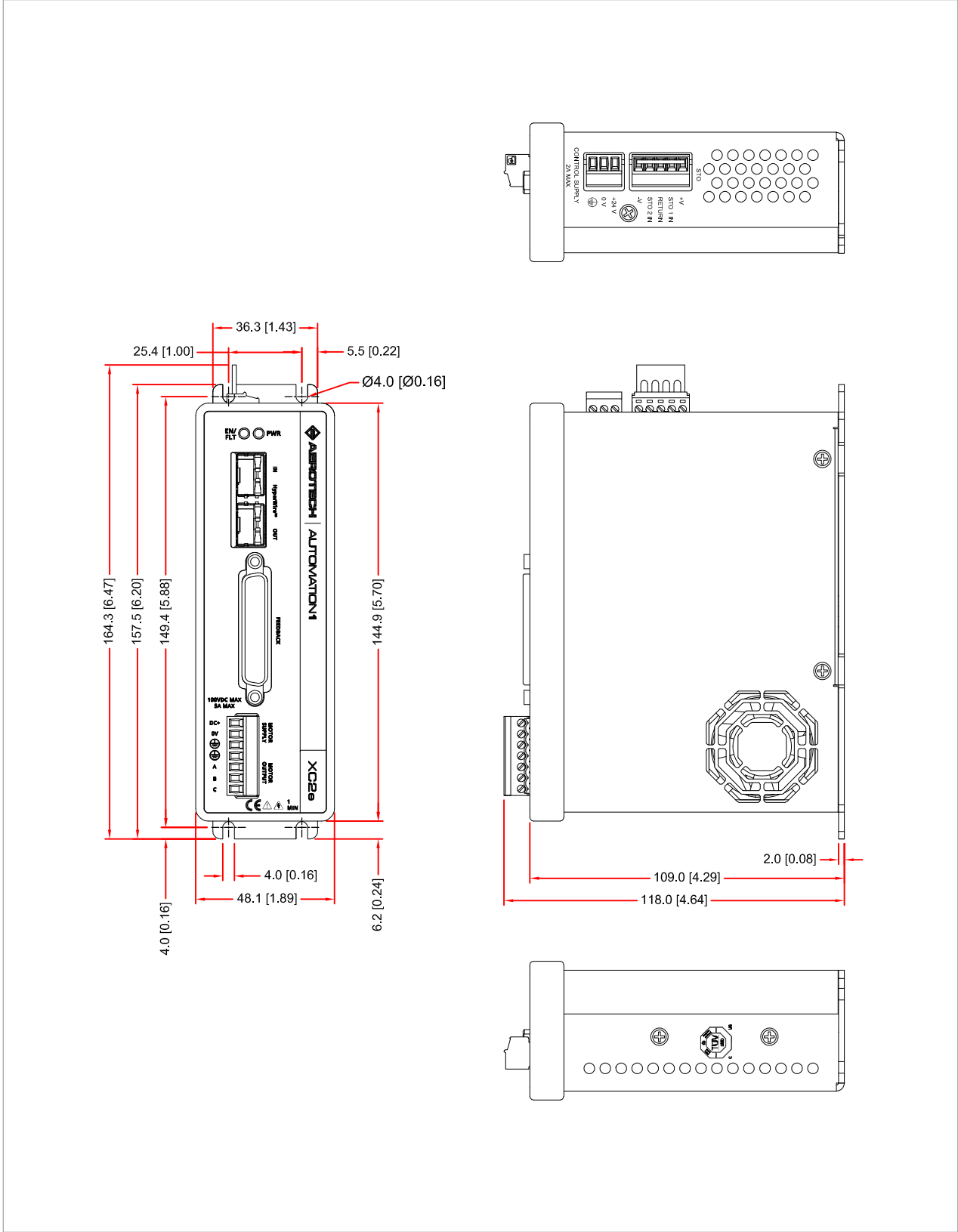
**-AX02** 2 axes of wiring

**-AX03** 3 axes of wiring

**-AX04** 4 axes of wiring

# AUTOMATION1 XC2e DIMENSIONS

AUTOMATION1 XC2e, -EB0 OPTION



# AUTOMATION1 XC2e DIMENSIONS

## AUTOMATION1 XC2e, -EB1 OPTION

