

# SERVOMOTOR DRIVES **AUTOMATION1-XC4e**



*Aerotech's XC4e next-generation panel-mount controller with high-speed optical HyperWire® communication bus.*

The XC4e PWM digital drive is Aerotech's highest performance single-axis motor drive for motion control applications. All versions are compatible with the Automation 3200 motion platform utilizing the HyperWire® motion bus.

The XC4e PWM amplifiers control brushless DC, brush DC, voice coil, or stepper motor types at up to 340 VDC operating voltage and 30 A peak current capability. The current loop and servo-loop are closed digitally to assure the highest level of positioning accuracy and rate stability. This allows loop closure rates of up to 20 kHz and allows digital and analog I/O processing, data collection, process control, and encoder multiplication tasks in real time.

Standard features for the XC4e include safe torque off (STO), a data array consisting of over 16 million 32-bit elements, digital and analog I/O (see table), one-axis Position Synchronized Output (PSO), dedicated home and end-of-travel limit inputs, and an enhanced current sense device. Encoder support includes square-wave, sine-wave, and absolute encoders.

The standard XC4e accepts square-wave encoder feedback at rates of up to 40 million counts-per-second. Sine-wave encoders

can be multiplied by up to 65,536, producing Aerotech's highest-resolution position feedback, with the optional encoder multiplier feature. Dual-multiplied encoder feedback is supported.

Each single-axis XC4e PWM digital drive can be ordered with the MX2 high-performance single encoder multiplier or the MX3 high-performance dual-loop encoder multiplier, enabling higher levels of position and velocity control.

Also available are a wide variety of extensions of the base PSO functionality. Track up to three encoders in real time with three-axis PSO or extend PSO's functionality to kinematic arrangements through the use of Aerotech's Part-Speed PSO feature.

Each drive has an optional I/O expansion board to greatly increase the number of I/O points. This I/O board includes a dedicated PSO output and a PSO synchronization input, often used to synchronize process control with an external mode-locked frequency input.

## — PRODUCT HIGHLIGHTS —

HyperWire® fiber-optic interface

Up to 30 A peak output current

Drive brush, brushless, voice coil, or stepper motors

Safe torque off (STO) safety circuit

Optional two-axis or three-axis position synchronized Output (PSO)

Optional two-axis or three-axis Part-Speed PSO

I/O expansion board

NRTL safety certification and CE approval; follows the 2011/65/EU RoHS 2 Directive

Supports amplified sine-wave encoders up to 2 MHz

## Automation1-XC4e Specifications

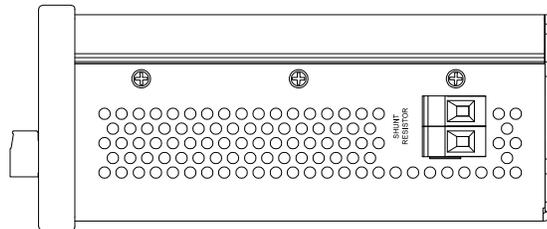
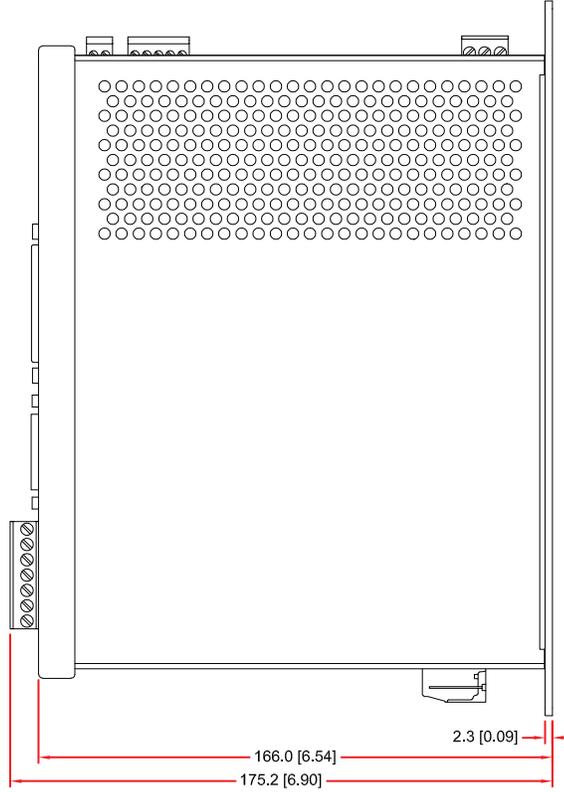
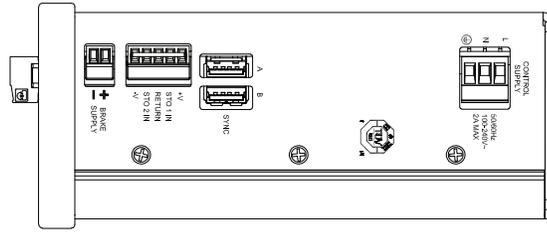
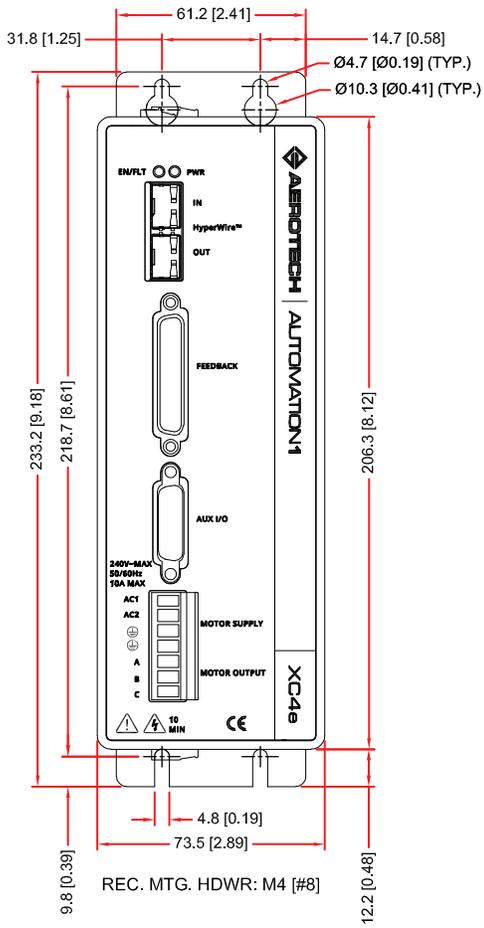
Specifications	10	20	30
Motor Style	Brush, brushless, voice coil, stepper <sup>1</sup>		
Motor Supply	Single-phase 0-240 VAC; 50/60 Hz		
Control Supply	100-240 VAC; 50/60 Hz		
Bus Voltage <sup>2</sup>	0-340 VDC		
Peak Output Current (1 sec) <sup>33</sup>	10 A <sub>pk</sub>	20 A <sub>pk</sub>	30 A <sub>pk</sub>
Continuous Output Current <sup>3</sup>	5 A <sub>pk</sub>	10 A <sub>pk</sub>	
Position Synchronized Output (PSO)	Standard: One-axis PSO (includes one-axis Part-Speed PSO) Optional: Two-axis PSO (includes two-axis Part-Speed PSO) Three-axis PSO (includes three-axis Part-Speed PSO) Two-axis Part-Speed PSO only Three-axis Part-Speed PSO only		
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		
26-Pin Auxiliary Feedback Connector	<ul style="list-style-type: none"> <li>•High-speed differential inputs (encoder sin, cos and marker)*</li> <li>•4x optically isolated digital inputs.</li> <li>•4x optically isolated digital outputs.</li> <li>•1x 16-bit differential ±10 V analog input</li> <li>•1x 16-bit single-ended ±10 V analog output</li> <li>•2x optically isolated high-speed inputs</li> </ul> *This channel is bidirectional, and can be used to echo out encoder signal.		
Multiplier Options	MX0; no encoder multiplier includes: Primary encoder 40 million counts-per-second square-wave input Auxiliary encoder 40 million counts-per-second square-wave input MX2; MX2 encoder multiplier includes: Primary encoder 2 MHz sine-wave input, encoder multiplier up to x65,536 Auxiliary encoder 40 million counts-per-second square wave input. MX3; MX3 encoder multiplier includes: Primary encoder 2 MHz sine-wave input, encoder multiplier up to x65,536 Auxiliary encoder 450 kHz sine-wave input, encoder multiplier up to x16,384		
I/O Expansion Board (-EB1)	1x additional PSO connection point 1x PSO synchronization Input 16x digital inputs, optically isolated 16x digital outputs, optically isolated 3x analog inputs, 16-bit, differential, ±10 V 3x analog outputs, 16-bit, single-ended, ±10 V		
Drive Array Memory	16,777,216 32-bit elements		
High-Speed Data Capture	Yes (50 ns latency)		
Safe Torque Off (STO)	Yes, SIL3/PLe/Cat 4		
HyperWire Connections	2x HyperWire small form-factor pluggable (SFP) Ports		
Automatic Brake Control	Standard; 24 V at 1 A		
Absolute Encoder	Renishaw Resolute BiSS; EnDat 2.1; and EnDat 2.2		
Current Loop Update Rate	20 kHz		
Servo Loop Update Rate	20 kHz		
Power Amplifier Bandwidth	Selectable through software (85-95% efficiency)		
Minimum Load Inductance	0.1 mH		
Operating Temperature	0 to 40°C		
Storage Temperature	-30 to 85°C		
Weight	2.36 kg (5.20 lb.)		
Compliance	CE approved, NRTL safety certification, 2011/65/EU RoHS 2 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 \* Apk.

# Automation1-XC4e Dimensions





## Automation1-XC4e **Ordering Information**

### XC4e

XC4e	XC4e PWM digital drive
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### Peak Current

-10	10 A peak, 5 A cont. current (default)
-20	20 A peak, 10 A cont. current
-30	30 A peak, 10 A cont. current

### Expansion Board

-EB0	No expansion board (default)
-EB1	IO expansion board

### Multiplier

-MX0	No encoder multiplier (default)
-MX2	2 MHz x65536 multiplier (primary), no multiplier (auxiliary)
-MX3	2 MHz x65536 multiplier (primary), 450 kHz x16384 multiplier (auxiliary)

### PSO

-PSO1	One-Axis PSO (default)
-PSO2	Two-Axis PSO
-PSO3	Three-Axis PSO
-PSO5	Two-Axis Part-Speed PSO
-PSO6	Three-Axis Part-Speed PSO

### External Shunt

-SX0	No 2-pin connector for external shunt (default)
-SX1	2-pin connector for external shunt