Enhanced PWM Servo Drive

Automation1 XC4e

Switch Up Your Performance

The XC4e PWM digital drive is an enhanced single-axis motor drive designed for ultra-precise motion control applications. All versions communicate to Automation1 PC- and drive-based controller products over the HyperWire® motion bus. The amplifiers control brushless DC, brush DC, voice coil and stepper motor types at up to 340 VDC operating voltage and 30 A peak current capability.

The XC4e is your go-to drive when precision and reliability are key to success. It supports multiple feedback device types, includes on-board memory and easily accommodates I/O via an expansion board option.

Automation1

The XC4e 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:

- High resolution current-loop enables ultra-precise **IN-POSITION STABILITY**
- **PRECISION TRAJECTORY TRACKING** enabled by 20 kHz digital servo fed by 20 kHz high-resolution controller trajectories
- Feedback connector includes **ALL REQUIRED SIGNALS** for controlling a precision axis of motion
- **INTEGRATED POWER SUPPLY** enables direct connection 100-240 VAC line voltages
- **STANDARD FEATURES** include Safe Torque Off (STO), digital & analog I/O, on-board memory & Position Synchronized Output (PSO)

AUTOMATION1 XC4e DEVICE SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Motor Style	Brush, brushless, voice coil, stepper[1]
Motor Supply	Single-phase 0-240 VAC; 50/60 Hz
Control Supply	100-240 VAC; 50/60 Hz
Bus Voltage[2]	0-340 VDC
Peak Output Current (1 sec)[3]	10 A_{pk} I 20 A_{pk} I 30 A_{pk}
Continuous Output Current[3][4]	5 A_{pk} I 10 A_{pk} I 10 A_{pk}
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	High-speed differential inputs (encoder sin, cos and marker)* 4x optically isolated digital inputs 4x optically isolated digital outputs 1x 16-bit differential ±10 V analog input 1x 16-bit single-ended ±10 V analog output 2x optically isolated high-speed inputs *This channel is bidirectional and can be used to echo out encoder signal
Multiplier Options	MX0 Option: Primary Encoder: 40 million counts-per-second square-wave input Auxiliary Encoder: 40 million counts-per-second square-wave input MX2 Option: Primary Encoder: 2 MHz / 450 kHz (bandwidth selectable) sine-wave input, encoder multiplier up to 65,536 Auxiliary Encoder: 40 million counts per second square-wave input MX3 Option: Primary Encoder: 2 MHz / 450 kHz (bandwidth selectable) sine-wave input, encoder multiplier up to 65,536 Auxiliary Encoder: 450 kHz sine-wave input, encoder multiplier up to x16,384* *Encoders multiplied with this input cannot be echoed out
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

chart continued on next page

AUTOMATION1 XC4e DEVICE SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Drive Array Memory	16,777,216 32-bit elements (67 MB)
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) 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, EU 2015/863 RoHS 3 directive

Notes:

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. Maximum achievable continuous output current depends on the thermal conditions of the drive.

AUTOMATION1 XC4e ORDERING OPTIONS

Automation1-XC4e

Automation1-XC4e	Enhanced PWM Servo Drive

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

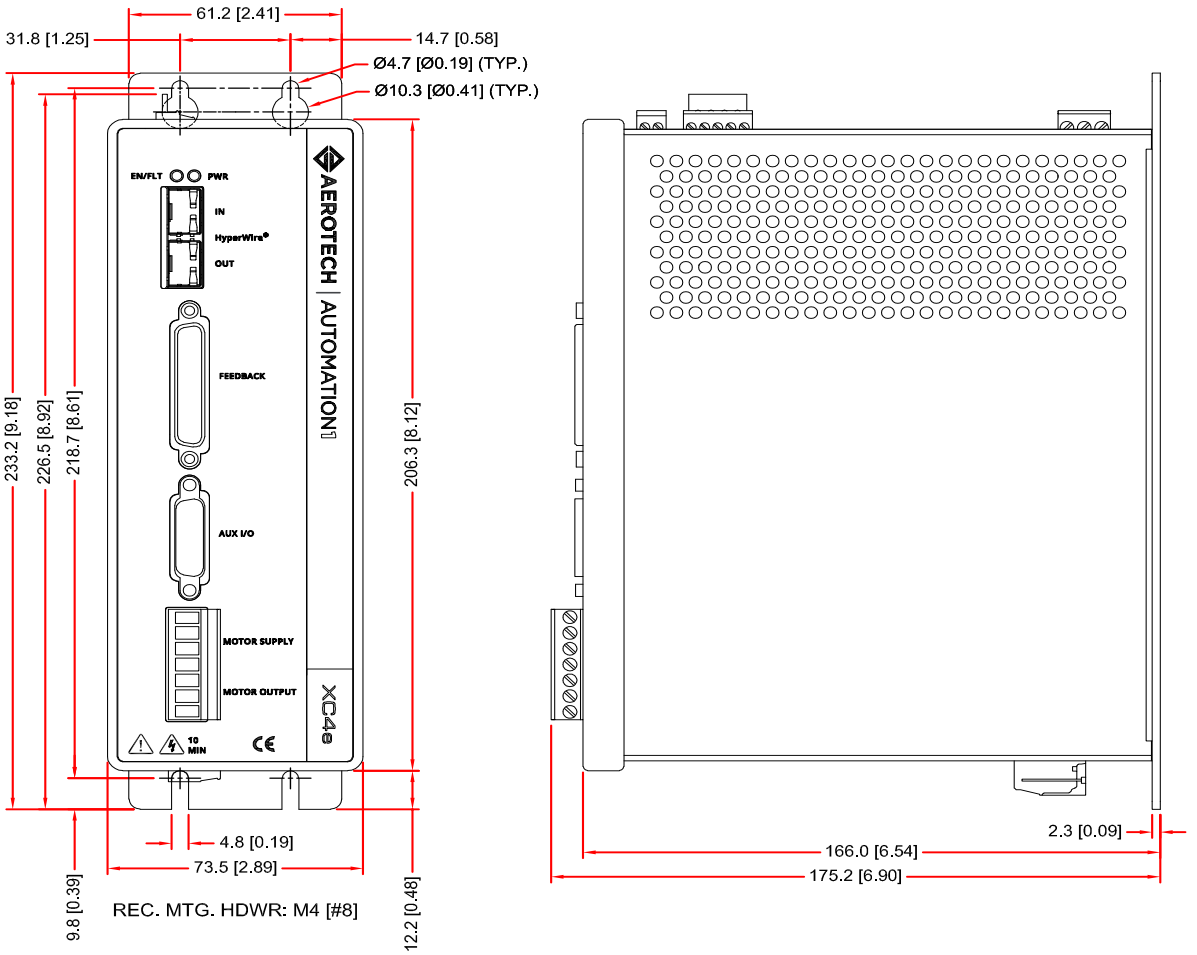
-PSO1	One-axis PSO (default)
-PSO2	Two-axis PSO
-PSO3	Three-axis PSO
-PSO5	Two-axis Part-speed PSO
-PSO6	Three-axis Part-speed PSO

External Shunt

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

AUTOMATION1 XC4e DIMENSIONS

AUTOMATION1-XC4e WITH -EBO (NO EXPANSION BOARD) OPTION



AUTOMATION1 XC4e DIMENSIONS

AUTOMATION1-XC4e WITH -EB1 (EXPANSION BOARD) OPTION