Linear Servo Drive
Automation1 XL2e

Less Noise. More Control.

The Automation1-XL2e combines high-end, low noise linear power amplifiers with precision servo control technology in a compact form factor—all without sacrificing our high-end controller features. With no switching noise or deadtime, it delivers the higher-precision sensing you need for applications like eddy current inspection, sensor testing, and high-precision position and velocity tracking. It's also ideal for small step size and in-position stability applications because control to servo motors can be active 100% of the time.

Automation1

The XL2e 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:

- **INTEGRATES EASILY IN MULTI-AXIS SYSTEMS** with other Automation1 drives & the iSMC motion controller
- Includes **STANDARD ABSOLUTE ENCODER** & square-wave encoder support
- Increases resolution of sine-wave feedback devices with optional **X65,536 ENCODER MULTIPLIER**
- Supports optional **DUAL-MULTIPLIED & DUAL-ABSOLUTE ENCODER FEEDBACK**
- Includes PSO, the **ULTIMATE IN POSITION-BASED CONTROL** for industrial lasers, cameras & more
- Features **SAFE TORQUE OFF (STO)** functional safety (certification pending)
- Offers optional **I/O EXPANSION BOARD**

AUTOMATION1-XL2e GENERAL SPECIFICATIONS

CATEGORY	SPECIFICATION
Position Synchronized Output (PSO)	Standard • One-axis PSO: Command position synchronized output pulses based on distance calculated from a single encoder. Includes one-axis Part-Speed PSO.* Optional • Two-axis PSO: Command position synchronized output pulses based on distance calculated from two encoders. Includes two-axis Part-Speed PSO.* • Three-axis PSO: Command position synchronized output pulses based on distance calculated from three encoders. Includes three-axis Part-Speed PSO.* • Two-axis Part-Speed PSO: Command position synchronized output pulses based on vector velocity command of up to two axes.* • Three-axis Part-Speed PSO: Command position synchronized output pulses based on vector velocity command of three or more axes.* *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 and fault) 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: 40 million counts per second square-wave input Auxiliary encoder: 40 million counts per second square-wave input (required EB1 expansion board) • MX2 option Primary encoder: 2 MHz/200 kHz (bandwidth selectable) sine-wave input, encoder multiplier up to 65,536 Auxiliary encoder: 40 million counts per second square-wave input (required EB1 expansion board) • MX3 option Primary encoder: 2 MHz/200 kHz (bandwidth selectable) sine-wave input, encoder multiplier up to 65,536 Auxiliary encoder: 200 kHz sine-wave input, encoder multiplier up to x16,384 (required EB1 expansion board)* *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 output 8x optically isolated digital inputs 8x optically isolated digital outputs
Available Power Supply	Automation1-PS2 (pending)
Drive Array Memory	67.1 MB (16,777,216 32-bit elements)
High Speed Data Capture	Yes (50 ns latency)

chart continued on next page

AUTOMATION1-XL2e GENERAL SPECIFICATIONS

CATEGORY	SPECIFICATION
Safe Torque Off (STO)	Yes, SIL3/PLe/Cat 4 (certification pending)
HyperWire Connections	2x HyperWire small form-factor pluggable (SFP) ports
Automatic Brake Control	Standard (24 V at 1.0 A)
Absolute Encoder	BiSS CUnidirectional; EnDat 2.1; EnDat 2.2; SSI
Current Loop Update Rate	20 kHz
Servo Loop Update Rate	20 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

AUTOMATION1-XL2e LINEAR AMPLIFIER SPECIFICATIONS

CATEGORY		XL2e-10 (±12 VDC)	XL2e-10 (±20 VDC)	XL2e-10 (±24 VDC)	XL2e-10 (±40 VDC)	XL2e-10 (±48 VDC)
Motor Supply	**Input Voltage**	+/-5VDC to +/-48 VDC				
	Input Current (Continuous)	5 Arms				
	Input Current (Peak)	10 Arms				
Control Supply	**Input Voltage**	24 VDC				
	Input Current	2 A max, 1.0 A typical without brake				
Nominal Motor Bus Voltage		Equals motor supply input voltage				
Common Motor Supply Voltage		±12 VDC	±20 VDC	±24 VDC	±40 VDC	±48 VDC
Continuous Output Current @ 25°C (1)(2)(3)		5.0 A_{pk} I 5.0 A_{pk}	3.3 A_{pk} I 4.5 A_{pk}	2.7 A_{pk} I 3.8 A_{pk}	1.6 A_{pk} I 2.2 A_{pk}	1.3 A_{pk} I 1.7 A_{pk}
Peak Output Current (1 second)(6)		10 A_{pk}				
Maximum Continuous Total Power Dissipation(3)		180 W				
Peak Amplifier Power Dissipation per Phase(5)		400 W				
Effective Heatsink Thermal Resistance		0.25 C/W				
Maximum Transistor Temperature		75°C				
Time to Reach Maximum Temperature at Maximum Continuous Power		8 minutes				
Current Loop Bandwidth		2500 Hz (software selectable)				
Minimum Load Resistance		0 Ω				
Minimum Load Inductance		0 H				
Modes of Operation		Brushless, brush, stepper				
Protection Features		Peak current limit, over temperature, RMS current limit, dynamic power limit (SOA)				
Encoder Supply		5V @ 500 mA				

1. AC or DC motor type with a 0 Ω winding resistance assumed.
2. The first value is for a stationary AC or DC motor. The second value is for a moving AC motor.
3. De-rate at temperatures above 25°C ambient.
4. Amplifier power dissipation is calculated as (Vbus – Vout) · Iout for each phase. A 40B configuration that drives 1 A into 0 Ω results in 40 W of power dissipation in the amplifier.
5. The XL2e amplifier has peak power-limiting circuitry to protect itself from damage. The power limiting bit in the drive status word indicates if this has occurred.
6. This specification depends on the motor supply voltage, the motor speed, and motor resistance. Contact an Aerotech sales engineer for more information.

AUTOMATION1 XL2e ORDERING OPTIONS

Automation1-XL2e

Automation1-XL2e	Enhanced, Compact Linear Servo Drive

Peak Current

-10	10 A peak current (default)

Expansion Board

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

Multiplier

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

**-MX3 requires the -EB1 option*

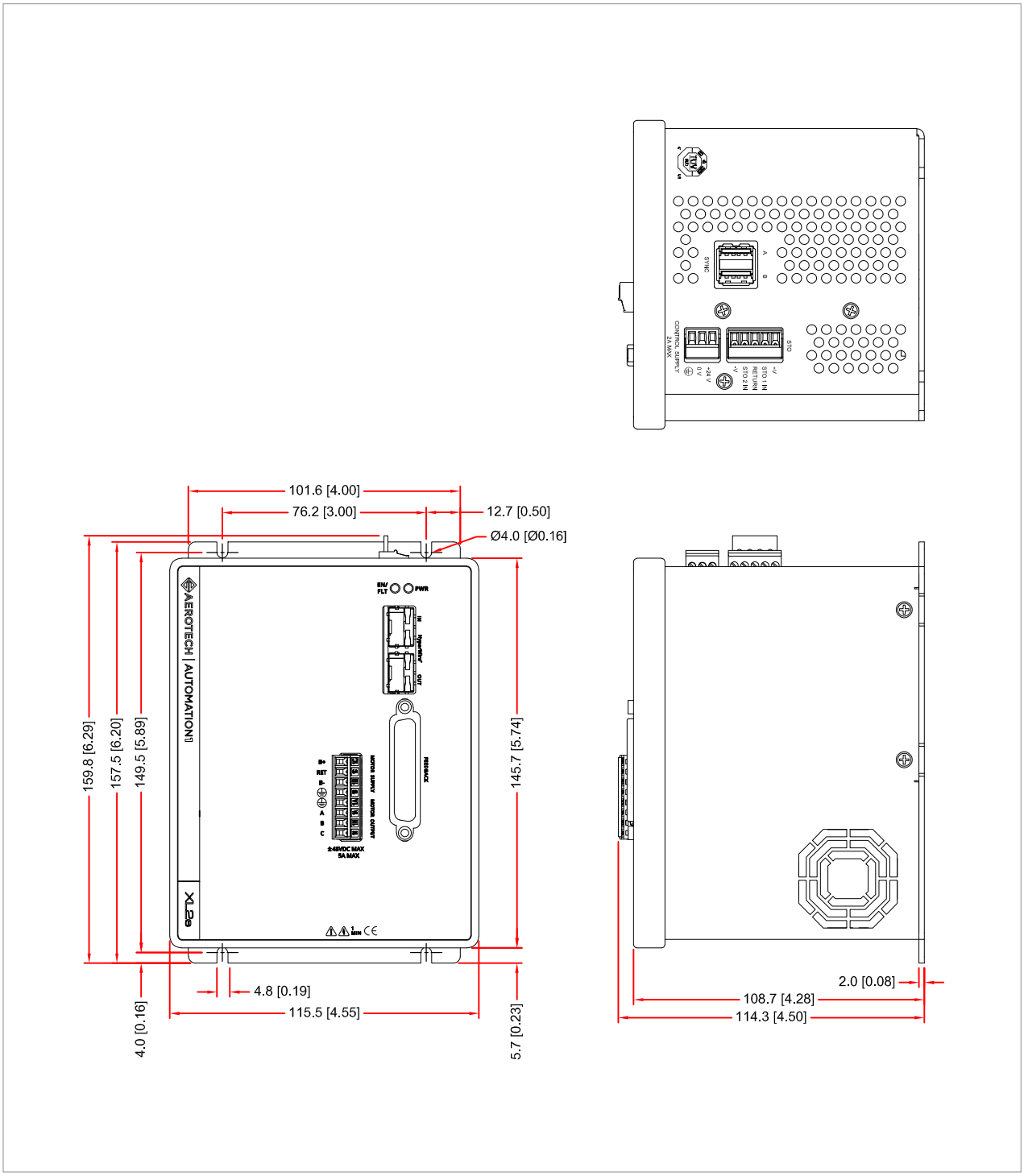
PSO*

-PSO1	One-axis PSO (includes one-axis Part-Speed PSO) (default)
-PSO2	Two-axis PSO (includes two-axis Part-Speed PSO)
-PSO3	Two-axis PSO (includes three-axis Part-Speed PSO)
-PSO5	Two-axis Part-Speed PSO
-PSO6	Three-axis Part-Speed PSO

**Requires -EB1 option to generate a PSO output pulse*

AUTOMATION1 XL2e DIMENSIONS

AUTOMATION1-XL2e WITH -EBO (NO EXPANSION BOARD) OPTION



AUTOMATION1 XL2e DIMENSIONS

AUTOMATION1-XL2e WITH -EB1 (EXPANSION BOARD) OPTION