

Control Any Amplifier

The Automation1 XI4 servo controller brings precision Automation1 servo control to any analog transconductance amplifier. Each XI4 axis of control generates an analog voltage command -- required by analog amplifiers to control the output current to a servo motor -- and receives encoder and axis feedback signals. The XI4 comes in both 2- and 4- axis configurations, each with an independent 20 kHz servo control loop. For added flexibility, each axis on the XI4 can be configured to output clock and direction control signals.

Automation1

The XI4 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:

- Supports SINGLE CONNECTOR axis interface including analog control output, encoder feedback, 2x EOT limit inputs, marker input, amplifier enable & fault, plus optional absolute encoder support
- Features up to 4 axes of 20 kHz CLOSED-LOOP SERVO control
- Features one ANALOG CURRENT COMMAND per axis
- Includes ONE-AXIS PSO standard with multi-axis options
- Include 8/8 DIGITAL I/O (optically isolated), 1x high speed input & dedicated PSO output

AUTOMATION1 XI4 SPECIFICATIONS

Pubmer P	CATEGORY	SPECIFICATION
Control Supply Voltage: 24 VDC Current, 2 Axis Unit: 2 A max, 0.45 A typical Current, 4 Axis Unit: 2 A max, 0.6 A typical Current, 4 Axis Unit: 2 A max, 0.6 A typical User Power Supply Output 5 VDC Modes of Operation Open loop Closed loop Protective Features 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) Three-axis PSO (includes three-axis part-speed PSO) Three-axis part-speed PSO) Three-axis part-speed PSO only 25-Pin Axis Connector Servo current commands / stepper clock & direction output High-speed differential inputs (encoder sin, cos & marker) Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Digital VO Connector 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 57.1 MB (16,777,216 32-bit elements) High Speed Data Capture 4x (50 ns latency) 4x (50 ns latency) 4x (50 ns latency) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 40 to 40 °C Weight Veight Veight 1.5 v DC Veight 1.5	HyperWire Communication	2x HyperWire small form-factor pluggable (SFP) ports
Current, 2 Axis Unit: 2 A max, 0.45 A typical Current, 4 Axis Unit 2 A max, 0.6 A typical Current, 4 Axis Unit 2 A max, 0.6 A typical Synchronized Output (PSO) Closed loop Protective Features	Control Output ⁽¹⁾	Supports two or four axes of stepper current command (±10 V) or clock & direction control
Current, 4 Axis Unit 2 A max, 0.6 A typical User Power Supply Output 5 VDC	Control Supply	Voltage: 24 VDC
User Power Supply Output		Current, 2 Axis Unit: 2 A max, 0.45 A typical
Modes of Operation Closed loop Protective Features Control power supply undervoltage 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) Three-axis PSO (includes three-axis part-speed PSO) Three-axis part-speed PSO only 25-Pin Axis Connector Servo current commands / stepper clock & direction output High-speed differential inputs (encoder sin, cos & marker) Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Encoder Input Options As optically isolated digital inputs (externally powered, 5-24 VDC) 1x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Article Province Supply Automatic Brake Control Assignable digital output E-Stop Sense Input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature - 3.0 to 85 °C Weight		Current, 4 Axis Unit 2 A max, 0.6 A typical
Closed loop Protective Features	User Power Supply Output	5 VDC
Protective Features Output short circuit Control power supply undervoltage 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) Three-axis part-speed PSO only 25-Pin Axis Connector Servo current commands / stepper clock & direction output High-speed differential inputs (encoder sin, cos & marker) Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Digital I/O Connector 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Ves (50 ns latency) Automatic Brake Control Assignable digital output Assignable digital input Absolute Encoder (Optional) BISS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature 0 to 40 °C Storage Temperature 0 50 to 85 °C Weight	Modes of Operation	Open loop
Control power supply undervoltage		Closed loop
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 two-axis part-speed PSO) Three-axis PSO (includes two-axis part-speed PSO) Three-axis part-speed PSO only 25-Pin Axis Connector Servo current commands / stepper clock & direction output High-speed differential inputs (encoder sin, cos & marker) Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Poesition Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight	Protective Features	Output short circuit
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) Three-axis part-speed PSO only Three-axis		Control power supply undervoltage
Optional: Two-axis PSO (includes two-axis part-speed PSO) Three-axis PSO (includes three-axis part-speed PSO) Three-axis part-speed PSO only 25-Pin Axis Connector Servo current commands / stepper clock & direction output High-speed differential inputs (encoder sin, cos & marker) Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Bigital I/O Connector 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight	Position Synchronized Output (PSO)	Standard:
Two-axis PSO (includes two-axis part-speed PSO) Three-axis PSO (includes three-axis part-speed PSO) Three-axis part-speed PSO only 25-Pin Axis Connector Servo current commands / stepper clock & direction output High-speed differential inputs (encoder sin, cos & marker) Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Digital I/O Connector 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Other Apperature O		One-axis PSO (includes one-axis part-speed PSO)
Three-axis PSO (includes three-axis part-speed PSO) Three-axis part-speed PSO only 25-Pin Axis Connector Servo current commands / stepper clock & direction output High-speed differential inputs (encoder sin, cos & marker) Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Digital I/O Connector 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x S VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight Versido Air Control Service Advisor Control Service Air Control Con		Optional:
Three-axis part-speed PSO only 25-Pin Axis Connector Servo current commands / stepper clock & direction output High-speed differential inputs (encoder sin, cos & marker) Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Bigital I/O Connector 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight Timber 2 clock & direction output High-speed Data Capture Serve Automatic Brake Control Serve Automatic Serve Automatic Brake Control Serve Automatic		Two-axis PSO (includes two-axis part-speed PSO)
25-Pin Axis Connector Servo current commands / stepper clock & direction output High-speed differential inputs (encoder sin, cos & marker) Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Bx optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight Ves (130 lb)		Three-axis PSO (includes three-axis part-speed PSO)
High-speed differential inputs (encoder sin, cos & marker) Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Bigital I/O Connector 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight Operating Temperature 0.59 kg (1.30 lb)		Three-axis part-speed PSO only
Absolute encoder interface (support optional) CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Bigital I/O Connector 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature 30 to 85 °C Weight Absolute Encoder (0.50 kg (1.30 lb)	25-Pin Axis Connector	Servo current commands / stepper clock & direction output
CW & CCW limits 5 VDC power supply Amplifier enable & fault Encoder Input Options 40 million counts per second square-wave input Bx optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight		High-speed differential inputs (encoder sin, cos & marker)
S VDC power supply Amplifier enable & fault		Absolute encoder interface (support optional)
Amplifier enable & fault Encoder Input Options		CW & CCW limits
Encoder Input Options 40 million counts per second square-wave input 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate 20 kHz Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight		
Digital I/O Connector 8x optically isolated digital inputs (externally powered, 5-24 VDC) 8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight Weight		Amplifier enable & fault
8x optically isolated digital outputs (externally powered, 5-24 VDC) 1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate 20 kHz Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight 0.59 kg (1.30 lb)	Encoder Input Options	40 million counts per second square-wave input
1x optically isolated high-speed inputs 1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate 20 kHz Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight 0.59 kg (1.30 lb)	Digital I/O Connector	
1x PSO TTL output 1x 5 VDC power supply Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate 20 kHz Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight 0.59 kg (1.30 lb)		
Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate 20 kHz Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight 0.59 kg (1.30 lb)		
Drive Array Memory 67.1 MB (16,777,216 32-bit elements) High Speed Data Capture Yes (50 ns latency) Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate 20 kHz Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight 0.59 kg (1.30 lb)		·
High Speed Data Capture Automatic Brake Control Assignable digital output E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate 20 kHz Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight Ves (50 ns latency) Assignable digital output E-Stop Sense Input Assignable digital input Digital input 20 kHz Oto 40 °C Storage Temperature -30 to 85 °C 0.59 kg (1.30 lb)		1x 5 VDC power supply
Automatic Brake Control E-Stop Sense Input Assignable digital input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate 20 kHz Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight 0.59 kg (1.30 lb)		
E-Stop Sense Input Absolute Encoder (Optional) BiSS C Unidirectional; EnDat 2.1; EnDat 2.2 Position Command Update Rate Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight 0.59 kg (1.30 lb)	High Speed Data Capture	
Absolute Encoder (Optional)BiSS C Unidirectional; EnDat 2.1; EnDat 2.2Position Command Update Rate20 kHzOperating Temperature0 to 40 °CStorage Temperature-30 to 85 °CWeight0.59 kg (1.30 lb)		
Position Command Update Rate20 kHzOperating Temperature0 to 40 °CStorage Temperature-30 to 85 °CWeight0.59 kg (1.30 lb)	E-Stop Sense Input	Assignable digital input
Operating Temperature 0 to 40 °C Storage Temperature -30 to 85 °C Weight 0.59 kg (1.30 lb)	Absolute Encoder (Optional)	BiSS C Unidirectional; EnDat 2.1; EnDat 2.2
Storage Temperature -30 to 85 °C Weight 0.59 kg (1.30 lb)	Position Command Update Rate	20 kHz
Weight 0.59 kg (1.30 lb)	Operating Temperature	0 to 40 °C
	Storage Temperature	-30 to 85 °C
Compliance CE approved; follows EU 2015/863 RoHS 3 directive	Weight	0.59 kg (1.30 lb)
	Compliance	CE approved; follows EU 2015/863 RoHS 3 directive

1. Single or two-phase current command output signals are available.

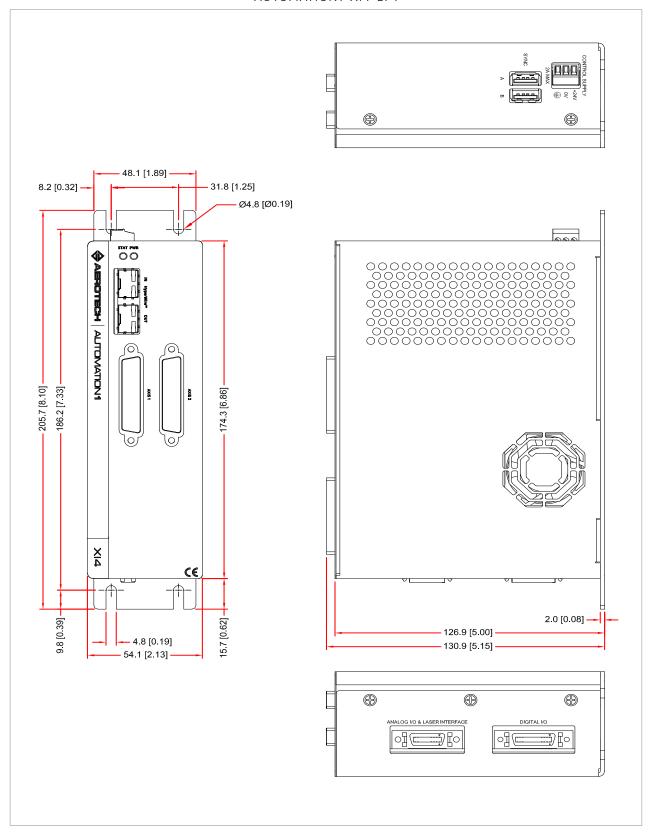


AUTOMATION1 XI4 ORDERING OPTIONS

2P1	2 Axes of Control, Standard Packaging
2P2	2 Axes of Control, OEM Packaging
4P1	4 Axes of Control, Standard Packaging
4P2	4 Axes of Control, OEM Packaging
Absolute Encoder	
A0	No Absolute Encoder Support (default)
A1	Absolute Encoder Support
PS0	
PSO1	One-axis PSO (includes one-axis part-speed PSO) (default)
PSO2	Two-axis PSO (includes two-axis part-speed PSO)
PSO3	Three-axis PSO (includes three-axis part-speed PSO)
PSO6	Three-axis part-speed PSO

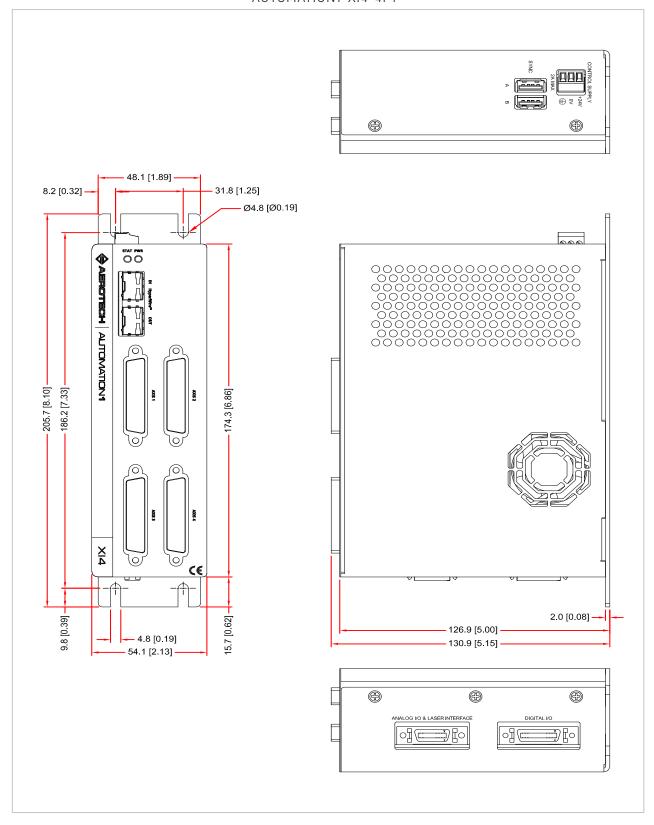


AUTOMATION1-XI4-2P1



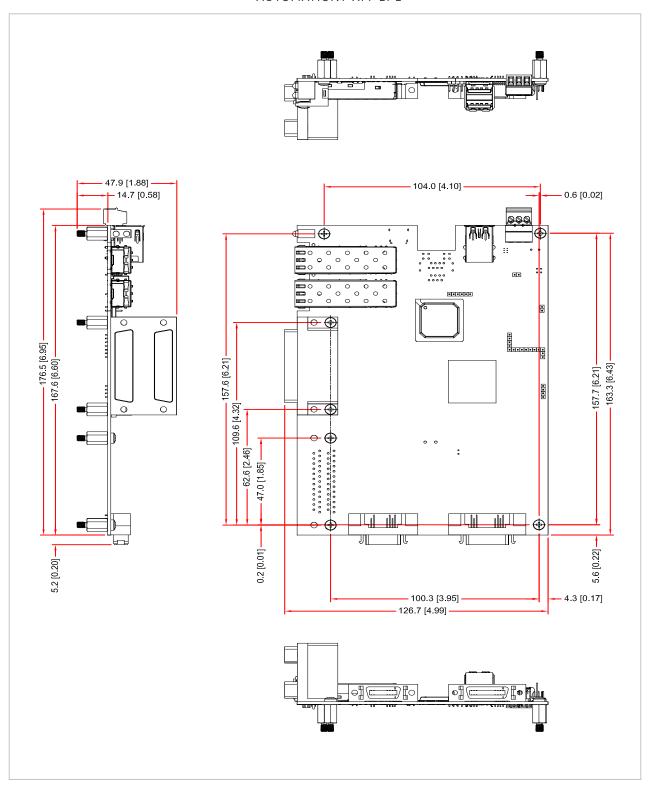


AUTOMATION1-XI4-4P1





AUTOMATION1-XI4-2P2





AUTOMATION1-XI4-4P2

