PWM Servo Drive with Motion Controller

Automation1 iXC6e

High-Powered Motion. High-Powered Control

Our Automation1-iXC6e single-axis PWM servo motor drive with integrated motion controller is two solutions in one: it's capable of complete machine control and also provides superior positioning and velocity control to high-powered linear or rotary servo motors —up to 100 amps peak at 680 VDC bus voltage. The iXC6e offers all the benefits of our iXC4e drive but with more power to move the largest payloads, so you'll accelerate large, brushless servo motors faster and reach higher top speeds without sacrificing smooth motion. The iXC6e is the powerful center of your motion control architecture. It can run the Automation1-iSMC motion controller, connect to other Automation1 drives over HyperWire and connect to other automation devices over EtherCAT, Modbus TCP/IP or a TCP Socket interface.

Automation1

The iXC6e 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:

- Unlocks the full motion control power of our Automation1-iSMC intelligent software-based motion controller
- Features **COMPLETE CONFIGURATION & PERFORMANCE CAPABILITY** of the XC6e PWM servo drive
- Provides **UP TO 100 AMPS** peak output
- Offers **240 VAC** & **480 VAC** voltage options
- **CONNECT TO THE CONTROLLER** using EtherCAT, Modbus or a Socket interface.
- Allows for **UP TO 12 AXES OF CONTROL** when more Automation1 drives are connected over the HyperWire fiber-optic bus
- Includes **SAFE TORQUE OFF (STO)** safety circuit

AUTOMATION1 iXC6e CONTROLLER SPECIFICATIONS

Specification	Description
Motion Controller[1]	Aerotech's Automation1-iSMC Intelligent Software-Based Motion Controller (version 2.1 and above)
Maximum Axes of Control[1]	Up to 12 axes
I/O Points[1]	See "general specifications" below. Note: Controller can control I/O from connected devices.
Programming Language[1]	AeroScript, RS-274 G-code
APIs[1]	• .NET (cross-platform Linux support) • C (cross-platform Linux support) • Python (cross-platform Linux support) • Instrument Driver for LabVIEW • EPICS (cross-platform Linux support) see EPICS & TANGO Drivers – Aerotech US • TANGO; see EPICS & TANGO Drivers – Aerotech US
Programming Tasks[1]	4 user tasks (standard) / 9 user tasks (optional) 1 reserved task
Position Modes	Absolute, incremental, dynamic trajectory correction
Motion Types[1]	• Linear motion • Clockwise & counterclockwise • Jogging • Homing • Rapid • Freerun • Many more
Acceleration Profiles	• Linear (time & rate based) • Sine (time & rate based) • S-curve (time & rate based)
Velocity Profiling[1]	Yes
Safe Zones[1]	Yes
Advanced Features[1]	• Corner rounding • Tool normalcy control • Cutter compensation • Programmable fixture offsets[2] • Rotation, mirroring & translation transformations • Part profile scaling • Polar & cylindrical transformations[2] • Orthogonality correction • Electronic gearing • EasyTune® & classical tuning • Backlash compensation • Spindle motion • High-speed registration • Multi-dimensional error mapping
Access Control	No
Controller File System	Yes (5 GB)
Supported HyperWire Drives	• Automation1-XC6e[3][4] • Automation1-XC4e[3][4] • Automation1-XC2e[3][4] • Automation1-XC4[3][4] • Automation1-XC2[3][4] • Automation1-XR3[3] • Automation1-XL5e[3][4] • Automation1-XL2e[3][4] • Automation1-SI4[3] • Automation1-XI4[3]
Industrial Ethernet Communication[5]	EtherCAT (optional, requires Automation1-iSMC, -IE2 option) Modbus (standard, 1 server, 1 client connection; optional, up to 16 client connections with Automation1-iSMC, -CP1 option)
Ethernet Communication[6]	Socket (standard, TCP client and TCP server)
Communication/Configuration Connection	• Ethernet • USB

Notes:

1. See the Automation1-iSMC controller page for more information.
2. May require advanced programming.
3. Contains I/O on base drive.
4. Drive I/O expansion board option available.
5. Modbus and EtherCAT cannot be used concurrently.
6. Socket interface can be used concurrently with industrial ethernet.

AUTOMATION1 iXC6e GENERAL SPECIFICATIONS

Category	Specification						
Motor Style	Brush, brushless, voice coil, stepper[1]						
Control Supply	100-240 VAC; 50/60 Hz						
Motor Supply	240 VAC (three-phase), 50/60 Hz		480 VAC (three-phase), 50/60 Hz				
Bus Voltage[2]	0-340 VDC		340-680 VDC				
PWM Frequency	20 kHz[3]						
Peak Output Current (1 sec)[4][5]	50 A_{pk}	100 A_{pk}	10 A_{pk}	20 A_{pk}	30 A_{pk}	50 A_{pk}	100 A_{pk}
Continuous Output Current[4][5]	25 A_{pk}	50 A_{pk}	5 A_{pk}	10 A_{pk}	15 A_{pk}	25 A_{pk}	30 A_{pk} @ 20 KHz 50 A_{pk} @ 10 KHz
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 signals.						
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 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	67.1 MB (16,777,216 32-bit elements)						
High Speed Data Capture	Yes (50 ns latency)						

chart continued on next page

AUTOMATION1 iXC6e GENERAL SPECIFICATIONS

Category	Specification
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	BiSS C Unidirectional; EnDat 2.1; 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	6.30 kg (13.89 lb)
Compliance	CE approved EU 2015/863 RoHS 3 directive, Pending NRTL safety certification

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. The specifications on this table are for 20kHz operation unless noted. All versions of this drive can be changed to 10kHz if motor heating caused by the environment or the operation of the drive becomes an issue.
4. Peak value of the sine wave; rms current for AC motors is 0.707 A_{pk}.
5. Rated at 25°C ambient temperature.

Automation1 iXC6e

Automation1-iXC6e	Automation1-iXC6e - Enhanced, High-Powered PWM Servo Drive with Motion Controller

Peak Current

-10	10 A peak, 5 A cont. current (480V input only)
-20	20 A peak, 10 A cont. current (480V input only)
-30	30 A peak, 15 A cont. current (480V input only)
-50	50 A peak, 25 A cont. current
-100	100 A peak, 50 A cont. current

Rated Motor Supply Voltage

-240V1	240 VAC Rated Motor Supply Voltage (50/100 Amp Versions)
-480V1	480 VAC Rated Motor Supply Voltage (50/100 Amp Versions)
-480V2	480 VAC Rated Motor Supply Voltage (10/20/30 Amp Versions)

Expansion Board

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

Multiplier

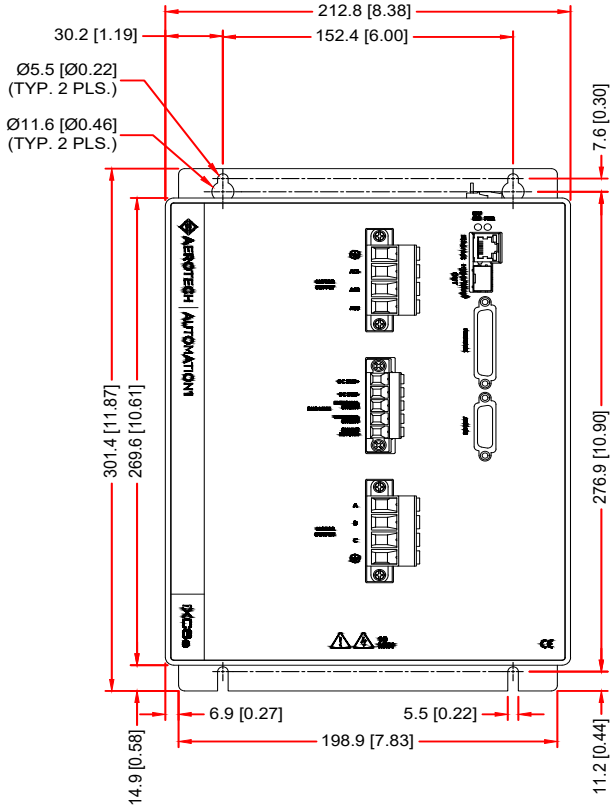
-MX0	No encoder multiplier (default)
-MX2	2 MHz x65536 multiplier (primary), no multiplier (auxiliary)
-MX3	2 MHz x65536 multiplier (primary), 450 kHz x16384 multiplier (auxiliary)

PSO

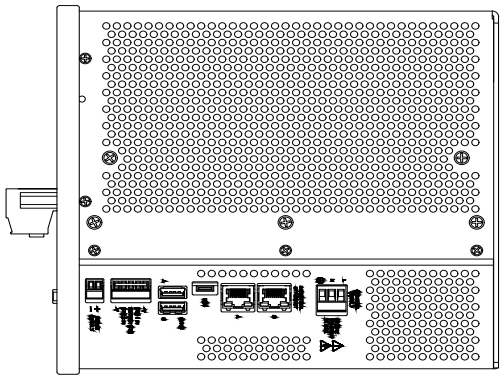
-PSO1	One-Axis PSO (includes One-axis Part-Speed PSO) (Default)
-PSO2	Two-Axis PSO (includes Two-Axis Part-Speed PSO)
-PSO3	Three-Axis PSO (includes Three-Axis Part-Speed PSO)
-PSO5	Two-Axis Part-Speed PSO
-PSO6	Three-Axis Part-Speed PSO

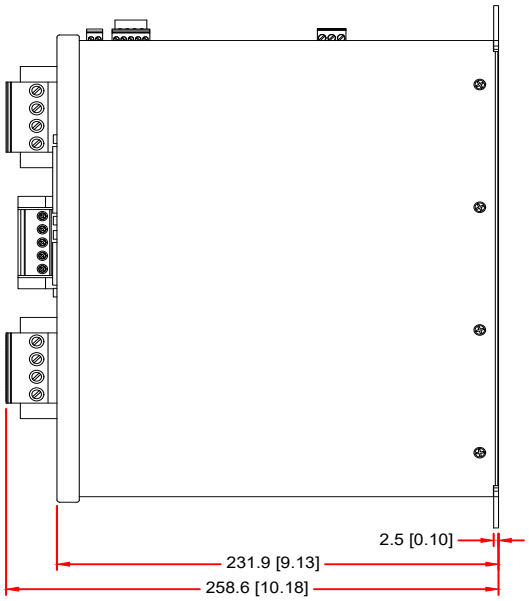
AUTOMATION1 iXC6e DIMENSIONS

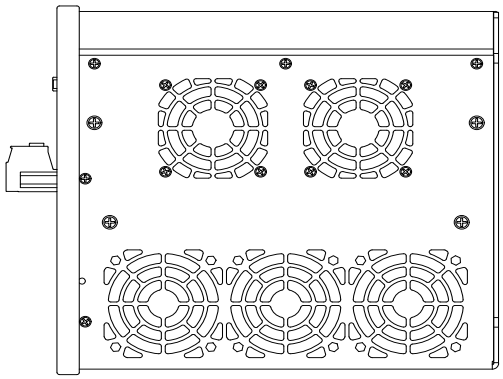
AUTOMATION1-iXC6e with -EBO (No Expansion Board) option



REC. MTG. HDWR: M5 [#10]

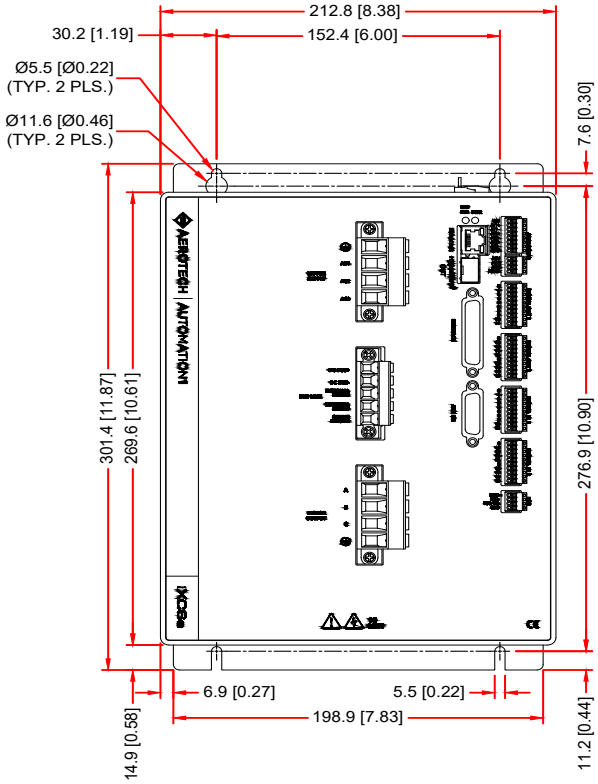






AUTOMATION1 iXC6e DIMENSIONS

AUTOMATION1-iXC6e with -EB1 (Expansion Board) option



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