

AEROTECH AUTOMATION1



PWM Servo Drive Automation1 XC4

Precision Comes Standard

The XC4 PWM digital drive is a single-axis motor drive for precision motion control applications. It communicates to Automation1 PC- and drive-based controller products over the HyperWire® motion bus, supports multiple feedback device types and includes on-board memory. 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. Control your industrial laser or process tool with precision using multi-axis Part-Speed PSO; control your entire process with an I/O or industrial Ethernet expansion board.

Automation1

The XC4 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 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 XC4 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} 20 A _{pk} 30 A _{pk}
Continuous Output Current⁽³⁾	5 A _{pk} 10 A _{pk} 10 A _{pk}
Position Synchronized Output (PSO)	Standard: One-axis PSO (includes one-axis part-speed PSO) ⁽⁴⁾ Optional: Three-axis part-speed PSO
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 MX1 Option: Primary Encoder: 2 MHz / 450 kHz (bandwidth selectable) sine-wave input, encoder multiplier up to x16,384* Auxiliary Encoder: 40 million counts per second square-wave input *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
Drive Array Memory	4,194,304 32-bit elements (16.7 MB)
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

chart continued on next page

AUTOMATION1 XC4 DEVICE SPECIFICATIONS

SPECIFICATION	DESCRIPTION
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. Encoder feedback-based PSO requires the -MX0 multiplier option.



AUTOMATION1 XC4 ORDERING OPTIONS

Automation1-XC4

Automation1-XC4 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)

-MX1 2 MHz / 450 kHz (bandwidth selectable) x16384 multiplier (primary), no multiplier (auxiliary)

PSO

-PSO1⁽¹⁾ One-axis PSO (includes One-axis Part-Speed PSO) (Default)

-PSO6 Three-axis Part-Speed PSO

1. Encoder feedback-based PSO requires the -MX0 multiplier option.

External Shunt

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

-SX1 2-pin connector for external shunt



AUTOMATION1 XC4 DIMENSIONS

AUTOMATION1-XC4 WITH -EBO (NO EXPANSION BOARD) OPTION



