copley controls
Precision Motion Control

Industrial
Servo Drives
for Commercial & Industrial

Copley Controls delivers high-performance motion solutions to a wide range of industries including semiconductor, life sciences, mobile robot, automated assembly and COTS military. An ISO 9001:2015 company, Copley produces products of the highest quality in state-of-the-art manufacturing facilities in the U.S. and China. Copley drives carry a full two-year warranty.

With over 35 years of experience in OEM partnerships, Copley's application team combines with R&D to deliver world-class, highly responsive support. Our global commitment is backed with sales offices and local technical resources in the U.S., Europe and Asia. From networked servo and stepper drives to traditional torque amplifiers, Copley has the solution for your system architecture. Both AC- and DC-powered drives with flexible packaging options are offered in the 100 W to 6 kW power range. They provide a comprehensive range of motor feedback interfaces, advanced tuning and commutation algorithms that maximize motor performance.

Ruggedized versions of select servo drives are available for COTS military applications. Built to withstand extremes of temperature and vibration with conformal coating for humidity tolerance, the Copley R-Series delivers reliable performance in the harshest environments.

Servo & Stepper Panel Drives
Copley offers a comprehensive range of digital drives for brush, brushless and stepper motors. High power density panel-mount and PCB-mount packages deliver installation flexibility. A complete set of feedback options are provided. Both AC- and DC-powered versions are available.

Industrial servo drives are full-featured drives with connectors, EMI shielding and PE grounding which can withstand the varied range of industrial conditions. Ruggedized versions of select servo drives are available for COTS military applications.

Configuration & Control Software
Copley drive configuration software, CME is highly intuitive and incorporates powerful diagnostic tools. An easy-to-use Indexer is built in.

Network software tools make multi-axis control system commissioning fast and simple. Proven Copley source code for the control and management of both EtherCAT and CANopen networks facilitates application implementation. Migration from CANopen to EtherCAT is straightforward and seamless.

PC Architecture
Copley drives connect seamlessly to both CANopen and EtherCAT—the networks of choice for PC-based systems. Copley drives are integrated into third-party software tools such as CoDeSys, enabling complete PC-based multi-axis motion control solutions. Copley also supports simple ASCII and serial binary protocols over RS-232 with serial multidrop using CAN.

Motion Controllers
Both the traditional ±10 V and PWM current/velocity command interfaces are built-in on all drives. For Omron/Omron/Delta Tau motion controllers, MACRO drives enable an optimal motion control system solution.

PLC Systems
Control via PLCs is facilitated by a step/direction interface as well as I/O selection and execution of predefined indexer programs. An ASCII command interface is also available.

Field Oriented Control
• Optimal orientation of magnetic field
• Motors run faster and cooler

Servo & PWM Performance
• High-bandwidth nested loops
• Biquad filter for notch or low pass filters
• High-efficiency dynamic PWM
• Edge filter accessories for low emissions

Stepper Technology
• Smooth, low audible noise
• Precision Microstepping, low resonance
• Servo mode for closed loop control
• Detent torque compensation

The Copley PLUS Advantage
PLUS drives support EtherCAT or CANopen and offer expanded feedback options. Metal enclosures ensure the highest level of noise immunity. Multi-axis versions deliver the lowest cost per node. PLUS drives feature high-resolution A/D converters for optimal current control as well as fast, hardware-based position capture and set point trigger output.

Design Standards
• UL/IEC 61010-1, 3rd Edition
• UL/IEC 61800-5-1
• UL/IEC 61800-5-2
• IEC 61800-3
• EN 55011
• EN 61000-6-1

STO (Safe Torque Off)
The STO capability of PLUS panel drives eliminates the expensive contactors and complex wiring traditionally used in safety-critical applications. STO provides two drive enable inputs, facilitating system conformance to SIL 3 (IEC 61800-5-2) and Category 3 PL d (ISO 13849-1).

Xenus — Servo

Xenus panels are available in two AC line-operated compact packages delivering power up to 6 kW. A +24 Vdc input powers control circuits, ensuring keep-alive operation. Control interfaces include CANopen as well as traditional analog commands. Incremental encoder feedback is standard with optional resolver and analog encoder interfaces.

	MODEL	VAC	IC	IP
XTL	XTL-230-18	100-240	6	18
	XTL-230-36	100-240	12	36
	XTL-230-40	100-240	20	40
XSJ	XSJ-230-06	100-240	3	6
Micro	XSJ-230-10	100-240	5	10

Accelnet — Servo

Accelnet panels are available in two DC-powered panel-mounted packages. Control interfaces include CANopen as well as traditional analog commands. Incremental encoder feedback is standard with optional resolver and analog encoder interfaces.

	MODEL	VDC	IC	IP
ADP	ADP-055-18	20-55	6	18
	ADP-090-09	20-90	3	9
	ADP-090-18	20-90	6	18
	ADP-090-36	20-90	12	36
	ADP-180-09	20-180	3	9
	ADP-180-18	20-180	6	18
	ADP-180-30	20-180	15	30
ACJ	ACJ-055-09	20-55	3	9
Micro	ACJ-055-18	20-55	6	18
	ACJ-090-03	20-90	1	3
	ACJ-090-09	20-90	3	9
	ACJ-090-12	20-90	6	12
				Sin/Cos: -S

Stepnet — Stepper

The Stepnet panel family comprises both AC- and DC-powered versions. Control interfaces include CANopen as well as traditional Step/Direction inputs. Microstepping delivers smooth, low-resonance performance. In Servo Mode, with encoder feedback, stepper motors run quietly and can operate at higher speeds without stalling.

	MODEL	VAC	IC	IP
STX	STX-115-07	100-120	5	7
	STX-230-07	100-240	5	7
STP	STP-075-07	20-75	5	7
	STP-075-10	20-75	10	10

Control Modes
- Indexer, Point-to-Point, PVT
- Camming, Gearing, Position, Velocity, Torque

Command Interface
- CANopen
- ASCII, Serial Binary and discrete I/O
- Stepper commands
- ±10 V Position/Velocity/Torque
- PWM Velocity/Torque command
- Master encoder (Gearing/Camming)

Communications
- CANopen
- RS-232

Feedback
- Digital quad A/B encoder
- Digital Halls
- Aux. encoder / encoder out
- Analog Sin/Cos encoder (-S option)
- Dual loop feedback

AFS Firmware Features (XTL,XSJ,ADP)
- BiSS-C Unidirectional, SSI (Consult factory)
- 32-bit floating point multi loop filters
- Frequency analysis tools

I/O — Digital
- 9-14 inputs, 3-4 outputs

Accessories
- XTL External regen resistors XTL-RA-XX
- XTL, XSJ External edge filter XTL-FA-01

Dimensions: mm (in)
- **XTL** 192 x 142 x 65 (7.6 x 5.6 x 2.6)
- **XSJ** 126 x 89 x 53 (5.0 x 3.5 x 2.1)
- **ADP** 168 x 99 x 31 (6.6 x 3.9 x 1.2)
- **ACJ** 97 x 64 x 33 (3.8 x 2.5 x 1.3)
- **STX** 146 x 119 x 55 (5.7 x 4.7 x 2.2)
- **STP** 136 x 84 x 42 (5.4 x 3.3 x 1.7)

Accelnet ADP AFS

Accelnet ACJ

Stepnet STX

Stepnet STP

Xenus XTL AFS

Xenus XSJ AFS

Xenus^{PLUS} — (Servo)

Xenus^{PLUS} AC-powered drives are available in both EtherCAT and CANopen versions. Multi-axis models deliver optimal cost per node. A wide range of absolute encoder interfaces are built-in, including EnDat, BiSS, Absolute A and SSI. STO functionality reduces system cost in safety-critical applications.

	MODEL	VAC	IC	IP
XEC, XPC	X*C-230-09	100-240	3	9
	X*C-230-12	100-240	6	12
	X*C-230-15	100-240	7.5	15
				Resolver: -R
XEL, XPL	X*L-230-18	100-240	6	18
	X*L-230-36	100-240	12	36
	X*L-230-40	100-240	20	40
				Resolver: -R
XE2, XP2	X*2-230-20	100-240	10	20
2-Axis				Resolver: -R

*Indicates E for EtherCAT and P for CANopen

Accelnet^{PLUS} — (Servo)

Accelnet^{PLUS} sets new levels of performance and is available in both EtherCAT and CANopen versions. Multi-axis models deliver optimal cost per node. A wide range of absolute encoder interfaces are built-in, including EnDat, BiSS, Absolute A and SSI. Higher-resolution current loops enable Accelnet^{PLUS} to meet the needs of the most demanding applications. STO functionality reduces system cost in safety-critical applications.

	MODEL	VDC	IC	IP
BEL, BPL	B*L-090-06	14-90	3	6
	B*L-090-14	14-90	7	14
	B*L-090-30	14-90	15	30
				Resolver: -R
BE2, BP2	B*2-090-06	14-90	3	6
2-Axis	B*2-090-14	14-90	7	14
	B*2-090-20	14-90	10	20
				Resolver: -R
AEZ, APZ	A*Z-090-50	9-90	25	50
Micro	A*Z-090-50	9-90	50	50

*Indicates E for EtherCAT and P for CANopen

Stepnet^{PLUS} — Stepper

Stepnet^{PLUS} sets new levels of performance and is available in both EtherCAT and CANopen versions. Multi-axis models provide optimal cost per node. Microstepping delivers smooth, low-resonance performance. In Servo Mode, with encoder feedback, stepper motors run quietly and can operate at higher speeds without stalling. A wide range of absolute encoder interfaces are built-in, including EnDat, BiSS, Absolute A and SSI.

	MODEL	VDC	IC	IP
TEL	TEL-090-07	14-90	5	7
	TEL-090-10	14-90	10	10
TE2, TP2	T*2-090-07	14-90	5	7
2-Axis	T*2-090-10	14-90	10	10

*Indicates E for EtherCAT and P for CANopen

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Precision Motion Control

Control Modes
- Indexer, Point-to-Point, PVT, PT, CSP, CST, CSV
- Camming, Gearing
- Position, Velocity, Torque

Command & Communications
- EtherCAT (XEC, XEL, XE2, BEL, BE2, TEL, TE2, AEZ)
- CANopen (XPC, XPL, XP2, BPL, BP2, TP2, APZ)
- RS-232, ASCII & Serial Binary
- Step/Direction, Step Up/Step Down
- ±10 V Position/Velocity/Torque
- PWM Velocity/Torque
- Master encoder
- Dual Analog UV command (XPL,XEL)

Feedback
- Incremental encoder & digital Halls
- BiSS, SSI, Absolute A, EnDat encoders
- Panasonic, Tamagawa, Sanyo Denki
- Analog Sin/Cos encoder
- Resolver (-R option)
- Aux. encoder / encoder out
- Dual Absolute (Single axis servo drives only)

Functional Safety
- STO Certified (Except X*L)

FPGA Firmware Features
- 32-bit floating point multi loop filters
- Frequency analysis tools
- Hardware pulse at position
- Cross coupling (Dual axis drives)
- High speed position capture
- Count divider

I/O — Digital
- Digital X*C: 11 inputs, 5 outputs
- Digital X*L: 15 inputs, 6 outputs
- Digital X*2: 22 inputs, 7 outputs
- Digital B*L, TEL: 11 inputs, 4 outputs
- Digital B*2: 18 inputs, 7 outputs
- Digital T*2: 24 inputs, 7 outputs
- Digital A*Z: 7 inputs, 6 outputs
- Analog X*C, B**, T*2: 1, 12-bit input
- Analog X*L: 2, 16-bit inputs; 1, 12-bit output
- Analog X*2: 2, 14-bit inputs
- Analog A*Z: 1, 16-bit input

Regen
- X*C, X*2: Built-in regen resistor
- X*L, X*2: External regen resistor accessory XTL-RA-XX

Dimensions: mm (in)
- **X*C** 191 x 116 x 54 (7.5 x 4.6 x 2.1)
- **X*L** 201 x 140 x 59 (7.9 x 5.5 x 2.3)
- **X*2** 235 x 138 x 91 (9.3 x 5.4 x 3.6)
- **B*L** 129 x 87 x 50 (5.1 x 3.4 x 2.0)
- **B*2** 172 x 119 x 44 (6.8 x 4.7 x 1.7)
- **TEL** 129 x 87 x 50 (5.1 x 3.4 x 2.0)
- **T*2** 172 x 119 x 50 (6.8 x 4.7 x 2.0)
- **A*Z** 112 x 53 x 42 (4.4 x 2.1 x 1.7)
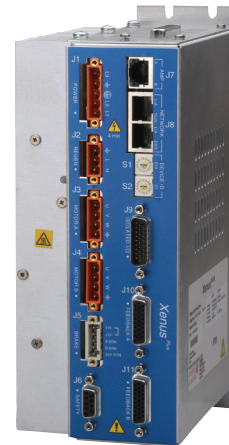- * Indicates E -EtherCAT and P -CANopen
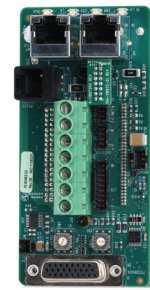
Accelnet^PLUS AEZ   *Xenus^PLUS XEL*

Xenus^PLUS XE2   *Xenus^PLUS XEC*

Accelnet^PLUS BE2 Stepnet^PLUS TE2   *Accelnet^PLUS BEL Stepnet^PLUS TEL*

MACRO Drives — Servo

MACRO facilitates the powerful combination of Omron/Delta Tau controllers and Copley drives. Both AC-powered Xenus^PLUS (1 & 2-axis) and DC powered Accelnet^PLUS drives are available. High-resolution A/D converters ensure optimal current loop performance. MACRO drives incorporate the STO capability and interface to a comprehensive range of encoders.

	MODEL	V_{AC}	I_C	I_P
XML	XML-230-18	100-240	6	18
	XML-230-36	100-240	12	36
	XML-230-40	100-240	20	40
				Resolver: -R
XM2	XM2-230-20	100-240	10	20
2-Axis				Resolver: -R
BML	BML-090-06	14-90	3	6
	BML-090-14	14-90	7	14
	BML-090-30	14-90	15	30

Command & Communications
- MACRO (fiber optic)
- Analog UV command (XML)
- Digital UV command
- Serial Network UV command

Feedback
- Incremental Encoder, Digital Halls
- BiSS, SSI, Absolute A, EnDat encoders
- Panasonic, Tamagawa, Sanyo Denki
- Analog Sin/Cos encoder
- Resolver
- Aux. encoder / encoder out
- Dual Absolute (Single axis drives)

Functional Safety
- STO Certified (XM2, BML)

I/O
- Digital XML: 15 inputs, 6 outputs
- Digital XM2: 22 inputs, 7 outputs
- Digital BML: 11 inputs, 4 outputs
- Analog XML: 2, 16-bit inputs; 1, 12-bit input; 1, 12-bit output
- Analog XM2: 2, 14-bit inputs
- Analog BML: 1, 12-bit input

Regen
- XML: External regen resistor accessory XTL-RA-XX
- XM2: Built-in regen resistor

Dimensions: mm (in)
- **XML** 201 x 140 x 59 (7.9 x 5.5 x 2.3)
- **XM2** 235 x 138 x 91 (9.2 x 5.4 x 3.6)
- **BML** 129 x 87 x 50 (5.1 x 3.4 x 2.0)

Custom Drives

Copley provides competitive advantage to the OEM by tailoring designs to precisely fit the application. Copley development engineers and application team will work closely with you to define your requirements and deliver a just-right solution.

Customization can be as simple as special I/O functions or as complex as a multi-axis drive package. Software customization includes application-specific indexer functions, control filters and specialized analysis and diagnostic tools.

In addition to customized drives, Copley's motion subsystem design and manufacturing capability can significantly reduce time to market while freeing-up key OEM resources to focus on core design issues. Copley's expertise in power and thermal management as well as experience in the accelerated life test of complex subsystems guarantee lowered cost of ownership. Optimized motion subsystem design ensures the highest level of performance in the smallest footprint.

Xenus^PLUS XML   *Xenus^PLUS XM2*

Accelnet^PLUS BML

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FOR MORE INFORMATION

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