Selection Guide

Servo Drives
Stepper Drives
Control Software

Copley Controls

Copley Controls

About Copley

Copley Controls delivers high performance motion solutions to a wide range of industries including semiconductor, life sciences, automated assembly, test and measurement and COTS military. An ISO 9001:2000 company, Copley produces RoHS compliant products of the highest quality in a state-of-the-art US manufacturing facility.

With over 25 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 US, Europe and Asia.

As a division of Analogic Corporation, Copley Controls has the buying power and resources to compete long term in the global marketplace. Our OEM commitment has stood the test of time with many models in production for well over a decade.

Servo & Stepper Drives

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 100W - 6kW power range. A comprehensive range of motor feedback interfaces is provided. Advanced tuning and commutation algorithms 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.

Configuration & Control Software

Copley drive configuration software is highly intuitive and incorporates powerful diagnostic tools. An easy-to-use Indexer is built in. For more complex applications, a flexible high-level language is provided with powerful editing and debugging capabilities.

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.
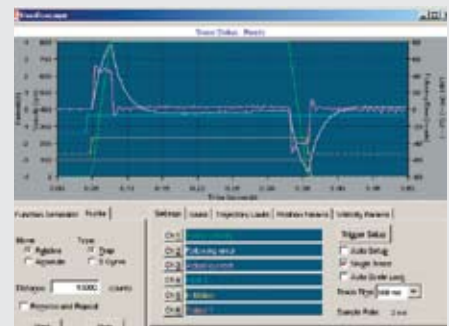
Custom OEM Solutions

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 timely solution.

Drive customization can be as simple as special I/O functions or as complex as a complete, cost-optimized multi-axis rack-based system. Software customization includes application-specific indexer functions, control filters and specialized analysis and diagnostic tools.

System Connectivity

CONTROL

PC Architecture

Copley drives connect seamlessly to both CANopen and EtherCAT - the networks of choice for PC-based systems. Copley drives are also integrated into third-party software tools, including LabVIEW and CoDeSys SoftMotion, for complete PC-based multi-axis motion control solutions.

Motion Control Cards

Both the traditional ±10 V and PWM current/velocity command interfaces are built-in on all drives. For Delta Tau motion cards, 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.

FEEDBACK

Incremental Encoders

Digital incremental encoder and Halls are the standard interface on all drives with position mode capability. Xenus and Accelnet feature an analog encoder option and incorporate a wake-and-wiggle algorithm for commutation without Halls.

Resolvers

Resolvers are the feedback of choice for rugged environments. Available as an option on Xenus and Accelnet, Copley's proprietary interface delivers 14-bit resolution up to 10,000 RPM.

Absolute Encoders

Select Copley drives are available with a range of open standard absolute encoder interfaces including EnDat, BiSS and SSI.

NETWORKS

CANopen

CANopen is a highly cost-effective implementation of distributed control. In PVT mode, the drive accepts tightly synchronized position/velocity/time points. In profile mode, the drive executes a move based on pretransmitted parameters. CANopen also accomodates velocity and torque modes.

Copley provides comprehensive hardware and software tools for CANopen. CAN-PCI-02 is a fully isolated dual-channel PCI card with an on-board micro controller. CAN-IPM-01 I/O Processor Module enables OEMs to design optimal system interfaces and integrate them seamlessly into a CANopen network.

EtherCAT

EtherCAT is an open, real-time Ethernet network. Fast and deterministic, EtherCAT supports a variety of network topologies including line, tree and star. EtherCAT leverages standard CANopen device profiles, facilitating migration to an Ethernet based system. Both centralized and distributed control architectures can be implemented with EtherCAT.

MACRO

Designed for Delta Tau controllers, MACRO is Ethernet based and available in both fiber and copper physical layers. MACRO is typically used in a centralized control architecture with position and velocity loops closed in the motion card.

RS-232 ASCII

RS-232 is used for point-to-point motion in both PLC- and PC-based systems. Drives operate as Indexers or execute moves based on pretransmitted parameters. Multiple axes can be addressed via a transparent CANopen connection between drives.

Software Tools


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                    ┌─────────────────────────────┐
                    │     APPLICATION LAYER       │
                    ├─────────────────────────────┤
                    │  COPLEY MOTION LIBRARIES    │
CANopen ────────────┤ CANOPEN  │   ETHERCAT       ├──────────── EtherCAT
                    ├─────────────────────────────┤
                    │      OPERATING SYSTEM       │
                    └─────────────────────────────┘
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Networking Software

Copley distributed control software makes system commissioning fast and simple. The development of low-level code to control a CANopen or EtherCAT network is eliminated. All network management is accomplished with a few simple commands linked into your application program.

The application program interacts with amplifier "objects." Amplifier objects are in turn connected to EtherCAT or CANopen objects. This means that a program written for one network can easily be ported to another network without changing the basic program.

Copley supports two development environments. Copley Motion Libraries (CML) source code can be compiled with a C++ application program. Copley Motion Objects (CMO) are COM objects that can be used by Visual Basic®, .NET®, LabVIEW® or any COM-compliant software.

Network Management
• Configuration and startup
• Synchronization
• Node guarding
• Message generation
• Heartbeat
• Error management

Motion Control
• Path planning
• PVT generation
• Profile execution
• PVT buffer management

General
• Parameter set/get
• Setup file download
• Drive fault handling
• I/O interfacing

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High Level Language

Copley Programming Language (CPL) is a powerful, flexible OEM programming environment for PLUS versions of Copley drives. Combining the best features of BASIC, C, and Java, CPL incorporates a rich set of motion system calls. Data types are extensive and include arrays and structures. The availability of both local and global variables enables well-structured code development.

CPL is based on the Netbeans Platform IDE, featuring an intuitive source code editor and powerful debugger. Project templates are provided for easy startup along with a comprehensive collection of example code. For real-time analysis, CME 2 diagnostic tools can run simultaneously.

Configuration

Java based CME 2 configuration software is powerful and intuitive. Comprehensive diagnostics, auto-tuning and advanced oscilloscope tools simplify system commissioning.

Auto-phasing eliminates the time-consuming rewire-and-try procedure for encoder/Halls/motor connections. CME 2 automatically compensates for crossed wires - the most common cause of startup headaches.
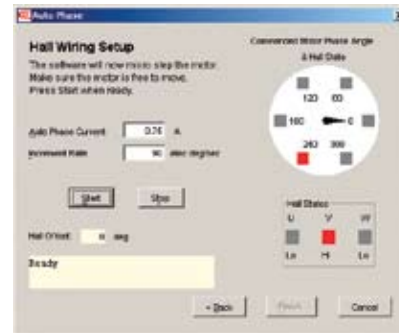
Easy-to-Use Indexer

For simpler applications, Copley provides a very easy-to-use indexer. Just point-and-click to define up to 32 indexes or index sequences. Index sequences can include parameter changes, dwell times and I/O control. Simply select the index/sequence and command GO.

Any parameter (e.g., move distance) can be assigned to a register for efficient adjustment by a PLC. For further simplification, Copley can also provide custom functions. Just install and fill in the blanks.

Cam Tables

Camming is an effective way to produce repetitive motion synchronized to an external device. A pre-defined cam table of slave positions is typically cycled through by a master encoder connected to the drive. The drive performs linear interpolation between points to minimize cam table size.

Digital Drive Overview

Comprehensive Drive Range

Copley offers a complete range of digital drives for brushless, brush and stepper motors. Xenus, Accelnet and Stepnet feature CANopen for distributed control. **PLUS** versions also incorporate EtherCAT and offer expanded feedback options. **PLUS** drives feature high resolution A/D converters for optimal current control as well as fast, hardware-based position capture and setpoint trigger output.

Feature	Xenus	Accelnet	Stepnet	Accelus	Junus
Motor	Brushless/Brush	Brushless/Brush	Stepper	Brushless/Brush	Brush
Input Power	100-240 VAC	20-180 VDC	VAC, VDC	20-180 VDC	20-180 VDC
Continuous Current	1-20 A	1-15 A	2-10 A	3-12 A	5-15 A
Feedback*	E, R, S, A	E, R, S, A	E	E	V
PLUS Version	•	•	•		
Ruggedized Version	•	•			
CANopen	•	•	•		
EtherCAT	•	•	•		
MACRO	•	•			
Indexer	•	•	•		
Camming	•	•	•		
Gearing	•	•	•	•	
Step/Direction	•	•	•	•	
PWM velocity/current	•	•	•	•	•
±10V velocity/current	•	•	•	•	•

* E=Incremental Encoder, R=Resolver, S=Analog Encoder, A=Absolute Encoder, V=Back-EMF

Custom Drive Designs

A broad spectrum of technology expertise enables Copley to respond rapidly and cost-effectively to OEM needs. Custom capabilities include:

• Optimized Packaging: connectors and form factor
• Power Ratings: custom current and voltage
• Multi-Axis: rack systems and 2-4 axis packages
• Java Beans: custom indexer functions
• Feedback: special encoders
• Enhanced Firmware: custom compensation filters
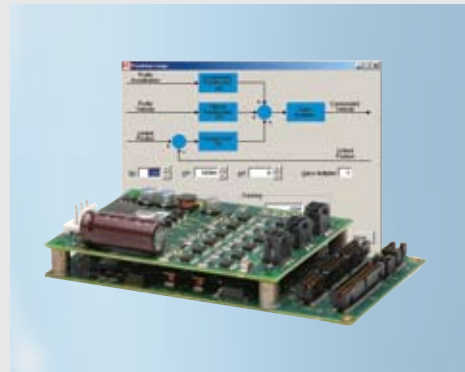
Installation Flexibility

Copley provides high power density panel-mount and PCB-mount packaging options. Multi-axis modules are available for optimal flexibility. Both AC- and DC-powered versions are available.

Technology Edge

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 flters
• 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

AC Powered

DC Powered

Ruggedized Drives

R-Series drives are ruggedized versions of Xenus and Accelnet. Designed to endure temperature extremes, high humidity, vibration and shock, the R-Series finds application in COTS military, nautical, aviation, oil refining and vehicle-based systems.

Ambient Temp.	-40ºC to 70ºC
Thermal Shock	-40ºC to 70ºC in 1 minute
Relative Humidity	95% non-condensing at 60ºC
Vibration	5 Hz to 500 Hz, up to 3.85 $g$rms
Altitude	-400 m to 5,000 m
Shock	40 g peak acceleration
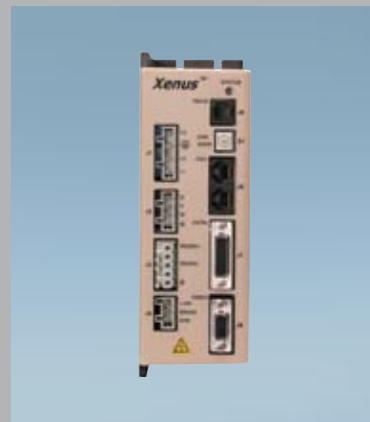
Xenus

XTL Panel

Model	VAC	Ic	Ip
XTL-230-18	100-240	6	18
XTL-230-36	100-240	12	36
XTL-230-40	100-240	20	40

XSJ Micro Panel

Model	VAC	Ic	Ip
XSJ-230-02	100-240	1	2
XSJ-230-06	100-240	3	6
XSJ-230-10	100-240	5	10

Xenus is available in two AC line operated compact packages delivering power up to 6 kW. A +24Vdc 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.

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

Command & Communications
• CANopen DS-402
• RS-232 ASCII
• Step/Direction, Step Up / Step Down
• ±10V position/velocity/torque
• PWM velocity/torque
• Master encoder

Feedback
• Incremental quadrature encoder
• Digital Halls
• Analog sin/cos encoder [-S option]
• Resolver [-R option]
• Aux. encoder / encoder out

I/O - Digital
• XTL: 12 inputs, 4 outputs
• XSJ: 14 inputs, 4 outputs

Regen
• XTL: internal transistor, external resistor
• XSJ: internal dissipation

Accessories
• External regen resistors
• External edge filter

Dimensions: mm [in]
• XTL: 191 x 140 x 64 [7.5 x 5.5 x 2.5]
• XSJ: 125 x 89 x 53 [5.0 x 3.5 x 2.1]

CANopen
R-Series

Xenus^{PLUS}

XPL, XEL Panel

Model	VAC	Ic	Ip
XPL-230-18	100-240	6	18
XPL-230-36	100-240	12	36
XPL-230-40	100-240	20	40

EtherCAT

Model	VAC	Ic	Ip
XEL-230-18	100-240	6	18
XEL-230-36	100-240	12	36
XEL-230-40	100-240	20	40

CANopen
EtherCAT

Xenus^{PLUS} sets new levels of performance, connectivity and flexibility. Both EtherCAT and CANopen versions are available. A wide range of absolute encoder interfaces are built-in, including EnDat, BiSS and SSI.

High resolution A/D converters ensure optimal current loop performance. Isolated I/O, as well as high-speed non-isolated I/O are provided. For safety critical applications, redundant power stage enable inputs can be employed [Safe Torque Off].

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

Command & Communications
• EtherCAT CoE DS-402 [XEL]
• CANopen DS-402 [XPL]
• RS-232 ASCII
• Step/Direction, Step Up / Step Down
• ±10V position/velocity/torque
• PWM velocity/torque
• Master encoder

Feedback
• Incremental quadrature encoder
• Digital Halls
• BiSS, SSI, Absolute A, EnDat encoders
• Panasonic, Tamagawa, Sanyo Denki, Gurley encoders
• Analog sin/cos encoder
• Resolver [-R option]
• Aux. encoder / encoder out

Safety Disable
• Safe Torque Off

I/O
• Digital: 15 inputs, 6 outputs
• Analog: 2, 16-bit inputs; 1, 12-bit output

Accessories
• External regen resistors
• External edge filter

Dimensions: mm [in]
• 201 x 145 x 58 [7.9 x 5.7 x 2.3]

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Accelnet Panel

ADP Panel

Model	VDC	Ic	Ip
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

ACJ Micro Panel

Model	VDC	Ic	Ip
ACJ-055-09	20-55	3	9
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

Accelnet is 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.

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

Command & Communications
• CANopen DS-402
• RS-232 ASCII
• Step/Direction, Step Up / Step Down
• ±10V position/velocity/torque
• PWM velocity/torque
• Master encoder

Feedback
• Incremental quadrature encoder
• Digital Halls
• Analog sin/cos encoder [-S option]
• Resolver [-R option]
• Aux. encoder / encoder out

I/O - Digital
• ADP: 12 inputs, 3 outputs
• ACJ: 9 inputs, 4 outputs

Dimensions: mm [in]
• ADP: 168 x 104 x 30 [6.6 x 4.1 x 1.2]
• ACJ: 97 x 63 x 33 [3.8 x 2.5 x 1.3]

CANopen
R-Series

Accelnet Module

ACM Module

Model	VDC	Ic	Ip
ACM-055-18	20-55	6	18
ACM-090-09	20-90	3	9
ACM-090-24	20-90	12	24
ACM-180-09	20-180	3	9
ACM-180-18	20-180	6	18
ACM-180-20	20-180	10	20

ACK Micro Module

Model	VDC	Ic	Ip
ACK-055-06	20-55	3	6
ACK-055-10	20-55	5	10
ACK-090-04	20-90	2	4
ACK-090-08	20-90	4	8

Accelnet Modules are available in two compact DC-powered PCB-mounted packages for optimal OEM flexibility. Control interfaces include CANopen as well as traditional analog commands. Incremental encoder feedback is standard with an optional resolver interface.

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

Command & Communications
• CANopen DS-402
• RS-232 ASCII
• Step/Direction, Step Up / Step Down
• ±10V position/velocity/torque
• PWM velocity/torque
• Master encoder

Feedback
• Incremental quadrature encoder
• Digital Halls
• Resolver [-R option]

I/O - Digital
• ACM: 10 inputs, 2 outputs
• ACK: 10 inputs, 3 outputs

Dimensions: mm [in]
• ACM: 102 x 71 x 25 [4.0 x 2.8 x 1.0]
• ACK: 64 x 41 x 21 [2.5 x 1.6 x 0.8]

CANopen
R-Series

Accelnet^{PLUS} Panel

AEP Panel

EtherCAT

Model	VDC	Ic	Ip
AEP-055-18	20-55	6	18
AEP-090-09	20-90	3	9
AEP-090-18	20-90	6	18
AEP-090-36	20-90	12	36
AEP-180-09	20-180	3	9
AEP-180-18	20-180	6	18

Accelnet^{PLUS} brings EtherCAT connectivity to the Accelnet Panel DC-powered drive. In addition, a wide range of absolute encoder interfaces are incorporated as well as expanded I/O capability.

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

Command & Communications
• EherCAT CoE DS-402
• RS-232 ASCII
• ±10V position/velocity/torque
• PWM velocity/torque
• Master encoder

Feedback
• Incremental quadrature encoder
• Digital Halls
• BiSS, SSI, Absolute A, EnDat encoders
• Panasonic, Tamagawa, Sanyo Denki, Gurley encoders
• Analog sin/cos encoder
• Aux. encoder / encoder out

I/O
• Digital: 16 inputs, 6 outputs
• Analog: two 12-bit inputs

Dimensions: mm [in]
• 196 x 104 x 30 [7.7 x 4.1 x 1.2]

EtherCAT

Accelnet^{PLUS} Module

APM, AEM 1-Axis Module

Model	VDC	Ic	Ip
APM-090-06	20-90	3	6
APM-090-14	20-90	7	14
APM-090-30	20-90	15	30

EtherCAT

Model	VDC	Ic	Ip
AEM-090-06	20-90	3	6
AEM-090-14	20-90	7	14
AEM-090-30	20-90	15	30

AP2, AE2 2-Axis Module

Model	VDC	Ic	Ip
AP2-090-06	20-90	3	6
AP2-090-14	20-90	7	14

EtherCAT

Model	VDC	Ic	Ip
AE2-090-06	20-90	3	6
AE2-090-14	20-90	7	14

Accelnet^{PLUS} Modules set new levels of performance, connectivity and flexibility. Both EtherCAT and CANopen versions are available. Multi-axis models deliver optimal cost per node. A wide range of absolute encoder interfaces are built-in, including EnDat, BiSS and SSI. Higher-resolution current loops enable Accelnet^{PLUS} to meet the needs of the most demanding applications.

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

Command & Communications
• EherCAT CoE DS-402 [AEM, AE2]
• CANopen DS-402 [APM, AP2]
• RS-232 ASCII
• Step/Direction, Step Up / Step Down
• ±10V position/velocity/torque
• PWM velocity/torque
• Master encoder

Feedback
• Incremental quadrature encoder
• Digital Halls
• BiSS, SSI, Absolute A, EnDat, Hiperface encoders
• Panasonic, Tamagawa, Sanyo Denki, Gurley encoders
• Analog sin/cos encoder
• Aux. encoder / encoder out

I/O
• Digital 1-Axis: 11 inputs, 6 outputs
• Digital 2-Axis: 20 inputs, 7 outputs
• Analog: one 12-bit input per axis

Dimensions: mm [in]
• APM, AEM: 77 x 59 x 20 [3.0 x 2.3 x 0.8]
• AP2, AE2: 114 x 73 x 20 [4.5 x 2.9 x 0.8]

CANopen
EtherCAT

Stepnet Panel

STX Panel

Model	VAC	Ic	Ip
STX-115-07	100-120	5	7
STX-230-07	100-240	5	7

STP Panel

Model	VDC	Ic	Ip
STP-075-07	20-75	5	7
STP-075-10	20-75	10	10

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.

Control Modes
• Indexer, Point-to-Point, PVT
• Camming, Gearing
• Position, Velocity, Torque [Servo Mode]
• Position [Microstepping]

Command & Communications
• CANopen DS-402
• RS-232 ASCII
• Step/Direction, Step Up / Step Down
• ±10V position/velocity/torque [STX]
• PWM velocity/torque [Servo Mode]
• Master encoder

Feedback
• Incremental quadrature encoder [Servo Mode]

I/O - Digital
• 12 inputs, 4 outputs

Dimensions: mm [in]
• STX: 146 x 119 x 55 [5.7 x 4.7 x 2.2]
• STP: 136 x 82 x 42 [5.4 x 3.2 x 1.7]

CANopen

Stepnet Module

STM Module

Model	VDC	Ic	Ip
STM-075-07	20-75	5	7

STL Micro Module

Model	VDC	Ic	Ip
STL-055-04	20-55	3	4.5
STL-075-03	20-75	2	3

ST3 3-Axis Module

Model	VDC	Ic	Ip
ST3-055-04	12-55	2	4

The Stepnet Modules provide optimal OEM installation flexibility. 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.

Control Modes
• Indexer, Point-to-Point, PVT
• Camming, Gearing
• Position, Velocity, Torque [Servo Mode]
• Position [Microstepping]

Command & Communications
• CANopen DS-402
• RS-232 ASCII
• Step/Direction, Step Up / Step Down
• ±10V position/velocity/torque [STM]
• PWM velocity/torque
• Master encoder

Feedback
• Incremental quadrature encoder [Servo Mode]

I/O - Digital
• STM, STL: 12 inputs, 4 outputs
• ST3: 15 inputs, 6 outputs

Dimensions: mm [in]
• STM: 102 x 70 x 25 [4.0 x 2.8 x 1.0]
• STL: 64 x 41 x 16 [2.5 x 1.6 x 0.6]
• ST3: 121 x 70 x 27 [4.8 x 2.8 x 1.1]

CANopen

Stepnet^{PLUS} Module

SPM, SEM 1-Axis Module

Model	VDC	Ic	Ip
SPM-090-07	20-90	5	7

EtherCAT

Model	VDC	Ic	Ip
SEM-090-07	20-90	5	7

SP2, SE2 2-Axis Module

Model	VDC	Ic	Ip
SP2-090-07	20-90	5	7

EtherCAT

Model	VDC	Ic	Ip
SE2-090-07	20-90	5	7

Stepnet^{PLUS} Modules set new levels of performance, connectivity and flexibility. Both EtherCAT and CANopen versions are available. 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.

Control Modes
• Indexer, Point-to-Point, PVT
• Camming, Gearing
• Position, Velocity, Torque [Servo Mode]
• Position [Microstepping]

Command & Communications
• EherCAT CoE DS-402 [SEM, SE2]
• CANopen DS-402 [SPM, SP2]
• RS-232 ASCII
• Step/Direction, Step Up / Step Down
• ±10V position/velocity/torque
• PWM velocity/torque
• Master encoder

Feedback
• Incremental quadrature encoder [Servo Mode]

I/O
• Digital 1-Axis: 11 inputs, 6 outputs
• Digital 2-Axis: 20 inputs, 7 outputs
• Analog: one 12-bit input per axis

Dimensions: mm [in]
• SPM, SEM: 77 x 59 x 20 [3.0 x 2.3 x 0.8]
• SP2, SE2: 114 x 73 x 20 [4.5 x 2.9 x 0.8]

CANopen
EtherCAT

MACRO Drives

Xenus^PLUS XML Panel

Model	VAC	Ic	Ip
XML-230-18	100-240	6	18
XML-230-36	100-240	12	36
XML-230-40	100-240	20	40

Accelnet AMP Panel

Model	VDC	Ic	Ip
AMP-055-18	20-55	6	18
AMP-090-09	20-90	3	9
AMP-090-18	20-90	6	18
AMP-090-36	20-90	12	36
AMP-180-09	20-180	3	9
AMP-180-18	20-180	6	18

MACRO

MACRO facilitates the powerful combination of Delta Tau controllers and Copley drives. Both AC-powered Xenus^PLUS and DC-powered Accelnet are available. Xenus^PLUS features high resolution A/D converters for optimal current loop performance as well as Safe Torque Off capability. All MACRO drives interface to a comprehensive range of encoders. A resolver option is available for Xenus^PLUS.

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

Command & Communications
• MACRO [fiber optic]
• RS-232 ASCII
• Step/Direction, Step Up / Step Down
• ±10V position/velocity/torque
• PWM velocity/torque
• Master encoder

Feedback
• Incremental quadrature encoder
• Digital Halls
• BiSS, SSI, Absolute A, EnDat encoders
• Panasonic, Tamagawa, Sanyo Denki, Gurley encoders
• Analog sin/cos encoder
• Resolver [XML -R option]
• Aux. encoder / encoder out

Safety Disable [XML]
• Safe Torque Off

I/O
• Digital XML: 15 inputs, 6 outputs
• Digital AMP: 11 inputs, 4 outputs
• Analog XML: 2, 16-bit input; 1, 12-bit output
• Analog AMP: 2, 12-bit inputs

Accessories [XML]
• External regen resistors
• External edge filter

Dimensions: mm [in]
• XML: 201 x 145 x 50 [7.9 x 5.7 x 2.3]
• AMP: 196 x 104 x 30 [7.7 x 4.1 x 1.2]

Accelus

ASP Panel

Model	VDC	Ic	Ip
ASP-055-18	20-55	6	18
ASP-090-09	20-90	3	9
ASP-090-18	20-90	6	18
ASP-090-36	20-90	12	36
ASP-180-09	20-180	3	9
ASP-180-18	20-180	6	18

ASC Card

Model	VDC	Ic	Ip
ASC-O55-18	20-55	6	18
ASC-090-09	20-90	3	9

Accelus delivers high performance control of brushless and brush motors in two cost-effective packages. Torque and velocity modes are complemented by Step/Direction position mode. Feedback is incremental encoder and digital Halls.

Control Modes
• Gearing
• Position, Velocity, Torque

Command Interface
• ±10V position/velocity/torque
• Step & Direction, CUP/CDN
• PWM velocity/torque
• Master encoder

Communications
• RS-232

Feedback
• Incremental quadrature encoder
• Digital Halls

I/O - Digital
• 6 inputs, 2 outputs

Dimensions: mm [in]
• ASP: 168 x 99 x 31 [6.6 x 3.9 x 1.2]
• ASC: 153 x 89 x 31 [6.0 x 3.5 x 1.2]

Junus

JSP Panel

Model	VDC	Ic	Ip
JSP-090-10	20-90	5	10
JSP-090-20	20-90	10	20
JSP-180-10	20-180	5	10
JSP-180-20	20-180	10	20
JSP-180-30	20-180	15	30

Junus is a cost-effective solution for the control of brush motors. Operating in torque and velocity mode, Junus accepts both analog and PWM commands. Sensorless velocity feedback is derived from the motor back-EMF.

Control Modes
• Velocity, Torque

Command Interface
• ±10V velocity/torque command
• PWM velocity/torque command

Communications
• RS-232

Feedback
• Back-EMF [velocity mode]

I/O - Digital
• 5 inputs, 1 output

Dimensions: mm [in]
• 130 x 91 x 31 [5.1 x 3.6 x 1.2]

Analog Amplifiers

Precision Applications

Free from quantization errors, an analog UV amplifier delivers high performance in precision applications. Accepting commutated current commands for both U and V motor windings, the amplifier synthesizes the commanded current for the W winding. For the most sensitive applications an internal edge filter option is available to minimize radiated switching noise.

Cost-Effective Solutions

PCB-mounted, high density modules are an ideal solution for cost-sensitive multi-axis application of both brushless and brush motors. Trapezoidally commutated, the amplifier modules deliver high current levels from a very small footprint.

Configuration

Analog amplifier modules are configured by host PCB components and analog control signal inputs. Panel-mounted amplifiers utilize a component header to set current limits and compensate for a wide range of motor inductances.

Amplifier Technology
• Excellent linearity
• High PWM switching frequency
• Compact size
• Zero deadband
• Internal edge filter option

Control Interface
• UV commutated current
• ±10V current command
• Current limits
• Current monitor

Protection
• Output short circuit
• Current limiting: continuous, peak, time
• Overtemperature
• Overvoltage shutdown
• Undervoltage shutdown

7000 Series

7000 Series UV amplifiers with optional internal edge filter meet the needs of high precision brushless motor applications. AC-powered, the amplifier does not require transformer isolation. A configuration header is available factory-set for off-the-shelf performance.

Control Mode: Torque
Command Interface: UV
Commutation: Sinusoidal
Dimensions: 191 x 176 x 69 [7.5 x 6.9 x 2.7]

Digital In: Enable, Reset, Motemp
Digital Out: Amp OK, Current Limiting
Analog In: REF (UV)
Analog Out: Motor Current (UV)

Model	VAC	Ic	Ip
7225AC	100-120	10	20
7425AC	100-240	10	20

BTM Module

The Bantam module is a highly cost-effective OEM solution for torque control of brushless and brush motors. PCB-mounted with solderless connectors, Bantam accepts a standard ±10V current command. Digital Hall feedback facilitates trapezoidal commutation of brushless motors. Analog control inputs set current limits and adjust balance.

Control Mode: Torque
Command Interface: ±10V
Commutation: Trapezoidal
Feedback: Digital Halls
Dimensions: 53 x 46 x 15 [2.1 x 1.8 x 0.6]

Digital In: Enable, Limits, Inductance Select
Digital Out: Amp OK, Regen, Brake
Analog In: REF, Balance, Ic/Ip/I^2t Limits
Analog Out: Motor Current, Ref. Current

Model	VDC	Ic	Ip
BTM-055-20	12-55	10	20
BTM-090-10	12-90	5	10

R-Series [BTM]