copley controls

Precision Motion Control

Ruggedized

Servo Drives

for Extreme Environments

Ruggedized

The Copley Edge

- **35 years of experience in servos and power systems**
- **Quality products designed and built in the U.S.A.**
- **Comprehensive range with custom capability**
- **ISO 9001:2015 certified**
- **RoHS compliant**
- **Agile, responsive R&D and applications team**
- **Global sales offices and technical support**

Why Ruggedized?

R-Series drives incorporate a range of command interfaces and communication channels for system integration flexibility. CANopen, an international standard for motion control, is proven in harsh environments. RS-232/422 interfaces enable control via ASCII or Serial binary commands. Step / direction and analog velocity / current command interfaces are ideal for integration into traditional architectures.

Installation Flexibility

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.

Ruggedized Drives

R-Series drives are ruggedized versions of Xenus, Accelnet, Stepnet and Plus drives. They deliver performance you can trust in the harshest environments. R-Series drives are designed to endure temperature extremes, high humidity, vibration and shock. Copley's proven drive technology finds application in COTS military, nautical, aviation, oil refining and vehicle-based systems.

- 150 W to 7 kW power range
- Indexing and trajectory tracking modes
- EtherCAT, CANopen, RS-232 and RS-422
- Analog and digital command interfaces
- Encoder (Incremental, Sin/Cos, Absolute) and resolver versions
- Ambient Temperature: -40°C to 70°C
- Thermal Shock: -40°C to 70°C in 1 minute
- Relative Humidity: 95% non-condensing at 60°C
- Vibration: 5 Hz to 500 Hz, up to 3.85 grms
- Altitude: -400 m to 5,000 – 16,000 m
- Shock: 40 g peak acceleration

Design Standards

- MIL-STD-810 Environmental Engineering Considerations and Laboratory test
- MIL-STD-1275 Characteristics of 28 VDC Electrical Systems in Military Vehicles
- MIL-STD-704 Aircraft, Electric Power Characteristics
- MIL-STD-461 Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment
- MIL-STD-1399 Interface Standard for Shipboard Systems
- IEC-60079 Electrical Apparatus for Explosive Gas Atmospheres
- IEC-60068 Environmental Testing
- 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

Configuration

CME configuration software is powerful and intuitive. Comprehensive diagnostics, auto-tuning and advanced oscilloscope tools simplify system commissioning. Auto-phasing eliminates time-consuming rewire-and-try for feedback connections. Advanced frequency analysis tools and multi-loop filters provide control solutions.

Network Software

Copley distributed control software for CANopen makes system commissioning fast and simple. All network management is taken care of by a few commands linked into your application program.

Copley supports two development environments. Copley Motion Libraries (CML) link into a C++ application program run on Windows, Linux and QNX. Copley Motion Objects (CMO) are .Net® framework objects that can be used by VB and C#.

Xenus — Servo
(R10, R11)

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
R10	R10-230-18	100-240	6	18
Panel	R10-230-36	100-240	12	36
	R10-230-40	100-240	20	40
R11	R11-230-10	100-240	5	10
Micro Panel				

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 command
- PWM Velocity/Torque command
- Master Encoder (Gearing/Camming)

Communications
- CANopen
- RS-232
- RS-422 (option)

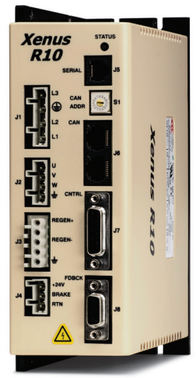
Feedback
- Digital quad A/B encoder
- Digital Halls
- Aux. encoder / encoder out
- Analog Sin/Cos encoder
- Resolver (w/ CSR)
- Dual loop feedback

AFS Firmware Features (R10, R11)
- BiSS-C Unidirectional, SSI (Consult factory)
- 32-bit floating point multi loop filters
- Frequency analysis tools

I/O
- 11-14 inputs, 4 outputs

Accessories
- R10 External regen resistors XTL-RA-XX
- R10 External edge filter R10-FA-01

Dimensions: mm (in)
- **R10** 191 x 140 x 64 (7.5 x 5.5 x 2.5)
- **R11** 126 x 90 x 53 (5.0 x 3.5 x 2.1)



Xenus R11 AFS

Xenus R10 AFS

Accelnet
(R20, R21, R22, R23)

Accelnet Panels are available in two DC-powered panel mounted packages and Accelnet modules are available in three 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.

	MODEL	VDC	IC	IP
R20	R20-090-36	20-90	12	36
Panel				
R21	R21-055-18	20-55	6	18
Micro Panel	R21-090-12	20-90	6	12
R22	R22-055-18	20-55	6	18
Module	R22-090-24	20-90	12	24
	R22-090-60	20-90	30	60
	R22-180-20	20-180	10	20
R23	R23-055-06	14-55	3	6
Micro Module	R23-055-10	20-55	5	10
	R23-090-08	20-90	4	8
R23 HC	R23-090-20	14-90	10	20
Micro Module	R23-090-30	14-90	15	30

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 command
- PWM Velocity/Torque command
- Master Encoder (Gearing/Camming)

Communication
- CANopen
- RS-232
- RS-422 (R20, R21, R22 option)

Feedback
- Digital quad A/B encoder
- Digital Halls
- Aux. encoder / encoder out (R20, R21)
- Analog Sin/Cos encoder
- Resolver option
- Dual loop feedback

AFS Firmware Features (R20, R23 HC)
- BiSS-C Unidirectional, SSI (R20, R23 HC)
- 32-bit floating point multi loop filters
- Frequency analysis tools

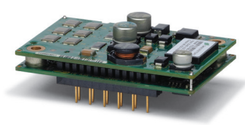
I/O
- 8–12 inputs, 2 outputs

Dimensions: mm (in)
- **R20** 168 x 99 x 31 (6.6 x 3.9 x 1.2)
- **R21** 97 x 64 x 33 (3.8 x 2.5 x 1.3)
- **R22** 102 x 69 x 25 (4.0 x 2.7 x 1.0)
- **R23** 64 x 41 x 16 (2.5 x 1.6 x 0.83)

Accelnet R20 AFS

Accelnet R21

Accelnet R22



Accelnet R23

Accelnet R23 HC AFS

Accelnet^{PLUS}
(R40, R41, R42)

Accelnet^{PLUS} sets new levels of performance and is available in CANopen version. These modules deliver high performance in two compact PCB-mounted packages. A wide range of absolute encoder interfaces are built-in, including BiSS, SSI, Absolute A and EnDat. Higher-resolution current loops enable Accelnet^{PLUS} to meet the needs of the most demanding applications.

	MODEL	VDC	IC	IP
R40	R40-090-06	14-90	3	6
Panel	R40-090-14	14-90	7	14
	R40-090-30	14-90	15	30
			Resolver: -R	
R41	R41-090-06	14-90	3	6
(2-Axis)	R41-090-14	14-90	7	14
Panel	R41-090-20	14-90	10	20
			Resolver: -R	
R42	R42-090-06	14-90	3	6
Module	R42-090-14	14-90	7	14
	R42-090-30	14-90	15	30
	R42-180-20	40-180	10	20
R43	R43-090-14	9-90	7	14
Module	R43-090-30	9-90	15	30
	R43-090-50	9-90	25	50
	R43-090-50-C	9-90	50	50
	R43-180-10	20-180	5	10
	R43-180-20	20-180	10	20
R44	R44-090-14	9-90	7	14
Module	R44-090-30	9-90	15	30
	R44-090-50	9-90	25	50
	R44-090-50-C	9-90	50	50
	R44-180-10	20-180	5	10
	R44-180-20	20-180	10	20
R52	R52-090-07	14-90	5	7
Module	R52-090-10	14-90	10	10

Control Modes
- CPL, Indexer, Point-to-Point, PVT, PT
- Camming, Gearing
- Position, Velocity, Torque (Servo)
- Microstepping (Stepnet)

Command & Communications
- CANopen (R40, R41, R42, R43, R52)
- EtherCAT (R44)
- RS-232, ASCII & Serial binary
- Step/Direction, Step Up/Step Down
- ±10 V Position/Velocity/Torque
- PWM Velocity/Torque
- Master encoder

Stepnet^{PLUS}
(R52)

Stepnet^{PLUS} modules deliver high-performance stepper control in two compact PCB-mounted packages. These 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 BiSS, SSI, Absolute A and EnDat.

Feedback
- Incremental encoder & digital Halls
- BiSS, SSI, Absolute A, EnDat encoders
- Panasonic, Tamagawa, Sanyo Denki
- Analog sin/cos encoder (R40, R41, R42, R43, R44)
- Resolver (R40, R41)
- Aux. encoder / encoder out (R40, R41, R42, R43, R44)
- Dual loop feedback (R40, R41, R42, R43, R44)

FPGA Firmware Features (R40, R41, R42, R43, R44)
- 32-bit floating point multi loop filters
- Frequency analysis tools
- Hardware pulse at position
- High-speed position capture
- Count divider

I/O
- 11-18 inputs, 4-6 outputs
- One 12-bit analog input

Dimensions: mm (in)
- **R40** 129 x 92 x 51 (5.1 x 3.6 x 2.0)
- **R41** 172 x 124 x 44 (6.8 x 4.9 x 1.7)
- **R42** 77 x 59 x 20 (3.0 x 2.3 x 0.8)
- **R43, R44** 64 x 41 x 17.6 (2.5 x 1.6 x .69)
- **R52** 77 x 59 x 20 (3.0 x 2.3 x 0.8)

Accelnet^{PLUS} R40

Accelnet^{PLUS} R41

Accelnet^{PLUS} R42

Stepnet^{PLUS} R52

Argus^{PLUS}
(R70, R71)

Argus^{PLUS} R70, R71

Argus^{PLUS} modules set new levels of performance, connectivity and flexibility. It operates as a CAN node using the CANopen protocol of DSP-402 for motion control devices. A wide range of absolute encoders are supported. Both isolated and high-speed non-isolated I/O are provided.

	MODEL	VDC	IC	IP
R70	R70-055-60	9-55	30	60
Module	R70-090-60	14-90	30	60
			Resolver: -R	
R71	R71-055-60	9-55	30	60
Module	R71-090-60	14-90	30	60
			Resolver: -R	

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

Command & Communications
- CANopen (R70)
- EtherCAT (R71)
- RS-232 ASCII, Serial binary and discrete I/O
- RS-R22 (option)
- Stepper commands
- ±10 V Position/Velocity/Torque
- PWM Velocity/Torque command
- Master encoder (Gearing/Camming)

Feedback

Incremental
- Digital quad A/B encoder
- Analog Sin/Cos encoder
- Panasonic Incremental A
- Aux. encoder / encoder out

Absolute
- SSI
- EnDAT 2.1 & 2.2
- Absolute A
- BiSS (B&C)
- Dual Absolute

Other
- Digital Halls
- Resolver (-R model)

FPGA Firmware Features
- 32-bit floating point multi loop filters
- Frequency analysis tools
- Hardware pulse at position
- High-speed position capture
- Count divider

I/O
- 11 inputs, 9 outputs
- One 16-bit analog input

Dimensions: mm (in)
- 78.7 x 60.1 x 23.4 (3.10 x 2.40 x 0.92)

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FOR MORE INFORMATION

Visit us at copleycontrols.com
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