



Mentor MP

High Performance DC Drive

25 A to 7030 A, 400 V / 575 V / 690 V
Two or four quadrant operation



Control Techniques™

Control Techniques

– a global leader in DC drive technology

Control Techniques is a leading provider of DC drive technology for industry. Our innovative products are used in the most demanding applications requiring performance, reliability and energy efficiency.

With facilities across Europe, the Americas and Asia, we can offer local technical sales, service and design expertise to customers around the world.

- Cutting edge drives and motors technology – providing reliable, high performance and energy efficient solutions for industrial applications
- Scalable automation solutions – from a simple drive and motor to a fully engineered system. Our products and services are backed by global industrial expertise and full support at a local level. We can provide turn-key solutions or integrate with system designers or machine manufacturers as required



5,500 employees



40+ Automation Centers



23 Manufacturing sites



8 Engineering and Design facilities



3 Regional despatch hubs



Mentor MP, the ultimate DC drive

25 A to 7030 A, 24 V - 400 V / 575 V / 690 V

Mentor MP is Control Techniques' 5th generation DC drive and integrates the control platform from the world's leading intelligent AC drive technology. This makes Mentor MP the most advanced DC drive available, giving optimum performance and flexible system interfacing capability. The Mentor MP drive allows you to maximize motor performance, enhance system reliability and interface digitally with modern control equipment using Ethernet and fieldbus networks. The drive is designed for easy retrofitting from Mentor II and for high power configuration.

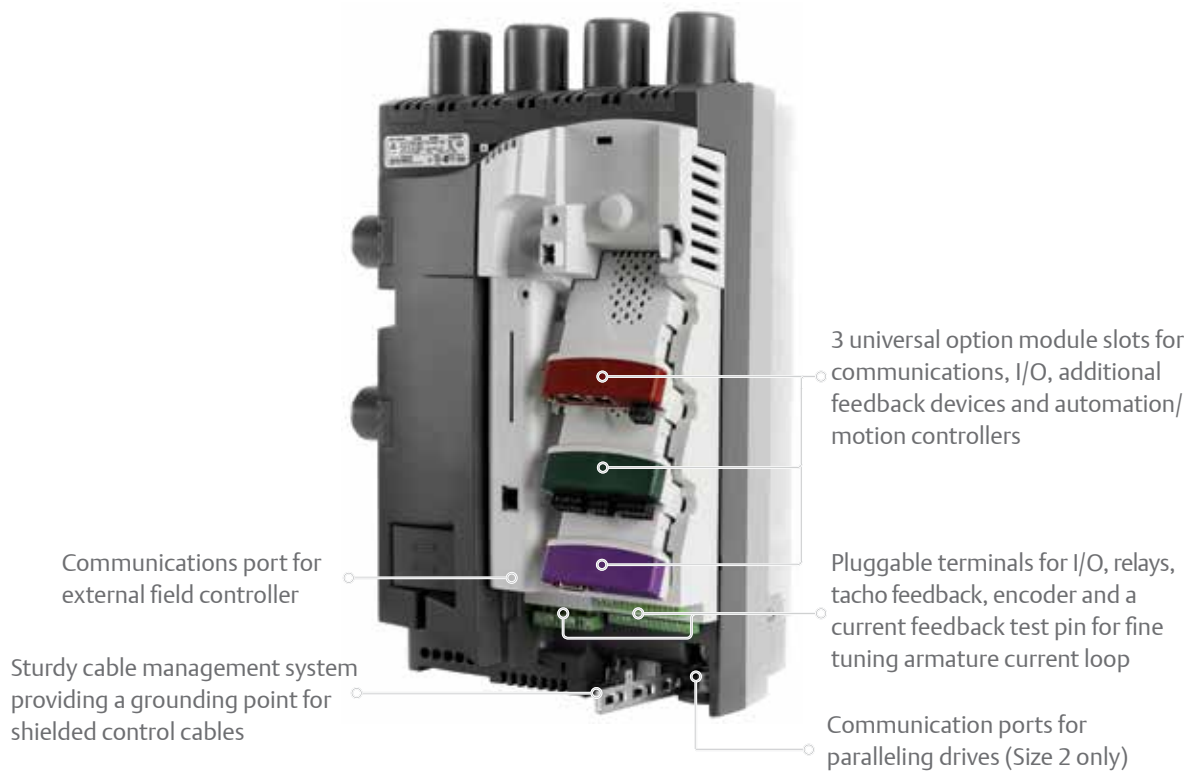
Mentor MP benefits:

- Designed for easy set-up and commissioning
- Drive intelligence and system integration
- Machine communications flexibility





Mentor MP DC drive features



Easy set-up of enhanced control and monitoring systems

Greater motor field control

- Built in field controller as standard
 - Gives excellent field control for the majority of DC motors
 - Reduces the need for external components

Enhanced field control with FXMP25

- The FXMP25 may be controlled digitally by using a standard RJ45 connection, allowing set-up by standard drive parameters
- The FXMP25 can also function in standalone mode using its integrated keypad and display

Enhanced system design

- The heatsink cooling fans are intelligently controlled and only run when required, thus increasing reliability and reducing maintenance
- Eighteen different option modules allow customisation of the drive, including fieldbus, Ethernet, I/O, extra feedback devices and motion controllers
- The drive system designer is able to embed automation and motion control within the drive, eliminating communications delays that reduce performance

Fast set-up, configuration and monitoring

- Quick and easy to set-up
- Can be configured using optional removable keypads
- Advanced autotune features help you get the best performance from your machine





PC software and smartcard tools for rapid commissioning

Control Techniques' software makes it easy to access the drive's feature set. It allows you to optimize drive tuning, back-up the configuration and set-up a communications network.

CTSoft

Our drive configuration tool for commissioning, optimising and monitoring allows you to:

- Use configuration wizards to commission your drive
- Read, save and load drive configuration settings
- Manage the drive's smartcard data
- Visualize and modify the configuration with live animated diagrams
- All motor data is entered in real units and the current limit window will calculate parameter settings based on ambient temperature and required overload rating

CTScope

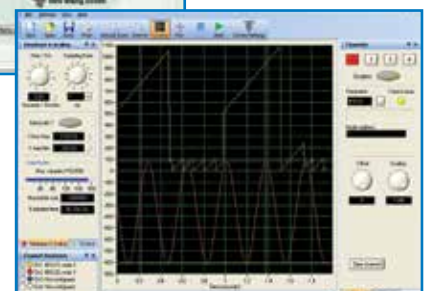
Drive oscilloscope software for viewing and analysing changing values within the drive.

- The time base can be set to give high speed capture for tuning or for longer term trends
- Based on a traditional oscilloscope, making it easy to use for all engineers

Smartcard

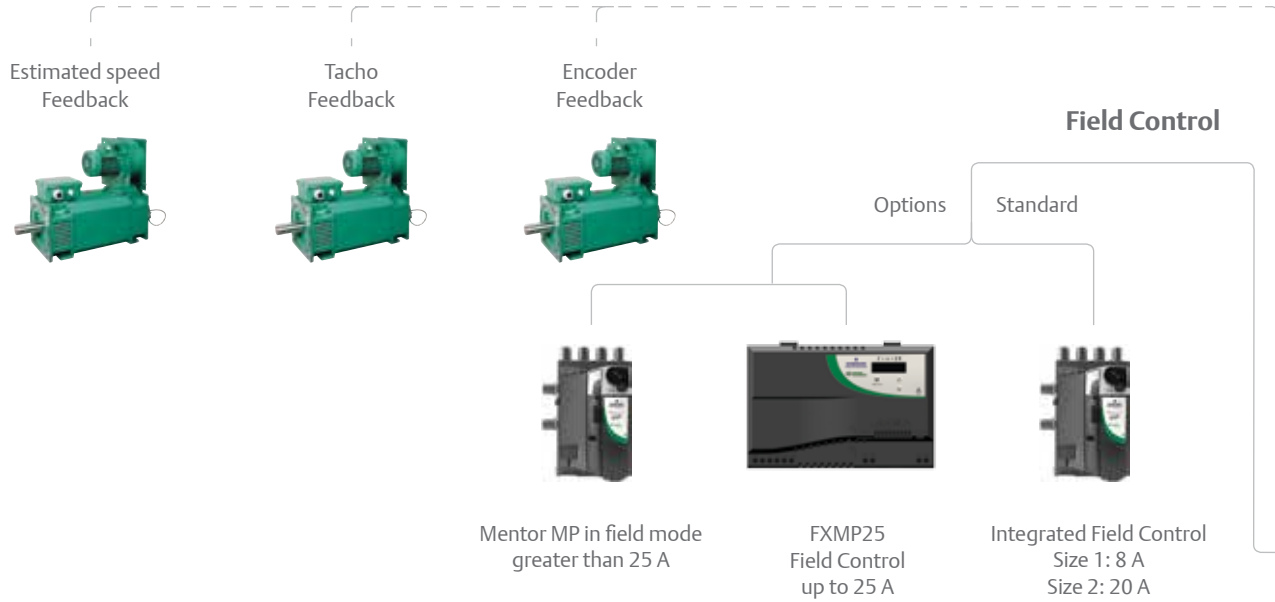
The smartcard is a backup memory device supplied with every Mentor MP.

- Parameter and program storage
- Simplify drive maintenance and commissioning
- Quick set-up for sequential build of machines
- Machine upgrades can be stored on a smartcard and sent to the customer for installation

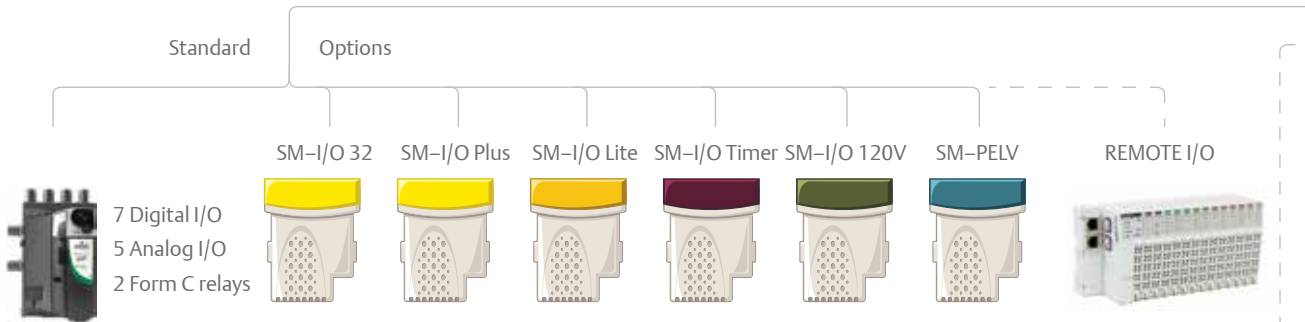
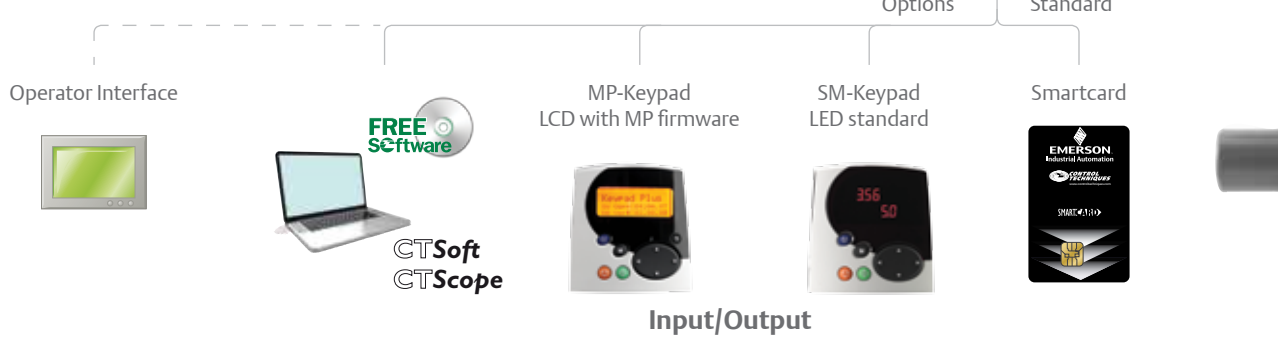


Mentor MP - Unparalleled integration flexibility

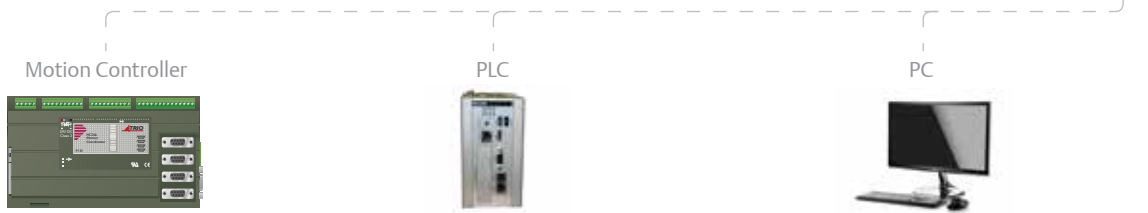
Control Mode

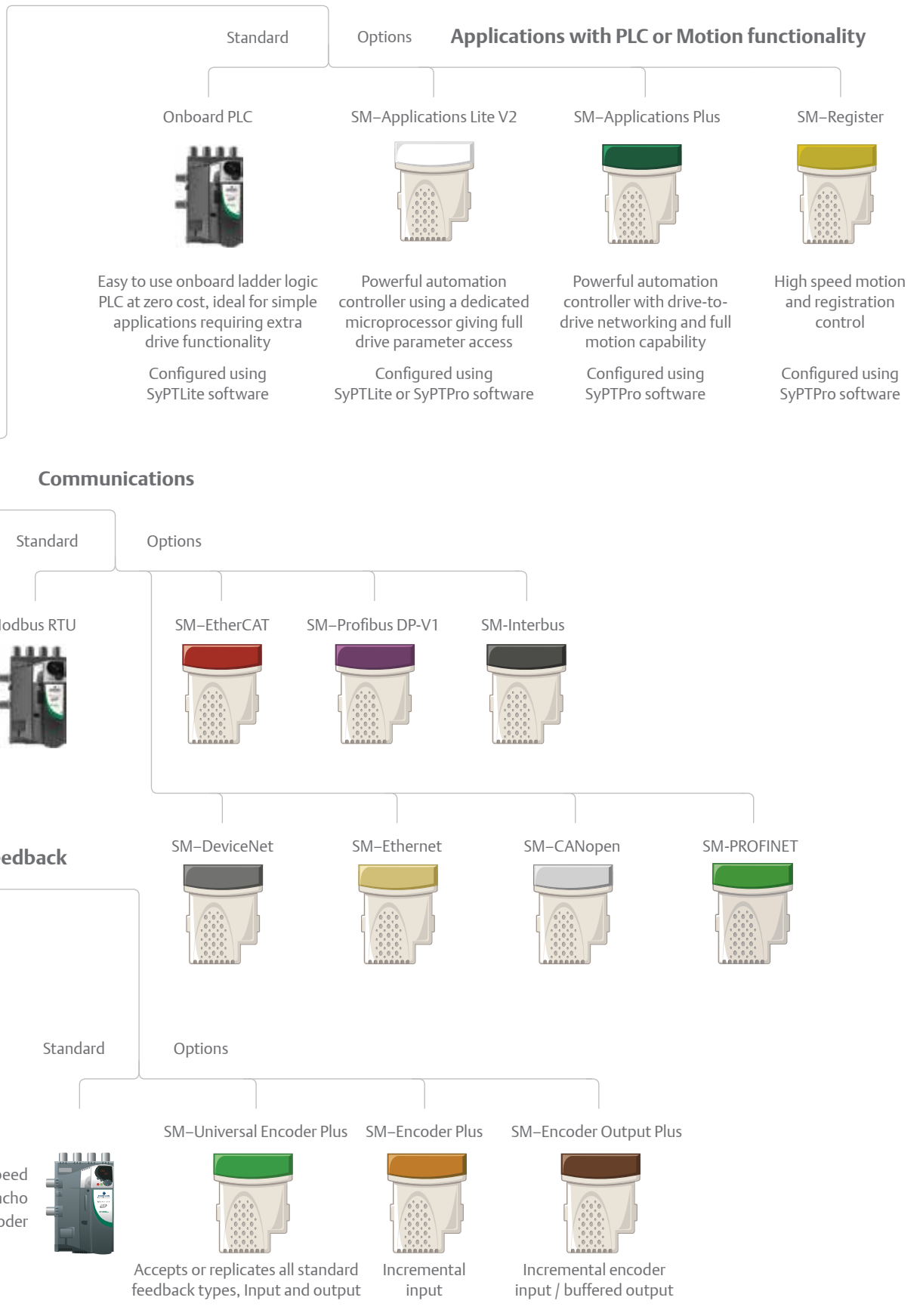


Drive Programming and Operator Interface



Centralized PLC/Motion Control





Mentor MP drive intelligence and system integration

Program inbuilt controller with SyPTLite

- Mentor MP has an inbuilt programmable controller. It is configured using SyPTLite, an easy to use ladder logic program editor, suitable for replacing relay logic or a micro PLC for simple drive control applications

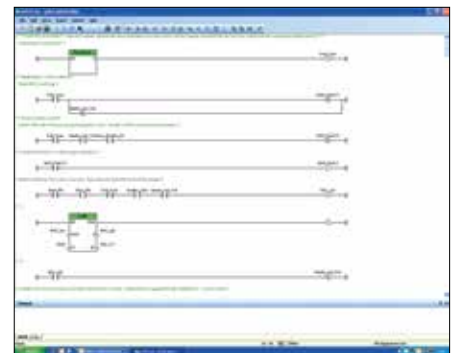
Develop tailored solutions for applications modules with SyPTPro

- SyPTPro is a fully featured automation development environment that can be used for developing tailored solutions for single or multiple drive applications
- The programming environment fully supports three industry standard languages: Function Block, Ladder and Structured Text. Motion control is configured using the new PLCopen motion language, supporting multiple axes

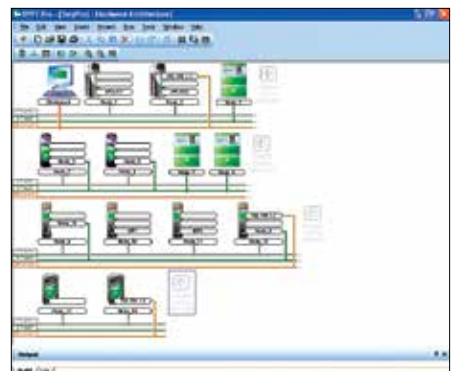
Create an intelligent networked system with CTNet

- CTNet, a high-speed, deterministic drive-to-drive network links the drives, SCADA and I/O together to form an intelligent networked system, with SyPTPro managing both the programming and communications

SyPTLite



SyPTPro





High performance automation

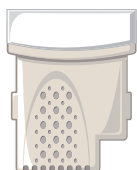
Control Techniques' SM-Applications option modules contain a separate high performance microprocessor enabling the execution of application programs. This leaves the drive's own processor to give the best possible motor performance.

The SM-Application modules include the SM-Application Plus and the SM-Application Lite V2 variants.

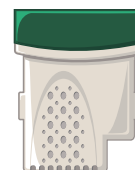
- Both modules can be used to tackle automation problems from simple start/stop sequencing with a single drive to more complex machine and motion control application
- The SM-Applications modules give you real-time access to all of the drive's parameters, plus access to data from I/O and other drives

SM-Applications Plus adds:

- Inputs/Outputs – The module has two digital inputs and two digital outputs for high-speed I/O operations such as position capture and actuator firing
- High speed serial port - The module features a serial communications port supporting a number of built-in protocols for connection to external devices such as operator interface panels. These are CT-ANSI slave, Modbus RTU in master and slave modes, Modbus ASCII in master and slave modes and 3 user modes. Both two and four wire configurations are possible.
- Drive-to-drive communications - SM-Applications Plus option modules include a high speed drive-to-drive network called CTNet. This network is optimized for intelligent drive systems offering flexible peer-to-peer communications



SM-Applications Lite



SM-Applications Plus

Mentor MP machine communications flexibility



PC for programming and monitoring using CTSOft, CTScope, SyPT or OPC. Connect using Serial, Ethernet, USB or CTNet



Fieldbus or Ethernet connection to main controller using a wide range of communications option modules



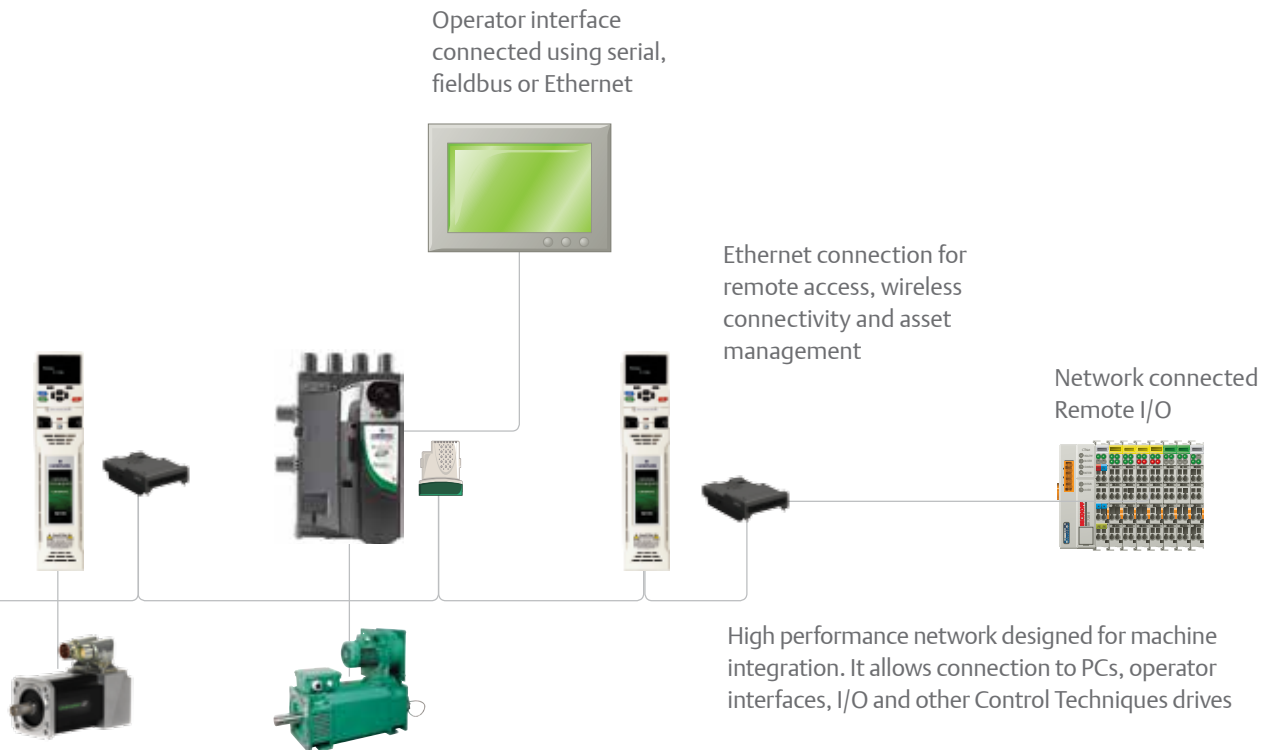
Fieldbus communications

Option modules for all common Industrial Ethernet fieldbus networks such as Ethernet/IP and Profibus, and servo networks such as Ethercat, are available.

Easy gateway

SM-Applications and CNet allow machine designers to design an easy gateway into which customers are able to interface using their preferred fieldbus or Ethernet interface. This solution improves the machine performance, simplifies the problem of being able to meet customer specifications for different fieldbus communications and helps to protect your intellectual property.

| | Onboard PLC | SM-Applications Lite V2 | SM-Applications Plus |
|----------------------------------|-------------|-------------------------|----------------------|
| Intellectual property protection | ✓ | ✓ | ✓ |
| SyPTLite Programming | ✓ | ✓ | |
| SyPTPro Programming | | ✓ | ✓ |
| Multi-tasking environment | | ✓ | ✓ |
| Motion control capabilities | | ✓ | ✓ |
| CNet drive-to-drive network | | | ✓ |
| Serial port | | | ✓ |
| High Speed I/O | | | ✓ |



Mentor II to Mentor MP retrofit

Mentor II is now at the end of its maintenance phase and the simplest strategy to secure plant availability is to replace with Mentor MP.

Retro-fit projects

- Easy integration with your existing motor, power supply, application equipment and communication networks has been ensured from the design stage
- Mentor MP brings performance and possibilities to your application with minimum migration costs

Ease of migration

- Mentor MP has been designed so existing Mentor II customers can easily migrate to the new platform
- All power terminal locations and mounting points have been retained
- At 900 A, Mentor MP has a much smaller frame size than Mentor II with smaller cable requirements enabling high power density paralleled configurations without custom-made bus bars
- CT Soft has a built in migration wizard to assist with the transfer of drive parameters and programs

NOTE: The control section of Mentor MP frame 2C and 2D is 90 mm deeper than Mentor II. If a depth extension is not possible, then for other solutions, please contact your Control Techniques supplier.

Motor Field Control

- Built in field controller as standard in every Mentor MP
 - Gives excellent field control for the majority of DC motors
 - Reduces the need for external components

An external motor field controller is recommended when:

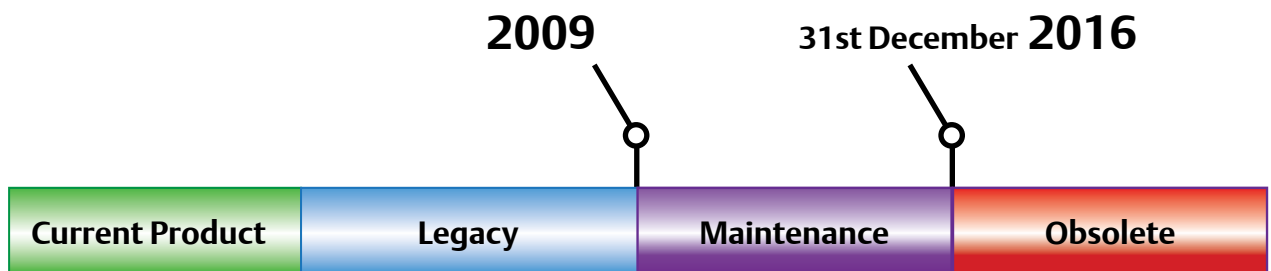
- The required field current is greater than that offered by the standard drive, up to 25 A. For example, older motors with low field voltages
- The field is required to be forced down more quickly than is possible with a standard half controlled field bridge
- Applications can be implemented with simple field current reversal, without armature reversal, if machine dynamics can still be met



Lifecycle Mentor MP replaces Mentor II

Mentor MP is capable of fully replacing and enhancing Mentor II installations. Therefore, Mentor II is moving into the next stage of its lifecycle.

Mentor II life cycle status

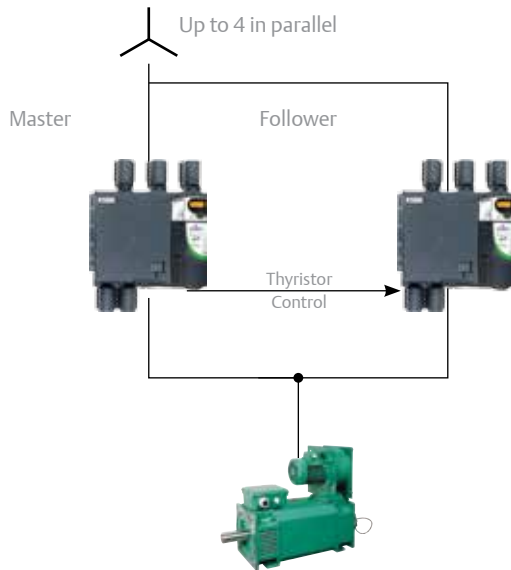


Mentor II is transitioning to become an obsolete product by the end of 2016. This means that parts for repair and services will no longer be available. We recommend all users upgrade to the latest generation of product at this stage.

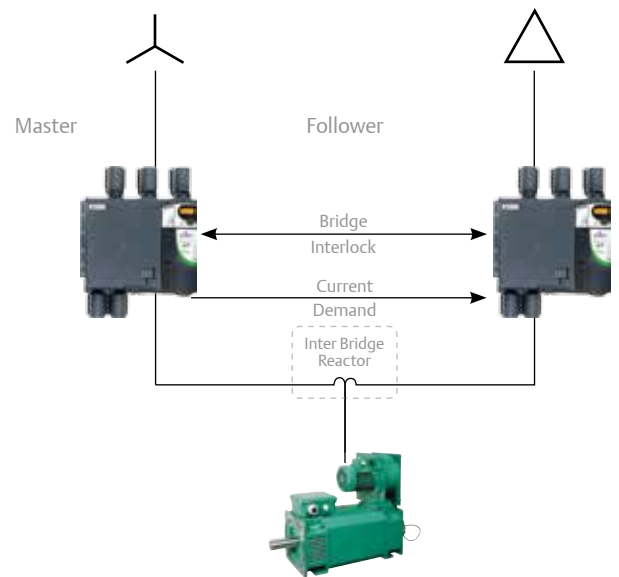
High power configuration

For higher armature currents and harmonic minimization the Mentor MP has standard features to enable the configurations below to be implemented. When paralleling the Mentor MP a 5% armature current de-rating must be applied. Up to 7030 A can be controlled.

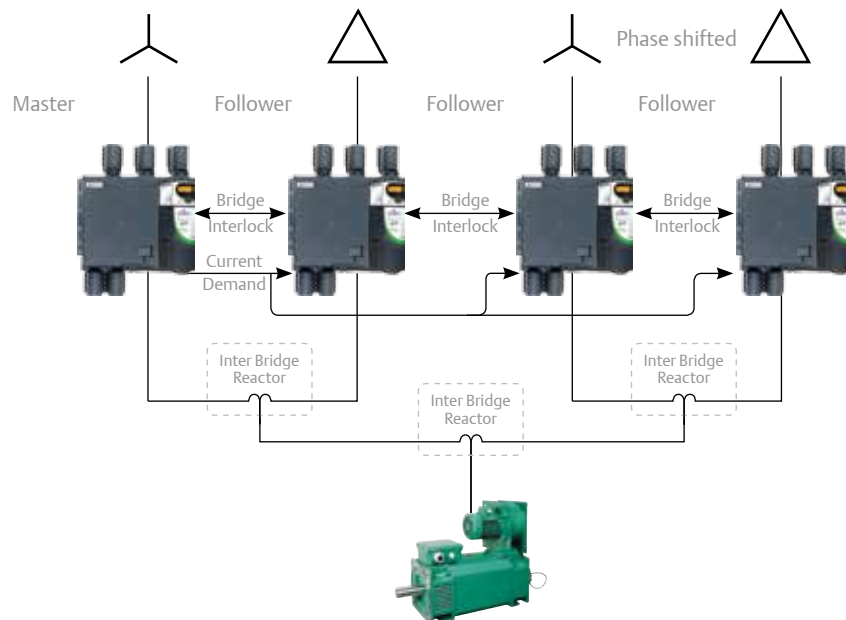
Parallel - 6 pulse



Parallel - 12 pulse



Parallel - 24 pulse





Mentor MP and DC motor solutions

Motor and drive solutions

Control Techniques Mentor MP DC drives and Leroy-Somer DC motors offer a total solution. Both companies offer quality and technology leadership to deliver the best possible combination of motors and drives. High efficiency DC motors combined with variable speed control offers a matched energy optimized solution.

Higher power DC motors

Control Techniques has access to several other ranges of DC motors, allowing us to cover the complete power range of Mentor MP DC drives.



Leroy-Somer LSK square frame DC motors:

- 2 – 750 kW (3 – 1,000 hp)
- 50 – 6,600 Nm (82.6 – 4,867.3 lb ft)
- Frame size: 112 - 355 mm (4.4 - 14 in)
- IP23S, IP44R, IP55R, IP55 with exchangers
- S1 duty
- PTC thermistors
- IC06 forced vent cooling with standard polyester filter
- Class H insulation
- 3-phase full bridge supply
- Terminal box in any position
- Forced vent top
- Tacho type REO444
- Incremental quadrature encoders/frequency and direction encoders

Conformance

- Humidity 95 % maximum (non condensing) at 40 °C (104 °F)
- Ambient temperature -15 °C to +40 °C (5 °F to +104 °F), 55 °C (131 °F) with derating
- Altitude: 0 to 3000 m, derate 1 % per 100 m between 1000 m and 3000 m
- Vibration: Tested in accordance with IEC 60068-2-64
- Mechanical shock tested in accordance with IEC 60068-2-29
- Storage temperature -40 °C to +70 °C (-40 °F to +158 °F)
- Electromagnetic immunity complies with EN 61800-3 and EN 61000-6-2
- Notch Immunity to IEC60146-1-1 class A
- IEC 61800-5-1 Electrical safety
- IEC 61131-2 I/O
- EN 60529 Ingress protection
- UL508C
- EN 61000-6-4 EMC - with optional EMC filters
- RoHS compliant

Order codes

DC Drive
MP1200A4R

MP - Mentor Platform

Maximum continuous armature current

Supply voltage rating
4 = 480 V 24 V to 480 V -20 % +10 %
5 = 575 V 500 V to 575 V-10 % +10 %
6 = 690 V 500 V to 690 V-10 % +10 %

R - 4 quadrant operation
Blank - 2 quadrant operation

External Field
FXMP25

FX - External Field

MP - Mentor Platform

25 - Maximum field current (A)



Note: At the time of ordering, please select the required interface option.

| Model | | | Frame | Armature current (A)* | Field current (A) | Overall dimensions | | | Quadrants of Operation | |
|---------------------|-----------------------------|---------------|-------|-----------------------|-------------------|--------------------|---------------------|---------------------|------------------------|---------|
| 480V EN / IEC cULus | 575V EN / IEC cULus to 600V | 690V EN / IEC | | | | Width (W) | Height (H) | Depth (D) | | |
| MP25A4(R) | MP25A5(R) | | 1A | 25 | 8 | 293mm (11.54in) | 444mm (17.48in) | 222mm (8.74in) | 2 and 4 | |
| MP45A4(R) | MP45A5(R) | | | 45 | | | | | | |
| MP75A4(R) | MP75A5(R) | | | 75 | | | | | | |
| MP105A4(R) | MP105A5(R) | | 1B | 105 | | 20 | 293mm (11.54in) | 444mm (17.48in) | 251mm (9.88in) | 2 and 4 |
| MP155A4(R) | MP155A5(R) | | | 155 | | | | | | |
| MP210A4(R) | MP210A5(R) | | | 210 | | | | | | |
| MP350A4(R) | MP350A5(R) | MP350A6(R) | 2A | 350 | 20 | | 495mm (19.49in) | 640mm (25.20in) | 301mm (11.85in) | 2 and 4 |
| MP420A4(R) | | | | 420 | | | | | | |
| | MP470A5(R) | MP470A6(R) | | 470** | | | | | | |
| MP550A4(R) | | | 550 | 20 | | 495mm (19.49in) | 640mm (25.20in) | 301mm (11.85in) | 2 and 4 | |
| MP700A4(R) | MP700A5(R) | MP700A6(R) | 700 | | | | | | | |
| MP825A4(R) | MP825A5(R) | MP825A6(R) | 825** | | | | | | | |
| MP900A4(R) | | | 900 | | 20 | 555mm (21.85in) | 1050mm (41.34in)*** | 611mm (24.06in) | 2 | |
| MP1200A4 | MP1200A5 | MP1200A6 | 1200 | | | | | | | |
| MP1850A4 | MP1850A5 | MP1850A6 | 1850 | | | | | | | |
| MP1200A4R | MP1200A5R | MP1200A6R | 2D | 1200 | | 20 | 555mm (21.85in) | 1510mm (59.45in)*** | 611mm (24.06in) | 4 |
| MP1850A4R | MP1850A5R | MP1850A6R | | 1850 | | | | | | |

*Current ratings are at 40°C with 150% overload for 30s. **For this rating at 575V and 690V, 150% overload time is 20s at 40°C and 30s at 35°C.

***Height including optional fit exhaust duct cover is 1252mm (49.29in) for size 2C and 1712mm (67.40in) for size 2D.

7030 A is achieved by parallel connection of Mentor MP drives

Control Techniques™

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theautomationengineer.com (blog)

