



**EMERSON**<sup>™</sup>  
Industrial Automation

## Mentor MP

Flexible DC Drive

25 A to 7400 A

208 V-480 V/575 V/690 V



**CONTROL  
TECHNIQUES**<sup>™</sup>

[www.emersonct.com](http://www.emersonct.com)

## The DC drive for the 21st century

Developed by the pioneer in DC drive technology, the new Control Techniques Mentor MP is the most advanced DC drive available, providing optimum performance and a high degree of versatile system interfacing capability. This 5th generation DC drive replaces the Mentor II and integrates the control platform from the world's leading intelligent AC drive, Unidrive SP.

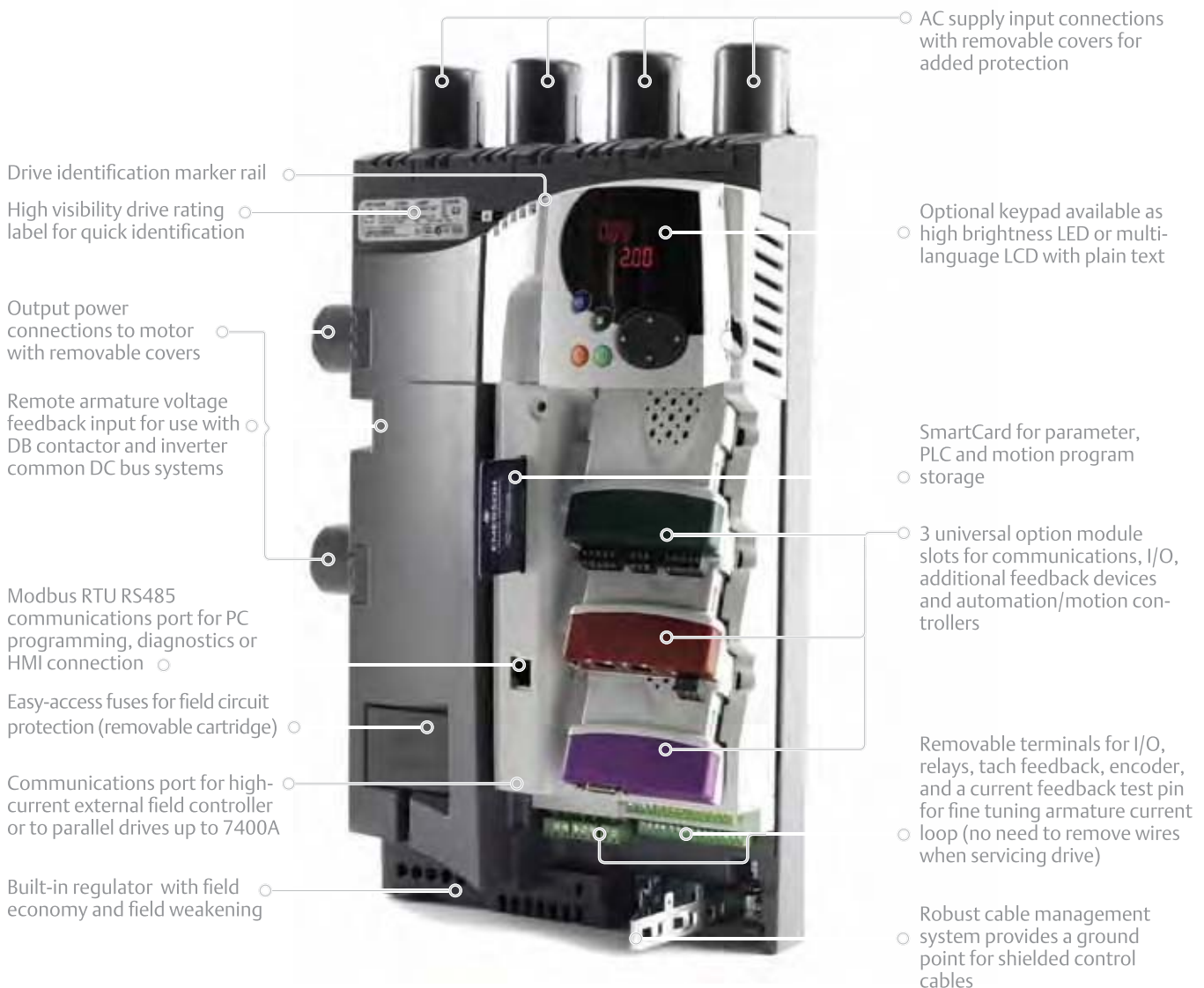
Existing Mentor II customers can easily migrate to the new MP platform. All power terminal locations and mounting points are the same as the Mentor II and free software tools are available to assist in transferring drive parameters and programs. Mentor MP is also an ideal retrofit choice when upgrading other manufacturers' obsolete drives, with features to ensure it can

integrate easily with your existing motor, power supply, application equipment and communication networks.

### Upgrading your control system

DC drives provide many performance advantages, especially in regenerative and high power applications. Most DC motors in use today are easily capable of providing continued service. Upgrading your drive to the Mentor MP allows you to maximize motor performance, enhance system reliability and interface digitally with the latest control equipment using Ethernet and a wide range of industrial networks. If you are planning to upgrade your Mentor or other manufacturer's DC system, Mentor MP is the clear choice.

### Mentor MP DC drive features



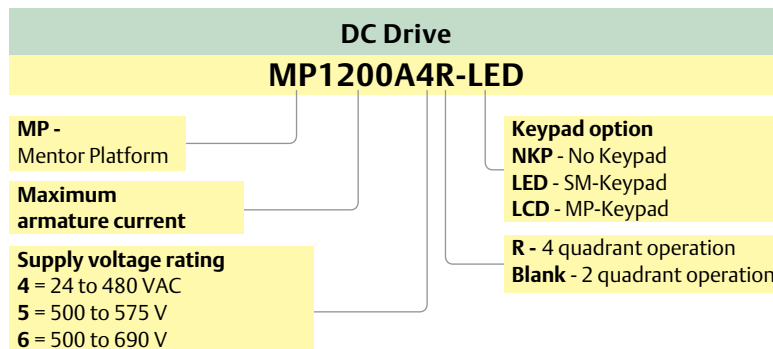
## Ratings and dimensions

Model			Frame	Armature Current (A)*	Field Current (A)	Height (H)	Width (W)	Depth (D)	Quadrants of Operation
480V EN / IEC cULus	575V EN / IEC cULus to 600V	690V EN / IEC							
MP25A4(R)	MP25A5(R)	n/a	1A	25	8	17.5 in (444 mm)	11.5 in (293 mm)	8.7 in (222 mm)	2 and 4
MP45A4(R)	MP45A5(R)			45					
MP75A4(R)	MP75A5(R)			75					
MP105A4(R)	MP105A5(R)	n/a	1B	105	20	17.5 in (444 mm)	11.5 in (293 mm)	9.9 in (251 mm)	2 and 4
MP155A4(R)	MP155A5(R)			155					
MP210A4(R)	MP210A5(R)			210					
MP350A4(R)	MP350A5(R)	MP350A6(R)	2A	350	20	25.2 in (640 mm)	19.5 in (495 mm)	11.9 in (301 mm)	2 and 4
MP420A4(R)	n/a	n/a		420					
n/a	MP470A5(R)	MP470A6(R)		470**					
MP550A4(R)	n/a	n/a	2B	550		25.2 in (640 mm)	19.5 in (495 mm)	11.9 in (301 mm)	2 and 4
MP700A4(R)	MP700A5(R)	MP700A6(R)		700					
MP825A4(R)	MP825A5(R)	MP825A6(R)		825**					
MP900A4(R)	n/a	n/a	2C	900	20	25.2 in (640 mm)	19.5 in (495 mm)	11.9 in (301 mm)	2 and 4
MP1200A4	MP1200A5	MP1200A6		1200					
MP1850A4	MP1850A5	MP1850A6		1850					
MP1200A4R	MP1200A5R	MP1200A6R	2D	1200	20	41.3 in (1,050 mm)	21.9 in (555 mm)	24.1 in (611 mm)	2
MP1850A4R	MP1850A5R	MP1850A6R		1850					

\*Current ratings are at 104°F (40°C) with 150% overload for 30s. \*\*For this rating at 575V and 690V, 150% overload time is 20s at 104°F (40°C) and 30s at 95°F (35°C). (R) indicates optional order code for 4-quadrant operation.



### Order string

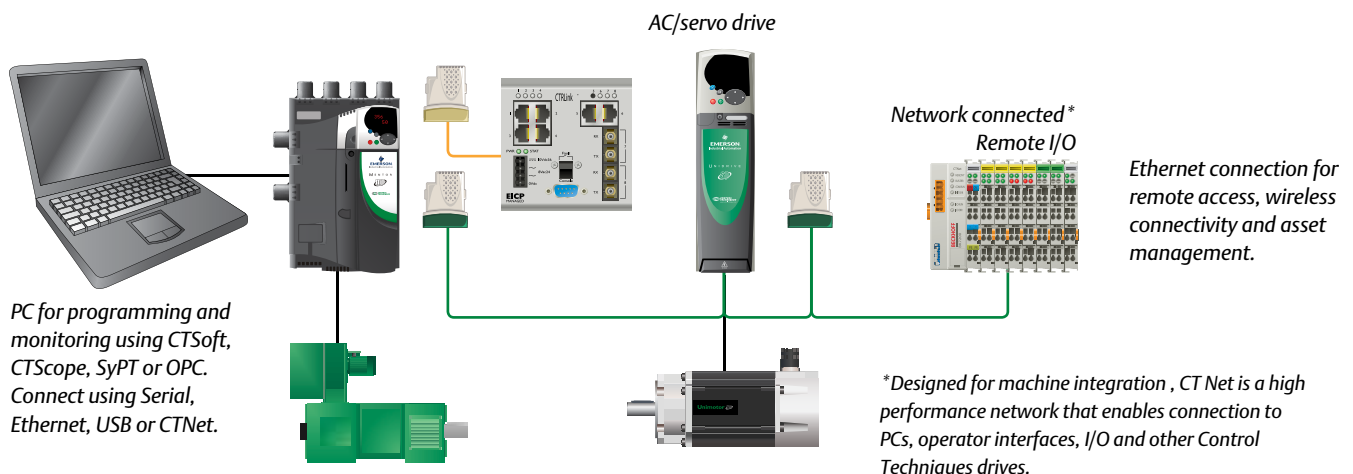


Note: 7,400A is achieved by parallel connection of Mentor MP drives.

## Machine communication has never been more flexible or easy to implement

Mentor MP can operate in virtually any machine networking environment. It can even serve as a gateway and support multiple communication protocols on a single network.

The SM-Applications Plus module provides expanded on-board processing power and ultra-high speed peer-to-peer communication between Mentor MP and Control Techniques' AC drives and servo drives.



## Control Mode

Armature Voltage  
Feedback



Tach  
Feedback



Encoder  
Feedback



## Field Control

Options

Standard



Mentor MP in field mode  
greater than 25 A



FXMP25  
Field Control  
up to 25 A



Integrated Field Control  
Size: 18A  
Size 2A and 2B: 10 A  
Size 2C and 2D: 20 A

## Drive Programming and Operator Interface

Operator Interface



FREE  
Software

CTSoft  
CTScope

MP-Keypad  
LCD Display



SM-Keypad  
LED Display



SmartCard



## Input/Output

Standard

Options



7 Digital I/O  
5 Analog I/O  
2 Form C relays

SM-I/O 32



SM-I/O Plus



SM-I/O Lite



SM-I/O Timer



SM-I/O 120V



SM-PELV



REMOTE I/O



## Centralized PLC

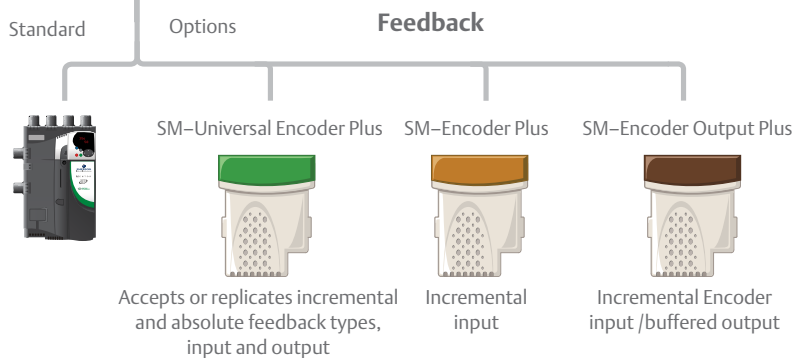
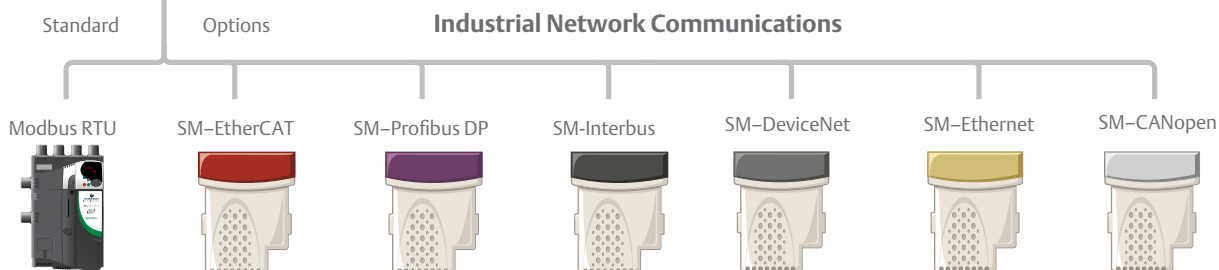
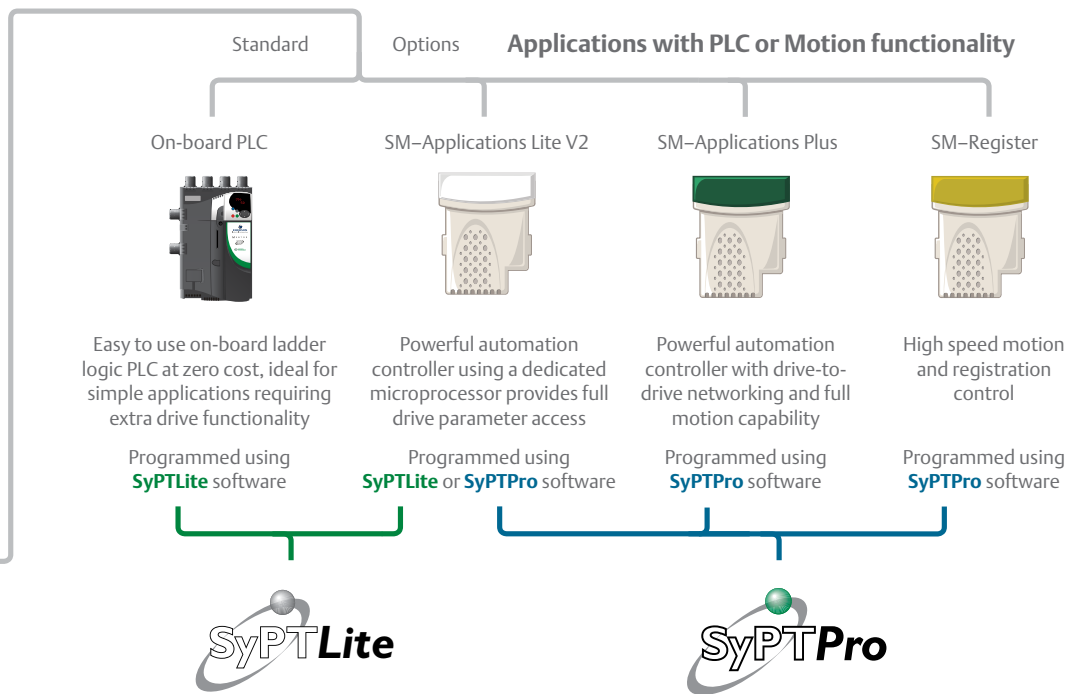


PLC

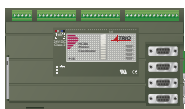
# ITOR



Integration versatility



C/Motion Control Options



Motion Controller



PC



## Options

Configuration Tools	Description	Order Code	Notes
Base Drive Configuration	Cloning and Parameter Storage	SmartCard	Shipped FREE with every order
	Configuration Software	CTSoft	Shipped FREE with every order
	Digital Oscilloscope	CTScope	Shipped FREE with every order
	Communications Cable - RS232/485	CT-Comms-Cable	RS232 PC-to-drive cable
	Communications Cable - USB	CT-USB-Cable	USB PC-to-drive cable
Operator Interface	LED Keypad	SM-Keypad	Bright, high-visibility LED display
	LCD Keypad	MP-Keypad	Multi-language display with help
	Programmable HMI Panels	CTVue series	Graphic and touchscreen operator interfaces
Solutions Modules	Description	Order Code	Notes
I/O	120/240 VAC I/O	SM-I/O-120 V	6 x 120 VAC inputs (or 3 x 240 VAC)
	24 V Protected I/O (48 V withstand)	SM-I/O-24 V	3 x digital inputs, 4 x digital I/O, 2 x relays, 2 x analog mA outputs
	32 Point Digital I/O	SM-I/O-32	SyPT Lite or SyPTPro software required for full 32 I/O configuration
	Extra I/O with Encoder Reference	SM-I/O-Lite	3 x digital inputs, encoder input, 1 x relay, 1 x analog input, 1 x analog output
	Protective Extra Low Voltage I/O	SM-I/O-PELV	1 x digital input, 4 x digital I/O, 2 x relays, 2 x analog mA inputs, 1 x analog output
	Extended Analog and Digital I/O	SM-I/O-Plus	3 x digital inputs, 3 x digital I/O, 2 x relays, 2 x analog V inputs, 1 x analog V output
	Extra I/O with Real-Time Clock/Calendar	SM-I/O-Timer	3 x digital inputs, encoder input, 1 x relay, 1 x analog input, 1 x analog output
	Remote CTNet Network I/O	Refer to factory	Connects to drive via CTNet port on SM-Apps-Plus
Feedback	Universal Encoder Feedback	SM-Uni-Encoder	Absolute and incremental encoders, SinCos, SSI, Hyperface and Endat signals supported
	Incremental Encoder Input	SM-Encoder-Plus	Incremental encoder feedback
	Incremental Encoder Input & Output	SM-Encoder-Out	Incremental encoder feedback plus simulated encoder output
Programmable Control	Systems Programming (Centralized Control)	SM-Apps-Lite-V2	
	Systems Programming (Distributed Control)	SM-Apps-Plus	Includes CTNet, RS485 (Modbus and CTSync) and 4 high speed digital I/O
	High Speed Capture & Registration	SM-Register	Includes CTNet, RS485 (Modbus and CTSync) and 4 high speed digital I/O with enhanced capture functions
PC Programming Tools	Description	Order Code	Notes
Programmable Control	Ladder and Function Blocks	SyPTLite	For use with base drive PLC and SM-Apps-Lite-V2; available as a free download.
System Programming	IEC 61131-3 (Ladder, FB, and Text Based)	SyPTPro	Drive and systems programming software for use with SM-Apps-Lite-V2, SM-Apps-Plus and SM-Register

## Box-it!™ Packaged drives and pre-engineered systems

Control Techniques can supply Mentor MP-based DC motor control solutions in industry-standard enclosures with a wide range of options and accessories including disconnects, fusing, contactors and control equipment.



## Accessories

### Power

- Dynamic Braking Resistors
- Line Reactors
- EMC Filters
- Field Supply Buck/Boost Transformers
- DC Motors



## Specifications

<b>Environment</b>	
Ambient Operating	32° to 131°F (0° to 55°C) Derate current 1.5% per °F/C from 104° to 131°F (40° to 55°C)
Cooling Method	MP25-MP45 natural convection MP75 and larger forced convection
Humidity	90% relative humidity at 122°F (50°C)
Storage Temperature	-40° to 131°F (-40° to 55°C)
Altitude	0 to 9,842 ft (0 to 3,000 m), derate 1% per 380 ft (100 m) between 3,280 ft (1,000 m) and 9,842 ft (3,000 m)
Enclosure	MP25-MP210 is IP20 MP350 and larger is IP00
<b>AC Supply Requirements</b>	
SCR Supply Voltage	24 to 480 VAC ±10% 500 to 575 VAC, 500 to 690 VAC ±10%, 3Ø
Frequency	48 to 65 Hz
Supply Fault Current	100 kA
Auxiliary Supply Voltage	208 to 480 VAC ±10%, 1Ø
Drive Efficiency	99%
Armature Voltage (max.)	2 Quadrant drives 1.35 X input VAC 4 Quadrant drives 1.15 X input VAC
Field Voltage (max.)	0.9 X input VAC with 1-phase input 1.35 X input VAC with 3-phase input (Mentor MP in field mode)
<b>Control</b>	
Analog Input Resolution	16-bit plus sign, 250µs (Qty 1), 10-bit plus sign, 250µs (Qty 2)
Speed Loop	250µs loop update
Current Loop	35µs current sampling time
Feedback Methods	Encoder (resolution 0.01%) DC tachometer (resolution 0.1%); AC tachometer (resolution 1%) Armature Voltage (resolution 5%) Optional additional incremental and absolute encoders (Qty 3)
Field Control	Current regulated with flux control MP25-MP210 8 A MP350-MP1850 20 A Optional FXMP25 25 A Mentor MP field mode 25 – 210 A
Serial Communications	2- or 4-wire RS422 or RS485, optically-isolated Protocol is ANSI x 3.28-2.54-A4 or Modbus RTU Baud rate is 300 to 115,200
<b>Protection &amp; Diagnostics</b>	
Control	Galvanic electrical isolation, 24 VDC power supply
Supply	Loss, undervoltage, overvoltage, transient suppression
Armature	Open circuit, I <sup>2</sup> t overload, instantaneous overcurrent
Field	Loss, overcurrent
Motor	Motor over-temp switch or thermistor overtemperature trips
Drive Thermal	Heatsink, SCR junction, control board and option module(s)
Current Loop Loss	Loss of analog current reference
<b>Standard Programmable I/O</b>	
Digital Inputs	3 x 24 VDC
Digital Input/Outputs	3 x 24 VDC
Relays	2 form C standard
Analog Inputs	1 x 16 bit differential 0-10 V, 2 x 10 bit voltage or mA
Analog Outputs	2 x 10 bit voltage or mA
<b>Fixed I/O</b>	
Drive Enable	24 VDC

