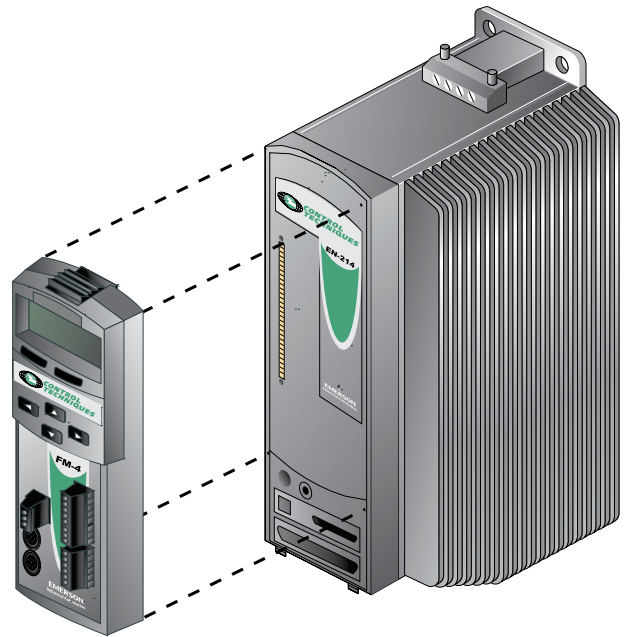


FM Controls for MDS and EN Series Drives

FM controls are application modules that provide added functionality to EN Series and MDS Drives. These modules mount directly to the front of any EN Series or MDS drive. This is convenient for existing installations with limited mounting space, and is an economical solution for users wishing to stock drives and not controls. Currently, there are eight FM control modules from which to choose, depending upon the level of control needed.

FM Controls



FM-2 Indexing Module

The FM-2 module enhances EN and MDS operation by adding positioning capability including Jog, Home, and Index functions. The FM-2 also includes additional I/O providing 8 digital inputs and 4 digital outputs.

Every FM module provides

- Unique Control Enhancements
- 8 additional optically-isolated digital Inputs for a total of 12
- 4 additional optically isolated digital Outputs for a total of 7

Every FM module has

- Modbus RTU standard via the drive
- Free, field upgradable firmware
- Free Software and Software Upgrades
- Two-Year warranty

Every FM Module is

- Easy to Install
- Easy to Program
- Easy to Use



FM-3E Programming Module

The FM-3E Ethernet module transforms the EN or MDS drive into a fully programmable 1½ axis motion controller. For flexibility above and beyond the FM-2, the FM-3E adds motion programming. The FM-3E utilizes PowerTools Pro versatile software giving the user an easy tool to create even the most complex of applications. Profibus (FM-3PB) and DeviceNet (FM-3DN) options are also available.

FM-4E Advanced Programming Module

For the most complex and challenging applications, the FM-4E can “do-it-all” while still maintaining our tradition of “Motion Made Easy”. The FM-4E Ethernet module extends beyond FM-3E functionality offering program multitasking, multiple profile summation, high speed position capture, queuing and many more features. Profibus (FM-4PB) and DeviceNet (FM-4DN) options are also available.

Connectivity

FM controls enable EN and MDS drives to seamlessly integrate with Modbus, DeviceNet, Profibus, and Ethernet networks. The “Motion Made Easy” implementation of Ethernet, DeviceNet and Profibus gives the user network setup that is as easy as “drag and drop.”



MODBUS TCP/IP

FM-2

Indexing Control

The FM-2 module expands the capability of the EN and MDS drives by adding positioning capabilities, including Jog, Index, and Home functions.

Operating information is set up via our free configuration software PowerTools. The FM-2 is designed to be extremely easy to set up and run. This saves time and money during installation and also makes long term support a breeze. For any simple point to point motion application, the FM-2 indexer is the right choice.



Programmable I/O

- Unique Control Enhancements
- 8 additional optically-isolated digital Inputs for a total of 12
- 4 additional optically isolated digital Outputs for a total of 7

Indexing

- 16 Indexes
- Position Tracker™ – Fieldbus Indexing
- Chaining index capability
- Chain indexes to home
- Compound Indexing

Jogging and Homing

- 2 jog velocities
- Homing
- Home to sensor
- Home to marker
- Home to sensor/marker

Alternate Mode

- Analog Velocity
- Analog Torque (with Speed Limit)
- Pulse Mode

User Units

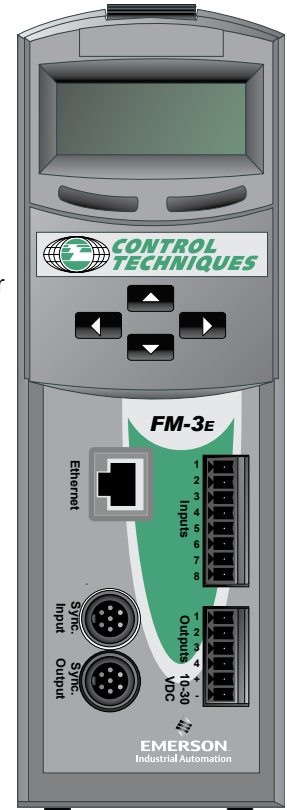
- Distance
- Velocity
- Time Scale
- Acceleration
- Software Oscilloscope
- Auto-Tune

FM-3E

Programming Control

The FM-3E Ethernet Programming Module allows the user to create programs to sequence motion, I/O control, and other machine operations in one environment. These programs used in conjunction with the Assignments or “virtual wiring” feature, provide the user with a powerful and easy-to-use programming environment.

With removable terminal block connectors for I/O and a pluggable sync cable for master encoder connections, setup of the FM-3E hardware is quick and clean. For diagnostics, the LCD keypad display on the front of the module gives the user a quick and handy way to change parameters, monitor feedback parameters, check module and drive revisions, change baud rates, view I/O states, and much more! Profibus (FM-3PB) and DeviceNet (FM-3DN) options are also available.



- User-defined Units for Distance, Velocity, Accel/Decel and Torque
- User Programs
- Synchronized Motion
- Global and Index PLS's
- S-Curve Accel and Decel
- User Variables
- Analog Input
- Supports 57 Indexes
- Ethernet (-3E), DeviceNet (-3DN) or Profibus (-3PB) Options
- Software Oscilloscope
- Auto-Tune

FM-4E

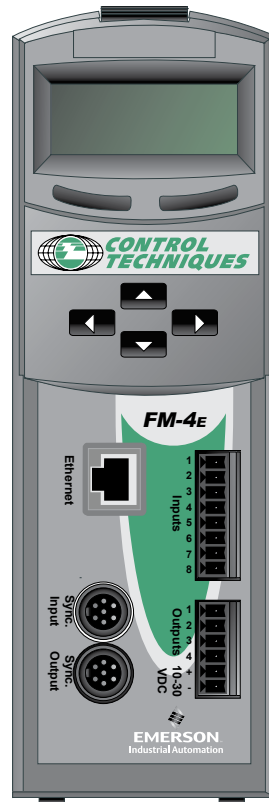
Advanced Programming

The FM-4E Advanced Programming Module with Ethernet takes all of the power and features of the FM-3E and combines them with advanced functions such as a Position Capture Object, Multiple Profile Summation, Queuing, and Program Multitasking.

The FM-4E module is the perfect solution for applications with complex motion profiles such as a random infeed conveyor, rotary knife, or high speed labeling machine.

Using the same software as the FM-3E, PowerTools Pro makes programming the FM-4E quick and easy.

Profibus (FM-4PB) and DeviceNet (FM-4DN) options are also available.



All the Programming Power of the FM-3E module, plus the following benefits:

- Program Multitasking
- Multiple Profile Summation
- Queuing
- User Configurable Capture Objects
- Ethernet (-4E), DeviceNet (-4DN) or Profibus (-4PB) Options

FM-2 SPECIFICATIONS

Logic I/O Supply

+10 to 30 VDC, 0.75A

Control Inputs

(8) Digital: +10 to 30 VDC, 2.8 kOhm, Sourcing, Optically isolated

Control Outputs

(4) Digital: +10 to 30 VDC, 150 mA, Sourcing, Optically isolated

Environmental

Ambient Temperature: 32° to 122°F (0 to 50°C) for rated performance

Vibration: 10 to 2000 Hz @ 2 g

Humidity: 10 to 95% non-condensing Storage

Temperature: -13° to 167°F (-25° to 75°C)

Ingress Protection: IP-20

Module Weight

0.5 lb (0.23 kg)

FM-3E AND FM-4E SPECIFICATIONS

Logic I/O Supply

+10 to 30 VDC, 0.75A

Control Inputs

Digital: (8) +10 to 30 VDC, 2.8 kOhm, Sourcing, Optically isolated

Pulse: Differential: RS422, 2 MHz/ Channel, 50% Duty Cycle

Control Outputs

Digital: (4) +10 to 30 VDC, 150 mA, Sourcing, Optically isolated

Pulse: Differential: RS422 and TTL compatible, 20 mA/Channel, Sink or Source

Environmental

Ambient Temperature: 32° to 122°F (0 to 50°C) for rated performance

Vibration: 10 to 2000 Hz @ 2 g

Humidity: 10 to 95% non-condensing

Storage Temperature: -13° to 167°F (-25° to 75°C)

Ingress Protection: IP-20

Module Weight

0.5 lb (0.23 kg)

DeviceNet (Optional)

Power Consumption: 25 mA

Baud Rates: 125, 250 and 500 kbps

Node Addresses: 00-63

Messaging: Explicit, Polled I/O, Change of State, Strobed and Cyclic

Connection: 5-wire terminal block

Profibus (Optional)

Baud Rates: Up to 12 Mbps

Node Addresses: 1-127

Messaging: Cyclic

Connector: DB9

Ethernet (Optional)

Data Rate: 10/100 base T

Messaging: Modbus TCP/IP, EtherNet/IP, SMTP, and HTTP

Connector: RJ45

FM CONTROL MODULE PINOUTS AND CONNECTIONS

| Inputs | |
|------------|---------|
| Pin Number | Signal |
| 1 | Input 1 |
| 2 | Input 2 |
| 3 | Input 3 |
| 4 | Input 4 |
| 5 | Input 5 |
| 6 | Input 6 |
| 7 | Input 7 |
| 8 | Input 8 |

| Outputs | |
|------------|---------------|
| Pin Number | Signal |
| 1 | Output 1 |
| 2 | Output 2 |
| 3 | Output 3 |
| 4 | Output 4 |
| 5 | I/O Supply + |
| 6 | I/O Supply 0V |

| Reserved | |
|------------|----------|
| Pin Number | Signal |
| 1 | Reserved |
| 2 | Reserved |
| 3 | Reserved |

Synchronized Input (mini-DIN)

Synchronized Output (mini-DIN)



Fieldbus Connectivity Options (FM-3 and FM-4 only)

| Ethernet (FM-3E and FM-4E only) | |
|---------------------------------|-------------------------|
| Pin Number | Signal (RJ45 connector) |
| 1 | TxData + |
| 2 | TxData - |
| 3 | RecvData + |
| 4 | NC |
| 5 | NC |
| 6 | RecvData- |
| 7 | NC |
| 8 | NC |

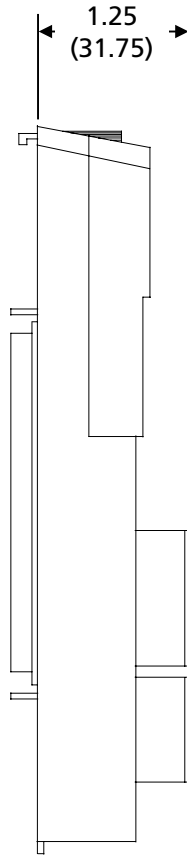
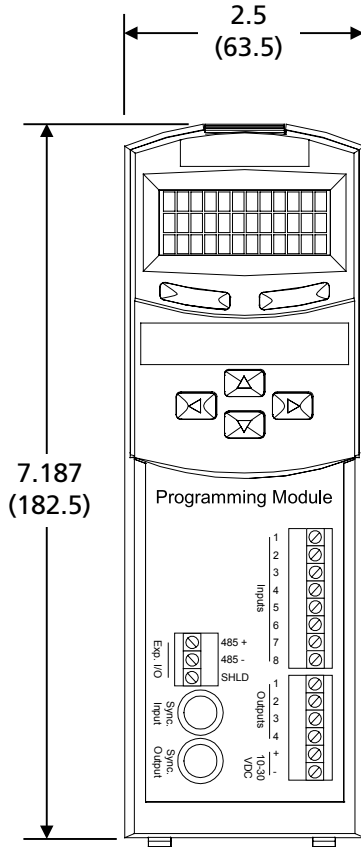
| DeviceNet (FM-3DN and FM-4DN only) | |
|------------------------------------|-----------------|
| Pin Number | Signal |
| 1 | DeviceNet V- |
| 2 | DeviceNet CAN_L |
| 3 | DeviceNet DRAIN |
| 4 | DeviceNet CAN_H |
| 5 | DeviceNet V+ |

| Profibus (FM-3PB and FM-4PB only) | |
|-----------------------------------|-----------------------------------|
| Pin Number | Signal (DB9 connector) |
| 1 | N/C |
| 2 | N/C |
| 3 | Signal + (B) |
| 4 | RTS |
| 5 | Data GND |
| 6 | +5 Volts (for Active Termination) |
| 7 | N/C |
| 8 | Signal - (A) |
| 9 | N/C |

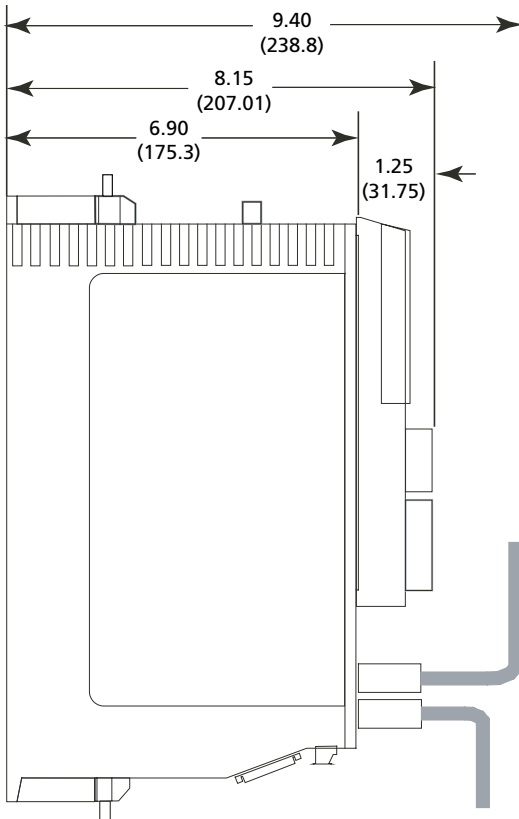


FM DIMENSIONS

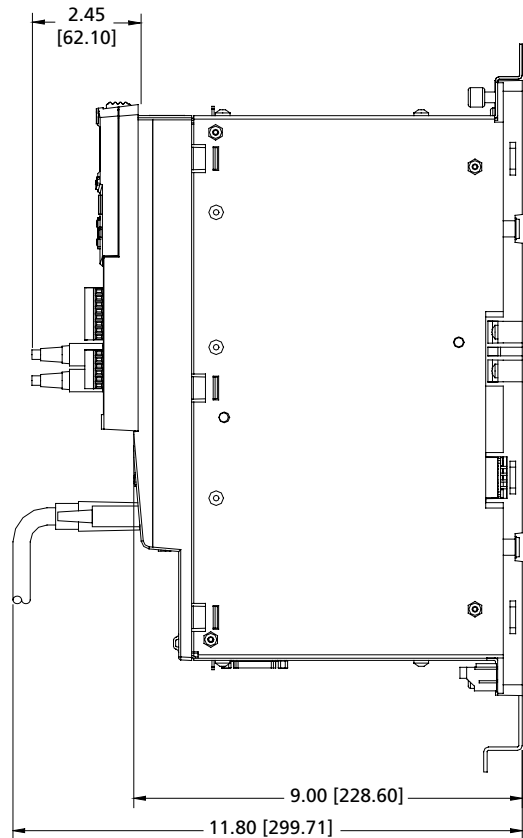
Go to
Power CD
for complete data



FM on EN Drive

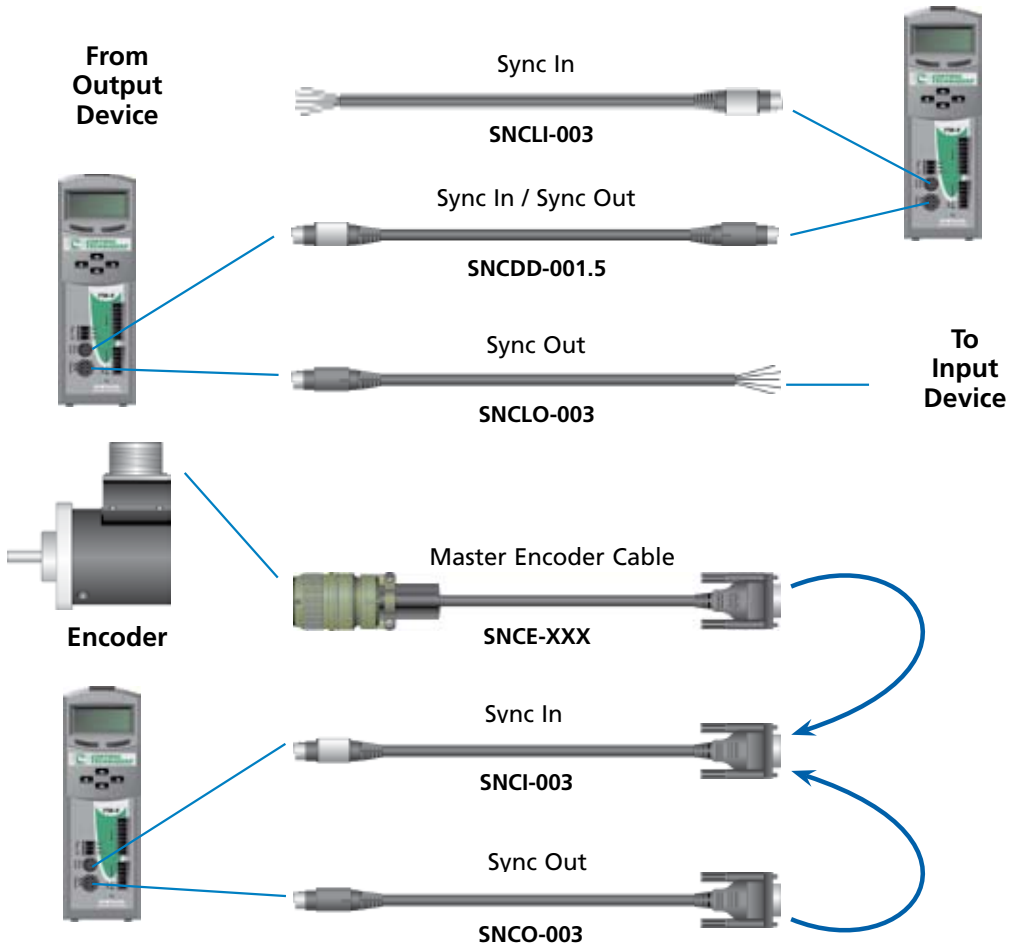


FM on MDS Drive

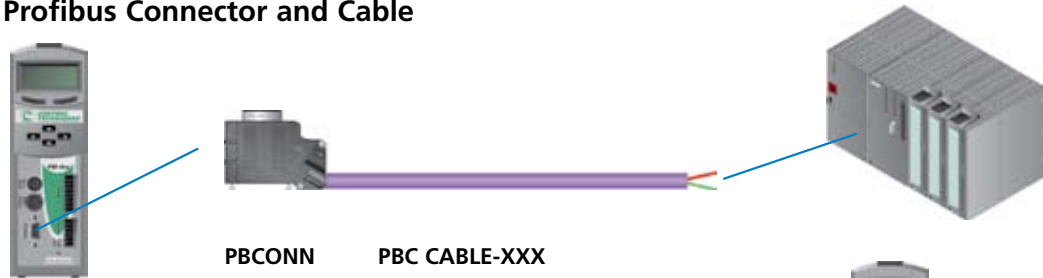


FM Cabling Options (See Options section for more information.)

FM SYNCHRONIZATION CABLES—PLUG AND PLAY



FM Profibus Connector and Cable



FM Ethernet Connector and Cable

