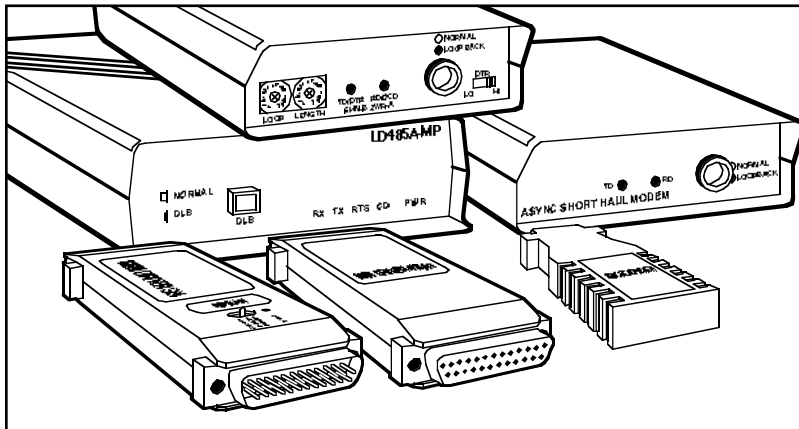


MICRODRIVER 9, SHORT-HAUL MODEM, & RS-232/RS-485 MULTIPOINT LINE DRIVER



Send your async data up to several miles from your computer equipment—without the expense of a modem.

Key Features

- ▶ **Send async data across short- and medium-range distances.**
- ▶ **Use existing in-house twisted-pair wiring to transmit data.**
- ▶ **Choose from a variety of data rates—as high as 115.2 kbps with the High-Speed SHM-B.**
- ▶ **Most offered as cards for rackmounting.**
- ▶ **Models for multipoint applications available.**
- ▶ **Compact, nonpowered versions offer easy installation.**
- ▶ **Microdriver 9 can be ordered with surge protection.**

If you want to transmit data from your computing equipment further than the 50-ft. (15.2-m) RS-232 limit but don't need a modem (which can transmit data worldwide), then order a BLACK BOX[®] Microdriver 9, Short-Haul Modem, or RS-232/RS-485 Multipoint Line Driver.

These compact, easy-to-install data-communication devices can exchange data within a building or across town. Higher data rates yield shorter distances. For details and distance/speed specifications for specific models, see the following pages.

What to consider when choosing:

First, determine whether you need a *nonpowered* or *powered* device.

The nonpowered models plug into the connector at the communications port of your DTE and derive their power from the port's interface (RS-232/ITU V.24) via one or more of the connector's pins. All Microdriver 9 models and SHM-NPR versions of our Short-Haul

Modems are powered this way.

Before choosing a specific nonpowered device, you'll need to confirm that your computing equipment has the pins needed to run the device. Then determine the gender of your computer's comm port connector and select a model with the proper connector gender.

Choose a powered device if your computer can't support nonpowered units and/or you prefer to rackmount equipment. Our Short-Haul Modem-B, High-Speed Short-Haul Modem-B, and RS-232/RS-485 Multipoint Line Drivers are all powered, requiring standard AC current to operate. What's more, they're available in standalone and rack card models. When choosing your model, consider your available installation space, the total units needed, and your existing equipment.

Next, determine if your system or software support sending data in a *point-to-point* or *multipoint* installation. Except for the

RS-232/RS-485 Multipoint Line Driver, all models featured here are designed to work point-to-point.

If you have a point-to-point network, you'll need a device that matches the type of wiring in your installation, whether it's in-house wiring for on-site applications or a 4-wire twisted-pair Local Area Data Circuit (LADC) leased from your phone company to send data off-site. In-house wiring will be either 2- or 4-wire twisted-pair cable that exists in your building or that you will install.

Lastly, determine the *speed* you want your data to travel, reviewing your computer's limitations to see if it supports high speeds, and the *distance* it must travel. You'll also need to consider how much room for error can you tolerate in data exchanges, what wire gauge(s) will be used, and how many splices will exist in the wire.

For more on the specific models, see [page 2](#).

Microdriver 9

Nonpowered, point-to-point, 4-wire

- Saves space—plugs into your PC's DB9 serial port.
- Sends data up to 17 miles (27.4 km) at 1200 bps using 24 AWG gauge wire.
- Models are available with RJ-11, RJ-45, or 5-screw terminal-block connectors.

This compact short-range, asynchronous, point-to-point, full-duplex line driver plugs directly into your computer or terminal port, and all power is drawn from the RS-232 interface

It's perfect for installations where there's no room to spare. Surface-mount technology makes the Microdriver 9's small size possible.

Used in pairs, the Microdriver 9 enables two asynchronous RS-232 devices with DB9 connectors to communicate at distances up to 17 miles (27.4 km) at 1200 bps over 24 AWG wiring.

Ten models are available, including surge-protected (SP) versions that feature 600-watt power dissipation at 1 ms and a response time of 1.0 picoseconds.

- The Microdriver 9 RJ-11 (ME790A-M, ME790A-F, ME792A-MSP, ME792A-FSP) has a female RJ-11 connector to connect to the twisted-pair lines and a male or female DB9 connector to connect to your computer port.
- The Microdriver 9 RJ-45 (ME794A-M, ME794A-F, ME794A-MSP, ME794A-FSP) has a female RJ-45 to connect to the twisted-pair lines and a male or female

DB9 connector to connect to your computer port.

- The Microdriver 9 5-Screw Terminal Block (ME793A-MSP, ME793A-FSP) has a 5-screw terminal block to connect to the twisted-pair lines and a male or female DB9 connector to connect to your computer port.

Short-Haul Modem (2-Wire), Nonpowered (SHM-NPR and SHM-NPR Plus)

Nonpowered, point-to-point, 2-wire

- Fast, efficient data exchanges via full-duplex operation without 4-wire cable operation costs.
- Using 24 AWG wire, the standard versions send data up to 0.6 miles (1 km) and the Plus models support distances of 1300 feet (396.2 m).
- Async data rates up to 38,400 bps.
- The Plus models have automatic local loopback circuitry for detecting line faults.
- The Plus models also offer transformer isolation to protect your DTEs from different ground potentials (a problem if your lines run outdoors or underground).

The SHM-NPR connects asynchronous terminals to computers for local data distribution. What makes this model unique is its ability to operate in full-duplex mode over a single pair of wires. This can be coax or single twisted-pair cable. In many cases, you should be able to use the 2-wire telephone line already installed in your building.

Compact and easy to install, the SHM-NPR plugs directly into the back of your terminal—there's no need for an extra cable.

Four models are available:

- The standard versions with either a male (ME738A-M) or female (ME738A-F) DB25 connector and a 2-screw terminal block.
- The Plus models, which offer automatic local loopback circuitry and transformer isolation and have either a male (ME739A-M-R2) or female (ME739A-F-R2) DB25 connector as well 2-screw terminal block connectors.

You don't need any power supply for the SHM-NPR because its innovative circuitry takes ultra-low power from the standard RS-232 data and control lines. It'll work even if you connect just the Transmit Data (Pin 2), Receive Data (Pin 3), and Signal Ground (Pin 7) line. Control signals are not required. In compliance with RS-232C and V.24 standards, the SHM-NPR generates both positive and negative signals—no matter what the state of Transmit Data, which can be constantly high or constantly low.

If you use 24 AWG cable with a pair of SHM-NPR units, you can transmit data up 0.6 miles (1 km). Maximum distances decrease with the higher the gauge used. You get the greatest distance by using RG62 coax cable.

The Plus models provide 24 AWG distances of up to 1300 feet (396.2 m).

Short-Haul Modem-B 2WA (SHM-B 2WA)

Powered, point-to-point, 2-wire

- A pair of these line drivers enables two RS-232 devices

to communicate at distances up to 2.3 miles (3.7 km) at 2400 bps over 24 or 26 AWG.

- Fully supports hardware handshaking, so you get reliable performance during every data exchange.
- Two status LEDs monitor transmit and receive lines.
- Loopback circuitry helps you detect line faults via a front-panel button.

The SHM-B 2W-A is an asynchronous, full-duplex line driver and receiver that requires only two wires to transmit data.

A pair of of these SHMs enables two RS-232 devices to communicate at distances of up to 2.3 miles (3.7 km) and at bit rates of up to 19.2 kbps, while fully supporting hardware handshaking.

The SHM-B 2W-A operates over a two-wire metallic circuit. Optimum performance is obtained with 22 to 26 AWG twisted-pair telephone cable, but you can use nearly any twisted-pair cable, with little or no performance degradation.

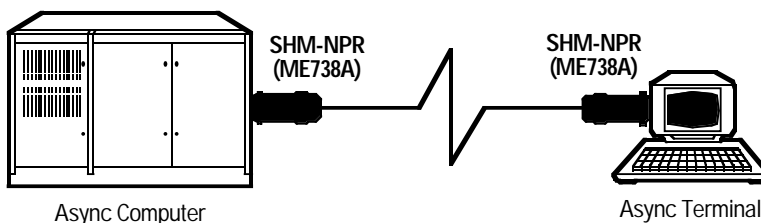
In addition to the transmitter and receiver circuits, the modem includes RS-232 control-line interfaces, status monitor LEDs, and a loopback switch.

A powered device, the SHM-B 2W-A is available in standalone 115-VAC (ME755A) or 230-VAC (ME755AE) versions and as card version (ME755-C) for mounting in our 8- or 16-Card Short-Haul Modem-B Rack.

Short-Haul Modem-B (SHM-B) Async

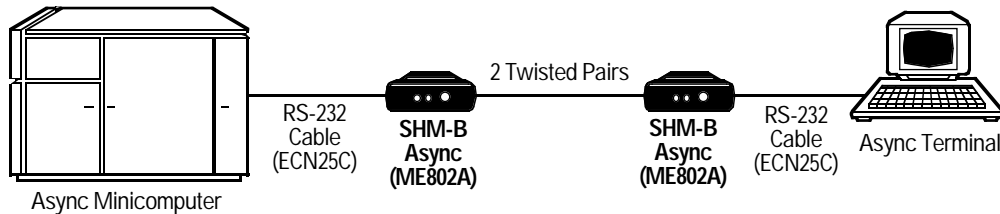
Powered, point-to-point, 4-wire

- Ideal for almost any point-to-point, 4-wire, full-duplex application.
- Equipped with a balanced loop interface and optical isolation circuitry, providing protection from differences in ground potential between areas.
- Local analogue loopback circuitry lets you check the operation of both your local and remote units.



A typical application using SHM-NPR (ME738A), a nonpowered, point-to-point, 2-wire line driver.

(continued on page 3)



A typical application using the High-Speed SHM-B Async, a powered driver that's ideal for sending async data point to point at speeds up to 115.2 kbps.

(continued from page 2)

- Distances up to 4 miles (6.4 km) at 2400 bps over 24 AWG wire.
- Speeds up to 19.2 kbps.
- Standalone and card versions.

The SHM-B Async is an asynchronous, full-duplex, 4-wire line driver/receiver that, when paired with another SHM-B Async, enables two EIA-232 devices to communicate at distances of up to 4 miles (at 2400 bps) over 24 AWG wire and at data speeds of up to 19.2 kbps.

In addition to the transmitter and receiver circuits, the SHM-B Async includes EIA-232 control line interfaces, status monitor LEDs, and a loopback switch.

The SHM-B Async is available in five versions:

- As a standalone 115-VAC model (ME800A).
- As a standalone 115-VAC model with cables included (ME800A-R3).
- As a standalone 230-VAC model with cables included (ME800AE-CABPAK-R2).
- As a rackcard version (ME805-C).
- As a rackcard version with cables included (ME805-C-R3).

The SHM-B is designed to operate over a 4-wire metallic circuit, and it works best when used with twisted-pair cable. However, you can use most types of twisted-pair cable, often with little or no performance degradation.

It's also designed for maximum operator safety—there are no voltages greater than 12 VDC or 16 VAC present on the circuit board of the unit. Receive lines are

protected from potential ground differences through optical isolators rated at 1500 volts.

High-Speed Short-Haul Modem-B (SHM-B) Async

Powered, point-to-point, 4-wire

- Speeds up to 115.2 kbps.
- Ideal for applications where data speed is crucial.
- Uses two unshielded twisted pairs.
- Includes optical isolation to protect against surge damage.
- Switch-selectable for DTE or DCE equipment.
- Available in both standalone and rackmount card versions.

With a pair of High Speed SHM-B Async units, two RS-232 devices can communicate at speeds of up to 115.2 kbps!

Data travels at this rate when the SHMs are configured for 1.5-mile (2.4-km) distances. To get the greatest distance—up to 4 miles (6.4 km) over 24 AWG wiring—set them to operate at 2400-bps speeds.

Along with transmitter and receiver circuits, the High Speed SHM-B Async includes EIA-232 control-line interfaces, status monitor LEDs, and a loopback switch. The High Speed SHM-B Async is available in both standalone versions (ME802A or ME802A-R3) and rackmount card versions (ME802C or ME802C-R3).

You use these SHMs with 4-wire metallic circuits, with twisted-pair cable offering the best performance. And although you can use most types of twisted-pair cable, to achieve maximum performance, we recommend that you use Level 4 or Level 5 UTP cable.

Because there are no voltages greater than ± 9 VDC or 17 VAC present on the circuit board of the High-Speed SHM-B Async, it offers maximum operator safety. Receive lines are protected from potential ground differences through optical isolators rated at 2500 volts.

Plus, the SHM offers easy installation. Because it's switch-selectable for either DTE or DCE equipment, you won't need any special cross-pinned cables; it works with the modular RJ cable that's already installed in your building.

RS-232/RS-485 Multipoint Line Driver (LD485A-MP)

Powered, point-to-point or multipoint, 2- or 4-wire

- Provides high-speed service (64 kbps) for large multipoint installations (up to 64 drops).
- Works with any DTE that can be polled, regardless of the DTE's RTS support.
- User-selectable port-timeout feature automatically disables a port once it finishes transmission.
- Operates in 2-wire half-duplex or 4-wire full-duplex mode.
- Maximum distances of 4 miles (6.4 km) at 1200 bps over 24 AWG wire.

Here's the ideal line driver for multipoint installations where you want to link many terminals—each with its own line driver—to a computer via one master line driver. Use it, for instance, in high-speed and polling applications. Depending on the operating environment, as many as 64 devices can be linked together using twisted-pair cable.

You can also use the RS-232/RS-485 Multipoint Line Driver

in point-to-point installations until you upgrade to a multipoint environment.

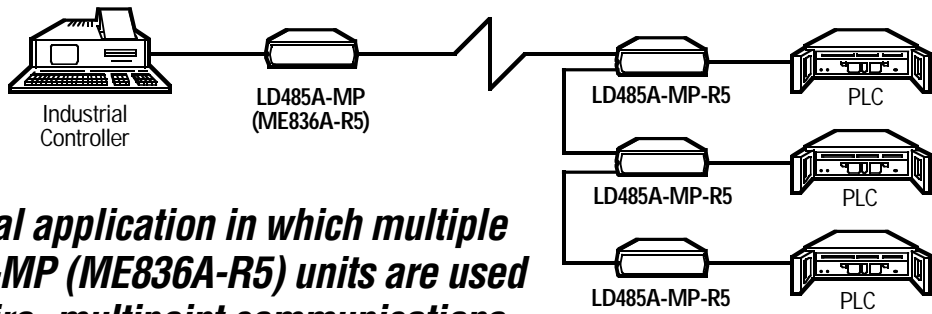
What's more, it operates as an RS-232 to RS-485 interface converter, enabling an RS-232 device to transmit data over much longer distances than is normally possible (up to 4 miles at 1200 bps). Although it's designed specifically to connect to other RS-232/RS-485 Multipoint Line Drivers, you can connect the RS-485 port to any device with an RS-422 or RS-485 interface. Connect, for instance, RS-485 and RS-422 devices to the same LD485A-MP in an industrial application.

The line driver also features a manual loopback test, so you can check the system wiring for both the RS-232 and RS-485 interfaces. In addition, transient protection on the RS-485 interface helps prevent damage due to voltage transients on the data line.

Special circuitry within the driver lets it work with any DTE that can be polled, regardless of the DTE's RTS support, so you get total compatibility with your DTE hardware.

The RS-232/RS-485 Multipoint Line Driver can be jumpered for a user-selectable port timeout. After the last character is sent from one of the ports and a specified period of time passes, the line driver disables any transmission from that port. This way, a single port won't monopolize your network.

You can order the RS-232/RS-485 Multipoint Line Driver in standalone 115-VAC (ME865A-R5) standalone 230-VAC (ME836AE-R3), and rackmount card (ME836C-R5) versions. Cables are included with the 115-VAC standalone model and the rackmount card model.



A typical application in which multiple LD485A-MP (ME836A-R5) units are used for 4-wire, multipoint communications.

Quick Reference Guide

ITEM	POWERED/ NONPOWERED	MULTIPOINT	2-WIRE	4-WIRE	FULL- DUPLEX	HALF- DUPLEX	TO 19.2 KBPS	TO 64 KBPS	TO 115.2 KBPS	POWER
ME790A-M, -F	Nonpowered			X	X	X	X			RS-232 interface, DCE mode: Pins 3, 4, 7
ME792A-MSP, -FSP	Nonpowered			X	X	X	X			RS-232 interface, DCE mode: Pins 3, 4, 7
ME793A-MSP, -FSP	Nonpowered			X	X	X	X			RS-232 interface, DCE mode: Pins 3, 4, 7
ME794A-MSP, -FSP	Nonpowered			X	X	X	X			RS-232 interface, DCE mode: Pins 3, 4, 7
ME794A-M, -F	Nonpowered			X	X	X	X			RS-232 interface, DCE mode: Pins 3, 4, 7
ME738A-M, -F	Nonpowered		X		X		X*			RS-232 interface, Pin 2, 4, 20, 6 VDC minimum
ME739A-M-R2, -F-R2	Nonpowered		X		X		X			RS-232 interface, Pin 2, 4, 20, 6 VDC minimum
ME755A	Powered		X		X		X			115 VAC, 60 Hz
ME755AE	Powered		X		X		X			230 VAC, 50 Hz
ME755-C	Powered		X		X		X			From the ME810 or RM007 rack
ME800A, 800A-R3	Powered			X	X		X			115 VAC, 60 Hz
ME800AE-CABPAK-R2	Powered			X	X		X			230 VAC, 50 Hz
ME805-C, 805-C-R3	Powered			X	X		X			From the ME810 or RM007 rack
ME802A, 802A-R3	Powered			X	X		X	X	X	115 VAC, 60 Hz
ME802C, 802C-R3	Powered			X	X		X	X	X	From the ME810 or RM007 rack
ME836A-R5	Powered	X	X	X	X	X	X	X		115 VAC, 60 Hz
ME836AE-R3	Powered	X	X	X	X	X	X	X		230 VAC, 50 Hz
ME836C-R5	Powered	X	X	X	X	X	X	X		From the RM005 rack

Specifications

All Models:

Protocol: Asynchronous

Microdriver 9 (ME790A, ME792A–ME794A)

Distance (Maximum): 24 AWG:
17 mi. (27.4 km) at 1200 bps

Operation: 4-wire full-duplex, point-to-point

Speed (Maximum): 19.2 kbps

Interface: RS-232

Connectors:

ME790A-M, ME792A-MSP:
(1) DB9 M, (1) RJ-11 F;
ME790A-F, ME792A-FSP:
(1) DB9 F, (1) RJ-11 F;
ME793A-MSP: (1) DB9 M,
(1) 5-screw terminal block;
ME793A-FSP: (1) DB9 F,
(1) 5-screw terminal block;
ME794A-M, ME794A-MSP:
(1) DB9 M, (1) RJ-45 F;
ME794A-F, ME794A-FSP:
(1) DB9 F, (1) RJ-45 F

Power: From the RS-232 interface

Size: 1.2"H x 0.75"W x 2.5"D
(3.1 x 1.9 x 6.4 cm)

Weight: 0.6 lb. (0.3 kg)

SHM-NPR (ME738A) and SHM-NPR Plus (ME739A-R2)

Distance (Maximum): 24 AWG:
ME738A: 0.6 mi. (1 km);
ME739A-R2: 1300 ft. (396.2 m)

Operation: 2-wire full-duplex,
point-to-point

Speed (Maximum):
ME738A: 38.4 kbps;
ME739A-R2: 19.2 kbps

Interface: RS-232

Connectors:

ME738A-F, ME739A-F-R2:
(1) DB25 F, (1) 2-screw terminal
block;
ME738A-M, ME739A-M-R2:
(1) DB25 M, (1) 2-screw terminal
block;

Power: From the RS-232 interface

Size: 0.9"H x 2.1"W x 4.3"D
(2.3 x 5.3 x 10.9 cm)

Weight: ME738A: 0.6 lb. (0.3 kg);
ME739A-R2: 0.2 lb. (0.1 kg)

SHM-B 2W-A (ME755A, ME755AE, ME755-C)

Distance (Maximum): 24 AWG:
2.3 mi. (3.7 km) at 2400 bps

Operation: 2-wire full-duplex, point-to-point

Speed (Maximum): 19.2 kbps

Interface: RS-232

Connectors: (1) DB25 F, (1) 2-screw
terminal block

Power:

ME755A: External 115 VAC, 60 Hz;
ME755AE: External 230 VAC,
50 Hz;
ME755-C: From the ME810 or
RM007 rack

Size: Standalone: 1.5"H x 4.3"W x
4.5"D (3.8 x 10.9 x 11.4 cm)

Weight: Standalone: 1.3 lb. (0.6 kg)

SHM-B Async (ME800A, ME800A-R3, ME800AE-CABPAK-R2, ME805-C, ME805-C-R3)

Distance (Maximum): 24 AWG:
4 mi. (6.4 km) at 2400 bps

Operation: 4-wire full-duplex, point-to-point

Speed (Maximum): 19.2 kbps

Interface: RS-232

Connectors: (1) DB25 F, (1) 4-screw
terminal block

Power: ME800A, ME800A-R3:
External 115 VAC, 60 Hz \pm 10%,
5 watts;
ME800AE-CABPAK-R2: Primary:
230 VAC \pm 10%, 50–60 Hz;
Secondary: 17 VAC, 700 mA;
ME805-C, ME805-C-R3: From the
ME810 or RM007 rack

Size: Standalone: 1.5"H x 4.3"W x
4.5"D (3.8 x 10.9 x 11.4 cm)

Weight: Standalone: 1.3 lb. (0.6 kg)

High-Speed SHM-B Async (ME802A, ME802A-R3, ME802C, ME802C-R3)

Distance (Maximum): 24 AWG:
4 mi. (6.4 km) at 2400 bps

Operation: 4-wire full-duplex, point-to-point

Speed (Maximum): 115.2 kbps

Interface: RS-232

Connections: (1) DB25 F, (1) 4-screw
terminal block

Power: ME802A, ME802A-R3:
External 115 VAC, 60 Hz;
ME802C, ME802C-R3: From the
ME810 or RM007 rack

Size: Standalone:
1.5"H x 4.4"W x 4.1"D
(3.8 x 11.2 x 10.4 cm)

Weight: Standalone: 2 lb. (0.9 kg)

RS-232/RS-485 Multipoint Line Driver (ME836A-R5, ME836AE-R3, ME386C-R5)

Distance (Maximum): 24 AWG:
4 mi. (6.4 km) at 1200 bps

Operation: 4-wire full-duplex, 2-wire
half-duplex, point-to-point or
multipoint

Speed (Maximum): 64 kbps

Interface: RS-232 or RS-485

Connectors: (1) DB25 F, (1) 4-screw
terminal block (RS-485)

Power: ME836A-R5: External
115 VAC, 60 Hz;
ME836AE-R3: External 230 VAC,
50 Hz;
ME836C-R5: From the RM005
rack

Size: Standalone: 1.8"H x 5.5"W x
8.5"D (4.6 x 14 x 21.6 cm)

Weight: Standalone: 1.8 lb. (0.8 kg)

Why Buy From Us? Exceptional Value and Tech Support. Period.

Recognise any of these situations?

- You wait more than 30 minutes to get through to a vendor's tech support.
- The so-called "tech" can't help you or gives you the wrong answer.
- You don't have a purchase order number and the tech refuses to help you.
- It's 9 p.m. and you need help, but your vendor's tech support line is closed.

According to a survey by Data Communications magazine, 90% of network managers surveyed say that getting the technical support they need is extremely important when choosing a vendor. But even though network managers pay anywhere from 10 to 20% of their overall purchase price for a basic service and support contract, the technical support and service they receive falls short of their expectations—and certainly isn't worth what they paid.

At Black Box, we guarantee the best value and the best support. You can even consult our Technical Support Experts before you buy if you need help selecting just the right component for your application.

Don't waste time and money—call Black Box today.

Ordering Information

ITEM	CODE
Microdriver 9 RJ-11	
Male	ME790A-M
Female	ME790A-F
Microdriver 9 RJ-11 with Surge Protection	
Male	ME792A-MSP
Female	ME792A-FSP
Microdriver 9 5-Screw Terminal Block with Surge Protection	
Male	ME793A-MSP
Female	ME793A-FSP
Microdriver 9 RJ-45	
Male	ME794A-M
Female	ME794A-F
Microdriver 9 RJ-45 with Surge Protection	
Male	ME794A-MSP
Female	ME794A-FSP
Short-Haul Modem, Nonpowered (SHM-NPR)	
Male	ME738A-M
Female	ME738A-F
Short-Haul Modem, Nonpowered (SHM-NPR) Plus	
Male	ME739A-M-R2
Female	ME739A-F-R2

ITEM	CODE
Short Haul Modem-B (SHM-B) 2W-A	
Standalone (115 VAC)	ME755A
Standalone (230 VAC)	ME755AE
Rackmount Card	ME755-C
Short-Haul Modem-B (SHM-B) Async	
Standalone (115-VAC)	ME800A
Standalone (115-VAC) with Cables	ME800A-R3
Standalone (230-VAC) with Cables	ME800AE-CABPAK-R2
Rackmount Card	ME805-C
Rackmount Card with Cables	ME805-C-R3
High-Speed Short-Haul Modem-B (SHM-B) Async	
Standalone (115-VAC)	ME802A
Standalone (115-VAC) with Cables	ME802A-R3
Rackmount Card	ME802C
Rackmount Card with Cables	ME802C-R3
<i>For all card versions above, you'll need a rack...</i>	
Short Haul Modem-B Rack (16-Card)	ME810
Short Haul Modem-B Desktop Rack (8-Card)	RM007
RS-232/RS-485 Multipoint Line Driver (LD485A-MP)	
Standalone (115-VAC) with Cables	ME836A-R5
Standalone (230-VAC)	ME836AE-R3
Rackmount Card with Cables	ME836C-R5
<i>For your ME836C-R5 cards, you'll need a...</i>	
Multi-Function Rack (16-Card)	RM005