



BLACK BOX®
NETWORK SERVICES



June 2015
MD940A-F
MD940A-M

Part Numbers

Fiber Driver - ST/DB25F MD940A-F

Fiber Driver - ST/DB25M MD940A-M

FIBER DRIVER



CUSTOMER SUPPORT INFORMATION

Order toll-free in the U.S.: 877-877-BBOX (outside U.S. call 724-746-5500)
FREE technical support, 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746
Mail order: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: www.blackbox.com • E-mail: info@blackbox.com

Specifications

Power

Wall-mount Power Supply, 100-240 VAC/47-63 Hz Input,
5 VDC, 1.2 Amp Output, UL/CUL

Interface

EIA RS-232-C; CCITT V.24, V.28; ISO 2110

Flow Control

Will pass XON/XOFF only.

Size

1"H x 2.7"W x 4.2"L

Weight

1.4 lb. includes supply

Data Rate

Transparent to rates up to 76.8 kbps (high/low speed jumper)

Data Format

Asynchronous, Bi-Directional

Connectors

(1) - DB25 female or male, (2) - fiber optic ST

Switches

(1) - DCE/DTE toggle

Fiber Optic Wavelength

850 nm

Receiver Sensitivity

Typical: 3 uW / -25.2 dBm

Transmitter Coupled Power

Actual coupled power varies in fiber optic applications due to mechanical alignment of components and/or connector and optical fiber tolerances. The Fiber Driver provides a range select feature that allows the user to compensate for these variations as needed.

Table 1.1 - Transmitter Coupled Power Settings (W3)

cable type	W3=A (short range) (uW/dBm)	W3=B (medium range) (uW/dBm)	W3=C (long range) (uW/dBm)
multimode 50/125 um	4.0/-24.0	12.0/-19.2	20.0/-17.0
multimode 62.5/125 um	10.0/-20.0	28.0/-15.5	46.0/-13.4
Multimode 100/140 um	24.0/-16.2	72.0/-11.4	120/-9.2

(NOTE: Set jumper W3 to the lowest power setting for your application to avoid saturating the far-end unit's receiver.)

Example Power Budget and Distance Calculations

Power Budget = Transmitter Output - Receiver Sensitivity
Distance = Power Budget ÷ Loss/km

Example:

Receiver Sensitivity = -25.2 dBm

Transmitter Output = -13.4 dBm

Fiber cable Loss/km = 3.5 dB/km

Power Budget = 11.8 dB

Distance = 3.4 km

Introduction

The Fiber Driver converts standard RS-232 signals into fiber optic signals, which can then be transmitted over several kilometers depending on cable type and power setting. These devices support asynchronous, bi-directional RS-232 data transmission. They are switch selectable for either DTE or DCE applications, eliminating the need for special cables and preventing confusion during installation. They can be ordered with male or female DB25 connectors for the RS-232 interface. Two units are connected using 50, 62.5, or 100 micron multi-mode fiber optic cable with ST style connectors.

Installation

Before you begin, make sure all equipment is powered off, including the Fiber Drivers.

Remove the two screws and lift off the cover to access the internal configuration jumpers on the Fiber Driver. Set jumpers W1, W2, and W3 as appropriate for your application (see Figure 3.1 and Table 3.1). Reinstall the cover, and then set toggle switch S1 for either DTE to connect to a PC, or DCE to connect to a modem. Connect the two fiber drivers using multi-mode fiber optic cables with ST style connectors. Make certain that the transmitter output of each unit is connected to the receiver input of the other unit. Next, connect the Fiber Drivers to your RS232 devices, either by attaching the Fiber Drivers directly to the RS232 connector on your devices, or using straight through cables. Power up the Fiber Drivers, and then apply power to your equipment.

Jumper	Function	Use
W1	Pull-up to +5	Install to assert pin 6 on DB25
W2	High speed filter	Install to operate at rates above 19.2 kbps
W3	Range select*	A-short range, B-medium range, C-long range

*Range selection is dependent upon the core size of the fiber optic cable used and the distance data is to be transmitted. Select the shortest range that accurately passes data.

Table 3.2 - RS232 Connector (J1)

Pin - Signal	S1 set to DCE	S1 set to DTE
2 - Transmitted Data	Output	Input
3 - Received Data	Input	Output
4 - Request To Send	connected to pin 5	connected to pin 5
5 - Clear To Send	connected to pin 4	connected to pin 4
6 - Data Set Ready (note 1)	Pulled High	Pulled High
7 - Common	Ground	Ground
8 - Data Carrier Detect	connected to pin 20	connected to pin 20
20 - Data Terminal Ready	connected to pin 8	connected to pin 8
22 - Ring Indicator	Open	Open

DCE - Data Carrier Equipment

DTE - Data Terminal Equipment

Set toggle switch S1 for either DTE to connect to a PC, or DCE to connect to a modem.

Note:

1. Pin 6 (DSR) is pulled to +5 volts through jumper W1. Please see Table 3.1 for details.

Troubleshooting

If the Fiber Drivers fail to operate check the following before calling for technical support.

1. Are both units powered on? Check to see if the power supplies are plugged into a working AC outlet.
2. Check to see if the inter-connect fiber optic cable is connected properly; transmitter to receiver.
3. Check to see if the DCE/DTE setting is appropriate for the interfacing equipment.
4. Check transmitter power settings.

**FEDERAL COMMUNICATIONS COMMISSION
AND
INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS**

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le Industrie Canada.



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