

Model MC-4012-FBP Fiber Barrier Powered

Manual Part Number 180-0319A

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1. INTRODUCTION

The MC-4012-FBP Fiber Optic Barrier with battery backup uses a dual fiber optic cable to form a fiber optic link system. The fiber optic link is used to isolate or provide a barrier to electrical transients and induced noise that would otherwise damage or disrupt communications in the AMR MC-4000 monitoring system. Transients induced in the MC-4000 twisted pair communications line on one side of the fiber optic link are blocked by the fiber optic cable and thus damage is reduced on the other side of the fiber optic cable. Noise that would be induced in a twisted pair communications cable placed in close proximity with another cable is eliminated by using the fiber optic cable instead. Each transceiver is connected to the AMR MC-4000 monitoring system RS-485 communications line. The transceiver converts the RS-485 level signals to light waves and applies them to the fiber optic cable. The companion transceiver receives the light waves, converts them back to RS-485 levels, and applies them to the MC-4000 monitor system communications line.

2. Specifications

Size: 14"W x 12"H x 6 3/8"D MC-4012-FBP

Size: 5" x 5" 253-0277 PC Board

Power: +15VDC to +28VDC at 40mA. and 120 VAC +15%/-20%

Communications: RS-485

Baud Rate: Switch Selectable 38.4K or 3800 baud.

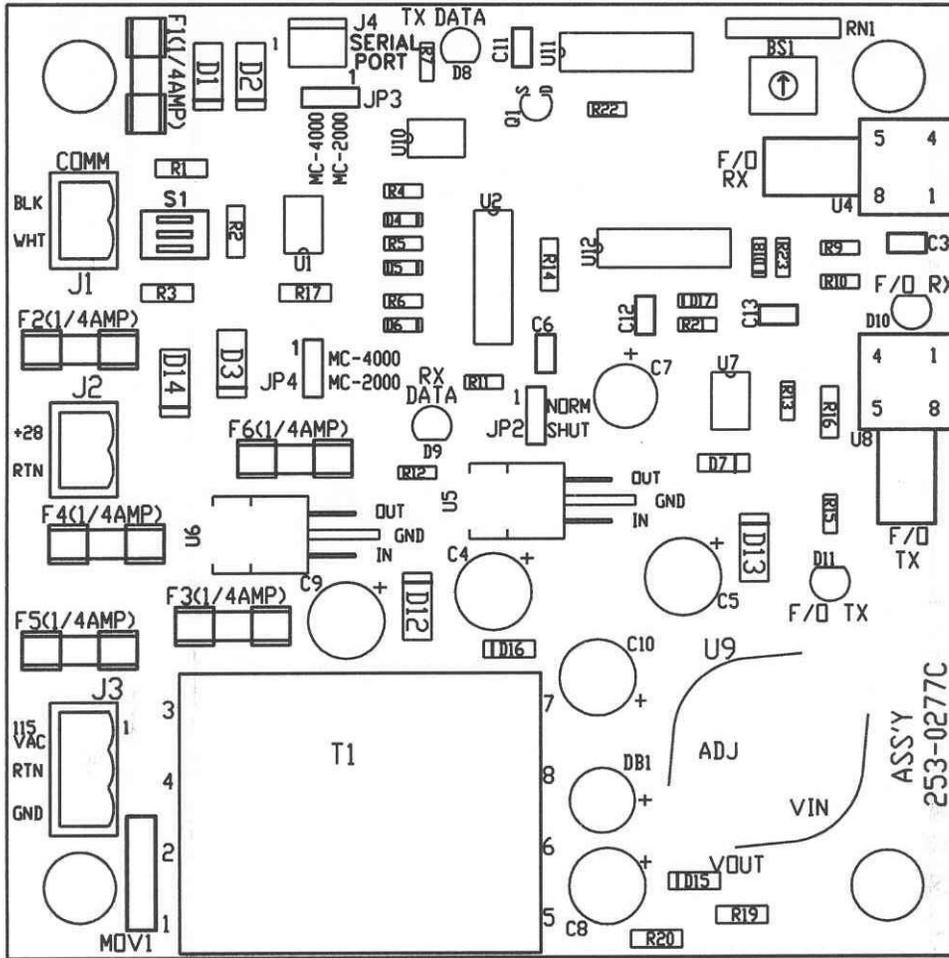
Fiber Optic Transmitter Power: -12 dbm. at 820 nm.

Fiber Optic Receiver Sensitivity: -27 dbm.

Fiber Optic Connector Type: ST

Fiber Optic Cable: Dual glass fiber, 62.5 uM/125 uM.

Figure 1, MC-4012 Fiber Optic Transceiver PC Board



3. Connections and Setup

The MC-4012-FBP fiber optic transceiver is setup and installed by making electrical connections, placing programming jumpers, and setting switch positions.

Electrical Connections

Communications Line - Connector J1 is used to connect to the MC-4000 monitor system communications line.

DC Power – Connector J2 is used to provide +15 VDC to +28 VDC at 40 mA to the transceiver PC board from the MC-4000 monitor system trunk line. However, the current output is limited to 200 mA and therefore a limited number of sensors and/or remotes may be powered from the MC-4012-FBP. Consideration should be given to how power is to be used from the barrier. The MC-4012-FBP does not provide remote kill capability, therefore provisions must be made to remotely kill power to the MC-4012-FBP if required. See figures 2, 3, and 4 for applications schemes that provide remote kill capability.

AC Power – Connector J3 is used to provide 120 VAC to the MC-4012-FBP PC board. The 120 VAC is converted to a regulated +28 VDC that is used to power the PC board and also provide +28 VDC output to connector J2 as described above.

Serial Port – Connector J4 is used to interface the MC-4012-FBP with the MC-4000 monitoring system by connecting to the communications cable.

Fiber Optic Connections

General - Each end of the fiber optic cable is terminated with a ST type connector. Care should be exercised when connecting or disconnecting the connectors. The cable end plug and the module receptacle each have keys that must be aligned before proper connection can be made. Once alignment has been achieved, the cable plug barrel is pushed toward the receptacle module while rotating the barrel clockwise. When the plug is in the proper position, the barrel is rotated clockwise and locks in place. To remove the plug from the receptacle, first push the cable plug toward the module receptacle while rotating the plug barrel counter clockwise. This step is required to release the connector locking mechanism. After the connector lock is

released, continue to rotate the plug barrel counter clockwise and the plug will disconnect from the receptacle.

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3. Connections and Setup (Cont.)

Fiber Optic Receiver – The receiver end of the fiber optic cable is connected to the fiber optic detector module U4 located in the upper right corner of the pc board assembly #253-0277 C (see Figure 1, 2, 3, and 4).

Programming Jumpers

Note: On assembly 253-0277 C, JP1 has been replaced with BS1. Programming jumpers are used to select the MC-4000 Communications system baud rate, select MC-4000 monitoring system interface, and select fiber optic transmitter normal or shutoff mode of operation.

Baud Rate – Use jumper JP1 on assembly 253-0277 C (see Figure 1) to select the baud rate that matches the MC-4000 system baud rate. Switch position 1 = 76.8 K baud, 2 = 38.4 K baud, 3 = 19.2 K baud, etc.

F/O Transmitter Mode – Use jumper JP2 (see Figure 1) to select the fiber optic transmitter mode of operation. Select NORMAL if the transmitter is to remain enabled should the RS-485 communications interface IC fails to receive data continuously for 30 seconds. Select this mode if there are NO PARALLEL connections made on the MC-4000 system communications line. Select SHUTDOWN if the transmitter is to be disabled should the RS-485 communications interface IC fails to receive data continuously for 30 seconds. Select this mode if there are parallel connections made on the MC-4000 system communications line. Disabling the MC-4012 FBP fiber optic transmitter allows the remaining portion of the MC-4000 system to be undisturbed by failures in monitor system branch circuits.

3. Connections and Setup (Cont.)

Switch Settings

Use switch SW1 to bias and terminate the MC-4000 communications line. Place SW1 positions 1 and 3 to **ON** to only bias the communications line. Place SW1 positions 1, 2, and 3 to **ON** to bias and terminate the communications line. Place SW1 position 2 to **ON** to only terminate the communications line. The table below summarizes the SW1 switch positions.

SW1 Positions	Communication Line Function
1, 3 ON and 2 OFF	Line biased but not terminated
1, 2, 3 ON	Line biased and terminated
1, 3 OFF and 2 ON	Line terminated but not biased

Fuse Function

Use only ¼ amp 2AG fast blow type fuses for F1, F2, F5, and F6. Use only ¼ amp 2AG slow blow fuses for F3 and F4. The table below lists the function of each fuse.

Fuse Number = Function

F1 and F2	Protects the MC-4000 com line driver IC
F3 and F4	Protects the +28 VDC and RTN supply lines
F5	Protects the 120 VAC supply input
F6	Protects the +5 VDC to the com line driver IC

Figure 2, Fiber Optic Barrier

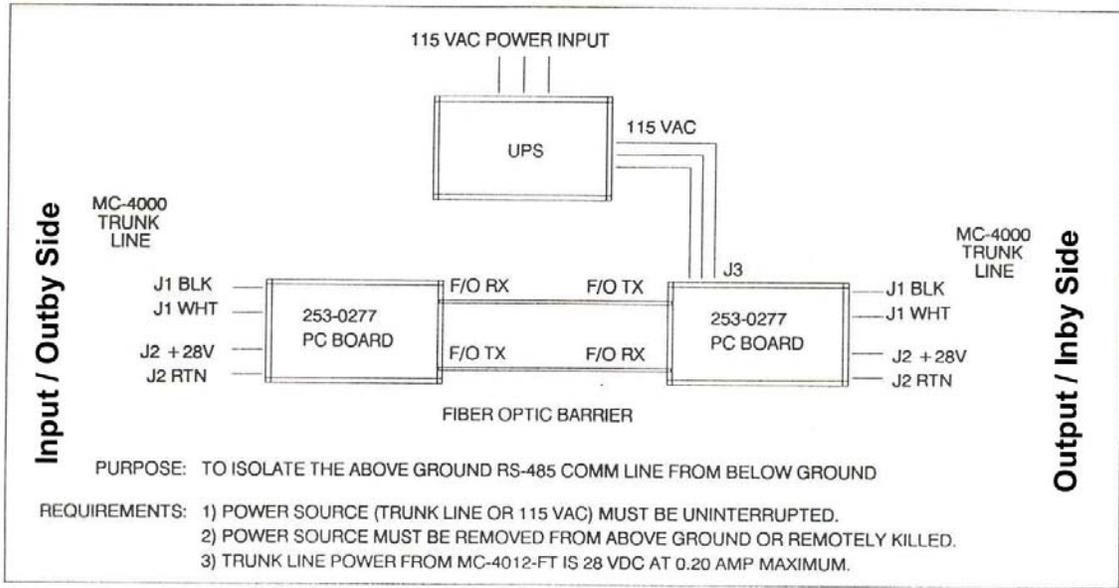


Figure 3, Fiber Optic Link

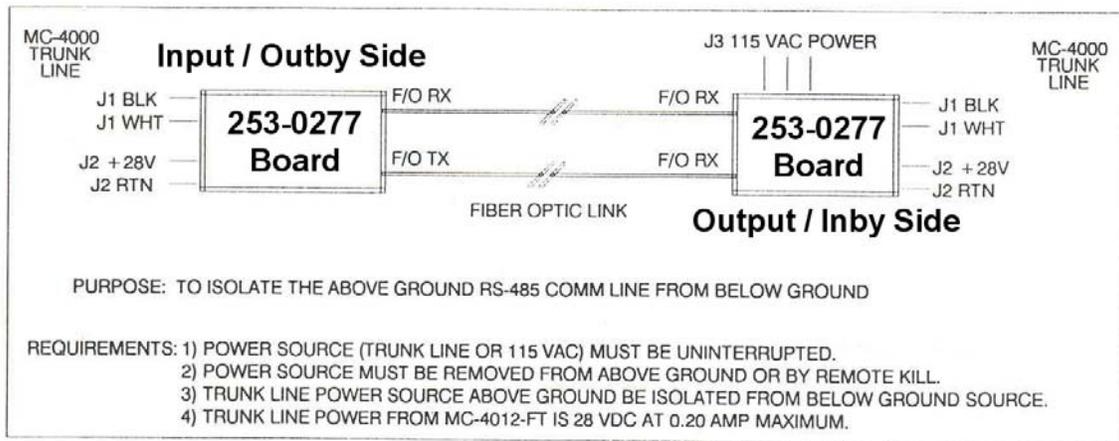


Figure 4, Fiber Optic Remote

