TR-FSL/TR-FML Fiber Modules
Product Installation Document

1 Description

The Triga Emergency Communication Systems that use the ECS-NVCM (Network Voice Control Module) and the Triga Fire Alarm Control Panels that use the TR-NIC (Network Interface Card) support two types of fiber-option modules to convert wire to fiber. These communication circuits are wired in Class X configuration so the option modules provide Class X outputs.

- TR-FML (Fiber-Optic Multi-Mode, Receiver)
- TR-FSL (Fiber-Optic Single-Mode, Transmitter)

1.1 Compatibility

The ECS-NVCM is compatible with:

- TR-2100ECS

The TR-NIC is compatible with:

- TR-2100
- TR-75

2 TR-FML (Fiber-Optic Multi-Mode, Receiver)

The TR-FML is a fiber module used as one channel to transmit or receive communications with the ECS-NVCM (Network Voice Control Module) or TR-NIC (Network Interface Card). It allows the multi-mode fiber to network between the TR-FML module boards.
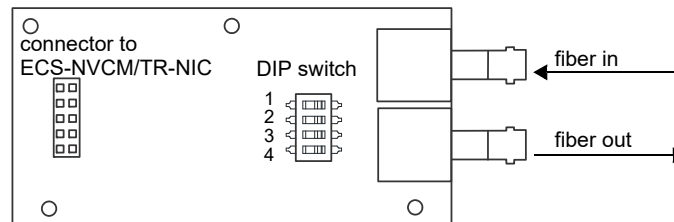

Figure 1 TR-FML Circuit Board

2.1 TR-FML Specifications

- Type of Connector: Type ST
- Maximum Attenuation: 8 dB for multi-mode with 62.5/125 micrometer cable @ 200 µm.
- Standby Current: 0.053 A
- Alarm Current: 0.053 A
- Environment Rating: 32° to 120°F (0° to 49°C), 0% to 93%
- Relative Humidity: Non-condensing at 90°F (30°C)

3 TR-FSL (Fiber-Optic Single-Mode, Transmitter)

The TR-FSL is a fiber module that is used as one channel to transmit or receive communications with the ECS-NVCM (Network Voice Control Module) or TR-NIC (Network Interface Card). It allows the single-mode fiber to network between the TR-FSL module boards.
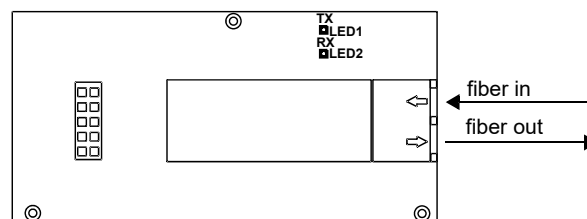

Figure 2 TR-FSL Circuit Board

3.1 TR-FSL Specifications

- Type of Connector: Type LC
- Maximum Attenuation: 30 dB for multi-mode with 9/125 micrometer cable @ 1,310 nm.
- Standby Current: 0.079 A
- Alarm Current: 0.079 A
- Environment Rating: 32° to 120°F (0° to 49°C), 0% to 93%
- Relative Humidity: Non-condensing at 90°F (30°C)

4 Installation

⚠ **CAUTION: STATIC SENSITIVE COMPONENTS**
THE CIRCUIT BOARD CONTAINS STATIC-SENSITIVE COMPONENTS. ALWAYS GROUND YOURSELF WITH A PROPER WRIST STRAP BEFORE HANDLING ANY BOARDS SO THAT STATIC CHARGES ARE REMOVED FROM THE BODY. USE STATIC SUPPRESSIVE PACKAGING TO PROTECT ELECTRONIC ASSEMBLIES.

⚡ **WARNING: RISK OF ELECTRICAL SHOCK AND EQUIPMENT DAMAGE**
DISCONNECT ALL SOURCES OF POWER (AC AND DC) BEFORE INSTALLING OR REMOVING ANY MODULES OR WIRING.

The following guidelines must be followed when installing the TR-FSL and TR-FML modules.

- Installations are to be indoors only, in dry locations, protected from rain, water, and rapid changes in temperature that could cause condensation. Equipment must be securely mounted on rigid, permanent walls.
- Operating temperature shall not exceed the range of 32°-120° F (0-49° C).
- Operating humidity not to exceed 93% non-condensing at 90° F (32° C).
- There should be adequate space around the installation to allow easy access for operation and servicing.
- All sub-assemblies and components are to be located in compliance with the local, the national codes and the manufacturer's recommendations.
- All installation field wiring shall be in compliance with the local code, the national code and the manufacturer's recommendations.
- Use the Architects and Engineering Specifications for detailed information on your Facility's Configuration.

4.1 TR-FML/TR-FSL Installation

Install a maximum of two boards per installation. Fiber modules can be mixed in the configuration.

1. Remove the unit from its static-shield bag, observing proper static protection measures.
2. Visually inspect the unit for damage. If any components are damaged, notify the shipping carrier immediately. Report missing components to Triga Customer Service.
3. Install three standoffs from the hardware kit into the holes shown in Figure 3 and Figure 4 below.
4. Plug the fiber module onto the connector of the ECS-NVCM or TR-NIC.
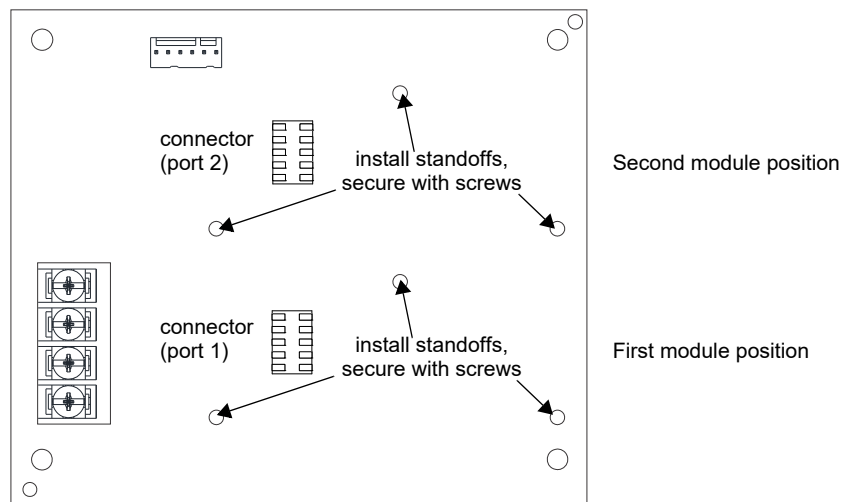5. Secure with three supplied #4-40 x 1/4" screws.

Figure 3 TR-NIC Installation

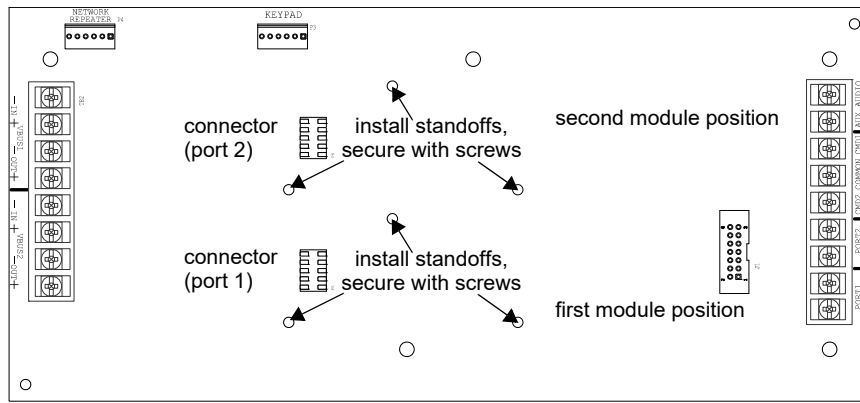Figure 4 illustrates mounting locations on the ECS-NVCM.

Figure 4 ECS-NVCM Installation

5 Wiring and Configuration

5.1 TR-FML

Use DIP switches 1-3 to set the output power for the transmitting fiber. DIP switch 4 is not used. Refer to Table 1 below. Use standard ST connector fiber-optic cable, multi-mode, up to 200 µm (optimized for 62.5/125 µm). There is a signal loss of up to 8dB maximum between nodes.

SW1-1	SW1-2	SW1-3	Drive Current
OFF	OFF	OFF	10 mA
OFF	OFF	**ON**	20 mA
OFF	**ON**	OFF	32 mA
OFF	**ON**	**ON**	42 mA
ON	OFF	OFF	54 mA
ON	OFF	**ON**	64 mA
ON	**ON**	OFF	76 mA
ON	**ON**	**ON**	86 mA

Table 1 TR-FML Switch Settings/Drive Currents

5.2 TR-FSL

Use LC connector fiber-optic cable, single mode, up to 1310 nm (optimized for 9/125 µm). There is a signal loss of up to 30dB maximum between nodes. There are two LED indicators on the TR-FSL. Refer to the table below.

LED #	Name	Color	Description
1	TX	Green	Lights when data is transmitted on the Repeater. When activity is detected, the TX light flickers and turns ON. If no activity is detected, the TX light turns OFF.
2	RX	Green	Lights when data is received on the Repeater. When activity is detected, the RX light flickers and turns ON. When no activity is detected, the RX light turns OFF.

Table 2 TR-FSL LED Functions

6 Reference Documentation

If you require detailed installation instructions on cabinetry, wiring, and specifications, you can download the following UL-Controlled documentation from the Triga website, www.trigaglobal.com.

- TR-2100/ECS Manual: LS10143-003TR-E
- TR-75 Manual: LS10147-004TR-E
- ECS-NVCM Installation Sheet: LS10169-003TR-E
- TR-NIC Installation Sheet: LS10171-003TR-E