

TC3004

50Mbps - 622Mbps
FIBER OPTIC MODE CONVERTER/REPEATER
(Rev A0.1)

User's Manual

MODEL: _____

S/N: _____

DATE: _____

Notice!

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Chapter 1 - Overview

Description

The TC3004 gives users the ability to convert Multimode fiber optic signals to Single Mode format for data transmission (and vice-versa). These conversions can benefit users by extending transmission distances and/or enabling dissimilar fiber optic devices to be used with different fiber types. The optic receiver detects the incoming optical signal and regenerates it for transmission through the second optic transmitter. The TC3004 is available in multiple configurations depending on your communication requirements. When both sides have the same wavelength, the TC3004 works like an optical signal repeater.

Data Rates

50Mbps to 622 Mbps

Optical Specifications

Transmitter:	LED; typical Launch Power:	-17 dBm* (1310nm, Multimode @62.5/125µm)
	LASER; typical Launch Power:	-10 dBm* (1310nm/1550nm, Single Mode @9/125µm)
Receiver:	PIN DIODE; typical Sensitivity:	-27 dBm* (1310nm, Multimode @62.5/125µm)
		-28 dBm* (1310nm/1550nm, Single Mode @9/125µm)
Loss Budget:	LED; 1310nm, MM @62.5/125µm	10 dB*
	LASER; 1310nm/1550nm, SM @9/125µm	18 dB*
Distance:	1310nm, Multimode @62.5/125µm	up to 2km*
	1310nm, Single Mode @9/125µm	up to 60km*
	1550nm, Single Mode @9/125µm	up to 80km*
Wavelength:	Note: Any two wavelength combinations are available on each unit.	
	1310nm Multimode (LED)	
	1310nm Single Mode (LASER)	
	1550nm Single Mode (LASER)	
Connector:	ST, or SC	for 1310nm Multimode
	ST, FC, or SC	for 1310/1550nm Single Mode

**Launch power, sensitivity and distance are listed for reference only. These numbers may vary. Contact factory for higher loss budgets.*

Front Panel LEDs, DIP Switches and Connectors

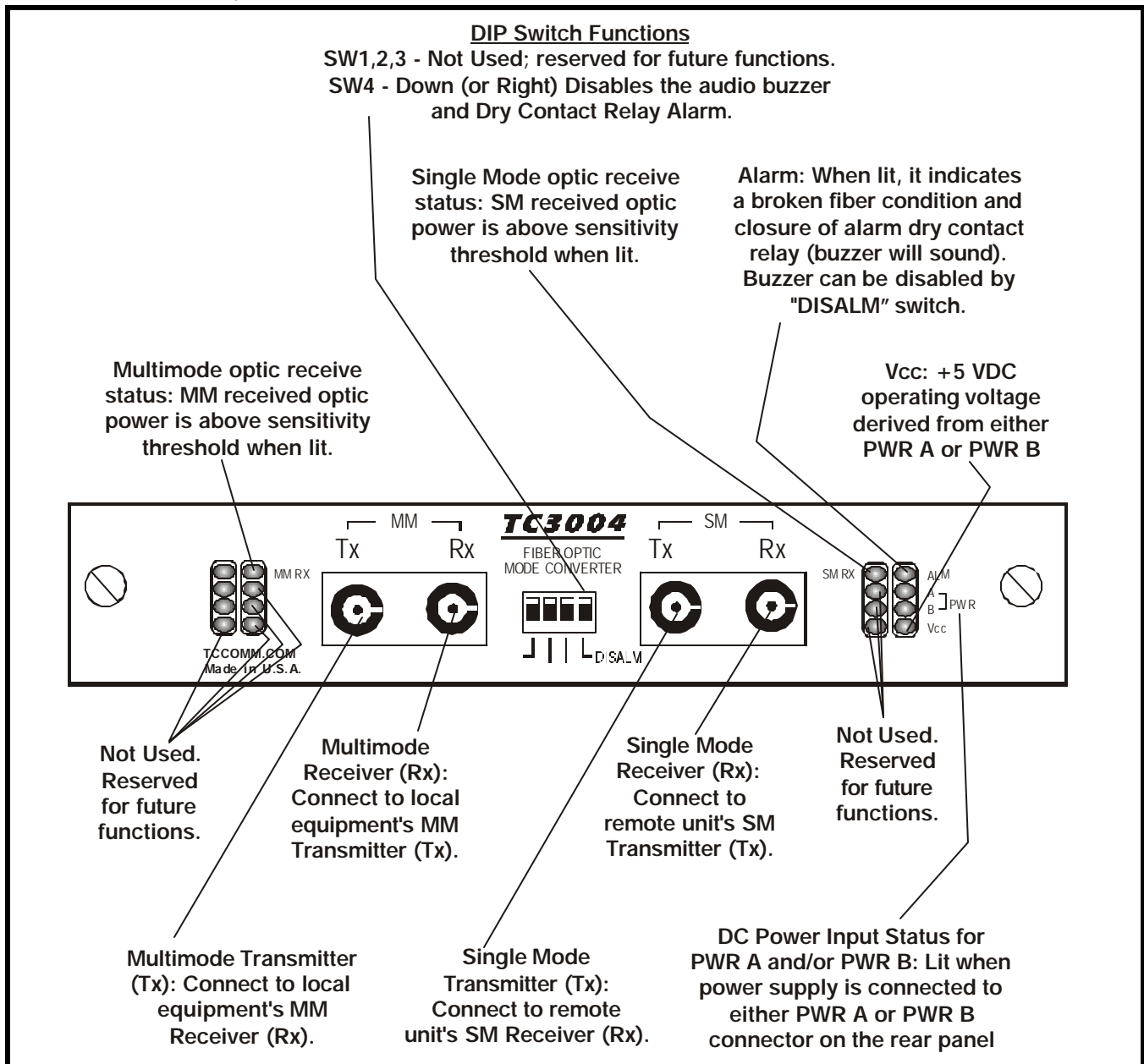


Figure 1. TC3004's Front Panel

Rear Panel Connectors

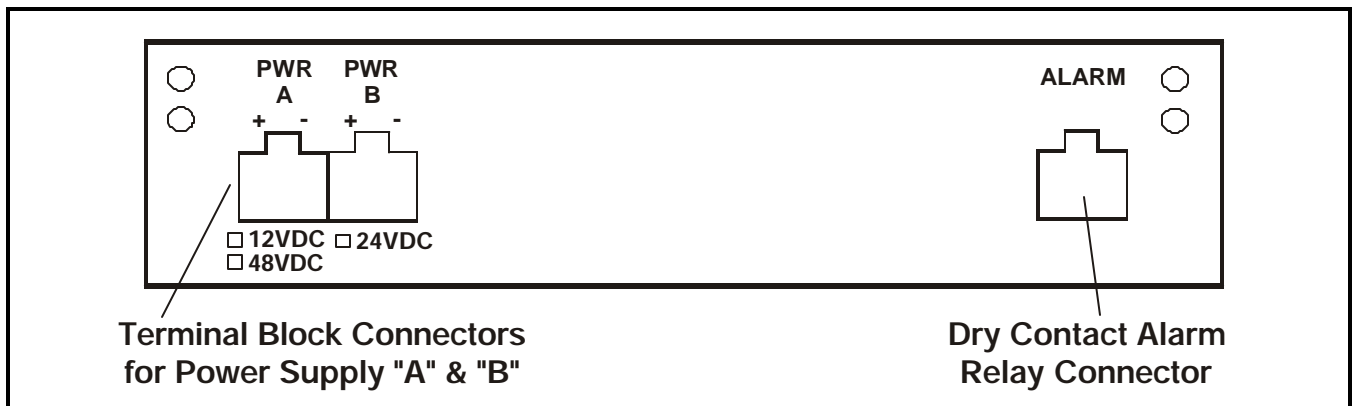


Figure 2. TC3004's Rear Panel

Chapter 2 - Installation

Unpacking the Unit

Before unpacking any equipment, inspect all shipping containers for evidence of external damage caused during transportation. The equipment should also be inspected for damage after it is removed from the container(s). Claims concerning shipping damage should be made directly to the pertinent shipping agencies. Any discrepancies should be reported immediately to the Customer Service Department at TC Communications, Inc.

Equipment Location

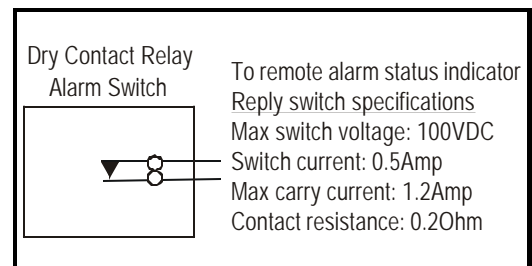
The TC3004 should be located in an area that provides adequate light, work space, and ventilation. Avoid locating it next to any equipment that may produce electrical interference or strong magnetic fields, such as elevator shafts or heavy duty power supplies. As with any electronic equipment, keep the unit from excessive moisture, heat, vibration, and freezing temperatures.

Power Supply

Standard input power to the TC3004 is 12VDC @600mA. There are two pairs of terminal block connectors on the rear panel (labeled "PWR A" and "PWR B"). Only one pair is required to power the unit. Polarity is indicated on each connector block. If both pairs are connected, the built-in power redundancy feature will be utilized. When this feature is utilized, both "A" and "B" share the load. If one power source fails, the other will assume the full load. Polarity is indicated on each connector block. Alternate power sources are available as an option (see Chapter 4 - Specifications).

Dry Contact Relay Alarm

A terminal block connector on the rear panel (labeled "ALARM") provides for the dry contact relay alarm (see Figure 2). Normally in the OPEN position, the loss of either optic signal will trigger an alarm condition and force the switch to the CLOSED position. This relay can be used in conjunction with an external device to monitor the condition of the fiber optic links. Note: If SW4 (DISALM) on the front panel is in the Down position, the audio buzzer will not sound and the dry contact relay will not activate.



Installation Diagrams

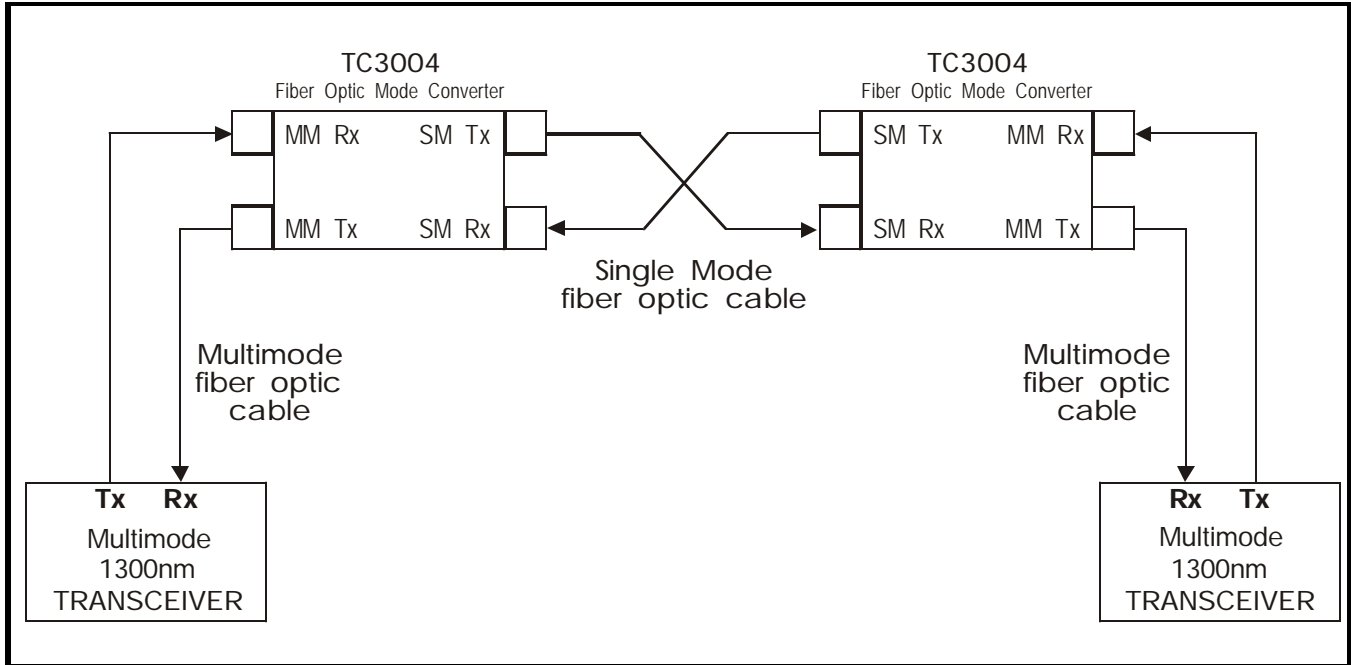


Figure 3. Installation Diagram for Dual TC3004 Application

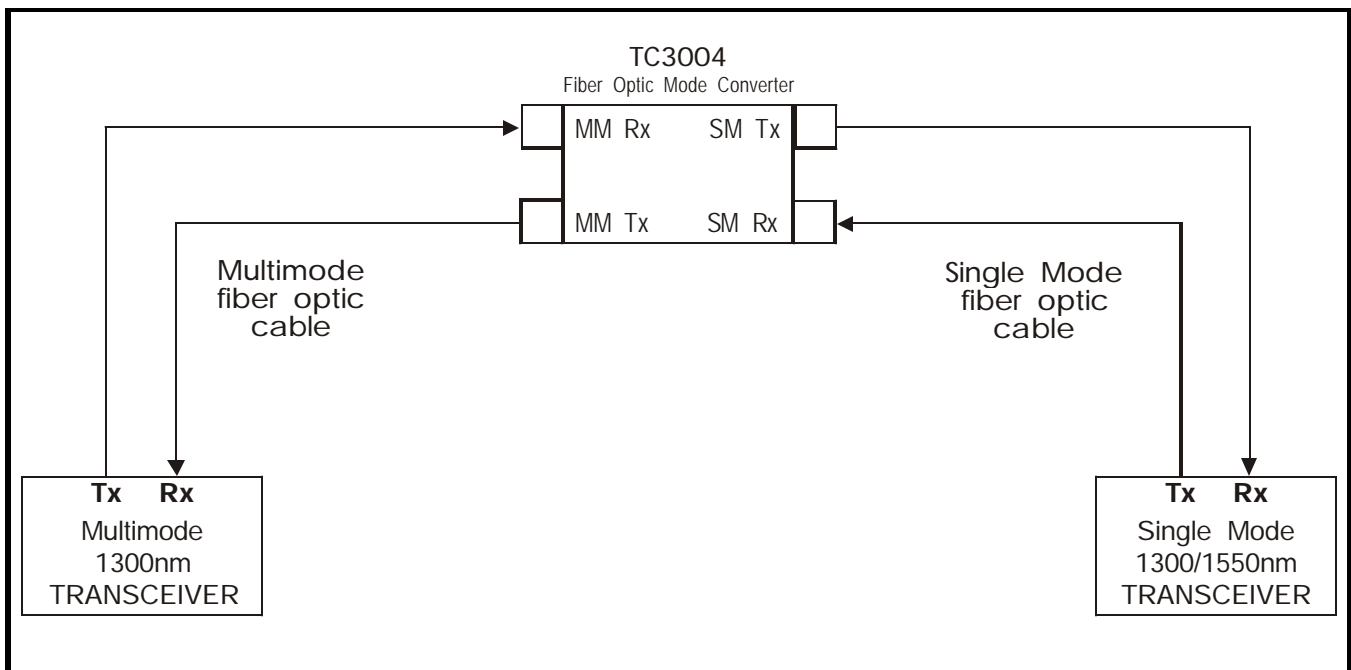


Figure 4. Installation Diagram for Single TC3004 Application

Chapter 3 - Troubleshooting

When the incoming optic power is greater than the saturation level of the receiver, optic "overdrive" can occur, which can cause high error rates or the device's failure to recognize the incoming optic signal. The maximum optic power that can be received without distortion is referred to as the optic receiver's "saturation level."

The TC3004's Multimode optic receivers have a typical saturation level of -10 dBm. The Single Mode optic receivers have a typical saturation level of -5 dBm. Therefore, if the user's equipment has a Multimode launch power greater than -10dBm (i.e. -9dBm or greater) or a Single Mode launch power greater than -5dBm (i.e. -4dBm or greater), and the fiber run is short and has low signal loss, it is likely to overdrive the TC3004's receivers. Usually, overdrive happens more likely on the TC3004's Multimode optical receivers.

If you suspect the Multimode receiver has an optic overdrive condition, a simple test will help verify it. At the receiving optic in question, simply disconnect the optic connector and back it out of the receptacle (about 1/8 of an inch), creating a gap between the fiber connector and the receiver. Verify that the equipment is still in "sync" with the optic signal and also that the overdrive condition has been corrected.

To resolve the overdrive condition permanently, insert a 5dB or 10dB in-line attenuator into the problematic link. In-line attenuators can be purchased from Metrotek* at (727) 547-8307. The part numbers are:

Description:	ST@5dB	ST@10dB	FC@5dB	FC@10dB
Part Number:	68-JJ-7-0513	68-JJ-7-1013	68-FF-0513	68-FF-1013

The following is a typical diagram illustrating a TC3004 Mode Converter with attenuators used to convert a 1300nm Single Mode optical signal into a 1300nm Multimode optic signal.

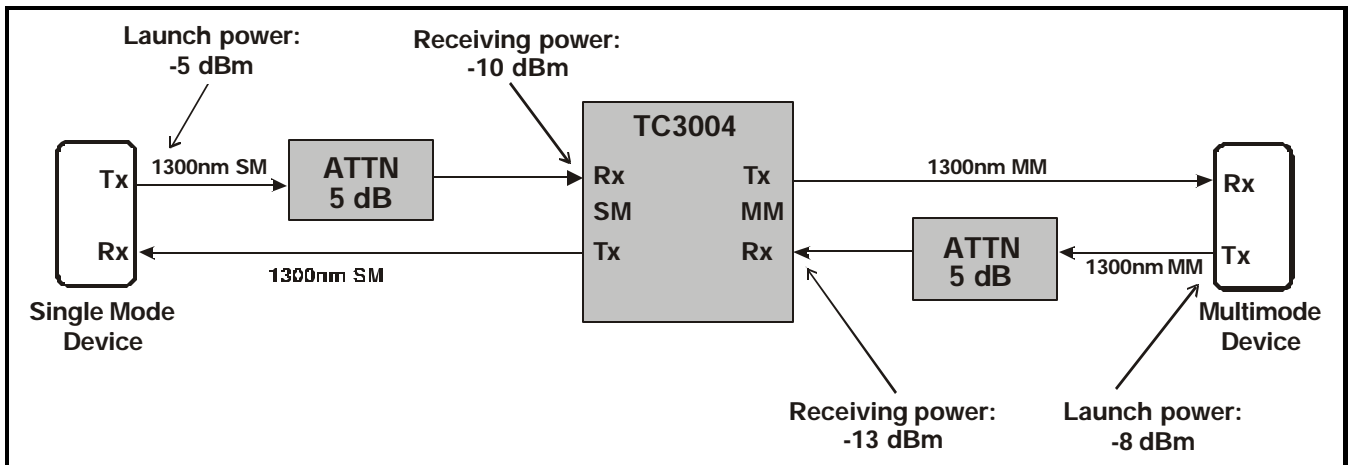


Figure 5. In-line Attenuator Placement Diagram

Chapter 4 - Specifications

Data Rates

..... 50Mbps to 622 Mbps

Optical

See page 3

Indicators

System status ALARM, PWR A/B, Vcc
Optic Signal Status MM Rx, SM Rx

Power Source

Standard 12VDC @600mA (typical)
Optional 24VDC, 48VDC or 115/230 VAC with an external power adapter

Temperature

Operating -10°C to 50°C
..... Hi-Temp Version (Optional) -20°C to 70°C
Storage -40°C to 90°C
Humidity 95% non-condensing

Physical Characteristics

Rack Mountable Card

Height: 7.0" (17.7 cm)
Width: 1.2" (3.1 cm)
Depth: 5.8" (14.8 cm)
Weight: 8.5 oz. (188 gm)

Stand Alone Unit

Height: 1.4" (3.5 cm)
Width: 7.1" (18 cm)
Depth: 6.6" (16.6 cm)
Weight: 1.5 lbs. (512 gm)

Appendix A

Return Policy

To return a product, you must first obtain a Return Material Authorization number from the Customer Service Department. If the product's warranty has expired, you will need to provide a purchase order to authorize the repair. When returning a product for a suspected failure, please provide a description of the problem and any results of diagnostic tests that have been conducted.

Warranty

Damages by lightning or power surges are not covered under this warranty.

All products manufactured by TC Communications, Inc. come with a five year (beginning 1-1-02) warranty. TC Communications, Inc. warrants to the Buyer that all goods sold will perform in accordance with the applicable data sheets, drawings or written specifications. It also warrants that, at the time of sale, the goods will be free from defects in material or workmanship. This warranty shall apply for a period of five years from the date of shipment, unless goods have been subject to misuse, neglect, altered or destroyed serial number labels, accidents (damages caused in whole or in part to accident, lightning, power surge, floods, fires, earthquakes, natural disasters, or Acts of God.), improper installation or maintenance, or alteration or repair by anyone other than Seller or its authorized representative.

Buyer should notify TC Communications, Inc. promptly in writing of any claim based upon warranty, and TC Communications, Inc., at its option, may first inspect such goods at the premises of the Buyer, or may give written authorization to Buyer to return the goods to TC Communications, Inc., transportation charges prepaid, for examination by TC Communications, Inc. Buyer shall bear the risk of loss until all goods authorized to be returned are delivered to TC Communications, Inc. TC Communications, Inc. shall not be liable for any inspection, packing or labor costs in connection with the return of goods.

In the event that TC Communications, Inc. breaches its obligation of warranty, the sole and exclusive remedy of the Buyer is limited to replacement, repair or credit of the purchase price, at TC Communications, Inc.'s option.

To return a product, you must first obtain a Return Material Authorization (RMA) number and RMA form from the Customer Service Department. If the product's warranty has expired, you will need to provide a purchase order to authorize the repair. When returning a product for a suspected failure, please fill out RMA form provided with a description of the problem(s) and any results of diagnostic tests that have been conducted. The shipping expense to TC Communications should be prepaid. The product should be properly packaged and insured. After the product is repaired, TC Communications will ship the product back to the shipper at TC's cost to U.S. domestic destinations. (Foreign customers are responsible for all shipping costs, duties and taxes [both ways]. We will reject any packages with airway bill indicating TC communications is responsible for Duties and Taxes. To avoid Customs Duties and Taxes, please include proper documents indicating the product(s) are returned for repair/retest).