TC8518 T1/E1, Voice/Data & 10/100 **Base-T Ethernet Fiber Optic Multiplexer**

User Manual

MNL-85180-01-22



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| Revision | Date | Description of Changes |
|----------|----------|---|
| 1.0 | 10/22/07 | Initial Release of TC8518. |
| 2.0 | 09/23/10 | Add voice and data option. |
| 2.1 | 02/07/12 | Update local/remote loop back instructions. |
| 2.2 | 01/29/14 | Updated rear expansion images. |
| | | |
| | | |

Record of Revisions

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Guide to Alert Symbols

These alert symbols are used in Caution, Warning, and Danger notes.

| Symbol | Meaning |
|--------|---|
| | Pinching or crushing hazard |
| 4 | Electrical hazard. |
| | Equipment alert: be careful of damage from static electricity |
| | General alert: used for all other hazardous conditions (referring to people, not equipment). |
| | |

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Chapter 1

1.1 Introduction

This manual contains a description of the TC8518 as a T1/E1, Data/Voice & Ethernet Fiber Optic Multiplexer that provides T1/E1, Data/Voice & Ethernet connectivity over fiber optics. It supports 8/12/16 channels of T1 or E1 and 3-port Ethernet switch over single mode (1300/1550nm), or multimode fiber (1300nm). The TC8518 has any one of these options: 8 additional T1, 4 additional E1, 8-channel voice, 4-channel 2-wire/4-wire analog, 8-channel data (RS-232/RS-422/RS-485).

This manual intends to:

- document items necessary to define each product and its method of operation
- provide technical information of the functional capabilities and performance levels necessary for system level networking designs



Figure 1-1 TC8518 (front)

1.2 General Information

This manual is for the operation and maintenance of the TC8518. It is intended for TC Communications factory-trained personnel.

1.3 TC8518 Product Description

This manual contains a description of the TC8518 as a T1/E1, Data/Voice & Ethernet Fiber Optic Multiplexer that provides T1/E1, Data/Voice & Ethernet connectivity over fiber optics. It supports 8/12/16 channels of T1 or E1 and 3-port Ethernet switch over single mode (1300/1550nm), or multimode fiber (1300nm). TC8518 has any one of these options: 8 additional T1, 6 additional E1, 8-channel voice, 4-channel 2-wire/4-wire analog, 8-channel data (RS-232/RS-422/RS-485).

It offers advanced features, such as jitter removal and support for AMI, B8ZS coding for T1 and AMI, HDB3 coding for E1. The TC 8518 offers optimum flexibility, extremely low current consumption, and high reliability.

Transparent to the framing format, the TC8518's T1/E1 interface shapes the transmit pulse to support CCITT G.703. Copper line distances for connecting T1/E1 can range from 0 to 655 feet. The internal elastic buffer removes jitter from the transmitted data.

Each T1/E1 channel LED indicator eases installation and facilitates troubleshooting. These LEDs can indicate an Alarm condition, T1/E1 Signal Loss, active Sync status and more.

The 3-Port Ethernet switch supports half/full-duplex and a combined bandwidth of 100Mbps. The TC8518 supports VLAN* and supports Ethernet Huge Frames (1916 bytes). Each T1 or E1 channel is independent, transparent to the framing format, and supports all applicable standards and line codes(AMI, B8ZS for T1 and HDB3, AMI for E1).

Management, setup, diagnostics, and monitoring are accessed via Web, SNMP, Telnet or Serial Console.

The TC8518 supports fiber optic distances up to 100 km and offers an optional twoway, "one fiber" communication option to maximize fiber cable usage. Standard redundant power and redundant optics including automatic switchover ensure maximum reliability.

Highly cost effective when used to multiplex T1/E1 channels & 10/100 Ethernet over a single duplex fiber, the TC8518 is often used in interconnecting PBXs in different buildings, extending satellite down links, transmiting beyond the normal limitation of twisted pairs (without a repeater), or connecting cell sites to central offices.

The TC8518 is available in basic stand-alone or 1U high rackmount. SC Optical Connectors and RJ-48F ports are standard. Standard power is 90/260VAC and includes redundant power supplies. Optional power sources include 24VDC, 48VDC, and 125VDC.

1.3.1 Features

- Integrates Multiple T1/E1 and Ethernet Over Fiber Optics
- 8, 16, 20, or 24 Channels of T1 or 8, 16, 20 Channels of E1
- 3-Port Auto-Negotiating & Auto-Sensing Ethernet Switch (100Mbps total bandwidth)
- Optional Voice (up to 8 channels FXS/FXO), 2-wire/4-wire analog (up to 4 channels), or Data (up to 8 channels RS-232/RS-422/RS-485)
- Ethernet VLAN* and Rate Limiting Capabilities, plus Statistics Monitoring (T1/E1, Optics, Ethernet)
- Hi-Temp (-20 to +70) and Extreme Temp (-40 to +80) Versions (optional)
- Supports the Following Line Codes. T1: AMI/B8ZS, E1: AMI/HDB3
- T1/E1 Jitter Attenuator
- Loopback support for testing/troubleshooting: Local and Remote Loopback for Ethernet, T1/E1, and Optics
- Management Using Web, SNMP, Console, and Telnet
- Distances ranging up to 2km on Multimode (1310nm) and up to 100km on Single Mode (1310nm/1550nm)
- Two-way "One Fiber" Communication (optional)
- Standard Optical Redundancy and Power Redundancy
- Power Supplies Available: 90-260VAC, 24VDC, -48VDC, or 125VDC
- Local Dry Contact Alarm Relay
- Network Time Server (NTP)
- Rackmount or Standalone
- * Future Release

1.3.1.1 TC8518 Front Panels

The TC8518 front panel consists of:

- Power Source A and B availability
- Alarm Relay (ALM RLY)
- Alarm (ALM)
- ACO Button
- Console Port (CON)
- 3 Ethernet Ports and related status LEDs
- 2 Fiber Ports and related status LEDs
- 16 T1/E1 Ports and related status LEDs



Figure 1-2 TC8518 Front Panel Connectors and Indicators



1.3.1.2 TC8518 System Configuration

TC8518 T1:

Standard:

4CH T1, 8CH T1, 12CH T1 and 16CH T1

Options (Only one of the following can be selected):

- 1. Phone FXS: 4CH FXS or 8CH FXS
- 2. Phone FXO: 4CH FXO or 8CH FXO
- 3. 2 wire/4 wire analog (up to 4 channels)
- 4. Serial: 4CH RS-232 or 8CH RS-232, with RTS CTS
- 5. Serial: 4CH RS-422/485 or 8CH RS-422/485
- 6. Serial: 4CH RS232 w/RTS CTS+4CH RS422/485
- 7. Additional T1: 4CH or 8CH

TC8518 E1:

Standard:

4CH E1, 8CH E1, 12CH E1 and 16CH E1

Options (Only one of the following can be selected):

- 1. Phone FXS: 4CH FXS or 8CH FXS
- 2. Phone FXO: 4CH FXO or 8CH FXO
- 3. 2 wire/4 wire analog (up to 4 channels)
- 4. Serial: 4CH RS-232
- 5. Serial: 4CH RS-422/485
- 6. Additional E1: 4CH



Figure 1-3 TC8518 Expansion Options

1.3.1.3 Hardware

The TC8518 has these standard features:

- Power, Fiber Redundancy
- Full interoperability and compatibility combined with seamless, transparent integration with other Layer 2 Ethernet switches
- Local Dry Contact Alarm Relay (DCAR)
- System readout LEDs

1.3.2 Environment

The TC8518 is an industrially hardened platform ruggedized for extreme weather conditions. The standard temperature option encompasses most environmental conditions, however, the TC8518 is also offered with an extreme temperature option for harsh conditions. Each card is monitored for temperature. There are no cooling fans or filtering devices.

- High Temperature $(-20^{\circ}\text{C to} + 70^{\circ}\text{C})$
- Extreme Temperature (-40° C to $+80^{\circ}$ C) Optional

1.3.3 Power

Each TC8518 is furnished with dual power inputs. There are several power supply input options available, see *TC8518 System Configuration*, on page 1-6.

- LEDs indicate if power is being supplied to the unit
- Dual power input is available

1.3.4 Management

The TC8518 has the following management features:

- Programmable Unit Alarms
- Remote management (Web, Telnet, SNMP)
- Security

1.3.4.1 Simple Network Management Protocol

Simple Network Management Protocol (SNMP) is used in network management systems to monitor network-attached devices for conditions that warrant administrative attention. The TC8518 comes standard with a built-in SNMP Agent.

The MIB file that TC provides is compatible with and may be run on any third party SNMP Management software. See *SNMP Management* for a complete description.

1.3.4.2 Console Terminal Sessions

A command-line interface (CLI) is a method for interacting with the system. It provides information to the user through the use of terminal interface via the console port.

1.3.5 Specifications (TC8518)

| Optical Fiber Interface | | |
|-------------------------|---|--|
| Wavelength | 1310 nm Multi-mode | |
| | 1310/1550 nm Single Mode | |
| Connector | SC Standard | |
| Loss Budget | 15dB Multimode 1310nm @ 62.5/125µm | |
| | Up to 40dB Single Mode 1310/1550nm @9/125µm | |

| Optical Fiber Interface Characteristics | | | |
|---|---------------------------|---------------|-------------|
| Multi-Mode | | | |
| Wavelength (nm) | Connector | Distance (km) | Loss Budget |
| Uni-direction 1310 | SC (Subscriber Connector) | 2 | 15 |
| Single Mode | | | |
| Uni-direction 1310 | SC (Subscriber Connector) | 30 | 20 |
| 1310 | SC (Subscriber Connector) | 50 | 30 |
| 1550 | SC (Subscriber Connector) | 20 | 12 |
| 1550 | SC (Subscriber Connector) | 100 | 40 |
| Single bi-direction (master) 1310/1550 | SC (Subscriber Connector) | 30 | 20 |

| T1 Line Interface | | | |
|-------------------|----------------------------------|---------------|-------------|
| Line Rate | 1.544 Mbps ± 50 bps | Output Signal | DSX1 |
| Line Code | AMI or B8ZS | Framing | Transparent |
| Input Signal | ABAM cable length up to 655 feet | Connector | RJ48C |

| E1 Line Interface | | | |
|-------------------|---------------------|----------------|--|
| Line Rate | 2.048 Mbps ± 50 bps | Connector | RJ48C |
| Line Code | AMI, HDB3 | Line Impedance | 120 Ohm for twisted pair, 75 Ohm coax/ RJ48C |

Ethernet Switch

• 10/100 Mbps half/ full duplex Ethernet Switch over 3 Ports.

• Support VLAN and extended Ethernet frame support.

| Management Port | | |
|-----------------|---|--|
| Connector | RJ45 on front panel (10/100 Ethernet ports 1, 2, & 3) | |
| Protocol | Web, SNMP, Telnet, Console | |

| Console | |
|------------|---------------------------------------|
| Connector | RJ45 on front panel (CON/RS-232 port) |
| Electrical | RS232 Interface |
| Baud Rate | 9600 |

Indicators

- Power A, Power B, Unit Alarm, T1/E1 Channel, Local Test, Remote Test, Remote Console
- Optics: SYNC, RDI, OPT-A, OPT-B, USE-B
- Ethernet: 100M, FUL/COL, LINK/ACT
- Local optical signal receives indication, working and protection.
- Remote optical signal receives indication, working and protection.

| Physical/Electrical | | |
|---------------------|--|--|
| Dimensions | 19 x 1.75 x 11 in / 48.26 x 4.43 x 27.94 cm (W x H x D) | |
| Mounting | Standalone, 19 or 23 inch rack mount | |
| Power Source (AC) | 90 to 260 VAC, 50/ 60 Hz | |
| Power Source (DC) | 24VDC | |
| | 48VDC | |
| | 125VDC | |
| Power Protection | Standard Redundancy | |
| Power Consumption | < 20 W | |
| Temperature Range | -10°C to 50°C (Standard); -20°C to 70°C (High Temp); -40°C to 80°C (Extreme Temp); | |

| Diagnostic Tests | |
|------------------|----------------------------|
| Optical Fiber | Local and Remote Loopbacks |
| T1/E1 Lines | Local and Remote Loopbacks |

Compliance Items

EMI/EMC EN55022 ANSI.403-1999, ANSI T1.408, AT&T TR 62411 ITU G.703, G.704, G.706, G.736, G.775, G.823, I.431, O.151, O.161 ETSI ETS 300 166, JTG.703, JTI.431, TBR12, TBR13, CTR4 CSA 60950 FCC PART 15 CLASS A NEMA TS-2 CALTRANS TEES

1.3.6 Pin Assignments, Configurations and Default Settings

Pin definition and connections are listed below. Console port can be connected via RS232 interface to a PC using HyperTerminal configured for VT100 or any VT100 terminal emulator.

| Pin Assignments | | | |
|-----------------------------------|---------------|------------------------------------|-------------|
| Console RJ-45 Port Pin Assignment | | Ethernet RJ-45 Port Pin Assignment | |
| Pin Number | Signal | Pin Number | Signal |
| 3 | Transmit Data | 1 | TPTX+ |
| 4 | Signal Ground | 2 | TPTX+ |
| 5 | Signal Ground | 3 | TPRX+ |
| 6 | Receive Data | 4 | TPRX+ |
| | | 5 | Chassis GND |
| | | 6 | Chassis GND |

| Alarm Relay Connector | | |
|-----------------------|------------|---------------------|
| Pin Number | Signal | Description |
| 3 | Alarm Fuse | Normal Close (left) |
| 4 | Alarm Fuse | Common (middle) |
| 5 | Alarm Fuse | Normal Open (right) |

| DC Power Connector | | |
|--------------------|--------|-------------|
| Pin Number | Signal | Description |
| 1 (Left) | +V | +DC Return |
| 2 (Right) | -V | -DC 24/28 V |

| T1/E1 RJ48 Line Connector | | |
|---------------------------|---------------|--------------------|
| Pin Number | Signal | Signal Direction |
| 1 | Receive Ring | Input to TC8518 |
| 2 | Receive Tip | Input to TC8518 |
| 4 | Transmit Ring | Output from TC8518 |
| 5 | Transmit Tip | Output from TC8518 |
| 7 | Unassigned | |

| T1/E1 RJ48 Line Connector | | |
|---------------------------|------------|--|
| 8 | Unassigned | |

| Console Port | | |
|---------------|--------|---------|
| Configuration | Option | Default |
| Baud Rate | 9600 | 9600 |
| Data Length | 8-bits | 8-bits |
| Stop Bits | 1-bit | 1-bit |
| Parity | None | None |

| 4 Wire | 2 Wire | RJ-11 Jack |
|------------|------------------|------------------|
| 1 - N/A | 1 - N/A | (Fin Assignment) |
| 2 - Input | 2 - N/A | |
| 3 - Output | 3 - Input/Output | |
| 4 - Output | 4 - Input/Output | |
| 5 - Input | 5 - N/A | |
| 6 - N/A | 6 - N/A | 6 5 4 3 2 1 |







1.3.7 Default Software Configuration

| Network Management (WEB/SNMP/CLI/TELNET) | | |
|--|--------|---------------|
| Configuration | Option | Default |
| IP Address | | 192.168.1.1 |
| Subnet Mask | | 255.255.255.0 |
| Gateway IP | | 0.0.0.0 |
| Username | | admin |
| Password | | admin |
| User | | administrator |

| SNMP | | |
|------------------------------|-----------------|-----------|
| Configuration | Option | Default |
| Read-Only Community Name | | public |
| Read-Write Community Name | | private |
| Trusted Peer | IP, Subnet | Undefined |
| SNMP Traps | Enable, Disable | Disable |

| Optical | | |
|-------------------------|-----------------------|------------|
| Configuration | Option | Default |
| Timing Mode | Non-Looped, Looped | Non-Looped |
| Statistics Refresh Rate | | 60 Seconds |

| T1/E1 | | |
|------------------|-----------------|---------|
| Configuration | Option | Default |
| Channels | Enable, Disable | Disable |
| Line Code | AMI, B8ZS, HDB3 | |
| Line Termination | 100 Ohm | |
| Line Build-Out | 1 to 655 ft | |
| Local Loopback | Enable, Disable | Disable |
| Remote Loopback | Enable, Disable | Disable |

| Ethernet | | |
|---------------|----------------------------|------------------|
| Configuration | Option | Default |
| Ports | Enable, Disable | Enable |
| Speed/Duplex | 10/100Mbps, Full/Half/Auto | Auto-negotiation |
| Flow Control | Enable, Disable | Disable |

1.3.8 Default Unit Alarm Settings

When the TC8518 reports an alarm condition, such as loss of synchronization, the alarm will cause the ALM LED on the front panel to flash RED. Each alarm can be individually enabled or disabled. The alarm types are listed in the table below.

| Alarm Type | | | |
|------------|-------------------|-----------------|---------|
| Alarm | | Option | Default |
| System | Loss of Power | Disable, Enable | Disable |
| | Unit Temp >90C | Disable, Enable | Disable |
| | Alarm Cut Off | Disable, Enable | Disable |
| | Dry Contact Relay | Disable, Enable | Disable |
| | Loopback | Disable, Enable | Enable |
| Optical | LOS | Disable, Enable | Enable |
| | RXBER | Disable, Enable | Disable |
| | RDI | Disable, Enable | Disable |
| | OPT-A LOS | Disable, Enable | Disable |
| | OPT-B LOS | Disable, Enable | Disable |
| T1/E1 | AIS | Disable, Enable | Enable |
| | LOS | Disable, Enable | Enable |
| | BPV | Disable, Enable | Enable |
| | TOCD | Disable, Enable | Disable |
| | TCLE | Disable, Enable | Disable |

1.3.9 Optical Redundancy

Figure 3 below, illustrates the function of optical redundancy. Optical redundancy is used to prevent the loss of data transmission in the event that an optic cable or transceiver is malfunctioning. Should this occur, the secondary optic link & receiver "B" is enabled automatically, thereby preserving the integrity of the communication. In the meantime, the "Alarm" LED will flash and the buzzer will sound to indicate an optic alarm (depending on Optic alarm settings).

With optical redundancy, the optic transmitter "TxA" and "TxB" both transmit the same signal to the remote unit. It is up to the remote unit to decide whether "RxA" or "RxB" should be used as the valid incoming optical signal. By default, "RxA" is the primary receiver; "RxB" is the standby backup.



Figure 1-4 Redundant Optics Logic Diagram

1.3.10 Environmental & EMI Compliance

| | | | TC Communications - JumboSv | vitch Type Test and Levels |
|----------|---|-----------------------------------|--|--|
| | lests | industrial Standards | Power Supply Unit (PSU) | RJ-45 & Signal |
| dity | Low Temperature Use | IEC 61850-3, IEEE 1613, NEMA TS-2 | IEC 60068-2-1: Δα- | -40°C- 16 bour |
| Ĩ | Low Temperature Storage | IEC 61850-3, IEEE 1613, NEMA TS-2 | | |
| ure/} | High Temperature Use | IEC 61850-3, IEEE 1613, NEMA TS-2 | IEC 60068-2-2; Be; | +80°C; 16 hour |
| perat | High Temperature Storage | IEC 61850-3, IEEE 1613, NEMA TS-2 | IEC 60068-2-2; Bd; | +85°C; 16 hour |
| Tem | Damp Heat | IEC 61850-3, IEEE 1613, NEMA TS-2 | IEC 60068-2-30; Db; +5 | 5°C; 95%; 96 hours |
| anical | Vibration | IEC 61850-3, IEEE 1613, NEMA TS-2 | IEC 60068-2-6; Fc; 3 - 150 Hz; 7.5 | mm; 2 g; 10 sweeps per axis |
| Mechi | Shock | IEC 61850-3, IEEE 1613, NEMA TS-2 | IEC 60068-2-27; E | a; 30g; 11ms |
| | Electrostatic Discharge Immunity | IEEE 1613 | IEC 61000-4-2; 8kV c | ontact; 15 kV air |
| Į. | Radiated RF Immunity | IEC 61850-3, IEEE 1613 | IEC 61000-4-3; 80 MHz - 1000 N | Hz; 20 V/m; AM 80% 1 kHz |
| patibi | EFT/Burst Immunity | IEC 61850-3, IEEE 1613 | IEC 61000-4-4; 4 kV CM | IEC 61000-4-4; 4 kV CM |
| Com | Surge Immunity | IEC 61850-3 | IEC 61000-4-5; 4 kV LG; 2 kV LL | IEC 61000-4-5; 4 kV LG; 2 kV LL |
| gnetic | Conducted RF immunity | IEC 61850-3 | IEC 61000-4-6; 150 kHz - 80 MHz; 10 V; AM 80% 1 kHz | IEC 61000-4-6; 150 kHz - 80 MHz; 10 V; AM 80% 1 kHz |
| troMa | Magnetic Field Immunity | IEC 61850-3 | IEC 61000-4-8; 50 Hz; 100 A | /m cont.; 1000 A/m 1 s |
| Elec | Damped Oscillatory Magnetic Field Immunity | IEC 61850-3 | IEC 61000-4-10; 10 | 0 kHz; 30 A/m |
| | Damped Oscillatory Magnetic Field Immunity | IEC 61850-3 | IEC 61000-4-10; 1 | MHz; 30 A/m |
| SI SI | AC Voltage Dips | IEC 61850-3 | IEC 61000-4-11; 30% & 100%, 0.5s | NA |
| iriatio | DC Voltage Dips | IEC 61850-3 | IEC 61000-4-29; 40% & 70%, 0.1s | NA |
| šU) V | Damped Oscillatory Wave | IEC 61850-3 | IEC 61000-4-12; 2.5 kV CM, 1.0 kV DM @1MHz | IEC 61000-4-12; 2.5 kV CM, 1.0 kV DM @ 1MHz |
| Jnit (P | Conducted PF CM Voltage | IEC 61850-3 | IEC 61000-4-16; 50 Hz; 30 V cont.; 300 V 1s | IEC 61000-4-16; 50 Hz; 30 V cont.; 300 V 1s |
| pply (| Conducted Emission | IEC 61850-3 | CE/FCC/CISPR22 class A | CE/FCC/CISPR22 class A |
| ver Su | Conducted emission | IEC 61850-3 | CE/FCC/CISPR22 class A | CE/FCC/CISPR22 class A |
| Po | Radiated emission | IEC 61850-3 | CE/FCC/CISPR2 | 2 class A |
| ctric | Dielectric 50 Hz Test | IEEE 1613 | IEC 60255-5; 2 kV | IEC 60255-5; 0.5 kV |
| Diele | Impulse Voltage Test | IEEE 1613 | IEC60255-5; 5 kV | IEC 60255-5; 5 kV |

1.3.11 Physical Dimensions



Chapter 2

2.1 General Information

The installation section describes how to:

- Unpack the unit
- Ensure an optimum site location
- Install the power supply and dry contact connection

2.2 Unpacking

Before unpacking any equipment:

- Inspect all shipping containers for evidence of external damage caused during transportation.
- Inspect for damage after it is removed from the containers.



Any 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. at (949) 852-1973.

2.3 Environmental Requirements

The TC8518 should be located in an area that provides adequate light, work space, and ventilation. You should choose the correct temperature option that encompasses your environmental conditions. See *Environment*, on page 1-8.

2.3.1 Equipment Location

Clearance allowances should be given to route the cable to prevent damage to the connectors and allow for easy installation and upgrades.

2.3.1.1 Site Selection Criteria

The following is a site criteria guideline to help you select a proper installation site for the TC8518.

• Room for adequate ventilation and cable routing

| Important | 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. |

2.4 Mechanical Installation

The TC8518 can either be stand-alone or rack-mounted.

2.4.1 19-Inch Rack Mounting

All TC8518s can be mounted on standard 19-inch racks.

Table 2-1: 19-Inch Configurations



2.4.2 **Power Supplies**

The TC8518 offers several different power input options (12 VDC, 24 VDC, -48 VDC, 110V/220V). Each configuration allows for two power supplies to share the load. The unit can still operate with one power input (either A or B).

ImportantRead and only connect a supply voltage that corresponds to the
type plate of your device. Make sure that the contact load capacity
of the signal contact is not exceeded.

Table 2-2: Power Supplies



| lf | Then |
|--|--|
| The LED is green on both power A and B. | Proceed. |
| The front LED is OFF. | This indicates a problem with the power source, the power supply or the connector. Please see <i>Power Supplies</i> , on page 2-2. |
| | Off PWR |

Determine if the front panel of PWR A and PWR B LED is green or ON.

2.4.2.1 Dry Contact Alarm Relay (DCAR)

A terminal block on the TC8518 provides for the dry contact relay alarm. This relay may be used in conjunction with an external device to monitor the condition of the TC8518. The rack mounted DCAR is located at the bottom of the TC8518.

Normally in the OPEN position, any alarm condition will trigger the switch to the CLOSED position.



Normal Close COM Normal Open

Figure 2-1 TC8518 Dry Contact Alarm Relay

| DCAR Specifications | |
|-------------------------|----------------|
| Max Load Voltage | 125 VAC, 60VDC |
| Continuous Load Current | 1A |
| Peak Load Current | 2A |
| Power Rating | AC: 62.5VA |
| | DC: 30W |

NOTE

Use only uni-directional transmissions.

NOTICE

A dry contact is a set of two switch contacts, like a set of contacts from a relay or from a toggle switch, etc., that has both terminals available and neither contact is connected to power. (Dry = no power) The contacts may be NO, normally open (also called form A), or NC, normally closed (also called form B). Form C would be a SPDT (single pole double throw) with 3 connections. You can connect the contact to any type of monitoring device you want, regardless of whether the device is already connected to power or any other circuit.

2.5 Unit Power

2.5.1 Powering on the TC8518

After powering up the TC8518, there will be a thirty second internal circuit testing. See *SNMP Query*, on page 5-1.

2.6 Cabling

There are three types of interface connectors used for the TC8518.

- The RJ-45(10/100 Base-T) Ports at the front of the TC8518 are accessed by using RJ-45 Ethernet connections. Be careful when inserting this type of connector as it is the weak point in any Ethernet cable.
- The Console (CON) Port at the bottom of the chassis is accessed through RS-232 Serial interface. Users will need a straight-through DB9 cable to connect the PC to the console port.
- T1/E1 ports on the TC8518 are accessed using T1 RJ-48 straight-through (ex.Channel Bank) or cross-over (ex. Cisco Router).

• The phone ports (RJ-11) on the expansion card are accessed using 2-wire phone cable.

Table 2-3: Cable Configurations

| RJ-45 Ethernet Connection | |
|---|--|
| RJ-45 to DB-9 (Included in the Package) | |
| RJ48-to-BNC Adapter (For E1 Only) Optional | |

2.7 Quick-Start Guide

This section describes the basic TC8518 configuration and setup.

Power On:

When power is initially connected to the TC8518, the Power, Alarm, Optic LEDs will light solid or flash for a few minutes, T1/E1 channel LEDs will light in a rotating pattern, and the alarm buzzer will sound. Once the unit finishes booting up, the buzzer will stop and the T1/E1 LEDs will stop rotating.

2.7.1 Installation Procedure Summary

The TC8518 is designed for quick and easy installation.

1. Prepare a PC to have the following settings: set the IP address to be in the 192.168.1.x range, for example, 192.168.1.50. The subnet mask should be 255.255.255.0. Using a CAT-5 cable, connect the PC to a TC8518 Ethernet port; with a web browser, enter http://192.168.1.1/; login with username "*admin*" and password "*admin*".

2. Set the Basic Settings to label and describe the TC8518. Please refer to Figure 3-5, *Web Application - Basic Settings*.

3. Set up the new IP address for the TC8518. This page can be accessed from the "IP Settings" link. Please refer to Web Application - IP Settings in Chapter 3, on page 3-9.

Note: After the IP has been applied, you will need to enter this new IP address in your web browser.

4. Setup the T1/E1 channels. This can be accessed from the "T1/E1 Options: Settings". Enable the channels to be used and edit each channel to the application's settings. If multiple channels share the same configuration, it is possible to use the "Copy Channel Settings". See Web Application - T1/E1 Options: Settings in Chapter 3, on page 3-24.

5. Repeat the steps for the second TC8518 unit. Using the PC, ping both TC8518s to verify a connection.

6. Connect fiber optic cables between the local & remote units. The local unit's TxA connects to the remote unit's RxA, and the local unit's RxA connects to the remote unit's TxA. The local TxB connects to the remote RxB, and the local unit's RxB connects to the remote unit's TxB. Observe that the "SYNC", "OPT-A", and "OPTB" LEDs lights solid when a good optic connection is present. With a PC connected to only one TC8518, ping both units to verify a connection.

7. Conduct a Local Optical Loopback, and Remote Optical Loopback Test on each unit (refer to Pages 7-76 through 7-81)

8. For Ethernet (10/100Base-T) signals, connect the Category 5 cable to one of the RJ-45 switch ports on the front panel of the TC8518. Observe that the 100M, FULL/COL, and LINK/ACT LEDs are on solid. If the Ethernet signal is 10Base-T and half duplex, the 100M and FULL LEDs should be off. If the Ethernet signal is 100Mbps and full duplex, the 100M and FULL LEDs should be lit.

Category 5 Cable Notes:

The TC8518 Ethernet ports are auto-sensing and auto-negotiating. This allows the use of either a straight through CAT5 cable or a cross-over CAT5 cable. This also means the TC8518 can detect the speed of the Ethernet connection without having to configure it.

3.1 Introduction

TC Communications' web management application is integrated on your TC8518. This user friendly interface may be accessed through the Ethernet ports on the TC8518. The web management may also be accessed remotely over the network if the TC8518 has been integrated to your network.

3.2 Setup

Connecting to the web interface, is as simple as typing the IP address assigned to the TC8518 into your web browser address field. Setup, diagnostics, and management are accessed via Web, SNMP, Serial Console, and Telnet. To connect your PC to the TC8518 and access these pages, see below.

To connect a PC

- 1. Using a CAT-5e or a CAT-6 cable, connect the PC to a TC8518 Ethernet port.
- 2. Power up the PC and access your Internet Browser.
- 3. Access the PC web browser and enter: *https://192.168.1.1/*.

NOTE The default IP address for TC8518 is 192.168.1.1. If there are multiple TC8518s in the network, make sure you change the IP address in order to prevent an IP conflict.

4. Login with default username "*admin*" and password "*admin*" or use the password and username assigned to you by the administrator. *The Home page appears*.

3.3 Home Page

The Home Page displays an overall view of the TC8518. Please refer to Figure 3-2, *Web Application - Home: Physical Status.*

Unit Uptime: Displays the time duration the TC8518 has been powered on. It separates the time into days, hours, minutes, and seconds.

T1/E1 Error Status: Displays if there is an alarm signal from T1/E1 channels. A green icon indicates there is no alarm present, and a red icon indicates an error is present. "---" indicates the channel is disabled.

Optical Error Status: Displays if there is an alarm signal from the optical ports. A green icon indicates there is no alarm present, and a red icon indicates an error is present. An Optical A LOS and Optical B LOS represent respective optical ports. Optical Error monitors all possible optical faults. Please refer to Figure 3-4, *Web Application - Home: Unit Alarm - Criteria*.

Port/Channel Error Status: Displays the configurations of the Ethernet ports and T1/E1 channels. Ethernet port statuses display the settings, connection speed, and duplex. T1/E1 channel statuses display the settings. Please refer to Section 4.8.Pages 4-51 and 4-53.

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|--|----------------------------------|-------------------|-----------|----------|-----------------------------|----------------------------|----------------------------------|------------------|
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| ТОР | TC8518 16 | Ch T1 ar | nd 10/100 | Ethernet | Fiber Opt | ic Multiplexe | r | |
| | Ur | nit Uptime: | | Days: 0 | Hours: 00 | Minutes: 07 | Seconds: | 22 |
| Physical Status | T1/F1 France | Status | | | | | | |
| Unit Alarm | Ch 1 | ch 2 | Ch 3 | Ch 4 | Ch 5 | Ch 6 | Ch 7 | Ch 8 |
| asic Settings | | G | | | | | | |
| Settings | | | | | | | | |
| dvanced | Ch 9 | Ch 10 | Ch 11 | Ch 12 | Ch 13 | Ch 14 | Ch 15 | Ch 16 |
| MP Settings | | | | | | | | |
| gin Settings | Ch 17 | Ch 18 | Ch 19 | Ch 20 | Ch 21 | ch 22 | ch 23 | Ch 24 |
| /E1 Options | GITAZ | CHIYO | Cirxy | Cil 20 | CH ZX | CITZZ | 01 25 | CH 24 |
| Status | | | | | | | | |
| Settings | Optical Error | Status | | | | | | |
| Statistics | 1 | Opti | cal A LOS | Opti | cal B LOS | Optical | Error | |
| status | | | 9 | | 9 | 9 | | |
| Status | Port/Channel | Status | | | | | | |
| Settings | Port/C | hannel | State | Speed | Duplex | Curr | rent Status | |
| Settings Statistics | Ethernet # | 1 | Enabled | Auto | Auto | Not | Connected | |
| Settings Statistics nernet Options | Ethernet #2 | | Enabled | Auto | Auto | 10 | 0 Mbps/Full | |
| Settings Statistics hernet Options Port Settings | Ethernet # | | Enabled | Auto | Auto | Not | Connected | |
| Settings Statistics hernet Options Port Settings Rate Limit | Ethernet # Ethernet # | 3 | | N/A | N/A | B8Z5 / 10 | 0 Ohm / 0 - 1 | 33 ft. |
| Settings Statistics hernet Options Port Settings Rate Limit Port Statistics | Ethernet # Ethernet # Ch 1 | 3 | Enabled | | N/A | B8ZS / 10 | 0 Ohm / 0 - 1 | 33 ft. |
| Settings Statistics Ethernet Options Port Settings Rate Limit | Ethernet # Ethernet # | 3 | | N/A | N/A | B8Z5 / 10 | 0 Ohm / 0 - 13 0 Ohm / 0 - 13 | 33 ft. 33 ft. |

Figure 3-1 Web Application - Home Page
3.3.1 Home: Physical Status

The Physical Status page displays the internal temperature of the TC8518 and the power supply statuses. Please refer to Figure 3-2, *Web Application - Home: Physical Status*.

Unit Temperature: The internal temperature of the TC8518 is regularly measured and displayed to provide the Network Administrator with the most current temperature status. The temperature is displayed in both Celsius and Fahrenheit scales.

Unit Power Status: Displays the most current statuses of the redundant power supplies, Power A and Power B. Plug-in Status displays one of three statuses: Installed and Supplying Power, Installed and Not Supplying Power, or Not Installed. The power type is also displayed, AC or DC.

Installed; Supplying Power: The power module is installed in the unit and it is supplying power.

Installed; Not Supplying Power: The power module is installed in the unit, but it is not supplying power.

Not Installed: The power module is not present or detected in the unit.

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| TC COMM THE LEADER IN FIB | UNICATIONS ER OPTIC CONNECTIVITY TCS | 8518 16-Ch T1 and 10 Fiber Optic Mul | D/100 Ethernet tiplexer |
| воттом | TC8518 Physical Status | | |
| Home | Unit Temperature: | 40 Celcius (| ~ 104 F) |
| Physical Status Unit Alarm | Unit Power Status | | |
| Basic Settings | Power | Plugin Status | Туре |
| IP Settings | Module A | <- Installed; Supplying Power | AC |
| Advanced | Module B | <- Installed; Supplying Power | AC |
| SNMP Settings | Lege | end | |
| Login Settings | [G | reen Text] : Unit temperature <= 90 C | |
| T1/E1 Ontions | [Ye | ellow Text] : Unit temperature > 90 C | |
| Status | | | |
| Settings | | | |
| Statistics | | Refresh | |
| Optical Options | | | |
| Settings | | | |
| Statistics | | | |
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3.3.2 Home: Unit Alarm

The Unit Alarm page displays the alarm status of the entire TC8518 unit. Alarm trigger criteria can be set on this page. Users must click on "Apply" for changes to take effect.

Unit Alarm Status: Displays the TC8518 alarm condition.

Unit Alarm Settings:

Alarm Buzzer Enabled: Enables the TC8518 to have an audible alarm to sound when a fault is detected.

Dry Contact Enabled: Allows an external device to signal the alarm condition.

Alarm Trigger Criteria: Click the 'Modify' button to configure the alarm triggers. Please refer to Figure 3-4, *Web Application - Home: Unit Alarm - Criteria*.

Clear Alarm: Clears all alarm signals on the TC8518. If an existing alarm is still present and the page is refreshed, the alarm condition will reappear.

Alarm Cut-Off (ACO): Clears all alarm signals on the TC8518. If an existing alarm is still present and the page is refreshed, the alarm condition will still be off. Only a new alarm that is triggered will change the Unit Alarm Status to on.

| NOTE | There is also a hardware ACO button located on the front of the TC8518. It serves 2 functions: |
|------|--|
| | 1) If you press and release the ACO button, it will clear all alarms until a new fault trigger is detected. Meaning, if an alarm condition still exists, the alarm indicators will not reflect as such. |
| | 2) If you press and hold the ACO button for 5 seconds, it will clear all alarm conditions. However, if an alarm condition still exists, then the alarm indicator will immediately reflect it. |

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| TC COMM THE LEADER IN FIB | UNICATIONS ER OPTIC CONNECTIVITY TC8518 16-Ch T1 and 10/100 Etherr Fiber Optic Multiplexer | 1et |
| воттом | TC8518 Unit Alarm | |
| Home | Unit Alarm Status: | |
| Physical Status Unit Alarm | Legend | |
| Basic Settings | : Unit Alarm is ON or Unit is in Testing Mode : Unit Alarm is OFF | |
| IP Settings | On : Unit Alarm is ON Off : Unit Alarm is OFF Flashing : Unit is in Testing Mode | |
| Advanced | <u></u> | _ |
| SNMP Settings | Unit Alarm Settings | |
| Login Settings | Alarm Buzzer Enabled | |
| T1/E1 Options | | |
| Status Settings | Alarm Trigger Criteria: Modify | |
| Statistics | Clear Alarm: | |
| Optical Options | Alarm Cut-Off (ACO): | |
| Status Settings | | |
| Statistics | | |
| Ethernet Options | (Apply) Refresh | |
| Port Settings Rate Limit | | |
| Port Statistics | | |
| Ethernet over Fiber | | |
| Logout | | |
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Figure 3-3 Web Application - Home: Unit Alarm

3.3.3 Home: Unit Alarm: Alarm Trigger Criteria

The Unit Alarm: Alarm Trigger Criteria page categorizes all possible alarm triggers for T1/E1, Optical, Loopback, and Physical Status alarms. The desired alarm triggers can be configured on this page. This page is accessible from the Unit Alarm page. At the Alarm Trigger Criteria section, click on "Modify" to reach this page. Please refer to Figure 3-3, *Web Application - Home: Unit Alarm* for default settings.

| T1/E1 Triggers | |
|----------------|---|
| AIS | Alarm Indication Signal |
| LOS | Loss Of T1/E1 Signal |
| BPV | Bipolar Violation |
| TOCD | Transmit Open-Circuit Detect. TOCD indicates that the LIU has detected an open circuit on the T1/E1 channel's transmit pair. This could be due to bad connections at either end of the cable or a cable break. It could also be due to a faulty receiver at the far end. |

| T1/E1 Triggers | |
|----------------|---|
| TCLE | Transmit Current-Limit Exceeded. TCLE indicates that there is a short on the T1/E1 channel's transmit pair. Common sources of this problem is damaged cables or a faulty receiver at the far end. |

| Optical Triggers | |
|------------------|---|
| LOS | Loss of Signal (Optical) |
| RXBER | Receive Bit Error Rate Threshold Exceeded |
| RDI | Remote Defect Indication |
| Optical A LOS | Optical A Port LOS |
| Optical B LOS | Optical B Port LOS |

Loopback Triggers:

All Remote and Local (Ethernet, Optical, and T1/E1)

Physical Status Triggers:

Loss of Power (Power A or Power B)

Unit Temperature > 90 C

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| TC COMM THE LEADER IN FIB | IUNICATIONS ER OPTIC CONNECTIVITY TC8518 16-Ch T1 and 10/100 Ethe Fiber Optic Multiplexer | rnet |
| воттом | Unit Alarm Criteria | |
| Home Physical Status | Select from the following to indicate what options will trigger the unit alarm T1/E1 Triggers: | |
| Unit Alarm | AIS LOS BPV TOCD TCLE | |
| Basic Settings | Optical Triggers: | |
| IP Settings | VLOS RXBER RDI VOptical A LOS VOptical B LOS | |
| Auvanced | Loopback Triggers: | |
| SNMP Settings | All Remote and Local (Ethernet, Optical, and T1/E1) | |
| Login Settings | Physical Status Triggers | |
| T1/E1 Options Status | Loss of Power (Power A or Power B) | |
| Settings | Unit Temperature > 90 C | |
| Statistics | | |
| Optical Options | | • |
| Status Settings | OK Apply Close | |
| Statistics | | |
| Ethernet Options | | |
| Port Settings | | |
| Rate Limit | | |
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Figure 3-4 Web Application - Home: Unit Alarm - Criteria

3.4 Basic Settings

The Basic Settings page allows the Network Administrator to label and describe the TC8518 in order to distinguish it fromother TC8518 units.

Name, Location, Contact, Description #1-#3

All of these fields can be entered with descriptions useful to the Network Administrator. It is recommended that the Contact information should refer to the Network Administrator.

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| | Basic Settings | | | |
| Home Physical Status Unit Alarm | • | Name | | |
| Basic Settings | | Contact | technicalsunnat@tocomm.com | |
| IP Settings | | Description #1 | termensupportageeennit.com | |
| Advanced | | Description #2 | | |
| SNMP Settings | | Description #2 | | |
| Login Settings | | Description #5 | | |
| T1/E1 Options Status Settings Statistics | | | Apply | • |
| Optical Options | | | | |
| Status Settings | | | | |
| Statistics | | | | |
| Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber | | | | |
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Figure 3-5 Web Application - Basic Settings

3.5 IP Settings

The IP Settings page displays the current IP and Network Settings and allows for IP configurations.

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| TC COMM THE LEADER IN FIB | ER OPTIC CONNECTIVITY TC8518 | 16-Ch T1 and 10/100 Ethernet Fiber Optic Multiplexer | |
| | IP Settings | | |
| Home Physical Status Unit Alarm Basic Settings IP Settings Advanced | Current Settings Current IP Address: Current Subnet Mask: Current Default Gateway: Physical Address: | 192.168.1.1 255.255.255.0 0.0.0.0 1c:bc:61:ad:de:13 | |
| SNMP Settings Login Settings T1/E1 Options Status Sattings | IP Settings IP Address: Subnet Mask: Default Gateway: | 152 168 1 1 255 255 255 0 0 0 0 0 | |
| Statistics Optical Options Status Settings | DNS Server Primary DNS Server: Secondary DNS Server: | | _ |
| Statistics Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber Logout | IP Address Aliases | New IP Address | |
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Figure 3-6 Web Application - IP Settings

3.5.1 IP Address Aliases

IP Address Aliases feature allows the TC8518 to respond to different IP addresses. It is recommended that the alias IP address to not be in the same subnet as the Current IP Address. The TC8518 has a maximum of 16 IP Address Aliases.

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| TC COMM THE LEADER IN FIB | UNICATIONS ER OPTIC CONNECTIVITY TC8518 16-Ch T1 and 10/100 Ethernet Fiber Optic Multiplexer | < |
| воттом | Additional IP Address Settings | |
| Home Physical Status Unit Alarm | IP Address: 0 0 0 Subnet Mask: 0 0 0 | |
| Basic Settings | | |
| IP Settings | | |
| Advanced | OK Cancel | |
| SNMP Settings | | |
| Login Settings | | |
| T1/E1 Options Status Settings Statistics | | |
| Optical Options Status Settings Statistics | | |
| Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber | | |
| Logoat | | |
| Done | 🐻 🚱 Internet | € 100% - |

Figure 3-7 Web Application - IP Address Alias

3.6 Advanced

The Advanced page gives the Network Administrator access to administrative functions.

About TC8518: Please refer to Figure 3-9, *Web Application - Advanced - About TC8518*.

Configuration File: Please refer to Figure 3-10, *Web Application - Advanced - Configuration File*, Figure 3-11, *Web Application - Advanced - Load Configuration File* and Figure 3-12, *Web Application - Advanced - Save Configuration File*.

Date and Time: Please refer to Figure 3-13, *Web Application - Advanced - Date and Time*.

Reboot: Please refer to Figure 3-14, Web Application - Advanced - Reboot.

Restore Defaults: Please refer to Figure 3-15, *Web Application - Advanced - Restore Defaults*.

TC8518 Firmware Upgrade: Please refer to Figure 3-16, *Web Application - Advanced - Firmware Upgrade* and Figure 3-17, *Web Application - Advanced - Upgrade from a Network PC*.

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| Home Physical Status Unit Alarm Basic Settings IP Settings Advanced SNMP Settings Login Settings | About TC8518 | Configuration File | Date and Time | Reboot | Restore Defaults | TCS518 Firmware Upgrade |
| T1/E1 Options Status Settings Statistics | | | | | | |
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Figure 3-8 Web Application - Advanced Page

3.6.1 Advanced: About TC8518

The About TC8518 page displays technical information regarding the TC8518 hardware and software. Contact information for TC Communications is also displayed.



Figure 3-9 Web Application - Advanced - About TC8518

3.6.2 Advanced: Configuration File

The Configuration File page allows the Network Administrator to save current TC8518 settings or load previously saved TC8518 settings.

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| Image: Configuration File Image: Configuration File <th>* *</th> | * * |
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| SNMP Settings Login Settings T1/E1 Options Status Settings Statistics | |
| Optical Options Status Settings Statistics Ethernet Options Port Settings Rate Limit | |
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Figure 3-10 Web Application - Advanced - Configuration File

Load Configuration File: This page allows the user to choose the location of where the configuration file is. Please refer to Figure 3-11, *Web Application - Advanced - Load Configuration File*.

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| TC COMM THE LEADER IN FIE | MUNICATIONS TC8518 16-Ch T1 and 10/100 Ethernet BER OPTIC CONNECTIVITY TC8518 Fiber Optic Multiplexer | <) |
| воттом | Load Configuration File | |
| Home | Browse to locate the file, then press OK to begin the configuration file loading process. | |
| Unit Alarm | Configuration File: | |
| Basic Settings | | - |
| IP Settings | | |
| Advanced | OK) Cancel | |
| SNMP Settings | | = |
| Login Settings | | |
| T1/E1 Options Status Settings Statistics | | |
| Optical Options | | |
| Status Settings | | |
| Statistics | | |
| Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Eiber | | |
| Logout | | ~ |
| Done | । |)% • ,;; |

Figure 3-11 Web Application - Advanced - Load Configuration File

Save Configuration File: The Save Configuration File feature allows the current TC8518 settings to be saved into a file. The file will be a *.conf file. Please refer to Figure 3-12, *Web Application - Advanced - Save Configuration File*.

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| воттом | Configuration File | |
| Home Physical Status Unit Alarm Basic Settings IP Settings Advanced | Lead Configuration File Save Configuration File Close | - |
| SNMP Settings | | |
| Login Settings | | |
| T1/E1 Options Status Settings Statistics Optical Options Status Settings Statistics | File Download Do you want to open or save this file? Image: TC8518.conf Type: IML Document From: 192.168.1.2 Open Save Cancel | |
| Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber Logout | While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. <u>What's the risk?</u> | |
| Start downloading from site: http://192 | 2. 168. 1. 2/rg_conf.cgi | % • ,;; |

Figure 3-12 Web Application - Advanced - Save Configuration File

The Date and Time page displays all time related fields and configurations.

Localization: Displays the current date and time. The current Time Zone is displayed and can be selected from the drop table. To manually configure the time, click on "Clock Set" at the bottom of the page.

Daylight Saving Time: Enable/Disable. Configurable if the Automatic Time Update is disabled

Automatic Time Update: Enable/Disable. Time Of Day (TOD) allows user to manually set the time. Network Time Protocol (NTP) enables the clock to synchronize with a time server. Users can define which time server to use as the default Time Server.

Status: Displays the connection status with the chosen Time Server.

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| воттом | Date and Time | | | |
| Home Physical Status Unit Alarm Basic Sottings | Localization Local Time: Time Zone: | Jan 2, 2003 02:40:05 GMT (GMT+00:00) | × | |
| IP Settings Advanced SNMP Settings | Daylight Saving DEnabled Start Time: | g Time | | |
| Login Settings | End Time: | Oct 💙 28 🌱 01 : 00 | | |
| T1/E1 Options | Unset: | 60 Minutes | | = |
| Status Settings | Automatic Tim | e Update | | |
| Statistics | Enabled | | | |
| Optical Options Status | Protocol: | Time Of Day (TOD) Network Time Protocol (NTP) | | |
| Settings Statistics | Update Every: | 24 Hours | Sync Now | |
| Ethernet Options | | Time Server | Action | |
| Rate Limit | clock.isc.org | | 2.34 | |
| Port Statistics | New Entry | | 4 | |
| Ethernet over Fiber Logout | Status: | Waiting for response from server | | |
| | | Press the Refresh button to update the second sec | he status. | - |
| | | OK Apply Cancel Clock Set | Refresh | ~ |
| Done | | | 😡 🚱 Internet | ₩ 100% - |

Figure 3-13 Web Application - Advanced - Date and Time

3.6.3 Advanced: Reboot

The Reboot page allows the user to reboot the unit.

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| TC COMM THE LEADER IN FIE | AUNICATIONS BER OPTIC CONNECTIVITY TC8518 16-Ch T1 and 10/100 Ethernet Fiber Optic Multiplexer | |
| воттом | Reboot | |
| Home Physical Status Unit Alarm | Are you sure you want to reboot TC8518 ? | |
| Basic Settings | OK) Cancel | |
| IP Settings | | |
| Advanced | | |
| SNMP Settings | | = |
| Login Settings | | |
| T1/E1 Options Status Settings Statistics | | |
| Optical Options Status Settings Statistics | | |
| Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber | | |
| Logout | G Contract 8 | ¥ 100% • |

Figure 3-14 Web Application - Advanced - Reboot

3.6.4 Advanced: Restore Defaults

The Restore Default page allows the user to reset all settings to his or her original default settings.

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| воттом | Restore Defaults | |
| Home Physical Status Unit Alarm Basic Settings IP Settings | Attention The following items will be set to default: • User Defined Settings • Network Connections (All connected DHCP clients will need to request new IP addresses) Also, TCSS18 will have to reboot. | |
| Advanced SNMP Settings | Are you sure you want to restore TC8518 manufacturer defaults? | |
| Login Settings T1/E1 Options Status Settings Statistics | OK) Cancel | |
| Optical Options Status Settings Statistics | | |
| Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber | | |
| Logout | | ~ |
| Done | 😡 🚇 Internet | € 100% |



3.6.5 Advanced: Firmware Upgrade

The Firmware Upgrade page allows the user to upgrade the firmware of the TC8518.

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| TC COMM THE LEADER IN FIB | IUNICATIONS TC8518 16-Ch T1 and 10/100 Ethernet Fiber Optic Multiplexer | ~ |
| воттом | TC8518 Firmware Upgrade | |
| Home Physical Status | Current Version: 1.0.0 | |
| Unit Alarm | Upgrade From a Computer in the Network | |
| Basic Settings | Select an updated TC8518 firmware file from a computer's hard drive or CD on the network | |
| IP Settings | Upgrade Now | |
| Advanced | | |
| SNMP Settings | | _ |
| Login Settings | Cancel | = |
| T1/E1 Options | | |
| Status | | |
| Settings Statistics | | |
| Ontical Ontions | | |
| Status | | |
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| Ethernet Options | | |
| Rate Limit | | |
| Port Statistics | | |
| Ethernet over Fiber | | _ |
| Logout | | ~ |
| Done | 🗔 🚱 Internet | € 100% |

Figure 3-16 Web Application - Advanced - Firmware Upgrade

3.6.6 Advanced: Upgrade From a Computer on the Network

The Upgrade page allows the user to choose the file to use as the upgrade.

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| TC COMM THE LEADER IN FIE | IUNICATIONS ER OPTIC CONNECTIVITY TC8518 16-Ch T1 and 10/100 Ethernet Fiber Optic Multiplexer | < |
| воттом | Upgrade From a Computer in the Network | |
| Home Physical Status | Browse to locate the file, then press OK to begin the firmware upgrade process. | . |
| Basic Settings IP Settings | Attention Uploading the firmware upgrade file may take a few minutes. Interrupting the upload process may result in an inoperable device. Please wait until a completion message appea before rebooting. | rs |
| Advanced | | |
| SNMP Settings | Firmware Upgrade File: Browse | - |
| Login Settings | | |
| T1/E1 Options Status Settings Statistics | OK) Cancel | |
| Optical Options Status Settings Statistics | | |
| Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber | | |
| Logout | | ~ |
| Done | 👩 🚱 Internet 🔍 | 100%: |

Figure 3-17 Web Application - Advanced - Upgrade from a Network PC

3.7 Simple Network Management Protocol (SNMP) Settings

The SNMP page allows the user to enable/disable SNMP management and configure settings. Please refer to Figure 3-18, *Web Application - Simple Network Management Protocol (SNMP) Page*.

Read-Only Community Name: Displays the current Read-Only Community Name. It can be user-defined. A SNMP management software with the Read-Only Community Name is granted authorization to view TC8518 values.

Read-Write Community Name: Displays the current Read-Write Community Name. It can be user-defined. Any SNMP management software with the Read-Write Community Name is granted authorization to read and configure any TC8518 values.

Trusted Peer: The user can define a specific IP address or a subnet of IP addresses that are authorized to use a SNMP management software to manage the TC8518.

SNMP Traps: Enable/Disable SNMP to send traps to a SNMP management software when an error is triggered.

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| Home Physical Status Unit Alarm Basic Settings TP Settings | • | ✓ Enabled Read-Only Community Name: Read-Write Community Name: | public private | |
| Advanced | | Trusted Peer | Any Address 🗸 | |
| SNMP Settings | | | | |
| Login Settings | | SNMP Traps | | |
| T1/E1 Options Status Settings Statistics | | | Cancel | |
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| Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber | | | | |
| Logout | | | | |
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Figure 3-18 Web Application - Simple Network Management Protocol (SNMP) Page

3.8 Login Settings

The Login Settings page allows the user to define security access for the TC8518.

Users: Displays the list of users with access to the TC8518. Users can be added or removed and usernames and passwords can be defined.



Groups: A tool to assist users in organizing multiple TC8518 users.

Figure 3-19 Web Application - Login Settings Page

3.9 T1/E1 Options

3.9.1 T1/E1 Options: Status

The T1/E1 Status page displays the channel alarm status and signal strength of enabled T1/E1 channels. Channels that appear gray are disabled channels.

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| | T1 /51 C | | | | | | | | _ |
| ВОТТОМ | TI/EI Sta | tus | | | | | | | |
| Home | | T1/E | 1 Erro | or Curr | ent St | atus | | | |
| Physical Status | | | AIS | RPV | 105 | тоср | TCLE | Ry Signal Strengt | |
| Unit Alarm | Ch 1 | | A13 | G | 03 | G | G | Greater than -2.5 di | в |
| Basic Settings | Ch 2 | | 6 | | | | | Greater than -2.5 di | в |
| ID Sottings | Ch 3 | | | | | | | to dB | |
| IP Settings | Ch 4 | | | | | | | to dB | |
| Advanced | Ch 5 | | | | | | | to dB | |
| SNMP Settings | Ch 6 | | | | | | | to dB | |
| Login Settings | Ch 7 | | | | | | | to dB | |
| | Ch 8 | | | | | | | to dB | = |
| 11/E1 Options | Ch 9 | | | | | | | to dB | |
| Settings | Ch 10 | | | | | | | to dB | |
| Statistics | Ch 11 | | | | | | | to dB | |
| | Ch 12 | | | | | | | to dB | |
| Optical Options | Ch 13 | | | | | | | to dB | |
| Settings | Ch 14 | | | | | | | to dB | |
| Statistics | Ch 15 | | | | | | | to dB | |
| The second second | Ch 16 | | | | | | | to dB | |
| Ethernet Options | | | | | | | | | |
| Rate Limit | | Legend | | | | | | | |
| Port Statistics | | AIS : Alarm Indication Signal | | BPV | : Bipolar \ | /iolation | | | |
| Ethernet over Fiber | | LOS : Loss of Signal | Detect | TOL | Transm | it Current | l imit Ex | randed | |
| Logout | | . Fanse in Dessent | Delett | | Canada N | - Deserved | - Linic LX | ceeueu | |
| Logout | | Error is Present | | | Error is N | ot Present | | | |
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Figure 3-20 Web Application - T1/E1 Options: Status Page

3.9.2 T1/E1 Options: Settings

The T1/E1 Settings page displays the T1/E1 channel alarm status and summary. Please refer to Figure 3-21, *Web Application - T1/E1 Options: Settings*.

T1/E1 Alarm Status: Displays if a T1/E1 channel alarm signal has been triggered.

Clear Alarm on All Channels: Allows users to clear all alarms on T1/E1 channels.

T1/E1 Alarm Settings Summary: Displays the summary of alarm trigger settings for T1/E1 Channels

T1/E1 Settings Summary: Each channel can be edited. A useful feature for users is the ability to edit one channel and then copy the same settings onto other channels.

For example, Channel 1 is configured to have Mode T1 and Build-Out to 0-133ft. If the user would like other channels to share this configuration, the user can select multiple channels by clicking on the checkbox for each channel, choose "Copy Channel Settings From" to be Ch 1, and click on Copy". This feature allows for simple and quick changes to multiple channels.

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| C-Home | l/EI Setu | ngs | | | | | | | | | |
| Basic Settings | | | | T1/I | 1 Multip | lexer St | atus | | | | |
| IP Settings | T1/E1 Aları | n Status | | | | | | | | | |
| Advanced | Channel | | Ch 1 | Ch 2 | Ch 3 | Ch 4 | Ch 5 | Ch 6 | Ch 7 | Ch 8 | |
| SNMP Settings | Alarm Ch | | E Clear | E Clear | E Clear | E Clear | E Clear | ₩ E | E Clear | E Clear | |
| Login Settings | Alarin Ci | 201 | Cical | Cicar | Cical | Cidal | Ciedi | Cidar | Cibar | | |
| ↑ T1/E1 Options | Channel | | Ch 9 | Ch 10 | Ch 11 | Ch 12 | Ch 13 | Ch 14 | Ch 15 | 6 Ch 16 | |
| Ctatur | Alarm | | ΘE | ΘE | ΘE | ΘE | ● E | ΘE | ΘE | ● E | |
| status | Alarm Clo | ear | Clear | Clear | Clear | Clear | Clear | Clear | Clear | Clear | |
| Settings | Clear | Alarm on All | Channe | ls: Pr | oceed | | | | | | |
| Statistics | | | | | | | | | | | |
| Diagnostic | T1/E1 Alar | m Settings Su AIS | immary I | BPV | LOS | то | CD | TCLE | Edi | t | |
| C-Optical Options | | Disabled | Dis | sabled | Enabled | Disa | bled | Disabled | 1 | | |
| €Ethernet Options | | Legend | | | | | | | | | |
| Logout | | AIS : Aları | m Indicat | ion Signal | | BPV : | Bipolar Viol | lation | | | |
| | | LOS : Loss TCLE : Tran | of Signa smit Curi | l rent-Limiter | Exceeded | TOCD : | Transmit O Channel is | pen-Circuit Disabled | Detect | | |
| | | | | | | | | | |] | |
| | T1/E1 Sett | ings Summary | / | | | | | | | | |
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| | Select/ | Unselect All (| Channels | 5: | Select All | | | | | | |
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| | Ch 2 | | | T1 | B8Z5 | 100 Ohm | 0 - 13 | з п. L | ong . | | |
| | Ch 3 | | | T1 | B8ZS | 100 Ohm | 0 - 133 | 3 ft. L | ong | | |
| | Ch 4 | | | T1 | B8ZS | 100 Ohm | 0 - 133 | 3 ft. L | ong | Сору То | |
| | Ch 5 | | | T1 | B8ZS | 100 Ohm | 0 - 133 | 3 ft. L | ong | Сору То | ~ |

Figure 3-21 Web Application - T1/E1 Options: Settings

3.9.3 T1/E1 Options: Statistics

The T1/E1 Statistics page displays all T1/E1 channels' statistics and alarm status history.

Save Rate: User-defined time interval at which the T1/E1 statistics are saved into a history.

Refresh Rate: The interval at which the T1/E1 statistics are updated. Range of 30-600 seconds.

Clear Summaries on All Channels: Reset all error counters to zero. Each channel has its own respective history that can be accessed by clicking on the icon under "Action".

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| ome | | | T1/E1 Sta | atistics S | ummary | | | | |
| Physical Status | | Save Rate: | Hourly | * | | | | | |
| Unit Alarm | | efresh Rate (30~600): | Every | 0 Seco | inds | | Apply | | |
| asic Settings | | Clear Summaries on All | Channels: | | | | Clear | | |
| Settings | | Channel | AIS | BDV | 105 | TOCD | TOLE | Action | i. |
| lvanced | Ch 1 | Channel | 1 | 0 | 1 | 0 | 0 | I D D | 1 |
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| otical Options | Ch 8 | | | | | | | | 1 |
| Status | Ch 9 | | | | | | | | 1 |
| Settings | Ch 10 | | | | | | | | 1 |
| Statistics | Ch 11 | | | | | | | | 1 |
| hernet Options | Ch 12 | | | | | | | | 1 |
| Port Settings | Ch 13 | | | | | | | | 1 |
| Rate Limit | Ch 14 | | | | | | | | 1 |
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| | | Action: | View 0 View 0 View 0 Clear | Channel Erro Channel Stati Channel Stat | r Seconds St istics History tistic Summa | atistics | | | |
| | | | | | | | | | -0 |

Figure 3-22 Web Application - T1/E1 Options: Statistics

3.9.4 T1/E1 Options: Statistics Error Seconds Total

The T1/E1 Statistics Error Seconds Total displays the time duration of each error for each T1/E1 channel.

Refresh Rate: User-defined time interval at which the T1/E1 Error Seconds Total is refreshed.

Clear Totals on All Channels: Clear the accumulated errors back to zero.

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| Home | | T1/ | E1 Statistic | s Error S | Seconds | Total | | |
| Physical Status | Refresh F | Rate (30~600): | Every 6 | 0 Seco | nds | | Apply | |
| Unit Alarm | Clear Tot | tals on All Channels | 5: | | | | Clear | |
| Basic Settings | | | | | | | | |
| IP Settings | d | hannel | AIS | BPV | LOS | TOCD | TCLE | Action |
| Advanced | Ch 1 | | 1 | 0 | 1 | 0 | 0 | ۵ |
| urunceu | Ch 2 | | 80944 | 0 | 1 | 0 | 0 | ۰ |
| SNMP Settings | Ch 3 | | | | | | | |
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| Status | Ch 10 | | | | | | | |
| Settings | Ch 11 | | | | | | | |
| Statistics | Ch 12 | | | | | | | |
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| Ethernet Options | Ch 15 | | | | | | | |
| Port Settings | Ch 15 | | | | | | | |
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| onout | | Ch # - E1 | | | | | | |
| | 1 A 44 | (B) | | | | | | |

Figure 3-23 Web Application - T1/E1 Options: Statistics Error Seconds Total

3.9.5 T1/E1 Options: Statistics History

The T1/E1 Statistics History page displays the errors that occurred within defined time intervals for an individual channel.

View: Displays previous rows of statistics history entries from the past.

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| Home Physical Status | | | Ch 2 T1/ | /E1 Statist | ics Histor | ry - Rows #1 | L ~ 12 | |
| Unit Alarm | A | IS | BPV | LOS | TOCD | TCLE | View | |
| Basic Settings | 1 | | 0 | 1 | 0 | 0 | Rows 1 ~ 12 | • |
| ID Sattings | | | | | | | | |
| IP Settings | | Row | Date | Time | AI | S BPV | LOS | |
| Advanced | | 1 | 01.02.200 | 3 00:01:3 | 5 0 | 0 | 0 | |
| SNMP Settings | | 2 | 01.01.200 | 3 23:01:3 | 3 0 | 0 | 0 | |
| Login Settings | | 3 | 01.01.200 | 3 22:01:3 | 2 0 | 0 | 0 | |
| | | 5 | 01.01.200 | 3 20:01:3 | 0 0 | 0 | 0 | |
| T1/E1 Options | | 5 | 01.01.200 | 3 19.01.2 | 6 0 | 0 | 0 | |
| Status | | 7 | 01.01.200 | 3 18:01:2 | 5 0 | 0 | 0 | |
| Statistics | | 8 | 01.01.200 | 3 17:01:2 | 3 0 | 0 | 0 | |
| Statistics | | 9 | 01.01.200 | 3 16:01:2 | 1 0 | 0 | 0 | |
| Optical Options | | 10 | 01.01.200 | 3 15:01:2 | 0 0 | 0 | 0 | |
| Status | | 11 | 01.01.200 | 3 14:01:1 | 8 0 | 0 | 0 | |
| Statistics | | 12 | 01.01.200 | 3 13:01:1 | 6 0 | 0 | 0 | |
| Statistics | | | | | | | | |
| Ethernet Options | | | | Close | lear History | Defreeh | | |
| Port Settings | | | | Close C | car matory | Reirean | | > |
| Done | | | | | | 👩 🚱 Interne | t 🔍 | 100% • |

Figure 3-24 Web Application - T1/E1 Options: Statistics History

3.9.6 T1/E1 Options: Diagnostics

This page displays the diagnostic options related to the T1/E1 channels.

Loop Code Monitor: Selects which signal will be monitored for CSU Loop Up / Down codes. See section 6.8.

Local Loopback: When enabled, the T1/E1 signal coming in to the RJ48 port will be looped back out. See section 6.6.

Remote Loopback: When enabled, the T1/E1 signal coming in from the remote unit, over the OC/3 signal, will be looped back to the remote unit. See section 6.6.

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| TC8518 @ loca unit | T1/E1 Diagnosti | ic | | |
| Home | Loop Up/Down Code | Monitoring: 💿 Disabled | Enable Local | ble Remote Set |
| Basic Settings | Manual Settings | | | |
| IP Settings | Channel | Label | Local Loopback | Remote Loopback |
| | 1 | | Disabled 🔻 | Disabled - |
| Advanced | 2 | | Disabled 🔻 | Disabled 🔻 |
| SNMP Settings | 3 | | Disabled 🔻 | Disabled - |
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| Ethernet Options | | | | |

Figure 3-25 Web Application - T1/E1 Options: Diagnostics

3.10 Optical Options

3.10.1 Optical Options: Optical Status

The TC8518's Optical Status displays the current status of alarms in regards to optics. "Current" and "Since Last Cleared" indicate to the Network Administrator if there has been an error since the last time the TC8518 was cleared of alarms.

Current: Displays the current status of optical alarms.

Since Last Cleared: Displays if an optical alarm has been triggered since the last time the "Clear Alarm" button was clicked.

For example, two TC8518s are connected properly and the Optical Status page appears similar to Figure 3-26, *Web Application - Optical Options: Status*. Then suppose Optical A suffers a Loss of Signal (Opt A LOS), but then is corrected after five minutes. **Current** will have displayed red only during that five minutes and then return to green. **Since Last Cleared** will display "Error" and remain doing so. This allows the network administrator to know if an error had occurred on the optical ports recently.

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| тор | Optical Status | | | | | | |
| Home | Status | Opt. A LOS | Opt. B LOS | LOS | RDI | RXBER | |
| Physical Status | Current | 9 | 9 | 9 | | 9 | |
| Unit Alarm | Since Last Cleared | Good | Good | Good | Good | Good | |
| Basic Settings | 1 | | | | | | |
| IP Settings | Legend | | | | | | |
| Advanced | RXBER : RX E | it Error Rate Thres | hold Exceeded | | | | |
| Auvanceu | LOS : Loss of | Signal | | RDI : Remot | e Defect Indication | n | |
| SNMP Settings | 🔍 : Error is | Currently Present | | 👄 : Error is | Currently Not Pre | sent | |
| Login Settings | Error : India | ates that an error | occurred since last | cleared. | | | |
| T1/E1 Options | | | | | | | |
| Status | | | | | | | |
| Settings | | | | | | | |
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Figure 3-26 Web Application - Optical Options: Status

3.10.2 Optical Options: Optical Settings

The TC8518's Optical Options displays the Optics Type, the Timing Mode, and Remote Optical Loopback time.

Optics Type: Displays the type of fiber optic signal wavelength and mode.

Timing Mode: <u>Non-Looped</u> means the TC8518 optics will transmit the signal clocked according to the local machine. <u>Looped</u> indicates the signal will be transmitted with the same timing as the signal that was received.

Remote Optical Loopback: Enables the local TC8518 to loopback any signal it receives through the optics. Time increments is in minutes.

Note: This feature is for advanced users only. Enabling this can have serious consequences on your network. It is intended for users with Ethernet testers.

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| | Optical Settings | | |
| Home Physical Status Unit Alarm | Optics Type: | 1300 nm, Single Mode | |
| Basic Settings | Timing Mode: | Non-Looped | |
| IP Settings | Remote Optical Loopback: | Enable for 1 Minutes Proceed | |
| Advanced | | A | |
| SNMP Settings | | Attention | |
| Login Settings | This feature is for advanced users only | | |
| T1/E1 Options | It is intended for user with Ethernet tes | sters. | |
| Status | | | |
| Statistics | | | |
| Optical Options | | Apply Refresh | |
| Status | | | |
| Settings Statistics | | | |
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Figure 3-27 Web Application - Optical Options: Settings

3.10.3 Optical Options: Statistics

The TC8518's Optical Statistics displays a summary of error types on the optics.

Refresh Rate: The interval at which the optical statistics are updated. Range of 30 to 600 seconds.

Clear All Statistics: Icon under Action column resets all error counters to zero.

Clear Statistic Counter: Clears individual error types.

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| Home Physical Status Unit Alarm Basic Settings | Optical Statistics Refresh Rate (30%6 Clear All Statistics: | 00): Every | 60 Seconds | Apply Clear | |
| ID Settings | Error Type | Error Count | Error Seconds | Action | |
| A becauge | Rx Bit | 0 | N/A | ٩ | |
| Advanced | FEBE | 0 | N/A | ٩ | |
| SNMP Settings | LOS | 1 | 65005 | ٩ | |
| Login Settings | RDI | 0 | 0 | ٩ | |
| T1/E1 Options | Optical A LOS | 1 | 65005 | 1 | |
| Status | Optical B LOS | 1 | 65005 | ٩ | |
| Settings Statistics | Legend | | | | |
| Optical Options Status Settings Statistics | FEBE : Far t | End Block Errors | Clear Statistic Counter | | |
| Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber Logout | | Refres | ih. | | |
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Figure 3-28 Web Application - Optical Options: Statistics

3.11 Ethernet Options

3.11.1 Ethernet Options: Port Settings

The TC8518's Ethernet Port Settings displays each Ethernet port's status and allows the configuration of port settings. Please refer to Figure 3-29, *Web Application - Ethernet Options: Port Settings*.

Port In Use: Enable or disable the Ethernet port. Default setting is Enabled.

Speed/Duplex: Choose either 100Mbps Full, 10Mbps Full, 100Mbps Half, 10Mbps Half. Default setting is Auto-Negotiate.

Flow Control: Enable or disable Flow Control; Default is disabled.

Eth # Label: Label the port with desired name to distinguish from other ports, up to 30 characters.

Huge Frame Support: Enable support for Ethernet frames up to 1916 bytes.

Timed Local Loopback: Enable local loopback on an Ethernet port. Range of 1-1440 minutes.

Note: This feature is for advanced users only. Enabling this can have serious consequences on your network. It is intended for users with Ethernet testers.

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| Po | ort Settings | | | | | | | |
| Home Rhysical Status | Port | Port In Use | Speed / | Duplex | Flow Control | Current Status | | |
| Unit Alarm Et | thernet #1 | Enabled 🗸 | Auto-Nego | tiate 🗸 | Disabled V | Not Connected | | |
| Basic Settings Et | th 1 Label | | | (Max. of 30 | characters) | | | |
| IP Settings Et | thernet #2 | Enabled 💙 | Auto-Nego | tiate 🗸 | Disabled 🛩 | 100 Mbps/Full | | |
| Advanced Et | th 2 Label | | | (Max. of 30 | characters) | | | |
| SNMP Settings Et | thernet #3 | Enabled 💙 | Auto-Nego | tiate 🗸 | Disabled V | Not Connected | | |
| Login Settings Et | th 3 Label | | | (Max. of 30 | characters) | | | |
| T1/E1 Options Status Settings Statistics | Huge Frame Support (up to 1916 Bytes): | | | | | | | |
| Optical Options | | Port | • 1440 milat | (3) | Local Loopback | | | |
| Status | Ethe | ernet #1 | | Enable for | 1 Minutes F | Proceed | | |
| Statistics | Ethe | ernet #2 | | Enable for | 1 Minutes F | Proceed | | |
| Ethernet Options | Ethe | ernet #3 | | Enable for | 1 Minutes F | Proceed | | |
| Port Settings Rate Limit Port Statistics Ethernet over Fiber Logout | This feature is for advanced users only. Enabling this can have serious consequences on your network. It is intended for user with Ethernet testers. | | | | | | | |
| | | | Apply | Refresh | | | ~ | |
| Done | | | | | 🗔 🕘 Internet | €, 100% | • | |

Figure 3-29 Web Application - Ethernet Options: Port Settings

3.11.2 Ethernet Options: Rate Limit

The TC8518's Ethernet Rate Limit feature allows the Network Administrator to regulate the bandwidth of each of the 3 Ethernet ports.

Transmitting and Receiving are separated to allow for extreme flexibility. The port rate limits can be set in increments of 32Kbps. If the Network Administrator enters a value that is not a multiple of 32, the TC8518 will automatically round to the nearest multiple of 32. For example, if you enter a limit of 100Kbps, then the TC8518 will automatically convert the 100Kbps into 128Kbps.

If you do not want any rate limit imposed on a port, enter '0' for that port's "Norm. Tx Limit" or "Normal Rx Limit" and click "Apply".

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| | Rate Limit Settings | | | | | | | | |
| Home Physical Status | Nor | mal (Norm.) Rate: Ente | r 0 to disable ra | te limit | | | | | |
| Unit Alarm | Actual (Act.) Rate: By increments of 32Kb | | | | | | | | |
| Basic Settings | | | | | | | | | |
| IP Settings | Ethernet #1 | 0 Khit/sec | Disabled | 0 Kbit/sec | Disabled | | | | |
| Advanced | Ethernet #2 | 0 Khit/sec | Disabled | 0 Kbit/sec | Disabled | | | | |
| SNMP Settings | Ethernet #3 | | Disabled | 0 Kbit/sec | Disabled | | | | |
| Login Settings | Ethernet #5 | NDIQ SEC | Disabica | Child Sec | DISUDICU | | | | |
| T1/E1 Options | | | | | • | | | | |
| Settings | | Apply | l | | | | | | |
| Statistics | | | 5 | | | | | | |
| Optical Options | | | | | | | | | |
| Status Settings | | | | | | | | | |
| Statistics | | | | | | | | | |
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Figure 3-30 Web Application - Ethernet Options: Rate Limit

3.11.3 Ethernet Options: Port Statistics

The Ethernet Port Statistics offers a comprehensive overview of the Ethernet traffic passing through the TC8518. It allows for a history of statistics that can be saved in regular intervals. The Network Administrator can define the save rate in increments of minutes.

Note: Setting the Save Rate to less than 5 minutes will damage the flash memory.

The Statistics Summary also separates the traffic into transmit (Tx) and receive (Rx) for each of the 3 Ethernet ports. The key Ethernet statistics that are monitored are Frames per Second (FPS), Bytes per Second (BPS), and Bandwidth Usage Percentage (BU%).

Statistics of Ethernet ports #1, #2, and #3 are independently monitored and recorded, and a Port History and Event Statistics can be accessed by the respective icons at the right of the Statistics Summary under the View column.

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| | Port Statistics | | | | | | | | |
| Home Physical Status Unit Alarm | • | Statistic Summary | | | | | | | |
| Basic Settings | Save Rate (1~ | 120): Eve | ery 👂 🛛 Mi | nutes | | | Ľ | Apply | |
| IP Settings Advanced SNMP Settings | Setting the S | ave Rate to les | s than 5 minute | Attention as will damage | n e the flash. | | | | |
| Login Settings | Port | Ty fos | Ty Ros | Ty BUIM | Ry fos | Ry Ros | Ry RUM | View | e 11 |
| T1/E1 Options | Ethernet #1 | 0 | 0 | 0.0% | 0 | 19 | 0.0% | 88 | |
| Status | Ethernet #2 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | <u> </u> | |
| Settings Statistics | Ethernet #3 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | 9 | |
| Optical Options Status Settings Statistics Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber Logout | fi iii | rgend bs : Frames per € : View Port H | Seconds B | ps : Bytes pe | r Seconds nt Statistic | BU : Bandwid | th Usage | | • |
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Figure 3-31 Web Application - Ethernet Options: Port Statistics

3.11.4 Ethernet Options: Port Statistics: Port History

The TC8518 Port History offers a comprehensive list of the statistics of a specific port shown on the Ethernet Options: Port Statistics page. It is updated with an entry for each Save Rate increment on the Ethernet Options: Port Statistics link.

Note: Setting the Save Rate to less than 5 minutes will damage the flash memory.

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| | | TIANA | | | | | | | | ^ |
| TC COM | MUNIC | ATIONS | T | 705 | 10 1 | 6-Ch T1 | and 10/1 | 100 Etherr | net | |
| THE LEADER IN I | FIBER OPTIC C | ONNECTIVITY | 11 | 00 | 10 F | iber Opti | c Multij | plexer | | |
| | | | | | | | | | | - 1 |
| ТОР | Port S | tatistics | | | | | | | | |
| | | | | Port | 2 Port Hi | story - Pao | ie 1 | | | |
| Home | | | | | | , | , | | | |
| Physical Status | Statist | ics Summary | / | Ty BII04 | Py for | Dy Bog | Dv BI | % History | Event | |
| Unit Alarm | 1 | 1079 | x 0ps | 0.0% | 1 | 360 | 0.0% | h Page 1 V | l ® | |
| Basic Settings | - | 1075 | | 01070 | - | 500 | 0107 | | | = |
| IP Settings | Port Hi | story | | | | | | | | |
| Advanced | Row | Date | Time | Rx fps | Rx Bps | Rx BU% | Tx fps | Tx Bps | Tx BU% | |
| SNMP Settings | 1 | 01.01.2003 | 00:25 | 1 | 793 | 0.0% | 2 | 281 | 0.0% | |
| | 2 | 01.01.2003 | 00:20 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Login Settings | 3 | 01.01.2003 | 00:15 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| T1/E1 Options | 4 | 01.01.2003 | 00:10 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Status | 5 | 01.01.2003 | 00:05 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Settings | 6 | 01.01.2003 | 00:00 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Statistics | 7 | 01.01.2003 | 02:20 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Optical Options | 8 | 01.01.2003 | 02:15 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Status | 9 | 01.01.2003 | 02:10 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Settings | 10 | 01.01.2003 | 02:05 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Statistics | 11 | 01.01.2003 | 02:00 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Ethernet Options | 12 | 01.01.2003 | 01:55 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Port Settings | 13 | 01 01 2003 | 01.50 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Rate Limit | 14 | 01 01 2002 | 01.45 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Port Statistics | 14 | 01.01.2003 | 01:45 | 0 | 0 | 0.0% | 0 | 0 | 0.0% | |
| Ethernet over Fiber | 15 | 01.01.2003 | 01:40 | 0 | U | 0.0% | 0 | 0 | 0.0% | |
| Logout | 16 | 01.01.2003 | 01:35 | U | 0 | 0.0% | 0 | 0 | 0.0% | ~ |
| Dana | 1 17 | 01 01 2003 | 01.30 | n | n | n n% | 1 | n | n n%. | |

Figure 3-32 Web Application - Ethernet Options: Port Statistics: Port History

3.11.5 Ethernet Options: Port Statistics: Event Statistics

The TC8518 Event Statistics offers a comprehensive list of the event statistics of a particular port since the unit was powered on. It displays totals of Ethernet events that the TC8518 experiences.

At the bottom of the page there is a 'Clear Event' button that allows the Network Administrator to clear the events and start at zero. This allows for statistics beginning at the Network Administrator's desired time.

The "Refresh" button allows the Network Administrator to view the most current event statistics available.

| C TC8518 Management Console - Wi | ndows Interne | t Explorer p | rovided by | Yahoo! | | | | | | | |
|----------------------------------|-------------------------|---------------|--------------|---------------|----------|--------------|---------------------|----------------------|----------------|--------|------------|
| () + (//192.168.1.1/index. | cgi?active%5fpag | e=9033&req% | 5fmode=08mii | nic%5fbutton% | 5ffield: | =tc%5fv | iew%5 💙 🐓 | K Google | 2 | | P- |
| Open PDF in Word | | | | | | | | | | | G - |
| 😭 🏟 😐 🖌 🍘 TC8518 Management (| Co X @ TC | 8518 Managem | ent Console | | | | | ☆・ ■ | | Page • | Tools + » |
| | | oo to managem | | | | | | | | | ···· |
| TC COMMU THE LEADER IN FIBER | NICATIO | | ГC8 | 518 | 1 F | 6-C liber | h T1 and Optic N | 1 10/10 /Iultiple | 0 Ethe exer | rnet | |
| тор Р | ort Statist | ics | | | | | | | | _ | |
| | Port 2 Event Statistics | | | | | | | | | | |
| Home | | | | | | | | | | | |
| Unit Alarm | | Statistics 9 | Summary | | | | | | | " | |
| | | Tx fps | Tx Bps | Tx BU% | Ro | c fps | Rx Bps | Rx BU% | History | | |
| Basic Settings | | 0 | 0 | 0.0% | 0 | | 13 | 0.0% | | | |
| IP Settings | | | То | tal Ty (KByd | oc) | Tota | Dv (KButec |) | | - | |
| Advanced | | 510 | | | | 35421 | 175 | , | | | |
| SNMP Settings | 1 | | <u>I</u> | | | | | | | | |
| Login Settings | | Event Stat | istics | | | | | | | | |
| T1/F1 Options | | | Eve | nt | | | Co | unt | | | = |
| Status | | Tx Broa | dcast: | | | 56825 | 25 Packets | | | | |
| Settings | | Tx Mult | icast: | | | 1385 Packets | | | | | |
| Statistics | | Tx Unic | ast: | | | 2734 Packets | | | | | |
| Optical Options | | Tx Pau | ie: | | | 35676 | i12 Packets | | | | |
| Status | | Tx Tota | l Collision: | | | 10739 | 69612 Packet | s | | | |
| Settings | | Tx Exce | ss Collisio | n: | | 0 Pac | kets | | | | |
| Statistics | | Tx Sing | le Collision | 1: | | 0 Pac | kets | | | | |
| Ethernet Options | | Des Dess | Collision: | | | 12220 | 0 De elvete | | | | |
| Port Settings | | RX Brod | lucast: | | | 15220 | eleste | | _ | | |
| Rate Limit | | RX Mult | act. | | | 15 Pa | ackets | | | | |
| Port Statistics | | Rx Dau | | | | 0 Pac | kete | | | | |
| Ethernet over Fiber | | CRC Fr | or: | | | 32212 | 24280 Packet | s | | | |
| Logout | | Oversiz | e Error: | | | 42949 | 67295 Packet | s | | | |
| | | Unders | ize Error: | | | 42949 | 67295 Packet | s | | | |
| | | | | | | | | | | | |
| | - | | | | | | | | | | |
| | | | | | | | | | | | |
| Dana | | | | Close | Clear E | vent | Refresh | a a trates | nat | a | 100% |
| Done | | | | | | | | 🛛 🕲 🐨 Inter | net | | 100% |

Figure 3-33 Web Application - Ethernet Options: Port Statistics: Event Statistics

3.11.6 Ethernet Options: Ethernet over Fiber

Ethernet over Fiber allows the user to temporarily enable Remote Ethernet Loopback without interrupting the T1/E1 signals. It is a feature to troubleshoot the TC8518's Ethernet function without interrupting the operation of the T1/E1 channels.

The Framing Mode is Generic Framing Procedure (GFP). The Ethernet over Fiber feature can be enabled in increments of minutes.

Note: This feature is for advanced users only. Enabling this can have serious consequences on your network. It is intended for users with Ethernet testers.

| C TC8518 Management Console - | - Windows Internet Explorer provided by Yahoo! | |
|--|--|----------------------|
| Http://192.168.1.1/m Http://192.16 | index.cgi?active%5fpage=9030&req%5fmode=0&mimic%5fbutton%5ffield=sidebar%3a+sideba 💙 🌮 🔀 Google | P• |
| Open PDF in Word | | • |
| 😭 🕸 🍘 TC8518 Management Con | ansole 🏠 🔹 👼 🚽 🔂 🖓 Age 🖛 🎲 | °ools ▼ [≫] |
| TC COMM THE LEADER IN FIL | MUNICATIONS IBER OPTIC CONNECTIVITY TC8518 16-Ch T1 and 10/100 Ethernet Fiber Optic Multiplexer | < |
| | Ethernet over Fiber Settings | |
| Home Physical Status Unit Alarm | Framing Mode: GFP | |
| Basic Settings | Remote Ethernet Loopback: Enable for 1 Minutes Proceed | |
| IP Settings | Attention | |
| Advanced | | |
| SNMP Settings | This feature is for advanced users only. Enabling this can have serious consequences on your network. It is intended for user with Ethernet testers. | |
| Login Settings | | |
| T1/E1 Options Status Settings Statistics | | -• |
| Optical Options Status Settings Statistics | | |
| Ethernet Options Port Settings Rate Limit Port Statistics Ethernet over Fiber | | |
| | J | ~ |
| Done | 🔀 🚱 Internet 🔍 10 |)%:: |

Figure 3-34 Web Application - Ethernet Options: Ethernet over Fiber Settings

3.12 Logout

The Logout link on the left column will exit the user from the TC8518 Web Management. It will return the user to the Login page.

| C TC8518 Management Console - Windows Internet Explo | rer provided by Yahoo! | | | |
|---|------------------------------------|-------------------------------|--------------------------------|--------------|
| C | %req%5fmode=0&mimic%5fbutton%5ffie | ld=sidebar%3a+sideba 💙 🐓 | Google | P • |
| Open PDF in Word | | | | € 3 • |
| 😭 🎄 | | | 🔓 • 🗟 • 🖶 • 🔂 Page • | Tools - " |
| TC COMMUNICATIONS THE LEADER IN FIBER OPTIC CONNECTIVITY | TC8518 | 16-Ch T1 and Fiber Optic M | 10/100 Ethernet Iultiplexer | |
| Login | | | | |
| | User has logged | d out, please login again: | | |
| | User Name: | | | |
| | Password: | | | |
| | | | | |
| | | | | _ |
| | | OK | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | \checkmark |
| Done | | | 👩 🚱 Internet | € 100% • |

Figure 3-35 Web Application - Logout
4.1 Introduction

Command Line Interface (CLI) is a text only interface integrated on-board the TC8518. This reference chapter defines commands, describes the parameter options, and shows examples you can choose using this tool. There are a few simple steps for using CLI.

- A. Type a command. The system will continue to wait for you to finish entering the text command until you press the Enter key.
- B. A command-line interpreter then receives, analyzes, and executes the requested command.
- C. After the command is executed, the command usually returns output to you in the form of text lines on the CLI. This output may be an answer if the command was a question, or otherwise a summary of the operation.

4.2 Setup

Accessing TC Command with your PC is as simple as connecting a cable from your PC to the TC8518 and booting up the software.

To connect a PC

- 1. Using a RJ45 to DB9 Cable cable, connect the PC to a TC8518 Console port (CON).
- 2. From the Start icon, access Accessories/Communications/Hyper terminal. *The New Connection - Hyper Terminal page appears.*

| Connect To | ? 🛛 |
|-------------------|---|
| 2 | |
| Enter details for | the phone number that you want to dial: |
| Country/region: | United States (1) |
| Area code: | |
| Phone number: | |
| Connect using: | СОМ1 |
| | OK Cancel |

Select the corresponding COM number from the pull-down menu and click on OK.
 If you do not know your COM number, you can find out by going to: Control

Panel/System. Under the Hardware tab, click "Device Manager", and a new window will open. Look for "Ports (COM & LPT)", and you should see the COM number you are currently using.

4. Create a new file with these settings.

| COM3 Properties | |
|-------------------------|---|
| Port Settings | Configuration - 9600 Data bits - 8 |
| Bits per second: 115200 | Parity - NoneStop bits - 1 |
| Data bits: 8 | Flow Control - None |
| Parity: None | |
| Stop bits: 1 | |
| Flow control: None | |
| Restore Defaults | |
| OK Cancel Apply | |

5. Click "Apply"

4.3 Console/Telnet Management

The console management can be accessed through the RS-232 port on the front panel (RJ-45 connector) using a PC and terminal software (Hyper Terminal).

Attention: If you are unsure about the settings, contact your network administrator. Improper settings may result in disruption of the existing network.

Once you connect to the TC8518, you will be prompted to enter a username and password. Both the username and password are "admin".

There are a couple of key functions that are essential to be familiar with.

help: At any given point, this will assist the user with instructions on how to use functions.

tab key: This will help fill out a partially entered function. For example, if the user typed only "he" and then pressed the tab key, the console will automatically complete the word (i.e. "help").

exit: This allows the user to leave the directory he or she is presently in.

| 🕸 TC8518 - HyperTerminal | | |
|---|-------------------------------|--|
| File Edit View Call Transfer Help | | |
| | | |
| Username: admin Password: ***** TC8518> port_settings rate_limit port_statistics eof tle1 optical unit_alarm remote basic_settings ip_settings login_settings login_settings firmware_update net exit help TC8518> | | |
| Connected 0:00:20 Auto detect 9600 8-N-1 SCROLL | L CAPS NUM Capture Print echo | |

Figure 4-1 Terminal Settings: Console Home

4.3.1 IP Settings

The IP Settings allows the user to view (get) or to configure (set) IP settings.

| 🗞 TC8518 - HyperTerminal | |
|--|--|
| File Edit View Call Transfer Help | |
| D 🖆 📨 🕉 = D 🗃 🖬 | |
| TC8518> TC8518> TC8518> TC8518> TC8518> ip_settings ip_settings> ip_get netmask_set gateway_get gateway_set exit help ip_settings> | |
| Connected 0:02:02 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo | |

Figure 4-2 Terminal Settings: Console IP Settings

4.3.2 Login Settings

The Login Settings allows the user to view or configure login details such as username, passwords, etc.

| 🗞 TC8518 - HyperTerminal | - DX |
|--|----------|
| File Edit View Call Transfer Help | |
| 口母 🖉 🖇 电子 留 | |
| D 译 《 3 四 译 留 TC8518> TC8518> TC8518> TC8518> TC8518> login_settings login_settings user_fullname_get user_fullname_set user_username_set user_group_set user_entry_add user_entry_add | <u> </u> |
| user_entry_username_set user_entry_password_set user_entry_group_set user_entry_print user_entry_print_ group_entry_add | |
| group_entry_del group_entry_foupname_set group_entry_description_get group_entry_description_set group_entry_print group_entry_print_all exit help login_settings>_ | |
| Connected 0:03:56 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo | × |

Figure 4-3 Terminal Settings: Console Login Settings

4.3.3 Advanced Settings

The Advanced Settings allows the user to enable Load Configuration, Reboot, and Restore to Default.

| 🗞 TC8518 - HyperTerminal | | | | | | | |
|---|------------|--------|------|-----|---------|------------|---|
| File Edit View Call Transfer Help | | | | | | | |
| 다 🖉 🖏 🖓 🖓 🖓 | | | | | | | |
| TC8518> TC8518> TC8518> TC8518> TC8518> TC8518> adv_settings adv_settings> conf_load reboot restore_default exit help adv_settings> | | | | | | | X |
| Connected 0:03:00 Auto detect | 9600 8-N-1 | SCROLL | CAPS | NUM | Capture | Print echo | |

Figure 4-4 Terminal Settings: Console Login Settings

4.3.4 Firmware Update

The Firmware Update allows the user to update the firmware of the TC8518.

| 🗞 TC8518 - HyperTerminal | |
|--|--|
| File Edit View Call Transfer Help | |
| 19 40 5 19 19 19 19 19 19 19 19 19 19 19 19 19 | |
| TC8518> TC8518> TC8518> TC8518> TC8518> firmware_update firmware_update> start exit help firmware_update> | |
| Connected 0:04:31 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo | |

Figure 4-5 Terminal Settings: Console Firmware Update

4.3.5 Serial Port Setting (Apply to Serial Expansion Card)

| CLI Commands | Functions | |
|----------------------------|---|--|
| serial settings_get | Shows serial ports current settings. | |
| serail status_get | Shows serial ports current status. | |
| serial enable_set | Enables/Disables serial ports. | |
| serial mode_set | Sets mode to RS422/RS485-2wire/RS485-4wire | |
| | (Only used in RS422/RS485-2wire/RS485-4wire) | |
| serial local_loopback_set | Enables/Disables local loopback on serial ports. | |
| serial remote_loopback_set | Enables/Disables remote loopback on serial ports. | |
| serial baud_rate_set | Allow user to set a baud rate from 1200 to 115200 baud. | |

| TC8518 - HyperTerminal | |
|---|---|
| File Edit View Call Transfer Help | |
| 00 00 00 | |
| TC8518> serial settings_get 1 | - |
| Port 1 settings | |
| Port Mode: RS232 with CTS & RTS Baud rate: 9600 Local loop-back: Disabled Remote loop-back: Disabled | |
| Returned 0 TC8518> | |
| mected 0:09:37 Auto detect 9600 644-1 SCROLL CAPS NUM Capture Print echo | |

Figure 4-6 Terminal Settings: Serial Get Settings

Figure 4-7 Terminal Settings: Serial Get Status

4.3.6 **Phone Port Settings (Applies to Phone expansion card)**

1. FXO Expansion:

| CLI Commands | Functions |
|----------------------|--|
| fxo port_status | Shows phone lines status and caller ID settings. |
| fxo caller_id_enable | Enables/Disables caller ID feature in FXO-to-FXS mode. |

| 🗞 TC8518 - HyperTerminal | | |
|--|----------|--|
| File Edit View Call Transfer Help | | |
| | | |
| TC8518> fxo port_status | <u> </u> | |
| Port Hook Ring Caller ID | | |
| 1 On No Enabled 2 On No Enabled 3 On No Enabled 4 On No Enabled 5 On No Enabled 6 On No Enabled 7 On No Enabled 8 On No Enabled 8 Beturned 0 | | |
| TC8518> | | |

Figure 4-8 Terminal Settings: FXO Port Status

2. FXS Expansion:

| CLI Commands | Functions |
|-----------------|---|
| fxs port_status | Shows phone lines status and caller ID settings |

| CLI Commands | Functions |
|----------------------|--|
| fxs caller_id_enable | Enables/Disables caller ID feature in FXO-to-FXS mode. |

| TC8518 | - HyperTermi | inal | | |
|---------------------------------|--|----------------------------------|---|---|
| File Edit W | ew Cal Trans | fer Help | | |
| 0 🖨 👳 | 8 00 | di | | |
| TC851 | B> fxs po | ort_statu | | A |
| Port | Hook | Ring | Caller ID | |
| 1 2 3 4 5 6 7 | On On On On On On On | No No No No No No | Enabled Enabled Enabled Enabled Enabled Enabled Enabled | |
| 8 Returi TC851 | On ned 0 3> | No | Enabled | |
| Connected 0:0 | H:13 Au | to detect 960 | 849-1 SCROLL CAPS NUM Capture Precedu | |

Figure 4-9 Terminal Settings: FXS Port Status

5.1 Introduction

The TC8518 comes standard with built-in SNMP Agent. Contact TC Communications Technical Support to get a copy of the MIB file. The TC Communications MIB file can be run on any 3rd party SNMP Management Software. Trap IP must be defined by the user and the MIB file compiled by SNMP Manager software prior to the trap operation.

5.2 SNMP Query

Figure 5-1, *SNMP Query Response* shows an example of a SNMP management station. This figure illustrates a SNMP Query of a TC8518. In this illustration, the Query shows that all T1 alarm statuses are off.



Figure 5-1 SNMP Query Response

5.3 SNMP Third Party Management Software

Figure 5-2, *Third Party SNMP Manager* shows an example of the TC8518 SNMP being managed with a third party vendor software.

| ST C SNMP Management Console | _ 8 | × |
|---|----------------------------------|---------|
| | | - |
| Samp Mils Custon-Tables magat private private f gotLathBook f gotLathBook | | |
| | THEI | |
| Info 09/27/2007 14:38:31 crserv: SNMP Open failed (trap port in use?) Info 09/27/2007 14:38:32 evnail: started; fromuser=snnpc, fromhost=127.0.0.1, auth=no Tc SNMP Server Started Normal 09/27/2007 14:38:32 localhost Trend Report Agent Connected to Server Normal 09/27/2007 14:38:32 localhost Trend Report Agent Connected to Server Normal 09/27/2007 14:38:32 localhost Trend Report Agent Connected to Server Normal 09/27/2007 14:38:32 localhost Trend Report Agent Connected to Server Normal 09/27/2007 14:38:32 localhost Trend Report Agent Connected to Server Normal 09/27/2007 14:38:32 localhost Device Responding to Poll [d > Current Alistory (TG3220) Custom 2 (Custom 3 (Custom 4 (Custom 5 (Custom 7 (Custom 8 (Custom 5 (Custom 7 (Custom 8 (Custom 5 (Custom 5 (Custom 7 (Custom 8 (Custom 5 (Custom 5 (Custom 7 (Custom 8 (Custom 5 (Custom 7 (Custom 8 (Custom 5 (Custom 7 (Custom 8 (Custom 7 (Custom 7 (Custom 8 (Custom 7 (Custom 7 (Custom 7 (Custom 8 (Custom 7 | * * * | |
| For Help, press Fl [ocalhost Administ MARMA @ 3 1 @] [] Tean Team - COM1 VI]]] TC SNMP Management C] [] BhYiew - TC8518 [] [] Common | trator Superviso) 答 下午 02:39 | .r ə |

Figure 5-2 Third Party SNMP Manager

5.4 SNMP Trap Management

Figure 5-3, *SNMP Trap Display* shows two examples of Alarm Traps sent from the TC8518 to the SNMP Manager Software on the administrator's desktop.



Figure 5-3 SNMP Trap Display

Chapter 6

6.1 Introduction

Alarm conditions occur whenever an optical or electrical problem (fault conditions) is detected by the TC8518. Under normal operation, all LEDs for the T1/E1 ports with a valid signal present should be lit (solid green). All T1/E1 Ports with no electrical signal present, should be Off.

| ŗ | | ALL DA | | - T1/ | E1 - | | | | |
|---|----|--------|-----|-------|------|----|----|----|--|
| | 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | |
| | 00 | 00 | 0.0 | 00 | | 00 | 00 | 00 | |
| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | |

T1/E1 Port 1-16

Figure 6-1 TC8518 T1/E1 Port Status

The Ethernet LINK/ACT LED is solid green when a port is connected and link signal is present (the signal will flash when activity is present). The FULL/COL LED will be lit depending on the incoming signal. (If the Ethernet signal is 10/100Mbps and full duplex, the FULL/COL and 100M LEDs should be lit). If the Ethernet connection is not 100Mbps or if it is half duplex, then both FULL/COL and 100M LEDs will be off.



Figure 6-2 TC8518 Ethernet Port Status

The Optical A and B (If unit is equipped with Optical Redundancy) LEDs should be lit (Solid Green). The MGMT Port LEDs, The 100M LED will be lit if the signal is 100Mbps or off if the signal is 10Mbps.



Figure 6-3 TC8518 Optical Port Status

6.2 All LEDs are "OFF"

If no LEDs are lit on the unit, check the power supply, connector plug, and/or the power source. If the problem persists, contact the Technical Support Department at TC Communications, Inc.

Warranty Breach Warning Note:

Do not, for any reason, open the TC8518 unit. If you suspect of any problems with the unit, contact the Technical Support Department at TC Communications, Inc. for assistance. If the unit is opened without prior authorization from TC Communications, it will result in the loss of warranty.

6.3 "Alarm Condition" - ALARM LED on the front panel

When an alarm condition is detected, the "ALARM" LED will flash red, and the dry contact relay will close or open depending on which contact you use. By default, the following fault conditions will cause the alarm to be triggered:

- 1. Optic signal lost from "RxA" (or "RxB" on dual optic models).
- 2. Optic signal is marginal, which causes invalid data packets to be received; the "Rx-A" (or "Rx-B") LED will be flashing.
- 3. The remote unit lost power.



Figure 6-4 TC8518 Alarm Status

6.4 Optic Cable Types

Conventionally, fiber optic cable with yellow-colored insulation is used for Single Mode applications; gray or orange-colored insulated cable is for Multimode use. If Multimode cable is used in a Single Mode application, the test results could be erroneous and confusing.

6.5 Calculating the loss on the Fiber

The fiber optic link and/or connectors are frequently the source of various problems. Check out the connectors and the integrity of the link first. Ideally, the link should be calibrated for total loss after the installation has been completed. This will accomplish two things: (1) it will verify that the total loss of the link is within the loss budget of the device and (2) it will provide a benchmark for future testing. For example, a system that has been tested as having 6dB total loss when installed and suddenly tests out as having a loss of 10dB probably has a connector or link problem.

These are the reference values we use to calculate the loss on the fiber:

| Multimode 1310nm | : | 2 dB loss per km on 62.5/125µm cable* |
|--------------------|---|---------------------------------------|
| Single Mode 1310nm | : | 0.5 dB loss per km on 9/125µm cable* |
| Single Mode 1550nm | : | 0.25 dB loss per km on 9/125µm cable* |

*Reference only. TCCI recommends an OTDR reading be used to determine actual link loss.

Figure 6-5 Reference for Calculating Fiber Loss

6.6 Loopback Tests

Loopback tests assist troubleshooting by helping in pinpointing the source of error. The TC8518 is a sophisticated product designed with multiple advanced technologies. Loopback tests have been implemented to test independent components of it.



Figure 6-6 Loopback Unit Diagram

6.6.1 T1/E1 Local Loopback Test

Local loopback is used to test wiring and the T1/E1 transceiver functionality. It can be enabled and disabled by sending a CSU Loop-up (10000) or Loop-down (100) pattern from the T1/E1 electrical side.

6.6.2 Optical Local Loopback Test

Optical local loopback tests if the optical transceivers on the local TC8518 are operating properly.

6.6.3 Ethernet Local Loopback Test

Ethernet local loopback tests if the Ethernet capabilities on the local TC8518 are operating properly.

6.6.4 T1/E1 Remote Loopback Test

T1/E1 Remote Loopback tests both the remote TC8518's optical transceivers and its T1/E1 capabilities. Please refer to Figure 6-8, *Local Loopback Tests*.

6.6.5 Ethernet Remote Loopback Test

Ethernet Remote Loopback tests the remote TC8518's optical transceivers and Ethernet capabilities.



Figure 6-7 Ethernet Remote Loopback Test

T1/E1 Local Loopback



Figure 6-8 Local Loopback Tests

6.7 Loopback Test - Remote Ethernet



Figure 6-9 Remote Loopback: Ethernet Tests



Figure 6-10 Loopback Test - T1/E1 Remote

6.8 T1/E1 CSU loop up & loop down codes

The TC8518 supports CSU up (10000) and CSU down (100) codes by automatically enabling loopbacks. CSU line code monitoring is disabled by default and can be configured using CLI by issuing the following command:

tle1 loop_code_monitor_set

Alternatively one can go to the T1/E1 Diagnostic webpage and set it up there. The options are Disabled, Enable Local and Enable Remote. By setting it to Enable Local, the device will be monitoring the incoming T1/E1 signal going to the RJ48 port for loop codes and will enable/disable local loopback accordingly. Using the Enable Remote setting will monitor the T1/E1 signal coming in from the remote unit (over the OC/3 signal) and enable / disable the remote loopback accordingly.

The diagram below shows the T1/E1 signal flow and related loopbacks.



T1/E1 Remote loopback

Figure 6-11 T1/E1 Remote Loop Back Signal Flow

| TC8518 Unit A Loop Monitor | TC8518 Unit B Loop Monitor | Functionality |
|-------------------------------|-------------------------------|--|
| Disabled | Enable Remote | This setting allows the Telco to send loop codes that will enable/disable the remote loopback on Unit B for a specific T1 channel. |

T1/E1 Local loopback



Figure 6-12 T1/E1 Local Loop Back Signal Flow

| TC8518 Unit A Loop Monitor | TC8518 Unit B Loop Monitor | Functionality |
|-------------------------------|-------------------------------|---|
| Enable Local | Disabled | This setting allows the Telco to send loop codes that will enable/disable the local loopback on Unit A for a specific T1 channel. |



T1/E1 Local loopback

Figure 6-13 T1/E1 Both Units Loop Back Signal Flow

| TC8518 Unit A Loop Monitor | TC8518 Unit B Loop Monitor | Functionality |
|-------------------------------|-------------------------------|---|
| Enable Local | Enable Local | This setting allows the Telco to enable/disable Unit A's local loopback by sending loop codes from the CO side. Also, loop codes sent from the demarcation side will enable/disable the local loopback on unit B. |

A.1 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.

A.1.1 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).

A.1.2 Limitation of Liability

- 1. In no event shall the total liability of T C COMMUNICATIONS, INC. to purchaser and/or end user for all damages including but not limited to compensatory, consequential and punitive damages, exceed the total amount paid to T C Communications, Inc. by purchaser for the goods from which the claim arose, in no event shall T C COMMUNICATIONS, INC. be responsible for indirect and consequential damages.
- 2. In no event shall liability attached to T C COMMUNICATIONS, INC. unless notice in writing is given to T C COMMUNICATIONS, INC. within ten days of the occurrence of the event giving rise to such claim.
- 3. T C COMMUNICATIONS, INC. shall not be responsible for delays or nondeliveries directly or indirectly resulting from or contributed to by foreign or domestic embargoes, seizure, fire, flood, explosion, strike, act of God, vandalism, insurrection, riot, war, or the adoption or enactment of any law, ordinances, regulation, or ruling or order or any other cause beyond the control of T C COMMUNICATIONS, INC.
- 4. T C COMMUNICATIONS, INC. shall not be responsible for loss or damage in transit and any claims for such loss or damage shall be filed by the purchaser with the carrier.

B.1 Overview

This manual contains instructions which must be observed to ensure your own personal safety and to avoid damage to devices and machinery.

B.2 Certified Usage

Please observe the following: the TC8518 may only be employed for the purposes described in the catalog and technical description, and only in conjunction with external devices and components recommended or approved by TC Communications. The product can only be operated correctly and safely if it is transported, stored, installed and assembled properly and correctly. Furthermore, it must be operated and serviced carefully.

B.2.1 Qualification Requirements for Personnel

Qualified personnel as understood in this manual and the warning signs, are persons who are familiar with the setup, assembly, startup, and operation of this product and are appropriately qualified for their job. This includes, for example, those persons who have been trained or directed or authorized to switch on and off, to ground and to label power circuits and devices or systems in accordance with current safety engineering standards.

B.2.2 National and International Safety Regulations

Ensure that the electrical installation meets local or nationally applicable safety regulations. The product can be used in living areas (living area, place of business, small business) and in industrial areas.

All LED components conform to the following standard; Light Emitting Diode - Class 1 Led Product.

| NOTE | Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations. |
|------|---|
| | These requirements are designed to provide sufficient protection against interference where the device is being used in a business environment. The device creates and uses high frequencies and can radiate at the same frequencies, and if it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a living area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference. |

B.2.3 Recycling

After usage, this product must be disposed of properly as electronic waste in accordance with the current disposal regulations of your county / state / country.

B.3 Power Supply

This device is electrically operated. Adhere strictly to the safety requirements relating to voltages applied to the device as described in the *Specifications* (TC8518), on page 1-10.

B.3.0.1 General Safety Instructions

The TC8518 is designed for operation with a safety extra-low voltage. It may only be connected to the supply voltage connections and to the signal contact with SELV circuits with the voltage restrictions in accordance with IEC/EN 60950-1. The supply voltage is electrically isolated from the housing.

- Use only undamaged systems! See *Unpacking*, on page 2-1.
- Relevant for North America: For Use in Class 2 Circuits. The subject unit is to be supplied by a Class 2 power source complying with the requirements of the National Electrical Code, table 11(b). If the power is redundant supplied (two individual power sources) the power sources together should comply with the requirements of the National Electrical Code, table 11 (b).
- Relevant for North America: Use 60/75°C or 75°C copper wire (CU) only.
- Relevant for North America for devices certified for hazardous locations: Peripheral equipment must be suitable for the location it is used in. Power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods [Article 501-4(b) of the National Electrical Code, NFPA 70] and in accordance with the authority having jurisdiction.
- The device does not contain any service components. Internal fuses only trigger if there is a fault in the device. If the device is not functioning correctly, or if it is damaged, switch off the voltage supply and contact TC Communications customer service.

• Only switch on the supply voltage to the device if the housing is closed, the terminal blocks are wired up correctly and the terminal blocks are connected to the correct type of voltage supply.

B.3.0.2 Grounding

All TC Communications products are fully grounded and are in compliance accordance with all regulations and *Specifications (TC8518)*, on page 1-10.

B.3.0.3 Housing

Only technicians authorized by TC Communications are permitted to open the housing and break the seal.

- Ensure that the electrical installation meets local or nationally applicable safety regulations.
- Never insert pointed objects (thin screwdrivers, wires, etc.) into the inside of the ventilation holes in the side of the housing! Failure to observe this point may result in injuries caused by electric shocks.

B.4 Environment

"Industrial Hardened" and "Industrial Ethernet" describe communications products designed to operate in industrial process control environments or geographical locations where harsh conditions are common.

To meet this level of durability, "Industrial" grade (synonyms for "industrial" commonly include "rugged," "outdoor," "hardened," and "substation hardened") TC's communications products are manufactured with special components, connectors and circuitry. This ensures reliable operation in the event of wide temperature swings, electromagnetic interference (EMI), radio interference, vibrations, or moisture and humidity fluctuations. Conformal coating is optional.

TC Communications Industrial Grade products are designed to exceed pertinent industry specifications. For example, communications equipment used in power substations are subject to extremes of temperature and humidity, as well as electrical transients from high voltage switching.

These environmental conditions are described in industrial standard specifications IEC 61850-3 and IEEE 1613 for networking devices. Similarly, equipment used for traffic control applications are required to withstand roadside vibration in addition to high/low heat and humidity. Testing standards pertinent to traffic control are described in the environmental requirements of the NEMA TS-2 standard.

Every TC Communications product passes through "live operating temperature" testing (unlike randomly selected products for statistical sampling) before it is shipped. Each unit is connected to an operating BER tester to ensure error-free operation while the temperature chamber cycles from -40°C to 80°C during the 24 hour testing period.

_

| • | • The installation location is to be selected so as to ensure compliance with t climatic limits listed in the Technical Data. | | | | |
|---------|---|--|--|--|--|
| • | Ensure the following criteria in site selection; | | | | |
| | - Room for adequate ventilation and cable routing. | | | | |
| | - Reserve space at least 0.5 m at the front and rear of the unit for human access, cables, and air flow. | | | | |
| Importa | • 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 | | | | |

Glossary

| _ | |
|---|--|
| Λ | |
| A | |
| | |

| ALM | A front panel LED that indicates an alarm. See SNMP Query, on page 5-1. |
|-----------|--|
| В | |
| Bandwidth | A range of frequencies available for signaling; the differences between the highest and lowest frequencies of a band are expressed in (Hz). |
| Bridge | A device used to connect two separate LANs or used to divide a large LAN into smaller LANs. Each LAN acts as its own LAN, but uses a bridge device to communicate from one LAN to another. |
| Bus | Path or channel, usually electrical, with one or more conductors, where all devices are able to receive all transmissions at the same time. |

С

Counter-Rotating Ring Aka. Self-Healing Ring; has two physical transmission lines or rings with transmitting and receiving signals in each ring traveling in opposite directions. If the line or a device along the ring fails, the ring re-anneals by bypassing the device and or line and forms with the other ring to form a new single ring.

D

| DCE | Acronym for Data Communication Equipment, aka. Data Circuit-Terminating Equipment. |
|------|--|
| DCAR | Acronym for Dry Contact Alarm Relay |
| DTE | Acronym for Data Terminating or Data Terminal Equipment. |
| DTR | Acronym for Data Terminal Ready. |

Ε

| EIA | Acronym for Electronic Industries Association. EIA, a standards body, has a set of standards which includes data communications and interface standards among others. |
|----------|---|
| Ethernet | Product name for one of the first popular LAN technologies, later standardized as |

Product name for one of the first popular LAN technologies, later standardized as IEEE 802.3.

F

| Fiber Optic Cable | Thin filaments of glass or other transparent material sheathed in an insulator through which a light beam may be transmitted for long distances by means of multiple internal reflections. A waveguide used to transmit digital information. |
|----------------------|--|
| Flow Control | A method for a receiver to control the information flow from a transmitter. It eliminates data overflow at the receiver. |
| FPGA | Acronym for Field Programmable Gate Array. |
| Full Duplex | A communication method where both ends can transmit and receive simultaneously. |

Η

| Half Duplex | A communication method where one end transmits while the other end receives, then reverses the process. |
|-------------|---|
| Hub | A device for local area networks (LANs) that is used to interconnect multiple devices over an internal bus. |

| IGMP Snooping | IGMP snooping is the process of listening to IGMP network traffic. IGMP snooping, as implied by the name, is a feature that allows a layer 2 switch to "listen in" on the IGMP conversation between hosts and routers by processing the layer 3 IGMP packets sent in a multicast network. |
|---------------|---|
| IP Address | An Internet Protocol (IP) address is a numerical identification (logical address) that is assigned to network devices, in this case the TC3848-1. Each TC3848-1 in the network will have its own unique IP address. |

L

LAN

A local area network is a group of PCs connected over a common medium within a building.

Μ

| MAC | An optical fiber that supports more than one propagating mode of light propagation. |
|-----------------|---|
| MIB | A management information base (MIB) stems from the OSI/ISO Network management model and is a type of database used for managing the devices in a communications network. It comprises a collection of objects in a (virtual) database used to manage entities (such as routers and switches) in a network |
| MGM | This LED indicates if the unit is managed by TC8518 Management card from the backbone. See <i>SNMP Query</i> , on page 5-1. |
| Multimode fiber | An optical fiber that supports more than one propagating mode of light propagation. |
| Multiplexer | Aka. or Multiplexor or Mux,. A device using several communications channels at the same time, transmits and receives messages and controls communications lines, may be a microprocessor. |
| MSTP | In MSTP, you can create a multiple groups for different types of VLANs and then run single instance of spanning tree for a single group of VLANs. But in traditional Per-VLAN Spanning Tree (PVST), there is a different instance of spanning tree for each VLAN. Single instance for a group of VLANs reduce the number of Bridge Protocol Data Units (BPDU), root bridges and root ports in the network. You can perform a proper load balancing across redundant links using MSTP group instances. |
| MSTR | The indicates whether the unit is a slave or master unit as it relates to its place in a ring. To determine the SHR slave/master setting for this unit. See <i>SNMP Query</i> , on page 5-1. |

Ν

- **N/A** Acronym for not applicable.
- **Node** A network-connected device, such as a server or PC.

0

OSI

(Open Data Interconnection Reference Model) - This is the International Standards Organization (ISO) model of how data communications systems can be interconnected. Communication is partitioned into seven function layers. Each layer builds on the services provided by those under it.

Ρ

| Packet | A grouping of data, usually consisting of data and an address header prior to being sent over a network. |
|----------|--|
| Polling | The method used for terminal to controller communications. The controller systematically asks for each terminal if it needs to transmit to the controller. |
| Protocol | A set of rules for data communication. All devices communicating together must adhere to the same rules. |
| PWR | The Power Source A and B are continuously monitored in the event of a failure. This LED indicates the condition. See <i>SNMP Query</i> , on page 5-1. |

Q

QoS Quality of service. In the field of computer networking and other packetswitched telecommunication networks, the traffic engineering term quality of service (QoS) refers to resource reservation control mechanisms rather than the achieved service quality. Quality of service is the ability to provide different priority to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow.

R

| DIN Rail | A DIN rail is a metal rail of a standard type widely used for mounting circuit breakers and industrial control equipment inside equipment racks. |
|---------------|--|
| Reserve Space | Reserve space is the distance between the cables or unit that allows for human access, cables bends that will not harm connections, and air flow. |
| Ring | Path or channel; usually electrical, where devices along the path receive transmissions sequentially from one device to the next along the ring. |

| | Router | Similar to a bridge but provides more complex and flexible networking support. It usually also supports WANs. |
|---|----------------------|--|
| | RS-232 | An interface used between DTE and DCE employing serial binary data interchange, defined by EIA, aka. EIA-232. Similar to standard V.24 of CCITT. |
| | RSTP | Rapid Spanning Tree Protocol. RSTP, as defined in the IEEE 802.1w, is an evolution of the Spanning Tree Protocol (STP). It provides for faster spanning tree convergence after a topology change and provides a loop free topology for any LAN or bridged network. |
| S | | |
| | SFP | The Small Factor-Form Pluggable Transceivers (SFP) is a hot-swappable input/output device that plugs into the Gigabit Ethernet port or slot, linking the port with the network. |
| | SNMP | (Simple Network Management Protocol) - A standard management protocol used to provide a common means of managing network devices. |
| | Single mode fiber | An optical fiber that supports only one mode of light propagation above the cutoff wavelength. |
| | SP | Strict Priority. See WFSQ. |
| | Subnet Mask | It is an IP address count prefix, that identifies an IP network. Each device within the network has a common, designated IP address routing prefix. Usually used for networks, this address is 255.255.255.0. |
| | | |

Т

TCP/IPAcronym for Transmission Control Protocol/Internet Protocol.TelnetIt is a network protocol used on the internet or local area networks to provide a
bidirectional interactive communications facility. Typically, telnet provides
access to a command-line interface on a remote host via a virtual terminal
connection which consists of an 8-bit byte oriented data connection over the
Transmission Control Protocol (TCP). User data is interspersed in-band with
TELNET control information.Tree structureA tree structure is a way of representing the hierarchical nature of a structure in a
graphical form.

U

Unit status Provide alarm co this Ma

Provides the Administrator with overall report of the TC8518 JumboSwitch. Any alarm condition reported by an interface card installed in the unit monitored by this Management Interface card will not only generate an alarm local to the reporting interface card but also at the Unit Status page.

V

| Vcc | This indicates that there is power supplied to the unit. See <i>SNMP Query</i> , on page 5-1. |
|--------------|---|
| Virtual Path | A software-controlled point-to-point connection between two devices or segments. |
| VLAN | A virtual LAN, commonly known as a VLAN, is a group of hosts with a common set of requirements that communicate as if they were attached to the same Broadcast domain, regardless of their physical location. A VLAN has the same attributes as a physical LAN, but it allows for end stations to be grouped together even if they are not located on the same network switch. Network recon figuration can be done through software instead of physically relocating devices. |

W



A computer network interconnected over distances beyond a city or metropolitan area.

Weighted fair queuing scheme (WFQS) is a data packet scheduling technique allowing different scheduling priorities to statistically multiplexed data flows.

| 802.1 | IEEE 802.1 is a working group of the IEEE 802 project of the IEEE. It is concerned with: |
|--------|--|
| | • 802LAN/MAN architecture |
| | • Internet working among 802 LANs, MANs and other wide area networks |
| | • 802 Link Security |
| | • 802 overall network management |
| | protocol layers above the MAC and LLC layers |
| 802.1Q | VLAN Tagging, is a networking standard written by the IEEE 802.1 workgroup allowing multiple bridged networks to transparently share the same physical network link without leakage of information between networks. |
| 802.1p | Is a 3 bit field within an Ethernet frame header when using tagged frames on an 802.1 network. It specifies a priority value of between 0 and 7 inclusive that can be used by Quality of Service (QoS) disciplines to differentiate traffic. |

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