TC3340 4-Port Switching/Bridging Ethernet Fiber Optic Media Converter with Rate Control

User's Manual

TC COMMUNICATIONS FIBER OPTIC CONNECTIVITY
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1 User's Manual

TC3340 Switching/Bridging Ethernet Fiber Media Converter w/ Rate Control

1.1 Scope

This User Manual contains a description of TC Communications Ethernet, Fiber Optic, Media Converter or Multiplexer. The TC3340 is frequently used by Data Service Providers to control the bandwidth they offer to customers. It is also used for its ability to transmit over long distances (100km or farther) without connecting to additional hardware, e.g. a Switch or a Router. Standard Temperature option is (-10C to +50C), the Hardened Temperature option enables it to be used in extreme environments (-20C to +70C) and Extreme Temp (-40C to +80C).

Content and Format

The content of the User's Manual is intended to provide clear, complete descriptions of the following information about the system:

- Overview: Features, Description, Site Selection and Mechanical Installation.
- Product Diagram, Pin Assignments and Configuration
- Installation and Quick-Start Guide.
- Web Management: Status, Alarms, IP Settings and Advanced Configuration.
- Console Management: Settings, Telnet and Firmware.
- SNMP Management. Query, 3rd Party Software and Trap Management.
- Troubleshooting, Maintenance and Loopback Testing.
- Return Policy and Warranty Information.

1.1.1 User's Manual Content

The User's Manual contains the following:

a. Overview

b. Installation and Quick-Start Guide

c. Management through Web

d. Management through Console/Telnet

e. SNMP Management

f. Troubleshooting/Maintenance & Testing

g. Return Policy and Warranty

h. Command Line Interface

i. Important Notice

1.1.1.1 Content Description

The User's Manual is a comprehensive document that describes the realized benefits from deployment of the TC Communications TC3340 Switching/Bridging Fiber Media Converter in a network design.

1.1.1.1.1 Overview

a. The Overview describes the TC3340 as a Switching/Bridging Ethernet Fiber Media Converter with Rate Control. It consists of 2 ports of 10/100/1000 Base-T copper and 2 Gigabit SFP ports of 1000SX/LX fiber. The copper ports support Auto-Negotiation and Auto-Sensing features, and the SFP ports support multimode or single mode optics.

1.1.1.1.2 Installation and Quick-Start Guide

a. The Installation and Quick-Start Guide describe how to unpack, inspect and perform initial setup of the TC3340 unit in a typical network application.

1.1.1.1.3 Management through Web Application

a. The Web Management application is an integral interface designed into your TC3340. This simple interface is may be accessed through any Ethernet ports on the front of the unit. In this section we step you through the setup and initialization of the unit.

1.1.1.1.4 Management through Console Telnet Session

a. The TC3340 may also be accessed over your LAN using a hyper-terminal or Telnet session to configure the unit. In this section we will describe how to interface with the unit in a Telnet session to set the system configuration.

1.1.1.1.5 SNMP Management

a. The TC3340 comes standard with a built in SNMP Agent. The MIB file that TC provides is compatible and may be run on any 3rd party SNMP Management software.

1.1.1.1.6 Troubleshooting/Maintenance and Testing

a. In the Troubleshooting and Maintenance section we will provide you with the tools to manage your TC3340 for the lifecycle of the product. This section contains detailed troubleshooting aids and test criteria.

1.1.1.1.7 Return Policy and Warranty

a. In the event you need servicing of your TC3340, this section of the manual provides detailed instructions for our Return Policy and Warranty Conditions.

2 Overview

The TC3340 10/100/1000M 4-port Switching Fiber Optic Ethernet Media Converter converts or connects 10/100/1000Base-TX (UTP) networks to 1000Base-SX/LX (fiber optic) networks.

2.1 Features

- 2 Ports 10/100/1000 Base-T with Auto-Negotiation and Auto-Sensing
- 2 SFP Ports 1000SX/LX: Multimode or Single mode
- Rate Control (128kbps to 285Mbps)
- Ethernet VLAN
- Remote Monitoring (RMON) Statistics
- Standard Temp (-10℃ to +50℃), (Hi-Temp (-20℃ to +70℃) and Extreme Temp (-40℃ to +80℃) Versions (optional)
- One Fiber Bi-Directional Optic (optional)
- Quality of Service (QoS)
- Management Using Web, SNMP, Console, and Telnet
- Distances up to 550meters on Multimode 850nm, 2km on Multimode 1300nm and 100km on Single Mode 1310nm/1550nm
- Optical Redundancy and Self-Healing Feature
- Standard Power Redundancy
- Power Supplies Available: 115/230VAC, 12 VDC, 24VDC, -48VDC
- Local Dry Contact Alarm Relay
- Network Time Protocol (NTP)
- Rackmount or Standalone

2.2 Description

The TC3340 10/100/1000M 4-port Switching Fiber Optic Ethernet Media Converter converts or connects 10/100/1000Base-TX (UTP) networks to 1000Base-SX/LX (fiber optic) networks. It includes 2 Ports 10/100/1000 Base-T and 2 SFP Ports 1000SX/LX:

Multimode or Single mode over single mode (1300/1550nm) or multimode fiber (850nm/1300nm).

Rate Control gives users, especially data service providers, the ability to control or limit bandwidth. Data rates for Rate Control can be set at 128K, 256K … 5Mb, 10Mb … 140Mb, and 285Mb. The TC3340 can be managed through Web, SNMP, Telnet, or Serial Console.
Password protection is provided. The Quality of Service feature enables the TC3340 to provide packets with priority assignment.

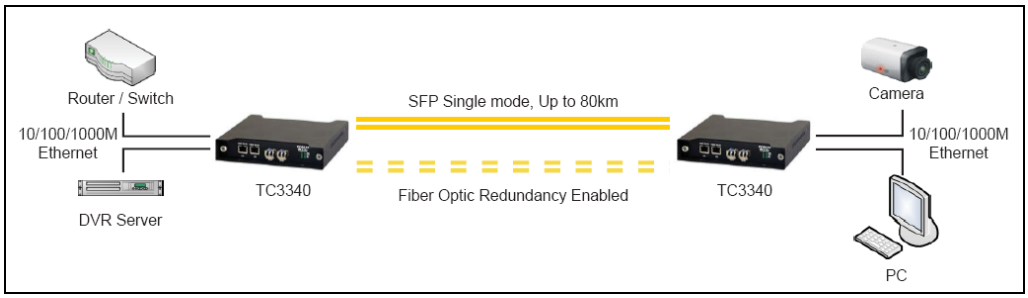
The TC3340 includes a built-in switch that enables distances up to 100km without additional hardware (e.g. Switch or Router). Transparent to the network, it operates effectively even during high demand traffic loads.

Configuration settings can be stored and recovered to simplify network administration, and firmware can be remotely upgraded. Virtual LAN (VLAN) and Network Time Protocol (NTP) are supported. The TC3340 supports single mode distances up to 100 km (1550nm laser) and works with all standard fiber optic cable. A One Fiber Bi-Directional single mode version is available. Fiber optic connectors are LC. The UTP connector is RJ-45 Female.

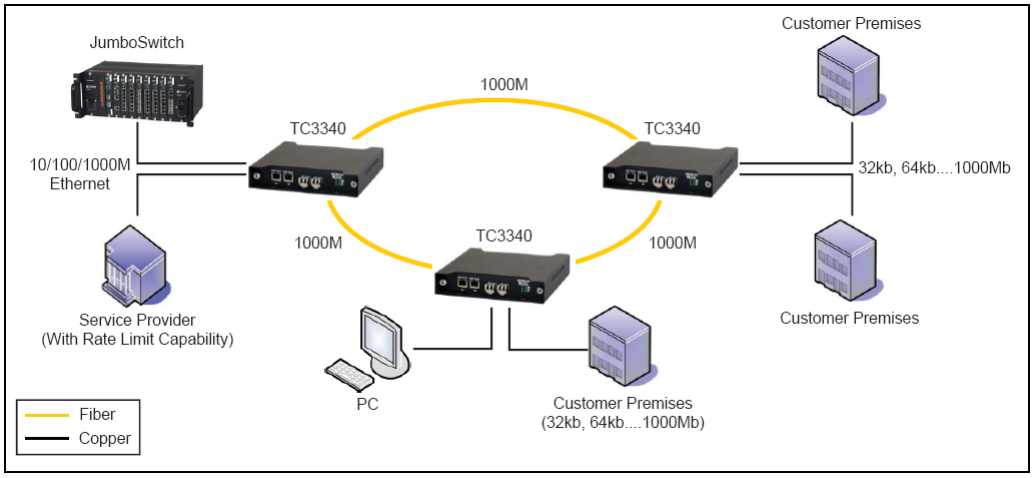
Standard temperature range is -10°C to 50°C. Optionally, the high-temp version ranges -20°C to 70°C. The optional extreme-temp version ranges from -40°C to 80°C, exceeding NEMA and CalTrans specifications.

Power source options include 12 VDC, 24VDC, -48VDC or 115/230VAC with an external power cube, and power redundancy is standard. TC3340 is available standalone or rack mount (up to 10 cards per Rack Assembly).

The TC3340 offers plug and play flexibility, maximizing application to the industrial community. Examples of typical installation applications include *"Link Redundancy"*



or a *"One-Fiber Bi-Directional"* option to form a Ring Network.



2.3 Site Selection Criteria

The following is a site selection guideline to select a proper installation site for the TC3340.

- Location of the TC3340 unit should be part of the central office equipment layout design. Considerations should be given to entrance cable routing.
- The installation site should provide proper room for adequate ventilation and cable routing. Reserve at least 0.5 m at the front and rear of the unit for human access, cables, and air flow.
- The site should provide a stable environment. The operating area should be clean and free from extremes of temperature, humidity, shock, and vibration.

2.4 Mechanical Installation

The TC3340 is a Standalone or Rack-mount unit, which offers redundant power supplies as a standard. The power supplies are 2 Plug-in boards located on the rear panel.

The TC3340 offers 5 different power supply options:

- 115/230VAC
- 12VDC (WARNING: (Vin -) is connected to Frame Ground)
- 24VDC (WARNING: (Vin -) is connected to Frame Ground)
- -48VDC (WARNING: (Vin +) is connected to Frame Ground)

Figure 1 TC3340 Standalone Unit Configuration

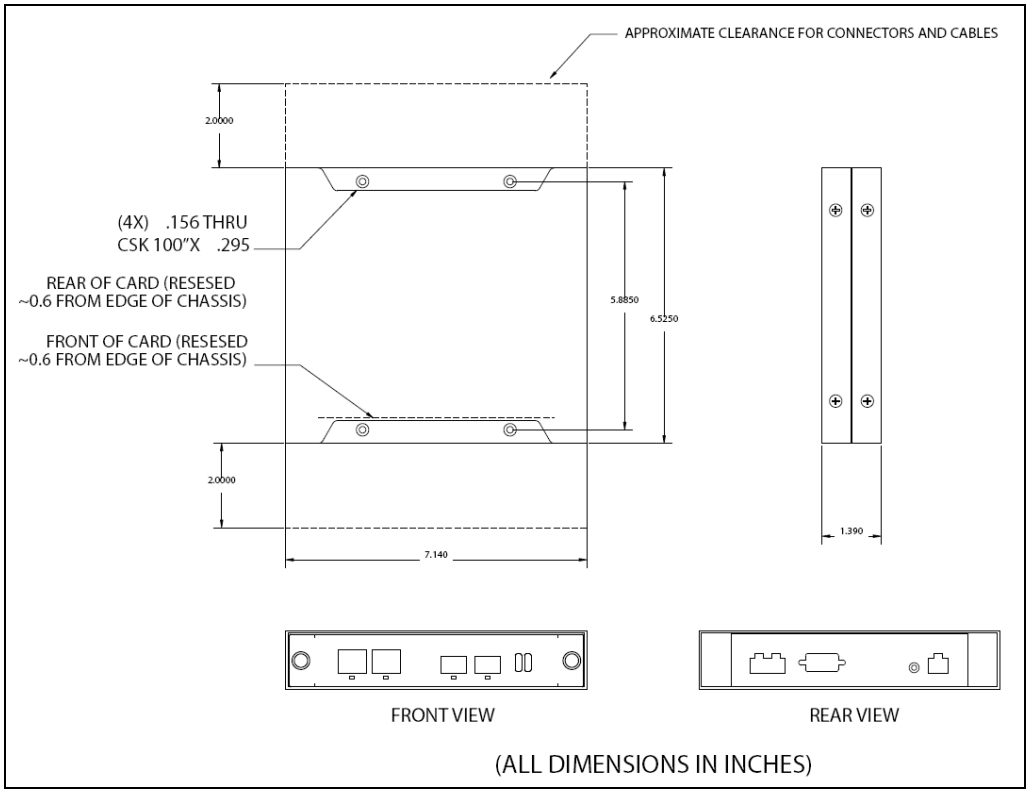


Figure 2 TC3340 Product Diagram - Dimensions

2.5 Connecting the Ring Structure

When you are building or adding to a ring structure using the 4-port Switching Fiber Optic Ethernet Media Converter you must connect the fiber cables as shown in the diagram below.

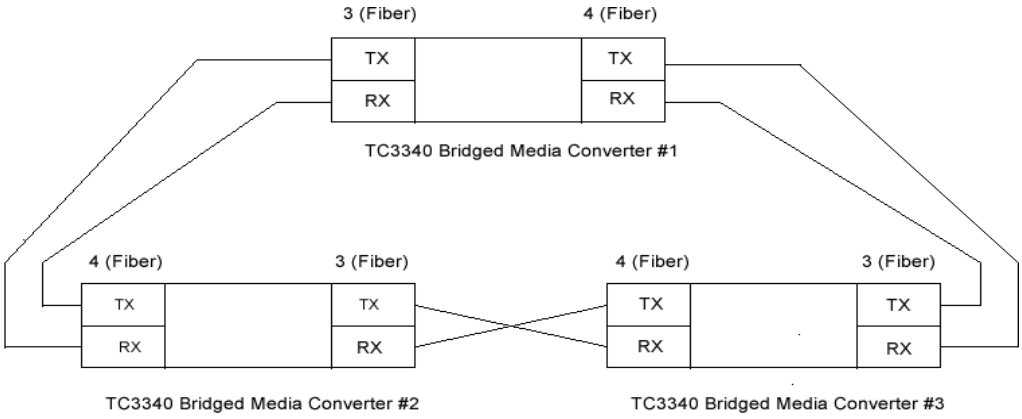


Figure 3 TC3340 Ring Structure

2.6 Front Panel Connectors and Indicators

The TC3340 front panel consists of 2 RJ-45 ports for Ethernet connectivity and two SX/LX fiber port connectors as shown in Figure 3 below. The RJ-45 connectors furnish LED indications for Link Established/Activity, Full Duplex Operation/Collision Detection and 100Mbps Operation. The Fiber Optic Connector also furnishes LED indication for Link Activity, Full Duplex Operation and 1000Mbps Operation. Self Healing Ring status and Master indicator, Unit LEDs include: Alarm Indication, Power Source A and Power Source B available, Power On (VCC) Indication and Watchdog Timer Indication.

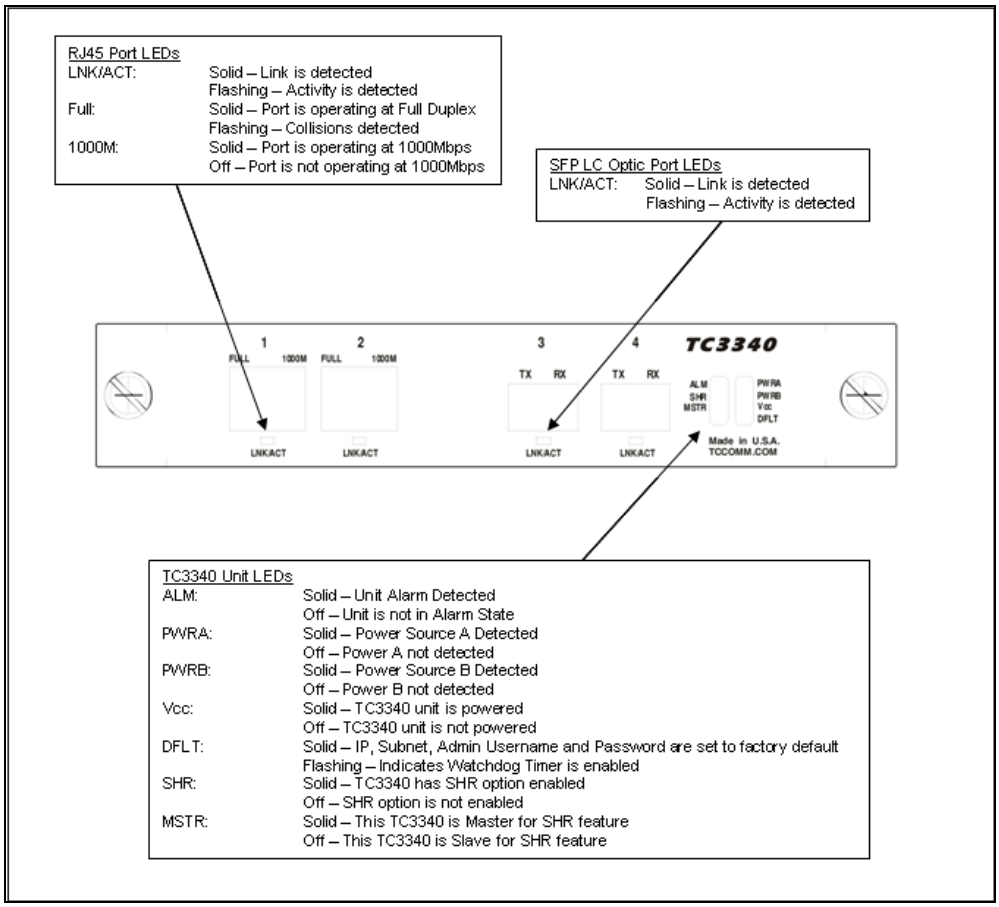


Figure 4 TC3340 Front Panel Connectors and Indicators

2.6.1.1.1 Optical, Line and Port Specifications

Optical Fiber Interface	
Wavelength	850/1300 nm Multi-mode
	1310/1550 nm Single Mode
Connector	LC
Loss Budget	15dB Multimode 850nm @62.5/125µm
	20dB Single Mode 40KM 1310/1550nm @9/125µm* * Check Factory for Optics Options

Table 1 TC3340 Power and Indicators

Optical Fiber Interface Characteristics			
Multi-mode*			
Wavelength (nm)	Connector	Distance (km)	Loss Budget (dB)
Uni-direction 850	LC (Small Form Factor Connector)	550m[2]	12
1310	LC	2	10
Single Mode*			
Uni-direction 1310	LC	20	15
1310	LC	40	20
1550	LC	60	20
1550	LC	80	25
Single bi-direction 1310/1550	LC	20	12
	LC	40	22
Single bi-direction 1490/1550	LC	60	22

Table 2 TC3340 Optical Fiber Interface Characteristics
* Specification may vary, check with factory.

Ethernet Switch
• 2 port 10/100/1000 Mbps half/ full duplex Ethernet Switch • Support VLAN and QoS

Table 3 TC3340 Ethernet Switch

Physical/Electrical	
Dimensions	7.14 x 1.39 x 6.53 in / 18.13 x 3.53 x 16.59 cm (W x H x D)
Mounting	Standalone or 19 inch rack mount
Power Source (AC)	115/230 VAC, 50/ 60 Hz
Power Source (DC)	12VDC 24VDC -48VDC
Power Protection	Standard Redundancy
Temperature Range	-10°C to 50°C (Standard); -20°C to 70°C (High Temp); -40°C to 80°C (Extreme Temp);

Table 4 TC3340 Console

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

Table 5 Compliance Items

2.7 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.

DC Power Connector			
CONDITION	PIN NUMBER	SIGNAL	DESCRIPTION
Using +12VDC or +24VDC	1 (LEFT)	+V	+12VDC or +24VDC
	2 (RIGHT)	-V (Connect Chassis GND)	DC Return
Using -48VDC	1 (LEFT)	+V (Connect Chassis GND)	DC Return
	2 (RIGHT)	-V	-48VDC

Table 6 DC Power Connector Contacts

Console	
Connector	Serial DB-9 on rear panel
Electrical	RS232 Interface
Baud Rate	9600
Pin 2	TXD
Pin 3	RXD
Pin 5	GND

Table 7 TC3340 Console

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

Table 8 Console Port

Dry Contact	
Normally Closed (NC)	Left Pin
Common (COM)	Right Pin

Table 9 Dry Contact Pin Assignment

2.8 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

Table 10 Network Management (WEB/SNMP/CLI/TELNET)

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

Table 11 SNMP

Ethernet (RJ45)		
Configuration	Option	Default
Cable Type	CAT 5E or CAT 6	Straight Through or Cross-over
Ports	Enable, Disable	Enable
Speed/Duplex	10/100/1000Mbps, Full/Half/Auto	Auto Sensing/Auto-negotiation
Priority (QoS)	0 - 7	0
Flow Control	Enable, Disable	Disable

Table 12 Ethernet Port Settings

3 Installation and Quick Start Guide

3.1 Unpacking the Unit

Before unpacking any equipment, inspect all shipping containers for evidence of external damage caused during transportation. The equipment should also be inspected for damage after it is removed from the container(s). Claims concerning shipping damage should be made directly to the pertinent shipping agencies. Any discrepancies should be reported immediately to the Customer Service Department at TC Communications, Inc at (949) 852-1973.

3.2 Equipment Location

The TC3340 should be located in an area that provides adequate light, work space, and ventilation. Location of the TC3340 unit should be part of the central office equipment layout design. Considerations should be given to entrance cable routing. The installation site should provide proper room for adequate ventilation and cable routing. Reserve at least 0.5 m at the rear of the unit for human access, cables, and air flow. 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.

3.3 Dry Contact Alarm Relay

The "ALM RLY" terminal block connector on the rear panel provides for the Dry Contact Alarm Relay. There are 2 pins on the terminal block, from left to right, NC (normally closed), and COM (common) please refer to Section 2.5. When an alarm condition occurs the NC relay will be forced to the OPEN position, and the NO relay will be forced to the CLOSED position (the "Alarm" LED will light). This relay can be used in conjunction with an external device to monitor the TC3340's operation. The alarm switch will only be activated when the TC3340 is under normal operation; it will not be activated when the unit is in a diagnostic (test) mode.

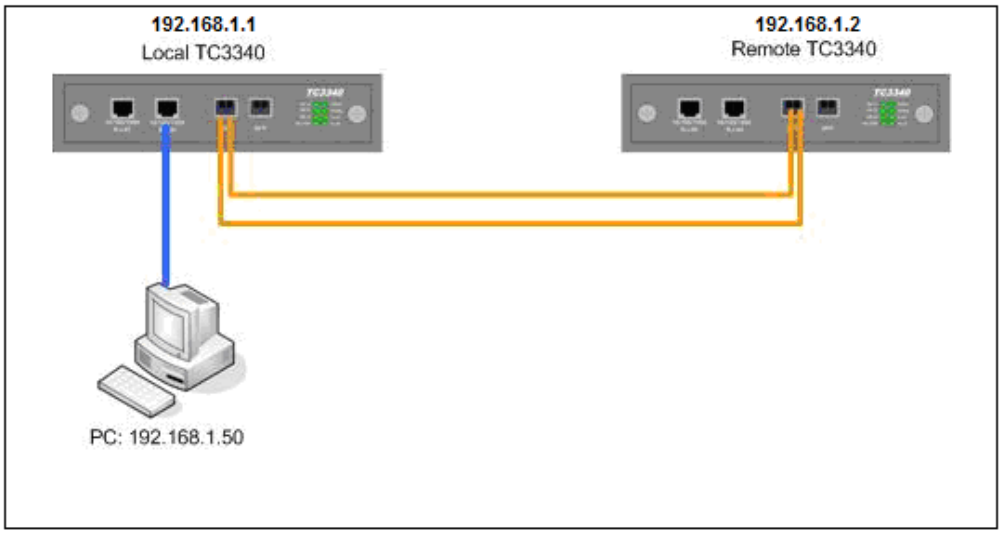
3.4 Quick-Start Guide

This section describes the basic TC3340 configuration and setup.

3.4.1 Installation Procedure Summary

Quick Start Guide for your TC3340

The TC3340 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 TC3340 Ethernet port; with a web browser, enter http://192.168.1.1/; login with **username "*admin*"** and **password "*admin*"**.

Note: Most TC Communications devices come with standard default IP address assignment of 192.168.1.1. If two devices are connected with default addresses, this condition will cause unpredictable behavior. Be sure to assign a unique IP Address to each unit before making any connections between two units.

2. Click on “Basic Settings” on the left column to label and describe the TC3340.

3. Click on “IP Settings” to set up the new IP address for the TC3340.

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

4. Repeat the steps for the second TC3340 unit. Using the PC, ping both TC3340s to verify a connection. We will refer to the first unit as the “local unit” and the second unit as the “remote unit.”

5. Connect fiber optic cables between the local & remote units using the SFP connectors. With a PC connected to only one TC3340, ping both units to verify a connection.

6. For Ethernet (10/100/1000Base-T) signals, connect the Category 5 cable to one of the RJ-45 switch ports on the front panel of the TC3340. Observe that the 1000M, FULL, and LINK/ACT LEDs are on correct. If the Ethernet signal is 10 or 100Base-T and half duplex, the 1000M and FULL LEDs should be off. If the Ethernet signal is 1000Mbps and full duplex, the 1000M and FULL LEDs should be lit solid.

Category 5 Cable Notes:

The TC3340 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 TC3340 can detect the speed of the Ethernet connection without having to configure it.

Restore Default Notes:

If for any reason the unit needs to be set back to the factory default, simply hold the "reset" push button at the back panel for 7 seconds and release. The unit will restart and reconfigure itself with factory default settings.

3.5 Management through the Web

The management web page can be accessed through any Ethernet ports on the front panel (RJ-45 connectors and SFP ports) using a PC and a web browser. The TC3340's default IP address is 192.168.1.1. Thus, the PC's IP address must be set within the range of 192.168.1.2 to 192.168.1.254 (make sure no other network device is sharing this IP address), and with subnet mask of 255.255.255.0.

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

You can also change the IP address of the TC3340 by matching it up with that of your PC, refer to Initial IP Setting Using the Console Section.

3.5.1 Login

Once you enter the IP address into your web browser and press Enter, you will see the login window where you will be prompted to enter a username and password. **Both the user name and password are "admin".**

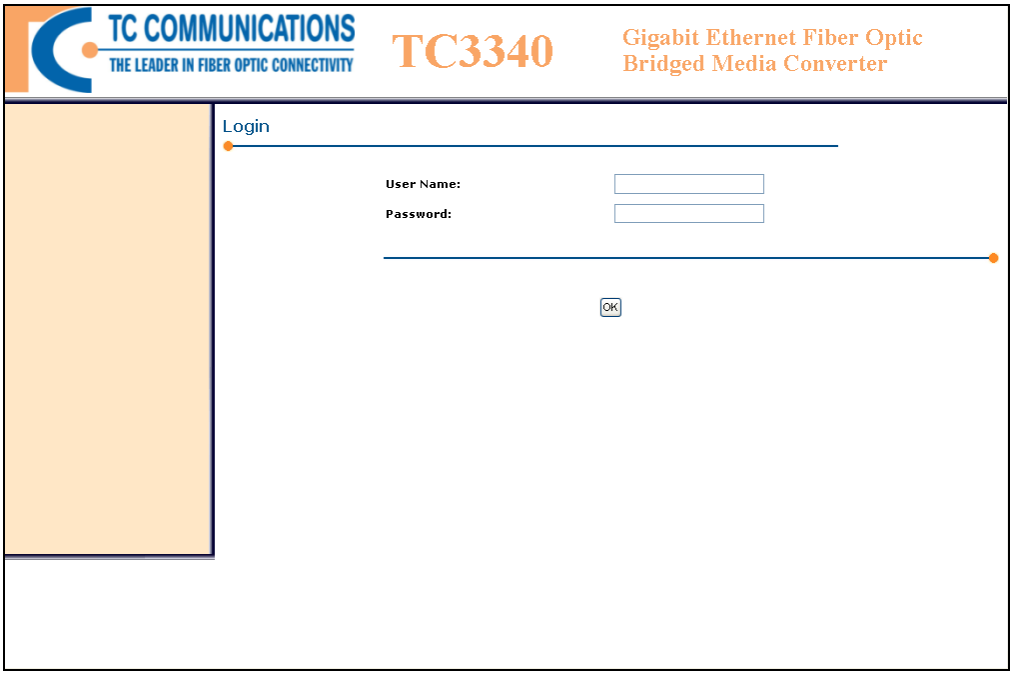


Figure 5 Web Application - Login Screen

3.5.2 Home Page

The Home Page displays an overall view of the TC3340.

Unit Status: Displays the time duration the TC3340 has been powered on. It separates the time into days, hours, minutes, and seconds. It also displays the voltage and current usage.

Self-Healing Ring (SHR) Status: Displays the current status of the SHR or *FlashRing*™ feature with respect to this TC3340 and if any SHR enabled units are detected on the Ring.

Port Status: Displays the status of all three Ethernet RJ-45 ports and the Fiber port.

The Ethernet ports & Fiber port show the following status for: Port In Use, Speed/Duplex, Flow Control and Link status.

Unit Temperature: The temperature is for reference only. Under normal operating conditions, the unit temperature will be ~15°C higher than the ambient temperature.

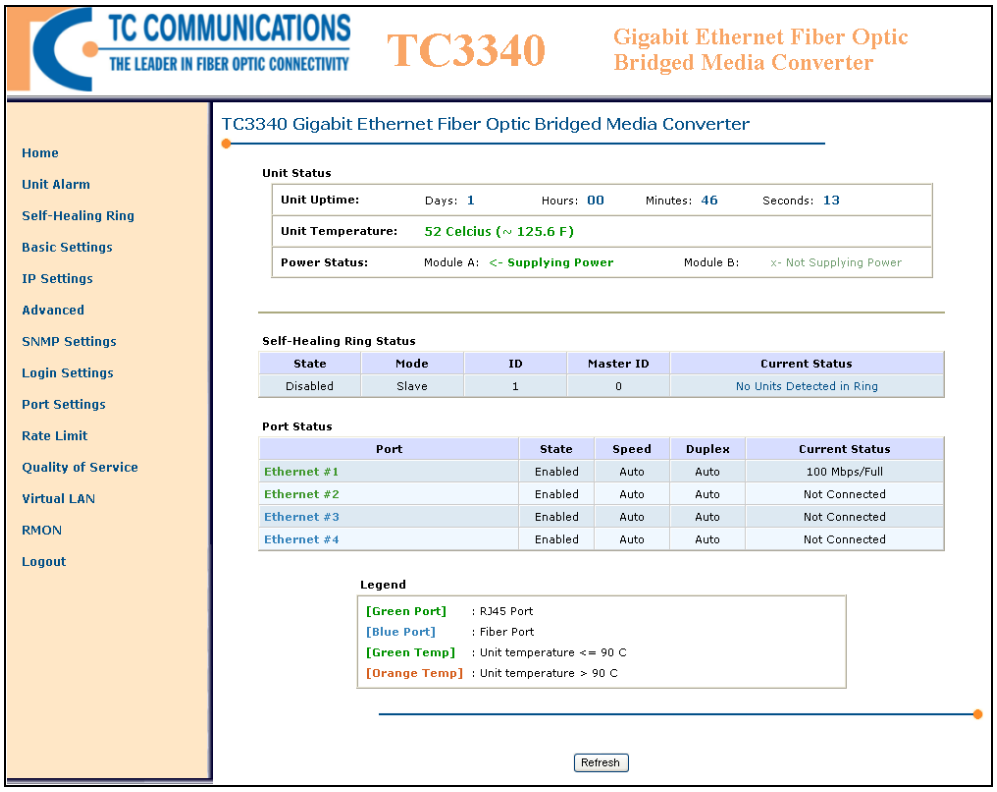


Figure 6 Web Application – Home Page Screen

3.5.3 Unit Alarm

The Unit Alarm page displays the alarm status of the entire TC3340 unit. Alarm trigger criteria can be set on this page. User must click on "Apply" for changes to take effect.

Unit Alarm Status: Displays the TC3340 alarm condition.

Unit Alarm Settings:

Alarm Buzzer Enabled: Enables TC3340 to have an audible alarm to sound when a fault is detected.
Dry Contact Enabled: Allow an external device to signal alarm condition.

Alarm Trigger Criteria: Click the 'Modify' button to configure the alarm triggers. Please refer to Section 4.3.1.

Clear Alarm: Clears all alarm signals on the TC3340. 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 TC3340. 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.

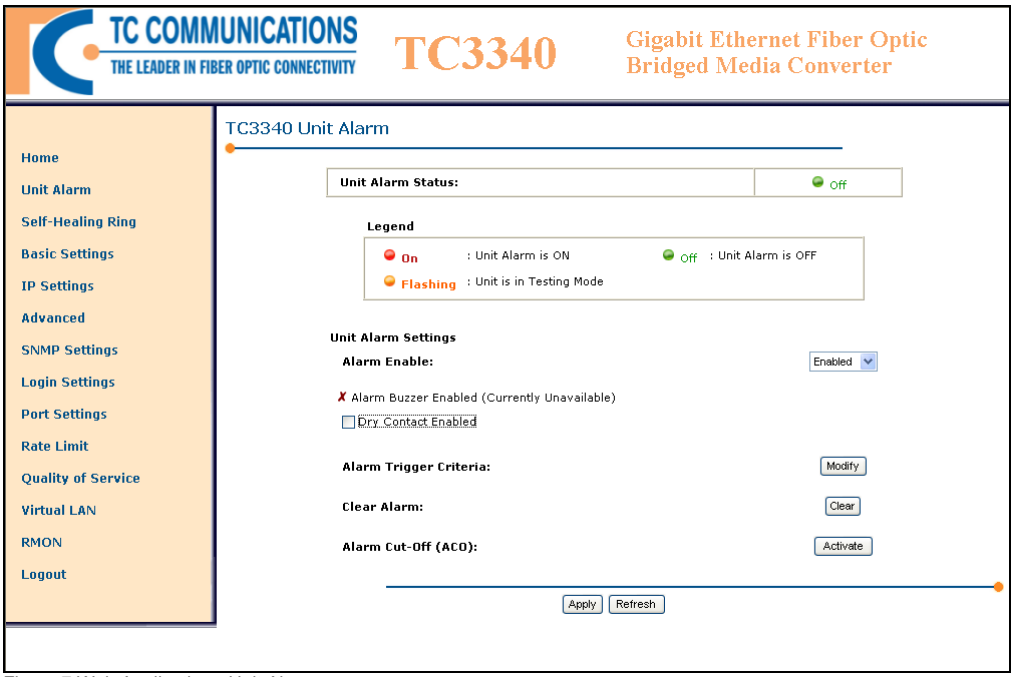


Figure 7 Web Application - Unit Alarm

3.5.3.1 Unit Alarm Criteria

The Unit Alarm Criteria page categorizes all possible alarm triggers for Ethernet ports, SHR Status, 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.

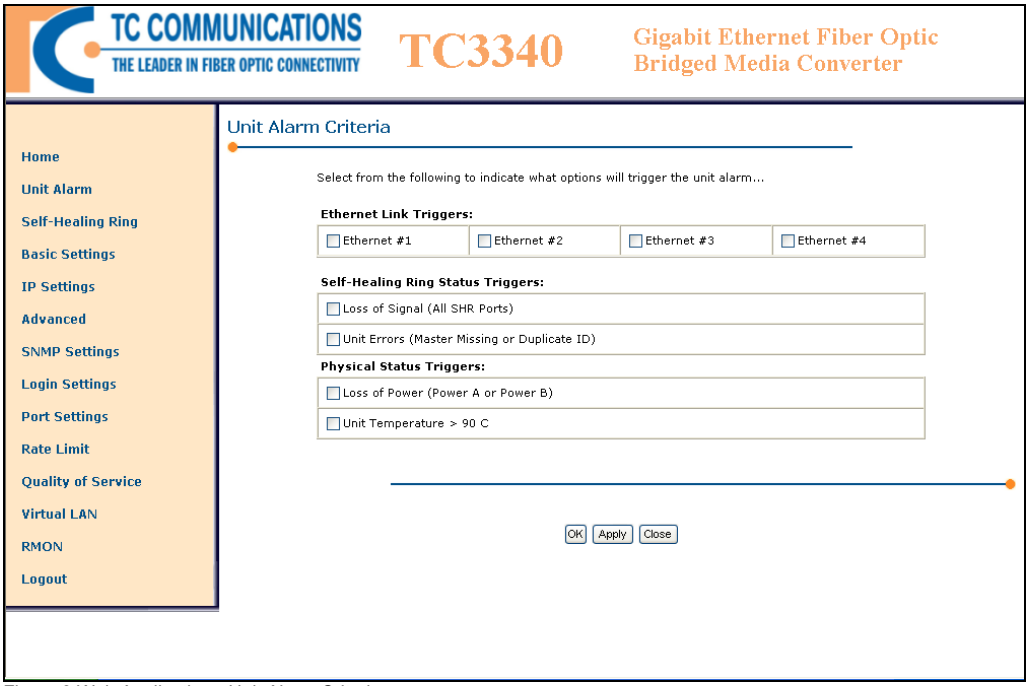


Figure 8 Web Application - Unit Alarm Criteria

3.5.4 Self-Healing Ring

The Self-Healing Ring (SHR) page provides the option of enabling the SHR or *FlashRing*™ feature of the TC3340 to achieve fiber optic redundancy. When two TC3340s are connected via dual fiber optic links in either single or multi-mode, this option is available to protect the integrity of the fiber link.

The Self-Healing Ring page shows the current SHR status of the fiber ports. To enable the feature select the "Settings" tab to access the settings page.

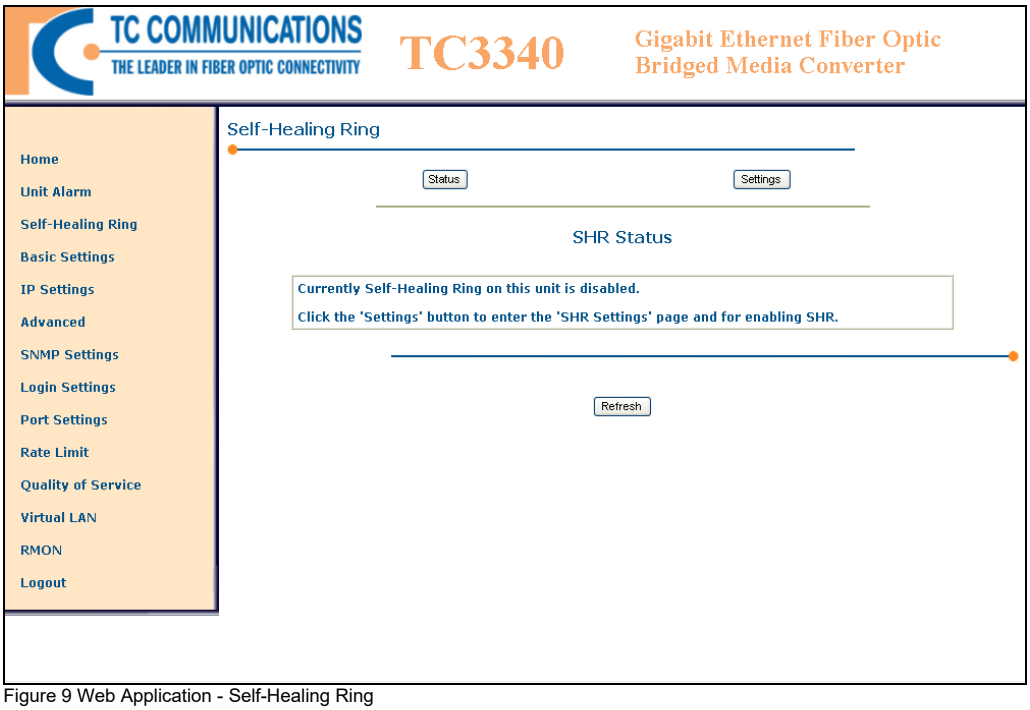


Figure 9 Web Application - Self-Healing Ring

Once navigated to the "Settings" page, the user will be presented with the option of selecting either Enabled or Disabled from the drop down menu to activate the feature as shown below.

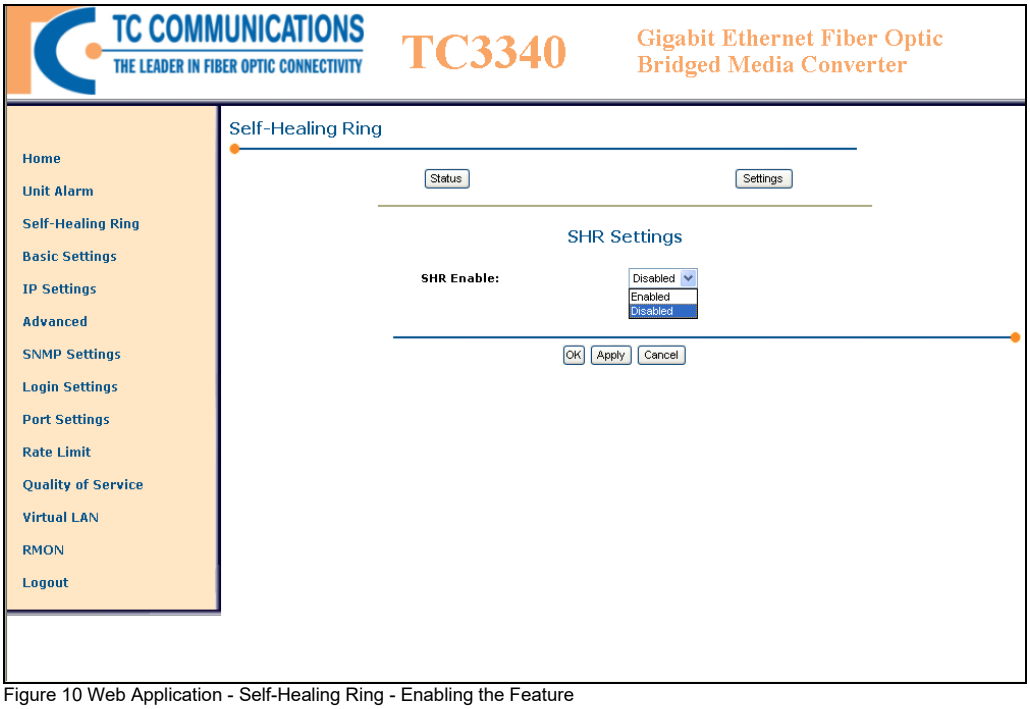


Figure 10 Web Application - Self-Healing Ring - Enabling the Feature

Once the feature is enabled from the drop down menu, the user will be presented with the settings applicable to the SHR feature. From the "Settings" page, the user may now select either Slave or Master mode for the TC3340 that is being configured, assign an SHR ID and identify the SHR Master ID as shown below.

NOTE: Only one unit should be set to "Master" and all other units should be set to "Slave". All slave units must identify the Master's SHR ID by entering it to the SHR Master ID field.

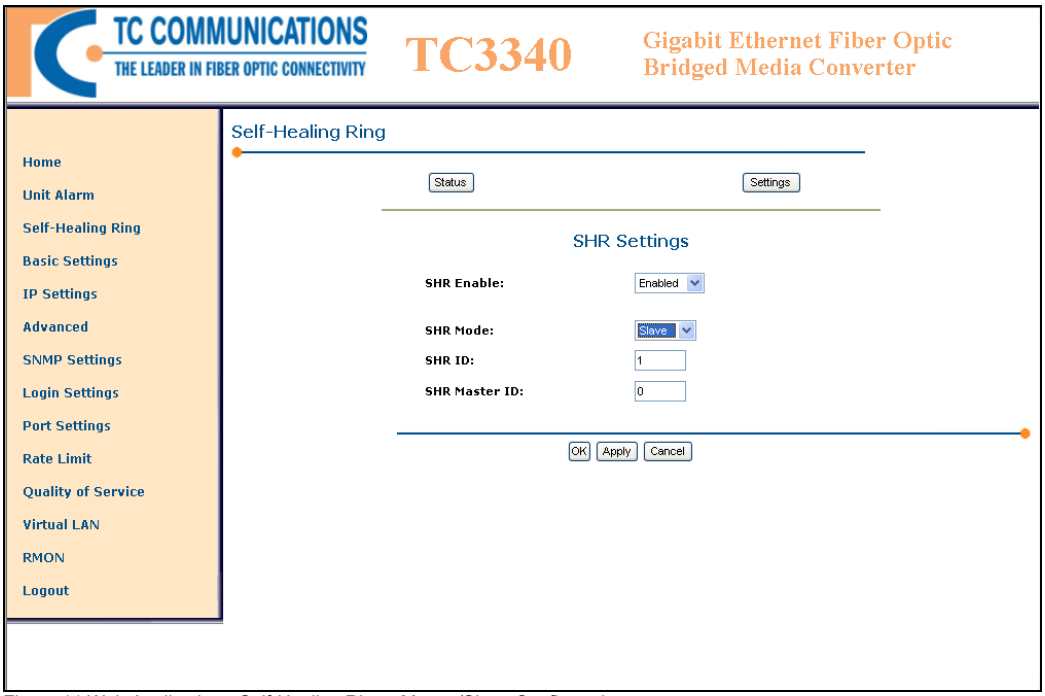


Figure 11 Web Application - Self-Healing Ring - Master/Slave Configuration

3.5.5 Basic Settings

Click the "Basic Setting" link on the left side of the page and you will see the window below, and you can begin the configurations. You may change the values of the fields as you like.

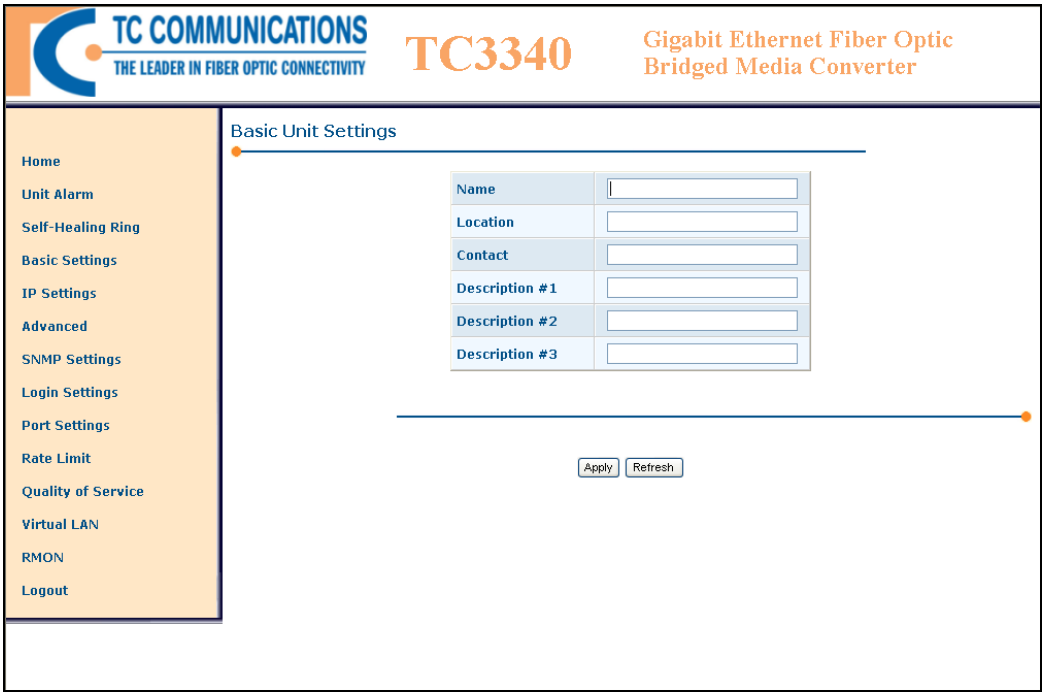


Figure 12 Web Application – Basic Settings

3.5.6 IP Settings

To configure the IP settings for Management and User, click the "IP Setting" link on the left side of the page. On the IP settings window, enter the IP addresses, Subnet Masks and Default Gateways as shown on the figure below. Domain Name Systems (DNS) can also be entered here. Only the Login Level Admin has access to both the Management and User IP settings. This gives the Administrator full control of both IP settings. The user has access to only the User IP settings. The Administrator may also configure the unit to automatically assign IP Address from a DHCP server using the "IP Options" Dropdown menu.

IP Address Aliases allows the unit to be accessed from different IPs. For example, a service provider may want the TC3340 in the 192.168.1.x network. If a customer needs access to this unit but not access to the service provider's network, an additional IP for the TC3340 can be set up, such as 30.30.0.100.

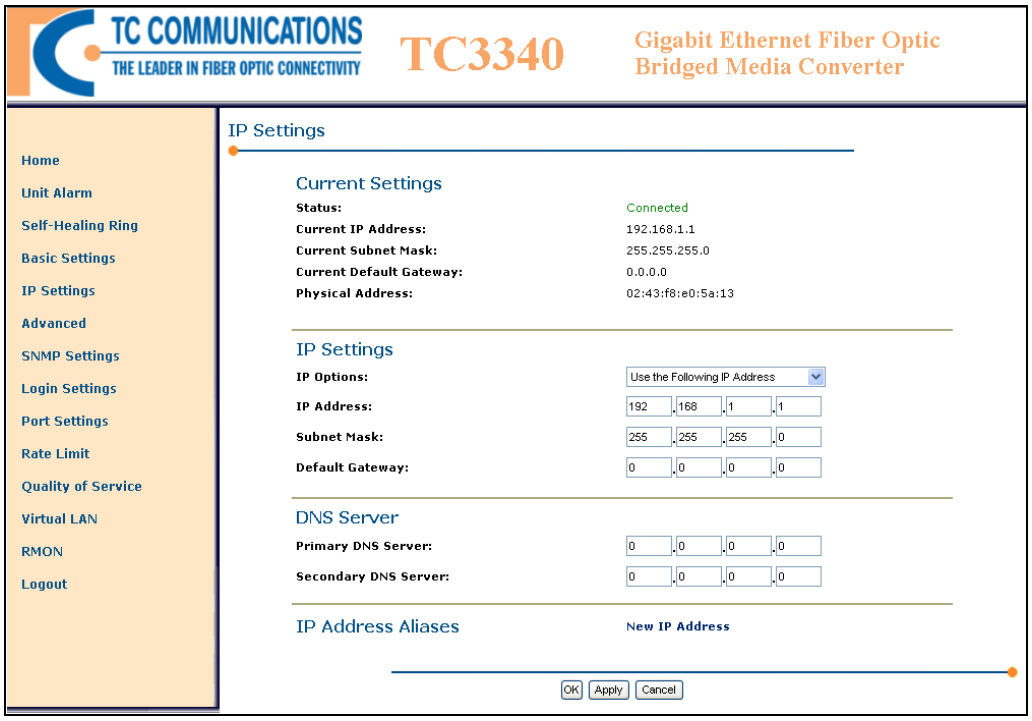


Figure 13 Web Application – IP Settings

3.5.7 Advanced Settings

This page gives you access to the advanced settings for the TC3340. Click on the corresponding icon to access the advanced setting.

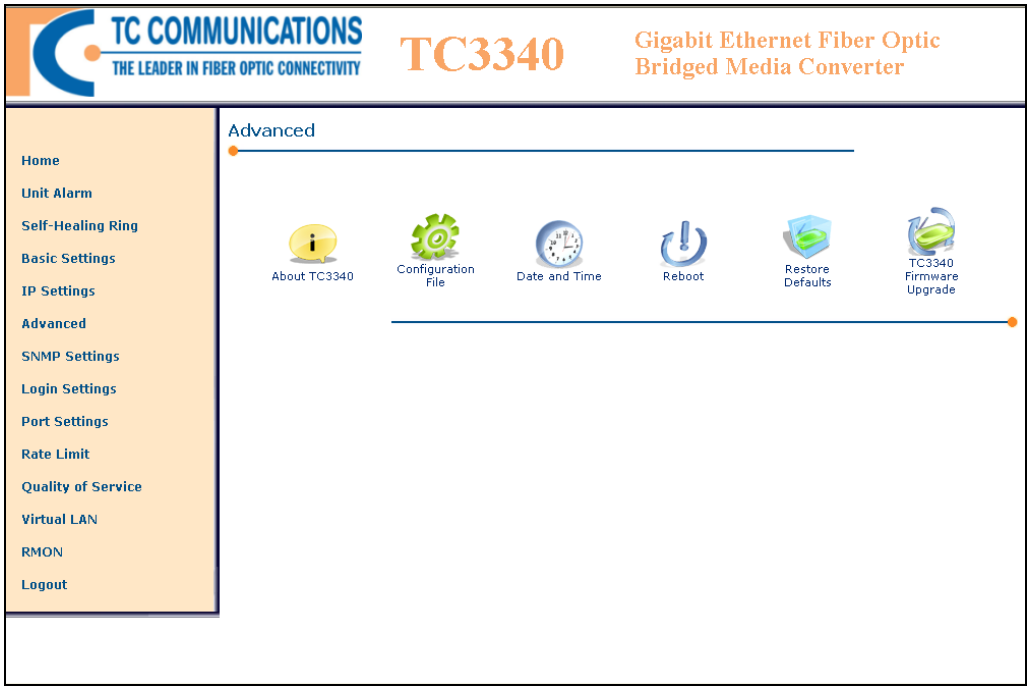


Figure 14 Web Application – Advanced Settings

3.5.7.1 About TC3340

The About TC3340 page displays technical information regarding the TC3340 hardware and software. Contact information for TC Communications is also displayed.

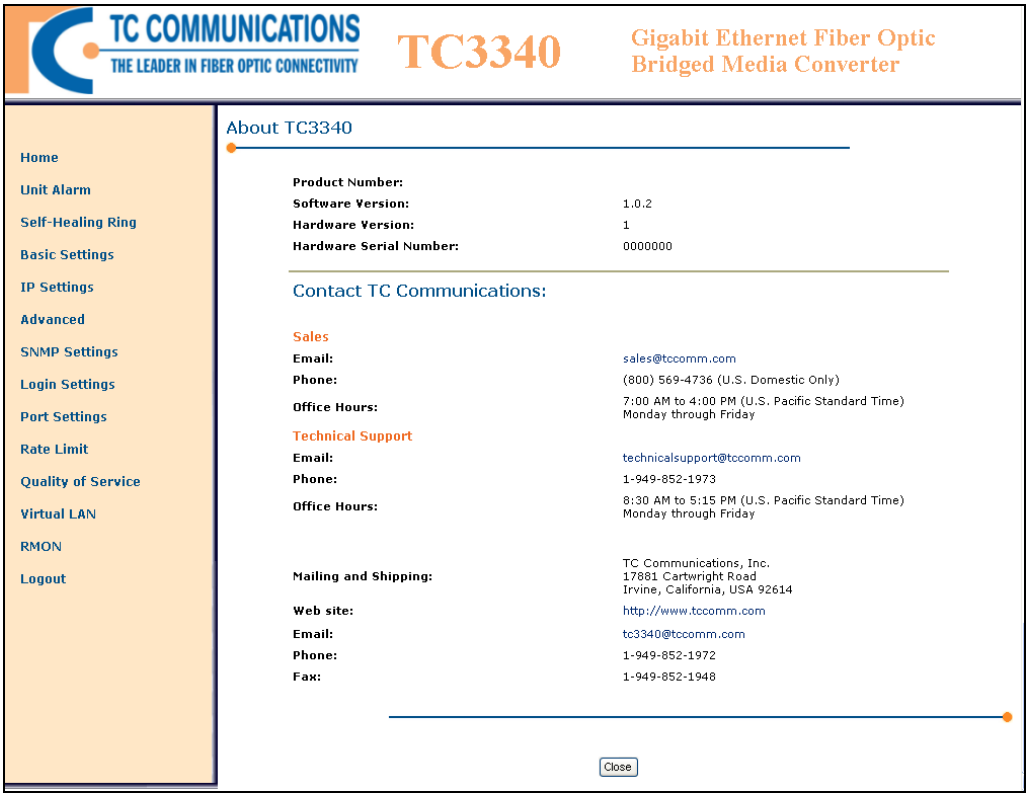


Figure 15 Web Application – Advanced Settings: About TC3340

3.5.7.2 Configuration File

The Configuration File page allows the Network Administrator to save current TC3340 settings or load previously saved TC3340 settings.

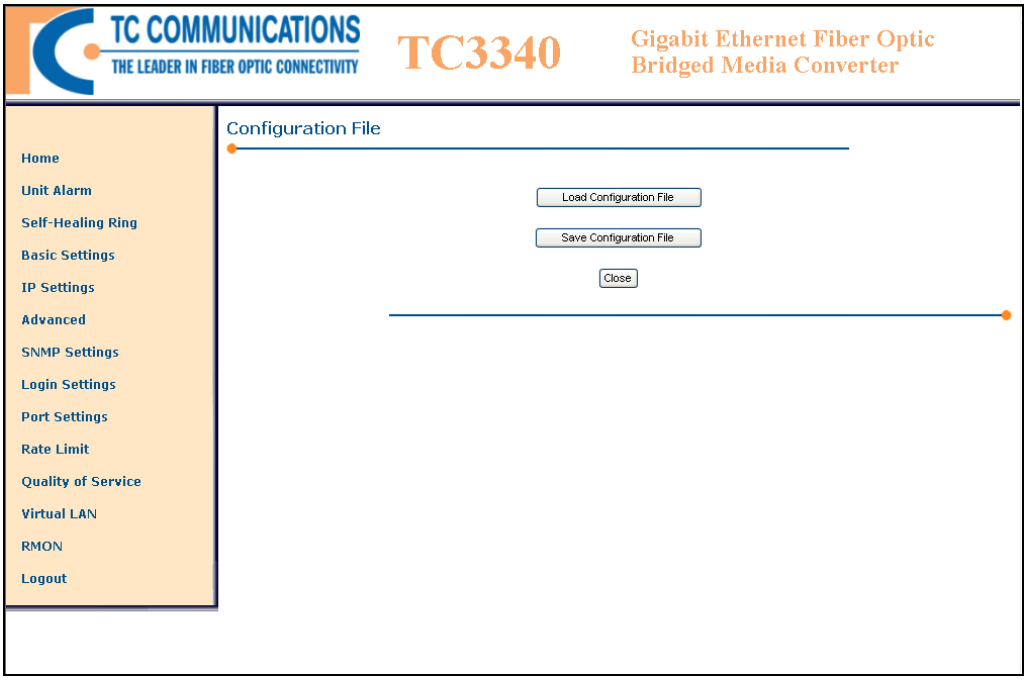


Figure 16 Web Application – Advanced Settings: Configuration File

3.5.7.2.1 Load Configuration File

When "Load Configuration File" is selected, the user may choose the configuration file that he wishes to load by browsing the network or a locally connected computer.

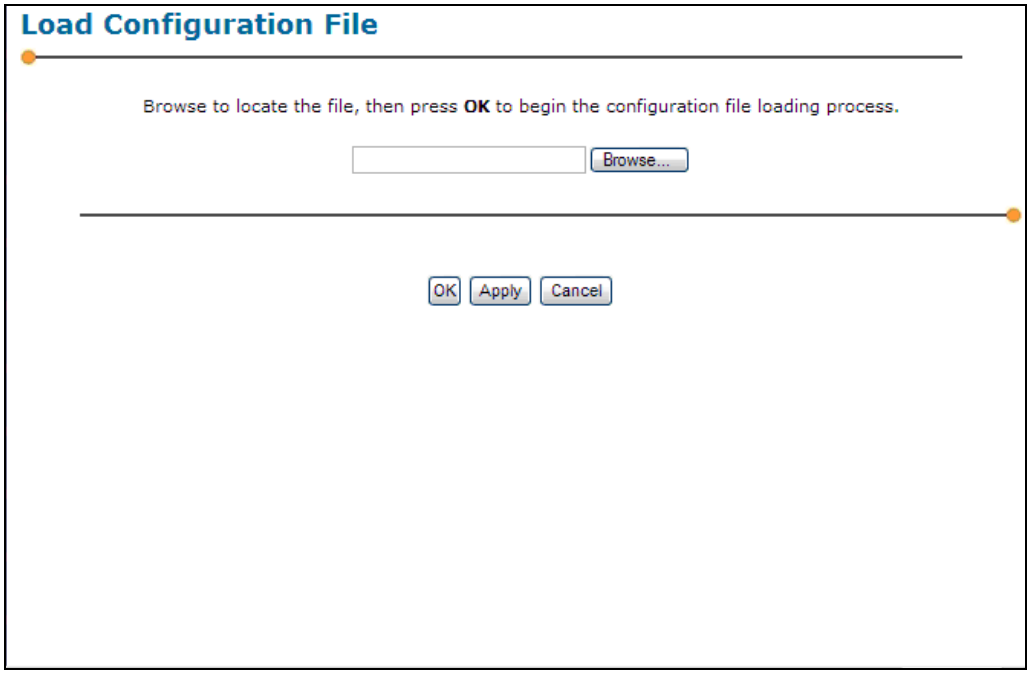


Figure 17 Web Application – Advanced Settings: Load Configuration File

3.5.7.2.2 Save Configuration File

Save Configuration File: The Save Configuration File feature allows the current TC3340 settings to be saved into a file. The file will be a *.conf file.

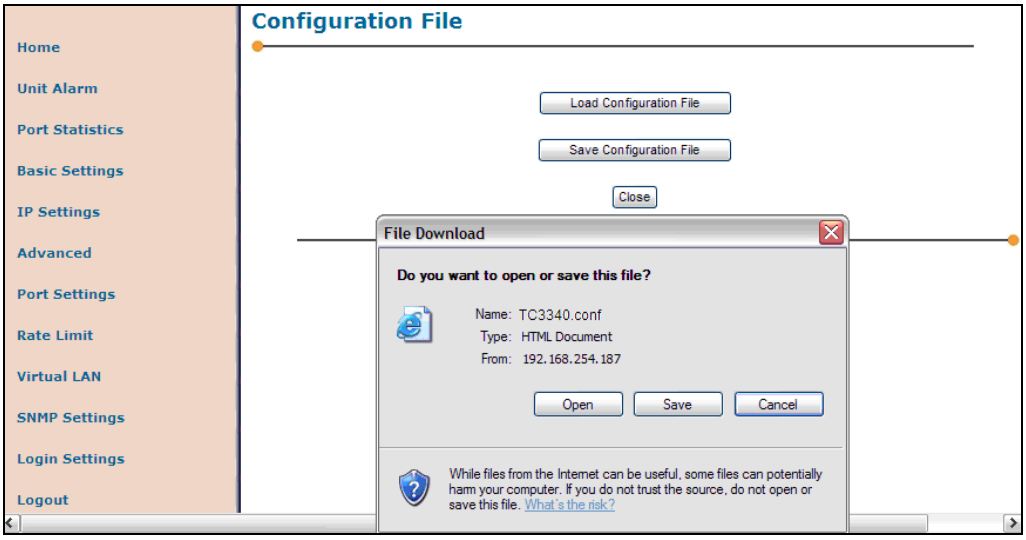


Figure 18 Web Application – Advanced Settings: Save Configuration File

3.5.7.3 Date and Time Settings

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. User can define which time server to use as the default Time Server.

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

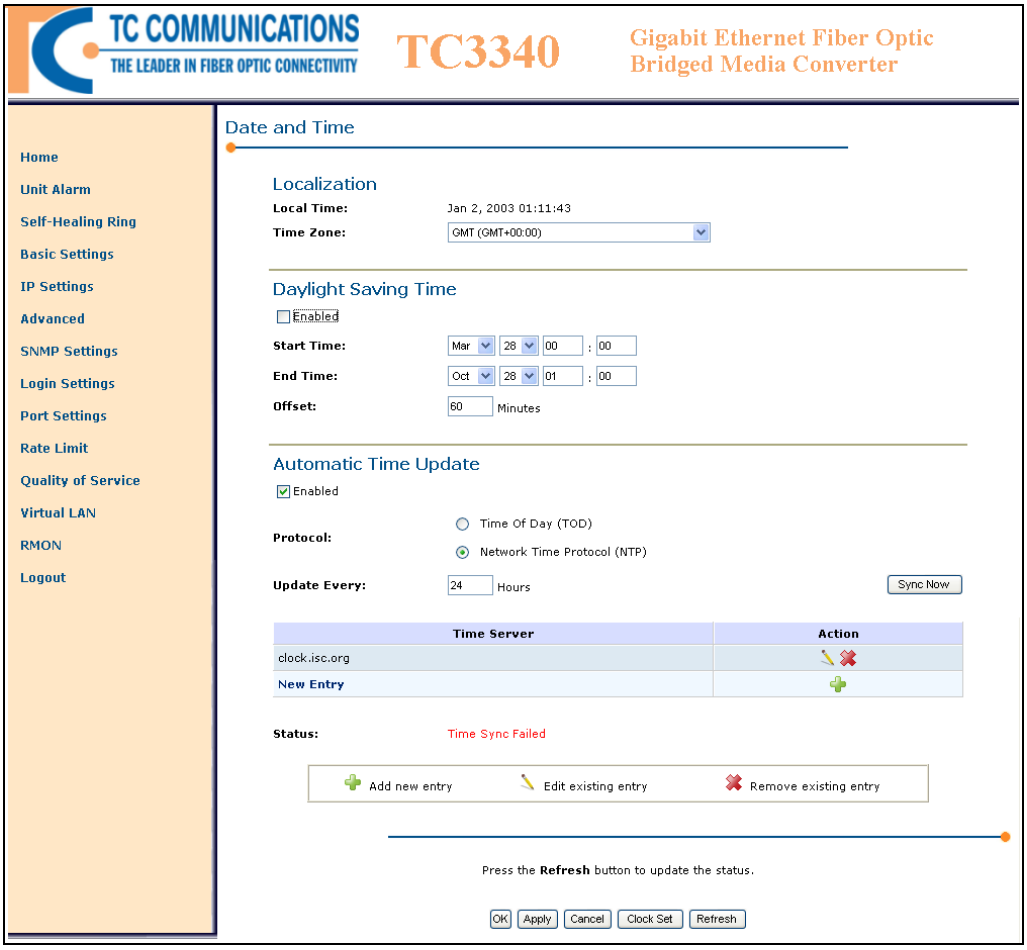


Figure 19 Web Application – Advanced Settings: TC3340 Date and Time Settings

Note: For Network Time Protocol (NTP) to function correctly, the default gateway and DNS must be correctly assigned for NTP to synchronize.

3.5.7.3.1 Clock Set

The Clock Set page allows you to manually define the date and time for the TC3340.

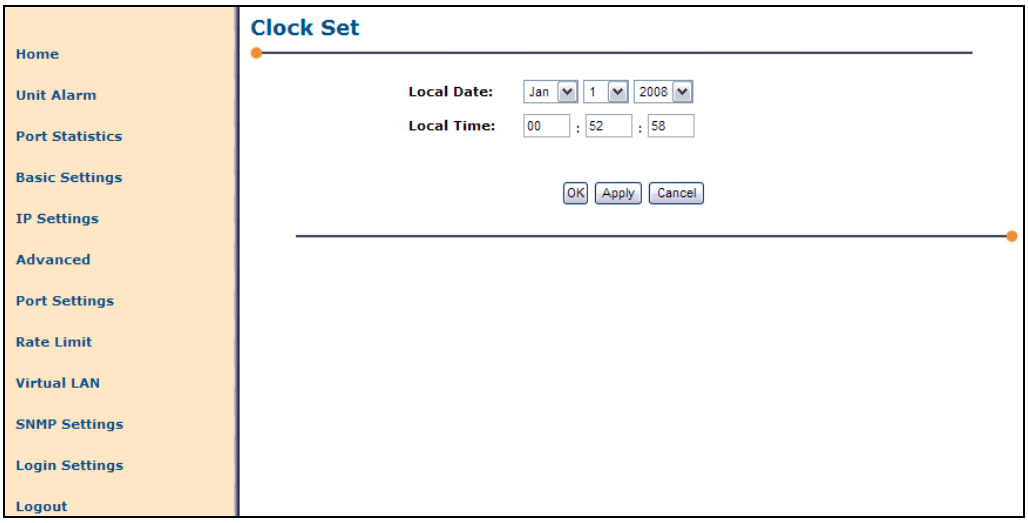


Figure 20 Web Application – Advanced Settings: TC3340 Clock Set

3.5.7.4 Reboot

The Reboot page allows the user to reboot the unit.

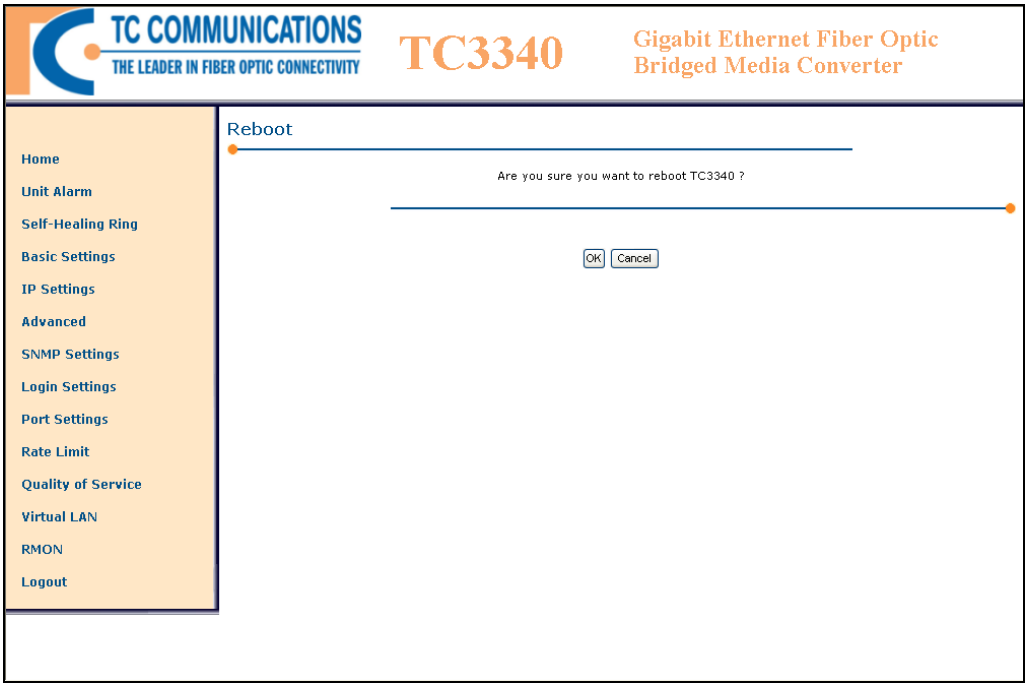


Figure 21 Web Application – Advanced Settings: Restart TC3340

3.5.7.5 Restore Defaults

The Restore Default page allows the user to reset all settings to their original default settings.

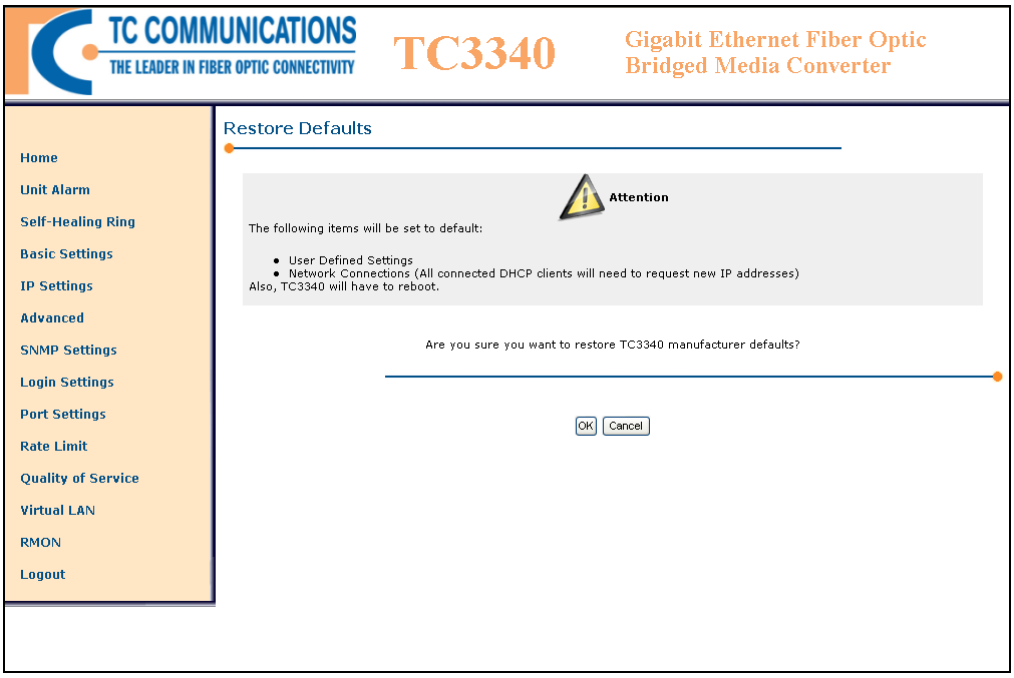


Figure 22 Web Application – Advanced Settings: Restore Default

3.5.7.6 TC3340 Firmware Upgrade

The Firmware Upgrade page allows the user to upgrade the firmware of the TC3340.

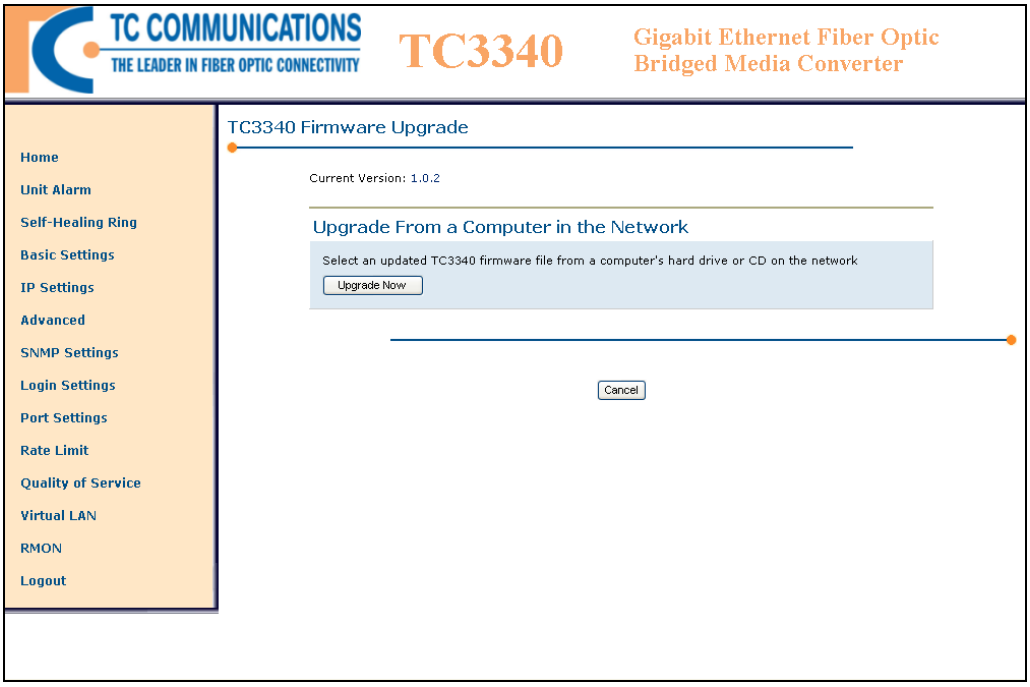


Figure 23 Web Application – Advanced Settings: TC3340 Firmware Upgrade

3.5.7.6.1 TC3340 Firmware Upgrade: Upgrade Now

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

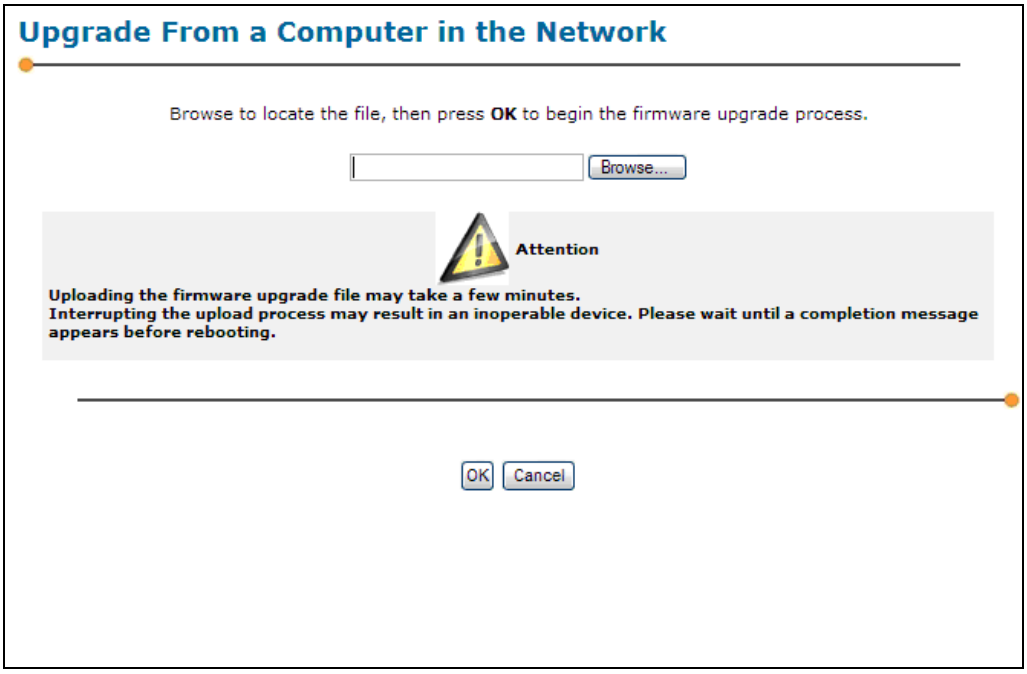


Figure 14 Web Application – Advanced Settings: TC3340 Firmware Upgrade

3.5.8 SNMP Settings

The SNMP (Simple Network Management Protocol) settings consist of two sections: SNMP Access Rights and SNMP Trap. Access Rights are the privileges clients are granted. Traps are alerts that are set off when an error occurs. There is a unique Community String for clients who have Read-Only privileges or Read-Write privileges.

There is a check box to enable SNMP. Next, a Community String may be defined for both users who have Read-Only privileges and users who have Read-Write privileges. Only SNMP clients with the appropriate Community String will be able to access the SNMP features.

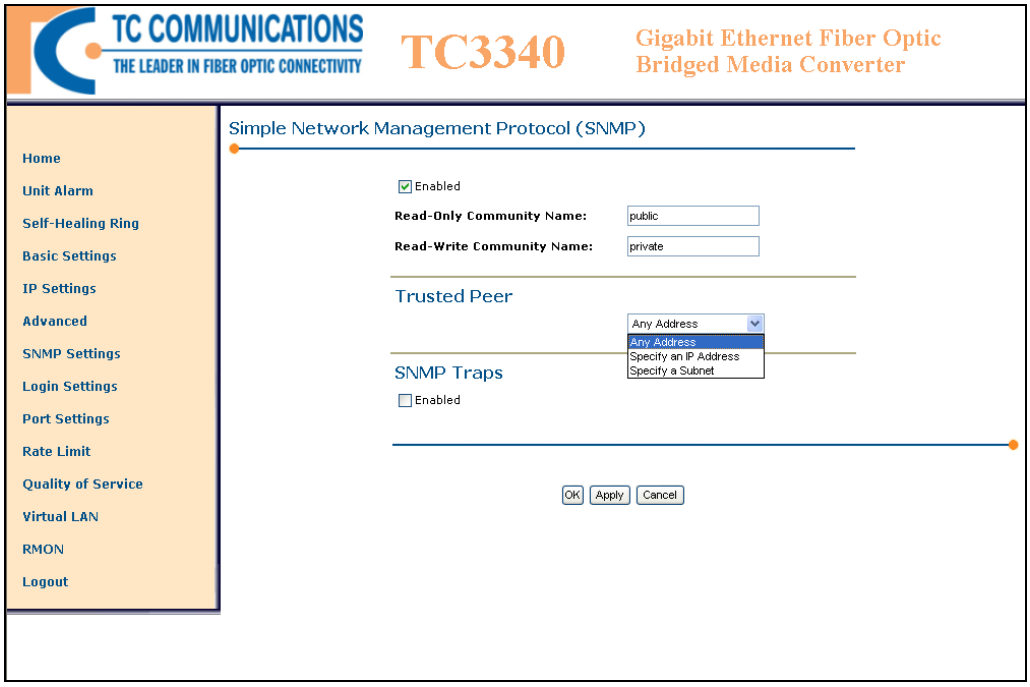


Figure 25 Web Application – SNMP Settings

Next is a check box to enable SNMP Trap. Below that, a Trap Receiving IP Address and the corresponding Community String may be defined. The Trap Receiving IP Address is the IP of the device that will be receiving the error alerts. The Trap Community String is similar to that of the Access Rights. Only users with the correct Community String may receive traps.

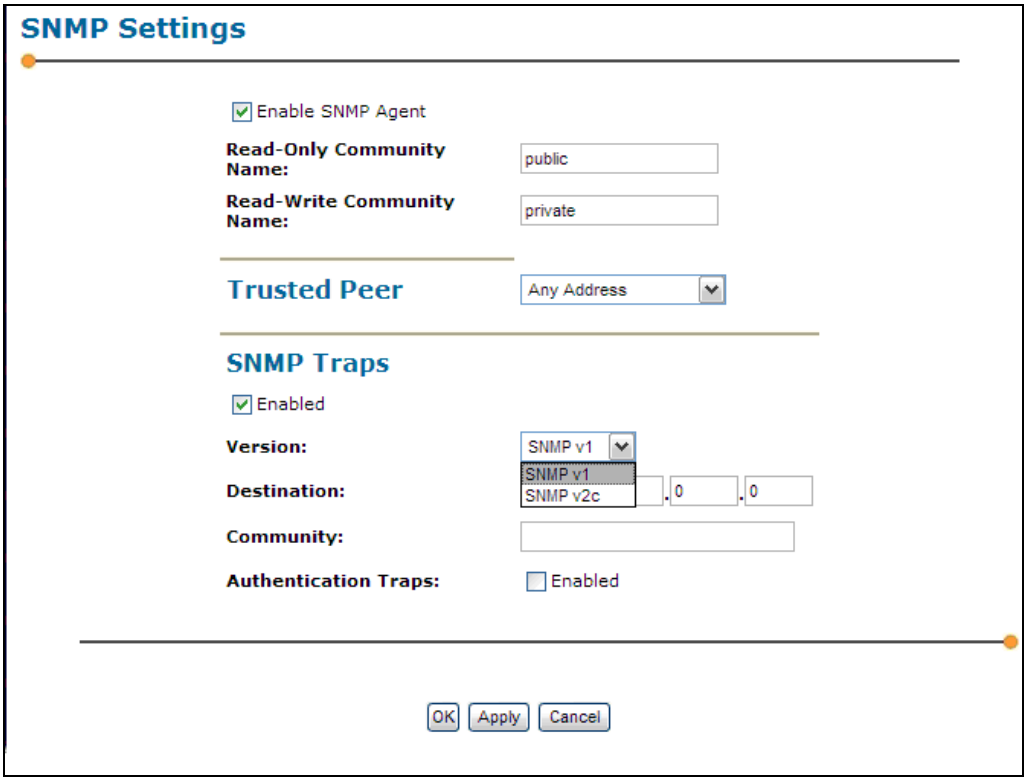


Figure 26 Web Application – SNMP: Traps

3.5.9 Login Settings

The Login Settings page allows the user to define the security access into the TC3340.

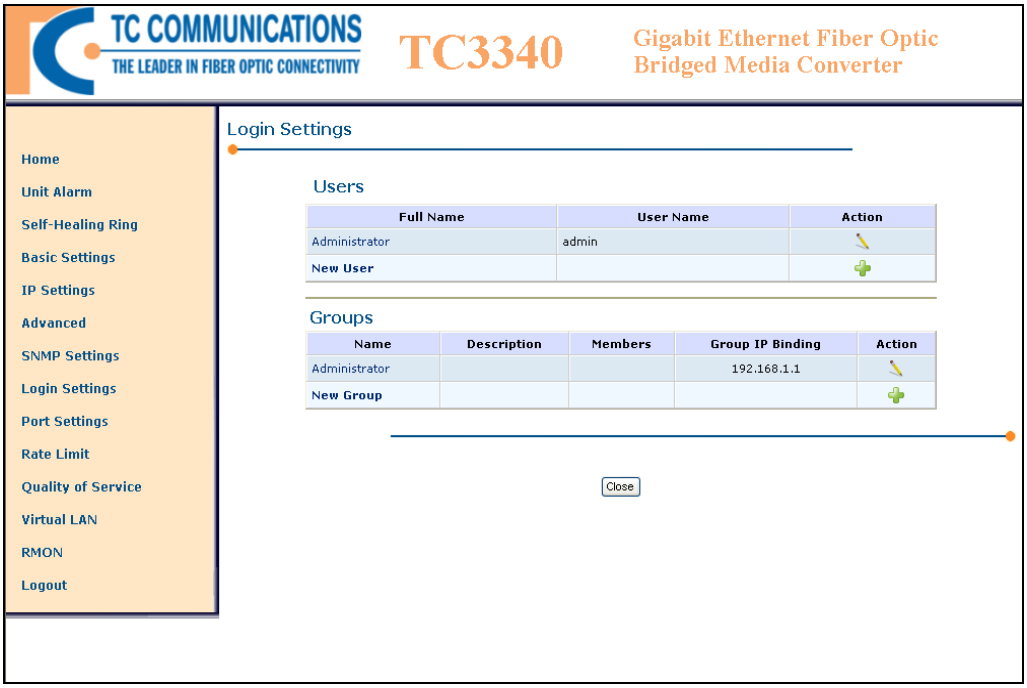


Figure 27 Web Application – Login Settings

3.5.9.1 Login User Setting

Users: Displays the list of users with access to the TC3340. Users can be added/removed, usernames can be edited, and passwords can be set.

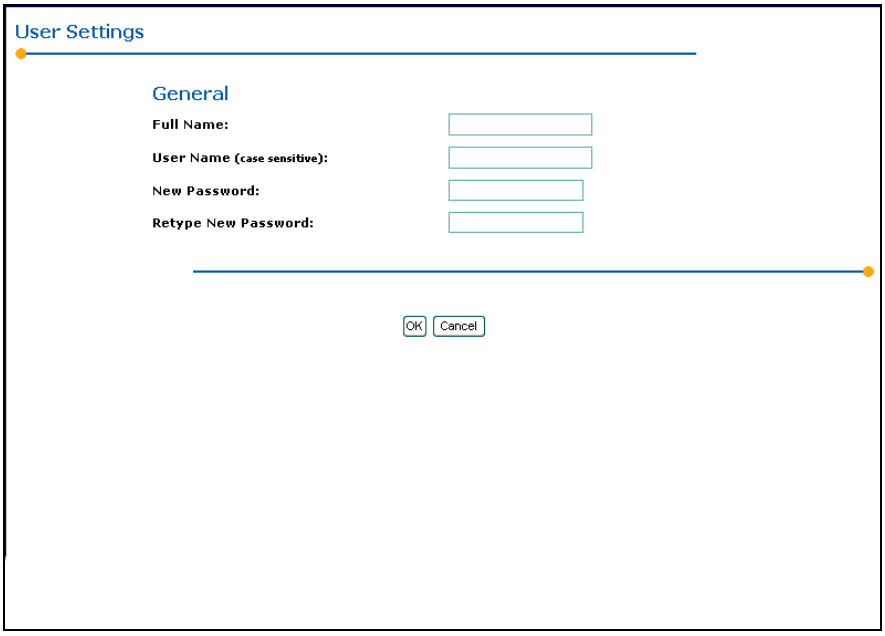


Figure 28 Web Application – Login Settings: Add New User

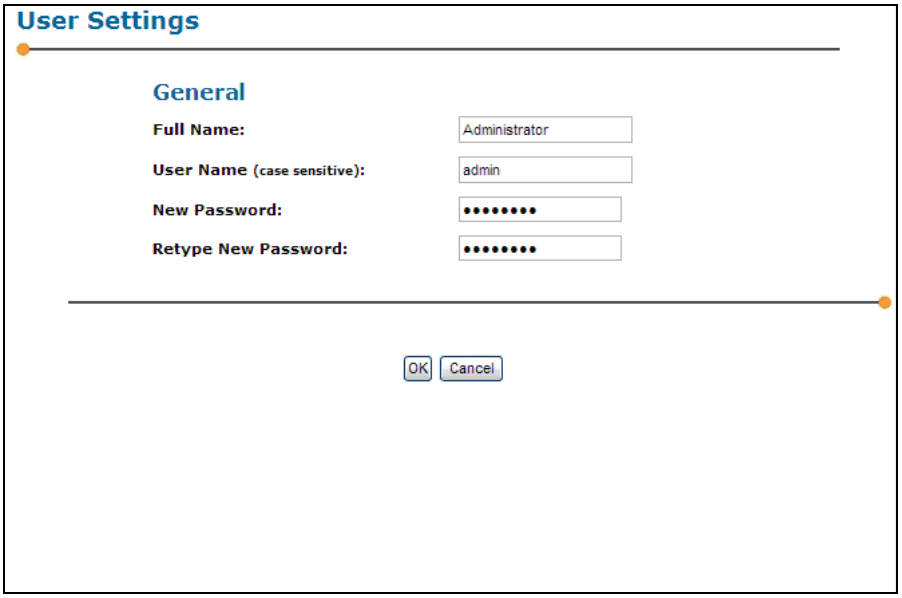


Figure 29 Web Application – Login Settings: Edit User

3.5.9.2 Login Group Setting

This tool can assist you to organize multiple TC3340 users. A group can be set up to include desired members. This simplifies the user settings by allowing you simply add multiple users into a group and only define the group settings.

A key security feature of the TC3340 is Group IP Binding. Similar to the idea of IP Aliases, this is the IP address that a group can use to access the TC3340. This allows groups to access the TC3340 without knowing the IP address that the network administrator uses to access the TC3340.

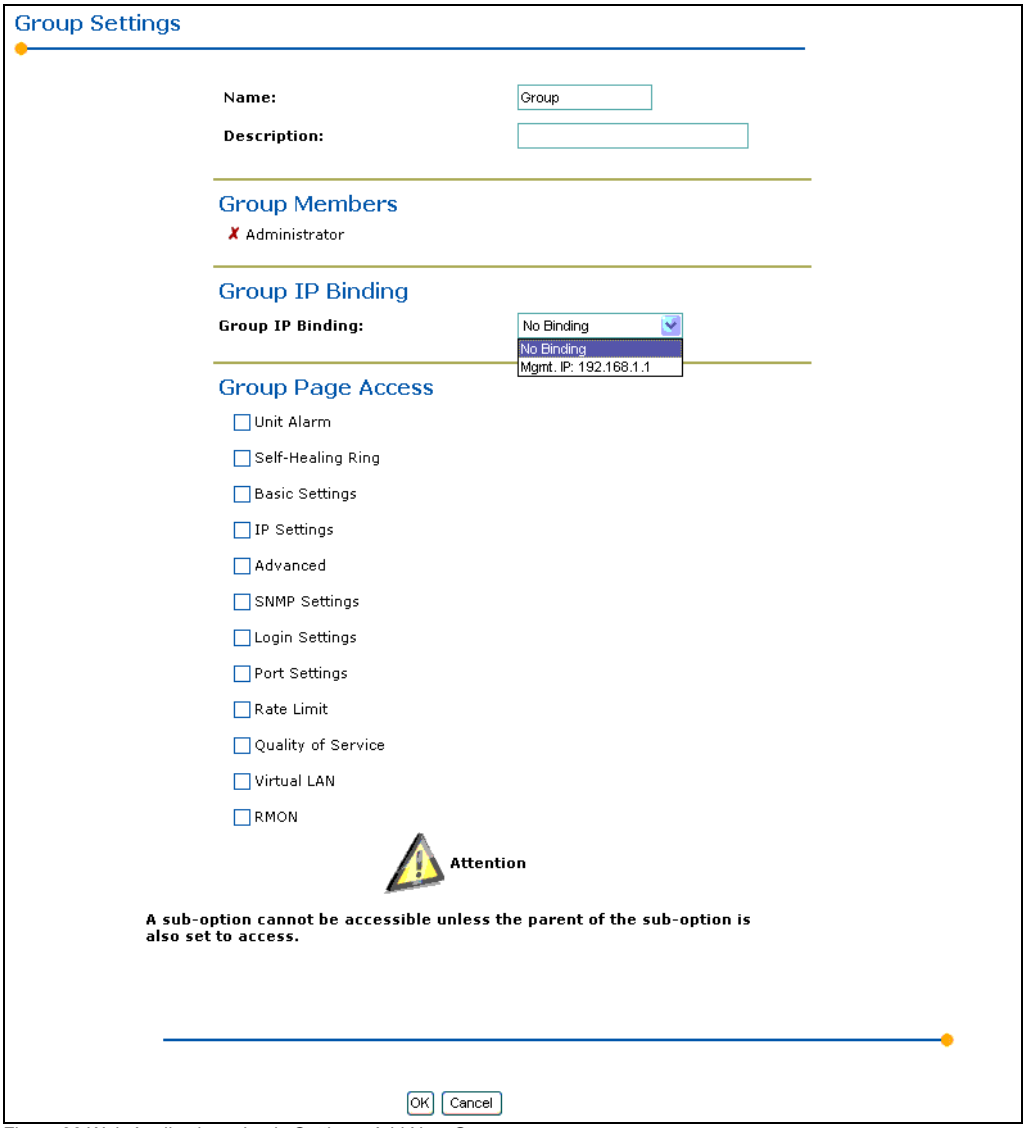


Figure 30 Web Application – Login Settings: Add New Group

An additional security feature is defining the group page access. Here you can define which pages/links of the TC3340 that each group can access.

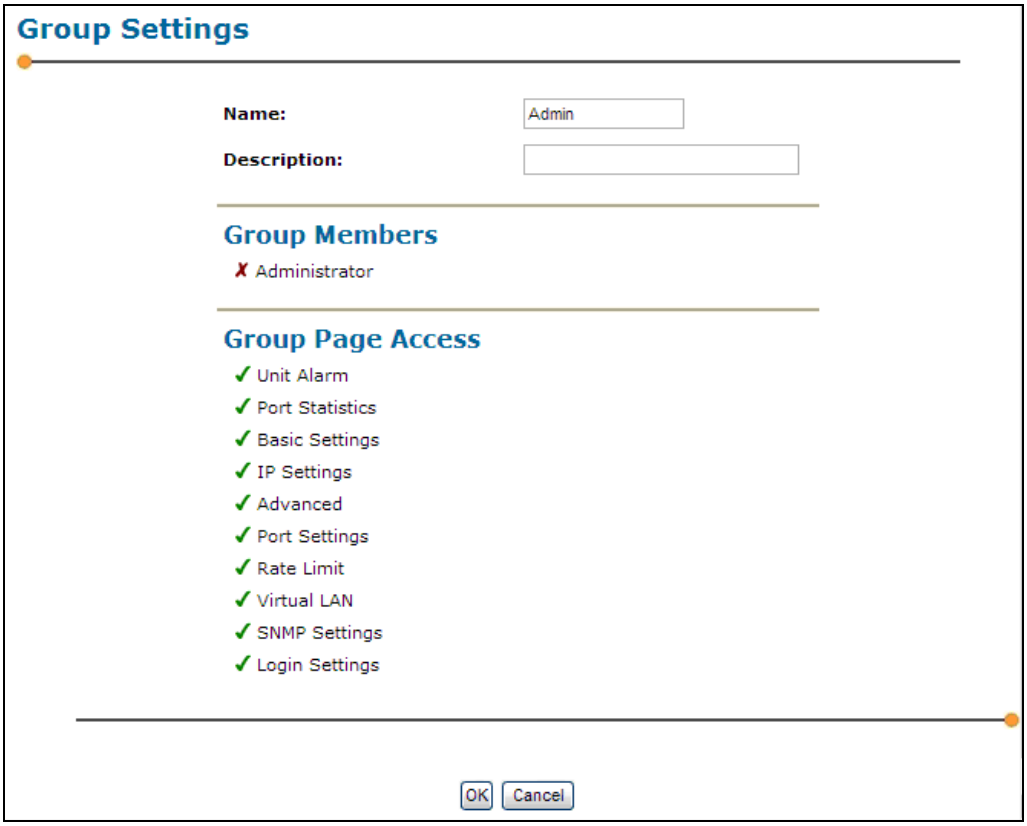


Figure 31 Web Application – Login Settings: Edit Group

3.5.10 Port Settings

TC3340's Ethernet Port Settings displays each Ethernet port's status and allows the configuration of port settings.

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

Speed/Duplex: Choose either 1000Mbps Full, 100Mbps Full, 10Mbps Full, 1000Mbps Half, 100Mbps Half, 10Mbps Half. Default setting is Auto-Negotiate.

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

Port Label (RJ45 or SFP): Label the port with desired name to distinguish from other ports, up to 30 characters.

SFP Information Options: Select Hide or Show SFP information. Once “Show” is selected, Show Diagnostics option can also be selected to show more SFP information including SFP power consumption, TX/RX and temperature.

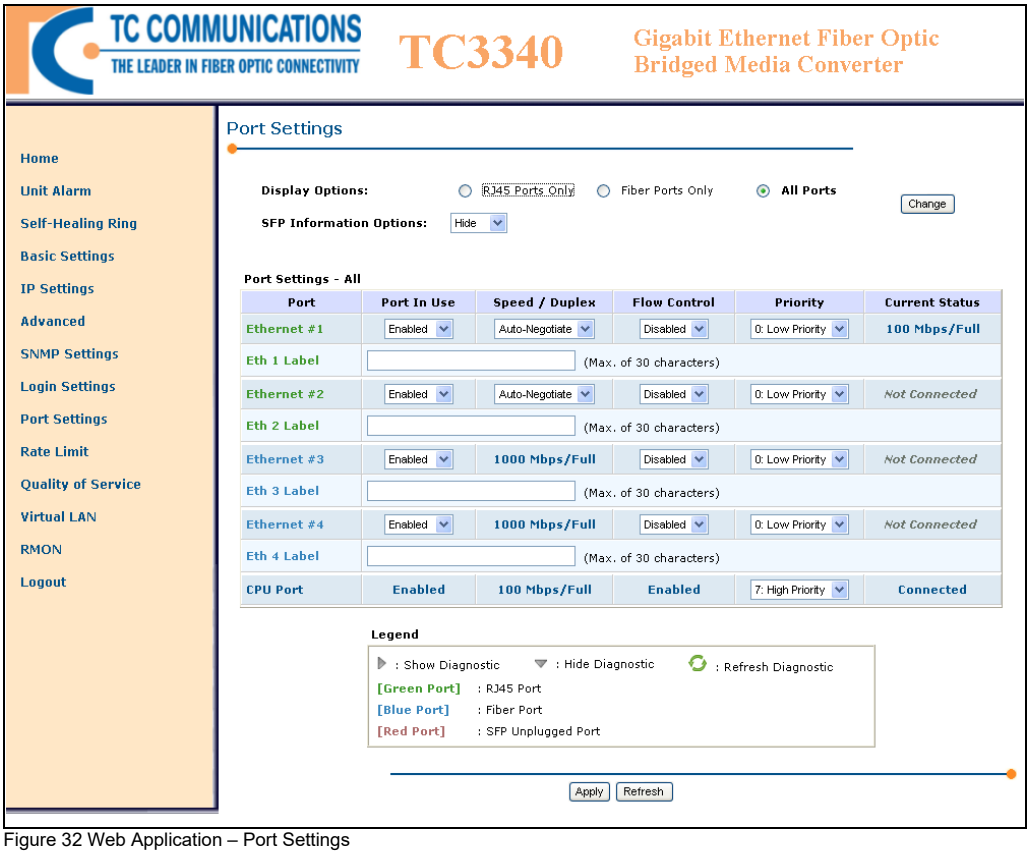


Figure 32 Web Application – Port Settings

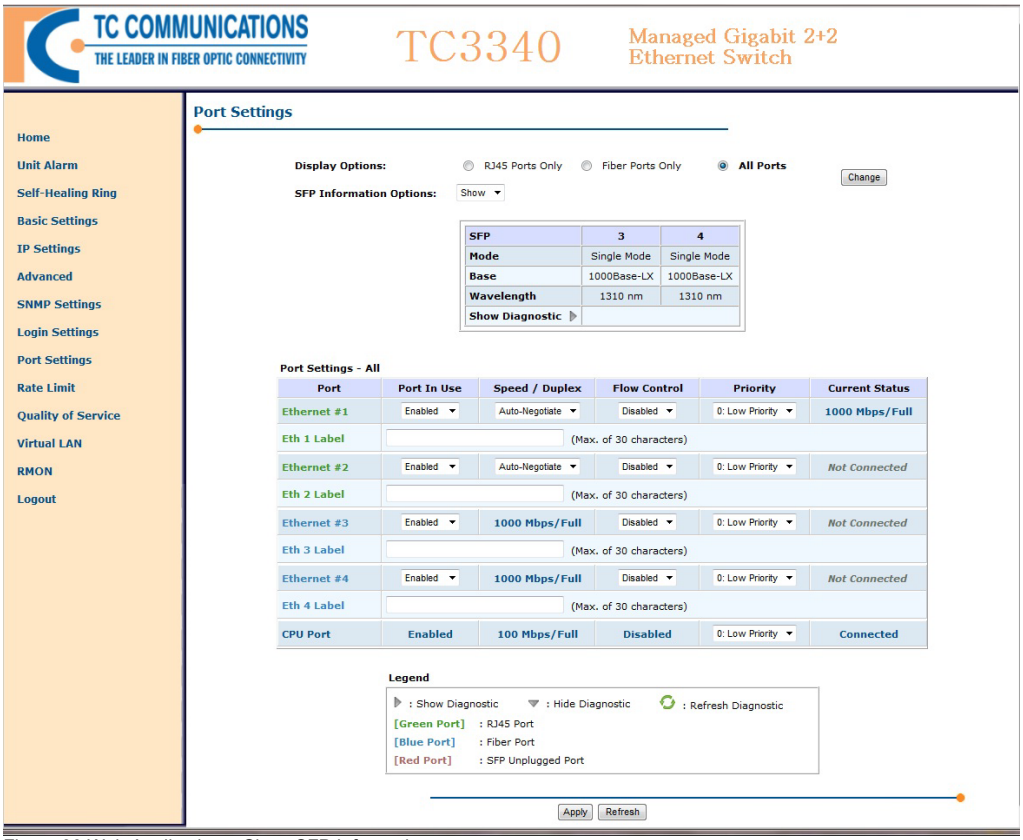


Figure 33 Web Application – Show SFP Information

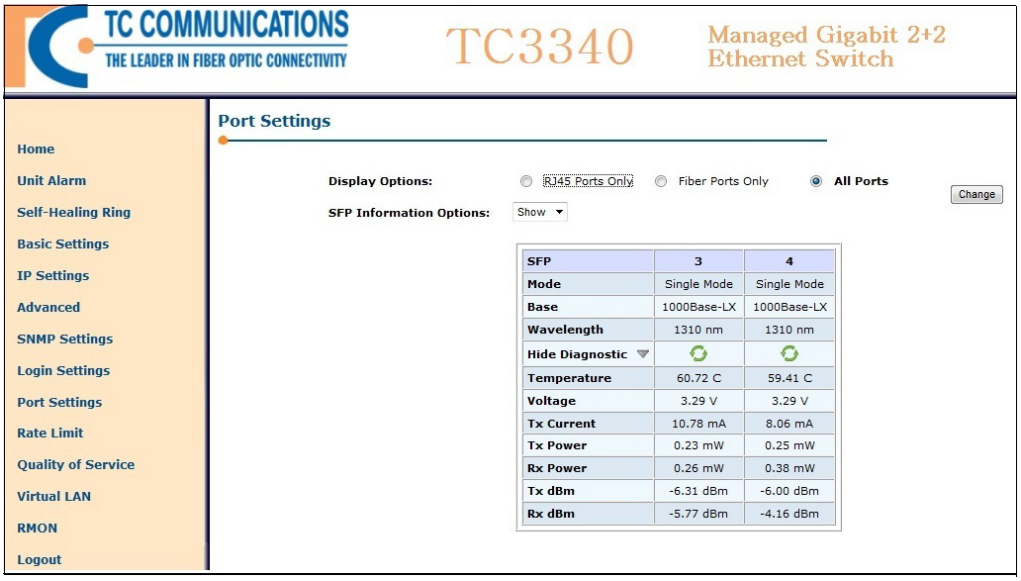


Figure 34 Web Application – Show SFP Diagnostic

3.5.11 Rate Limit

TC3340's Ethernet Rate Limit feature allows the Network Administrator to regulate the bandwidth of each of the Ethernet ports.

The port receiving rate limit can be set from 128Kb to 285Mb. In addition to the rate limit, the limit can be applied to specific packet types received. This is configured with the "Limit Type" option.

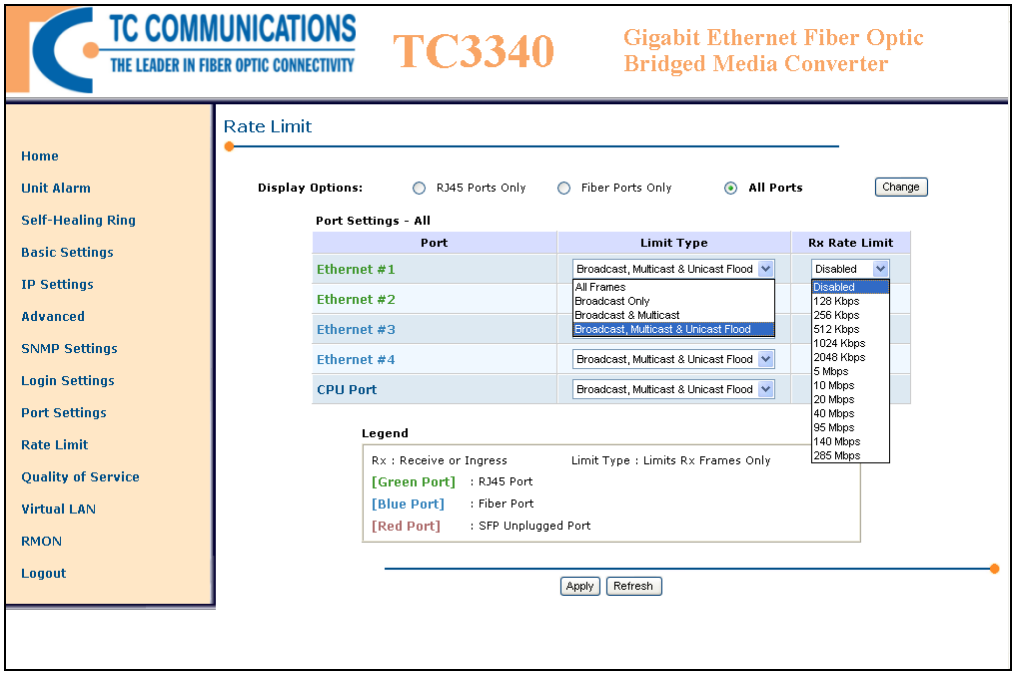


Figure 35 Web Application – Rate Limit Settings

3.5.12 Quality of Service (QoS)

The Quality of Service settings allow the Administrator to tailor the TC3340 to the unique bandwidth requirements of the network. Default settings will satisfy most network requirements however, these options are available to optimize TC3340 performance. To optimize performance, the user may select either Round Robin (Monte Carlo style algorithm) or Strictly weighted criteria with ranges of 0 at the lowest priority and 7 at the highest.

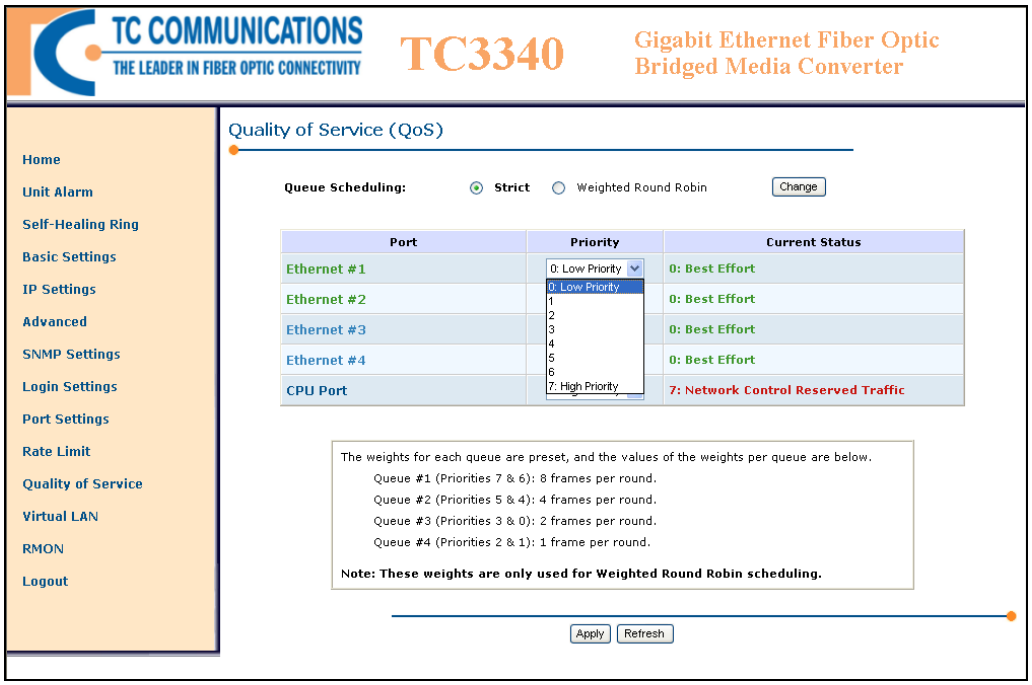


Figure 36 Web Application – Quality of Service

3.5.13 Virtual LAN

A VLAN is a logical local area network (LAN) that extends beyond a single traditional LAN to a group of LAN segments, given specific software configurations. This first Virtual LAN page displays the member status of each port for various VLAN IDs. You may add/remove any of the 4 ports as a member of a VLAN ID. This first page gives you a general overview of all of the existing Virtual LAN IDs. You can easily make quick changes to multiple VLAN IDs.

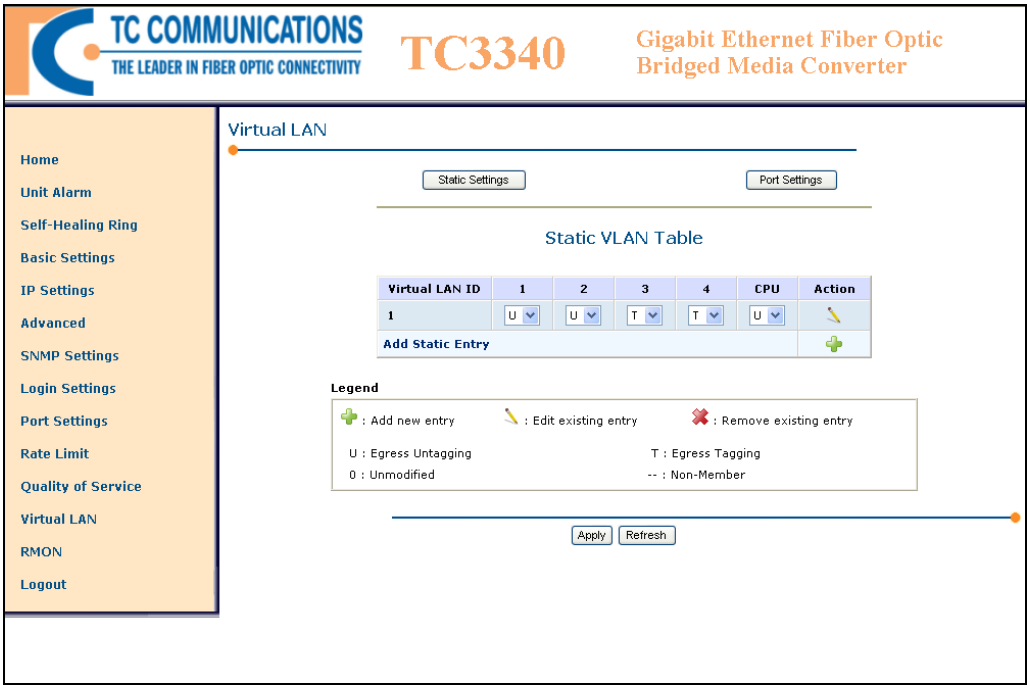


Figure 37 Web Application – Virtual LAN

Under the 'Action' column, you may edit the settings of a VLAN ID Entry, such as changing the default VLAN ID of each port.

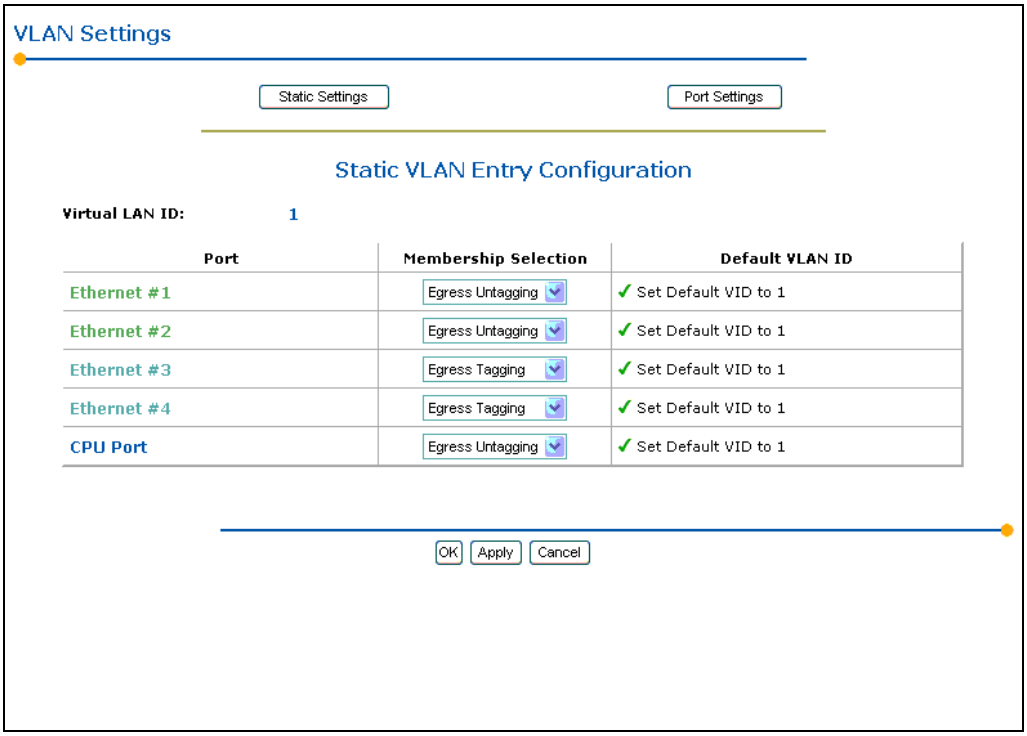


Figure 38 Web Application – VLAN: Edit VLAN

3.5.13.1 VLAN Static Settings

If you create a new VLAN ID, you will need to set it up individually. The VLAN static page allows you to do this.

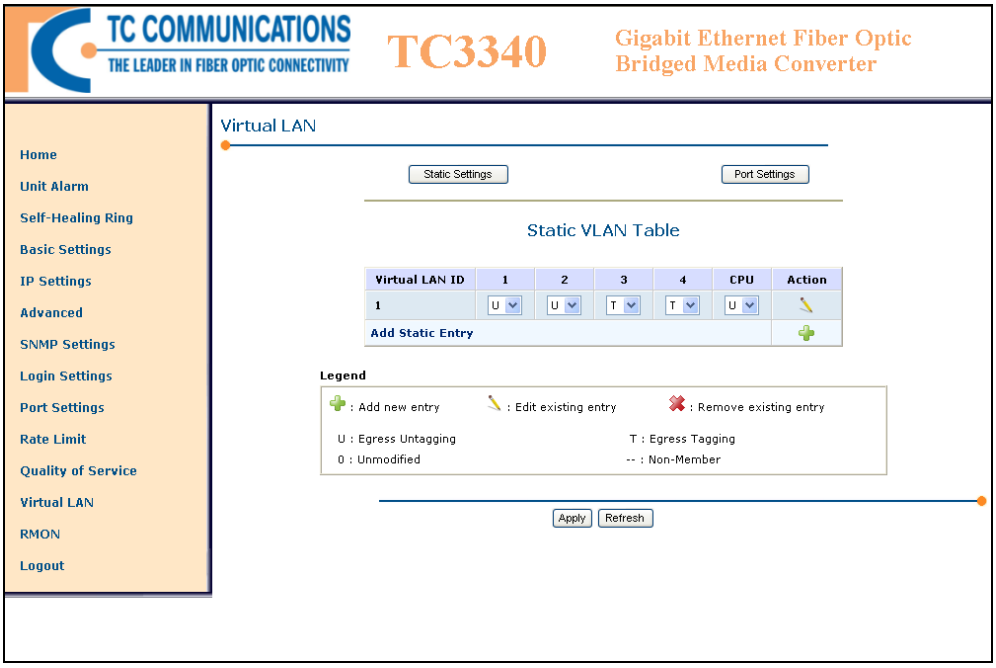


Figure 39 Web Application – VLAN: Static Settings

3.5.13.2 VLAN Port Settings

VLAN Port Settings allows you to edit the settings of the VLANs from the perspective of each port. Each port's VLAN filter can be enabled/disabled and the Default VLAN ID can be set.

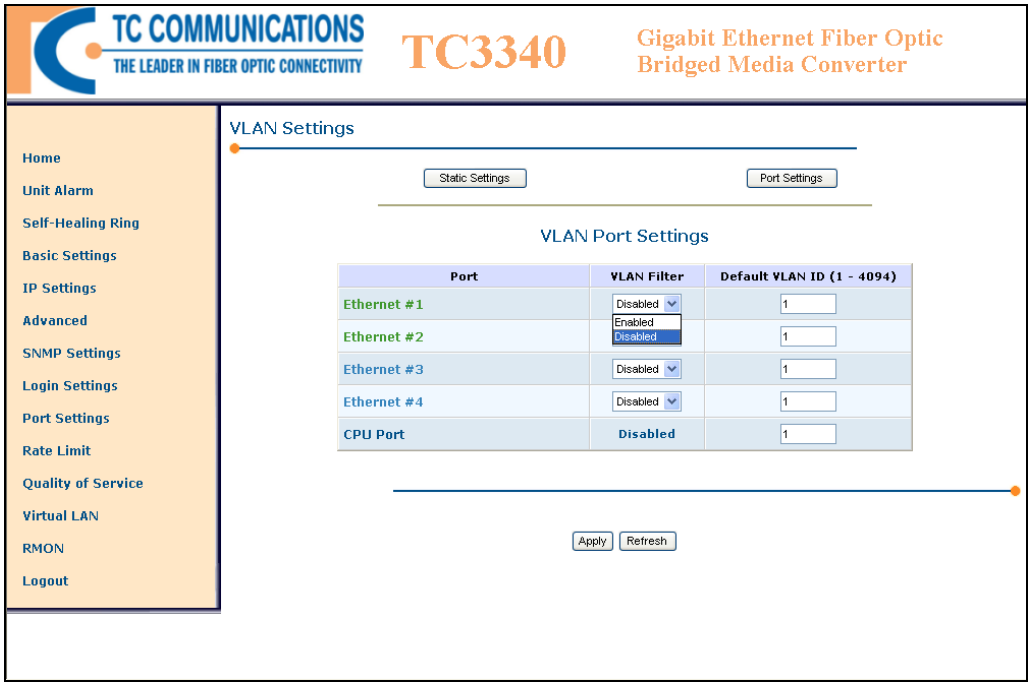


Figure 40 Web Application – VLAN: Port Settings: Port Type

3.5.14 RMON

Remote Monitoring (RMON) settings allow the user to monitor ingress and egress statistics for each of the Ethernet ports and also check error counts on each port.

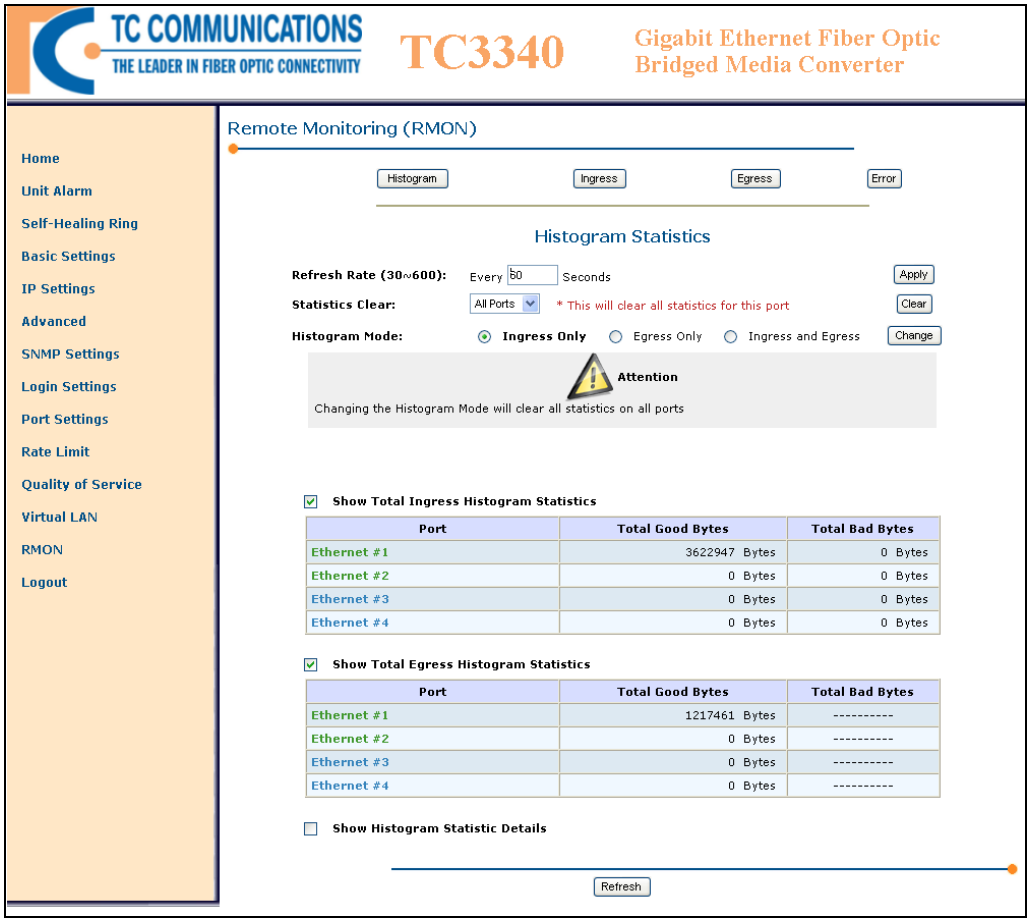


Figure 41 Web Application – RMON Settings

To monitor Ingress Frame Statistics, the user would select the "Ingress" option from the RMON page which will present the Ingress Frame Statistics page as shown below.

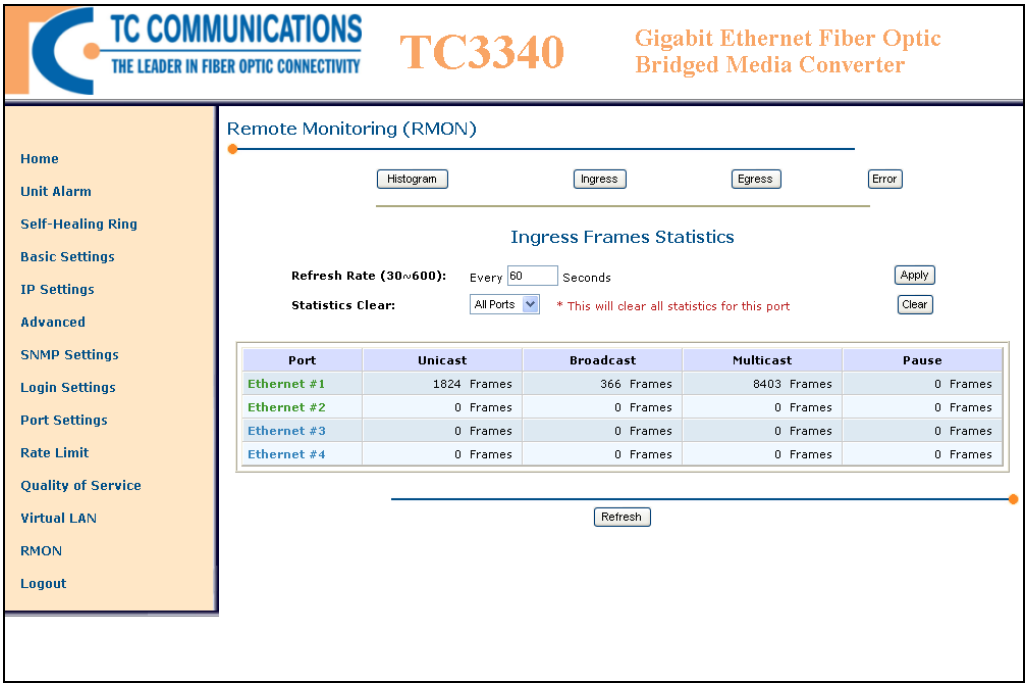


Figure 42 Web Application – Ingress Frame Statistics

To monitor Egress Frame Statistics, the user would select the "Egress" option from the RMON page which will present the Egress Frame Statistics page as shown below.

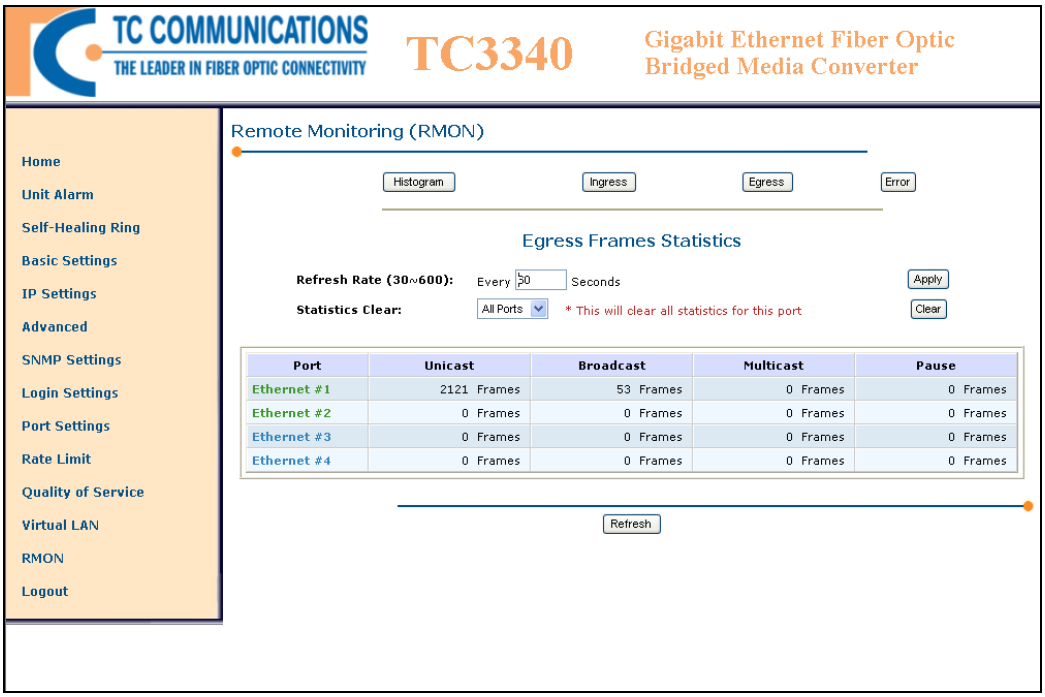


Figure 43 Web Application – Egress Frame Statistics

To monitor Error Statistics, the user would select the "Error" option from the RMON page which will present the Error Statistics page as shown below.

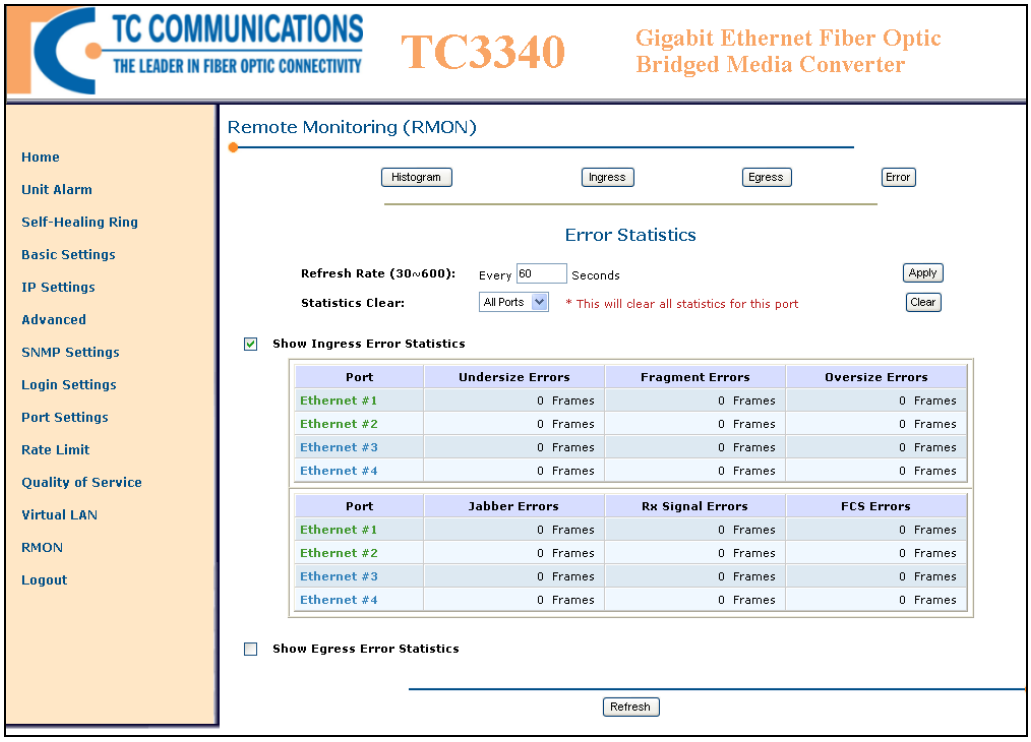


Figure 44 Web Application – Error Statistics

For each of the options available to the user, the refresh rate may be set between 30 to 600 seconds and all statistics may be cleared before beginning your monitoring period by using the "Statistics Clear" option.

3.5.15 Logout

The Logout link on the left column will exit the user from the TC3340 Web Management. It will return the user to the Login page.

Figure 45 Web Application – Log Out

4 Management via Console/Telnet

4.1 Console/Telnet Management

The console management can be accessed through the RS-232 port on the backpanel
(DB9 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 TC3340, you will be prompted to enter a Username and Password. Both the user name 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 user with instruction of 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 into "help".

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

The console port allows the user either to use a local VT-100 terminal or use a remote VT-100 terminal via modem for system configuration, diagnostics, polling status reports,
etc. The console port Baud rate, data bit length, stop bit length, and parity bit length.

4.1.1 Initial IP setting using the Console

1. Connect the computer and the TC3340 via a DB9 serial cable.

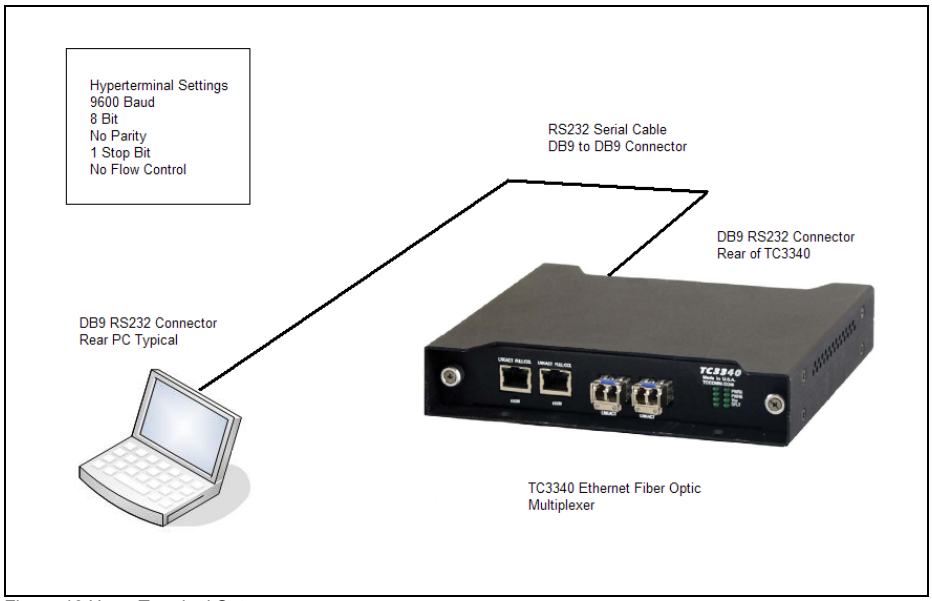


Figure 46 HyperTerminal Setup

2. Power up the TC3340 unit.
3. Open the HyperTerminal of your computer and under properties select the following settings: 9600 Baud, 8 data bits, No parity, 1 stop bit, and None for flow control.
4. Click "OK" or press Enter, when done.
5. Press the "Enter" key until you see a "Login" prompt.
6. Type admin after the Login prompt and press "Enter."
7. Type password after the "Password" prompt.

Note: You will not see the password characters when typed.

8. When password has being entered correctly, you will see: Password Accepted.
9. At this point, you can continue to enter all the settings, as shown on below.
10. Enter set IP 192.168.1.50 and press "Enter," the IP address will be set and you will be prompted to type "reset" to apply the new setting. We recommend you reset the settings at the end.
11. Enter set netmask 255.255.255.0 and press "Enter,"
12. Enter set gateway 192.168.1.1 and press "Enter,"
13. Enter set username admin and press "Enter,"
14. Enter set password to “password” and press "Enter,"
15. Type "reset" to apply all the settings.

When you see the "TC3340 Console Ver1.0" prompt, you have successfully configured your TC3340 unit.

4.1.2 Console Help

The console "help" and "help set" commands will assist you with information about various command descriptions as shown below:

<ip_settings ip_set> Set Unit's IP Address.

e.g. ip_settings ip_set 192.168.254.123

<ip_settings netmask_set> Set Unit's Netmask.

e.g. ip_settings netmask_set 255.255.255.0

<ip_settings gateway_set> Set Unit's Gateway IP

e.g. ip_settings gateway_set 192.168.254.1

<adv_settings restore_default> Set unit to default

e.g. Type "adv_settings", then type "restore defaults"

NOTE 1: All set commands required reset to apply new settings

NOTE 2: The default "timeout" value for console setting is two minutes.

4.1.3 Current_Get Command

The "***current_get***" command will show the current IP settings of the TC3340 unit.

4.1.4 Telnet Settings

You may also use Telnet to set the IP configuration, username, and password. You may use the Telnet option from the network or local connection using a PC connected by RS232 Serial port connection.

To access the unit via Telnet open a command window or terminal.
Type the command *Telnet <ip address>*
This will return the username request.

Note: in our example the TC3340 that we are connected to has been assigned ip address 192.168.1.105 - this will vary with your initial configuration typically 192.168.1.1 as with most standard router/switch devices).

Type the default username <*admin*>
This will return the password request.

Type the default password <*password*>
You now have established a telnet session with the TC3340

With a Telnet Session established, you may review available options and commands by accessing help.

To access help, Type <help>
This will return the default help menu as shown below.

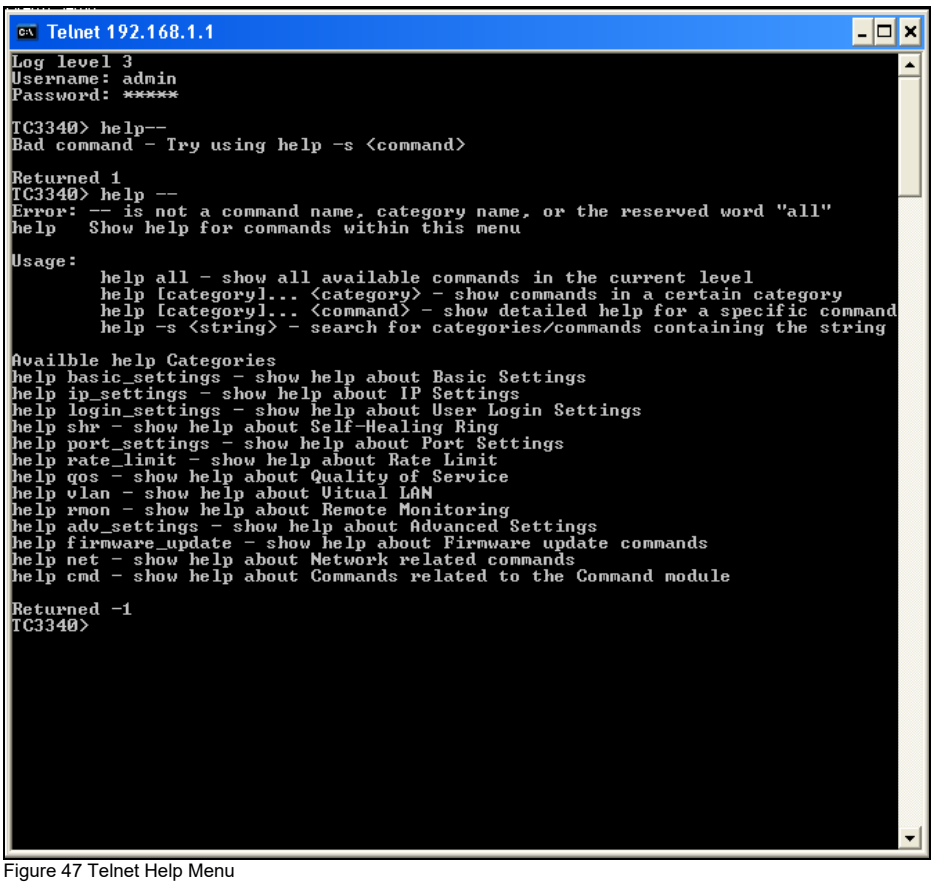


Figure 47 Telnet Help Menu

Note: To access any of the help options, syntax is case and context sensitive. Type commands exactly as they appear in the menu.

Note: The Telnet default "timeout" is two minutes.

4.1.4.1 Basic Settings

You may request unit basic settings for the TC3340 by typing the command *<help basic_settings>.*This will return the basic settings command subset as shown below.

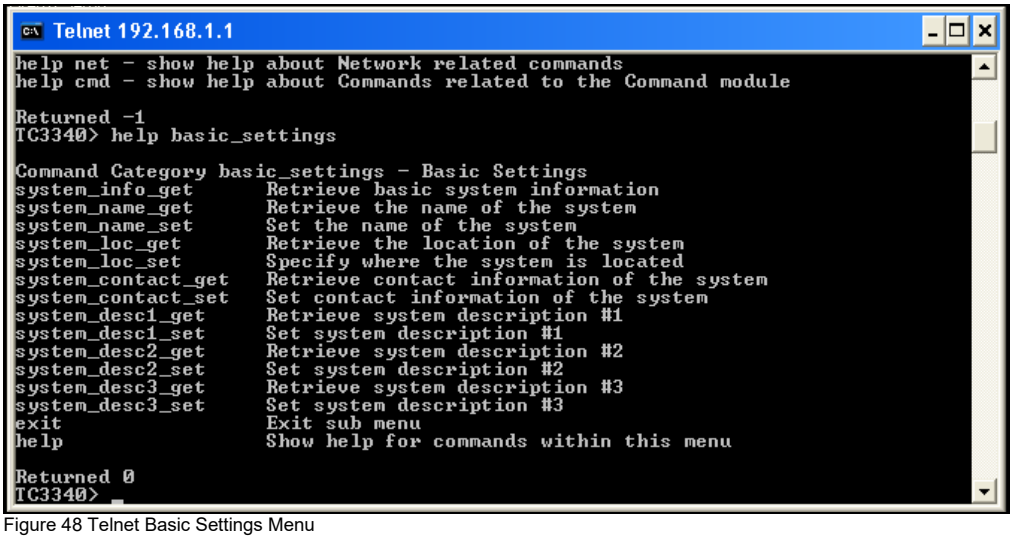


Figure 48 Telnet Basic Settings Menu

4.1.4.2 IP Settings

You may request unit ip settings for the TC3340 by typing the command *<help ip_settings>.*This will return the ip settings command subset as shown below.

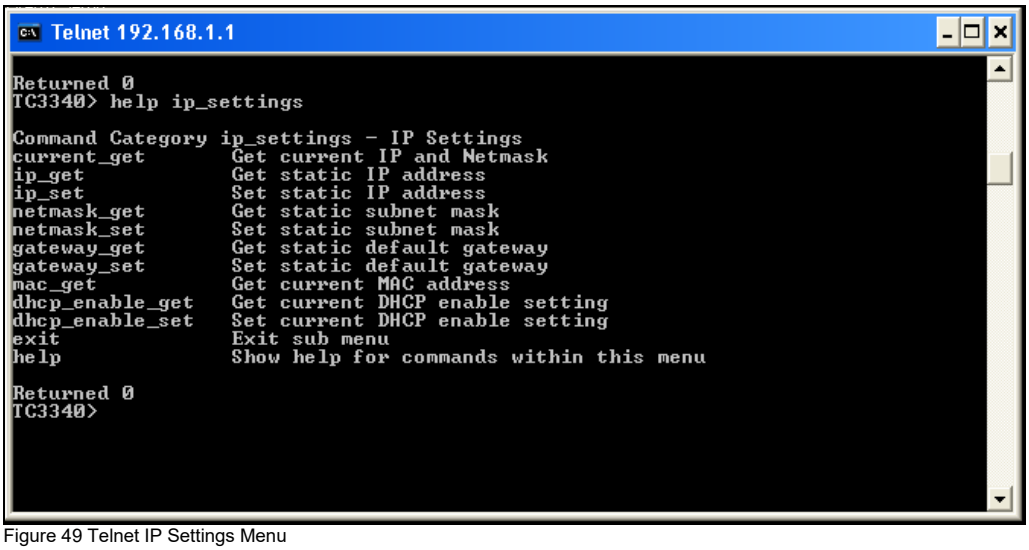


Figure 49 Telnet IP Settings Menu

4.1.4.3 Login Settings

You may request unit login settings for the TC3340 by typing the command *<help login_settings>.*This will return the login command subset as shown below.

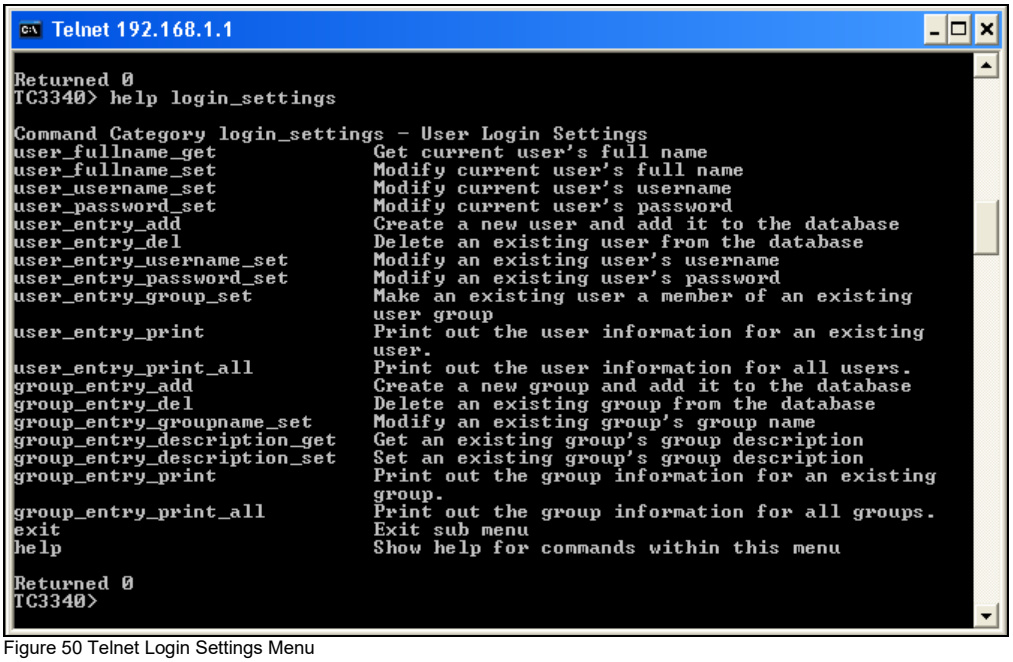


Figure 50 Telnet Login Settings Menu

4.1.4.4 SHR (Self-Healing Ring)

You may request Self-Healing Ring status and settings for the TC3340 by typing the command
*<help shr>.*This will return the unit alarm command subset as shown below.

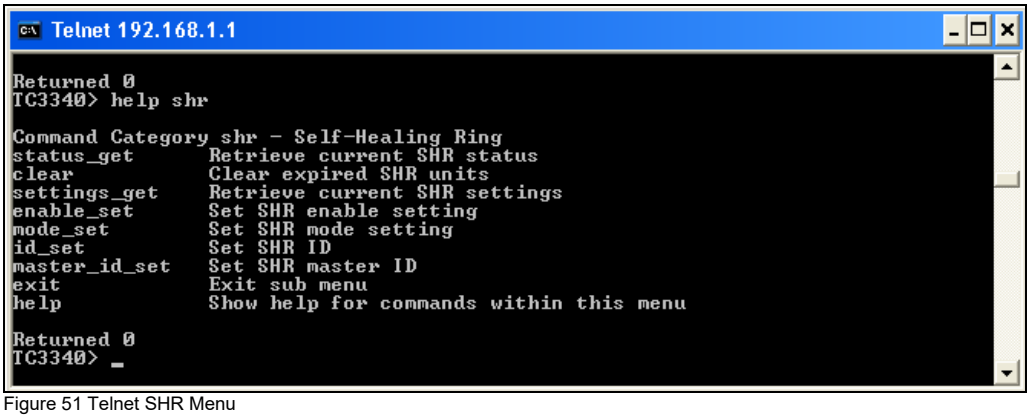


Figure 51 Telnet SHR Menu

4.1.4.5 Port Settings

You may request unit port settings for the TC3340 by typing the command *<help port_settings>.*This will return the port settings command subset as shown below.

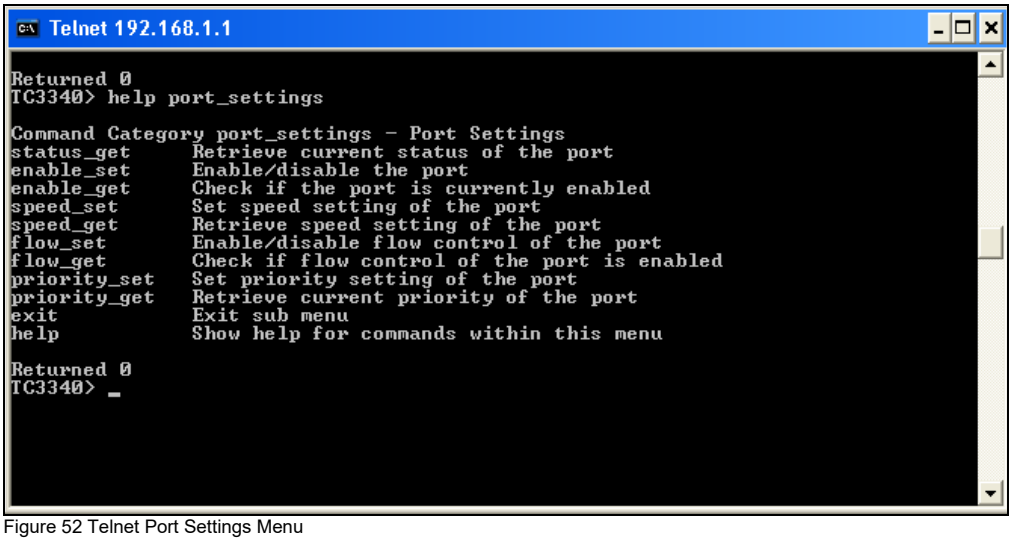


Figure 52 Telnet Port Settings Menu

4.1.4.6 Rate Limit

You may request unit rate limit for the TC3340 by typing the command *<help rate_limit>.*This will return the rate limit command subset as shown below.

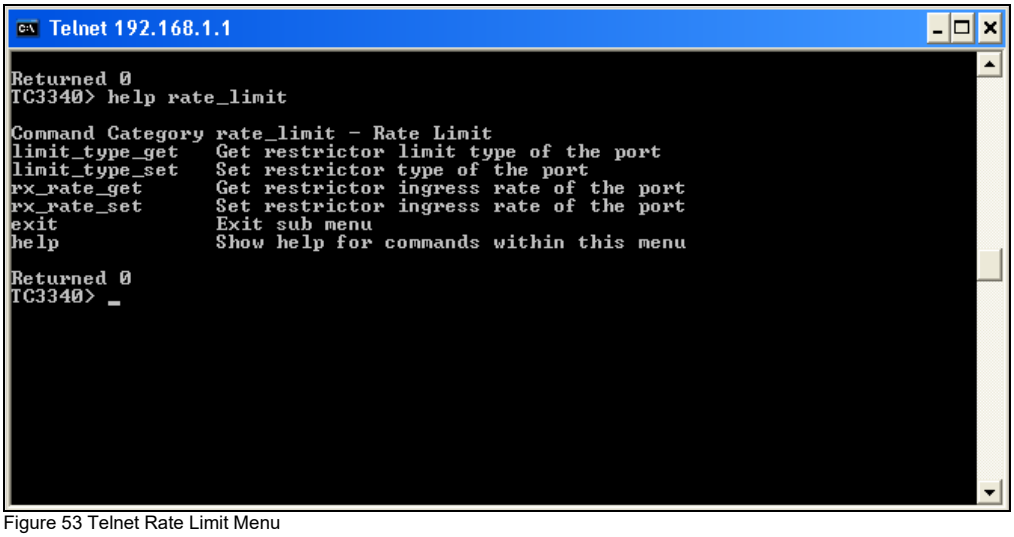


Figure 53 Telnet Rate Limit Menu

4.1.4.7 Quality of Service (QOS)

You may request unit QoS settings for the TC3340 by typing the command <*help qos*>.This will return the Quality of Service command subset as shown below.

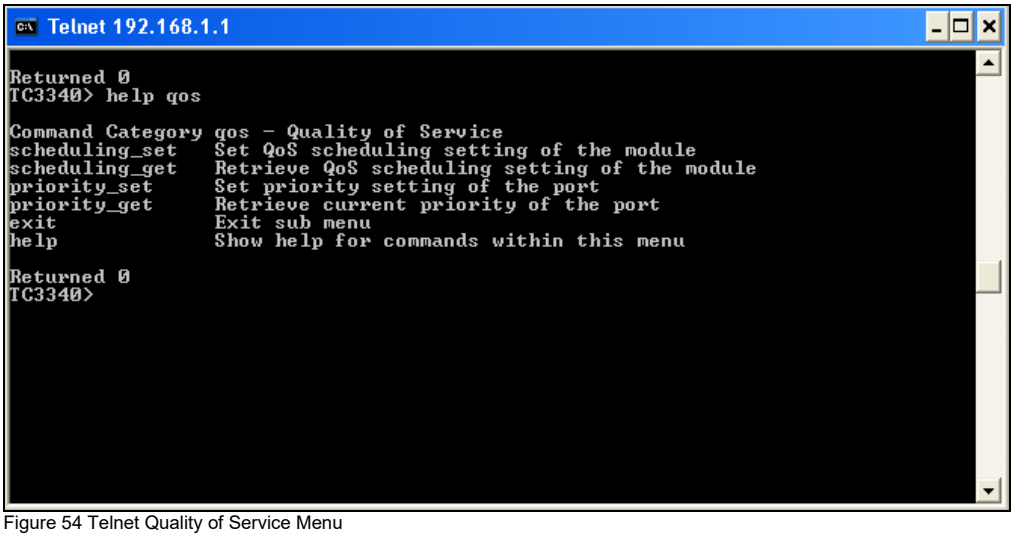


Figure 54 Telnet Quality of Service Menu

4.1.4.8 VLAN

You may request unit virtual LAN settings for the TC3340 by typing the command <*help vlan*>.This will return the VLAN command subset as shown below.

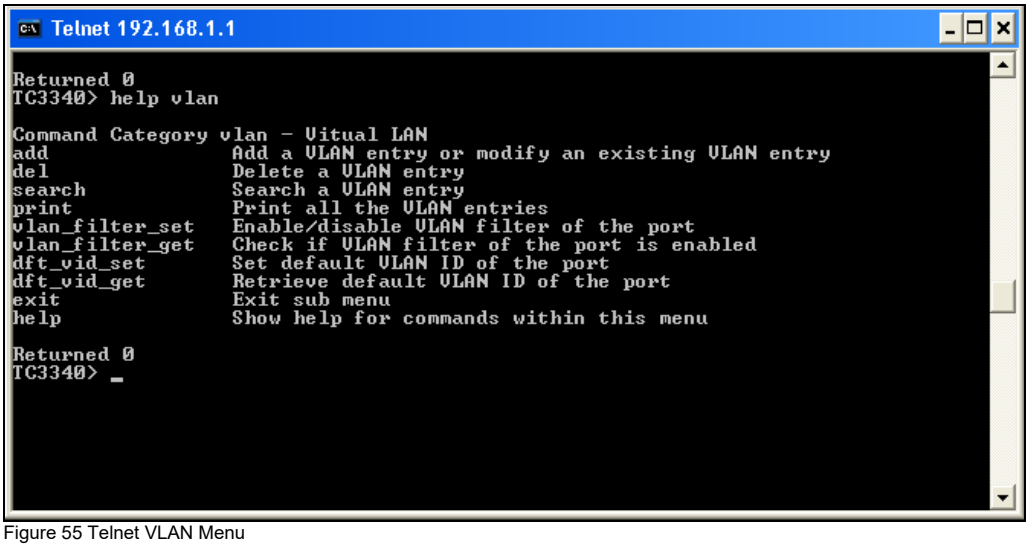


Figure 55 Telnet VLAN Menu

4.1.4.9 RMON Settings

You may request remote monitoring options for the TC3340 by typing the command *<help rmon>*.This will return the Remote Monitoring command subset as shown below.

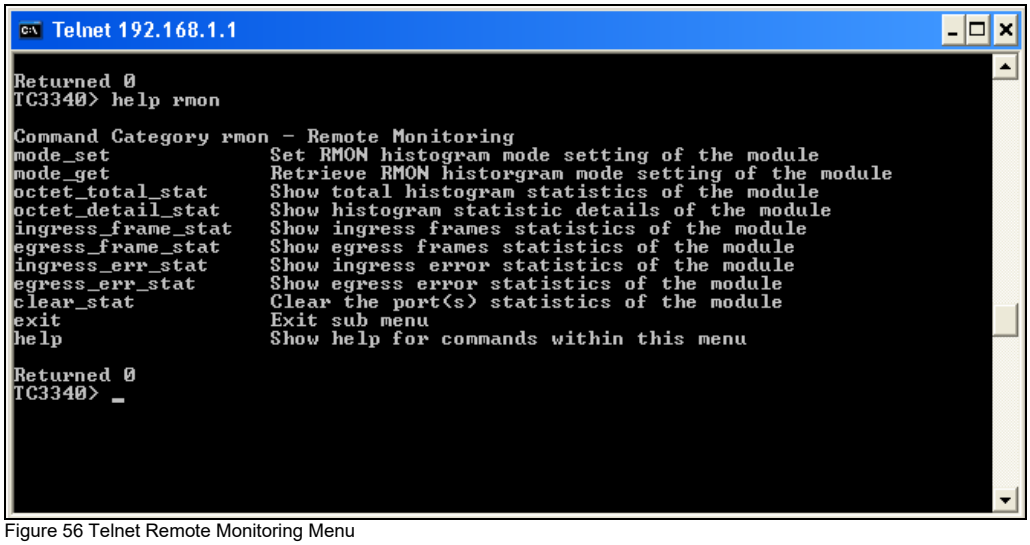


Figure 56 Telnet Remote Monitoring Menu

4.1.4.10 Advanced Settings

You may request unit advanced settings for the TC3340 by typing the command *<help adv_settings>.*This will return the advanced settings command subset as shown below.

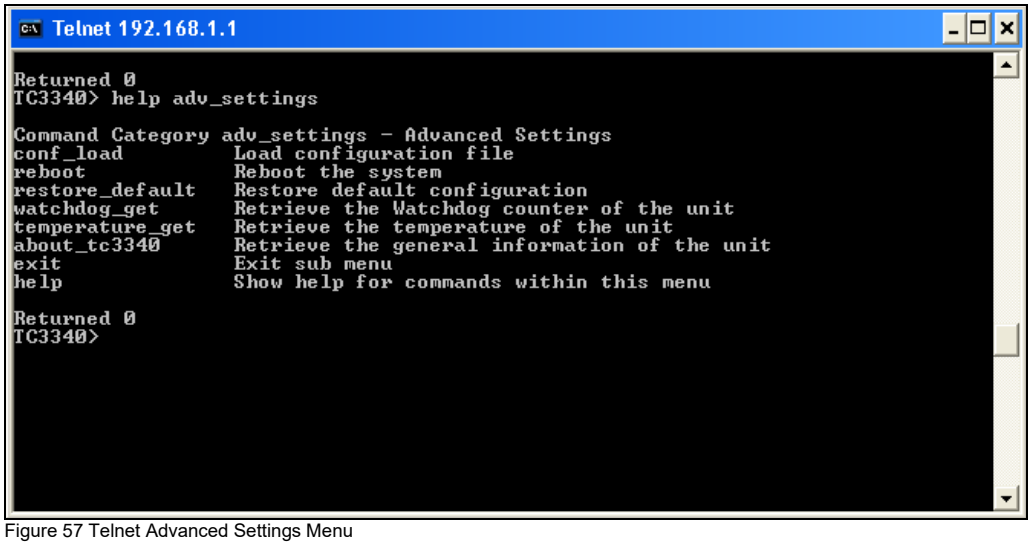


Figure 57 Telnet Advanced Settings Menu

4.1.4.11 Firmware Update Settings

You may request unit firmware update options for the TC3340 by typing the command *<help firmware_update>*.This will return the update command subset as shown below.

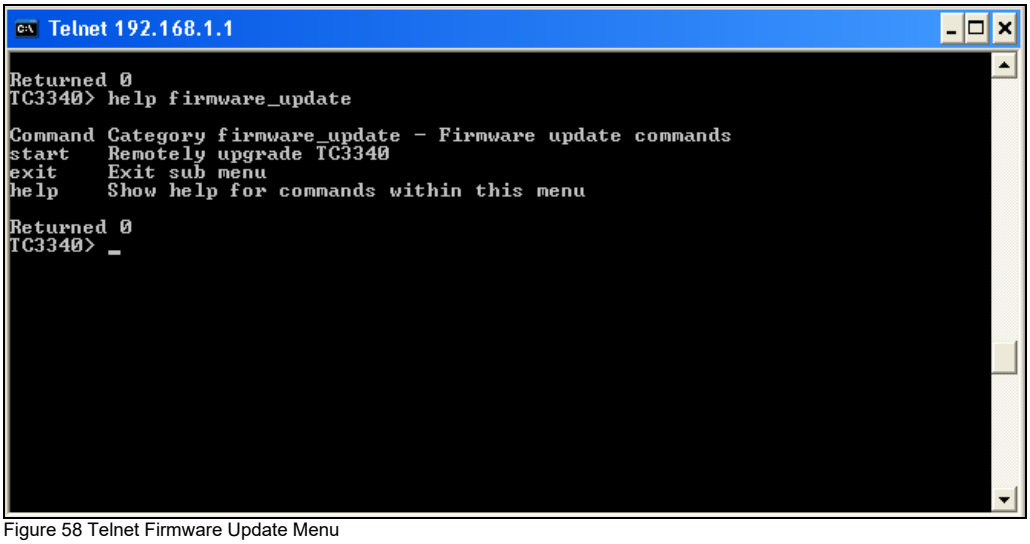


Figure 58 Telnet Firmware Update Menu

4.1.4.12 Network Settings

You may request unit network settings for the TC3340 by typing the command *<help net>*.This will return the network command subset as shown below.

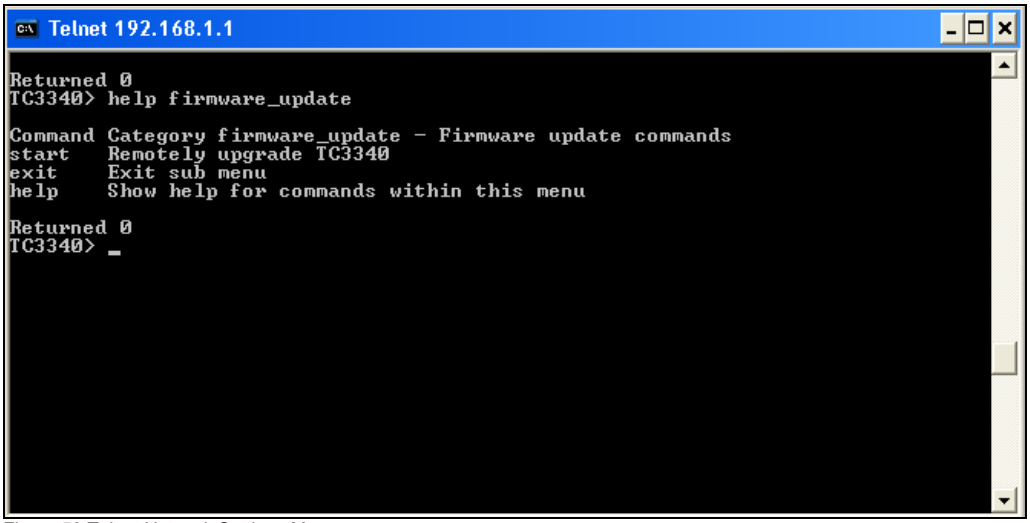


Figure 59 Telnet Network Settings Menu

4.1.4.13 Command Settings

You may request unit command settings subset for the TC3340 by typing the command
<help cmd>.This will return the command subset as shown below.

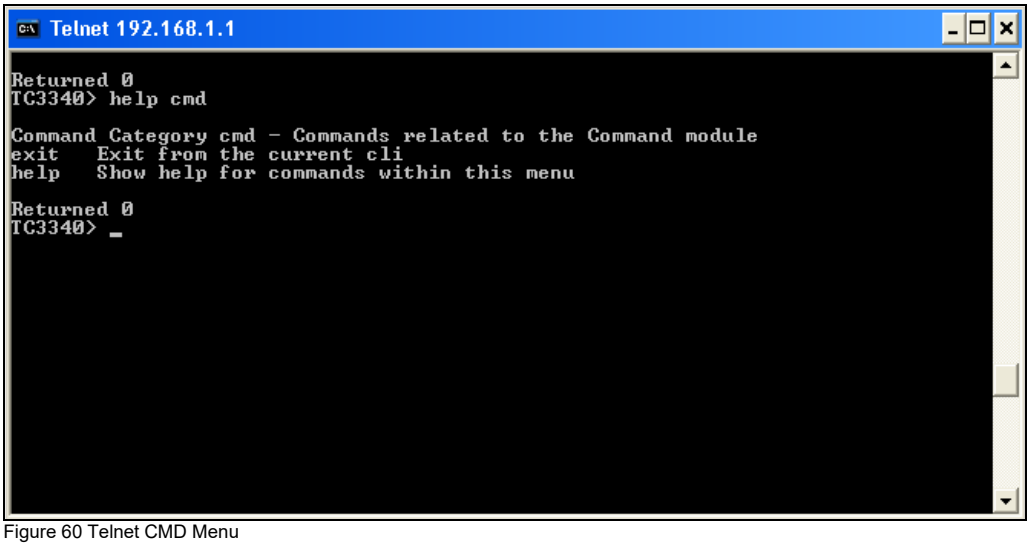


Figure 60 Telnet CMD Menu

5 SNMP Management

5.1 SNMP Management

The TC3340 comes standard with built in SNMP Agent. Contact TC Communication Technical Support to get a copy of the MIB file. 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.

5.1.1 SNMP Query

In Figure 58 below shows an example of a SNMP management station. This figure illustrates a SNMP Query of a TC3340. In this illustration the Query shows that all alarm status are off.

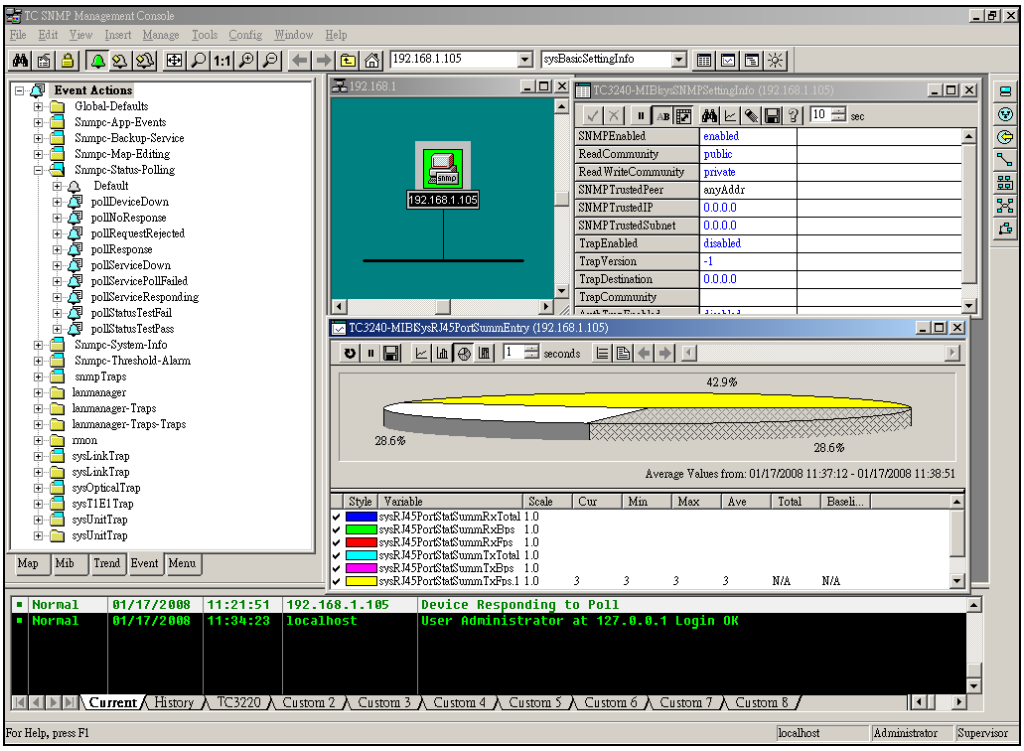


Figure 61 SNMP Query Response

5.1.2 SNMP Third Party Management Software

The figure below shows an example of the TC3340 SNMP being managed with a third party vendor software.

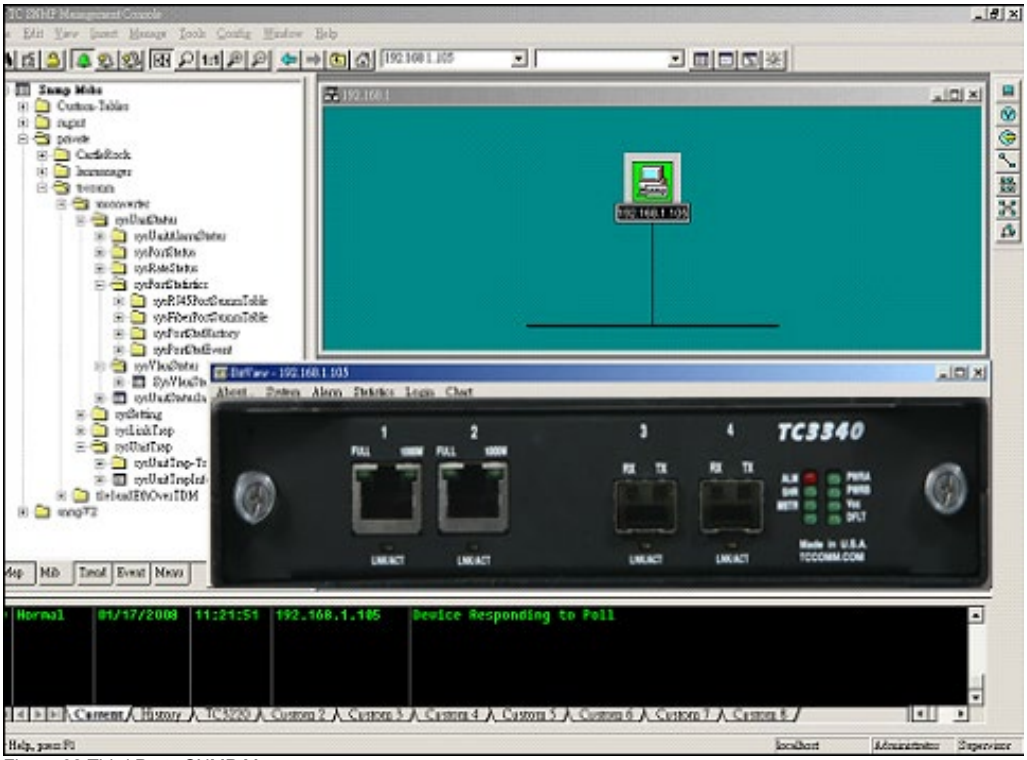


Figure 62 Third Party SNMP Manager

6 Troubleshooting/Maintenance and Testing

6.1 General

Alarm conditions occur whenever an optical or electrical problem (fault conditions) is detected by the TC3340.

Electrical:
The copper ports' LINK/ACT is solid green when a connection on the port is detected, and it will flash when activity is present. The FULL LED will be lit depending on the incoming signal. If the Ethernet signal is full duplex, the FULL LED will light solid.

Optics:
If an Ethernet signal is detected, the LINK LED will light solid. Otherwise, they will be off.

6.1.1 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 TC3340 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 TCCI, it will result in the loss of warranty.

6.1.2 "Alarm Condition" - ALM LED on the front panel

When an alarm condition is detected, the "ALARM" LED will light solid RED, and the dry contact relay will close.

6.1.3 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.

6.1.4 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 61 Reference for Calculating Fiber Loss

7 Return Policy and Warranty

7.1 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.

7.2 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).

7.3 Limitation of Liability

In no event shall the total liability of TC 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 TC Communications, Inc. by purchaser for the goods from which the claim arose, in no event shall TC Communications, Inc. be responsible for indirect and consequential damages.

In no event shall liability attached to TC Communications, Inc. unless notice in writing is given to TC Communications, Inc. within ten days of the occurrence of the event giving rise to such claim.

TC Communications, Inc. shall not be responsible for delays or non-deliveries 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 TC Communications, Inc.

TC 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.

Appendix A – Command Line Interface

Terminal Operation

This appendix provides an overview of the command-line interface commands and features for configuring and troubleshooting the TC3340 Multiplexer. The TC3340 provides configuration and test capabilities through the console port or Telnet connection. A VT-100 type terminal can be used to connect to the console port on the front of the TC3340, or the user can Telnet through an Ethernet connection.

The TC3340 CLI has a hierarchy of multiple modes. The commands available to you depend on which mode you are currently in. Common commands include **help**, **exit**, and the **tab key**.

Help -	show all available help commands within this menu
Exit -	exit the current mode
Tab Key	1) lists all elements within mode.
	2) completes a partially entered command.

Appendix B - Important Notice

Important Notice

Important Notice !!!

Please read carefully

If you need to return our products for any reason…….

TC Communications, Inc. is not responsible for items lost or damaged during shipments back to our facilities. It is the customer's responsibility to ensure proper packaging before shipment.

TC Communications recommends **retaining the original box and packaging material** to ensure proper equipment protection before shipment.

If you need assistance or have additional questions, please contact our Technical Support Department at (949) 852-1973.