RAD
data communications

Installation and Operation Manual

Egate-100

Channelized Ethernet Gateway

Version 1.0

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Notice

For further information contact RAD at the address below or contact your local distributor.

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RAD warrants to DISTRIBUTOR that the hardware in the Egate-100 to be delivered hereunder shall be free of defects in material and workmanship under normal use and service for a period of twelve (12) months following the date of shipment to DISTRIBUTOR.

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This Agreement shall be construed and governed in accordance with the laws of the State of Israel.

General Safety Instructions

The following instructions serve as a general guide for the safe installation and operation of telecommunications products. Additional instructions, if applicable, are included inside the manual.

Safety Symbols

Warning

This symbol may appear on the equipment or in the text. It indicates potential safety hazards regarding product operation or maintenance to operator or service personnel.

Danger of electric shock! Avoid any contact with the marked surface while the product is energized or connected to outdoor telecommunication lines.

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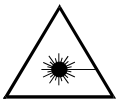
Protective earth: the marked lug or terminal should be connected to the building protective earth bus.



Warning

Some products may be equipped with a laser diode. In such cases, a label with the laser class and other warnings as applicable will be attached near the optical transmitter. The laser warning symbol may be also attached. Please observe the following precautions:

- **Before turning on the equipment, make sure that the fiber optic cable is intact and is connected to the transmitter.**
- **Do not attempt to adjust the laser drive current.**
- **Do not use broken or unterminated fiber-optic cables/connectors or look straight at the laser beam.**
- **The use of optical devices with the equipment will increase eye hazard.**
- **Use of controls, adjustments or performing procedures other than those specified herein, may result in hazardous radiation exposure.**

ATTENTION: The laser beam may be invisible!

In some cases, the users may insert their own SFP laser transceivers into the product. Users are alerted that RAD cannot be held responsible for any damage that may result if non-compliant transceivers are used. In particular, users are warned to use only agency-approved products that comply with the local laser safety regulations for Class 1 laser products.

Always observe standard safety precautions during installation, operation and maintenance of this product. Only qualified and authorized service personnel should carry out adjustment, maintenance or repairs to this product. No installation, adjustment, maintenance or repairs should be performed by either the operator or the user.

Handling Energized Products

General Safety Practices

Do not touch or tamper with the power supply when the power cord is connected. Line voltages may be present inside certain products even when the power switch (if installed) is in the OFF position or a fuse is blown. For DC-powered products, although the voltages levels are usually not hazardous, energy hazards may still exist.

Before working on equipment connected to power lines or telecommunication lines, remove jewelry or any other metallic object that may come into contact with energized parts.

Unless otherwise specified, all products are intended to be grounded during normal use. Grounding is provided by connecting the mains plug to a wall socket with a protective earth terminal. If an earth lug is provided on the product, it should be connected to the protective earth at all times, by a wire with a diameter of 18 AWG or wider. Rack-mounted equipment should be mounted only in earthed racks and cabinets.

Always make the ground connection first and disconnect it last. Do not connect telecommunication cables to ungrounded equipment. Make sure that all other cables are disconnected before disconnecting the ground.

Connection of AC Mains

Make sure that the electrical installation complies with local codes.

Always connect the AC plug to a wall socket with a protective ground.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Always connect the power cord first to the equipment and then to the wall socket. If a power switch is provided in the equipment, set it to the OFF position. If the power cord cannot be readily disconnected in case of emergency, make sure that a readily accessible circuit breaker or emergency switch is installed in the building installation. For IT power distribution systems, the switch must disconnect both holes simultaneously.

Connection of DC Mains

Unless otherwise specified in the manual, the DC input to the equipment is floating in reference to the ground. Any single pole can be externally grounded. Due to the high current capability of DC mains systems, care should be taken when connecting the DC supply to avoid short-circuits and fire hazards.

DC units should be installed in a restricted access area, i.e. an area where access is authorized only to qualified service and maintenance personnel. Make sure that the DC supply is electrically isolated from any AC source and that the installation complies with the local codes.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Before connecting the DC supply wires, ensure that power is removed from the DC circuit. Locate the circuit breaker of the panel board that services the equipment and switch it to the OFF position. When connecting the DC supply wires, first connect the ground wire to the corresponding terminal, then the positive pole and last the negative pole. Switch the circuit breaker back to the ON position.

A readily accessible disconnect device that is suitably rated and approved should be incorporated in the building installation. If the DC mains is floating, the switch must disconnect both poles simultaneously.

Connection of Data and Telecommunications Cables

Data and telecommunication interfaces are classified according to their safety status.

The following table lists the status of several standard interfaces. If the status of a given port differs from the standard one, a notice will be given in the manual.

Ports	Safety Status	
V.11, V.28, V.35, V.36, RS-530, X.21, 10 BaseT, 100 BaseT, Unbalanced E1, E2, E3, STM, DS-2, DS-3, S-Interface ISDN, Analog voice E&M	SELV	Safety Extra Low Voltage: Ports which do not present a safety hazard. Usually up to 30 VAC or 60 VDC.
xDSL (without feeding voltage), Balanced E1, T1, Sub E1/T1	TNV-1	Telecommunication Network Voltage-1: Ports whose normal operating voltage is within the limits of SELV, on which overvoltages from telecommunications networks are possible.
FXS (Foreign Exchange Subscriber)	TNV-2	Telecommunication Network Voltage-2: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are not possible. These ports are not permitted to be directly connected to external telephone and data lines.
FXO (Foreign Exchange Office), xDSL (with feeding voltage), U-Interface ISDN	TNV-3	Telecommunication Network Voltage-3: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are possible.

Always connect a given port to a port of the same safety status. If in doubt, seek the assistance of a qualified safety engineer.

Always make sure that the equipment is grounded before connecting telecommunication cables. Do not disconnect the ground connection before disconnecting all telecommunications cables.

Some SELV and non-SELV circuits use the same connectors. Use caution when connecting cables. Extra caution should be exercised during thunderstorms.

When using shielded or coaxial cables, verify that there is a good ground connection at both ends. The earthing and bonding of the ground connections should comply with the local codes.

The telecommunication wiring in the building may be damaged or present a fire hazard in case of contact between exposed external wires and the AC power lines. In order to reduce the risk, there are restrictions on the diameter of wires in the telecom cables, between the equipment and the mating connectors.

Caution

To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cords.

Attention

Pour réduire les risques s'incendie, utiliser seulement des conducteurs de télécommunications 26 AWG ou de section supérieure.

Some ports are suitable for connection to intra-building or non-exposed wiring or cabling only. In such cases, a notice will be given in the installation instructions.

Do not attempt to tamper with any carrier-provided equipment or connection hardware.

Electromagnetic Compatibility (EMC)

The equipment is designed and approved to comply with the electromagnetic regulations of major regulatory bodies. The following instructions may enhance the performance of the equipment and will provide better protection against excessive emission and better immunity against disturbances.

A good earth connection is essential. When installing the equipment in a rack, make sure to remove all traces of paint from the mounting points. Use suitable lock-washers and torque. If an external grounding lug is provided, connect it to the earth bus using braided wire as short as possible.

The equipment is designed to comply with EMC requirements when connecting it with unshielded twisted pair (UTP) cables. However, the use of shielded wires is always recommended, especially for high-rate data. In some cases, when unshielded wires are used, ferrite cores should be installed on certain cables. In such cases, special instructions are provided in the manual.

Disconnect all wires which are not in permanent use, such as cables used for one-time configuration.

The compliance of the equipment with the regulations for conducted emission on the data lines is dependent on the cable quality. The emission is tested for UTP with 80 dB longitudinal conversion loss (LCL).

Unless otherwise specified or described in the manual, TNV-1 and TNV-3 ports provide secondary protection against surges on the data lines. Primary protectors should be provided in the building installation.

The equipment is designed to provide adequate protection against electro-static discharge (ESD). However, it is good working practice to use caution when connecting cables terminated with plastic connectors (without a grounded metal hood, such as flat cables) to sensitive data lines. Before connecting such cables, discharge yourself by touching earth ground or wear an ESD preventive wrist strap.

FCC-15 User Information

This equipment has been tested and found to comply with the limits of the Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the Installation and Operation manual, may cause harmful interference to the radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Emission Requirements

This Class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulation.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Warning per EN 55022 (CISPR-22)

Warning	This is a class A product. In a domestic environment, this product may cause radio interference, in which case the user will be required to take adequate measures.
Avertissement	Cet appareil est un appareil de Classe A. Dans un environnement résidentiel, cet appareil peut provoquer des brouillages radioélectriques. Dans ces cas, il peut être demandé à l'utilisateur de prendre les mesures appropriées.
Achtung	Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkströrungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Declaration of Conformity

Manufacturer's Name: RAD Data Communications Ltd.

Manufacturer's Address: 24 Raoul Wallenberg St.
Tel Aviv 69719
Israel

Declares that the product:

Product Name: Egate-100

Conforms to the following standard(s) or other normative document(s):

EMC:	EN 55022:1998 + A1:2000, A2:2003	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement.
	EN 55024:1998 + A1:2001, A2:2003	Information technology equipment – Immunity characteristics – Limits and methods of measurement.
Safety:	EN 60950-1:2001	Information technology equipment – Safety – Part 1: General requirements.

Supplementary Information:

The product herewith complies with the requirements of the EMC Directive 89/336/EEC, the Low Voltage Directive 73/23/EEC and the R&TTE Directive 1999/5/EC for wired equipment. The product was tested in a typical configuration.

Tel Aviv, 28 July 2005

Haim Karshen
VP Quality

European Contact: RAD Data Communications GmbH, Otto-Hahn-Str. 28-30,
85521 Ottobrunn-Riemerling, Germany

Quick Start Guide

The installation of Egate-100 should be carried out by an experienced technician only. If you are familiar with Egate-100, use this quick guide to prepare the unit for operation.

1. Installing Egate-100

Connecting the Interfaces

1. Connect the STM-1/OC-3 equipment to the fiber optic front panel connectors.
2. Connect the 1000BaseT or 1000BaseSx LAN to the DATA front panel connector.
3. Use a straight cable to connect the control terminal to the front panel CONTROL connector,

   – or –

   Connect a Telnet host, a PC running a Web-browsing application or a RADview management station to the ETH MNG port.

Connecting the Power

- Connect the power cable to the power connector on the Egate-100 front panel.

  The unit has no power switch. Operation starts when the power is applied to the power connector.

2. Configuring Egate-100

Configure Egate-100 via an ASCII terminal connected to the front panel CONTROL port. Alternative configuration tools are described in *Chapter 3*.

Starting a Terminal Session for the First Time

➤ **To start a terminal configuration session:**

1. Connect an ASCII terminal to the Egate-100 CONTROL port (default settings are: 115,200, N, 8, 1, Flow control: None).
2. Set the terminal emulator to VT100 emulation for optimal view of system menus.
3. If you are using Hyper Terminal, set the terminal mode to 132 column mode for optimal view of system menus (Properties>Settings>Terminal Setup>**132 column mode**).

4. Power up Egate-100 and verify that the PWR LED on the front panel is On.
5. Verify the unit's correct startup by observing one of the following:
   - From the ASCII terminal verify that the Self-Test was successfully completed
   - Check the ALM LED on the front panel of the unit:
     - Off: no alarms present
     - On: device ALM is present.
6. If an alarm is present, check physical connections.
7. Press any key to display the user name and password entry form.
8. Enter your user name and password and proceed with the management session.

Note *The Egate-100 default user names are **su** and **user**, default password is **1234**. Only **su** has permission to modify configuration parameters and download new software versions.*

Configuring Egate-100 Elements

➤ **To configure Egate-100 elements:**

1. From the menu Main > Configuration > System > Management > **Host IP**, configure the following parameters:
   - **Host IP address**
   - **Host IP mask**
   - **Default gateway**
2. From the menu Main > Configuration > System > Management > Host IP **> Encapsulation**, configure the following parameters:
   - **Host tagging** (untagged/tagged)
   - **Host VLAN ID** (for tagged only)
   - **Host VLAN Priority** (for tagged only)
3. From the menu Main > Configuration > Physical Ports > **GbE**, configure the following parameters:
   - **Activation**: Specify whether the network port is enabled or disabled.
   - **Alarm**: Specify whether to mask or unmask the alarms**.**
   - **Autonegotiation**: Enable or disable autonegotiation mode.
4. From the menu Main > Configuration > Physical Ports > **SDH/SONET**, configure the following parameters:
   - **Activation**: Specify whether the network port is enabled or disabled.
   - **Transmit Clock Source**: Select the source of the system clock: **Internal** or **Loopback Timing.**
   - **Alarms**: Specify whether to mask or unmask the alarms**.**

- **Mapping**: Specify the E1 framed mode.

5. From the menu Main > Configuration > **Logical Ports**, define and configure the required logical ports.
6. From the menu Main > Configuration > Application > **Bridge**, configure the following bridge parameters:
   - **Bridge mode**: VLAN-Aware or VLAN-Unaware
   - **Aging time**
   - **VLAN Membership** (VLAN-Aware bridge only)
7. From the same menu, define the relevant bridge ports.

Parameter	Possible Values	Remarks
IP Address	0.0.0.0 to 255.255.255.255	Default: **None**
IP Mask	0.0.0.0 to 255.255.255.255	Default: **None**
Default Gateway	0.0.0.0 to 255.255.255.255	Default: **None**
Host Tagging	Tagged Untagged	Specifies if the management station is using tagged or untagged frames. Egate-100 transmits in the same format, even if the bridge is in VLAN-Aware mode. Default: **Untagged**
Host VLAN ID	1-4094	Sets the VLAN ID of the packets sent by the host Default: **1**
Host VLAN priority	0-7	Sets VLAN priority for packets sent by host. Relevant if Host Tagging is set to Tagged. Default: **0**
Bridge Mode	VLAN-Aware VLAN-Unaware	Selects Bridge operation mode. Default: **VLAN-Unaware**

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Chapter 1
Introduction

1.1 Overview

Egate-100 is an Ethernet aggregator, grooming Ethernet traffic carried over PDH (E1/T1) over SDH into a Gigabit Ethernet MAN. Up to 63 E1s or 84 T1s can be mapped over the CH-STM-1/OC-3 link.

Egate-100 provides full L2 switching (bridge) functionality between the Ethernet segments beyond the SDH and GbE networks. The bridge supports VLAN-Unaware and VLAN-Aware bridging modes, and thus can be used for VLAN-based L2 VPNs.

Egate-100 includes an electrical or optical Gigabit Ethernet (1000BaseTx/Sx) port and a dual port to the SDH/SONET network. Statistics are collected to enable performance monitoring and troubleshooting.

The unit supports Telnet and ConfiguRAD (Web-based) for inband configuration and management, as well as an ASCII terminal for out-of-band management.

Egate-100 is supplied as a compact standalone 1U (19″) enclosure, with an optional 19″ rack mounting kit.

Versions

AC/DC Options

The AC version is connected to AC mains of 100 to 240 VAC, 50 or 60 Hz, using the supplied power cable.

On the DC version, the terminals on the DC plug are connected to DC mains of 48 VDC.

Single/Dual Power Supply

Single or dual power supply versions are available.

STM-1/OC-3 Port

The STM-1/OC-3 port versions are:

- Single mode, 1310 nm short haul per G.957-S1.1, LC (SFP) connector
- Single mode, 1310 nm long haul per G.957-L1.1, LC (SFP) connector
- Multimode, 1310 nm, LC (SFP) connector.

Gigabit Ethernet Port

The 1GbE port versions are:

- 1000BaseSx – LC (SFF) connector
- 1000BaseT – RJ-45 connector.

Applications

Figure 1-1 illustrates a typical application, where Egate-100 supports two user VLANs (CPEs using tag stacking) and an additional Host VLAN shared by the two CPEs for management traffic. Ethernet switching between remotes in VLAN-Aware mode enables both user and management traffic to be carried over E1s between a SDH/SONET network and a GbE network.

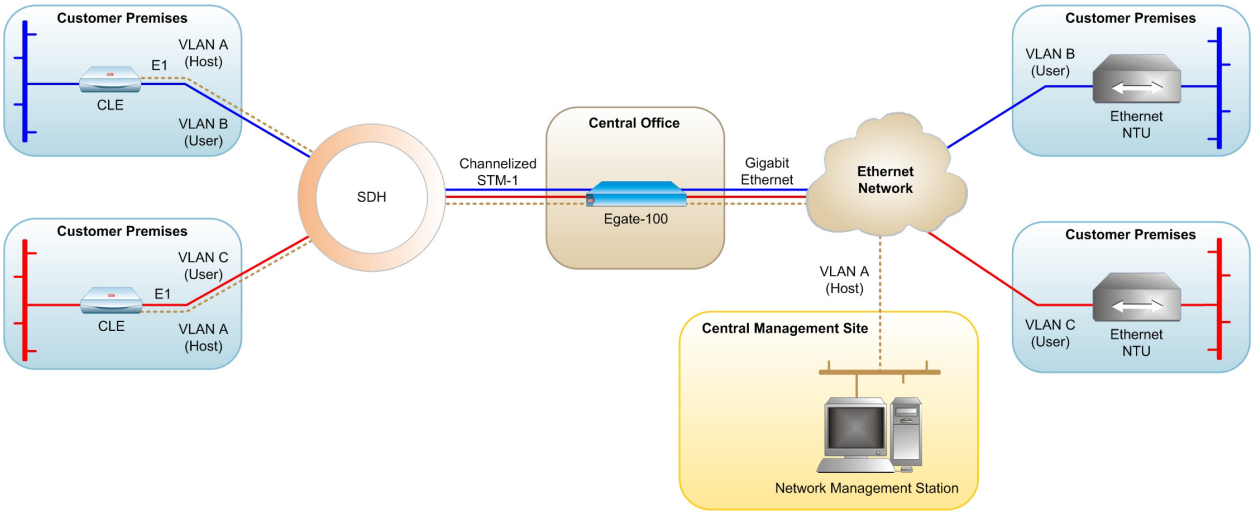

Figure 1-1. Typical Egate-100 Application

Features

Egate-100 is an Ethernet concentrator grooming Ethernet traffic carried over PDH (E1/T1) over SDH into a GbE MAN.

The unit includes:

- One Gigabit Ethernet interface (electrical or optical)
- One CH-STM-1/OC-3 interface over which up to 63 E1s or 84 T1s can be mapped
- One Fast Ethernet port for inband management
- One Control port for out-of-band management.

Gigabit Ethernet Interface

The Gigabit Ethernet interface operates in full duplex, supporting regular size (1536 bytes) frames. Egate-100 supports the following Ethernet interfaces:

- 1000BaseSx
- 1000BaseT

STM-1/OC-3 Interface

Egate-100 supports two CH-STM-1/OC-3 interfaces for SDH mapping (E1s o VC-12 o VC4) or SONET mapping (T1s o VT1.5 o STS1 o STS3): either one can be configured as the active port. The fiber optic interface of the unit uses a single-mode 1310 nm short-haul or long-haul laser diode transmitter, or a multi-mode 1310 nm transceiver.

SDH/SONET mode is user-configurable. Jitter output and tolerance complies with G.825 requirements.

Ethernet over PDH:

Up to 63 E1s or 84 T1s can be mapped into Egate-100's CH-STM-1/OC-3 interface: Ethernet over HDLC over E1/T1 (RIC-E1/T1, FCD-E1, FCD-IP compatible).

Ethernet can be mapped over unframed E1/T1, or over fractional E1/T1. For fractional E1/T1 – n x 64, where n (number of time slots) = 1-32 for E1 and 1-24 for T1 – up to 128 bundles (associated with up to 128 remote users) are supported.

Bridging

Egate-100 provides a bridging function between its different bridge ports:

- Gigabit Ethernet port
- E1/T1 on SDH/SONET (Ethernet over E1/T1 or fractional E1/T1)
- Fast Ethernet for management
- Internal host.

The internal bridge operates in VLAN-Unaware or VLAN-Aware modes (with or without VLAN double tagging).

The VLAN-Aware bridge mode allows the user to create a subgroup of bridge ports within the bridge. Each such subgroup is associated with a unique VID. Frames can be forwarded only between bridge ports that are members of the same VLAN, thus enabling a total separation between different VLAN users within the same bridge.

In VLAN-Unaware mode the bridge ignores VLAN tags and forwards frames only according to their source and destination MAC addresses.

Management

Setup, control and monitoring of status and diagnostics information can be performed using one of the following methods:

- Local and remote management via the Gigabit Ethernet port or the Fast Ethernet management port
- Local management via an ASCII terminal connected to the V.24 (RS-232) DCE control port.

ConfiguRAD is a user-friendly Web-based element management system for remote device configuration and maintenance. It is embedded in Egate-100 and provided at no additional cost. ConfiguRAD can be run from any standard Web browser.

Diagnostics

Egate-100 supports Ping tests and review of self-test results.

Statistics

Egate-100 provides statistics and counter capability at both logical-port and bridge-port levels.

Alarms

Active alarms and log file at the SDH/SONET, GbE, FE and system levels.

Compact Size

E-gate100 is a compact unit, 1U high and half the width of a standard 19″ rack. It can be mounted in a rack or used as a standalone unit.

1.2 Physical Description

E-gate100 is a 1U high standalone or rack mountable device. *Figure 1-2* shows a three dimensional view of E-gate100 with Gigabit Ethernet and STM-1/OC-3 network interfaces.

Figure 1-2. Egate-100 3D View

The unit's LEDs, interface and control connectors, and two hot-swappable power connectors (dual power supply version) are located on the front panel. For more information see *Chapter 2*.

1.3 Functional Description

This section describes the major functional features of Egate-100.

Interfaces

SDH/SONET Interface

The SDH/SONET port supports STM-1/OC-3 over optical interface. The optical interface can be either single mode short haul according to G.957 S 1.1, single mode long haul according to G.957 L 1.1, or multimode according to ANSI T1 646.

Egate-100 operates in either SONET or SDH mode to support the differences in framing and mapping parameters.

Two mapping schemes are presented:

- E1 over STM-1 (SDH path).
- T1 over OC-3 (SONET path).

STM-1 Mapping

The following figure illustrates the mapping of E1s over SDH.

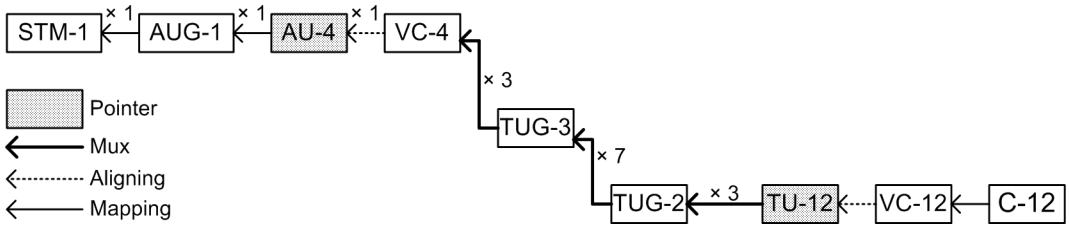

Figure 1-3. STM-1 / AU-4 / VC-4 / TUG-3s / TUG-2s / TU-12s / VC-12s /E1s

SONET Mapping

The following figure illustrates the mapping of T1s over SONET.

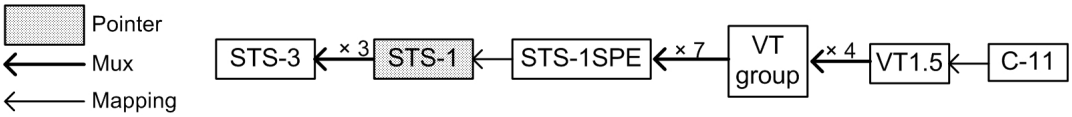

Figure 1-4. Low Order: OC-3 / STS-1 SPEs / VT Group / VT1.5s / T1s

Gigabit Ethernet Interface

The Gigabit Ethernet physical interface is either an optical 1000BaseSx or an electrical 1000BaseT. The interface supports autonegotiation.

The Gigabit Ethernet interface supports Ethernet and 802.3 standards.

Ethernet Access (Bridge)

Egate-100 has a multi-port bridge with up to two Ethernet bridge ports and up to 128 bridge ports over the CH-STM-1/OC-3 interface. The bridge supports two modes of operation: VLAN-Aware and VLAN-Unaware.

VLAN-Aware Mode

This mode enables creation of sub-groups of bridge ports within the bridge. Each sub-group is defined per VLAN and is associated with a unique VID. Frames with specific VID can be forwarded only between bridge ports that are members of this specific VLAN, thus enabling a total separation between different VLAN users within the same bridge.

Bridge Features

- Full VLAN-Aware bridge as per 802.1q
- Option for VLAN tag stacking ("double VLAN") at bridge-port ingress
- Learning and forwarding according to MAC address and VID
- Learning of up to 64,000 MAC table entries (MAC-VID pairs)
- MAC learning limit – can be configured for each bridge port
- Aging time – can be configured at the bridge level
- MAC table viewing (learned MACs).

The mechanism of the VLAN-Aware bridge can be described as five different processes:

- **Ingress** – checks each frame entering the bridge to decide if and how this frame should be passed on to the forwarding process
- **Learning** – learns new MAC table entries (MAC only or MAC VID pairs)
- **Aging** – checks the forwarding MAC table periodically
- **Forwarding** – decides to which bridge port/ports to forward the frame
- **Egress** – selects the format of the transmitted frame at the output port, with or without VLAN.

Ingress Process

The ingress process is composed of three sub-processes: frame admission, ingress filtering and PVID assignment to untagged/priority only tagged frames.

- **Frame admission** – has two modes of operation (configurable per bridge):
  - **Admit all frames** – all frames arriving from the port are admitted and proceed to the Ingress Filtering process.
  - **Admit only VLAN tagged frames** – only VLAN-tagged frames are admitted and allowed to proceed to the ingress filtering process. Untagged or priority-only tagged frames are discarded.
- **Ingress filtering** – configured per bridge, to one of the following modes:

- **Enabled** – perform ingress filtering according to VID. This means that only frames that share a VID assigned to this bridge port are admitted
- **Disabled** – all frames are forwarded.

Only admitted frames that pass filtering are submitted to the learning and forwarding processes. *Table 1-1* summarizes the behavior of the ingress process.

Table 1-1. Ingress Process

Frame Admission Mode	Ingress Filtering Mode	Bridge Behavior
Admit all frames	Enabled	VLAN-tagged frames with a VID (or PVID for untagged/priority tagged frames) that do not include the bridge port in their VLAN member set are dropped.
	Disabled	All frames pass.
Admit VLAN-tagged frames	Enabled	VLAN-tagged frames with a VID that do not include the bridge port in their member set are dropped. Untagged/priority tagged frames are dropped.
	Disabled	All VLAN-tagged frames pass. Untagged/priority tagged frames are dropped.

- **PVID assignment** – Per bridge port configuration.

  In VLAN-Aware mode, each received frame entering the bridge is associated with a single VID. In case the received frame does not contain VLAN ID (untagged or priority only tagged frames), a specific PVID is assigned to these frames before they pass to the forwarding process.

  This means that the untagged/priority tagged frames that have passed the admission are tagged with PVID and proceed to the ingress filtering process. Tagged frames are double-tagged with the PVID only if Tag Stacking is enabled.

  For untagged frames that were tagged during this process to VID=PVID, a priority tag of “0” is assigned at the VLAN priority field.

  For tagged frames that were double-tagged by PVID (in the case of tag-stacking enabled), the VLAN Priority field of the outer VLAN will be copied from that of the original frame.

Learning Process

The learning process observes the source MAC address (SA) and the VID of the received frame, and updates the forwarding database with the MAC-VID pair and with the bridge port that the frame was received from. The Forwarding Data Base (FDB) is also referred to as the MAC table.

Entries in the MAC table can be dynamic (inserted by the learning process) or static (inserted by configuration). A dynamic entry has an aging time associated with it.

The Egate-100 VLAN-Aware bridge is an Independent VLAN Learning (IVL) bridge.

The learning process inserts a new dynamic entry to the MAC table. This entry consists of a MAC-VID pair and bridge port.

- If the MAC-VID pair already exists for the same port, the aging time is updated
- If the MAC-VID pair already exists but for a different bridge port (dynamic entry), the new entry overrides the existing one
- If the MAC-VID pair already exists for a different bridge port (static entry), the static entry prevails.

Aging Process

The aging period for a table entry is the time since the last frame for this entry has entered the bridge.

The aging process checks the forwarding MAC table periodically. Each dynamic entry for which the aging period has exceeded the configured Aging Time Limit is deleted. The periodic check of the MAC table (aging time intervals), results in actual aging time that can reach up to twice the value that was configured by the user.

Forwarding Process

The forwarding process is performed based on the frame destination MAC-VID pair. The frame is forwarded to the bridge port that was specified in the MAC table for this MAC-VID pair entry.

Untagged frames are forwarded according to the PVID that was attached to that frame during the ingress process.

Frames are forwarded, dropped or flooded according to these guidelines:

- Forwarded: if the **bridge port** of the pair entry (DA, VID) in the MAC table is both an active bridge port and a member of the VLAN, the frame is forwarded to that bridge port only.
- Dropped:
  - Local Filtering: If the bridge port for the pair entry (DA, VID) in the MAC table is the port on which the frame was received, the frame is dropped.
  - If there are no active ports associated with the frame's VID, the frame is dropped.
- Flooded:
  - If the pair (DA, VID) is not learned and does not exist in the MAC table, the frame is transmitted to all bridge ports that are associated with the frame's VLAN ID.
  - Multicasts and broadcasts are flooded only through the bridge ports whose VLAN ID is identical to the frame's VLAN ID.

Egress Process

After the forwarding process identifies the destination bridge port/ports to which the frame should be transmitted, the transmission process transmits it with the appropriate format (Egress Tag-handling configuration).

The user can configure per port the frame format to be used at egress:

- None (Do Not Strip VLAN):
  - VLAN-tagged frames are transmitted unchanged, or with PVID tag stacking if this is enabled
  - Untagged frames are transmitted tagged with priority 0 and VID=PVID of the port from which they have entered
  - Priority-tagged frames are transmitted tagged with original priority and VID = PVID
- Strip VLAN – in this mode, one level of VLAN is stripped from each frame.

VLAN-Unaware Mode

In this mode the bridge forwarding ignores the VLAN ID of VLAN tagged frames.

Each Ethernet packet received from each bridge port (1GbE, FE or E1s) is forwarded according to its destination MAC address.

Bridge Features

- Learning and forwarding according to MAC address only
- Learning of up to 64,000 MAC addresses
- MAC learning limit – can be configured for each bridge port
- Aging time – can be configured at the bridge level
- VLAN tagged frames transparency (forwarding according to MAC only)
- MAC table viewing.

Ingress Process

All frames are accepted in this mode: untagged, priority-tagged or VLAN-tagged.

Learning and forwarding is based on the MAC addresses, independent of the VLAN. This mode is sometimes referred to as transparent mode, due to "tag transparency".

Learning Process

The learning process observes the source MAC address (SA) of the received frame and updates the forwarding database (FDB) with the MAC and the bridge port that the frame was received from. The FDB is also referred to as the MAC table.

The learning process inserts a new entry into the MAC table. This entry consists of MAC and bridge port.

- If the MAC already exists for the same bridge port, the aging time will be updated

- If the MAC already exists, but for a different bridge port, (dynamic entry) the new entry will override the existing one.

Aging Process

The aging process checks the forwarding MAC table periodically. Each dynamic entry aging time period that has exceeded the configured Aging Time Limit is deleted. The aging time period is the period of time since the last frame for this entry has entered the bridge. The periodic check of the MAC table (aging time intervals), results in an actual aging time that can reach up to twice the value that was configured by the user.

Forwarding Process

The forwarding process is performed based on the frame MAC Destination Address (MDA). The frame is forwarded to the Bridge/port specified in the MAC table for this MAC.

Frames are forwarded, dropped or flooded at this stage for the following reason:

- **Forwarded**: A frame will be forwarded according to its DA, to the bridge port where its DA was learned
- **Dropped**: (Local filtering) - If the port for that DA entry in the MAC table is the port on which the frame was received, the frame will be dropped
- **Flooded**:
  - If there is no information regarding the DA in the MAC table then the frame is flooded to all ports
  - Frames with multicast or broadcast address are flooded to all ports.

Egress Process

In this bridge mode (VLAN-Unaware), the frames are transmitted unchanged: No tags are added or removed.

Quality of Service

Egate-100 supports QoS mapping to up to four strict priority queues at the E1/T1 egress according to one of the following:

- VLAN priority (available in VLAN-Aware bridge mode only)
- IP precedence (ToS byte)
- DSCP (ToS byte)

IP Precedence / DSCP

The IP header is shown in *Figure 1-5*. TOS byte structure for IP Precedence is shown in *Figure 1-6* and for DSCP in *Figure 1-7*.

Non-IP frames are mapped to the lowest-priority queue.

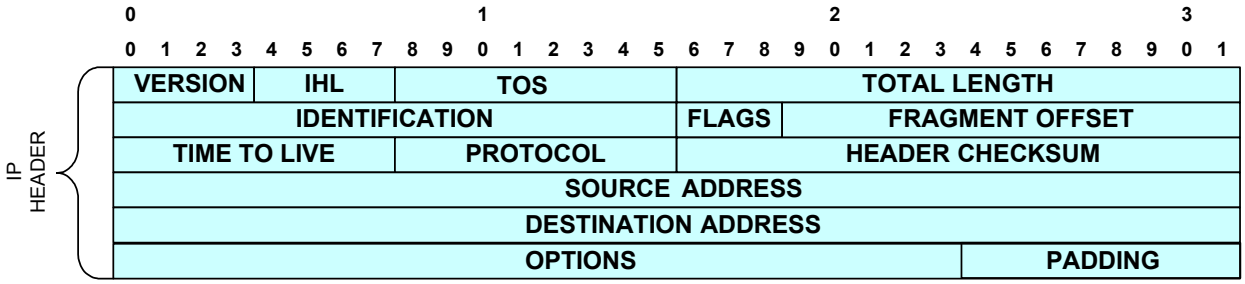

Figure 1-5. IP Header

Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
P2	P1	P0	XX	XX	XX	XX	XX

P2–P0: Precedence value

Figure 1-6. ToS Byte IP Precedence Field

Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
DS5	DS4	DS3	DS2	DS1	DS0	XX	XX

DSCP: six bits (DS5–DS0)

Figure 1-7. ToS Byte DSCP Field

VLAN Priority

VLAN, according to IEEE 802.1p&q, adds four bytes to the MAC layer of the Ethernet frame. The user can set the contents of these bytes, MAC layer priority and VLAN ID.

Figure 1-8 shows the VLAN tag format.

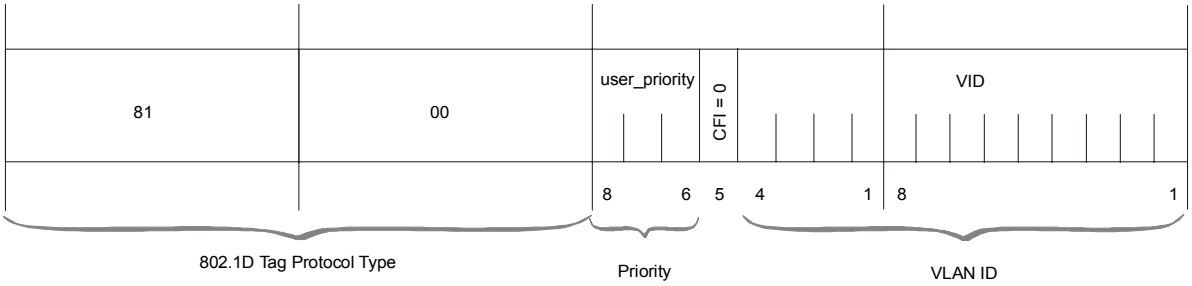

Figure 1-8. VLAN Tag Format (802.1)

Untagged frames are tagged by the Egate PVID. VLAN priority is set to 0 in this case, and the frame is mapped accordingly.

In the case of tag stacking, the original VLAN priority is copied to the new VLAN and the frame is mapped according to this value.

Flooding

The user can choose how to map each one of the following frame types:

- Multicasts
- Broadcasts
- Unknown unicasts.

Buffer Management

Egate-100 has a total of 3050 frame buffers, and frames in each buffer are limited in size by maximum frame length.

Each bridge port priority queue (at egress) has a configurable threshold. When a frame enters the bridge, it is assigned for transmission to the appropriate bridge port based on the functioning of the bridge, and to the appropriate bridge-port priority queue based on the packet's priority fields.

If the number of packets in the bridge port priority queue exceeds the configured threshold, the incoming packet is dropped. Otherwise, it is queued for transmission.

A second threshold is used at the level of a group of priority queues. For each priority level, a threshold can be configured for the group of all priority queues (of the E1/T1 bridge ports) of that priority level. Before a packet is queued for transmission, both thresholds (individual and group) are checked.

The buffer-management scheme described allows for over-subscription of buffers: -- Number-of-bridge-ports x Packet-threshold > 3050 – to allow for a high burst tolerance at the bridge-port level while preventing the high-priority queues from suffering buffer starvation.

The setting also includes the GbE and FE buffer threshold. Proper design of the setting will ensure that there will be no buffer starvation for the GbE regardless of E1/T1 buffer state: E1/T1-threshold + GbE threshold = 3050.

All thresholds are configurable, and the user may modify settings as well as specify the desired amount of oversubscription, if any.

Management

Egate-100 can be monitored locally from an ASCII terminal, or from a remote site using Telnet or ConfiguRAD Web based application. RADviewLite application is also supported.

Event Log File

Events are stored and time-stamped in an event log file that is saved in a non-volatile memory. Up to 5000 cyclic entries are maintained.

Inband Management

E-gate100 supports inband management via Telnet, Web and RADView-Lite. Configuration, monitoring and statistics are available.

Out-of-Band Management

Egate-100 enables full configuration and diagnostics via an ASCII terminal. The ASCII terminal is connected to the Control Port in the Egate-100 front panel.

ASCII terminal activation is provided in *Chapter 3* including general instructions for navigating through the system menus and windows and modifying data.

Management Access

E-gate architecture allows access from the GbE network or from the FE management port to both the E-gate host and remote site devices. In certain configuration modes, by use of different VLANs a total separation of management traffic from user traffic can be achieved.

VLAN-Based Management Scheme

In this scenario, traffic coming from the remote CPE uses two VLANs: One VLAN is user traffic, for which the CPE may use tag stacking; the second is management traffic. All CPEs connected to the Egate-100 share the same management VLAN.

In VLAN-Aware mode, Egate-100 forwards management traffic to the network management station in the Ethernet network. As a different VLAN is used, total separation between user traffic and management traffic is maintained. See *Figure 1-9*.

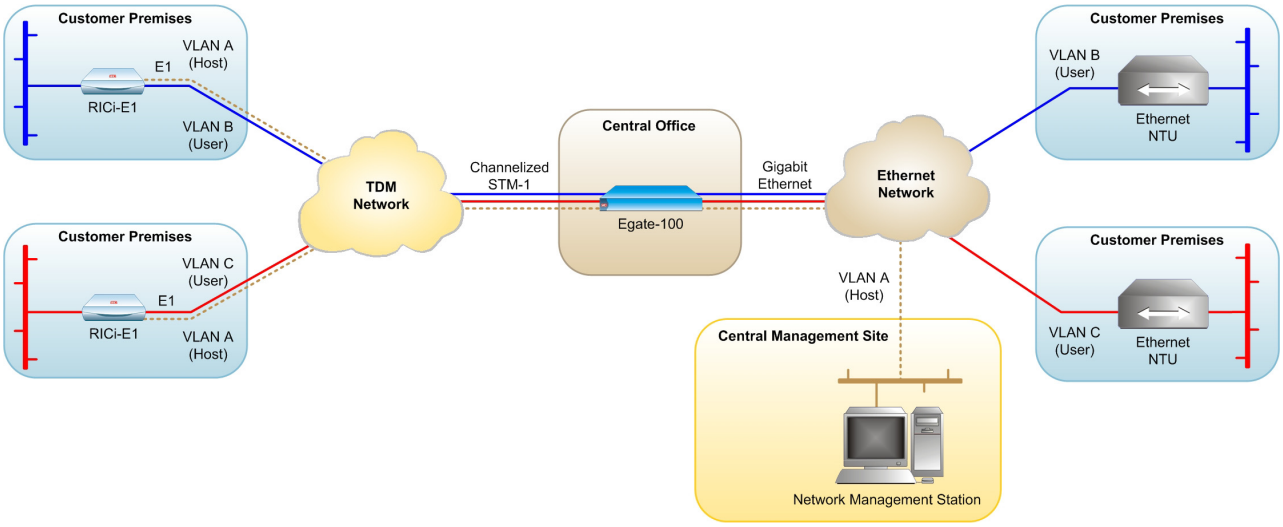

Figure 1-9. Management Traffic in a VLAN-Aware Application

Security

ASCII terminal, Telnet and Web access are password protected. After a period of 15 minutes of inactivity during which no character was sent to the terminal the system exits to the password screen. The Telnet or Web session is closed.

Egate-100 supports the following access authorization levels:

- Super-user mode for configuration and monitoring
- User mode for monitoring and configuration view only.

Statistics and Alarms

Provides statistics and counters capability at the bridge port level.

Active alarms and log file at SDH/SONET, GbE, FE and system level. For more information, see *Chapter 6*.

E1/T1 Timing

Egate-100 has a single clock domain and functions as the clock master. All remote units operate in loopback timing (LBT) mode and use the Egate-100 as their timing source. The E1/T1 clock source can be driven by an internal oscillator or derived from the SDH/SONET Rx.

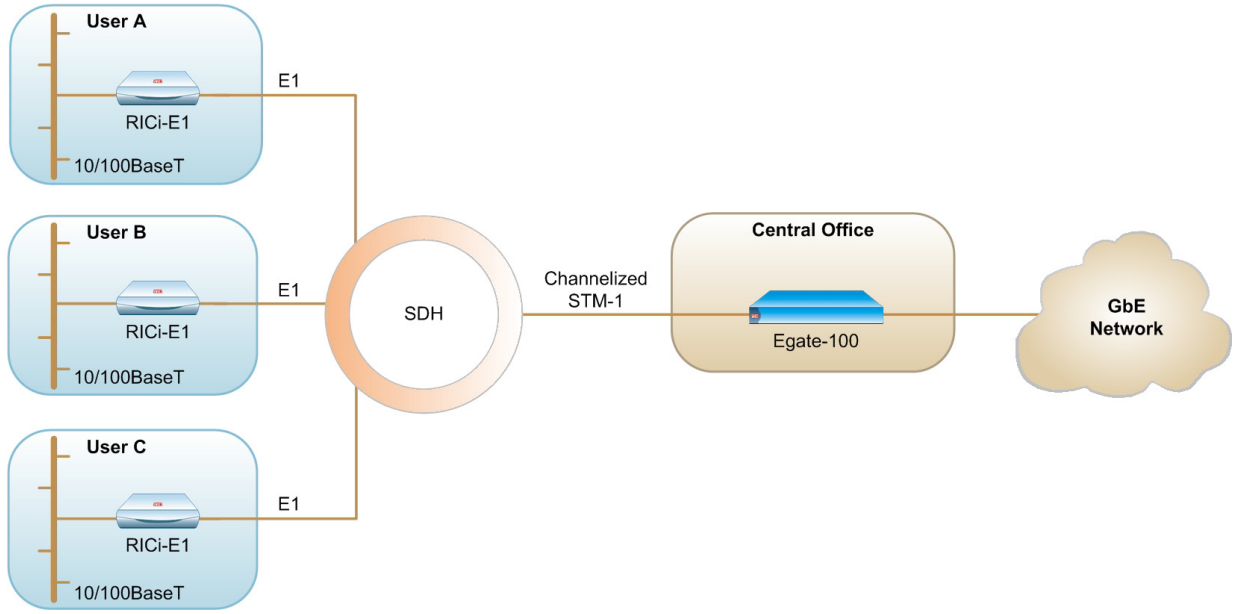

Figure 1-10. E1/T1 Timing

Diagnostics

There are several types of diagnostics and troubleshooting procedures. For more information see *Chapter 6*.

- Ping test and self test
- Events/Traps

  Hierarchically-layered traps/alarms – events resulting from events that were already reported and are still active – are not sent. For example, LOF event traps will not be sent if LOS was sent and the physical layer problem persists.

  Alarms and traps can be masked, upon user configuration.

1.4 Technical Specifications

Gigabit Ethernet Interface	*Number of Ports*	1
	Compatibility	Relevant sections of IEEE 802.3u, 802.3x, 802.1p and 802.3q
	Data Rate	1000 Mbps
	Frame Size	Regular (1600 bytes)
	Duplex Mode	Full duplex
	Interface Connector	1000BaseSx – Optical interface, LC Connector
		1000BaseT – Electrical interface, RJ-45 Connector. Cat. 5 cable
	Range	1000BaseSx – 220m/720 ft over 62.5 μm multimode fiber or 500m/1640 ft over 50 μm multimode fiber
		1000BaseT – 100 meters/328 feet on UTP category 5 cables
	Wavelength	850 nm
	Optical input range	0 to -17 dBm
	Optical output power	0 to -9.5 dBm
Fast Ethernet Management Interface	*Number of Ports*	1
	Compatibility	Ethernet standards, IEEE 802.3
	Data Rate	10/100 Mbps
	Frame Size	Regular (1536 bytes)
	Electrical Cable Type	Cat. 5 cable
	Connector	RJ-45
	Range	100 meters/328 feet on UTP category 5 cables
	Duplex modes	Full duplex / Half duplex
	Autonegotiation	Supported
STM-1/OC-3 Interface	*Number of Ports*	1 active, 1 inactive
	Connector	LC (SFP)
	Data Rate	155 Mbps
	Options	Single mode 1310 short haul G.957 S1.1
		Single mode 1310 long haul G.957 L1.1
		Multimode ANSI T1.646
	Range	Long haul: 40 km/25 miles

		Short haul: 15 km/9.4 miles
	Wavelength	1310 nm
	Optical input range	Long haul: -10 to -34 dBm
		Short haul: -8 to -28 dBm
	Optical output power	Long haul: 0 to -5 dBm
		Short haul: -8 to -15 dBm
Internal Bridge	*Number of Ports*	Up to 131 including: • Gigabit Ethernet • Fast Ethernet for management • Local host • ETH o E1/T1s o STM-1/OC-3 (up to 128)
	LAN Table	Up to 64,000 MAC addresses (learned)
	Operation Mode	VLAN-Aware, VLAN-Unaware
	Buffer	3050 frame buffer
	Filtering and forwarding	Up to 220,000 pps (Full CH-STM-1 capacity)
Control Port	*Interface*	RS-232/V.24 (DTE asynchronous)
	Data Rate	9.6, 19.2, 38.4, 57.6, 115.2 kbps
	Connector	9-pin, D-type, female (DB9)
Monitoring	*Statistics*	System and physical layer alarms
		ETH o E1 frame counters
		FE and GbE physical layer alarms and frame counters
Indicators	*PWR (green)*	On: Egate-100 is powered on
		Off: Egate-100 is off
	ALM (red)	On: Interface (FE, GbE, SDH/SONET)) or system alarm exists
		Off: No Alarm
	ACT (yellow)	Blinking: Ethernet frame received or sent within the last second
		Off: No frame received or sent within the last second
	SYNC (green)	On: STM-1 port is synchronized
		Off: LOS, LOF
Power	*AC Source*	100 to 240 VAC (±10%), 50 to 60 Hz
	DC Source	48 VDC
	Power Consumption	30W max

Physical	*Height*	43 mm / 1.7 in (1U)
	Width	430 mm / 19 in
	Depth	240 mm / 9.4 in
	Weight	Single power supply: 3.5 kg / 7.7 lb Dual power supply: 4.0 kg / 8.8 lb
Environment	*Temperature*	0°–50°C / 32°–122°F
	Humidity	Up to 90%, non–condensing

Chapter 2

Installation and Setup

This chapter includes the following topics:

- Site requirements and specifications
- Package contents
- Equipment needed
- Installation and setup.

2.1 Introduction

Egate-100 is delivered completely assembled. It is designed for installation as a desktop unit or for mounting in a 19-inch rack. For rack installation instructions, refer to the *Rack Mounting Kit for 19-inch Racks* guide that comes with the RM kit.

After installing the unit, configure Egate-100 using an ASCII terminal connected to the Egate-100 control port. The Egate-100 configuration procedures are described in *Chapter 3* and *Chapter 4*.

If problems are encountered, refer to *Chapter 6*.

Warning

No internal settings, adjustment, maintenance and repairs should be performed by either the operator or the user. Such activities must be performed only by skilled personnel who are aware of the hazards involved. Always observe standard safety precautions during installation, operation and maintenance of this product.

2.2 Site Requirements and Prerequisites

Note *See also the sections Connection of AC Mains and Connection of DC Mains in the safety instructions at the beginning of this document.*

AC-powered Egate-100 units should be installed within 1.5 meters (5 feet) of an easily accessible and grounded AC outlet, capable of furnishing the required supply voltage in the range of 100 to 240 VAC, at 50 or 60 Hz.

DC-powered Egate-100 units should be connected to -48 or -60 VDC mains in accordance with the DC Connection supplement.

Allow at least 90 cm (36 in) of frontal clearance for operator access. For continuous product operation allow at least 10 cm of frontal clearance, and at least 15 cm at rear of the unit, for cable connections and ventilation. For proper ventilation, keep at least 2.5 cm clearance from the sides and top of the product.

The ambient operating temperature of Egate-100 is 0° to 50° C (32° to 122°F), at a relative humidity of up to 90%, non-condensing.

2.3 Package Contents

The Egate-100 package contains:

- Egate-100 unit
- AC power cord
- DC adapter plug (for DC option)
- Technical documentation CD
- RM-34 installation kit (optional).

2.4 Equipment Needed

Hand Tools and Kits

Egate-100 needs no special tools for installation. You need a screwdriver to mount Egate-100 in a 19-inch rack.

Power Cable

Egate-100 comes equipped with an appropriate (country or region dependent) power cord to be connected from the power socket on the rear panel to the mains.

Cable and Connectors

Refer to the following table to determine what cables and connectors are required for installation. *Appendix A* specifies the wiring of all connector pinouts.

Table 2-1. Required Connection Media

Interface	Cable/Connector
Control port	Straight RS-232/V.24 cable with DB-9 female connector for ASCII terminal
SDH/SONET interface	LC (SFP) fiber optic connection media

Table 2-1. Required Connection Media (Cont.)

Interface	Cable/Connector
Fast Ethernet interface	RJ-45, 8-pin connection media
GbE interface	Electrical: RJ-45, 8-pin connection media
	Optical: LC (SFF) fiberoptic connection media

2.5 Connecting the Interfaces

Connect the Egate-100 network and user interfaces using the ports on the front panel.

Refer to *Appendix A* for all connector pinouts.

Connecting the SDH/SONET Port

The Egate-100 SDH/SONET network port terminates in a fiber optic interface with LC connectors (SDH/SONET).

➤ **To connect the SDH/SONET interface:**

- Connect the SDH/SONET equipment to the fiber optic front panel connectors.

Connecting the GbE Port

The Egate-100 GbE interface terminates with an 8-pin RJ-45 (electrical) or LC (optical) connector.

➤ **To connect the GbE interface:**

- Connect the GbE equipment to the relevant connector on the front panel:
  - **Electrical**: Connect using the RJ-45, 8-pin connector.
  - **Optical**: Connect using the fiber optic LC (SFF) front panel connectors.

Connecting the Fast Ethernet Port

The Egate-100 user Fast Ethernet interface terminates in an 8-pin RJ-45 connector.

➤ **To connect the Fast Ethernet interface:**

- Connect the 100BaseT cable to the ETH-MNG RJ-45 front panel connector.

Connecting the Terminal

➤ **To connect the terminal:**

Use a straight cable to connect the control terminal to the front panel 9-pin CONTROL connector,

– or –

Connect the CONTROL port to an ASCII terminal using a straight RS-232 cable.

2.6 Connecting the Power

Egate-100 can be ordered with either AC power or DC power (for more information, refer to the Egate-100 data sheet).

Connecting the AC Power

AC power is supplied to Egate-100 via a standard 3-prong plug with an integral fuse holder.

AC power should be supplied through the 1.5m (5 ft) standard power cable terminated by a 3-prong plug. The cable is provided with the unit.

Warning

Before switching on this unit and connecting or disconnecting any other cable, the protective earth terminals of this unit must be connected to the protective ground conductor of the mains power cord. If you are using an extension cord (power cable) make sure it is grounded as well.

Any interruption of the protective (grounding) conductor (inside or outside the instrument) or disconnecting of the protective earth terminal can make this unit dangerous. Intentional interruption is prohibited.

If the Egate-100 unit is equipped with two hot-swappable power supplies, DO NOT install AC and DC power supplies together in the same unit.

➤ **To connect AC power:**

1. Connect the power cable to the power connector on the Egate-100 front panel.
2. Connect the power cable to mains outlet.

   The unit turns on automatically upon connection to the mains.

Connecting the DC Power

➤ **To connect DC power:**

- Refer to the DC power supply connection supplement, located on the Technical Documentation CD, and the safety instructions at the beginning of this document.

Chapter 3
Operation

This chapter:

- Explains power-on and power-off procedures
- Provides a detailed description of the front panel controls and indicators and their functions
- Provides instructions for using a terminal connected to the Egate-100 control port
- Describes how to navigate menus
- Illustrates the management menu tree.

3.1 Turning Egate-100 On

➤ **To turn on the Egate-100 unit:**

- **AC unit:** Connect the unit to AC mains using a RAD-supplied power cable.
- **DC unit:** Use the circuit breaker in the building installation to turn the Egate-100 unit on, connecting the terminals on the DC plug to the DC mains.

  The PWR indicator lights up and remains lit as long as Egate-100 receives power.

Egate-100 requires no operator attention once installed, with the exception of occasional monitoring of the front panel indicators. Intervention is only required when the unit must be configured to its operational requirements, or when diagnostic tests are performed.

3.2 Controls and Indicators

The unit's LEDs are located on the front panel (see *Figure 3-1)*. *Table 3-1* lists the functions of the LED indicators.

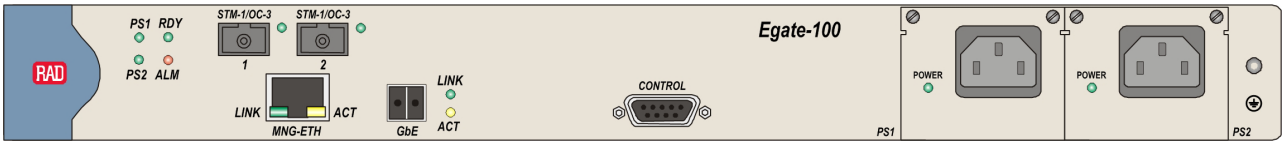

Figure 3-1. Egate-100 Front Panel (Dual Power Supply Version)

Table 3-1. Egate-100 LEDs and Controls

Name	Color	Function
PWR (single power supply version) PS1 / PS2 (dual power supply version)	*Green*	On: Egate-100 is powered on Off: Egate-100 is off
RDY	*Green*	On: Self test has been completed successfully Blinking: Self test has failed
ALM	*Red*	On: Interface (FE, GbE, SDH/SONET) or system alarm exists Off: No Alarm
LINK (FE) LINK (GbE)	*Green*	On: Ethernet connection is up Off: Ethernet connection is down
ACT (FE) ACT (GbE)	*Yellow*	Blinking: Ethernet frame was received or sent within the last second
SYNC 1 SYNC 2	*Green*	On: STM-1 port is synchronized Off: LOS, LOF

3.3 Default Settings

Table 3-2 lists the default settings of the Egate-100 configuration parameters.

Table 3-2. Default Settings

Component	Parameter	Default Value
System	Device Name	EGATE100
	Location	The Location of this Device
	Contact Person	Name of Contact Person
	Host IP address	0.0.0.0
	Host IP mask	0.0.0.0
	Host default gateway	0.0.0.0
	Read community	Public
	Write community	(null)
	Trap community	(null)
	Host Tagging	Untagged
	Host VLAN ID	1
	Host Priority Tag	0

Table 3-2. Default Settings (Cont.)

Component	Parameter	Default Value
	Baud rate	115,200 bps
	Master Clock Source	Rx Clock (SONET/SDH Rx)
	Fallback Clock Source	Rx Clock (SONET/SDH Rx)
	Max Buffers	100
SDH/SONET Port	Activity	Up
	Alarm	Unmasked
	Frame type	SDH
	Tx clock	Loopback Timing
	SOH Alarms	Unmasked
	HVC Alarms	Unmasked
	LVC Alarms	Unmasked
	APS	Port 1
	STM-1 Mapping Activation	Enabled
	E1/T1 Frame Type	Unframed
	E1/T1 Idle Code	0
	E1/T1 Alarms	Unmasked
GbE Port	Activity	Up
	Alarm	Unmasked
	Autonegotiation	Enabled
Fast Ethernet Port	Activity	Up
	Alarm	Unmasked
	Autonegotiation	Enabled
	Speed	100BaseT
	Mode	Full-duplex
Logical Ports	Type	HDLC
Bridge	VLAN-Mode	VLAN-Unaware
	Aging Time	300
Bridge Ports	Activation	Enabled
	Ingress Filtering	Disabled
	Accept Frame Type	All
	Port VID	1

Table 3-2. Default Settings (Cont.)

Component	Parameter	Default Value
	Egress Tag Handling	None
	Ingress Tag Handling	None
	Maximum Learning MAC Address	64000

3.4 Configuration Alternatives

Configuration and monitoring operations are performed locally from an ASCII terminal connected to the control port or from a PC running a Web browser, Telnet, or RADview-Lite over the GbE network or via the FE MNG port.

The SU account has permission to view and to change all configuration parameters. The User account has permission only to view parameters.

The following functions are supported by the Egate-100 management software:

- Viewing system information
- Modifying configuration and mode of operation, including setting system default values and resetting the unit
- Monitoring Egate-100 performance
- Upgrading software.

Managing via the Terminal Port

Egate-100 includes a V.24/RS-232 asynchronous DCE port, designated CONTROL and terminated in a 9-pin D-type female connector. The control port continuously monitors the incoming data stream and immediately responds to any input string received through this port.

The Egate-100 control port can be configured to communicate at the following rates: 9.6, 19.2, 38.4, 57.6 or 115.2 kbps.

➤ **To start a terminal control session:**

1. Make sure all Egate-100 cables and connectors are properly connected.
2. Connect Egate-100 to a PC equipped with an ASCII terminal emulation application (for example, Windows Hyper Terminal or Procomm).
3. Turn on the control terminal PC and set its default port parameters to 19,200 baud, 8 bits/character, 1 stop bit, no parity, no flow control.
4. Set the terminal emulator to ANSI VT100 emulation (for optimal view of system menus).
5. Press any key to display the login screen.

Logging In via an ASCII Terminal

➤ **To log in via an ASCII terminal:**

1. Enter **SU** as the user name. SU (super user) has full read/write permissions.
2. Enter **1234** for (default) password.

Note *It is recommended to change default passwords to prevent unauthorized access to the unit.*

Choosing Terminal Options

➤ **To choose an option:**

1. Type the number corresponding to the option, and press **<Enter>**.
2. When any change is made in the menu, the **Save** option appears as the last option in the menu.
3. Type the number corresponding to the **Save** option in the current menu, and press **<Enter>** to save your change.

   Egate-100 updates its database with a new value or displays a new menu for the selected option.
4. If you press <**ESC**> to exit the menu without saving your changes, the following message appears:

   "**`Do you want to save changes (Y/N/C)?`**"

   Type the appropriate letter to save or not save your changes (**Y**es/**N**o/**C**ancel).

Navigating Terminal Tables

Some of the Egate-100 management software screens are tables, which are larger than standard menus and require scrolling to navigate between parameters.

Use the following keys (case-sensitive) for table navigation:

- **<Ctrl>+L** – scroll left
- **<Ctrl>+R** – scroll right
- **<Ctrl>+U** – scroll up
- **<Ctrl>+D** – scroll down
- **Right/Left Arrows** – move right/left (editable tables only)
- **Up/Down Arrows** – move up/down (editable tables only)
- **<Tab>** – select next editable cell
- **G<row number>,<col number>** – go to a specific cell
- **<Ctrl>+G** – go to top of table (log file, MAC table)

Note *You can display these navigation keys by typing <**?**> from a table.*

Managing via ConfiguRAD

ConfiguRAD is a Web-based remote access terminal management software. It provides a user-friendly interface for configuring, collecting statistics and monitoring the Egate-100 unit.

Web Browser Requirements

The following Web browsers can be used to access Egate-100 ConfiguRAD supervision utility from any location using Internet protocols.

- Internet Explorer 6.0, running on Windows™ 98, Windows™ 2000 or Windows™ XP
- Netscape Communicator 7.1, running on Windows™ NT or Unix.

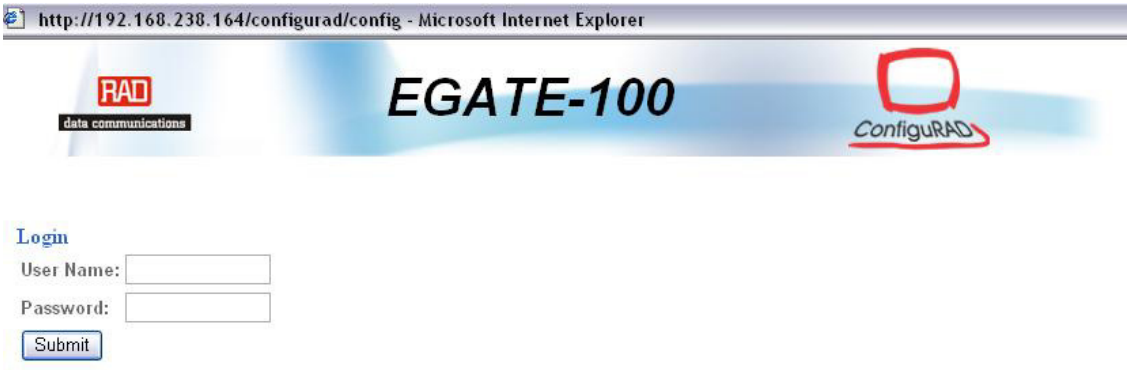

Figure 3-2. Web Browser Access – Login Window

Logging In via ConfiguRAD

➤ **To login via Web browser:**

1. Connect the Ethernet port of Egate-100 to the LAN.
2. Open the Web browser.
3. Disable any pop-up blocking software, such as Google Popup Blocker.
4. Enter the IP address of the Egate-100 in the address field of the browser in the following format: **http://IP address** and then press **<Enter>** to command the browser to connect (**IP address** stands for the actual Egate-100 IP address which has to be assigned via an ASCII terminal).

5. After the opening window is displayed, click **LOGIN**.
6. In the Login window (*Figure 3-2*), enter your user name (read/write user default is **SU**) and password (default is **1234**).

   The ConfiguRAD Main Menu for Egate-100 is displayed (*Figure 3-3*).

Note

- *It is recommended to change default passwords to prevent unauthorized access to the unit.*
- *Egate-100 allows up to six management sessions to be active at a time. This includes up to five network sessions (Telnet, Terminal, ConfiguRAD, RADview-Lite) and one ASCII terminal session.*
- *If no user input is detected for 15 minutes during a ConfiguRAD session, Egate-100 automatically disconnects from the management station.*

Navigating the ConfiguRAD Menus

At the left-hand bottom corner, ConfiguRAD provides some auxiliary management tools:

- **Status** – shows the number of users currently managing Egate-100.
- **Trace** – opens an additional pane for system messages, progress indicators (ping, software and configuration file downloads) and alarms. It is recommended to keep the trace pane open all the time.
- **Refresh All** – refreshes performance registers.

➤ **To choose an option:**

1. Click a link in the ConfiguRAD screen to display the next menu.
2. Once the target screen is displayed, select a value from the drop-down box or enter it in a text box.

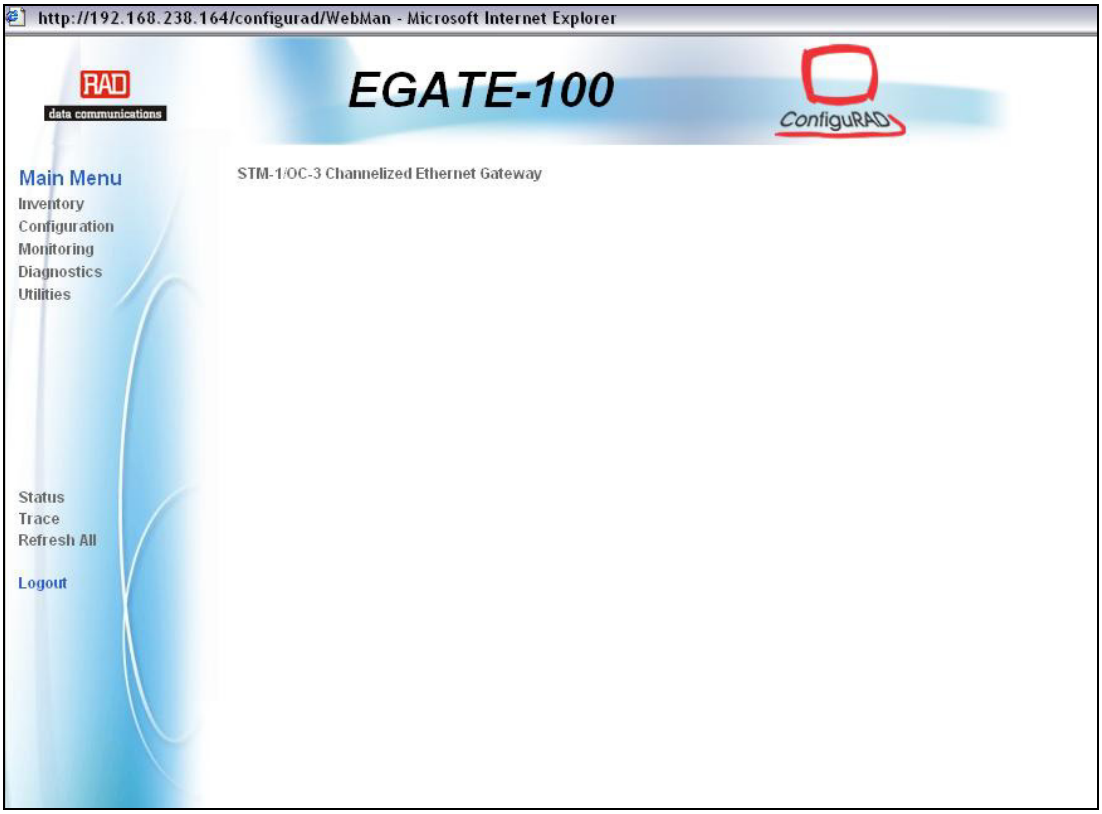

Figure 3-3. Web Browser Access – Main Menu

Managing via RADview-Lite

RADview-Lite is a user-friendly and powerful SNMP-based element management system (EMS), used for planning, provisioning and managing heterogeneous networks. RADview-Lite provides monitoring of RAD products and networks via their SNMP agents.

Configuration and monitoring capabilities are via a GUI-cut-through to ConfiguRAD.

Contact your local distributor for more details about RADview-Lite, or refer to the RADview-Lite User's Manual.

Obtaining a New Password

If a user forgets a password, follow the procedure below.

➤ **To obtain a new password:**

1. Log in with the username CHNGPASS.

   A random identification number (**Dynamic Key**) is displayed at the bottom of the screen.

2. Contact RAD Technical Support and refer to this key. You will be given a temporary password.

3. Log in using the temporary password. You will be prompted to enter and confirm a new password for future sessions.

3.5 Overview of Menu Operations

Egate-100's management software includes tools for configuring, operating and monitoring the system. The Main Menu options (see *Figure 3-4*) are:

- **Inventory –** displays information on the functional blocks of the unit
- **Configuration –** defines parameters for the Egate-100 system, physical layer (SDH/SONET, GbE and FE ports), bridge and quality of service.
- **Monitoring** – displays port connection status; a log file; active alarms; Ethernet status and physical characteristics; bridge port statistics; and a MAC table for running applications.
- **Diagnostics** – initiates diagnostic tests – ping and displaying self-test results.
- **Utilities** – manages transfer of updates to/from a remote server: upload of software and download/upload of the configuration file.

You can use this menu tree as a reference aid when performing configuration and control functions.

```
                                EGATE-100

Main Menu

 1. Inventory                   >
 2. Configuration               >
 3. Monitoring                  >
 4. Diagnostics                 >
 5. Utilities                   >


Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit
```

Figure 3-4. Egate-100 Main Menu

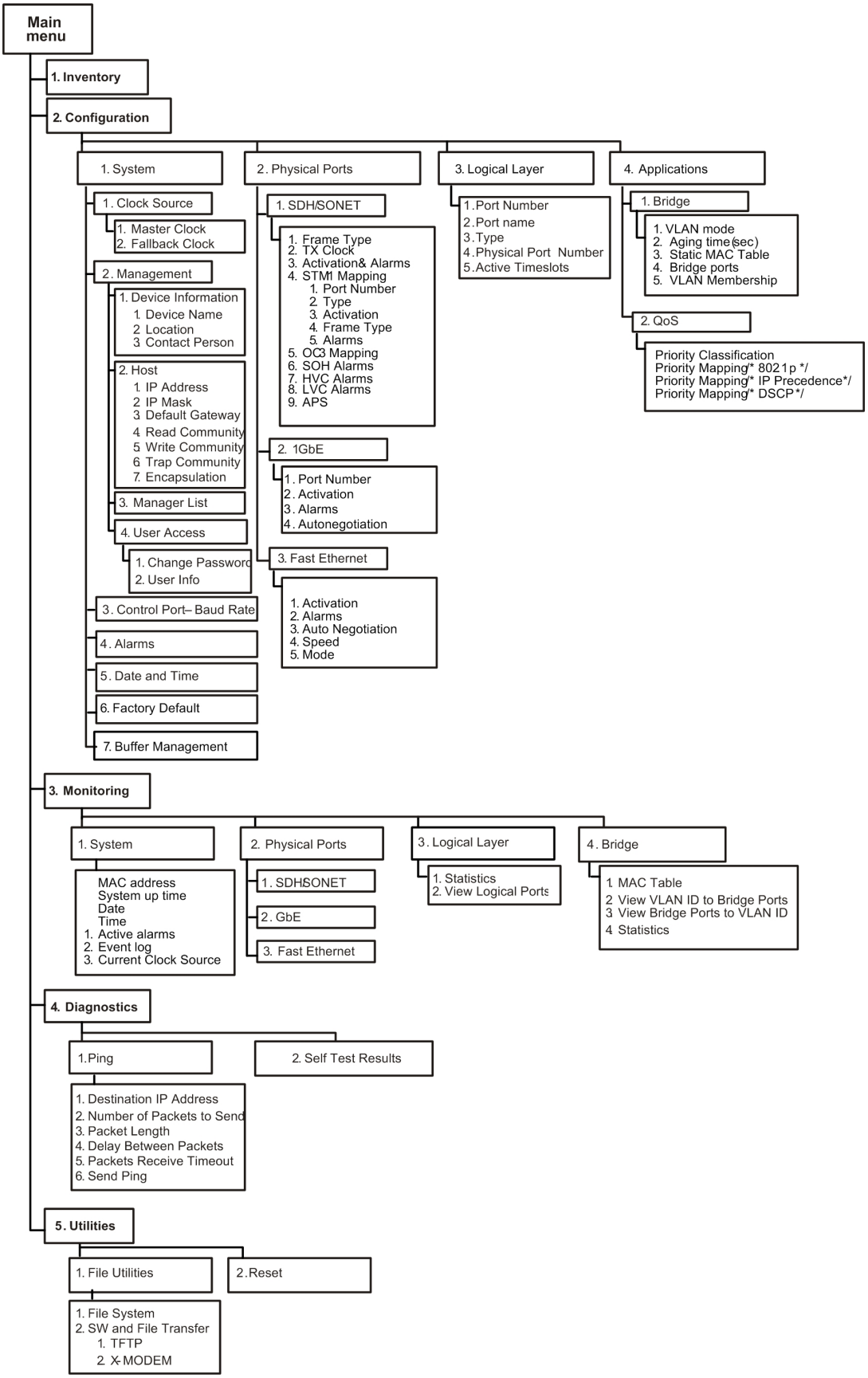

Figure 3-5. Menu Tree

3.6 Turning Egate-100 Off

➤ **To power off the Egate-100 unit:**

- Remove the power cord from the power source.

Chapter 4
Configuration

This chapter explains the Egate-100 configuration, utility and inventory screens and provides guidance on the parameter options. Although examples are given from a terminal screen, the information is relevant for Telnet and ConfiguRAD as well, as their menus are the same as those of the terminal.

The following three Main Menu options are presented in this chapter:

- **Inventory –** displays information on the functional blocks of the unit (see *Section 4.7*)
- **Configuration –** defines parameters for the Egate-100 system, physical layer bridge and quality of service (see *Section 4.1*)
- **Utilities –** manages transfer of software updates from a remote server: upload of software and download/upload of the configuration file (see *Section 4.8*).

The complete menu tree of Egate-100's management software is shown in *Chapter 3*. Monitoring and diagnostics menus are presented in *Chapter 6*.

4.1 Configuration Sequence

The configuration procedure for Egate-100 includes the following stages:

1. Defining system parameters (IP and terminal access settings) (see *Section 4.2*)
2. Configuring the physical layer (SDH/SONET, GbE and FE ports) (see *Section 4.3*)
3. Configuring the logical layer (see *Section 4.4*)
4. Configuring the internal bridge (see *Section 4.5*) and Quality of Service (see *Section 4.6*).

Egate-100 must be defined by the user at each stage, as many of the parameters do not have default settings. If a parameter is not defined correctly, an error message appears.

4.2 Defining System Parameters

The Egate-100 management software allows you to do the following via the System menu (see *Figure 4-1*):

- Select the system master and fallback clock sources
- Configure the management environment, including:

  - Assign a name and give a description for the device, and enter information regarding device location and a contact person
  - Define IP parameters of the Egate-100 host (network management station)
  - Configure management access
  - Control user access
- Configure terminal baud rate
- Mask or unmask the system alarms
- Set the internal system data and time
- Reset Egate-100 to factory default settings (see *Section 4.9*)
- Define buffer management thresholds.

```
                                EGATE-100
Main Menu>Configuration>System
 1. Clock Source                >
 2. Management                  >
 3. Control Port                >
 4. Alarms                      >
 5. Date and Time               >
 6. Factory Default
 7. Buffer Management           >

Please select item <1 to 7>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-1. System Menu

Selecting the Clock Source

Egate-100's system clock is used for E1/T1 tributary timing. Egate-100 is assigned a master system clock, and a fallback clock that goes into action in case the master clock fails (e.g. when the link supplying the timing fails).

The master and fallback clock can be assigned as the internal clock of the Egate-100 unit, or as the SDH/SONET (active link) Rx clock. It is recommended to have different settings for the master clock and fallback clock: for example, **SDH/SONET** for the master clock and **Internal** for the fallback clock.

In the event that both Master and Fallback clocks (set to Rx) fail, the system clock is automatically set to Internal.

➤ **To select the Clock Source:**

1. Follow the path: Main Menu > Configuration > System > **Clock Source**

   The Clock Source menu appears:

```
                                EGATE-100
Main Menu>Configuration>System>Clock Source
 1. Master Clock                >
 2. Fallback Clock              >
Please select item <1 to 2>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-2. Clock Source Menu

2. From the Clock Source menu, select **Master Clock.**

   The Master Clock menu appears:

```
Main Menu>Configuration>System>Clock Source>Master Clock
 1. Source                      >   (Rx Clock)
 2. Wait to Restore (sec)[0 - 720]
    Port                        >   (SDH/SONET)

Please select item <1 to 2>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-3. Master Clock Menu

3. Choose one of the following to indicate the first-priority source of timing for the Egate-100:
   - **Internal**, if you want the master clock to be the internal clock of the Egate-100 unit.
   - **Rx Clock**, if you want the master clock source to be the Rx clock from the SDH/SONET active link. This is the default value.
4. If you choose Rx Clock, enter a **Wait to Restore** value: the number of seconds (between 0 and 720) to wait before an attempt for the Master clock to be restored.
5. Select **Save**.
6. From the Clock Source menu, select **Fallback Clock.**

   The Fallback Clock menu appears (see *Figure 4-4*).

```
                                EGATE-100
Main Menu>Configuration>System>Clock Source>Fallback Clock
 1. Source                      >   (Internal)
Please select item <1 to 1>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-4. Fallback Clock Menu

7. Choose one of the following, to indicate the second-priority source of timing:
   - **Internal**, if you want the fallback clock to be the internal clock of the Egate-100 unit.
   - **Rx CLock**, if you want to set the fallback clock as the Rx clock from the SDH/SONET active link. This is the default value.
8. If you choose Rx Clock, enter a **Wait to Restore** value (between 0 and 720 seconds).
9. Select **Save.**

Note *It is not recommended to set both the Master and the Fallback clock sources to the same Rx clock.*

Entering Device Information

The Egate-100 management software allows you to assign a name to the unit, and specify its location to distinguish it from the other devices installed in your organization. A contact person can also be assigned. Each of these fields can hold up to 50 characters.

➤ **To enter device information:**

1. Follow the path: Main Menu > Configuration > System >Management > **Device Information**

   The Device Info menu appears (see *Figure 4-5*).
2. From the Device Info menu, select **Device Name** and enter a desired name for the Egate-100 unit. The default name is EGATE100.
3. Select **Location**, and enter a description of the Egate-100's current location.
4. Select **Contact Person**, and enter the name of a contact person for this unit.
5. Select **Save.**

```
                                EGATE-100
Main Menu>Configuration>System>Management>Device Information
    Description      ... (EGATE100 HW Version:0.00/A, SW Version:1.00)
 1. Name             ... (EGATE100)
 2. Location         ... (The location of this device)
 3. Contact          ... (Name of contact person)
Please select item <1 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-5. Device Information Menu

Configuring IP Host Parameters

Egate-100 can be managed by a network management station connected to the unit's Fast Ethernet port, or via the 1GbE network. In order to establish a proper connection, it is necessary to configure the following: Host IP address, subnet mask, default gateway, its trap, read and write communities. In addition, by selecting forwarding mode and VLAN parameters, it is possible to create a separate management VLAN.

➤ **To define the IP parameters:**

1. From the Management menu, select **Host**.

   The Host menu appears:

```
                                EGATE-100
Main Menu>Configuration>System>Management>Host
 1. IP Address                  ... (0.0.0.0)
 2. IP Mask                     ... (0.0.0.0)
 3. Default Gateway             ... (0.0.0.0)
 4. Read Community              ... (public)
 5. Write Community             ... ()
 6. Trap Community              ... ()
 7. Encapsulation               >
Please select item <1 to 7>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-6. Host Menu

2. From the Host menu, perform the following (refer to *Table 4-1*):
   - Select **IP Address** to define the IP address of the host.
   - Select **IP Mask** to define the host IP subnet mask.
   - Select **Default Gateway** and set the default gateway IP address to that of the host IP subnet.
   - Select **Read Community** to enter the name of a community with Read-Only authorization.
   - Select **Write Community** to enter the name of a community with Write authorization.
   - Select **Trap Community** to enter the name of a community to which Egate-100 should send traps.

Table 4-1. Host Parameters

Parameter	Possible Values	Remarks
IP Address	0.0.0.0 to 255.255.255.255	Host IP address **Default: 0.0.0.0**
IP Mask	0.0.0.0 to 255.255.255.255	Host IP subnet mask **Default: 0.0.0.0**

Table 4-1. Host Parameters (Cont.)

Parameter	Possible Values	Remarks
Default Gateway	0.0.0.0 to 255.255.255.255	Default gateway IP address : Should be set to that of the host IP subnet **Default: 0.0.0.0**
Read Community	public private	**Default: public**
Write Community	public private	**Default: (none)**
Trap Community	public private	**Default: (none)**

3. Select **Encapsulation** to define VLAN tagging performed by the host
   The Encapsulation menu appears:

```
                                EGATE-100
Main Menu>Configuration>System>Management>Host>Encapsulation
 1. Host Tagging                  >   (Tagged)
 2. Host VLAN ID[1 - 4094]        ... (1)
 3. Host Priority Tag[0 - 7]      ... (0)

Please select item <1 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-7. Encapsulation Menu

4. From the Encapsulation Menu, perform the following (refer to *Table 4-2*):
   - Select the **Host Tagging** mode: Tagged or Untagged.
   - Select **Host VLAN ID** to specify the host VLAN ID (1–4094).
     Displayed only when Tagged mode is selected for Host Tagging.
   - Select **Host Priority Tag** to specify the priority level for the host VLAN (0–7).
     Displayed only when Tagged mode is selected for Host Tagging.
5. Select **Save**.
6. Return to the Host IP menu and save again.

Table 4-2. Host Encapsulation Parameters

Parameter	Possible Values	Remarks
Host Tagging	Untagged Tagged	Untagged: The host transmits and receives only untagged frames. In VLAN-Aware mode, the host bridge port must be set to Stripping. Tagged: The host transmits VLAN-tagged frames and receives only frames tagged with the same VLAN ID as that of the host. **Default: Untagged**
Host VLAN ID	1–4094	Sets the VLAN ID of the packets sent by the host. (Displayed only when Host Tagging is set to Tagged.) **Default: 1**
Host Priority Tag	0–7	Quality of Service priority tag for packets sent by the host. (Displayed only when Host Tagging is set to Tagged.) **Default: 0**

Configuring the Network Managers

Define or modify the network management stations to which the SNMP agent of Egate-100 sends traps. Up to 16 managers can be defined. The IP address defines each management station. In addition, you can temporarily prevent a manager station from receiving traps by masking the network manager.

➤ **To add a network manager:**

1. From the Management menu, select **Managers List**.
   The Managers List menu appears (see *Figure 4-8*).
2. Enter a sequential number, corresponding to the manager you wish to specify.
3. Specify **IP Address** and **Trap** (masked/unmasked).

➤ **To edit the managers list:**

1. From the Management menu, select **Managers List**.
   The Managers List menu appears (see *Figure 4-8*).

```
                                    EGATE-100
Main Menu>Configuration>System>Management>Managers List
    Num       IP address        Trap
     1          0.0.0.0        Unmask
     2          0.0.0.0        Unmask
|    3          0.0.0.0        Unmask
v    4          0.0.0.0        Unmask
     5          0.0.0.0        Unmask
     6          0.0.0.0        Unmask
     7          0.0.0.0        Unmask
 1. Change cell                    ... (0.0.0.0)
Please select item <1 to 1>
C - Clear
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 4-8. Managers List Menu

2. From the Managers List menu, move the cursor to the Manager IP cell you wish to change by pressing **<Tab>**.

   The selected cell is highlighted and the value is displayed in the **Change cell** field.

3. Select **Change cell**, and enter a new IP address for the selected network manager.
4. Move the cursor to the Trap field and toggle between **Mask** and **Unmask** to mask or unmask traps for the selected management station.

Controlling User Access

From the User Access menu you can change the current user's password. Egate-100 supports only two user names (SU and User). The unit is supplied with the following default user settings:

- Superuser name – **SU**, Password – **1234**.
- User name – **User**, Password: **1234**.

The SU account has permission to view and to change all configuration parameters. The User account has permission only to view parameters.

➤ **To change the current user name and password:**

1. Follow the path: Main Menu>Configuration>System>Management>User Access>**Change Password**.

   The Change Password screen is displayed (see *Figure 4-9*).

2. From the Change Password screen, confirm that the current user name is displayed: User or SU.
3. Select **Password**, and enter the current password (default is 1234).

4. Select **New Password** and assign a new password of up to eight characters to the current user.

   The password is case sensitive.

5. Select **Confirm new Password** to confirm the new password.

   If the new password and confirmation do not match then an **Illegal confirm password** error message is displayed.
   Reassign the new password.

6. Select **Save**.

```
                                EGATE-100
Configuration>System>Management>User Access>Change Password

1. User Name                          ... (USER)
2. Password                           ... (********)
3. New Password                       ... (********)
4. Confirm new Password               ... (********)
5. Save

> Please select item from 1 to 5

ESC-Previous menu; !-Main menu; &-Exit                              1 user(s)
```

Figure 4-9. Change Password Menu

➤ **To view users with permission to access the system:**

- Follow the path: Main Menu>Configuration>System>Management>User Access>**User info**

  The User Info table appears (see *Figure 4-10*). It shows users with permission to access Egate-100 and their access level (Read Only or Read/Write). Note that the device supports only permanent accounts.

```
                                EGATE-100
Main Menu>Configuration>System>Management>User Access>User Info

       User Name    Access level   Dynamic/Permanent
     1    USER           RO            Permanent
     2     SU            RW            Permanent
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 4-10. User Info Table

Configuring Terminal Parameters

Egate-100 allows you to configure the terminal baud rate.

Note *The Baud Rate parameter is masked during a Telnet or Web-based session, as the baud rate is used for the session communication.*

➤ **To change the terminal baud rate:**

1. Follow the path: Main Menu > Configuration > System >**Control Port**.
   The Control Port menu appears:

```
                                EGATE-100
Main Menu>Configuration>System>Control Port
 1. Baud Rate                        >    (19200 bps)
Please select item <1 to 1>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-11. Control Port Menu

2. From the Control Port menu, select Baud Rate**.**
   The **Baud Rate** menu appears.
3. Select the desired baud rate (9600, 19200, 38400, 57600, 115200). The default baud rate is 115200.

Table 4-3. Terminal Parameters

Parameter	Possible Values	Remarks
Baude Rate	9600 bps	Communication speed
	19200 bps	**Default: 19200**
	38400 bps	
	57600 bps	
	115200 bps	

Configuring Alarm Masking

➤ **To mask/unmask system alarms:**

1. Follow the path: Main Menu > Configuration > System > **Alarms**
   The Alarms configuration screen appears (see *Figure 4-12*).
2. Configure system alarms: Masked or Unmasked. (By default they are Unmasked.)

```
                                    EGATE-100
Main Menu>Configuration>System>Alarms


1. Alarms                      > (Unmasked)


ESC-prev.menu; !-main menu; &-exit
```

Figure 4-12. Alarm Configuration Screen

Entering Date and Time

➤ **To enter date and time information:**

1. Follow the path: Main Menu > Configuration > System > **Date and Time**

   The Date and Time screen appears (see *Figure 4-13*).

2. Select **Date** to update the date in the format illustrated.
3. Select **Time** to update the time in the format illustrated.

```
                                    EGATE-100
Main Menu>Configuration>System>Date and Time
 1. Date  [YYYY-MM-DD]              ... (2005-03-31)
 2. Time [HH:MM:SS]                 ... (13:14:15)
Please select item <1 to 2>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-13. Date and Time Screen

Entering Buffer Management Information

Buffers are used to hold frames in the event of a burst of traffic. Egate-100's management software allows you to customize Egress drop thresholds (maximum burst supported) for individual logical port queues – each of four priority levels – and for the total of all logical-port queues of each priority level. Drop thresholds can also be specified for the GbE, Fast Ethernet (ETH 1) and Host ports. See *Chapter 1* for additional information.

➤ **To configure buffer management:**

1. Follow the path: Main Menu > Configuration > System > **Buffer Management**

   The Buffer Management menu appears (see *Figure 4-14*).

2. From the Buffer Management menu, select a logical-port priority level (for example, **Traffic Class 1 Max**) and specify the maximum number of buffers allowed for each logical-port queue at this Quality-of-Service priority level.
3. Repeat the previous step for any additional priority levels you wish to customize at the individual queue level (Max).

4. From the Buffer Management menu, select a logical-port priority level (for example, **Traffic Class 1 Total**) and specify the total maximum number of buffers for all logical port queues at this Quality-of-Service priority level.
5. Repeat the previous step for any additional priority levels you wish to customize at the queue group level (Total).
6. Select **GbE Max** to change the maximum number of buffers for the GbE port.
7. Select **ETH 1 Max** to change the maximum number of buffers for the Fast Ethernet port.
8. Select **HOST Max** to change the maximum number of buffers for host management.

➤ **To reset buffer management parameters:**

1. Follow the path: Main Menu > Configuration > System > **Buffer Management**

   The Buffer Management menu appears (see *Figure 4-14*).

2. From the Buffer Management menu, select **Set to Default**.

   The default configuration is restored.

```
                                EGATE-100
Configuration>System>Buffer Management


 1. Traffic Class 0 Max[1 - 3000]  ... (100)
 2. Traffic Class 1 Max[1 - 3000]  ... (100)
 3. Traffic Class 2 Max[1 - 3000]  ... (100)
 4. Traffic Class 3 Max[1 - 3000]  ... (100)
 5. Traffic Class 0 Total[1 - 3000]... (600)
 6. Traffic Class 1 Total[1 - 3000]... (600)
 7. Traffic Class 2 Total[1 - 3000]... (600)
 8. Traffic Class 3 Total[1 - 3000]... (2500)
 9. GbE Max [1 - 3000]             ... (50)
10. ETH 1 Max[1 - 3000]            ... (100)
11. HOST Max[1 - 3000]             ... (100)
12. Set To Default
>
Please select item <1 to 12>


ESC-prev.menu; !-main menu; &-exit                                1 M/ 1 C
--------------------------------------------------------------------------
```

Figure 4-14. Buffer Management Menu

Table 4-4 Buffer Management Parameters

Parameter	Possible Values	Remarks
Traffic Class 0 Max	1–3000	Maximum burst supported for a bridge port priority queue of traffic class 0 **Default: 100**
Traffic Class 1 Max	1–3000	Maximum burst supported for a bridge port priority queue of traffic class 1 **Default: 100**
Traffic Class 2 Max	1–3000	Maximum burst supported for a bridge port priority queue of traffic class 2 **Default: 100**
Traffic Class 3 Max	1–3000	Maximum burst supported for a bridge port priority queue of traffic class 3 **Default: 100**
Traffic Class 0 Total	1–3000	Total burst supported for all bridge port priority queues of traffic class 0 **Default: 600**
Traffic Class 1 Total	1–3000	Total burst supported for all bridge port priority queues of traffic class 1 **Default: 600**
Traffic Class 2 Total	1–3000	Total burst supported for all bridge port priority queues of traffic class 2 **Default: 600**
Traffic Class 3 Total	1–3000	Total burst supported for all bridge port priority queues of traffic class 3 **Default: 2500**
GbE Max Buffers	1–3000	Maximum burst supported for GbE port **Default: 50**
ETH 1Max Buffers	1–3000	Maximum burst supported for Fast Ethernet port **Default: 100**
HOST Max Buffers	1–3000	Maximum burst supported for Fast Ethernet port **Default: 100**
Set to Default		Restores the default buffer mangement configuration.

4.3 Configuring Ports at the Physical Level

Egate-100 has SDH/SONET, GbE and Fast Ethernet ports. The SDH/SONET, GbE and Fast Ethernet configuration menus are accessed from the Physical Ports menu.

If you need to make a change to the configuration of SDH/SONET physical ports, you must first clear any mapping of these ports to the logical ports.

Configuring the SDH/SONET Port

➤ **To configure SDH/SONET ports:**

1. Follow the path: Main Menu > Configuration > **Physical Ports**.
   The Physical Ports menu appears:

```
                                EGATE-100
Main Menu>Configuration>Physical Ports
 1. SDH/SONET                       >
 2. 1GbE                            >
 3. Fast Ethernet                   >
Please select item <1 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-15. Physical Ports Menu

2. From the Physical Ports menu, select SDH/SONET.
   The SDH/SONET menu appears (see *Figure 4-16*).
3. Configure SDH/SONET Frame type and Tx CLock. (See *Table 4-5* for details)
4. Configure SDH/SONET APS (setting Port 1 or Port 2 as the in-force port).
5. Configure Activation and Alarms (see below).
6. Configure STM-1 Mapping (see below).
7. Configure SOH, HVC and LVC Alarms (see below).

```
                                EGATE-100
Main Menu>Configuration>Physical Ports>SDH/SONET
 1. Frame Type                  >   (SDH)
 2. Tx Clock                    >   (Internal)
 3. Activation & Alarms         >
 4. STM-1 Mapping                >
 5. SOH Alarms                  >
 6. HVC Alarms                  >
 7. LVC Alarms                  >
 8. APS                         >
Please select item <1 to 8>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-16. SDH/SONET Menu

Table 4-5. SDH/SONET Port Parameters

Parameter	Possible Values	Remarks
Frame type	SDH SONET	This parameter sets the Egate-100 mode of operation: E1s o SDH or T1s o SONET. **Default: SDH**
Tx clock	Loopback Timing Internal	Transmit clock source of the SDH/SONET port **Default: Loopback Timing**
SOH Alarms	Masked Unmasked	Section-level Alarms, per port **Default: Unmasked**
HVC Alarms	Masked Unmasked	High VC level. For SDH: per port. For SONET: Per VC3 per port. **Default: Unmasked**
LVC Alarms	Masked Unmasked	Low VC level, per VC12 or VT1.5 link. Range of links may be set. For VC12: 1-63; For VT1.5: 1-84 **Default: Unmasked**
APS	Port 1 Port 2	Specifies which port is in use. (APS is not supported at this stage. However, the user may specify which of the two available ports to use.)

➤ **To configure SDH/SONET activation and alarms:**

1. Follow the path: Main Menu > Configuration > Physical Ports >SDH/SONET > **Activation & Alarms.**

The Activation & Alarms screen appears (see *Figure 4-17*).

```
                                EGATE-100
Main Menu>Configuration>Physical Ports>SDH/SONET>Activation & Alarms
 1. Port Number                 >   (1)
 2. Activation                  >   (Enabled)
 3. Alarms                      >   (Unmasked)
Please select item <1 to 3
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-17. Activation & Alarms Screen

2. Select the Port Number (1 or 2) and specify **Activation** (Enabled or Disabled) and **Alarms** (Masked or Unmasked).

Note *When SDH/SONET Activation is set to Disabled, the SYNC indicator (LED) will be turned off.*

➤ **To configure SDH/SONET port mapping:**

1. Follow the path: Main Menu > Configuration > Physical Ports >SDH/SONET > **STM-1 Mapping** .

   The STM-1 Mapping menu appears (see *Figure 4-18*.

```
                                EGATE-100
Main Menu>Configuration>Physical Ports>SDH/SONET>STM-1 Mapping

 1. Port Number [1-63]          ... (5-12)
 2. Type                        >   (E1 over VC12)
 3. Activation                  >   (Enabled)
 4. E1 Frame Type               >   (Unframed)
 5. E1 Idle Code [0-ff]         ... (0)
 6. E1 Alarms                   >   (Unmasked)
 7. Save

Please select item <1 to 7>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-18. SDH/SONET STM-1 Mapping Menu

2. Select an individual E1/T1 Port Number or a range of ports. You can map up to 63 E1s or 84 T1s (E1 over VC12 only, or T1 over VT1.5 only).
3. Configure STM-1 Mapping parameters for E1 (refer to *Table 4-6*) or T1 (refer to *Table 4-7*).
4. Enter **F** (forward) to move to the next port and **B** (back) to return to the previous port.

Table 4-6. SDH/SONET STM-1 Mapping Parameters (E1)

Parameter	Possible Values	Remarks
Port Number	1–63	Parameters may be specified for an individual or range of ports.
Type	E1 over VC12	This parameter shows the type of mapping of PDH over SDH. Determined by frame type (SDH or SONET). **Default: E1 over VC12 (Read-only)**
Activation	Enabled Disabled	**Default: Enabled**
E1 Frame Type	Unframed Framed-CRC4 Framed-NoCRC4	Specifies framing mode, including for Ethernet o fractional E1, if E1 is defined here as Framed. **Default: Unframed**
E1 Idle Code	0 – FF	(For E1 Framed only) **Default: 0**
E1 Alarms	Masked Unmasked	**Default: Unmasked**

Table 4-7. SDH/SONET STM-1 Mapping Parameters (T1)

Parameter	Possible Values	Remarks
Port Number	1–84	Parameters may be specified for an individual or range of ports.
Type	T1 over VT1.5	This parameter shows the encapsulation of PDH over SDH. Determined by frame type (SDH or SONET). **Default: T1 over VT1.5 (Read-only)**
Activation	Enabled Disabled	**Default: Enabled**
T1 Frame Type	Unframed Framed-ESF Framed-D4	Specifies framing mode, including for Ethernet o fractional T1, if T1 is defined here as Framed. **Default: Unframed**
T1 Alarms	Masked Unmasked	**Default: Unmasked**

➤ **To configure SDH/SONET SOH or HVC alarms:**

1. Follow the path: Main Menu > Configuration > Physical Ports >SDH/SONET > **SOH/HVC Alarms**.

The SOH or HVC Alarms screen appears (see *Figure 4-19*).

2. For each port, or a range of ports, select the Port Number and specify whether alarms are to be Masked or Unmasked. Refer to *Table 4-5*.
3. Enter **F** (forward) to move to the next port and **B** (back) to return to the previous port.

```
                                EGATE-100
Main Menu>Configuration>Physical Ports>SDH/SONET>SOH/HVC Alarms
 1. Port Number                 ... (1)
 2. Alarms                      >   (Unmasked)
Please select item <1 to 2>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-19. SDH/SONET SOH/HVC Alarms Screen

➤ **To configure SDH/SONET LVC alarms:** {XE "LVC"}

1. Follow the path: Main Menu > Configuration > Physical Ports >SDH/SONET > **LVC Alarms**.

   The LVC Alarms screen appears (see *Figure 4-20*).
2. For each port, or a range of ports, select the **Port Number** and specify whether alarms are to be Masked or Unmasked. Refer to *Table 4-5*.
3. Enter **F** (forward) to move to the next port and **B** (back) to return to the previous port.

```
                                EGATE-100
Main Menu>Configuration>Physical Ports>SDH/SONET>LVC Alarms


 1. LVC Number[1 - 63]          ... (10-13)
 2. Alarms                      >   (Unmasked)


Please select item <1 to 2>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-20 SDH/SONET LVC Alarms Screen

Configuring the 1GbE Port

➤ **To configure the 1GbE port:**

1. Follow the path: Main Menu > Configuration > Physical Ports > **1GbE**.

   The 1GbE Physical Ports menu appears (see *Figure 4-21*).
2. Configure 1GbE port parameters. (See *Table 4-8* for details).
3. Select **Save** to finish the 1GbE port configuration.

```
                                EGATE-100
Main Menu>Configuration>Physical Ports>1GbE
 1. Port Number          >    (1)
 2. Activation           >    (Enabled)
 3. Alarms               >    (Unmasked)
 4. Auto Negotiation     >    (Disabled)

Please select item <1 to 4>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-21. 1GbE Physical Ports Menu

Table 4-8. 1GbE Port Parameters

Parameter	Possible Values	Remarks
Port number	1	GbE port number **Default: 1**
Activation	Enabled Disabled	Set the administrative status of the 1GbE port **Default: Enabled**
Alarms	Masked Unmasked	Mask 1GbE alarms. **Default: Unmasked**
Auto Negotiation	Enabled Disabled	Enabling autonegotiation allows for automatic determination of the speed and duplex mode. **Default: Enabled**

Configuring the Fast Ethernet Port

The following parameters can be configured for the Ethernet ports at the physical level:

- Activation
- Alarm masking
- Autonegotiation
- Data rate and duplex mode (only when autonegotiation is disabled.)

➤ **To configure the Fast Ethernet port:**

1. Follow the path: Main Menu>Configuration>Physical Ports menu> **Fast Ethernet**.

   Fast Ethernet menu appears (see *Figure 4-22*).

2. Configure the Fast Ethernet port parameters. (See *Table 4-9* for details)
3. Select **Save** to finish the port configuration.

```
                                EGATE-100
Main Menu>Configuration>Physical Ports>Fast Ethernet
 1. Activation          >   (Enabled)
 2. Alarms              >   (Unmask)
 3. Auto Negotiation    >   (Disabled)
 4. Speed               >   (100 Mbps)
 5. Mode                >   (Full Duplex)

Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-22. Ethernet Menu

Table 4-9. Fast Ethernet Parameters

Parameter	Possible Values	Remarks
Activation	Enabled Disabled	Fast Ethernet activation **Default: Enabled**
Alarms	Masked Unmasked	Mask Fast Ethernet alarms. **Default: Unmasked**
Autonegotiation	Enabled Disabled	Enabling autonegotiation allows for automatic determination of the speed and duplex mode. **Default: Enabled**
Speed	10 Mbps 100 Mbps	The Speed & Duplex parameter specifies the static speed and duplex mode that the port will use. (Available when autonegotiation is disabled.) **Default: 100 Mbps**
Mode	Half Duplex Full Duplex	**Default: Full Duplex**

4.4 Configuring the Logical Ports

One or more logical ports can be bound to each of the E1/T1 ports.

In order to change or delete any logical ports, you must first erase any associations with a bridge port.

➤ **To configure the logical ports:**

1. From the Configuration menu (Main Menu>Configuration), select **Logical Layer**.

   The Logical Layer menu (E1 or T1) appears:

```
                                EGATE-100
Main Menu>Configuration>Logical Layer
 1. Port Number[1 - 126]          ... (2-10)
 2. Port Name                     ... (Central)
 3. Type                          >   (HDLC)
 4. Physical Port Number[1 - 63]  ... (2-10)

Please select item <1 to 4>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-23. Logical Layer Menu (E1)

```
                                EGATE-100
Main Menu>Configuration>Logical Layer
 1. Port Number[1 - 126]          ... (4)
 2. Port Name                     ... (HDLC Logical Port 4)
 3. Type                          >   (HDLC)
 4. Physical Port Number[1 - 84]  ... (4)
 5. Active Timeslots              >   (1-3,15-20,24)
Please select item <1 to 5>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-24. Logical Layer Menu (T1)

2. From the Logical Layer menu, configure the following:
   - **Port Number**: Select a number between 1 and 126
   - **Port Name**: Select a descriptive name for the logical port.
   - **Type :** HDLC only**.**

- **Physical Port Number:** Select a number between 1 and 63 (E1) or between 1 and 84 (T1).
- **Active Timeslots** (see the procedure below). This option is displayed only when the selected Physical Port is framed.

3. Select **Save** to finish the logical layer port configuration.

➤ **To configure the active timeslots for framed physical ports:**

1. From the Configuration>**Logical Layer** menu, after specifying one or more framed physical ports, select **Active Timeslots**.

   The Active Timeslots menu appears:

```
                                EGATE-100
Main Menu>Configuration>Logical Layer>Active Timeslots (1-3,15-26,30)
 1. [1 - 31]... (1-3)
 2. [1 - 31]... (15-26)
 3. [1 - 31]... (30)
 4. Delete Range...
Please select item <1 to 4>
ESC-prev.menu; !-main menu; &-exit; A-add
```

Figure 4-25. Active Timeslots Screen (E1)

2. To add a new range, enter **a,** and specify a range.
3. Select a set of timeslots. Individual values or ranges of up to ten can be entered.
4. To delete a range, select **Delete Range** and enter a range for deletion: for example, 15-26.

Table 4-10 Logical Port Parameters

Parameter	Possible Values	Remarks
Port Number	1–126	Logical port number
Port Name	String of up to 20 characters	Descriptive name for the logical port. **Default: Logical Port [port #]**
Type	HDLC only	Traffic protocol type. Only HDLC is available. **Default: HDLC**
Physical Port Number	1–63 (E1) 1–84 (T1)	Number of the physical port to which the logical port is mapped.
Active Timeslots	1–31 (E1) or range 1–24 (T1) or range	The fractional E1 active timeslots that carry traffic regarding the logical port Displayed only when the selected Physical Port is framed. **Default: (none)**

4.5 Configuring the Internal Bridge

Configuration of the Egate-100 internal bridge involves configuring global parameters for the bridge (VLAN-Aware/unaware, and aging) and assigning and configuring bridge ports. Configuration of the bridge is performed via the Applications menu.

In order to change a bridge from VLAN-Aware to VLAN-Unaware (or from VLAN-Unaware to VLAN-Aware), you must first remove any defined bridge ports. After changing the bridge mode, you must reset the device.

For a detailed explanation of the Egate-100 bridge functionality, see *Chapter 1*. Refer to *Table 4-11* for an explanation of configuration parameters.

➤ **To configure the internal bridge:**

1. Follow the path: Main Menu > Configuration > Applications > **Bridge**.
   The Bridge menu is displayed (see *Figure 4-26*).
2. From the Bridge menu, configure **VLAN Mode** and **Aging Time.**
3. If you set the bridge to VLAN-Aware mode, define the **VLAN Membership** (see procedure below).

```
                                EGATE-100
Main Menu>Configuration>Applications>Bridge


1. VLAN Mode                    >    (Aware)
 2. Aging Time (Sec)[30 - 10000]... (300)
 3. Static MAC Table           []>
 4. Bridge Ports                 >
 5. VLAN Membership              >
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-26. Bridge Menu

Table 4-11 Bridge Parameters

Parameter	Possible Values	Remarks
VLAN Mode	Unaware Aware	Aware: forwarding is based on VLAN and MAC address. Unaware: forwarding is based on MAC address only. **Default: Unaware**
Aging Time	30–10000 seconds	For dynamic table entries. If the aging time elapses and no frame has been received with this MAC, the entry is erased from the table. **Default: 300**

Using the Static MAC Table

Static MAC addresses are stored in the MAC table. The column for VLAN ID appears in a VLAN-Aware bridge only.

➤ **To add a static MAC address:**

1. From the Bridge menu (Main Menu>Configuration>Applications>**Bridge**), select **Static MAC Table**.

   The Static MAC Table appears:

```
                                  E-GATE-100
Configuration>Applications>Bridge>Static MAC Table

     VLAN ID   MAC Address        Receive Bridge Port
   1     1     11-11-11-11-11-11           1
|  2     2     22-22-22-22-22-22           2
v  3     3     33-33-33-33-33-33           3
   4     4     44-44-44-44-44-44           4
   5     5     55-55-55-55-55-55           5

1. MAC address … (11-11-11-11-11-11)

S/s - Save ; A/a - Add entry
ESC-prev menu; !-main menu; &-exit; ?-help
```

Figure 4-27. Static MAC Table

2. From the Static MAC Table type **a**.

   The Static MAC Table display changes, entering the Add mode (see *Figure 4-28*).

```
                                  EGATE-100
Configuration>Applications>Bridge>Static MAC Table
 1. VLAN Number                   > ()
 2. MAC Address                   > (0.0.0.0)
 3. Bridge Port Number            > ()

Please select item <1 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-28. Static MAC Table, Add Screen (Aware Bridge)

3. When in Add mode, refer to *Table 4-12* to perform the following:
   - Select **VLAN Number**, and choose a VLAN Number for the MAC address, between 0-4094 (VLAN-Aware mode only).
   - Select **MAC Address**, and enter a MAC address.
   - Select **Bridge Port Number**, and choose a Bridge Port Number for the MAC address, between 2 and 128.

Table 4-12 MAC Table Parameters

Parameter	Possible Values	Remarks
VLAN Number	1–4094	VLAN of the traffic for this table entry This parameter can be set in VLAN-Aware mode only.
MAC Address		MAC address from which traffic is received **Default: 00 00 00 00 00 00**
Bridge Port Number	2–128	Number of the bridge port used for traffic of this table entry

➤ **To remove a static address from the table:**

- From the Static MAC Table (*Figure 4-27*), select a row containing a MAC address that you want to remove and type **r**.

  The MAC address is deleted from the table.

➤ **To clear the MAC table:**

1. In the Static MAC Table (*Figure 4-27*), type **c**.

   Egate-100 displays the following message: Are you sure (Y/N)?

2. Type **Y** to confirm deletion of all MAC addresses from the table.

Configuring the Bridge Ports

A bridge port can be bound to the GbE port (GIGA), the FE port (ETH), or a logical port, as well as the Host port. Bridge Port 1 is always bound to the Host port.

➤ **To configure the bridge port:**

1. From the Bridge menu, select **Bridge Ports**.

   The Bridge Port menu appears (see *Figure 4-29*).

```
                                EGATE-100
Main Menu>Configuration>Applications>Bridge >Bridge Ports
    Bind to                                      >  (GIGA)
 1. Port Number [1 - 128]                        ... (3)
 2. Activation                                   >   (Enabled)
 3. Ingress Filtering                            >   (Disabled)
 4. Accept Frame Types                           >   (All)
 5. Port VID [1 - 4094]                          ... (1)
 6. Egress Tag Handling                          >   (None)
 7. Ingress Tag Handling                         >   (None)
 8. Maximum Learning MAC Address[1 - 64000]      ... (64000)
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-29. Bridge Port Configuration Menu

2. In the Bridge Ports menu, configure the Bridge Ports parameters (see *Table 4-13*). The settings pertain to the port to which you bound the bridge port previously.
3. Select **F** (for Forward) or **B** (for Backward) to navigate among the defined bridge ports.
4. To remove the bridge port, select **R** (Remove Port).
5. Select **Save** to complete the bridge ports configuration.

Table 4-13. Bridge Port Parameters

Parameter	Possible Values	Remarks
Bridge Port Number	1–128	Bridge port number Bridge port number 1 is reserved for the host bridge port.
Bind to	Host GIGA ETH Logical Port	Specifies the physical or logical port to which this bridge port is bound.
Activation	Enabled Disabled None	Specifies if this port is part of the bridge or not. **Default: Enabled**

Table 4-13. Bridge Port Parameters (Cont.)

Parameter	Possible Values	Remarks
Ingress Filtering	Enabled Disabled	When Enabled, the device discards incoming frames for VLANs which do not include this port in its member set. When Disabled, the port accepts all incoming frames. Appears in a VLAN-Aware bridge only. **Default: Disabled**
Accept Frame Type	All Tag Only	Tag Only specifies that the device discards untagged frames at ingress. All specifies that untagged frames received on this port are accepted and assigned to the PVID for this port. Appears in a VLAN-Aware bridge only. **Default: All**
Port VID	1–4094	This is the PVID, the VLAN ID assigned to untagged frames received on this port. If Stacking is enabled, this is the tag to be added. Appears in VLAN-Aware bridge only. **Default: 2**
Egress Tag Handling	Stripping None	Stripping: removes the first VLAN tag from every transmitted frame, on the egress of the port (pop). Appears in VLAN-Aware bridge only. **Default: None**
Ingress Tag Handling	Stacking None	Stacking: adds the PVID to every frame received on the ingress of the port (push). None: Adds PVID only to untagged frames received at the port's ingress . Appears in VLAN-Aware bridge only. **Default: None**
Maximum Learning MAC Address	1–12000	Maximum number of MAC addresses that can be learned from this port. **Default: 12000**

Configuring VLAN Membership

➤ **To configure VLAN Membership (VLAN-Aware bridge only):**

1. Follow the path: Main Menu > Configuration > Applications > Bridge > **VLAN Membership**.

   The VLAN Membership menu is displayed (see *Figure 4-30*).

2. Select **VLAN ID**,

   The VLAN ID definition screen appears (see *Figure 4-31*).

3. Enter a VLAN ID or range of VLAN IDs you wish to configure and select **Save All**.

4. To remove the displayed VLAN or range of VLANs from the VLAN table, select **Delete Range**.

5. In the VLAN Membership menu, select **Egress Transparent Ports.**

   The Egress Transparent Ports definition screen appears (see *Figure 4-31*).

6. Define the set of ports that should be members of this VLAN (see *Figure 4-32*) and select **Save All**.

7. To remove the displayed port or range of ports from the VLAN membership, select **Delete Range**.

8. In the VLAN Membership menu, select **View VLAN ID to Bridge Ports** or **View Bridge Ports to VLAN ID**.

   A table is displayed showing mapping of VLAN IDs to bridge ports, or mapping of bridge ports to VLAN IDs. See *Figure 4-33* and *Figure 4-34*. Use **<Ctrl>+D** and **<Ctrl>+U** arrow keys to navigate down and up within the tables.

9. Press **<ESC>** to return to the VLAN Membership menu.

```
                                EGATE-100
...Configuration>Applications>Bridge>VLAN Membership
 1. VLAN ID                      >    (-)
 2. Egress Transparent Ports     >    (-)
 3. View VLAN ID to Bridge Ports  []
 4. View Bridge Ports to VLAN ID  []
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-30. VLAN Membership Menu

```
                                EGATE-100
...Configuration>Bridge >VLAN Membership>VLAN ID (-)


 1. [1 - 4094]... (1-10)
 2. Delete Range...
 3. Save All


>
ESC-prev.menu; !-main menu; &-exit; A-add
```

Figure 4-31. VLAN Membership- VLAN ID

```
                                    EGATE-100
...Configuration>Bridge >VLAN Membership>Egress Transparent Ports (-)

 1. [1 - 128]... (4-7)
 2. Delete Range...
 3. Save All

>
ESC-prev.menu; !-main menu; &-exit; A-add
```

Figure 4-32. VLANMembership- Egress Transparent Ports

```
                                    EGATE-100

Configuration>Bridge >VLAN Membership>View VLAN ID to Bridge Ports

       VLAN ID  Egress Transparent Ports
     1    1      4-7
     2    2      4-7
     3    3      4-7
     4    4      4-7
     5    5      4-7
     6    6      4-7
     7    7      4-7
     8    8      4-7
     9    9      4-7
    10    10     4-7
      ->>
>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 4-33. VLAN ID to Bridge Ports

```
                                EGATE-100

Configuration>Bridge >VLAN Membership>View Bridge Ports to VLAN ID


        E-Port  VLAN ID
     1    4     1-10
     2    5     1-10
     3    6     1-10
     4    7     1-10
      ->>
>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 4-34. Bridge Ports to VLAN ID

4.6 Configuring QoS (Quality of Service)

Egate-100's QoS mapping is configurable at the bridge level. Three methods of traffic classification are supported:

- 802.1 priority mapping (VLAN-Aware bridge only)
- DSCP priority mapping, using tag values
- Priority mapping per IP precedence.

The classification method is chosen using the Priority Classification menu. See *Table 4-14* for explanation of Quality of Service parameters.

```
                                EGATE-100
*Configuration>Applications>QoS


 1. Priority Classification         >   (802.1p)
 2. Priority Mapping                >
 3. Unknown Unicast Priority        >   (Traffic Class 0)
 4. Multicast Priority              >   (Traffic Class 0)
 5. Broadcast Priority              >   (Traffic Class 0)


>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-35. QoS Menu

```
                                EGATE-100
Configuration>Applications>QoS >Priority Classification  (None)
 1. None
 2. 802.1p          [VLAN-Aware only]
 3. DSCP
 4. IP Precedence
>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-36. QoS Priority Classification Menu

Selecting Priority Classification

➤ **To select a priority classification method:**

1. Follow the path: Main Menu > Configuration > Applications > QoS > **Priority Classification.**

   The Priority Classification menu is displayed (see *Figure 4-36*).

2. From the Priority Classification menu, select the desired traffic classification method: **802.1p** (VLAN-Aware mode only), **DSCP**, **IP Precedence**, or **None**.

3. Select **Save** to save the changes

   An option for the QoS Priority Mapping menu is added to the QoS menu, as well as options for setting Unknown Unicast, Multicast and Broadcast Priority (see *Figure 4-35*).

Configuring QoS Priority Mapping

Egate-100 supports four different traffic queues. These traffic queues can be assigned different priority levels, according to the level of service represented by each queue, where the lowest priority is represented by Traffic Class 0 and the highest priority by Traffic Class 3.

➤ **To assign priorities to traffic queues, for 802.1p and IP Precedence:**

1. Following the above procedure, select **802.1p** or **IP Precedence** as the desired traffic classification method.

2. Follow the path: Main Menu > Configuration > Applications > QoS > **Priority Mapping**.

   The Priority Mapping menu is displayed (see *Figure 4-37*).

3. There are eight priority levels (0 – 7). From the Priority Mapping menu, select the desired priority level (**Tag Value**).

4. Enter the assigned traffic queue number (Traffic Class 0 – 3).

5. A traffic queue can be assigned to more than one priority. Repeat for all priorities.

6. Select **Save** to save the changes.

➤ **To assign priorities to traffic queues, for DSCP:**

1. Following the above procedure, select **DSCP** as the desired traffic classification method.
2. Follow the path: Main Menu > Configuration > Applications > QoS > **Priority Mapping**.

   The Priority Mapping menu is displayed (see *Figure 4-38*). The menu lists only those values that are different from Traffic Class 0.
3. From the Priority Mapping menu, select the desired **Tag Value** (0 – 63) and enter the assigned traffic queue number (Traffic Class 0 – 3).
4. To add a new entry, select **a** (add) and enter the **Tag Value** and **Traffic Class** (see *Figure 4-39* and *Figure 4-40*.)
5. Repeat for all tag values you wish to change. A traffic queue can be assigned to more than one tag.
6. Unassigned values will be automatically mapped to the lowest priority queue (Traffic Class 0).
7. Select **Save** to save the changes.

Table 4-14. Quality of Service Parameters

Parameter	Possible Values	Remarks
Priority Classification	802.1 IP Precedence DSCP None	Method by which to assign priority. 802.1 option is for VLAN-Aware bridge only.
Tag Value 0 Priority through Tag Value 7 Priority (for IP Precedence and 802.1)	Traffic Class 0–3	**Default: Traffic Class 0** for each Tag Value 0–7
Tag Value (for DSCP)	0–63	**Default: Tag Value 0 displayed**
Traffic Class (for DSCP)	Traffic Class 0–3	**Default: Traffic Class 0** for each Tag Value 0–63
Unknown Unicast Priority	Traffic Class 0–3	**Default: Traffic Class 0**
Multicast Priority	Traffic Class 0–3	**Default: Traffic Class 0**
Broadcast Priority	Traffic Class 0–3	**Default: Traffic Class 0**

```
                                EGATE-100

Configuration>Applications>QoS >Priority Mapping

 1. Tag Value 0              >   (Traffic Class 1)
 2. Tag Value 1              >   (Traffic Class 2)
 3. Tag Value 2              >   (Traffic Class 1)
 4. Tag Value 3              >   (Traffic Class 3)
 5. Tag Value 6              >   (Traffic Class 1)
 6. Tag Value 7              >   (Traffic Class 1)

>ESC-prev.menu; !-main menu; &-exit
```

Figure 4-37. QoS Priority Mapping Menu (802.1 and IP Precedence)

```
                                EGATE-100

Configuration>Applications>QoS >Priority Mapping

 1. Tag Value[0 - 63]  ... (0)
 2. Traffic Class      >   (Traffic Class 0)



>
A - Add
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-38. QoS Priority Mapping Initial Menu (DSCP)

```
                                EGATE-100

...>Applications>QoS >Priority Mapping>Traffic Class (Traffic Class 0)

 1. Traffic Class 0
 2. Traffic Class 1
 3. Traffic Class 2
 4. Traffic Class 3
>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-39. QoS Priority - Traffic Classes (DSCP)

```
                                EGATE-100

*Configuration>Applications>QoS >Priority Mapping

 1. Tag Value[0 - 63]  ... (2)
 2. Traffic Class      >   (Traffic Class 1)
 3. Save

>
A - Add
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-40. QoS Priority Mapping Menu (DSCP)

Configuring Unknown Unicast, Multicast and Broadcast Priorities

Egate-100 supports four different traffic queues, where the lowest priority is represented by Traffic Class 0 and the highest priority by Traffic Class 3.

➤ **To assign priorities to traffic queues:**

1. Following the above procedure, select the desired traffic classification method (**802.1p**, **DSCP**, or **IP Precedence**).
2. Follow the path: Main Menu > Configuration > Applications > QoS > **Unknown Unicast Priority, Multicast Priority** or **Broadcast Priority**.

   The appropriate priority menu is displayed.
3. Select the traffic queue number (Traffic Class 0 – 3).
4. Select **Save** to save the change.

4.7 Displaying the Inventory

The Egate-100 inventory displays description of the unit, its hardware revision and power supply type.

➤ **To display the Egate-100 inventory:**

- From the Main menu, select **Inventory**.

  The Inventory table appears (see *Figure 4-41*).
- In the Inventory table, use the arrow keys to navigate.

```
                                EGATE-100
Main Menu>Inventory
    Boot Version              ... (E1.00)
    SW Version                ... (1.00)
    HW Version                ... (0.00/A)

        INTERFACES INFORMATION
    SDH/SONET link 1          ... (155M 1310nm SM/L, LC (SFP))
    SDH/SONET link 2          ... (155M 1310nm SM/L, LC (SFP))
    1Gbe link 1               ... (UTP (1000BaseT),RJ-45)
    Fast Eth link             ... (10/100BaseT, RJ-45)
    Power supply 1            ... (PS-AC HW - 1.00/A)
```

Figure 4-41. Inventory Screen

4.8 Transferring Software and Configuration Files

This section presents procedures for installing new software releases into the Egate-100 units and transferring configuration files.

Egate-100 stores two software versions, each of them in one of the two partitions of its memory. The software is stored in compressed format. The main (operational) version is uncompressed and loaded into the Egate-100 RAM upon power-up. The second version is kept for backup purposes. If the operational software becomes corrupted, you can swap it with the backup. Egate-100 is delivered with main and backup software installed.

New software releases are distributed as ***.img** files, which are downloaded to Egate-100. When starting a download, the current backup is erased and the new software placed in the backup partition. When downloading is complete, the unit checks the integrity of the new software file. If it is correct, then after reset of the unit by the user the new software release becomes active and the previously active software becomes the backup. If a failure occurs during downloading, the new version is erased. In this case, only one version is left in memory.

Software files can also be uploaded, for additional backup.

Configuration files can be uploaded for storage and backup, and they can be downloaded as well.

Management software allows file transfer via TFTP or XMODEM. The software files can also be downloaded to Egate-100 via Boot Manager, using TFTP or XMODEM, as explained in *Appendix B*.

➤ **To delete a backup version:**

1. Follow the path: Main Menu > Utilities > File Utilities > **File System**.

   The File System screen appears:

```
                                EGATE-100
Main Menu>Utilities>File Utilities>File System

 1. SW Files
 2. SWAP SW Files
 3. Delete Backup Version
Please select item <1 to 3
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-42. File System Screen

2. Select **Delete Backup Version**. You are asked to confirm your action.

➤ **To swap files:**

This action is available only if there is a backup version of the software.

1. Follow the path: Main menu > Utilities > File Utilities > **File System.**
   The File System screen appears (see *Figure 4-42*).
2. Select **SWAP SW Files**. You are asked to confirm your action.
3. Perform a reset of the device in order to activate the version that was formerly the backup (see *Section 4.9*).

➤ **To transfer files via TFTP:**

1. Follow the path: Main Menu > Utilities > File Utilities > SW & File Transfer **> TFTP**.
   The File Transfer menu appears (see *Figure 4-43*).

```
                                EGATE-100
Main Menu>Utilities>File Utilities>SW & File Transfer>TFTP

 1. Server IP                    ... (172.171.40.123)
 2. Remote File Name             ... (e-gate.img)
 3. Total Timeout (sec) [1 - 1000]... (60)
 4. Command
    Transfer Status              >   (No operation)
    Transfer Error               >   (No error)
Please select item <1 to 4>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-43. File Transfer Menu

2. Select **Server IP,** and enter IP address of TFTP server.
3. Select **Remote File Name**, and enter a file name:
   - When downloading, specify name of the file, which is to be downloaded to Egate-100.
   - When uploading, specify a name, under which the file is going to be saved on the remote server.

4. Select **Total Timeout**, and choose a duration between 1 and 1,000 seconds for file transfer timeout. In case of a failure in the download process, the process will be reinitialized as long as this timeout period has not elapsed.
5. Select **Save** to save the changes.

   If Host IP, Server IP and Remote File Name are specified, the **Command** menu item appears.
6. Select **Command** to start the desired procedure:
   - **Upload** – saving a software or configuration file on a remote server.
   - **Download** – transferring a software or configuration file to Egate-100.

   Egate-100 starts the file transfer.

The file transfer process is logged using the following system messages, which are stored in the event log file (see *Chapter 6*):

- Starting Upload
- Starting Download
- Upload Failed
- Download Failed.

➤ **To transfer files via XMODEM:**

1. Follow the path: Main menu > Utilities > File Utilities > SW & File Transfer **> X-MODEM**.
2. Select Command.

   The XMODEM Command menu appears (see *Figure 4-44*).
3. Perform the necessary download or upload operations.

```
                                EGATE-100
Main Menu>Utilities>File Utilities>SW & File Transfer>X-Modem>Command
 1. No Operation
 2. SW download to main
 3. SW download to backup
 4. SW upload from main
 5. SW upload from backup
 6. Configuration file download
 7. Configuration file upload
Please select item <1 to 7>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-44. XMODEM Command Menu

4.9 Resetting Egate-100

Egate-100 supports two types of reset:

- Reset to the factory-default settings
- Overall reset of the device.

Resetting to Factory Defaults

You can reset Egate-100 to its default configuration settings. For a complete list of the configuration defaults, see *Chapter 3*.

➤ **To reset Egate-100 to the default settings:**

1. Follow the path: Main Menu > System > **Set Factory Defaults**.

   Egate-100 displays the following message:

   `The device parameters will be set to defaults. Unit must be reset. Do you want to proceed? (Y/N)`

2. Type **Y** to confirm the reset of parameters.

   After you reset the device (see procedure below), Egate-100 resets all parameters to their default settings.

Resetting the Unit

When necessary, you can perform an overall reset of Egate-100 unit.

➤ **To reset Egate-100:**

1. Follow the path: Main Menu > Utilities > **Reset**.

   The following confirmation message appears:

   `The device will restart. Do you want to proceed? (Y/N)`.

2. Type **Y** to confirm the device reset.

Note *Resetting the unit does not affect configuration settings.*

Chapter 5

Configuring a Typical Application

This chapter gives detailed instructions for configuring Egate-100 for a typical application.

5.1 Application Requirements

Figure 5-1 illustrates a typical application, where Egate-100 supports two user VLANs (CPEs using tag stacking) and an additional Host VLAN shared by the two CPEs for management traffic. Ethernet switching between remotes in VLAN-Aware mode enables both user and management traffic to be carried over E1s between a SDH/SONET network and a GbE network.

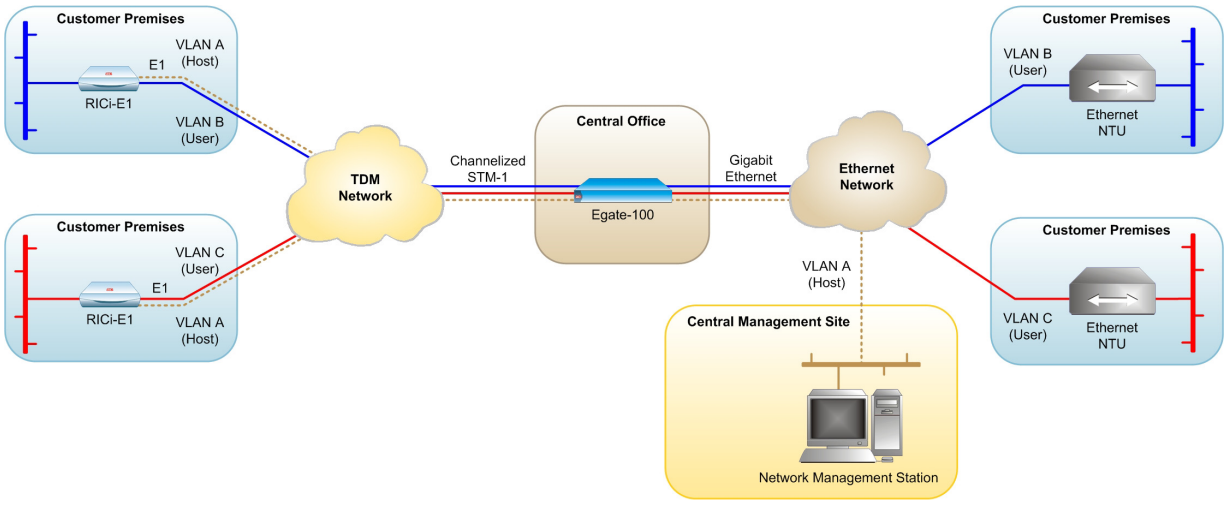

Figure 5-1. Typical Egate-100 Application

The following requirements exist for the Egate-100:

- 1000 BaseT/BaseSx connection to the GbE where an Ethernet NTU is used for each of two LANs.
- E1 links to the SDH/SONET network where a RIC-E1 is installed for each of the two LANs.
- GbE connection
- Network management station for management via Telnet or Web.

The Egate-100 unit is initially configured via an ASCII terminal connection. The configuration procedure is divided into four main stages:

1. Defining system parameters
2. Configuring physical port parameters (SDH/SONET, 1000BaseT, and 10/100 BaseT)
3. Configuring the logical layer
4. Configuring the bridge.

Procedures entailed for each of these stages are included below. Refer to *Chapter 4* for further details about the relevant configuration parameters.

5.2 Configuring the System Parameters

Make sure that the Egate-100 is properly installed and connected to an ASCII terminal.

Configuring Parameters via ASCII Terminal

➤ **To configure the Egate-100 system parameters:**

1. Configure an ASCII terminal to: 115,200 bps, one start bit, eight data bits, no parity, one stop bit, no flow control, and VT100 emulation.
2. Connect the terminal to the local Egate-100 DB-9 CONTROL port.
3. Press <**Esc**> to initiate the control session and then enter the user name and password.
4. Configure the system parameters necessary for IP management (Host IP address and mask, and SNMP read/write communities (Main Menu > Configuration > System > Management > **Host IP**).
5. Define the manager(s) (Main Menu > Configuration > System > Management > **Manager List**).

5.3 Configuring the Physical Ports

Configure the following physical ports:

- SDH/SONET port
- Gigabit Ethernet port
- Fast Ethernet port.

Configuring the SDH/SONET Port

➤ **To configure the SDH/SONET port parameters:**

- Display the SDH/SONET Physical Port menu (Main Menu > Configuration > Physical Ports > **SDH/SONET**) and configure the parameter values for the port:
  - **Frame type**: SDH or SONET
  - **Tx clock**: Internal or Rx
  - Alarm masking for **SOH**, **LVC** and **HVC** levels: masked or unmasked
  - **STM-1 mapping** for the E1 lines (two in the application illustrated).

Configuring the GbE Port

➤ **To configure the GbE port parameters:**

- Display the GbE Physical Port menu (Main Menu > Configuration > Physical Ports > **GbE**) and configure the autonegotiation parameter for the port.

Configuring the Fast Ethernet Port

➤ **To configure the Fast Ethernet port parameters:**

- Display the Ethernet Physical Port menu (Main Menu > Configuration > Physical Ports > Ethernet) and configure the Ethernet parameter values according to the requirements of the deployment:
  - **Autonegotiation**: Enabled or disabled.
  - **Speed & Duplex** (only if autonegotiation is disabled).

5.4 Configuring the Logical Layer

In the typical application illustrated here, two logical ports are required.

➤ **To configure the logical layer:**

1. Display the Logical Layer menu (Main Menu > Configuration > **Logical Layer**) and configure the logical port:
   - Specify a **number** (and optionally a **name**) for the logical port.
   - Assign the relevant (E1) **physical port number**.
2. For a framed E1 port, configure the relevant **active timeslots** in Main Menu > Configuration > Logical Layer > **Active Timeslots**.
3. Repeat this process for any additional E1 ports.

5.5 Configuring the Bridge

The internal bridge must be configured to properly process the VLAN tags in order to maintain priority of the data flows.

The following steps must be performed:

1. Configure the bridge parameters
2. Configure the bridge ports
3. Defining VLAN membership for the bridge ports.

Configuring the Bridge Parameters

➤ **To configure the bridge parameters:**

- Display the Bridge menu (Main Menu > Configuration > **Applications** > **Bridge**) and configure the following:
  - **VLAN mode**: Aware, so that forwarding is based on VLAN as well as MAC address
  - **Aging time**: 30 to 10000 seconds.

Configuring the Bridge Ports

In the typical application illustrated here, four bridge ports are required.

➤ **To configure the bridge ports:**

1. Display the Bridge Port menu (Main Menu > Configuration > Applications > Bridge > **Bridge Ports**) and configure the Bridge Port parameter values:
   - **Activation:** Enabled
   - **Ingress Filtering:** Enabled
   - **Accept Frame Types:** Tag only
   - **Port VID:** Not relevant here, as frames arrive tagged
   - **Egress Tag Handling:** Stripping for Host port, None for other ports
   - **Ingress Tag Handling:** None
   - **Max Learning MAC Address:** Between 1 and 64000.
2. Bind the bridge port to the underlying layer: Logical port (first E1).
3. Repeat this process for the remaining logical E1 ports (one additional port in this example), and for the GbE and Host ports.

Configuring the Bridge VLAN Membership

In the typical application illustrated here, three VLANs are required.

➤ **To define VLANs:**

- Display the VLAN Membership menu (Main Menu > Configuration > Applications > Bridge > **VLAN Membership**) and define the VLANs for the application:
  - The management VLAN: This is VLAN A in *Figure 5-1* (brown-coded in color displays). Add the Host port, as well as both E1 bridge ports and GbE, to VLAN A's membership.
  - User VLAN B: This is VLAN B in *Figure 5-1* (blue-coded in color displays). Add the relevant "LAN" E1 bridge port and GbE to VLAN B's membership.
  - User VLAN C: This is VLAN C in *Figure 5-1* (red-coded in color displays). Add the relevant "LAN" E1 bridge port and GbE to VLAN C's membership.

Chapter 6

Troubleshooting and Diagnostics

This chapter describes the unit's monitoring and diagnostics functions:

- Displaying device information, alarms and events
- Checking the current master and fallback clock sources
- Displaying status of the physical interfaces
- Displaying statistics for the logical layer
- Displaying MAC table and bridge statistics
- Performing Ping tests and view self-test results.

6.1 System Monitoring

You can view device information as well as alarms, the event log, and clock sources.

➤ **To view the system settings:**

- Follow the path: Main Menu>Monitoring>**System**.

  The System Monitoring screen appears (see *Figure 6-1*). The system's MAC address, system up time, date and time are displayed.

```
                                EGATE-100
Main Menu>Monitoring>System
    MAC address              (00-20-D2-21-C6-00)
    System Up Time           (00:15:12)
    Date                     (2005-03-31)
    Time                     (13:09:18)
 1. Active Alarms       []
 2. Event Log           >
 3. Current Clock Source>
Please select item <1 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-1. System Monitoring Screen

Identifying Alarm and Event Sources

Alarms and events are triggered from a variety of sources. *Table 6-1* summarizes the sources of Egate-100's alarms and events.

Table 6-1. Sources for Alarms and Events

Alarm/Event Source	Description
DEVICE	System alarms and events
P1 SDH	SDH/SONET port 1 alarms
P2 SDH	SDH/SONET port 2 alarms
P1 SOH	SDH/SONET port 1 SOH-level alarms
P2 SOH	SDH/SONET port 2 SOH-level alarms
P1 HVC P1 HVC 1.. 3	SDH port 1 HVC-level alarms SONET port 1 HVC 1-3 level alarms
P2 HVC P2 HVC 1.. 3	SDH port 2 HVC-level alarms SONET port 2 HVC 1-3 level alarms
LVC 1..63 LVC 1..84	SDH LVC 1-63 level alarms SONET LVC 1-63 level alarms
CH 1..63(84)	E1-/T1-level alarms (63 for SDH / 84 for SONET)
FETH	Fast Ethernet port alarms
P1 GIGA	1GBE port 1 alarms
EVENT	Non- alarm events

Viewing Active Alarms

➤ **To access the active alarms list:**

1. Follow the path: Main Menu>Monitoring>System>**Active Alarms**.

   The Active Alarms screen appears (see *Figure 6-2*).

2. Type <**Ctrl+G>** to go to the top of the list, and <**Ctrl+D>** to move down in the list.

```
                                    EGATE-100
Main Menu>Monitoring>System>Active Alarms
       Source           Description                        Status
     1 P2 SOH           LOS                              Unmasked
     2 CH-2             AIS                              Unmasked
|    3 CH-3             AIS                              Unmasked
v    4 CH-4             AIS                              Unmasked
     5 CH-5             AIS                              Unmasked
     6 CH-6             AIS                              Unmasked
     7 CH-7             AIS                              Unmasked
     8 CH-8             AIS                              Unmasked
     9 CH-9             AIS                              Unmasked
    10 CH-10            AIS                              Unmasked
ESC-prev.menu; !-main menu; &-exit; ^D-down; ^G-start
```

Figure 6-2. Active Alarms Screen

Table 6-2 presents the alarm types that appear in the active alarms screen:

Table 6-2. Active Alarms List

Code	Alarm	Description
3	Self test failure	Error detected in the device HW component
4	PS1 failure	No voltage in PS1
5	PS2 failure	No voltage on PS2
6	Fan1 failure	Failure detected in FAN 1
7	Fan2 failure	Failure detected in FAN 2
12	Master clock failure	Master clock failed. Applicable when Master clock is set to Rx clock
13	Fallback clock failure	Fallback clock failed. Applicable when Fallback clock is set to Rx clock
70	SDH/SONET SFP Tx	SFP passed Tx threshold
71	SDH/SONET SFP Rx	SFP passed Rx threshold
72	SDH/SONET SFP shut down	SFP shutdown received
80	SOH LOS	Detecting loss of signal at SOH level
81	SOH LOF	Detecting loss of frame at SOH level
82	SOH AIS	Detecting line alarm indication signal at SOH level
83	SOH OOF	Detecting out of frame at SOH level

Table 6-2. Active Alarms List (Cont.)

Code	Alarm	Description
84	SOH EED	Detecting EED at SOH level
86	SOH RDI	Detecting line remote defect indication at SOH level
87	SOH SD	Detecting signal degrading at SOH level
100	HVC LOP	Loss of pointer on path level
101	HVC AIS	Detecting path alarm indication signal
102	HVC EED	Detecting path EED
104	HVC PLM	Detecting signal lable payload mismatch
105	HVC LOM	Detecting loss of multiframe
106	HVC RDI	Detecting remote defect indication at path level
107	HVC SD	Detecting signal degrading at path level
120	LVC LOP	Detecting loss of pointer at tributary level
121	LVC AIS	Detecting alarm indication signal at tributary level
122	LVC EED	Detecting EED at tributary level
124	LVC PLM	Detecting signal lable payload mismatch at tributary level
125	LVC RDI	Detecting remote defect indication at tributary level
126	LVC SD	Detecting signal degrading at tributary level
140	CH LOF	Detecting loss of frame on E1/T1
141	CH AIS	Detecting alarm indication signal on E1/T1
142	CH RDI	Detecting remote defect indication on E1/T1
160	1GBE Link integrity fail	Fail in 1GBE port integrity
161	1GBE SFP Tx	SFP passed Tx threshold
162	1GBE SFP Rx	SFP passed Rx threshold
163	1GBE SFP shut down	SFP shut down received
180	FETH Link integrity fail	Fail in FETH port integrity

Viewing the Event Log

Egate-100 maintains a log file, which can hold up to 5000 system messages. All events are time-stamped.

➤ **To access the event log:**

1. Follow the path: Main Menu>Monitoring>System>**Event Log**.

   The Event Log screen appears (see *Figure 6-3*).

2. In the Event Log screen, use filtering if you wish to limit the view to a subset of the events:

- **Source** – All sources or a specific source: see *Table 6-1* for the complete listing of sources.
- **LVC Number**, when the selected source is LVC
  Channel Number, when the selected source is CH
- **From Event** and **To Event,** to specify a range of log file entries.

```
                                EGATE-100
Main Menu>Monitoring>System>Event Log
    Number Of Events                          (5000)
 1. Source                                 >    (All)
 2. From Event[1 - 5000]                   ...  (1)
 3. To Event[2 - 5000]                     ...  (5000)
 4. View Event Log                         []

ESC-prev.menu; !-main menu; &-exit
```

Figure 6-3. Event Log Screen

```
                                EGATE-100
Monitoring>System>Event Log

    Number Of Events                          (2434)
 1. Source                                 >    (LVC)
 2. LVC Number [1 - 63]                    ...  (1)
 3. From Event[1 - 5000]                   ...  (1)
 4. To Event[2 - 5000]                     ...  (5000)
 5. View Event Log                         []

>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-4. Event Log Screen – LVC

```
                                EGATE-100
Monitoring>System>Event Log


    Number Of Events                              (2434)
 1. Source                                 >    (LVC)
 2. Channel Number [1 - 63]                ...  (1)
 3. From Event[1 - 5000]                   ...  (1)
 4. To Event[2 - 5000]                     ...  (5000)
 5. View Event Log                         []


>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-5. Event Log Screen- Channel

```
                                EGATE-100
Monitoring>System>Event Log>Source (All)
 1. DEVICE
 2. P1 SDH
 3. P2 SDH
 4. P1 SOH
 5. P2 SOH
 6. P1 HVC
 7. P2 HVC
 8. LVC
 9. CH
 10. FETH
 11. P1 GIGA
 12. EVENT
 13. All
>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-6. Event Log Source Menu

3. Select **View Event Log**.

   The View Event Log screen appears (see *Figure 6-7*).

4. Type **<Ctrl+G>** to go to the top of the table, and use the **<Ctrl+D>** to move down in the event list.

```
                                    EGATE-100
Main Menu>Monitoring>System>Event Log>View Event Log
       Source   Alarm                              Status     Date         Time
     1 1GbE-1   Link integrity fail                 OFF      2005-04-13   07:22:58
     2 P1 SOH   SD                                 OFF      2005-04-13   06:54:10
|    3 1GbE-1   Link integrity fail                 ON       2005-04-13   06:54:05
v    4 CH-63    AIS                                ON       2005-04-13   06:54:05
     5 CH-60    AIS                                ON       2005-04-13   06:54:05
     6 CH-57    AIS                                ON       2005-04-13   06:54:05
     7 CH-54    AIS                                ON       2005-04-13   06:54:05
     8 CH-51    AIS                                ON       2005-04-13   06:54:05
     9 CH-48    AIS                                ON       2005-04-13   06:54:05
    10 CH-45    AIS                                ON       2005-04-13   06:54:05
C - Clear All
ESC-prev.menu; !-main menu; &-exit; ^D-down; ^G-start
```

Figure 6-7. View Event Log Screen

Table 6-3 presents the event types that appear in the event log:

Table 6-3. Event List

Code	Event	Description
30	SW download to main started	Start software download main version
31	SW download to main ended	Software download to main version ended successfully
32	SW download to main failed	Software download to main version failed
33	SW download to backup started	Start software download backup version
34	SW download to backup ended	Software download to backup version ended successfully
35	SW download to backup failed	Software download to backup version failed
36	SW upload from main started	Start upload main version
37	SW upload from main ended	Software upload from main version ended successfully
38	SW upload from main failed	Software upload from main version failed
39	SW upload from backup started	Start upload backup version

Table 6-3. Event List (Cont.)

Code	Event	Description
40	SW upload from backup ended	Software upload from backup version ended successfully
41	SW upload from backup failed	Software upload from backup version failed
42	Configuration download started	Start configuration download
43	Configuration download ended	Configuration download ended successfully
44	Configuration download failed	Configuration download failed
45	Configuration upload started	Start configuration upload
46	Configuration upload ended	Configuration upload ended successfully
47	Configuration upload failed	Configuration upload failed
48	Local login	Attempt to login to the device
49	Invalid login	Attempt to login with invalid user name or password
50	Restart	Device powered up

➤ **To clear the event log**

- From the Event Log screen, type **c**.

Viewing the Clock Sources

➤ **To check what the current clock sources are:**

1. Follow the path: Main Menu>Monitoring>System>**Current Clock Source**.

   The Current Clock Source screen appears (see *Figure 6-8*).

2. Select **Nodal Mode,** and specify which clock you wish to monitor: Master or Fallback.

   The current source of the Master or Fallback clock is displayed.

```
                                EGATE-100
Main Menu>Monitoring>System>Current Clock Source
    Nodal Mode                      >    (Master)
    Source                          >    (Internal)
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-8. Current Clock Source Screen – Master Clock

6.2 Interface Status

You can access interface status options from the Monitoring Physical Ports menu:

```
                                EGATE-100
Main Menu>Monitoring>Physical Ports
 1. SDH/SONET                    >
 2. 1GbE                         >
 3. Fast Ethernet                >
Please select item <1 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-9. Monitoring Physical Ports Menu

Each of the port status screens (illustrated below) includes the following information:

- **Activation** – activation of the link (Enabled or Disabled) via configuration
- **Operation** – actual operational status of the link (Up or Down for a port in use, or Not Present for an unused port)
- **Alarms** – Masked or Unmasked
- **Autonegotiation Status** (for Fast Ethernet with autonegotiation enabled only) – Configuring (when in progress) or Complete
- **Speed & Duplex Status** (for Fast Ethernet only, when autonegotiation is disabled or not in progress) – current data rate and duplex mode of the link.

Viewing SDH/SONET Status

The SDH/SONET interface may be either optical or electrical.

➤ **To view SDH/SONET status:**

1. Follow the path: Main Menu>Monitoring >**Physical Ports** and select **SDH/SONET**.
2. Depending on the type of connector in the device – **Optical Transceiver** or **Electrical Transceiver** – the SDH/SONET Optical Transceiver (or Electrical Transceiver) status screen appears:

```
                                EGATE-100
Main Menu>Monitoring>Physical Ports>SDH/SONET>Optical Transceiver
                 Port 1          Port 2
 Activation      Enabled         Enabled
 Operation       Down            Not present
 Alarms          Unmasked        Unmasked
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 6-10. SDH/SONET Port Status (Optical Transceiver)

Viewing Gigabit Ethernet Status

The GbE interface may be either optical or electrical.

➤ **To view 1GbE status:**

- Follow the path: Main Menu>Monitoring >**Physical Ports** and select **1GbE**.

  Depending on the type of connector in the device – **Optical Transceiver** or **Electrical Transceiver** – the 1GbE Electrical Transceiver (or Optical Transceiver) status screen appears:

```
                                EGATE-100
Main Menu>Monitoring>Physical Ports>1GbE>Electrical Transceiver
                 Port 1
 Activation      Enabled
 Operation       Down
 Alarms          Unmasked
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 6-11. 1GbE Port Status (Electrical Transceiver)

Viewing Fast Ethernet Status

From the Ethernet menu you can display the Ethernet status data.

➤ **To view Fast Ethernet status:**

- Follow the path: Main Menu>Monitoring >Physical Ports>**Fast Ethernet.**

  The Fast Ethernet status screen appears:

```
                                EGATE-100
Main Menu>Monitoring>Physical Ports>Fast Ethernet
    Activation                  >   (Enabled)
    Operation                   >   (Up)
    Alarms                      >   (Unmasked)
    Autonegotiation Status      >   (Complete)
    Speed & Duplex Status       >   (100Mbps Full Duplex)
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-12. Fast Ethernet Status

6.3 Logical-Layer Monitoring

You can perform the following monitoring functions for the logical layer (see *Figure 6-13*):

- Display statistical data for the logical layer
- View status information for the logical ports, including the logical-physical port mapping.

```
                                EGATE-100
Main Menu>Monitoring>Logical Layer

 1. Statistics                  >
 2. View Logical Ports          []

Please select item <1 to 2>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-13. Logical Layer Menu

Viewing Logical Layer Statistics

➤ **To view logical layer statistics:**

1. Follow the path: Main Menu>Monitoring >**Logical Layer.**
2. Select **Statistics**.

   The Logical Layer Statistics screen appears (see *Figure 6-14*).
3. Select **Port number** and enter a port number between 1 and 126.

   Rx statistics (HDLC FCS and Abort) for the specified port are displayed.
4. Type **F** (Forward) to proceed to the next logical port, and **B** (Back) to return to the previous port.

```
                                  EGATE-100
Main Menu>Monitoring>Logical Layer>Statistics
    Rx HDLC FCS                   ... (0)
    Rx HDLC Abort                 ... (0)
 1. Port number[1 - 126]          ... (1)
Please select item <1 to 1>
F - Next port
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-14. Logical Layer Statistics Screen

Viewing Logical Port Status

➤ **To view logical port status:**

1. Follow the path: Main Menu>Monitoring >**Logical Layer**
2. Select **View Logical Ports**.

   The View Logical Ports screen appears:

```
                                  EGATE-100
Main Menu>Monitoring>Logical Layer>View Logical Ports
       Logical  Physical      Mode       Timeslots
     1    1        1        Unframed     All
     2    2        2        Unframed     All
     3    3        3        Unframed     All
     4    4        4        Unframed     All
     5    5        5        Unframed     All
     6    6        6        Unframed     All
     7    7        7        Unframed     All
     8    8        8        Unframed     All
     9    9        9        Unframed     All
    10    10       10       Unframed     All
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 6-15. View Logical Ports Screen

6.4 Monitoring the Bridge

You can access the following information for bridge monitoring from the Bridge Monitoring menu (see *Figure 6-16*):

- MAC Table
- Mapping of VLAN-to-Bridge Port and Bridge Port-to-VLAN
- Bridge Statistics.

```
                                EGATE-100
Main Menu>Monitoring>Bridge
 1. MAC Table                   >
 2. View VLAN ID to Bridge Ports  []
 3. View Bridge Ports to VLAN ID  []
 4. Statistics                  >
Please select item <1 to 4>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-16. Bridge Monitoring Screen

Viewing the MAC Table

➤ **To view the MAC table:**

1. Follow the path: Main Menu>Monitoring >**Bridge**.
2. Select **MAC Table**.

   The MAC table screen appears, and the size of the table (**MAC Table Entries**) is displayed:

```
                                EGATE-100
Main Menu>Monitoring>Bridge>MAC Table
    MAC Table Entries           ... (1)
 1. VLAN Number[0 - 4094]       ... (2)
 2. MAC Address                 ... (00-00-00-00-00-00)
 3. Bridge Port Number[0 - 128] ... (44)
 4. View MAC Table              []
Please select item <1 to 4>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-17. MAC Table Screen

3. Create a filter to specify the subset of MAC table entries you wish to view, or skip this step to view the entire table:

   VLAN Number (for an aware-mode bridge only) – Specify a VLAN ID or a range (for example, 2-5), or 0 for all VLANs.

MAC Address – Specify a MAC address, or 00's for all MAC addresses.

Bridge Port Number –a Bridge Port number or a range (for example, 3-10). Or 0 for all bridge ports.

4. Select **View MAC Table**.

   The View MAC Table screen appears (see *Figure 6-18*). Press **<Ctrl+G>** to go to the top of the table and **<Ctrl+D>** to scroll down.

```
                                EGATE-100
Monitoring>Bridge>MAC Table>View MAC Table
       MAC address            Bridge port    Status
     1 00-03-47-17-0C-C7           3         Dynamic
     2 00-03-47-48-70-94           3         Dynamic
|    3 00-0A-F4-62-44-80           3         Dynamic
v    4 00-0D-65-AD-51-07           3         Dynamic
     5 00-11-11-0F-2C-0A           3         Dynamic
     6 00-20-D2-16-7F-B5           3         Dynamic
     7 00-20-D2-21-C6-00           1         Static
     8 00-20-D2-22-BD-5F           3         Dynamic
     9 00-60-E0-03-4A-FE           3         Dynamic
    10 00-90-27-1A-2E-F5           3         Dynamic
C - Clear All
ESC-prev.menu; !-main menu; &-exit; ^D-down; ^G-start
```

Figure 6-18. View MAC Table Screen

The MAC Table screen includes the following information:

- MAC Address – MAC address of incoming frame
- VLAN ID (for an aware-mode bridge only)
- Bridge Port – Bridge port paired with the MAC address
- Status – Static or Dynamic entry.

➤ **To clear the MAC Table:**

- From the View MAC Table screen, type **c**.

Viewing the Mapping between VLANs and Bridge Ports

➤ **To view the mapping of VLAN IDs to Bridge Ports**:

1. Follow the path: Main Menu>Monitoring >**Bridge**.
2. Select **VLAN ID to Bridge Ports**.

The VLAN ID to Bridge Ports screen appears:

```
                                EGATE-100
Main Menu>Monitoring>Bridge>View VLAN ID to Bridge Ports
       VLAN ID  Egress Transparent Ports
     1    1     1-2
     2    2     1-2
|    3    3     1-2
v    4    4     1-2
     5    5     1-2
     6    6     1-2
     7    7     1-2
     8    8     1-2
     9    9     1-2
    10    10    1-2
      ->>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 6-19. VLAN ID to Bridge Ports

➤ **To view the mapping of Bridge Ports to VLAN IDs**:

1. Follow the path: Main Menu>Monitoring >**Bridge**.
2. Select **Bridge Ports to VLAN ID**.

   The Bridge Ports to VLAN ID screen appears:

```
                                EGATE-100
Main Menu>Monitoring>Bridge>View Bridge Ports to VLAN ID
        E-Port  VLAN ID
     1    1     1-10,12-13
     2    2     1-10,12-13
      ->>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 6-20. Bridge Ports to VLAN ID

Viewing Bridge Statistics

➤ **To view bridge statistics:**

1. Follow the path: Main Menu>Monitoring >**Bridge**.
2. Select **Statistics**.

The Bridge Statistics screen appears (see *Figure 6-21)*. Type **F** (Forward) to proceed to the next port, and **B** (Back) to return to the previous port.

```
                                EGATE-100
Main Menu>Monitoring>Bridge>Statistics
    Bind To                                 ... (FETH)
    Rx Correct Frames                       ... (543)
    Rx Correct Octets                       ... (36969)
    Rx FCS Errors                           ... (0)
    Tx Correct Frames                       ... (210)
    Tx Correct Octets                       ... (14686)
    Tx Drop                                 ... (0)
 1. Port Number[2 - 128]                    ... (3)
Please select item <1 to 1>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-21. Bridge Statistics Screen – Bind to Fast Ethernet

Table 6-4. Bridge Statistics Parameters

Parameter	Description
Rx Correct Frames	The total number of correct frames received
Rx Correct Octets	The total number of octets (bytes) received
Rx FCS Errors	Total number of frames received with a valid length, but with invalid FCS and an integral number of octets (not applicable for logical ports)
Tx Correct Frames	The number of frames successfully transmitted
Tx Correct Octets	The number of octets successfully transmitted
Tx Drop	The number of congested dropped frames.

6.5 Diagnostics

Egate-100 allows you to check network integrity by running Ping tests and displaying self-test results (see *Figure 6-22*).

```
                                EGATE-100
Main Menu>Diagnostics
 1. PING                        >
 2. Self test result            >
Please select item <1 to 2>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-22. Diagnostics Menu

Running a Ping Test

You can ping the remote IP host to check the Egate-100 IP connectivity.

➤ **To ping an IP host:**

1. Follow the path: Main menu > Diagnostics > **Ping**
   The Ping menu appears (see *Figure 6-23*).
2. From the Ping menu, configure the following:
   - **Remote IP address** (IP address of the host that you intend to ping, 0.0.0.0 to 255.255.255.255).
   - **Number of packets to send**: Select 0 to send a continuous stream of packets, or 1-50 to send a specified number of packets.
   - **Packet Length**: Select parameter between 64 and 1450.
   - **Delay Between Packets**: Select a delay in seconds.
   - **Packets Receive Timeout**: Select a limit before timeout in seconds.
3. Select **Send Ping** and set it to On to start sending pings.
4. Select **Send Ping** and set it to Off to stop the ping test.

```
                                EGATE-100
Main Menu>Diagnostics>PING
    Packets Success Count       ... (0)
    Packets Failure Count       ... (0)
 1. Remote IP Address           ... (123.12.123.111)
 2. Number of Packets to Send   ... (0)
 3. Packet Length [64 - 1450]   ... (64)
 4. Delay Between Packets (sec) ... (1)
 5. Packets Receive Timeout (sec) ... (5)
 6. Send Ping                   >   (Off)
Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-23. Ping Menu

Viewing Self Test Results

Egate-100 displays the results of self tests run when the unit is switched on.

➤ **To view self test results:**

1. Follow the path: Main menu > **Diagnostics**

   The Diagnostics menu appears (see *Figure 6-22*).

2. Select **Self test result**.

If the test is successful, the screen displays the message **"Successful"**. Possible unsuccessful results are:

- Host memory
- Packet memory
- Parameter memory
- SDH/SONET framer
- SDH/SONET mapper
- TOD access
- Logic access

6.6 Technical Support

Technical support for this product can be obtained from the local distributor from whom it was purchased.

For further information, please contact the RAD distributor nearest you or one of RAD's offices worldwide.

Appendix A
Connector Wiring

This appendix describes the Egate-100 connector pinouts.

A.1 Control Connector

The control terminal interface terminates in a V.24/RS-232 9-pin D-type female DCE connector. *Table A-1* lists the control connector pin assignments.

Table A-1. CONTROL Connector Pinout

Pin	Function
1	-
2	Receive Data (RD)
3	Transmit Data (TD)
4	-
5	Ground (GND)
6	-
7	-
8	-
9	-

A.2 Interface Connectors

SDH/SONET Connector

The SDH/SONET network interface requires an SC fiber optic connection media.

Fast Ethernet Interface Connector

The 10/100BaseT Ethernet electrical interface terminates in an 8-pin RJ-45 connector, wired in accordance with *Table A-2*.

Table A-2. 10/100BaseT Ethernet Connector Pinouts

Pin	Function
1	Tx+
2	Tx–
3	Rx+
4, 5	–
6	Rx–
7, 8	–

Gigabit Ethernet Interface Connector (Cx)

Egate-100 Gigabit Ethernet interfaces require an RJ-45, 8 pin connection media.

Table A-3. Gigabit Ethernet Port Pinout

Pin	Function
1	B+
2	B–
3	A+
4	D+
5	D–
6	A–
7	C+
8	C–

Optical Gigabit Ethernet Interface Connector (LC)

The Gigabit Ethernet optical connector is LC, 850 nm multimode.

Appendix B
Boot Sequence

B.1 Introduction

This appendix describes the Egate-100 boot procedure via an ASCII terminal for downloading software.

The Egate-100 software is stored in flash memory in two sections: in the boot sector and in the file system. The boot sector holds a boot program that calls up the rest of the program from the file system.

The file system contains two compressed copies of the Egate-100 code. One copy is called the **operating file**, and the other is called the **backup file**. The operating file is the default-executable Egate-100 code. The backup file is used whenever the operating file is absent or corrupted.

B.2 Booting Egate-100

Egate-100 boots up automatically. After powering up, no user intervention is required, except when the user wishes to access the file system to modify or update the Egate-100 application software.

Boot Sequence

The following is a description of the boot sequence. If the system is working normally, the entire process is completed within two minutes.

- The boot program searches for the operating file in the file system. If the file exists, the program continues.

  If the file does not exist, the boot program searches for the backup file. If the backup file is found, it is used instead of the operating file and the boot process continues.

  If there is no backup file, you must download a file via the XMODEM protocol or via TFTP. The received file is saved as the operating file in the file system.
- Files in the file system are compressed and automatically decompressed into the RAM before execution begins.
- After decompression, the software starts to execute and the user can begin working.

Boot Process

When Egate-100 is turned on, the first screen that appears is the Main Boot screen.

```
RAD DATA COMMUNICATIONS
Boot software version E1.00 MAR 10 2005, 10:29:00
Press Ctrl-A to enter debug screen
```

Figure B-1. Main Boot Screen

If Ctrl-A is not pressed, the boot will proceed as described in *Boot Sequence* on page *B-1*.

If Ctrl-A is pressed, the Boot Option screen appears.

```
BOOT WP 747-Rev-B1 - FILE MENU



1. File Download
2. File Utility

Select mode: 2
```

Figure B-2. Boot Option Screen

File Download

In this mode the user is able to perform a download of a new application file. In order to use this mode two conditions apply:

- No application file was found
- Option **1** was selected after Ctrl-A was pressed.

➤ **To download an application file:**

- Type **1** in the Boot Option screen.

  The Application File Not Found screen appears (see *Figure B-4*).

Downloading via XMODEM

➤ **To download an application file via XMODEM:**

1. Type **1** in the Application File Not Found screen.

   The following screen appears:

```
BOOT WP 747-Rev-B1 - FILE MENU

1. File Download
2. File Utility

Application file was not found

 Download application file using:
 0. Exit
 1. Xmodem Protocol
 2. TFTP Protocol
 Select one protocol: 1

Downloading application file using XMODEM (Y/N)
```

Figure B-4. Application File Not Found Screen

2. Type **Y**.

   The XMODEM File Transfer screen appears and downloading begins.

Downloading via TFTP

TFTP server must be connected to Egate-100 via the Ethernet 1 port.

➤ **To download an application file via TFTP:**

1. Type **2** in the Application File Not Found screen.

   The TFTP Parameters Setting screen appears:

```
BOOT WP 747-Rev-B1 - TFTP PARAMETERS SETTING

FILE NAME:              e-gate.img
HOST IP:                172.17.140.123
HOST MASK:              255.255.255.0
DEFAULT GATEWAY:        172.17.140.1

TFTP IP SERVER:         192.168.238.173

Press S to start transferring the file (N to cancel).
```

Figure B-6. TFTP Parameters Setting Screen

2. Type in the file name, host IP, host mask and default gateway information.

3. Type **s**.

   The downloading begins. Once the downloading is completed, Egate-100 is reset automatically.

File Utility (Accessing the File Menu)

The File Menu is an option that allows the user to perform basic file transfer operations. These operations are all optional.

➤ **To access the File Menu:**

1. Type **2** in the Boot Option screen.

   The File Menu appears:

```
                              RAD BOOT
                              FILE MENU
0. Reset the System
1. File swap: Operating backup
2. Delete Operating file (existing backup will be saved as operating)
3. Delete Configuration file
9. Delete ALL file system (Software and Configuration files)

Select operating mode:
```

Figure B-7. File Menu

From the File menu, you can:

- Exchange the operating and backup files
- Delete the operating file. The backup file becomes the operating file
- Delete all the configuration files
- Format the files system.

Caution Formatting the file system means deleting all files in the system, including the software-operating main, backup and configuration files.

If you choose to exchange or delete a file, a confirmation message is displayed.

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