INSTALLATION AND OPERATION MANUAL

Egate-100

Gigabit Ethernet over TDM Aggregation Gateway

Version 4.0

EtherAccess

RAD

data communications

The Access Company

Egate-100

Short Description

Version 4.0

Installation and Operation Manual

Notice

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

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Limited Warranty

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.

If, during the warranty period, any component part of the equipment becomes defective by reason of material or workmanship, and DISTRIBUTOR immediately notifies RAD of such defect, RAD shall have the option to choose the appropriate corrective action: a) supply a replacement part, or b) request return of equipment to its plant for repair, or c) perform necessary repair at the equipment's location. In the event that RAD requests the return of equipment, each party shall pay one-way shipping costs.

RAD shall be released from all obligations under its warranty in the event that the equipment has been subjected to misuse, neglect, accident or improper installation, or if repairs or modifications were made by persons other than RAD's own authorized service personnel, unless such repairs by others were made with the written consent of RAD.

The above warranty is in lieu of all other warranties, expressed or implied. There are no warranties which extend beyond the face hereof, including, but not limited to, warranties of merchantability and fitness for a particular purpose, and in no event shall RAD be liable for consequential damages.

RAD shall not be liable to any person for any special or indirect damages, including, but not limited to, lost profits from any cause whatsoever arising from or in any way connected with the manufacture, sale, handling, repair, maintenance or use of the Egate-100, and in no event shall RAD's liability exceed the purchase price of the Egate-100.

DISTRIBUTOR shall be responsible to its customers for any and all warranties which it makes relating to Egate-100 and for ensuring that replacements and other adjustments required in connection with the said warranties are satisfactory.

Software components in the Egate-100 are provided "as is" and without warranty of any kind. RAD disclaims all warranties including the implied warranties of merchantability and fitness for a particular purpose. RAD shall not be liable for any loss of use, interruption of business or indirect, special, incidental or consequential damages of any kind. In spite of the above RAD shall do its best to provide error-free software products and shall offer free Software updates during the warranty period under this Agreement.

RAD's cumulative liability to you or any other party for any loss or damages resulting from any claims, demands, or actions arising out of or relating to this Agreement and the Egate-100 shall not exceed the sum paid to RAD for the purchase of the Egate-100. In no event shall RAD be liable for any indirect, incidental, consequential, special, or exemplary damages or lost profits, even if RAD has been advised of the possibility of such damages.

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

Product Disposal

To facilitate the reuse, recycling and other forms of recovery of waste equipment in protecting the environment, the owner of this RAD product is required to refrain from disposing of this product as unsorted municipal waste at the end of its life cycle. Upon termination of the unit's use, customers should provide for its collection for reuse, recycling or other form of environmentally conscientious disposal.

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.

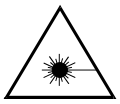
Safety Symbols

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.

Protective ground: the marked lug or terminal should be connected to the building protective ground 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 ground terminal. If a ground lug is provided on the product, it should be connected to the protective ground at all times, by a wire with a diameter of 18 AWG or wider. Rack-mounted equipment should be mounted only in grounded 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.

Some products may have panels secured by thumbscrews with a slotted head. These panels may cover hazardous circuits or parts, such as power supplies. These thumbscrews should therefore always be tightened securely with a screwdriver after both initial installation and subsequent access to the panels.

Connecting 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 (20A for USA and Canada). The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A (40A for USA and Canada).

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.

In cases when the power distribution system is IT type, the switch must disconnect both poles simultaneously.

Connecting DC Power

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 power systems, care should be taken when connecting the DC supply to avoid short-circuits and fire hazards.

Make sure that the DC power 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 (20A for USA and Canada). The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A (40A for USA and Canada).

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 power supply is floating, the switch must disconnect both poles simultaneously.

Connecting 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 grounding 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 ground 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 ground 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 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	Das vorliegende Gerät fällt unter die Funkstörgrenzwertklasse A. In Wohngebieten können beim Betrieb dieses Gerätes Rundfunkströrungen auftreten, für deren Behebung der Benutzer verantwortlich ist.

Mise au rebut du produit

Afin de faciliter la réutilisation, le recyclage ainsi que d'autres formes de récupération d'équipement mis au rebut dans le cadre de la protection de l'environnement, il est demandé au propriétaire de ce produit RAD de ne pas mettre ce dernier au rebut en tant que déchet municipal non trié, une fois que le produit est arrivé en fin de cycle de vie. Le client devrait proposer des solutions de réutilisation, de recyclage ou toute autre forme de mise au rebut de cette unité dans un esprit de protection de l'environnement, lorsqu'il aura fini de l'utiliser.

Instructions générales de sécurité

Les instructions suivantes servent de guide général d'installation et d'opération sécurisées des produits de télécommunications. Des instructions supplémentaires sont éventuellement indiquées dans le manuel.

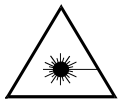
Symboles de sécurité

Avertissement

Ce symbole peut apparaitre sur l'équipement ou dans le texte. Il indique des risques potentiels de sécurité pour l'opérateur ou le personnel de service, quant à l'opération du produit ou à sa maintenance.

Danger de choc électrique ! Evitez tout contact avec la surface marquée tant que le produit est sous tension ou connecté à des lignes externes de télécommunications.

Mise à la terre de protection : la cosse ou la borne marquée devrait être connectée à la prise de terre de protection du bâtiment.



Avertissement

Certains produits peuvent être équipés d'une diode laser. Dans de tels cas, une étiquette indiquant la classe laser ainsi que d'autres avertissements, le cas échéant, sera jointe près du transmetteur optique. Le symbole d'avertissement laser peut aussi être joint.

Veuillez observer les précautions suivantes :

- Avant la mise en marche de l'équipement, assurez-vous que le câble de fibre optique est intact et qu'il est connecté au transmetteur.
- Ne tentez pas d'ajuster le courant de la commande laser.
- N'utilisez pas des câbles ou connecteurs de fibre optique cassés ou sans terminaison et n'observez pas directement un rayon laser.
- L'usage de périphériques optiques avec l'équipement augmentera le risque pour les yeux.
- L'usage de contrôles, ajustages ou procédures autres que celles spécifiées ici pourrait résulter en une dangereuse exposition aux radiations.

ATTENTION : Le rayon laser peut être invisible !

Les utilisateurs pourront, dans certains cas, insérer leurs propres émetteurs-récepteurs Laser SFP dans le produit. Les utilisateurs sont avertis que RAD ne pourra pas être tenue responsable de tout dommage pouvant résulter de l'utilisation d'émetteurs-récepteurs non conformes. Plus particulièrement, les utilisateurs sont avertis de n'utiliser que des produits approuvés par l'agence et conformes à la réglementation locale de sécurité laser pour les produits laser de classe 1.

Respectez toujours les précautions standards de sécurité durant l'installation, l'opération et la maintenance de ce produit. Seul le personnel de service qualifié et autorisé devrait effectuer l'ajustage, la maintenance ou les réparations de ce produit. Aucune opération d'installation, d'ajustage, de maintenance ou de réparation ne devrait être effectuée par l'opérateur ou l'utilisateur.

Manipuler des produits sous tension

Règles générales de sécurité

Ne pas toucher ou altérer l'alimentation en courant lorsque le câble d'alimentation est branché. Des tensions de lignes peuvent être présentes dans certains produits, même lorsque le commutateur (s'il est installé) est en position OFF ou si le fusible est rompu. Pour les produits alimentés par CC, les niveaux de tension ne sont généralement pas dangereux mais des risques de courant peuvent toujours exister.

Avant de travailler sur un équipement connecté aux lignes de tension ou de télécommunications, retirez vos bijoux ou tout autre objet métallique pouvant venir en contact avec les pièces sous tension.

Sauf s'il en est autrement indiqué, tous les produits sont destinés à être mis à la terre durant l'usage normal. La mise à la terre est fournie par la connexion de la fiche principale à une prise murale équipée d'une borne protectrice de mise à la terre. Si une cosse de mise à la terre est fournie avec le produit, elle devrait être connectée à tout moment à une mise à la terre de protection par un conducteur de diamètre 18 AWG ou plus. L'équipement monté en châssis ne devrait être monté que sur des châssis et dans des armoires mises à la terre.

Branchez toujours la mise à la terre en premier et débranchez-la en dernier. Ne branchez pas des câbles de télécommunications à un équipement qui n'est pas mis à la terre. Assurez-vous que tous les autres câbles sont débranchés avant de déconnecter la mise à la terre.

Connexion au courant du secteur

Assurez-vous que l'installation électrique est conforme à la réglementation locale.

Branchez toujours la fiche de secteur à une prise murale équipée d'une borne protectrice de mise à la terre.

La capacité maximale permissible en courant du circuit de distribution de la connexion alimentant le produit est de 16A (20A aux Etats-Unis et Canada). Le coupe-circuit dans l'installation du bâtiment devrait avoir une capacité élevée de rupture et devrait fonctionner sur courant de court-circuit dépassant 35A (40A aux Etats-Unis et Canada).

Branchez toujours le câble d'alimentation en premier à l'équipement puis à la prise murale. Si un commutateur est fourni avec l'équipement, fixez-le en position OFF. Si le câble d'alimentation ne peut pas être facilement débranché en cas d'urgence, assurez-vous qu'un coupe-circuit ou un disjoncteur d'urgence facilement accessible est installé dans l'installation du bâtiment.

Le disjoncteur devrait déconnecter simultanément les deux pôles si le système de distribution de courant est de type IT.

Connexion d'alimentation CC

Sauf s'il en est autrement spécifié dans le manuel, l'entrée CC de l'équipement est flottante par rapport à la mise à la terre. Tout pôle doit être mis à la terre en externe.

A cause de la capacité de courant des systèmes à alimentation CC, des précautions devraient être prises lors de la connexion de l'alimentation CC pour éviter des courts-circuits et des risques d'incendie.

Assurez-vous que l'alimentation CC est isolée de toute source de courant CA (secteur) et que l'installation est conforme à la réglementation locale.

La capacité maximale permissible en courant du circuit de distribution de la connexion alimentant le produit est de 16A (20A aux Etats-Unis et Canada). Le coupe-circuit dans l'installation du bâtiment devrait avoir une capacité élevée de rupture et devrait fonctionner sur courant de court-circuit dépassant 35A (40A aux Etats-Unis et Canada).

Avant la connexion des câbles d'alimentation en courant CC, assurez-vous que le circuit CC n'est pas sous tension. Localisez le coupe-circuit dans le tableau desservant l'équipement et fixez-le en position OFF. Lors de la connexion de câbles d'alimentation CC, connectez d'abord le conducteur de mise à la terre à la borne correspondante, puis le pôle positif et en dernier, le pôle négatif. Remettez le coupe-circuit en position ON.

Un disjoncteur facilement accessible, adapté et approuvé devrait être intégré à l'installation du bâtiment.

Le disjoncteur devrait déconnecter simultanément les deux pôles si l'alimentation en courant CC est flottante.

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 + A11:2004	Information technology equipment – Safety – Part 1: General requirements

Supplementary Information:

The product herewith complies with the requirements of the EMC Directive 2004/108/EC, the Low Voltage Directive 2006/95/EC and the R&TTE Directive 99/5/EC for wired equipment. The product was tested in a typical configuration.

Tel Aviv, 14 January 2008

Haim Karshen
VP Quality

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

Glossary

Address	A coded representation of the origin or destination of data.
Agent	In SNMP, this refers to the managed system.
Analog	A continuous wave or signal (such as human voice).
ANSI	American National Standards Institute.
AWG	The American Wire Gauge System, which specifies wire width.
Balanced	A transmission line in which voltages on the two conductors are equal in magnitude, but opposite in polarity, with respect to ground.
Bandwidth	The range of frequencies passing through a given circuit. The greater the bandwidth, the more information can be sent through the circuit in a given amount of time.
Baud	Unit of signaling speed equivalent to the number of discrete conditions or events per second. If each signal event represents only one bit condition, baud rate equals bps (bits per second).
Bit	The smallest unit of information in a binary system. Represents either a one or zero (“1” or “0”).
Bit Interleaving/Multiplexing	A process used in time division multiplexing where individual bits from different lower speed channel sources are combined (one bit from one channel at a time) into one continuous higher speed bit stream.
bps (Bits Per Second)	A measure of data transmission rate in serial transmission.
Bridge	A device interconnecting local area networks at the OSI data link layer, filtering and forwarding frames according to media access control (MAC) addresses.
Buffer	A storage device. Commonly used to compensate for differences in data rates or event timing when transmitting from one device to another. Also used to remove jitter.
Bus	A transmission path or channel. A bus is typically an electrical connection with one or more conductors, where all attached devices receive all transmissions at the same time.
Byte	A group of bits (normally 8 bits in length).
Carrier	A continuous signal at a fixed frequency that is capable of being modulated with a second (information carrying) signal.

Cell	The 53-byte basic information unit within an ATM network. The user traffic is segmented into cells at the source and reassembled at the destination. An ATM cell consists of a 5-byte ATM header and a 48-byte ATM payload, which contains the user data.
Channel	A path for electrical transmission between two or more points. Also called a link, line, circuit or facility.
Clock	A term for the source(s) of timing signals used in synchronous transmission.
Compression	Any of several techniques that reduce the number of bits required to represent information in data transmission or storage, thereby conserving bandwidth and/or memory.
Concentrator	Device that serves as a wiring hub in a star-topology network. Sometimes refers to a device containing multiple modules of network equipment.
Congestion	A state in which the network is overloaded and starts to discard user data (frames, cells or packets).
Data	Information represented in digital form, including voice, text, facsimile and video.
Data Link Layer	Layer 2 of the OSI model. The entity, which establishes, maintains, and releases data-link connections between elements in a network. Layer 2 is concerned with the transmission of units of information, or frames, and associated error checking.
dB (Decibel)	A unit used to measure relative increase or decrease in power, voltage or current, using a logarithmic scale.
dBm	A measure of power in communications: the decibel in reference to one milliwatt (0 dBm = 1 milliwatt and -30 dBm = .001 milliwatt).
Decibel	See **dB**.
Diagnostics	The detection and isolation of a malfunction or mistake in a communications device, network or system.
Differential Delay	Differential delay is caused when traffic is split over different lines that may traverse shorter and longer paths. Products like the RAD IMX-2T1/E1 inverse multiplexer compensate for any differential delay (up to 64 msec) between the T1 lines, to properly reconstruct the original stream.
Digital	The binary ("1" or "0") output of a computer or terminal. In data communications, an alternating, non-continuous (pulsating) signal.
E3	The European standard for high speed digital transmission, operating at 34 Mbps.

Encapsulation	Encapsulating data is a technique used by layered protocols in which a low level protocol accepts a message from a higher level protocol, then places it in the data portion of the lower-level frame. The logistics of encapsulation require that packets traveling over a physical network contain a sequence of headers.
Ethernet	A local area network (LAN) technology which has extended into the wide area networks. Ethernet operates at many speeds, including data rates of 10 Mbps (Ethernet), 100 Mbps (Fast Ethernet), 1,000 Mbps (Gigabit Ethernet), 10 Gbps, 40 Gbps, and 100 Gbps.
Ethernet OAM	Ethernet operation, administration and maintenance (OAM) are a set of standardized protocols for measuring and controlling network performance. There are two layers of Ethernet OAM: Service OAM (provides end-to-end connectivity fault management per customer service instance, even in multi-operator networks) and Link or Segment OAM (detailed monitoring and troubleshooting of an individual physical or emulated link).
Flow Control	A congestion control mechanism that results in an ATM system implementing flow control.
Frame	A logical grouping of information sent as a link-layer unit over a transmission medium. The terms packet, datagram, segment, and message are also used to describe logical information groupings.
Framing	At the physical and data link layers of the OSI model, bits are fit into units called frames. Frames contain source and destination information, flags to designate the start and end of the frame, plus information about the integrity of the frame. All other information, such as network protocols and the actual payload of data, is encapsulated in a packet, which is encapsulated in the frame.
Full Duplex	A circuit or device permitting transmission in two directions (sending and receiving) at the same time.
FXO (Foreign Exchange Office)	A voice interface, emulating a PBX extension, as it appears to the CO (Central Office) for connecting a PBX extension to a multiplexer.
FXS (Foreign Exchange Subscriber)	A voice interface, emulating the extension interface of a PBX (or subscriber interface of a CO) for connecting a regular telephone set to a multiplexer.
Gateway	Gateways are points of entrance and exit from a communications network. Viewed as a physical entity, a gateway is that node that translates between two otherwise incompatible networks or network segments. Gateways perform code and protocol conversion to facilitate traffic between data highways of differing architecture.
Grooming	In telecommunications, the process of separating and segregating channels by combing, such that the broadest channel possible can be assembled and sent across the longest practical link. The aim is to minimize de-multiplexing traffic and reshuffling it electrically.

Half Duplex	A circuit or device capable of transmitting in two directions, but not at the same time.
Interface	A shared boundary, defined by common physical interconnection characteristics, signal characteristics, and meanings of exchanged signals.
IP Address	Also known as an Internet address. A unique string of numbers that identifies a computer or device on a TCP/IP network. The format of an IP address is a 32-bit numeric address written as four numbers from 0 to 255, separated by periods (for example, 1.0.255.123).
Jitter	The deviation of a transmission signal in time or phase. It can introduce errors and loss of synchronization in high speed synchronous communications.
Laser	A device that transmits an extremely narrow and coherent beam of electromagnetic energy in the visible light spectrum. Used as a light source for fiber optic transmission (generally more expensive, shorter lived, single mode only, for greater distances than LED).
Loopback	A type of diagnostic test in which the transmitted signal is returned to the sending device after passing through all or part of a communications link or network.
MAN (Metropolitan Area Network)	A network that provides regional connectivity within a metropolitan area (such as a city).
Manager	An application that receives Simple Network Management Protocol (SNMP) information from an agent. An agent and manager share a database of information, called the Management Information Base (MIB). An agent can use a message called a traps-PDU to send unsolicited information to the manager. A manager that uses the RADview MIB can query the RAD device, set parameters, sound alarms when certain conditions appear, and perform other administrative tasks.
Master Clock	The source of timing signals (or the signals themselves) that all network stations use for synchronization.
Multimode Fiber	A fiber with a large core diameter; 50-200 microns compared with the wavelength of light. It therefore propagates more than one mode. With multimode fiber, light traverses multiple paths, some longer than others. This leads to dispersion, which reduces optical range.
Multiplexer	At one end of a communications link, a device that combines several lower speed transmission channels into a single high speed channel. A multiplexer at the other end reverses the process. Sometimes called a mux. See **Bit Interleaving/Multiplexing**.
Network	(1) An interconnected group of nodes. (2) A series of points, nodes, or stations connected by communications channels; the collection of equipment through which connections are made between data stations.

Node	A point of interconnection to a network.
Packet	An ordered group of data and control signals transmitted through a network, as a subset of a larger message.
parameters	Parameters are often called arguments, and the two words are used interchangeably. However, some computer languages such as C define argument to mean actual parameter (i.e., the value), and parameter to mean formal parameter. In RAD CLI, parameter means formal parameter, not value.
Payload	The 48-byte segment of the ATM cell containing user data. Any adaptation of user data via the AAL will take place within the payload.
Physical Layer	Layer 1 of the OSI model. The layer concerned with electrical, mechanical, and handshaking procedures over the interface connecting a device to the transmission medium.
Port	The physical interface to a computer or multiplexer, for connection of terminals and modems.
prompt	One or more characters in a command line interface to indicate that the computer is ready to accept typed input.
Protocol	A formal set of conventions governing the formatting and relative timing of message exchange between two communicating systems.
QoS (Quality of Service)	Refers to the capability of a network to provide better service to selected network traffic over various technologies, including Frame Relay, Asynchronous Transfer Mode (ATM), Ethernet and 802.1 networks.
Router	An interconnection device that connects individual LANs. Unlike bridges, which logically connect at OSI Layer 2, routers provide logical paths at OSI Layer 3. Like bridges, remote sites can be connected using routers over dedicated or switched lines to create WANs.
Serial Transmission	A common mode of transmission, where the character bits are sent sequentially one at a time instead of in parallel.
Single Mode	Describing an optical wave-guide or fiber that is designed to propagate light of only a single wavelength (typically 5-10 microns in diameter).
Space	In telecommunications, the absence of a signal. Equivalent to a binary 0.
Sync	See **Synchronous Transmission**.
Synchronous Transmission	Transmission in which data bits are sent at a fixed rate, with the transmitter and receiver synchronized.

T1	A digital transmission link with a capacity of 1.544 Mbps used in North America. Typically channelized into 24 DS0s, each capable of carrying a single voice conversation or data stream. Uses two pairs of twisted pair wires.
T3	A digital transmission link with a capacity of 45 Mbps, or 28 T1 lines.
Telnet	The virtual terminal protocol in the Internet suite of protocols. It lets users on one host access another host and work as terminal users of that remote host. Instead of dialing into the computer, the user connects to it over the Internet using Telnet. When issuing a Telnet session, it connects to the Telnet host and logs in. The connection enables the user to work with the remote machine as though a terminal was connected to it.
Throughput	The amount of information transferred through the network between two users in a given period, usually measured in the number of packets per second (pps).
Timeslot	A portion of a serial multiplex of timeslot information dedicated to a single channel. In E1 and T1, one timeslot typically represents one 64 kbps channel.
VLAN-Aware	A device that is doing the Layer 2 bridging according to the VLAN tag in addition to the standard bridging parameters. A VLAN-aware device will not strip or add any VLAN header.

Quick Start Guide

Only an experienced technician should install Egate-100. If you are familiar with Egate-100, use this quick guide to prepare Egate-100 for operation.

1. Installing Egate-100

Connecting the Interfaces

➤ To connect Egate-100 to the network equipment:

1. Make the following connections, depending on the installed interface:
   - Connect the STM-1/OC-3 equipment to the fiber optic front panel connectors.
   - Connect the T3 equipment to the T3 front panel connectors.
2. Connect the 1000BaseT or 1000BaseSx LAN to the DATA connector on the front panel.
3. Use a straight cable to connect the ASCII terminal to the CONTROL connector on the front panel

   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

➤ To connect Egate-100 to power:

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

  The unit starts running.

2. Configuring Egate-100

Configure Egate-100 to the desired operation mode via an ASCII terminal connected to the front panel CONTROL port. Alternatively, you can manage Egate-100 over Telnet, a PC running a Web browsing application, or SNMP via the Ethernet or E3 port.

Note *Remote management requires assigning an IP address*

Starting a Terminal Session for the First Time

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

1. Connect an ASCII terminal to the CONTROL port on the front panel. The default settings are as follows:
   - **Baud Rate**: 115,200 bps
   - **Data Bits**: 8
   - **Parity**: None
   - **Stop Bits**: 1
   - **Flow Control**: None.
2. To optimize the view of the system menus, do the following:
   - Set the terminal emulator to **VT100**.
   - If you are using HyperTerminal, set the terminal mode to the 132-column mode.
3. Power up Egate-100 and verify that the PWR LED on the front panel is on.
4. 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
     - On – Device alarm.
5. If the ALM LED is on, check the physical connections.
6. Press any key to display the Login screen.
7. Enter the user name and the password and proceed with the management session.

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

Configuring Basic Parameters

The Quick Setup menu allows you to configure mandatory elements. For additional information on parameters and the menus, refer to *Chapter 4*.

Configuration via the Quick Setup Menu

➤ **To configure the required parameters using the Quick Setup menu:**

1. Navigate to Main Menu › Configuration › **Quick Setup**.

   The Quick Setup appears as illustrated below.

```
                          Egate-100
Main Menu> Configuration> Quick Setup

 1. Management                  >
 2. Frame Type                  > (SONET)
 3. VLAN Mode                   > (Aware)
 4. Flows Support               > (No)
 5. Network Setting (Ethernet)  >
 6. User Setting                >

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

Quick Setup Menu

2. In the Quick Setup menu, configure the following parameters:
   - Frame Type (SONET or SDH)
   - VLAN Mode (Aware or Unaware)
   - Flows Support (Yes or No)
3. In the Host menu (Quick Setup > Management > Host), configure the following parameters:
   - IP Address
   - IP Mask
   - Default Gateway
   - Host Tagging (Untagged/Tagged)
4. In the Management Ports menu (Quick Setup > Management > Ports), select Bind to in order to bind a bridge port to the Host port or ETH-MNG port.
   - To navigate between the bridge ports, press <F> or <B>.
   - To remove the binding to a bridge port, press <R>.
5. In the Network Settings Port menu (Quick Setup > Network Setting > Ports), select Bind to in order to bind the bridge ports to the Gigabit Ethernet ports (Gbe-1 and Gbe-2).
   - To remove the binding to the bridge port, press <R>.
6. In the Quick Setup menu, select User Setting.

   The User Setting menu appears.

```
                          Egate-100
Main Menu> Configuration> Quick Setup> User Setting

     Bridge Port Number [1 - 130]   ...(3)
 1.  Port Name                      ...(Bridge Port 3)
 2.  Protocol Type                  >  (HDLC)
 3.  Physical Port Number[1 - 63]   >  (1)
 4.  Frame Type                     >  (Unframed)
 5.  HDLC Flags[1-7]                >  (1)
 6.  Administrative Status          >  (Up)
 7.  Queue Profile Name             >  ()
 8.  Ingress Filtering              >  (Enabled)
 9.  Accept Frame Types             >  (Tag only
 10. Port VID >                     ...(1)
 11. Default Priority Tag           ...(0)
 12. Replace Priority               >  (No)
 13. Egress Tag Handling            >  (None)
 14. Ingress Tag Handling           >  (None)
 15. Loop Detection                 >  (Enable)
 16. Link OAM (802.3ah)             >  (Disabled)
 17. Maximum MAC Address[1 - 64000] ...(64000)
 18. VLAN ID                        ...(0)

>
Please select item <1 to 6>
F – Fwd Port; B – Backward Port; R – Remove Port; A – Add Port
ESC-prev.menu; !-main menu; &-exit
```

Quick Setup User Setting Menu

7. For each physical port that you wish to configure and/or bind to a bridge port, press ‹A› and configure the following parameters:

   - Protocol Type. HDLC, PPP over HDLC for multiple E1/T1, or MLPPP for the bundle that is bound to the PPP logical port, or GFP multi (LCAS) for multiple E1/T1 ports
   - Physical Port Number. One of the 63/84 physical E1/T1 ports
   - Frame Type. Framing mode, Unframed/CRC-4/no CRC-4 for E1, Unframed/ESF/D4 for T1
   - HDLC Flags. 1-7. The flags before and after an HDLC frame indicate the start and end of the frame
   - Administrative Status. Enabled (Up) or disabled (Down)
   - Queue Profile Name. Name allocated to the queue profile
   - Ingress Filtering. Enabled or disabled
   - Accept Frame Types. All or Tag only
   - Port VID

- **Default Priority Tag**
- **Replace Priority Tag**. Yes or No
- **Egress Tag Handling**. None, Stripping, Stacking
- **Ingress Tag Handling**. None, Stripping, Stacking
- **Loop Detection**. Disabled or Enabled
- **Link OAM (802.3ah)**. Disabled or Enabled
- **Maximum MAC Adress**. 1 – 64000
- **VLAN ID**
- **Active Timeslots** for framed physical ports only (1-31 or a list of values for E1, 1-24 for a list of values for T1).

Configuration using Standard Menus

This section describes how to configure the required parameters using the full menu structure.

➤ **To configure the host parameters:**

- In the Host menu (**Main › Configuration › System › Management › Host**), configure the following parameters:
  - **IP Address**
  - **IP Mask**
  - **Default Gateway**.

➤ **To configure the host encapsulation:**

- In the Encapsulation menu (Main › Configuration › System › Management › Host› Encapsulation), configure the following parameters:
  - **Host Tagging** (untagged/tagged)
  - **Host VLAN ID** (for tagged only)
  - **Host VLAN Priority** (for tagged only).

➤ **To configure the Ethernet interfaces:**

- In the Ethernet menu (**Main › Configuration › Physical Layer › Ethernet**), press ‹**F**› or ‹**B**› to select the Gigabit Ethernet port under **Port**, and then configure the following parameters:
  - **Alarms**: Specify whether to mask or unmask the alarms
  - **Autonegotiation**: Enable or disable autonegotiation mode.

Note *The Autonegotiation option is only available for electrical interfaces, not for optical interfaces.*

➤ **To configure STM-1/OC-3 interfaces:**

- In the SDH/SONET menu (**Main › Configuration › Physical Layer › SDH/SONET**), configure the following parameters:

- **Frame Type**: Specify whether mode of operation is SDH or SONET
- **Administrative Status**: Specify whether the network port is to be used.
- **Tx Clock**: Select the source of the system clock: Internal or Loopback Timing.
- **Alarms**: Specify whether to mask or unmask the alarms.
- **E1/T1**: Specify the E1/T1 frame mode and port parameters.

➤ **To configure channelized T3 interfaces:**

1. In the T3 menu (**Main > Configuration > Physical Layer > T3**), configure the following parameters:
   - **Administrative Status**: Specify whether the network port is to be used.
   - **Tx Clock**: Select the source of the system clock: Internal or Loopback Timing.
   - **Line Length**: Specify long or short T3 line.
   - **Alarms**: Specify whether to mask or unmask the alarms.
2. Navigate to T1 (**Main > Configuration > Physical Layer > T3 > T1**) and configure the mapped T1 channel parameters for each T3 port.

➤ **To configure logical ports:**

- In the Logical Ports menu (**Main > Configuration > Logical Layer**), define and configure the required logical ports, including the selection of the protocol (HDLC, PPP over HDLC, MLPPP, GFP, or VCG).

➤ **To configure bridge ports:**

1. In the Bridge menu (**Main > Configuration > Applications > Bridge**), configure the necessary bridge parameters:
   - **VLAN Mode** (VLAN-aware or VLAN-unaware): Specify whether bridge operates in VLAN-aware or VLAN-unaware mode.
   - **Aging Time**: Specify how long to keep MAC table entry without erasing it, if no frame is received with the MAC.
   - **Split Horizon**: Specify whether bridge operates with split horizon feature, to prevent switching packets between bridge ports bound to logical ports
   - **VLAN Ethertype**: Specify value used to identify and manipulate VLAN frames
   - **Loop Detection**: Specify whether loop detection is enabled.
2. In the Bridge Port menu (**Main > Configuration > Applications > Bridge> Bridge Ports**), define the relevant bridge ports.

➤ **To enable Gigabit Ethernet port redundancy:**

- In the Ethernet aggregation menu (**Main > Configuration > System > Protection > Ethernet Aggregation**), enable **Ethernet Aggregation**.

Note *To enable Ethernet aggregation, both Gigabit Ethernet links must be set to Full Duplex mode at the same line speed, and autonegotiation must be enabled.*

Contents

Chapter 7. Application Tutorial

Chapter 1
Introduction

1.1 Overview

Egate-100 is a Gigabit Ethernet over TDM aggregation gateway that combines Ethernet traffic carried over PDH (E1/T1) into a Gigabit Ethernet MAN (Metropolitan Area Network). Egate-100 can aggregate up to 126 remote LANs over fractional E1/T1 or up to 42 links using standard bonding protocols.

The unit features next-generation Ethernet over PDH encapsulation and bonding capabilities with support for standard protocols such as generic framing procedure (GFP), virtual concatenation (VCAT), and link capacity adjustment scheme (LCAS). The GFP, VCAT, and LCAS protocols allow service providers to dynamically allocate bandwidth to their customers. By incorporating these enhanced capabilities, Egate-100 enables higher user throughput, and offers the following benefits:

- Allows users to fully utilize their contracted bandwidth by ensuring low and constant traffic overhead
- Minimizes service disruptions in cases of link failures via hitless traffic restoration
- Enables high service resiliency for real-time applications by dramatically reducing delays on the TDM connections
- Ensures robust traffic delivery with automatic error correction and minimal packet retransmissions
- Enhances Ethernet over NG-PDH capabilities by supporting multiple NTUs in up to 42 remote locations.

Full Layer 2 switching (bridge) between the Ethernet segments beyond the SDH and Gigabit Ethernet networks is provisioned. The bridge supports VLAN-aware and VLAN-unaware bridging modes, and can be used for VLAN-based Layer 2 VPNs.

Egate-100 also supports flow classification and policing for network ingress traffic. Classification is supported per port that enables packet identifiers such as VID, p-bit, DSCP and IP-precedence.

The unit includes two electrical or optical Gigabit Ethernet ports and, depending on the interface option ordered, either a dual port to the SDH/SONET network or three channelized T3 ports. The Gigabit Ethernet ports support link aggregation according to IEEE 802.3ad requirements. The dual SDH/SONET ports support unidirectional APS or 1+1 optimized bidirectional mode, as per ITU G.841 Annex B.

Egate-100 can be managed via Telnet and the Web-based management application for inband configuration and management, as well as an ASCII terminal for out-of-band management.

The unit is supplied as a compact standalone 1U high enclosure, with an optional 19-inch rack mounting kit.

Product Options

Gigabit Ethernet Port Options

The Gigabit Ethernet port versions are:

- 1000BaseSx, 850nm, LC (SFP) connector
- 1000BaseLx, 1310 nm, LC (SFP) connector
- 10/100/1000BaseT, RJ-45 connector.

Uplink Options

Egate-100 is equipped with two STM-1/OC-3 ports or three channelized T3 interfaces.

STM-1/OC-3 Port Options

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
- Multi mode, 1310 nm, LC (SFP) connector.

T3 Port Options

Egate-100 has three channelized T3 ports. Each T3 port has 28 T1s mapped to the T3 interface via M13 multiplexer.

Single/Dual Power Supply

Single or dual power supply versions are available.

Note *A combination of DC and AC power supplies on the same unit is not allowed.*

Applications

Figure 1-1 illustrates a typical application, where Egate-100 supports three remote sites using different user VLANs (CPEs using tag stacking) and an additional host VLAN shared by the three CPEs for secured management traffic. See *Chapter 7* for information on implementing this application.

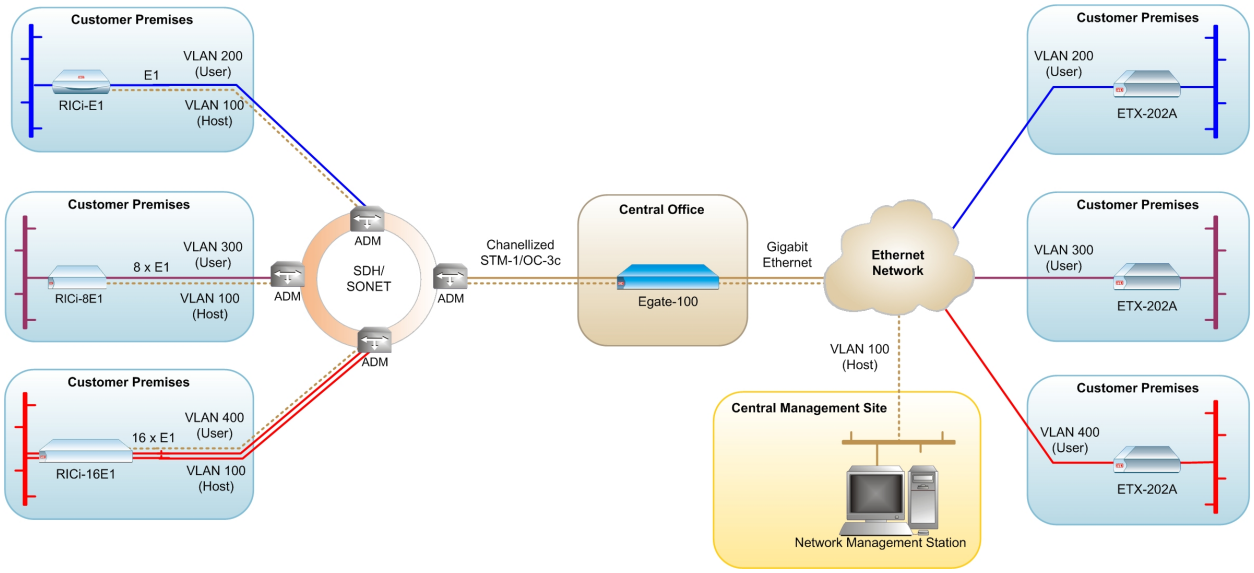


Figure 1-1. Typical Egate-100 Application

Features

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

The unit includes the following interfaces:

- Two Gigabit Ethernet ports
- Two STM-1/OC-3c ports or three channelized T3 ports
- Fast Ethernet port for management
- Terminal control port for out-of-band management.

Gigabit Ethernet

The two Gigabit Ethernet interfaces operate in full duplex mode, supporting regular size frames (1600 bytes). The Ethernet ports support flow control as per IEEE 802.3, including support for pause frames. The ports can act as bridge ports or be aggregated to provide Gigabit Ethernet link redundancy The Gigabit Ethernet ports support the following interfaces:

- 1000BaseSx
- 1000BaseLx
- 10/100/1000BaseT with autonegotiation.

Ethernet Link Redundancy

Egate-100 supports Gigabit Ethernet link redundancy based on the link aggregation protocol IEEE 802.3ad.

STM-1/OC-3

Egate-100 supports two channelized STM-1/OC-3 interfaces (with APS support) for SDH mapping (E1s over VC-12 over VC4) or SONET mapping (T1s over VT1.5 over STS1 over STS3). Either port can be configured as the active port.

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

STM-1/OC-3 APS

The option for APS (Automatic Protection Switching) between the two STM-1/OC-3 ports is available, and can be configured for either unidirectional or 1+1 optimized bidirectional mode, as per ITU G.841 Annex B.

Ethernet over E1/T1 Encapsulation

Egate-100 allows you to map up to 63 E1 or 84 T1 channels into the CH-STM-1/OC-3 interface using the four protocols listed below individually or in combination:

- **GFP (G.8040) VCAT (G.7043) LCAS (G.7041):** Up to 42 remote sites of Ethernet over up to 16 E1/T1 links. Egate-100 can work opposite RAD's RICi-16 at the remote end to support a complete remote and central site solution for Ethernet over n x E1/T1.
- **GFP (G.8040):** Up to 63/84 remote sites of Ethernet over GFP. Ethernet is mapped over framed E1/T1. For E1, the GFP frames are mapped into 16-frame multi-frame according to G.704. For T1, they are mapped into 24-frame 1544 kbps multi-frame.
- **MLPPP:** Up to 42 remote sites of Ethernet over n x E1/T1, using MLPPP. Ethernet can be mapped over up to 8 E1/T1 links. Egate-100 can work opposite RAD's RICi-4E1/T1 or RICi-8E1/8T1 at the remote end to support a complete remote and central site solution for Ethernet over n x E1/T1.
- **PPP/BCP:** Up to 126 remote sites of Ethernet over PPP/BCP (FCD-E1 and FCD-IP compatible). Ethernet can be mapped over unframed E1/T1, or over fractional E1/T1: n x 64, where n (number of timeslots) = 1–31 for E1 and 1–24 for T1.
- **HDLC:** Up to 126 remote sites of Ethernet over RAD HDLC over E1/T1 (RICi-E1/T1, FCD-E1, and FCD-IP compatible). Ethernet can be mapped over unframed E1/T1, or over fractional E1/T1: n x 64, where n (number of timeslots) = 1–31 for E1 and 1–24 for T1.

Bridge

Egate-100 provides a bridging functionality between its bridge ports:

- E1/T1 over SDH/SONET (Ethernet over E1/T1 or fractional E1/T1), or T1 over T3
- Gigabit Ethernet ports
- Fast Ethernet management port
- 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 you to create a subgroup of bridge ports within the bridge. Each such subgroup is associated with a unique VLAN ID. 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 according to only their source and destination MAC addresses.

Flows

Egate-100 provides traffic flow classification and policing for Network ingress traffic. Egate-100 supports up to 253 unidirectional flows originating from SVI bound to GbE and heading towards the logical pot. Each flow is defined by a classification profile.

Incoming traffic is classified and mapped according to port-based (all-in-one) bundling or by port and CE VLAN-ID, VLAN priority, DSCP and IP precedence. Operators can differentiate services using classification methods, police the traffic and enforce SLA per service.

Classification

The Egate-100 classifier uses classification fields/rules per port. Up to 256 classification profiles/instances are supported.

For more information about flow classification, refer to *Functional Description*.

Policing and Bandwidth profiles

Policers can be applied per flow and operate according to the dual bucket mechanism (CIR + CBS, EIR + EBS). Egate-100 supports up to 256 policers.

Ethernet OAM

The device provides OAM tools to monitor and troubleshoot an Ethernet network and quickly detect failures in a single segment (link) according to IEEE 802.3ah for remote management and remote fault indication, including remote terminal. The OAM mechanism is useful for monitoring link operation.

The device supports OAM discovery, continuity check, and remote fault indication. The discovery process enables you to observe the remote device MAC address, capabilities, and vendor type.

The continuity check issues an alarm when there is no OAM connection with the remote device. The remote fault indication issues an alarm when it receives one of the following from the remote device:

- Link failure
- Dying gasp
- Critical event.

Simple Network Time Protocol

The Simple Network Time Protocol (SNTP) provides the means of synchronizing all managed elements across the network to a reliable clock source. The Egate-100 clock can be automatically synchronized to an accurate time from an NTP server at user-selectable intervals.

Management

You can set up, control, and monitor Egate-100 using one of the following methods:

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

Web-based Management

Egate-100s Web-based element management system for remote device configuration and maintenance is embedded in Egate-100 and provided at no additional cost. The management system can be accessed from any standard Web browser. For additional information, refer to *Chapter 3*.

Security

The following security protocols are provided by Egate-100 to ensure client-server communication privacy and correct user authentication:

- RADIUS (client authentication only)
- SSLv3 for Web-based management application
- SSHv2 for Secure Shell communication session
- SNMPv3 (SNMPv1 is used if SNMPv3 is not enabled).

In addition, management access can be limited to only stations in the Manager List.

Diagnostic Tools

Egate-100 supports ping tests, E1/T1 PRBS tests, and reviewing self-test results. For additional information, refer to *Chapter 5*.

Statistics

The device provides statistics and counters capability for the various physical interfaces, as well as at the level of logical port and bridge port. For additional information, refer to *Chapter 5*.

Alarms

There is an active alarm and log file at the SDH/SONET, T3, Gigabit Ethernet, and system levels. For additional information, refer to *Chapter 5*.

1.2 Physical Description

Egate-100 is a 1U high standalone or rack-mountable device. *Figure 1-2* illustrates three-dimensional views of Egate-100 with Gigabit Ethernet and STM-1/OC-3 network interfaces, and Egate-100 with 3xT3 interfaces.

The unit's LEDs, interface, and control connectors (and two hot-swappable power-supply connectors) are located on the front panel. For additional information about the unit's LEDs, refer to *Chapter 3*.

Figure 1-2. Egate-100 3D View

1.3 Functional Description

This section explains the data flow inside Egate-100. For mapping schemes and backup mechanisms on OC-3/STM-1 and GbE ports, refer to *STM-1/OC-3 Mapping* and *Gigabit Ethernet Link Aggregation* respectively.

Note *Egate-100 is equipped with either two STM-1/OC-3 ports or three channelized T3 ports. Therefore, certain sections may not apply to the configuration you ordered.*

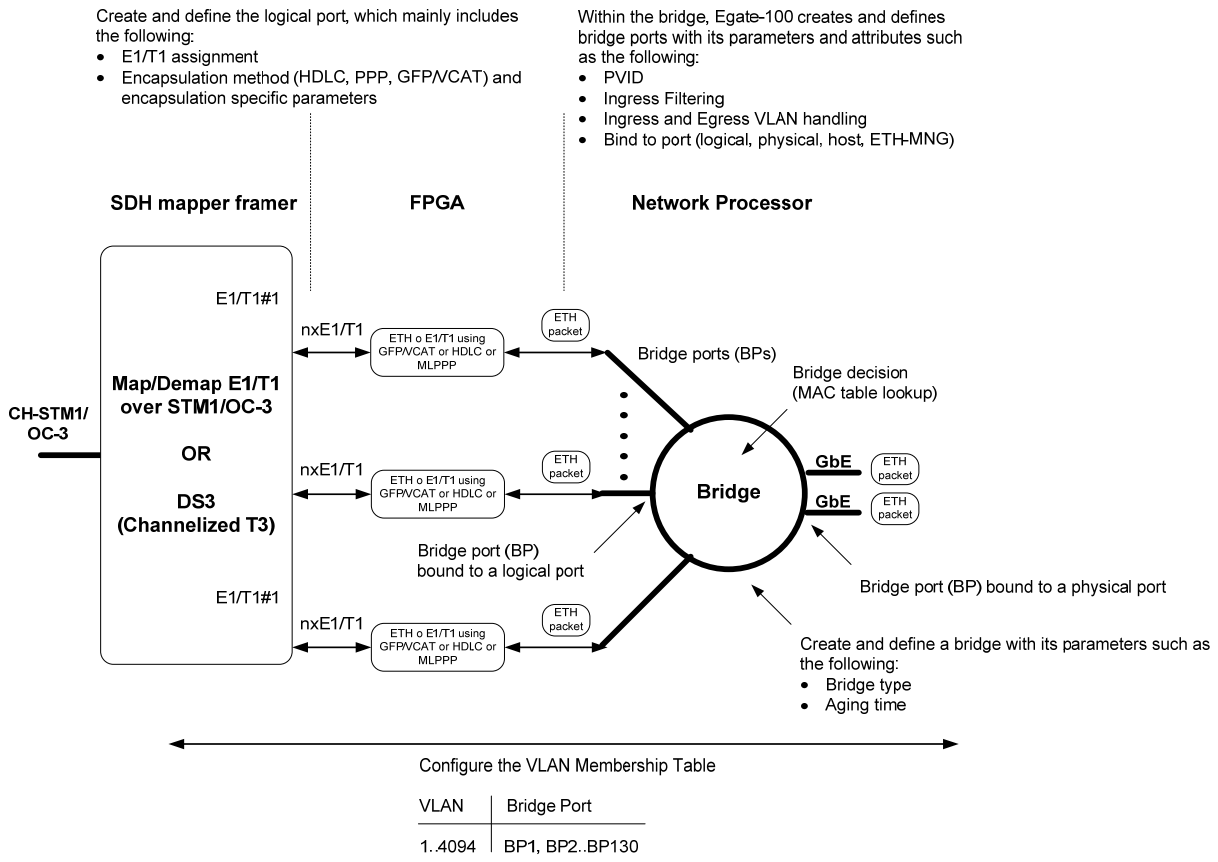


Figure 1-3. Egate-100 Work Flow

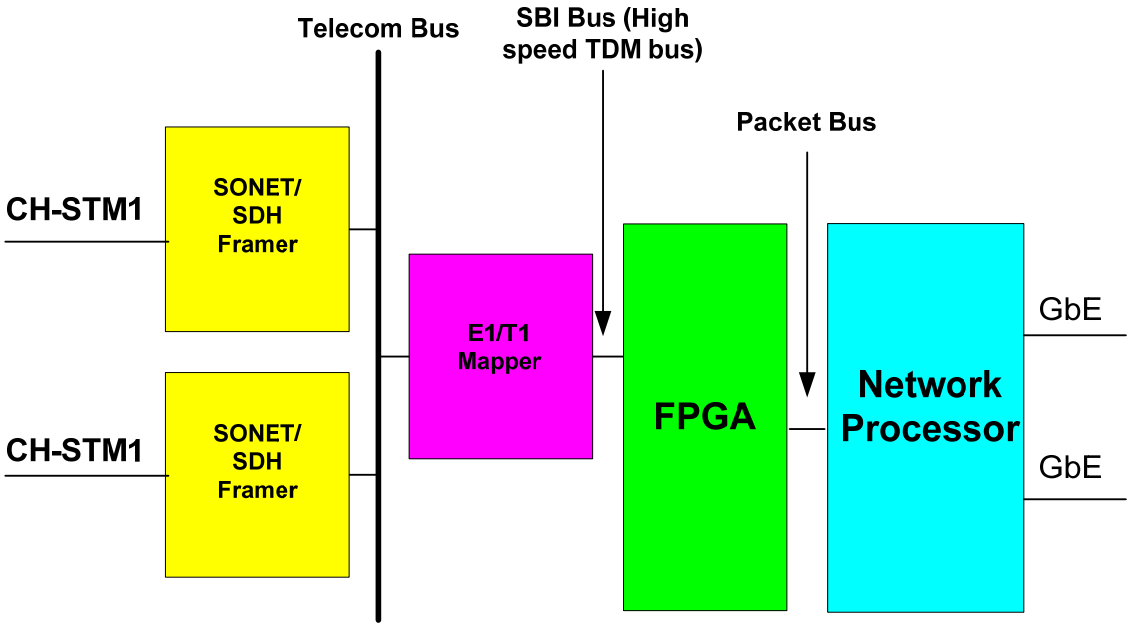


Figure 1-4. Egate-100 Hardware Block Diagram

Incoming traffic from the Ethernet ports is processed by the Network processor, which performs bridging, forwarding and QoS based queuing, which results in an egress bridge to a logical port. The packets are marked with a bridge port ID and forwarded over the high speed bus to the FPGA. The FPGA maps the packets of each bridge port to the associated E1/T1 group according to the associated encapsulation method.

Figure 1-3 illustrates the work flow and *Figure 1-4* illustrates the corresponding hardware blocks inside Egate-100.

The FPGA is responsible for the HDLC/GFP encapsulation including CRC calculation and zero bit insertion. The FPGA then maps each of these flows into the right bundle and forwards it over the TDM bus to the SDH/SONET mapper.

In the opposite direction, the same process takes place with the packet being transferred to the Ethernet port. Local switching between two virtual ports is possible.

In case of an MLPPP bundle (nxE1/T1 bundle), the network processor is responsible for the implementation of the appropriate inverse multiplexer scheme/buffer. In case of GFP and GFP bonding, the FPGA handles the GFP encapsulation and bonding unlike the MLPPP case where the network processor performs the bonding.

STM-1/OC-3 Mapping

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.

Two STM-1/OC-3 ports support APS, to ensure that one is available at all times. Egate-100 operates in either SDH or SONET mode to support different 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.

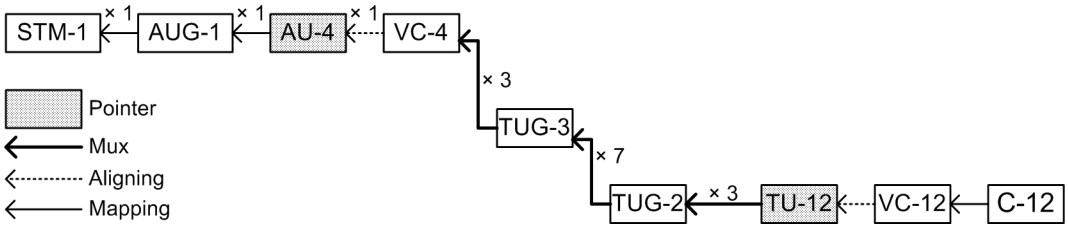


Figure 1-5. STM-1 / AU-4 / VC-4 / TUG-3s / TUG-2s / TU-12s / VC-12s /E1s

SONET Mapping

The following figure illustrates the mapping of T1s over SONET.

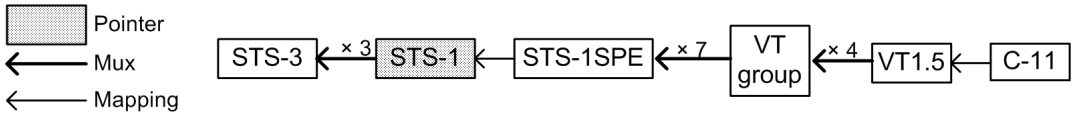


Figure 1-6. Low Order: OC-3 / STS-1 SPEs / VT Group / VT1.5s / T1s

Gigabit Ethernet Link Aggregation

The two Gigabit Ethernet ports can be configured to operate independently as two separate Ethernet interfaces, or as a single Ethernet interface with link aggregation mode in accordance with IEEE 802.3ad (without LACP). This mode inherently provides redundancy: if one of the two Ethernet ports fails, the second one takes over.

The two Gigabit Ethernet ports use link aggregation in accordance with IEEE 802.3ad without LACP (Link Aggregation Control Protocol). In the virtual link group only one link transmits at a time. If the transmitting link encounters an error, Egate-100 switches to the redundant link in the group.

With link aggregation, the two Gigabit Ethernet ports serve as a single logical interface. The two ports must be connected to the same switch/router and set to the same speed and full duplex autonegotiation must be enabled. *Figure 1-7* illustrates link aggregation mode.

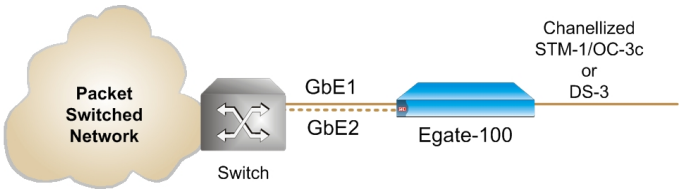


Figure 1-7. Link Aggregation Mode

Failure of one of the links is detected by sensing the loss of valid signals at a port, in which case the traffic is sent through the remaining port.

The equipment connected to the Gigabit Ethernet ports must support and be configured for link aggregation according to 802.ad with LACP disabled:

- Layer 2 switching networks – signal loss

As the two Gigabit Ethernet ports serve as a single logical interface, the learning tables do not change as a result of the interface flip.

The switching time for Gigabit Ethernet optical interfaces is below 50 ms. For 1000BaseT, the switching time is below 1 second, limited by the longer loss of signal detection for 1000BaseT technology.

Note *For Gigabit Ethernet redundancy to work properly when 802.3ad is enabled, both Gigabit Ethernet ports must be set to full duplex mode at the same line speed, and autonegotiation must be enabled.*

Bridge

Egate-100 has a multiport bridge with up to two Ethernet bridge ports and up to 130 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 subgroups of bridge ports within the bridge. Each subgroup is defined per VLAN and is associated with a unique VLAN ID. Frames with a specific VLAN ID 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.

The bridge features in VLAN-aware mode are:

- Full VLAN-aware bridge as per 802.1Q
- VLAN tag options:
  - Option for VLAN tag stacking ("double VLAN") at bridge port ingress
  - Option for VLAN tag stacking ("double VLAN") at bridge port egress
  - Option to copy/set VLAN priority tag at port ingress
  - Option for VLAN tag stripping at port egress
  - Option for VLAN tag stripping 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)
- Up to 1024 VLANs supported (out of the full VLAN range)
- MAC learning limit – can be configured for each bridge port
- Aging time – can be configured at the bridge level
- MAC table viewing (learned MACs)
- Optional loop detection
- Ethernet OAM (802.3ah).

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 subprocesses: 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 VLAN ID (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 VLAN ID 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** – configurable per bridge port:
  - In VLAN-aware mode, each received frame entering the bridge is associated with a single VID. In cases where the received frame does not contain a VLAN ID (i.e., untagged or priority-only tagged frames), a specific PVID is assigned to the frame before it passes 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.
- **Default priority tag** – configurable per bridge port:
  - In VLAN-aware mode, each received frame entering the bridge is associated with a single VLAN ID and priority. In cases where the received frame does not contain a VLAN ID (i.e., untagged frames), a specific PVID

and default priority tag are assigned to the frame before it passes to the forwarding process. If tag stacking is enabled, the user can select the priority according to the received priority tag or the default priority tag.

- **Replace priority** – configurable per bridge port:
  - When stacking is disabled in VLAN-aware mode, each received frame that enters the bridge is tagged with VLAN ID and priority. The original priority can be replaced with the default priority tag when this parameter is set to **Yes**.
- **Copy origin priority** – configurable per bridge port:
  - When stacking is enabled in VLAN-aware mode, each received frame that enters the bridge is tagged with VLAN ID and priority. When this parameter is set to **Yes**, the original priority can be copied to the double tag. When copy origin priority is set to **No**, the double tag is set with the default priority tag.
- **Strip VLAN tag** – configurable for Gigabit Ethernet port:
  - The VLAN tag of each received frame can be stripped at the Gigabit Ethernet port ingress, before the frame enters the bridge. For single-tagged ports, the frame enters the bridge with the user-defined PVID and default priority.

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 into 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 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 the 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 VLAN ID, unless Split Horizon is enabled on the remote side.
  - Multicasts and broadcasts are flooded only through the bridge ports whose VLAN ID is identical to the frame VLAN ID, unless Split Horizon is enabled on the remote side.

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).

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

- 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 the VLAN priority that was set when entering the Gigabit Ethernet port; VID is the PVID of that port.
  - Priority-tagged frames are transmitted tagged with original priority and VID = PVID
- Strip VLAN – One level of VLAN is stripped from each frame
- Stack VLAN – You can configure the Gigabit Ethernet port to have each outgoing frame stacked with a predefined VLAN ID; the VLAN priority tag can be optionally copied.

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 (Gigabit Ethernet or E1/T1s) is forwarded according to its destination MAC address.

The bridge features in VLAN-unaware mode are:

- 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
- Optional loop detection
- Ethernet OAM (802.3ah).

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 is updated
- If the MAC already exists, but for a different bridge port (dynamic entry), the new entry overrides 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 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 (DA). The frame is forwarded to the 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, the frames are transmitted unchanged: No tags are added or removed.

VLAN Ethertype

By default, the system uses Ethertype 8100 to identify and manipulate VLAN frames (including stacking and other actions).

It is possible to configure Egate-100 to use another Ethertype to identify and manipulate VLAN frames. Thus, Egate-100 can support a proprietary VLAN Ethertype (9100) or new standards (S-TAG per 802.1ad using 88A8).

The Egate-100 VLAN Ethertype configuration is in effect for any VLAN identification and operation. Thus, only frames with the configured Ethertype are identified as VLAN-tagged frames, and all stacking operations are done using the configured Ethertype.

Split Horizon

The Egate-100 split horizon functionality overrides the VLAN-aware bridge forwarding rules, and imposes a logical forwarding restriction on the bridge standard behavior to support certain application requirements.

The basic VLAN-aware bridge forwarding rules determine that bridge ports sharing the same VLAN act as the same Ethernet segment for this VLAN. This means that unicast connectivity between the ports is possible and broadcasts, multicasts, and unknown unicasts are flooded to all ports sharing the same VLAN.

There are applications where remote sites sharing the same VLAN must disable the local switching performed at Egate-100 between the remote sites. An example of such an application is Internet Access/DSLAM Aggregation.

There are three options for Split Horizon:

- Enabling local switching
- Disabling switching between the PDH ports for all LANs
- Enabling Split Horizon for specific VLANs. This means that for example Internet access VLANs may use Split Horizon while other VLANs used for VPNs between remotes still use the connectivity between the bridge ports at the Egate-100 level.

Flows

Egate-100 supports up to 253 unidirectional flows. Flows are defined by ingress and egress ports, a classification profile and a priority. The flow traffic can be passed, dropped or policed.

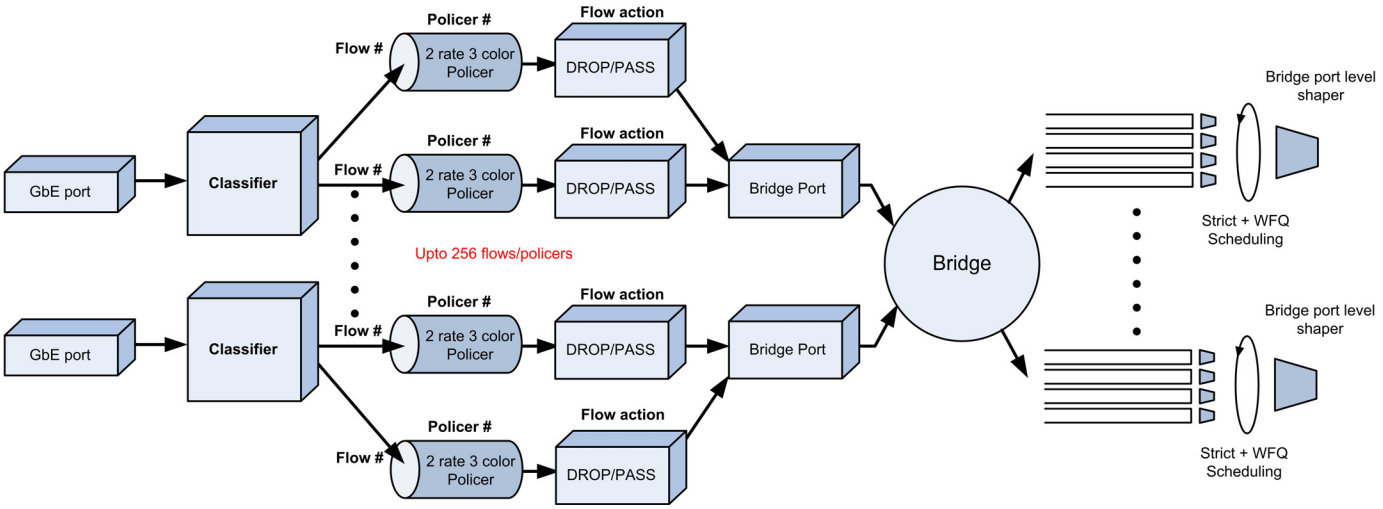


Figure 1-8. Data Flow – Network GbE to E1T1/SDH Interface

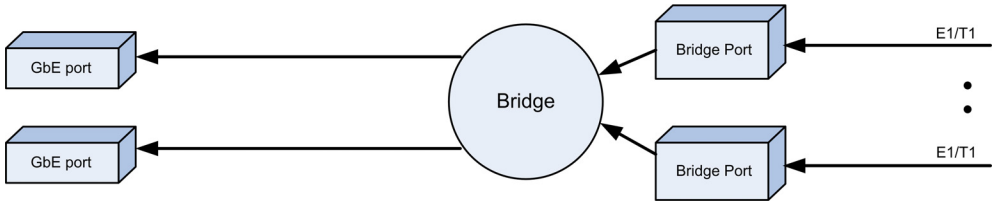


Figure 1-9. Data Flow – E1T1/SDH Interface to Network GbE

Classification

The ingress user traffic is mapped to the Ethernet flows using classification types. Egate-100 allows two of the following combinations per port (port + ...)

- VLAN
- 802.1p
- IP Precedence
- DSCP
- VLAN + 802.1p
- VLAN + IP Precedence
- VLAN + DSCP
- 802.1p + IP Precedence
- 802.1p + DSCP

- VLAN + 802.1p + IP Precedence
- VLAN + 802.1p + DSCP

Policing and Bandwidth Profiles

Egate-100 supports 256 policer profiles and instances.

Policers can be applied per flow. The policers operate according to the dual token bucket mechanism with the following configurable parameters:

- CIR
- CBS
- EIR
- EBS

Egate-100 does not support policer for Network to User flows.

Queue Management

The following sections explain how queues are managed.

Priority Queues

Egate-100 supports four queues at the egress E1/T1 ports.

The scheduling method can be configured by the user, per queue, to be strict or WFQ, according to the scheduling method. This allows a combination of strict and WFQ queue management scheme.

Strict. The data flow set to the highest priority is transmitted first. If this data flow stops, all tasks at lower priorities move up by one priority level. For example, the data flow set to the second-highest priority is then transmitted at the highest priority.

WFQ. Allows different scheduling priorities to statistically multiplex data flows with different shares on the service. Each data flow has a separate FIFO queue. A link transmitting at a data rate ***R***, ***N*** non-empty data flows are served simultaneously according to the assigned share ***w***, each at an average rate of $R/(w_1 + w_2 + w_3 + \ldots + w_N)$. If one data flow stops, the remaining data flows each receive a larger share w.

Congestion Control

Each queue employs an early discard mechanism for yellow packets to ensure CIR traffic (green packets). Early discard of yellow packets (EIR), upon crossing a predefined fill level threshold ensures CIR traffic over EIR traffic. Green packets are dropped in the tail drop mechanism.

Quality of Service

Egate-100 supports QoS mapping with up to four strict or WFQ priority queues at the logical port 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 1-10*. ToS byte structure for IP Precedence is shown in *Figure 1-11* and for DSCP in *Figure 1-12*.

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

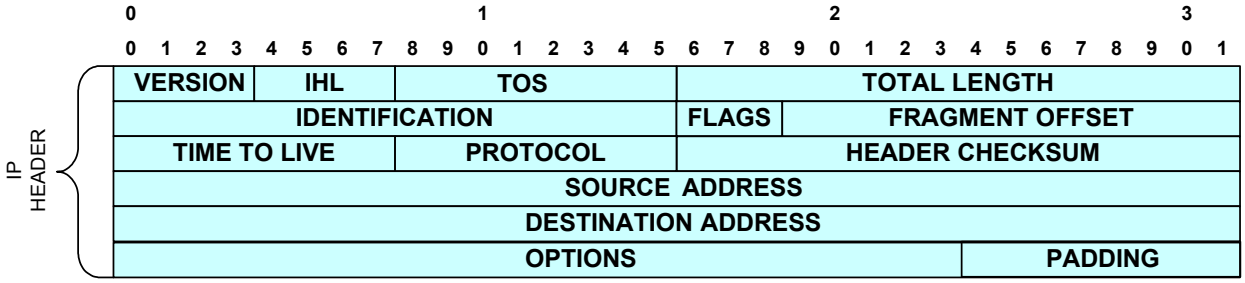


Figure 1-10. IP Header

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 1-11. 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 1-12. 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 1-13 shows the VLAN tag format.

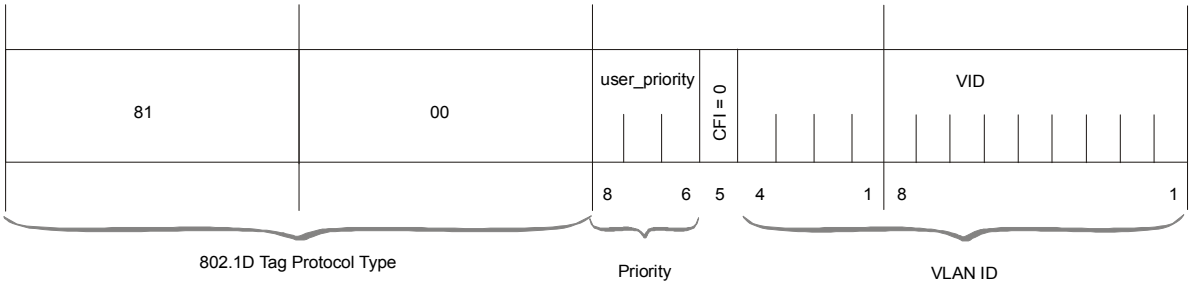


Figure 1-13. VLAN Tag Format (802.1)

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.

Encapsulation

GFP

Egate-100 supports the following two types of GFP:

- GFP single (non-VCAT, non-LCAS)
- GFP (multi) VCAT LCAS

GFP Single

Up to 63/84 E1/T1 remotes over single E1/T1 can be supported using Ethernet over GFP encapsulation. The GFP is as defined in ITU-T G.7041 and ITU-T G.8040 and, for virtual concatenation VCAT header only (as non-LCAS transmitter), in ITU-T G.7043.

GFP VCAT LCAS

Up to 42 E1/T1 remotes over up to 16 E1/T1 links can be supported using Ethernet over GFP VCAT encapsulation as defined in ITU-T G.8040. The links are grouped using VCAT as defined in ITU-T G.7043. The LCAS protocol is supported as defined in ITU-T G.7042.

The important features of these NG-PDH standards are:

- Up to 42 Virtual Concatenation Groups (VCGs) are supported
- LCAS mechanisms that:
  - Ensure that traffic flow recovers quickly from E1/T1 link failures

- Allow on-the-fly addition/deletion of group members.

- Up to 100 ms differential delay.

GFP Technical Overview

TX Traffic Path

In this direction, the ETHERNET packet with the CRC32 is encapsulated into GFP.

The encapsulation can be divided into two main sections: a Core Header and a Payload Area.

The Core Header contains the packet length and a CRC16 result of the length. It is used by the frame-delineation procedure (as explained in the RX path description below) to detect the boundaries of the frame. The Core Header is scrambled by xoring the 32 bits (length and CRC16) with the 32 bits B6AB31E0. The scrambling of the GFP Core Header improves the robustness of the frame-delineation procedure, and provides a sufficient number of 0-1 and 1-0 transitions during idle transmission periods.

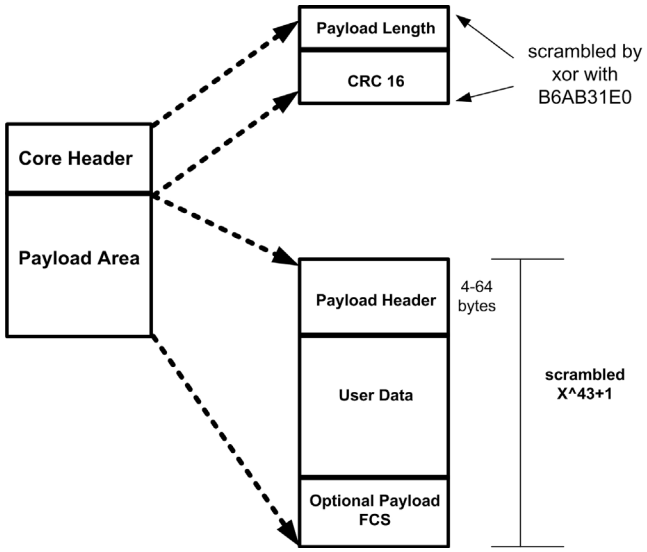


Figure 1-14. GFP Encapsulation

The Payload Area is divided into three subsections: the Payload header, the User data (Ethernet packet), and an optional FCS (CRC 32) that is calculated on all payload information filed. For encapsulation of Ethernet frames, this CRC appears to be unnecessary. The PFCS addition is user configurable.

All octets in the GFP Payload Area are scrambled using a 1 + x^43 scrambler; this scrambler is always activated.

The Payload Area contains between 4 and 64 bytes, according to the following:

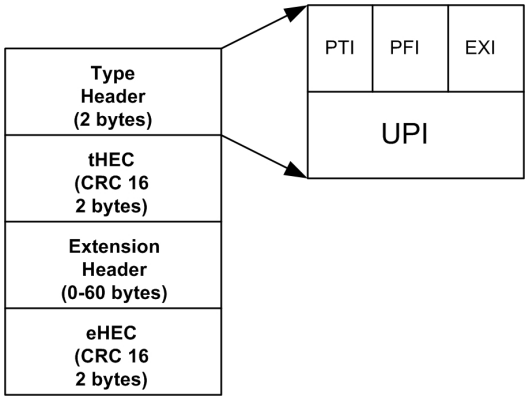


Figure 1-15. GFP Encapsulation – Payload Area

- PTI – Payload Type Identifier – indicates the content of the GFP frame: user frame or management frame (Egate-100 does not generate management frames in the Tx direction)
- PFI – indicates whether the packet includes PFCS
- EXI – indicates the type of extension header encapsulated in the frame. Egate-100 supports transmission of a Null extension header (i.e., no extension header is added)
- UPI - indicates the type of user data encapsulated in the GFP format.

Egate-100 transmits an Ethernet-over-GFP payload identifier when the GFP frames are user frames. When there is no user packet to be transmitted over GFP, Egate-100 generates idle packets.

Idle packets - The GFP Idle frame is a special four-octet GFP control frame consisting of only a GFP Core Header with the PLI and cHEC fields set to 0. These frames are generated by the transmitter in order to keep the frame-delineation mechanism in the far-end receiver in a sync state.

The GFP signal is mapped into TDM according to the following. The procedure of mapping the GFP packets over the PDH signals is described in the G.8040 standard.

- The PDH signal works in multiframe mode: CRC-4 multiframe mode for E1 (31 timeslots) and ESF framing mode for T1 (24 timeslots) are supported
- The first timeslot in each multiframe is used for transferring the VCAT header information
- In all other timeslots there is user data after the encapsulation of GFP according to G.7041 (as described above).

The VCAT header information is the LCAS CONTROL packet, as described in the G.7043 standard. One control packet is transmitted in a period of 16 multiframes.

Egate-100 can work as a non-LCAS transmitter if all the fields such as MST, RSACK, SQ, GID, CONTROL & CRC & MFI2 MSB are set to zero. The MFI 1 parameter is incremented in a round-robin manner.

RX Traffic Path

The traffic received from TDM ports is assumed by Egate-100 to be traffic arriving from a non-LCAS GFP transmitter. Egate-100 hence treats the data according to the following:

- **VCAT header extraction:** The VCAT header is extracted from the first timeslot of each multiframe.
- **Frame Delineation:** The frame border is recognized by synchronization on the core header which contains the frame length & CRC16 on the length. The GFP LINK is kept in sync state if the cHEC is correct per frame. To ensure that the GFP LINK is always synchronized, the transmitter in Egate-100 generates idle frames, with the Delta parameter equal to 2.
- **Single-bit error correction:** The GFP receiver has the ability to correct a single-bit error in Thec or Chec or Ehec. This function is always active. The single-bit error correction on Chec is not active when the GFP signal is in Presync or hunt state.

The data is also descrambled (during sync state) before the packets are transferred to the bridge.

Payload FCS / CRC 32 of Ethernet packet check: The GFP receiver checks that the payload FCS (if enabled) or the CRC32 of Ethernet is correct. If incorrect, it discards the packet.

GFP over PDH actual bandwidth: GFP mapping over a PDH signal involves the following overhead:

- The PDH signal works in multiframe mode. For E1, TS0 is used for frame synchronization, and for T1, the F bit is used.
- Space is also reserved for a VCAT header every multiframe.

From this it can be determined that the actual PDH rate for GFP frames is as follows:

- For E1 links: (2.048Mbs –64Kbps – 64/16 k) = 1.98Mbs
- For T1 links: (1.544Mbs –8Kbps – 64/24 k) ~1.533Mbs. The overall calculation must also take into account the following overhead for GFP encapsulation:

- Chec_O (Core header encapsulation) – four bytes (always added to the packet)
- Thec_O (Type header encapsulation) – four bytes (always added to the packet)
- Ehec_O (Linear extension header encapsulation) – four bytes (optional; user-configurable)
- P_FCS (Payload FCS -CRC32) – four bytes (optional; user-configurable).

The maximum PPS (packets per second) that can be generated on the PDH is thus determined as follows (where P_SIZE is the packet size, and other parameters are as described above):

- For E1 links: PPS =1.98Mbs/ 8/ (P_SIZE + Chec_O + Thec_O + Ehec_O + P_FCS)

- For T1 links: PPS ~1.533Mbs / 8/ (P_SIZE + Chec_O + Thec_O + Ehec_O + P_FCS).

In Egate-100:

- Ehec_O is 0
- P_FCS is user-configurable.

Statistics

Statistics include:

- Tx underrun
- Transmitted correct frames
- Transmitted correct octets
- Received correct frames
- Received correct octets
- FCS errors (in GFP, RX_CRC32_ERROR).

In GFP encapsulation Egate-100 supports the following additional statistics:

- Link State (In sync / Out of sync)
- Rx GFP data Not Valid
- Rx Single Bit Corrected
- Rx_Thec_Multi_Error
- Rx_Ehec_Multi_Error.

HDLC

Up to 126 E1/T1 remotes over unframed or fractional E1/T1 can be supported using Ethernet over HDLC encapsulation.

Synchronous HDLC protocol is a bit-oriented protocol, where data is transmitted in frames. Each frame starts and ends with a flag (7E hex). All frames contain a 16-bit CRC field. Zero-bit insertion is used, to allow the contents of the frame to be transparent. Zero-bit insertion means that a binary 0 is inserted after a succession of five 1s within a frame (i.e., between flags).

Frame boundaries are defined by flags and all frames are transmitted with a 16-bit CRC.

The 32-bit LAN CRC is not transmitted over the E1/T1. No PPP or other headers are added to the Ethernet frame with this encapsulation.

PPP/BCP

Up to 126 E1/T1 remotes over unframed or fractional E1/T1 can be supported using Ethernet over PPP/BCP encapsulation, with an HDLC CRC of 16 bits. The LAN FCS is stripped and not transmitted over the link.

The supported PPP/BCP protocols are:

- LCP (Line Control Protocol) as per RFC 1661

  - User-configurable protocol field compression
  - User-configurable address and control field compression
  - Echo request and answer support
  - Max MRU of 1543 bytes (corresponds to 1536-byte frames)
  - Not supported: Authentication
- NCP of type BCP, as per RFC 3518, with MACs support according to 802.3.

LCP/BCP status alarms can be included, as per user configuration.

Multilink PPP

Egate-100 allows the establishment of Ethernet service with bandwidths over the E1/T1 rate by binding up to eight E1 links or up to eight T1 links into one logical link, using MLPPP. A logical port associated with these E1/T1 links can represent (n × 2Mb)/(n × 1.5Mb) of Ethernet traffic where **n** is the number of links.

MLPPP features include:

- Support of up to 42 MLPPP bundles for E1/T1
- Support of up to eight E1/T1 channels by each bundle
- Unframed or fractional E1/T1 with 31/24 timeslots assigned
- Recovery mechanism upon E1 or T1 link failure: shift from n x E1/T1 to (n-1) x E1/T1
- Worst case of 16 msec-delay compensation buffer for 64-byte frames. For larger frames the delay compensation grows linearly: for example, 128-byte frames with a delay compensation of 32 msec
- Support of packet fragmentation.

The supported MLPPP protocols are:

- LCP (Line Control Protocol) as per RFC 1661
  - Echo request and answer support
  - Max MRU of 1543 bytes (corresponds to 1536-byte frames)
- MLPPP as per RFC 1990
- MLPPP extension to LCP as per RFC 1990: supports 24-bit sequence number
- BCP (Bridge Control Protocol) per RFC 3518
- Loop Detection on the LCP level.

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 Egate-100 as their timing source.

With SDH/SONET interface, system clock options are:

- SDH/SONET Rx
- Internal clock.

With DS3 interface, the system clock options are:

- One of the DS3 Rxs
- Internal clock.

Buffer Management

Egate-100 has a total of 2500 frame buffers. The frames in each buffer are limited in size by the 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 functionality 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 × Packet-threshold › 2500) allowing 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 Gigabit Ethernet buffer threshold. Proper design of the setting ensures that there is no buffer starvation for the Gigabit Ethernet interface regardless of E1/T1 buffer state:
E1/T1-threshold + Gigabit Ethernet threshold = 2500.

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 the ConfiguRAD Web-based application. The RADview Lite application is also supported.

Inband Management

Egate-100 supports inband management via Telnet, Web, and RADView Lite. Configuration, monitoring, and statistics are available.

Out-of-Band Management

Egate-100 allows full configuration and diagnostics via ASCII terminal or Fast Ethernet management port. The ASCII terminal is connected to the control port on the Egate-100 front panel.

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

Note *For out-of-band management, the second Gigabit Ethernet port can be used to connect to the management network. If you use the second Gigabit Ethernet port for management, it is recommended to operate the port at 100Mbps to minimize the impact of management traffic bursts on Gigabit Ethernet user traffic.*

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 and the Telnet or Web session is closed.

Egate-100 supports the following access authorization levels and mechanisms:

- Superuser mode for configuration and monitoring
- User mode for monitoring and configuration view only
- Radius support for password authentication and management.

Egate-100 also supports secured Telnet and Web access using SSL/SSH. The security level is user-configurable:

- Access enabled
- Secured access (SSL/SSH only)
- Managers only (access allowed only for stations on the Manager List)
- Access disabled (no access to Telnet or Web).

Management Access

Egate-100 architecture allows access from the Gigabit Ethernet network port to the Egate-100 host and remote site devices. In VLAN-aware mode, separation of management traffic from user traffic can be achieved by use of different VLANs.

In the scenario illustrated by *Figure 1-16*, traffic coming from the remote CPE uses separate VLANs for user and management traffic. Each remote uses two VLANS, one for user traffic, for which the CPE can use tag stacking, and the other for management traffic. All CPEs connected to Egate-100 share the same management VLAN.

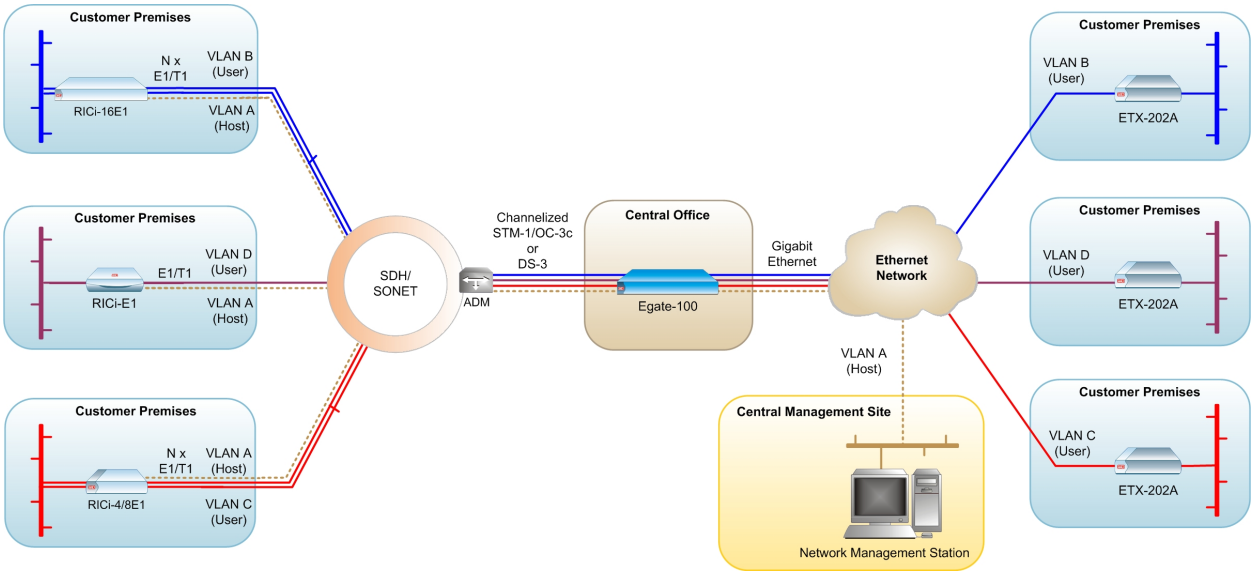


Figure 1-16. Management Traffic in a VLAN-Aware Application

Loop Detection

Egate-100 functions as a VLAN-aware bridge (L2 Ethernet switch) with PDH links (E1/T1s) as the bridge ports.

E1/T1 loops are quite common in PDH networks (for diagnostic purposes, among others). These can in turn produce Ethernet loops, resulting in Ethernet network problems. Egate-100 features mechanisms to detect E1/T1 loops and avoid Ethernet loops by disabling the bridge port. When the loop is released, Egate-100 automatically recovers.

The loop detection uses the following mechanisms according to the encapsulation mode:

- For GFP VCAT mode, loop detection is performed on each channel using the VCAT mechanism to detect a loop on the channel. In this mode, loops can also be detected on the logical layer.
- Hardware loops can be detected on units that support single GFP and VCAT. This mechanism requires units of Version 01-C or higher.
- For PPP and MLPPP modes, the PPP LCP mechanism is used for loop detection.
- For other modes, the loop detection mechanism is based on the transmission of periodic Ethernet frames over the link. If the frames are detected back at the sending port, a loop is declared.

The loop detection frames are frames with SA=DA of the originating Egate-100 device, so they do not propagate in the network beyond the opposite Ethernet/PDH bridge port (RICi-E1/T1 or other).

The loop detection frames are tagged with a VLAN ID that is predefined by the user; This VLAN ID should not be used for a user traffic VLAN.

Loop detection frames are sent every five seconds. If a loop detection frame is received back at the sending port, a loop is declared and transmission at the

bridge port is shut down. Egate-100 continues to send loop detection frames, and detects the end of the loop after three consecutive loop detection frames do not return, upon which transmission resumes at the bridge port.

Diagnostics

Several types of diagnostics and troubleshooting procedures are available:

- Ping test and self-test
- E1/T1 PRBS tests for E1/T1
- Events/traps.

Alarms and traps can be masked by user configuration.

For more information, refer to *Chapter 5*.

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

Statistics Collection

Egate-100 provides the following diagnostic information:

- Statistics for physical ports, logical ports, bridge ports, flows and RADIUS
- Active alarms and a log file at STM-1/OC-3, channelized T3, Gigabit Ethernet, and system levels.

For more information about monitoring statistics, see *Chapter 5*.

Configuration Reset

When required, the Egate-100 configuration parameters can be reset to their default values. In addition to resetting to the factory-set values, Egate-100 allows you to save the current settings as the device default settings, replacing the original factory default settings. It is then possible to return to the saved settings when using the Reset to Factory Defaults option from the configuration menu.

When required, the saved settings can be erased completely, restored the default settings to the original factory default values.

1.4 Technical Specifications

Gigabit Ethernet Interface	*Number of Ports*	2
	Compliance	IEEE 802.3u, 802.3x, 802.1p, and 802.3q
	Data Rate	1000 Mbps
	Frame Size	Regular (64 to 1600 bytes)
	Duplex Mode	Full duplex
	Max Frame Size	1600 bytes
	Interface Connector	10/100/1000BaseT – Electrical interface, RJ-45 Connector 1000BaseSx – Optical interface (SFP), LC Connector 1000BaseLx – Optical interface (SFP), LC Connector
	Range	10/100/1000BaseT – 100 meters/328 feet over UTP Cat. 5 cable 1000BaseSx – 220m/720 ft over 62.5 µm multimode fiber or 500m/1640 ft over 50 µm multimode fiber 1000BaseLx – 10 km/6.2 miles over 9 µm single mode fiber
	Wavelength	1000BaseSx – 850 nm 1000BaseLx – 1310 nm
	Optical input range	Single mode: -8 to -20 dBm Multimode: 0 to -17 dBm
	Optical output power	Single mode: -3 to -9.5 dBm Multimode: 0 to -9.5 dBm
	Electrical Cable Type	Category 5 UTP/STP. For cables longer than 30 meters (98 feet), it is recommended to use shielded cables.
STM-1/OC-3 Interface	*Number of Ports*	2
	APS	Unidirectional 1+1 Optimized bidirectional (compliant with G.841 Annex B)

STM-1/OC-3 Interface (cont.)	*Compliance*	G.957 S1.1, G.957 L1.1, ANSI T1.646, G. 825 (jitter), G.841 (APS)
	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	Single mode long haul: 40 km (25 miles) Single mode short haul: 15 km (9.3 miles) Multimode: 2 km (1.2 miles)
	Wavelength	1310 nm
	Optical input range	Single mode long haul: -10 to -34 dBm Single mode short haul: -8 to -28 dBm Multimode: -14 to -30 dBm
	Optical output power	Single mode long haul: 0 to -5 dBm Single mode short haul: -8 to -15 dBm Multimode: -14 to -20 dBm
Channelized T3 Interface	*Number of Ports*	3 (according to ordering option)
	Connector	BNC, 75 ohm
	Compliance	T1.107, GR-499-CORE
	Data Rate	44,736 Mbps
	Range	100 meters (328 feet)
	Mapping	28 T1s mapped over T3 via M13
	Framing	M23 or C-Bit parity
Internal Bridge	*Number of Ports*	Up to 130 including: • Gigabit Ethernet (2) • Ethernet management port • Local host • ETH o E1/T1s o STM-1/OC-3 (up to 126) or ETH o T1s o T3

Internal Bridge (cont.)	*LAN Table*	Up to 64,000 MAC addresses (learned, automatic aging check)
	Operation Mode	VLAN-aware, VLAN-unaware
	Buffer	2500 frames
	Filtering and Forwarding	Up to 253,000 pps (full CH-STM-1 capacity)
Quality of Service	*Classification*	802.1p, DSCP, and IP precedence
	Congestion Management	Four strict priority queues
Protocols	*Types*	HDLC, PPP, MLPPP, GFP (with and without VCAT LCAS)
ETH over GFP Single	*Encapsulation*	ETH over GFP single (non-VCAT, non-LCAS)
	Compliance	G.7041, G.8040 and, for concatenation header only (as non-LCAS transmitter), ITU-T G.7043
ETH over GFP VCAT LCAS	*Encapsulation*	ETH over GFP VCAT LCAS (multi)
	Compliance	G.7041, G.8040, G.7042, G.7043
ETH over MLPPP	*Encapsulation*	ETH o PPP o MLPPP o HDLC o (n x E1/T1)
	Control Protocols	LCP, BCP
	Delay Compensation	Up to 16 ms delay compensation
	Max Transmit Unit	64 to 1540 bytes
	Compliance	RFC 1661 – PPP protocol RFC 1662 – PPP in HDLC-like framing RFC 3518 – PPP BCP (bridging-control protocol) RFC 1990 – PPP multilink protocol
ETH over PPP	*Encapsulation*	ETH over PPP over HDLC over E1/T1
	Control Protocols	LCP, BCP
	Compliance	RFC 1661 – PPP protocol RFC 1662 – PPP in HDLC-like framing RFC 3518 – PPP BCP (bridging-control protocol)

ETH over HDLC	*Encapsulation*	ETH over HDLC over E1/T1: RAD-proprietary protocols
	Remote Devices	Up to 126 devices
Standard Compliance	*MEF*	MEF 9 EPL
10/100BaseT Management Port	*Compliance*	IEEE 802.3
	Operation	Full duplex, autonegotiation
Control Port	*Interface*	RS-232/V.24 (DCE asynchronous)
	Data Rate	9.6, 19.2, 38.4, 57.6, 115.2 kbps (user-configurable)
	Connector	9-pin, D-type, female (DB-9)
Monitoring	*Statistics*	System and physical layer alarms
		ETH over E1 frame counters
		Gigabit Ethernet physical layer alarms and frame counters
Indicators	*POWER (green/red) (LED on PS module)*	Green: Power supply is functioning properly Red: Power supply is faulty or not connected to electrical output.
	ALM (red)	On: Alarm exists for interface (GbE, SDH/SONET / T3) or system
		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*	100–240 VAC (±10%), 50/60 Hz
	DC Source	48/60 VDC nominal (40–72 VDC)
	Power Consumption	40W max

Physical	*Height*	43.7 mm (1.7 in)
	Width	440 mm (17.3 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 describes installation and setup procedures for the Egate-100 unit.

After installing the unit, refer to *Chapter 3* for operating instructions.

If a problem is encountered, refer to *Chapter 5* for test and diagnostic instructions.

Egate-100 ships completely assembled. It is designed for installation as a desktop unit or mounted in a 19-inch rack. For rack installation instructions, refer to the documentation that comes with the RM kit.

Warning

Internal settings, adjustment, maintenance, or repairs must be performed only by a skilled technician who is aware of the hazards involved.

Always observe standard safety precautions during installation, operation, and maintenance of this product.

Warning

For your protection and to prevent possible damage if a fault condition such as a lightning strike or contact with high voltage power lines occurs on the cables connected to the equipment, Egate-100 must be properly grounded at all times. Any interruption of the protective (grounding) connection inside or outside the equipment, or disconnection of the protective ground terminal, can make this equipment dangerous. Intentional interruption is prohibited.

2.1 Site Requirements and Prerequisites

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 50/60 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.

Note *See also the sections describing connections of AC and DC mains at the beginning of this manual.*

2.2 Package Contents

The Egate-100 package contains:

- Egate-100 unit
- SFP modules (if ordered)
- AC power cord (for AC option)
- DC connection kit (for DC option)
- CBL-DB9F-DB9M-STR straight cable for ASCII terminal connection (if ordered)
- RM-34 (if ordered) for mounting one Egate-100 unit in a 19-inch rack
- WM-34 (if ordered) for mounting one Egate-100 unit on the wall.

2.3 Required Equipment

Egate-100 requires no special tools for installation. You need a screwdriver to mount Egate-100 in a 19-inch rack. You need a screwdriver and drill to mount Egate-100 on the wall.

Removing/installing the hot-swappable AC/DC units requires a flathead screwdriver.

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

Refer to *Table* 2-1 to determine which cables and connectors are required for installation.

Table 2-1. Required Connectors

Interface	Cable/Connector
Control port	Straight RS-232/V.24 cable with DB-9 male connector for ASCII terminal
Fast Ethernet management port	RJ-45, 8-pin connector
SDH/SONET interfaces	LC (SFP) fiber optic connector
Channelized T3 interface	BNC connector
Gigabit Ethernet interfaces	Electrical: RJ-45, 8-pin connector Optical: LC (SFP) fiber optic connector

2.4 Mounting the Unit

Egate-100 is designed for installation as a desktop unit or mounted in a rack.

- For rack-mounting instructions, refer to the installation kit manual.
- If Egate-100 is to be used as a desktop unit, place and secure the unit on a stable, non-movable surface.

Refer to the clearance and temperature requirements in *Site Requirements and Prerequisites.*

2.5 Installing Fiber Optic SFP Modules

Egate-100 uses SFP modules with LC fiber optic connectors that provide hot-swappable industry-standard interfaces.

Warning

Third-party SFP optical transceivers must be agency-approved, complying with the local laser safety regulations for Class 1 laser equipment.

➤ **To install the SFP modules:**

1. Lock the wire latch of each SFP module by lifting it up until it clicks into place, as illustrated in *Figure* 2-1.

Note

Some SFP models have a plastic door instead of a wire latch.

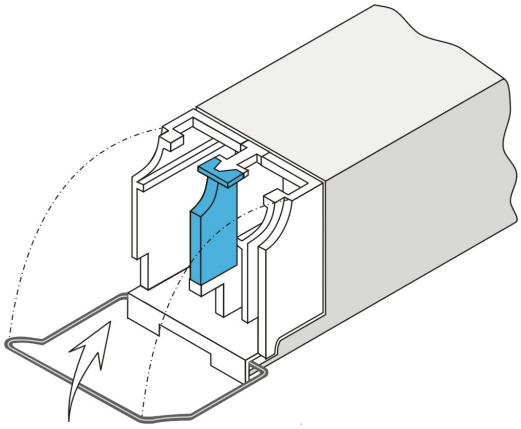


Figure 2-1. Locking the SFP Wire Latch

2. Carefully remove the dust covers from the SFP slot.
3. Insert the rear end of SFP into the socket, and push slowly backwards to mate the connectors until the SFP clicks into place. If you feel resistance before the connectors are fully mated, retract the SFP using the latch wire as a pulling handle, and then repeat the procedure.
4. Remove the protective rubber caps from the SFP modules.

➤ **To remove SFP module:**

1. Disconnect the fiber optic cables from the SFP module.
2. Unlock the wire latch by lowering it downwards (as opposed to locking).
3. Hold the wire latch and pull the SFP module out of the port.

2.6 Connecting to Channelized T3 Equipment

The Egate-100 channelized T3 interface terminates in three pairs of BNC connectors.

➤ **To connect the T3 interface:**

- Connect Egate-100 to the T3 equipment using BNC cables terminated with BNC connectors.

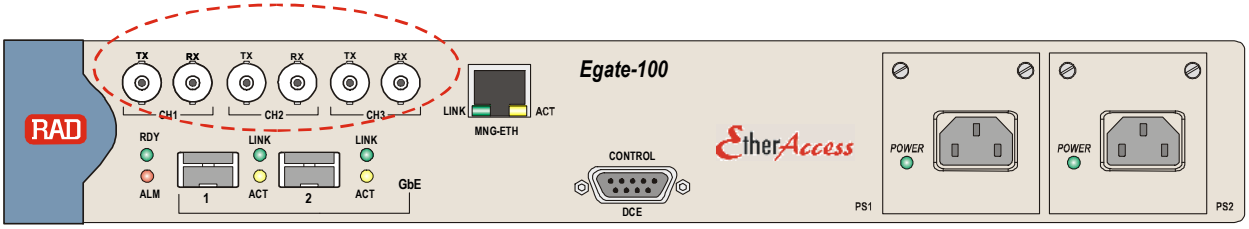


Figure 2-2. T3 BNC Connectors

2.7 Connecting to SDH/SONET Equipment

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

➤ **To connect the SDH/SONET network equipment:**

- Connect Egate-100 to the SDH/SONET network equipment using a standard fiber optic cable terminated with an LC connector. Refer to *Installing Fiber Optic SFP Modules* for details on installing fiber optic SFPs.

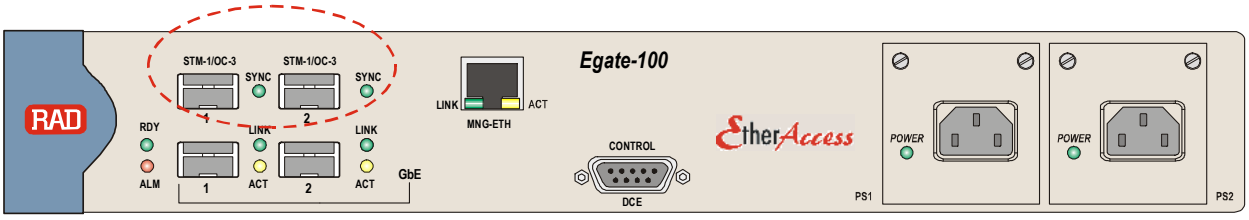


Figure 2-3. SDH/SONET SFP Connectors

2.8 Connecting to Gigabit Ethernet Equipment

The Egate-100 GbE interface terminates in 8-pin RJ-45 (electrical) or LC (optical) connectors.

➤ **To connect to the Gigabit Ethernet equipment with fiber optic SFP:**

- Connect Egate-100 to the Gigabit Ethernet network equipment using a standard fiber optic cable terminated with an LC connector. Refer to *Installing Fiber Optic SFP Modules* for details on installing fiber optic SFPs.

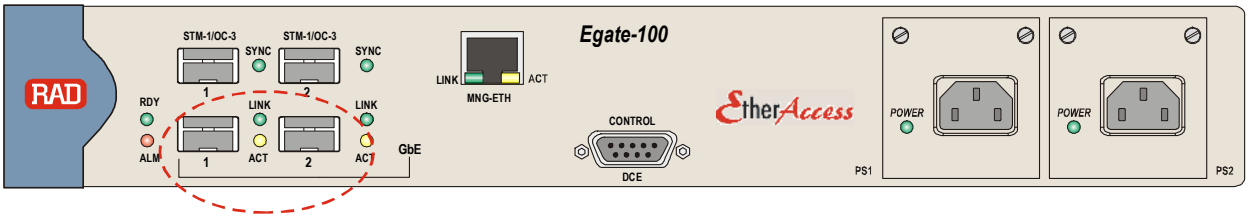


Figure 2-4: Gigabit Ethernet SFP Connectors

➤ **To connect to the Gigabit Ethernet equipment with a copper interface:**

- Connect Egate-100 to the Gigabit Ethernet network equipment using a standard straight UTP/STP cable terminated with an RJ-45 connector.

Note *When connecting Gigabit Ethernet cables longer than 30 meters (98 feet), it is recommended to use shielded cables.*

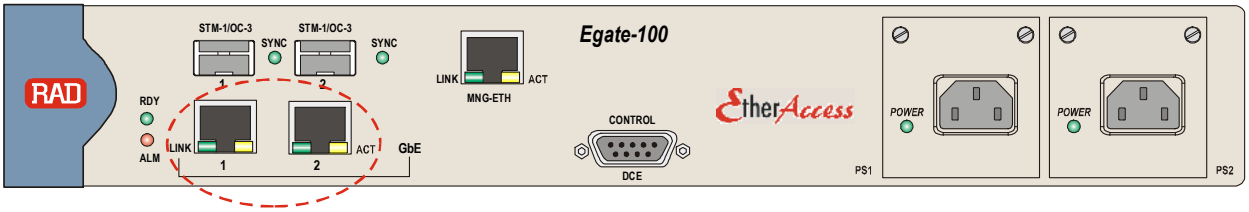


Figure 2-5: Gigabit Ethernet 10/100/1000BaseT Electrical Connectors

2.9 Connecting to Management Stations

Egate-100 can be connected to a local ASCII terminal via the CONTROL port or to a remote network management station via dedicated Ethernet management port.

Connecting to the Terminal

Egate-100 is connected to an ASCII terminal via a 9-pin D-type female connector designated CONTROL. Refer to *Appendix A* for the connector pinout.

➤ **To connect to the terminal:**

1. Connect the male 9-pin D-type connector of CBL-DB9F-DB9M-STR straight cable available from RAD to the CONTROL connector.

2. Connect the other connector of the CBL-DB9F-DB9M-STR cable to an ASCII terminal.

Caution Terminal cables must have a frame ground connection. Use ungrounded cables when connecting a supervisory terminal to a DC-powered unit with floating ground. Using improper terminal cable may result in damage to supervisory terminal port.

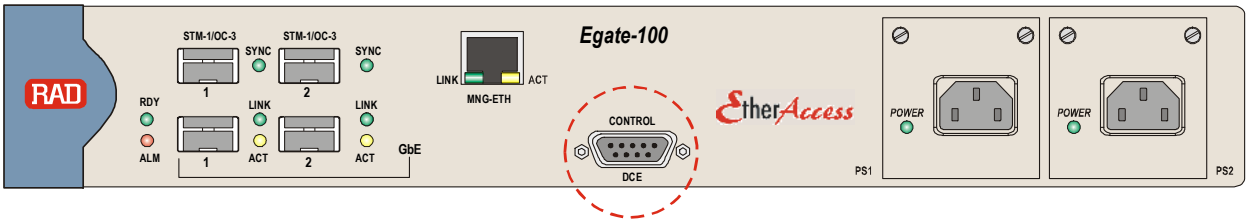


Figure 2-6: CONTROL Connector

Connecting to the Network Management Station

Egate-100 is connected to an NMS via an 8-pin RJ-45 connector designated MNG ETH. Refer to *Appendix A* for the connector pinout.

➤ **To connect to an NMS:**

- Connect Egate-100 to a hub or switch using a straight cable

  or

- Connect Egate-100 to a network interface card using a cross cable.

Note *When connecting Fast Ethernet cables longer than 30 meters (98 feet), it is recommended to use shielded cables.*

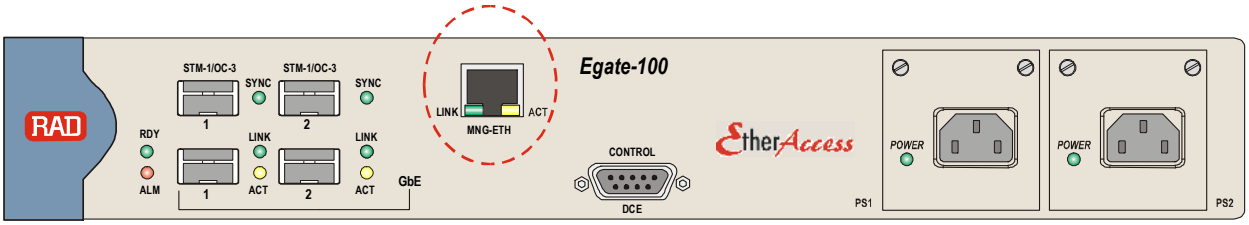


Figure 2-7: Fast Ethernet Management Connector

2.10 Connecting to Power

Egate-100 can be ordered with either AC power or DC power (single or dual power supply).

Connecting to AC Power

AC power is supplied to Egate-100 via a standard 3-prong plug.

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 connecting or disconnecting any communication cable, the unit must be grounded by connecting its power cord to a power outlet with a ground terminal, and by connecting the ground terminal on the panel (if provided) to a protective ground.

Interrupting the protective (ground) conductor inside or outside the unit, or disconnecting the protective ground terminal may render 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. Verify that the AC outlet is grounded properly. Ensure that the supply voltage is in the range 100 VAC to 240 VAC
2. Connect the power cable to a power connector on the Egate-100 front panel.
3. Connect the power cable to the mains.

   The unit turns on automatically.

Connecting to DC Power

➤ **To connect DC power:**

- Refer to the DC power supply connection supplement, located on the Technical Documentation CD or at the end of this manual. Also, refer to the safety instructions at the beginning of this document.

Replacing AC/DC Hot-Swappable Power Supply Unit

Egate-100 can contain one or two hot-swappable power-supply units (AC or DC) that are located in two slots, PS1 and PS2, on the front panel. The following instructions describe the installation or replacement of either of the units.

Caution

DO NOT install AC and DC power supplies together in the same unit.

➤ **To replace a power supply unit:**

1. Disconnect the power supply unit from the mains.

The green power indicator(s) on the power supply turns off.

2. Disconnect power cables as follows:
   - AC power supply: Disconnect the power cable.
   - DC power supply: Remove the cable screws connected to the hex nuts on the PS panel.
3. Using a flathead screwdriver, loosen the two tightening screws that secure the unit to the chassis.
4. Carefully pull and remove the power supply from the chassis.
5. Slide the new power supply into its slot until the unit is firmly in place.
6. Secure the new power supply unit with the two tightening screws as follows:
   - DC power supply: Lock the DC connector by inserting the two locking-cable screws into the hex nuts on the power supply panel.
   - AC power supply: Connect the power cable connector to the power supply.

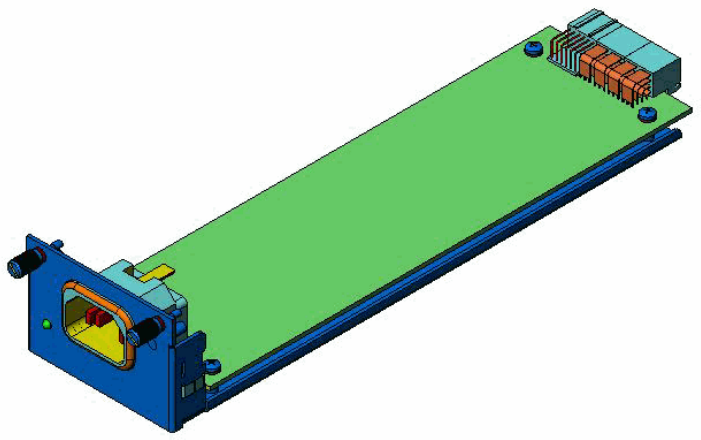


Figure 2-8. AC Power Supply Unit

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 On the Unit

➤ To turn on the unit:

- AC power: Connect the unit to AC mains using a RAD-supplied power cable.
- DC power: 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 Indicators

The unit's LEDs are located on the front panel as illustrated in *Figure 3-1*. *Table 3-1* lists the functions of the LED indicators.

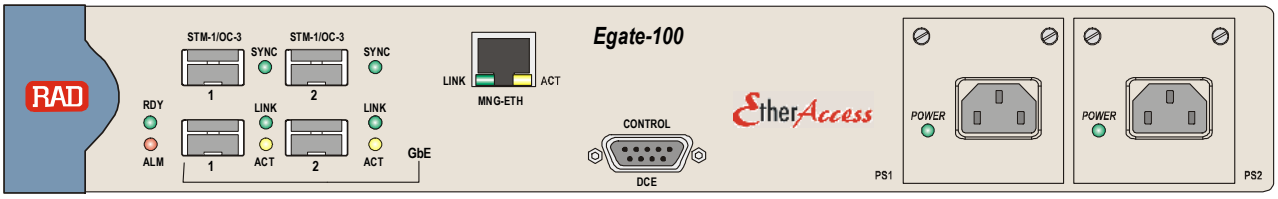


Figure 3-1. Egate-100 Front Panel (Dual Power Supply Version)

Table 3-1. Egate-100 LED Indicators

Name	Color	Function
POWER	Green/Red	**Green**: Power supply performing properly **Red**: Power supply error or disconnected
RDY	Green	**On**: Self test completed successfully **Blinking**: Self test failed
ALM	Red	**On**: Interface or system alarm activated **Off**: No Alarm
LINK (GbE)	Green	**On**: Ethernet connection is up **Off**: Ethernet connection is down
ACT (GbE)	Yellow	**Blinking**: Ethernet frame was received or sent within the last second
SYNC 1	Green	STM-1/OC-3 version: **On**: STM-1 port is synchronized **Off**: LOS, LOF
SYNC 2		DS-3 version: **On**: T3 port is synchronized **Off**: LOS

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	EGATE-100
	Location	The Location of this Device
	Contact Person	Name of Contact Person
	IP address	0.0.0.0
	IP mask	0.0.0.0
	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

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
	Rx Clock port number (T3 option)	1
	Syslog Logging Status	Disable
SDH/SONET Port	Admin Status	Up
	Alarm	Unmasked
	Frame type	SDH
	Tx clock	Loopback Timing
	SOH Alarms	Unmasked
	HVC Alarms	Unmasked
	LVC Alarms	Unmasked
	APS Protection	No
	APS Mode	1+1 optimized bidirectional
	APS Working Port	1
	APS Wait to Restore	300
	APS Command	No Command
	APS Flip upon SD	No
	Mapping	Enabled
	E1/T1 Frame Type	Unframed
	E1/T1 Idle Code	7F
	E1/T1 Alarms	Unmasked
Channelized-T3 Port	Admin Status	Up
	Transmit source clock	Internal
	Frame Type	M23
	Line Length	Short
	Alarms	Unmasked
GbE Port	Alarms	Unmasked
	Autonegotiation	Enabled
	GbE Aggregation	Disabled

Component	Parameter	Default Value
Logical Ports	Port Name	Logical Port *[port-number]*
	Type	HDLC
	Alarms	Unmasked
Bridge	VLAN-Mode	VLAN-Unaware
	Aging Time	300
	Split Horizon	Disable
	Loop Detection	Disable
	VLAN Loop Detection	1
	Ethertype	8100
	Remote Terminal	Disable
Bridge Ports	Admin Status	Up
	Ingress Filtering	Disable
	Accept Frame Type	All
	Port VID	2
	Default Priority Tag	0
	Replace Priority	No
	Copy Origin Priority	No
	Egress Tag Handling	None
	Ingress Tag Handling	None
	Maximum Learning MAC Address	64000
	Loop Detection	Enable
	Link OAM (802.3ah)	Disable

3.4 Configuration and Management Alternatives

You can manage and configure Egate-100 using out-of band management or inband management interfaces. Refer to the respective section for further information and instructions:

- *Working with Terminal*
- *Working with the Web-Based Management Application*

Working with Terminal

You can connect an ASCII terminal directly to the Egate-100 control port.

Any standard ASCII terminal, dumb terminal, or a PC running a terminal emulation application equipped with a V.24/RS-232 communication interface can be used to set up and configure Egate-100.

➤ **To connect Egate-100 to a control terminal:**

1. Make sure that all Egate-100 cables and connectors are properly connected.
2. Connect Egate-100 to a PC equipped with an ASCII terminal emulation application such as HyperTerminal or Procomm.
3. Connect an ASCII terminal to the CONTROL port on the front panel. The default settings are as follows:
   - **Baud Rate**: 115,200 bps
   - **Data Bits**: 8
   - **Parity**: None
   - **Stop Bits**: 1
   - **Flow Control**: None.
4. To optimize the view of the system menus, do the following:
   - Set the terminal emulator to **VT100**.
   - If you are using HyperTerminal, set the terminal mode to 132-column mode.
5. Power up Egate-100.

   When the unit has initialized and completed the self-test, a menu appears displaying initialization and self-test results. When the self test has been successfully completed, the RDY LED on the front panel turns green.

To access the main menu, you have to log in first.

Logging In

➤ **To log in:**

1. While connected to the terminal, click <**ESC**> to access the login screen.

   The following login screen appears:

```
User name      su
Password       >1234
```

Figure 3-2. Terminal Login Screen

2. Enter your user name (**su**, **tech** or **user**) and your password when prompted. The factory-set password for all users is **1234**.

ASCII Screen Format

```
                              Egate-100
Sample Menu> Screen Path

1. Number              ... (1)
2. List of numbers     ... (1,3,5-7,9)
3. String              ... (String)
4. Selectable          >   (Selectable Value)
5. Submenu             >
6. Command

Prompt>
Please select item <1 to 6>
Hot Keys
Esc-previous menu; !-main Menu; &-exit
------------------------------------------------------------------
Scroll Message
```

Figure 3-3. Typical Sample Screen

Parameters that appear in menu screens are described in tables following the screen images. A typical table contains the following three columns:

- **Parameter** – specifies the parameters appearing on the screen, including submenus, where applicable.
- **Description** – describes each parameter's function.
- **Possible Values** – provides all the values possible for the parameter, or a range of values, including the default value, where applicable.

Working with the Web-Based Management Application

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

Requirements for Web-Based Management

- Internet Explorer 6.0 and up, running on Windows™
- Firefox 1.0.4 and up, running on Windows™
- Mozilla 1.4.3 and up, running on Linux.

➤ **Before you start using a Web browser for remote management or monitoring:**

- Enable scripts.
- Configure the firewall that might be installed on your PC to allow access to the destination IP address.
- Disable pop-up blocking software, such as Google Popup Blocker. You may also have to configure spyware and adware protecting software to accept traffic from/to the destination IP address.
- To prevent configuration errors, you must flush the browser's cache whenever you return to the same screen.

Logging In

➤ **To log in from a Web browser:**

1. Connect the Ethernet port to the LAN.
2. Verify that an IP address has been assigned to the relevant unit, using an ASCII terminal.
3. Open the Web browser.
4. Disable any pop-up blocking software, such as Google Popup Blocker.
5. In the address field, type the IP address of Egate-100 and then click ‹**Enter**›.

   The Web opening window appears.
6. Click **LOGIN**.

   You are prompted for user name and the password.
7. Type your user name and password. The default user name for read/write permission is **su** and the default password is **1234**.

   The Web Main menu appears.

Notes

- *It is recommended to change default passwords to prevent unauthorized access to the unit*
- *Egate-100 allows two management sessions to be active simultaneously: one network session (Telnet, Web-Based Management) and one ASCII terminal session.*
- *If no user input is detected for 5 minutes during a Web session, Egate-100 automatically disconnects from the management station.*

Navigating the Web Menus

The Web-based remote access terminal management software provides a user-friendly interface for configuring, collecting statistics and performing diagnostic tests on the Egate-100 units. Menus and available options are identical to the ones available using Telnet or an ASCII terminal.

The auxiliary management tools are at the left-hand bottom corner of the Web Management window:

- **Status**. Shows the number of users currently managing Egate-100
- **Trace**. Opens an additional pane for system messages, progress indicators such as ping, software and configuration file downloads, and alarms. It is recommended to keep the trace pane open at all times.
- **Refresh All**. Refreshes performance registers.

➤ **To choose an option:**

1. Click a link in the Web Management screen to display the next menu.
2. Once the target screen appears, select a value from the dropdown list or type it in a text field.

3.5 Overview of Menu Operations

Once you have logged in, navigate the Egate-100 menus to set and view configuration parameters.

Main Menu Paths

Figure 3-4 below illustrates the Egate-100 main menu. You access all system configuration and control functions from this menu.

The main menu options are:

- **Inventory –** displays information on the functional blocks of the unit
- **Configuration –** defines parameters for the Egate-100 system, physical layer (SDH/SONET, GbE, Ethernet management port), 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, E1/T1 PRBS, and display of self-test results.
- **Utilities** – manages transfer of updates to/from a remote server: upload of software and download/upload of the configuration file.

```
                              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. Main Menu

Principles of Navigation

The main menu categories lead to submenus and items with selectable parameters. These items are listed and explained in *Chapter 4* and *Chapter 5*.

All terminal screens are titled "Egate-100", while the current screen's name and path are underlined as illustrated in *Figure 3-4*.

At any given screen, you may return to the main menu by typing **<!>**.

Hot Keys

Table 3-3 summarizes the functionality of hot keys that are available in the different menu screens.

Table 3-3. Hot Keys

Hot Key	Functionality
P/p	Previous menu page (for long menus that exceed a page). Scrolling up for menu items
N/n	Next menu page (for long menus that exceed a page). Scrolling down for menu items
F/f	Forward (next entry) – stay in same menu with next instance (Port) on axis Y
B/b	Backward (previous entry) – stay in same menu with previous instance (Port) on axis Y
CTRL F/f	Forward (next entry) – stay in same menu with next instance (Interval) on axis X
CTRL B/b	Backward (previous entry) – stay in same menu with previous instance (Interval) on axis X

Hot Key	Functionality
CTRL G/g	Refresh tables such as the MAC Address and the Event log tables.
A,a	Add (new entry) and display its parameters in menu items
R,r	Remove entry that has its parameters displayed in menu items
G, g	Get (entry), Go
←	Skip left (move to the previous cell)
→	Skip right (move to the next cell)
↓	Skip down (move to the down cell)
CTRL R/r	Scroll right
CTRL L/l	Scroll left
CTRL D/d	Scroll down
CTRL U/u	Scroll up
?	Display table help (if available)
TAB	Select next changeable cell (skip read-only cells)
G,g	Select specified cell in table – row_num, col_num
A,a	Add table entry
R,r	Remove table entry
C,c	Clear all table entries
M,m	Display selected table entry as a menu
S,s	Save table session changes
DEL	Clear currently typed string
ESC	Previous menu
!	Go to main menu
&	Exit from the menus; if user presses any key, LOGIN is displayed
@	Spread the messages scrolling area to full screen
$	Display history
#	Display previous command
+	Command filter start
-	Parameter start

Note *Selecting **Save** after each set of actions is essential for saving and applying configuration changes.*

Menu Maps

Use these menu trees as a reference aid while performing configuration and control functions. *Chapter 4* illustrates menus and explains parameters. *Table 3-2* lists default values.

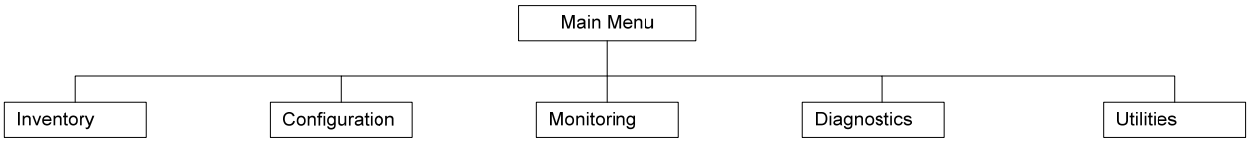


Figure 3-5. Main Menu

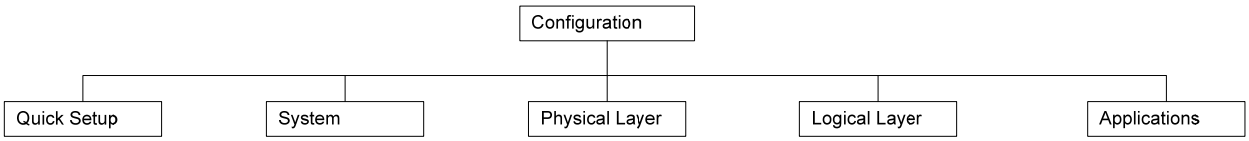


Figure 3-6. Main Menu › Configuration

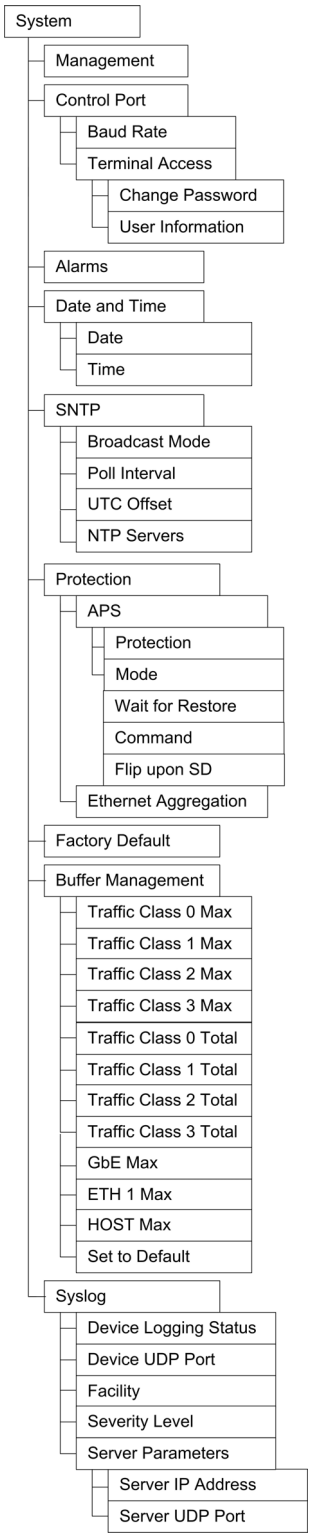


Figure 3-7. Configuration › System

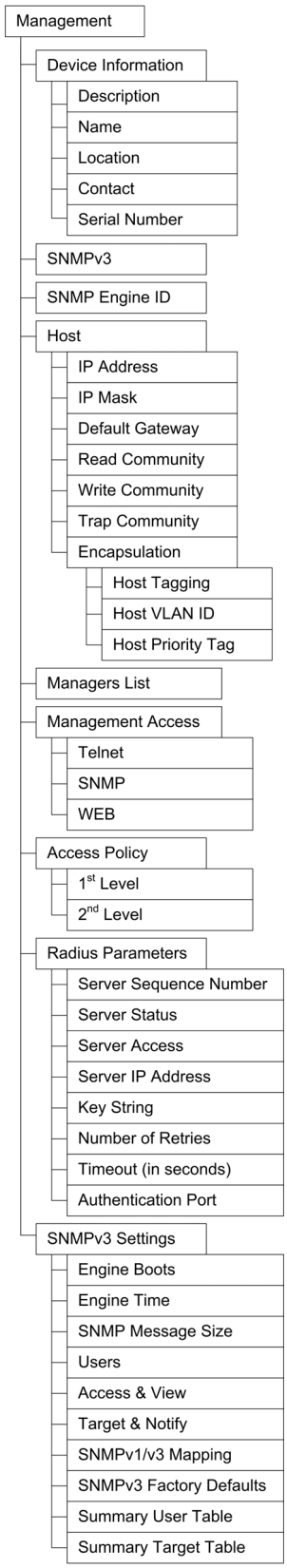


Figure 3-8. Configuration › System › Management

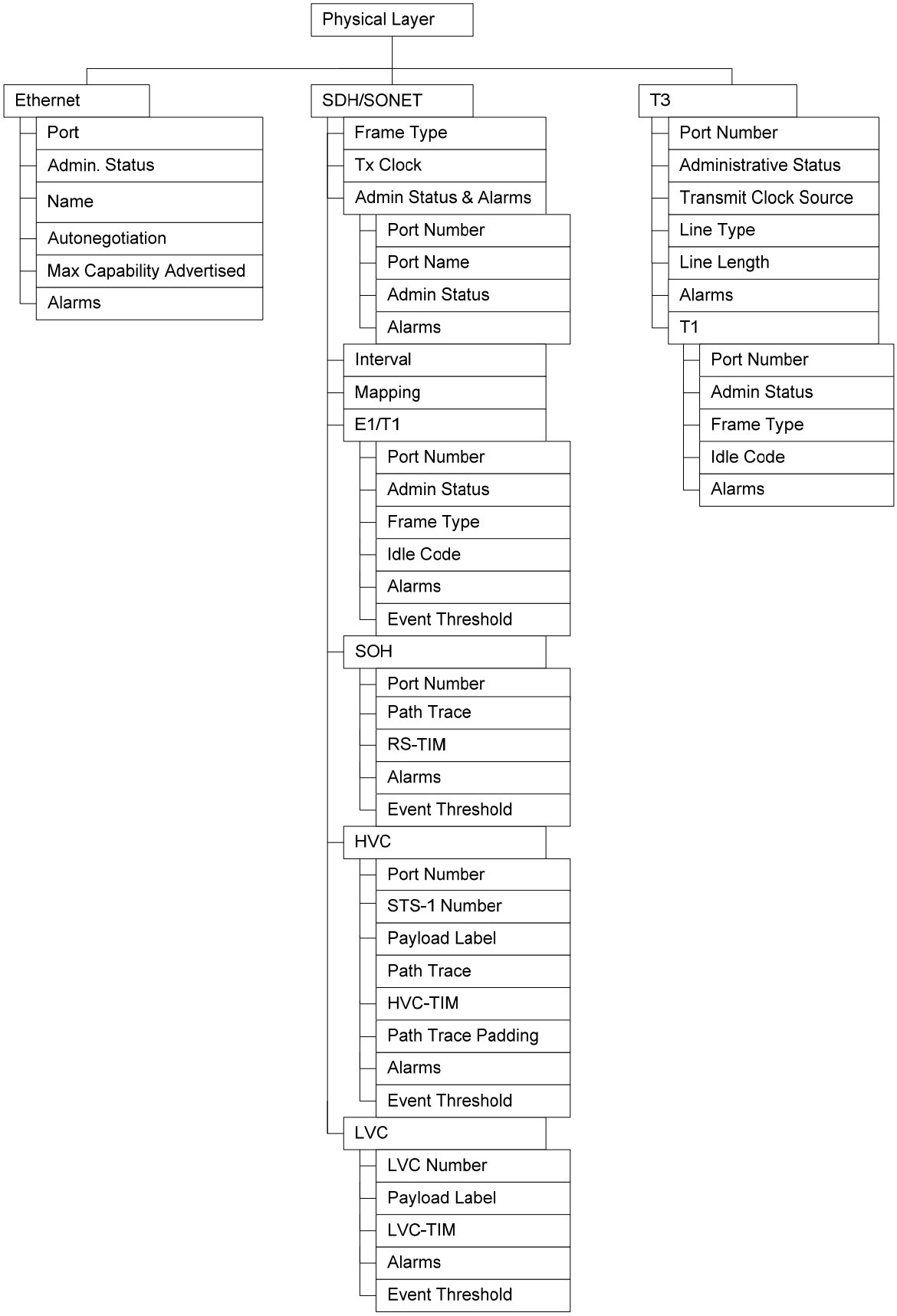


Figure 3-9. Configuration › Physical Layer

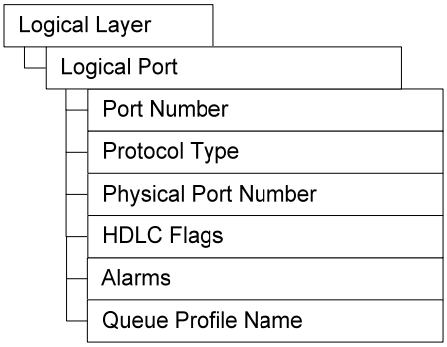


Figure 3-10. Configuration > Logical Layer – HDLC (E1)

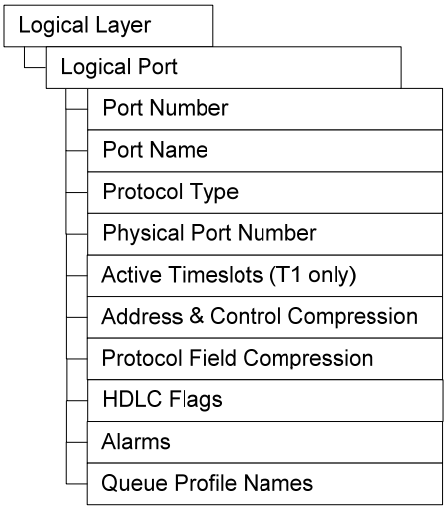


Figure 3-11. Configuration > Logical Layer – PPP over HDLC (E1/T1)

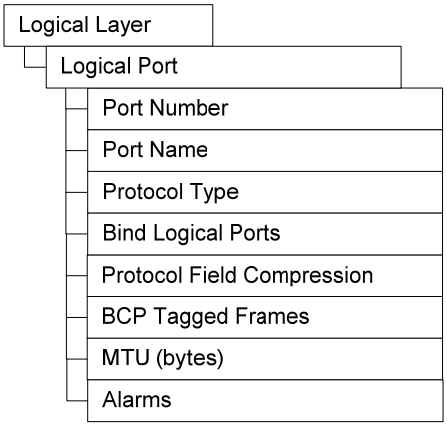


Figure 3-12. Configuration > Logical Layer – MLPPP

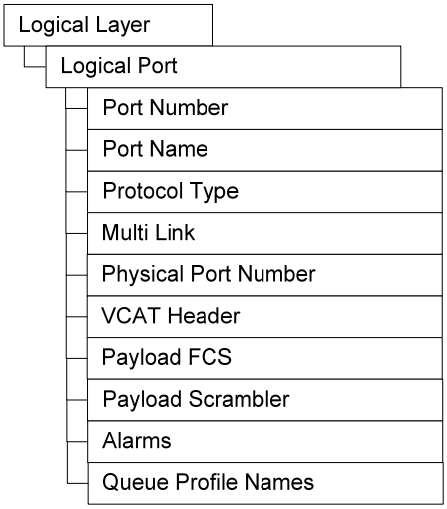


Figure 3-13. Configuration › Logical Layer – GFP, non-VCAT, non-LCAS

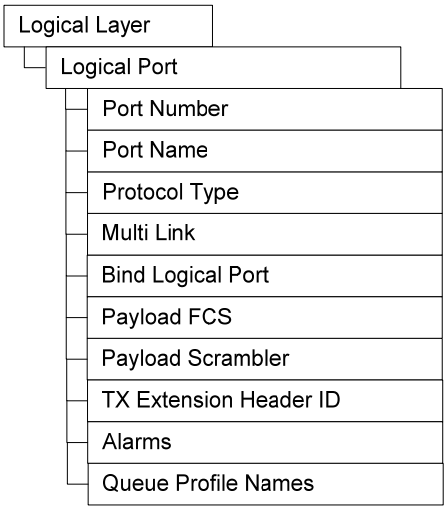


Figure 3-14. Configuration › Logical Layer – GFP, VCAT, LCAS

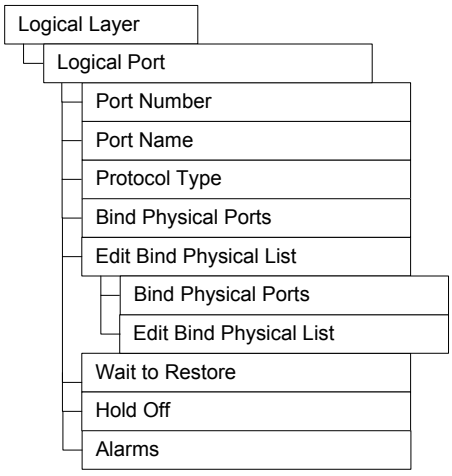


Figure 3-15. Configuration › Logical Layer – VCG

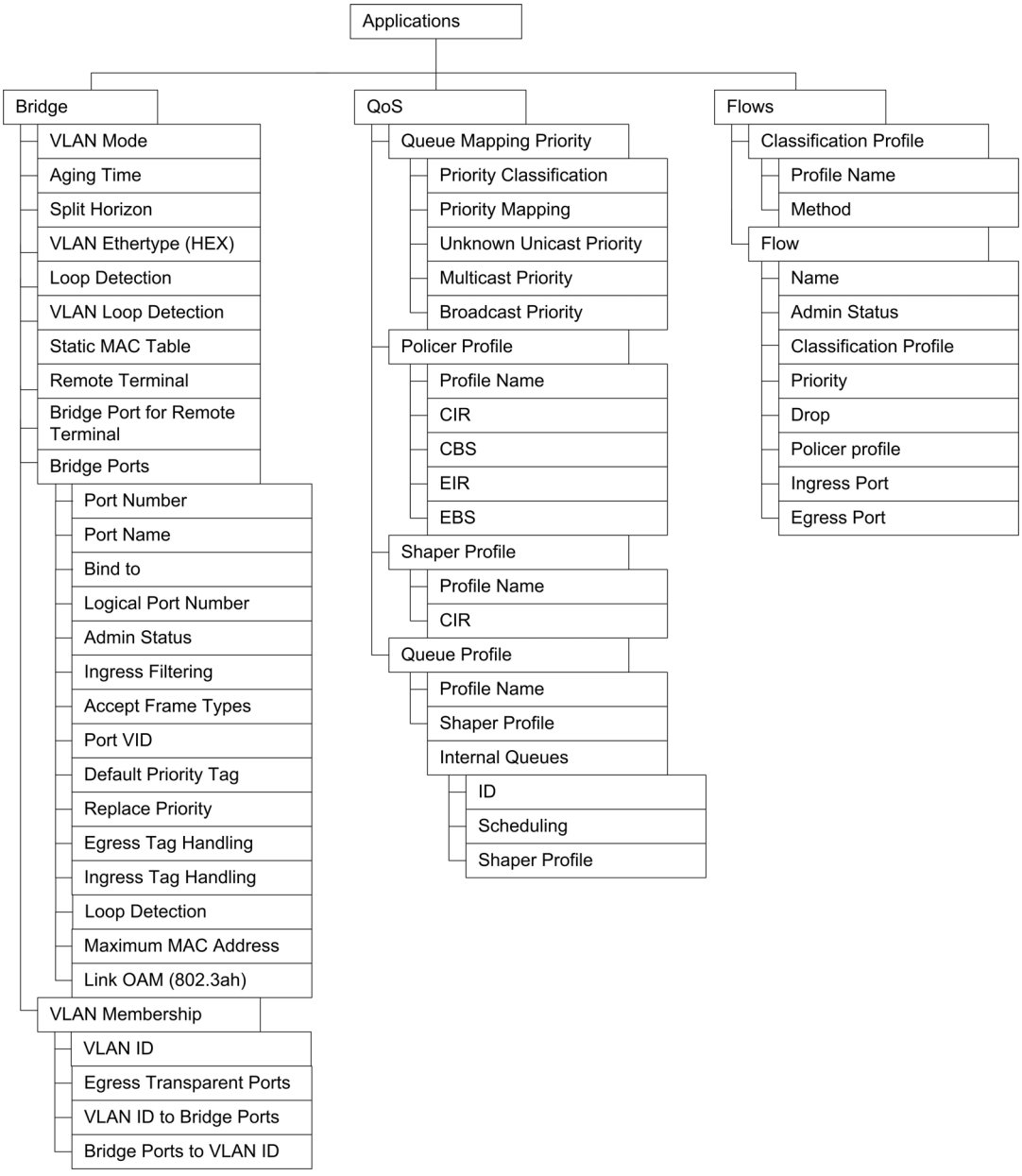


Figure 3-16. Configuration › Applications

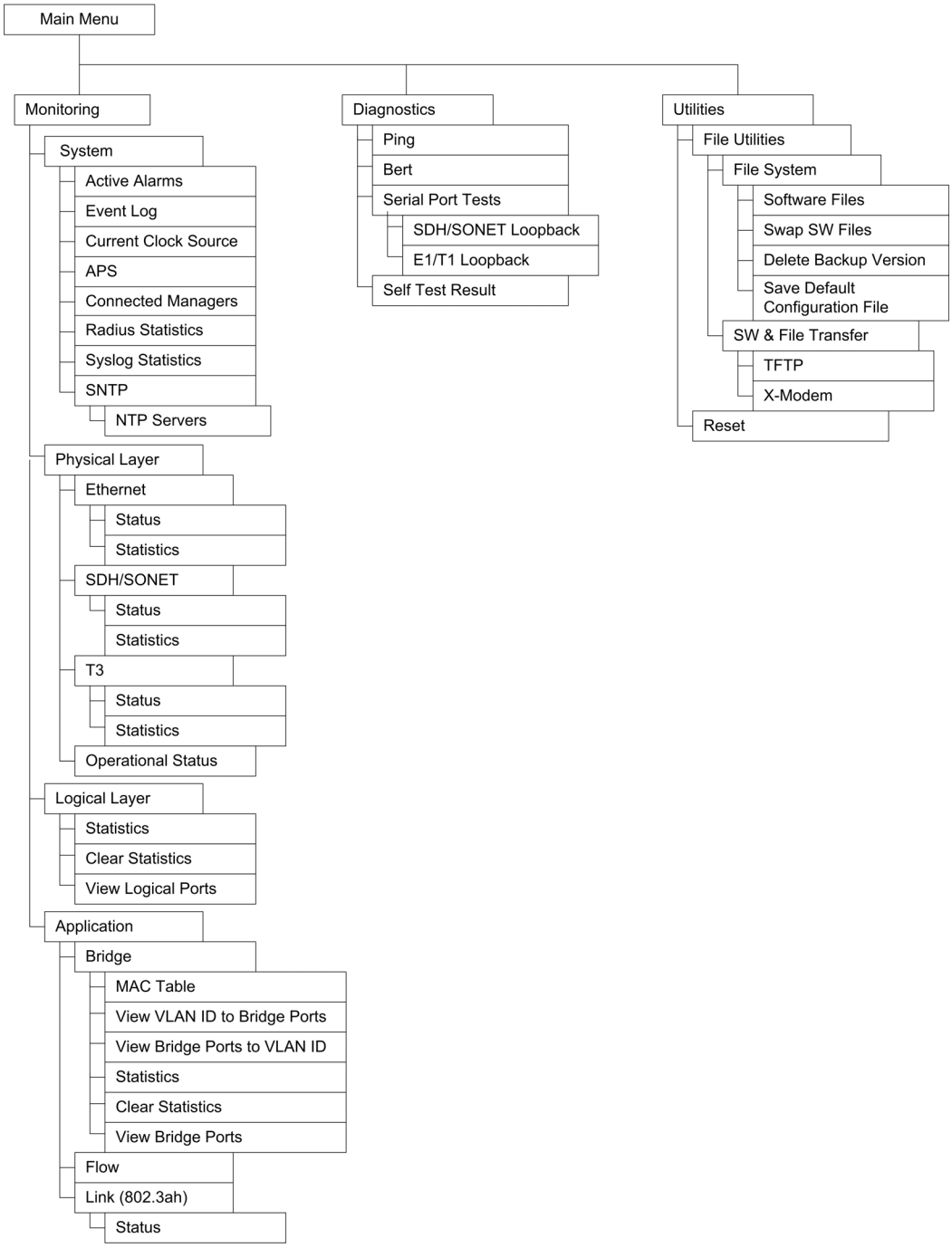


Figure 3-17. Monitoring, Diagnostics, Utilities

3.6 Turning Off the Unit

➤ To turn off the unit:

- Remove the power cord from the power source.

Chapter 4

Configuration

This chapter explains the Egate-100 configuration, utility, and inventory menus and provides guidance on the parameter options. Although examples are given from a terminal screen, the information is relevant for Telnet 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. For additional information, refer to *Section 4.4*.
- Configuration. Defines parameters for management and operation of Egate-100. For additional information, refer to *Sections 4.2 and 4.3*.
- Utilities. Manages transfer of software updates from a remote server: upload of software and download/upload of the configuration file. For additional information, refer to *Section 4.4*.

For the menu tree of Egate-100 management software, refer to *Chapter 3*. For monitoring and diagnostics menus, including the configuration of alarms, refer to *Chapter 5*.

A Quick Setup menu, illustrated in *Figure 4-1,* is available for users who are already familiar with Egate-100. This menu includes mandatory configuration settings such as host IP settings, frame type, and VLAN mode. For an overview of these settings, refer to the *Quick Start Guide* at the beginning of this manual. Detailed explanations of parameters are available in the relevant sections of this chapter.

```
                              Egate-100
Main Menu> Configuration> Quick Setup

 1. Management                    >
 2. Frame Type                    > (SONET)
 3. VLAN Mode                     > (Aware)
 4. Flows Support                 > (Yes)
 5. Network Setting               >
 6. User Setting                  >

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

Figure 4-1. Quick Setup Menu

4.1 Services

This section lists and explains services available for Egate-100. You configure one Ethernet management service that defines the host and bridge ports to include the required Ethernet Management ports and SDH/SONET ports.

Ethernet Management Traffic

Egate-100 can be managed using an out of band connection using the Ethernet Management port and/or via an inband connection using the Gigabit Ethernet interfaces. In addition, you can create a management path via PSN to manage remote RICi units.

The diagram below (*Figure 4-2*) illustrates the data flow for Ethernet management traffic between the relevant Ethernet or PSN network ports and the host. *Table 4-1* illustrates the configuration steps corresponding to the numbers (callouts) in *Figure 4-2.*

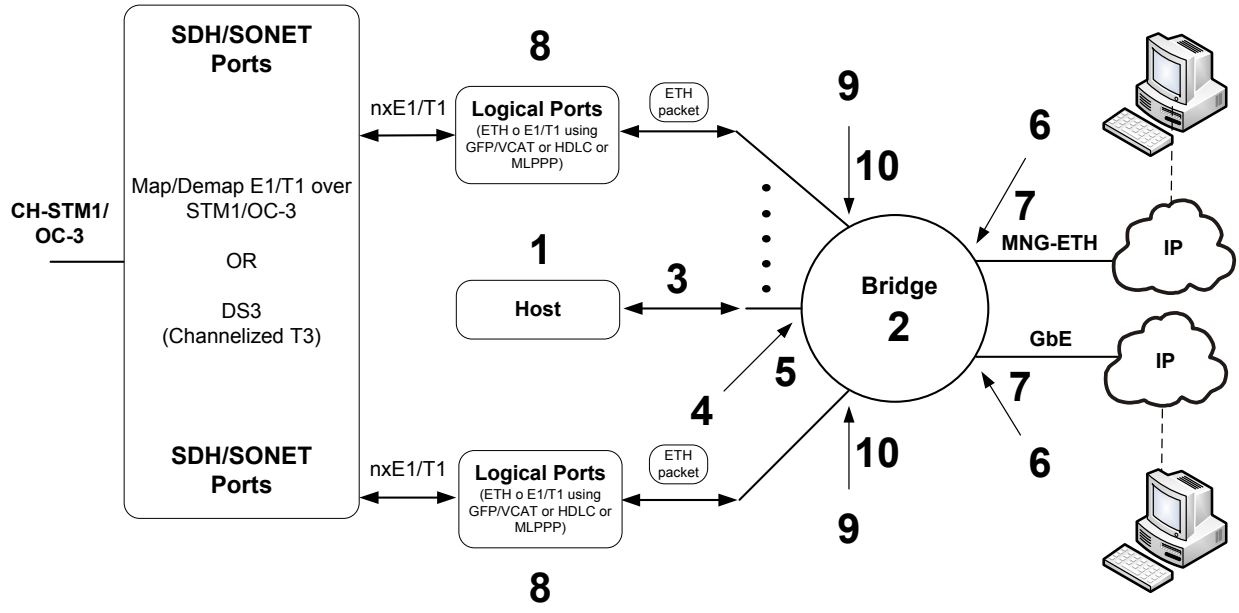


Figure 4-2. Ethernet Management Access Traffic Flow

Table 4-1. Ethernet Management Traffic Configuration – Host To Management VLAN

Callout	Step	Menu	Comments
1	*Defining Host Parameters*	Main Menu › Configuration › System › Management › **Host**	This assigns the IP address, subnet mask and default gateway to the Egate-100 unit.

Callout	Step	Menu	Comments
2	Defining a Host VLAN, available under *Configuring Host Encapsulation*	Main Menu > Configuration > System > Management > Host > **Encapsulation**	This assigns the management VLAN to the host. Host Tagging must be enabled.
3	Configuring the bridge, available under *Configuring the Bridge*	Configuration > Applications > **Bridge**	
4	Binding the Host to a bridge port, available under *Configuring the Bridge Ports*	Main Menu > Configuration > Applications > Bridge > **Bridge Ports**	This binds the host to a bridge port.
5	Adding the bridge port associated with the host as a member to the Management VLAN, available under *Configuring VLAN Membership*	Main Menu > Configuration > Applications > Bridge > **VLAN Membership**	Adds the Management VLAN ID to the bridge port associated with the host.

At this point, the host is configured and mapped to the bridge and the Management VLAN. To allow access to the host, you have to add the required ports to the Management VLAN as well by following the steps in *Table 4-2*.

Table 4-2. Ethernet Management Traffic Configuration – Ports To Management VLAN

Callout	Step	Menu	Comments
6	Binding Ethernet ports for management to the corresponding bridge ports, available under *Configuring the Bridge Ports*	Main Menu > Configuration > Applications > Bridge > **Bridge Ports**	Depending on your requirements, you can bind the Ethernet Management port (ETH-MNG) as out-of-band management port or Gigabit Ethernet ports as inband management port(s) to the corresponding bridge ports.
7	Adding the bridge ports associated with the Ethernet port(s) as members to the Management VLAN, available under *Configuring VLAN Membership*	Main Menu > Configuration > Applications > Bridge > **VLAN Membership**	Adds the Management VLAN ID to the bridge port.

Callout	Step	Menu	Comments
8	Defining logical ports, available under *Configuring Logical Layer Parameters*	Main Menu > Configuration > **Logical Layer**	Logical ports define groups of E1/T1 ports and the Ethernet over PDH encapsulation mode and parameters (GFP, MLPPP, HDLC). This and the following steps are required to include the remote RICi units into the Management VLAN
9	Binding the logical ports to the corresponding bridge ports, available under *Configuring the Bridge Ports*	Main Menu > Configuration > Applications > Bridge> **Bridge Ports**	
10	Adding the bridge ports associated with the logical ports to the Management VLAN, available under *Configuring VLAN Membership*	Main Menu > Configuration > Applications > Bridge > **VLAN Membership**	Adds the Management VLAN ID to the bridge port.

E-LAN Services

To forward Ethernet traffic from the Gigabit Ethernet ports to the SDH/SONET ports or vice versa over TDM, you have to define a VLAN and add bridge ports associated with physical and logical ports as VLAN members.

The diagram below illustrates the data flow for Ethernet traffic between the relevant Ethernet or PDH and the PSN network ports. *Table 4-3* illustrates the configuration steps corresponding to the numbers (callouts) in *Figure 4-3.*

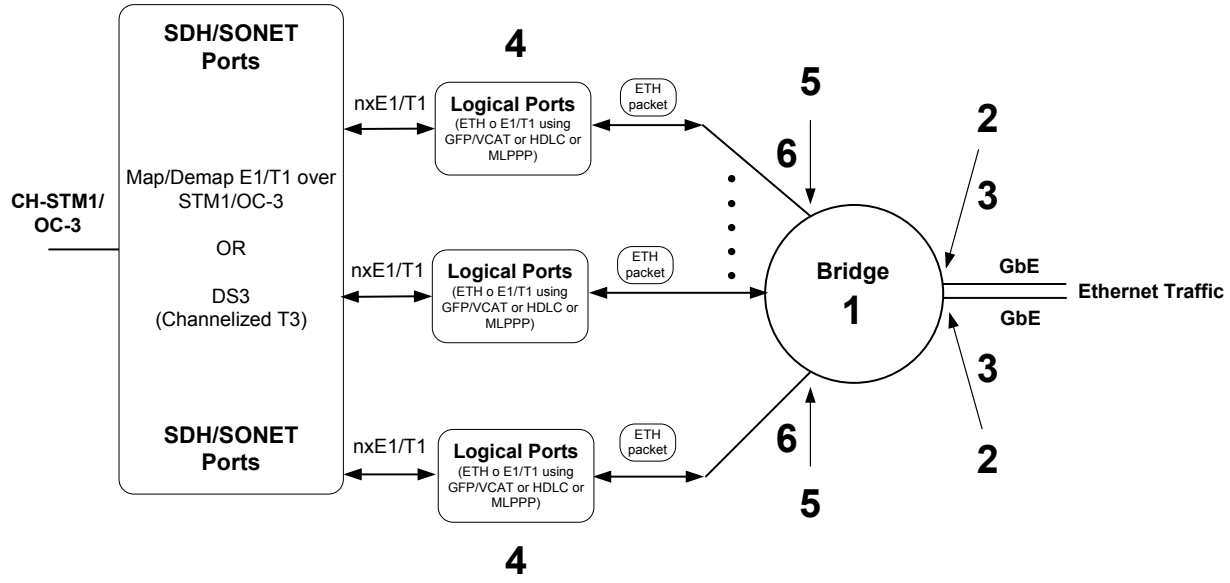


Figure 4-3. Ethernet Traffic Flow

Table 4-3. Ethernet Traffic Configuration, Adding Ports to VLAN

Callout	Step	Menu	Comments
1	Configuring the bridge, available under *Configuring the Bridge*	Configuration › Applications › **Bridge**	
2	Binding Ethernet ports to the corresponding bridge ports, available under *Configuring the Bridge Ports*	Main Menu › Configuration › Applications › Bridge› **Bridge Ports**	Binds the Gigabit Ethernet ports to the corresponding bridge ports.
3	Adding the bridge ports associated with the Ethernet port(s) as members to the desired VLAN, available under *Configuring VLAN Membership*	Main Menu › Configuration › Applications › Bridge › **VLAN Membership**	Adds the VLAN ID to the bridge port.
4	Defining logical ports, available under *Configuring Logical Layer Parameters*	Main Menu › Configuration › **Logical Layer**	Logical ports define groups of E1/T1 ports and the Ethernet over PDH encapsulation mode and parameters (GFP, MLPPP, HDLC).
5	Binding the logical ports to the corresponding bridge ports, available under *Configuring the Bridge Ports*	Main Menu › Configuration › Applications › Bridge› **Bridge Ports**	

Callout	Step	Menu	Comments
6	Adding the bridge ports associated with the logical ports to the Management VLAN, available under *Configuring VLAN Membership*	Main Menu > Configuration > Applications > Bridge > **VLAN Membership**	Adds the VLAN ID to the bridge port.

E-LAN Services with Quality of Services

Egress traffic from a bridge port is defined by one of the methods listed below and mapped to one of four traffic classes. Each traffic class is assigned to a priority level. The number of available priority levels depends on the method you selected.

The methods are the following:

- None
- 802.1p (p-bit)
- DSCP
- IP-Precedence

Every physical and logical port is assigned to a four-queue scheduler with a strict priority scheduling scheme (SP1, SP2, SP3, SP4). Traffic classes range from 0 – 3 and are automatically mapped to the strict priority queues of the relevant ports as follows:

- Traffic Class 0: SP1
- Traffic Class 1: SP2
- Traffic Class 2: SP3
- Traffic Class 3: SP4

The diagram below illustrates the use of QoS for Ethernet traffic between the relevant PDH and PSN network ports. *Table 4-4* illustrates the configuration steps corresponding to the numbers (callouts) in *Figure 4-4.*

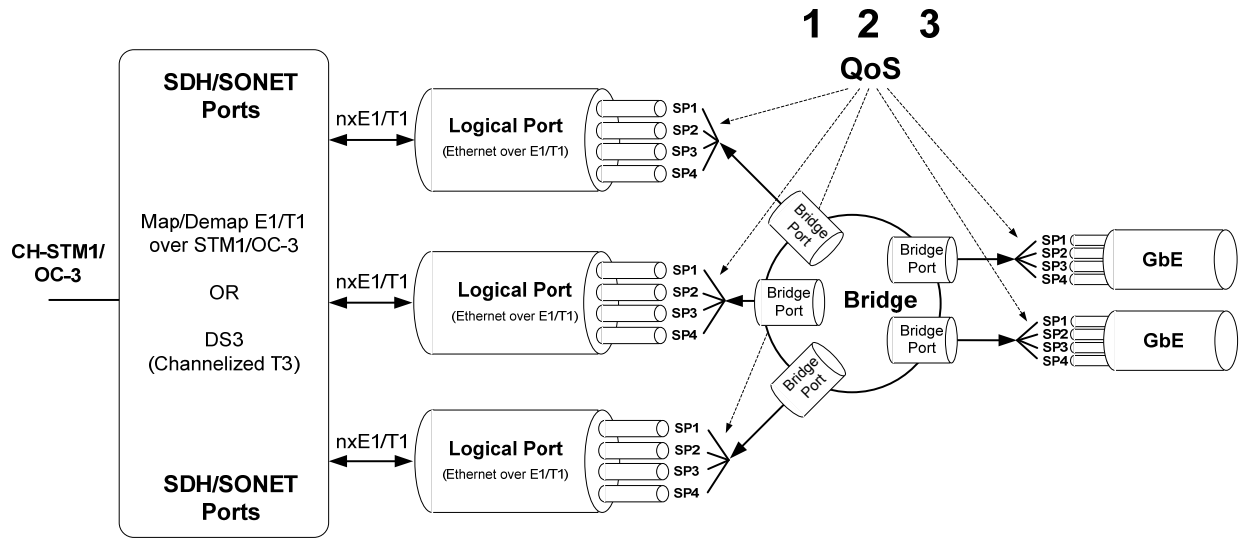


Figure 4-4. Prioritized Ethernet Traffic

Table 4-4. Defining Priorities to Ethernet Traffic

Callout	Step	Menu	Comments
1	Select a priority classification method, available under *Configuring the Quality of Service*	Configuration › Applications › QoS › Queue Mapping Profile › **Priority Classification**	The respective classification method (802.1p, DSCP, IP Precedence or None) affects the number of priority mapping tables.
2	Map the respective traffic class to a priority, referred to as tag value, available under *Configuring QoS Priority Mapping*	Configuration › Applications › QoS › Queue Mapping Profile › **Priority Mapping**	This maps the traffic class to a priority. The number of available priorities are determined by the classification method: • **IP Precedence**: 0-7 • **802.1p**: 0-7 • **DSCP**: 0-63
3	Select the traffic class for the traffic type, available under *Configuring Unknown Unicast, Multicast, and Broadcast Priorities*	Configuration › Applications › QoS › Queue Mapping Profile › **Unknown Unicast Priority** **...** › **Multicast Priority** **...** › **Broadcast Priority**	Unknown unicast, multicast and broadcast traffic must be mapped to separate traffic queues (Traffic Class values). • **Traffic Class**: 0-3

4.2 Configuring Egate-100 for Management

Configuring Egate-100 for management includes configuring host parameters, defining network managers, specifying user access and terminal parameters, and providing device information.

The Egate-100 management platforms allow you to set system parameters as listed below and illustrated in *Figure 4-5.*

- Configure the management environment, including the following:
  - Assigning a name and give a description for the device, and entering information regarding device location and a contact person
  - Defining host IP parameters
  - Defining network management stations
  - Configuring management access
  - Controlling user access.
- Specify the terminal data rate.
- Mask or unmask the system alarms.

```
                          Egate-100
Main Menu> Configuration> System

 1. Clock Source                  >
 2. Management                    >
 3. Control Port                  >
 4. Alarms                        >
 5. Date and Time                 >
 6. SNTP                          >
 7. Protection                    >
 8. Factory Default               >
 9. Buffer Management             >
 10.Syslog                        >

Please select item <1 to 8>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-5. System Menu

Defining Host Parameters

Egate-100 can be managed using a network management station connected to the Gigabit Ethernet 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.

➤ **To define the host IP parameters:**

1. Navigate to Main Menu › Configuration › System › **Management**, and then select **Host**.

   The Host menu appears as illustrated in *Figure 4-6*.

2. Set the IP parameters according to *Table 4-5*:

```
                          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

Table 4-5. Host IP Parameters

Parameter	Description	Possible Values
IP Address	Host IP address **Default: 0.0.0.0**	0.0.0.0 to 255.255.255.255
IP Mask	Host IP subnet mask **Default: 0.0.0.0**	0.0.0.0 to 255.255.255.255
Default Gateway	Specifies the default gateway server's IP address associated with the subnet to which Egate-100 belongs. **Default: 0.0.0.0**	0.0.0.0 to 255.255.255.255

Note

To assign an IP address the first time the unit is powered up, or after resetting the unit to the factory default, you must connect an ASCII terminal to the CONTROL interface and use HyperTerminal to access the Egate-100 menus.

To establish a management link, you have to specify the SNMP trap, read, and write communities.

➤ **To define the Egate-100 communities:**

- In the Host menu (*Figure 4-6*), set the communities according to *Table 4-6*:

Table 4-6. Egate-100 Communities

Parameter	Description	Possible Values
Read Community	Name of a community with read-only authorization **Default: None**	None public private
Write Community	Name of a community with read/write authorization **Default: None**	None public private
Trap Community	Name of a community to which Egate-100 should send traps **Default: None**	None public private

Configuring Host Encapsulation

Egate-100 allows you to create a dedicated management VLAN in order to separate management traffic from the user data. In addition, via the Management Access menu you can restrict the management traffic to the network or user ports or allow inband management via any of the Egate-100 ports.

➤ **To configure the host encapsulation:**

1. To define VLAN tagging, in the Host menu (*Figure 4-6*) select **Encapsulation**.

   The Encapsulation menu appears as illustrated in *Figure 4-7*.

```
                              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

2. From the Encapsulation menu, specify the parameters (according to *Table 4-7*):
3. Select **Save**.
4. Return to the Host menu and select **Save** again.

Table 4-7. Host Encapsulation Parameters

Parameter	Description	Possible Values
Host Tagging	The Host Tagging mode: • **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**	Untagged Tagged
Host VLAN ID	Sets the VLAN ID of the packets sent by the host. This parameter only shows when **Host Tagging** is set to **Tagged**. **Default: 1**	1-4094
Host Priority Tag	Quality of Service priority tag for packets sent by the host. This parameter only shows when **Host Tagging** is set to **Tagged**. **Default: 0**	0–7

Configuring SNMPv3

Egate-100 supports SNMP version 3 entity, providing secure SNMP access to the device by authenticating and encrypting packets transmitted over the network.

Configuring the SNMP Engine ID

Engine ID is an alphanumeric string used for identification of the Egate-100 agent in the SNMPv3 environment. The engine ID must be unique to allow the user to query the SNMP engine. It must be defined prior to enabling SNMPv3 functionality. The length of the string is up to 27 characters.

➤ **To define the SNMP engine ID:**

1. Navigate to the SNMP Engine ID menu (Configuration › System › Management › SNMP Engine ID),
2. Select **Remaining Bytes** and define the value of the engine ID section reserved for user SNMP engine identification.

   The value is automatically translated in hexadecimal format and displayed in the read-only Engine ID field.

```
                              Egate-100
Configuration > System > Management>SNMP Engine ID

    Engine ID,                ... (800000a40400000000)
    Engine ID Config Type >       (Text)
 1. Remaining Bytes           ... (2)

>
S - Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-8. SNMP Engine ID Menu

3. Select **Save**.

Enabling SNMPv3

➤ **To enable SNMPv3:**

1. From the Management menu (Configuration › System › Management), select **SNMPv3** and then select **Enable**.
2. Select **Save**.

   A warning message is displayed advising that the current configuration of SNMP agent will be deleted.
3. Select **Y** to continue or **N** to cancel.

   Once enabled, the SNMPv3 Settings line is added to the Management menu as illustrated in *Figure 4-9*.

```
                              Egate-100
Configuration > System > Management

 1. Device Information  >
 2. SNMPv3                    (Enabled)
 3. SNMP Engine ID      >
 4. Host                >
 5. Managers List     []>
 6. Management Access   >
 7. Access Policy       >
 8. Radius Parameters   >
 9. SNMPv3 Setting      >


>
s - Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-9. Management Menu

4. From the Management menu, select **SNMPv3 Settings**.

   The SNMPv3 Settings menu is displayed as illustrated in *Figure 4-10*.

```
                              Egate-100
Configuration > System > Management>SNMPv3 Setting

    Engine Boots                    (2)
    Engine Time                     (276)
    SNMP Message Size          ... (1500)
 1. Users                      >
 2. Targets & Notify           >
 3. SNMPv1/v3 Mapping          >
 4. SNMPv3 Factory Defaults
 5. Summary User Table         []
 6. Summary Target Table       []

>
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-10. SNMPV3 Settings Menu

Adding SNMPv3 Users

Egate-100 supports up to ten SNMPv3 managers with different authorization and privacy attributes.

Note *Access control policy is defined via the* `vacmSecurityToGroupTable` *and* `vacmAccessTable` *tables, which can be accessed via an SNMP browser only.*

➤ To add an SNMPv3 user:

1. From the SNMPv3 Settings menu (Configuration › System › Management › SNMPv3 Settings), select Users.

   The SNMPv3 Settings menu appears.

2. Select **Security Name** and enter security name for a new user (up to 32 alphanumeric characters).

   The **Privacy Protocol**, **Authentication Password** and **Privacy Password** lines are added to the SNMPv3 Users menu as illustrated in *Figure 4-11.*

```
                              Egate-100
Configuration > System > Management>SNMPv3 Settings>Users

 1. Security Name              ... (1)
 2. Authentication Protocol    >   (usmHMACM5AuthProtocol)
 3. Privacy Protocol           >   (usmDESPrivProtocol)
 4. Authentication Password    ... []
 5. Privacy Password           ... []

>
F-Forward; B-Back; R-Remove; S-Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-11. SNMPv3 Users Menu

3. Select **Authentication Protocol** and define the authentication protocol to be used for authenticating the user:

- usmNoAuthProtocol (No authentication is performed)
- usmHMACMD5AuthProtocol (MD5 protocol)
- usmHMACSHAAuthProtocol (SHA protocol)

4. Select **Privacy Protocol** and define the type of privacy protocol to be used for encryption:
   - usmNoPrivProtocol (Privacy protocol is not used)
   - usmDESPrivProtocol (DES protocol)
5. Select **Authentication Password** and define the authentication password of the user. This is not available if authentication has been disabled.
6. Select **Privacy Password** and define the private key used for encryption. This is not available if privacy has been disabled.

Note *Minimum password length is at least 8 characters long.*

7. Select **Save**.

➤ **To view the summary of the SNMPv3 user configuration:**

- From the SNMPv3 Settings menu (Configuration › System › Management › SNMPv3 Settings), select **Summary User Table.**

➤ **To delete an SNMPv3 user:**

- From the Users menu (Configuration › System › Management › SNMPv3 Settings › Users), perform the following:
  - Type **F** (Forward) or **B** (Back) to select an SNMPv3 user.
  - Type **R** (Remove) to delete the selected user.

Adding SNMPv3 Notification Entries

You can define which types of notification will be sent to the target management stations (the target stations are defined separately, as explained in *Configuring Target Parameters*).

➤ **To define a notification entry:**

1. From the SNMPv3 Settings menu (Configuration › System › Management › SNMPv3 Settings), select **Targets & Notify**.
2. Select **Notify**.

   The Notify menu is displayed as illustrated in *Figure 4-12*.
3. From the Notify menu, define the following:
   - Name – up to 60 characters (ASCII string identifying the notification entry)
   - Tag – 0-255 (A tag value to be associated with the current notification entry. This tag is used to identify the current notification entry when configuring the target address).

```
                                    Egate-100
Configuration>System>Management> SNMPv3 Settings> Target & Notify > Notify

    Type                >  (Trap)

 1. Name                ...()
 2. Tag                 ...()

>
F-Forward  B-Backwards  R- Remove
ESC-prev.menu; !-main menu; &-exit                                  1 Mngr/s
```

Figure 4-12. Notify Menu

4. Select **Save**.

➤ **To delete a notification entry:**

- From the Targets & Notify menu (Configuration › System › Management › SNMPv3 Settings › Targets & Notify), select **Notify**.
  - Type **F** (Forward) or **B** (Back) to select a notification entry.
  - Type **R** (Remove) to delete the selected entry.

Assigning Traps

One or more traps must be assigned to each notification entry.

➤ **To assign traps to notification entries:**

1. From the Target & Notify menu (Configuration › System › Management › SNMPv3 Settings › Targets & Notify), select **Trap**.

   The Trap menu is displayed as illustrated in *Figure 4-13*.

2. From the Trap menu, define the following:
   - Tag Name (A tag from the list of previously defined notification tags)
   - Trap (A trap to be assigned to the selected tag).

```
                                    Egate-100
Configuration>System>Management> SNMPv3 Settings> Target & Notify > Trap

 1. Tag Name            >    (Power Failure)
 2. Trap                >    (1)

>
F-Forward  B-Backwards  R-Remove
ESC-prev.menu; !-main menu; &-exit                                  1 Mngr/s
```

Figure 4-13. Trap Menu

➤ **To delete a trap:**

- From the Targets & Notify menu (Configuration › System › Management › SNMPv3 Settings › Targets & Notify), select **Trap**.

- Type **F** (Forward) or **B** (Back) to select a notification entry.
- Type **R** (Remove) to delete the selected entry.

Configuring Target Parameters

Target is an SNMPv3 network management station to which Egate-100 is going to send trap notifications. A set of parameters has to be configured and assigned to each target.

➤ **To configure target parameters:**

1. From the Targets & Notify menu (Configuration › System › Management › SNMPv3 Settings › Targets & Notify), select **Target Params**.

   The Target Params menu is displayed as illustrated in *Figure 4-14*.

2. From the Target Params menu, configure the following:
   - Name (An ASCII string identifying current set of target parameters)
   - Message Processing Model (The Message Processing Model to be used when generating SNMP messages using this entry):
     - SNMPv1
     - SNMPv2c
     - SNMPv2u
     - SNMPv3
   - Security Model (The Security Model to be used when generating SNMP messages using this entry):
     - Any
     - SNMPv1
     - SNMPv2c
     - User-Based Security Model (USM)
     - Not defined
   - Security Name (Identification of the principal on whose behalf SNMP messages are to be generated using this entry. This can be either SNMPv3 user or SNMPv1/SNMPv2 community string.)
   - Security Level (The level of security to be used when generating SNMP messages using this entry):
     - noAuthNoPriv (Authorization and privacy are disabled)
     - authNoPriv (Authorization is enabled, privacy is disabled)
     - authPriv (Authorization and privacy are enabled)

```
                                  Egate-100
Configuration>System>Management> SNMPv3 Settings> Target & Notify > Target Params

 1. Name                        ... (11)
 2. Message Processing Model    >   (SNMPv1)
 3. Security Model              >   (Any)
 4. Security Name               ... ()
 5. Security Level              >   (noAuthNoPriv)

>
F-Forward  B-Backwards  R-Remove
ESC-prev.menu; !-main menu; &-exit                                  1 Mngr/s
```

Figure 4-14. Target Params Menu

3. Select **Save**.

➤ **To delete a target parameter:**

- From the Targets & Notify menu (Configuration › System › Management › SNMPv3 Settings › Targets & Notify), select **Target Parameters**.
  - Type **F** (Forward) or **B** (Back) to select a notification entry.
  - Type **R** (Remove) to delete the selected entry.

Configuring Target Address

Each target must have a valid IP address, IP mask. In addition, a previously configured parameter set and notification tags must be assigned to the target.

➤ **To configure the target address:**

1. From the Targets & Notify menu (Configuration › System › Management › SNMPv3 Settings › Targets & Notify), select **Target Address**.

   The Target Address menu is displayed as illustrated in *Figure 4-15*.

2. From the Target Address menu, configure the following:
   - Name (ASCII string identifying the target)
   - IP Address (Valid IP address of the NMS. Must be in the xxx.xxx.xxx.xxx:162 format, where 162 is a standard SNMP port used for sending traps)
   - Params Name (List of previously defined target parameter names)
   - Address Mask (An IP mask of the NMS)
   - Tag List (List of previously defined notification tags).
3. Select **Save**.

➤ **To view the summary of the SNMPv3 target configuration:**

- From the SNMPv3 Settings menu (Configuration › System › Management › SNMPv3 Settings), select **Summary Target Table.**

```
                                    Egate-100
Configuration>System>Management> SNMPv3 Settings> Target & Notify > Target Address

 1. Name                  ... (11)
 2. IP Address            ... (0.0.0.0)
 3. Params Name           ... (param1)
 4. Tag List              ... (traps)

>
F-Forward  B-Backwards  R-Remove>
ESC-prev.menu; !-main menu; &-exit                                    1 Mngr/s
```

Figure 4-15. Target Address Menu

➤ To delete a target address:

- From the Targets & Notify menu (Configuration › System › Management › SNMPv3 Settings › Targets & Notify), select **Target Address**.
  - Type **F** (Forward) or **B** (Back) to select a notification entry.
  - Type **R** (Remove) to delete the selected entry.

Mapping SNMPv1 to SNMPv3

Egate-100 supports coexistence of different SNMP versions by mapping SNMPv1/SNMPv2 community name to the SNMPv3 security name value. The mapping is performed according to the RFC 3584 requirements.

➤ To map SNMPv1 to SNMPv3:

1. From the SNMPv3 Settings menu (Configuration › System › Management › SNMPv3 Settings), select **SNMPv1/v3 Mapping**.

   The SNMPv1/v3 Mapping menu is displayed as illustrated in *Figure 4-16*.

2. From the SNMPv1/v3 Mapping menu, define the following:
   - Community Index (SNMP community index)
   - Community Name (SNMPv2/SNMPv2 community name)
   - Security Name (SNMPv3 security name to be mapped to the SNMPv2/SNMPv2 community name)
   - Transport Tag (Specifies a set of the transport endpoints that are used, in either of the following methods:
     - Specifying the transport endpoints from which an SNMP entity accepts management requests
     - Specifying the transport endpoints to which a notification may be sent, using the community string matching the corresponding instance of community name.

```
                                Egate-100
Configuration>System>Management>SNMPv3 Settings>SNMPv1/v3 Mapping

 1. Community Index            ... ()
 2. Community Name             ... ()
 3. Security Name              ... ()
 4. Transport Tag              ... ()

>
F-Forward  B-Backwards  R-Remove
ESC-prev.menu; !-main menu; &-exit                              1 Mngr/s
```

Figure 4-16. SNMPv1/v3 Mapping Menu

3. Select **Save.**

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:**

4. Navigate to Main Menu › Configuration › System ›Management › **Device Information**

   The Device Information menu appears displaying the hardware and software versions in use as illustrated in *Figure 4-17*.

5. From the Device Info menu, select **Name** and enter a name for the Egate-100 unit. The default name is **Egate-100**.
6. Select **Location**, and enter a description of the Egate-100's current location.
7. Select **Contact Person**, and enter the name of a contact person for this unit.
8. Select **Serial Number**, and enter a unique identification number corresponding to the vendor-specific serial number.
9. Select **Save.**

```
                              Egate-100
Configuration> System> Management> Device Information

    Description      ... (Egate-100 HW Ver:0.10/A, SW Ver:3.00)
 1. Name             ... (Egate-100)
 2. Location         ... (The location of this device)
 3. Contact          ... (Name of contact person)
 4. Serial Number    ... <>

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

Figure 4-17. Device Information Menu

Controlling Management Access

You can configure the management access from the management access menu. You can configure access for Telnet, SNMP and Web access as explained below.

➤ **To access the Management Access menu:**

- Navigate to Main Menu › Configuration › System › **Management,** and then select **Management Access**.

  The Management Access menu appears as illustrated in *Figure 4-18*.

```
                          Egate-100
Configuration> System> Management> Management Access

 1. Telnet                          >   (Enable)
 2. SNMP                            >   (Enable)
 3. WEB                             >   (Enable)
>
Please select item <1 to 3>

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

Figure 4-18. Management Access Menu

➤ **To configure Telnet access:**

- Select **Telnet** and then choose as follows:
  - **Enable** – All users are enabled.
  - **Enable Managers Only** – Network managers listed in the manager list are enabled.
  - **Secure** – Users using an SSH connection are enabled.
  - **Secure Managers Only** – Network managers listed in the manager list and using an SSH connection are enabled.
  - **Disable** – Telnet access is disabled.

➤ **To configure SNMP access:**

- Select **SNMP** and then choose as follows:
  - **Enable** – All users are enabled.
  - **Enable Managers Only** – Network managers listed in the manager list are enabled.
  - **Disable** – SNMP access is disabled.

➤ **To configure Web access:**

- Select **WEB** and then choose as follows:
  - **Enable** – All users are enabled.
  - **Enable Managers Only** – Network managers listed in the manager list are enabled.
  - **Secure** – Users using an SSL connection are enabled.

- **Secure Managers Only** – Network managers listed in the manager list and using an SSL connection are enabled.
- **Disable** – Web access is disabled.

Defining Access Policy

Access policy allows configuration of multiple authentication protocols. User authentication is performed in the order the methods are selected. If the first authentication method is not available or the user is not found, the next selected method is used.

➤ **To define the access policy:**

1. Navigate to Main Menu › Configuration › System › **Management**, and then select **Access Policy**.

   The Access Policy menu appears.

2. Choose the desired option to configure the first level of authentication (**1st Level**) as listed below:
   - **Local** – Egate-100 uses the locally stored authentication database.
   - **Radius** – Egate-100 uses the authentication database stored on the Radius server.

     2nd Level becomes available. If the user name is not found in the Radius Server database or the password you enter does not match the user name, the authentication fails.
3. Choose the desired option to configure the second level of authentication (**2nd Level**) as listed below:
   - **None** – Egate-100 is only accessible via the 1st level.
   - **Local** – Egate-100 uses the locally stored authentication database.

Note *Special rules apply to **su** (superuser). If **su** does not exist in the Radius server database or the system loses the connection to the Radius server, Egate-100 uses the local authentication database to authenticate the user if the 2nd level is set to **local**.*

Configuring User Access

Users with different access levels can access Egate-100 to make configuration changes.

There are three access levels:

- **su**. Read and write access including administrator privileges that include adding and removing of other users as well as changing passwords for other users.
- **tech**. Read and limited write access. The password of this user can be changed by this user.
- **user**. Read-only access. This user allows you to view and only modify basic parameters. You are able to change the password for this user.

The system ships with one default user for each access level. These users cannot be removed. In addition, up to 16 more users can be added. These users can be assigned to any of the access levels.

➤ To view current users:

- Navigate to Configuration > Control Port > **Terminal Access**, and then select **User Information**.

  The User Information menu appears.

```
Configuration> System> Control Port> Terminal Access> User
Information

User Name                  ... Access Level    Type
Bob                    ...       SU            Dynamic
Shiela                           SU            Dynamic
su                               SU            Permanent
tech                             TECH          Permanent
user                             USER          Permanent

Permanent users cannot be removed
A-Add; R-Remove; Clear
ESC-Previous menu; !-Main menu; &-Exit  ?-help
```

Figure 4-19. User Information Menu

Note *If you are logged on as user or with a user name associated with user privileges, **Changing Password** appears instead of **Terminal Access** in the menu.*

➤ To add a user:

1. In the User Information menu, type **A**.

   You are prompted to assign a user name and a password and assign this user to an access level as illustrated in *Figure 4-20*.

```
Configuration> System> Control Port> Terminal Access> User
Information

 1. User Name           ...(-)
 2. Password            ...(****)
 3. Access Level        >  (-)

Permanent users cannot be removed
S-Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-20. Add User Menu

2. After you specify the user name and password and assign an access level, type **S**.

   The new user is saved in the system.

➤ **To remove a user:**

1. Select the desired user and type **R**.

   You are asked to confirm or reject your selection.

2. Type **Y** or **N** to confirm or reject the selection.

➤ **To remove all users:**

1. In the User Information menu, type **C**.

   You are asked to confirm or reject your selection.

2. Type **Y** or **N** to confirm or reject the request.

   If confirmed, all added users are removed. The default users remain in the system.

Note *If you are logged on as **user** or with a user name associated with user privileges, you are unable to add or remove users.*

Egate-100 allows you to change the password for both the read-only user and the super user. In case you forget your user password, you can obtain a new one.

➤ **To change a password**

- Refer to *Configuring User* for instructions.

➤ **To obtain a new password:**

1. Log in with the username **CHNGPASS**.

   An ID number (**Dynamic Key**) appears at the bottom of the menu.

2. Contact RAD Technical Support and refer to this key.

   You will receive a temporary password.

3. Log in using the temporary password.

   You will be prompted to enter and confirm a new password for future sessions.

Configuring Network Managers

You can define or modify the network management stations to which the Egate-100 SNMP agent sends traps. Up to 16 managers can be defined. 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 **Manager List**.

   The Manager List menu appears as illustrated in *Figure 4-21*.

2. Enter a sequential number, corresponding to the manager you wish to specify.

3. Specify **IP Address** and **Trap** (masked/unmasked).

➤ **To edit the manager list:**

1. From the Management menu, select **Manager List**.

   The Manager List menu appears as illustrated in *Figure 4-21*.

```
                              Egate-100
Main Menu> Configuration> System> Management> Manager 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
     8           0.0.0.0         Unmask
     9           0.0.0.0         Unmask
    10           0.0.0.0         Unmask
    11           0.0.0.0         Unmask
    12           0.0.0.0         Unmask
    13           0.0.0.0         Unmask
    14           0.0.0.0         Unmask
    15           0.0.0.0         Unmask
    16           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 4-21. Manager List Menu

2. From the Manager List menu, move the cursor to the Manager IP cell you wish to change by clicking <**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.

Configuring Radius Server Parameters

Egate-100 supports connectivity to up to four Radius authentication servers.

➤ **To configure Radius server parameters:**

1. Navigate to Main Menu › Configuration › System › Management, and then select **Radius Parameters**.

   The Radius Server menu appears.

2. Specify the following parameters according to *Table 4-8*:

- **Server Access** – Enable or Disable
- **Server IP Address** – The Radius server's IP address
- **Key String** – Free text to identify the server
- **Number of Retries and Timeout** – Access-attempt parameters
- **Authentication Port** – Port used for authentication.

3. To switch to additional Radius servers, type **F** or **B** respectively.

```
                          Egate-100

Configuration>System>Management>Radius Parameters

    Server Sequence Number                    (1)
    Server Status                        >    (NOT_CONNECTED)
 1. Server Access                             (Disable)
 2. Server IP Address                    ...  (0.0.0.0)
 3. Key String                           ...  ()
 4. Number of Retries[0 - 10]            ...  (2)
 5. Timeout (in seconds)[1 - 5]          ...  (2)
 6. Authentication Port[1 - 65535]       ...  (1812)

Please select item <1 to 6>
F - Forward; B - Backward
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-22. Radius Parameters

Table 4-8. Radius Parameters

Parameter	Description	Possible Values
Server Sequence Number	Sequential Radius server number **Default: 1**	1-4
Server Status	Radius server connection status **Default: NOT CONNECTED**	CONNECTED NOT_CONNECTED
Server Access	Enable or disable access to the Radius server **Default: Disable**	Disable Enable
Server IP Address	IP address of the Radius server **Default: 0.0.0.0**	0.0.0.0 to 255.255.255.255
Key String	User ID on the server	User name (case sensitive)
Number of Retries	Max. number of access attempts **Default: 2**	1-10
Timeout	Number of seconds before access attempt fails **Default: 2**	1-5
Authentication Port	Authentication protocol port **Default: 1812**	1-65535

Configuring Terminal Parameters

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

Note *The Baud Rate parameter is masked during a Telnet or Web-based session, as it is only relevant when using the terminal to access Egate-100.*

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

1. Navigate to Main Menu › Configuration › System › **Control Port**.

   The Control Port menu appears as illustrated in *Figure 4-23*.

```
                              Egate-100
Main Menu> Configuration> System> Control Port

 1. Baud Rate                        >    (115200 bps)
 2. Terminal Access                  >

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

Figure 4-23. Control Port Menu

2. From the Control Port menu, select **Baud Rate.**

   The Baud Rate menu appears.

3. Select the desired data rate as listed in *Table 4-9*.

Table 4-9. Terminal Parameters

Parameter	Description	Possible Values
Baud Rate	Communication speed **Default: 115200 bps**	9600 bps 19200 bps 38400 bps 57600 bps 115200 bps

4.3 Configuring Egate-100 for Operation

To configure Egate-100 for operation, follow the steps below.

1. Define device-level parameters such as master and fallback clock source, link protection, buffer-management thresholds, and syslog parameters
2. Configure the physical layer (SDH/SONET and Gigabit Ethernet ports)
3. Configure the logical ports
4. Configure the internal bridge

5. Configure bridge port parameters
6. Configure QoS parameters.

You have to define Egate-100 at every step, as many of the parameters do not have default settings. If a parameter is not correctly defined, an error message appears.

Setting Device-Level Parameters

Configuring the Clock Source

Note *The clock source is available for configuration only if the unit is equipped with a T3 interface. In a unit with STM-1/OC-3 interfaces, the clock is set to the Rx clock of the SDH/SONET link. If the link fails, the clock is set to the internal clock until the link recovers.*

Egate-100 has 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 sources can be the Rx clock of the T3 active link, or the internal clock of the Egate-100 unit. It is recommended to have different settings for the master clock and fallback clock: for example, **Rx Clock** 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. Navigate to Main Menu › Configuration › System › **Clock Source**

   The Clock Source menu appears as illustrated in *Figure 4-24*.

```
                          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 4-24. Clock Source Menu

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

   The Master Clock menu appears as illustrated in *Figure 4-25.*

```
                              Egate-100
…Configuration> System> Clock Source> Master Clock

 1. Source                          >    (Rx Clock)
 2. Wait to Restore (sec)           ...  (300)
 3. Port Number [1 - 3]             >    (1)

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

Figure 4-25. Master Clock Menu (SDH/SONET)

```
                              Egate-100
…Configuration> System> Clock Source> Master Clock

 1. Source                          >   (Rx Clock)
 2. Wait to Restore(sec)[0 - 720] ... (300)
 3. Port Number [1 - 3]             ... (2)

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

Figure 4-26. Master Clock Menu (T3)

3. Choose one of the following to indicate the first-priority source of timing for the Egate-100:
   - **Rx Clock**. If you want the master clock source to be the Rx clock from the T3 active link. This is the default value
   - **Internal**. If you want the master clock to be the internal clock of the Egate-100 unit.
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. For Rx Clock, specify the port number to be used.
6. Select **Save**.
7. From the Clock Source menu, select **Fallback Clock.**

   The Fallback Clock menu appears as illustrated in *Figure 4-27*.

```
                              Egate-100
Main Menu> Configuration> System> Clock Source> Fallback Clock

 1. Source                          >   (Internal)

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

Figure 4-27. Fallback Clock Menu (SDH/SONET)

```
                              Egate-100
Main Menu> Configuration> System> Clock Source> Fallback Clock

 1. Source                          >   (Internal)
 2. Wait to Restore (sec)[0 - 720]...   (300)
 3. Port Number [1 - 3]              ... (2)

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

Figure 4-28. Fallback Clock Menu (T3)

8. 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 T3 active link. This is the default value.
9. If you choose **Rx Clock**, enter a **Wait to Restore** value, ranging between 0 and 720 seconds.
10. For Rx Clock, specify the port number to be used.
11. Select **Save.**

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

Configuring Protection

Egate-100 supports the following backup (protection) options to ensure continued operation in case of link failure, available in the Protection menu (see *Figure 4-29*):

- APS in 1+1 optimized bidirectional or uni-directional mode, for SDH/SONET links (available only in unit with STM-1/OC-3 interface)
- Gigabit Ethernet redundancy according to 803.2ad.

```
                              Egate-100
Main Menu> Configuration> System> Protection>

 1. APS                          >
 2. Ethernet Aggregation         >

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

Figure 4-29. Protection Menu, Unit with STM-1/OC-3 Interface

➤ **To configure APS:**

1. Navigate to Main Menu › Configuration › System › **Protection**.

The Protection menu appears.

2. From the Protection menu, choose **APS**.

   The APS menu appears as illustrated in *Figure 4-30*.

3. Enable **Protection**. To do so, select **Protection**, and then select **Yes**.

   Additional parameters appear as illustrated in *Figure 4-30*.

4. Configure APS parameters according to *Table 4-10*.

5. Select **Save**.

```
                              Egate-100
Main Menu> Configuration> System> Protection> APS

 1. Protection                    > (Yes)
 2. Mode                          > (1+1 optim. bidirectional)
 3. Working Port                  > (1)
 4. Wait to Restore (sec)[1-720]...(300)
 5. Command                       > (No Command)
 6. Flip upon SD                  > (No)

>
Please select item <1 to 6>
S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-30. APS Configuration Menu

Table 4-10. APS Parameters

Parameter	Description	Possible Values
Protection	Activate or deactivate APS protection **Default: No**	Yes No
Mode	APS mode **Default: 1+1 optimized bidirectional**	1+1 optimized bidirectional Uni-directional
Working Port	Port to receive data **Default: 1**	1 2
Wait to Restore (sec)	Number of seconds after link recovery before the next protection switch is possible. **Default: 300**	1 – 720
Command	• **Clear**. Removes the previous command. • **Lockout of Protection**. Prevents possible APS switching. • **Force Switch**. Moves the active link to the next port. This option is available for **1+1 Bi-Optimized Bidirectional** only. • **No Command**. This is the default until a command is selected.	Clear Lockout of Protection Force Switch
Flip upon SD	Whether the two ports flip in the event of signal	Yes

Parameter	Description	Possible Values
	degradation. Default: No	No

➤ To enable Gigabit Ethernet redundancy in unit with STM-1/OC-3 interface:

1. Navigate to Main Menu › Configuration › System › Protection.

   The Protection menu appears.

2. From the Protection menu, choose Ethernet Aggregation, and then choose Enable.

   The second Gigabit Ethernet port is ready to take over if the currently used one fails.

```
                              Egate-100
Main Menu> Configuration> System> Protection> Ethernet
Aggregation

 1. Aggregation                      > (Disable)

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

Figure 4-31. Ethernet Aggregation Menu, Unit with STM-1/OC-3 Interface

➤ To enable Gigabit Ethernet redundancy in unit with DS-3 interface:

1. Navigate to Main Menu › Configuration › System › Ethernet Aggregation.

   The Ethernet Aggregation menu appears.

2. Choose Enable.

   The second Gigabit Ethernet port is ready to take over if the currently used one fails.

```
                              Egate-100
Main Menu> Configuration> System> Ethernet Aggregation

 1. Aggregation                      > (Disable)

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

Figure 4-32. Ethernet Aggregation Menu, Unit with DS-3 Interface

Note *Gigabit Ethernet aggregation requires both Gigabit Ethernet ports be set to the same speed and to **Full Duplex**, with autonegotiation enabled. Both Gigabit Ethernet ports must have identical bridge port parameters (ingress filtering mode, port VID, etc.) and be members of the same VLAN.*

Configuring the Frame Buffers

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 Gigabit Ethernet and Host ports. See *Chapter 1* for additional information.

➤ **To configure buffer management:**

1. Navigate to Main Menu › Configuration › System › **Buffer Management**

   The Buffer Management menu appears (see *Figure 4-33*).

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 Gigabit Ethernet ports.

7. Select **HOST Max** to change the maximum number of buffers for host management.

➤ **To reset buffer management parameters:**

1. Navigate to Main Menu › Configuration › System › **Buffer Management**

   The Buffer Management menu appears as illustrated in *Figure 4-33*.

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

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

Figure 4-33. Buffer Management Menu

Table 4-11 Buffer Management Parameters

Parameter	Description	Possible Values
Traffic Class 0 Max	Maximum burst supported for a bridge port priority queue of traffic class 0 (highest priority) **Default: 100**	1–2500
Traffic Class 1 Max	Maximum burst supported for a bridge port priority queue of traffic class 1 **Default: 100**	1–2500
Traffic Class 2 Max	Maximum burst supported for a bridge port priority queue of traffic class 2 **Default: 100**	1–2500
Traffic Class 3 Max	Maximum burst supported for a bridge port priority queue of traffic class 3 (lowest priority) **Default: 100**	1–2500
Traffic Class 0 Total	Total burst supported for all bridge port priority queues of traffic class 0 (highest priority) **Default: 600**	1–2500
Traffic Class 1 Total	Total burst supported for all bridge port priority queues of traffic class 1 **Default: 600**	1–2500

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

Configuring the Syslog Parameters

Syslog enables you to forward log messages via UDP over the network to a receiving device, referred to as server from this point on.

➤ **To configure the Syslog parameters:**

1. From the System menu (**Configuration** > **System**), select **Syslog**.

   The Syslog menu is displayed (see *Figure 4-34*).

2. Configure the Syslog parameters according to *Table 4-12*.
3. Select **Save**.

```
                          Egate-100

Configuration> System> Syslog

 1. Device Logging Status      >   (Enabled)
 2. Device UDP Port [1-65535]  ... (514)
 3. Facility                   >   (Local 1)
 4. Severity Level             >   (Minor)
 5. Server Parameters          >

>
S-Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-34. Syslog Menu

Table 4-12. Syslog Parameters

Parameter	Description	Possible Values
Device logging status	Determines whether logging to the Syslog server is enabled or disabled. When disabled, Egate-100 logs the events internally. **Default: Disabled**	Enabled Disabled
Device UDP port	The local UDP port from which the Syslog messages are sent. **Default: 514** ***Note:*** *The port cannot be changed when the logging status is enabled.*	1–65535
Facility	Identifies the software module, task or function from which the Syslog messages are sent. **Default: Local 1**	Local 1 – Local 7
Severity level	Only events that their severity equals or exceeds the selected severity level are sent. **Default: Minor**	**Critical** – corresponds to the Emergency (0) severity level of Syslog **Major** – corresponds to the Alert (1) and Critical (2) severity levels of Syslog **Minor** – corresponds to the Error (3) severity level of Syslog **Warning** – corresponds to the Warning (4) severity level of Syslog **Event** – corresponds to the Notice (5) severity level of Syslog **Info** – corresponds to the Informational (6) severity level of Syslog **Debug** – corresponds to the Debug (7) severity level of Syslog.

➤ **To configure the Syslog server parameters:**

1. From the Syslog menu (Configuration › System › Syslog), select Server Parameters.

   The Server Parameters menu is displayed (see *Figure 4-35*).

2. Configure the Server parameters according to *Table 4-13*.
3. Select **Save**.

```
                          Egate-100

Configuration> System> Syslog >Server Parameters

    Server Sequence           ... (1)
    Server Access             >   (Disable)
 1. Server IP Address         ... (190.72.140.100)
 2. Server UDP Port[1-65535]  ... (514)

>
S-Save
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-35. Syslog Server Parameters Menu

Table 4-13. Syslog Server Parameters

Parameter	Description	Possible Values
Server Sequence	Server sequence number **Default: 1**	1–5
Server Access	Server access parameter **Default: Disabled**	Enabled Disabled
Server IP Address	IP address of the Syslog server to which the event logs are sent.	0.0.0.0 – 255.255.255.255
Server UDP Port	The UDP port of the Syslog server. **Default: 514** ***Note:*** *The port cannot be changed when the logging status is enabled.*	1–65535

Setting Physical Layer Parameters

Egate-100 has SDH/SONET or Channelized T3 ports, depending upon installation option, as well as Gigabit Ethernet ports. The SDH/SONET, T3, and Gigabit Ethernet configuration menus are accessed from the Physical Layer menu.

If you need to make a change to the configuration of SDH/SONET or T3 physical ports, you must first clear any mapping of these ports to the logical ports. The Egate-100 device provides a read-only mapping table that describes the SDH/SONET tributary mapping to physical E1/T1 ports (see *Figure 4-47* and *Figure 4-48*).

Configuring the SDH/SONET Ports

➤ **To configure SDH/SONET ports:**

1. Navigate to Main Menu › Configuration › **Physical Layer**.

   The Physical Layer menu appears as illustrated in *Figure 4-36*.

```
                              Egate-100
Main Menu> Configuration> Physical Layer

 1. Ethernet              >
 2. SDH/SONET             >

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

Figure 4-36. Physical Layer Menu (SDH/SONET)

2. From the Physical Layer menu, select **SDH/SONET**.

   The SDH/SONET menu appears as illustrated in *Figure 4-37*.

3. Configure the SDH/SONET Frame Type and Tx Clock. Refer to *Table 4-14* for additional information.
4. Configure **Administrative Status & Alarms** as explained on *page 4-38*.
5. Configure E1/T1 parameters as explained on *page 4-38*.
6. Configure SOH parameters as explained on *page 4-42*.
7. Configure HVC parameters as explained on *page 4-45*.
8. Configure LVC parameters as explained on *page 4-47*.

```
                              Egate-100

Configuration> Physical Layer> SDH/SONET

 1. Frame Type                          >    (SDH)
 2. Tx Clock                            >    (Loopback Timing)
 3. Administrative Status & Alarms      >
 4. Interval (15 minutes)[0-96]          ...(0)
 5. Mapping                             []
 6. E1/T1                               >
 7. SOH                                 >
 8. HVC                                 >f
 9. LVC                                 >

>
Please select item <1 to 8>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-37. SDH/SONET Menu

Table 4-14. SDH/SONET Port Parameters

Parameter	Description	Possible Values
Frame Type	The Egate-100 mode of operation: E1s o SDH or T1s o SONET. **Default: SDH**	SONET SDH
Tx Clock	Transmit clock source of the SDH/SONET port. **Default: Loopback Timing**	Internal Loopback Timing

Parameter	Description	Possible Values
Interval (15 minutes)[0-96]	15 minutes time interval in order to check the counters value **Default: 0**	0-96

➤ **To configure SDH/SONET administrative status and alarms:**

1. Navigate to Main Menu › Configuration › Physical Layer ›SDH/SONET › **Administrative Status & Alarms.**

   The Administrative Status & Alarms menu appears as illustrated in *Figure 4-38*.

```
                                Egate-100
...>Configuration>Physical Layer>SDH/SONET>Administrative Status & Alarms
 1. Port Number                  >   (1)
 2. Port Name                    >   (Port SDH-1)
 3. Administrative Status        >   (Up)
 4. Alarms                       >   (Unmasked)

Please select item <1 to 5>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-38. Administrative Status & Alarms Menu

2. Select **Port Number**, and then select the desired port number.
3. Select **Port Name**, and then select the desired port name.
4. Select **Administrative Status**, and then select **Up** or **Down** to enable or disable the SDH/SONET link respectively.
5. Select **Alarms** and specify whether to display (unmask) or to not display (mask) them.

Note *When the SDH/SONET Administrative Status is set to **Down**, the SYNC indicator (LED) is turned off.*

➤ **To configure SDH/SONET E1/T1:**

1. Navigate to Main Menu › Configuration › Physical Layer ›SDH/SONET › **E1/T1**.

   The E1/T1 menu appears as illustrated in *Figure 4-39*.

```
                          Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> E1/T1

 1. Port Number [1-63]              ... (5-12)
 2. Administrative Status           >   (Up)
 3. Frame Type                      >   (Unframed)
 4. Idle Code [0-ff]                ... (0)
 5. Alarms                          >   (Unmasked)
 6. Event Threshold                 []>

Please select item <1 to 6>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-39. SDH/SONET STM-1 E1/T1 Menu

2. Select an individual E1/T1 Port Number or a range of ports. You can map up to 63 E1s or 84 T1s (in case of E1 over VC12 or T1 over VT1.5).
   - To move to the next port, type **F**.
     To move to the previous port, type **B**.
3. Configure parameters for E1 according to *Table 4-15* or T1 according to *Table 4-16* respectively.

Table 4-15. SDH/SONET E1/T1 Parameters (E1)

Parameter	Remarks	Possible Values
Port Number	Parameters can be specified for an individual or range of ports.	1-63
Administrative Status	User-controlled activation of the port. **Default: Up**	Up Down
E1 Frame Type	Specifies the framing mode, including for Ethernet o fractional E1, if E1 is defined as framed. **Default: Unframed**	Unframed Framed-CRC4 Framed-NoCRC4
E1 Idle Code	E1 Idle code parameter. For E1 Framed only **Default: 01**	0-FF
E1 Alarms	Specifies whether to use masking or not. **Default: Unmasked**	Masked Unmasked

Table 4-16. SDH/SONET E1/T1 Parameters (T1)

Parameter	Remarks	Possible Values
Port Number	Parameters can be specified for an individual or range of ports.	1-84

Parameter	Remarks	Possible Values
Administrative Status	User-controlled activation of the port. **Default: Up**	Up (default) Down
T1 Frame Type	Specifies framing mode, including for Ethernet o fractional T1, if T1 is defined as framed. **Default: Unframed**	Unframed (default) Framed-ESF Framed-D4
T1 Idle Code	T1 Idle code parameter. For T1 Framed only **Default: 01**	0-FF
T1 Alarms	Specifies whether to use masking or not. **Default: Unmasked**	Masked Unmasked (default)

➤ To configure E1/T1 event threshold:

1. Navigate to Main Menu › Configuration › Physical Layer ›SDH/SONET › E1/T1 and select **Event Threshold.**

   The E1/T1 Event Threshold menu appears as illustrated in *Figure 4-40.*

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> >E1/T1
>Event Threshold (Port Number 1)
 Counter      Rising        Falling
 ES             (0)           (0)
 SES            (0)           (0)
 UAS            (0)           (0)
 FE-UAS         (0)           (0)
 FE-SES         (0)           (0)
 FE-UAS         (0)           (0)

 1. Change Cell [0-65535]
>
Please select item <1 to 1>
F - Forward; B - Backward
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-40. E1/T1 Event Threshold Menu

2. Configure event threshold parameters according to *Table 4-17.*

Table 4-17. E1/T1 Event Threshold Parameters

Parameter	Description	Possible Values
Counter	Displays the event threshold counter	**ES** - ES threshold value for sending event log and trap. **SES** – Number of severely errored seconds (SES) in the current interval. A second is considered to be a severely errored second if

Parameter	Description	Possible Values
		multiple error events of the types described for ES occurred. **UAS** – Number of unavailable seconds (UAS) in the current interval. An unavailable second is any second in which one or more SEF defects were detected. **FE-ES** – FE-ES threshold value for sending event log and trap. **FE-SES** – Number of far end severely errored seconds (FE-SES) in the current interval. A second is considered to be a severely errored second if multiple error events of the types described for ES occurred. **FE-UAS** – Number of far end unavailable seconds (FE-UAS) in the current interval. An unavailable second is any second in which one or more SEF defects were detected.
Rising	Specifies the alarm rising threshold. The selected event is triggered when the defined rising threshold is crossed. **Default: 0**	0-65535
Falling	Specifies the alarm falling threshold. The selected event is triggered when the defined falling threshold is crossed. **Default: 0**	0-65535

➤ **To configure SDH/SONET SOH:**

1. Navigate to Main Menu › Configuration › Physical Layer ›SDH/SONET › **SOH**.

   The SOH menu appears as illustrated in *Figure 4-41*.

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> SOH

 1. Port Number              >...(1)
 2. Path Trace                    (01)
 3. RS-TIM                   >    (Disable)
 4. Path Trace Padding            (Spaces)
 5. Alarms                   >    (Unmasked)
 6. Event Threshold               []>

Please select item <1 to 6>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-41. SDH/SONET SOH Menu

2. Configure SOH parameters according to *Table 4-18*.

Table 4-18. SDH/SONET SOH Parameters

Parameter	Description	Possible Values
Port Number	Parameters can be specified for an individual or range of ports.	1–2
Path Trace	Defines the J0 transmit path trace string **Default: 01**	01 (SDH) J0 – Tx Path (SONET)
RS-TIM	Defines whether to check the received J0 path trace **Default: Disable**	Enable Disable
Path Trace Padding	Defines the type of path trace padding used to fill the path trace length **Default: Spaces**	Spaces Null
Alarms	Section and Line Overhead alarms, per port. For each port, or range of ports, select the port number and specify whether to mask or unmask alarms. **Default: Unmasked**	Masked Unmasked

➤ **To configure SOH event threshold:**

1. Navigate to Main Menu › Configuration › Physical Layer ›SDH/SONET › SOH and select **Event Threshold.**

   The SOH Event Threshold menu appears as illustrated in *Figure 4-42.*

```
                                Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> >SOH
>Event Threshold (Port Number 1)
 Counter              Rising       Falling
 Section ES             (0)           (0)
 Section SES            (0)           (0)
 Section SEFS           (0)           (0)
 Section CV             (0)           (0)
 Line ES                (0)           (0)
 Line SES               (0)           (0)
 Line CV                (0)           (0)
 Line UAS               (0)           (0)
 FE-Line ES             (0)           (0)
 FE-Line SES            (0)           (0)
 FE-Line CV             (0)           (0)
 FE-Line UAS            (0)           (0)

 1. Change Cell [0-65535]
 >
Please select item <1 to 1>
F - Forward; B - Backward
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-42. SOH Event Threshold Menu

2. Configure event threshold parameters according to *Table 4-19.*

Table 4-19. SOH Event Threshold Parameters

Parameter	Description	Possible Values
Counter	Displays the event threshold counter	**Section ES** – Section ES threshold value for sending event log and trap **Section SES** – Number of section severely errored seconds (SES) in the current interval. A second is considered to be a severely errored second if multiple error events of the types described for ES occurred. **Section SEFS** - Number of section severely errored frame seconds (SEFS) in the current interval. A second is considered to be a severely errored second if multiple error events of the types described for SEFS occurred. SEFSs are not incremented during unavailable seconds. **Section CV** - Number of section coding violations (CV) in the current interval: a coding violation is declared when a Bit Interleaved Parity (BIP) error is detected in the incoming signal. The BIP information is collected using the B1 byte in the Section Overhead. **Line ES** – Line ES threshold value for sending event log and trap. **Line SES** – Number of line severely errored

Parameter	Description	Possible Values
		seconds (SES) in the current interval. A second is considered to be a severely errored second if multiple error events of the types described for ES occurred. **Line CV** - Number of line coding violations (CV) in the current interval: a coding violation is declared when a Bit Interleaved Parity (BIP) error is detected in the incoming signal. The BIP information is collected using the B1 byte in the Section Overhead. **Line UAS** – Number of line unavailable seconds (UAS) in the current interval. An unavailable second is any second in which one or more SEF defects were detected. **FE-Line ES** – FE-Line ES threshold value for sending event log and trap. **FE-Line SES** – Number of far end line severely errored seconds (SES) in the current interval. A second is considered to be a severely errored second if multiple error events of the types described for ES occurred. **FE-Line CV** - Number of far end line coding violations (CV) in the current interval: a coding violation is declared when a Bit Interleaved Parity (BIP) error is detected in the incoming signal. The BIP information is collected using the B1 byte in the Section Overhead. **FE-Line UAS** – Number of far end line unavailable seconds (UAS) in the current interval. An unavailable second is any second in which one or more SEF defects were detected.
Rising	Specifies the alarm rising threshold. The selected event is triggered when the defined rising threshold is crossed **Default: 0**	0-65535
Falling	Specifies the alarm falling threshold. The selected event is triggered when the defined falling threshold is crossed **Default: 0**	0-65535

➤ **To configure SDH/SONET HVC:**

1. Navigate to Main Menu › Configuration › Physical Layer ›SDH/SONET › **HVC**.

   The HVC menu appears as illustrated in *Figure 4-43*.

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> HVC

 1. Port Number                ... (1)
 2. STS-1 Number               >   (1)
 3. Path Trace                     (J1-Tx Path)
 4. Payload Label [0 - ff]     ... (02)
 5. Path Trace Padding             (Spaces)
 6. HVC-TIM                    >   (Disable)
 7. Alarms                     >   (Unmasked)
 8. Event Threshold            []>

Please select item <1 to 8>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-43. SDH/SONET HVC Menu

2. Configure HVC parameters according to *Table 4-18*.

Table 4-20. SDH/SONET HVC Parameters

Parameter	Description	Possible Values
Port Number		1–2
STS-1 Number	Defines the number of STS1 in a specific SONET link **Default: 1**	1-3
Path Trace	Defines the J1 transmit path trace string **Default: J1-Tx Path**	15 Characters (SDH) 62 Characters (SONET)
Payload Label	Defines the payload label to attach to packets **Default: 01**	00 – FF
Path Trace Padding	Defines the type of path trace padding used to fill the path trace length **Default: Spaces**	Spaces Null
HVC-TIM	Defines whether to check the received J1 path trace **Default: Disable**	Enable Disable

Parameter	Description	Possible Values
Alarms	High VC level alarms. For SDH: per port For SONET: Per VC3 per port For each port, or range of ports, select the port number and specify whether to mask or unmask alarms **Default: Unmasked**	Masked Unmasked (default)

➤ **To configure HVC event threshold:**

1. Navigate to Main Menu › Configuration › Physical Layer ›SDH/SONET › HVC and select **Event Threshold.**

   The HVC Event Threshold menu appears as illustrated in *Figure 4-44.*

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> >HVC
>Event Threshold (Port Number 1)
 Counter              Rising        Falling
 Path ES                (0)           (0)
 Path SES               (0)           (0)
 Path CV                (0)           (0)
 Path UAS               (0)           (0)
 FE-Line ES             (0)           (0)
 FE-Line SES            (0)           (0)
 FE-Line CV             (0)           (0)
 FE-Line UAS            (0)           (0)

 1. Change Cell [0-65535]
 >
Please select item <1 to 1>
F - Forward; B - Backward
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-44. HVC Event Threshold Menu

2. Configure event threshold parameters according to *Table 4-21.*

Table 4-21. HVC Event Threshold Parameters

Parameter	Description	Possible Values
Counter	Displays the event threshold counter	**Path ES** – Path ES threshold value for sending event log and trap **Path SES** – Number of path severely errored seconds (SES) in the current interval. A second is considered to be a severely errored second if multiple error events of the types described for ES occurred. **Path CV** - Number of path coding violations (CV) in the current interval: a coding violation is declared when a Bit Interleaved Parity (BIP)

Parameter	Description	Possible Values
		error is detected in the incoming signal. The BIP information is collected using the B1 byte in the Section Overhead. **Path UAS** – Number of path unavailable seconds (UAS) in the current interval. An unavailable second is any second in which one or more SEF defects were detected. **FE-Path ES** – FE-Path ES threshold value for sending event log and trap **FE-Path SES** – Number of far end path severely errored seconds (SES) in the current interval. A second is considered to be a severely errored second if multiple error events of the types described for ES occurred. **FE-Path CV** - Number of far end path coding violations (CV) in the current interval: a coding violation is declared when a Bit Interleaved Parity (BIP) error is detected in the incoming signal. The BIP information is collected using the B1 byte in the Section Overhead. **FE-Path UAS** – Number of far end path unavailable seconds (UAS) in the current interval. An unavailable second is any second in which one or more SEF defects were detected.
Rising	Specifies the alarm rising threshold. The selected event is triggered when the defined rising threshold is crossed **Default: 0**	0-65535
Falling	Specifies the alarm falling threshold. The selected event is triggered when the defined falling threshold is crossed **Default: 0**	0-65535

➤ **To configure SDH/SONET LVC:**

1. Navigate to Main Menu › Configuration › Physical Layer ›SDH/SONET › **LVC**.

The LVC menu appears as illustrated in *Figure 4-45*.

```
                          Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> LVC

 1. LVC Number [1-63]       ... (1)
 2. Payload Label           ... (Asynchronous)
 3. Path Trace                  (J2-Tx Path)
 4. LVC-TIM                 >   (Disable)
 5. Path Trace Padding          (Spaces)
 6. Alarms                  >   (Unmasked)
 7. Event Threshold          []>

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

Figure 4-45. SDH/SONET LVC Menu

2. Configure LVC parameters according to *Table 4-22*.

Table 4-22. SDH/SONET LVC Parameters

Parameter	Description	Possible Values
LVC Number		1–2
Payload Label	Defines the payload label for packets **Default: Asynchronous**	Unequipped Equipped Asynchronous Bit Synchronous Byte Synchronous Extended Signal Label Test Label VC—AIS
Path Trace	Defines the J2 transmit path trace string **Default: J2 – Tx Path**	15 Characters (SDH) 62 Characters (SONET)
LVC-TIM	Defines whether to check the received J2 path trace **Default: Disable**	Enable Disable
Path Trace Padding	Defines the type of path trace padding used to fill the path trace length **Default: Spaces**	Spaces Null

Parameter	Description	Possible Values
Alarms	Low VC level, per VC12 or VT1.5 link. Range of links can be set. For VC12: 1-63; For VT1.5: 1-84 For each port, or range of ports, select the port number and specify whether to mask or unmask alarms **Default: Unmasked**	Masked Unmasked

➤ To configure LVC event threshold:

1. Navigate to Main Menu › Configuration › Physical Layer ›SDH/SONET › LVC and select **Event Threshold**.

   The LVC Event Threshold menu appears as illustrated in *Figure 4-46.*

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> >LVC
>Event Threshold (LVC Number 1)
 Counter              Rising        Falling
 Trib ES                (0)           (0)
 Trib SES               (0)           (0)
 Trib CV                (0)           (0)
 Trib UAS               (0)           (0)
 FE-Trib ES             (0)           (0)
 FE-Trib SES            (0)           (0)
 FE-Trib CV             (0)           (0)
 FE-Trib UAS            (0)           (0)

 1. Change Cell [0-65535]
 >
Please select item <1 to 1>
F - Forward; B - Backward
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-46. LVC Event Threshold Menu

2. Configure event threshold parameters according to *Table 4-23.*

Table 4-23. LVC Event Threshold Parameters

Parameter	Description	Possible Values
Counter	Displays the event threshold counter	**Trib ES** – Trib ES threshold value for sending event log and trap. **Trib SES** – Number of tributary severely errored seconds (SES) in the current interval. A second is considered to be a severely errored second if multiple error events of the types described for ES occurred. **Trib CV** - Number of tributary coding violations (CV) in the current interval: a coding violation is declared when a Bit Interleaved Parity (BIP)

Parameter	Description	Possible Values
		error is detected in the incoming signal. The BIP information is collected using the B1 byte in the Section Overhead. **Trib UAS** – Number of tributary unavailable seconds (UAS) in the current interval. An unavailable second is any second in which one or more SEF defects were detected. **FE-Trib ES** – FE-Trib ES threshold value for sending event log and trap. **FE-Trib SES** – Number of far end tributary severely errored seconds (SES) in the current interval. A second is considered to be a severely errored second if multiple error events of the types described for ES occurred. **FE-Trib CV** - Number of far end tributary coding violations (CV) in the current interval: a coding violation is declared when a Bit Interleaved Parity (BIP) error is detected in the incoming signal. The BIP information is collected using the B1 byte in the Section Overhead. **FE-Trib UAS** – Number of far end tributary unavailable seconds (UAS) in the current interval. An unavailable second is any second in which one or more SEF defects were detected.
Rising	Specifies the alarm rising threshold. The selected event is triggered when the defined rising threshold is crossed **Default: 0**	0-65535
Falling	Specifies the alarm falling threshold. The selected event is triggered when the defined falling threshold is crossed **Default: 0**	0-65535

➤ **To view SDH/SONET Mapping:**

- Navigate to Main Menu > Configuration > Physical Layer >SDH/SONET > **Mapping**.

  The SDH/SONET Mapping menu appears as illustrated in *Figure 4-47* and *Figure 4-48* for SDH and SONET respectively. It shows the mapping between the E1/T1 ports and the STM channels.

```
                                Egate-100
Configuration> Physical Layer> SDH/SONET> Mapping (SDH)

             TUG3 1              TUG3 2              TUG3 3
        TU1  TU2  TU3       TU1  TU2  TU3       TU1  TU2  TU3
 TUG2-1 1    22   43        2    23   44        3    24   45
 TUG2-2 4    25   46        5    26   47        6    27   48
 TUG2-3 7    28   49        8    29   50        9    30   51
 TUG2-4 10   31   52        11   32   53        12   33   54
 TUG2-5 13   34   55        14   35   56        15   36   57
 TUG2-6 16   37   58        17   38   59        18   39   60
 TUG2-7 19   40   61        20   41   62        21   42   63
>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 4-47. SDH Mapping

```
                                Egate-100
Configuration> Physical Layer> SDH/SONET> Mapping (SONET)

             STS1 1                   STS1 2                   STS1 3
        TU1  TU2  TU3  TU4       TU1  TU2  TU3  TU4       TU1  TU2  TU3  TU4
 TUG2-1 1    8    15   22        29   36   43   50        57   64   71   78
 TUG2-2 2    9    16   23        30   37   44   51        58   65   72   79
 TUG2-3 3    10   17   24        31   38   45   52        59   66   73   80
 TUG2-4 4    11   18   25        32   39   46   53        60   67   74   81
 TUG2-5 5    12   19   26        33   40   47   54        61   68   75   82
 TUG2-6 6    13   20   27        34   41   48   55        62   69   76   83
 TUG2-7 7    14   21   28        35   42   49   56        63   70   77   84
>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 4-48. SONET Mapping

Configuring the Channelized T3 Ports

➤ To configure channelized T3 ports:

1. Navigate to Main Menu > Configuration > **Physical Layer**.

   The Physical Layer menu appears as illustrated in *Figure 4-49*.

```
                          Egate-100
Main Menu> Configuration> Physical Layer

 1. T3                              >
 2. Ethernet                        >
 3. Interval (15 minutes)[0-96]     >

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

Figure 4-49. Physical Layer Menu (T3)

2. From the Physical Layer menu, select **T3**.

The T3 menu appears as illustrated in *Figure 4-50*.

3. Specify the number of the port you wish to configure.
4. Configure T3 parameters according to *Table 4-24*.
5. Configure T1 channels according to *Table 4-25*.
6. Repeat this procedure for the additional T3 ports as relevant.

```
                              Egate-100

Configuration> Physical Layer> T3

 1. Port Number [1 - n]              ...(1)
 2. Port Name                       >   (Port T3-1)
 3. Administrative Status           >   (Up)
 4. Transmit Clock Source           >   (Internal)
 5. Line type                       >   (M23)
 6. Line length                     >   (Short)
 7. Alarms                          >   (Unmasked)
 8. Event Threshold                 >
 9. T1                              >

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

Figure 4-50. T3 Port Menu

Table 4-24. T3 Port Parameters

Parameter	Description	Possible Values
Port Number	Number of the T3 port to be configured	1-3
Port Name	Index identifying the port	Port T3-1 for port 1 Port T3-2 for port 2 Port T3-4 for port 3
Administrative Status	User-controlled activation of the T3 port **Default: Up**	Up Down
Transmit Clock Source	Transmit clock source of the T3 port **Default: Internal**	Loopback Timing Internal
Line Type	T3 frame type **Default: M23**	M13 M23 C-Bit
Line Length	T3 line length: Short – Up to 255 feet (77.7 meters) Long – Over 255 feet (77.7 meters) **Default: Short**	Short Long
Alarms	Specifies whether to use masking or not. **Default: Unmasked**	Masked Unmasked

Parameter	Description	Possible Values
T1	Submenu. Refer to *Figure 4-51*	

➤ **To configure individual T1 port parameters:**

1. Navigate to Main Menu › Configuration › Physical Layer › T3 › **T1.**

   The T1 menu appears as illustrated below.

```
                                        Egate-100
Configuration> Physical Layer> T3> T1

 1. Port Number[1 - 28]            ... (1)
 2. Administrative Status          >   (Up)
 3. Frame Type                     >   (Unframed)
 4. Idle code[0 - ff]               ...(5)
 5. Alarms                         >   (Unmasked)
>
Please select item <1 to 4>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-51. Individual T1 Menu

2. Configure the T1 channel according to *Table 4-25*.

Table 4-25. Individual T1 Parameters

Parameter	Description	Possible Values
Port Number	Number of the T1 port to be configured. Each T3 port corresponds to 28 T1 ports, e.g. if the first T3 port has been selected then only T1 ports 1 – 28 can be configured	1 – 84, depending on selected T3 port
Administrative Status	User-controlled activation of the T1 port **Default: Up**	Up Down
Frame Type	T1 frame type **Default: Unframed**	Unframed D4 ESF
Idle Code	Idle code This parameter is available for framed T1 only. **Default: 01**	0 - ff
Alarms	Specifies whether to use masking or not. **Default: Unmasked**	Masked Unmasked

Configuring the Ethernet Ports

Egate-100 provides two Gigabit Ethernet ports. You can use the second port as a backup to ensure that the unit continues operating if the first port fails. For instructions on enabling Gigabit Ethernet redundancy, refer to *Configuring Protection*. The device also contains a Fast Ethernet management port.

➤ **To configure the Ethernet ports:**

1. Navigate to Main Menu › Configuration › Physical Layer › **Ethernet**.

   The Ethernet menu appears as illustrated in *Figure 4-52*.

2. Under **Port**, specify the desired Gigabit Ethernet link or the management Ethernet port.

   The relevant Ethernet port parameters appear.

3. Specify the Ethernet port parameters according to *Table 4-26*.

4. Select **Save**.

```
                          Egate-100
Main Menu> Configuration> Physical Layer> Ethernet

 1. Port                   >   (GbE-1)
 2. Port Name              >   (Port GbE)
 3. Administrative Status  >   (Up)
 4. Auto Negotiation       >   (Disabled)
 5. Speed & Duplex         >   (100BaseT Full Duplex)
 6. Alarms                 >   (Unmasked)

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

Figure 4-52. Ethernet Physical Port Menu – Autonegotiation Disabled

```
                          Egate-100
Main Menu> Configuration> Physical Layer> Ethernet

 1. Port                        >   (GbE-1)
 2. Port Name                   >   (G-ETH Port 1)
 3. Administrative Status       >   (Up)
 4. Auto Negotiation            >   (Enabled)
 5. Max. Capability Advertised  >   (1000BaseT Full Duplex)
 6. Alarms                      >   (Unmasked)

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

Figure 4-53. Gigabit Ethernet Physical Port Menu – Autonegotiation Enabled

Table 4-26. Gigabit Ethernet Port Parameters

Parameter	Description	Possible Values
Port	Choose the desired Ethernet port **Default: GbE-1**	GbE-1 GbE-2 ETH MNG
Port Name	Choose the desired Ethernet port name	Port GbE-1 Port GbE-2 Port ETH-MNG
Administrative Status	Defines if port is available for operation **Default: Down**	Up Down
Name	String identifying the port	String of characters
Auto Negotiation	Enabling autonegotiation allows for automatic determination of the speed and duplex mode. For 1000BaseT, autonegotiation is mandatory and enabled by default. Autonegotiation is also mandatory for Gigabit Ethernet redundancy **Default: Disabled**	Enabled Disabled
Speed & Duplex	Appears if **Auto Negotiation** is **disabled**: The speed can be 10/100BaseT at full duplex or half duplex. For Gigabit Ethernet redundancy, both links must be set to the same speed and to **Full Duplex**.	10 Mbps Half Duplex 10 Mbps Full Duplex 100 Mbps Half Duplex 100 Mbps Full Duplex
Ethernet Max Capability Advertised	Appears if **Auto Negotiation** is **enabled** and the Port is not ETH MNG: Define the maximum speed and duplex mode. The system will not exceed the speed you specified even if the ports were able to negotiate a faster speed.	10 Mbps Half Duplex 10 Mbps Full Duplex 100 Mbps Half Duplex 100 Mbps Full Duplex 1000 Mbps Full Duplex
Alarms	Mask Gigabit Ethernet alarms **Default: Unmasked**	Masked Unmasked (default)

Configuring Logical Layer Parameters

Logical port configuration includes the definition of the protocol for each physical E1/T1 port. After a logical port is defined, it is bound to a bridge port, and bridge port properties are configured.

Logical ports can be used to define one or more of the following:

- Ethernet over HDLC over E1/T1

- PPP/BCP (PPP over HDLC)
- Ethernet over MLPPP over n x E1/T1
- GFP (non-VCAT, non-LCAS). You can configure whether Egate-100 expects GFP frames to have VCAT headers, to enable interoperability with devices that do not support G.8040, such as MiRIC.
- GFP (VCAT LCAS)
- Virtual Concatenation Group (VCG).

In order to define an MLPPP (multi-link PPP) logical port, you must first define a set of PPP logical ports over E1/T1, and then attach (bind) up to eight such PPP logical ports to the MLPPP port. The MLPPP port is then bound to a bridge port.

In order to define a GFP (VCAT LCAS) port, you must first define a VCG logical port over E1/T1, and then attach (bind) the VCG logical port to the GFP port. The GFP port is then bound to a bridge port.

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

Configuring Logical Ports

➤ To configure the logical ports:

1. Navigate to Main Menu > Configuration > **Logical Layer**

   The Logical Layer menu appears.

2. From the Logical Layer menu, select **Logical Port**.

   The Logical Port menu (E1 or T1) appears as illustrated in *Figure 4-54* through *Figure 4-60*, according to the selected protocol type.

```
                          Egate-100
Main Menu> Configuration> Logical Layer> Logical Port

 1. Port Number[1 - 144]          ... (5)
 2. Port Name                     ... (Central)
 3. Protocol Type                 >   (HDLC)
 4. Physical Port Number[1 - 84]  ... (5)
 5. HDLC Flags[1-7]               ... (1)
 6. Alarms                        >   (Unmasked)
 7. Queue Profile Name            ... ()

Please select item <1 to 5>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-54. Logical Port Menu – HDLC (E1)

```
                          Egate-100

Main Menu> Configuration> Logical Layer> Logical Port

 1. Port Number[1 - 144]          ... (1)
 2. Port Name                     ... (Logical Port 1)
 3. Protocol Type                 >   (PPPoHDLC)
 4. Physical Port Number[1 - 84]  ... (1)
 5. Address & Control Compression >   (On)
 6. Protocol Field Compression    >   (On)
 7. HDLC Flags[1-7]               ... (1)
 8. Alarms                        >   (Unmasked)
 9. Queue Profile Name            ... ()

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

Figure 4-55. Logical Port Menu – PPP over HDLC (E1)

```
                          Egate-100

Configuration> Logical Layer> Logical Port

 1. Port Number[1 - 144]          ... (3)
 2. Port Name                     ... (Logical Port 3)
 3. Protocol Type                 >   (PPPoHDLC)
 4. Physical Port Number[1 - 84]  ... (1)
 5. Active Timeslots              >   (1-24)
 6. Address & Control Compression >   (Off)
 7. Protocol Field Compression    >   (Off)
 8. HDLC Flags[1-7]               ... (1)
 9. Alarms                        >   (Unmasked)
10. Queue Profile Name            ... ()
>
Please select item <1 to 6>
F - Forward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-56. Logical Port Menu – PPP over HDLC (T1)

```
                          Egate-100

Configuration> Logical Layer> Logical Port

 1. Port Number[1 - 144]          ... (85)
 2. Port Name                     ... (Logical Port 85)
 3. Protocol Type                 >   (MLPPP)
 4. Bind Logical Ports            >   (1-8)
 5. Protocol Field Compression    >   (Off)
 6. BCP Tagged Frames             >   (Enable)
 7. MTU(bytes)                    >   (0)
 8. Alarms                        >   (Unmasked)
 >
Please select item <1 to 6>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-57. Logical Port Menu – MLPPP

```
                          Egate-100

Configuration> Logical Layer> Logical Port

 1. Port Number [1 - 144]         ... (65)
 2. Port Name                     ... (Logical Port 65)
 3. Protocol Type                 >   (GFP)
 4. Multi Link                    >   (No)
 5. Physical Port Number [1 - 84] ... (1)
 6. VCAT header                   >   (Enable)
 7. Payload FCS                   >   (Disable)
 8. Payload Scrambler             >   (Enable RX/TX)
 9. Alarms                        >   (Unmasked)
10. Queue Profile Name            ... ()
>
Please select item <1 to 8>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-58. Logical Port Menu – GFP, non-VCAT, non-LCAS

```
                          Egate-100

Configuration> Logical Layer> Logical Port

 1. Port Number[1 - 144]          ... (48)
 2. Port Name                     ... (Logical Port 48)
 3. Protocol Type                 >   (GFP)
 4. Multi Link                    >   (Yes)
 5. Bind Logical Port             >   (47)
 6. Payload FCS                   >   (Disable)
 7. Payload Scrambler             >   (Enable RX/TX)
 8. TX Extension Header ID        >   (Null Header)
 9. Alarms                        >   (Unmasked)
10. Queue Profile Name            ... ()
>
Please select item <1 to 7>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-59. Logical Port Menu – GFP, VCAT, LCAS

```
                          Egate-100

Configuration> Logical Layer> Logical Port

 1. Port Number [1 - 144]              ...  (75)
 2. Port Name                          ...  (Logical Port 75)
 3. Protocol Type                      >    (VCG)
 4. Bind Physical Ports                ...  (1)
 5. Edit Bind Physical List            >
 6. Wait to Restore (sec) [0 - 720]    >    (244)
 7. Hold Off (msec) [0 - 1000]         >    (100)
 8. Alarms                             >    (Unmasked)
 >
Please select item <1 to 9>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-60. Logical Port Menu – VCG

3. In the Logical Port menu, configure the parameters according to *Table 4-27*.
4. Select **Save** to finish the logical port configuration.

➤ **To configure the physical port list for VCG protocol type:**

1. In the Logical Port menu, select **Edit Bind Physical List**.

   The Edit Bind Physical List menu appears as illustrated in *Figure 4-61*. It displays the physical port(s) associated with the logical port, and allows you to add or delete ports.

```
                              Egate-100

Configuration> Logical Layer> Logical Port> Edit Bind Physical
List

    Physical Port List of VCG           ...  1
 1. Add physical port to VCG            ...  (-)
 2. Delete physical port from VCG       >    (-)
>
Please select item <1 to 8>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-61. Edit Bind Physical List Menu for VCG

2. To add a physical port to the VCG, select **Add physical port to VCG**.
3. To remove a physical port, select **Delete physical port from VCG**.

Table 4-27 Logical Port Parameters

Parameter	Description	Possible Values
Port Number	Logical port number	1 - 144
Port Name	Descriptive name for the logical port **Default: Logical Port [port #]**	String of up to 20 characters
Protocol Type	Traffic protocol type: PPP o HDLC for multiple E1/T1; MLPPP (up to eight of type PPP for each MLPPP); GFP (VCAT LCAS or non-VCAT non-LCAS) VCG **Default: HDLC**	HDLC PPP o HDLC MLPPP GFP VCG
Physical Port Number	For non- MLPPP: Number of the physical port to which the logical port is mapped	1 - 63 (E1) 1 - 84 (T1)
Address and Control Compression	For PPP over HDLC: Specifies whether address and control compression is on or off	On Off
Protocol Field Compression	For PPP over HDLC: Specifies whether protocol field compression is on or off	On Off
BCP Tagged Frames	For MLPPP: Specifies, during BCP negotiation, whether VLAN tag is enabled or disabled.	Enable Disable
Active Timeslots	For non-GFP, if selected physical port is framed: The fractional E1 or T1 active timeslots that carry traffic regarding the logical port **Default: None**	None (default) 1 - 31 or list (E1) 1 - 24 or list (T1)
Bind Logical Ports	For MLPPP: Numbers of the PPPoHDLC logical ports comprising the MLPPP bundle	1 - 8 or list

Parameter	Description	Possible Values
MTU(bytes)	For MLPPP: Maximum Transmission Unit, in bytes, to allow fragmentation for low reassembly delay. Selecting 0 means that there is no fragmentation **Default: 0**	0 (default) 64, 128 256 512 1024
Multi Link	For GFP: Specifies single or multi VCAT LCAS mode No: single GFP (non-VCAT non-LCAS) Yes: multi VCAT LCAS	No Yes
Bind Logical Port	For GFP (VCAT LCAS): Port number of VCG logical port to attach to the GFP port	1 - 8 or list
Payload FCS	For GFP: Specifies whether Payload FCS is enabled or disabled. If you want to minimize bandwidth, it is recommended to not use this option as the original CRC32 of the Ethernet packet is transferred when the packet is encapsulated into GFP	Enable Disable
Payload Scrambler	For GFP: Specifies whether transmission scrambler is enabled or disabled **Default: Disable**	Disable Enable Rx/Tx Enable Rx Enable Tx
TX Extention Header ID	For GFP: Specifies whether hardware loop detection on the physical layer (harware loop detection) is enabled or disabled. Null Header (default) – disabled Linear Header – enabled	Null Header (default) Linear Header ***Note**: This parameter requires VCAT support, which is implemented for hardware version 01-C or higher.*
VCAT Header	For GFP (non-VCAT non-LCAS): Specifies whether VCAT header is expected in frames. Disable – Egate-100 eliminates the VCAT header from transmitted frames and does not expect VCAT header in received frames. Enable - Egate-100 adds VCAT header to transmitted frames and expects VCAT header in received frames	Disable Enable
Bind Physical Ports	For VCG: Numbers of the physical ports comprising the virtual concatenation group.	1 - 28 or list
Edit Bind Physical List	For VCG: Opens submenu to edit list of physical ports comprising the virtual concatenation group. This is available after the logical port is saved for the first time.	

Parameter	Description	Possible Values
Wait To Restore	For VCG: Specifies how long Egate-100 does not change its settings after it detects that an error no longer exists	0 - 720
Hold Off	For VCG: Specifies how long long Egate-100 does not change its settings after it detects an error. After this timeout, Egate-100 checks for the error, and if it still exists then it changes its settings	0 - 1000
HDLC Flags	Number of flags/bytes which are inserted between the frames in order to delay and therefore decrease the rate of frames. At least one flag must be used.	1 - 7
Alarms	Specifies if alarms are unmasked or masked **Default: Unmasked**	Unmasked Masked
Queue Profile Name	The profile of the queue used by this logical port	

Configuring the Service Virtual Interface (SVI)

The Service Virtual Interface (SVI) acts as a virtual port. A virtual port can be used to bind the Gigabit Ethernet to a bridge port when working with flows. Each flow has an ingress point (GbE1 or GbE2) and an egress port. In this case, the egress port can be a virtual port (SVI-1 or SVI-2).

Note *Utilizing a service virtual interface (SVI) is the only way to bind the Gigabit Ethernet to the Bridge port when using flows.*

➤ **To define the service virtual interface:**

1. Navigate to Main Menu › Configuration › **Logical Layer**

   The Logical Layer menu appears.

2. From the Logical Layer menu, select **Service Virtual Interface**.

   The Service Virtual Interface menu appears as illustrated in *Figure 4-62*.

3. In the Service Virtual Interface, configure the parameters according to *Table 4-28*.

```
                              Egate-100
Main Menu> Configuration> Logical Layer> Service Virtual
Interface

 1. Port Number[1 - 2]            ... (1)
 2. Port Name                     ... (SVI-1)

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

Figure 4-62. Service Virtual Interface Menu

Table 4-28. Service Virtual Interface Parameters

Parameter	Description	Possible Values
Port Number	Defines the egress port number **Default: 1**	1-2
Port Name	Defines the port name	SVI-1 SVI-2

Configuring the Bridge

The configuration of the Egate-100 internal bridge involves setting global parameters for the bridge (VLAN-Aware/Unaware, aging, VLAN identification, and VLAN loop detection) and assigning and configuring bridge ports. Configuration of the bridge is performed via the Applications menu.

Note *If the application is set to Flows Support, the bridge parameters are inaccessible. For information about configuring Flow Support, see Quick Start Guide.*

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

For a detailed explanation of Egate-100's bridge, refer to *Chapter 1*. For information on configuration parameters, refer to *Table 4-29*.

➤ **To configure the internal bridge:**

1. Navigate to Main Menu › Configuration › Applications › **Bridge**.

   The Bridge menu appears as illustrated in *Figure 4-63*.

2. From the Bridge menu, configure the parameters as specified in *Table 4-29*.
3. If you set the bridge to VLAN-aware mode, define **VLAN Membership** as described in *Configuring VLAN Membership*.

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

 1. VLAN Mode                        >    (Aware)
 2. Aging Time (Sec)[30 - 10000]     ...  (300)
 3. Split Horizon                    >    (Disabled)
 4. Vlan Ethertype (HEX)             ...  (8100)
 5. Loop Detection                    ... (Enable)
 6. Vlan Loop Detection [1 - 4094]   ...  (1)
 7. Static MAC Table                 []   >
 8. Remote Terminal                       (Enable)
 9. Bridge Port for Remote Terminal       (100)
10. Bridge Ports                     >
11. VLAN Membership                  >

Please select item <1 to 10>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-63. Bridge Menu

Table 4-29 Bridge Parameters

Parameter	Description	Possible Values
VLAN Mode	Specifies the VLAN mode: • **Aware.** Forwarding is based on VLAN and MAC address. The bride operates according to 802.1Q. If enabled, **VLAN Membership** becomes available. • **Unaware.** Forwarding is based on the MAC address only. The bridge operates according to 802.1D **Default: Unaware**	Unaware Aware
Aging Time	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**	30–10000 seconds

Parameter	Description	Possible Values
Split Horizon	Split Horizon: • Prevents switching packets between bridge ports bound to logical ports. • If the VLAN mode is set to **VLAN Aware** and **Split Horizon** is set to **Based VLAN**, you have to to enable or disable **Split Horizon** for each VLAN separately. This prevents frames tagged with a VLAN ID from being switched between the bridge ports that are members of this VLAN. To enable or disable Split Horizon for a specific VLAN, navigate to Bridge Port in the VLAN Membership menu **Default: Disable**	Disable Enable Based VLAN
Vlan Ethertype	Egate-100 uses the Ethertype value to identify and tag VLAN tagged frames **Default: 8100**	Any HEX value
Loop Detection	Specifies whether loop detection is enabled for the bridge. For loop detection message to be sent, you must enable loop detection on a bridge port **Default: Disable**	Disable Enable
Vlan Loop Detection	Specifies the VLAN ID of the loop-detection frame This parameter appears in the menu only if Loop Detection is enabled **Default: 1**	1–4094
Static MAC Table	Refer to *Configuring the MAC Table*.	
Remote Terminal	Enables viewing the terminal of the remote device This parameter appears only if OAM is enabled on a bridge port and the discovery process has completed **Default: Disable**	Disable Enable
Bridge Port for Remote Terminal	Specifies the bridge port to user for the remote termnial This parameter appears only if Remote Terminal is enabled **Default: 1**	1–130
Bridge Ports	Refer to *Configuring the Bridge Ports*.	

Parameter	Description	Possible Values
VLAN Membership	• Refer to *Configuring VLAN Membership.* • This parameter becomes available if the VLAN mode is **VLAN Aware**.	

Configuring the 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. Navigate to Main Menu › Configuration › Applications › **Bridge**, and then select **Static MAC Table**.

   The Static MAC Table appears as illustrated in *Figure 4-64*.

```
                          Egate-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 4-64. Static MAC Table

2. In the Static MAC Table, type **A**.

   The Static MAC Table switches to the Add mode as illustrated in *Figure 4-65*.

```
                          Egate-100
Configuration> Applications> Bridge> Static MAC Table

 1. VLAN Number                    > ()
 2. MAC Address                    > (0.0.0.0)
 3. Received Bridge Port           > ()

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

Figure 4-65. Static MAC Table, Add Menu (Aware Bridge)

3. In Add mode, configure the MAC Table parameters according to *Table 4-30*.
4. Select **Save**.

Table 4-30 MAC Table Parameters.

Parameter	Description	Possible Values
VLAN Number	VLAN of the traffic for this table entry This parameter can be set in VLAN-Aware mode only **Default: 0**	1-4094
MAC Address	MAC address from which traffic is received **Default: 00 00 00 00 00**	
Received Bridge Port	Number of the bridge port used for traffic of this table entry.	2-130

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

- From the Static MAC Table (*Figure 4-64*), 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 4-64*), 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 a Gigabit Ethernet port, the Fast Ethernet management port, or a logical port (including an MLPPP or GFP (VCAT LCAS) port), as well as the Host port. Bridge Port 1 is always bound to the Host port.

➤ **To configure the bridge ports:**

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

   The Bridge Port menu appears as illustrated in *Figure 4-66*.

```
                              Egate-100
Main Menu> Configuration> Applications> Bridge> Bridge Ports



 1. Port Number [1 - 130]                ... (3)
 2. Port Name                            ... (Bridge Port 3)
 3. Bind to                              >   (Logical Port)
 4. Logical Port Number [1 - 144]        ... (1)
 5. Administrative Status                >   (Up)
 6. Ingress Filtering                    >   (Enable)
 7. Accept Frame Types                   >   (Tag Only)
 8. Port VID [1 - 4094]                  ... (1)
 9. Default Priority Tag[0 - 7]          ... (0)
 10.Replace Priority                    >   (No)
 11.Egress Tag Handling                 >   (None)
 12.Ingress Tag Handling                >   (None)
 13.Loop Detection                      >   (Enable)
 14.Maximum MAC Address[1 - 64000]      >...(64000)
 15.Link OAM(802.3ah)                   >...(Disabled)

Please select item <1 to 16>
F - Forward Port; B - Backward Port; R - Remove Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-66. Bridge Port Configuration Menu

In the Bridge Ports menu, configure the Bridge Port parameters according to *Table 4-31*. The settings pertain to the port to which you bound the bridge port previously.

2. To navigate through the defined bridge ports, type **F** or **B** to move one port forward or backward respectively.
3. To remove the current bridge port, type **R**.
4. Select **Save**.

Table 4-31. Bridge Port Parameters

Parameter	Description	Possible Values
Bind to	Specifies the physical, logical or virtual port to which the bridge port is bound **Default: Logical Port**	Host 1GbE-1 or 1GbE-2 ETH MNG Logical Port SVI-1 SVI-2
Logical Port Number	The logical port number. This parameter appears only if binding to a logical port	1-126
Port Number	The bridge port number. 1 is reserved for the host bridge port.	1-130

Parameter	Description	Possible Values
Port Name	The name of the bridge port	Alphanumeric string
Administrative Status	Specifies if this port is part of the bridge or not **Default: Up**	Up Down None
Ingress Filtering	• **Enabled**: The device discards incoming frames for VLANs which do not include this port in its member set • **Disabled**: The port accepts all incoming frames Appears in a VLAN-Aware bridge only **Default: Disable**	Enable Disable
Accept Frame Types	• **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**	All Tag Only
Port VID	This is the PVID, the VLAN ID assigned to untagged frames received on this port. If stacking is enabled, this is the tag that is added Appears in VLAN-Aware bridge only **Default: 2**	1-4094
Default priority tag	Priority of the VLAN asigned to untagged frames. It can also be used to replace the incoming VLAN priority, or in Stacking mode **Default: 0**	0-7
Replace Priority	• **Yes**: The default priority tag is set instead of the incoming VLAN frame value. • This parameter is valid only if Ingress Tag Handling is set to **None**. **Default: No**	Yes No
Egress Tag Handling	• **Stripping**: Removes the first VLAN tag from every transmitted frame, on the egress of the port (pop). • **Stacking**: Adds the PVID and default priority to every transmitted frame on the egress of the port (push). Appears in VLAN-aware bridge only **Default: None**	Stripping Stacking None

Parameter	Description	Possible Values
Ingress Tag Handling	• **Stripping**: Removes the first VLAN tag from every frame received on the ingress of the port (pop). • **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. This parameter is only available with VLAN-aware bridge, and does not appear when the logical port is bound to the Gigabit Ethernet port **Default: None**	Stripping Stacking None
Loop Detection	• When enabled, and if Vlan Loop Detection for the bridge is not 0, a loop-detection message is sent. • When disabled, no loop detection message is sent. This parameter is only available for bridge ports bound to logical ports **Default: Enable**	Disable Enable
Maximum MAC Address	Maximum number of MAC addresses that can be learned from this port **Default: 64000**	1–64000
Link OAM (802.3ah)	Specifies OAM link operation for the bridge port **Default: Disable**	Disable Enable

Configuring VLAN Membership

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

1. Navigate to Main Menu › Configuration › Applications › Bridge › **VLAN Membership**.

   The VLAN Membership menu appears as illustrated in *Figure 4-67*.

2. Select **VLAN ID**, and select a set of VLAN IDs.
3. Select **Egress Transparent Ports**, and select a set of bridge ports (E-Ports).
4. Select **Save All**.
5. In the VLAN Membership menu, select **VLAN ID to Bridge Ports** or **Bridge Ports to VLAN ID**.

   A table appears displaying the mapping of VLAN IDs to bridge ports, or bridge ports to VLAN IDs as illustrated in *Figure 4-68* and *Figure 4-70* respectively. Type ‹**Ctrl**-**U**› and ‹**Ctrl**-**D**› to navigate up and down within the tables if they exceed the screen length.

6. To open the menu associated with a selected VLAN ID or Egress Port, navigate to the desired row and type **M**.

   You can add a VLAN ID or Egress Port or delete the highlighted VLAN ID or Egress Port.

7. In the menu for each VLAN ID selected in the View VLAN ID to Bridge Ports menu, select **E-Port** and specify one or more Egress Ports to map to this VLAN ID, or select **Delete E-Port** to remove the current mapping.

8. In the menu for each Egress Port selected in the Bridge Port to VLAN IDs menu, select **VLAN ID** and specify one or more VLAN IDs to map to this Egress Port, or select **Delete VLAN ID** to remove the current mapping.

9. Press <**ESC**> to return to the VLAN ID to Bridge Ports or the Bridge Ports to VLAN ID menu.

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

➤ **To clear VLAN Membership Mapping (VLAN-aware bridge only):**

1. Navigate to Main Menu > Configuration > Applications > Bridge > **VLAN Membership**.

   The VLAN Membership menu appears as illustrated in *Figure 4-67*.

2. To delete the configuration of all VLAN IDs, select **VLAN ID to Bridge Ports**, and then type **C** in the VLAN ID to close the Bridge Ports menu.

3. To delete the configuration of all Egress Ports, select **Bridge Ports to VLAN ID**, and then type **C** in the Bridge Port to close the VLAN ID menu.

```
                              Egate-100
Configuration> Applications> Bridge> VLAN Membership

 1. VLAN ID                              (1-5,10)
 2. Egress Transparent Ports             (2-3,6,8-9)
 3. VLAN ID to Bridge Port               []
 4. Bridge Ports to VLAN ID              []

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

Figure 4-67. VLAN Membership Menu

```
                              Egate-100
Configuration> Applications > Bridge >VLAN Membership>
VLAN ID to Bridge Ports

 VLAN ID     Egress Transparent Ports          Split Horizon
 3           3,14                              Enable
 100         2                                 Disable

>
A-Add;R-Remove;C - Clear All
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 4-68. VLAN ID to Bridge Ports

```
                          Egate-100
Configuration> Applications > Bridge > VLAN Membership>
VLAN ID to Bridge Ports

1. E-Ports[1-130]          ... (-)
2. VLAN ID[1 - 4094]       ... (-)

>
A-Add;R-Remove;C - Clear All
ESC-prev.menu; !-main menu; &-exit                    1 M/ 1 C
```

Figure 4-69. Adding a VLAN ID

```
                          Egate-100
Configuration> Applications > Bridge >VLAN Membership>
Bridge Ports to VLAN ID

 E-Port      VLAN ID
 2           3-7
 3           3

>
A-Add;R-Remove;C - Clear All
ESC-prev.menu; !-main menu; &-exit; ?-help             1 M/ 1 C
```

Figure 4-70. Bridge Ports to VLAN ID

```
                          Egate-100
Configuration> Applications > Bridge> VLAN Membership>
Bridge Ports to VLAN ID

    E-Port[1 - 130]        ... (2)
 1. VLAN ID                ... (3-7)
 2. Delete VLAN ID         ... (-)

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

Figure 4-71. VLAN Membership – Adding Egress Transparent Port

Configuring the Quality of Service

You can configure Egate-100's QoS (Quality of Service) mapping at the bridge level. Egate-100 supports three methods of traffic classification:

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

You specify the classification using the Priority Classification menu. For an explanation of Quality of Service parameters, refer to *Table 4-32.*

```
                              Egate-100
Configuration> Applications> QoS

 1. Queue Mapping Profile          >
 2. Policer Profile                >
 3. Shaper Profile                 >
 4. Queue Profile                  >


Please select items from 1 to 4
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-72. QoS Menu

```
                              Egate-100
Configuration> Applications> QoS> Queue Mapping Profile

 1. Profile Name                      >   (queue mapping profile)
 2. Priority Classification           >   (802.1p)
 3. Priority Mapping                  >
 4. Unknown Unicast Priority          >   (Queue 0)
 5. Multicast Priority                >   (Queue 0)
 6. Broadcast Priority                >   (Queue 0)

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

Figure 4-73. Queue Mapping Profile Menu

```
                              Egate-100
Configuration> Applications> QoS> Queue Mapping Profile
>Priority Classification (None)

 1. None
 2. 802.1p          [VLAN-Aware only]
 3. DSCP
 4. IP Precedence
>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-74. QoS Priority Classification Menu

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

1. Navigate to Main Menu › Configuration › Applications › QoS › Queue Mapping Profile › **Priority Classification.**

   The Priority Classification menu appears as illustrated in *Figure 4-74*.

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. Refer to *Figure 4-73*.

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 **Traffic Class 0** represents the highest priority and **Traffic Class 3** the lowest.

➤ **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. Navigate to Main Menu › Configuration › Applications › QoS › Queue Mapping Profile › **Priority Mapping**.

   The Priority Mapping menu appears as illustrated in *Figure 4-75*.
3. From the Priority Mapping menu, select the desired priority level (**Tag Value**). Eight priority levels are available, ranging from 0 to 7.
4. Enter the assigned traffic queue number (Traffic Class 0 – 3).
5. To assign a traffic queue to additional priorities, repeat this procedure for each desired priority.
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. Navigate to Main Menu › Configuration › Applications › QoS › Queue Mapping Profile › **Priority Mapping**.

   The Priority Mapping menu appears as illustrated in *Figure 4-76*. The menu lists only those values that differ 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, type **A** and enter the **Tag Value** and **Traffic Class** as illustrated in *Figure 4-77* and *Figure 4-78.*
5. To assign a traffic queue to an additional value, repeat this procedure for each desired Tag value.

   Unassigned values are automatically mapped to the highest priority queue (Traffic Class 0).
6. Select **Save**.

Table 4-32. Quality of Service Parameters

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

```
                          Egate-100

Configuration> Applications> QoS> Queue Mapping Profile
> 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 4              >   (Traffic Class 3)
 6. Tag Value 5              >   (Traffic Class 2)
 7. Tag Value 6              >   (Traffic Class 1)
 8. Tag Value 7              >   (Traffic Class 1)

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

Figure 4-75. QoS Priority Mapping Menu (802.1 and IP Precedence)

```
                          Egate-100

Configuration> Applications> QoS> Queue Mapping Profile
> Priority Mapping

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

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

Figure 4-76. QoS Priority Mapping Initial Menu (DSCP)

```
                                Egate-100

Configuration> Applications > QoS> Queue Mapping Profile > Priority
Mapping> Tag Value 1 (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 4-77. QoS Priority – Traffic Class (DSCP)

```
                                Egate-100

Configuration> Applications> QoS> Queue Mapping Profile > Priority
Mapping

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

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

Figure 4-78. QoS Priority Mapping Menu (DSCP)

Configuring Unknown Unicast, Multicast, and Broadcast Priorities

Egate-100 supports four different traffic queues, where the highest priority is represented by Traffic Class 0 and the lowest 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. Navigate to Main Menu › Configuration › Applications › QoS › Queue Mapping Profile › Unknown Unicast Priority, …› Multicast Priority, or …› Broadcast Priority.

   The appropriate priority menu appears.
3. Select the traffic queue number (Traffic Class 0 – 3).
4. Select Save.

Defining Policer Profiles

Traffic policing is monitoring network traffic for conformity with a traffic contract and if required, dropping traffic to enforce compliance with that contract. Traffic sources which are aware of a traffic contract can apply traffic shaping in order to ensure their output stays within the contract and is therefore not dropped (see *Defining Shaper Profiles*) Policer profiles can be applied to traffic flows to ensure

the desired flow classification and prioritization. Policer configuration can be defined using the Policer Profiles menu.

Note *Traffic policing is only available if the application is set to Flows Support. For information about configuring Flow Support, see Quick Start Guide.*

➤ **To configure policer profiles:**

1. Navigate to Configuration > Application > QoS.

   The QoS menu appears as illustrated in *Figure 4-72*.

2. From the QoS menu, select **Policer Profiles**.

   The Policer Profiles menu appears as illustrated in *Figure 4-79.*

```
                              Egate-100
Configuration > Application > QoS > Policer Profiles

 1. Profile Name                ... (Policer1)
 2. CIR (Kpbs)[0-1000000]       ... (0)
 3. CBS (Bytes)[0-32767]        ... (0)
 4. EIR (Kbps)[0-1000000]       ... (1000000)
 5. EBS (Bytes)[0-32767]        ... (12176)

>
s-Save, r-Remove, f-Forward, b-Backward
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-79. Policer Profiles Menu

3. Select **Profile Name** and define a new profile name.
4. Define the associated policer parameters according to *Table 4-33.*
5. Select **Save.**

Table 4-33. Policer Profiles Parameters

Parameter	Description	Possible Values
CIR	Defines the Committed Information Rate (CIR) for the current profile. The CIR specifies a bandwidth with committed service guarantee ("green bucket" rate). Granularity: 64 Kbps up to 130 Mbps and 512 Kbps up to 1 Gbps **Default: 0**	0 –1,000,000 kbps
CBS	Defines the Committed Burst Size (CBS) for the current profile. The CBS specifies the maximum guaranteed burst size ("green bucket" size). 1 x Byte granularity **Default: 1600**	0-32767 Bytes

Parameter	Description	Possible Values
EIR	Defines the Excess Information Rate (EIR). The EIR specifies an extra bandwidth with no service guarantee ("yellow bucket" rate). Granularity: 64 Kbps up to 130 Mbps and 512 Kbps up to 1 Gbps **Default: 32,000**	0 –1,000,000 kbps
EBS	Defines the Excess Burst Size (EBS). The EBS specifies the extra burst with no service guarantee ("yellow bucket" size). 1 x Byte granularity **Default: 1600**	0-32767 Bytes

Defining Shaper Profiles

Traffic shaping is commonly applied to control traffic flow entering the network A traffic shaper is necessary to obtain a traffic pattern that can be easily policed (see *Defining Policer Profiles*). Shaper profiles can be applied to traffic flows to ensure the desired flow classification and prioritization. Shaper configuration can be defined using the Shaper Profiles menu.

Note *Traffic shaping is only available if the application is set to Flows Support. For information about configuring Flow Support, see Quick Start Guide.*

➤ **To configure shaper profiles:**

1. Navigate to Configuration > Application > QoS.

   The QoS Profiles menu appears as illustrated in *Figure 4-72*.

2. From the QoS menu, select **Shaper Profiles**.

   The Shaper Profiles menu appears as illustrated in *Figure 4-80.*

```
                          Egate-100
Configuration > Application > QoS > Shaper Profiles

 1. Profile Name                ... (S1)
 2. CIR [0-100000]              ... (100000)

>
s-Save, r-Remove, f-Forward, b-Backward
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-80. Shaper Profiles Menu

3. Select **Profile Name** and define a new profile name.
4. Define the associated shaper parameters according to *Table 4-34.*
5. Select **Save.**

Table 4-34. Shaper Profiles Parameters

Parameter	Description	Possible Values
CIR	Defines the Committed Information Rate (CIR) for the current profile. The CIR specifies a bandwidth with committed service guarantee ("green bucket" rate). Granularity: 64 Kbps up to 130 Mbps and 512 Kbps up to 1 Gbps **Default: 0**	0,100–32,000 kbps

Defining Queue Profiles

A queue profile controls the buffering and dropping behavior of the egress queues by letting you set the buffer weight of the queue and the drop thresholds. Queue profiles can be applied to the traffic flows to ensure the desired flow classification and prioritization. Queue configuration can be defined using the Queue Profiles menu.

➤ **To configure queue profiles:**

1. Navigate to Configuration › Application › QoS.

   The QoS Profiles menu appears as illustrated in *Figure 4-72*.

2. From the QoS menu, select **Queue Profiles**.

   The Queue Profiles menu appears as illustrated in *Figure 4-81.*

```
                          Egate-100
Configuration > Application > QoS > Queue Profiles

 1. Profile Name               ... (Q1)
 2. Shaper Profile            >    (S1)
 3. Internal Queues           >

>
a-Add, f-Forward, b-Backward
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-81. Queue Profiles Menu

3. Select **Profile Name** and define a new profile name.
4. Select **Shaper Profile** and define a shaper profile.
5. Select **Save.**

Once you have saved the queue profile, the **Internal Queues** option appears.

➤ **To configure internal queues:**

1. From the Queue Profiles menu (Configuration›Application›QoS› Queue Profiles), select Internal Queues.

   The Internal Queues menu appears as illustrated in *Figure 4-82*.

```
                              Egate-100
Configuration>Application>QoS>Queue Profiles>Internal Queues

 1. ID [0-3]                    ... (1)
 2. Scheduling                  ... (WFQ)
 3. Weight [1-35]              ... (3)

>
f-Forward; b-Backward
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-82. Internal Queues Menu

2. Press <**F**> to select an internal queue (0–3) that you intend to configure.
3. Configure the internal queue according to *Table 4-35*.
4. Select **Save**.

Table 4-35. Internal Queue Parameters

Parameter	Description	Possible Values
Scheduling	Defines the queue scheduling method. If one of the internal queues is configured to the WFQ mode, the queues with the lower priority cannot be configured to the strict mode. ***Note**: In configurations with Strict and WFQ queues, the WFQ frames are transmitted only after the transmission of packets associated with the Strict queues is completed.*	**Strict –** High-priority queues that are always serviced first. If a lower-priority queue is being serviced and a packet enters a higher queue, that queue is serviced immediately. **WFQ** – Weighted Fair Queuing, if one port does not transmit, its unused bandwidth is shared by the 'transmitting' queues according to the assigned weight. **Default: Strict**
Weight	Determines the weight of an internal queue when the scheduling weight is configured to WFQ.	1–35 **Default: 1**
Shaper Profile	Defines the shaper profile to use for the internal queue.	Default Shaper Profile

Configuring Flows

Egate-100 provides traffic flow classification between the traffic source and its final destination. Egate-100 supports up to 253 unidirectional flows. Each flow is defined by a classification profile. Egate-100 supports 3 different flow priority types, where the lowest priority is represented by 0 and the highest priority by 3.

Incoming customer traffic is classified and mapped according to port-based (all-in-one) bundling or by user port and CE VLAN-ID, VLAN priority, DSCP and IP precedence. Operators can differentiate services using classification methods, police the traffic and enforce SLA per service

This section explains how to define flows and add packets to the flows according to specific criteria.

Note *If Egate-100's application mode is set to **Bridge**, the Flows parameter does not show.*

The following flow related options are available:

- Classification profiles
- Flow definitions.

Defining Classification Profiles

➤ **To define a classification profile:**

1. From the Flows menu (Configuration > Applications > Flows), select **Classification Profile**.

   The Classification Profile Definition menu appears as illustrated in *Figure 4-83.*

2. Configure the classification profile according to *Table 4-36*.
3. Select **Save**.

```
                          Egate-100
Configuration > Applications > Flows > Classification Profile

 1. Profile Name              ... ()
 2. Method                        (Unclassified)

>
s-Save; r-Remove; f-Forward; b-Backward
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-83. Classification Profile Definition Screen

Table 4-36. Classification Profile Definition

Parameter	Description	Possible Values
Profile Name		
Method	Defines the classification method used for the profile	Unclassified Vlan ID 802.1p VLAN + 802.1p DSCP IP Precedence VLAN + DSCP VLAN + IP Precedence 802.1p + DSCP 802.1p + IP Precedence VLAN + 802.1p + DSCP VLAN + 802.1p + IP Precedence

Defining Flows

➤ To define a flow:

1. From the Flows menu (Configuration > Applications > Flows), select **Flow**.

   The Flow Definition menu appears as illustrated in *Figure 4-84*.

2. Select **Name** and define a new flow name.

   A new flow is added and a Flow ID is assigned (1-64).

3. Specify the desired **Flow Name** before you press <**S**> for **Save**.

   The remaining interface parameters are displayed once you have saved for the first time.

4. Configure the remaining parameters as detailed in *Figure 4-84* and *Table 4-37*.

   - To navigate to a different flow ID, press <**f**> or <**b**> to browse the Flow IDs forward or backward respectively.

5. Select **Save**.

```
                              Egate-100
Configuration > Applications > Flows > Flow Definition

 1. Name                       ... (Flow 1)
 2. Administrative Status          (Enable)
 3. Classification Profile     >   (-)
 4. Priority [0-3]             ... (1)
 5. Drop                       >   (Enable)
 6. Policer Profile            >   (-)
 7. Ingress Port.              >...(GbE-1)
 8. Egress Port                >   (SVI-1)

>
s-Save; r-Remove; f-Forward; b-Backward
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-84. Flows Definitions Screen

Table 4-37. Flow Definitions

Parameter	Description	Possible Values
Name	Assign a name to a specific flow Default: Flow-<ID#>	Flow-<ID#>
Administrative Status	Defines the administartive staus of the flow. **Default: Enable**	Enable Disable
Classification Profile	Defines which classification profile to use **Default: None**	Profile name
Priority	Priority of the port (**0** represents the lowest priority and **3** the highest) **Default: 0**	0-3

Parameter	Description	Possible Values
Drop	Defines whether to allow dropped frames or not **Default: Disable**	Enable Disable
Policer Profile	Ingress brandwidth profile index **Default: None**	Policer Profile name
Ingress Port	Determines in which port the flow starts **Default: None**	GbE-1 GbE-2
Egress Port	Determines to which port the flow is forwarded **Default: None**	SVI1 SVI2

4.4 Additional Tasks

You can perform additional maintenance tasks that may be necessary or helpful from time to time:

- *Displaying Device Status*
- *Displaying Flow Information*
- *Viewing Inventory*
- *Configuring Date, Time, and SNTP Parameters*
- *Resetting Egate-100.*

Displaying Device Status

Viewing System Status Information

You can view device information, as well as MAC address, system up time, date and time, and security key (**SSL**, **SSH**, or **SSL+SSH**).

➤ **To view the system status:**

- Navigate to Main Menu > Monitoring > **System**.

  The System Monitoring menu appears as illustrated in *Figure 4-1* through *Figure 4-88*, depending on whether APS and Ethernet link aggregation are enabled.

```
                              Egate-100
Main Menu> Monitoring> System

    MAC address                           (00-20-D2-23-35-88)
    System Up Time                        (00:16:32)
    Date                                  (2006-03-14)
    Time                                  (17:10:28)
    Security Key                          (SSL + SSH)
 1. Active Alarms                 []
 2. Event Log                     >
 3. Current Clock Source          >
 4. Connected Managers            []
 5. Radius Statistics             []
 6. Syslog Statistics             >
 7. SNTP                          >
>
Please select item <1 to 6>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-85. System Monitoring Menu, APS and Ethernet Link Aggregation Not Enabled

```
                          Egate-100
Main Menu> Monitoring> System

    MAC address                          (00-20-D2-23-35-88)
    System Up Time                       (00:16:32)
    Date                                 (2006-03-14)
    Time                                 (17:10:28)
    Security Key                         (SSL + SSH)
 1. Active Alarms               []
 2. Event Log                   >
 3. Current Clock Source        >
 4. APS                         >
 5. Connected Managers          []
 6. Radius Statistics           []
 7. Syslog Statistics           >
 8. SNTP                        >
>
Please select item <1 to 6>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-86. System Monitoring Menu, APS Enabled, Ethernet Link Aggregation Not Enabled

```
                          Egate-100
Main Menu> Monitoring> System

    MAC address                          (00-20-D2-23-35-88)
    System Up Time                       (00:16:32)
    Date                                 (2006-03-14)
    Time                                 (17:10:28)
    Security Key                         (SSL + SSH)
    Ethernet Aggregation Active Link     (GETH_1)

 1. Active Alarms                  []
 2. Event Log                      >
 3. Current Clock Source           >
 4. Connected Managers             []
 5. Radius Statistics              []
 6. Syslog Statistics              >
 7. SNTP                           >
>
Please select item <1 to 6>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-87. System Monitoring Menu, APS Not Enabled, Ethernet Link Aggregation Enabled

```
                              Egate-100
Main Menu> Monitoring> System

    MAC address                          (00-20-D2-23-35-88)
    System Up Time                       (00:16:32)
    Date                                 (2006-03-14)
    Time                                 (17:10:28)
    Security Key                         (SSL + SSH)
 1. Active Alarms                 []
 2. Event Log                     >
 3. Current Clock Source          >
 4. Protection                    >
 5. Connected Managers            []
 6. Radius Statistics             []
 7. Syslog Statistics             >
 8. SNTP                          >
>
Please select item <1 to 6>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-88. System Monitoring Menu, APS and Ethernet Link Aggregation Enabled

Viewing the Clock Sources

Note *This section is relevant only if the unit has a T3 interface.*

➤ To check the current clock sources:

1. Navigate to Main Menu › Monitoring › System › **Current Clock Source**.

   The Current Clock Source menu appears as illustrated in *Figure 4-89*.

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

   The current source of the Master or Fallback clock appears.

```
                              Egate-100
Main Menu> Monitoring> System> Current Clock Source

    Nodal Mode                       >    (Master)
    Source                           >    (Internal)
    Source Port                      >    (SDH/SONET)

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

Figure 4-89. Current Clock Source Menu – Master Clock

Viewing the Connected Managers

➤ To check the current managers:

- Navigate to Main Menu › Monitoring › System › **Connected Managers**.

  The Connected Managers menu appears as illustrated in *Figure 4-90*.

```
                              Egate-100
Monitoring> System> Connected Managers

 Index    IP Address         Terminal Type      User Name
 0        0.0.0.0            UART               SU
 1        192.144.162.121    TELNET             SU
 2        172.55.144.60      SSH                SU
 3        172.55.144.60      SSL                User

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

Figure 4-90. Connected Managers Menu

Table 4-38. Connected Managers Parameters

Parameter	Description
Index	Manager's serial number in the list of managers
IP Address	IP Address of the manager connecting remote agent. For UART this field is not used.
Terminal Type	Manager's terminal type (UART, TELNET, WEB, SSL, or SSH)
User Name	Egate-100 login user name

Viewing SNTP Status

You can view the system date and time, as well as SNTP information.

➤ **To view SNTP status:**

1. Follow the path: Monitoring › System › **SNTP**.

   The Monitoring SNTP menu appears as illustrated in *Figure 4-91*.

2. To display the list of NTP Servers, select **NTP Servers**.

   The Monitoring NTP Servers menu appears as illustrated in *Figure 4-92*.

```
                              Egate-100
Monitoring> System> SNTP

    System Uptime                 ... (00:02:17:10)
    System Date                   ... (2008:09:01)
    System Time                   ... (20:11:07)
    Current Source                ... (127.0.0.1)
 1. NTP Servers                   >

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

Figure 4-91. Monitoring SNTP Menu

```
                                Egate-100
Monitoring> System> SNTP > NTP Servers

   ID  NTP Server        Admin     UDP     Stratum  Last         Received
                         Status    Port              Timestamp    ddd:hh:mm:ss Ago
1.     001.001.001.001   Prefer    123     4        01-09-2008   000:00:00:01
                                                    00:00:10
2.     002.002.002.002   Enable    1234    5        01-09-2008   000:00:00:10
                                                    00:00:01
3.     003.003.003.003   Disable   12345   --       --           --

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

Figure 4-92. Monitoring NTP Servers Menu

Viewing Link Protection Status

Viewing Ethernet Link Aggregation Status

➤ To view Ethernet link aggregation status:

1. Follow the path: Main Menu› Monitoring › **System**.

   The Monitoring System menu appears as illustrated in *Figure 4-1* through *Figure 4-88*, depending on the status of APS and Ethernet Link aggregation. If the Monitoring System menu does not contain **Protection** or **Ethernet Aggregation Active Link**, then Ethernet link aggregation is not enabled.

2. If the Monitoring System menu contains **Protection**, select it.

   The Monitoring System Protection menu appears as illustrated in *Figure 4-93*.

3. The **Ethernet Aggregation Active Link** parameter contains one of the following:

   - GETH_1 – The first Gigabit Ethernet port is the active link
   - GETH_2 – The second Gigabit Ethernet port is the active link
   - N/A – Although Ethernet link aggregation is enabled, the Gigabit Ethernet ports are not both set to the same data rate, or to full duplex, or the active link was not yet set.

```
                            Egate-100
Monitoring> System> Protection

    Ethernet Aggregation Active Link       (GETH_1)
 1. APS                        >

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

Figure 4-93. Monitoring Protection Menu

Viewing APS Status

➤ To view APS status for STM-1/OC-3:

1. Follow the path: Main Menu› Monitoring › **System**.

   The Monitoring System menu appears as illustrated in *Figure 4-1* through *Figure 4-88*, depending on the status of APS and Ethernet Link aggregation. If the Monitoring System menu does not contain **APS** or **Protection**, then APS is not enabled.

   - If the Monitoring System menu contains **APS**, select it.

     The System APS status menu appears as illustrated in *Figure 4-94*.

   - If the Monitoring System menu contains **Protection**, select it and then select **APS** from the Monitoring System Protection menu (*Figure 4-93*).

     The System APS status menu appears as illustrated in *Figure 4-94*.

2. Select **Signal Fail & Degrade** for status per port as illustrated in *Figure 4-95*.
3. Select **Total Counter** for current status and cumulative counts of mode mismatch, channel mismatch, switch-byte failure, and FE-protection-line failure, as illustrated in *Figure 4-96*.

```
                          Egate-100
Monitoring> System> APS (or Monitoring> System> Protection>APS)

    APS Mode                  >   (1+1 optimized bidirectional)
    Current Working Port      >   (1)
    RX K1K2(Hex)                  (0000)
    TX K1K2(Hex)                  (0000)
 1. Signal Fail & Degrade         []
 2. Total Counter                 []
 3. Clear Counters

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

Figure 4-94. APS Status Menu

Table 4-39 APS Status Parameters

Parameter	Description
RX K1K2(Hex), TX K1K2(Hex)	Bits 1-4 of K1 byte indicate the request - 0 – No request ; 1 – Do not revert ; 2 – Reverse request ; 8 – Manual switch ; 10 – SD low priority ; 11 – SD high priority ; 12 – SF low priority ; 13 – SF high priority ; 14 – Force switch ; 15 – Lockout Bits 5-8 of the K1 byte indicate the channel associated with the request – to which channel the request refers Bits 1-4 of the K2 byte indicate the channel: In 1+1 optimized bi-directional mode, bridge status indicates which section is currently the primary section. In uni-directional mode, bridge status indicates where the data is located (0=on the current working link, 1=on the protected link). In 1+1 optimized bi-directional mode: 1; 2 In uni-directional mode: 0; 1
Signal Fail and Degrade	See *Figure 4-95*
Total Counter	See *Figure 4-96*
Clear Counters	Command to reset all the APS counters

```
                              Egate-100
Monitoring> System> APS> Signal Fail & Degrade

 Port       State          Status        SF Count      SD Count

 1        Primary            SF             1          805306368
 2        Secondary          SF             1          805306368

>

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

Figure 4-95. APS Signal Fail/Degrade Status

Table 4-40 APS Signal Fail/Degrade Status Parameters

Parameter	Description
Slot/Port	SDH/SONET Port or slot number
State	APS activation state (Primary/Secondary)
Status	Lockout: Locked command was set; jump to secondary link not permitted SD: Signal Degrade detected SF: Signal Fail detected Switch: request to switch occurred, causing switch between links Wait to Restore: wait to restore timing count
SF Count	Signal failure count
SD Count	Signal degradation count

```
                                Egate-100
Monitoring> System> APS> Total Counter

 Status Item                        Current Status          Total
 Mode Mismatch                      No                      2
 Channel Mismatch                   No                      3
 Switch Byte Failure                No                      0
 FE Protection Line Failure         No                      0
>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 4-96. APS Total Counter Status

Table 4-41 APS Total Counter Status Parameters

Parameter	Description
Mode Mismatch	A conflict between the current local mode and the received K2 mode information constitutes a mode mismatch. Monitor protection line K2 bit 5 indicates the architecture, and K2 bits 6–8 indicate the mode (unidirectional or bidirectional).
Channel Mismatch	Indicates that a mismatch between the transmitted K1 channel and the received K2 channel has been detected.
Switch Byte Failure	Indicates that a protection switch byte failure is in effect. This condition occurs when either an inconsistent APS byte or an invalid code is detected. • An inconsistent APS byte occurs when no three consecutive K1 bytes of the last 12 successive frames are identical. • An invalid code occurs when the incoming K1 byte contains an unused code or a code irrelevant for the specific switching operation, in three consecutive frames. An invalid code also occurs when the incoming frame contains an invalid channel number in three consecutive frames.
FE Protection Line Failure	Monitor the K1 byte for Far End Protection Failure. A Far End Protection Line defect is declared based on receiving signal failure on the protection line.

➤ To clear APS counters:

1. Navigate to Main Menu› Monitoring › System› **APS** (or Main Menu› Monitoring › System› Protection › **APS**).

   The APS status menu appears as illustrated in *Figure 4-94*.

2. Select **Clear Counters**.

   The following confirmation message is displayed:

   ```
   Clear APS counters. Are you sure? (Y/N)
   ```

3. Type **Y** to clear the APS counters.

Viewing Physical Layer Status

You can access physical layer status options from the Monitoring Physical Layer menu.

```
                          Egate-100
Main Menu> Monitoring> Physical Layer

 1. Ethernet                >
 2. SDH/SONET               >
 3. Operational Status      >

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

Figure 4-97. Monitoring Physical Layer Menu (STM-1/OC-3)

```
                          Egate-100
Main Menu> Monitoring> Physical Layer

 1. Ethernet                >
 2. T3                      >
 3. Operational Status      >

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

Figure 4-98. Monitoring Physical Layer Menu (T3)

Viewing STM-1/OC-3 Status

➤ To view interface status for STM-1/OC-3

1. Navigate to Main Menu › Monitoring › Physical Layer › **SDH/SONET**.
2. Select **Status**.

   The SDH/SONET monitoring menu appears as illustrated in *Figure 4-99*.
3. Select **Interface**.

   The SDH/SONET interface status menu appears as illustrated in *Figure 4-100*.

```
                              Egate-100
Monitoring> Physical Layer> SDH/SONET >Status

 1. SFP                                >
 2. Interface                          >
 3. HVC                                >
 4. LVC                                >
 5. Free Resources                     []
>
Please select item <1 to 5>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-99. SDH/SONET Monitoring

```
                              Egate-100
Monitoring> Physical Layer> SDH/SONET> Status >Interface

    Connector Type              >   (SFP-In)
    Administrative Status       >   (Up)
    Operation Status            >   (Down)
    Received Rx Path Trace      >   (-)
    Alarms                      >   (Unmasked)
 1. Port                        >   (1)
>
Please select item <1 to 1>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-100. SDH/SONET Interface Menu

➤ **To view SFP status for STM-1/OC-3 :**

1. Navigate to Main Menu › Monitoring › Physical Layer › **SDH/SONET › SFP**.

   The SDH/SONET SFP status menu appears as illustrated in *Figure 4-101*.

2. For **Port Number**, specify the number of the port you wish to monitor.

   The port's SFP status is displayed as illustrated in *Figure 4-101*.

```
                          Egate-100
Monitoring> Physical Layer> SDH/SONET>SFP

    Connector Type              ... (RJ45)
    Manufacturer Name           ... (Infineon FO GmbH)
    Typical Max. Range          ... (0)
    Wave Length                 >   (1310nm)
    Fiber Type                  >   (SM)
    TX Power (dBm)              ... (2158524704)
    RX Power (dBm)              ... (2158524704)
    Laser Bias (mA)             ... (2158524704)
    Laser Temperature(C)        ... (2158524704)
 1. Port Number                 >   (1)

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

Figure 4-101. SDH/SONET SFP Status Menu

➤ To view HVC status for STM-1/OC-3:

1. Navigate to Main Menu › Monitoring › Physical Layer › SDH/SONET › **HVC**.

   The SDH/SONET HVC status menu appears as illustrated in *Figure 4-102*.

2. For **Port**, specify the number of the port you wish to monitor.

   The port's HVC status is displayed.

```
                          Egate-100
Monitoring> Physical Layer> SDH/SONET> HVC

    Received Rx Path Trace          >   (-)
    Received Payload Label[0 - fff] ... (FF)
    Alarms                          >   (Unmasked)
 1. Port                            >   (1)

>

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

Figure 4-102. SDH/SONET HVC Status Menu

➤ To view LVC status for STM-1/OC-3:

1. Navigate to Main Menu › Monitoring › Physical Layer › SDH/SONET › **LVC**.

   The SDH/SONET LVC status menu appears as illustrated in *Figure 4-103*.

2. For **VC**, specify the number of the VC you wish to monitor.

   The VC's status is displayed.

```
                              Egate-100
Monitoring> Physical Layer> SDH/SONET> LVC

    Received Rx Path Trace          >   (-)
    Received Payload Label[0 - fff] ... (07)
    Alarms                          >   (Unmasked)
 1. VC[1 - 63]                      ... (1)

>

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

Figure 4-103. SDH/SONET LVC Status Menu

➤ To view the free resources status for STM-1/OC-3:

- To view free resources (no logical ports assigned), navigate to Main Menu› Monitoring › Physical Layer› SDH/SONET› **Free Resources**.

  The SDH/SONET Free Resources status menu appears as illustrated in *Figure 4-103*.

```
                        Egate-100
Monitoring> Physical Layer> SDH/SONET> Free Resources
Physical      Mapping           Frame Type     Free Timeslots
  63  STS1-3/VT Group-7VT1.5-1    ESF              1-25
  64  STS1-3/VT Group-7VT1.5-2    ESF              1-25
  65  STS1-3/VT Group-7VT1.5-2    ESF              1-25
  66  STS1-3/VT Group-7VT1.5-2    ESF              1-25
  67  STS1-3/VT Group-7VT1.5-2    ESF              1-25
  68  STS1-3/VT Group-7VT1.5-2    ESF              1-25
  69  STS1-3/VT Group-7VT1.5-2    ESF              1-25
  70  STS1-3/VT Group-7VT1.5-2    ESF              1-25
  71  STS1-3/VT Group-7VT1.5-3    ESF              1-25
  72  STS1-3/VT Group-7VT1.5-3    ESF              1-25

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

Figure 4-104. SDH/SONET Free Resources Status Menu

➤ To view free resources for STM-1/OC-3:

- Navigate to Main Menu› Monitoring › Physical Layer › SDH/SONET › **Free Resources**.

The SDH/SONET Free Resources menu appears as illustrated in *Figure 4-105*.

```
                              Egate-100
Monitoring> Physical Layer> SDH/SONET> Free Resources

Physical    Mapping            Frame Type       Free Timeslot
  1     TUG3-1/TUG2-1/VC12-1   Unframed             N/A
  2     TUG3-2/TUG2-1/VC12-1   Unframed             N/A
| 3     TUG3-3/TUG2-1/VC12-1   Unframed             N/A
| 4     TUG3-1/TUG2-2/VC12-1   Unframed             N/A
v 5     TUG3-2/TUG2-2/VC12-1   Unframed             N/A
  6     TUG3-3/TUG2-2/VC12-1   Unframed             N/A

>

ESC-prev.menu; !-main menu; &-exit; D-down; ^G-start
```

Figure 4-105. SDH/SONET Free Resources Menu

Viewing Channelized T3 Status

➤ To view channelized T3 status:

1. Navigate to Main Menu › Monitoring › Physical Layer › T3 › **Status**.

   The Channelized T3 status menu appears as illustrated in *Figure 4-106*.

```
                              Egate-100
Monitoring> Physical Layer> T3> Status

    Connector Type             >   (BNC)
    Administrative Status      >   (Up)
    Operation Status           >   (Up)
    Alarms                     >   (Unmasked)
 1. Port[1 - 3]                ... (1)

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

Figure 4-106. Channelized-T3 Port Status

2. Specify the **Port** for which you wish to view status information.

   The port status menu includes the following information relating to the specified port:

   - **Administrative Status** – activation of the link (Up or Down) via configuration
   - **Operation Status** –current operational status of the link, Up or Down for a port in use, or Not Present for an unused port.
   - **Alarms** – Masked or Unmasked.

Viewing Gigabit Ethernet Status

➤ To view Gigabit Ethernet status:

- Navigate to Main Menu > Monitoring > Physical Layer > Ethernet > **Status** and set **Port** to GbE-1.

  The Gigabit Ethernet port information appears on the Ethernet Status menu as illustrated in *Figure 4-107*.

```
                              Egate-100
Monitoring> Physical Layer> Ethernet> Status

    Connector Type             >   (RJ45)
    Administrative Status      >   (Up)
    Operational Status         >   (Down)
    Auto Negotiation           >   (Disabled)
    Speed & Duplex             >   (1000 Mbps Full Duplex)
    Alarms                     >   (Unmasked)
 1. Port                       >   (GbE-1)

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

Figure 4-107. Gigabit Ethernet Port Status

Viewing Logical Port Status

- You can view status information for the logical ports, including the logical-physical port mapping.

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

 1. Statistics                    >
 2. Clear Statistics
 3. View Logical Ports            []

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

Figure 4-108. Monitoring Logical Layer Menu

➤ To view logical port status:

1. Navigate to Main Menu > Monitoring > **Logical Layer**.
2. Select **View Logical Ports**.

   The View Logical Ports menu appears as illustrated in *Figure 4-109*.

```
                                    Egate-100
Monitoring> Logical Layer> View Logical Ports

Logical   Type  Physical Mode  Timeslots/PPP  Bind to  Log.status Phys.status

    1   HDLC        1   CRC-4 Enable   1-31     Bridge 3      N/A      Up
    2   HDLC        2   CRC-4 Enable   1-31     Bridge 4      N/A      Up
|   3   HDLC        3   CRC-4 Enable   1-31     Bridge 5      N/A      Up
v   4   PPPoHDLC    4   Unframed       All      Logical 10    LCP Up   Up
    5   PPPoHDLC    5   Unframed       All      Logical 10    LCP Up   Up
    6   PPPoHDLC    6   Unframed       All      Logical 10    LCP Up   Up
    7   PPPoHDLC    7   Unframed       All      Logical 10    LCP Up   Up
    8   PPPoHDLC    8   Unframed       All      Logical 10    LCP Up   Up
    9   PPPoHDLC    9   Unframed       All      Logical 10    LCP Up   Up
    10  MLPPP     N/A    N/A           4-9      Bridge 6      BCP Up   N/A
      ->>
>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 4-109. View Logical Ports Menu

The columns in the table include the following:

- **Bind to**, representing one of two cases:
  - Where the logical port is not part of an MLPPP bundle: the bridge port to which the logical port is bound
  - Where the logical port is part of a bundle: the MLPPP logical port.
- **Logical Status**, applicable only for logical port of type of PPPoHDLC or MLPPP:
  - For PPPoHDLC the status is LCP Up or LCP Down
  - For MLPPP the status is BCP Up or BCP Down.
  - For GFP the status is GFP In Sync or GFP Out of Sync.
- **Physical Status**, where Up indicates that there is no failure on the physical port (E1/T1) or above this layer in the hierarchy.

➤ **To view the parameters of a specific logical port:**

- In the Logical Ports menu, type **M** anywhere in the row representing a port.

  The entry is displayed as a menu containing the logical parameters of the specific port.

Viewing OAM Status

You can view remote terminal information for OAM.

➤ **To view OAM status:**

- Navigate to Main Menu › Monitoring › Application › Link(802.3ah) › **Status**.

  The OAM Status menu appears as illustrated in *Figure 4-111*

```
                              Egate-100
Main Menu>Monitoring>Application>Link(802.3ah)

 1. Status     >
 2. Remote Information                          []

>

Please select item <2 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-110. OAM Monitoring Menu

```
                              Egate-100
Main Menu>Monitoring>Application>Link(802.3ah)>Status

1.  Bridge Port Number [1-126]            >   (1)
    Bridge Port  Name                     >   (Bridge 1)

    Local Discovery State                 >   (Operational)
    Loopback State                        >   (Off)
    Remote Revision                       >   (0)
    Remote MAC Address                    ... 0020D225224C
    Remote Vendor                         ... (RAD)
    Remote Port Name                      ... (RicPort 1)

    Remote Capabilities:
    PDU Size  …                           ... (1500)
    Vars Retrieval                        >   (Supported)
    Link Events                           >   (Supported)
    Loopback  >                           >   (Supported)
    Unidirectional                        >   (Supported)
    OAM mode  >                           >   (Active)

Please select item <2 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-111. OAM Status Menu

➤ To view remote terminal information:

1. Navigate to Main Menu › Monitoring › Application › **Link(802.3ah)**.

   The OAM Monitoring menu appears as illustrated in *Figure 4-110*.

2. Select **Remote Terminal** and set to **Enable** to enable view OAM remote information.
3. Select **Bridge Port For Remote Terminal** and set to the bridge port to be used.
4. Select **Remote Information**.

   The OAM Remote Information menu appears as illustrated in *Figure 4-111*

```
                                Egate-100
Main Menu>Monitoring>Application>Link(802.3ah)>Remote Information

Bridge     BP Name       Loc Discovery
Port                     State
1          Tel-aviv      Operational
2          Jerusalem     Operational
3          Haifa         Operational

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

Figure 4-112. OAM Remote Information Menu

Viewing Bridge Status

You can access the following information for bridge monitoring from the Bridge Monitoring menu as illustrated in *Figure 4-113*:

- MAC Table
- Mapping of VLAN to bridge port and bridge port to VLAN
- Bridge port configuration settings.

This menu also allows you to clear all accumulated bridge statistics.

```
                              Egate-100
Main Menu>Monitoring>Application>Bridge

 1. MAC Table                       >
 2. View VLAN ID to Bridge Ports    []
 3. View Bridge Ports to VLAN ID    []
 4. Statistics                      >
 5. Clear Statistics
 6. View Bridge Ports               > []

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

Figure 4-113. Bridge Monitoring Menu

Viewing the MAC Table

➤ To view the MAC table:

1. Navigate to Main Menu › Monitoring › **Bridge**.
2. Select **MAC Table**.

   The MAC Table menu appears with the size of the table (MAC Table Entries) 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 4-114. MAC Table Menu

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, 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 menu appears as illustrated in *Figure 4-115*.
   - To move to the top of the table, type <**Ctrl+G**>.
   - To scroll down, type <**Ctrl+D**>.

```
                              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 4-115. View MAC Table Menu

The MAC Table menu 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 menu, type **C**.

Viewing the Mapping between VLANs and Bridge Ports

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

1. Navigate to Main Menu > Monitoring > **Bridge**.
2. Select **View VLAN ID to Bridge Ports**.

   The VLAN ID to Bridge Ports menu appears as illustrated in *Figure 4-116*.

```
                              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 4-116. VLAN ID to Bridge Ports

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

1. Navigate to Main Menu > Monitoring > **Bridge**.
2. Select **View Bridge Ports to VLAN ID**.

   The Bridge Ports to VLAN ID menu appears as illustrated in *Figure 4-117*.

```
                              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 4-117. Bridge Ports to VLAN ID

Viewing Bridge Port Configuration Settings

➤ **To view bridge port configuration settings:**

1. Navigate to Main Menu > Monitoring > **Bridge**.
2. Select **View Bridge Ports**.

   The View Bridge Ports menu appears as illustrated in *Figure 4-118*.

```
                          Egate-100
Monitoring> Bridge> View Bridge Ports

  Bridge  Name               Bind to     Physical Port
    1     Bridge Port 1        Host           N/A
    2     Bridge Port 2        GIGA           N/A
    3     Bridge Port 3     Logical 1      Physical 1

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

Figure 4-118. VLAN ID to Bridge Ports

➤ **To view information for a specific bridge port:**

- Highlight a bridge port in the Bridge or Name column and type **M**.

  The parameters and corresponding values for the selected bridge port appear as illustrated in *Figure 4-119*.

```
                          Egate-100
Monitoring> Bridge> View Bridge Ports

  Bridge[1 - 130]                      (6)
  Name                                 (Bridge Port 6)
  Administrative status          >     (Up)
  Ingress filtering              >     (Enable)
  Accept Frame Types             >     (Tag Only)
  Port VID[1 - 4094]             >     (1)
  Default Priority Tag[0 - 7]    >     (1))
  Egress Tag Handling            >     (None)
  Ingress Tag Handling           >     (None)
  VLAN ID                              (3)
  Loop Detection                 >     (Disable)
  Maximum MAC Address[1 - 64000]       (64000)
>
ESC-prev.menu; !-main menu; &-exit; ?-help            1 M/ 1 C
```

Figure 4-119. Bridge Configuration

➤ **To view the logical port configuration:**

- Highlight a bridge port in the Bind To column and type **M**.

  The logical port parameters appear as illustrated in *Figure 4-120*.

```
                              Egate-100
Monitoring> Bridge> View Bridge Ports

  Bind to                          (Logical 3))
  Protocol Type            >       (HDLC)
  Physical Port                    (Physical 3)
  Active Timeslots                 (1-24)
>
ESC-prev.menu; !-main menu; &-exit;                        1 M/ 1 C
```

Figure 4-120. Logical Port Configuration

➤ To view the physical port configuration:

- Highlight a bridge port in the Physical Port column and type **M**.

  The physical port parameters appear as illustrated in *Figure 4-121*.

```
                              Egate-100
Monitoring> Bridge> View Bridge Ports

  Administrative Status     >   (Up)
  Frame Type                >   (ESF)
>
ESC-prev.menu; !-main menu; &-exit;                        1 M/ 1 C
```

Figure 4-121. Physical Port Configuration

Displaying Flow Information

Displaying Flow Information

Egate-100 provides information on incoming customer traffic. This traffic is mapped to the Ethernet flows according to user defined per-port criteria. You can access information about flows from the Flow Monitoring menu as illustrated in *Figure 4-122.*

Note *Flow information is only available if the application is set to Flows Support. For information about configuring Flow Support, see Quick Start Guide.*

➤ To display flow information:

- From the Application menu (Monitoring > Application), select **Flows**.

  The Flow screen appears as illustrated in *Figure 4-122.* The parameters are described in *Table 4-42*.

```
                              Egate-100
Main Menu > Monitoring > Application > Flows

 1. Flow Name                          (Flow 1)
    Forward Green Packets              (0)
    Forward Green Bytes                (0)
    Forward Yellow Packets             (0)
    Forward Yellow Bytes               (0)
    Transmitted Green Packets          (0)
    Transmitted Green Bytes            (0)
    Transmitted Yellow Packets         (0)
    Transmitted Yellow Bytes           (0)
    Discard Green Packets              (0)
    Discard Green Bytes                (0)
    Discard Yellow Packets             (0)
    Discard Yellow Bytes               (0)
    Discard Red Packets                (0)
    Discard Red Bytes                  (0)
    Forward Green Bits/Sec             (0)
    Forward Yellow Bits/Sec            (0)
    Transmitted Green Bits/Sec         (0)
    Transmitted Yellow Bits/Sec        (0)
    Discard Green Bits/Sec             (0)
    Discard Yellow Bits/Sec            (0)
    Discard Red Bits/Sec               (0)

>
f-Forward   b-Backward   c-Clear Statistics
ESC-Previous menu; !-Main menu; &-Exit
```

Figure 4-122. View Flow Screen

Table 4-42. View Flow Parameters

Parameter	Description
Flow Name	Flow name corresponding to the flow ID.
Forward Green Packets	Number of forwarded packets that were marked as green by the policer located on the flow.
Forward Green Bytes	Number of forwarded bytes that were marked as green by the policer located on the flow.
Forward Yellow Packets	Number of forwarded packets that were marked as yellow by the policer located on the flow.
Forward Yellow Bytes	Number of forwarded bytes that were marked as yellow by the policer located on the flow.
Transmitted Green Packets	Number of transmitted packets that were marked as green by the policer located on the flow.
Transmitted Green Bytes	Number of transmitted bytes that were marked as green by the policer located on the flow.

Parameter	Description
Transmitted Yellow Packets	Number of transmitted packets that were marked as yellow by the policer located on the flow.
Transmitted Yellow Bytes	Number of transmitted bytes that were marked as yellow by the policer located on the flow.
Discard Green Packets	Number of discarded packets that were marked as green by the policer located on the flow, due to lack of egress buffer space.
Discard Green Bytes	Number of discarded bytes that were marked as green by the policer located on the flow, due to lack of egress buffer space.
Discard Yellow Packets	Number of discarded packets that were marked as yellow by the policer located on the flow, due to lack of egress buffer space.
Discard Yellow Bytes	Number of discarded bytes that were marked as yellow by the policer located on the flow, due to lack of egress buffer space.
Discard Red Packets	Number of discarded packets that were marked as red by the policer located on the flow, due to lack of egress buffer space.
Discard Red Bytes	Number of discarded bytes that were marked as red by the policer located on the flow, due to lack of egress buffer space.
Forward Green Bits/Sec	Number of actual forwarded packets that were marked as green.
Forward Yellow Bits/Sec	Number of actual forwarded packets that were marked as yellow.
Transmitted Green Bits/Sec	Number of actual transmitted packets that were marked as green.
Transmitted Yellow Bits/Sec	Number of actual transmitted packets that were marked as yellow.
Discard Green Bits/Sec	Number of actual discarded packets that were marked as green.
Discard Yellow Bits/Sec	Number of actual discarded packets that were marked as yellow.
Discard Red Bits/Sec	Number of actual discarded packets that were marked as red.

Viewing Inventory

The inventory displays description of the unit and its ports, its hardware and software revision, and power supply type.

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

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

   The Inventory table appears. Refer to *Figure 4-123* for STM-1/OC-3 and *Figure 4-124* for T3 respectively.

2. In the Inventory table, use the arrow keys to navigate.

```
                                Egate-100
Main Menu> Inventory

    Boot Version              ... (E1.01)
    SW Version                ... (2.50E24)
    HW Version                ... (0.00/A)

        INTERFACES INFORMATION
    SDH/SONET link 1          ... (155M 1310nm SM SH RJ45(SFP))
      SFP: Vendor: Infineon FO GmbH; Part No.: V23848-C18-C56; Rev: F1A8
    SDH/SONET link 2          ... (155M 1310nm MM SH RJ45(SFP))
      SFP: Vendor: DELTA; Part No.: LCP-155A4HDM; Rev: 000
    1Gbe link 1               ... (UTP (1000BaseT),RJ-45)
    1Gbe link 2               ... (UTP (1000BaseT),RJ-45)
    Power supply 1            ... (Module not installed)
    Power supply 2            ... (Module not installed)
```

Figure 4-123. Inventory Menu (STM-1/OC-3)

```
                                Egate-100
Main Menu> Inventory

    Boot Version              ... (E1.01)
    SW Version                ... (2.50E25)
    HW Version                ... (0.00/A)
    Serial Number             ... (ID 123456789)

        INTERFACES INFORMATION
    T3 link                   ... (BNC)
    1Gbe link 1               ... (UTP (1000BaseT),RJ-45)
    1Gbe link 2               ... (UTP (1000BaseT),RJ-45)
    Power supply 1            ... (Module not installed)
    Power supply 2            ... (PS-DC)
```

Figure 4-124. Inventory Menu (T3)

Configuring Date, Time, and SNTP Parameters

You can set the date and time for the Egate-100 internal real-time clock. In addition, you can add an NTP server, to lock Egate-100 to a reliable clock source.

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

1. Navigate to Main Menu › Configuration › System › **Date and Time**.

   The Date and Time menu appears as illustrated in *Figure 4-125*.

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 4-125. Date and Time Menu

➤ **To set SNTP parameters:**

1. Navigate to Main Menu › Configuration › System › **SNTP**.

   The SNTP menu appears as illustrated in *Figure 4-126*.

2. Configure the parameters according to *Table 4-43*.
3. Select **NTP Servers** to configure NTP servers.

```
                          Egate-100
Main Menu> Configuration> System> SNTP

System Date                                ... (2008-03-31)
System Time                                ... (13:14:15)
Time Since Last Poll (minutes)             ... (5)
 1. Broadcast Mode                             (Enable)
 2. Poll Interval (minutes) [1 - 1440]     ... (1)
 3. UTC Offset [-12 - +13]                 ... (00.00)
 4. NTP Servers                            []>

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

Figure 4-126. SNTP Menu

Table 4-43. SNTP Parameters

Parameter	Description	Possible Values
Broadcast Mode	If enabled, Egate-100 listens to NTP broadcast messages and obtains accurate timestamps from them **Default: Disable**	Enable Disable
Poll Interval	Defines how often Egate-100 polls NTP server **Default: 1**	1–1440
UTC Offset	Difference between your local time and Greenwich Mean Time	-12 to +13

➤ **To configure SNTP servers:**

- In the SNTP menu (Main Menu > Configuration > System > **SNTP**) select **NTP Servers**.

  The NTP Servers menu appears as illustrated in *Figure 4-127*.

  - To add an NTP server, type **A**.

    The Add NTP Servers menu appears as illustrated in *Figure 4-128*.

    - Configure the parameters according to *Table 4-44* and save your changes.

  - To modify the parameters of an NTP server, position the cursor at the line containing the NTP server and type **M**.

    The Modify NTP Servers menu appears as illustrated in *Figure 4-129*

    - Configure the parameters according to *Table 4-44*.
    - Select **Query Server** if you want to send an immediate NTP request.
    - Save your changes.

```
                                    Egate-100
Main Menu> Configuration> System> SNTP> NTP Servers

   ID  NTP Server        Admin     UDP     Stratum  Last          Received
                         Status    Port               Timestamp     ddd:hh:mm:ss Ago
1.     001.001.001.001   Prefer    123     4        01-09-2008    000:00:00:01
                                                    00:00:10
2.     002.002.002.002   Enable    1234    5        01-09-2008    000:00:00:10
                                                    00:00:01
3.     003.003.003.003   Disable   12345   --       --            --

A-Add Server; R-Remove; C-Clear; M-Modify;
ESC-prev.menu; !-main menu; &-exit
```

Figure 4-127. NTP Servers Menu

```
                              Egate-100
Configuration> System> SNTP> NTP Servers> Add Server

 1. NTP Server                                    (0.0.0.0)
 2. Admin Status                                >   (Enable)
 3. UDP Port                                    ... (123)

>
Please select item <1 to 3>
S-Save
ESC-prev.menu; !-main menu; &-exit                        1 M/ 2 C
```

Figure 4-128. Add NTP Server Menu

```
                              Egate-100
Configuration> System> SNTP> NTP Servers> Modify Server

   NTP Server                        ... (120.2.2.3)
 1. Admin Status                     >   (Enable)
 2. UDP Port                         ... (123)
   Stratum                           ... (4)
   Last Timestamp                    ... (01-09-2008 00:00:10)
   Received ddd:hh:mm:ss Ago         ... (000:00:00:01)
 3. Query Server                         (Off)

>
Please select item <1 to 3>
S-Save
ESC-prev.menu; !-main menu; &-exit                        1 M/ 2 C
```

Figure 4-129. Modify NTP Server Menu

Table 4-44. NTP Server Parameters

Parameter	Description	Possible Values
NTP Server	IP address of NTP server	IP address
Admin Status	Egate-100 sends NTP requests to the server with Admin Status set to Prefer. If no NTP server has Admin Status set to Prefer or if the preferred NTP server is not answering, then Egate-100 sends NTP requests to servers with Admin Status set to Enable. The device does not send NTP requests to servers with Admin Status set to Disable. ***Note**: Only one NTP server can have Admin Status set to Prefer.*	Prefer Enable Disable
UDP Port	UDP port used in NTP requests sent to the NTP server	1–65535

Parameter	Description	Possible Values
Stratum	This parameter indicates the quality of the NTP server. The lower the number, the higher the quality, therefore if there are multiple servers you should select the server with the lowest stratum as the preferred NTP server. ***Note**: If no timestamp has been received from the server, or if counter overflow occurs in the parameter Received ddd:hh:mm:ss Ago, '--' is displayed.*	
Last Timestamp	Last date and time received from the NTP server, in format: dd-mm-yyyy hh:mm:ss ***Note**: If no timestamp has been received from the server, or if counter overflow occurs in the parameter Received ddd:hh:mm:ss Ago, '--' is displayed.*	
Received ddd:hh:mm:ss Ago	Displays elapsed time since date and time were received from the NTP server, in format ddd:hh:mm:ss ***Note**: If no timestamp has been received from the server, or if counter overflow occurs in this paramete then '--' is displayed.*	

Resetting Egate-100

Egate-100 supports two types of reset:

- Reset all parameters to their factory defaults
- Restart the device.

Resetting to Factory Defaults

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

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

1. Navigate to Main Menu > System > **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 your request.

   The device enters user mode, where you cannot configure parameters.

3. Reset the Egate-100 device.

   All Egate-100 device parameters are reset to their default settings, after the reset completes.

Note *If you have saved different default settings, Egate-100 returns to them and not to the factory default settings.*

Resetting the Unit

When necessary, you can perform a normal reset of the unit. This restarts Egate-100 without resetting it to factory defaults.

➤ **To reset Egate-100:**

1. Navigate to 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 your request.

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

Chapter 5

Monitoring 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 and other tests and viewing self-test results.

5.1 Monitoring Performance

You can monitor the physical layer as follows:

- Display statistical data for the Ethernet ports
- Display and clear statistical data for the SDH/SONET ports.

Viewing Ethernet Statistics

You can display statistical data for the Ethernet links.

➤ **To display Ethernet statistics:**

- Navigate to Monitoring › Physical Layer › Ethernet › **Statistics**.

  The Ethernet Statistics menu appears as illustrated in *Figure 5-1*.

```
                              Egate-100
Monitoring>Physical Layer>Ethernet>Statistics

Rx Correct Frames                          ...     (0)
Rx Correct Octets                          ...     (0)
Rx Bits/Sec                                ...     (0)
Rx FCS Errors                              ...     (0)
Rx Broadcast                               ...     (0)
Rx Multicast                               ...     (0)
Tx Correct Frames                          ...     (0)
Tx Correct Octets                          ...     (0)
Tx Bits/Sec                                ...     (0)
Tx Broadcast                               ...     (0)
Tx Multicast                               ...     (0)
Rx Frames                                  ...     (0)
Rx Bytes…                                  ...     (0)
Tx Frames                                  ...     (0)
Tx Bytes…                                  ...     (0)
Errors Count                               ...     (0)
Collision Count                            ...     (0)
1.      Port Number                        ...     (Gbe-1)

Please select item from 1 to 1
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 5-1. Ethernet Statistics Menu

Viewing SDH/SONET Statistics

Egate-100 allows you to display SDH/SONET statistics for SOH, HVC, LVC, and E1/T1 from the SDH/SONET statistics menu.

```
                              Egate-100
Main Menu> Monitoring> Physical Layer> SDH/SONET> Statistics

 1. SOH Statistics                    >
 2. HVC Statistics                    >
 3. LVC Statistics                    >
 4. E1/T1 Statistics                  >
 5. Clear Current Statistics
 6. Clear Intervals Statistics

Please select item <1 to 6>
ESC-prev.menu; !-main menu; &-exit
```

Figure 5-2. SDH/SONET Statistics Menu

➤ To clear SDH/SONET current statistics:

- In the SDH/SONET Statistics menu, select **Clear Current Statistics** to clear all SDH/SONET current statistics.

➤ **To clear SDH/SONET interval statistics:**

1. In the SDH/SONET Statistics menu, select **Clear Intervals Statistics**.

   A confirmation message appears:

   ```
   Clear all intervals statistics. Are you sure? (y/n)
   ```

2. Type **Y** to confirm your request.

   All SDH/SONET interval statistics are cleared.

➤ **To display the SDH/SONET statistics for SOH:**

1. Navigate to Monitoring › Physical Layer › SDH/SONET › Statistics› **SOH**.
2. The SOH statistics screen appears (*Figure 5-3*). *Table 5-1* describes the SDH/SONET SOH statistic counters.
3. To advance to the next SOH statistics screen, type f.

```
                                  Egate-100
Monitoring>Physical Layer>SDH/SONET>Statistics>SOH Statistics

 1. Port Number          >     (1)
    Time Elapsed (sec)         (153)      Far-End Line ES         (80)
    Section ES                 (153)      Far-End Line SES        (80)
    Section SES                (153)      Far-End Line UAS        (80)
    Section SEFS               (153)      Far-End Line CV         (80)
    Section CV                 (0)
    Line ES                    (20)
    Line SES                   (20)
    Line UAS                   (20)
    Line CV                    (20)

>
Please select item <1 to 1>
^F-Forward Interval; ^B-Backward Interval
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 5-3. SDH/SONET SOH Statistics

➤ **To display the SDH/SONET statistics for HVC:**

1. Navigate to Monitoring › Physical Layer › SDH/SONET › Statistics› **HVC**.
2. The HVC statistics screen appears (*Figure 5-4*), showing statistics for interval 0. *Table 5-1* describes the SDH/SONET HVC statistic counters.
3. To see HVC statistics for a different interval, select **Interval Number** and set to the desired interval number.

```
                                    Egate-100
Monitoring>Physical Layer>SDH/SONET>Statistics>HVC Statistics

 1. Port Number                                          (1)
 2. Interval Number [0-96]   >                           (0)
    Time Elapsed (sec)                                   (582)
    Path ES                                              (153)
    Path SES                                             (153)
    Path UAS                                             (582)
    Path CV                                              (0)
    Far-End Path ES                                      (80)
    Far-End Path SES                                     (80)
    Far-End Path UAS                                     (80)
    Far-End Path CV                                      (80)

>
F-Forward; B-Backward; ^F-Forward Interval; ^B-Backward Interval
Please select item <1 to 1>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 5-4. SDH/SONET HVC Statistics

➤ To display the SDH/SONET statistics for LVC:

1. Navigate to Monitoring › Physical Layer › SDH/SONET › Statistics › **LVC**.
2. The LVC statistics screen appears (*Figure 5-5*), showing statistics for VC 1 and interval 0. *Table 5-1* describes the SDH/SONET LVC statistic counters.
3. To see LVC statistics for a different VC, select **VC** and set to the desired VC.
4. To see LVC statistics for a different interval, select **Interval Number** and set to the desired interval number.

```
                                    Egate-100
Monitoring>Physical Layer>SDH/SONET>Statistics> LVC Statistics

 1. VC [1-63]                >                           (1)
 2. Interval Number [0-96]   >                           (0)
    Time Elapsed (sec)                                   (527)
    Near-End ES                                          (0)
    Near-End SES                                         (0)
    Near-End UAS                                         (551)
    Near-End CV                                          (19516)
    Far-End ES                                           (0)
    Far-End SES                                          (0)
    Far-End UAS                                          (583)
    Far-End CV                                           (19998)

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

Figure 5-5. SDH/SONET LVC Statistics

➤ **To view E1/T1 statistics:**

1. Navigate to Monitoring › Physical Layer › SDH/SONET › Statistics› **E1/T1**.

   The E1/T1 statistics menu appears.

```
                                Egate-100
Monitoring>Physical Layer>SDH/SONET>Statistics> E1/T1
Statistics

1. 15 Min. Intervals                        >
2. 1 Day Interval                           >
3. Clear Current Statistics
4. Clear Intervals Statistics

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

Figure 5-6. SDH/SONET E1/T1 Statistics Menu

2. Perform one of the following:

   - To view statistics for 15-minute intervals, select **15 Min. Intervals**:

     a. The E1/T1 Statistics screen appears as illustrated in *Figure 5-7*. The statistics are described in *Table 5-1*.

     b. To see statistics for a different E1/T1 port, select **E1/T1 Number** and set to the desired E1/T1 port.

     c. To see statistics for a different interval, select **Interval Number** and set to the desired interval number.

   - To view statistics for one-day intervals, select **1 Day Interval**:

     a. The E1/T1 Statistics screen appears as illustrated in *Figure 5-8*. The statistics are described in *Table 5-1*.

     b. To see statistics for a different E1/T1 port, select **E1/T1 Number** and set to the desired E1/T1 port.

```
                                Egate-100
...Physical Layer>SDH/SONET>Statistics> E1/T1 Statistics > 15 Min. Intervals

 1. E1/T1 Number [1-63]      >                          (1)
 2. Interval Number [0-96]   >                          (0)
    Time Elapsed (sec)                                  (499)
    ES                                                  (0)
    SES                                                 (0)
    UAS                                                 (500)
    Far End ES                                          (0)
    Far End SES                                         (0)
    Far End UAS                                         (100)
>
F-Forward; B-Backward; ^F-Forward Interval; ^B-Backward Interval
Please select item <1 to 2>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 5-7. SDH/SONET E1/T1 Statistics, 15-Minute Intervals

```
                                    Egate-100
...Physical Layer>SDH/SONET>Statistics> E1/T1 Statistics > 1 Day Interval

 1. E1/T1 Number [1-63]      >                              (1)
    Intervals                                             (5)
    ES                                                    (4294566)
    SES                                                   (2011583)
    UAS                                                   (2014457)
    Far End ES                                            (2014257)
    Far End SES                                           (2014428)
    Far End UAS                                           (0)

>
F-Forward; B-Backward; ^F-Forward Interval; ^B-Backward Interval
Please select item <1 to 1>
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 5-8. SDH/SONET E1/T1 Statistics, One-Day Intervals

➤ To clear E1/T1 current statistics:

- In the E1/T1 Statistics menu, select **Clear Current Statistics** to clear all E1/T1 current statistics.

➤ To clear E1/T1 interval statistics:

1. In the E1/T1 Statistics menu, select **Clear Intervals Statistics**.

   A confirmation message appears:

   ```
   Clear all intervals statistics. Are you sure? (y/n)
   ```

2. Type **Y** to confirm your request.

   All E1/T1 interval statistics are cleared.

Table 5-1. SDH/SONET Statistic Counters

Parameter	Description
ES	Number of seconds during which one or more of the following faults occurred: • Severely Errored Frame (SEF) (also called Out of Frame (OOF)): A SEF defect is declared after detection of four contiguous errored frame alignment words. The SEF defect is terminated when two contiguous error free frame words are detected. • Loss of Signal (LOS) defect: A LOS defect is declared after when no transitions are detected in the incoming line signal (before descrambling) during an interval of 2.3 to 100 microseconds. The LOS defect is terminated after a 125 microsecond interval (one frame) during which no LOS defect is detected. • Loss of Pointer (LOP) defect: A LOP defect is declared after no valid pointer is detected in eight consecutive frames. The LOP defect will not be reported while an AIS signal is present. The LOP defect is terminated after a valid pointer is detected.

Parameter	Description
	• Alarm Indication Signal (AIS) received in the SDH/SONET overhead.
SES	Number of severely errored seconds (SES) in the current interval. A second is considered to be a severely errored second if multiple error events of the types described for ES occurred.
UAS(SEFS)	Number of unavailable seconds (UAS(SEFS)) in the current interval. An unavailable second is any second in which one or more SEF defects were detected
CV	Number of coding violations (CV) in the current interval: a coding violation is declared when a Bit Interleaved Parity (BIP) error is detected in the incoming signal. The BIP information is collected using the B1 byte in the Section Overhead.

Viewing Logical Layer Statistics

You can monitor the logical layer as follows:

- Display statistical data for the logical layer
- Clear statistical data for all logical ports.

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

 1. Statistics                      >
 2. Clear Statistics
 3. View Logical Ports              []

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

Figure 5-9. Monitoring Logical Layer Menu

➤ **To display logical layer statistics:**

1. Navigate to Main Menu › Monitoring › **Logical Layer.**
2. Select **Statistics**.

   The Logical Layer Statistics menu appears as illustrated in *Figure 5-10* to *Figure 5-13*.

3. Select **Port number** and enter a port number between 1 and 126.

   Relevant statistics, depending on protocol type for the specified port, are displayed. See *Table 5-2* for descriptions.

4. To switch to the next or the previous logical port, press ‹**F**› or ‹**B**› respectively.
5. To clear the statistics for this port, press ‹**C**›.

```
                              Egate-100
Main Menu> Monitoring> Logical Layer> Statistics

    Type                  HDLC
    Rx HDLC FCS                     ... (0)
    Rx HDLC Abort                   ... (0)
 1. Port number[1 - 126]            ... (1)

Please select item <1 to 1>
F - Next port; C - Clear
ESC-prev.menu; !-main menu; &-exit
```

Figure 5-10. Logical Layer Statistics Menu (HDLC)

```
                              Egate-100
Main Menu> Monitoring> Logical Layer> Statistics

   Type                   PPPoHDLC
   Rx HDLC FCS                    ... (0)
   Rx HDLC Abort                  ... (0)
   PPP TX Fragments               ... (0)
   PPP RX Fragments               ... (0)
1. Port number                    ... (1)

Please select item <1 to 1>
F - Next port; C - Clear
ESC-prev.menu; !-main menu; &-exit
```

Figure 5-11. Logical Layer Statistics Menu (PPP over HDLC)

```
                              Egate-100
Main Menu> Monitoring> Logical Layer> Statistics

   Type                   MLPPP
   MP Rx Overflow Event           ... (0)
1. Port number                    ... (1)

Please select item <1 to 1>
F - Next port; C - Clear
ESC-prev.menu; !-main menu; &-exit
```

Figure 5-12. Logical Layer Statistics Menu (MLPPP)

```
                              Egate-100
Main Menu> Monitoring> Logical Layer> Statistics

   Type                          >   (GFP)
   Link State                     ... (Out Of Sync)
   Rx Data Type Not Valid         ... (0)
   RX Single Error Corrected      ... (0)
   Rx tHEC Multi Error            ... (0)
   Rx eHEC Multi Error            ... (3)
   Rx CRC 32 Error                ... (0)
1. Port number [1-126]            ... (4)

>
Please select item <1 to 1>
F - Next port; B - Previous port; C - Clear
ESC-prev.menu; !-main menu; &-exit
```

Figure 5-13. Logical Layer Statistics Menu (GFP)

Table 5-2. Logical-layer Statistics Parameters

Parameter	Description
Rx HDLC FCS	The number of received HDLC frames with HDLC FCS errors
Rx HDLC Abort	The number of received HDLC frames with HDLC Abort indication
PPP TX Fragments	The number of MLPPP fragments transmitted over the specified logical link. (The size of the fragment package is based on the configured MTU.)
PPP RX Fragments	The number of received MLPPP fragments packages on the specified logical link. (The size of the fragmented package is based on the remote device MTU.)
MP Rx Overflow Event	The number of MLPPP sequence-number overflow events at the receiver. This indicates that the receiver cannot resequence and assemble the received frames because of excessive loss of frames at the E1/T1 links or a large delay at one of the links (larger than the device's maximum compensation delay of 16ms)
Link state	This status has two modes: In_Sync: the RX GFP frame delineation process is in sync state Out_of_sync: the RX GFP frame delineation process is in out of sync state.
Rx GFP Data Type Not Valid	This counter is incremented on every packet arriving to a GFP machine with a GFP type different from Ethernet Over GFP
Rx Single Bit Error Corrected	This counter increments on every frame in which the GFP machine detected a single-bit error in one of the following fields of the GFP headers: Chec, Thec, or Ehec The statistics does not distinguish among the different types.

Parameter	Description
RX_THEC_MULTI_ERROR	This counter increments on every frame in which the GFP machine detected an error in more than one bit of the THEC header
RX_EHEC_MULTI_ERROR	This counter increments on every frame in which the GFP machine detected an error in more than one bit of the EHEC header
RX_CRC32_ERROR	This counter increments on every frame in which the GFP machine detected an error in the Ethernet CRC or the PFCS (if the GFP frame contains a PFCS)

Viewing Bridge Statistics

You can access bridge statistics from the Bridge Monitoring menu as illustrated in *Figure 5-14*. This menu also allows you to clear all accumulated bridge statistics.

```
                              Egate-100
Main Menu>Monitoring>Application>Bridge

 1. MAC Table                        >
 2. View VLAN ID to Bridge Ports     []
 3. View Bridge Ports to VLAN ID     []
 4. Statistics                       >
 5. Clear Statistics
 6. View Bridge Ports                > []

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

Figure 5-14. Bridge Monitoring Menu

➤ **To view bridge statistics:**

- Navigate to Main Menu› Monitoring› Bridge › **Statistics**.

  The Bridge Statistics menu appears as illustrated in *Figure 5-15*. To switch to the next port or the previous port, type **F** or **B** respectively.

➤ **To view the parameters of a specific bridge port:**

- In the Bridge Monitoring menu, type **M** anywhere in the row representing a bridge port.

  The entry is displayed as a menu containing the physical and logical parameters of the specific bridge port.

➤ **To clear statistics for a bridge port:**

1. Following the previous procedure, select a port for which to view bridge statistics.
2. Type **C** to clear statistics for the selected bridge port.

➤ To clear all bridge port statistics:

1. In the Bridge Monitoring menu, select **Clear Statistics**.

   A confirmation message is displayed:
   Clear all the bridge port statistics. Are you sure? (y/n)

2. Type **Y** to confirm your request.

   All bridge port statistics are cleared.

```
                              Egate-100
Main Menu> Monitoring> Bridge> Statistics

    Bind To                                   ... (GbE)
    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 5-15. Bridge Statistics Menu

Table 5-3. 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.

Viewing Radius Statistics

➤ To display Radius statistics:

- Navigate to Main Menu > Monitoring > System > **Radius Statistics**.

  The Radius Statistics menu appears as illustrated in *Figure 5-16*.

```
                              Egate-100
Monitoring>System>Radius Statistics

                        Server1  Server2  Server3  Server4
 Access Requests        0        0        0        0
 Access Retransmits     0        0        0        0
 Access Accepts         0        0        0        0
 Access Rejects         0        0        0        0
 Access Challenges      0        0        0        0
 Malformed Response     0        0        0        0
 Bad Authenticators     0        0        0        0
 Pending Requests       0        0        0        0
 Timeouts               0        0        0        0
 Unknown Types          0        0        0        0
 Packets Dropped        0        0        0        0
ESC-prev.menu; !-main menu; &-exit; ?-help
```

Figure 5-16. Radius Statistics Menu

5.2 Detecting Problems

To detect and resolve faults/errors in Egate-100, the following options are available:

Self Test

Egate-100 performs hardware self-test upon turn-on (see *Viewing Self Test Results*). The self-test sequence checks the critical circuit functions of Egate-100. If the Egate-100 fails the self-test, the unit's RDY LED blinks (see *LEDs*) and the Self test failure alarm is stored in the alarm buffer (see *Displaying Alarms*).

LEDs

The LEDs indicate normal operation, test runs, and errors as listed in *Table 5-4*.

Table 5-4. Egate-100 LED Indicators

Name	Color	Function
POWER	Green/Red	**Green**: Power supply performing properly **Red**: Power supply error or disconnected
RDY	Green	**On**: Self test completed successfully **Blinking**: Self test failed
ALM	Red	**On**: Interface or system alarm activated **Off**: No Alarm
LINK (GbE)	Green	**On**: Ethernet connection is up **Off**: Ethernet connection is down
ACT (GbE)	Yellow	**Blinking**: Ethernet frame was received or sent within the last second

Name	Color	Function
SYNC 1	Green	STM-1/OC-3 version: **On**: STM-1 port is synchronized **Off**: LOS, LOF DS-3 version: **On**: T3 port is synchronized **Off**: LOS

Alarms and Events

Egate-100 maintains a cyclic event log file that stores up to 2000 events. All stored events are time-stamped. The event log file contents may be viewed on the ASCII terminal or a Network Management Station (NMS). The event view it may be cleared at any time.

To detect and resolve faults/errors, choose one of the following options:

- Check for active alarms. For instructions, refer to *Displaying Alarms*.
- Review the events recorded in the event log. For instructions, refer to *Displaying Events*. For lists of possible events and alarms, refer to the tables below.
- Perform external and internal loopback tests, such as ATM port timed external loop (towards the line) or ATM port timed internal loop (towards the ATM link).
- Perform cell tests, in which a predefined cell is sent towards the ATM link.
- Review the troubleshooting chart based on LED indications or other inputs. A troubleshooting chart is available in *Table 5-20*.

Table 5-7 - *Table 5-18* list alarms and events that may appear in the event log. *Table 5-5* lists the sources for the various alarms. A list of traps can be found in *Table 5-19*.

Table 5-5. Sources for Alarms and Events (SDH/SONET)

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

Alarm/Event Source	Description
LVC 1..63 LVC 1..84	SDH LVC 1-63 level alarms SONET LVC 1-84 level alarms
CH 1..63(84)	E1-/T1-level alarms (63 for SDH / 84 for SONET)
P1 GIGA	1GBE port 1 alarms
P2 GIGA	1GBE port 2 alarms
ETH MNG	Ethernet management port alarms
Logical 1.. 126	Logical-level alarms
Bridge 1.. 130	Bridge port-level alarms
EVENT	Non-alarm events

Table 5-6. Sources for Alarms and Events (T3)

Alarm/Event Source	Description
DEVICE	System alarms and events
CH 1..63(84)	E1-/T1-level alarms (63 for SDH / 84 for SONET)
T3 1..3	T3 level alarms
P1 GIGA	1GBE port 1 alarms
P2 GIGA	1GBE port 2 alarms
ETH MNG	Ethernet management port alarms
Logical 1.. 126	Logical-level alarms
Bridge 1.. 130	Bridge port-level alarms
EVENT	Non-alarm events

Table 5-7. Device Alarms List

Code	Event	Description
3	Self test failure	The self test failed for unspecified reasons
4	Power Supply 1 failure	Power supply 1 failed
5	Power Supply 2 failure	Power supply 2 failed
6	Fan 1 failure	Fan 1 failed
7	Fan 2 failure	Fan 2 failed
12	Master clock failure	The master clock failed
13	Fallback clock failure	The fallback clock failed
14	PS types mismatch	The power supply types are not identical, thus the second power supply cannot take over if the fist one fails.

Code	Event	Description
15	Unknown Power Supply 1	Power supply 1 is not copatible with Egate-100.
16	Unknown Power Supply 1	Power supply 2 is not copatible with Egate-100
17	Link Aggregation not available	Ethernet link aggregation is not available
18	CPLD Download not finished	Hardware problem on the CPLD chip
19	Fan 3 failure	Fan 3 failed

Table 5-8. System Events 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
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

Code	Event	Description
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	Error login	Attempt to login with invalid user name or password
50	Cold Start	Device powered up
51	Excessive SN error	Invalid MLPPP sequence number
52	MLPPP timeout	The MLPPP sequence timed out
53	CH-STM1 cpld fifo full	Hardware problem with th CPLD chip on the STM-1 port
54	CH-STM1 cpld fifo empty	Hardware problem with th CPLD chip on the STM-1 port
55	SDH/SONET link switched	The system witched to the redundant SDH/SONET link configured via APS
56	SDH/SONET link far and event	The device at the ther end of the pseudowire connection switched to the redundant link configured via APS.
57	Demo license has been expired	The demo license expired.
58	VCG reinit	VCG re-initalized
59	FEBE reinit	FEBE re-initialized
60	Restart	The unit is about to restart
64	MAC Flip BP	Identifies identical MAC learnt on different bridge ports
65	Access Denied	Access denied to the unit

Alarms and events are triggered from a variety of sources. *Table 5-5* and *Table 5-6* summarize the sources of Egate-100 alarms and events.

Table 5-9. SDH/SONET Alarms List

Code	Event	Description
70	SFP Tx power over high level	Transmission power exceeds the upper level.
71	SFP Rx power below low level	Transmission power is below the lower level.
72	SFP shut down	The SFP stops transmitting.
73	Wong SFP module inserted	The SFP inserted is not supported.

Table 5-10. SOH Alarms List

Code	Event	Description
80	LOS	Loss of stream
81	LOF	Loss of frame
82	AIS	Line alarm indication signal
83	OOF	Out of frame
84	EED	EED at SOH level
85	TIM	TIM at SOH level
86	RDI	Line remote defect indication
87	SD	Signal degrading
88	Event Threshold Section ES	Number of error seconds exceeds the specified threshold.
89	Event Threshold Section SES	Number of severe error seconds in a section exceeds the specified threshold.
90	Event Threshold Section SEFS	Number of severe errored frame seconds in a section exceeds the specified threshold.
91	Event Threshold Section CV	Number of coding violations in a section exceeds the specified threshold.
92	Event Threshold Line ES	Number of error seconds in a line exceeds the specified threshold.
93	Event Threshold Line SES	Number of severe error seconds in a line exceeds the specified threshold.
94	Event Threshold Line CV	Number of coding violations in a line exceeds the specified threshold.
95	Event Threshold Line UAS	Number of unavailable seconds in a line exceeds the specified threshold.
96	Event Threshold FE-Line ES	Number of error seconds in a line exceeds the specified threshold at the far end.
97	Event Threshold FE-Line SES	Number of severe error seconds in a line exceeds the specified threshold at the far end.
98	Event Threshold FE-Line CV	Number of coding violations in a line exceeds the specified threshold at the far end.
99	Event Threshold FE-Line UAS	Number of seconds in a line exceeds the specified threshold at the far end.

Table 5-11. HVC Alarms List

Code	Event	Description
100	LOP	Loss of pointer on path level

Code	Event	Description
101	AIS	Path alarm indication signal
102	EED	Path EED
103	TIM	TIM at HVC level
104	PLM	Signal lable payload mismatch
105	LOM	Loss of multiframe
106	RDI	Remote defect indication at path level
107	SD	Signal degrading at path level
108	Event Threshold Path ES	Number of detected error seconds in a path
109	Event Threshold Path SES	Number of severe error seconds in a path exceeds the specified threshold.
110	Event Threshold Path CV	Number of coding violations in a path exceeds the specified threshold.
111	Event Threshold Path UAS	Number of unavailable seconds in a path exceeds the specified threshold.
112	Event Threshold FE-Path ES	Number of error seconds in a path at the far end exceeds the specified threshold.
113	Event Threshold FE-Path SES	Number of severe error seconds in a path at the far end exceeds the specified threshold.
114	Event Threshold FE-Path CV	Number of coding violations in a path at the far end exceeds the specified threshold.
115	Event Threshold FE-Path UAS	Number of unavailable seconds in a path at the far end exceeds the specified threshold.

Table 5-12. LVC Alarms List

Code	Event	Description
120	LOP	Loss of pointer at tributary level
121	AIS	Alarm indication signal at tributary level
122	EED	EED at tributary level
123	TIM	TIM at LVC level
124	PLM	Signal lable payload mismatch at tributary level
125	RDI	Remote defect indication at tributary level
126	SD	Signal degrading at tributary level
127	Event Threshold VT ES	Number of error seconds in a VT exceeds the specified threshold.
128	Event Threshold VT SES	Number of severe error seconds in a VT exceeds the specified threshold.

Code	Event	Description
129	Event Threshold VT CV	Number of coding violations in a VT exceeds the specified threshold.
130	Event Threshold VT UAS	Number of unavailable seconds in a VT exceeds the specified threshold.
131	Event Threshold FE-VT ES	Number of error seconds in a VT at the far end exceeds the specified threshold.
132	Event Threshold FE-VT SES	Number of severe error seconds in a VT exceeds the specified threshold.
133	Event Threshold FE-VT CV	Numbe of coding violations in a VT at the far end exceeds the specified threshold
134	Event Threshold FE-VT UAS	Number of unavailable seconds in a VT at the far end exceeds the specified threshold.

Table 5-13. E1/DS1 (Channel) Alarms List

Code	Event	Description
140	LOF	Loss of frame
141	AIS	Alarm indication signal
142	RDI	Remote defect indication
144	OOF	Out of frame
145	CRC MF	Multiframe (VCG) CRC
146	TSF /*for LCAS */	Trail Signal Failure on VCG
147	TSD /*for LCAS */	Trail Signal Degrading on VCG
148	LOM /*for LCAS */	Loss of multiframe (VCG)
149	Loop detected /*for LCAS */	Loop on VCG
150	MND /*for LCAS */	Member Non-skewable alarm: The Delay on a member of VCG is too long, thus cannot be compensated.
151	VCAT Member No Tx /*for LCAS*/	Detection problem in transmitting traffic to a member of the VCAT bundle.
152	VCAT Member No Rx /*for LCAS*/	Detection problem in receiving traffic from a member of a VCAT bundle.
153	Event Threshold ES	Number of error seconds exceeds the specified threshold.
154	Event Threshold SES	Number of severe error seconds exceeds the specified threshold.
155	Event Threshold UAS	Number of unavailable seconds exceeds the specified threshold.

Code	Event	Description
156	Event Threshold FE ES	Number of error seconds at the far end exceeds the specified threshold.
157	Event Threshold FE SES	Number of severe error seconds at the far end exceeds the specified threshold.
158	Event Threshold FE UAS	Number of unavailable seconds at the far end exceeds the specified threshold.

Table 5-14. E3/DS3 Alarms List

Code	Event	Description
160	LOS	Loss of stream
162	AIS	Alarm indication signal
163	RDI	Remote defect indication
164	Event Threshold PES	Number of P-bit error seconds exceeds the specified threshold.
165	Event Threshold PSES	Number of P-bit severe error seconds exceeds the specified threshold.
166	Event Threshold SEFS	Number of severe error framed seconds exceeds the specified threshold.
167	Event Threshold UAS	Number of unavailable seconds exceeds the specified threshold.
168	Event Threshold LES	Number of line error seconds exceeds the specified threshold.
169	Event Threshold CES	Number of C-bit error seconds exceeds the specified threshold.
170	Event Threshold CSES	Number of severe C-bit error framed seconds exceeds the specified threshold.

Table 5-15. Gigabit Ethernet Alarms List

Code	Event	Description
180	Link integrity fail	The GbE port integrity failed
181	SFP Tx power over high level	Transmission power exceeds the upper level.
182	SFP Rx power below low level	Transmission power drops below the lower level.
183	SFP shut down	The SFP stops transmitting.
184	Wong SFP module inserted	The SFP inserted is not supported.

Table 5-16. Ethernet Alarms List

Code	Event	Description
200	Link integrity fail	The FE port integrity failed

Table 5-17. Logical Ports Alarms List

Code	Event	Description
221	No match to bundle	The logical port cannot be added to the pseudowire (bundle)
222	LCP Fail	LCP down for PPPoHDLC ports
223	BCP Fail	BCP down for MLPPP ports
224	GFP Out Sync	GFP signals are out of sync.
225	Loop Detected HW	Hardware loop detected on the physical layer. Frames are returning due to an error along the path or because a loop was defined on the relevant physical port.

Table 5-18. Bridge Ports Alarms List

Code	Event	Description
241	Remote link fail	OAM/EFM detected that the remote link failed.
242	Remote critical event	OAM/EFM detected a critical event.
243	Remote dying gasp	OAM/EFM alarm indicates that the power supply is failing.
244	Loop detected	Loop detected on the bridge port.

Traps

Refer to *Table 5-19* for the list of traps sent by Egate-100.

Table 5-19. Trap List

Trap	Description	OID
coldStart	The unit has been restarted	1.3.6.1.6.3.1.1.5.1
authenticationFailure	User authentication has failed	1.3.6.1.6.3.1.1.5.5
linkDown	Interface has been disconnected	1.3.6.1.6.3.1.1.5.3
linkUp	Interface has been connected	1.3.6.1.6.3.1.1.5.4
ApsEventSwitchover	SDH/SONET APS switchover has occurred	1.3.6.1.2.1.10.49.2.0.1
successfulLogin	Successful login occurred	1.3.6.1.4.1.164.6.1.0.24
failedLogin	Failed login occurred	1.3.6.1.4.1.164.6.1.0.25

Trap	Description	OID
licenseUpdateTrap	License was updated	1.3.6.1.4.1.164.6.1.0.27
agnPowerFailureTrap	Power failure occurred	1.3.6.1.4.1.164.6.1.0.13
agnStatusChangeTrap	The device status has changed	1.3.6.1.4.1.164.6.1.0.2
dacsMuxAlarmsTrap	A mux alaram has been triggered.	1.3.6.1.4.1.164.3.3.0.2
tftpStatusChangeTrap	TFTP operation has successfully completed or has failed	1.3.6.1.4.1.164.6.1.0.1
agnFanFailureTrap	A fan has failed	1.3.6.1.4.1.164.6.1.0.14
risingAlarm	Alarm triggered due to the defined rising threshold being crossed	1.3.6.1.2.1.16.0.1
fallingAlarms	Alarm triggered due to the defined falling threshold being crossed	1.3.6.1.2.1.16.0.2

Statistic Counters

Statistic counters can be used to indicate possible errors. For details, refer to *Monitoring Performance*.

5.3 Handling Events

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

Displaying Events

This section explains how display events. A full list of possible alarms and events can be found under *Alarms and Events*.

.

➤ **To access the event log:**

1. Navigate to Main Menu › Monitoring › System › **Event Log**.

   The Event Log menu appears as illustrated in *Figure 5-17*.

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

   - **Source** – All sources or a specific source as listed in *Table 5-5* and *Table 5-6*.
   - **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 5-17. Event Log Menu

```
                              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 5-18. Event Log Menu – 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 5-19. Event Log Menu – 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. ETH MNG
11. P1 GIGA
12. P2 GIGA
13. LOGICAL
14. BRIDGE
15. EVENT
16. All
>
ESC-prev.menu; !-main menu; &-exit
```

Figure 5-20. Event Log Source Menu (SDH/SONET)

```
                              Egate-100
Monitoring> System> Event Log> Source (All)

 1. DEVICE
 2. T3
 3. CH
10. P2 GIGA
11. P1 GIGA
13. ETH MNG
12. LOGICAL
13. BRIDGE
14. EVENT
15. All
>
ESC-prev.menu; !-main menu; &-exit
```

Figure 5-21. Event Log Source Menu (T3)

3. Select **View Event Log**.

   The View Event Log menu appears as illustrated in *Figure 5-22*.

4. Type ‹**Ctrl+G**› to go to the top of the table, and use ‹**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 5-22. View Event Log Menu

➤ To clear the event log

- In the Event Log menu, press <C>.

Displaying Alarms

This section explains how display active alarms. A full list of possible alarms and events can be found under *Alarms and Events*.

➤ To access the active alarms list:

1. Navigate to Main Menu › Monitoring › System › Active Alarms.

   The Active Alarms menu appears as illustrated in *Figure 5-23*.

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 5-23. Active Alarms Menu

For a list of alarms and events, refer to *Table 5-5* till *Table 5-18*.

Masking Alarms

➤ **To mask/unmask system alarms:**

1. Navigate to Main Menu › Configuration › System › **Alarms.**

   The Alarms configuration menu appears as illustrated in *Figure 5-24*.

2. Select **Alarms** and then select **Masked** or **Unmasked** as desired.

   You are prompted to confirm your request.

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

1. Alarms                                    > (Unmasked)

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

Figure 5-24. Alarm Configuration Menu

5.4 Troubleshooting

The following troubleshooting chart is based on LED indications or other inputs.

Use this chart to identify the cause of a problem that may arise during operation. For detailed description of the LED indicators functions refer to *Chapter 3*.

To correct the reported problem, perform the suggested remedial actions. If a problem cannot be resolved by performing the suggested actions, please contact RAD technical support. For additional information, refer to *Section* .

Table 5-20. Troubleshooting Chart

Fault/Problem	Probable Cause	Remedial Actions
Egate-100 unit is "dead" (POWER LED is off)	No power	• Check that both ends of the power cable are properly connected • Replace the power supply.
SYSTEM RDY LED blinks	Self test failed	Navigate to the Self Test Result menu to locate the failure and then send the unit for repair. If the menu is not accessible, send the unit for repair.
SDH/SONET SYNC LED is off	SONET/SDH Rx path failure	Check the fiber or cable and Rx levels, as well as the remote unit Tx level.
SDH/SONET SYNC LED blinks	SONET/SDH Tx path failure	• Check the Tx optical power to see whether it is in range. If out of range, send it for repair • Check the fiber optic connections.

Fault/Problem	Probable Cause	Remedial Actions
Channelized T3 LED is off	T3 Rx path failure Problems with physical interfaces or frame format definitions	• Check/replace the cables • Check Rx levels, as well as the remote Tx level • Check T3 frame format definition in the remote device and same definition in E-gate (M23 or C-bit Parity). • Check remote equipment T3 interface (replace cards/device). • Check Egate-100 (replace card/device).
Ethernet LINK LED is off	Ethernet cable problem Autonegotiation mismatch	• Check the Ethernet cable to see whether a cross or straight cable is needed • Check/replace Ethernet cable • Check range to be within limits • Check the port by connecting to a different port switch at the remote end • Check autonegotiation settings for autonegotiation mismatch • Send the device for repair.

5.5 Performing Diagnostics Tests

Egate-100 allows you to check network integrity by running ping and PRBS tests and displaying self-test results.

➤ **To access test results:**

Navigate to Main Menu › **Diagnostics**.

The Diagnostics menu appears as illustrated in *Figure 5-25*.

```
                          Egate-100
Main Menu> Diagnostics
 1. PING                          >
 2. BERT                          >
 3. Self test result              >
Please select item <1 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 5-25. Diagnostics Menu

Running Ping Test

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

➤ **To ping an IP host:**

1. Navigate to Main menu › Diagnostics › **Ping.**

   The Ping menu appears as illustrated in *Figure 5-26*.

2. From the Ping menu, configure the **Remote IP address**. This is the IP address of the host that you intend to ping, 0.0.0.0 to 255.255.255.255.

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. Send Ping                     >   (Off)

Please select item <1 to 6>
ESC-prev.menu; !-main menu; &-exit
```

Figure 5-26. Ping Menu

Running BERT Test

You can check the quality of the physical E1/T1 line between Egate-100 and a remote end customer-premises device (for example, RICi-E1/T1) by running a BERT test.

The selected BERT pattern should be looped by the remote device and analyzed upon return to Egate-100. The line quality is determined based on the level of errors detected in the received stream.

➤ **To run a BERT test:**

1. Navigate to Main menu › Diagnostics › **BERT**

   The BERT menu appears as illustrated in *Figure 5-27*.

2. From the BERT menu, configure the following:
   - **Port Number –** Number of the port whose line you wish to test: 1 to 64 for E1 and 1 to 84 for T1.
   - **Pattern –** Select 2^11-1, 2^15-1 or QRSS
   - **Timeslot** – Select 1-31 for E1 and 1-24 for T1 (framed only)
3. Select **Send BERT** and set it to On to start sending the pattern.

   The **Sync State** and the **Bit Error Count** are displayed.
4. Select **Insert Error** to insert a single Bit Error into the generated pattern, and then press ‹**C**› to reset the Bit Error counter.
5. Select **Send BERT** and set it to **Off** to stop the test.
6. To switch to the next port or the previous port, type ‹**F**› or ‹**B**› respectively.

```
                          Egate-100
Main Menu> Diagnostics> BERT

 1. Port Number[1 - 84]            ... (1)
 2. Pattern                        >   (2^11-1)
 3. Send BERT                      >   (Off)
>
Please select item <1 to 3>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 5-27. BERT Menu

Viewing Self Test Results

Egate-100 can display the results of self tests run when the unit is powered up.

➤ **To view self test results:**

1. Navigate to Main menu › **Diagnostics**

   The Diagnostics menu appears as illustrated in *Figure 5-25*.
2. Select **Self Test Result**.

If the test is successful, the message **Successful** is displayed. Possible unsuccessful results are:

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

5.6 Frequently Asked Questions

Q: If I forget my password, what should I do?

A: Reset the device via the Boot Manager, and contact technical support.

5.7 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. This information can be found at www.rad.com (in the **Where to Buy > End Users** page).

Chapter 6

Software Upgrade

This chapter explains how to upgrade Egate-100.

Software upgrade is required to fix product limitations, enable new features, or to make the unit compatible with other devices that are already running the new software version.

Egate-100 stores two software versions, each of them in one of the two 1.15 MB partitions of its flash memory, which also contains a boot program. The software is stored in compressed format. The main version is decompressed and loaded into the Egate-100 RAM upon power-up. The backup software is kept for backup purposes. If the main software becomes corrupted, you can swap it with the backup. By default, Egate-100 is delivered with active software only.

New software releases are distributed as ***.img** files, to be downloaded to Egate-100. When starting a download, Egate-100 erases the current backup and places the new software in the backup partition. When downloading is complete, the unit checks the integrity of the new software file. If it is correct, the backup and active files are swapped. The new software release becomes active and the former active software becomes the backup.

If a failure occurs during downloading, the new version is erased. In this case, only one version is left stored in the flash memory. The backup software can be downloaded to the unit and swapped with the main software later.

The information in this chapter includes the following:

- Detailed conditions required for the upgrade
- Any impact the upgrade may have on the system
- Overview of downloading options
- Upgrade via the Utilities menu.
- Upgrade via the Boot menu.

6.1 Compatibility Requirements

Following are the software releases that can be upgraded to versions above version 4.0B, as well as the hardware revisions that can accept software version 4.0B or higher.

- Software – 4.0B and above
- Hardware – 1.0 and above.

6.2 Impact

Egate-100 continues operating with the previous software version until you manually reset the unit.

6.3 Software Upgrade Options

Application software can be downloaded to Egate-100 via XMODEM or TFTP, using the boot menu.

6.4 Prerequisites

This section details the Egate-100 software and versions compatible with version 4.0B. It also lists the software file names and outlines system requirements needed for the upgrade procedure.

Software Files

The version 4.0B release is distributed as a software file named **Egate-100 4.0B.img**. The file can be obtained from the local RAD business partner from whom the device was purchased.

Note *Specific file names stated in this chapter are for the current version release only and may differ from file names of future software releases.*

System Requirements

Before starting the upgrade, verify that you have the following:

- For upgrade via XMODEM:
  - Operational Egate-100 unit
  - Connection to a PC via HyperTerminal
  - Software file (**Egate-100 4.0B.img**) stored on the PC.
- For upgrade via TFTP:
  - Operational Egate-100 unit with a router interface, connected via Ethernet and with valid IP parameters configured
  - Connection to a PC with a TFTP server application (such as 3Cdaemon or PumpKIN), and a valid IP address
  - Software file (**Egate-100 4.0B.img**) stored on the PC.

6.5 Upgrading Egate-100 Software via the File Utilities Menu

The 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 *Upgrading Egate-100 Software via the Boot Menu*.

Transferring Software Files via TFTP

➤ To transfer software files via TFTP:

1. Navigate to Main Menu › Utilities › File Utilities › SW & File Transfer › TFTP.

   The File Transfer menu appears.

```
                          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 6-1. File Transfer Menu

2. Select **Server IP,** and enter IP address of TFTP server.
3. Select **Remote File Name**, and enter a file name as follows:
   - When downloading, specify the name of the file to be downloaded to Egate-100.
   - When uploading, assign a name to the file that uploads to the remote server.
4. Select **Total Timeout**, and specify 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 appears.
6. Select **Command** to start the desired procedure:
   - **Upload**. Save a configuration file on a remote server.
   - **Download**. Transfer a software or configuration file to Egate-100.

   The file transfer starts.

The file transfer process is logged using the system messages listed below:

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

The system messages are stored in the event log file. For additional information regarding the log file, refer to *Chapter 5*.

Transferring Software Files via X-Modem

➤ To transfer files via X-Modem:

1. Navigate to Main menu › Utilities › File Utilities › SW & File Transfer › X-Modem.

   The X-Modem menu appears.

2. Select Command.

   The X-Modem Command menu appears as illustrated in *Figure 6-2*.

3. Select the required download or upload operations.

```
                              Egate-100
Main Menu> Utilities> File Utilities> SW & File Transfer> X-Modem>
Command

 1. SW download to main
 2. SW download to backup
 3. Configuration file download
 4. Configuration file upload
 5. Log file upload
Please select item <1 to 6>
ESC-prev.menu; !-main menu; &-exit
```

Figure 6-2. X-Modem Command Menu

Saving/Deleting the Current Configuration as Default

You can save any current setting as the device default setting in order to replace the original factory default settings, thus enabling Egate-100 to use these settings when 'resetting Egate-100 to the factory defaults.

If required, you can erase these settings completely and restore the factory defaults.

➤ To save the current configuration as the default configuration:

- From the File System menu (*Figure 6-3*), select Save Default Configuration File.

  The current values of all configuration parameters are saved as the unit's default values.

➤ To delete the saved default configuration and restore the original factory default:

- From the File System menu, select Delete Default Configuration File.

Additional Utilities Menu Commands

➤ **To delete the backup version:**

1. Navigate to Main Menu > Utilities > File Utilities > **File System**.

   The File System menu appears as illustrated in *Figure 6-3*.

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

 1. SW Files
 2. SWAP SW Files
 3. Delete Backup Version
 4. Save Default Configuration File
 5. Delete Default Configuration File

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

Figure 6-3. File System Menu

2. Select **Delete Backup Version**.

   You are prompted to confirm your choice.

➤ **To swap files:**

Note *This option is only available if a backup of the software file is stored in the backup partition.*

1. Navigate to Main menu > Utilities > File Utilities > **File System.**

   The File System menu appears as illustrated in *Figure 6-3*.

2. Select **SWAP SW Files**.

   You are prompted to confirm your choice.

3. Reset the unit in order to activate the backup version. For instructions on resetting Egate-100, refer to *Chapter 4, Resetting Egate-100*.

6.6 Upgrading Egate-100 Software via the Boot Menu

Software downloading can also be performed using the Boot menu. The Boot menu can be reached while Egate-100 performs initialization, for example, after power-up.

You may need to start loading the software from the Boot menu when it is impossible to enter commands (for example, because the Egate-100 software has not yet been downloaded or is corrupted).

Caution The Boot menu procedures are recommended only for use by authorized personnel, because this menu provides many additional options that are intended for use only by technical support personnel.

The following software download option is available from the Boot menu:

- Downloading using the XMODEM protocol. This is usually performed by downloading from a PC directly connected to the CONTROL DCE port of the unit.

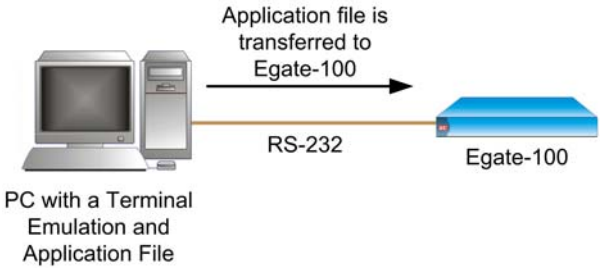


Figure 6-4. Downloading a Software Application File to Egate-100 via XMODEM

- Downloading using the TFTP. This is usually performed by downloading from a remote location that provides an IP communication path to an Ethernet port of Egate-100.

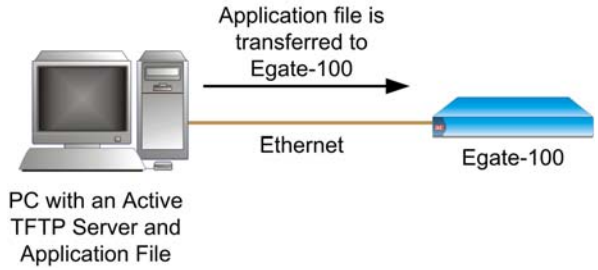


Figure 6-5. Downloading a Software Application File to Egate-100 via TFTP

Accessing the Boot Menu

Use the following procedure to access the boot menu before starting the software upgrade.

1. Verify that **Egate-100 4.0B.img** is stored on the PC with the terminal application.
2. Configure the communication parameters of the selected PC serial port for asynchronous communication for 115.2 kbps, no parity, one start bit, eight data bits and one stop bit. Turn all types of flow control off.
3. Turn off Egate-100.
4. Activate the terminal application.
5. Turn on Egate-100 and immediately start pressing the **<Enter>** key several times in sequence until you see the Boot screen. A typical screen is shown below (the exact version and date displayed by your Egate-100 may be different).

Note *If you miss the timing, Egate-100 performs a regular reboot process (this process starts with* ***Loading*** *and ends with a message to press* ***<Enter>*** *a few times to display the log in screen).*

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

```
RAD DATA COMMUNICATIONS
Boot software version E1.01 AUG 17 2005, 10:29:00
Press Ctrl-A to enter debug screen
```

Figure 6-6. Main Boot Menu

If <**Ctrl-A**> is not typed, the boot proceeds as described in the *Note*, above.

If <**Ctrl-A**> is typed, the Boot Option menu appears.

```
BOOT WP 787-Rev-B1 - FILE MENU


1. File Download
2. File Utility

Select mode: 2
```

Figure 6-7. Boot Option Menu

Downloading an Application Using the XMODEM Protocol

➤ **To download an application file using XMODEM protocol:**

1. Select **Xmodem Protocol** in the Application File Not Found menu.

The Application File Not Found menu appears as illustrated in *Figure 6-8*.

```
BOOT WP 787-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 6-8. Application File Not Found Menu

2. Type **Y**.

The XMODEM File Transfer menu appears and downloading begins.

Downloading an Application Using TFTP

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

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

1. Select **TFTP Protocol** in the Application File Not Found menu.

The TFTP Parameters Setting menu appears.

```
BOOT WP 787-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 6-9. TFTP Parameters Setting Menu

2. Enter 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.

Additional Boot Menu Commands

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:**

- Select **File Utility** in the Boot Option menu.

  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
4. Delete ALL file system (Software and Configuration files)

Select operating mode:
```

Figure 6-10. 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 file 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 appears.

6.7 Verifying Upgrade Results

To verify that the upgrade was successful, you have to use the Terminal application and log on to Egate-100 via HyperTerminal to view the Inventory screen (Main Menu > Inventory), indicating the active software version.

Chapter 7

Application Tutorial

This chapter provides specific instructions for configuring Egate-100 for typical applications.

7.1 User and Management Traffic Separated by VLAN

This chapter provides specific instructions for configuring Egate-100 to connect three remote sites using different user VLANs (CPEs using tag stacking) and an additional host VLAN shared by the three CPEs for secured management traffic.

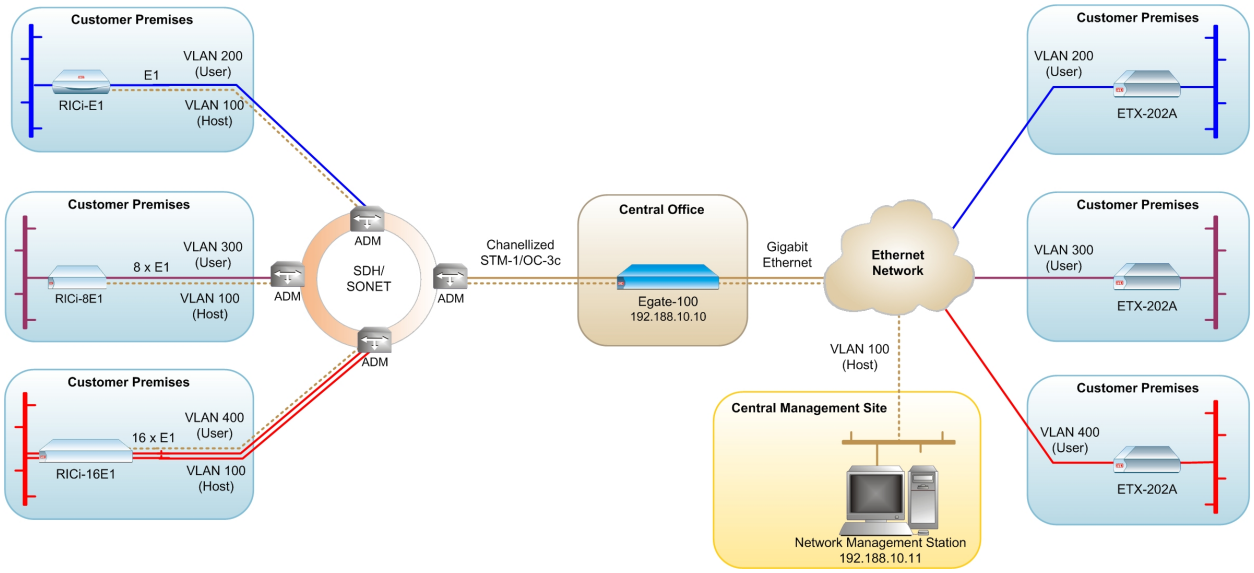


Figure 7-1. Egate-100 Application with VLANs, Management via Gigabit Ethernet Port

The following is required to set up a typical application:

- 1000 BaseT/BaseSx connection to the Ethernet network where the ETX-202A NTU is used for each VLAN
- E1 links to the SDH/SONET network where RICi-E1/T1, RICi-8E1/T1 and RICi-16E1/T1 are installed
- Network management station for management.

Equipment List

The following is a list of equipment needed to set up this application:

- Egate-100
- ETX-202A NTU, ICi-E1/T1, RICi-8E1/T1, RICi-16E1/T1
- Network management station
- Network connectors (see *Table 7-1*).

Table 7-1. Required Connectors

Interface	Cable/Connector
Control port	Straight RS-232/V.24 cable with DB-9 male connector for ASCII terminal
Fast Ethernet management port	RJ-45, 8-pin connector
SDH/SONET interfaces	LC (SFP) fiber optic connector
Channelized T3 interface	BNC connector
Gigabit Ethernet interfaces	Electrical: RJ-45, 8-pin connector Optical: LC (SFP) fiber optic connector

Installing Egate-100

Egate-100 requires no special tools for installation. You need a screwdriver to mount Egate-100 in a 19-inch rack. You need a screwdriver and drill to mount Egate-100 on the wall.

Removing/installing the hot-swappable AC/DC units requires a flathead screwdriver.

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

Refer to *Table 7-1* to determine which cables and connectors are required for installation.

➤ **To install Egate-100:**

1. Mount the unit.
2. Install fiber optic SFP modules.
3. Connect to channelized T3 equipment.
4. Connect to SDH/SONET equipment.
5. Connect to Gigabit Ethernet equipment.
6. Connect to management stations.
7. Connect to power.

After installing the unit, refer to the section *Configuring the Egate-100* for configuration instructions.

Mounting the Unit

Egate-100 is designed for installation as a desktop unit or mounted in a rack.

- For rack-mounting instructions, refer to the installation kit manual.
- If Egate-100 is to be used as a desktop unit, place and secure the unit on a stable, non-movable surface.

Installing Fiber Optic SFP Modules

Egate-100 uses SFP modules with LC fiber optic connectors that provide hot-swappable industry-standard interfaces.

Warning

Third-party SFP optical transceivers must be agency-approved, complying with the local laser safety regulations for Class 1 laser equipment.

➤ **To install the SFP modules:**

1. Lock the wire latch of each SFP module by lifting it up until it clicks into place, as illustrated in *Figure 7-2*.

Note

Some SFP models have a plastic door instead of a wire latch.

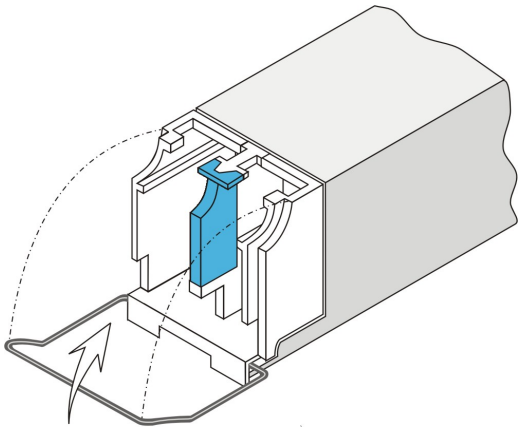


Figure 7-2. Locking the SFP Wire Latch

2. Carefully remove the dust covers from the SFP slot.
3. Insert the rear end of SFP into the socket, and push slowly backwards to mate the connectors until the SFP clicks into place. If you feel resistance before the connectors are fully mated, retract the SFP using the latch wire as a pulling handle, and then repeat the procedure.
4. Remove the protective rubber caps from the SFP modules.

Connecting to Channelized T3 Equipment

The Egate-100 channelized T3 interface terminates in three pairs of BNC connectors.

➤ **To connect the T3 interface:**

- Connect Egate-100 to the T3 equipment using BNC cables terminated with BNC connectors.

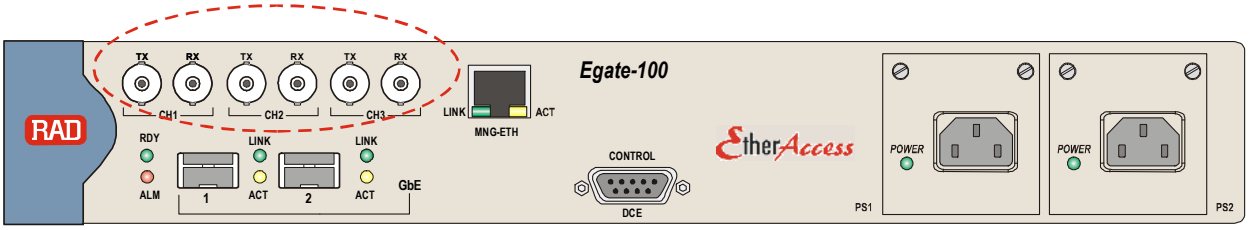


Figure 7-3. T3 BNC Connectors

Connecting to SDH/SONET Equipment

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

➤ **To connect the SDH/SONET network equipment:**

- Connect Egate-100 to the SDH/SONET network equipment using a standard fiber optic cable terminated with an LC connector. Refer to *Installing Fiber Optic SFP Modules* for details on installing fiber optic SFPs.

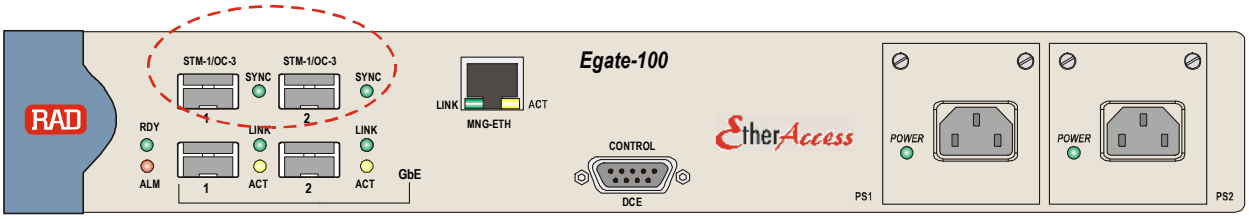


Figure 7-4. SDH/SONET SFP Connectors

Connecting to Gigabit Ethernet Equipment

The Egate-100 GbE interface terminates in 8-pin RJ-45 (electrical) or LC (optical) connectors.

➤ **To connect to the Gigabit Ethernet equipment with fiber optic SFP:**

- Connect Egate-100 to the Gigabit Ethernet network equipment using a standard fiber optic cable terminated with an LC connector. Refer to *Installing Fiber Optic SFP Modules* for details on installing fiber optic SFPs.

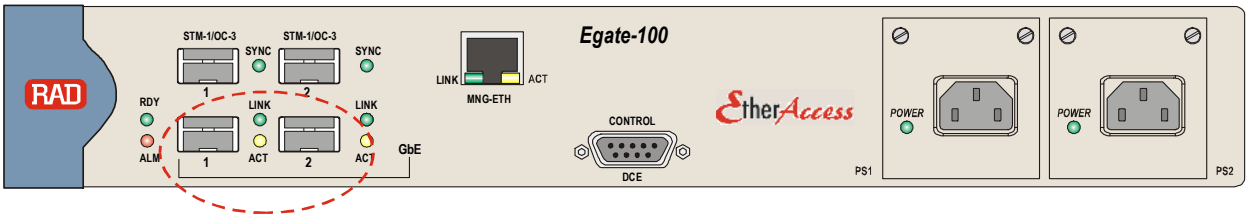


Figure 7-5: Gigabit Ethernet SFP Connectors

➤ **To connect to the Gigabit Ethernet equipment with a copper interface:**

- Connect Egate-100 to the Gigabit Ethernet network equipment using a standard straight UTP/STP cable terminated with an RJ-45 connector.

Note *When connecting Gigabit Ethernet cables longer than 30 meters (98 feet), it is recommended to use shielded cables.*

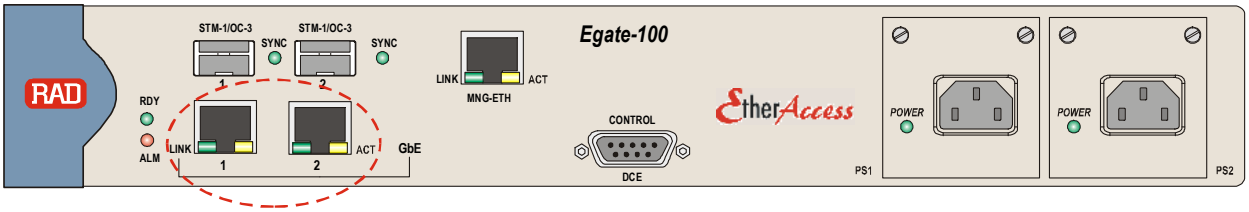


Figure 7-6: Gigabit Ethernet 10/100/1000BaseT Electrical Connectors

Connecting to Management Stations

Egate-100 can be connected to a local ASCII terminal via the CONTROL port or to a remote network management station via dedicated Ethernet management port.

Connecting to the Terminal

Egate-100 is connected to an ASCII terminal via a 9-pin D-type female connector designated CONTROL. Refer to *Appendix A* for the connector pinout.

➤ **To connect to the terminal:**

1. Connect the male 9-pin D-type connector of CBL-DB9F-DB9M-STR straight cable available from RAD to the CONTROL connector.
2. Connect the other connector of the CBL-DB9F-DB9M-STR cable to an ASCII terminal.

Caution Terminal cables must have a frame ground connection. Use ungrounded cables when connecting a supervisory terminal to a DC-powered unit with floating ground. Using improper terminal cable may result in damage to supervisory terminal port.

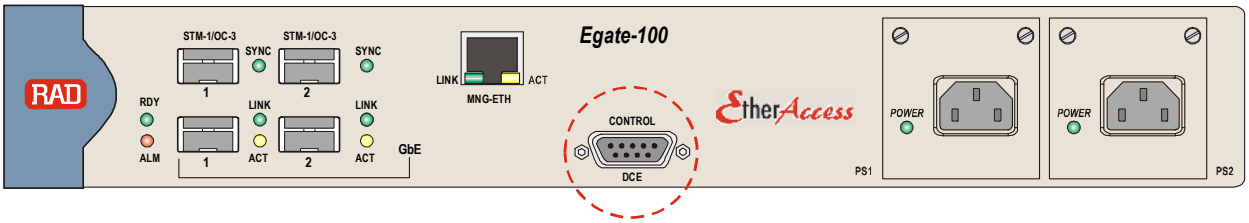


Figure 7-7: CONTROL Connector

Connecting to the Network Management Station

Egate-100 is connected to an NMS via an 8-pin RJ-45 connector designated MNG ETH. Refer to *Appendix A* for the connector pinout.

➤ **To connect to an NMS:**

- Connect Egate-100 to a hub or switch using a straight cable

  Or;

- Connect Egate-100 to a network interface card using a cross cable.

Note

When connecting Fast Ethernet cables longer than 30 meters (98 feet), it is recommended to use shielded cables.

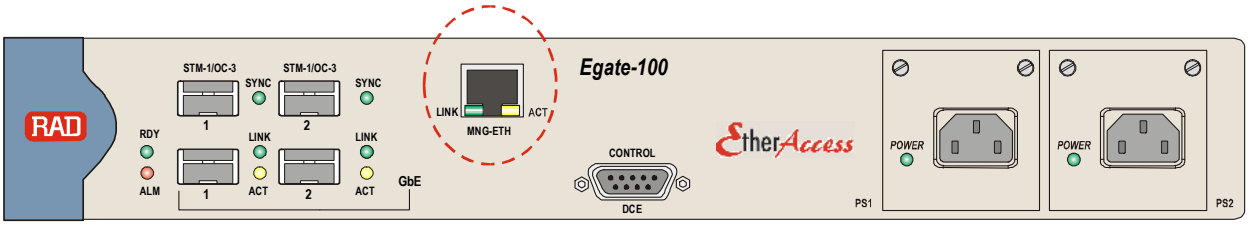


Figure 7-8: Fast Ethernet Management Connector

Connecting to Power

Egate-100 can be ordered with either AC power or DC power (single or dual power supply).

Connecting to AC Power

AC power is supplied to Egate-100 via a standard 3-prong plug.

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 connecting or disconnecting any communication cable, the unit must be grounded by connecting its power cord to a power outlet with a ground terminal, and by connecting the ground terminal on the panel (if provided) to a protective ground.

Interrupting the protective (ground) conductor inside or outside the unit, or disconnecting the protective ground terminal may render 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. Verify that the AC outlet is grounded properly. Ensure that the supply voltage is in the range 100 VAC to 240 VAC
2. Connect the power cable to a power connector on the Egate-100 front panel.
3. Connect the power cable to the mains.

   The unit turns on automatically.

Connecting to DC Power

➤ **To connect DC power:**

- Refer to the DC power supply connection supplement, located on the Technical Documentation CD or at the end of this manual. Also, refer to the safety instructions at the beginning of this document.

Configuring Egate-100

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

- *Setting System Parameters*
- *Setting Ethernet Parameters*
- *Setting SDH/SONET Parameters*
- *Setting Logical Layer Parameters*
- *Setting Bridge Parameters*

Note

Unless indicated otherwise, the configuration procedures for T1/SONET and E1/SDH are identical.

Setting System Parameters

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.

Note *To assign an IP address the first time the unit is powered up, or after resetting the unit to the factory default, you must connect an ASCII terminal to the CONTROL interface and use HyperTerminal to access the Egate-100 menus.*

➤ **To set the host IP parameters:**

1. Navigate to Configuration›System›Management›**Host** and set the host IP parameters as illustrated in *Figure 7-9*.

```
                              Egate-100
Main Menu> Configuration> System> Management> Host

 1. IP Address                      ... (192.188.10.10)
 2. IP Mask                         ... (255.255.255.0)
 3. Default Gateway                 ... (192.188.10.1)
 4. Read Community                  ... (public)
 5. Write Community                 ... (private)
 6. Trap Community                  ... (public)
 7. Encapsulation                   >

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

Figure 7-9. Configuring Host Parameters

2. Navigate to Host›**Encapsulation** and set the host encapsulation parameters as illustrated in *Figure 7-10*.

```
                              Egate-100
Main Menu> Configuration> System> Management> Host>
Encapsulation

 1. Host Tagging                    >   (Tagged)
 2. Host VLAN ID[1 - 4094]          ... (100)
 3. Host Priority Tag[0 - 7]        ... (0)

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

Figure 7-10. Configuring Host Encapsulation

➤ **To add the network manager:**

1. Navigate to Main Menu›Configuration›System›Management›**Manager List**.
2. Move the cursor to the Manager IP cell you wish to change by clicking ‹**Tab**›.

   The selected cell is highlighted and the value is displayed in the **Change Cell** field.
3. Select **Change Cell**, and enter **192.188.10.11** for the selected network manager.

Setting Ethernet Parameters

The Gigabit Ethernet ports must be configured for operation if the default values are not suitable for the application.

➤ **To configure the Gigabit Ethernet interface:**

- Navigate to Main Menu›Configuration›Physical Layer›**Ethernet** and configure the following for both Gigabit Ethernet links according to your application requirements:
  - Autonegotiation
  - Max capability.

For detailed instructions refer to *Chapter 4* of this manual.

Setting SDH/SONET Parameters

Configuring the SDH/SONET Interface

The clock is provided by the SDH/SONET network; therefore, you must configure the SDH/SONET physical layer to use the timing from the SDH/SONET interface.

➤ **To configure the SDH/SONET interface timing:**

- Navigate to Main Menu›Configuration›Physical Layer›**SDH/SONET** and configure the parameter values as illustrated in *Figure 7-11*.

```
                          Egate-100
Configuration> Physical Layer> SDH/SONET

 1. Frame Type                          >    (SDH)
 2. Tx Clock                            >    (Loopback Timing)
 3. Administrative Status & Alarms      >
 4. Mapping                             []
 5. E1/T1                               >
 6. SOH                                 >
 7. HVC                                 >
 8. LVC                                 >

>
Please select item <1 to 8>
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-11. SDH/SONET Menu

Configuring the SDH/SONET E1 Ports

You must configure the E1 ports with the appropriate frame type as specified in *Table 7-2*. You must configure the following E1 ports:

- For RICi-E1/T1: E1 port 11, framed (CRC 4 enabled)
- For RICi-8E1/T1: E1 ports 12 – 19, unframed
- For RICi-16E1/T1: E1 ports 20 – 35, framed (CRC 4 enabled).

The E1 port is configured in the SDH/SONET Physical Port E1 menu. To access the menu, navigate to Main Menu›Configuration›Physical Layer›**SDH/SONET**.

Table 7-2. E1 Port Specifications

Unit/Interface	E1 port numbers	Framing type	Logical port numbers	Protocol	Bridge port number
RICi-E1/T1	11	CRC 4 enabled	11	GFP (non-VCAT non-LCAS)	101
RICi-8E1/T1	12 – 19	Unframed	12 – 19	PPPoHDLC	
			20	MLPPP, bound to logical ports 12 – 19	102, bound to MLPPP port
RICi-16E1/T1	20 – 35	CRC 4 enabled	21	VCG	
			22	GFP (VCAT LCAS), bound to logical port 21	103, bound to GFP port

➤ **To configure the E1 port for RICi-E1/T1:**

- In the SDH/SONET Physical Port E1 menu, configure E1 port 11 as illustrated in *Figure 7-12*.

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> E1

 1. Port Number [1-63]              ... (11)
 2. Administrative Status           >   (Up)
 3. Frame Type                      >   (CRC-4 Enable)
 4. Idle Code [0-ff]                ... (0)
 5. Alarms                          >   (Unmasked)

Please select item <1 to 5>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-12. Configuring E1 Port for RICi-E1/T1

➤ **To configure the E1 ports for RICi-8E1/T1:**

1. In the SDH/SONET Physical Port E1 menu, configure E1 port 12 as illustrated in *Figure 7-13*.
2. Repeat the same configuration for E1 ports 13 to 19.

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> E1

 1. Port Number [1-63]              ... (12)
 2. Administrative Status           >   (Up)
 3. Frame Type                      >   (Unframed)
 4. Alarms                          >   (Unmasked)

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

Figure 7-13. Configuring E1 Ports for RICi-8E1/T1

➤ **To configure the E1 ports for RICi-16E1/T1:**

1. In the SDH/SONET Physical Port E1 menu, configure E1 port 20 as illustrated in *Figure 7-14*.
2. Repeat the same configuration for E1 ports 21 to 35.

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> E1

 1. Port Number [1-63]              ... (20)
 2. Administrative Status           >   (Up)
 3. Frame Type                      >   (CRC-4 Enable)
 4. Idle Code [0-ff]                ... (0)
 5. Alarms                          >   (Unmasked)

Please select item <1 to 5>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-14. Configuring E1 Ports for RICi-16E1/T1

Setting Logical Layer Parameters

You must configure logical ports for the E1 ports, as specified in *Table 7-3*.

The following logical ports must be configured:

For RICi-E1/T1: Logical port 11, GFP (non-VCAT non-LCAS)

For RICi-8E1/T1: Logical ports 12 – 19 with PPP over HDLC, which are then bound to logical port 20 with MLPPP protocol

For RICi-16E1/T1: Logical port 21 with VCG, which is then bound to logical port 22 with GFP (VCAT LCAS) protocol.

The logical ports are configured in the Logical Layer menu (Main Menu >Configuration >**Logical Layer**).

Table 7-3. E1 Port Specifications

Unit/Interface	E1 port numbers	Framing type	Logical port numbers	Protocol	Bridge port number
RICi-E1/T1	11	CRC 4 enabled	11	GFP (non-VCAT non-LCAS)	101
RICi-8E1/T1	12 – 19	Unframed	12 – 19	PPPoHDLC	
			20	MLPPP, bound to logical ports 12 – 19	102, bound to MLPPP port
RICi-16E1/T1	20 – 35	CRC 4 enabled	21	VCG	
			22	GFP (VCAT LCAS), bound to logical port 21	103, bound to GFP port

➤ **To configure the logical layer for the E1 port to RICi-E1/T1:**

- In the Logical Layer menu, configure logical port 11 with GFP protocol (non-VCAT non-LCAS), to correspond to physical port 11, as illustrated in *Figure 7-15*.

```
                          Egate-100
Configuration> Logical Layer

 1. Port Number [1 - 126]          ... (11)
 2. Port Name                      ... (Logical Port 11)
 3. Protocol Type                  >   (GFP)
 4. Multi Link                     >...(No)
 5. Physical Port Number [1 - 63] ... (11)
 6. Payload FCS                    >   (Disable)
 7. VCAT header                    >   (Enable)
 8. Alarms                         >   (Unmasked)
>
Please select item <1 to 8>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-15. Configuring Logical Port for RICi-E1/T1

➤ **To configure the logical layer for the E1 ports to RICi-8E1/T1:**

1. In the Logical Layer menu, configure logical port 12 with PPP over HDLC protocol, to correspond to physical port 12, as illustrated in *Figure 7-16*.
2. Repeat the same configuration for logical ports 13 to 19, to correspond to physical ports 13 to 19.
3. In the Logical Layer menu, configure logical port 20 with MLPPP protocol, binding it to logical ports 12 to 19, as illustrated in *Figure 7-17*.

```
                          Egate-100
Main Menu> Configuration> Logical Layer

 1. Port Number[1 - 126]           ... (12)
 2. Port Name                      ... (Logical Port 12)
 3. Protocol Type                  >   (PPPoHDLC)
 4. Physical Port Number[1 - 63]   ... (12)
 5. Address & Control Compression  >   (On)
 6. Protocol Field Compression     >   (On)
 7. Alarms                         >   (Unmasked)

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

Figure 7-16. Configuring PPPoHDLC Logical Ports for RICi-8E1/T1

```
                              Egate-100
Configuration> Logical Layer

 1. Port Number[1 - 126]          ... (20)
 2. Port Name                     ... (Logical Port 20)
 3. Protocol Type                 >   (MLPPP)
 4. Bind Logical Ports            >   (12-19)
 5. MTU(bytes)                    >   (0)
 6. Alarms                        >   (Unmasked)
>
Please select item <1 to 6>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-17. Configuring MLPPP Logical Port for RICi-8E1/T1

➤ **To configure the logical layer for the E1 ports to RICi-16E1/T1:**

1. In the Logical Layer menu, configure logical port 21 with VCG protocol, to correspond to physical ports 20 to 35, as illustrated in *Figure 7-18*.
2. In the Logical Layer menu, configure logical port 22 with GFP protocol (VCAT LCAS), binding it to logical port 21, as illustrated in *Figure 7-19*.

```
                              Egate-100
Configuration> Logical Layer

 1. Port Number [1 - 126]            ...  (21)
 2. Port Name                        ...  (Logical Port 21)
 3. Protocol Type                    >    (VCG)
 4. Bind Physical Ports              ...  (20 - 35)
 5. Edit Bind Physical List          >
 6. Wait to Restore (sec) [0 - 720]  >    (300)
 7. Hold Off (msec) [0 - 1000]       >    (5)
 8. Alarms                           >    (Unmasked)
>
Please select item <1 to 8>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-18. Configuring Logical Port for RICi-16E1/T1 (VCG)

```
                              Egate-100
Configuration> Logical Layer

 1. Port Number[1 - 126]          ... (22)
 2. Port Name                     ... (Logical Port 22)
 3. Protocol Type                 >   (GFP)
 4. Multi Link                    >...(Yes)
 5. Bind Logical Port             >   (21)
 6. Payload FCS                   >   (Disable)
 7. Alarms                        >   (Unmasked)
>
Please select item <1 to 7>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-19. Configuring Logical Port for RICi-16E1/T1 (GFP)

Setting Bridge Parameters

The following steps must be performed:

1. Configuring the bridge to VLAN-aware
2. Configuring the bridge ports as specified in *Table 7-4*
3. Defining VLAN memberships as specified in *Table 7-5*.

Configuring the Bridge

The bridge must be configured to VLAN-aware, so that Egate-100 forwards traffic based on VLAN as well as MAC address.

➤ To configure the bridge parameters:

- Navigate to the Bridge menu (Main Menu › Configuration › Applications › **Bridge**) and configure the parameter values as illustrated in *Figure 7-20*.

```
                              Egate-100
Main Menu> Configuration> Application> Bridge

 1. VLAN Mode                     >    (Aware)
 2. Aging Time (Sec)[30 - 10000]  ...  (300)
 3. Split Horizon                 >    (Disabled)
 4. Vlan Ethertype (HEX)          ...  (8100)
 5. Loop Detection                 ... (Enable)
 6. Vlan Loop Detection [1 - 4094] ...  (1)
 7. Static MAC Table              []   >
 8. Remote Terminal                    (Disable)
 9. Bridge Ports                  >
10. VLAN Membership               >

Please select item <1 to 9>
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-20. Configuring the Bridge

Configuring the Bridge Ports

The bridge ports required for the application are shown in *Table 7-4*. The binding of bridge port 1 to the host port is automatic in Egate-100, so does not have to be configured. The bridge port bound to the host must perform egress tag stripping because it handles management traffic that had the tag added to the frame, therefore it must be stripped at egress. The Port VID can be left as the default value, as user frames arrive tagged.

The configuration of the bridge ports is performed in the Bridge Port menu (Main Menu › Configuration › Applications › Bridge › **Bridge Ports**).

Table 7-4. Bridge Port Specifications

Bridge port number	Bind to	Egress tag handling
1	Host (automatic)	Stripping
2	GbE-1	None
3	GbE-2	None
101	Logical port 11	None
102	Logical port 20	None
103	Logical port 22	None

➤ To configure the bridge port for the host:

- From the Bridge Port menu, configure the **Egress Tag Handling** for the host bridge port to perform stripping, as illustrated in *Figure 7-21*.

```
                          Egate-100
Main Menu> Configuration> Application> Bridge> Bridge Ports

 1. Port Number [1 - 130]                ... (1)
 2. Port Name                            ... (Bridge Port 1)
    Bind to                                  Host
 3. Administrative Status                >   (Up)
 4. Ingress Filtering                    >   (Enable)
 5. Accept Frame Types                   >   (Tag Only)
 6. Port VID [1 - 4094]                  ... (1)
 7. Default Priority Tag[0 - 7]          ... (0)
 8. Replace Priority                     >   (No)
 9. Egress Tag Handling                  >   (Stripping)
 10. Ingress Tag Handling                >   (None)

Please select item <1 to 10>
F - Forward Port; B - Backward Port; R - Remove Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-21. Configuring Bridge Port for Host

➤ **To configure the bridge port for the Gigabit Ethernet ports:**

1. From the Bridge Port menu, configure the bridge port parameters for bridge port 2, binding it to GbE-1, as illustrated in *Figure 7-22*.
2. Repeat the same configuration for bridge port 3, binding it to GbE-2.

```
                              Egate-100
Main Menu> Configuration> Application> Bridge> Bridge Ports

 1. Port Number [1 - 130]                ... (2)
 2. Port Name                            ... (Bridge Port 2)
 3. Bind to                                  (GbE-1)
 4. Administrative Status                >   (Up)
 5. Ingress Filtering                    >   (Enable)
 6. Accept Frame Types                   >   (Tag Only)
 7. Port VID [1 - 4094]                  ... (1)
 8. Default Priority Tag[0 - 7]          ... (0)
 9. Replace Priority                     >   (No)
 10. Egress Tag Handling                 >   (None)
 11. Ingress Tag Handling                >   (None)
 12. Maximum MAC Address[1 - 64000]      >...(64000)

Please select item <1 to 12>
F - Forward Port; B - Backward Port; R - Remove Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-22. Configuring Bridge Port for Gigabit Ethernet Port

➤ **To configure the bridge ports for the logical ports:**

1. From the Bridge Port menu, configure the bridge port parameters for bridge port 101, binding it to logical port 11, as illustrated in *Figure 7-23*.
2. Repeat the same configuration for bridge ports 102 and 103, binding them to logical ports 20 and 22 respectively.

```
                              Egate-100
Main Menu> Configuration> Application> Bridge> Bridge Ports

 1.  Port Number [1 - 130]                ... (101)
 2.  Port Name                            ... (Bridge Port 101)
 3.  Bind to                                  (Logical Port)
 4.  Logical Port Number [1 - 144]            (11)
 5.  Administrative Status                >   (Up)
 6.  Ingress Filtering                    >   (Enable)
 7.  Accept Frame Types                   >   (Tag Only)
 8.  Port VID [1 - 4094]                  ... (1)
 9.  Default Priority Tag[0 - 7]          ... (0)
 10. Replace Priority                     >   (No)
 11. Egress Tag Handling                  >   (None)
 12. Ingress Tag Handling                 >   (None)
 13. Loop Detection                       >   (Enable)
 14. Link OAM(802.3ah)                    >...(Disabled)
 15. Maximum MAC Address[1 - 64000]       >...(64000)

Please select item <1 to 15>
F - Forward Port; B - Backward Port; R - Remove Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-23. Configuring Bridge Port for E1 Ports

Configuring the Bridge VLAN Memberships

You must configure the VLAN memberships as specified in

Table 7-5. The following VLANs are required:

Management VLAN (100):	Contains the host port, the bridge ports bound to the E1 logical ports, and the bridge ports bound to the Gigabit Ethernet ports.
User VLAN for RICi-E1/T1 (200):	Contains the bridge port bound to the logical port for the E1 port to RICi-E1/T1, and the bridge ports bound to the Gigabit Ethernet ports.
User VLAN for RICi-8E1/T1 (300):	Contains the bridge port bound to the logical port for the E1 ports to RICi-8E1/T1, and the bridge ports bound to the Gigabit Ethernet ports.
User VLAN for RICi-16E1/T1 (400):	Contains the bridge port bound to the logical port for the E1 ports to RICi-16E1/T1, and the bridge ports bound to the Gigabit Ethernet ports.

The VLAN membership is configured in the VLAN Membership menu (Main Menu›Configuration›Applications›Bridge›**VLAN Membership**).

Table 7-5. VLAN Memberships

VLAN	Bridge Port Members
100 (management)	1, 2, 3, 101, 102, 103
200 (RICi-E1/T1 user data)	2, 3, 101
300 (RICi-8E1/T1 user data)	2, 3, 102
400 (RICi-16E1/T1 user data)	2, 3, 103

➤ **To define the management VLAN memberships:**

- In the VLAN Membership menu, configure the parameters as illustrated in *Figure 7-24*.

```
                          Egate-100
Configuration> Application> Bridge> VLAN Membership

 1. VLAN ID                                (100)
 2. Egress Transparent Ports               (1-3,101-103)
 3. View VLAN ID to Bridge Port                 []
 4. View Bridge Ports to VLAN ID                []

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

Figure 7-24. Configuring Management VLAN Membership

➤ **To define the memberships for the user VLAN for RICi-E1/T1:**

- In the VLAN Membership menu, configure the parameters as illustrated in *Figure 7-25*.

```
                          Egate-100
Configuration> Application> Bridge> VLAN Membership

 1. VLAN ID                                (200)
 2. Egress Transparent Ports               (2-3,101)
 3. View VLAN ID to Bridge Port                 []
 4. View Bridge Ports to VLAN ID                []

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

Figure 7-25. Configuring User VLAN Membership (RICi-E1/T1)

➤ **To define the memberships for the user VLAN for RICi-8E1/T1:**

- In the VLAN Membership menu, configure the parameters as illustrated in *Figure 7-26*.

```
                              Egate-100
Configuration> Application> Bridge> VLAN Membership

 1. VLAN ID                                (300)
 2. Egress Transparent Ports               (2-3,102)
 3. View VLAN ID to Bridge Port              []
 4. View Bridge Ports to VLAN ID             []

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

Figure 7-26. Configuring User VLAN Membership (RICi-8E1/T1)

➤ **To define the memberships for the user VLAN for RICi-16E1/T1:**

- In the VLAN Membership menu, configure the parameters as illustrated in *Figure 7-27*.

```
                              Egate-100
Configuration> Application> Bridge> VLAN Membership

 1. VLAN ID                                (400)
 2. Egress Transparent Ports               (2-3,103)
 3. View VLAN ID to Bridge Port              []
 4. View Bridge Ports to VLAN ID             []

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

Figure 7-27. Configuring User VLAN Membership (RICi-16E1/T1)

Running Diagnostic Tests

Egate-100 allows you to check network integrity by running ping and PRBS tests and displaying self-test results.

For detailed instructions on running the diagnostic tests and understanding test results, refer to Chapter 5, *Performing Diagnostics Tests*.

➤ **To access test results:**

- Navigate to Main Menu›**Diagnostics**.

  The Diagnostics menu appears as illustrated in *Figure 7-28*.

```
                              Egate-100
Main Menu> Diagnostics
 1. PING                              >
 2. BERT                              >
 3. Self test result                  >
Please select item <1 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-28. Diagnostics Menu

Collecting Performance Statistics

You can monitor and display statistics for the physical and logical layers:

➤ **To display statistical data for the Ethernet ports:**

- Navigate to Monitoring›Physical Layer›Ethernet›**Statistics**.

➤ **To display SDH/SONET statistics:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›**Statistics**.

➤ **To display the SDH/SONET statistics for SOH:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›**SOH**.

➤ **To display the SDH/SONET statistics for HVC:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›**HVC**.
  - To see HVC statistics for a different interval, select Interval Number and set to the desired interval number.

➤ **To display the SDH/SONET statistics for LVC:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›LVC.
  - To see LVC statistics for a different VC, select VC and set to the desired VC.
  - To see LVC statistics for a different interval, select Interval Number and set to the desired interval number.

➤ **To view E1/T1 statistics:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›**E1/T1**.
  - To see statistics for a different E1/T1 port, select **E1/T1 Number** and set to the desired E1/T1 port.
  - To see statistics for a different interval, select I**nterval Number** and set to the desired interval number.

➤ **To display logical layer statistics:**

- Navigate to Main Menu › Monitoring › **Logical Layer** and select **Statistics**.
  - Select **Port number** and enter a port number between 1 and 126.
  - To switch to the next or the previous logical port, press ‹**F**› or ‹**B**› respectively.

For more information on displaying and understanding the logical layer statistics, see Chapter 5, *Viewing Logical Layer Statistics*.

➤ **To view bridge statistics:**

- Navigate to Main Menu›Monitoring›Bridge›**Statistics**.
  - To switch to the next port or the previous port, type **F** or **B** respectively.

For more information on displaying and understanding the bridge statistics, see Chapter 5, *Viewing Bridge Statistics*.

7.2 IP DSLAM and WiMAX Backhauling over SDH/SONET

Figure 7-1 illustrates a typical application where Egate-100 provides IP DSLAM and WiMAX backhauling over SDH/SONET, operating opposite RICi-4E1, RICi-E1, and MiRICi-E1. Management is performed via the Fast Ethernet management port. A separate VLAN is used for secured management traffic.

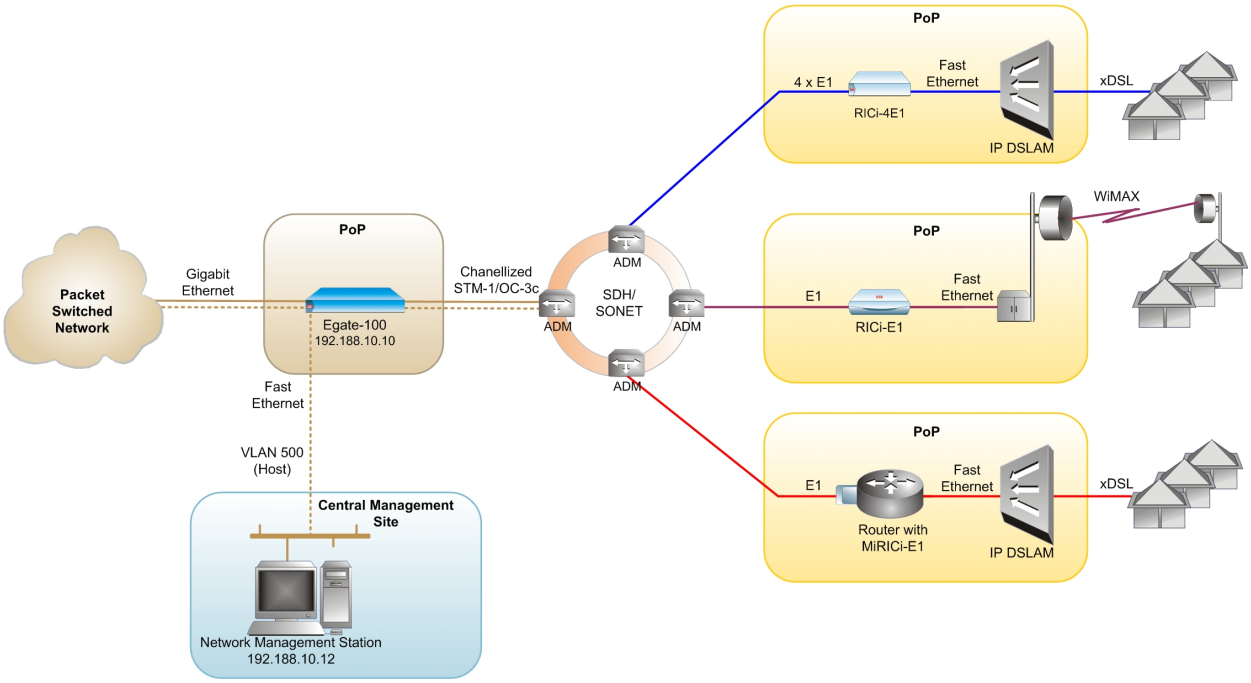


Figure 7-29. IP DSLAM and WiMAX Backhauling over SDH/SONET

The following is required to set up this application:

- 1000 BaseT/BaseSx connection to the packet-switched network
- E1 links to the SDH/SONET network where RICi-4E1/T1, RICi-E1/T1 and a router with MIRICi-E1/T1 are installed
- Fast Ethernet management port
- Network management station for management.

Equipment List

The following equipment is needed to set up this application:

- Egate-100
- RICi-4E1/T1, RICi-E1/T1, router with MIRICi-E1/T1
- Network management station.

Installing Egate-100

Egate-100 requires no special tools for installation. You need a screwdriver to mount Egate-100 in a 19-inch rack. You need a screwdriver and drill to mount Egate-100 on the wall.

Removing/installing the hot-swappable AC/DC units requires a flathead screwdriver.

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

➤ **To install Egate-100:**

1. Mount the unit.
2. Install fiber optic SFP modules.
3. Connect to channelized T3 equipment.
4. Connect to SDH/SONET equipment.
5. Connect to Gigabit Ethernet equipment.
6. Connect to management stations.
7. Connect to power.

After installing the unit, refer to the section *Configuring the Egate-100* for configuration instructions.

Mounting the Unit

Egate-100 is designed for installation as a desktop unit or mounted in a rack.

- For rack-mounting instructions, refer to the installation kit manual.
- If Egate-100 is to be used as a desktop unit, place and secure the unit on a stable, non-movable surface.

Installing Fiber Optic SFP Modules

Egate-100 uses SFP modules with LC fiber optic connectors that provide hot-swappable industry-standard interfaces.

Warning

Third-party SFP optical transceivers must be agency-approved, complying with the local laser safety regulations for Class 1 laser equipment.

➤ **To install the SFP modules:**

1. Lock the wire latch of each SFP module by lifting it up until it clicks into place, as illustrated in *Figure 7-30*.

Note *Some SFP models have a plastic door instead of a wire latch.*

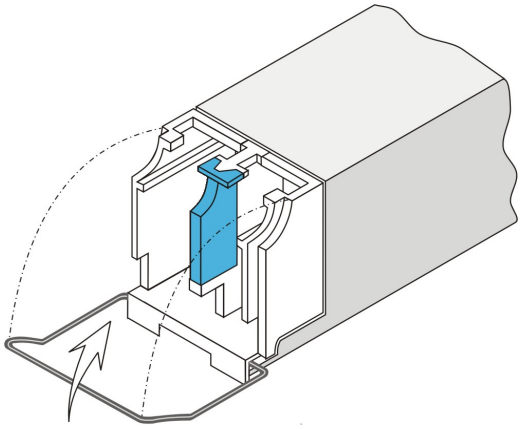


Figure 7-30. Locking the SFP Wire Latch

2. Carefully remove the dust covers from the SFP slot.
3. Insert the rear end of SFP into the socket, and push slowly backwards to mate the connectors until the SFP clicks into place. If you feel resistance before the connectors are fully mated, retract the SFP using the latch wire as a pulling handle, and then repeat the procedure.
4. Remove the protective rubber caps from the SFP modules.

Connecting to Channelized T3 Equipment

The Egate-100 channelized T3 interface terminates in three pairs of BNC connectors.

➤ **To connect the T3 interface:**

- Connect Egate-100 to the T3 equipment using BNC cables terminated with BNC connectors.

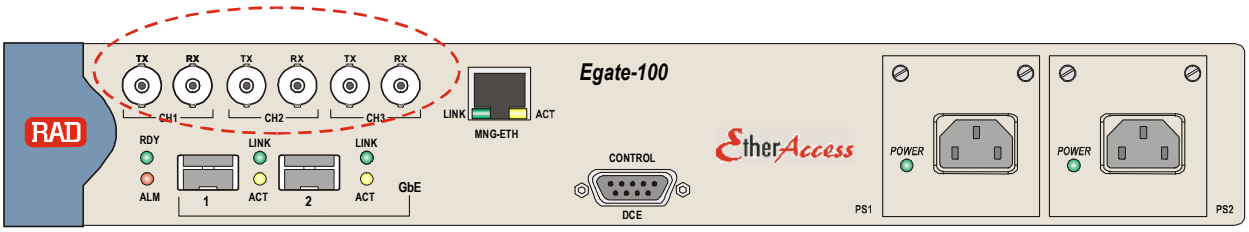


Figure 7-31. T3 BNC Connectors

Connecting to SDH/SONET Equipment

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

➤ **To connect the SDH/SONET network equipment:**

- Connect Egate-100 to the SDH/SONET network equipment using a standard fiber optic cable terminated with an LC connector. Refer to *Installing Fiber Optic SFP Modules* for details on installing fiber optic SFPs.

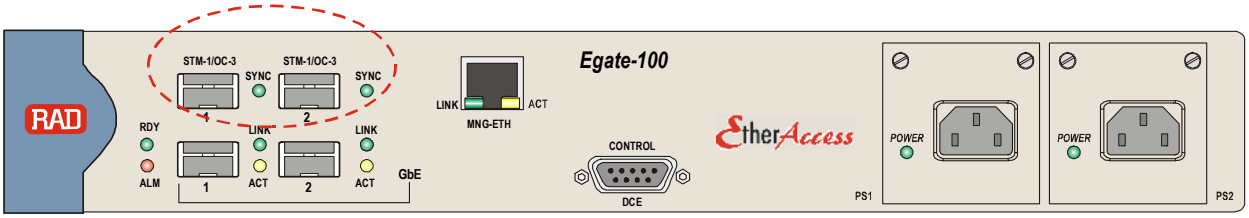


Figure 7-32. SDH/SONET SFP Connectors

Connecting to Gigabit Ethernet Equipment

The Egate-100 GbE interface terminates in 8-pin RJ-45 (electrical) or LC (optical) connectors.

➤ **To connect to the Gigabit Ethernet equipment with fiber optic SFP:**

- Connect Egate-100 to the Gigabit Ethernet network equipment using a standard fiber optic cable terminated with an LC connector. Refer to *Installing Fiber Optic SFP Modules* for details on installing fiber optic SFPs.

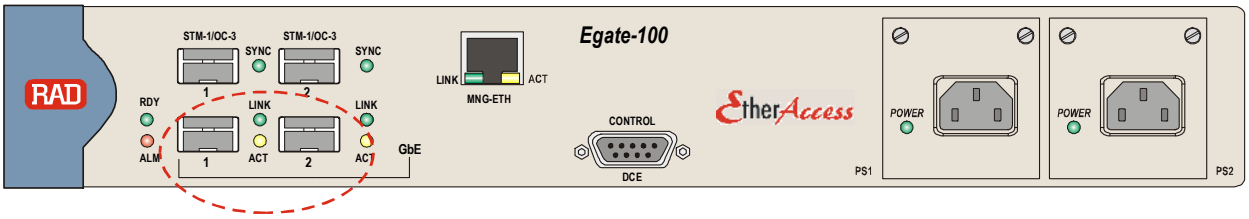


Figure 7-33: Gigabit Ethernet SFP Connectors

➤ **To connect to the Gigabit Ethernet equipment with a copper interface:**

- Connect Egate-100 to the Gigabit Ethernet network equipment using a standard straight UTP/STP cable terminated with an RJ-45 connector.

Note *When connecting Gigabit Ethernet cables longer than 30 meters (98 feet), it is recommended to use shielded cables.*

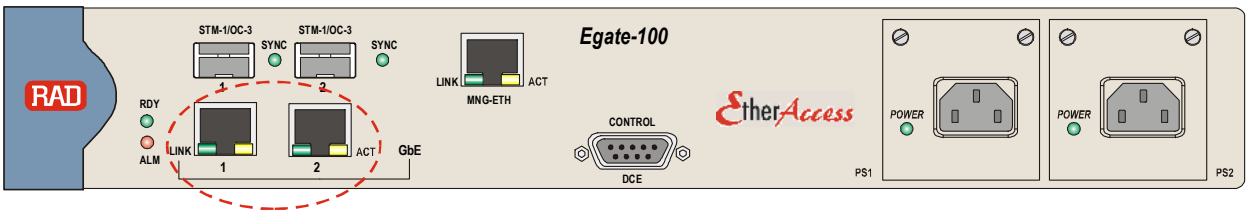


Figure 7-34: Gigabit Ethernet 10/100/1000BaseT Electrical Connectors

Connecting to Management Stations

Egate-100 can be connected to a local ASCII terminal via the CONTROL port or to a remote network management station via dedicated Ethernet management port.

Connecting to the Terminal

Egate-100 is connected to an ASCII terminal via a 9-pin D-type female connector designated CONTROL. Refer to *Appendix A* for the connector pinout.

➤ **To connect to the terminal:**

1. Connect the male 9-pin D-type connector of CBL-DB9F-DB9M-STR straight cable available from RAD to the CONTROL connector.
2. Connect the other connector of the CBL-DB9F-DB9M-STR cable to an ASCII terminal.

Caution Terminal cables must have a frame ground connection. Use ungrounded cables when connecting a supervisory terminal to a DC-powered unit with floating ground. Using improper terminal cable may result in damage to supervisory terminal port.

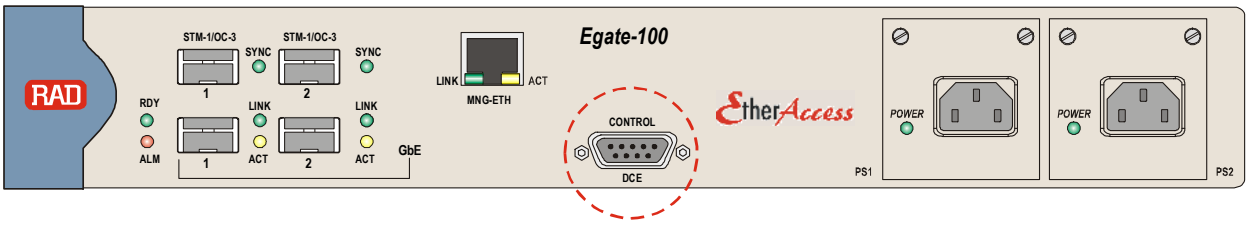


Figure 7-35: CONTROL Connector

Connecting to the Network Management Station

Egate-100 is connected to an NMS via an 8-pin RJ-45 connector designated MNG ETH. Refer to *Appendix A* for the connector pinout.

➤ **To connect to an NMS:**

- Connect Egate-100 to a hub or switch using a straight cable

  Or;

- Connect Egate-100 to a network interface card using a cross cable.

Note *When connecting Fast Ethernet cables longer than 30 meters (98 feet), it is recommended to use shielded cables.*

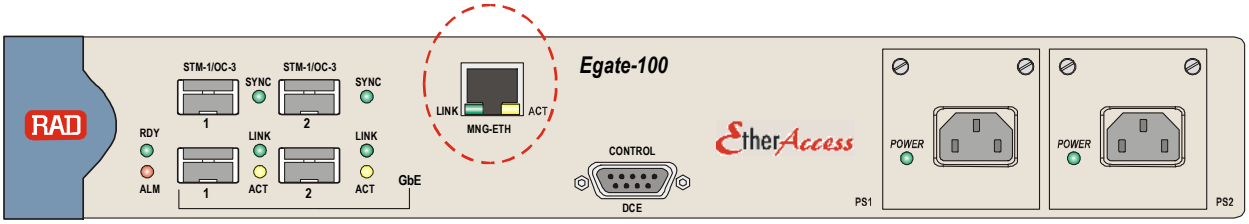


Figure 7-36: Fast Ethernet Management Connector

Connecting to Power

Egate-100 can be ordered with either AC power or DC power (single or dual power supply).

Connecting to AC Power

AC power is supplied to Egate-100 via a standard 3-prong plug.

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 connecting or disconnecting any communication cable, the unit must be grounded by connecting its power cord to a power outlet with a ground terminal, and by connecting the ground terminal on the panel (if provided) to a protective ground.

Interrupting the protective (ground) conductor inside or outside the unit, or disconnecting the protective ground terminal may render 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. Verify that the AC outlet is grounded properly. Ensure that the supply voltage is in the range 100 VAC to 240 VAC
2. Connect the power cable to a power connector on the Egate-100 front panel.
3. Connect the power cable to the mains.

   The unit turns on automatically.

Connecting to DC Power

➤ **To connect DC power:**

Refer to the DC power supply connection supplement, located on the Technical Documentation CD or at the end of this manual. Also, refer to the safety instructions at the beginning of this document.

Configuring the Egate-100

This section describes the configuration of the Egate-100 unit as it appears in *Figure 7-1*. The configuration stages are:

- *Setting System Parameters*
- *Setting Ethernet Parameters*
- *Setting SDH/SONET Parameters*
- *Setting Logical Layer Parameters*
- *Setting Bridge Parameters*

Setting System Parameters

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

➤ **To set the host parameters:**

1. Display the Host menu (Configuration›System›Management›**Host**), and configure the host parameters as illustrated in *Figure 7-9*.
2. To define host VLAN tagging, in the Host menu select **Encapsulation** to navigate to the Encapsulation menu.
3. Configure the host encapsulation parameters as illustrated in *Figure 7-37*.

```
                              Egate-100
Main Menu> Configuration> System> Management> Host>
Encapsulation

 1. Host Tagging                    >   (Tagged)
 2. Host VLAN ID[1 - 4094]          ... (500)
 3. Host Priority Tag[0 - 7]        ... (0)

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

Figure 7-37. Configuring Host Encapsulation

➤ **To add the network manager:**

1. In the Manager List menu (Main Menu › Configuration › System › Management › **Manager List**), move the cursor to the Manager IP cell you wish to change by clicking ‹**Tab**›.

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

2. Select **Change Cell**, and enter **192.188.10.12** for the selected network manager.

➤ **To configure the system clock source:**

1. Navigate to the master clock source menu (Main Menu›Configuration› System›Clock Source›**Master Clock**) and configure the parameter values as illustrated in *Figure 7-38*.
2. Navigate to the fallback clock source menu (Main Menu›Configuration› System›Clock Source›**Fallback Clock**) and configure the parameter values as illustrated in *Figure 7-39*.

```
                              Egate-100
…Configuration> System> Clock Source> Master Clock

 1. Source                          >   (Rx Clock)
 2. Wait to Restore(sec)[0 - 720] ... (300)
 3. Port Number [1 - 3]             ... (1)

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

Figure 7-38. Configuring Master Clock Source

```
                              Egate-100
Main Menu> Configuration> System> Clock Source> Fallback Clock

 1. Source                          >   (Internal)
 2. Wait to Restore (sec)[0 - 720]...  (300)
 3. Port Number [1 - 3]              ... (2)

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

Figure 7-39. Configuring Fallback Clock Source

Setting Ethernet Parameters

The Gigabit Ethernet ports must be configured for operation if the default values are not suitable for the application.

➤ To configure the Gigabit Ethernet interface:

1. Display the Ethernet Menu (Main Menu›Configuration›Physical Layer› **Ethernet**).
2. Configure the following for both Gigabit Ethernet links according to your application requirements:
   - Autonegotiation
   - Max capability.

Setting SDH/SONET Parameters

Configuring the SDH/SONET Interface

The clock is provided by the SDH/SONET network, therefore you must configure the SDH/SONET physical layer to use the timing from the SDH/SONET interface.

➤ To configure the SDH/SONET interface timing:

- Navigate to Main Menu›Configuration›Physical Layer›**SDH/SONET** and configure the parameter values as illustrated in *Figure 7-40*.

```
                              Egate-100
Configuration> Physical Layer> SDH/SONET

 1. Frame Type                              >    (SDH)
 2. Tx Clock                                >    (Loopback Timing)
 3. Administrative Status & Alarms          >
 4. Mapping                                 []
 5. E1/T1                                   >
 6. SOH                                     >
 7. HVC                                     >
 8. LVC                                     >

>
Please select item <1 to 8>
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-40. SDH/SONET Menu

Configuring SDH/SONET E1 ports

You must configure the E1 ports with the appropriate frame type as specified in *Table 7-6*. You must configure the following E1 ports:

For RICi-4E1/T1: E1 ports 41 – 44, unframed

For RICi-E1/T1: E1 port 45, unframed

For MiRICi-E1/T1: E1 port 46, framed (CRC 4 enabled)

The E1 port configuration is done in the SDH/SONET Physical Port E1 menu (Main Menu ›Configuration ›Physical Layer › SDH/SONET).

Table 7-6. E1 Port Specifications

Unit/Interface	E1 port numbers	Framing type	Logical port numbers	Protocol	Bridge port number
RICi-4E1/T1	41 – 44	Unframed	41 – 44	PPPoHDLC	
			45	MLPPP, bound to logical ports 41 – 44	111, bound to MLPPP port
RICi-E1/T1	45	Unframed	46	HDLC	112
MiRICi-E1/T1	46	CRC 4 enabled	47	GFP (non- VCAT non-LCAS), VCAT header disabled	113

➤ To configure the E1 ports for RICi-4E1/T1:

1. In the SDH/SONET Physical Port E1 menu, configure E1 port 41 as illustrated in *Figure 7-41*.
2. Repeat the same configuration for E1 ports 42 to 44.

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> E1

 1. Port Number [1-63]              ... (41)
 2. Administrative Status           >   (Up)
 3. Frame Type                      >   (Unframed)
 4. Alarms                          >   (Unmasked)

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

Figure 7-41. Configuring E1 Ports for RICi-4E1/T1

➤ **To configure the E1 port for RICi-E1/T1:**

- In the SDH/SONET Physical Port E1 menu, configure E1 port 45 as illustrated in *Figure 7-42*.

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> E1

 1. Port Number [1-63]              ... (45)
 2. Administrative Status           >   (Up)
 3. Frame Type                      >   (Unframed)
 4. Idle Code [0-ff]                ... (0)
 5. Alarms                          >   (Unmasked)

Please select item <1 to 5>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-42. Configuring E1 Port for RICi-E1/T1

➤ **To configure the E1 port for MiRICi-E1/T1:**

- In the SDH/SONET Physical Port E1 menu, configure E1 port 46 as illustrated in *Figure 7-43*.

```
                              Egate-100
Main Menu> Configuration> Physical Layer> SDH/SONET> E1

 1. Port Number [1-63]              ... (46)
 2. Administrative Status           >   (Up)
 3. Frame Type                      >   (CRC-4 Enable)
 4. Idle Code [0-ff]                ... (0)
 5. Alarms                          >   (Unmasked)

Please select item <1 to 5>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-43. Configuring E1 Port for MiRICi-E1/T1

Setting Logical Layer Parameters

You must configure logical ports for the E1 ports, as specified in *Table 7-7*. You must configure the following logical ports:

For RICi-4E1/T1: Logical ports 41 – 44 with PPP over HDLC, which are then bound to logical port 45 with MLPPP protocol

For RICi-E1/T1: Logical port 46, HDLC protocol

For MiRICi-16E1/T1: Logical port 47, GFP (non-VCAT non-LCAS) protocol with VCAT header disabled

The logical ports are configured in the Logical Layer menu (Main Menu ›Configuration ›**Logical Layer**).

Table 7-7. E1 Port Specifications

Unit/Interface	E1 port numbers	Framing type	Logical port numbers	Protocol	Bridge port number
RICi-4E1/T1	41 – 44	Unframed	41 – 44	PPPoHDLC	
			45	MLPPP, bound to logical ports 41 – 44	111, bound to MLPPP port
RICi-E1/T1	45	Unframed	46	HDLC	112
MiRICi-E1/T1	46	CRC 4 enabled	47	GFP (non- VCAT non-LCAS), VCAT header disabled	113

➤ **To configure the logical layer for the E1 ports to RICi-4E1/T1:**

1. In the Logical Layer menu, configure logical port 41 with PPP over HDLC protocol, to correspond to physical port 41, as illustrated in *Figure 7-44*.
2. Repeat the same configuration for logical ports 42 to 44, to correspond to physical ports 42 to 44.
3. In the Logical Layer menu, configure logical port 45 with MLPPP protocol, binding it to logical ports 41 to 44, as illustrated in *Figure 7-45*.

```
                              Egate-100
Main Menu> Configuration> Logical Layer

 1. Port Number[1 - 126]          ... (41)
 2. Port Name                     ... (Logical Port 41)
 3. Protocol Type                 >   (PPPoHDLC)
 4. Physical Port Number[1 - 63]  ... (41)
 5. Address & Control Compression >   (On)
 6. Protocol Field Compression    >   (On)
 7. Alarms                        >   (Unmasked)

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

Figure 7-44. Configuring PPPoHDLC Logical Ports for RICi-4E1/T1

```
                              Egate-100
Configuration> Logical Layer

 1. Port Number[1 - 126]          ... (45)
 2. Port Name                     ... (Logical Port 45)
 3. Protocol Type                 >   (MLPPP)
 4. Bind Logical Ports            >   (41-44)
 5. MTU(bytes)                    >   (0)
 6. Alarms                        >   (Unmasked)
>
Please select item <1 to 6>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-45. Configuring MLPPP Logical Port for RICi-4E1/T1

➤ **To configure the logical layer for the E1 port to RICi-E1/T1:**

- In the Logical Layer menu, configure logical port 46 with HDLC protocol, to correspond to physical port 45, as illustrated in *Figure 7-46*.

```
                              Egate-100
Configuration> Logical Layer

 1. Port Number [1 - 126]         ... (46)
 2. Port Name                     ... (Logical Port 46)
 3. Protocol Type                 >   (HDLC)
 4. Physical Port Number [1 - 63] ... (45)
 5. Alarms                        >   (Unmasked)
>
Please select item <1 to 5>
F - Forward Port; B - Backward Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-46. Configuring Logical Port for RICi-E1/T1

➤ **To configure the logical layer for the E1 port to MiRICi-E1/T1:**

- In the Logical Layer menu, configure logical port 47 with GFP protocol (non-LCAS), with VCAT header disabled, to correspond to physical port 46, as illustrated in *Figure 7-47*.

```
                              Egate-100
Configuration> Logical Layer

 1. Port Number[1 - 126]           ... (47)
 2. Port Name                      ... (Logical Port 47)
 3. Protocol Type                  >   (GFP)
 4. Multi Link                     >...(No)
 5. Physical Port Number [1 - 63] >   (46)
 6. Payload FCS                    >   (Disable)
 7. VCAT Header                    >   (Disable)
 8. Alarms                         >   (Unmasked)
>
Please select item <1 to 8>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-47. Configuring Logical Port for MiRICi-E1/T1

Setting Bridge Parameters

The following steps must be performed:

1. Configuring the bridge to VLAN-aware
2. Configuring the bridge ports as specified in *Table 7-8*
3. Defining VLAN memberships as specified in *Table 7-9*.

Configuring the Bridge

The bridge must be configured to VLAN-aware, so that Egate-100 forwards traffic based on VLAN as well as MAC address.

➤ **To configure the bridge parameters:**

- Navigate to the Bridge menu (Main Menu › Configuration › Applications › **Bridge**) and configure the parameter values as illustrated in *Figure 7-20*.

Configuring the Bridge Ports

The bridge ports required for the application are shown in *Table 7-8*. The binding of bridge port 1 to the host port is automatic in Egate-100, so does not have to be configured. The bridge ports bound to the host and Fast Ethernet management port must perform egress tag stripping because they handle management traffic that had the tag added to the frame, therefore it must be stripped at egress.

The Port VID can be left as the default value for the bridge ports other than the Fast Ethernet management port, as user frames arrive tagged. For the Fast Ethernet port, the Port VID is set to the management VLAN ID.

The bridge ports are configured in the Bridge Port menu (Main Menu›Configuration›Applications›Bridge›**Bridge Ports**).

Table 7-8. Bridge Port Specifications

Bridge port number	Bind to	Egress tag handling
1	Host (automatic)	Stripping
2	GbE-1	None
3	GbE-2	None
4	FE MNG	None
111	Logical port 45	None
112	Logical port 46	None
113	Logical port 47	None

➤ **To configure the bridge port for the host:**

- From the Bridge Port menu, configure the **Egress Tag Handling** for the host bridge port to perform stripping, as illustrated in *Figure 7-21*.

➤ **To configure the bridge port for the Gigabit Ethernet ports:**

1. From the Bridge Port menu, configure the bridge port parameters for bridge port 2, binding it to GbE-1, as illustrated in *Figure 7-22*.
2. Repeat the same configuration for bridge port 3, binding it to GbE-2.

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

- From the Bridge Port menu, configure the bridge port parameters for bridge port 4, binding it to ETH MNG, as illustrated in *Figure 7-48*.

```
                              Egate-100
Main Menu> Configuration> Application> Bridge> Bridge Ports

 1. Port Number [1 - 130]                ... (4)
 2. Port Name                            ... (Bridge Port 4)
 3. Bind to                                  (ETH MNG)
 4. Administrative Status                >   (Up)
 5. Ingress Filtering                    >   (Disable)
 6. Accept Frame Types                   >   (All)
 7. Port VID [1 - 4094]                  ... (500)
 8. Default Priority Tag[0 - 7]          ... (0)
 9. Replace Priority                     >   (No)
 10. Egress Tag Handling                  >   (Stripping)
 11. Ingress Tag Handling                >   (None)
 12. Maximum MAC Address[1 - 64000]      >...(64000)

Please select item <1 to 12>
F - Forward Port; B - Backward Port; R - Remove Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-48. Configuring Bridge Port for Fast Ethernet Port

➤ To configure the bridge ports for the logical ports:

1. From the Bridge Port menu, configure the bridge port parameters for bridge port 111, binding it to logical port 45, as illustrated in *Figure 7-49*.
2. Repeat the same configuration for bridge ports 112 and 113, binding them to logical ports 46 and 47 respectively.

```
                              Egate-100
Main Menu> Configuration> Application> Bridge> Bridge Ports

 1.  Port Number [1 - 130]               ... (111)
 2.  Port Name                           ... (Bridge Port 111)
 3.  Bind to                                 (Logical Port)
 4.  Logical Port Number [1 - 144]           (45)
 5.  Administrative Status               >   (Up)
 6.  Ingress Filtering                   >   (Enable)
 7.  Accept Frame Types                  >   (Tag Only)
 8.  Port VID [1 - 4094]                 ... (1)
 9.  Default Priority Tag[0 - 7]         ... (0)
 10. Replace Priority                    >   (No)
 11. Egress Tag Handling                 >   (None)
 12. Ingress Tag Handling                >   (None)
 13. Loop Detection                      >   (Enable)
 14. Link OAM(802.3ah)                   >...(Disabled)
 15. Maximum MAC Address[1 - 64000]      >...(64000)


Please select item <1 to 15>
F - Forward Port; B - Backward Port; R - Remove Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-49. Configuring Bridge Port for E1 Port

Configuring the Bridge VLAN Memberships

The VLAN memberships (see *Table 7-9*) are configured in the VLAN Membership menu (Main Menu›Configuration›Applications›Bridge›**VLAN Membership**).

The required Management VLAN (500) contains the following: the host port, the bridge ports bound to the E1 logical ports, the bridge ports bound to the Gigabit Ethernet ports, and the bridge port bound to the Fast Ethernet management port.

Table 7-9. VLAN Memberships

VLAN	Bridge Port Members
500 (management)	1, 2, 3, 4, 111, 112, 113

➤ **To define the management VLAN memberships:**

- In the VLAN Membership menu, configure the parameters as illustrated in *Figure 7-50*.

```
                          Egate-100
Configuration> Application> Bridge> VLAN Membership

 1. VLAN ID                              (500)
 2. Egress Transparent Ports             (1-4,111-113)
 3. View VLAN ID to Bridge Port               []
 4. View Bridge Ports to VLAN ID              []

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

Figure 7-50. Configuring Management VLAN Memberships

Running Diagnostic Tests

Egate-100 allows you to check network integrity by running ping and PRBS tests and displaying self-test results.

For detailed instructions on running the diagnostic tests and understanding test results, refer to Chapter 5, *Performing Diagnostics Tests*.

➤ **To access test results:**

- Navigate to Main Menu›**Diagnostics**.

  The Diagnostics menu appears as illustrated in *Figure 7-51*.

```
                          Egate-100
Main Menu> Diagnostics
 1. PING                          >
 2. BERT                          >
 3. Self test result              >
Please select item <1 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-51. Diagnostics Menu

Collecting Performance Statistics

You can monitor and display statistics for the physical and logical layers:

➤ **To display statistical data for the Ethernet ports:**

- Navigate to Monitoring›Physical Layer›Ethernet›**Statistics**.

➤ **To display SDH/SONET statistics:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›**Statistics**.

➤ **To display the SDH/SONET statistics for SOH:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›**SOH**.

➤ **To display the SDH/SONET statistics for HVC:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›**HVC**.
  - To see HVC statistics for a different interval, select Interval Number and set to the desired interval number.

➤ **To display the SDH/SONET statistics for LVC:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›LVC.
  - To see LVC statistics for a different VC, select VC and set to the desired VC.
  - To see LVC statistics for a different interval, select Interval Number and set to the desired interval number.

➤ **To view E1/T1 statistics:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›**E1/T1**.
  - To see statistics for a different E1/T1 port, select **E1/T1 Number** and set to the desired E1/T1 port.
  - To see statistics for a different interval, select I**nterval Number** and set to the desired interval number.

➤ **To display logical layer statistics:**

- Navigate to Main Menu › Monitoring › **Logical Layer** and select **Statistics**.
  - Select **Port number** and enter a port number between 1 and 126.
  - To switch to the next or the previous logical port, press ‹**F**› or ‹**B**› respectively.

For more information on displaying and understanding the logical layer statistics, see Chapter 5, *Viewing Logical Layer Statistics*.

➤ **To view bridge statistics:**

- Navigate to Main Menu›Monitoring›Bridge›**Statistics**.
  - To switch to the next port or the previous port, type **F** or **B** respectively.

For more information on displaying and understanding the bridge statistics, see Chapter 5, *Viewing Bridge Statistics*.

7.3 WiMAX Backhauling Opposite RICi-4T1

Figure 7-52 illustrates a typical application where Egate-100 provides WiMAX backhauling over SDH/SONET, operating opposite multiple RICi-4T1s. Egate-100 is managed via the Fast Ethernet management port. Different user VLANs are used for each customer and a separate VLAN is used for secured management traffic.

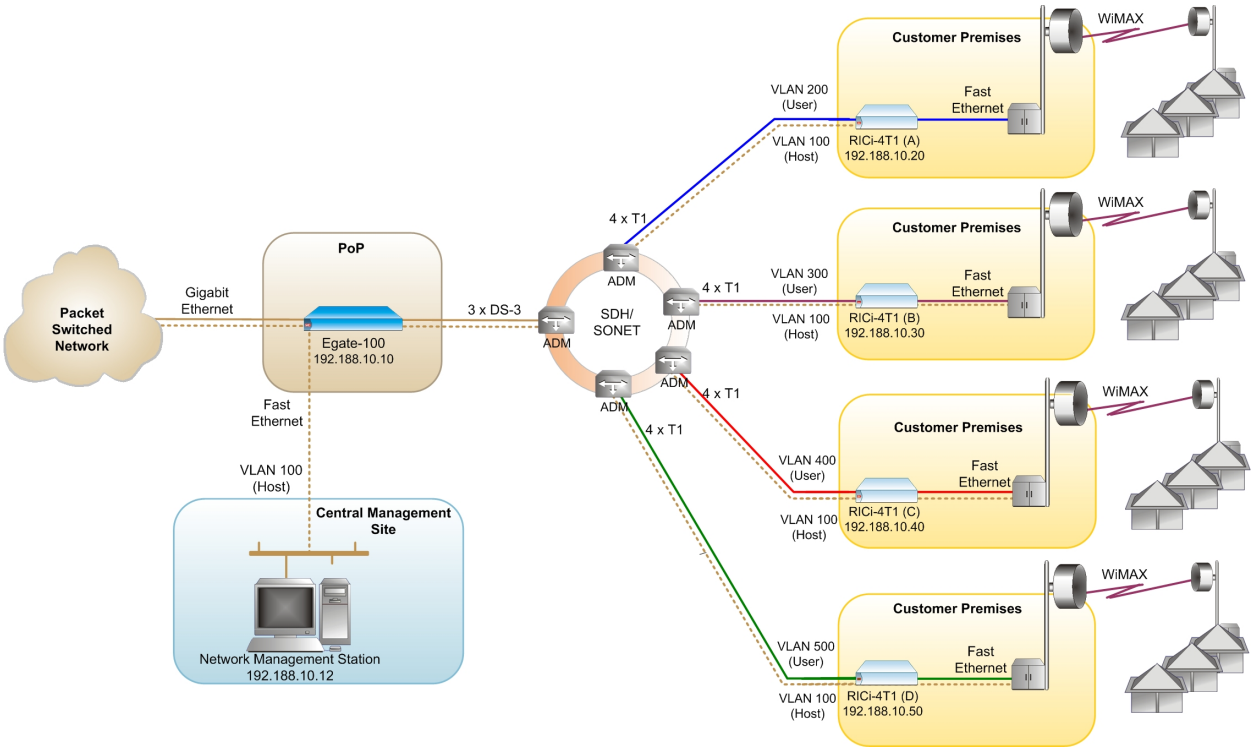


Figure 7-52. Egate-100 Application with WiMAX backhauling opposite RICi-4T1, Management via Fast Ethernet Port

The following is required to set up this application:

- 1000 BaseT/BaseSx connection to the packet-switched network
- T3 links to the SDH/SONET network where RICi-4T1s are installed
- Fast Ethernet management port
- Network management station for management.

Equipment List

The following is a list of equipment needed to set up this application:

The following equipment is needed to set up this application:

- Egate-100

- RICi-4E1/T1
- Network management station.

Installing Egate-100

Egate-100 requires no special tools for installation. You need a screwdriver to mount Egate-100 in a 19-inch rack. You need a screwdriver and drill to mount Egate-100 on the wall.

Removing/installing the hot-swappable AC/DC units requires a flathead screwdriver.

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

Refer to *Table 7-1* to determine which cables and connectors are required for installation.

➤ **To install Egate-100:**

1. Mount the unit.
2. Install fiber optic SFP modules.
3. Connect to channelized T3 equipment.
4. Connect to SDH/SONET equipment.
5. Connect to Gigabit Ethernet equipment.
6. Connect to management stations.
7. Connect to power.

After installing the unit, refer to the section *Configuring the Egate-100* for configuration instructions.

Mounting the Unit

Egate-100 is designed for installation as a desktop unit or mounted in a rack.

- For rack-mounting instructions, refer to the installation kit manual.
- If Egate-100 is to be used as a desktop unit, place and secure the unit on a stable, non-movable surface.

Installing Fiber Optic SFP Modules

Egate-100 uses SFP modules with LC fiber optic connectors that provide hot-swappable industry-standard interfaces.

Warning

Third-party SFP optical transceivers must be agency-approved, complying with the local laser safety regulations for Class 1 laser equipment.

➤ **To install the SFP modules:**

1. Lock the wire latch of each SFP module by lifting it up until it clicks into place, as illustrated in *Figure 7-53*.

Note *Some SFP models have a plastic door instead of a wire latch.*

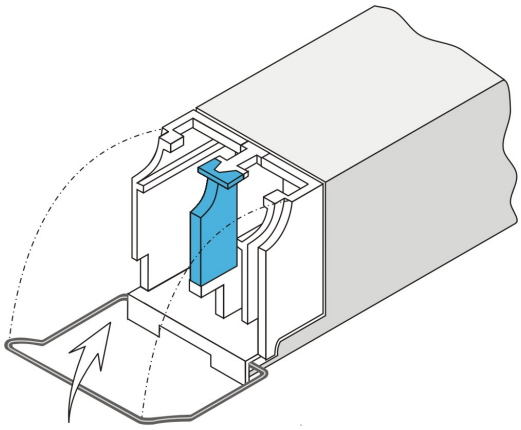


Figure 7-53. Locking the SFP Wire Latch

2. Carefully remove the dust covers from the SFP slot.
3. Insert the rear end of SFP into the socket, and push slowly backwards to mate the connectors until the SFP clicks into place. If you feel resistance before the connectors are fully mated, retract the SFP using the latch wire as a pulling handle, and then repeat the procedure.
4. Remove the protective rubber caps from the SFP modules.

Connecting to Channelized T3 Equipment

The Egate-100 channelized T3 interface terminates in three pairs of BNC connectors.

➤ **To connect the T3 interface:**

- Connect Egate-100 to the T3 equipment using BNC cables terminated with BNC connectors.

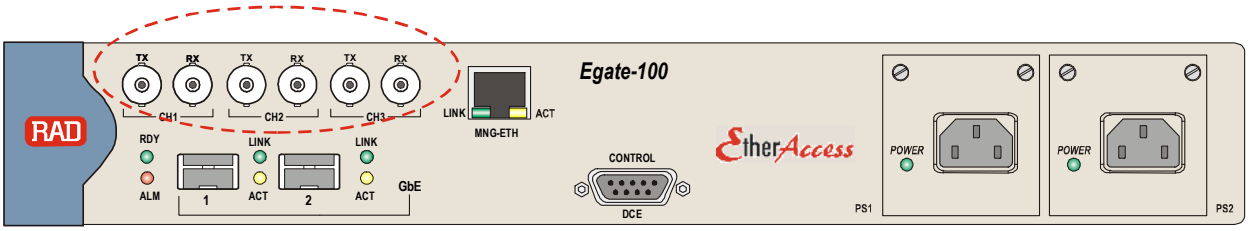


Figure 7-54. T3 BNC Connectors

Connecting to SDH/SONET Equipment

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

➤ **To connect the SDH/SONET network equipment:**

- Connect Egate-100 to the SDH/SONET network equipment using a standard fiber optic cable terminated with an LC connector. Refer to *Install fiber optic SFP modules* for details on installing fiber optic SFPs.

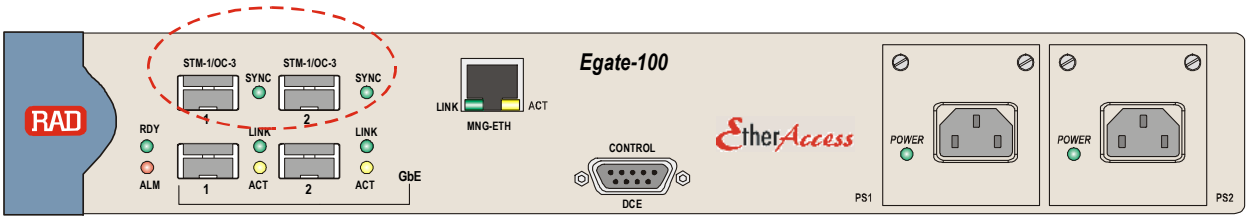


Figure 7-55. SDH/SONET SFP Connectors

Connecting to Gigabit Ethernet Equipment

The Egate-100 GbE interface terminates in 8-pin RJ-45 (electrical) or LC (optical) connectors.

➤ **To connect to the Gigabit Ethernet equipment with fiber optic SFP:**

- Connect Egate-100 to the Gigabit Ethernet network equipment using a standard fiber optic cable terminated with an LC connector. Refer to *Install fiber optic SFP modules* for details on installing fiber optic SFPs.

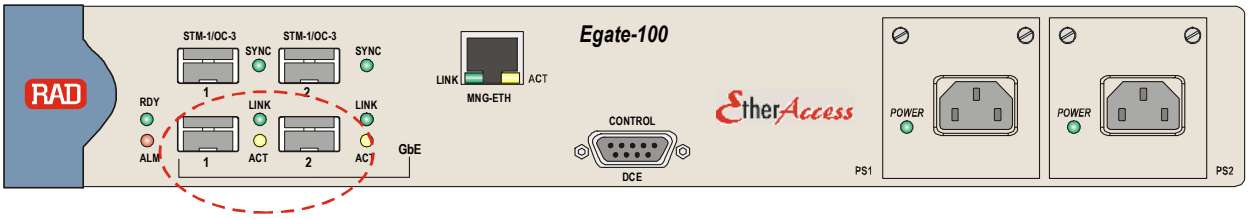


Figure 7-56: Gigabit Ethernet SFP Connectors

➤ **To connect to the Gigabit Ethernet equipment with a copper interface:**

- Connect Egate-100 to the Gigabit Ethernet network equipment using a standard straight UTP/STP cable terminated with an RJ-45 connector.

Note *When connecting Gigabit Ethernet cables longer than 30 meters (98 feet), it is recommended to use shielded cables.*

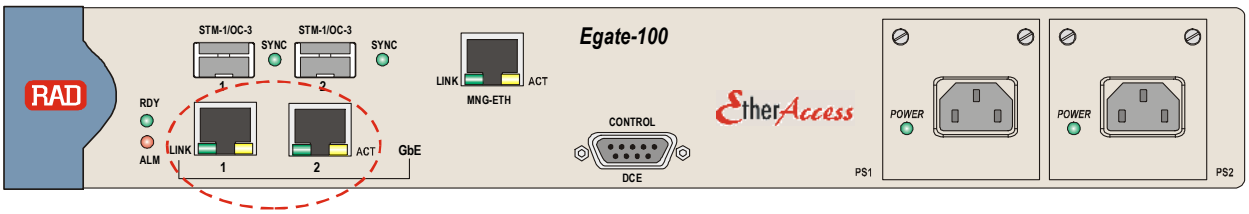


Figure 7-57: Gigabit Ethernet 10/100/1000BaseT Electrical Connectors

Connecting to Management Stations

Egate-100 can be connected to a local ASCII terminal via the CONTROL port or to a remote network management station via dedicated Ethernet management port.

Connecting to the Terminal

Egate-100 is connected to an ASCII terminal via a 9-pin D-type female connector designated CONTROL. Refer to *Appendix A* for the connector pinout.

➤ **To connect to the terminal:**

1. Connect the male 9-pin D-type connector of CBL-DB9F-DB9M-STR straight cable available from RAD to the CONTROL connector.
2. Connect the other connector of the CBL-DB9F-DB9M-STR cable to an ASCII terminal.

Caution Terminal cables must have a frame ground connection. Use ungrounded cables when connecting a supervisory terminal to a DC-powered unit with floating ground. Using improper terminal cable may result in damage to supervisory terminal port.

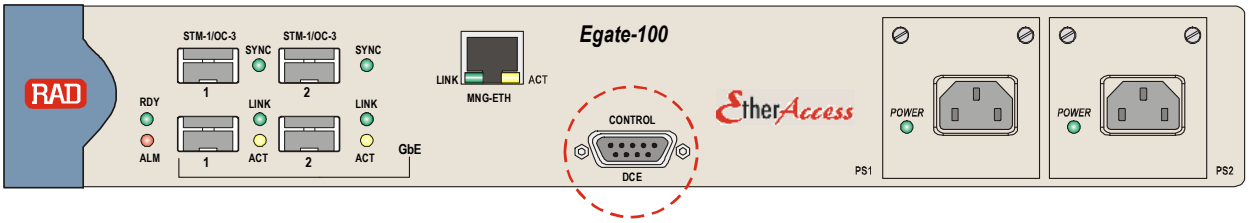


Figure 7-58: CONTROL Connector

Connecting to the Network Management Station

Egate-100 is connected to an NMS via an 8-pin RJ-45 connector designated MNG ETH. Refer to *Appendix A* for the connector pinout.

➤ **To connect to an NMS:**

- Connect Egate-100 to a hub or switch using a straight cable

  Or;

- Connect Egate-100 to a network interface card using a cross cable.

Note *When connecting Fast Ethernet cables longer than 30 meters (98 feet), it is recommended to use shielded cables.*

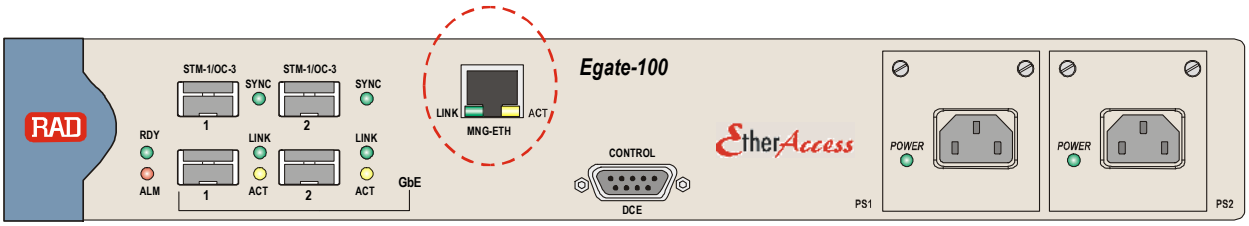


Figure 7-59: Fast Ethernet Management Connector

Connecting to Power

Egate-100 can be ordered with either AC power or DC power (single or dual power supply).

Connecting to AC Power

AC power is supplied to Egate-100 via a standard 3-prong plug.

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 connecting or disconnecting any communication cable, the unit must be grounded by connecting its power cord to a power outlet with a ground terminal, and by connecting the ground terminal on the panel (if provided) to a protective ground.

Interrupting the protective (ground) conductor inside or outside the unit, or disconnecting the protective ground terminal may render 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. Verify that the AC outlet is grounded properly. Ensure that the supply voltage is in the range 100 VAC to 240 VAC
2. Connect the power cable to a power connector on the Egate-100 front panel.
3. Connect the power cable to the mains.

   The unit turns on automatically.

Connecting to DC Power

➤ **To connect DC power:**

- Refer to the DC power supply connection supplement, located on the Technical Documentation CD or at the end of this manual. Also, refer to the safety instructions at the beginning of this document.

Configuring Egate-100

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

- *Setting System Parameters*
- *Setting Ethernet Parameters*
- *Setting SDH/SONET Parameters*
- *Setting Logical Layer Parameters*
- *Setting Bridge Parameters*

Note *Unless indicated otherwise, the configuration procedures for T1/SONET and E1/SDH are identical.*

Setting System Parameters

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.

Note *To assign an IP address the first time the unit is powered up, or after resetting the unit to the factory default, you must connect an ASCII terminal to the CONTROL interface and use HyperTerminal to access the Egate-100 menus.*

➤ To set the host IP parameters:

1. Navigate to Configuration›System›Management›**Host** and set the host IP parameters as illustrated in *Figure 7-60*.

```
                              Egate-100
Main Menu> Configuration> System> Management> Host

 1. IP Address                      ... (192.188.10.10)
 2. IP Mask                         ... (255.255.255.0)
 3. Default Gateway                 ... (192.188.10.1)
 4. Read Community                  ... (public)
 5. Write Community                 ... (private)
 6. Trap Community                  ... (public)
 7. Encapsulation                   >

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

Figure 7-60. Configuring Host Parameters

2. Navigate to Host›**Encapsulation** and set the host encapsulation parameters as illustrated in *Figure 7-10*.

```
                              Egate-100
Main Menu> Configuration> System> Management> Host>
Encapsulation

 1. Host Tagging                    >   (Tagged)
 2. Host VLAN ID[1 - 4094]          ... (100)
 3. Host Priority Tag[0 - 7]        ... (0)

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

Figure 7-61. Configuring Host Encapsulation

➤ To add the network manager:

1. Navigate to Main Menu›Configuration›System›Management›**Manager List**.
2. Move the cursor to the Manager IP cell you wish to change by clicking ‹**Tab**›.

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

3. Select **Change Cell**, and enter **192.188.10.11** for the selected network manager.

➤ **To configure the system clock source:**

1. Navigate to the master clock source menu (Main Menu›Configuration› System ›Clock Source›**Master Clock**) and configure the parameter values as illustrated in *Figure 7-62*.
2. Navigate to the fallback clock source menu (Main Menu›Configuration› System›Clock Source › **Fallback Clock**) and configure the parameter values as illustrated in *Figure 7-63*.

```
                              Egate-100
…Configuration> System> Clock Source> Master Clock

 1. Source                          >   (Rx Clock)
 2. Wait to Restore(sec)[0 - 720] ... (300)
 3. Port Number [1 - 3]             ... (1)

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

Figure 7-62. Configuring Master Clock Source

```
                              Egate-100
Main Menu> Configuration> System> Clock Source> Fallback Clock

 1. Source                          >   (Internal)
 2. Wait to Restore (sec)[0 - 720]...  (300)
 3. Port Number [1 - 3]              ... (2)

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

Figure 7-63. Configuring Fallback Clock Source

Setting Ethernet Parameters

The Gigabit Ethernet ports must be configured for operation if the default values are not suitable for the application.

➤ **To configure the Gigabit Ethernet interface:**

- Display the Ethernet Menu (Main Menu › Configuration › Physical Layer › **Ethernet**), and configure the following for both Gigabit Ethernet links according to your application requirements:
  - Autonegotiation
  - Max capability.

Setting SDH/SONET Parameters

Configuring SDH/SONET Interface

The clock is provided by the SDH/SONET network, therefore you must configure the SDH/SONET physical layer to use the timing from the SDH/SONET interface.

➤ **To configure the SDH/SONET interface timing:**

- Navigate to the SDH/SONET Physical Port menu (Main Menu > Configuration > Physical Layer > **SDH/SONET**) and configure the parameter values as illustrated in *Figure 7-64*.

```
                              Egate-100
Configuration> Physical Layer> SDH/SONET

 1. Frame Type                          >    (SONET)
 2. Tx Clock                            >    (Loopback Timing)
 3. Administrative Status & Alarms      >
 4. Mapping                             []
 5. E1/T1                               >
 6. SOH                                 >
 7. HVC                                 >
 8. LVC                                 >

>
Please select item <1 to 8>
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-64. SDH/SONET Menu

Configuring T3 and T1 ports

You must configure the T3 ports with the clock source, and the T1 ports with the appropriate frame type as specified in *Table 7-10*.

The following T3 and T1 ports must be configured:

For RICi-4T1 (A): T3 port 1, T1 ports 22 – 25, framed, D4

For RICi-4T1 (B): T3 port 2, T1 ports 53 – 56, framed, D4

For RICi-4T1 (C): T3 port 3, T1 ports 77 – 80, framed, D4

For RICi-4T1 (D): T3 port 3, T1 ports 81 – 84, framed, D4

The T3 port is configured in the Physical Port T3 menu (Main Menu > Configuration > Physical Layer > **T3**).

The T1 port is configured in the Physical Port T3 T1 menu (Main Menu > Configuration > Physical Layer > T3 > **T1**).

Table 7-10. T1 Port Specifications

Unit	T3 port number	T1 port numbers	Framing type	Logical port numbers	Protocol	Bridge port number
RICi-4T1 (A)	1	22 – 25	Framed, D4	22 – 25	PPPoHDLC	
				120	MLPPP, bound to logical ports 22 – 25	120, bound to MLPPP port
RICi-4T1 (B)	2	53 – 56	Framed, D4	53 – 56	PPPoHDLC	
				121	MLPPP, bound to logical ports 53 – 56	121, bound to MLPPP port
RICi-4T1 (C)	3	77 – 80	Framed, D4	77 – 80	PPPoHDLC	
				122	MLPPP, bound to logical ports 77 – 80	122, bound to MLPPP port
RICi-4T1 (D)	3	81 – 84	Framed, D4	81 – 84	PPPoHDLC	
				123	MLPPP, bound to logical ports 81 – 84	123, bound to MLPPP port

➤ **To configure the T3 and T1 ports for RICi-4T1 (A):**

1. In the Physical Port T3 menu, configure T3 port 1 as illustrated in *Figure 7-65*.
2. Navigate to the Physical Port T1 menu by selecting **T1**.
3. In the Physical Port T1 menu, configure T1 port 22 as illustrated in *Figure 7-66*.
4. Repeat the same configuration for T1 ports 23 to 25.

```
                              Egate-100
Configuration> Physical Layer> T3

 1. Port Number [1 - n]              ... (1)
 2. Administrative Status           >    (Up)
 3. Transmit Clock Source           >    (Loopback Timing)
 4. Line type                       >    (M23)
 5. Line length                     >    (Long)
 6. Alarms                          >    (Unmasked)
 7. T1                              >

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

Figure 7-65. Configuring T3 Port for RICi-4T1 (A)

```
                              Egate-100
Main Menu> Configuration> Physical Layer> T3> T1

 1. Port Number [1-28]              ... (22)
 2. Administrative Status           >   (Up)
 3. Frame Type                      >   (D4)
 4. Idle code[0 - ff]                ...(0)
 5. Alarms                          >   (Unmasked)

Please select item <1 to 5>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-66. Configuring T1 Ports for RICi-4T1 (A)

➤ **To configure the T3 and T1 ports for RICi-4T1 (B):**

1. In the Physical Port T3 menu, configure T3 port 2 as illustrated in *Figure 7-67*.
2. Navigate to the Physical Port T1 menu by selecting **T1**.
3. In the Physical Port T1 menu, configure T1 port 53 as illustrated in *Figure 7-68*.
4. Repeat the same configuration for T1 ports 54 to 56.

```
                              Egate-100
Configuration> Physical Layer> T3

 1. Port Number [1 - n]             ... (2)
 2. Administrative Status          >   (Up)
 3. Transmit Clock Source          >   (Loopback Timing)
 4. Line type                      >   (M23)
 5. Line length                    >   (Long)
 6. Alarms                         >   (Unmasked)
 7. T1                             >

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

Figure 7-67. Configuring T3 Port for RICi-4T1 (B)

```
                              Egate-100
Main Menu> Configuration> Physical Layer> T3> T1

 1. Port Number [29-56]              ... (52)
 2. Administrative Status            >   (Up)
 3. Frame Type                       >   (D4)
 4. Idle code[0 - ff]                 ...(0)
 5. Alarms                           >   (Unmasked)

Please select item <1 to 5>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-68. Configuring T1 Ports for RICi-4T1 (B)

➤ **To configure the T3 and T1 ports for RICi-4T1 (C):**

1. In the Physical Port T3 menu, configure T3 port 3 as illustrated in *Figure 7-69*.
2. Navigate to the Physical Port T1 menu by selecting **T1**.
3. In the Physical Port T1 menu, configure T1 port 77 as illustrated in *Figure 7-70*.
4. Repeat the same configuration for T1 ports 78 to 80.

```
                              Egate-100
Configuration> Physical Layer> T3

 1. Port Number [1 - n]              ... (3)
 2. Administrative Status          >   (Up)
 3. Transmit Clock Source          >   (Loopback Timing)
 4. Line type                      >   (M23)
 5. Line length                    >   (Long)
 6. Alarms                         >   (Unmasked)
 7. T1                             >

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

Figure 7-69. Configuring T3 Port for RICi-4T1 (C)

```
                              Egate-100
Main Menu> Configuration> Physical Layer> T3> T1

 1. Port Number [57-84]              ... (77)
 2. Administrative Status          >   (Up)
 3. Frame Type                     >   (D4)
 4. Idle code[0 - ff]               ...(0)
 5. Alarms                         >   (Unmasked)

Please select item <1 to 5>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-70. Configuring T1 Ports for RICi-4T1 (C)

➤ **To configure the T1 ports for RICi-4T1 (D):**

1. In the Physical Port T3 menu, select T3 port 3, and then navigate to the Physical Port T1 menu by selecting **T1**. (It is not necessary to configure T3 port 3, as it was already configured in the procedure for RICi-4T1 (C).)
2. In the Physical Port T1 menu, configure T1 port 81 as illustrated in *Figure 7-71*.
3. Repeat the same configuration for T1 ports 82 to 84.

```
                              Egate-100
Main Menu> Configuration> Physical Layer> T3> T1

 1. Port Number [57-84]              ... (81)
 2. Administrative Status          >   (Up)
 3. Frame Type                     >   (D4)
 4. Idle code[0 - ff]               ...(0)
 5. Alarms                         >   (Unmasked)

Please select item <1 to 5>
F - Forward Port; B - Backward Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-71. Configuring T1 Ports for RICi-4T1 (D)

Setting Logical Layer Parameters

You must configure logical ports for the T1 ports, as specified in *Table 7-11*. You must configure the following logical ports:

For RICi-4T1 (A): Logical ports 22 – 25 with PPP over HDLC, which are then bound to logical port 120 with MLPPP protocol.

For RICi-4T1 (B): Logical ports 53 – 56 with PPP over HDLC, which are then bound to logical port 121 with MLPPP protocol.

For RICi-4T1 (C): Logical ports 77 – 80 with PPP over HDLC, which are then bound to logical port 122 with MLPPP protocol.

For RICi-4T1 (D): Logical ports 81 – 84 with PPP over HDLC, which are then bound to logical port 123 with MLPPP protocol.

The logical ports are configured in the Logical Layer menu (Main Menu > Configuration > **Logical Layer**).

Table 7-11. T1 Port Specifications

Unit	T3 port number	T1 port numbers	Framing type	Logical port numbers	Protocol	Bridge port number
RICi-4T1 (A)	1	22 – 25	Framed, D4	22 – 25	PPPoHDLC	
				120	MLPPP, bound to logical ports 22 – 25	120, bound to MLPPP port
RICi-4T1 (B)	2	53 – 56	Framed, D4	53 – 56	PPPoHDLC	
				121	MLPPP, bound to logical ports 53 – 56	121, bound to MLPPP port
RICi-4T1 (C)	3	77 – 80	Framed, D4	77 – 80	PPPoHDLC	
				122	MLPPP, bound to logical ports 77 – 80	122, bound to MLPPP port
RICi-4T1 (D)	3	81 – 84	Framed, D4	81 – 84	PPPoHDLC	
				123	MLPPP, bound to logical ports 81 – 84	123, bound to MLPPP port

➤ **To configure the logical layer for the T1 ports to RICi-4T1 (A):**

1. In the Logical Layer menu, configure logical port 22 with PPP over HDLC protocol, to correspond to physical port 22, as illustrated in *Figure 7-72*.
2. Repeat the same configuration for logical ports 23 to 25, to correspond to physical ports 23 to 25.
3. In the Logical Layer menu, configure logical port 120 with MLPPP protocol, binding it to logical ports 22 to 25, as illustrated in *Figure 7-73*.

```
                              Egate-100
Main Menu> Configuration> Logical Layer

 1. Port Number[1 - 126]           ... (22)
 2. Port Name                      ... (Logical Port 22)
 3. Protocol Type                  >   (PPPoHDLC)
 4. Physical Port Number[1 - 84]   ... (22)
 5. Address & Control Compression  >   (On)
 6. Protocol Field Compression     >   (On)
 7. Alarms                         >   (Unmasked)

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

Figure 7-72. Configuring PPPoHDLC Logical Ports for RICi-4T1 (A)

```
                              Egate-100
Configuration> Logical Layer

 1. Port Number[1 - 126]           ... (120)
 2. Port Name                      ... (Logical Port 120)
 3. Protocol Type                  >   (MLPPP)
 4. Bind Logical Ports             >   (22-25)
 5. MTU(bytes)                     >   (0)
 6. Alarms                         >   (Unmasked)
>
Please select item <1 to 6>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-73. Configuring MLPPP Logical Port for RICi-4T1 (A)

➤ **To configure the logical layer for the T1 ports to RICi-4T1 (B):**

1. In the Logical Layer menu, configure logical port 53 with PPP over HDLC protocol, to correspond to physical port 53, as illustrated in *Figure 7-74*.
2. Repeat the same configuration for logical ports 54 to 56, to correspond to physical ports 54 to 56.
3. In the Logical Layer menu, configure logical port 121 with MLPPP protocol, binding it to logical ports 53 to 56, as illustrated in *Figure 7-75*.

```
                              Egate-100
Main Menu> Configuration> Logical Layer

 1. Port Number[1 - 126]          ... (53)
 2. Port Name                     ... (Logical Port 53)
 3. Protocol Type                 >   (PPPoHDLC)
 4. Physical Port Number[1 - 84]  ... (53)
 5. Address & Control Compression >   (On)
 6. Protocol Field Compression    >   (On)
 7. Alarms                        >   (Unmasked)

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

Figure 7-74. Configuring PPPoHDLC Logical Ports for RICi-4T1 (B)

```
                              Egate-100
Configuration> Logical Layer

 1. Port Number[1 - 126]          ... (121)
 2. Port Name                     ... (Logical Port 121)
 3. Protocol Type                 >   (MLPPP)
 4. Bind Logical Ports            >   (53-56)
 5. MTU(bytes)                    >   (0)
 6. Alarms                        >   (Unmasked)
>
Please select item <1 to 6>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-75. Configuring MLPPP Logical Port for RICi-4T1 (B)

➤ **To configure the logical layer for the T1 ports to RICi-4T1 (C):**

1. In the Logical Layer menu, configure logical port 77 with PPP over HDLC protocol, to correspond to physical port 77, as illustrated in *Figure 7-76*.
2. Repeat the same configuration for logical ports 78 to 80, to correspond to physical ports 78 to 80.
3. In the Logical Layer menu, configure logical port 122 with MLPPP protocol, binding it to logical ports 77 to 80, as illustrated in *Figure 7-77*.

```
                              Egate-100
Main Menu> Configuration> Logical Layer

 1. Port Number[1 - 126]          ... (77)
 2. Port Name                     ... (Logical Port 77)
 3. Protocol Type                 >   (PPPoHDLC)
 4. Physical Port Number[1 - 84]  ... (77)
 5. Address & Control Compression >   (On)
 6. Protocol Field Compression    >   (On)
 7. Alarms                        >   (Unmasked)

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

Figure 7-76. Configuring PPPoHDLC Logical Ports for RICi-4T1 (C)

```
                              Egate-100
Configuration> Logical Layer

 1. Port Number[1 - 126]          ... (122)
 2. Port Name                     ... (Logical Port 122)
 3. Protocol Type                 >   (MLPPP)
 4. Bind Logical Ports            >   (77-80)
 5. MTU(bytes)                    >   (0)
 6. Alarms                        >   (Unmasked)
>
Please select item <1 to 6>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-77. Configuring MLPPP Logical Port for RICi-4T1 (C)

➤ **To configure the logical layer for the T1 ports to RICi-4T1 (D):**

1. In the Logical Layer menu, configure logical port 81 with PPP over HDLC protocol, to correspond to physical port 81, as illustrated in *Figure 7-78*.
2. Repeat the same configuration for logical ports 82 to 84, to correspond to physical ports 82 to 84.
3. In the Logical Layer menu, configure logical port 120 with MLPPP protocol, binding it to logical ports 81 to 84, as illustrated in *Figure 7-79*.

```
                              Egate-100
Main Menu> Configuration> Logical Layer

 1. Port Number[1 - 126]          ... (81)
 2. Port Name                     ... (Logical Port 81)
 3. Protocol Type                 >   (PPPoHDLC)
 4. Physical Port Number[1 - 84]  ... (81)
 5. Address & Control Compression >   (On)
 6. Protocol Field Compression    >   (On)
 7. Alarms                        >   (Unmasked)

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

Figure 7-78. Configuring PPPoHDLC Logical Ports for RICi-4T1 (D)

```
                              Egate-100
Configuration> Logical Layer

 1. Port Number[1 - 126]          ... (123)
 2. Port Name                     ... (Logical Port 123)
 3. Protocol Type                 >   (MLPPP)
 4. Bind Logical Ports            >   (81-84)
 5. MTU(bytes)                    >   (0)
 6. Alarms                        >   (Unmasked)
>
Please select item <1 to 6>
F - Forward Port; B - Backward Port; R - Remove Port
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-79. Configuring MLPPP Logical Port for RICi-4T1 (D)

Setting Bridge Parameters

The following steps must be performed:

1. Configuring the bridge to VLAN-aware
2. Configuring the bridge ports as specified in *Table 7-11.*
3. Defining VLAN memberships as specified in *Table 7-12*.

Configuring the Bridge

The bridge must be configured to VLAN-aware, so that Egate-100 forwards traffic based on VLAN as well as MAC address.

➤ To set the bridge parameters:

- Navigate to the Bridge menu (Main Menu > Configuration > Applications > **Bridge**) and set the parameter values as illustrated in *Figure 7-20*.

Configuring the Bridge Ports

The bridge ports required for the application are shown in *Table 7-11*. The binding of bridge port 1 to the host port is automatic in Egate-100, so does not

have to be configured. The bridge ports bound to the host and Fast Ethernet management port must perform egress tag stripping because they handle management traffic that had the tag added to the frame, therefore it must be stripped at egress.

The Port VID can be left as the default value for the bridge ports other than the Fast Ethernet management port, as user frames arrive tagged. For the Fast Ethernet port, the Port VID is set to the management VLAN ID.

The configuration of the bridge ports is performed in the Bridge Port menu (Main Menu > Configuration > Applications > Bridge > **Bridge Ports**).

➤ **To configure the bridge port for the host:**

- From the Bridge Port menu, configure the **Egress Tag Handling** for the host bridge port to perform stripping, as illustrated in *Figure 7-21*.

➤ **To configure the bridge port for the Gigabit Ethernet ports:**

1. From the Bridge Port menu, configure the bridge port parameters for bridge port 2, binding it to GbE-1, as illustrated in *Figure 7-22*.
2. Repeat the same configuration for bridge port 3, binding it to GbE-2.

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

- From the Bridge Port menu, configure the bridge port parameters for bridge port 4, binding it to ETH MNG, as illustrated in *Figure 7-80*.

➤ **To configure the bridge ports for the logical ports:**

1. From the Bridge Port menu, configure the bridge port parameters for bridge port 120, binding it to logical port 120, as illustrated in *Figure 7-81*.
2. Repeat the same configuration for bridge ports 121 to 123, binding them to logical ports 121 to 123 respectively.

```
                              Egate-100
Main Menu> Configuration> Application> Bridge> Bridge Ports

 1. Port Number [1 - 130]                ... (4)
 2. Port Name                            ... (Bridge Port 4)
 3. Bind to                                  (ETH MNG)
 4. Administrative Status                >   (Up)
 5. Ingress Filtering                    >   (Disable)
 6. Accept Frame Types                   >   (All)
 7. Port VID [1 - 4094]                  ... (100)
 8. Default Priority Tag[0 - 7]          ... (0)
 9. Replace Priority                     >   (No)
 10. Egress Tag Handling                  >   (Stripping)
 11. Ingress Tag Handling                >   (None)
 12. Maximum MAC Address[1 - 64000]      >...(64000)

Please select item <1 to 12>
F - Forward Port; B - Backward Port; R - Remove Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-80. Configuring Bridge Port for Fast Ethernet Port

```
                              Egate-100
Main Menu> Configuration> Application> Bridge> Bridge Ports

 1.  Port Number [1 - 130]                ... (120)
 2.  Port Name                            ... (Bridge Port 120)
 3.  Bind to                                  (Logical Port)
 4.  Logical Port Number [1 - 144]            (120)
 5.  Administrative Status                >   (Up)
 6.  Ingress Filtering                    >   (Enable)
 7.  Accept Frame Types                   >   (Tag Only)
 8.  Port VID [1 - 4094]                  ... (1)
 9.  Default Priority Tag[0 - 7]          ... (0)
 10. Replace Priority                     >   (No)
 11. Egress Tag Handling                  >   (None)
 12. Ingress Tag Handling                 >   (None)
 13. Loop Detection                       >   (Enable)
 14. Link OAM(802.3ah)                    >...(Disabled)
 15. Maximum MAC Address[1 - 64000]       >...(64000)


Please select item <1 to 15>
F - Forward Port; B - Backward Port; R - Remove Port; S - Save
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-81. Configuring Bridge Port for T1 Port

Configuring the Bridge VLAN Memberships

You must configure the VLAN memberships as specified in *Table 7-12*. The following VLANs are required:

Management VLAN (100): Contains the host port, the bridge ports bound to the T1 logical ports, the bridge ports bound to the Gigabit Ethernet ports, and the bridge port bound to the Fast Ethernet management port.

User VLAN for RICi-4T1 (A): Contains the bridge port bound to the logical port for the T1 ports to RICi-4T1 (A), and the bridge ports bound to the Gigabit Ethernet ports.

User VLAN for RICi-4T1 (B): Contains the bridge port bound to the logical port for the T1 ports to RICi-4T1 (B), and the bridge ports bound to the Gigabit Ethernet ports.

User VLAN for RICi-4T1 (C): Contains the bridge port bound to the logical port for the T1 ports to RICi-4T1 (C), and the bridge ports bound to the Gigabit Ethernet ports.

User VLAN for RICi-4T1 (D): Contains the bridge port bound to the logical port for the T1 ports to RICi-4T1 (D), and the bridge ports bound to the Gigabit Ethernet ports.

The VLAN membership is configured in the VLAN Membership menu (Main Menu › Configuration › Applications › Bridge › **VLAN Membership**).

Table 7-12. VLAN Memberships

VLAN	Bridge Port Members
100 – management data	1, 2, 3, 4, 120, 121, 122, 123
200 – RICi-4E1/T1 (A) user data	2, 3, 120
300 – RICi-4E1/T1 (B) user data	2, 3, 121
400 – RICi-4E1/T1 (C) user data	2, 3, 122
500 – RICi-4E1/T1 (D) user data	2, 3, 123

➤ **To define the management VLAN memberships:**

- In the VLAN Membership menu, configure the parameters as illustrated in *Figure 7-82*.

```
                              Egate-100
Configuration> Application> Bridge> VLAN Membership

 1. VLAN ID                                  (100)
 2. Egress Transparent Ports                 (1-4,120-123)
 3. View VLAN ID to Bridge Port                   []
 4. View Bridge Ports to VLAN ID                  []

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

Figure 7-82. Configuring Management VLAN Memberships

➤ **To define the memberships for the user VLAN for RICi-4T1 (A):**

- In the VLAN Membership menu, configure the parameters as illustrated in *Figure 7-83*.

```
                              Egate-100
Configuration> Application> Bridge> VLAN Membership

 1. VLAN ID                                  (200)
 2. Egress Transparent Ports                 (2-3,120)
 3. View VLAN ID to Bridge Port                   []
 4. View Bridge Ports to VLAN ID                  []

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

Figure 7-83. Configuring User VLAN Membership for RICi-4T1 (A)

➤ **To define the memberships for the user VLAN for RICi-4T1 (B):**

- In the VLAN Membership menu, configure the parameters as illustrated in *Figure 7-84*.

```
                              Egate-100
Configuration> Application> Bridge> VLAN Membership

 1. VLAN ID                                (300)
 2. Egress Transparent Ports               (2-3,121)
 3. View VLAN ID to Bridge Port                 []
 4. View Bridge Ports to VLAN ID                []

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

Figure 7-84. Configuring User VLAN Membership for RICi-4T1 (B)

➤ **To define the memberships for the user VLAN for RICi-4T1 (C):**

- In the VLAN Membership menu, configure the parameters as illustrated in *Figure 7-85*.

```
                              Egate-100
Configuration> Application> Bridge> VLAN Membership

 1. VLAN ID                                (400)
 2. Egress Transparent Ports               (2-3,122)
 3. View VLAN ID to Bridge Port                 []
 4. View Bridge Ports to VLAN ID                []

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

Figure 7-85. Configuring User VLAN Membership for RICi-4T1 (C)

➤ **To define the memberships for the user VLAN for RICi-4T1 (D):**

- In the VLAN Membership menu, configure the parameters as illustrated in *Figure 7-86*.

```
                              Egate-100
Configuration> Application> Bridge> VLAN Membership

 1. VLAN ID                                (500)
 2. Egress Transparent Ports               (2-3,123)
 3. View VLAN ID to Bridge Port                 []
 4. View Bridge Ports to VLAN ID                []

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

Figure 7-86. Configuring User VLAN Membership for RICi-4T1 (D)

Running Diagnostic Tests

Egate-100 allows you to check network integrity by running ping and PRBS tests and displaying self-test results.

For detailed instructions on running the diagnostic tests and understanding test results, refer to Chapter 5, *Performing Diagnostics Tests*.

➤ **To access test results:**

- Navigate to Main Menu›**Diagnostics**.

The Diagnostics menu appears as illustrated in *Figure 7-51*.

```
                          Egate-100
Main Menu> Diagnostics
 1. PING                          >
 2. BERT                          >
 3. Self test result              >
Please select item <1 to 3>
ESC-prev.menu; !-main menu; &-exit
```

Figure 7-87. Diagnostics Menu

Collecting Performance Statistics

You can monitor and display statistics for the physical and logical layers:

➤ **To display statistical data for the Ethernet ports:**

- Navigate to Monitoring›Physical Layer›Ethernet›**Statistics**.

➤ **To display SDH/SONET statistics:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›**Statistics**.

➤ **To display the SDH/SONET statistics for SOH:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›**SOH**.

➤ **To display the SDH/SONET statistics for HVC:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›**HVC**.
  - To see HVC statistics for a different interval, select Interval Number and set to the desired interval number.

➤ **To display the SDH/SONET statistics for LVC:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›LVC.
  - To see LVC statistics for a different VC, select VC and set to the desired VC.
  - To see LVC statistics for a different interval, select Interval Number and set to the desired interval number.

➤ **To view E1/T1 statistics:**

- Navigate to Monitoring›Physical Layer›SDH/SONET›Statistics›**E1/T1**.
  - To see statistics for a different E1/T1 port, select **E1/T1 Number** and set to the desired E1/T1 port.
  - To see statistics for a different interval, select I**nterval Number** and set to the desired interval number.

➤ **To display logical layer statistics:**

- Navigate to Main Menu › Monitoring › **Logical Layer** and select **Statistics**.
  - Select **Port number** and enter a port number between 1 and 126.

- To switch to the next or the previous logical port, press ‹**F**› or ‹**B**› respectively.

For more information on displaying and understanding the logical layer statistics, see Chapter 5, *Viewing Logical Layer Statistics*.

➤ **To view bridge statistics:**

- Navigate to Main Menu ›Monitoring ›Bridge ›**Statistics**.
  - To switch to the next port or the previous port, type **F** or **B** respectively.

For more information on displaying and understanding the bridge statistics, see Chapter 5, *Viewing Bridge Statistics*.

Appendix A

Connection Data

This appendix specifies the Egate-100 electrical connector pinouts.

A.1 Ethernet Interface Connectors

10/100BaseT Connector

The 10/100BaseT Ethernet electrical interface terminates in an 8-pin RJ-45 connector, wired as specified in *Table A-1*.

Table A-1. 10/100BaseT Ethernet Connector Pinouts

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

1000BaseTConnector

The Gigabit Ethernet electrical interface has an RJ-45, 8-pin connector.

Table A-2. Gigabit Ethernet RJ-45 Connector Pinouts

Pin	Function
1	BI_DA+
2	BI_DA–
3	BI_DB+
4	BI_DC+
5	BI_DC–
6	BI_DB–
7	BI_DD+
8	BB_DD–

A.2 Control Connector

The control terminal interface terminates in a V.24/RS-232 9-pin D-type female DCE connector. *Table A-3* lists the control connector's pin assignments.

Table A-3. CONTROL Connector Pinout

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

Appendix B

SDH/SONET Mapping

This appendix describes the SDH and SONET mapping, specifying the TU-G3, TU-G2 and VT 1.5 numbering for the 63 ports of SDH (*B.1*) and the 84 ports of SONET (*B.2*).

B.1 TU-xx Numbering System – SDH

TU#	TUG3	TUG2	VT 1.5
1	1	1	1
2	2	1	1
3	3	1	1
4	1	2	1
5	2	2	1
6	3	2	1
7	1	3	1
8	2	3	1
9	3	3	1
10	1	4	1
11	2	4	1
12	3	4	1
13	1	5	1
14	2	5	1
15	3	5	1
16	1	6	1
17	2	6	1
18	3	6	1
19	1	7	1
20	2	7	1
21	3	7	1

TU#	TUG3	TUG2	VT 1.5
22	1	1	2
23	2	1	2
24	3	1	2
25	1	2	2
26	2	2	2
27	3	2	2
28	1	3	2
29	2	3	2
30	3	3	2
31	1	4	2
32	2	4	2
33	3	4	2
34	1	5	2
35	2	5	2
36	3	5	2
37	1	6	2
38	2	6	2
39	3	6	2
40	1	7	2
41	2	7	2
42	3	7	2

TU#	TUG3	TUG2	VT 1.5
43	1	1	3
44	2	1	3
45	3	1	3
46	1	2	3
47	2	2	3
48	3	2	3
49	1	3	3
50	2	3	3
51	3	3	3
52	1	4	3
53	2	4	3
54	3	4	3
55	1	5	3
56	2	5	3
57	3	5	3
58	1	6	3
59	2	6	3
60	3	6	3
61	1	7	3
62	2	7	3
63	3	7	3

B.2 TU-xx Numbering System – SONET

TU#	TUG3	TUG2	VT 1.5
1	1	1	1
2	1	2	1
3	1	3	1
4	1	4	1
5	1	5	1
6	1	6	1
7	1	7	1
8	1	1	2
9	1	2	2
10	1	3	2
11	1	4	2
12	1	5	2
13	1	6	2
14	1	7	2
15	1	1	3
16	1	2	3
17	1	3	3
18	1	4	3
19	1	5	3
20	1	6	3
21	1	7	3
22	1	1	4
23	1	2	4
24	1	3	4
25	1	4	4
26	1	5	4
27	1	6	4
28	1	7	4

TU#	TUG3	TUG2	VT 1.5
29	2	1	1
30	2	2	1
31	2	3	1
32	2	4	1
33	2	5	1
34	2	6	1
35	2	7	1
36	2	1	2
37	2	2	2
38	2	3	2
39	2	4	2
40	2	5	2
41	2	6	2
42	2	7	2
43	2	1	3
44	2	2	3
45	2	3	3
46	2	4	3
47	2	5	3
48	2	6	3
49	2	7	3
50	2	1	4
51	2	2	4
52	2	3	4
53	2	4	4
54	2	5	4
55	2	6	4
56	2	7	4

TU#	TUG3	TUG2	VT 1.5
57	3	1	1
58	3	2	1
59	3	3	1
60	3	4	1
61	3	5	1
62	3	6	1
63	3	7	1
64	3	1	2
65	3	2	2
66	3	3	2
67	3	4	2
68	3	5	2
69	3	6	2
70	3	7	2
71	3	1	3
72	3	2	3
73	3	3	3
74	3	4	3
75	3	5	3
76	3	6	3
77	3	7	3
78	3	1	4
79	3	2	4
80	3	3	4
81	3	4	4
82	3	5	4
83	3	6	4
84	3	7	4

Supplement

AC/DC Adapter (AD) Plug

for DC Power Supply Connection

Note *Ignore this supplement if the unit is AC-powered.*

Certain units are equipped with a wide-range AC/DC power supply. These units are equipped with a standard AC-type 3-prong power input connector located on the unit rear panel. This power input connector can be used for both AC and DC voltage inputs.

For DC operation, a compatible straight or 90-degree AC/DC Adapter (AD) plug for attaching to your DC power supply cable is supplied with your RAD product (see *Figure 1* and *Figure 2*).

Connect the wires of your DC power supply cable to the AD plug, according to the voltage polarity and assembly instructions provided on *page 2*.

Figure 1. Straight AD Plug

Figure 2. 90-Degree AD Plug

Caution

Prepare all connections to the AD plug **before** inserting it into the unit's power connector.

Publication No. SUP-930-07/08

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➤ **To prepare the AD plug and connect it to the DC power supply cable:**

1. Loosen the cover screw on the bottom of the AD plug to open it (see *Figure 3*).
2. Run your DC power supply cable through the removable cable guard and through the open cable clamp.
3. Place each DC wire lead into the appropriate AD plug wire terminal according to the voltage polarity mapping shown. Afterwards, tighten the terminal screws closely.
4. Fit the cable guard in its slot and then close the clamp over the cable. Tighten the clamp screws to secure the cable.
5. Reassemble the two halves of the AD plug and tighten the cover screw.
6. Connect the assembled power supply cable to the unit.

***Note**: You have to flip over the non-90-degree AD plug type by 180 degrees to insert it into the unit. After inserting it, verify that the blue (negative) wire is connected to the POWER and the brown (positive) wire is connected to the RETURN.*

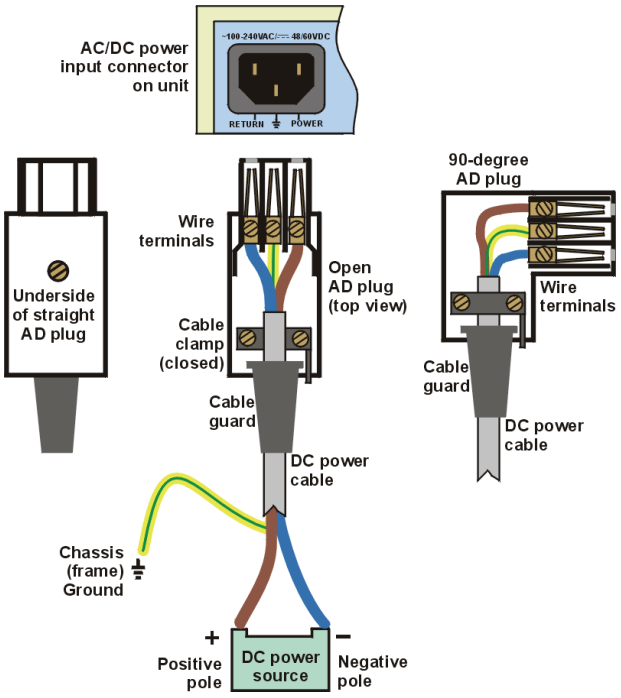

Figure 3. AD Plug Details

Warning

- **Reversing the wire voltage polarity will not cause damage to the unit, but the internal protection fuse will not function.**
- **Always connect a ground wire to the AD plug's chassis (frame) ground terminal. Connecting the unit without a protective ground, or interrupting the grounding (for example, by using an extension power cord without a grounding conductor) can damage the unit or the equipment connected to it!**
- **The AD adapter is not intended for field wiring.**

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Publication Number: 405-200-01/12

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