

# RIC-622GE

Gigabit Ethernet over STM-4/OC-12c Network Termination Unit



Simple and efficient connection between two remote LANs over an SDH or SONET infrastructure

- Connecting Gigabit Ethernet LANs over SDH/SONET links
- VLAN tagging and stacking for secure separation of management traffic, transparent to customer VLAN settings
- Four levels of Quality of Service (QoS) according to 802.1p
- Fault propagation of STM-4/OC-12c error conditions to Ethernet port and SDH loop detection
- 64,000 MAC address table

**EtherAccess**

RIC-622GE is a Network Termination Unit (NTU) offering a migration path for connecting future-ready Ethernet/IP devices over existing SDH/SONET networks at 622 Mbps access rates.

RIC-622GE is part of RAD's unique set of EtherAccess product family. These products enable service provisioning and carrier backhaul applications over low and high speed SDH/SONET and PDH circuits from fractional and full E1/T1, E3/T3 over STM-1/STM-4 to Gigabit Ethernet.

Typical applications include IP DSLAM backhaul, inter-POP connectivity, or high-bandwidth private line services.

RIC-622GE is equipped with an STM-4/OC-12c SFP-based optical interface, and an optical 1000BaseSX/LX or electrical 1000BaseT interface.

The bridge filters and forwards traffic, enabling optimum utilization of the high-priced WAN circuit. Low device latency results in a high throughput of TCP/IP applications.

Large traffic bursts are handled by a large 3150 frame buffer, reducing SDH/SONET congestion.



**data communications**

Innovative Access Solutions

# RIC-622GE

## Gigabit Ethernet over STM-4/OC-12c Network Termination Unit

RIC-622GE features fault propagation. If a link failure is detected on either the Ethernet or SDH port, RIC-622GE forwards an alarm to the appropriate interface, and shuts it down.

Redundant hot-swappable power supplies provide carrier-class reliability.

The unit is supplied in a 1U, 19" box, with a rack-mount option.

### BRIDGE

The RIC-622GE bridge is a learning bridge with a MAC table consisting of 64,000 entries.

The RIC-622GE bridge operates in two forwarding modes:

- VLAN-unaware MAC address learning
- VLAN-aware mode; internal double tagging ensures transparency of user VLAN and traffic separation between Gigabit Ethernet user traffic and Fast Ethernet management traffic.

### QUALITY OF SERVICE (QoS)

The device classifies Ethernet packets into four strict priority egress queues on the network port. Based on VLAN priority tagging (802.1p), different traffic flows are differentiated and prioritized according to the application.

### PROTOCOLS

RIC-622GE utilizes native HDLC for encapsulating Ethernet traffic over SDH/SONET STM-4/OC12c circuits.

### DIAGNOSTICS AND STATISTICS

Comprehensive diagnostic and performance monitoring capabilities include:

- Ping tests for IP connectivity checks
- Statistics collection at the Ethernet physical layer
- STM-4/OC-12c interface frame counters
- Alarms and events log
- Loopback tests.

### LOOP DETECTION

RIC-622GE features mechanisms to detect SDH loopbacks, and thus avoid resulting Ethernet loopbacks by disabling the bridge port. When the loopback is released, RIC-622GE automatically recovers.

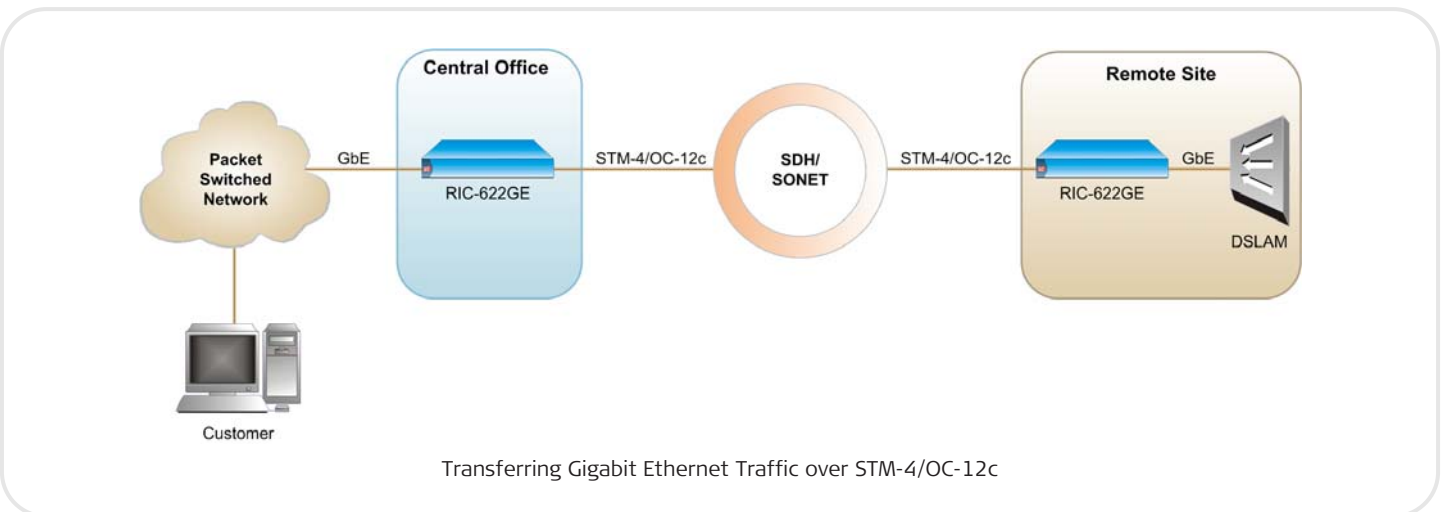
### MANAGEMENT

Management options include:

- ASCII terminal
- Dedicated 10/100BaseT management port
- Telnet server
- ConfiguRAD via a Web browser
- RADview-Lite SNMP based fault management service package, with ConfiguRAD element manager.

Software upgrades and configuration files are downloaded/uploaded to/from the RIC-622GE via TFTP or XMODEM.

Access to the unit's management software is password-protected. The unit can be managed by up to 16 different managers simultaneously. This enables viewing the network status and managing the unit from different locations.



## Specifications

### STM-4/OC-12C INTERFACE

**Number of Ports**

1

**Interface Type**

SFP

*Note: For a detailed description of SFP interface modules, see the SFP Transceivers datasheet.*

**Data Rate**

622 Mbps

**Operation Mode**

SDH/SONET

**Mapping**

VC-4-4C

### GIGABIT ETHERNET INTERFACE

**Number of Ports**

1

**Interface Type**

1000BaseSx, 1000BaseLx or 1000BaseT

**Compliance**

Relevant sections of IEEE 802.3

**Data Rate**

1000 Mbps

**Max Frame Size**

1664 bytes

**Connectors**

LC (SFF) for optical  
RJ-45 for electrical (1000BaseT)

### FAST ETHERNET INTERFACE

**Number of Ports**

1

**Interface Type**

100BaseT

**Compliance**

Relevant sections of IEEE 802.3

**Data Rate**

100 Mbps

**Max Frame Size**

1664 bytes

**Connectors**

RJ-45 for electrical (100BaseT)

### CONTROL INTERFACE

**Interface Type**

RS-232/V.24 (asynchronous DCE)

**Data Rate**

9.6, 19.2, 38.4, 57.6, 115.2 kbps

**Connector**

9-pin, D-type, female

### INTERNAL BRIDGE

**Number of Ports**

4 (host, SONET/SDH, GbE, FE)

**Compliance**

Relevant sections of 802.1Q

**LAN Table**

Up to 64,000 MAC addresses (learned, with automatic aging check)

**Buffer**

3150 frames

**Filtering and Forwarding**

Up to 946,000 pps (VLAN-unaware)  
Up to 856,000 pps (VLAN-aware)

### GENERAL

**Power**

AC: 100–240 VAC ( $\pm 10\%$ ), 50–60 Hz  
DC: –48 VDC (–40 to –60)

**Power Consumption**

25W max

**Environment**

Temperature: 0–50°C (32–122°F)  
Humidity: Up to 90%, non-condensing

**Physical**

Height: 43.7 mm (1.7 in) 1U  
Width: 430 mm (19.0 in)  
Depth: 240 mm (9.4 in)  
Weight: 3.5 kg (7.7 lb)

Product Comparison Table

Feature	RIC-155GE	RIC-622GE
Frame Size (Bytes)	64–1664	64–1664
MAC Address Table	16,384	64,000
QoS	802.1p	802.1p
Number of Queues	4 (strict)	4 (strict)
Fault Propagation	Yes, in both SDH and GbE directions: <ul style="list-style-type: none"> <li>SDH link failure sends alarm to unit, which as a result disconnects GbE link</li> <li>GbE link failure sends alarm to unit, which sends alarms towards SDH</li> </ul>	Yes, in both SDH and GbE directions: <ul style="list-style-type: none"> <li>SDH link failure sends alarm to unit, which as a result disconnects GbE link</li> <li>GbE link failure sends alarm to unit, which sends alarms towards SDH</li> </ul>
Hot-Swappable Power Supplies	Yes	Yes

## Ordering

### RIC-622GE/!/^/+/S

Gigabit Ethernet to STM-4/OC-12c converter

#### ! Power Supply:

- AC** Single 100 to 230 VAC
- ACR** Dual 100 to 230 VAC (for redundancy)
- 48** single -48 VDC
- 48R** Dual -48 VDC (for redundancy)

#### ^ Specify SFP optical interface type for STM-4 port:

- SFP-14D** 1310 nm multimode, 0.5 km (0.3 miles), LC connector
- SFP-15** 1310 nm single mode, 15 km (9.3 miles), LC connector
- SFP-16** 1550 nm single mode, 80 km (49.7 miles), LC connector
- Null** Empty SFP slot

#### Notes:

- *It is strongly recommended to order this device with original RAD SFPs installed. This will ensure that prior to shipping, RAD has performed comprehensive functional quality tests on the entire assembled unit, including the SFP devices. RAD cannot guarantee full compliance to product specifications for units using non-RAD SFPs.*
  - *For a detailed description of SFP interface modules, see the SFP Transceivers datasheet.*
- +** Specify Gigabit Ethernet interface type:
- 13L** 1000BaseLX, 1310 nm single mode, 5 km (3.1 miles), LC connector
  - 85** 1000BaseSX, 850 nm multimode, 270m (1000 ft), LC connector
  - UTP** built-in 1000BaseT, RJ-45 connector

- S** NEBS-3 compliancy:
  - N3** NEBS-3 compliant
  - Null** Not NEBS-3 compliant

### SUPPLIED ACCESSORIES

AC Power cord  
DC connection kit (if a DC-powered unit is ordered)

#### RM-34

Hardware kit for mounting one RIC-622GE unit in a 19" rack

### OPTIONAL ACCESSORIES

#### CBL-DB9F-DB9M-STR

DB9-to-DB9 control port cable

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