

# RIC-155L

## Gigabit Ethernet over STM-1/OC-3 Converter



### Connects Gigabit Ethernet LANs over STM-1/OC-3 links

- Gigabit Ethernet connectivity over SDH/SONET networks.
- QoS per VLAN priority bit, with four priority queues based on Strict Priority scheduling
- Standard GFP encapsulation per ITU-T G.7041
- SDH/SONET to Ethernet Fault propagation
- Inband and out-of-band management for configuration, monitoring and diagnostics

RIC-155L is a convertor that bridges between Gigabit Ethernet networks and STM-1/OC-3c networks, providing simple, efficient, and cost-effective Gigabit Ethernet connectivity over SDH/SONET. The unit offers a migration path for connecting future-ready IP devices to existing SDH/SONET networks. The device enables cost-effective deployment of the SDH/SONET infrastructure for internet access and LAN connectivity. RIC-155L supports encapsulation using GFP per ITU-T G.7041 or ANSI T1-105.02, providing efficient bandwidth utilization. RIC-155L can be managed for configuration, monitoring and diagnostics.

Typical applications include enabling IP DSLAM, IP Node B and WiMAX BTS backhauling (*Figure 1*), and connecting point-to-point Ethernet Private Line over SDH/SONET (*Figure 2*).

The unit supports frame size of 64–10000 bytes, including VLAN-tagged frames.

RIC-155L operation is based on VC-4/STS-3c.



**data communications**

The Access Company

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### MANAGEMENT

The unit can be monitored, configured, and tested using the following ports and applications:

- Out-of-band via the local Ethernet management port
- Inband via the network STM-1 port using a dedicated VLAN
- Using a highly scalable, Java-based multiplatform; RADview-EMS carrier-class element management system, for network configuration, provisioning, monitoring and management.

### WEB APPLICATION

The Web-based management application provides remote device configuration and maintenance and is embedded into RIC-155L. This application can be accessed from any standard Web browser and is provided at no extra cost.

### DIAGNOSTICS

Remote (RLB) and local loopbacks (LLB) are used for physical layer troubleshooting.

### LOS AND FAULT PROPAGATION

RIC-155L provides user configurable, unidirectional fault propagation. The LAN link is deactivated if one of the following user-defined alarms is issued:

- LOS (Loss of signal)
- AIS (Alarm indication signal)
- RDI (Remote defect indication).

### ENCAPSULATION

RIC-155L employs standard GFP encapsulation as per Generic Framing Procedure (ITU-T G.7041/Y.1303).

### QUALITY OF SERVICE – QOS

For prioritizing user traffic, RIC-155L features up to four separate queues.

The queues handle traffic for different services based on VLAN priority (802.1p), which enables mapping the 8 priority levels of VLAN to 4 traffic classes.

### SDH/SONET TIMING OPTIONS

The user can define the following SDH/SONET clock sources:

- Internal
- Recovered from STM-1/OC-3 interface.

### FLEXIBILITY

RIC-155L operates with the following devices using standard encapsulation:

- RAD's RICi-155GE (Central Ethernet gateway)
- RAD's FCD-155E
- Third-party devices that employ standard GFP encapsulation.

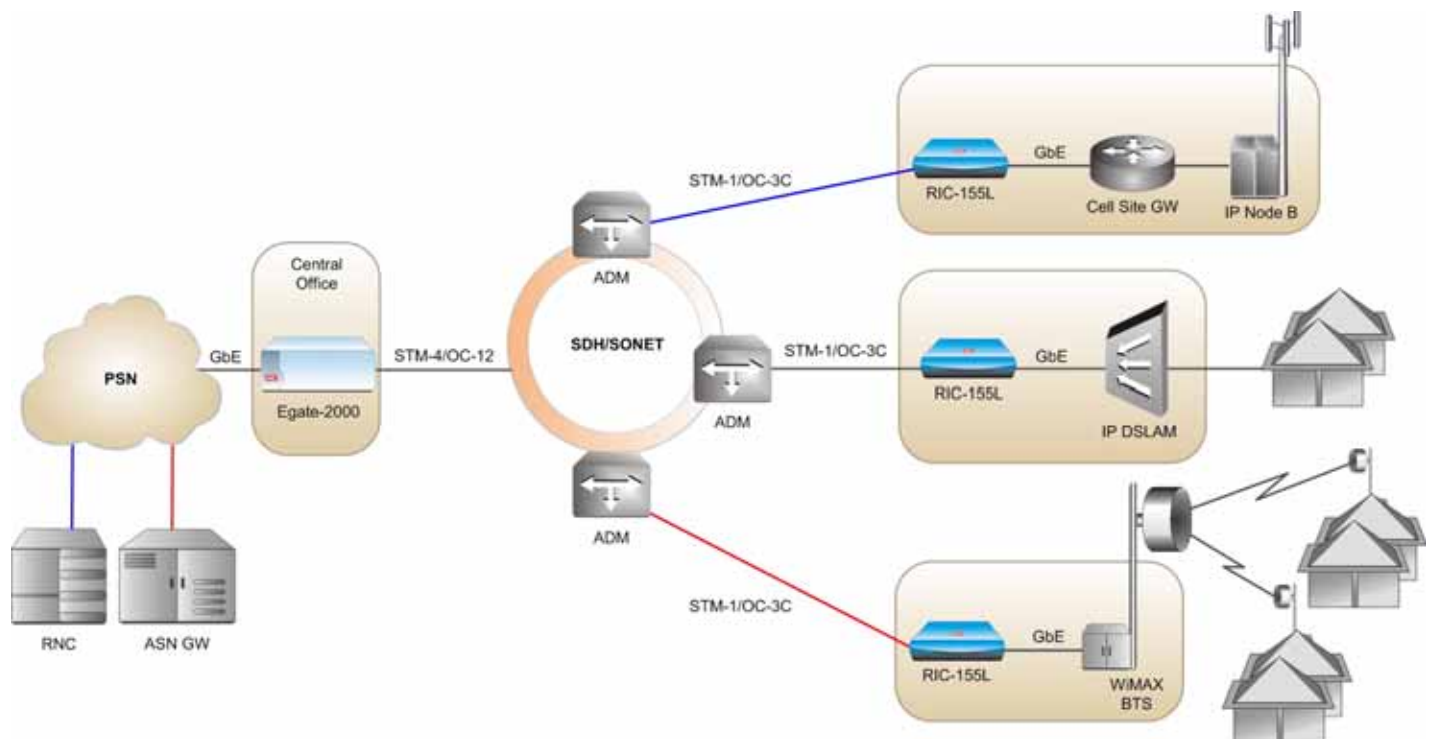


Figure 1. IP DSLAM, IP Node B, and WiMAX BTS Backhauling

## Specifications

### SDH/SONET INTERFACE

#### Number of Ports

1 optical (STM-1/OC-3)

#### Data Rate

155.52 Mbps

#### Operation Mode

SDH/SONET

#### Framing

SDH: ITU-T G.708, G.709  
SONET: GR-253-core, OC-3

#### Compliance

SDH: ITU-T G.7041, G.957  
SONET: GR-253-core

#### Encapsulation

Generic Framing Procedure  
(ITU T G.7041/Y.1303)

#### Timing

Internal  
Recovered from STM-1/OC-3 interface

#### SFP Transceivers

For full details, see the SFP Transceivers data sheet at [www.rad.com](http://www.rad.com)

**Note:** 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.

**Note:** There is no DDM SFP support.

#### Connector

SFP

### ETHERNET INTERFACE (DATA)

#### Number of Ports

2

#### Type

100/1000BaseT  
100/1000BaseFX

#### Operation Modes

Full/half duplex, autonegotiation

#### Data Rate

100 Mbps or 1 Gbps

#### Frame Size

Up to 10 kbytes

#### Compliance

Conforms to the relevant sections of IEEE 802.3

#### Connector

RJ-45  
SFP

### ETHERNET INTERFACE (MANAGEMENT)

#### Number of Ports

1

#### Type

10/100BaseT, full/half duplex, autonegotiation

#### Data Rate

100 Mbps

#### Compliance

Conforms to the relevant sections of IEEE 802.3

#### Connector

RJ-45

### TERMINAL CONTROL PORT

#### Type

RS-232/V.24 (DCE asynchronous)

#### Data Rate

115.2 Kbps

#### Connector

DB-9, female

### GENERAL

#### Diagnostics

Remote and local loopbacks on SDH/SONET and Gigabit Ethernet interfaces

#### Indicators

PWR (green) – Power status  
TST/ALM (red) – Test/alarm status  
ETH/LINK (green) – Ethernet status  
ETH/ACT (yellow) – Ethernet activity status  
LOS (red) – Loss of signal  
SDH/SONET ON (green) – Frame sync/loss status

#### Power

Wide-range power supply:  
AC/DC: 100 to 240 VAC or 48 to 60 VDC

#### Power Consumption

AC: 5W  
DC: 4.5W

#### Physical

Height: 43.7 mm (1.7 in)  
Width: 220 mm (8.6 in)  
Depth: 170 mm (6.7 in)  
Weight: 0.5 kg (1.1 lb)

#### Environment

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



Figure 2. Point-to-Point Ethernet Private Line over SDH/SONET

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### Ordering

#### STANDARD CONFIGURATION

##### RIC-155L/NULL/NULL

**Notes:** RIC-155L is supplied with the following:

- 1×10/100/1000 Mbps UTP Ethernet data port  
1×100/1000 Mbps SFP Ethernet data port  
1×10/100 Mbps Ethernet management port.
- Wide-range power supply:  
AC/DC: 100 to 240 VAC or 48 to 60 VDC

#### SFP Transceivers

SFPs for SDH/SONET and Ethernet interfaces are to be ordered separately.

For full details, see the SFP Transceivers data sheet at [www.rad.com](http://www.rad.com)

**Note:** 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.

**Note:** There is no DDM SFP support.

#### SUPPLIED ACCESSORIES

Wide range 100–240 VAC/48–60 VDC cable

#### OPTIONAL ACCESSORIES

##### RM-33-2

Hardware kit for mounting one RIC-155L unit into a 19-inch rack

##### CBL-DB9F-DB9M-STR

Control port cable

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