RIC-155

10/100BaseT to STM-1/OC-3c Network Termination Unit

RAD

FEATURES

- Connects 10/100BaseT Ethernet LANs over STM-1/OC-3c lines
- Simple and low-cost
- Conforms to the relevant sections of IEEE standards: 802.3u, 802.3x and 802.1Q

- Inband or out-of-band management via:
  - ASCII terminal
  - Web browser
  - Telnet
  - SNMP-based network management station
- Provides Ethernet and STM-1/OC-3c statistics collection

- Fault propagation of STM-1/OC-3c error conditions to Ethernet port
- Wide range of STM-1/OC-3c interfaces, including long haul, WDM fiber optic, and coaxial options

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DESCRIPTION

- RIC-155 connects Fast Ethernet LANs over STM-1/OC-3c lines.

- Typical applications are:
  - Transparent LAN services (see *Figure 1*)
  - Wireless and terrestrial backhaul (see *Figure 2*)
  - Enterprise connection
  - Low cost alternative to STM-1/OC-3c router interface.

- Setup, control and monitoring are performed either inband, within the Ethernet flow or out-of-band using a dedicated port.

- Management and user traffic are separated by different VLANs to ensure management security.

- Management options include:
  - ASCII terminal
  - Telnet server
  - ConfiguRAD via a Web browser
  - RADview, RAD's SNMP network management application.

- Fault propagation mechanism disconnects the Ethernet interface, if the STM-1/OC-3c link failure is detected.

- Comprehensive diagnostic capabilities include:
  - Real-time alarms to alert user on fault conditions. Alarms are reported to the management station and simultaneously relayed via a dry contact port.
  - Ethernet and SDH/SONET link monitoring.

- The STM-1/OC-3c link can be ordered in a variety of fiber optic and coaxial interfaces (see *Table 1*).

SPECIFICATIONS

USER LAN INTERFACE

- **Compatibility**
  Relevant sections of IEEE 802.3u, 802.3x, 802.1Q

- **Data Rate**
  User-configurable, with autonegotiation support.
  - 10BaseT: 10 Mbps
  - 100BaseT: 100 Mbps

- **Line Code**
  10BaseT: Manchester
  100BaseT: MLT3

- **LAN Table**
  1,024 MAC addresses with automatic learning and aging

- **Filtering and Forwarding**
  150,000 frames per second

- **Buffer**
  170 frames

- **Maximum Frame Size**
  1553 bytes

STM-1/OC-3C INTERFACE

- **Fiber Optic**
  See *Table 1*

- **Electrical**
  - Line attenuation is not greater than 12.7 dB at 78 MHz
  - 75Ω impedance
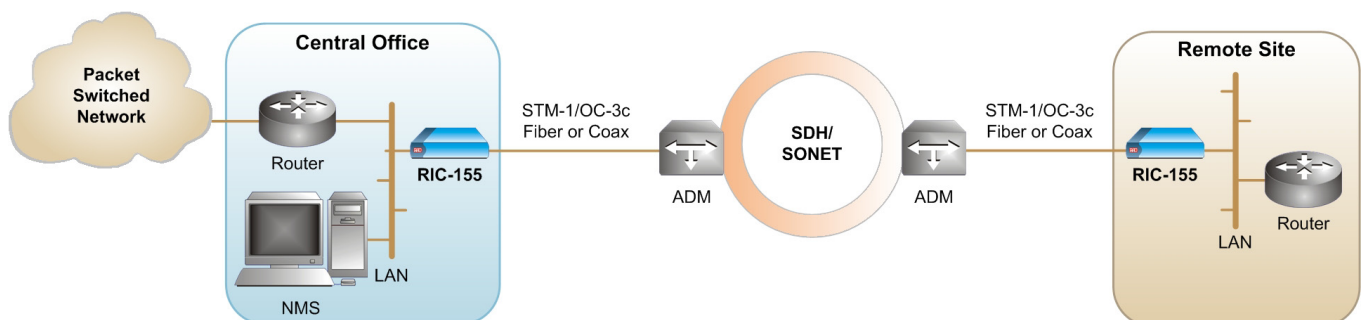 - BNC coax connectors

APPLICATIONS

Figure 1. Connecting Fast Ethernet LANs over STM-1/OC-3c Lines

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MANAGEMENT PORTS

- **Terminal Port**
  - Interface: V.24/RS-232 DTE
  - Connector: 9-pin D-type, female
  - Format: asynchronous
  - Baud rate: 9.6 to 115.2 kbps

- **Ethernet Port**
  - Interface: 10/100BaseT
  - Connector: RJ-45 shielded

GENERAL

- **Monitoring**
  STM-1/OC-3c interface:
  - Optical input signal
  - Input signal monitoring based on received B2 error counting
  - Frame signal
  - Alarm indication signal (AIS)
  - Remote detect indication (RDI)

  LAN interfaces:
  - Received valid frames
  - Transmitted valid frames

- **Timing**
  - Internal, from internal oscillator
  - LBT, from received signal

- **Indicators**
  PWR (green) – Power
  SPEED (green) – LAN speed
  LINK/ACT (yellow) – Ethernet link integrity and activity
  ALM (red) – Alarm
  SIG (green) – Fiber optic signal status

- **Alarm Relay Port**
  Dry contact via 9-pin, D-type, female connector.
  Operates as Normally Open and Normally Closed, using different pins.

Table 1. RIC-155 Fiber Optic Interface Characteristics

| Wavelength	Fiber Type	Transmitter Type	Typical Power	Receiver Sensitivity	Connector	Typical Max. Range	
[nm]	[µm]		[dBm]	[dBm]		[km]	[miles]
1310	62.5/125 multimode	LED	-18	-31	SC	2	1.2
1310	9/125 single mode	Laser	-12	-31	ST, SC, FC	20	12.4
1310	9/125 single mode	Laser (long haul)	-2	-34	ST, SC, FC	40	25.0
1550	9/125 single mode	Laser (long haul)	-2	-34	SC	80	49.7
SF1 (WDM)	9/125 single mode	Laser, Tx – 1310 Rx – 1550	-12	-29	SC	20	12.4
SF2 (WDM)	9/125 single mode	Laser, Tx – 1550 Rx – 1310	-12	-29	SC	20	12.4
SF3 (single fiber)	9/125 single mode	Laser, 1310 Tx and Rx	-12	-27	SC/APC	20	12.4
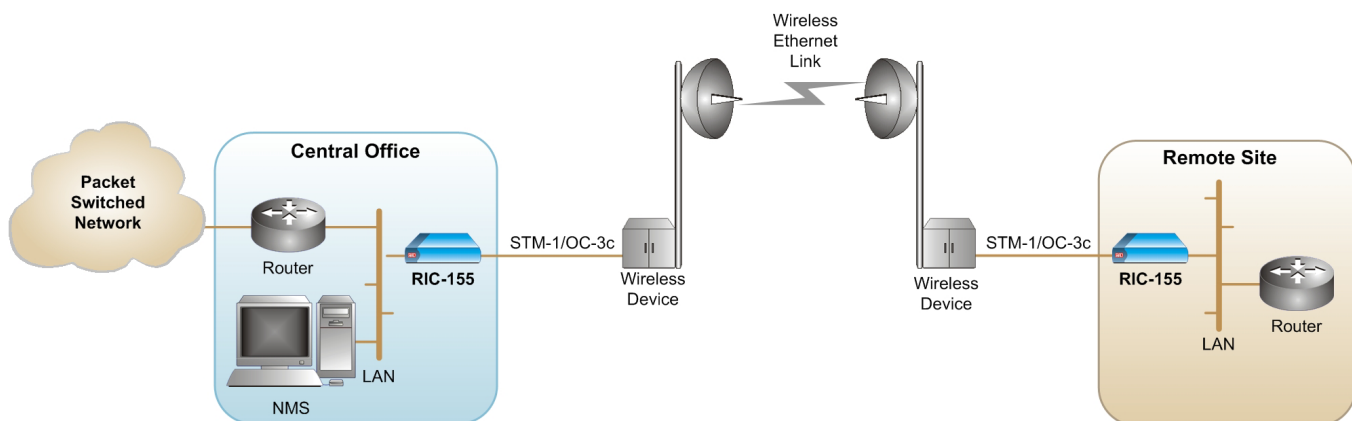
Figure 2. Connecting Fast Ethernet LANs over a Wireless STM-1/OC-3c Link

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- **Power**
  AC: 100 to 240 VAC (±10%),
     50 to 60 Hz
  DC: -48 VDC (±10%)

- **Power Consumption**
  8.8W

- **Physical**
  Height: 44 mm (1.7 in)
  Width: 240 mm (9.4 in)
  Depth: 170 mm (6.6 in)
  Weight   1.7 kg (3.7 lb)

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

ORDERING

RIC-155/*/#/&
10/100BaseT to STM-1/OC-3c
interface converter

* Specify power supply:
   AC for 100 to 240 VAC
   48 for -48 VDC

Specify SDH/SONET connector
   type:
   BNC for electrical, coax connector
   ST for fiber optic ST connector
   SC for fiber optic SC connector
   FC for fiber optic FC connector
   SC/APC for fiber optic SC/APC
      connector (SF3 option only)

& Specify the optical wavelength, fiber
   and transmitter type:
   13 for 1310 nm, multimode, LED
   13L for 1310 nm, single mode,
      laser diode
   13LH for 1310 nm, single mode,
      long haul laser
   15LH for 1550 nm, single mode,
      long haul laser (SC connector only)
   SF1 for WDM laser,
      transmit 1310 nm, receive
      1550 nm (SC connector only)
   SF2 for WDM laser,
      transmit 1550 nm, receive
      1310 nm (SC connector only)
   SF3 for laser diode,
      1310 nm transmit and receive
      (SC/APC connector only)

Note: *For WDM connection, one of the devices
      must be ordered with an SF1 interface
      and the other with an SF2 interface.*

SUPPLIED ACCESSORIES

AC power cord (with AC power
supply only)

DC connection kit (with DC power
supply only)

CBL-DB9F-DB9M-STR
Control port cable

OPTIONAL ACCESSORIES

RM-35/@
Hardware kit for mounting one or
two RIC-155 units in a 19" rack.

@ Specify rack mounting kit type:
   P1 for mounting one unit
   P2 for mounting two units

WM-35
Hardware kit for mounting one
RIC-155 unit on a wall.