Data Sheet

RICi-E3, RICi-T3

Fast Ethernet over E3/T3 Intelligent Network Termination Units

- Transparent user traffic and secure management, via double VLAN tagging
- Three levels of QoS, based on VLAN priority queues as per IEEE 802.1p
- Inband and out-of-band management
- Monitoring and statistics collection of TDM and Ethernet ports
- Fault propagation of E3 or T3 error conditions to the Ethernet port

Connect Fast Ethernet LANs transparently to a TDM Infrastructure

EtherAccess

RICi-E3 and RICi-T3 are state of the art Network Termination Units (NTU) connecting Fast Ethernet LANs over E3 or T3 circuits. The devices enable service providers and ISPs to supply transparent Ethernet services to remote locations over existing E3/T3 infrastructure.

RICi-E3 and RICi-T3 comply with RAD's unique set of EtherAccess™ features. This feature set provides services and carrier backhaul applications over low and high-speed SDH/SONET and PDH circuits, from fractional and full E1/T1 or E3/T3 over STM-1/OC-3 or STM-4/OC-12 to Gigabit Ethernet.

The devices can be used in a point-to-point application or in a hub-and-spoke topology, operating opposite third-party gateways. Typical applications include:

- Ethernet private Line/LAN services
- IP DSLAM, cellular IP, and WiMAX base station backhauling
- Interoffice or enterprise LAN connection.

RICi-E3 and RICi-T3 have one unframed E3 or one framed T3 port, and one 10/100BaseTx port. Packets are forwarded from the Ethernet network to the E3 or T3 network at wire-speed, fully utilizing the expensive TDM circuit bandwidth.

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TRAFFIC SEPARATION

VLAN stacking transports user traffic transparently, keeping user LAN settings intact. In addition, management traffic can be tagged with a different VLAN tag to separate user traffic from management data.

QUALITY OF SERVICE (QoS)

Different service types require different levels of QoS to be provided end-to-end. The VLAN Priority bits (802.1p) enable users to define three QoS levels according to application requirements, providing high priority to real-time applications such as voice and video.

INTERNAL BRIDGE

The internal bridge handles 1536-byte frames supporting VLANs and other protocols requiring large frame sizes. In filter mode, the bridge learns MAC addresses and filters local traffic, and in transparent mode it forwards any received packet.

MANAGEMENT

The device can be managed inband from the Fast Ethernet user port or remotely through the TDM port. You can access RICi-E3, RICi-T3 using Telnet, Web browser, and SNMP.

RADview Lite, RAD's SNMP-based system, provides fault management and monitoring, with a GUI cut-through to ConfiguRAD, a Web-based tool for element configuration and diagnostics.

Management traffic and user Ethernet traffic are transported together in the same Ethernet flow, separated by different VLANs. Local management is supported via an ASCII terminal.

LOOP DETECTION

Ethernet loops caused by loops in the PDH network or the Ethernet interface are immediately detected and the bridge port is closed, to avoid Ethernet loops that cause "Ethernet storms" in the Ethernet network. When the loop is removed, normal operation resumes at the bridge port.

FAULT PROPAGATION

The fault propagation mechanism enables routers and switches connected to both ends of the link to reroute traffic to alternative paths.

If an error is detected on the TDM port, the fault propagation mechanism deactivates the Fast Ethernet link and reports the error to the Ethernet network.

DHCP CLIENT

The DHCP client automatically obtains the IP address, IP mask, and default gateway, minimizing installation time.

DIAGNOSTICS

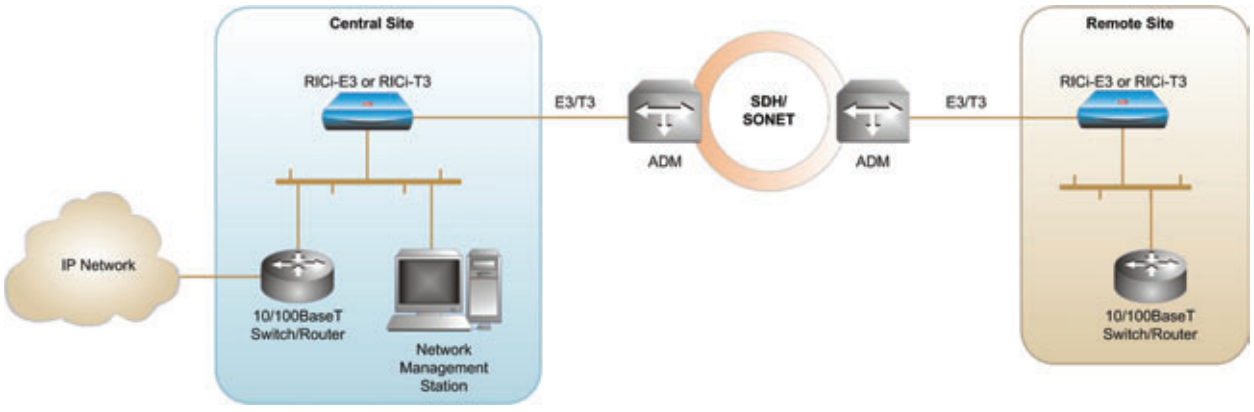
Remote and local loopbacks are used for problem isolation at the physical layer.

A built-in ping utility allows checking IP connectivity by pinging remote IP hosts.

A trace route application quickly maps a route from RICi-E3, RICi-T3 to any other network device.

ENVIRONMENT

RICi-E3 and RICi-T3 are available in a temperature-hardened version that extends the operating temperature range to -22° to 65°C (-7.6° to 149°F).



Transparent LAN Services over Leased Lines

Specifications

E3 INTERFACE

Number of Ports
1

Compliance
G.703

Data Rate
34.368 Mbps

Line Code
HDB3

Framing
Unframed

Line Impedance
75Ω, unbalanced

System Clock
Internal or loopback

Diagnostics
Remote and local loopback

Connector
BNC, coaxial

T3 INTERFACE

Number of Ports
1

Compliance
GR-499-CORE
ANSI T1.107
ANSI T1.102

Data Rate
44.736 Mbps

Line Code
B3ZS

Framing
M23, C-bit parity

Line Impedance
75Ω, unbalanced

System Clock
Internal or loopback

Diagnostics
Remote and local loopback

Connector
BNC, coaxial

WAN PROTOCOL

Type
HDLC-like framing (native HDLC compatible with RAD products)
X.86 (LAPS)

ETHERNET INTERFACE

Number of Ports
One

Type
10/100 Mbps, autonegotiation, full/half duplex, flow control

Max Frame Size
1536 bytes

Compliance
Conforms to the relevant sections of IEEE 802.3 and 802.3u

Connector
RJ-45

INTERNAL BRIDGE

LAN Table
Up to 512 MAC addresses (learned)

Operation Mode
VLAN-aware, VLAN-unaware

Filtering and Forwarding
Transparent or filtered

TERMINAL CONTROL PORT

Type
V.24 /RS-232 (DCE asynchronous)

Data Rate
9.6, 19.2, 115.2 kbps

Connector
9-pin, D-type, female

GENERAL

Diagnostics
Remote loopbacks on E3 and T3 interfaces

Indicators
PWR (green) – Power status
TST (yellow) – Test status
ALM (red) – Alarm status
LOS (red) – Loss of signal
ETH LINK (green) – Ethernet link status

Power
AC/DC: 100–240 VAC, 50/60 Hz or
48/60 VDC nominal (40–72 VDC)

Power Consumption
8W

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:
Standard enclosure:
0 to 50°C (32 to 122°F)
Temperature-hardened enclosure:
-22 to 70°C (-7.6 to 158°F)
Humidity: Up to 90%, non–condensing

RICi-E3, RICi-T3

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Ordering

RICi-E3/$

RICi-T3/$

Legend

$ Temperature range:
H Temperature-hardened

Note: If H is not specified, the supplied unit supports the standard temperature range.

SUPPLIED ACCESSORIES

AC power cord
DC connection kit

OPTIONAL ACCESSORIES

RM-33-2
Hardware kit for mounting one or two units in a 19-inch rack

CBL-DB9F-DB9M-STR
Control port cable

RICi Family Product Comparison Table

Feature	RICi-E1, RICi-T1 (Ver. 2.1)	RICi-E3, RICi-T3 (Ver. 1.1)	RICi-4E1, RICi-4T1 RICi-8E1, RICi-8T1 (Ver. 1.3)	RICi-16E1, RICi-16T1 (Ver. 2.0)
Protocol Type	RAD HDLC HDLC IS GFP (G.8040, G.7041/Y.1303)	RAD HDLC X.86 (LAPS)	MLPPP	GFP (G.8040, G.7041/Y.1303) VCAT (G.7043) LCAS (G.7042)
Fault Propagation	Yes	Yes	Yes	Yes
QoS	802.1p IP Precedence	802.1p	802.1p DSCP Per port	802.1p DSCP Per port
QoS Mechanism	Strict	Strict	Strict	Strict
Host VLAN	Yes	Yes	Yes	Yes
VLAN Stacking Support	Yes	Yes	Yes	Yes