

# RIC-E1, RIC-T1

## E1, T1 Interface Converters



### FEATURES

- Convert from V.35, X.21, V.36, RS-530 to E1 or T1 interfaces
- Connect 10BaseT and 100BaseT LANs and VLANs over E1 or T1 services
- Integrated IP router for connecting IP domains over E1/T1 services
- 10/100BaseT bridge supporting IEEE 802.3x flow control and backpressure
- Diagnostic loopback activation in compliance with ITU V.54 standard
- Available as cards for RAD's ASM-MN-214 card cage
- Plug and play

### DESCRIPTION

- RIC-E1 and RIC-T1 interface converters enable communication between devices with E1/T1 interfaces and equipment with V.35, X.21, V.36, RS-530 interfaces.
- When equipped with the new IR-ETH/V interface module, RIC-E1 and RIC-T1 transparently connect remote LANs and VLANs over unframed E1/T1 links utilizing the full E1/T1 bandwidth. The IR-ETH/V interface module supports autonegotiation, allowing connection without additional configuration.
- RIC-E1 and RIC-T1 equipped with the IR-IP interface module operate as IP gateways, forwarding IP packets destined to the WAN. This saves the cost of an IP router equipped with an E1/T1 interface.
- Front panel LEDs indicate transmit/receive activity, E1/T1 signal loss condition, and diagnostic loopback operation. Rear panel LEDs of the Ethernet interface modules indicate the LAN status and activity.
- RIC-E1 and RIC-T1 are available as plug-in cards for RAD's ASM-MN-214, 19-inch card cage.

### SPECIFICATIONS

#### E1/T1 INTERFACE

- **Data Transmission**  
Synchronous, full duplex
- **Standard**  
E1 or T1, unframed
- **Line Code**
  - E1: HDB3 or AMI
  - T1: B8ZS or AMI
- **Line Impedance**
  - E1: 120 $\Omega$ , balanced and 75 $\Omega$ , unbalanced
  - T1: 100 $\Omega$ , balanced
- **Range**  
Up to 300m (1000 ft) over 24 AWG (0.5 mm) cable
- **Connectors**
  - E1: RJ-45, 8-pin, balanced and two BNC coaxial, unbalanced
  - T1: RJ-45, 8-pin, balanced

#### DTE INTERFACE

- **Type**
  - V.35: 34-pin, female
  - X.21: 15-pin, D-type, female
  - RS-530: 25-pin, D-type, female
  - V.36: 37-pin, D-type, female, via adapter cable
  - IR-ETH (Ethernet bridge): RJ-45 or BNC
  - IR-ETH/V (Ethernet/Fast Ethernet bridge): RJ-45
  - IR-IP (IP router): RJ-45

*Note: For the specifications of the Ethernet interface modules, refer to Table 1.*

# RIC-E1, RIC-T1

## E1, T1 Interface Converters

### GENERAL

#### • Timing

- Received, from the G.703 line
- External, from the attached DTE
- Internal, from internal oscillator

**Note:** Units with Ethernet interface modules do not support external clock.

#### • Diagnostics

Local analog loopback (LLB) in compliance with V.54 standard (loop 3), activated from RIC-E1 and RIC-T1 or DTE interface circuit 141 (not available for X.21 and Ethernet interfaces)

#### • Physical

Height: 40 mm / 1.5 in  
 Width: 190 mm / 7.4 in  
 Depth: 160 mm / 6.2 in  
 Weight 0.6 kg / 1.3 lb

#### • Indicators

PWR (green) – Power is ON  
 RXD (yellow) – Data is received from the link  
 TXD (yellow) – Data is transmitted to the link  
 LOS (red) – No E1/T1 data is received from the link  
 TST (red) – A loopback is active (not relevant for the Ethernet interface modules)  
 LINK (green) – LAN is connected to IR-ETH, IR-ETH/V or IR-IP  
 ACT (yellow) – Transmit or receive activity detected on the Ethernet link of IR-ETH/V or IR-IP  
 100M (green) – LAN operates at 100 Mbps (IR-ETH/V)

#### • Power

AC: 100–240 VAC, 47–63 Hz  
 DC: 24 or -48 VDC

#### • Power Consumption

RIC-E1, RIC-T1: 3W max  
 RIC-E1/R, RIC-T1/R: 5.2W max

#### • Environment

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

## ORDERING

### RIC-E1\*/#

E1 interface converter

### RIC-T1\*/#

T1 interface converter

### RIC-E1/R/#

E1 interface converter, card version for ASM-MN-214 card cage

### RIC-T1/R/#

T1 interface converter, card version for ASM-MN-214 card cage

\* Specify power supply:  
**AC** for 100 to 240 VAC  
**24** for 24 VDC  
**48** for -48 VDC

# Specify DTE interface type:

**V35** for V.35 interface

**X21** for X.21 interface

**V36** for V.36 interface

**530** for RS-530 interface

**UTP** for IR-ETH module with RJ-45 connector

**BNC** for IR-ETH module with BNC connector

**UTP/QN** for IR-ETH/V module

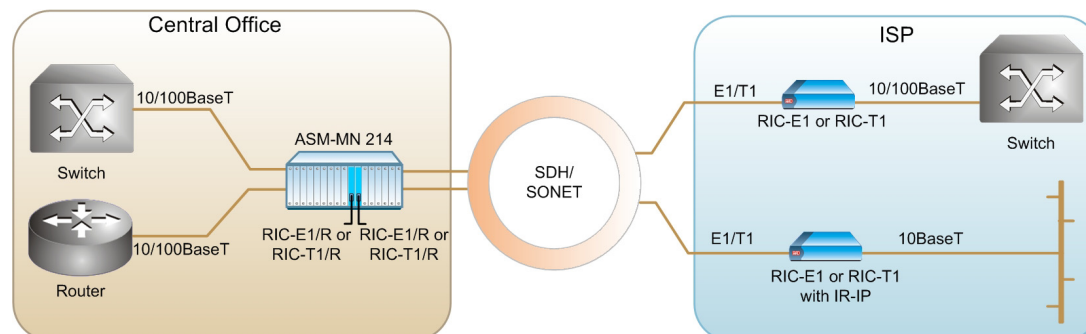
**UTP/IP** for IR-IP module

**Table 1. Ethernet Interface Modules Characteristics**

Interface Module	LAN Table [addresses]	Throughput [pps]	Buffer [frames]	Latency [μs]	Line Code	WAN Protocol
IR-ETH	10,000	3,990	256	350 (10 Mbps LAN rate)	Manchester	HDLC
IR-ETH/V	2,048	4,050	120	300 (100 Mbps LAN rate)	Manchester (10BT) MLT3 (100BT)	HDLC
IR-IP	10,000	3,990	256	350 (10 Mbps LAN rate)	Manchester	<ul style="list-style-type: none"> <li>• PPP (PAP/CHAP)</li> <li>• Frame Relay (RFC 1490)</li> <li>• HDLC</li> </ul>

**Notes:** All Ethernet interface modules conform to the IEEE 802.3/Ethernet V2 standard. Additionally, IR-ETH/V complies with the requirements of IEEE 802.1q (relevant parts), 802.1p and 802.3x. Throughput and latency are calculated for the 64-byte frames and 2 Mbps WAN rate.

## APPLICATION



**Figure 1. Connecting LANs over SDH/SONET Services**



data communications

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