

MIRiCi-E3T3

Intelligent Miniature Ethernet to E3/T3 Remote Bridge



Connecting Fast or Gigabit Ethernet LANs over framed/unframed E3 or T3 links

- E3/T3 connectivity to any Ethernet device with SFP MSA-compatible socket
- Full duplex, E3/T3 wire-speed packet forwarding
- GFP, RAD HDLC and cHDLC encapsulation
- VLAN support according to 802.1p, including VLAN stacking (Q-in-Q) capabilities, allowing traffic separation and prioritization
- Fault propagation to LAN link
- Inband and out-of-band management for configuration, monitoring, and diagnostics
- I²C management interface for simple management integration with host devices

MIRiCi-E3T3 forwards Fast or Gigabit Ethernet packets to a TDM-based WAN at full duplex wire-speed, fully utilizing the expensive E3 or T3 TDM bandwidth.

The TDM interface type (E3 or T3) is user-configurable.

The unit transmits the following frame sizes, including VLAN-tagged frames:

- 64–2016 bytes for Fast Ethernet
- 64–10000 bytes for Gigabit Ethernet.

LAN traffic is transparently directed, thus preserving the user LAN settings.

All parameters are user-configurable including transmit timing sources and data formats.

MANAGEMENT

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

- Out-of-band via the I²C channel (off the SFP edge connector)
- Inband via the Ethernet port using a Web browser.

To facilitate integration of a new device into an IP network, if no IP address has been manually configured, MIRiCi-E3T3 automatically requests one from the DHCP server upon booting.

MIRiCi-E3T3 sends SNMP traps to up to eight management stations.

Application software can be downloaded to MIRiCi-E3/T3 via the central server, using TFTP.

LOS AND FAULT PROPAGATION

The LAN link is deactivated and the link status LED turns off if one of the following user-defined alarms is issued and fault propagation is enabled:

- LOS (Loss of Signal)
- LOF (Loss of Frame)
- FEAC (Far-end Alarm and Control)
- RLOL (Receive Loss of Lock)
- AIS (Alarm Indication Signal)
- RDI (Remote Defect Indication).

In addition, the above-listed error type indications are propagated towards the host by sending an electrical signal via the LOS pin on the MSA edge connector. The LOS LED turns ON, visually indicating the LOS condition.



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ENCAPSULATION

MiRiCi-E3T3 employs the GFP, RAD HDLC and cHDLC WAN encapsulation protocols.

FLOW CONTROL

A flow control mechanism is activated when LAN traffic exceeds the WAN link (E3/T3) capacity and the watermarks of the internal frame buffer. Pause packets are transmitted to the LAN port, halting LAN traffic until the buffer has been emptied to below the watermark limit.

QUALITY OF SERVICE (QoS)

MiRiCi-E3T3 facilitates differentiated services on the same link according to Ethernet or IP marking. Classification is based on VLAN (802.1p) or Differentiated Services Code Point (DSCP) priority, while classification results are mapped to transmit priority queues. Priority queues can be defined to be Strict Priority or Weighted Round Robin (WRR).

DIAGNOSTICS AND LOOP DETECTION

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

MiRiCi-E3T3 detects loops on the WAN or the LAN side by transmitting special loop detection frames.

If a loop is detected on the LAN side, a loop detection alarm is sent

If a loop is detected on the WAN side, the

unit blocks the traffic and only then a loop detection alarm is sent.

The unit also performs Bit Error Rate (BERT) diagnostic tests. MiRiCi-E3T3 generates and detects pseudo-random patterns and repetitive patterns from 1 to 32 bits in length.

ETHERNET OAM

MiRiCi-E3T3 provides single segment (link) OAM based on 802.3ah, including discovery, continuity check, and remote fault indication.

CLOCK OPTIONS

MiRiCi-E3T3 uses Tx clock sources for the internal and receive clocks. Standard statistics for 15-minute time intervals are collected.

FLEXIBILITY

MiRiCi-E3T3 operates opposite the following devices using standard GFP, RAD HDLC and cHDLC encapsulation:

- RAD's RICI-16, RICI-E3 and RICI-T3
- Third-party devices that support standard GFP, RAD HDLC and cHDLC encapsulation.

SFP ENCLOSURE

Housed in a Small Form Factor Pluggable (SFP) package, MiRiCi-E3T3 complies with the Multi-Source Agreement (MSA).

Running on power derived from the host device, it requires no additional power supply.

MiRiCi-E3T3 is hot swappable and features a special release mechanism for easy extraction from the SFP socket.

SFP CONFIGURATION ADAPTER

An optional configuration adapter module, SFP-CA, is available for configuring MiRiCi-E3T3 by connecting it to a PC via a USB port.

The configuration adapter is used for preliminary configuration, such as assigning an IP address for first use or specifying the operation mode. It is used as well to download software to the MiRiCi-E3T3 units.

POSSIBLE APPLICATIONS

MiRiCi-E3T3 can be used in the following applications:

- Transparent LAN services over leased lines
- Remote branch connectivity over E3/T3 lines
- Connecting LANs over E3/T3 radio links or in campus applications.

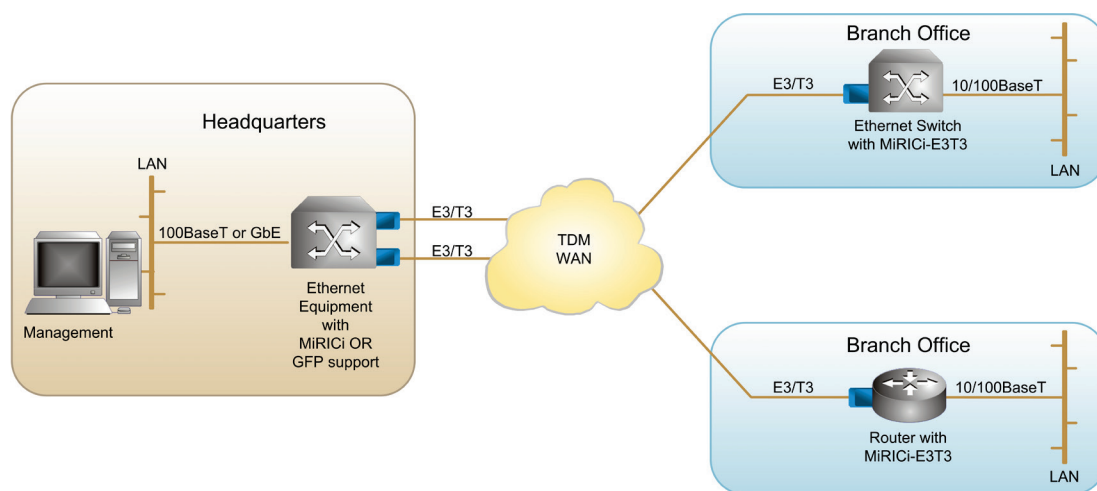


Figure 1. Providing Transparent LAN Services over Leased Lines

Specifications

WAN INTERFACE

Number of Ports

1, configurable as E3 or T3

Tx Clock

Receive or internal clock

Connector

DIN 1.0/2.3 connector

E3 INTERFACE

Number of Ports

1

Compliance

G.703, G.775, G.823, G832, G.751

Data Rate

34.368 Mbps

Line Code

HDB3, AMI

Framing

Framed (G.832, G.751), unframed

Line Impedance

75Ω, unbalanced

Cable Length (max)

Up to 275m (900 ft)

T3 INTERFACE

Number of Ports

1

Compliance

GR-499-CORE, T1.107, T1.404, G.703, G.704, G.775, G.824

Data Rate

44.736 Mbps

Line Code

B3ZS, AMI

Framing

Framed (C-bit, M23), unframed

Line Impedance

75Ω, unbalanced

Cable Length (max)

Up to 275m (900 ft)

LAN INTERFACE

Type

Fast or Gigabit Ethernet port

Compliance

IEEE 802.3

Edge Connector

SFP-based, MSA-compliant

Frame Size

FE: 64–2016 Bytes

GE: Up to 10 kBytes (jumbo)

WAN PROTOCOL

Encapsulation

GFP (G.8040, G.7041/Y.1303)

RAD HDLC

cHDLC

GENERAL

LED Indicators

MiRiCi-E3T3/FE: LINK (green)

– Ethernet link status

MiRiCi-E3T3/GE: LINK/ACT (green)

– Ethernet link status and activity

LOS (red) –E3/T3 loss of signal

Power

3.3V

Power Dissipation

1.25W

Environment

Temperature:

MiRiCi-E3T3/FE:

Ambient: –40 to 65°C (–40 to 149°F)

Case: –40 to 78°C (–40 to 172°F)

MiRiCi-E3T3/GE:

Ambient: –40 to 65°C (–40 to 149°F)

Case: –40 to 78°C (–40 to 172°F)

Humidity: Up to 90%, non-condensing

Physical Dimensions

Height: 12.4 mm (0.49 in)

Width: 14 mm (0.55 in)

Depth: 79 mm (3.11 in)

Weight: 15.0 g (0.5 oz)

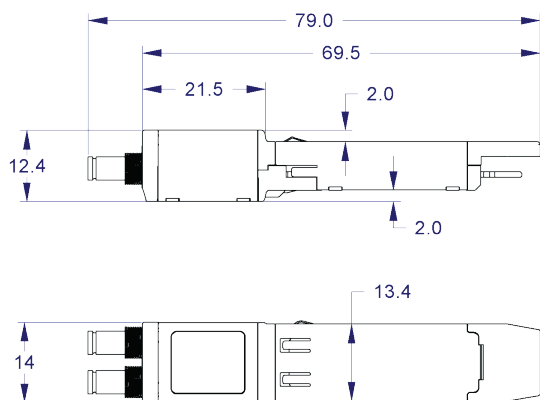


Figure 2. Physical Dimensions

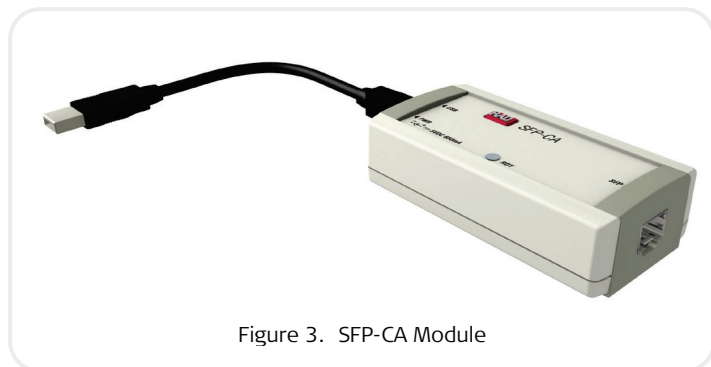


Figure 3. SFP-CA Module

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Ordering

MiRiCi-E3T3/+

Legend

- + SFP port:
- FE Fast Ethernet
- GE Gigabit Ethernet

SUPPLIED ACCESSORIES

CBL-1023-BNC



Two 30 cm (11.8 in) DIN 1.0/2.3 to BNC cable adapters

OPTIONAL ACCESSORIES

SFP-CA

Configuration adapter module for configuring MiRiCi-E3T3 by connecting it to a PC

Table 1. MiRiCi Family Product Comparison

	MiRiCi-E1/T1 (Ver. 2.5)	MiRiCi-E3/T3 (Ver. 2.5)
Feature		
Protocol type	GFP (G.8040, G.7041/Y.1303) RAD HDLC cHDLC	GFP (G.8040, G.7041/Y.1303) RAD HDLC cHDLC
Framing	G.732.N, G.732.N CRC, unframed(E1) ESF, D4, unframed (T1)	G.832, G.751, unframed (E3) C-bit, M23, unframed (T3)
QoS	VLAN priority (802.1p, strict priority, WRR)	VLAN priority (802.1p, strict priority, WRR)
Loop detection	Yes (LAN or WAN)	Yes (LAN or WAN)
Fault propagation	Yes (LOS, FDL, LOF, AIS, RDI)	Yes (LOS, LOF, FEAC, RLOL, AIS, RDI)
SNMP traps	Yes, up to 8 management stations	Yes, up to 8 management stations

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