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MiRICi-155

Intelligent Miniature GbE over STM-1/OC-3 NTU

- Gigabit-to-STM-1/OC-3 bridge
- Gigabit Ethernet connectivity over SDH/SONET networks
- Standard GFP encapsulation
- 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-155 is a state-of-the-art network termination unit that bridges between Gigabit Ethernet networks and STM-1/OC-3 networks, providing simple, efficient, and cost—effective Gigabit Ethernet connectivity over SDH/SONET networks.

MARKET SEGMENTS AND APPLICATIONS

MiRICi-155 offers a migration path for connecting future-ready IP devices to existing SDH/SONET networks.

Typical applications include Connecting Gigabit Ethernet LANs over

- STM-1/OC-3 lines (*Figure 1*)
- Wireless STM-1/OC-3 links (*Figure 2*).

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

INTEROPERABILITY

MiRICi-155 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.

GIGABIT ETHERNET

Encapsulation
MiRICi-155 uses standard GFP encapsulation according to ITU-T G.7041/Y.1303 requirements.

QoS
For prioritizing user traffic, MiRICi-155 features up to four separate queues.

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

TIMING AND SYNCHRONIZATION

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

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

MANAGEMENT AND SECURITY

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-155 automatically requests one from the DHCP server upon booting.

Application software can be downloaded to MiRICi-155 via the central server, using TFTP.

ARCHITECTURE

Housed in a Small Form Factor Pluggable (SFP) package (*Figure 3*), MiRICi-155 complies with the Multi-Source Agreement (MSA).

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

MiRICi-155 is hot swappable and features a special release mechanism for easy extraction from the SFP socket.

OPERATION AND MAINTENANCE

SFP Configuration Adapter
An optional configuration adapter module, SFP-CA.2, is available for configuring MiRICi-155 by connecting it to a PC via a USB port. The configuration adapter is used for

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preliminary configuration such as assigning an IP address for first use or specifying the mode of operation. It is also used to download software to the MiRICi-155 units.

MONITORING AND DIAGNOSTICS

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

Fault Propagation

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

* LOS (Loss of Signal)

* AIS (Alarm Indication Signal)

* RDI (Remote Defect Indication).

In addition, the above-listed error conditions are propagated towards the host by sending an electrical signal via the LOS pin on the MSA edge connector.
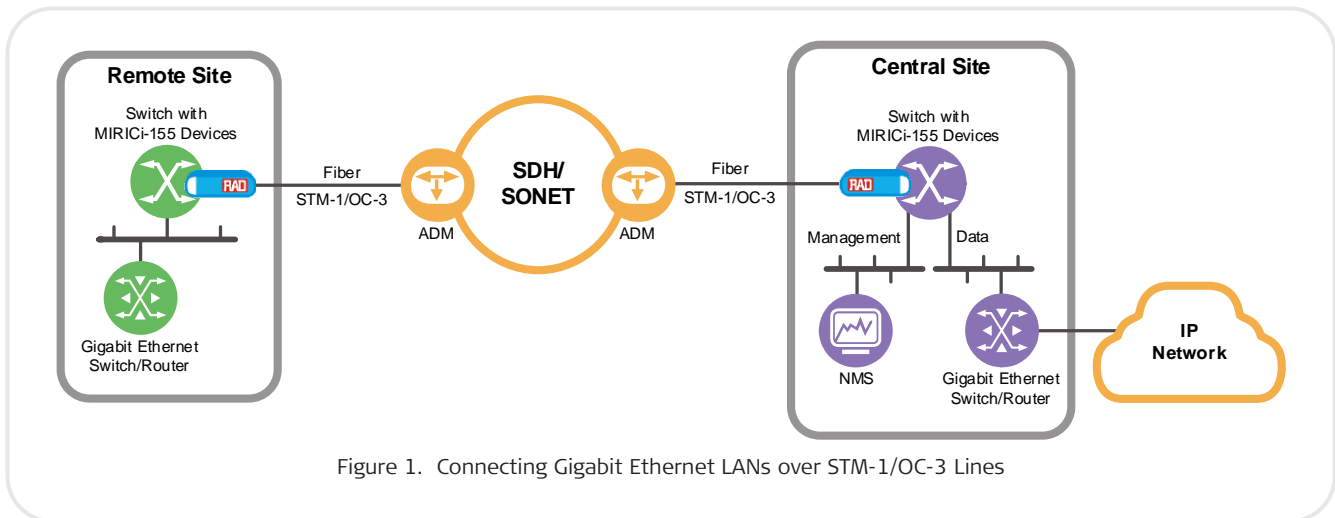

Figure 1. Connecting Gigabit Ethernet LANs over STM-1/OC-3 Lines
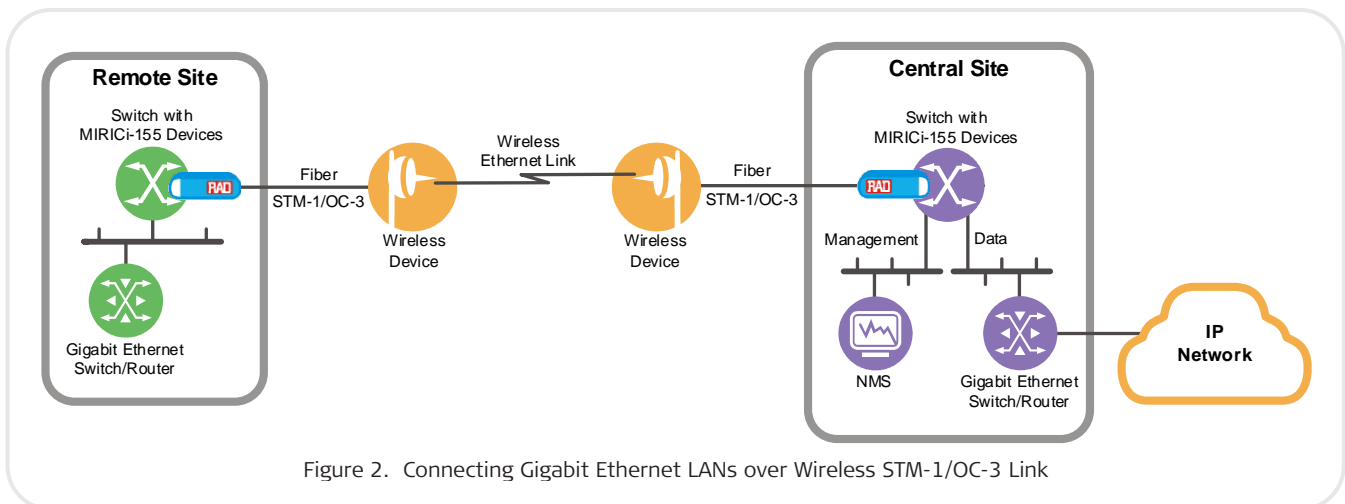

Figure 2. Connecting Gigabit Ethernet LANs over Wireless STM-1/OC-3 Link

Specifications

STM-1/OC-3 INTERFACE

Number of Ports
1, optical

Data Rate
155.52 Mbps

Operation Mode
SDH/SONET

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

Framing
SDH: ITU-T, G.707
SONET: GR-253-core, OC-3

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

Timing
Internal

Recovered from STM-1/OC-3 interface

Interface Type
Laser 1310 nm, single mode

Connector
LC

GIGABIT ETHERNET INTERFACE

Type
Gigabit Ethernet

Edge Connector
SFP-based, MSA-compliant

Data Rate
1000 Mbps

Frame Size
64 bytes–10,000 bytes (jumbo frames)

Compliance
Conforms to the relevant sections of
IEEE 802.3

GENERAL

Physical
Height: 12.2 mm (0.48 in)
Width: 13.7 mm (0.53 in)
Depth: 76.2 mm (3 in)
Weight: 15g (0.5 oz)

Power
3.3 V

Power Consumption
1.5 W

Environment
Temperature:

Ambient: −10 to 65°C (50 to 149°F)

Case: −10 to 80°C (50 to 176°F)

Humidity: Up to 90%, non–condensing

Table 1. Fiber Optic Gigabit Ethernet Characteristics

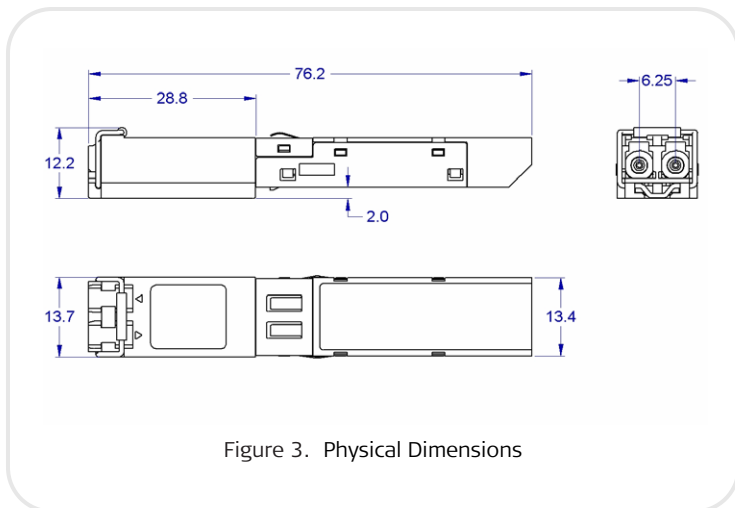| Ordering Name	Wavelength, Fiber Type [nm], [µm]	Transmitter Type	Input Power [dBm] [min]	[max]	Output Power [dBm] [min]	[max]	Typical Max. Range [km]	[miles]
MiRICi-155 Gigabit Ethernet/STM-1, LC, Internal calibration	1310, 9/125 single mode	Laser	-28	-8	-15	-8	15	9.3

Figure 3. Physical Dimensions

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Ordering

RECOMMENDED CONFIGURATIONS

MiRICi-155

OPTIONAL ACCESSORIES

SFP-CA.2
Configuration adapter module for configuring MiRICi-155 by connecting it to a PC

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