Data Sheet

ETX-201

Carrier Ethernet Demarcation Device

Smart demarcation point between the service provider and customer networks

EtherAccess

- SLA monitoring to assure delivery of contracted Ethernet services
- VLAN bridging and stacking with P-bit, DSCP, Per Port or ToS traffic prioritization
- Complete Ethernet OAM and Layer-2 loopback functionality for reduced Opex
- Network link protection based on 802.3ad or dual homing for increased service resiliency
- Up to two Fast or Gigabit Ethernet network ports and up to four Fast Ethernet user ports

ETX-201 is a carrier-class demarcation device owned and operated by the service provider and installed at the customer premises.

Providing monitoring and diagnostic as well as QoS capabilities, ETX-201 focuses on the service and allows the service provider to achieve end to end rather than edge-to-edge service control.

IP address, IP mask and default gateway can be automatically obtained using DHCP.

ETHERNET CAPABILITIES

ETX-201 features an internal bridge, operating in VLAN-aware and VLAN-unaware modes.

VLAN stacking can be used for traffic separation between different users or services by defining a Service VLAN ID per customer or service. When VLAN stacking is used, a Service VLAN tag is added to the user traffic and removed from network traffic. Both Service VLAN ID and Service VLAN priority can be defined.

CARRIER ETHERNET MEF Certified Compliant

RAD data communications
The Access Company

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The unit provides a user-configurable fault propagation mechanism. When a link failure is detected at the network port, ETX-201 optionally shuts down a user port until the network link is restored.

LAYER-2 LOOPBACK WITH MAC SWAPPING

Layer-2 link integrity can be tested by a non-disruptive loopback with MAC address swapping. When the loopback is activated, ETX-201 exchanges source and destination MAC addresses of the incoming packets. This loopback can be performed per VLAN (or EVC), it passes through Ethernet bridges and does not disrupt traffic flows, which are not being tested.

ETHERNET OAM

ETX-201 provides comprehensive Ethernet OAM capabilities:

- End-to-end OAM based on IEEE 802.1ag and ITU-T Y.1731 enable Ethernet service providers to monitor their services proactively, measure end-to-end performance and guarantee that the customers receive the contracted SLA.
- Performance monitoring includes Frame Delay, Frame Delay Variation, Frame Loss and Availability.
- Single segment (link) OAM according to IEEE 802.3ah for remote management and fault indication, including remote loopback, dying gasp, and MIB parameters retrieval.

NETWORK INTERFACE REDUNDANCY

The unit supports two redundancy modes:

- Link aggregation (1+1) based on IEEE 802.3ad
- Dual homing (1:1), allowing ETX-201 to be connected to two different upstream devices.

PORT COMBINATIONS

ETX-201 offers flexible network and user port combinations:

- Port 1 and 2 – Any standard Fast or Gigabit Ethernet fiber optic SFP
- Port 3–6 – Any standard Fast Ethernet fiber optic SFP or built-in 10/100BaseT.

QoS

Different service types require different levels of QoS to be provided end-to-end. QoS can be defined per subscriber as well as per service. QoS has two aspects: rate limitation and traffic prioritization.

Hierarchical rate limitation defines peak traffic rate per user, port service or per traffic aggregate. This maximizes bandwidth utilization.

For prioritizing user traffic ETX-201 features up to four separate queues, which handle traffic with different service demands, such as real-time traffic, premium data or best-effort data. In case of congestion, the relevant service receives higher priority at the customer premises.

Traffic can be classified dynamically and mapped to different priority queues according to VLAN priority, DSCP, Per Port or ToS. Appropriate QoS can be achieved without customer marking, by mapping different services and different user ports (port-based priority).

MANAGEMENT

The unit can be managed using the following ports and applications:

- Local management via an ASCII terminal connected to the RS-232 port
- Remote inband management via user or the network ports. Remote management via Telnet, Web browser or RADview-EMS (RAD's SNMP-based management system).

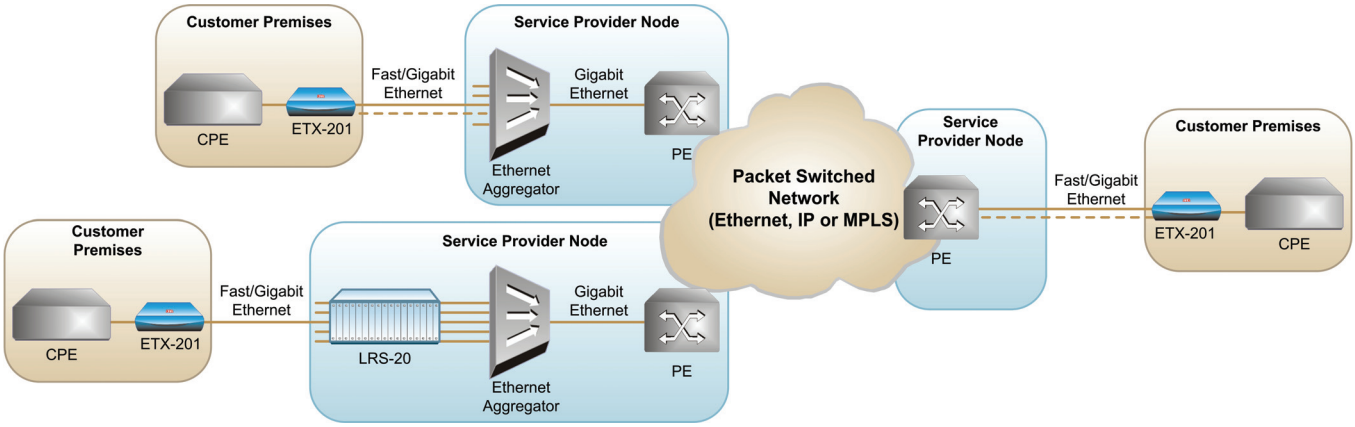

Figure 1. Three Access Topologies for Providing Managed Ethernet Services over a PSN using ETX-201

Management traffic can be separated from user data by creating a dedicated management VLAN.

Up to ten different stations can manage ETX-201 simultaneously, enabling monitoring the network status from different locations.

The following security protocols are provided by ETX-201 to ensure client-server communication privacy and correct user authentication:

- RADIUS (client authentication only)
- SSL for Web-based management
- SSH for Secure Shell Telnet session
- SNMPv3 for secure SNMP sessions.

REMOTE MONITORING

ETX-201 uses the Syslog protocol to generate and forward event notifications over IP networks.

The device supports DDM (Digital Data Management) SFPs according to SFF-8472 Version 9.3.

COLLECTING TFTP STATISTICS

ETX-201 supports collecting TFTP statistics via RAD's SNMP-based management system for upload to the NMS.

MEF-9, MEF-14 CERTIFICATION

The device is certified by the Metro Ethernet Forum for EPL services (MEF-9, MEF-14).

TYPICAL APPLICATIONS

ETX-201 provides access to packet switched networks (Ethernet, IP/MPLS), as well as next-generation SDH/SONET backbones over Ethernet, using standard fiber optic interfaces. Access to legacy networks is possible when the edge devices include tributary Ethernet ports (see Figure 2). The termination unit can be used for site-to-site connectivity (E-line), and for multiple site connectivity (E LAN), depending on the network topology.

ENVIRONMENT

ETX-201/H is a temperature-hardened version with matching SFPs intended for industrial installations.

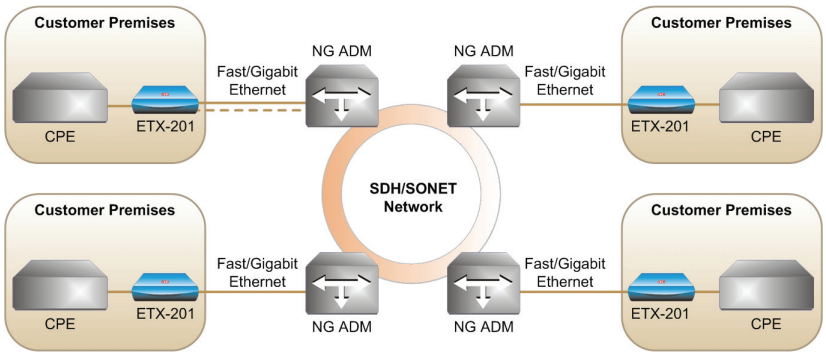

Figure 2. Providing Managed Ethernet Services over a Next-Generation SDH/SONET Network

Specifications

NETWORK INTERFACE

Number of Ports
Up to 2 (redundancy)

Type
Fast Ethernet (100BaseFx, 100BaseLX10, 100BaseBx10),

SFP-based Gigabit Ethernet (1000BaseSx, 1000BaseLX10, 1000BaseBx10)

Connector
LC

Fast Ethernet SFPs

- SFP-1: 1310 nm, 2 km (1.2 miles)
- SFP-1D: 1310 nm, 2 km (1.2 miles), DDM, internal calibration
- SFP-2: 1310 nm, 15 km (9.3 miles)
- SFP-2D: 1310 nm, 15 km (9.3 miles), DDM, internal calibration
- SFP-2H: 1310 nm, 15 km (9.3 miles), temperature-hardened
- SFP-3: 1310 nm, 40 km (24.8 miles)
- SFP-3D: 1310 nm, 40 km (24.8 miles), DDM, internal calibration
- SFP-3H: 1310 nm, 40 km (24.8 miles), temperature-hardened
- SFP-4: 1550 nm, 80 km (49.7 miles)
- SFP-4D: 1550 nm, 80 km (49.7 miles), DDM, internal calibration
- SFP-10a: Tx – 1310 nm, Rx – 1550 nm, single fiber, 20 km (12.4 miles)
- SFP-10b: Tx – 1550 nm, Rx – 1310 nm, single fiber, 20 km (12.4 miles)
- SFP-18A: Tx – 1310 nm, Rx – 1550 nm, single fiber, 40 km (24.8 miles)
- SFP-18B: Tx – 1550 nm, Rx – 1310 nm, single fiber, 40 km (24.8 miles)
- SFP-19a: Tx – 1490 nm Rx – 1570 nm, single fiber, 80 km (49.7 miles)
- SFP-19b: Tx – 1570 nm, Rx – 1490 nm, single fiber, 80 km (49.7 miles).

Gigabit Ethernet SFPs

- SFP-5: 1310 nm, 0.55 km (0.3 miles)
- SFP-5D: 1310 nm, 0.55 km (0.3 miles), DDM, internal calibration
- SFP-5H: 1310 nm, 0.55 km (0.3 miles), temperature-hardened
- SFP-5DH: 1310 nm, 0.55 km (0.3 miles), DDM, internal calibration, temperature-hardened
- SFP-6: 1310 nm, 10 km (6.2 miles)
- SFP-6D: 1310 nm, 10 km (6.2 miles), DDM, internal calibration
- SFP-6H: 1310 nm, 10 km (6.2 miles), temperature-hardened
- SFP-6DH: 1310 nm, 10 km (6.2 miles), DDM, internal calibration, temperature-hardened
- SFP-7: 1550 nm, 80 km (49.7 miles)
- SFP-7D: 1550 nm, 80 km (49.7 miles), DDM, internal calibration
- SFP-8: 1310 nm, 40 km (24.8 miles)
- SFP-8D: 1310 nm, 40 km (24.8 miles), DDM, internal calibration
- SFP-8H: 1310 nm, 40 km (24.8 miles), temperature-hardened
- SFP-8DH: 1310 nm, 40 km (24.8 miles), DDM, internal calibration, temperature-hardened
- SFP-17a: Tx – 1310 nm, Rx – 1490 nm, single fiber, 10 km (6.2 miles)
- SFP-17b: Tx – 1490 nm, Rx – 1310 nm, single fiber, 10 km (6.2 miles)
- SFP-20: 1550 nm, 120 km (74.5 miles)
- SFP-22a: Tx – 1490 nm Rx – 1570 nm, single fiber, 80 km (49.7 miles)
- SFP-22b: Tx – 1570 nm, Rx – 1490 nm, single fiber, 80 km (49.7 miles).

Note: *It is strongly recommended to order this device with* ***original*** *RAD SFPs* ***installed****. This will ensure that prior to shipping, RAD has performed comprehensive functional quality tests on the entire assembled unit, including the SFP devices. RAD cannot guarantee full compliance to product specifications for units using non-RAD SFPs. For detailed specifications of the SFP transceivers, refer to the SFP Transceivers data sheet.*

USER INTERFACE – FIBER OPTIC

Number of Ports
1 (port 3)

Type
Fast Ethernet (100BaseFx, 100BaseLX10, 100BaseBx10), SFP-based

Fast Ethernet SFPs
Refer to the network interface specifications

USER INTERFACE – COPPER

Number of Ports
Up to 4 (ports 3–6)

Type
10/100BaseT

Connector
RJ-45

GENERAL

Certifications
MEF-9 EPL, MEF-14 EPL

Compliance
IEEE 802.3, 802.3u, 802.1d, 802.1q, 802.1p, 802.3ad, 802.3ah

Maximum Frame Size
1,632 bytes

MAC Address Table Size
8,192 entries

Management

- Out-of-band: via dedicated terminal port; V.24/RS-232 DCE; 9.6, 19.2, 115.2 kbps; DB-9 female connector
- Inband: via network or user ports

Power
AC/DC: 100–240 VAC or 48/60 VDC
DC: 24/48/60 VDC nominal (18–72 VDC)

Power Consumption
6.1W max

Physical

ETX-201:	Height: 43.7 mm (1.7 in) Width: 217 mm (8.5 in) Depth: 170 mm (6.7 in) Weight: 0.5 kg (1.1 lb)
ETX-201/H:	Height: 47 mm (1.8 in) Width: 215 mm (8.4 in) Depth: 147 mm (5.8 in) Weight: 0.7 kg (1.5 lb)

Environment
Temperature:
ETX-201: 0–50°C (32–122°F)
ETX-201/H: -40– 65°C (-40–149°F)
Humidity: Up to 90%, non-condensing

ETX-201

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Table 1. ETX Family Comparison Table

Feature	ETX-102 (Ver. 3.6)	ETX-201 (Ver. 3.6)	ETX-202 (Ver. 3.6)	ETX-202A (Ver. 1.2)
Network interface	2 × Fast Ethernet	Up to 2 × Gigabit or Fast Ethernet (auto-detect) One interface may be configured as user or network interface	2 × Gigabit Ethernet	2 × Gigabit Ethernet
User interface	Up to 4 × Fast Ethernet	1× Gigabit or Fast Ethernet (if one network interface is configured as user interface) and up to 4 × Fast Ethernet	Up to 4 × Gigabit Ethernet	Up to 4 × Gigabit Ethernet
Service type	EPL (port-based)	EPL (port-based)	EPL (port-based)	EVPL (flow-based)
Forwarding mode	VLAN-aware/unaware bridging, 8K MAC addresses	VLAN-aware/unaware bridging, 8K MAC addresses	VLAN-aware/unaware bridging, 8K MAC addresses	Flow-based forwarding
QoS	Rate limitation Traffic classification (802.1p bits, ToS, DSCP, port-based)	Rate limitation Traffic classification (802.1p bits, ToS, DSCP, port-based)	Rate limitation Traffic classification (802.1p bits, ToS, DSCP, port-based)	Rate limitation per flow Traffic classification (Port-based, VLAN, 802.1p bits, ToS, DSCP) Shaping
Bandwidth profile	CIR/CBS per port	CIR/CBS per port	CIR/CBS per port	CIR/CBS, EIR/EBS per EVC.COS
Remote management	Telnet, Web, RADview	Telnet, Web, RADview	Telnet, Web, RADview	Telnet, Web, RADview

Data Sheet

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Ordering

ETX-201/?/!/+1/+2/+3

Legend

? Power supply type (Default=AC/DC wide-range power supply):

WRDC	Wide range DC power supply

Note: *The wide-range DC power supply is available only for units with temperature-hardened enclosures.*

! Temperature range (Default=Regular enclosure):

H	Temperature-hardened enclosure

Note: *The ETX-201/H version requires temperature-hardened SFP transceivers.*

+1 Port 1 (network) interface type:

SFP-1	SFP-1 transceiver
SFP-1D	SFP-1D transceiver
SFP-2	SFP-2 transceiver
SFP-2D	SFP-2D transceiver
SFP-3	SFP-3 transceiver
SFP-3D	SFP-3D transceiver
SFP-4	SFP-4 transceiver
SFP-4D	SFP-4D transceiver
SFP-10A	SFP-10a transceiver
SFP-10B	SFP-10b transceiver
SFP-18A	SFP-18a transceiver
SFP-18B	SFP-18b transceiver
SFP-19A	SFP-19a transceiver
SFP-19B	SFP-19b transceiver
SFP-5	SFP-5 transceiver
SFP-6	SFP-6 transceiver
SFP-7	SFP-7 transceiver
SFP-8	SFP-8 transceiver
SFP-17A	SFP-17a transceiver
SFP-17B	SFP-17b transceiver
SFP-20	SFP-20 transceiver
SFP-22A	SFP-22a transceiver
SFP-22B	SFP-22b transceiver
NULL	Empty SFP slot

+2 Port 2 (network/user) interface type: Refer to the network port 1 options above

+3 Ports 3–6 (user) interface type and combination:

1SFP-1-3UTP	SFP-1 transceiver (port 3) and 3 UTP, ports 4–6
1SFP-2-3UTP	SFP-2 transceiver (port 3) and 3 UTP, ports 4–6
1SFP-3-3UTP	SFP-3 transceiver (port 3) and 3 UTP, ports 4–6
1SFP-4-3UTP	SFP-4 transceiver (port 3) and 3 UTP, ports 4–6
1SFP-5-3UTP	SFP-5 transceiver (port 3) and 3 UTP, ports 4–6
1SFP-10A-3UTP	SFP-10a transceiver (port 3) and 3 UTP, ports 4–6
1SFP-10B-3UTP	SFP-10b transceiver (port 3) and 3 UTP, ports 4–6
1SFP-18A-3UTP	SFP-18a transceiver (port 3) and 3 UTP, ports 4–6
1SFP-18B-3UTP	SFP-18b transceiver (port 3) and 3 UTP, ports 4–6
1SFP-19A-3UTP	SFP-19a transceiver (port 3) and 3 UTP, ports 4–6
1SFP-19B-3UTP	SFP-19b transceiver (port 3) and 3 UTP, ports 4–6
1Null-3UTP	Empty SFP slot
1UTP	1 UTP (port 3)
4UTP	4 UTP ports

SUPPLIED ACCESSORIES

AC power cord
DC power connection kit

OPTIONAL ACCESSORIES

RM-33-2
Hardware kit for mounting one or two ETX-201 units in a 19-inch rack

CBL-DB9F-DB9M-STR
Control port cable

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