Data Sheet

ETX-203A

Carrier Ethernet Demarcation Device

The ETX-203A Carrier Ethernet demarcation device delivers SLA-based business services to the customer premises over native Ethernet access networks.

ETX-203A is extremely price competitive, ensuring SDH/SONET-like performance and

Feature-rich, best price-performance demarcation point for SLA-based Ethernet business services

Recognized for value and price performance

- Feature-rich Carrier Ethernet demarcation device delivering end-to-end service and transport (up to 4 Gbps)
- MEF-compliant, services with CIR/EIR traffic profiles and hierarchical traffic management
- Sub microsecond per EVC.CoS SLA measurements with hardware-powered ITU-T Y.1731 functionality
- Throughput testing across routed/switched networks up to line rate by using Layer-2 RFC-2544 traffic generator and analyzer, and Layer-2/3 loopbacks
- Quick network fault detection with complete OAM toolset: ITU-T Y.1731, IEEE 802.1ag, IEEE 802.3ah

Five Nines reliability for IP VPN and VoIP transport, as well as for dedicated Internet access and Layer-2 LAN-to-LAN services, all with differentiated quality of service and end-to-end monitoring.

The ETX-203A architecture ensures powerful traffic management that allows the service provider to control bandwidth and enforce traffic SLA.

ETX-203A features hardware-powered OAM for multiple flow monitoring at line rate. It provides 15 different SLA tools (see *Table 1*) to assure and control the traffic by the service provider around the clock.

ETX-203A is a compact low power consumption demarcation device that delivers MEF 9 and MEF 14 certified services. It provides Ethernet uplink NNI ports as well as UNI ports.

RAD
Your Network's Edge

ETX-203A

Carrier Ethernet Demarcation Device

MARKET SEGMENTS AND APPLICATIONS

ETX-203A is used in the following MEF-defined applications:

- Ethernet Private Line (EPL) – site-to-site connectivity over dedicated bandwidth without service multiplexing (see *Figure 1*)
- Ethernet Virtual Private Line (EVPL) – site-to-site connectivity over shared bandwidth with service multiplexing (see *Figure 2*)
- Ethernet LAN – site-to-site connectivity over dedicated bandwidth with or without service multiplexing.

ETHERNET

Classification

Traffic is mapped to the Ethernet flows using very flexible classification criteria that can be combined, for example:

- VLAN + VLAN priority
- VLAN + IP precedence
- VLAN + DSCP
- Ether Type
- IP/MAC source/destination address
- Untagged.

More classification criteria and combinations can be found in the user manual.

Layer-2 Control Processing

ETX-203A can be configured to pass through Layer-2 control frames (including other vendors' L2CP frames) across the network, to peer supported protocols (IEEE 802.3-2005 and LACP), or to discard the L2CP frames.

L2PT support with optional MAC address replacement offers LACP tunneling through any Layer-2 network. LACP tunneling provides transparent support of LACP between customer endpoints.

OAM

Featuring ultra fast, hardware-powered processing, ETX-203A performs OAM and PM measurements in line rate with maximum precision, offering the following powerful benefits:

- Immediate detection of loss of continuity (LOC), ensuring under 50 ms protection switching
- Highly accurate frame loss measurements with live traffic testing
- Flow-level monitoring, enabling simultaneous processing of hundreds of OAM sessions
- Loopback testing at line rate.

ETX-203A provides these types of Ethernet OAM:

- Single-segment (link) OAM according to IEEE 802.3-2005 (formerly 802.3ah) for remote management and fault indication in active and passive mode, including remote loopback, dying gasp, and MIB parameter retrieval.
- End-to-end connectivity OAM based on IEEE 802.1ag-D8 that enables Ethernet service providers to monitor their services proactively and guarantee that customers receive the contracted SLA
- End-to-end service and performance monitoring based on ITU-T Y.1731. Fault monitoring and end-to-end performance measurement include frame delay, frame delay variation, frame loss and availability.

Traffic Management/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 three aspects: rate limitation, traffic shaping, and traffic prioritization.

Traffic policing is applied per flow or group of flows, and operates according to the dual token bucket mechanism based on user-configurable CIR + CBS and EIR + EBS.

Traffic can be limited to the line rate or the data rate.

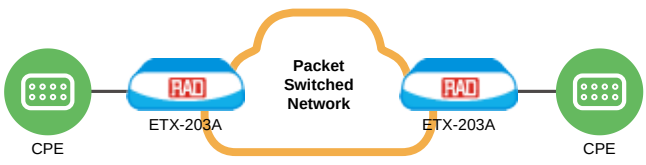

Figure 1. Ethernet Private Line

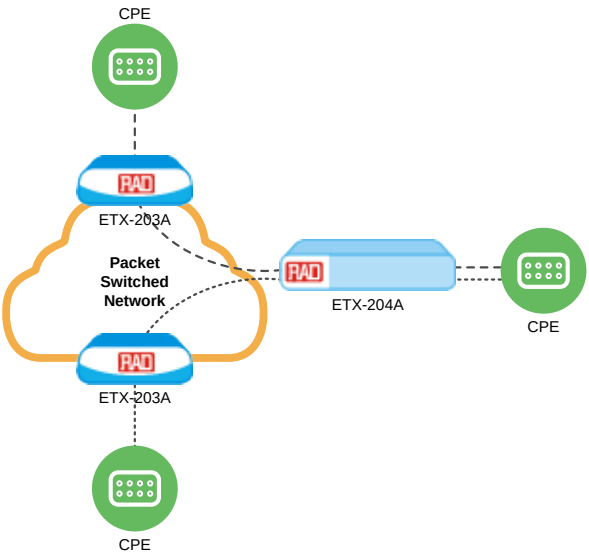

Figure 2. Ethernet Virtual Private Line

For prioritizing user traffic, ETX-203A maps user traffic to up to eight separate queues per service. Each can be configured as strict priority queues or weighted fair queues (WFQ).

The queues handle traffic with different service demands, such as real-time traffic, premium data, or best-effort data.

The device uses the WRED policy to ensure that in case of congestion, high-priority packets are not dropped (low-priority packets may be dropped).

Forwarding

Every flow has its own queues and scheduler. ETX-203A supports up to 192 flows, and up to 30 queue blocks per network port. Each queue block is a group of eight queues per class of service.

The VLAN priority bit in Ethernet frames can be modified at network ingress according to the 'color' of the frame. This allows service consistency and QoS continuity across color-aware (Drop Eligible-enabled) as well as color-unaware networks.

Smart SFPs

Integrated management of MiRICi smart SFPs provides TDM (E1/T1/E3/T3/OC-3/STM-1) connectivity over PDH or SDH legacy networks. ETX-203A supports configuration and statistic collection for the smart SFP TDM port.

RESILIENCY

Dying Gasp

ETX-203A reports power failures to defined network management stations by sending an IEEE 802.3-2005 message and trap, thus enabling the unit to properly disconnect from the network with notification of the reason for the service problem.

Fault Propagation

The unit provides a user-configurable fault propagation mechanism in the network-to-user or user-to-network direction. When a link failure is detected or OAM failure received, ETX-203A can shut down the affected port or forward the OAM failure message. The fault propagation mechanism enables routers and switches connected to both ends of the link to reroute the traffic to the redundancy path.

Ethernet Path Protection

Flow-based resiliency on uplinks is provided, as well as G.8031 – Ethernet linear protection on the network ports.

ETX-203A implements EPS Ethernet Path protection according to ITU-T G.8031.

The device protects one or multiple EVCs in the network via standard APS messages and via OAM ETH AIS/LOC criteria, ensuring protection switching under 50 msec. The protected EVC runs over one uplink or dual uplinks per customer requirement.

Protection is available for the following topologies:

- End-to-end EPS path protection for one or multiple EVCs transported over MPLS/VPLS access network
- Opposite standard PE supporting G.8031 EPS.

Link Protection

The following protection methods are provided via port-based resiliency on the network ports:

- Link aggregation (LAG) based on 802.3ad
- Dual homing (1:1), allowing ETX-203A to be connected to two different upstream devices.

Figure 3. Smart SFPs MiRICi-E1T1 and MiRICi-E3T3

Figure 4. RAD Ether ASIC Chip

MANAGEMENT AND SECURITY

The following security protocols are provided by ETX-203A to ensure client server communication privacy and correct user authentication:

- SNMPv3
- RADIUS (client authentication)
- TACACS+
- SSH for Secure Shell communication session.

Ports
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 network ports routed via separate VLANs, Telnet, or a third-party OSS system
- Out-of-band management via a dedicated management port
- SFTP – Secure File Transfer Protocol.

Command Line Interface
Databases and scripts of commonly used commands can be easily created and applied to multiple units using command line interface.

Trap Synchronization
Traps are sent with sequence IDs to network manager groups, to enable the managers to detect when traps are lost and request the traps be sent again.

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

MONITORING AND DIAGNOSTICS

RFC-2544
The device provides a built-in RFC-2544 wirespeed traffic generator and analyzer for unidirectional and bidirectional testing of throughput, latency, and frame loss. The tests are done over any Layer-2, based on standard OAM messages, and can be performed for multiple flows.

Enhanced RFC-2544 functionality provides service-oriented KPI analysis. SLA conformance is measured per service bandwidth and packet size, within a user-defined amount of time, for faster service introduction.

Loopback Tests
As services and networks become more complex, tracking service and network faults is very important for conforming to the SLA. Therefore it is vital that the service provider can perform network loopbacks to easily track failures. Layer-2 and/or layer-3 network integrity can be tested by a non-disruptive loopback performed per flow, with swapping of MAC address and optionally IP address. When the loopback is activated, ETX-203A exchanges the source and destination MAC/IP addresses of the incoming packets. This loopback passes through Ethernet bridges (MAC address) and routers (IP address).

Table 1. OAM and SLA Tools

Feature	Tool
Connectivity Verification	IEEE 802.3-2005 heartbeat IEEE 802.1ag CC IEEE 802.1ag LB, MAC ping
Fault Detection and Isolation	IEEE 802.1ag LT, MAC trace route IEEE 802.1ag LB, MAC ping
Fault Propagation	Subscriber port shutdown ITU-T Y.1731 RDI IEEE 802.3ah dying gasp, SNMP trap
Diagnostic Loopbacks	Layer-1 loopback IEEE 802.3-2005 loopback Layer-2/3 loopback with MAC/IP swap per EVC/VLAN/Source Address
Performance Management	ITU-T Y.1731: Packet Loss, PD, PDV, per EVC.cos statistics, HW-powered OAM RFC-2544 generator and analyzer

ETX-203A

Carrier Ethernet Demarcation Device

Specifications

CAPACITY

Max. Frame Size
12,288 bytes

ETHERNET NETWORK INTERFACES

Number of Ports
Up to 2:

- Ports 1 and 2 can serve as an uplink with redundancy
- Port 2 can serve as a network or user port

Type
Fiber optic:
Fast Ethernet (100BaseFx, 100BaseLX10, 100BaseBx10), SFP-based
Gigabit Ethernet (1000BaseSx, 1000BaseLX10, 1000BaseBx10), SFP-based
Copper: 10/100BaseT or 10/100/1000BaseT

Connector
Port 1: SFP slot
Port 2: SFP slot or RJ-45

SFP Transceivers
For full details, see the SFP Transceivers data sheet at www.rad.com

ETHERNET USER INTERFACES

Number of Ports
Up to 3 (second Ethernet port can serve as network or user)

Type
See network interface specifications

SFP Transceivers
For full details, see the SFP Transceivers data sheet at www.rad.com

Connector
SFP slot or RJ-45

***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.*

MANAGEMENT

Ethernet Management Port
Type: 10/100BaseT
Connector: RJ-45

Control Port
Interface: V.24/RS-232 DCE
Connector: RJ-45
Format: Asynchronous
Data rate: 9.6, 19.2, or 115.2 kbps

GENERAL

Compliance
MEF 9, MEF 14: EPL and EVPL
MEF 6 (E-Line – EPL and EVPL), MEF 10
IEEE 802.3, 802.3u, 802.1q, 802.1p, 802.3ad, 802.3-2005, 802.1ag-D8
ITU-T G.8031, Y.1731, RFC-2544

Indicators
PWR (green):
On –ETX-203A is powered up
1–4 (green):
On – Corresponding Ethernet link OK
Blinking – Data is being transmitted and received on the Ethernet link
LINK/ACT (green):
On – Ethernet link OK
Blinking – Data is being transmitted and received on the Ethernet link

Power
AC/DC inlet connector with auto detection
Wide-range AC power supply:
100–240 VAC, 50/60 Hz
DC power supply:
48V (40–370 VDC)

Power Consumption
8W typical
12W max

Physical
Height: 43.7 mm (1.7 in)
Width: 220 mm (8.6 in)
Depth: 170 mm (6.7 in)
Weight: 0.6 kg (1.3 lb)

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

Table 2. ETX Family Comparison Table

Feature	ETX-203A (Ver. 3.02) 	ETX-204A (Ver. 3.02) 
Function	Advanced NTU	Premium NTU
Bandwidth	100/1000 Mbps per port	100/1000 Mbps per port
Ethernet Ports (Net/net/user)	1/1/2 SFP/UTP	1/1/2 or 1/1/4 SFP/UTP Combo
Network interface	Up to 2 × Gigabit or Fast Ethernet	Up to 2 × Gigabit or Fast Ethernet SFP/UTP combo ports
User interface	Up to 3 × Gigabit or Fast Ethernet	Up to 5 × Gigabit Ethernet SFP/UTP combo ports
Number of flows (EVC.cos) / shapers / MEPs	192/30/128 or 192/2/128	192/30/64
Service type	EPL and EVPL (flow-based)	EPL and EVPL (flow-based)
Forwarding mode	Flow-based forwarding	Flow-based forwarding
Management interface	Command line	Command line
G.8031 protection	Yes	Yes
QoS	Rate limitation per flow Traffic classification (Port-based, VLAN, 802.1p bits, ToS, DSCP) Shaping	Rate limitation per flow Traffic classification (Port-based, VLAN, 802.1p bits, ToS, DSCP) Shaping
Bandwidth profile	CIR/CBS, EIR/EBS per EVC.COS	CIR/CBS, EIR/EBS per EVC.COS
RFC-2544 testing	Yes	Yes
Max. frame size	12,288 bytes	12,288 bytes
E1/T1, E3/T3, OC-3/STM-1 bridging	Supported, includes integrated management	Supported, includes integrated management
Timing options	No	Yes (SyncE, IEEE 1588v2 slave)
Temperature-hardened option	No	Yes
Power supply	Universal AC/DC	AC or DC
Power supply redundancy	No	Yes

ETX-203A

Carrier Ethernet Demarcation Device

Ordering

RECOMMENDED CONFIGURATIONS

ETX-203A/GE30/2SFP/2UTP

ETX-203A/GE30/1SFP1UTP/2UTP

ETX-203A/GE/2SFP/2UTP

ETX-203A/GE/1SFP1UTP/2UTP

ETX-203A/2SFP/2UTP

ETX-203A/1SFP1UTP/2UTP

SPECIAL CONFIGURATIONS

ETX-203A/NP/+2/+3

Legend

NP Software package (Default= 100 Mbps per port and 2 shaped EVCs):
- **GE** 1 Gbps per port
- **GE30** 1 Gbps per port, 30 shaped EVCs

+2 Two Ethernet network ports or network and user port
- **1SFP1UTP** 1 SFP slot + 1 UTP Ethernet port
- **2SFP** 2 SFP Ethernet ports

+3 Ethernet user ports
- **2UTP** 2 UTP Ethernet ports
- **2SFP** 2 SFP Ethernet ports

SUPPLIED ACCESSORIES

AC power cord

OPTIONAL ACCESSORIES

DC connection kit

CBL-RJ45/D9/F/6FT
Control port cable with male RJ-45 and female DB-9 connector

RM-33-2
Hardware kit for mounting one or two ETX-203A units in a 19" rack

International Headquarters
24 Raoul Wallenberg Street
Tel Aviv 69719, Israel
Tel. 972-3-6458181
Fax 972-3-6498250, 6474436
E-mail market@rad.com

North American Headquarters
900 Corporate Drive
Mahwah, NJ 07430, USA
Tel. 201-5291100
Toll free 1-800-4447234
Fax 201-5295777
E-mail market@rad.com

www.rad.com

Order this publication by Catalog No. 803944

Your Network's Edge