preliminary

Data Sheet

ETX-203A

Carrier Ethernet Demarcation Device

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

- Feature-rich Carrier Ethernet demarcation device delivers 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 ASIC-powered ITU-T Y.1731 functionality
- Test throughput across routed/switched networks up to line rate by using Layer-2/3 loopbacks and Layer-2 RFC-2544 traffic generator and analyzer
- Quickly pinpoint network defects with complete OAM toolset: ITU-T Y.1731, IEEE802.1ag, IEEE802.3ah

EtherAccess

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

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

ETX-203A enables the pay-us-when-your-customers-pay-you business model with easy capacity expansion by software license.

The ASIC-based architecture provides powerful traffic management that allows the service provider to control bandwidth and ensure traffic SLA.

ETX-203A features hardware-powered OAM that supports multiple flow monitoring at line rate. It provides 15 different SLA tools 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
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The Access Company

ETX-203A

Carrier Ethernet Demarcation Device

FLEXIBLE TRAFFIC MAPPING

Traffic is mapped to the Ethernet flows (EVCs) 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.

HIERARCHICAL SCHEDULING AND SHAPING PER FLOW

Every flow has its own queues and scheduler. ETX-203A supports up to 192 flows, and a total of 16 or 30 queue blocks per network port. Each queue block is a group of eight queues per CoS. Each flow can be bound to each queue block.

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.

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, green packets are not dropped (yellow packets may be dropped).

TYPICAL 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 3*)
- Ethernet LAN – Site-to-site connectivity over dedicated bandwidth with or without service multiplexing.

ETHERNET 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 50ms 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.

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.

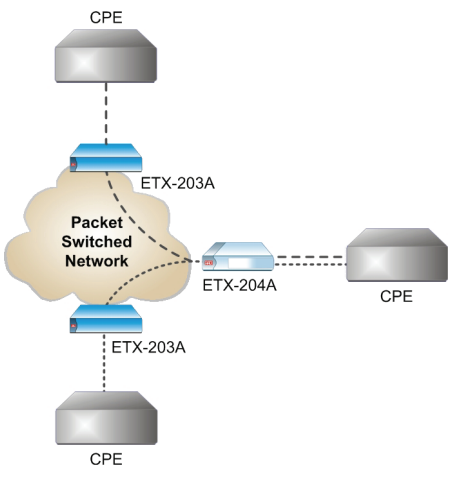

Figure 1. Ethernet Virtual Private Line

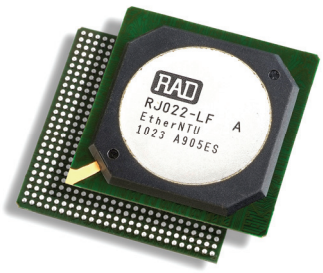

Figure 2. RAD Ether ASIC Chip

NETWORK INTERFACE RESILIENCY

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 can protect 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 can run over one uplink or dual uplinks per customer requirement.

The 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.

Additionally, 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.

COLOR-AWARE P-BIT RE-MARKING

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.

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.

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 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.

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.

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.

LICENSING

Pay-us-when-your-customers-pay-you business model:

- Save Opex by using cost-optimized demarcation device at customer site with throughput up to 100Mbps, increasing capacity by software license to up to 1000Mbps when capacity is growing
- Buy additional number of EVCs per software license.

INTEGRATED SMART SFP SUPPORT

Integrated management of smart MiRIC/MiRICi SFPs provides E1/T1/E3/T3 STM1 or OC3 Eth over PDH or SDH legacy networks. The ETX-203A management includes MiRIC/MiRICi configuration and statistic collection.

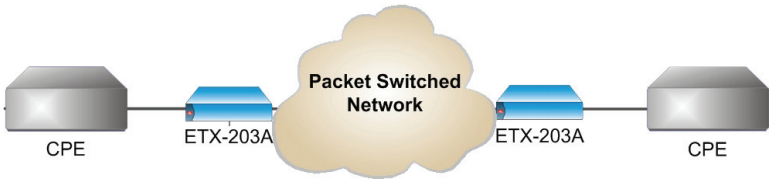

Figure 3. Ethernet Virtual Line

Figure 4. Smart SFPs MiRICi-E1T1 and MiRICi-E3T3

ETX-203A

Carrier Ethernet Demarcation Device

LAYER-2/ LAYER-3 LOOPBACK WITH MAC AND IP ADDRESS SWAPPING

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).

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.

L2CP HANDLING

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.

JUMBO FRAMES AND EGRESS MTU

The unit supports large frames of up to 12 Kbytes.

COMPACT SIZE

The unit is supplied in a compact 8.5-inch 1U high enclosure.

DHCP

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

COMMAND LINE INTERFACE

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

UNIVERSAL POWER SUPPLY

The ETX-203A power supply inlet can be connected to AC or DC power.

MOUNTING OPTIONS

ETX-203A can be rack mounted with a dedicated RM kit (see ordering options) or can be wall mounted (see user manual for instructions).

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

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Specifications

NETWORK INTERFACE

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 (according to license)
Copper: 10/100BaseT or 10/100/1000BaseT (according to license)

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

USER INTERFACE

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

Type
See network interface specifications

Connector
SFP slot or RJ-45

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

***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 PORTS

Out-of-Band 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

Max. Frame Size
12,288 bytes

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
1–6 (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

Physical
Plastic enclosure
Height: 43.7 mm (1.7 in)
Width: 215 mm (8.4 in)
Depth: 150 mm (5.9 in)
Weight: 2.4 kg (5.2 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. 3.0B) 		ETX-204A (Ver. 3.0B) 	
Size	Height: 43.7 mm (1.7 in) Width: 215 mm (8.4 in) Depth: 150 mm (5.9 in)		8.4" unit: Height: 43.7 mm (1.7 in) Width: 215 mm (8.4 in) Depth: 300 mm (11.8 in)	17.4" unit: Height: 43.7 mm (1.7 in) Width: 440 mm (17.4 in) Depth: 240 mm (9.5 in)
Function	Basic NTU ASIC based	Advanced NTU (SW license) ASIC based	Premium NTU Flexi core	
Bandwidth	100 Mbps per port	100/1000 Mbps per port	100/1000 Mbps per port	
Circuit validation and PM (H/W OAM, MEP/MIP, RFC-2544, L1/L2/L3 loops)	Yes	Yes	Yes	
Flow classifications and policing	Yes	Yes	Yes	
G.8031, HQoS and per EVC shaping	Yes	Yes	Yes	
Number of flows (EVC.cos) / shapers / MEPs	192/16/128	192/30/128	192/30/128	
Ethernet ports (Net/net – User/user)	1/1/2 SFP/UTP	1/1/2 SFP/UTP	1/1/2 or 1/1/4 SFP/UTP combo	
E1/T1, E3/T3, OC-3/STM-1 bridging	Supported, includes integrated management		Supported, includes integrated management	
Timing options	No		Yes (SyncE, 1588v2 master/slave)	
External temperature range option	No		Yes	
Power supply	AC/DC		AC/ACR/DC/DCR	

ETX-203A

Carrier Ethernet Demarcation Device

Ordering

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

Legend

NP Software Package (Default= 100Mbps per port and 16 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 Ethernet slot, 1 UTP Ethernet port
- **2SFP** 2 SFP Ethernet ports

+3 Ethernet User Ports
- **2UTP** 2 UTP Ethernet ports

SUPPLIED ACCESSORIES

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

OPTIONAL ACCESSORIES

License Packages
ETX-203A_SW/NP

NP Software package
- **GE** 1 Gbps per port
- **GE30** 1 Gbps per port, 30 shaped EVCs

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

Table 3. Recommended Ordering Options

Option	Configuration Description
Device	
ETX-203A/GE/1SFP1UTP/2UTP	1 SFP Gigabit Ethernet slot and 3 UTP Gigabit Ethernet ports, 16 shaped EVCs
ETX-203A/GE/2SFP/2UTP	2 SFP Gigabit Ethernet slots and 2 UTP Gigabit Ethernet ports, 16 shaped EVCs
ETX-203A/1SFP1UTP/2UTP	1 SFP Fast Ethernet slot and 3 UTP Fast Ethernet ports, 16 shaped EVCs
ETX-203A/2SFP/2UTP	2 SFP Fast Ethernet slots and 2 UTP Fast Ethernet ports, 16 shaped EVCs
ETX-203A/GE30/1SFP1UTP/2UTP	1 SFP Fast/Gigabit Ethernet slot and 3 UTP Fast/Gigabit Ethernet ports, 30 shaped EVCs
ETX-203A/GE30/2SFP/2UTP	2 SFP Fast/Gigabit Ethernet slots and 2 UTP Fast/Gigabit Ethernet ports, 30 shaped EVCs
Item	
ETX-203A_SW/GE	License for 1 Gbps per port
ETX-203A_SW/GE30	License for 1 Gbps per port and 30 shaped EVCs

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Order this publication by Catalog No. 803944

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