

# ETX-2

## Carrier Ethernet Demarcation



- Feature-rich demarcation and aggregation suite, offering a complete Service Assured Access (SAA) solution
- Ideal for carriers, wholesalers and mobile operators, seeking to deliver and monitor SLA-based MEF-certified Carrier Ethernet 2.0, Layer-3 VPN, and TDM-over-packet services
- Versatile offering of multi-rate Ethernet over fiber, SHDSL and TDM, assuring unified service delivery over any access technology
- Hardware-based OAM and diagnostics for scalable and accurate traffic monitoring, quick fault detection and troubleshooting
- Wide-range product offering for increased revenue and reduced TCO

The ETX-2 Carrier Ethernet demarcation device, together with the ETX-5 Carrier Ethernet aggregation platform, are the main components of RAD's Service Assured Access solution, providing:

- Ethernet service uniformity over multiple access technologies including GbE and 10GbE, SHDSL, PDH, and SDH
- Operation in diverse topologies including ring, daisy chain, and hub and spoke
- PW functionality for mobile backhauling and business services
- Synchronization for mobile 2G, 3G, LTE, and LTE-A backhauling networks.

ETX-2 devices can be ordered in different hardware flavors (ETX-203AM, ETX-203AX, ETX-205A, and ETX-220A). *Table 1* provides further information on the capabilities offered by each flavor.

### MARKET SEGMENTS AND APPLICATIONS

ETX-2 is ideal for carriers, service providers, wholesale providers, and mobile operators seeking to offer unified SLA-based Ethernet business services, such as Ethernet Private Line (EPL), Ethernet Virtual Private Line (EVPL), and bridged E-LAN for enterprise and carrier-to-carrier applications as well as mobile backhauling applications.

### NETWORK TOPOLOGIES AND INTEROPERABILITY

ETX-2 supports several network topologies such as linear, daisy chain, and self-healing rings (G.8032v2), working opposite ETX-5 or third-party Ethernet devices.

### CARRIER ETHERNET 2.0

ETX-2 incorporates a complete set of CE 2.0-certified Ethernet service tools that allow the service provider to distinguish between high- and low-priority traffic, and to optimize TCP sessions.

ETX-2 provides two-rate three-color policers, and delivers true multi-CoS with hierarchical traffic management. Additionally, it supports advanced scheduling, WRED per CoS, shaping per EVC, and flexible classification rules.

### Services

ETX-2 delivers E-Line (EVL, EVPL), E-LAN (EPLAN, EVPLAN), and E-Tree (EP-TREE, EVP-TREE) services.

### End-To-End Service Assurance

ETX-2 provides wire-speed Ethernet OAM with delay measurements at line rate. Furthermore ETX-2 offers service activation tools such as RFC-2544/Y.1564 testers.



### Layer-2 Control Processing

ETX-2 can be configured to forward Layer-2 control frames (including other vendors' L2CP frames), with optional MAC change, across the network or to peer supported protocols (IEEE 802.3-2005 and LACP), or to discard the L2CP frames.

### ROUTING

ETX-2 features a 1G bidirectional router with Virtual Routing Instances (VRF), allowing service providers to deploy L2 and L3 VPNs.

### ETHERNET OVER PDH

ETX-2 transports Ethernet over PDH infrastructure via the following NG-PDH technologies:

- Generic Framing Procedure (GFP G.7041)
- GFP o PDH (G.8040)
- PDH Virtual Concatenation (VCAT G.7043)
- Link Capacity Adjustment Scheme (VCAT G.7042).

NG-PDH solutions improve overall network availability by reducing latency and optimizing line utilization and throughput.

Integrated management of MiRiCi and MiTOP smart SFPs provides TDM (E1/T1/E3/T3/ OC-3/STM-1) connectivity over PDH or SDH legacy networks.



# ETX-2

## Carrier Ethernet Demarcation

### E1/T1 PSEUDOWIRE

ETX-2 provides E1/T1 pseudowire (PW) services via 4 or 8 integrated interfaces, as well as via a smart SFP (MiTOP). The PWs can be encapsulated using CESoPSN per IETF RFC 5086 or SAToP per IETF RFC 4553. The PWs are transmitted over IP networks or L2 networks with UDP/IP or MEF-8 encapsulation.

### RESILIENCY

ETX-2 offers fast protection for virtually any kind of failure and in any linear, ring, or dual-homed topology. The device employs IEEE 802.3ad link aggregation (1:1 LAG), ITU-T G.8032v2 Ethernet ring protection, and ITU-T G.8031 Ethernet linear protection to ensure continuous availability and sub-50ms restoration in the event of network outages.

### TIMING AND SYNCHRONIZATION

ETX-2 incorporates RAD's advanced SyncTop synchronization and timing over packet feature set to support mobile heterogeneous network (HetNet) topology.

The device combines Synchronous Ethernet (SyncE) with IEEE 1588v2 Precision Time Protocol per ITU-T G.8265.1 and G.8275.1 Telecom profiles for cost-effective synchronization of frequency and phase.

With an integrated GPS receiver and 1588v2 Grandmaster support, ETX-2 offers a Distributed GM™ solution, allowing mobile operators and service providers to cost-effectively provide reliable frequency and phase accuracy for LTE-A. The device also supports 1588v2 slave clock, boundary clock (BC), and transparent clock (TC).

### MANAGEMENT AND SECURITY

The device can be managed via RADview, RAD's carrier-class NMS for Windows and Unix, or any SNMP-based management system. ETX-2 supports a variety of access protocols, including CLI over Telnet, SNMPv3, and TFTP.

Security features include SNMPv3, RADIUS (client authentication), TACACS+ (client authentication, authorization, and accounting), SSH, and SFTP.

Access Control Lists (ACL) can also be used to flexibly filter and mark

management traffic, enabling service providers to maintain network security by dropping unwanted packets.

### MONITORING AND DIAGNOSTICS

Featuring multi-layer OAM and PM tools, ETX-2 performs hardware-based monitoring and diagnostics at high scale and precision. End-to-end connectivity OAM (IEEE 802.1ag) as well as single-segment OAM (IEEE 802.3-2005) ensure flow-level fault management and performance monitoring over Layer-2 networks and also quickly detect connectivity failures for robust protection. RFC-5357 TWAMP Light delivers the same functionality over Layer-3 networks. Layer-2 and 3 wire-speed loopbacks offer flexible diagnostic tools.

The Performance Management Portal is an SLA assurance system that is part of the RADview management system, enabling real-time monitoring of Ethernet service performance by collecting KPI data from RAD devices.

### Digital Diagnostics Monitoring

ETX-2 supports digital diagnostics monitoring (DDM) SFP functions according to SFF-8472, excluding external DDM calibration.

## Applications

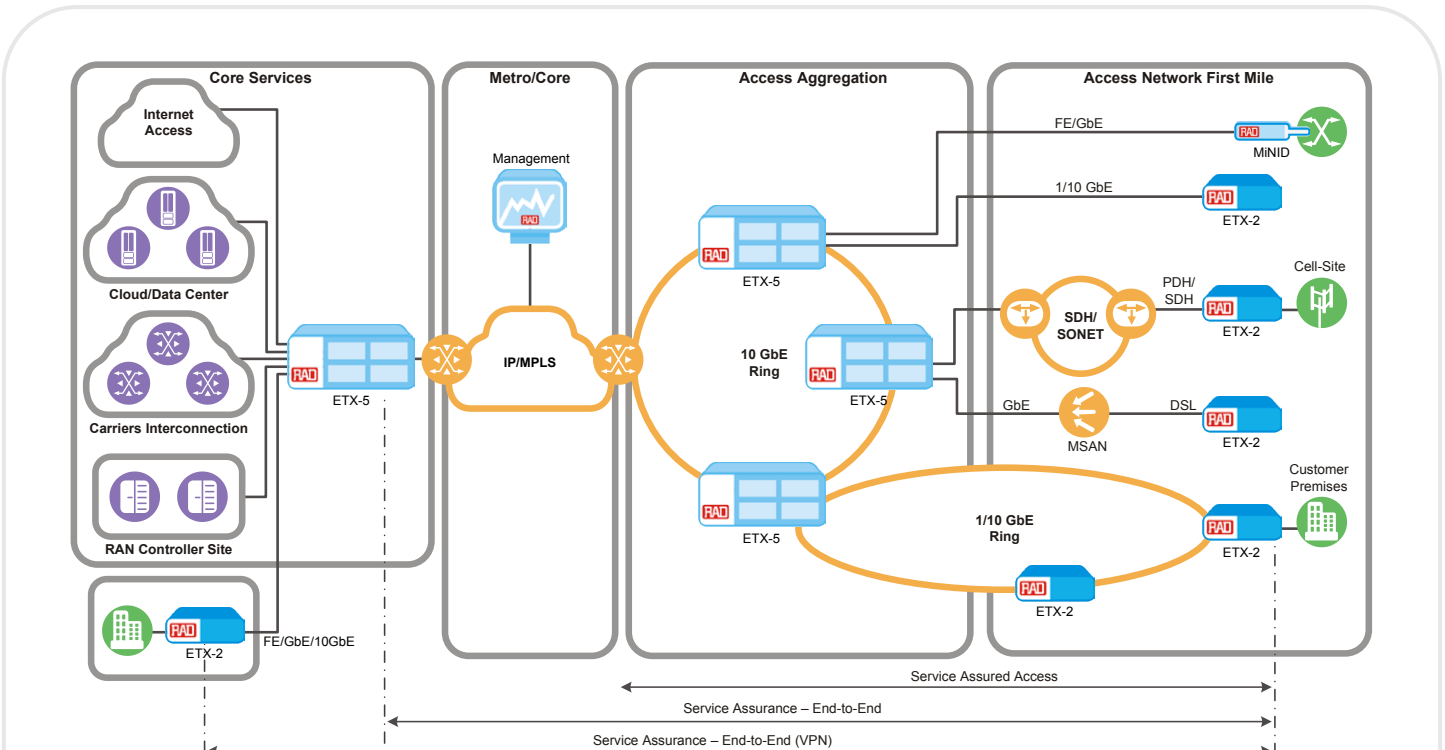


Figure 1. Access Aggregation with SLA-Based Services

Table 1. Feature Comparison

Service Assured Access Capabilities		ETX-203AX	ETX-203AM	ETX-205A	ETX-220A
Interfaces	10GbE XFP interfaces				✓
	FE/GbE SFP interfaces	✓	✓	✓	✓
	GbE combo interfaces		2 ports	✓	
	10/100/1000 electrical interfaces	✓	✓	✓	✓
	PDH network interfaces (GFP mapping)		✓ (4/8 E1/T1, 1/2 T3)		
	SHDSL network interfaces		✓		
	E1/T1 user interfaces (SAToP, CESoPSN, CAS)			✓	
	E1/T1/T3/STM-1/OC3 network interfaces via integrated smart SFP (MiRIC)	✓	✓	✓	✓
	E1/T1/T3 PWE services via integrated smart SFP (MiTOP)	✓	✓	✓	✓
	Timing interfaces (2 MHz, 2 Mbps, 1PPS, ToD)			✓	✓
Networking Capabilities	Ethernet E-Line, E-LAN, E-Tree services	✓	✓	✓	✓
	Wire-speed L2 forwarding	✓	✓	✓	✓
	1 Gbps wire-speed router with Virtual Routing Instances (VRF)		✓	✓	
	Flexible classification rules	✓	✓	✓	✓
	2-rate/3-color policing per EVC.CoS	✓	✓	✓	✓
	H-QoS shaping per EVC and EVC.CoS	✓	✓	✓	✓
	Strict priority and weighted fare queuing (WFQ) scheduling	✓	✓	✓	✓
	G.8031 linear protection	✓	✓	✓	✓
	G.8032v2 ring protection	✓	✓	✓	✓
	1:1 link protection with 1:1 LAG/LACP	✓	✓	✓	✓
	1:1 link protection with dual homing	✓	✓	✓	✓
	LAG with load balancing				✓
	Jumbo frame support	✓	✓	✓	✓
	Synchronous Ethernet (SyncE) on all interfaces			✓	✓
	IEEE-1588v2 precision time protocol (PTP) per G.8265.1 and G.8275.1 Telecom profiles	TC	TC	Slave, TC, BC, GM with integrated GPS	Slave, TC, BC
OAM and Diagnostics	8 built-in RFC-2544 service activation testers	✓	✓	✓	✓
	8 built-in Y.1564 service activation testers	✓	✓	✓	✓ (up to 10G services)
	Continuity fault management (CFM) per IEEE 802.3ag	✓	✓	✓	✓
	Service utilization and performance monitoring per ITU-T Y.1731	✓	✓	✓	✓
	Accurate one-way delay measurement (microsecond accuracy)			✓	✓
	TWAMP light generator and responder	✓	✓	✓	✓
	LLDP discovery per IEEE 802.1AB	✓	✓	✓	✓
	Link-level OAM per IEEE 802.3-2005	✓	✓	✓	✓
General and Management	RMON2 port-level counters	✓	✓	✓	✓
	On-demand Layer-2 and 3 loopbacks	✓	✓	✓	✓
	Zero-touch provisioning (DHCP, PPPoE)	✓	✓	✓	✓
	SNMPv1/v2/v3	✓	✓	✓	✓
	RADIUS and TACACS+ AAA	✓	✓	✓	✓
	Network time protocol (NTP)	✓	✓	✓	✓
General and Management	Power supply redundancy			✓	✓
	Temperature-hardened option		✓	✓	✓

### Specifications

#### CAPACITY

##### Max. Frame Size

12,288 bytes

ETX-203AM:

SHDSL uplink module: 2,048 bytes

E1/T1/T3 EoPDH uplink module:  
10,240 bytes

#### BRIDGE

##### Compliance

802.1D, 802.1Q, 802.1ad

##### Mode

VLAN-aware, VLAN-unaware

#### ROUTER

##### (ETX-203AM, ETX-205A)

Integrated router providing up to 1 Gbps Layer-3 IPv4 and IPv6 forwarding with performance of over 2 MPPS, as well as bidirectional forwarding detection (BFD) for fast forwarding path failure detection

#### VLAN Editing

Inner/outer VLAN editing per VLAN and p-bit values

#### HIERARCHICAL QUALITY OF SERVICE (HQOS)

##### Policing

Dual token bucket with user-configurable CIR + CBS and EIR + EBS

##### Scheduling

8 × CoS per EVC scheduling elements  
Strict Priority (SP) and Weighted Fair Queue (WFQ)

##### Shaping

Single- and dual-rate per EVC/EVC.CoS

#### FLOWS

##### Classification

Per port, outer VLAN or outer + inner VLAN, PCP, TOS/DSCP, Ethertype, or IP/MAC source/destination address

#### RESILIENCY

##### Dual Homing

Dual homed link redundancy

##### Link Aggregation

IEEE 802.1ax (802.3ad) 1:1 LAG with LACP for pairs of network or user Ethernet ports

##### Ethernet Ring

G.8032v2 rings with sub 50 ms protection for Ethernet traffic

##### Ethernet Path Protection

G.8031, for linear 1:1 protection

#### DIAGNOSTICS

##### Loopback Tests

Non-disruptive loopback per flow, with swapping of MAC address and optionally IP address

Loopbacks at Ethernet port level

##### Service Activation Tests

RFC-2544: 8 built-in wire-speed testers

ITU-T Y.1564: 8 built-in wire-speed testers

Table 2. Ethernet Interfaces

Specifications	ETX-203AX	ETX-203AM	ETX-205A	ETX-220A	
10GbE	Number of Ports			Network: 1 or 2 User: 1 or 2	
	Type			XFP	
	Fiber Optic (XFP-based)			10GBaseSR, 10GBaseER, 10GBaseLR, 10GBaseZR	
	Connector			XFP slot	
	XFP Transceivers			See <i>Note</i>	
GbE	Number of Ports	Network: 2 User: 4	Network: 2 with GbE network module, or 1 with router module User: 4 (3 with router module)	Network: 2 User: 4 with regular router, or 2 with wire-speed router	Network: up to 2 User: up to 10 or 20
	Type	SFP or copper port	Network: SFP/copper combo port User: SFP or copper port	SFP/copper combo port	SFP or copper port
	Fiber Optic (SFP-based)		Fast Ethernet: 100BaseFx, 100BaseLX10, 100BaseBx10 Gigabit Ethernet: 1000BaseSx, 1000BaseLX10, 1000BaseBx10		
	Copper		10/100BaseT or 10/100/1000BaseT		
	Connector	Port 1: SFP slot All other ports: SFP slot or RJ-45	Replaceable module with SFP slot and RJ-45	SFP slot or RJ-45	SFP slot or RJ-45
SFP Transceivers	See <i>Note</i>	See <i>Note</i>	See <i>Note</i>	See <i>Note</i>	

**Note:** It is strongly recommended to order this device with **original** RAD SFPs/XFPs. RAD cannot guarantee full compliance to product specifications for units using non-RAD SFPs/XFPs. For full details on SFP/XFP transceivers, see the SFP/XFP Transceivers data sheet at [www.rad.com](http://www.rad.com). For the list of SFP/XFP transceivers supported by ETX-220A, see the [SFP/XFP Compatibility](#) document.

## SHDSL INTERFACES (ETX-203AM: SHDSL NETWORK MODULE)

### Type

SHDSL.bis

### Number of Ports

2 or 4

### Number of Wires

4 or 8

### Connector

Replaceable network module, with one RJ-45 for 4-wire ordering option or two RJ-45s for 8-wire ordering option

### Line Coding

16 or 32 TC-PAM

### Line Rate

192–5696 kbps (see *Table 3*)

### Impedance

135Ω

### Compliance

ITU-T G.991.2, ETSI TS 101524

### Bonding

According to IEEE 802.3ah, ITU-T G.998.2

## E1/T1 INTERFACES

(ETX-203AM: EoPDH E1/T1 network module)

### Number of Ports

4 or 8

### Compliance

G.703, G.823

### Data Rate

E1: 2.048 Mbps

T1: 1.544 Mbps

### Line Coding

E1: HDB3

T1: B8ZS

### Framing

E1: Framed (G732N with CRC)

T1: Framed (ESF)

### Impedance

E1: 120Ω, balanced

75Ω, unbalanced (via adapter cable)

T1: 100Ω, balanced

### Connector

Replaceable module, with four RJ-45 connectors:

Four E1/T1 ports:

One E1/T1 interface per RJ-45

Eight E1/T1 ports:

Two E1/T1 interfaces per RJ-45,

with adapter cable

## T3 INTERFACES

(ETX-203AM: EoPDH T3 network module)

### Number of Ports

1 or 2

### Compliance

G.703, G.823

### Data Rate

44.736 Mbps

### Line Code

B3ZS

### Framing

C-bit parity

### Line Impedance

75Ω, unbalanced

### Connector

Replaceable network module, with one or two pairs of BNC connectors:

One T3 port – One pair

Two T3 ports – Two pairs

## E1/T1 INTERFACES

(ETX-205A: Built-in TDM PW E1/T1 ports)

### Number of Ports

4 or 8

### Compliance

E1: G.703, G.732N, G.732S

T1: ANSI T1.101, ANSI T1.403

### Data Rate

E1: 2.048 Mbps

T1: 1.544 Mbps

### Line Coding

E1: HDB3

T1: B8ZS

### Framing

E1: Framed (G.732N with or without CRC)

Framed with CAS (G.732S with or without CRC)

Unframed

T1: Unframed or ESF

### Impedance

E1: 120Ω, balanced

75Ω, unbalanced (via adapter cable)

T1: 100Ω, balanced

### Connector

Electrical, RJ-45

Table 3. SHDSL Typical Ranges (26 AWG)

Data Rate	4-wire		8-wire	
	[kbps]	[km] [mi]	[km] [mi]	[mi]
192	8	4.9	8	4.9
512	6.7	4.1	6.7	4.1
1536	6	3.7	6.5	4
2048	5.7	3.5	6.4	3.9
4096	5.1	3.1	5.7	3.5
4608	5	3	5.5	3.4
5696	4.6	2.8	5.1	3.1
11392	2.9	1.8	4.6	2.8
17088	–	–	3.5	2.1
22784	–	–	2.9	1.8

# ETX-2

## Carrier Ethernet Demarcation

### PSEUDOWIRE (ETX-205A)

#### Payload Encapsulation

CESoPSN, SAToP

#### Network Encapsulation

MEF 8, UDP/IP

### TIMING

#### Synchronous Ethernet

ITU-T G.8261-G.8264

#### 1558v2

Slave clock (ETX-205A, ETX-220A)

Boundary clock (ETX-205A, ETX-220A)

Master clock with GPS (ETX-205A)

Transparent clock (TC)

Phase and frequency synchronization

#### Station Clock

##### (ETX-205A, ETX-220A)

Type: Balanced E1, unbalanced E1 (via adapter cable)

Connector: RJ-45

#### PTP Ports

##### (ETX-205A, ETX-220A)

TOD/1PPS (RJ-45)

External clock (BNC)

1PPS (BNC)

### MANAGEMENT

#### Ethernet Management Port

Type: 10/100/1000BaseT

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

#### Management Options

Password-protected access, authorization levels

Secure CLI via SSH

Telnet, SNMPv3, SFTP

RADIUS or TACACS+ authentication

Plug and play zero touch provisioning

#### Routing for Management

IP forwarding, dual-stack IPv4 and IPv6 routing, static routing

### GENERAL

#### Compliance

CE 2.0, MEF 6 (E-Line – EPL and EVPL, E-LAN – EPLAN and EVPLAN), MEF 10, MEF 9, MEF 14, MEF 20, IEEE 802.3, 802.3u, 802.1q, 802.1p, 802.3ad, 802.3-2005, 802.1ax, 802.1ag, ITU-T Y.1731, G.8031, G.8032v2, G.8262, G.8265, RFC-2544, ITU-T Y.1564

Table 4. Physical Specifications

Specifications	ETX-203AX	ETX-203AM	ETX-205A	ETX-220A	
Power	AC/DC inlet connector with auto detection AC (wide range): 85–264 VAC, 47/63 Hz DC: 48 VDC (40–370 VDC)	AC: 100–230 VAC (±10%), 47–63 Hz DC: -48 VDC (36–72 VDC)	AC: 100–240 VAC, 50/60 Hz DC: -24/48 VDC nominal (20–72 VDC)	AC: 100–240 VAC, 50/60 Hz DC: -48 VDC nominal (-40 to 72 VDC)	
	Power Consumption	15W max	GbE uplink module: 15W max SHDSL uplink module (4-wire): 15W max SHDSL uplink module (8-wire): 17W max E1/T1/T3 uplink module: 5W max	17W max	70W max
Physical	Height	43.7 mm (1.7 in)	43.7 mm (1.7 in)	43.7 mm (1.7 in)	
	Width	220 mm (8.6 in)	215 mm (8.5 in)	440 mm (17.4 in)	440 mm (17.4 in)
	Depth	170 mm (6.7 in)	300 mm (11.8 in)	240 mm (9.5 in)	240 mm (9.5 in)
	Weight	0.7 kg (1.54 lb)	2.3 kg (5.1 lb)	3.1 kg (6.8 lb)	3.1 kg (6.8 lb)
Environment	Temperature	0 to 50°C (32 to 122°F)	Regular: 0 to 50°C (32 to 122°F) Temperature-hardened: -20 to 65°C (-4 to 149°F)	Regular: 0 to 50°C (32 to 122°F) Temperature-hardened: -40 to 65°C (-40 to 149°F)	Regular: 0 to 50°C (32 to 122°F) Temperature-hardened: -20 to 65°C (-4 to 149°F)
	Humidity	Up to 90%, non-condensing	Up to 90%, non-condensing	Up to 90%, non-condensing	Up to 90%, non-condensing

## Ordering

### RECOMMENDED CONFIGURATIONS

#### ETX-203AX:

##### ETX-203AX/2SFP/4SFP

2 SFP Ethernet ports, 4 empty SFP slots

##### ETX-203AX/2SFP/2UTP2SFP

2 SFP Ethernet ports, 2 UTP Ethernet ports, 2 SFP Ethernet ports

##### ETX-203AX/2SFP/4UTP

2 SFP Ethernet ports, 4 Ethernet UTP ports

##### ETX-203AX/2UTP/4UTP

2 UTP Ethernet ports, 4 Ethernet UTP ports

##### ETX-203AX/1SFP1UTP/4UTP

1 SFP Ethernet slot, 1 UTP Ethernet port, 4 Ethernet UTP ports

*Note for ETX-203AX: All ordering options are also available with the GE or GE30 options.*

#### ETX-203AM:

##### ETX-203AM/?/!/NP/MA/ +3

#### Legend

?	Enclosure type (Default=Regular enclosure)
H	Industrially-hardened enclosure
!	Power supply
AC	AC power supply
DC	DC power supply
NP	Software package (Default=100 Mbps per port)
GE	1 Gbps per port
GE30	1 Gbps per port, 30 shaped EVCs
MA	Network port module (Default=no network port module)
2ETH	2 Ethernet combo ports
SH4W	SHDSL 4-wire (2 ports)
SH8W	SHDSL 8-wire (4 ports)
4E1T1	4 E1/T1 ports
8E1T1	8 E1/T1 ports
1T3	1 T3 port
2T3	2 T3 ports
RTR	1 Gbps router
+3	Ethernet user ports
2SFP2UTP	2 SFP Ethernet ports + 2 1000BaseT Ethernet ports

4SFP	4 SFP Ethernet ports
4UTP	4 1000BaseT Ethernet ports

Configuration examples:

##### ETX-203AM/DC/2ETH/2SFP2UTP

DC power supply, GbE network module, 2 SFP Ethernet ports, 2 copper Ethernet ports

##### ETX-203AM/AC/GE30/SH4W/4UTP

AC power supply, 1 Gbps per port, 30 shaped EVCs, SHDSL 4-wire network module, 4 copper Ethernet ports

##### ETX-203AM/AC/GE30/2ETH/4SFP

AC power supply, 1 Gbps per port, 30 shaped EVCs, GbE network module, 4 SFP Ethernet ports

##### ETX-203AM/AC/GE30/8E1T1/4UTP

AC power supply, 1 Gbps per port, 30 shaped EVCs, E1/T1 8-port network module, 4 copper Ethernet ports

##### ETX-203AM/AC/4UTP

AC power supply, no network module, 4 copper Ethernet ports

##### ETX-205A:

##### ETX-205A/AC/19

100–240 VAC, 19" enclosure

##### ETX-205A/AC/19/4E1T1

100–240 VAC, 19" enclosure, 4 E1/T1 ports

##### ETX-205A/AC/19/8E1T1

100–240 VAC, 19" enclosure, 8 E1/T1 ports

##### ETX-205A/AC/19/SYE

100–240 VAC, 19" enclosure, SyncE

##### ETX-205A/AC/19/PTP

100–240 VAC, 19" enclosure, 1588v2 timing and SyncE

##### ETX-205A/AC/19/4E1T1/PTP

100–240 VAC, 19" enclosure, 4 E1/T1 ports, 1588v2 timing and SyncE

##### ETX-205A/AC/19/8E1T1/PTP

100–240 VAC, 19" enclosure, 8 E1/T1 ports, 1588v2 timing and SyncE

##### ETX-205A/AC/19/GPS

100–240 VAC, 19" enclosure, integrated grandmaster and GPS receiver

##### ETX-205A/AC/19/RTR

100–240 VAC, 19" enclosure, integrated 1 Gbps router

*Note for ETX-205A: All ordering options are available with any combination of AC or DC power supplies.*

#### ETX-220A:

##### ETX-220A/AC/2XFP/20S/SYE/ESK

AC power supply, 2 XFP 10GbE ports, 20 SFP GbE ports, SyncE, enhanced SW key

##### ETX-220A/AC/2XFP/10U10S/SYE/ESK

AC power supply, 2 XFP 10GbE ports, 10 copper GbE ports, 10 SFP GbE ports, SyncE, enhanced SW key

##### ETX-220A/AC/3XFP/10S/SYE/ESK

AC power supply, 3 XFP 10GbE ports, 10 SFP GbE ports, SyncE, enhanced SW key

##### ETX-220A/AC/3XFP/10U/SYE/ESK

AC power supply, 3 XFP 10GbE ports, 10 copper GbE ports, SyncE, enhanced SW key

##### ETX-220A/AC/3XFP/10S/PTP/ESK

AC power supply, 3 XFP 10GbE ports, 10 SFP GbE ports, SyncE, 1588v2, enhanced SW key

##### ETX-220A/H/DCR/2XFP/20S/SYE/ESK

Temperature hardened, dual DC power supplies, 2 XFP ports, 20 SFP GbE ports, SyncE, enhanced SW key

##### ETX-220A/AC/4XFP/10U/SYE/ESK

AC power supply, 4 XFP 10GbE ports, 10 copper GbE ports, SyncE, enhanced SW key

##### ETX-220A/AC/4XFP/SYE/ESK

AC power supply, 4 XFP 10GbE ports, SyncE, enhanced SW key

##### ETX-220A/AC/2XFP/20S/SYE/BSK

AC power supply, 2 XFP 10GbE ports, 20 SFP GbE ports, SyncE, basic SW key

##### ETX-220A/AC/2XFP/10U10S/SYE/BSK

AC power supply, 2 XFP 10GbE ports, 10 copper GbE ports, 10 SFP GbE ports, SyncE, basic SW key

##### ETX-220A/AC/3XFP/10S/SYE/BSK

AC power supply, 3 XFP 10GbE ports, 10 SFP GbE ports, SyncE, basic SW key

## ETX-2

## Carrier Ethernet Demarcation

**ETX-220A/AC/3XFP/10U/SYE/BSK**

AC power supply, 3 XFP 10GbE ports,  
10 copper GbE ports, SyncE, basic SW key

**ETX-220A/AC/3XFP/10S/PTP/BSK**

AC power supply, 3 XFP 10GbE ports,  
10 SFP GbE ports, SyncE, 1588v2, basic  
SW key

**ETX-220A/DC/4XFP/10S/SYE/BSK**

DC power supply, 4 XFP 10GbE ports,  
10 SFP GbE ports, SyncE, basic SW key

**ETX-220A/DC/4XFP/10U/SYE/BSK**

DC power supply, 4 XFP 10GbE ports,  
10 copper GbE ports, SyncE, basic SW key

**ETX-220A/DC/4XFP/SYE/BSK**

DC power supply, 4 XFP 10GbE ports,  
SyncE, basic SW key

**Notes for ETX-220A:**

- *The Enhanced Software (ESK) option provides all Ver. 5.0 features; the (Basic Software) BSK option contains all features provided by ESK, except the BSK option supports one level of QoS with two shapers per NNI port (2x8 CoS)*
- *All ordering options are available with AC, DC, dual AC (ACR) or dual DC (DCR) power supplies*
- *Temperature-hardened options are available; please contact your local RAD partner for further information.*

**SPECIAL CONFIGURATIONS**

Please contact your local RAD partner for additional configuration options

**SUPPLIED ACCESSORIES**

Power cord (one per power supply)

**CBL-RJ45/D9/F/6FT**

Control port cable with male RJ-45 and female DB-9 connector

**CBL-E1-SPLT**

Cable to extract 2 E1/T1 ports from one RJ-45 connector of ETX-203AM E1/T1 network module (four cables are supplied if 8 E1T1 option is ordered)

**RM-34**

Hardware kit for mounting one ETX-205A or ETX-220A unit in a 19" rack

**RM-34-23**

Hardware kit for mounting one ETX-205A or ETX-220A unit in a 23" rack

**OPTIONAL ACCESSORIES****ETX-203AM-SW/GE30**

Software license for 1 Gbps per port, and up to 64 shaped EVCs per port

**ETX-203AM-SW/GE**

Software license for 1 Gbps per port

**ETX-203AX-SW/GE30**

Software license for 1 Gbps per port, and up to 64 shaped EVCs per port

**ETX-203AX-SW/GE**

Software license for 1 Gbps per port

**ETX-M/2ETH**

Ethernet uplink module for ETX-203AM with two combo ports

**ETX-M/SH4W**

EFM bonded uplink module for ETX-203AM with 2 SHDSL ports (4-wire)

**ETX-M/SH8W**

EFM bonded uplink module for ETX-203AM with 4 SHDSL ports (8-wire)

**ETX-M/4E1T1**

Ethernet uplink module for ETX-203AM with 4 E1/T1 ports

**ETX-M/8E1T1**

Ethernet uplink module for ETX-203AM with 8 E1/T1 ports

*Note: The CBL-E1-SPLT cables must be ordered separately when ordering this module.*

**ETX-M/1T3**

Ethernet uplink module for ETX-203AM with 1 T3 port

**ETX-M/2T3**

Ethernet uplink module for ETX-203AM with 2 T3 ports

**ETX-M/RTR**

Ethernet module with integrated 1 Gbps router

**RM-35/@**

Hardware kit for mounting one or two ETX-203AM units in a 19" rack

@ Rack mount kit (Default=Both kits):

**P1** Kit for mounting one unit

**P2** Kit for mounting two units

**RM-33-2**

Hardware kit for mounting one or two ETX-203AX units in a 19" rack

**WM-34**

Wall mount hardware kit for one ETX-205A or ETX-220A unit

**WM-35**

Wall mount hardware kit for one ETX-203AM unit

**ETX-205A\_PS/!**

! Power supply

**AC** Single AC power supply

**DC** Single DC power supply

**ETX-220A\_PS/N/!**

! Power supply:

**AC** Single AC power supply

**DC** Single DC power supply

**CBL-RJ45/2BNC/E1/X**

Balanced E1 (RJ-45) to unbalanced E1 (2 BNC) adapter cable

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