General Availability

ETX-2i-10G

10G Ethernet Business & Cell-Site Gateway

- Advanced 10G Ethernet demarcation and aggregation device, delivering SLA assured, MEF 3.0 certified Carrier Ethernet VPN services
- Advanced traffic management with hierarchical QoS and high scale flow management
- TWAMP and Layer2 OAM diagnostics for scalable and accurate performance monitoring, quick fault detection, and troubleshooting of Layer 2 and Layer 3 networks
- Flexible hardware, optional license activation, eight HW configurable 1GbE/10GbE ports, Grow-As-You-Go future upgrade interfaces for a multipurpose device
- Precision timing synchronization for mobile networks*

FLEXIBLE SERVICE DELIVERY AND ASSURANCE AT 10G AND 1G

ETX-2i-10G, part of RAD's Service Assured Access solution, provides service demarcation and aggregation at 10GbE and 1GbE data rates.

ETX-2i-10G enables operators to deliver service level guarantees, by supporting multilayer diagnostics, fine-grained SLA enforcement, and accurate performance monitoring. Built-in service activation testers support verification of end-to-end network performance.

ETX-2i-10G also offers best-in-class traffic management capabilities, includes an advanced classification engine, VLAN manipulation, and sophisticated service shaping, providing operators full flexibility and control over traffic flows.

MARKET SEGMENTS AND APPLICATIONS

ETX-2i-10G is ideal for carriers, service providers, wholesale providers, and mobile operators seeking to offer unified SLA-based Ethernet business services, such as E-Line, E-LAN, E-Tree, and E-Access services.

CARRIER ETHERNET SERVICES

ETX-2i-10G incorporates a complete set of MEF 3.0 certified Ethernet service tools that allow the service provider to distinguish between high and low-priority traffic, and optimize TCP sessions.

ETX-2i-10G provides MEF 10.3 color aware and unaware Policers, delivering high-scale multi-CoS services with hierarchical Quality of Service (HQoS).

It supports advanced scheduling, WRED per CoS, shaping per EVC and per port, with flexible classification rules and access lists.

ETX-2i-10G delivers E-Line (EVL, EVPL), E-LAN (EPLAN, EVPLAN), E-Tree (EP-TREE, EVP-TREE), Access E-Line, and Transit E-Line services compliant with MEF3.0 and CE2.0 certifications.

TIMING AND SYNCHRONIZATION

ETX-2i-10G family incorporates RAD's advanced SyncTop synchronization and timing over packet feature set to support mobile heterogeneous network topology.

ETX-2i-10G 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.

ETX-2i-10G also supports 1588v2 slave clock, boundary clock (BC), and transparent clock (TC), as well as a dual master operating simultaneously in G.8265.1 and G.8275.1 modes.

[*] ETX-2i-10G/8SFPP currently supports 1588v2 TC mode only. A full timing suite support is part of the product's roadmap.

RESILIENCY

ETX-2i-10G offers fast protection for virtually any kind of failure, in any linear, ring, or dual-homed topology. The device employs IEEE 802.3ad link aggregation (1:1 LAG and load-balancing 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.

TDM PSEUDOWIRE

ETX-2i-10G provides pseudowire (PW) services via a smart SFP (MiTOP). PWs can be encapsulated using CESoPSN per IETF RFC 5086 or SAToP per IETF RFC 4553.

ETHERNET OVER PDH

ETX-2i-10G transports Ethernet over PDH infrastructure via a smart SFP (MiRICi), including the following NG-PDH technologies:

- Generic Framing Procedure (GFP G.7041)
- GFP over 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 smart SFPs provides TDM (E1/T1/E3/T3/OC-3/STM-1) connectivity over PDH or SDH legacy networks.

SDN READY MANAGEMENT

ETX-2i-10G supports a variety of access protocols, including CLI over Telnet, SNMPv3, and TFTP.

Security features include SNMPv3, RADIUS, TACACS+, 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.

NETCONF/YANG

ETX-2i-10G is delivered ready for SDN transformation with comprehensive support for the NETCONF/YANG protocol, enabling operators to utilize modern network service orchestrators.

Zero Touch

ETX-2i-10G implements RAD's unique ZTP process, allowing devices to onboard automatically and securely without human intervention, and enabling operators to provision services easily and reliably.

MONITORING AND DIAGNOSTICS

Featuring multi-layer OAM and PM tools, ETX-2i-10G 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. Layer 2 and Layer 3 loopbacks offer flexible diagnostic tools.

RFC-5357 TWAMP light delivers the same functionality over Layer 3 networks, as well as one-way TWAMP and two-way ICMP Echo, with counters for loss, delay, fragmented packets, reorders, and duplication, and configurable test packet size. Multiple VRFs support the robust TWAMP setup.

Service Activation Tests

ETX-2i-10G offers service activation tools with multiple RFC-2544, Y.1564, and L3 SAT testers.

Digital Diagnostics Monitoring

ETX-2i-10G supports digital diagnostics monitoring (DDM) SFP functions according to SFF-8472, excluding external DDM calibration.

Access Aggregation with SLA-Based Services
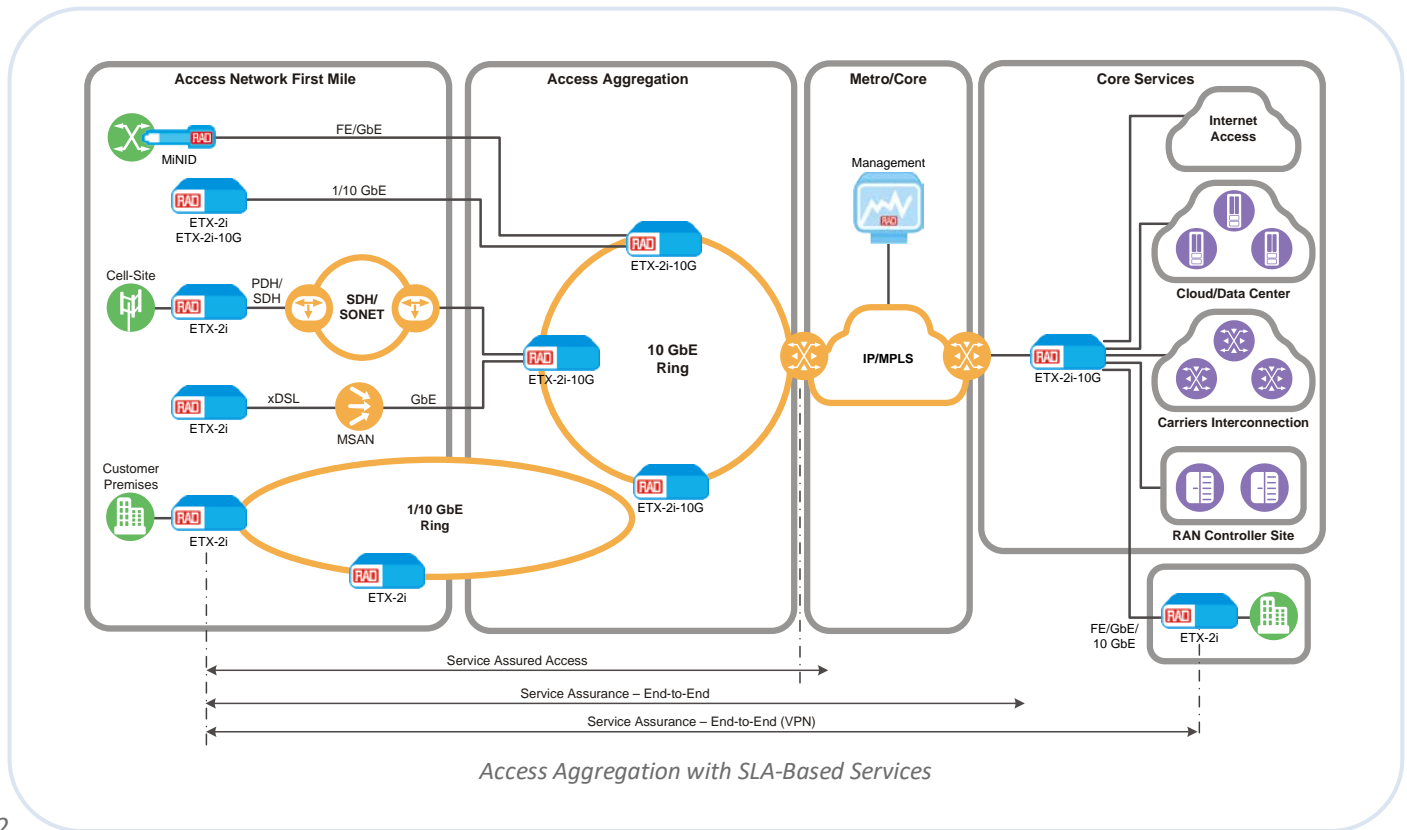
ETX-2i-10G

10G Ethernet Business & Cell-Site Gateway

Specifications

BRIDGE

Compliance

802.1D, 802.1Q, 802.1ad

Mode

VLAN-aware, VLAN-unaware

VLAN Editing

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

Max. Frame Size

9600 bytes

LAYER 2 CONTROL PROCESSING

ETX-2i-10G can be configured to forward or discard Layer 2 control frames (including other vendors' L2CP frames).

HIERARCHICAL QUALITY OF SERVICE (HQOS)

Policing

Color aware/unaware dual token bucket with user-configurable CIR, CBS, and EIR, EBS
Hierarchical envelope policer per MEF 10.3

Scheduling

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

Shaping

Per port
Per EVC
Per EVC.CoS

FLOWS CLASSIFICATION

Per port, outer VLAN or outer + inner VLAN, PCP, TOS/DSCP, EtherType, IP/MAC source/destination address, or 5-tuple ACL

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
Load Balancing LAG with up to four ports per LAG group

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 MAC/IP address swap Loopbacks at Ethernet port level

MEF 46 Latching Loopback support – remote activation of loopbacks via the data plane

Service Activation Tests

RFC-2544: 8 built-in wirespeed testers
ITU-T Y.1564: 8 built-in wirespeed testers

ICMP Echo

Over L2 and L3 services
Tests IP connectivity (PING)

1GBE/10GBE INTERFACES

Number of Ports

Eight

Type

SFP+/SFP

Fiber Optic (SFP+ based)

1000BaseLx/Sx
10GBase-SR/LR/ER/ZR

Connectors

SFP slot

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

ETX-2i-10G

10G Ethernet Business & Cell-Site Gateway

TIMING AND SYNCHRONIZATION

Synchronous Ethernet

ITU-T G.8261-G.8264

1588v2

Slave clock
Boundary clock
Dual master operating simultaneously in G.8265.1 and G.8275.1 modes
Transparent clock (TC)
Phase and frequency synchronization

PTP Ports (optional)

ToD/1PPS (RJ-45)
External clock (CONN.COAX SMA)
1PPS (CONN.COAX SMA)

Station Clock

Type: Balanced E1, unbalanced E1 (via adapter cable)
Connector: RJ-45
ToD/1PPS (RJ-45)
External clock (CONN.COAX SMA)
1PPS (CONN.COAX SMA)

MANAGEMENT

Ethernet Management Port

Type: 10/100/1000BaseT
Connector: RJ-45

Control Port

Interface: V.24/RS-232 DCE
Connector: micro USB
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
NETCONF/YANG management interface

GENERAL

Compliance

MEF3.0, CE 2.0, MEF 6 (E-Line – EPL and EVPL, E-LAN – EPLAN and EVPLAN), MEF 10, MEF 9, MEF 14, MEF 20, MEF 36, MEF 46, IEEE 802.3, 802.3u, 802.1D, 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

PHYSICAL

Power Supply

8.5" enclosure

Single, fixed PS
AC: 100-240 VAC (±10%), 50/60 Hz
or
DC: 48 VDC (40-60 VDC)

19" enclosure
Hot swappable, redundant PS
AC: 100-240 VAC (±10%), 50/60 Hz
DC: 48 VDC (40-60 VDC)

Power Consumption

8.5" and 19" enclosures

Max: 75W
Average: 70W

Dimensions

8.5" enclosure

Height: 43.7 mm (1.7 in)
Width: 215.5 mm (8.5 in)
Depth: 301 mm (11.8 in)

19" enclosure

Height: 43.7 mm (1.7 in)
Width: 440 mm (17.4 in)
Depth: 240 mm (9.5 in)

Environment

Storage Temperature: -40 to 85°C (-40 to 185°F)

Operating Temperature:

Regular: 0 to 50°C (32 to 122°F)
Temperature hardened: -40 to 65°C (-40 to 149°F)*

Humidity: 5% to 90%, non-condensing

ETX-2i-10G

10G Ethernet Business & Cell-Site Gateway

Ordering

TYPICAL CONFIGURATIONS

ETX-2i-10G-B/8.5/H/DC/8SFPP/PTP*

8.5" metal enclosure, 8 SFP+ Ethernet ports, SyncE and 1588v2 timing, Temperature Hardened, DC Power Supply

ETX-2i-10G-B/8.5/AC/8SFPP

8.5" metal enclosure, 8 SFP+ Ethernet ports, AC Power Supply

ETX-2i-10G-B/19/H/ACR/8SFPP/PTP*

19" metal enclosure, 8 SFP+ Ethernet ports, SyncE and 1588v2 timing, Temperature Hardened, Redundant AC Power Supply

ETX-2i-10G-B/19/ACR/8SFPP

19" metal enclosure, 8 SFP+ Ethernet ports, Redundant AC Power Supply

*option not yet available for this model

SUPPLIED ACCESSORIES

AC power cord (with AC models)
DC connector kit PLUG-DC/TB-S/J

OPTIONAL ACCESSORIES

RM-34

HW kit for mounting 19" unit in a 19" rack

CBL-UUSB-DB9F

Micro-USB cable to DB9 to connect device to a serial port

RM-35/?

Hardware kit for mounting one or two 8.5" units in a 19" rack

?	Rack mount kit (Default=Both kits):	
	P1	Kit for mounting one unit
	P2	Kit for mounting two units

WM-35

Wall mount hardware kit for one 8.5" unit

ETX-2i-10G-PS/?

?	Extractable power supply for 19" units	
	AC	Kit for mounting one unit
	DC	Kit for mounting two units

SOFTWARE LICENSES

ETX-2i-SW TWAMP

License to activate and operate TWAMP related functionalities in ETX-2i-10G.

www.rad.com

Your Network's Edge®