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Data Sheet

General Availability

# ETX-1p

## CPE for VPN and Cloud Access Services/IoT Gateway

- Branch office router, optimized for cloud access services via IP-VPN, broadband or LTE networks
- IoT gateway
- Edge computing by hosting 3rd party container software for customized applications
- Zero Touch provisioning
- One or two embedded cellular modems (optional second cellular modem, Wi-Fi access point and client, or LoRaWAN)
- Two SIM cards for maximum link resiliency
- Wi-Fi access point and client
- GPS for location reporting
- Zone-based stateful firewall

## MARKET SEGMENTS AND APPLICATIONS

Digital transformation accelerates the adoption pace of new services. Service providers deliver value-added services from their data centers, including networking (e.g., voice, secure Internet access) and IT (e.g., cloud on-ramp) services.

ETX-1p is a branch office CPE, enabling business customer transition to the cloud.

ETX-1p features a security hardened operating system, optimized to provide maximum performance with small SW footprint.

By combining powerful networking capabilities with flexible connectivity options, rich management interfaces, and embedded security services, ETX-1p enables service provides to deliver advanced IP-VPN services, as well as value added virtual services from the data center to the customer branch.

When equipped with LoRaWAN radio, ETX-1p aggregates multiple low-power low-bandwidth sensors/meters deployed over a wide area. This provides an ideal solution for rural and other non-dense areas saving CAPEX and OPEX.

### Reduced Total Cost of Ownership

The all-in-one form factor includes full featured routing, security, switching, LTE and Wi-Fi, making it easy to connect branches to the Internet and critical applications, without the need for extra hardware or complicated configurations.

The comprehensive, multi-service functionality together with a variety of interfaces, enables ETX-1p to support multiple use-cases and market segments in a single device, while reducing capital costs and simplifying logistics and operations.

### Flexible Overlay and Underlay

ETX-1p is the service provider's demarcation point at branch offices, enabling underlay connectivity to IP-VPN and broadband networks, as well as overlay connectivity to the service provider's data center. Branch offices consume their networking services from the service provider's data center, including IP-VPN connectivity to other branch offices, Internet access and public cloud access.

ETX-1p serves as an endpoint for the underlay and overlay networks at the branch site, offering resilient connectivity over multiple links to IP-VPN and fixed/mobile broadband networks.

It can also serve as an endpoint for overlay connectivity to the service provider's data center to provide value added services running at the data center and deploy centralized vCPE.

Branch site underlay connectivity is resilient with a backup link, typically connected to a broadband network.

### IoT

ETX-1p addresses the IoT market, with applications such as:

- Secure and resilient transport
- IoT asset management
- Advanced resilient satellite communication
- SMB IoT remote monitoring & management
- Smart meter concentration

## INTEROPERABILITY

ETX-1p is compatible and can interwork with SecFlow-1p and any routers that support standard protocols.

## VPN SERVICES

The device features a VPN gateway with two operation modes:

- Inter-site connectivity using 30 IPsec tunnels
- Remote user access using SSH

RAD

Your Network's Edge®

# ETX-1p

## CPE for VPN and Cloud Access Services/IoT Gateway

An inter-site VPN-based encrypted link ensures transparent L3 connection of the Ethernet networks sites.

For remote access, the router uses an SSH-encrypted tunnel, with user authentication and specific access authorization.

### ROUTING

ETX-1p features static routing, OSPF and BGP.

### SINGLE/DUAL LTE MODEMS AND GPS

ETX-1p features flexible configuration for one LTE modem with two SIM cards, or two embedded LTE modems, for maximum resiliency. GPS for location reporting is also supported. The ETX-1p HW is ready for future support of 5G modems.

### CONTAINERS – NEXT LEVEL OF FLEXIBILITY

ETX-1p can host containerized edge applications, supporting any 3rd party containers, which extend its original functionality to a new level. Containers can easily be installed and managed via the Docker CLI.

### RESILIENCY

A link redundancy mechanism allows tracking connectivity to specific IP addresses, using fault propagation and IP monitoring capabilities.

### MANAGEMENT AND SECURITY

#### Management

ETX-1p can be managed via Web, CLI or by RADview.

To automate the setup of overlay connectivity to the data center, ETX-1p can be integrated with the service provider's SDN controllers or orchestration systems, using NETCONF/YANG modeling.

RADview supports fault management, task management and web shortcuts.

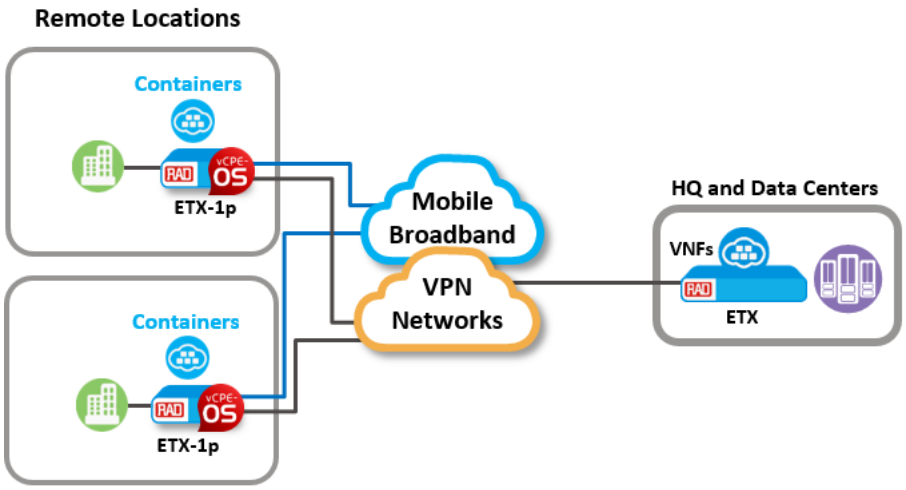
#### Embedded Advanced Security

For meeting the evolving security needs of distributed environments, ETX-1p includes embedded security features and options, such as stateful, zone-based firewall, and threat protection.

### DESIGNED FOR ZERO TOUCH AND EASY OPERATION

ETX-1p is designed to simplify operations, while providing service providers visibility to their branch office demarcation.

ETX-1p incorporates secure Zero-Touch-Provisioning mechanisms for agile and seamless vCPE deployment, reducing truck rolls and minimizing mass deployment operating costs.




*ETX-1p Business Services over Fiber and 4G/LTE*

# ETX-1p

## CPE for VPN and Cloud Access Services/IoT Gateway

## Specifications

### MEMORY AND STORAGE

| | |
|---|---|
| **DRAM** | 1 Gb, 2 Gb |
| **Flash Storage** | 8 Gb, 32 Gb |

### INTERFACES

| | |
|---|---|
| **GNSS** | GPS – American (default) |
| | Galileo – European |
| **LAN** | 4 GbE UTP (RJ-45) |
| **LTE** | LTE modem with dual SIM |
| **WAN** | 1 GbE SFP and 1 GbE UTP (RJ-45) ports |
| **Wi-Fi** | 802.11b/g/n/ac dual band |

### CELLULAR AND GPS

| | |
|---|---|
| **Cellular Authentication** | PAP, CHAP |
| **Firmware Upgrade** | FOTA (Firmware upgrade Over the Air) |
| **GPS** | Location reporting |
| **LTE** | Dual LTE modems |
| | Dual SIM |
| | Single SIM |
| | LTE bands – see Table 1 |
| **Multi APN** | Supported for L450A/L450B |
| **Operation Modes** | PPP, IP |
| **SIM Card** | Mini SIM, 25 mm x 15 mm (0.98 in x 0.59 in) |
| | Form factor: 2 FF |
| **Transmission Modes** | Diversity |
| | MIMO |

### LORAWAN

| | |
|---|---|
| **LoRaWAN Modem** | EU868, RU864, US915, AS923 (1-4), AU915, KR920, IN865 bands |
| | SX1303 baseband processor |
| | 8 x 8 channels LoRa packet detectors |
| | 8 x SF5-SF12 LoRa demodulators, 8 x SF5-SF10 LoRa demodulators |
| | LoRaWAN Class A, B, C |
| | Packet forwarder |

**Table 1. Integrated Cellular Modems**

| LTE Ordering Code | Modem Category and Frequency Bands |
|---|---|
| L1 | **CAT 4 EMEA/Korea/Thailand**<br>LTE FDD: B1, B3, B5, B7, B8, B20<br>LTE TDD: B38, B40, B41<br>WCDMA: B1, B5, B8<br>GSM: B3, B8 |
| L3 | **CAT 4 Australia/New Zealand/Taiwan/Brazil**<br>LTE FDD: B1, B2, B3, B4, B5, B7, B8, B28<br>LTE TDD: B40<br>WCDMA: B1, B2, B5, B8<br>GSM: B2, B3, B5, B8 |
| L4 | **CAT 4 North America, Verizon wireless + AT&T LTE**<br>LTE FDD: B2, B4, B5, B12, B13, B14, B66, B71<br>WCDMA: B2, B4, B5 |
| L450A | **CAT 4 450 MHz for private LTE networks**<br>LTE FDD: B3, B7, B20, B31, B72 |
| L450B | **CAT 4 450 MHz for private LTE networks**<br>LTE FDD: B3, B20, B87 |
| L5 | **CAT 4 Japan**<br>LTE FDD: B1, B3, B8, B18, B19, B26<br>LTE TDD: B41<br>WCDMA: B1, B6, B8, B19 |
| LTA | **CAT 4 North America, TAA-compliant**<br>LTE-FDD: B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B26, B28, B66<br>TDD-LTE: B38, B40, B41<br>WCDMA: B1, B2, B3, B4, B5, B6, B8, B19<br>GSM: B2, B3, B5, B8 |

### WI-FI

| | |
|---|---|
| **Frequency** | 2.4/5 GHz |
| **Mode** | Access Point, Client |
| **Radio Mode** | 802.11a/b/g/n/ac |
| **Security** | WPA2-AES |
| **Users** | Max. 8 concurrent |

# ETX-1p

## CPE for VPN and Cloud Access Services/IoT Gateway

### MANAGEMENT

| | |
|---|---|
| **Control Port** | RS-232 interface, RJ-45 connector<br>***Note**: Control port cable is not included and must be ordered separately (see Optional Accessories)* |
| **Configuration** | Web-based interface using HTTPS |
| | CLI with password-protected access |
| **DHCP Server** | IPv4, IP subnet pools support 256 addresses |
| **Protocols** | NETCONF server (v1.0/v1.1)/ YANG |
| | SNMP v2/v3 |
| | SSH v2, HTTPS server, TFTP/SFTP |
| **Users** | User roles and privileges |

### SECURITY

| | |
|---|---|
| **Trusted Platform Module** | Secure boot |
| | TPM2.0 |
| **Access Lists** | Standard and extended |
| **Authentication** | Locally, RADIUS, TACACS+ (also for authorization and accounting) |
| | Port-based: 802.1X on Ethernet and Wi-Fi |
| | Multi-factor authentication (MFA) |
| | One-time password (OTP) |
| **Features** | Login lockout |
| **Firewall** | Zone-based, stateful ACL rules |
| **Public Keys** | Public Key Infrastructure with X.509 certification for Zero Touch |
| | Certificates with SCEP CA server |
| **Session** | Monitoring and limiting |

### ZONE-BASED FIREWALL

| | |
|---|---|
| **Type** | Stateless |
| | Stateful |
| **IPv4 and IPv6 NAT** | SNAT, DNAT<br>REDIRECT<br>NAPT/NAT |
| **Configuration** | via Web GUI, SSH and SNMP |
| **Rules** | Interfaces are assigned to zones, for which a set of rules is configured |
| | IPv4 and IPv6 |
| | Limit maximum number of simultaneous connections |
| | Limit rules by traffic (kilobyte per second/packet per second) |
| | Rule hits reported to local LINUX Syslog* |
| **DoS Prevention** | Blocklist |
| | Defend from IP sweep |

### IP ADDRESSING AND ROUTING

| | |
|---|---|
| **Addressing** | IPv4 and IPv6 |
| **DHCP** | Client, server, relay |
| | IP helper addresses |
| **DNS** | Server |
| **NAT** | Static/dynamic |
| | NAPT/NAT |
| **Routing Protocols** | OSPF v2, BGP v4 |
| | VRRP |
| | IP-BFD for fast route propagation* |
| **Routing Technologies** | Static |
| | Policy-based |
| | VRF (10), router Interfaces (32) |

### OAM

| | |
|---|---|
| **SLA Monitoring** | ICMP echo, UDP echo |
| **ZTP** | On-net |
| | Off-net (over unsecured network) performs secure “call home” using Public Key Infrastructure (X.509) |

### RESILIENCY

| | |
|---|---|
| **Link Redundancy** | Tracking connectivity to specific IP addresses using fault propagation and IP monitoring |

### DIAGNOSTICS

| | |
|---|---|
| **Features** | Traceroute, ping |
| | Syslog |
| | Port mirroring |
| | Alarm and event logs |
| **LEDs** | Alarm indication and cellular RSSI level |

### TIMING

| | |
|---|---|
| **Date and Time** | Local time setting |
| **Protocol** | SNTPv4 |

** This feature will be released in a future version.*

# ETX-1p

## CPE for VPN and Cloud Access Services/IoT Gateway

### IP QUALITY OF SERVICE

| | |
|---|---|
| **Classification** | Port-based, IP-based, DSCP |
| **Egress Queues** | 8 queues per port |
| **Queuing** | Class-based, SPQ, WFQ |
| **Scheduling** | Strict Priority/WRR |
| **Traffic Class Actions** | CoS mapping (queues) |
| | Marking, remarking (DSCP) |
| **Traffic Processing** | Shaping |

### IP VPNS

| | |
|---|---|
| **IPsec** | Up to 30 tunnels |
| **DH Groups** | 1 (768-bit modulus)<br>2 (1024-bit modulus)<br>5 (1536-bit modulus)<br>14 (2048-bit modulus)<br>19 (256-bit elliptic curve)<br>20 (384-bit elliptic curve) |
| **ESP Algorithms** | AES CTR 128, 256 and 192, AES GCM 128 and 256, ChaCha20-Poly1305 |
| **IKE Algorithms** | ECDH-SHA2 NISTP 521, 384 and 256, Curve25519-SHA256, DH-Group18-SHA512, DH-Group17-SHA512, DH-Group16-SHA512, DH-Group15-SHA512, DH-Group14-SHA256, DH-GEX-SHA256 |
| **IKE Hashing Algorithms** | SHA2-256-128-HMAC, SHA2-512-256-HMAC |
| **Protocols** | Policy- and route-based IPsec, GRE |
| | GREoIPsec |
| | IKEv1, IKEv2 |
| | L3 mGRE DMVPN* |
| | L3 IPsec VPN |
| | PPPoE supporting Broadband or LTE access |
| **Technologies** | NAT traversal |
| | Interoperability with SCEP server 2012 and higher |

### EDGE COMPUTING (CONTAINERS)

| | |
|---|---|
| **Containers** | Docker |

### INTEGRATED ROUTING AND BRIDGING (IRB)

| | |
|---|---|
| **Bridges** | Max 4 |
| **Bridge Ports** | Max 32 |
| **MAC Addresses per Bridge** | Max 512 |
| **Operation Mode** | VLAN-aware VLAN-unaware |
| | Static or dynamic MAC addresses |

### GENERAL

| | |
|---|---|
| **Compliance** | EMC: EN 55032, EN 55035, ETSI EN 301 489-1, ETSI EN 301 908-1, CFR 47 FCC, VCCI-CISPR 32, AS/NZS CISPR 32, ICES-003 |
| | EU: CE |
| | FCC and TUV for North America |
| | Safety: UL 62368-1, IEC/EN 62368-1 |

#### Environment

| | |
|---|---|
| **Temperature** | Operating: -10 to 50°C (32 to 122°F) |
| | Storage: -40 to 65°C (-40 to 149°F) |
| **Humidity** | 5% to 90%, non-condensing |

#### Physical

| | |
|---|---|
| **Enclosure** | Plastic Box |
| **Height** | 44 mm (1.73”) |
| **Width** | 230 mm (9.05”) |
| **Depth** | 175 mm (6.9”) |
| **Weight** | Net: 0.5 kg (1.1 lb) |
| | Max (including device + package + power supply + cable adaptor + 2 LTE antennas + 2 Wi-Fi antennas): 1.04 kg (2.3 lb) |

#### Power

| | |
|---|---|
| **Power Supply** | External 90–240 VAC |
| **Power Consumption** | < **5W** |
| | Idle: 3.0W** |
| | Typical: 3.6W** |
| | Maximum: 4.5W** |
| | **On a platform with one LTE modem |

*

*This feature will be released in a future version.*

# ETX-1p

## CPE for VPN and Cloud Access Services/IoT Gateway

## Ordering

The information below represents examples of supported configurations. For additional configuration options, please contact your local RAD partner.

**ETX-1P/ACEX/1SFP1UTP/4UTP/L1**

**ETX-1P/ACEX/1SFP1UTP/4UTP/L1/WF**

**ETX-1P/ACEX/1SFP1UTP/4UTP/L3**

**ETX-1P/ACEX/1SFP1UTP/4UTP/L4/WF**

**ETX-1P/ACEX/1SFP1UTP/4UTP/WF**

**ETX-1P/ACEX/1SFP1UTP/4UTP/L4/LRA/2R**

**ETX-1P/ACEX/1SFP1UTP/4UTP/LRA/G/LTA/2R**

### ORDERING OPTIONS

Some options are not supported by all models. Some option combinations are invalid or may require a minimum order. To determine the BOM for your application, please contact your local RAD partner.

| | | |
|---|---|---|
| **Cellular Ports** | L1 | LTE modem for Europe |
| | L3 | LTE modem for Oceania and Latin America |
| | L4 | LTE modem for North America, Verizon wireless + AT&T |
| | L450A | LTE modem 450 MHz for private LTE networks, LTE-FDD: B3/7/20/31/72 |
| | L450B | LTE modem 450 MHz for private LTE networks, LTE-FDD: B3/20/87 |
| | L5 | LTE modem for Japan |
| | LTA | LTE modem for North America, TAA-compliant |

***Notes:***

- *In options with dual modems, both modems are of the same type (L1, L3, L4, L450A or L450B).*
- *The cellular modem is supplied with two matching antennas (see Supplied Accessories).*

| | | |
|---|---|---|
| **Ethernet LAN Ports** | 4UTP | 4 x RJ-45 GbE UTP |
| **Ethernet WAN Ports** | 1SFP1UTP | 1 x 1000FX, 4 x 10/100/1000BASE-T |
| **GNSS** | G | Integrated GPS |

***Note:*** *The GPS modem is supplied with one antenna (see Supplied Accessories).*

| | | |
|---|---|---|
| **LoRaWAN Modem** | LRA | LoRaWAN modem with 8 channels and frequency scheme selectable for US915, AU915, AS923-(1-4), or KR920 |
| | LRB | LoRaWAN modem with 8 channels and frequency scheme selectable for EU868, IN865, or RU864 |
| | L9 | LoRaWAN modem with 8 channels and frequency scheme selectable for US915, AS923, AU915, KR920, TAA compliant |

***Note*:** *The LoRaWAN modem is supplied with one antenna matching the frequency ordered.*

| | | |
|---|---|---|
| **Power Supply** | ACEX | External AC power adaptor |
| **RAM** | Default | 1G RAM |
| | 2R | 2G RAM |
| **Wi-Fi Interface** | WF | Wi-Fi 2.4 GHz/5 GHz |

***Note:*** *The WiFi modem is supplied with two matching antennas (see Supplied Accessories).*

### SUPPLIED ACCESSORIES

AC power cord for ACEX

**SF-ANT-GPS-PAS-3DBI-MAG/3M**
GPS passive antenna, 3m, for options with integrated GPS

**SF-ANT-LTE699-4DBI-SMA**
LTE antenna, 4dBi, for options with LTEx modems

**SF-ANT-WIFI-DUALBAND-3DBI-SMA**
WiFi dual band antenna, 3 dBi, for options with WiFi modem

**SF-ANT-LoRA-3DBI-SMA**
LoRaWAN antenna, 3 dBi, for options with LoRaWAN modem

***Note***: *The LoRaWAN modem is supplied with one antenna matching the frequency ordered: EU868, AU915, US915, AS923 (1-4), RU864, KR920, IN865*

# ETX-1p

## CPE for VPN and Cloud Access Services/IoT Gateway

### OPTIONAL ACCESSORIES

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

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

**SF-ANT4G-2M**

Outdoor antenna for 4G cellular modem, 2m connecting cable, 3 dBi, 699-960 MHz/1710-2170 MHz/2500-2690 MHz

**SF-ANT4G-5M**

Outdoor antenna for 4G cellular modem, 5m connecting cable, 3 dBi, 699-960 MHz/1710-2170 MHz/2500-2690 MHz

**SF-ANT-LTE700-7DBI-MGNT**

Outdoor magnetic base antenna for ETX-1p LTE options and for LoRaWAN 868 and 915 MHz, 7 dBi

**RM-33-2**

Hardware kit for mounting an ETX-1p device in a 19-inch rack

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