

DATASHEET

1647

1G Ethernet Access Device



Single Box for Carrier Ethernet and IP Services

The 1647 1G Ethernet Access Device with OneOS6 software provides CSPs with a service delivery platform for high-speed Ethernet services to enterprise customers and can be deployed in both wholesale and retail scenarios. With optional IP routing capabilities, the 1647 is a single service delivery box that supports both L2 and L3, eliminating the need for multiple service delivery platforms.

1647 Models and Positioning

The 1647 EAD base model provides two 1Gbps combo ports (UTP or SFP) for WAN connectivity, two 1Gbps SFP ports and four 10/100/100Base-T interfaces are provided for customer connectivity.

This unit is positioned to provide cost-effective 1G Ethernet demarcation capabilities for both wholesale and retail Ethernet services and is delivered as a desktop unit with single or dual external power supplies.

Additional variants exist on the base model:

- Version with 4G CAT6 radio interface
- Version with 5G radio interface

These variants exist to extend Ethernet services over 4G/5G networks in multiple deployment scenarios. The main scenario is to use the 4G/5G radio to provide temporary mobile connectivity while awaiting the installation of permanent fiber connections. Once the permanent link is up and running, the same demarcation device can be used to provide backup in case of link failure. Another scenario is to use the 4G/5G access network as a primary link to provide Ethernet services in remote areas where fixed fiber infrastructure is not available or practical to install.

MEF Services

The 1647 is MEF 3.0 Carrier Ethernet certified for the following services at speeds up to 1 Gbps: E-LINE, E-LAN, E-Tree, E-ACCESS, and E-Transit.

SLA Monitoring

Scalable SLA monitoring capabilities provide measurement tools to support MEF managed services. OAM monitoring of Ethernet flows allows monitoring of multiple quality parameters such as service availability, frame delay, inter-frame delay variation and frame loss. Both point-to-point OAM monitoring (IEEE802.3ah) and end-to-end performance monitoring (IEEE802.1ag & ITU-T Y.1731) are supported on all Ethernet interfaces

Service Activation Testing (SAT)

The implementation of various service activation mechanisms reduces the operational cost of deploying high-speed Ethernet services. The 1647 1G EAD supports SAT testing based on RFC2544 or the more advanced Y.1564 and implements both traffic generator and traffic reflector. Upon completion of the test, the system provides a clear text birth certificate for local storage or archiving. SAT testing allows operators to perform an intrusive end-to-end test to verify that the service being delivered meets the agreed SLA agreements. The ability to perform these tests without going on-site enables operators to install, activate and change services at minimal cost.

IP Routing

The 1647's perimeter functionality can be extended with an IP Routing license option that transforms the device into a full-featured IP branch office router. See the technical specifications in this datasheet for details or refer to the OneOS6 datasheet for a complete description of supported features.

Netconf/YANG and CLI

Supporting both CLI and Netconf/YANG as management interfaces, the 1647 provides a future-proof solution for managing Ethernet services in a next-generation orchestration environment while still supporting familiar CLI-based operation of the device.

Technical Specifications



1647 4Gb 6T



1647 4Gb 6T (-4G)(5G)

Ethernet Interfaces

- 1647 4Gb6T:
 - WAN: 2× 1G COMBO ports (UTP or SFP)
 - LAN: 2× 1G SFP, 4× 1G UTP
- 1647 4Gb6T-4G
 - WAN: 2× 1G COMBO ports (UTP or SFP)
 - LAN: 2× 1G SFP, 4× 1G UTP
 - Radio: 4G CAT6 LTE, Quectel EM060K-GL
 - Antennas: MIMO 2×2 with diversity support, fixed or remote
 - Data rates: LTE: max 300 Mbps DL; 50Mbps UL, UMTS: max 42 Mbps DL; 11.2 Mbps UL
 - Supported bands:
 - LTE FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/ 32/66/71
 - LTE TDD: B34/38/39/40/41/42/43/46/48
 - UMTS: B1/2/3/4/5/6/8/19
- 1647 4Gb6T-5G:
 - WAN: 2× 1G COMBO ports (UTP or SFP)
 - LAN: 2× 1G SFP, 4× 1G UTP
 - Radio: 5G, Quectel RM520N-GL
 - 3GPP rel16 compliant
 - NSA and SA mode support
 - Antennas: MIMO 4×4, fixed or remote with SMA connectors
 - Data rates:
 - 5G SA Sub-6: DL 2.4 Gbps; UL 900 Mbps
 - 5G NSA Sub-6: DL 3.4 Gbps; UL 550 Mbps
 - LTE: DL 1.6 Gbps; UL 200 Mbps
 - UMTS: DL 42 Mbps; UL 5.76 Mbps
 - Supported bands:
 - 5G NR: n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29/30/38/40/41/48/66/70/71/75/76/77/78/79
 - LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71
 - LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46;
 - UMTS: B1/2/4/5/8

Additional Interfaces

- Console: V.24/V.28 with RJ-45
- SIM card holder

Scalability

- Switching capacity: 10 Gbps
- Up to 65 EVCs
- 512 policers/shapers
- 10.000 MAC addresses
- Max MRU: 10.100 bytes

Ethernet Frame Handling

- Basic and extended L2 filtering
- BDPU filtering
- Configurable L2CP transparency (peer, drop or tunnel)
- L2PT for tunnelling of L2 protocols (cdp, dtp, eapol, efmoam, gvrp, gmrp, lacp, lacpm, lldp, mmrp, mvrp, oam, pagp, pvst, stp, udld, upfast, vlanbr, vtp, esmc)
- Configurable Multicast Traffic Behavior
- IGMPv2 Snooping
- IEEE802.3x Flow control
- LLDPv2

Layer 2 Protocols

- IEEE 802.1D Transparent Bridging
- IEEE 802.1D Spanning Tree Bridging
- IEEE 802.1W Rapid Spanning Tree Bridging
- IEEE 802.1S Multiple Spanning Tree Bridging

VLAN Support

- IEEE 802.1Q VLAN Tagging
- VLAN Switching (single or double tagged traffic)
- Port-based VLANs
- QinQ (VLAN stacking up to 2 levels)
- IEEE802.1ad Provider Bridging (C-Tag, S-Tag)
- Policy-based Bridging

Tunnelling Mechanisms

- GRE tunnelling (L2 over IP)

Quality of Support (QoS)

- IEEE 802.1p QoS
- Classification based on Source & Destination MAC Address, Number of VLAN tags, VLAN ID, priority bits (COS), Protocol (EtherType), TPID, DEI bits, IP access list
- Egress shaping
- Ingress Policing (three colour, two rate)
- Congestion Avoidance: RED, WRED
- Hierarchical QoS per EVC and EVC COS

OAM

- IEEE 802.3ah EFM-OAM Link Management
- IEEE 802.1ag Connectivity Fault Management (CFM)
- ITU-T Y.1731 Performance Monitoring
- Multi-COS OAM
- Link State Tracking and Notification to local link
- Dying Gasp (SNMP & Syslog)
- Ethernet Loopback with MAC Address Swapping
- Line/facility loopback (all traffic or VLAN-based)
- Equipment/terminal loopback (all traffic or VLAN-based)
- Port mirroring (port or VLAN-based)
- SFP Digital Diagnostics Monitoring (DDM)

Technical Specifications

Backup & Redundancy

- G. 8031 end-to-end linear protection (1+1 unidirectional, 1+1 bidirectional, 1:1 bidirectional)
- IEEE802.3ad Link Aggregation (LAG, active/standby mode or load balancing)
- IEEE802.1AX Link Aggregation Control Protocol (LACP)

SAT (Service Activation Testing)

- Embedded RFC2544 test generator and analyzer
- ITU-T Y.1564 Service Activation Testing

IP Routing (License required)

- IPv4/IPv6 router
- Internet-related: NAT/PAT, Selective NAT, ACL, DHCP client/server/relay, DNS server/relay, stateful firewall, IP filtering, ALG
- Multicast Routing: IGMPv2/v3, MLDv1/v2, Static multicast routes, PIM-SMv1/v2
- QoS-related: QoS with 8 priority classes, Classification, Marking, Re-Marking, Policing, Shaping, Low Latency Queueing, Absolute priority, Weighted Fair Queueing, Class-based WFQ, HQoS, RED, WRED, ECN, DiffServ
- IPv4 routing protocols: Static, Policy-based, RIPv1/2, OSPFv2, BGPv4
- Routing instances/resiliency: VRF, VRRP, BFD
- Load balancing
- Tunneling: GRE, L2TPv2, IPsec
- IPsec ESP hashing: SHA-1, SHA-2 and MD5
- IKEv1 & IKEv2 with pre-shared keys and certificates
- IPsec tunnel and transport modes
- NAT traversal
- Encryption: AES-CBC, AES-GCM
- IPv6 routing protocols: Static, RIPng, OSPFv3, BGP4
- Deep Packet Inspection
- QoS measurement probe
- Netflow

Advanced Connectivity & Security (License required)

- ECMP supporting Least Loaded First
- Zone-based firewall
- L2TPv3
- Dynamic Virtual Tunnel Interfaces (DVTI)
- Easy VPN server with X-AUTH, MODE-CFG support
- Host-based Weighted Fair Queueing
- TWAMP & TWAMP Light initiator

Security

- IEEE802.1x Port Authentication
- BDPU Filtering and Guard
- NAT session limiting, Denial of Service protection
- Password protected management access for different protocols, roles and users
- Enable/disable all management access to the device per interface

- Overall access for specific management tools can be disabled (e.g. Telnet, SSH, SNMP, HTTP(s),...)
- RADIUS for authentication
- TACACS+ for AAA (Authentication, Authorization and Accounting)
- User Access Logging (failed and successful logins)
- User login blacklisting for Telnet/SSH
- Certificate management (RFC4809) with trust-points: SCEP, Certificate import with HTTP, pkcs12 format support, CRL management, auto-enrolment

Management

- Operating system: Ekinops OneOS6
- CLI over console port, Telnet, SSHv2 (server or client)
- Multi-user, protocol-dependent and multi-level access security
- User Authentication: Local, Radius or TACACS+
- Selective enable/disable management protocols
- SNMP v1, v2, v3, MIB II + proprietary MIB
- Embedded web server with customizable web GUI
- Netconf/YANG for configuration
- CWMP (TR-069) with Zero-Touch provisioning
- DHCP-based provisioning
- Syslog, Ping, NTP/SNTP Server or client, TraceRoute
- TFTP, FTP, SFTP, HTTP/ HTTPs Client (configuration or software download)
- SCP, TFTP server for file transfer
- Inbound or outbound Access Lists on Management Traffic
- Two firmware images can be stored in flash memory
- Embedded Event Manager
- Alarm handling framework
- Historical statistics (2h, 24h, 7 days) for interfaces
- Packet Capturing with Filters to console port, file or remote server
- Recovery of last working configuration
- Automated provisioning and software management with OneManage

Dimensions & Environmental

- 1647 (all models):
 - WxHxD: 292 × 44 × 182 mm (11.49" × 1.69" × 7.16")
 - Weight: 1.5Kg (2.2 lbs)
 - Rack mount kit is available
- Storage: ETSI ETS 300 019-1-1 Class 1.1; Temperature: -25°C to +70°C, Relative humidity 0 – 95% non-condensing
- Transport: ETSI ETS 300 019-1-2 Class 2.3
- Stationary use: ETSI ETS 300 019-1-3 Class 3.1; Relative humidity 5 to 90% non-condensing; ambient operational temperature 0°C to +40°C
- Maximum altitude: 5000m
- International protection (IP) class of protection against solid and liquids: IP30 for metal housing
- Fanless, no noise
- Optional Rack Mount Kit or Wall Mount available

Technical Specifications

Power Supply

- 2 external power connectors for power redundancy and load sharing (12V, 3A) on barrel jack connectors (with cable fastener). The device can also function on one external power supply.
- Various external power supplies available for different world regions (EU, US/Canada, Australia/New Zealand, India, South-Africa, UK) or DC/DC external power supply for 24/48Vdc.

Regulatory Compliance

- European compliance: CE mark
- Safety: EN 62368-1: 2020, UL 62368-1:2014 and CSA C22.2 No.62368-1:2014; AS/NZ 62368.1:2018
- Health: EN62311: 2008
- Overvoltage and overcurrent: ITU-T K.44, K.21 and ETSI ETS 300 386-2. (K21+ optionally)
- Electro-magnetic emission: FCC 15B classA, ICES-003 class A, EN55032, EN61000-6-3
- Electro-magnetic immunity:
 - EN55035 Immunity
 - EN61000-3-2: 2019 Harmonics
 - EN61000-3-3: 2013 + A1:2019 Voltage fluctuations and flicker
 - EN61000-4-2 ESD immunity
 - EN61000-4-3 Radiated immunity (RFI)
 - EN61000-4-4 EFT/burst
 - EN61000-4-5 Surge immunity
 - EN61000-4-6 Conducted electromagnetic Field Immunity (CFI)
 - EN61000-4-8 Power magnetic field immunity
 - EN61000-4-11 Voltage dips & drops
 - EN300386 EMC Requirements
- LTE: EN 301 489, part 1, 17 and 52; EN 301 908 part 2 and 13; EN 301 511 (GSM, EDGE, GPRS)
- 5G: EN 301 908-25 (NR, 5G)
- EN63000 (2018): RoHS
- EU 2019/1782 ERPD – External PSU; EU 1275/2008 and 801/2013 ERPD – Stby & Off mode

Compliance with MEF standards

- MEF 3.0 CE Certified for 1Gbps
 - EP-Line, EVP-Line
 - EP-LAN, EVP-LAN
 - EP-Tree, EVP-Tree
 - Access E-Line
 - Transit E-Line

1647 Standard Versions

- 71904 1647 4Gb6T
- 71952 1647 4Gb6T-4G (Quectel EM060K-GL)
- 71922 1647 4Gb6T-5G (Quectel RM520N-GL)
- 52559 1647 IP Routing License
- 52560 1647 Routing License Subscription 1 year
- 52026 ACS-CATEGORY-2 (Advanced Connectivity and Security perpetual license)
- 52473 ACS-CATEGORY-2 sub-1yr (Advanced Connectivity and Security subscription license for 1 year)

1647 Customized Versions

- Rebranding
- Accessories, hardware options
- Pre-mounted options or assemblies
- Country-dependent options (e.g. power plugs)
- Customer approved software version
- Factory loaded pre-configuration (for e.g. Zero Touch Provisioning)

About Ekinops

Ekinops is a European leader in optical networking and secured connectivity solutions for service providers, enterprises and public organizations around the world.

Ekinops designs, develops and manufactures high-performance solutions with cutting-edge software used to deliver high-bandwidth connectivity and managed services in over 70 countries worldwide.

Ekinops leads in the areas of:

- Advanced coherent optical networking for all metropolitan, regional, long-distance and datacenter interconnection applications
- Secured connectivity solutions for enterprises, from voice and data routing devices to Secure Access Service Edge (SASE) capabilities, including ZTNA (Zero-Trust Network Access), SD-WAN, and SSE.

Ekinops operates globally and is listed on Euronext Paris (FR0011466069 - EKI).