

## DATASHEET

## 1647

## 1G Ethernet Access Device



The 1647 1G EAD (Ethernet Access Device) with OneOS6 software provides CSPs with a demarcation device for high-speed Ethernet services for enterprise customers and be deployed in both wholesale and retail scenarios. In terms of services and QoS, the 1647 is compliant with all MEF-defined services (E-Line, E-LAN, E-tree, E-Access and E-Transit). Scalable SLA monitoring functions provide the measuring tools to support managed services and the implementation of various service activation tests reduce operational costs during the provisioning of high-speed Ethernet services. Supporting both CLI and Netconf/ YANG as management interfaces, the 1647 provides a future-proof solution for managing Ethernet services in a next-generation orchestrated environment while still providing familiar CLI-based operation of the device.

## 1647 Models and Positioning

The basic model of the 1647 EAD provides two 1Gbps Combo ports (UTP or SFP) for WAN connectivity and two SFP ports for customer fiber connectivity in addition to four 1Gbps UTP ports.

This device is positioned to provide cost-effective 1G Ethernet demarcation functions for both wholesale and retail Ethernet services and comes as a desktop version with redundant external power supplies.

Additional variants exist on the base model:

- Version with 4G CAT12 radio interface as main or backup link
- Version with 5G radio interface as main or backup link

This is to be able to provide Ethernet services over 4G/5G networks in several deployment scenarios. The most important scenario is to use the 4/5G radio to provide temporary wireless connections awaiting the installation of permanent fiber connections. Once the permanent connection 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 4/5G access network as primary link to deliver Ethernet services in remote places where a fixed fiber network infrastructure is not available or practical to install.

## Metro Ethernet Services

The 1647 supports delivery of Ethernet services like E-LINE, E-LAN, E-Tree, E-ACCESS and E-Transit and is fully compliant with MEF 3.0.

## OAM Monitoring

OAM monitoring of Ethernet data flows enables to monitor multiple quality parameters like service availability, Frame Delay, Inter Frame Delay Variation and Frame Loss. Some of these parameters are further processed internally to provide time-based statistics. 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. Results can be retrieved in real time or can be further processed locally to provide statistical records based on 2h, 24h, 7 days or 1 month statistics. These processes can run in the background and can be retrieved when needed, avoiding the need to permanently keep track of thousands of parameters in a backoffice server

## Service Activation Testing

The 1647 1G EAD supports SAT testing based on RFC2544 or with the more advanced Y.1564 and implements both traffic generator and traffic reflector. After completing the test, a birth certificate in plain text is delivered by the system for local storage or for archiving purposes. SAT testing allows operators to provide an intrusive end-to-end test to verify that the offered service complies to the agreed SLA agreements. The ability to perform these tests without going on-site enables operators to install, turn on and modify services at minimal cost.

# Technical Specifications



1647 4Gb 6T



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

## Ethernet Interfaces

- 1647 4Gb6T:
  - WAN: 2x 1G COMBO ports (UTP or SFP)
  - LAN: 2x 1G SFP, 4x 1G UTP
- 1647 4Gb6T-4G:
  - WAN: 2x 1G COMBO ports (UTP or SFP)
  - LAN: 2x 1G SFP, 4x 1G UTP
  - Radio: 4G CAT12 LTE, Sierra Wireless EM7565
- 1647 4Gb6T-5G:
  - WAN: 2x 1G COMBO ports (UTP or SFP)
  - LAN: 2x 1G SFP, 4x 1G UTP
  - Radio: 5G, multiple modules available (contact Ekinops for more info)

## Additional Interfaces

- Console: V.24/V.28 with RJ-45

## Scalability

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

## Ethernet Frame Handling

- Basic and extended L2 filtering
- BPDU filtering
- L2PT for tunnelling of L2 protocols
- Configurable Multicast Traffic Behaviour
- IGMP Snooping
- Configurable L2CP transparency
- IEEE802.3x Flow control

## 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
- 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

## Quality of Support (QoS)

- IEEE 802.1p QoS
- Classification based on Source & Destination MAC Address, VLAN ID, priority bits, Protocol (EtherType), Port-based VLAN-ID
- 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

## Backup & Redundancy

- 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

## Security

- IEEE802.1x Port Authentication
- BPDU Guard

## Management

- Operating system: Ekinops OneOS6
- CLI over console port, Telnet, SSHv2
- 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

## Technical Specifications

- Netconf/YANG
- CWMP (TR-069) with Zero-Touch provisioning
- DHCP-based provisioning
- Syslog, Ping, NTP/SNTP Server, TraceRoute
- TFTP Client, FTP Client, SFTP Client, SCP Server, HTTP/HTTPs Client (configuration or software download)
- Inbound or outbound Access Lists on Management Traffic
- Two firmware images can be stored in flash memory
- Embedded Event Manager
- Packet Capturing with Filters to console port, file or remote server
- Automated provisioning and software management with OneManage

### Dimensions & Environmental

- 1647 (all models):
  - WxHxD: 292 x 44 x 182 mm (11.49" x 1.69" x 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 to 40°C
- Maximum altitude: 5000m
- International protection (IP) class of protection against solid and liquids: IP30 for metal housing

### Power Supply

- 2 external power adapters 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)

### Regulatory Compliance

- European compliance: CE mark
- Safety: EN60950-1 class 2, IEC 62368-1, EN 62311:2008
- Overvoltage and overcurrent: ITU-T K.44, K.21 and ETSI ETS 300 386-2. (K21+ optionally)
- Electro-magnetic emission: EN 55022 class B, EN 61000-6-3
- Electro-magnetic immunity:
  - EN55024 Immunity
  - EN61000-3-2 Harmonics
  - EN61000-3-3 Voltage fluctuations and flicker
  - EN61000-4-2 ESD
  - EN61000-4-3 Radiated immunity
  - EN61000-4-4 EFT/burst
  - EN61000-4-5 Surge
  - EN61000-4-6 Conducted immunity
  - EN61000-4-8 Power magnetic field immunity
  - EN61000-4-11 Voltage dips & drops
- LTE: EN 301 489, part 1 and 52, EN 301 908 part 1, 2 and 13, EN 301 511

### Compliance with MEF standards

- MEF 3.0 CE
  - EP-Line, EVP-Line
  - EP-LAN, EVP-LAN
  - P-Tree, EVP-Tree
  - Access E-Line
  - Transit E-Line

### 1647 Versions

- 71904 1647 4Gb6T
- 71905 1647 4Gb6T-4G
- 8xxxxx 1647 4Gb6T-5G (customer-specific)

About  EKinops

Ekinops is a leading provider of open and fully interoperable Layer 1, 2 and 3 solutions to service providers around the world. Our programmable and highly scalable solutions enable the fast, flexible and cost-effective deployment of new services for both high-speed, high-capacity optical transport networks and virtualization-enabled managed enterprise services

Our product portfolio consists of three highly complementary product and service sets: Ekinops360, OneAccess and Compose.

- Ekinops360 provides optical transport solutions for metro, regional and long-distance networks with WDM for high-capacity point-to-point, ring and optical mesh architectures, and OTN for improved bandwidth utilization and efficient multi-service aggregation.
- OneAccess offers a wide choice of physical and virtualized deployment options for Layer 2 and Layer 3 access network functions.
- Compose supports service providers in making their networks software-defined with a variety of software management tools and services, including the scalable SD-WAN Xpress.

As service providers embrace SDN and NFV deployment models, Ekinops enables future-proofed deployment today, enabling operators to seamlessly migrate to an open, virtualized delivery model at a time of their choosing.

A global organization, Ekinops (EKI) - a public company traded on the Euronext Paris exchange - operates in 4 continents.

