

## DATASHEET

## 1651

## 10G Ethernet Access Device



The 1651 10G Ethernet Access Device with OneOS6 software provides CSPs with a service delivery platform for high-speed Ethernet services for enterprise customers and can be deployed in both wholesale and retail scenarios. The demarcation version of the 1651 focuses on Ethernet service termination while the aggregation version is designed to aggregate multiple gigabit Ethernet connections into 10G. Scalable SLA monitoring functions provide the measuring tools to support managed MEF services and the implementation of various service activation mechanisms reduces operational costs during the provisioning of high-speed Ethernet services. Supporting both CLI and Netconf/ YANG as management interfaces, the 1651 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.

## 1651 Demarcation

The 1651 Demarcation version provides 2 SFP+ ports for WAN connectivity and 2 SFP+ ports for client connectivity. Two additional GigE Combo ports are provided for additional Ethernet connections.

This device is positioned to provide cost-effective 10G demarcation for both wholesale and retail Ethernet service providers and comes as a desktop version with redundant external power supplies. Alternatively, the device is also available as a 19" rackmount version with dual internal hot-swappable and load-sharing power supplies.

## 1651 Aggregation

The Aggregation version provides 2 SFP+ ports for WAN connectivity, 2 SFP+ ports for subscriber connectivity and up to 12 customer facing GigE client ports (4x UTP, 4x SFP, 4x Combo).

This device is positioned to aggregate multiple GigE connections into a 10G uplink and comes as a rackmount 1U device with built-in redundant, hot-swappable and load-sharing power supplies.

## Metro Ethernet Services

The 1651 is MEF 3.0 Carrier Ethernet certified for the following services with speeds up to 10 Gbps: E-LINE, E-LAN, E-Tree, E-ACCESS and E-Transit.

## 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 1651 10G 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. The 1651 Demarcation desktop version supports SAT testing up to 1 Gbps while the 1651 rackmount versions supports SAT testing up to 10Gbps. 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



1651 10G Demarcation EAD (Desktop)



1651 10G Demarcation EAD (Rackmount)



1651 10G Aggregation EAD (Rackmount)

## Ethernet Interfaces

- Model Demarcation Desktop (1651 4G+2Gb2T DT)
  - 4x SFP+, 2x GigE Combo (UTP or SFP)
- Model Demarcation Rackmount (1651 X4G+2Gb2T RM)
  - 4x SFP+, 2x GigE Combo (UTP or SFP)
- Model Aggregation Rackmount (1651 X4G+10Gb10T RM)
  - 4x SFP+ 6x GigE Combo (UTP or SFP), 4x GigE UTP, 4x GigE SFP
- SFP+ interfaces are dual rate (1/10Gbps)

## Additional Interfaces

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

## Scalability

- Switching capacity: 50 Gbps
- Up to 250 EVCs
- 8K policers/shapers
- 32.000 MAC addresses
- Max MRU: 10.240 bytes

## Ethernet Frame Handling

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

## 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)

## 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 color, two rate)

## 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 or facility loopback
- Equipment or terminal loopback

## Backup & Redundancy

- G.8031 end-to-end linear protection based (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

## Management

- 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
- SNMP traps
- 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/

## Technical Specifications

- HTTPs Client (configuration or software download)
- Inbound or outbound Access Lists on Management Traffic
- Two firmware images can be stored in flash memory
- Timed Statistics 15', 2h, 24h (Interface related)
- Inbound & Outbound bandwidth usage
- Embedded Event Manager
- Packet Capturing with Filters to console port, file or remote server
- Automated provisioning, configuration and software management with OneManage

### Dimensions & Environmental

- 1651 Demarcation desktop:
  - WxHxD: 360 x 44 x 221 mm (14.17" x 1.73" x 8.7")
  - Weight: 3Kg (6.61 lbs)
  - Rack mount kit is available
- 1651 Rackmount (both Aggregation and Demarcation versions):
  - WxHxD: 440 x 44 x 240mm (17.32" x 1.73" x 9.45")
  - Weight: 4.5 Kg (9.92 lbs)
  - Rack mountable in 19" Rack
- Storage: ETSI ETS 300 019-1-1 Class 1.1; Temperature: -25 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

- 1651 Demarcation Desktop:
  - 2 external power adapters for power redundancy and load sharing (12V, 5A, 60W each)
- 1651 Rackmount (Demarcation & Aggregation versions)
  - 2 internal redundant hot swappable Power Supplies supporting load sharing (2 x 60W)
- Internal AC PSU: Voltage range: 90 – 264 VAC, 50/60Hz
- Internal DC Internal PSU: Voltage range: 48 VDC (optional item)

### Regulatory Compliance

- European compliance: CE mark
- UL 62368-1: 2014
- CAN/CSA-C22.2 NO. 62368-1-14
- 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

### MEF 3.0 CE Certified

- MEF 3.0 CE
  - EP-Line, EVP-Line
  - EP-LAN, EVP-LAN
  - EP-Tree, EVP-Tree
  - Access E-Line
  - Transit E-Line
- All for 10Gbps

### Versions and Standard Codes

- 71688 1651 4G+2Gb2T DT: Demarcation Desktop
- 71691 1651 X4G+2Gb2T DT: Demarcation Desktop
- 71690 1651 X4G+2GBT RM: Demarcation Rackmount
- 71797 1651 X4G+10GB10T RM: Aggregation Rackmount
- 71839 1651 X4G+2GBT RM US: Demarcation Rackmount
- 71840 1651 X4G+10GB10T RM US: Aggregation Rackmount

About



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.

