



Tellabs® 1100 Optical Line Terminal (OLT) Series Ethernet Switching Unit (ESU)

Overview

The Ethernet Switching Unit (ESU) provides centralized intelligence and control allowing bandwidth, Quality of Service and security to be defined in software and dynamically allocated based on real-time requirements down to ports, users and devices. The ESU manages advanced Layer 2 Ethernet and Layer 3 IP functionality across the end-to-end Tellabs network in a focused, simplified manner. The ESU module contains a nonblocking wire-speed IP/Ethernet switching engine that aggregates, processes and forwards all packets between the far-reaching network interface(s) and the IP/Ethernet end devices.

The ESU is engineered to support most critical enterprise business services and applications in the private sector, government, hospitality, healthcare and education markets. It supports higher-level IP functionality (both IPv4 and IPv6) with full IEEE protocol support, including efficient user-to-user and machine-to-machine communication with Ethernet Bridging and powerful VLAN architecture that supports a converged network (voice, data, video, and any device with an IP address). In addition, Layer 2 through Layer 4 Access Control Lists (ACL) for enterprise network security and full IEEE 802.1x are supported. Quality of Service (QoS) is supported at the port level to provide required traffic segmentation/classification, rate limiting (shaping), queue management (buffering) and scheduling (policing) mechanisms.

The Tellabs® 1100 platform and the ESU ensure carrier-class enterprise network stability and the highest resiliency for superior business continuity. With two ESU modules per shelf in a primary and protect configuration, Ethernet Link Aggregation is used to load-balance both modules and effectively double the processing capacity of the system. Redundant ESU modules also allow for nonservice-affecting side switching, failover or card swapping with switching times of less than 50 ms. Any failover of redundantly deployed cards in the system generates an alarm, although service remains intact due to protection. Additionally, the ESU has dual memory for minimal service interruption during software and hardware upgrades.

Standard Form-factor Pluggable (SFP) and 10-Gigabit Small Form-factor Pluggable (XFP) modules are utilized for flexible network interfaces, supporting a wide range of physical media, wavelengths and optical budgets.

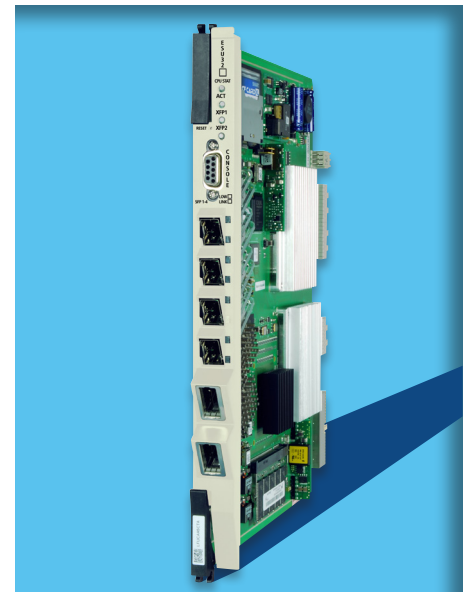
The Tellabs® 1100 platform and the ESU are environmentally hardened and capable of operation in extended temperature environments for deployment flexibility and system-cooling savings.



Tellabs® ESU2 Module 200G Full-Duplex Switch Fabric (Tellabs® 1150 and Tellabs® 1150E)



Tellabs® ESU30 Module 12G Full-Duplex Switch Fabric (Tellabs® 1134 Only)



Tellabs® ESU32 Module 64 G Full-Duplex Switch Fabric (Tellabs® 1134 Only)

The ESU optimizes passive optical Local Area Networks technology to support the requirements of today's and tomorrow's enterprise LANs, which is simple, stable, secure, scalable and saves money compared to legacy copper-based active LAN solutions. The ESU supports voice, video, data, wireless, smart building apps, security, surveillance, environmental and automation along with any auxiliary device that has an IP/Ethernet port on a single network.

Network Uplink Interfaces

- Multiple 1 GbE and 10 GbE interfaces support Ethernet Link Aggregation (LAG) — IEEE 802.1AX, Rapid Spanning Tree Protocol (RSTP) — IEEE 802.1D and Multiple Spanning Tree Protocol (MSTP) — IEEE 802.1Q for maximum flexibility of network resources and resiliency.
- Support 48 GbE uplink utilizing Link Layer Aggregation Control Protocol (LACP) — IEEE 802.1ax — previously 802.3ad
- With each uplink interface, the user is able to specify a list of associated Virtual Local Area Networks (VLANs) employing advanced traffic segmentation, classification, QoS and security.
- Support multiple uplink interfaces to facilitate breaking out of the Voice over Internet Protocol (VoIP) interfaces used for transport of Tellabs voice ports. This allows a direct connection to the voice network without having to pass through an intervening switch. This also allows connection to the Tellabs® 1000 Voice Gateway or a VoIP Softswitch network.

Efficient Enterprise Services and Applications Delivery

- Ethernet Bridging
 - Standard Enterprise operation allows efficient user-to-user communications — fully compliant with IEEE 802.1D
- Supporting both IPv4 and IPv6
- Data, voice, video and auxiliary devices (LAN wireless access points, surveillance, security, automation, environmental controls) are on the same unified network.
- VLAN trunking, termination and translation as defined in IEEE 802.1Q
 - Support for multiple services and/or multiple end-user devices per Ethernet port on the ONT
 - User interface rate shaping per service type
- Link Layer Discovery Protocol (LLDP) IEEE 802.1AB with the extension Media End-point Discovery (MED) as defined in ANSI/TIA-1057
 - Used by network devices for advertising their identity, capabilities and neighbors on an Ethernet network
 - Supports autodiscovery of subtended devices, device location, power management of Power over Ethernet (PoE) devices and inventory management. This allows for complete 911 location specification while optimizing data input on common elements. This capability removes the need to manually provision this attribute in every VoIP handset.

Quality of Service (QoS)

- Traffic classification per IEEE 802.1D and IEEE 802.1Q
- Differentiated Services Code Point (DSCP) as defined by IETF-RFC 5865
 - Supports classifying and managing network traffic, such as providing low latency to critical network traffic — for example, voice or streaming video, while providing simple best-effort service to noncritical network traffic, such as Web traffic or file transfer
- User Interface Rate Shaping per Service Type
 - Optimized service delivery, works in conjunction with VLAN trunking for cost- and performance-efficient deployments
- Rapid Spanning Tree Protocol (RSTP) as defined by IEEE 802.1D (previously IEEE 802.1w)
 - Responds to a topology change within milliseconds
 - Provides increased support for elimination of loops
- Multiple Spanning Tree Protocol (MSTP) as defined in IEEE 802.1Q (previously IEEE 802.1s)
 - Allows VLANs to be placed into groups that are in different spanning trees. This enables a redundant path for each VLAN, which independently switches traffic between the redundant paths.
 - Supports load-balancing traffic

Advanced Security

- Network Access Control (NAC)
 - The purpose of NAC is to provide security policy enforcement and credentialed access management, and block access to entities (e.g., users or machines) that pose a security risk to LAN
- Strong Authentication Functions
 - Port-based Network Access Control as defined by IEEE 802.1X (previously 802.1x)
 - Supports an authentication mechanism for devices requesting attachments to the LAN
 - Supports authentication servers running software supporting RADIUS and EAP protocols
 - Dynamic Host Control Protocol (DHCP), including Option 82 as defined by IETF RFC 2131
 - DHCP servers maintain a database of available IP addresses and other kinds of addresses, such as default route, and one or more DNS server addresses.
 - Option 82 provides additional security when DHCP is used to allocate network addresses. The controller adds the DHCP Option 82 payload and forwards the request to the DHCP server.
 - Trusted Host support for the OLT
 - Public Key Infrastructure (PKI) ensures that only approved network elements are placed on a Local Area Network.
- L2, L3, L4 Access Control Lists (ACL)
 - Security provision necessary to enable Ethernet Bridging
 - Support profiles that can be used to set restrictions and/or to grant permissions for certain types of data traffic that can be allowed on a port.
 - Ingress ACL Rate Limiting

Redundancy and Protection

- Equipment redundancy
- Type-B (Layer 1) PON Protection
 - Supports a 2x splitter that allows two OLT fibers to be connected to a PON and can be used with both OLT fibers on the same or different OLTs.
- Dual homing to core router using LACP, RSTP and MSTP

Scalability

- High-capacity Gigabit Ethernet switching
- Nonblocking wire-speed processing
- Support for up to 4,096 VLANs
- Broad Indoor ONT Portfolio
 - End-user devices that are cost- and function-optimized for Enterprise networks supporting (Ethernet, IP and RF video, VoIP and Analog Voice, and Power over Ethernet)
- Fully managed through Tellabs® Panorama™ PON Manager. Supports Operations, Administration and Maintenance (OAM) functions required by IT professionals
 - Support for both Windows and Solaris environments
 - Allows fast Moves, Adds and Changes with LAN environment
- Virtual Windows support

System Protocols

- IEEE 802.1 — Ethernet
- IEEE 802.1AB — LLDP/LLDP-MED
- IEEE 802.1ad — Provider Bridging
- IEEE 802.1ag — Connectivity Fault Management
- IEEE 802.1AX — Link Aggregation
- IEEE 802.1D — MAC Bridging Standard
- IEEE 802.1p — Traffic Classification
- IEEE 802.1Q — Virtual LANs
- IEEE 802.1v — VLAN by protocol/by port
- IEEE 802.1X — Port-based Network Access Control
- IEEE 802.3af — Power over Ethernet (12.9W)
- IEEE 802.3at — Power over Ethernet (25.5W)
- IEEE 802.3x — Flow Control
- IEEE 802.3ax — Link Aggregation Protocol
- IEEE 802.3ah — Link-level OAM
- IEEE 802.3az — Energy Savings
- IEEE 802.3z — Gigabit Ethernet
- IEEE 1588 Timing over Packet (ToP)
- RFC 2236 IGMPv2 Snooping and Proxy
- RFC 3376 IGMPv3 Snooping and Proxy
- RFC 1046 Priority Queuing
- RFC 3662 Weighted Fair Queuing
- RFC 3261 SIP
- RFC 2327 SDP
- RFC 3350/3551 RTP
- ANSI/TIA-1057 End-point Discovery (MED)

General Specifications

Physical

- Height: 10.8 in (27.4 cm)
- Width: ESU2 — 1.44 in (3.7 cm);
ESU30 — .87 in (2.2 cm)
ESU32 — .87 in (2.2 cm)
- Depth: 9.2 in (23.4 cm)

Environmental

- Operating Temperature: -40° C to +70° C
- Relative humidity: 5%–95%, noncondensing

	ESU2	ESU32	ESU30	Next Generation ESU*
Tellabs 1150 OLT	√			√
Tellabs 1150E OLT	√			√
Tellabs 1134 OLT		√	√	√
Switch capacity (full-duplex)	1150 = 184 Gbps 1150E = 164 Gbps	64 Gbps	10 Gbps	420 Gbps
Network Interface ports (per ESU)	2 x 10 GbE 4 x 1 GbE	2 x 10 GbE 4 x 1 GbE	6 x 1 GbE	2 x 40 GbE 2 x 10 GbE (SFP+)
Multi-service slot capacity	40 Gbps	40 Gbps	4 Gbps	80 Gbps
Backplane capacity	1150 = 640G 1150E = 560G	1134 = 160G	1134 = 16G	1150 = 1.2T 1150E = 1.1T 1134 = 320G
RS-232 Craft port	√	√	√	√
Ethernet Craft port	√	√	√	√

SFP and XFP modules are sold separately.

*Shelf and slot capacity calculated based on shelf being equipped with next generation ESU and next generation 10 G-PON service module

Ordering Information

- Ethernet Switching Unit 2 (ESU2)
 - Part number 4115091
- Ethernet Switching Unit 30 (ESU30)
 - Part number 4115090
- Ethernet Switching Unit 32 (ESU32)
 - Part number 81.11C-ESU32-R5

SFP and XFP Options

Small Form-factor Pluggable (SFP) Options

- Part Number = 128211
 - 1000Base-SX with LC/MM connector
 - 850nm with up to 550 meter reach
- Part Number = C.11T-S1GBELX1131S
 - 1000 Base-SX and LC/SM connector
 - 1310nm and 10 kilometer reach
- Part Number = 81.11T-S1GB40KM-R6
 - 1000 Base-LX and LC/SM connector
 - 1310nm and 40 kilometer reach
- Part Number = C.11T-S1GBER450030
 - 1000 Base-T and RJ-45
 - Up to 100 meters reach

10 Gigabit Form-factor Pluggable (XFP) Options

- Part Number = C.11T-XO192SR1851M
 - 10GbE with LC/MM connector
 - 850nm with up to 550 meter reach
- Part Number = 4195098
 - 10GbE with LC/SM connector
 - 1310nm with up to 10 kilometer reach
- Part Number = C.11T-8800-XFP-IR2
 - 10GbE with LC/SM connector
 - 1550nm with up to 40 kilometer reach

Take the next step. Contact Tellabs today.



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