Tellabs® Optical Network Terminals

A broad portfolio of choices to best result in lowest costs and optimize energy and space savings

Overview

With explosive demand for high bandwidth in the access network and the Local Area Network (LAN), and the trend of fiber migrating from outside homes and buildings to inside data centers, telecom closets and down to the desks, Tellabs stands ready to lead this all-fiber and Passive Optical Network (PON) evolution.

Tellabs® Optical Network Terminal (ONT) design and development are built from nearly 10 years of high-volume PON commercial deployments. Tellabs' fourth-generation ONTs deliver modern high-performance LAN services cost effectively over a PON platform to the IP/Ethernet end points. This means that all services are supported natively over a single fiber, including analog voice, VoIP, high-speed data, IP video and/or RF video, wireless access, building security, building surveillance and building automation end points.

Tellabs ONTs support network configurations where each Virtual Local Area Network (VLAN) group can be bridged or placed in private VLAN. In the bridged mode, all end-users in a VLAN group are bridged per IEEE 802.1d for peer-to-peer communication. In the private VLAN mode, all end-user traffic must traverse network uplink to the Layer-3 edge or core network router.

All Tellabs ONTs provide software and hardware features similar to the look and feel of legacy Active Ethernet LANs but leverage the inherent benefits of PON (e.g., less CapEx, less OpEx, less energy, less space).

Service Delivery — Tellabs ONTs optimize service delivery, work in conjunction with service differentiation and service QoS for cost-effective and efficient deployments.

- Data, voice (e.g., POTS, VoIP), unified communications and video (e.g., IP video, RF video)
- Facility wireless access points, surveillance, security, automation, monitoring and other corporate resources
- Link Layer Discovery Protocol (LLDP) for automated provisioning, power management and enhanced 911 location service

Quality of Service — Tellabs ONTs are supported from a highly reliable Optical Line Terminal (OLT) and allow service-level VLANs to extend into the end-user environment that segregates and secures data flows to each client device.

- VLAN trunking, termination and translation, with user interface rate shaping per service type
- Traffic classification per IEEE 802.1p, IEEE 802.1q and even DSCP for voice
- Dynamic Bandwidth Allocation for bursty upstream traffic
- Type-B PON protection for redundant path to ports, modules or OLTs

Advanced Security — Tellabs has implemented unique security features optimized for the enterprise networks, which are necessary to enable Ethernet bridging.

- Access Control Lists (ACLs) at Layer-2 Ethernet, Layer-3 IP and Layer-4 TCP/UDP levels
- Ingress Broadcast Rate Limiting
- Advanced Encryption Standard AES-128

Strong Authentication — Tellabs' advanced authentication mechanisms provide intrusion detection and protection from unauthorized device activity.

- Network Access Control (NAC) with Dynamic VLAN, Guest VLAN and Quarantine support
- IEEE 802.1x
- RADIUS
- Dynamic Host Control Protocol, including Option 82

All service delivery, traffic management, quality of service, bandwidth, security and authentication provisioning parameters are defined in the software and dynamically allocated, based on real-time requirements. This enables the homogenous operation of LANs in geographically dispersed locations and the automated flow-through of software-defined LAN provisioning parameters.

ONTs	Services	Size	Mounting	Interfaces	Features
Indoor					

Tellabs® 140C Optical Network Terminals	• VoIP
	• IP video
	• data
		• 5.5 in/139 mm
		• 4.1 in/104 mm
		• 1.6 in/41 mm
			• indoor
			• desk or wall
			• in-cubicle
			• secure/lockable
			• free-standing
			• vertical/
			  horizontal
			• plenum
				• (4) 10/100/1000	• remote or local
					  - power
					  - battery
					• PoE

Tellabs® 140W Optical Network Terminals	• VoIP
	• IP video
	• data
		Base:
		• 2.56in/65 mm H
		• 1.85 in/47 mm W
		• 1.28 in/32 mm D
		Faceplate:
		• 4.76 in/120 mm H
		• 2.79 in/70 mm W
		• .87 in/22 mm D
			• indoor
			• in-wall
			• in-cubicle
			• flush wall plate
			• secure/lockable
				• (4) 10/100/1000	• remote or local
					  - power
					  - battery
					• PoE

Tellabs® 142R OpticalNetwork Terminals	• VoIP/POTS
	• IP video/RF video
	• data
		• 8.6 in/220 mm
		• 6.6 in/168 mm
		• 1.3 in/34 mm
			• indoor
			• desk or wall
			• free-standing
			• vertical/
			  horizontal
			• secure/lockable
				• (4) 10/100/1000
				• (2) POTS
				• (1) RF video
					• local
					  - power
					  - battery

Tellabs® 729 Optical Network Terminals	• VoIP/POTS
	• IP video
	• data
		• 1.7 in/43 mm H
		• 17.3 in/439 mm W
		• 17.5 in/279 mm D
			• indoor
			• rack mount
			• comm. closet
			• IDF or zone box
				• (24) 10/100/1000
				• (24) POTS
					• remote or local
					  - power
					  - battery
					• PoE

Table 1: Tellabs broad portfolio of ONTs that are cost and function optimized for enterprise networks

Indoor Optical Network Terminals (ONTs)

Tellabs® Optical LAN Solutions provide broadband fiber connections directly to the local area network end-users. It is the evolutionary technology that replaces legacy Active Ethernet equipment and associated copper-based CATx wiring with passive G-PON equipment, near-future-proof single-mode fiber, additional security and faster speeds. CAT3, CAT5 and CAT5e cable have historically outdated themselves every 3 to 5 years, and there is no confidence that CAT6, CAT7 or CAT8 will break that trend. As this CATx copper-based cabling solution has evolved to satisfy today's explosive bandwidth demands, it has grown larger, stiffer, heavier and more expensive. Single-mode fiber now represents the bandwidth future-proof, technology-transparent low-cost long-term solution for in-building LAN wiring. Tellabs Optical LAN uses 30%–50% less CapEx, 50%–70% less OpEx, 30%–65% less energy and 90% less space compared with legacy copper-based Active Ethernet LAN.

Indoor serving 4-port Gigabit Ethernet with free-standing or vertical or horizontal or plenum mounting options — In the Fiber to the Desktop architecture, single-mode fiber is installed to the end IP/ Ethernet device (Picture 1). Optical Distribution Network (ODN) splitters can be positioned in the data center, telecom closet or remote fiber distribution housing, depending on the building fiber design strategy (e.g., home-run or distributed). The small form factor ONT handles the optical to electrical conversion providing the G-PON to Ethernet transition.

Picture 1: Tellabs® 142R Optical Network Terminal

Fiber to the Desktop architecture is preferred where PON's inherent benefits and value proposition are fully exploited. This can be achieved when new facilities are able to push fiber all the way to the IP/Ethernet devices served. This architecture can also be taken advantage of when building owners and IT managers upgrade the existing copper-based CATx cable infrastructure to near-future-proof single-mode fiber.

Whether serving 200 IP/Ethernet end points or 8,192 end points, Tellabs can match ONTs' sizes, interfaces, mounting and network architecture for the lowest first cost CapEx, ongoing OpEx, energy use and space required.

Service Delivery — These ONTs support voice (both analog and VoIP), and data and video (both RF and IP). Either voice is supported with SIP agents at the POTS ports (i.e., RJ-11), or unified communications systems can be supported over data ports (i.e., RJ-45). IP video is supported either through deterministic multicast IGMP or through broadcast bridged configurations.

RF video over PON is supported using the 1550 nm overlay wavelength, ultimately terminating on the F-Connector port of the ONT. In addition to voice and video, all enterprise LAN service can be delivered over a PON, such as wireless access points, building surveillance cameras and other building resources.

Mounting — ONT mounting can be located above the desk or below the desk, or ONTs can be wall mounted. Where security is a priority, lockable enclosures can be used for any of the above-listed locations. They can also be mounted in zone boxes, with optional plenum brackets and in raised floors.

Powering — ONT powering options include both local AC and remote DC. For local AC power, power adaptors are used to transform 120 AC power from the wall plug to 48 DC power delivered to the ONT. For the remote DC power option, a centrally located bulk rectifier can be used, and 48 VDC power is delivered over CATx cables or new hybrid fiber/copper cables.

Battery Backup — If a local power option is deployed, then the battery backup is a separate device at the ONT. If a remote power option is utilized, then a centrally located bulk battery backup can be used. Typically, the chosen battery backup solution provides easy-to-read LEDs, audible alarm and self-diagnostic tests, and provides support for hot-swappable battery exchange.

Power over Ethernet — Certain versions of the Fiber to the Desktop ONTs support IEEE 802.3at Power over Ethernet, ultimately powering VoIP phones, wireless access points, building surveillance cameras and other building resources. In addition, 25.6 watts of PoE+ is provided on a per port basis for a total maximum of 65 watts per ONT.

Indoor ONT serving 2-port or 4-port Gigabit Ethernet with plenum or in-wall or cubicle flush mount options — The Tellabs® 100 Series ONTs are an evolutionary form factor that allowsfor installation in standard 1-gang or 2-gang electrical boxeswithin walls (Picture 2) or within the raceways of modular cubicle work environments.

Picture 2: Tellabs® 140W Optical Network Terminal

In-wall and cubicle raceway-mounted mini ONTs are best used in deployments where aesthetics are a priority or where security initiatives require concealed mini ONTs. Their purpose is to replicate the same work area outlet and present a flush connector input (RJ-45) as in legacy Active Ethernet LAN deployment. However, once again the inherent benefits of PON are exploited, such as breaking the traditional 100-meter reach constraint (i.e., PON can reach 30 km).

Service Delivery — The initial release of Tellabs® 100 Series ONTs is focused on data-only networks, such as VoIP unified communications, LAN traffic, wireless access points, building surveillance cameras, building automation and other building resources. On some models there will be future expansion modules, such as Assured Service SIP voice, the addition of two more 10/100/1000 modules and dual PON uplink options. IP video (e.g., entertainment, security, conference) is supported either through deterministic multicast IGMP or through broadcast bridged configurations. The ONTs are IPv6 ready.

Mounting — These ONTs are designed, engineered and tested for mounting inside standard in-wall drywall rings or within cubicle raceways. In both installations a flush wall plate conceals the ONTs inside the wall. The Tellabs 140C can also be mounted in zone boxes, with optional plenum brackets and in raised floors.

Powering — ONT powering options include both local AC and remote DC. For local AC power, power adaptors are used to transform 120 AC power from the wall plug to 48 DC power delivered to the ONT. For the remote DC power option, a centrally located bulk rectifier can be used and 48 VDC power is delivered over CATx cables or new hybrid fiber/ copper cables. Tellabs 100 Series Mini ONTs support IEEE 802.3az energy-efficient Ethernet providing a sleep mode for idle Gigabit Ethernet ports.

Battery Backup — If a local power option is deployed, then the battery backup is a separate device at the ONT. If a remote power option is utilized, then a centrally located bulk battery backup can be used. Typically, the chosen battery backup solution provides easy-to-read LEDs, audible alarm and self-diagnostic tests and support for hot-swappable battery exchange.

Power over Ethernet — The Tellabs 100 Series Mini ONTs support both IEEE 802.3af and E 802.3at Power over Ethernet, ultimately powering VoIP phones, wireless access points, building surveillance cameras and other building resources with 15.4 watts (802.3af) PoE or 25.6 watts (802.3at) PoE+ is provided on a per port basis. Tellabs 100 Series Mini ONTs support Link Layer Data Protocol (LLDP) for Powered Device (PD) configuration, power management and power monitoring.

Picture 3: Tellabs® 140C ONT

Indoor serving 24-port gigabit Ethernet with rack mounting options — In the Fiber to the MultiDesk architecture (also known as Fiber to the Communications Closet), single-mode fiber is installed to the telecom closet where the 24-port 1 rack unit ONT is rack mounted in a standard telecom rack (Pictures 3 and 4). Optical distribution network splitters can be positioned anywhere between the data center and the ONTs in the telecom closet. Typically, five 24-port ONTs are served from an ODN splitter. The 1 rack unit ONT can be equipped with 24 ports of POTS and 24 ports of data.

Picture 4: Tellabs® 729GP ONT

Fiber to the MultiDesk architecture is ideal when clients choose to leverage existing CATx cabling, which may occur when building owners want to best match their existing copper-based Active Ethernet infrastructure. A building owner or IT manager may make the decision to deploy optical LAN in a phased approach with the first phase being Fiber to the MultiDesk and the second phase being Fiber to the Desktop.

Service Delivery — These ONTs support voice (both analog and VoIP), data and all forms of IP video (e.g., entertainment, security, conference). Either voice is supported with SIP agents at the standard 50-pin connector (e.g., RJ-21), or unified communications systems can be supported over data ports (i.e., RJ-45). IP video is supported either through deterministic multicast IGMP or through broadcast bridged configurations.

Mounting — These 24-port ONTs are 1 RU in height and can be mounted on a standard 19″ telecom rack or 23″ rack with appropriate mounting brackets.

Powering — For local AC power, input power takes 120/240 AC from a 3-pin AC power connector with an on-board switch and fuse accessible from the back of the ONT.

Battery Backup — For backup power options, existing building backup power generation systems can be utilized.

Power over Ethernet — Both the 728GP and 729GP MDU ONT support IEEE 802.3at Power over Ethernet, ultimately powering VoIP phones, wireless access points, building surveillance cameras and other building resources. In addition, 25.6 watts of PoE+ is provided on a per port basis for a total maximum of 450 watts per ONT.

Ordering Information

- Tellabs 140C Mini ONT, order part number 81.11G-ONT140C-R6

- Tellabs 140W Mini ONT, order part number 81.11G-ONT140W-R6

- Tellabs 142R ONT, order part number 81.11GONT142R-R6

- Tellabs 729GP ONT, order part number 81.16G-729GP0PB-R6

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