



# Telco Access: Unwavering Support for Legacy Telecom Services

Service provider networks are evolving to take advantage of new technologies that support users' insatiable demand for bandwidth. But change does not happen overnight, and legacy telecom services continue to remain an important part of network operations. In many cases, large and small businesses have made big investments in legacy equipment and related processes. When the companies expand to new locations or add capacity, it often makes sense to continue deploying embedded technologies. And in some cases, government tariffs regulate that service providers must offer services that fall into the "legacy" category.

Tellabs Telco Access products are well suited to meet the demands of all services in today's networks with a clear path to evolving services. Tellabs is one of the only, if not the only, telecom equipment provider that supports service providers' needs for all legacy services while simultaneously providing emerging services.

## Analog Services

The Tellabs Telco Access product line offers many legacy analog interfaces that support Plain Old Telephone Service (POTS) two- and four-wire switched and nonswitched services. Examples of services include Coin, DID/DOD, FXS/FXO and support for Centrex and PBX.

### Traditional POTS

The cornerstone of many networks is POTS. The Tellabs® 1000 Multiservice Access Platform (MSAP) provides POTS to residential and business subscribers in the access network and interface to the Public Switched Telephone Network (PSTN). The Tellabs 1000 MSAP can interface with all Class 5 switches and supports all three standard interface types deployed in North America: universal with GR-57, and integrated with GR-08 and GR-303. The Tellabs 1000 MSAP is extremely scalable. A system can be deployed as a single shelf with one to one hundred subscribers or can be up to 32 connected terminals in various topologies with up to eight shelves each, providing service for up to 2,000 subscribers.

#### GR-303

The primary benefits of the Tellabs 1000 GR-303 interface include:

- Reduced costs for equipment procurement, maintenance, and inventory; no need for L-POTS, L-PAY, L-UVG or L-ISDN plug-in cards
- Reduced costs through efficient use of switch ports
- Increased revenue through greater subscriber concentration and dynamic time slot interchange
- Higher quality of service because of the digital interface, including increased modem speeds

Tellabs GR-303 solution delivers the following capabilities:

- Up to three interface groups per Tellabs 1000 MSAP system
- From 2 to 28 DS-1s per interface group; up to 28 total DS-1s per Tellabs 1000 MSAP system
- Up to 2,048 CRVs per interface group; up to 2,048 total CRVs per Tellabs 1000 system at a 3:1 concentration
- Up to 672 subscribers off-hook simultaneously
- Support for up to 32 remote terminals per LET or master terminal
- Support for 4:1 ISDN D-channel multiplexing

### Support for up to 2,000 Lines

The Tellabs 1000 MSAP supports up to 2,000 off-hook lines of POTS services without consuming narrowband DS-0s on the terminal's primary shelf. The Tellabs 1000 MSAP converts analog/TDM POTS traffic and passes the traffic to the primary shelf for transport over SONET OC-3, OC-12 or Gigabit Ethernet. An EBC-3+ plug-in card provides the conversion between TDM and cell/packet.

### Special Services

Analog special services continue to be deployed. The Tellabs 1000 MSAP is one of the only, if not the only, DLC available that can provide a full range of services. The table above shows examples of the analog special services that are supported along with the plug-in cards that support them and the number of circuits supported by each plug-in card.

## Digital Legacy Services

The Tellabs Telco Access product portfolio supports digital legacy services as well as legacy services and higher bandwidth xDSL and Ethernet services. Examples of legacy digital services are T1 (using T1 or HDSL), Fractional T1, DDS and ISDN.

### T1

Network operators and service providers rely heavily on standard T1 transmission for services and interconnection. Some services use T1 directly for data services for its entire 1.5 Mbps, while other services need only a fraction of the T1's capacity, also known as a "fractional T1" or "Nx64." Network operators use T1s in many ways, including Class 5 switch interface (GR-08 and GR-303), business PBX and interfacing to mobile network base stations to use the Tellabs 1000 MSAP for mobile backhaul. In some areas where fiber optic cable is not available, network operators can use multiple T1s in an Inverse Multiplex ATM (IMA) configuration to boost the T1 capacity by a multiplier.

Service Description	CO Side Line Card	Remote Side Line Card	Number of Circuits
Direct Inward Dial Service (DID)	R-UVG or SS 2/4	L-UVG or SS 2/4	6 or 2
Direct Outward Dial Service (DOD)	L-UVG or SS 2/4	R-UVG or SS 2/4	6 or 2
2- or 4-wire E&M Service usually used in the central office	E&M	E&M	4 or 2
Equalized Transmission Only (ETO)	SS 2/4	SS 2/4	2
Foreign Exchange service applications (FXO/FXS)	L-UVG or SS 2/4	R-UVG or SS 2/4	2
Voice private line services (Leased line) — Analog, nonswitched, 2- or 4-wire service	SS 2/4 or TO	SS 2/4 or TO	2, 4 or 6
Off-premises extension — Analog 2-wire	R-UVG or SS 2/4	L-UVG or SS 2/4	6 or 2
Off-premises PBX — Analog 2-wire	R-UVG or SS 2/4	L-UVG or SS 2/4	6 or 2
PBX — Local PBX trunk service	L-UVG or SS 2/4	R-UVG or SS 2/4	6 or 2
Private Line Automatic Ringdown “hotline” service (PLAR)	R-UVG or SS 2/4	R-UVG or SS 2/4	6 or 2

Tellabs® 1000 MSAP supports analog special services with easy-to-install plug-in cards.

The Tellabs 1000 MSAP offers multiple T1 options to provide services and network transport, including T1A modules for full 1.5 Mbps services (with and without line powering options), channelized T1 modules, supporting access to the individual 64 Kbps channels (with and without line powering options) along with HDSL2 (2-wire HDSL) and HDSL4 (4-wire HDSL) modules.

*T1 Applications*

T1 is a standard digital transmission link with a speed of 1.544 Mbps. T1 provides 24 DS-0 channels for voice or data from one point to another. Originally, T1 was delivered on two pairs of unshielded twisted copper wires, one pair to transmit and one pair to receive. T1 interfaces now operate over fiber optic cable, coaxial cable, infrared or microwave as well as copper.

**Asynchronous** — Asynchronous service, also known as intact service, provides a T1 interface to the terminating equipment where the entire 1.544 Mbps is used for customer payload. The circuit assignment is at the DS-1 level.

Nonline Powering T1 plug-in cards are referred to as DS-1X and are identified by having an “X” after the T1 designation. DS-1X plug-in cards cannot support line powering and are used in short-haul applications, such as interface to a switch within the central office (CO) or interface to an office repeater bay (ORB) within the CO. The maximum distance of a DS-1X plug-in card should not exceed 666 feet. The Nonline Powering T1 Transceiver (T1X-XCVR) plug-in card provides an indoor ANSI/T1 DS-1X-level interface. It transmits and receives up to 24 DS-0s of voice or data originating from either the channel units in the CBA subscriber slots, another T1 transceiver card or a digital carrier line unit in a digital switch. It operates at the T1 rate of 1.544 Mbps. Use the T1X-XCVR card for applications requiring interface to multiplexers or other co-located equipment.

*HDSL*

The T1 HDSL2 Transceiver (T1HD2-XCVR) plug-in card provides a T1 rate interface, transmitting and receiving up to 24 DS-0s of voice or data over one copper wire pair. The T1HD2-XCVR does not use separate transmit and receive pairs. Instead, it uses one pair that provides bidirectional transmission. The card can function in an unframed format to allow for intact (asynchronous) T1 delivery to subscribers. It can also function in a framed format to deliver groomed T1 service. The T1HD2-XCVR card provides a single T1 rate interface up to 12 kft over nonrepeated 24 AWG copper facilities or 23 kft over repeated 24 AWG copper facilities.

The T1 HDSL4 Transceiver (T1HD4-XCVR) plug-in card provides a T1 rate interface, transmitting and receiving up to 24 DS-0s of voice or data over two copper wire pairs. The card uses two copper wire pairs, each running at half the HDSL4 data rate. Each copper wire pair provides bidirectional transmission. The T1HD4-XCVR card can function in an unframed format to allow for intact (asynchronous) T1 delivery to subscribers. It can also function in a framed format to deliver groomed T1 service. The T1HD4-XCVR card provides a single T1 rate interface up to 14.8 kft over nonrepeated 24 AWG copper facilities or 45 kft over repeated 24 AWG copper facilities.

*ISDN*

Integrated Services Digital Network (ISDN) is a standard technology that supports many services, such as radio circuits, business-to-business intranetwork connections and legacy DDS.

Tellabs provides the capability to provide ISDN in switched networks in both universal and integrated switch interface configurations.

Legacy DDS provides functionality in applications that need only relatively low bit rates. There's no reason to blast large amounts of data and capacity at a function when only a small amount is required. Examples of the functions/services include bank ATM machines, retail store scanners and lottery machines.

The legacy DDS capability in the Tellabs® 1000 MSAP product line is centered on the OCU-DP and DS-0 DP modules. These line cards support the standard DDS (Digital Data Service) of 2.4 Kbps, 4.8 Kbps, 9.6 Kbps and 64 Kbps services.

## Summary

Legacy telecom services continue to be an important part of how service providers deliver voice and digital services to customers. Tellabs Telco Access products provide ongoing support for legacy services while providing a path for transitioning to newer technologies.

Take the next step. Contact Tellabs today.



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