

Product Family Overview



WorldDSL is ADC's line of high-speed HDSL access devices specifically designed for the diverse telecommunications needs of global markets. Ideal for telco and enterprise networks, WorldDSL products comply with international standards to ensure compatibility, performance and safety within your network environment.

WorldDSL products provide repeaterless HDSL transport of full or fractional E1 (FE1) service or Nx64k leased line data service over one or two pairs of unconditioned copper wire. They also eliminate the costly and time consuming steps of pair selection, loop conditioning and repeater installation.

The WorldDSL family is made up of several broad product categories: 2B1Q 2-pair fixed rate and 1-pair rate selectable systems and G.shdsl 1-pair rate selectable systems.



Description

WorldDSL™ 2-Pair Fixed Rate Systems

These 2B1Q HDSL systems, in ITU terminology, are made up of LTUs and NTUs. LTUs act as communication masters and can line power NTUs or regenerators. NTUs act as communication slaves and can be either AC or line powered. WorldDSL NTUs are available in 2 variants. The first is a card that plugs into a WorldDSL enclosure or chassis (called a UTU or Universal Terminating Unit) and the second is packaged in a desktop housing (called an ETU) with built-in power, either line or AC. This family of products is compliant with European Telecommunications Standard Group (ETSI) TS101135 and ITU-T G.991.1. The user payload is delivered over two HDSL twisted pairs at a fixed rate. These feature-rich systems offer the following capabilities:



- ETSI-compliant HDSL transmission
- Fiber optic quality (BER 10^{-10})
- G.703/704 port models (full or fractional E1)
- Nx64k V.35/V.36/X.21/RS-530 software selectable data port models
- Combined G.703/704 and user data port models
- Channel blocking
- User selected idle code word inserted into blocked channels automatically
- Single pair mode where the unit uses only one pair at a maximum rate of 1 Mbps
- Point-to-multipoint configurations where a single LTU can operate two 1 Mbps NTUs each via a single twisted pair to reduce system costs
- Timeslot priority mode where, if one of the two HDSL pairs fails, the FAS, signaling and first 15 voice channels are switched to the operating pair to preserve critical communications
- Downloadable programs from ADC's Web site for easy unit upgrade
- Fully manageable either locally or remotely via ASCII text screens or SNMP GUI

Extended Range Operation

For loops whose length exceeds the range of the two pair HDSL capability (typically 3.8 km), the WorldDSL product family includes an ETSI-compliant regenerator or doubler which regenerates the signal to increase range. Doublers are always line powered from an LTU. Up to two doublers can be installed in a circuit, each of which will extend the reach of the circuit. For example, if, based on the noise model and wire gauge, reach is 3 km, adding one doubler will extend reach to 5.8 km and a second will extend reach to 7.5 km. Doublers and their enclosure are designed for severe outdoor environments and can be mounted on poles, in underground vaults or elsewhere.





Description

WorldDSL™ 1-Pair Rate Selectable (RS) Systems

These 2B1Q systems, available in either G.703/704 or V.35/V.36/RS-530/X.21 Nx64k versions, operate over a single twisted pair at any rate from 64 kbps to 2 Mbps offering dramatic savings in copper cost and the cost of the modem itself. By automatically varying the actual HDSL transmission rate to match the user's bandwidth requirement, the units achieve very long range at lower bit rates and lesser range than a two-pair fixed rate system at rates of about 768 kbps to 2 Mbps. The RS systems are competitive in price with baseband modems, with the advantages of single pair operation and growth to full 2 Mbps operation as the demand by customers for more bandwidth grows. The family of products is made up of UTUs and ETUs, either of which may be user-programmed to act as a communication master or as a communication slave to create low cost point-to-point circuits. The UTUs can plug into either a WorldDSL chassis or enclosure. The ETU is packaged in a desktop housing with built-in AC power.



WorldDSL™ G.S 1-Pair Rate Selectable Systems

Meeting the ITU-T G.SHDSL standard, this family of products utilizes 16-Level Trellis coded PAM modulation to enhance reach and improve compatibility with ADSL in the same binder group and is fully standards based. Based on proven RS software, this new family of single pair rate selectable modems is fully compliant with ITU-T specifications including enhanced performance monitoring, both G.21 and G.26 E-1 performance measures and performance and alarm history exceeding the standard. Optional 32-level Trellis coded PAM allows even greater reach. Because these units are based on proven software, they are managed in a fashion similar to ADC's 2B1Q modems minimizing user training and problems when introducing this new technology. The G.SHDSL modems are fully compatible with current WorldDSL chassis', enclosures, management software and accessories ensuring minimum cost and easy changeovers.

HDSL Modem Compatibility

All members of each family (2-pair and 1-pair 2B1Q and 1-pair G.shdsl) are compatible with all other members of the family. For example, a V.35 modem at the customer premises can be interfaced to an E1 modem in the central office. There are no restricted combinations.



Chassis and Enclosures

All WorldDSL LTUs and UTUs, whether 2-pair Fixed Rate or 1-pair Rate Selectable, share a common set of chassis and enclosures, which minimizes initial and inventory costs and space requirements. Two 17-slot high density chassis are offered, each fully connectorized for both G.703 balanced and unbalanced circuits and Nx64k dataport circuits. 16 slots are used for HDSL modems, while one slot is reserved for a management card. 2-pair and 1-pair modems may be freely mixed in a chassis. Both chassis are designed for 19 inch rack mounting. One provides rear access to the connectors while the other provides front access. All circuit cards plug in from the front of the chassis for easy maintenance. All ADC modems are powered by -48VDC with distributed logic power supplies on each circuit card, eliminating costly shelf mounted supplies and a major potential single point of failure.

WorldDSL includes a line of enclosures designed for wall, shelf or desktop mounting. These units come in single or two slot versions and an outdoor hardened version. Enclosures can accommodate any WorldDSL LTU or UTU and are fully connectorized in a manner the same as the chassis. The single slot enclosure may be powered by either AC or DC or both for the highest possible reliability. Made of heavy gauge aluminum, the single slot enclosure is rugged and lightweight.



Description

Management

ADC provides a range of network management tools to allow configuration and management of HDSL modems. All tools are compatible with the entire line of 2-pair and 1-pair HDSL modems. Most importantly, in all management methods, the remotely installed NTU can be managed from the LTU or a central network management center. Once installed, there is never a need to travel to the customer premises in normal operations.

Each modem has a V.24 craft port and can be managed locally simplifying circuit installation and maintenance. Rather than setting multiple switches and jumpers, an easy to use software screen provides full management and configuration information and control. The NTU can be programmed via the LTU craft port to minimize the amount of expensive field work. With a Management Unit installed in a WorldDSL chassis, Terminal Access Option (TAO) provides a means for local or remote management of all modems installed in one or more shelves and the corresponding NTUs (using a PC and screens identical to the craft port methodology). TAO access can be local by plugging into the TAO port of the Management Card or remote over the dial-up network using a Hayes compatible modem. With this method, ASCII alarm messages for any modem may be transmitted from the Management Card over the dial-up network to any selected telephone number.



All ADC WorldDSL modems include both a 24-hour by 15-minute and a 7-day by 24-hour history database. The complete log of all alarms is also included. Alarms may be enabled or disabled, and many can have a user-set threshold.

The Management Card has a complete set of SNMP agents and allows the exchange office shelves to be managed from a Windows computer over a private Ethernet LAN or via Telnet on a dial-up basis. A powerful GUI application running on top of HP OpenView for Windows is available to make configuration and management of the HDSL modems simple and low in cost. The ADC provided SNMP based management software supports BOOTP and TFTP and allows multiple chassis in a common location to be interconnected by a 10Base2 LAN to further simplify management. The Management Card also provides multiple alarm relays that can be attached to a Central Office alarm system for modem performance monitoring. Individual alarms can be enabled or disabled to tailor the alarm system to the user's needs.

Built-In Bit Error Rate Testing

Each WorldDSL LTU has a built-in Bit Error Rate tester. Testing can be implemented and monitored via any WorldDSL management method. Utilizing the built-in $2^{15}-1$ pattern generator and remote loop-back capability of the NTU, short and long term tests can be run to determine a Bit Error Rate for the entire circuit. Using these capabilities means lower installation costs and easier sectionalization in the event of a problem.

OEM Modules

A line of WorldDSL-compatible OEM modules is also available which enables equipment manufacturers to easily incorporate HDSL transmission technology into their designs. These modules are fully interoperable with ADC's WorldDSL transmission products. OEM Modules are available in both 2-pair and 1-pair rate selectable 2B1Q versions.

Applications

Almost any digital access line can be provisioned more cost-effectively with HDSL than with any other technology. Typical applications for ADC WorldDSL systems are PABX connections to a Central Office and dedicated leased line service for data, video conferencing and wireless interconnection.

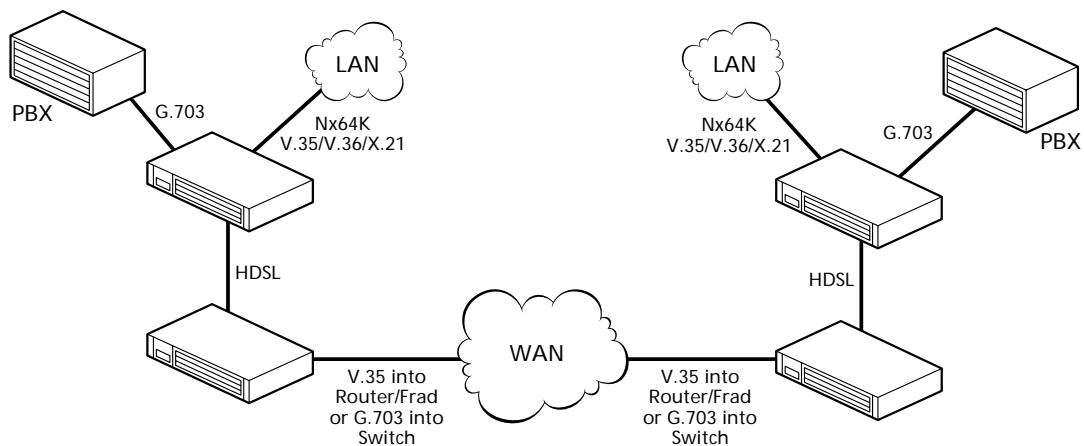


Figure 1: WorldDSL private network application

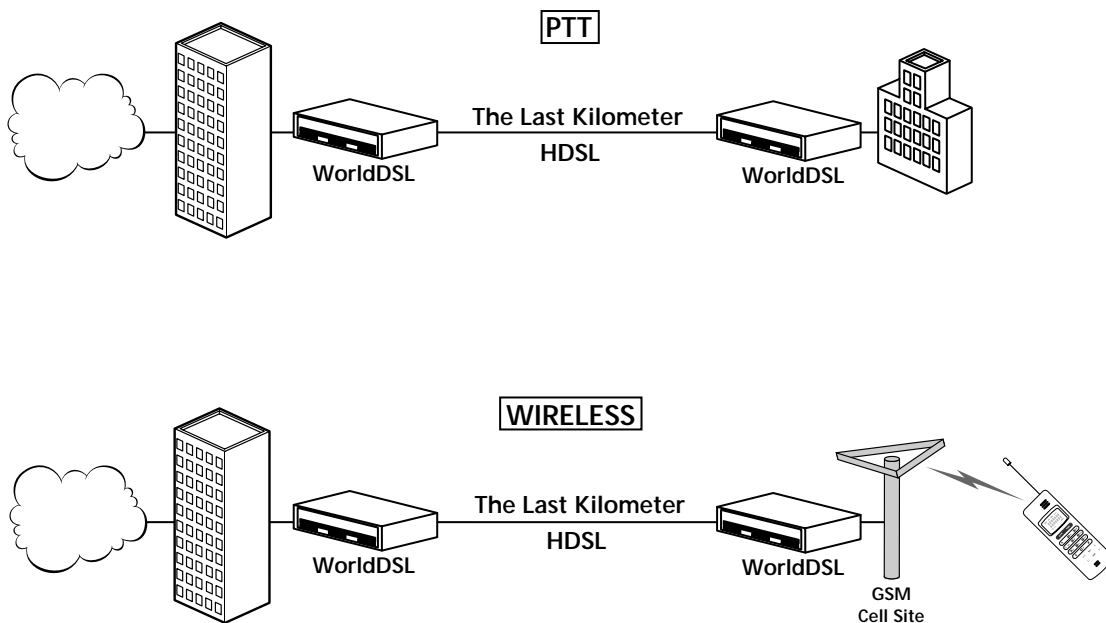


Figure 2: Typical 2-pair WorldDSL applications

Quality and Reliability

All ADC WorldDSL products are 100% tested and burned-in in the most modern TL 9000 accredited manufacturing facilities. A closed loop quality system ensures tight control of the manufacturing process to ensure that the reliability designed-in is always built-in. To back up our commitment to quality, all WorldDSL circuit cards are warranted for a full five years.



Web Site: www.adc.com

From North America, Call Toll Free: 1-800-366-3891 • Outside of North America: +1-952-938-8080 Fax: +1-952-946-3292
For a complete listing of ADC's global sales office locations, please refer to our web site.

ADC Telecommunications, Inc., P.O. Box 1101, Minneapolis, Minnesota USA 55440-1101
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