Campus-RS

Rate-Selectable SDSL Systems

Campus-RS™ is a versatile symmetric digital subscriber line (SDSL) system – ideal for a wide range of private networking environments, including corporate campuses, universities, medical complexes and military facilities. Campus-RS provides reliable, high-speed enterprise connectivity using the existing copper cable plant.

Featuring a flexible, rate-selectable design, the Campus-RS family of products seamlessly accommodates a wide range of network interfaces and access speeds. The result is an innovative system that delivers high performance and cost savings by supporting a wide range of applications through a single platform solution. Campus-RS can be used for local area network (LAN) extension, remote data access, PBX networking, video conferencing and distance learning.

Features:

- Rate selectability – accommodates a broad range of line speeds and distance requirements
- Flexible network interface options – supports a variety of data, voice and video applications
- SNMP-based network management – enables reliable, standards-based monitoring and troubleshooting
- Proven SDSL technology – allows for quick installation while providing fiber optic quality transmission

Description

Campus-RS Remote

The Campus-RS remote installs in just minutes and provides support for a variety of network interfaces, including 10BASE-T, V.35 and DS1, to enable data, voice and video applications within a private enterprise network. The Campus-RS remote features user-selectable DSL data rates ranging from 128 kbps up to 2.3 Mbps over a single loop (2-wire) and up to 4.6 Mbps over two loops (4-wire). Units also support standard T1 (1.544 Mbps) and E1 (2.048 Mbps) rates. Campus-RS remotes can be connected back-to-back within the network or into the Campus-RS Star concentrator to support a variety of point-to-point or point-to-multipoint network applications.

- Line speeds from 128 kbps up to 4.6 Mbps*
- Front panel set-up and monitoring with LCD
- Ethernet bridging and static IP routing
- Serial data/router interfaces
- T1/E1 network access

*Data rates vary depending on interface cards

Campus-RS Star Concentrator

The Campus-RS Star concentrator provides a central site concentrator for aggregating multiple SDSL connections. The Star concentrator supports up to 14 line units interoperating with Campus-RS remotes or with another line unit in a remote Campus-RS Star. Each slot in the Campus-RS Star is capable of supporting the full range of DSL line rates from 128 kbps up to 4.6 Mbps and a variety of network interfaces including 10BASE-T, V.35 and DS1. The Campus-RS Star also provides centralized SNMP network management and redundant AC or DC power supplies.

- Industry's first SNMP-managed SDSL platform
- Supports up to 14 simultaneous connections
- Scalable, modular design
- Rack mountable – 19" and 23"

Network Management

The Campus-RS Management Unit (CMU) installs into the Star concentrator and performs SNMP agent functions. With the CMU installed, network management can be enabled using any 3rd party network management system. The REX Ethernet interface module also features an embedded SNMP agent in support of specific bridging functions. Network management is further enhanced with the StarGazer™ Element Management System.

- SNMPv1 MIB II compliant
- 3rd party NMS (Network Management Software) support
- StarGazer™ GUI management application
- In-band (AUI port) and remote (SLIP port) management
- BootP and TFTP support
- Front panel access and local console port
- Alarm and status LEDs
- Local and remote loopbacks

Description

Network Interface Modules

Network interface modules install directly into both the Campus-RS remote and Campus-RS Star Concentrator to provide the local network interface at each end of the DSL connection. The Campus-RS REX interface module is a full-bandwidth Ethernet bridge or static IP router. The serial data interface modules support a full range of nx56/64 kbps synchronous rates. The integrated CSU modules are designed to provide direct connections to a T1 switch/mux or directly to the WAN.

- 10BASE-T bridge/router
- Fractional rate serial interfaces: V.35, X.21/V.11, RS-530, RS-449
- DS1 and DSX-1 w/integrated CSU
- G.703 (75 Ω/120 Ω)
- Multiport "FLEX" (DSX-1 with 2 serial ports)

Specifications

SDSL WAN Interface	Physical Interface: RJ-48C Signal Format: full-duplex 2B1Q line code, 130.7 to 2352 kbps per loop, 1 or 2 loops, selectable Data Rate: One loop: 128 kbps to 2304 kbps, in 64 kbps increments* Two loops: 256 kbps to 4608 kbps, in 128 kbps increments* Transmit Signal Power: +13.5 dBm (±1 dBm) Return Loss: 20 dB, 40 kHz to 200 kHz Loop Provisioning Loss: 35 dB at 200 kHz at 135 Ω (at a T1 rate) One-Way Transmission Delay: <300 µ (at a T1 rate)
Clock Options	Internal, SDSL or data port (depending upon interface option)
Performance Monitoring	Errored seconds and unavailable seconds in the last 24 hours, 15-minute intervals Errored seconds and unavailable seconds in the last 7 days, 24-hour intervals Signal/noise margin on SDSL lines SDSL line attenuation
Alarms	SDSL link, errored seconds threshold (local and remote), SDSL low margin (selectable threshold), local data port loss of signal, remote data port loss of signal
Loopbacks	Up to 5 selectable loopback modes (depending upon interface option)
Management/ Maintenance	RS-232 (RJ-45 connector); 9600, 8/N/1 2 x 16 LCD with push buttons for status/configuration Alarm and status indication LEDs
Power Input	Remote: AC: 110 VAC@60 Hz or 220 VAC@50–60 Hz, 8W DC: -18 to -72 VDC Star Concentrator: AC: 110 VAC@60 Hz or 220 VAC@50–60 Hz, 100W DC: -36 to -72 VDC
Environmental	Operating Temperature: 0 to 50°C Relative Humidity: 0 to 85% Electromagnetic Emissions: FCC Part 15 Class A, CE Safety Compliance: UL, CSA, CE

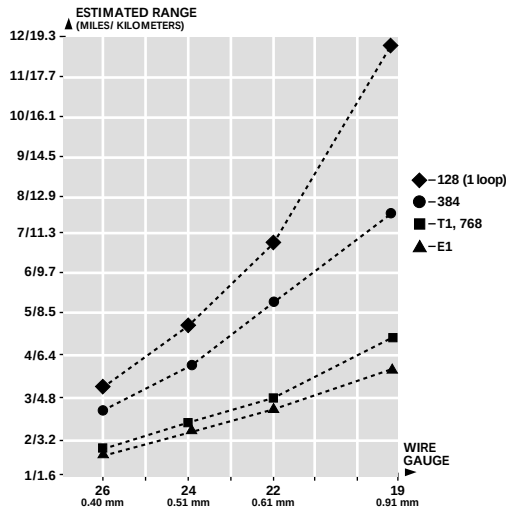

Figure 1: Campus-RS Reach Profile (based on 10^{-10} BER)

*Data rates vary depending on interface cards

Network Interfaces

REX (Remote Ethernet Bridge)	10BASE-T port (RJ-48C) Full-bandwidth forwarding and filtering Low-overhead HDLC encapsulation Optional PPP encapsulation of MAC-layer frames Full IEEE 802.1d transparent MAC-layer bridging Dynamic address learning Learning for 2000 MAC addresses with aging Static IP routing Embedded SNMP agent: BootP/TFTP download (with RFC 1542 extensions) RFC 1213 MIB II, RFC 1493 bridge MIB (base, ST, transparent groups) ADC SDSL bridge MIB extensions RFC 1215 Traps and ST Traps Data rates up to 1.152 Mbps for 1 loop, 2.3 Mbps for 2 loops
Serial Data (SDI)	V.35, RS-449, RS-530, RS-530A and X.21 Physical Interface: V.35: AMP 34-pin, Type-F; RS-449: DB-37; RS-530/RS-530A: DB-25; X.21: DB-15 Synchronous rates of nx56/64 kbps, from 56 kbps to 4608 kbps Timing reference is selectable from internal clock, SDSL signal or data port V.54 loopback support
CSU/DS1/DSX-1	Fully integrated CSU/DSU Physical Interface: DS1: RJ-45; DSX-1: RJ-45 and DB-15 T1 or 768 payload rates Flexible channel blocking Coding Format: AMI, B8ZS Framing Format: D4 Superframe, ESF Line Build Out: selectable from 0 to -30 dB (DS1)/0 to 655 ft. (DSX-1) ANSI PRM: selectable Test interface: Bantam jacks (DS1 only); signal monitoring, signal insertion RAI/yellow alarm generation AIS generation Loopbacks: AT&T TR 54016, ANSI T1.403-1995 Transmit/Receive pair swapping via jumper (DSX-1 only)
G.703	Physical Interface: 8NC/DB-15F Input: 0 to -7.5 dB Data Rate: 2.048 Mbps (E1) Impendance: 75 Ω/120 Ω
Multiport "FLEX"	One DSX-1 port plus two serial ports (V.35, RS-232/449/530, X.21) DSX-1: Physical Interface: RJ-48C Input: 0 to -7.5 dB Output Line Build Out: selectable 0 to 655 ft. in five steps Framing: ESF/SF (fractional) n x 56/64 kbps Line coding: AMI/B8ZS Impedance: 100 Ω Serial Ports: Physical Interface: mini-SCSI, 26-pin high-density Data Rate: n x 56/64 kbps from 56 kbps to 1.544 Mbps Conversion cables for V.35, RS-232, RS-530, RS-449, X-21

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