BLACK BOX®
NETWORK SERVICES

Campus RS

Key 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

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.

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

Campus-RS Star Concentrator

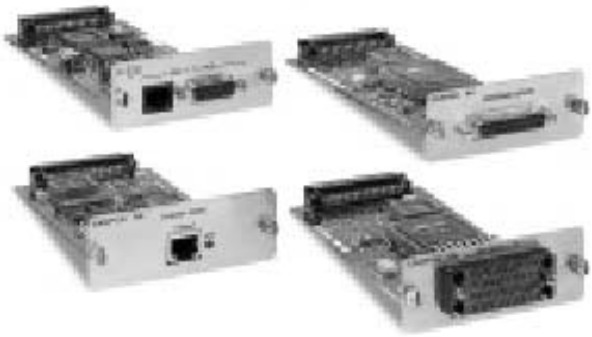
The Campus-RS Star concentrator provides a central site concentrator for aggregating multiple SDSL connections. The Star concentrator supports up to 14 line units interoperating with Campus-RS remotes or with another line unit in a remote Campus-RS Star. Each slot in the Campus-RS Star is capable of 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 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)



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

Benefits and Features:

- Comprehensive capabilities include fault management, configuration management, performance monitoring, security capabilities, in-band management, Campus management and system maintenance and administration
- Multi-platform with Windows NT and Solaris compatibility
- Java-based user interface provides a graphical representation of all ports, protocols and features
- Real-time element monitoring and statistics gathering for easy evaluation and problem solving
- Template and index definition for easy reference of port configuration, traffic and user profiles

Fault Management Features:

Stargazer contains expert fault management capabilities to detect potential failures. This can eliminate or significantly minimize the cost of unexpected system malfunctions.

- Alarms to indicate system faults and to recognize errors based on user-selected alarm thresholds
- Multiple levels of alarm severity
- Predictive fault detection eliminates or minimizes the risk of unexpected system malfunctions
- Fault localization and identification of causes of fault registration
- Intelligent monitoring accommodates normal spikes in daily activities
- Historical event logs available to highlight the frequency of events

Configuration Features:

StarGazer's configuration management feature provides intuitive dialog boxes. These boxes allow users to see an exact graphical representation of the managed device. Displayed information includes:

- System information, such as system name and location
- Management card IP address, subnet mask and default gateway
- Trap receiver settings
- ATM traffic profiles
- ADSL and SDSL line and alarm profiles
- T1, DS3 and ATM ports
- Cell and frame channel card VCCs and VPCs
- LAN tunnel, bridging and routing settings

Performance Monitoring Features:

StarGazer performance monitoring features provide the user with easy access to the status and performance history of the various system interfaces.

- ADSL, SDSL, T1 and DS3 loop status and performance history
- SONET status and performance history, by Medium, Section, Line and Path
- Performance parameters can be viewed individually or on a combined screen

Security Features:

StarGazer offers three levels of security based on multi-level access. These security levels dictate the options available to different users.

- Read-Only: Provides access to the FrontPanel and all performance monitoring dialogs. Members of this community cannot change any configuration settings.
- Read-Write: Provides access to the FrontPanel and all the configuration and monitoring features of StarGazer. Members of this community cannot access the Community Manager, where community names are assigned.
- Admin: Provides complete access to all the features of StarGazer, including the ability to create, modify and delete community names.

In-Band and Out-Of-Band Management Features:

StarGazer can access the Avidia System and Megabit Modems® via an ATM connection or an Ethernet connection. When an Ethernet connection is not available, users can access the systems via an ATM path. The Avidia system acts as a proxy agent to coordinate distribution of SNMP commands and configuration files. Only one management PVC is needed between StarGazer and the Avidia System to manage the platform and all attached CPE.

Campus Management Features:

The Campus FrontPanel provides a graphical, real-time representation of a Campus-RS Star chassis and its installed line cards. This interface provides access to a wide variety of configuration and performance monitoring tools. The FrontPanel image represents a specific Campus-RS Star system.

System Maintenance and Administration Features:

StarGazer enables you to perform the following administrative functions:

- Complete management of SNMP Management Information Bases (MIBs) using an SNMP MIB browser
- Automatically compiles system inventory, including hardware serial numbers and software version numbers
- Downloads system software to Avidia System or Megabit Modems
- Resets individual cards or the entire system
- Activates and deactivates ports

Product Requirements:

Windows NT

- PC with 450 MHz Pentium processor or higher
- 128 MB RAM required, 256 MB recommended
- 100 MB available hard drive space
- Windows NT 4.x or higher

Sun Solaris

- Sun Solaris 2.51, 2.6, 7
- 128 MB RAM required, 256 MB recommended

In addition, to use StarGazer with HP OpenView, you need the following:

- HP OpenView Network Node Manager 6.x with the latest consolidated patch from OpenView installed
- Netscape Communicator 4.x

Specifications

CAMPUS RS

SDSL WAN — Physical Interface: RJ-48C

Interface

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 — Errored seconds and unavailable seconds in the last 24 hours, 15-minute intervals

Monitoring — 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

CAMPUS STAR CONCENTRATOR

Chassis Hardware —
- Four cooling fans
- RS-232 SNMP/SLIP port
- AUI SNMP/LLC port
- Two high-density 50-pin telco connectors
- 14 DB-15 SDSL WAN line connectors
- 19"/23" rack mountable

Campus Management Unit —
- Plug-in module
- 2 x 16 LCD and push buttons
- DB-9 RS-232 console port
- Alarm and status indication LEDs
- SNMP/UDP/IP/ICMP/ARP
- BOOTP and TFTP
- SLIP

Campus Power Supplies —
- Plug-in modules (maximum two per Campus-RS 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

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We are, with 25 years of experience, the world leader in network infrastructure services.

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Ordering information

ITEM	CODE
Campus RS Remote	
incl. 1 AC Power Supply	MDS-CRS
Remote incl. 1 DC Power Supply	MDS-CRS-48VDC
Campus RS Star Concentrator	
14-Slot-Chassis incl. 1 AC Powersuply	MDS-CRS-700
AC Power Supply (for redundance)	MDS-CRS-720
Campus RS Line Unit	MDS-CRS-LU02
Interfacemodules for Campus RS Desktop	
x.21/V.11	MDS-CRS-X21
V.35	MDS-CRS-V35
Ethernet (2-wire to 1.152Mbps, 4-wire to 2.3Mbps)	MDS-CRS-REX
G.703/120 Ω	MDS-CRS-G703120
G.703/75 Ω	MDS-CRS-G70375
RS530	MDS-CRS-RS530
RS530A	MDS-CRS-RS530A
RS449	MDS-CRS-RS449