

Transmission

Copper Solutions for Network Extension

DSL Flavor	VDSL	G.SHDSL ATM	G.SHDSL TDM	IDSL	Services
Line Rates	16 Mbps	2.3 Mbps	4.6 Mbps	144 kbps	ATM
Distance	1 mile (1.6 km)	3.0 miles (4.9 km)	3.0 miles (4.9 km)	5 miles (8.1 km)	FR
Edge Solutions	3324 (pg 82)	ForeFront (pg 77)	3224 (pg 80) ForeFront (pg 74)	3092 (pg 94)	IP
CPE Solutions	1058 (pg 91) & 1068 (pg 92)	3201 (pg 89), 3086FR (pg 87), FR (pg 83) & 3087 (pg 87)	3201 (pg 89), 3086 (pg 86) & 3088 (pg 84)	1092 (pg 95) & 1082 (pg 96)	Leased Line Voice
Copper					TDM
Network					

NETLINK™ DSL Choose from G.SHDSL and IDSL — along with T1/E1 NTUs — and get the right user interface for your network. The NetLink system provides a variety of CPE options — from compact CPE with fixed interfaces to flexible *QuikConnect™* interfaces. Central office solutions range from 1U high rack-mount TDM concentration units to 2U one-card-per-subscriber rack solutions with flexible front and rear card swappability. It's so easy you will wonder how you ever managed without Patton's NetLink system.



NetLink DSL Products
Page 94–97

FOREFRONT™ DSL Patton's ForeFront™ Access Infrastructure Solutions provide DSL solutions in a scalable carrier-class access platform. With a variety of card styles to provide TDM or IP concentration options and their ability to be mixed and matched in any of the cPCI chassis available, the ForeFront DSL platform gives users a solution to answer their DSL needs now and into the future. Harness the explosive growth of DSL with a tightly integrated, cost-effective solution to aggregate high speed traffic while gaining flexibility and protecting your investment.



ForeFront DSL, Page 70–78

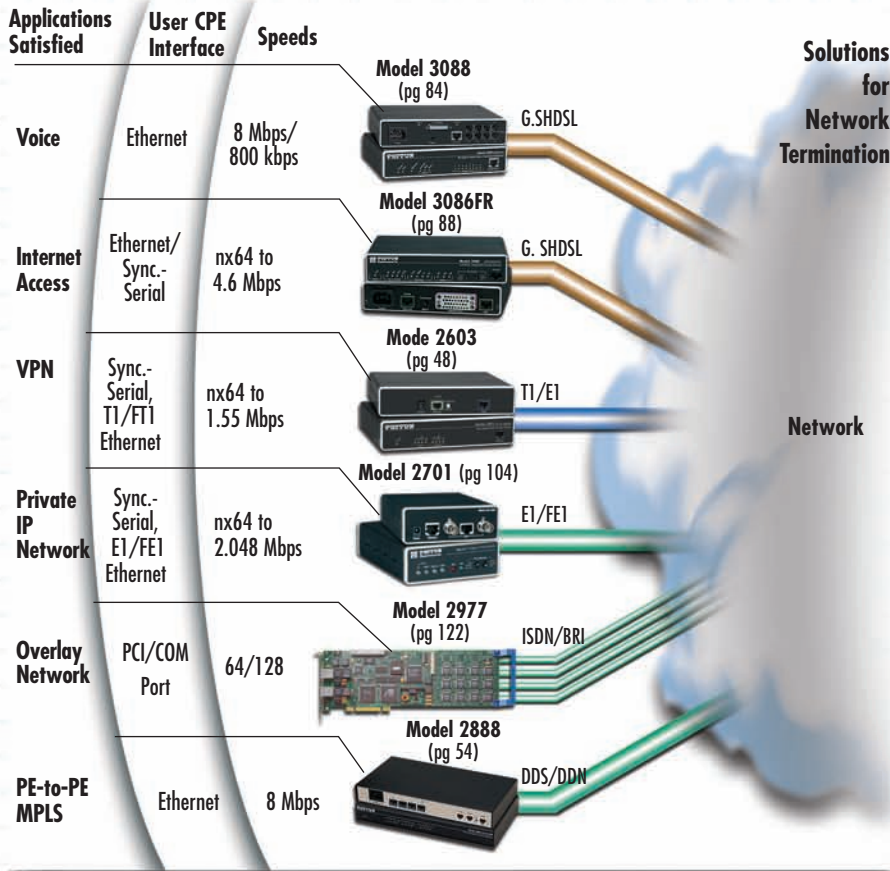
VDSL The low cost solution for truly high bandwidth demands. Patton's VDSL offers the fastest technology available today over copper twisted-pair. With symmetric data rates up to 16 Mbps, Patton's VDSL solutions address the bandwidth needs for video-on-demand, broadcast TV, high speed data exchange, and voice services. Available in many versions, the Patton product line includes multi-rate asymmetrical/symmetrical standalone and rack card modems, fixed-rate standalone and rack card modems, and a VDSL access concentrator.



VDSL
Page 98

Your First Choice for the Last Mile

Network Termination



In This Section

DSL Solutions	66
Integrated DSL Access Infrastructure	68
ipDSLAMs	78
G.SHDSL CPE	82
VDSL CPE	89
IDSL CPE	92



Patton EtherRockets: A New Kind of T1 and E1 Converters

- Uses Remote Router Porting™ to transparently extend Ethernet over T1/E1 lines
- Terminates T1/E1 Services
- Nx56/64 speeds to 1.554 Mbps and 2.048 Mbps
- Totally plug-and-play
- 75-ohm and 120-ohm (E1), 100-ohm (T1) connections



Branch Office



Call today to get your free whitepaper on Remote Router Porting and learn how you can save on your next T1 or E1 deployment.

Channelized Gigabit T1/E1 Router

Patton's IPLink Model 2884 multimedia routers concentrate up to 124 WAN connections or bond up to 4 T1/E1s for an 8-Mbps link to serve high-density and bandwidth hungry applications.



DSL Solutions

TDM Concentration

Standalone Functionality					Central Site Systems			Models	Page	
DSL Transport	Sync. Serial	T1/E1	Bridged Ethernet	Routed Ethernet	Access Rack	TDM Concentration	IP Concentration			
IDSL	Yes	64K G.703 Only	Yes		Yes	Yes	Yes	1082 Standalone	96	
								1092 Standalone	95	
								1092 Rack Cards	95	
								3092 IDSL-DACS	94	
G.SHDSL TDM	Yes	Yes	Yes	Yes	Yes	Yes		3088 Standalone	84	
								3088RC Standalone	51	
								ForeFront Access System	70-78	
G.SHDSL	Yes	Yes	Yes	Yes			Yes	3201 G.SHDSL Router	89	
								3086 G.SHDSL	86	
								3224 G.SHDSL Access Server	80	
								ForeFront DSL Access System	70	
ADSL2+			Yes	Yes				Yes	3101RC	76
VDSL			Yes		Yes			Yes	1058 Standalone	91
									3324 Access Concentrator	82



**EnviroNET™
EH Series**
Environmentally
Hardened



**EnviroNET™
EC Series**
Environmentally
Controlled



**EnviroNET™
ET Series**
Extended
Temperature

Extended Temperature -40 to 85°C allows CPEs to operate in environments that do not have heating or cooling options.

NEMA 4 (IP65) enclosure protects against elements such as dirt, rain, sleet, snow, dust, and the external formation of ice on the enclosure.



Page 144

xDSL CPEs

- IDSL
- G.SHDSL
- VDSL



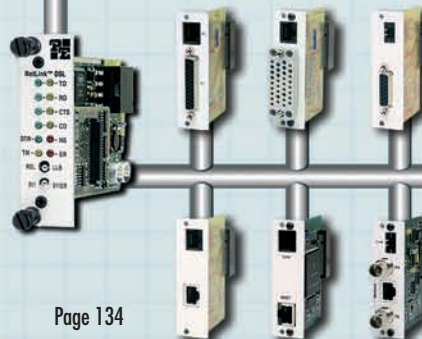
Access Rack

IP Concentration

One Card per Subscriber



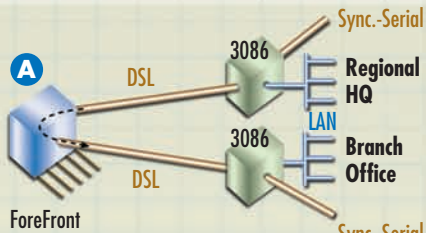
1001 Rack



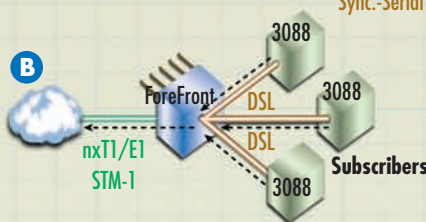
Page 134

The model 1001 rack system gives users port-by-port flexibility in a 2U-high 19-in. rack-mount chassis. Supporting up to 16 cards per chassis, the user can choose from IDSL, G.SHDSL, HDSL, VDSL, T1/FT1, E1/FE1, G.703/G.704, or Baseband modem cards. Our unique midplane design enables users to mix and match not only the transmission technology, but also the interfaces used. Add in management cards, AC/DC redundant power supplies and you have a truly flexible solution for systematically expanding your network.

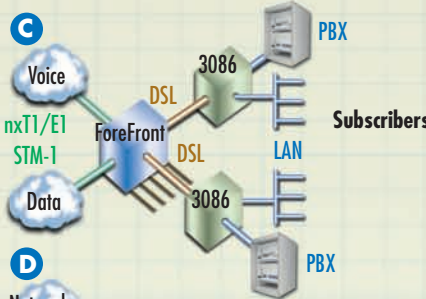
Everything Over DSL



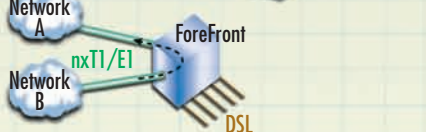
A Metro Area Leased Line
Connect two local sites by mapping DSOs (cross-connect) of one G.SHDSL port to another G.SHDSL port at the ForeFront chassis.



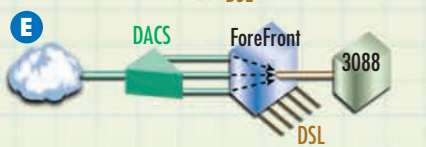
B DSL Concentration
Concentrate data from many DSL links into a few cost-effective uplinks by mapping the DSOs from multiple G.SHDSL ports into the DSOs of the WAN uplink ports.



C Voice/Data DSO Segmentation
To separate or *segment* different types of data (to separate voice from data transmission, for example), map DSOs of specific data types to specific WAN.



D DSL plus T1/E1 DACS
In addition to DSL, map any of the WAN timeslots back to any other WAN timeslot for flexible T1/E1 cross-connecting.



E DACS Pass-Thru
Effectively bypass the cross-connect feature and directly map a single DSL port to a T1/E1 WAN port on a one-to-one basis.



ForeFront

Page 70



Page 94



ForeFront

Routed End-Points

Models 3201 & 3086 provide integrated IP routing. The 3086, with its FlexIP software, provides IP routing and sync. serial interfaces on the same unit.

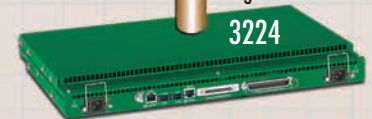


DSL Concentrator with Routed End-Points for IP Overlay Networks

Patton's ForeFront system provides high level DSL concentration of IP traffic across SDH, SONET, or ATM networks. Providing routed end-points and high speed nxT1/E1 and/or STM-1 egress.

In This Section

DSL Solutions	68
Integrated DSL Access Infrastructure	70
ForeFront Solutions for DSL	71
ForeSight™ NMS	72
G.SHDSL Line Card	74
IDSL Line Card	75
ADSL2+ Triple-Play Access Line Card	76
Router Line Card	77
Matrix Switch Line Card	78
ipDSLAMs	80
High-Speed G.SHDSL Concentrator for IP Traffic	80
VDSL Access Concentrator/Switch	82
G.SHDSL CPE	84
Low-Cost, High-Speed G.SHDSL Modem	84
G.SHDSL FRF.5/FRF.8 over ATM NTU	85
G.SHDSL Integrated Access Device	86
ipRocketLink™ Serial G.SHDSL	87
G.SHDSL FRF.5/FRF.8 over ATM IAD	88
G.SHDSL High-Speed Router	89
G.SHDSL.bis Business Router	90
VDSL CPE	91
VDSL Data & Voice Modems	91
Variable-Rate VDSL Modems	92
IDSL CPE	94
IDSL DACS Provides Quad T1/E1 & 24 IDSL Ports	94
2B1Q Encoding, 2 or 4-Wire Baseband Modem	95
IDSL Modems with V.35, X.21, or 10Base-T (Ethernet) Interfaces	96
High-Speed Serial Extender & RS-232 Serial Extender	97



Page 80

DSL Access Servers for IP Backbones

Patton makes IP concentration easy with high density 1U-high integrated chassis solutions. They provide everything you need in 1U—modems, uplink, router engine, redundant power supplies, management, and advanced routing features.

ForeFront Solutions for DSL

Half-Pipe, Full-Pipe, and Xtreme delivery platforms for DSL

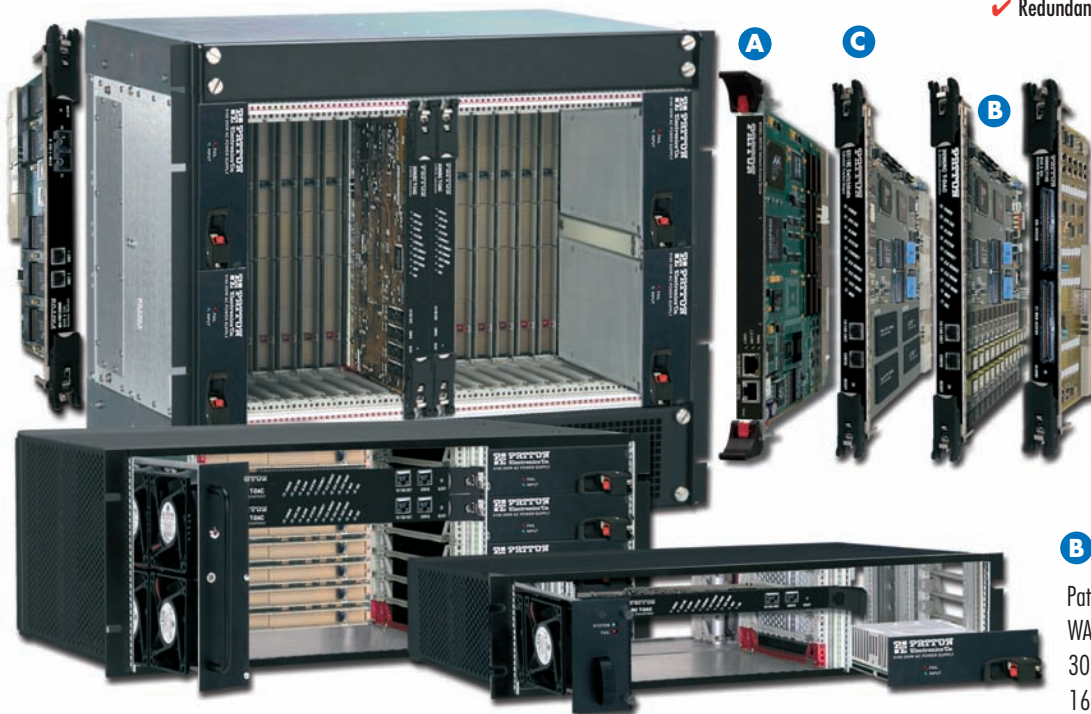
The ForeFront AIS brings next-generation access to your DSL network.

Patton's ForeFront Access Solutions for DSL address the new point-of-presence requirements demanded by today's providers. Using a modular approach, the ForeFront AIS includes all system components needed to provide DSL

access. With multiple chassis options, card configurations and the CPE to go with it, the ForeFront AIS is the solution of choice for your next network expansion!

FEATURES & BENEFITS

- ✓ Up to 288 ADSL2+ ports per chassis
- ✓ Up to 208 G.SHDSL ports per chassis
- ✓ T1/E1, STM-1 WAN egress options
- ✓ The ForeFront Full-Pipe—configured with 3096RC T-DACs—provides up to 128 G.SHDSL links in a 4U chassis. E1 or STM-1 interface options make data network integration a snap. Combined with Patton's 3086 CPE, it provides the complete solution.
- ✓ Redundant AC or DC



Major Components

A Router Cards

The Model 6081RC EdgeROUTE is an Access Server for the ForeFront AIS that is optimized for IP routing and VLAN aggregation. With ample support for MAC address filtering, VLAN priority, and VLAN tagging of individual streams, the EdgeROUTE is a perfect solution for integrating TDM and IPDSLAM traffic into core and edge MPLS networks.

B G.SHDSL Line Cards

Patton has combined G.SHDSL ports, DACs, and WAN functions in a single card. The Model 3096RC TDM-Digital Access Concentrator links 16 G.SHDSL circuits to multiple WAN uplink modules and offers completely flexible any-to-any grooming. Each 2.3-Mbps port offers user-selectable nx64 data rates. With its built-in cross-connect, each data channel, or channel group, can be multiplexed onto any uplink or DSL port—even to ports on other 3096RC blades in the same chassis. With an integrated SNMP/HTTP-based NMS, the entire system is easily manageable.

D ADSL Line Cards

The Patton Model 3101RC provides up to 48 ADSL2/2+ ports of triple-play access, supporting extended reach and higher downstream bandwidth up to 24 Mbps.

The Model 3101RC delivers affordable ADSL/ADSL2/2+ network access for triple-play ready ADSL service. The ADSL2+ IPDSLAM module, together with Patton's ForeFront Access Platform, is the premier solution for fault tolerant Triple-Play enabled network deployments.

The Model 3101RC offers complete ADSL, ADSL2 and ADSL2+ support including extended range operation and enhanced speeds. Each 3101RC IPDSLAM Module includes all the intelligence necessary to function as a complete single card IPDSLAM thereby providing unparalleled redundancy and fault tolerance in network deployments.

C 6511 Matrix Switch

The Patton Model 6511 Matrix Switch is an integrated multimedia switching engine complete with a digital access cross-connect, high speed STM-1 trunk interface, wire-speed Ethernet packet switch, and GUI management system. The Model 6511's flexible channel switching fabric allows non-blocking switching from any input to any output. The channelized STM-1 interface integrates into a SDH/SONET network, enabling users to channelize an STM-1 down to 64 kbps timeslots. With full grooming capability the Model 6511 Matrix Switch allows any-to-any TDM mapping and can place any channel from any card onto any port.

ForeFront™ Solutions Center

The ForeFront DSL solutions are made to specifically match the needs of your network. They are easily configurable to meet your uplink needs, your DSL needs, and more. The example systems below show some of the limitless options available with the ForeFront DSL solutions.

The Xtreme

This example comprises two independent STM-1 uplinks, 208 G.SHDSL modems with built-in SNMP management, power supplies, alarm cards, and cooling. The Xtreme's specially designed high speed backplane (with integrated H.110 and 2.16 Ethernet buses) allows mapping of any DSO timeslot to any other DSO timeslot, whether it is DSL, T1/E1, or STM-1. If this isn't enough, you can easily upgrade the Xtreme with two redundant STM-1 ports and up to a total of 208 T1/E1 WAN ports.



The Full-Pipe STM-1

This high density solution gives users 96 G.SHDSL modems and an STM-1 uplink card, along with the integrated features that are standard in the ForeFront solutions, such as built-in DACS, SNMP management, power supplies, alarm cards, and cooling.

The Full-Pipe T1/E1

For those who want a high density solution, but don't have access to an STM-1 uplink, the Full-Pipe also comes with T1/E1 uplinks. Choose how many you want—from 4 to as many as 96 T1/E1 uplinks can be used in the Full-Pipe. Plus, when you are ready for the STM-1, just add the card—the Full-Pipe is ready to go.



The Half-Pipe

If you are ready to start deploying DSL and want to start slow but with a system that will grow as your needs grow, choose the Half-Pipe. This solution is small but powerful—it packs an impressive 64 G.SHDSL modems, DACS, management, supplies, cooling, and 16 T1/E1 WAN ports (upgradeable to 64) into a 2U-high chassis. In addition, as your needs grow and you move to a larger system, the cards will move right along with you to either the Full-Pipe or the Xtreme systems. Ensuring that your investment pays dividends well into the future.



ForeFront cPCI

Configured chassis systems for ForeFront

FEATURES & BENEFITS

- ✓ CompactPCI Open System—Flexible, standards-based, rugged design ensures that it will be a reliable viable platform well into the future.
- ✓ 2U, 4U, 6U Platforms—Get 4, 8, or 17 slots for any system card and scale your deployment.
- ✓ Universal AC or Telco DC power modules offer high power with full 1+1 or N+1 redundancy
- ✓ Integrated management module monitors fan tachometers, voltage, and temperature.

ForeFront chassis solutions



ORDERING INFORMATION

ForeFront Chassis Systems: The ForeFront models below are our most popular configurations. Each is loaded with redundant AC, DC, or mixed AC/DC power supplies, fan modules, and alarm cards. Just add your choice of STM-1 and/or DSL modules to complete your system.

Half-pipe 4-slot chassis with fan module, alarm card, redundant power supplies, & H.110 backplane

6276/RUI: Universal AC supplies

6276/R48: Universal DC supplies

6276/U48: Universal AC/DC supplies

Full-pipe 8-slot chassis with fan module, alarm card, redundant power supplies, and 2.16 backplane

6476/RUI: Universal AC supplies

6476/R48: Universal DC supplies

6476/U48: Universal AC/DC supplies

Xtreme 17-slot chassis with fan module, alarm card, redundant power supplies, and 2.16 backplane

6676/RUI: Universal AC supplies

6676/R48: Universal DC supplies

6676/U48: Universal AC/DC supplies

ForeSight™ NMS
Model 6300 FCAPS EMS

The ForeSight™ Model 6300 is a scalable Element Management System for full life-cycle network management of user services in TDM and routed networks.

The Model 6300 NMS offers integrated FCAPS element management features on a stable Linux platform for full life-cycle network management. The FS6300 scales from a single local server to a distributed, hierarchical multi-station plan with complete redundancy for fail-safe operation. Full life-cycle network management begins with planning the network provisioning to analyzing performance for timely extension of network infrastructure and services. The hierarchical topology of networks is traversed visually via the network tree and main graphical display. Administrators and operators can roam from the top-level "Network" through Areas, Nodes, Chassis, and Cards down to the port level, as the management task dictates. By dividing the networks into separate management domains, the operators are given credential-based visual access.

The integration and design of the FS6300 exceeds the simple aggregation of FCAPS features. The modular management falls under the standardized categories of FCAPS to manage Faults, Configuration, Administration/Accounting, Performance, and Security. These five categories are integrated to function as more than independent units, but to

enforce the discipline of properly documented planning and provisioning directly in the NMS. A major advantage with the integration into a single system minimizes the errors and inefficiencies from duplicate efforts.

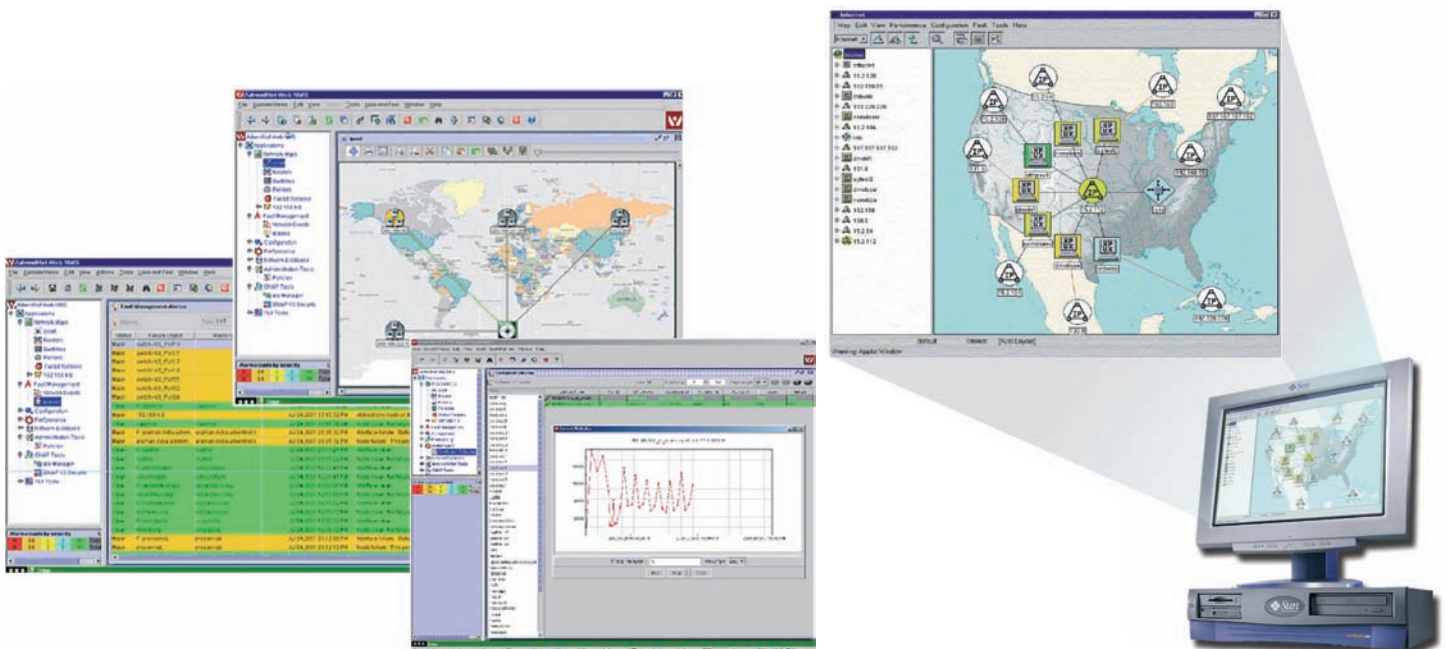
Configuration Management begins with planning resource provisioning, then the deployment of equipment, and subsequently auto-discovery of installed nodes. Schedule automatic software upgrades at low traffic times for selective sites or network areas without having to reconfigure each card again. Configuration changes can be executed at any authorized network station to upgrade a client's service or disconnect for clients not maintaining their service contract.

"FCAPS+" Management

Accounting/Administration Information is secured in the network database. Resource administration and client accounting can be grouped into domains for easing these management tasks and increasing the security level of protection. A containment tree view enables an operator to quickly browse the entire inventory.

FEATURES & BENEFITS

- ✓ **Integrated FCAPS**—By integrating the 5 modular FCAPS management tasks, network management efficiency increases while easily enforcing good network management techniques.
- ✓ **Scalable NMS**—The original NMS is built from the basic building blocks of Linux platform for small enterprise network for cost-effective and technically easy NMS growth to large multi-tiered carrier networks.
- ✓ **Configuration Management**—Support good network planning techniques and efficient deployment of new sites and client services. Includes resource provisioning, auto-discovery, and scheduled software image upgrades.
- ✓ **Alarm Management**—Simplify event and alarm management with alarm correlation, filtering and triggers for specific actions, like sending a page or email.
- ✓ **Security Management**—Increase security by dividing the network into mutually exclusive domains assigned to specific operators. Credential-based visual access. Management sessions are secured locally or via remote clients.
- ✓ **Administration Management**—Keep client information in a secured database. Manage equipment resources and client services which can be grouped into domains. Backup and restore configurations.
- ✓ **Performance Management**—Data collection and presentation is essential for maintaining SLAs and the pre-planning required for future network growth. Print custom reports, save electronic copies of reports, monitor real-time graphical displays of desired network parameters.



6300 ForeSight Web NMS Editions			
	FS6300/LX (Local)	FS6300/DX (Regional)	FS6300/EX (Regional)
Size of managed networks	≤ 10,000 managed interfaces	≤ 100,000 managed interfaces	100,000 managed interfaces
Maximum number of concurrent clients	5	10 per Front End Server	10 per front end server
Supported Databases*	MySQL	MySQL	MySQL

* Contact marketing if other databases must be supported.

Supported Features			
	FS6300/LX	FS6300/DX	FS6300/EX
Topology maps	Yes	Yes	Yes
Auto-discovery	Yes	Yes	Yes
Configuration Management	Yes	Yes	Yes
Fault (Alarm/Event) Management	Yes	Yes	Yes
Security Management	Standard (limited) Full (optional)	Yes	Yes
Administration/Accounting Management	No	Yes	Yes
Performance Management	No	Yes	Yes
Reports	Yes	Yes	Yes
Provisioning	No	Yes	Yes
Fall-over	No	Yes	Yes
Database redundancy	No	Yes	Yes
Distributed Front-End Server/Load Balancing	No	Yes	Yes
Backup & Restore	Yes	Yes	Yes
SNMP	Yes	Yes	Yes
CORBA	Yes	Yes	Yes
CLI	Yes	Yes	Yes

Supported Operating Systems			
	FS6300/LX	FS6300/DX	FS6300/EX
NMS Server	Fedora Core 6,	Fedora Core 6,	Fedora Core 6,
Remote Application Clients	Windows NT4 / 2000 / XP	Windows NT4 / 2000 / XP	Windows NT4 / 2000 / XP

The ForeSight 6300 Network Management System scales from small enterprise networks to large carrier networks. Providing a *la carte* selection of the NMS components gives the network managing organization the maximum in planning and growing the NMS. As more front-end servers and application clients are added, the NMS can expand from a flat to a multi-tiered hierarchical, mutually exclusive domain-oriented architecture. Distributed and redundant databases implement robustness in operation and also in failure scenarios to avoid the loss of data and management capability.

Use the NMS to support the pre-planning phase through deployment of network elements and client network services to future planning of anticipated network growth. By integrating these phases, the NMS goes well beyond standard FCAPS management as it covers the network management's entire life-cycle. A further benefit is to ease the enforcement of good network discipline in designing, provisioning, monitoring and extension of the network and its management features. Network management includes more than fault detection, port configuration, etc., but also the deployment and performance monitoring of client services.

When moving beyond the size of a local enterprise network, NMS backup and restoration for network elements is critical for continual offering of network services. ForeSight supports fail-over servers as hot stand-bys for the NMS and database servers.

The ForeSight 6300's graphical maps, auto-discovery, integration of independent FCAPS modules, scalability, and stable operation create the solution for full life-cycle management of your network.

ORDERING INFORMATION

FS6300/LX: FS6300 Management Station. Supports up to 10,000 managed interfaces. Includes database commercial license, rackmount workstation, RAM, HD, backup device, 17-in. monitor, and pre-installed FS6300 software per preceding "Supported Feature" table.

FS6300/DX: FS6300 Management Station. Supports up to 100,000 managed interfaces. Includes database commercial license, rackmount workstation, RAM, HD, backup device, 17-in. monitor, and pre-installed FS6300 software per preceding "Supported Feature" table.

FS6300/EX: FS6300 Management Station. Supports more than 100,000 managed interfaces. Includes database commercial license, rackmount workstation, RAM, HD, backup device, 17-in. monitor, and pre-installed FS6300 software per preceding "Supported Feature" table.

FS6300/WRAC: FS6300 Windows Remote Application Client includes Windows-based PC with WRAC software to operate remotely with the FS6300/LX, -/DX, or -/EX Management Stations

G.SHDSL Line Card

Model 3096RC 16-Port G.SHDSL TDM Concentrator



G.SHDSL front card

Connect 16 G.SHDSL users and support nx64 kbps access up to 2.3 Mbps.

Patton has combined G.SHDSL ports, DACS, and WAN functions into a powerful system operating on Patton's ForeFront Access Platform. The Model 3096RC TDM-Digital Access Concentrator, or T-DAC, links 16 G.SHDSL circuits to multiple WAN uplink modules and offers completely flexible any-to-any grooming. Each port offers user-selectable nx64 (to 2.3 Mbps) data rates. With its built-in cross-connect, each data channel, or channel group, can be multiplexed onto any uplink or DSL port—even to ports on other 3096RC blades in the same chassis. The entire

system is easily managed through an integrated SNMP/HTTP-based NMS. Use the T-DAC in any Patton 2U, 4U, or 6U ForeFront Access System and scale-up density while reducing costs! Fully redundant power and integrated cooling enable these lightweight chassis to grow while accepting new technologies.

Harness the explosive growth of DSL with a tightly integrated, cost-effective solution to aggregate high speed traffic while gaining flexibility and protecting your investment. Choose the 3096RC for your next network rollout.



Rear transition modules with flexible interface capabilities

FEATURES & BENEFITS

- ✓ 16 G.SHDSL ports per card
- ✓ Standards based DSL is interoperable with third party G.SHDSL modems
- ✓ Speed to 2.3 Mbps on a single twisted pair
- ✓ Distance to 32,000 feet (9,754 meters)
- ✓ Built-in TimeSlot DACS for any-to-any mapping of DSO timeslots
- ✓ Flexible WAN Egress: 4, 8, 12 or 16 T1/E1 Rear Transition module
- ✓ WEB/SNMP manageable from anywhere in the world via the Internet
- ✓ Hot-swappable front and rear cards
- ✓ Complete alarm facilities
- ✓ Uses standard copper twisted pair
- ✓ Integrated line protection circuitry on rear transition module protects your investment
- ✓ User selectable G.SHDSL (TCPAM line coding) or HDSL (2B1Q line coding)

ORDERING INFORMATION

16-port G.SHDSL T-DAC front/rear card sets

3096RC/16G0E: 16 DSL, No E1/T1 ports

3096RC/16G4E: 16 DSL, 4 E1/T1 ports

3096RC/16G8E: 16 DSL, 8 E1/T1 ports

3096RC/16G12E: 16 DSL, 12 E1/T1 ports

3096RC/16G16E: 16 DSL, 16 E1/T1 ports

16-port G.SHDSL T-DAC front card

3096RC: 16 E1/T1 ports; no rear transition module

T-DAC rear cards

3096RCT/0E: 50-pin Telco for 16 G.SHDSL ports (no E1/T1 ports)

3096RCT/4E: 50-pin Telco for 16 G.SHDSL ports; 68-pin SCS1 for 4 E1/T1 WAN ports.

3096RCT/8E: 50-pin Telco for 16 G.SHDSL ports; 68-pin SCS1 for 8 E1/T1 WAN ports.

3096RCT/12E: 50-pin Telco for 16 G.SHDSL ports; 68-pin SCS1 for 12 E1/T1 WAN ports.

3096RCT/16E: 50-pin Telco for 16 G.SHDSL ports; 68-pin SCS1 for 16 E1/T1 WAN ports.

Cables

10-3096TM68/64-6 & 10-3096TM64-6: Cable combination for T1/E1 to punch down block

10-3096TM50-20: Cable for DSL to punch down block

Any-to-any time slot mapping



With the 3096RC in the ForeFront AIS, users have total flexibility in mapping their data. Whether it is concentration, segmentation, metro mapping, WAN mapping, or pass-thru, the 3096RC can handle it. Choose an application or mix them all within the same card. The user has total flexibility.

SPECIFICATIONS

G.SHDSL: G.991.2 ITU G.SHDSL Annex A and Annex B G.994.1 G.hs nx64 kbps data rates up to 2.3 Mbps (n=1...36) over 2 wires, full-duplex, symmetrical TCPAM encoding

G.SHDSL Distance: 32,000 feet (9,754 m) at 1.92 kbps; 18,000 feet (5,487 m) at 2.304 Mbps

G.SHDSL connection: 16 ports presented on a 50-pin Telco connector

Transition modules: Uplink module options include 4, 8, 12, or 16 T1/E1 ports

Ethernet Port: Single 10/100Base-T (RJ-45 connector)

G.SHDSL modems: Patton 3201, 3086, and other standards-based G.SHDSL modems

WAN clocking: Internal, Network (from T1/E1 WAN port) or system via H.110

G.SHDSL clocking: Provides clocking to the remote NTUs/modems

Front panel indicators: LEDs for power, CPU, system, Ethernet, clock source, alarms, test mode, DSL, and WAN

Management services: HTTP, SNMP, TELNET, Ethernet, RS-232 Console Port, SYSLOG Client, Remote Software Upgrade via FTP

Alarm Reporting: Configurable alarms; remote SNMP traps, front panel LEDs; 3-contact relay (3-pin terminal block)

Compliance: Safety UL/CSA per UL1950 (METS) Canadian cMET and CS-03, EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC (EN-60950),

FCC Part 15, CE Mark, CTR12, CTR13 FCC Part 68.

Op. Temp.: 14–140°F (-10–60°C)

Humidity: 5–90%, non-condensing

Dimensions

Front blade
0.75H x 10.5W x 6.3D in.
(1.9H x 26.7W x 16.0D cm)

Rear blade
0.75H x 10.5W x 3.15D in.
(1.9H x 26.7W x 8.0D cm)

IDSL Line Card

Model 3196RC 16-Port IDSL TDM Concentrator



IDSL front card

The Patton Model 3196RC IDSL T-DAC connects 16 users and supports data rates of 64, 128, and 144 kbps. This high density offering provides affordable access concentration to speed up first-mile networks.

Patton's Model 3196RC IDSL TDM-Digital Access Concentrator, or IDSL T-DAC provides affordable first-mile access concentration for virtually any low speed network application.

Leverage low cost IDSL technology to offer the right service at the right price. Patton has combined IDSL ports, DACS, and WAN up-links and functions into a powerful system operating on Patton's ForeFront Access Platform.

The Model 3196RC, links up to 16 IDSL circuits to multiple WAN modules and offers complete any-to-any DSO grooming. Each IDSL port offers user selectable data rates of 64, 128, and 144 kbps. With

a built-in cross connect, each data channel or channel group can be multiplexed onto any up-link or other DSL port — even ports on other 3196RC or 3096RC T-DACS in the same chassis. An integrated SNMP/HTTP-based management system allows for easy configuration via any SNMP enabled NMS.

Each 3196RC T-DAC has its own processing capability built in, offering continuous operation even in the presence of multiple network outages. Use the T-DAC in any Patton 2U, 4U or 6U ForeFront Access System and affordably scale up density to network growth requirements.



Rear transition modules with flexible interface capabilities

FEATURES & BENEFITS

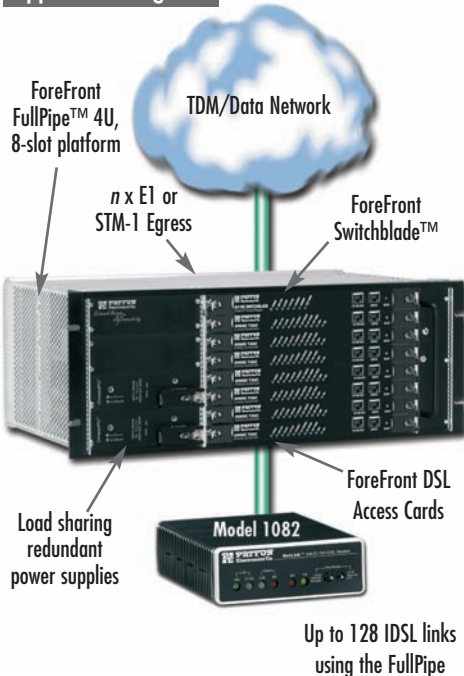
- ✓ Up to 16 IDSL ports per card — Get high density per card and lower your cost per port. Easily scale by adding more cards
- ✓ Speeds of 64, 128, & 144 kbps — Each port is independently selectable for any bandwidth. Distances to 16.4 km/10.1 miles on 0.9 mm/19 gauge copper wire
- ✓ Standards-based line coding — Uses 2B1Q per ETSI ETR-080 and ANSI T1.601 standards
- ✓ Built-in timeslot DACS — Perform any-to-any DSO mapping between any DSL and WAN port in a ForeFront chassis
- ✓ SNMP/HTTP management — SNMP/HTTP manageable from anywhere in the world including attached CPE units
- ✓ Complete alarm facilities — Configurable alarm reporting with SNMP traps, front panel LEDs, 3-contact relay, and syslog messages



I'm Ovidio, Patton's Regional Director of Latin America Operations. If you have any questions about products or applications using DSL technology, please call me at +1 301.975.1000, x118, or send e-mail to ovidio@patton.com.



Application diagram



SPECIFICATIONS

IDSL: 2B1Q modulation per European Telecommunications Standards Institute (ETSI) as ETR-080 and American National Standards Institute (ANSI) as T1.601
IDSL Distance: 16.4 km/10.1 miles using 19-gauge (AWG)/0.9-mm copper wire
IDSL Connections: Up to 16 ports presented on a 50-pin RJ-21x Telco connector
Rear Module: Up-link options include 4, 8, 12, or 16 T1/E1 ports
Ethernet Management: Single 10/100Base-T (RJ-45 connector); simultaneous dual redundant operation over backplane
IDSL Modems: Use Patton Model 1082 and 1092A IDSL modems
WAN Clocking: Internal, Network (from T1/E1) or via the system backplane from any other card
IDSL Clocking: Provides clocking to the remote NTUs/Modems
Front Panel Indicators: LEDs for power, CPU, system, Ethernet, clock

source, alarms, test mode, DSL, and transition module WAN ports
Management Services: HTTP, SNMP, Telnet, Ethernet, RS-232 Console Port, syslog client, remote software upgrades via TFTP
Alarm Reporting: Configurable alarms, remote SNMP traps, front panel LEDs, 3-Contact Relay (Form-C)
Compliance: Safety: UL 60950, IEC 60950 (CB Scheme); EMI: FCC Part 15 Class 'A'; Telecom: TIA/EIA/IS-968 (for T1/E1 interfaces); CE
Operating temp.: 14 to 140°F (-10 to 60°C)
Humidity: 5 to 90%, non-condensing
Dimensions:
Front Module: 0.75 H x 10.5 W x 6.3 D in. (1.9 H x 26.7 W x 16.0 D cm)
Rear Module: 0.75 H x 10.5 W x 3.15 D in. (1.9 H x 26.7 W x 8.0 D cm)

Note: DSC and WAN cables sold separately.

ORDERING INFORMATION

- 3196RC:** T-DACS, Front Card, 16 IDSL
 - 3196RC/16IOE:** T-DACS, 16 IDSL & 0 T1/E1
 - 3196RC/16I16E:** T-DACS, 16 IDSL, 16 T1/E1
 - 3196RC/16I4E:** T-DACS, 16 IDSL & 4 T1/E1
 - 3196RC/16I8E:** T-DACS, 16 IDSL & 8 T1/E1
-
- 16-port G.SHDSL T-DAC front card**
3196RC: 16 E1/T1 ports; no rear transition module
-
- T-DAC rear cards**
3196RC/0E: 50-pin Telco for 16 G.SHDSL ports (no E1/T1 ports)
3196RC/4E: 50-pin Telco for 16 G.SHDSL ports; 68-pin SCS1 for 4 E1/T1 WAN ports.
3196RC/8E: 50-pin Telco for 16 G.SHDSL ports; 68-pin SCS1 for 8 E1/T1 WAN ports.
3196RC/12E: 50-pin Telco for 16 G.SHDSL ports; 68-pin SCS1 for 12 E1/T1 WAN ports.
3196RC/16E: 50-pin Telco for 16 G.SHDSL ports; 68-pin SCS1 for 16 E1/T1 WAN ports.

ADSL2+ Triple-Play Access

Model 3101RC ADSL2/2+ IPDSLAM Module

The Patton Model 3101RC provides up to 48 ADSL2/2+ ports of triple-play access, supporting extended reach and higher downstream bandwidth up to 24 Mbps.

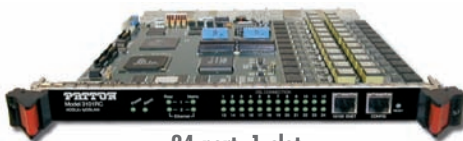


The Model 3101RC delivers affordable ADSL/ADSL2/2+ network access for triple-play ready ADSL service. The ADSL2+ IPDSLAM module, together with Patton's ForeFront Access Platform, is the premier solution for fault tolerant triple-play enabled network deployments.

The Model 3101RC offers complete ADSL, ADSL2 and ADSL2+ support including extended range operation, and enhance speeds. Each 3101RC IPDSLAM Module includes all the intelligence necessary to function as a complete single card IPDSLAM thereby providing unparalleled redundancy and fault tolerance in network deployments. The Model 3101RC includes redundant

10/100/1000 Ethernet uplink ports as well as redundant mid-plane connections to ensure non-stop operation.

The Model 3101RC is designed for triple-play networks where the reliable delivery of IP based voice, video and data services depends on the QoS metrics that are assigned to the flows. Consequently, the Model 3101RC supports the mapping of ATM CBR/UBR/VBR traffic types and cell rates to IEEE 802.1p/Q VLAN priority classes. VLAN stacking or "Q-in-Q" is likewise supported to ensure transparent extension of subscriber VLAN networks. In order to maximize WAN bandwidth, IGMP Snooping is supported to ensure that IP Multicast traffic is detected and forwarded accordingly.



24-port, 1-slot
version available!

FEATURES & BENEFITS

- ✓ Built-in Triple-Play Support—ADSL2+ high-bandwidth downstream with Multicast support and QoS included.
- ✓ QoS—Per PVC traffic classification with shaping and policing; 802.1p VLAN priority; ToS/DiffServ stripping and priority queuing
- ✓ 24–48 ADSL2/2+ Ports—"Right size" the deployment with the best port-per-card ratio. Easily scale by adding cards.
- ✓ Per-Port Configuration—To facilitate the provisioning and tailoring of services, ports are independently selectable to the individual DSL standard and required port speeds.
- ✓ SNMP/HTTP Management—SNMP/HTTP manageable from anywhere in the world including attached CPE units.
- ✓ Management Features—Configurable alarm reporting with SNMP Traps, RMON for performance monitoring, Dying Gasp support on ADSL ports, I.610 OA&M, F5 loopback support, G.PLOAM, embedded HTTPS web server for easy configuration via a browser.
- ✓ Annex M and Annex L support.

ORDERING INFORMATION

3101RC/24A/2GE: ADSL IPDSLAM with 24 ADSL Annex A Ports and two Gigabit Ethernet ports occupying one ForeFront slot

3101RC/48A/2GE: ADSL IPDSLAM with 48 ADSL Annex A Ports and two Gigabit Ethernet ports occupying two ForeFront slots

3101RC/24B/2GE: ADSL IPDSLAM with 24 ADSL Annex B Ports and two Gigabit Ethernet ports occupying one ForeFront slot

3101RC/48B/2GE: ADSL IPDSLAM with 48 ADSL Annex B Ports and two Gigabit Ethernet ports occupying two ForeFront slots

SPECIFICATIONS

ADSL Ports: 24 or 48 ports configurable as ANSI T1.413i2, G.992.1 (G.DMT) Annex A/B with UR-2, G.992.2 (G.Lite), G.992.3 (ADSL2) Annex A/B/L/M, G.992.5 (ADSL2+) Annex A/B/L/M supporting G.997.1 (G.PLOAM) and G.994.1 (G.HandShake)

Ethernet Ports: Two 10/100/1000 backplane-facing, auto-negotiating ports; Two 10/100/1000 auto-negotiating rear card ports with SFP interface for easy media selection; Single 10/100 auto-negotiating, full/half duplex front card; 802.1ad Link Aggregation and LACP

ATM Support: 12 PVCs per port including per PVC traffic classification; RFC 1483/2684; PPPoE forwarding; AAL5 per I.363.5; Traffic classes: UBR, CBR, VBR-rt, VBR-nt; UNI 3.1/4.0; I.610 OA&M with F5 loopback

VLAN & bridging support: IEEE 802.1Q including per interface tagging;

IEEE 802.1p priority queuing and re-striping; VLAN stacking or "Q-in-Q"; Spanning Tree (802.1D); RSTP (802.1w); MSTP (802.1s/Q); IGMP Snooping; MAC address filtering (8 per VLAN)

Management Service: HTTP/HTTPS, SNMP, Telnet Ethernet, RS-232 Console Port, SYSLOG Client, Software upgrade via TFTP

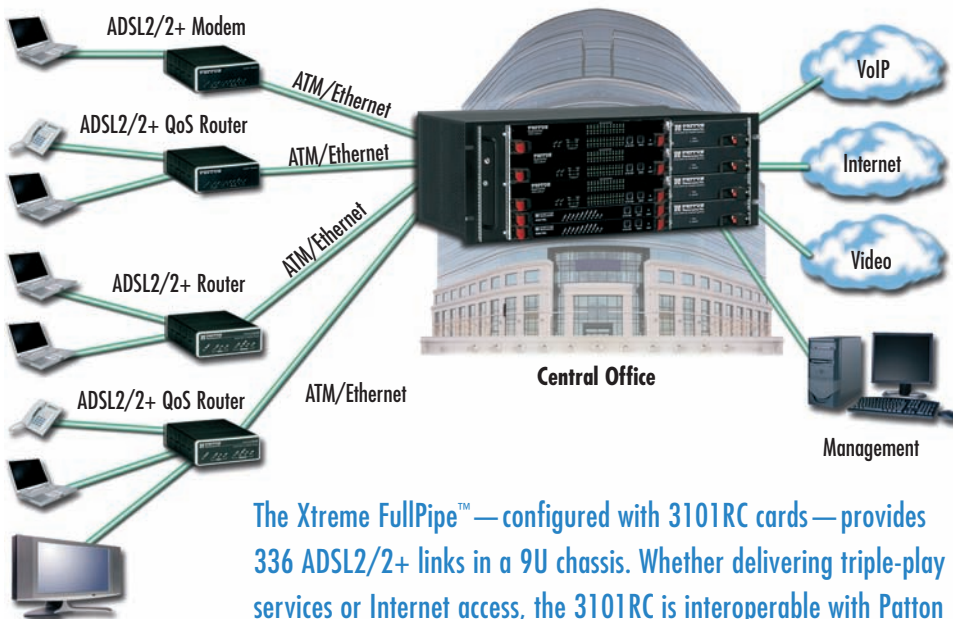
Alarm Reporting: Configurable alarms; Remote SNMP traps; front panel LEDs

Compliance: UL-1950; CSA per 22.2-No. 950; FCC Part 15 Class A; CE Mark; EN55022; EN61000; RoHS Compliant

Operating temp.: 0–60°C (14–104°F)

Humidity: 5–90% non-condensing

Why use our 3101RC?



The Xtreme FullPipe™—configured with 3101RC cards—provides 336 ADSL2/2+ links in a 9U chassis. Whether delivering triple-play services or Internet access, the 3101RC is interoperable with Patton CPE as well as with third-party solutions.

Router Line Card
Model 6081RC EdgeROUTE

This feature-rich IP service module for ForeFront AIS addresses the demanding deployment needs of service and enterprise organizations.



The Patton Model 6081RC is a Packet Access Server for ForeFront AIS that is optimized to process IP traffic from multiple access and uplink cards. The Packet Access Server converts any ForeFront AIS chassis into a powerful IpDSLAM or modular Access Router. The 6081RC comes standard with dual 10/100Base-T Ethernet ports, while at the same time, it has access to any port on any card attached to the ForeFront System for up-linking traffic. With its powerful feature set, service providers can deploy new IP services while retaining the ability to support their TDM infrastructure investment.

The 6081RC supports MAC Address filtering, VLAN priority, and VLAN tagging to facilitate the transition

from traditional IP router-based networking to modern-day VLAN/MPLS networks. Regardless of whether the customer traffic comes in via DSL or T1/E1, the EdgeROUTE can terminate and tag the stream, making it transparent to core/edge networks.

Easily tailor and manage the level of service to the needs of the subscriber with traffic shaping and policing. Filter by IP address, IP port or by physical port in either ingress or egress directions. The extensive filtering capabilities of the 6081RC turns this access router into a capable edge firewall. NAT is likewise supported for either masquerading applications or for simple address translation. Customize security for each end user or use a standard configuration for all. Use the built-in traffic filtering features of the 6081RC and SSH to secure your management connection.

VPN applications, including access service wholesaling, can be deployed with L2TP providing standards-based tunneling of IP traffic and easy interconnection with existing VPN networks. Use RIP or OSPF to route traffic between any WAN, LAN or DSL port.



FEATURES & BENEFITS

- ✓ Dual 10/100 Ethernet easily bridges the gap between the LAN and Access Network with differentiated service offerings
- ✓ Built-in IP address, IP port, and MAC address filtering
- ✓ Perform IP address and port translation for any ForeFront port
- ✓ Extensive IP Routing with RIP and OSPF allows easy interoperability and integration.
- ✓ Create layer 2 and layer 3 VPNs with PPTP and IPsec
- ✓ SNMP/HTTP manageable from anywhere in the world including attached CPE units.

SPECIFICATIONS

Routing: RIPv1 (RFC 1058), RIPv2 (RFC 2453), OSPFv2 (RFC 2328), VLSM (RFC 1878)

RADIUS client: Authentication (RFC 2865 & 2868), Accounting (RFC 2866 & 2867), PAP (RFC 1332), CHAP (RFC 1334 & 1994)

VPN Services: L2TP (RFC 2661 with RFC 2809 & 2888) - LAC & LNS, PPTP, IPsec

IP Services: (RFC1701/2784), IP-within-IP (RFC 2003), ARP (RFC0826), Proxy-ARP (RFC1027), ICMP (RFC0950, RFC1256), NTPv3 (RFC1305), IGMP & IGMPv2 (RFC2236), DiffServ (RFC2474), NAT (RFC 1631/2663/2766/2953); DHCP (RFC2131/2132/2563)

Ethernet Ports: Dual 10/100BaseT (RJ-45 connector); auto-negotiating; half or full duplex operation

Management Service: HTTP, SNMP, Telnet, Ethernet, RS-232 Console Port, SYSLOG Client, Software upgrade via FTP, SSH, SNTIP

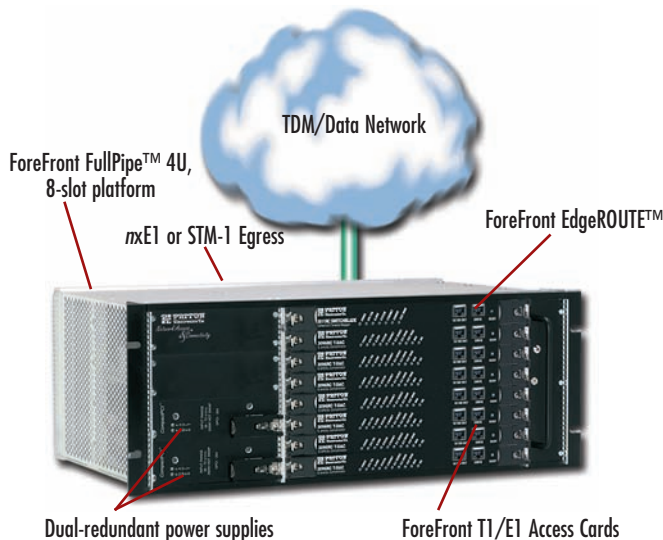
Alarm Reporting: Configurable alarms; Remote SNMP Traps; Front Panel LEDs

Compliance: Safety: UL/CSA per UL1950 (METS) Canadian cMET and CS-03, EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC (EN60950), FCC Part 15, CE Mark, CTR12, CTR13, FCC Part 68

Op. temp.: 0–40°C (32–104 °F)

Humidity: 5–90% non-condensing
Dimensions:
Front blade: 0.75 H x 10.5 W x 6.3 D in. (1.9 H x 26.7 W x 16.0 D cm)
Rear blade: 0.75 H x 10.5 W x 3.15 D in. (1.9 H x 26.7 W x 8.0 D cm)

Typical application



ORDERING INFORMATION

6081RC/800H/FE2P: IP Router, 800-MHz with 3 10/100 Front Access Ethernet Ports

6081RC/800H/FE2T: IP Router 800-MHz with 1 front 10/100 Ethernet ports & 2 rear 10/100 Ethernet ports

6081RC/800H/GE2P: IP Router, 800-MHz with 1 10/100 & 2 Gigabit Ethernet Ports

6081RC/800H/GE4P: IP Router, 800-MHz with 1 10/100 & 4 Gigabit Ethernet Ports

Matrix Switch Line Card

Model 6511 Matrix-SW/155

Get non-blocking any-to-any TDM access, packet-switched Ethernet, and high speed trunking—all in a single card.

The Model 6511's flexible channel switching fabric allows non-blocking switching from any input to any output. The channelized STM-1 interface integrates into a SDH/SONET network, enabling users to channelize an STM-1 down to 64 kbps timeslots. With full grooming capability, the Model 6511 DACs allows any-to-any TDM mapping and can place any channel from any card onto any port.

Combined with the ForeFront AIS 40-Gig Packet-Switched Backplane, the Model 6511 Matrix Switch redundantly interconnects every slot—at wire-speed—and aggregates traffic from each system card onto dual-switched uplink Ethernet ports. With increased performance and throughput, the packet backplane allows non-blocking access to the Matrix Switch, other system cards, and the uplink ports.

With the ForeFront architecture, TDM and packet can be used simultaneously and to full capacity. In a system loaded with dual Matrix Switches, the high speed channel switching and

packet backplane on the Model 6511 offers 1+1 redundancy.

Management is a snap with VT-100, TELNET, SNMP and WEB options. Connect to any card out-of-band or route management traffic through available timeslots in-band. Complete switching database allows easy building of circuits end-to-end.

Master time and space with the Model 6511 Matrix Switch and realize an unequalled level of density and control over the new convergent network.



FEATURES & BENEFITS

- ✓ Non-blocking I/O fabric
- ✓ Get dedicated connectivity to every input and every output port while grooming TDM or switching packet data
- ✓ Use dual 6511s and get 1+1 redundancy.
- ✓ Hot swappable cards for fast maintenance and quick upgrades.
- ✓ Integrated STM-1 DACS
- ✓ Resolve traffic down to 64 kbps timeslots, with any-to-any mapping.
- ✓ WEB/SNMP manageable—Use the embedded HTTP/SNMP agent to manage the Model 6511 from anywhere in the world.
- ✓ Optical or electrical egress: electrical BNC or optical SC connectors
- ✓ Redundant packet switching

SPECIFICATIONS

Line Framing: DS1-SF, SLC-95, ESF, E1—G.704 basic, CRC-4 multiframe (G.706 framing), DS3—M23, C-bit parity formats, E3—G.751, G.832 E3, STM-1—G.707, SONET/STS-3—Per ANSI T1.105-2001

Mapping: DS1—VT1.5 → STS-1 SPE, TU-11 → STM1/VC3, TU-11 → TUG3 → STM1/VC4, TU12 → STM1/VC3, TU-12 → TUG3 → STM1/VC4; E1—VT2 → STS1 SPE, TU-12 → STM-1/VC3, TU-12 → TUG3 → STM-1/VC4; DS3—DS3 → VC3 → AU3 → STS-1 SPE; STM-1—G.707; SONET/STS3—Per ANSI T1.105.02-2001

Clocking: STM-1—G.813; STS-3—ANSI T1.101-1999, T1.105.09-1995, G4-1244

Error Counts: G.821 & G.826 (ES, SSES, US, EB, and BBE; T1.231 & GR-253-CORE ES, SES, US and SEFS

Line Testing: PRBS per ITU-T 0.151 & 0.152; DS3/E3 Diagnostic & Line Loopback; DS2 Demux Loopback; T1/E1 Diagnostic & Loopback

Ethernet Ports: Dual 10/100Base-T (RJ-45 connector)

STM-1/STS-3 Ports: Single mode dual SC fiber (20km) per G.957 using 1300 nm lasers per G.652 or Dual 75-Ohm BNC per G.703

LED Indicators: LEDs for power, CPU, Dual Ethernet, test mode, egress synchronization, egress trunk status

Management Services: HTTP, SNMP, TELNET Ethernet, RS-232 Console Port, SYSLOG Client, Remote Software Upgrade via FTP

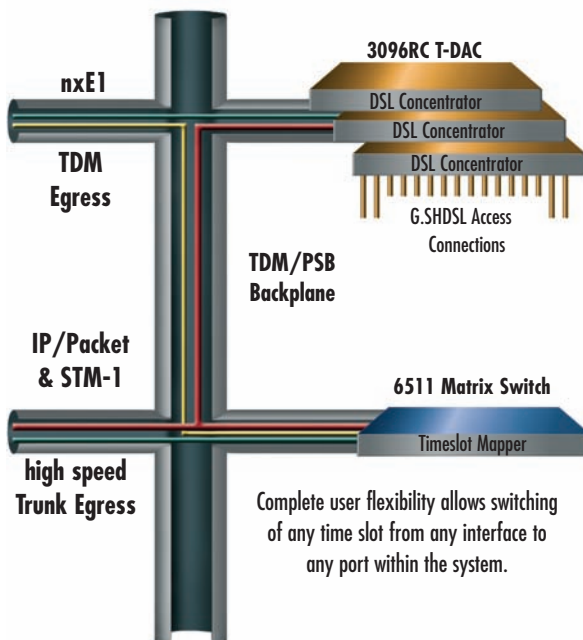
Alarm Reporting: Configurable alarms; Remote SNMP Traps; Front Panel LEDs

Compliance: Safety: UL/CSA per UL1950 (METS) Canadian cMET and CS-03, EMC Directive 89/336/EEC, FCC Part 15, CE Mark, CTR12, CTR13 FCC Part 68, Laser Safety: Class 1, IEC-825-1, 1993

Op. temp.: 14 to 43°F (-10 to 60°C);

Humidity: 5–90%, non-condensing

Any-to-any time slot mapping



The Matrix Switch architecture guarantees total non-blocking operation for any TDM application and for Packet switching applications over the redundant Packet Switching Bus (PSB). With the ability to simultaneously transmit and receive on both full-duplex 10/100 Ethernet up-link ports, the Matrix Switch offers unparalleled switching to any DSL, E1, STM-1 media as well as redundant PSB and TDM buses.

Rear card options include electrical (BNC) and optical (SC) physical connections.



ORDERING INFORMATION

6511RC/SST/SC20: OC-3/STM-1 TDM and Packet Switch, with SC optical interface

6511RC/SST/EBNC: OC-3/STM-1 TDM and Packet Switch, with BNC electrical interface

PATTON

Network Access & Connectivity Solutions for Enterprise, Carrier & Industrial Applications

Patton Electronics—a leader in the production of network access and connectivity products—is building on its expertise in integrated network access, transmission, IP and Frame Relay technologies and leading in the development of right-priced products to simplify human and machine access to the global network.

The Patton brothers, Bobby and Burt, founded Patton Electronics in 1984, while students in college. Over the succeeding 20+ years, Patton has taken those simple beginnings and expanded into a multi-national manufacturing company that today employs more than 180 people and provides a product line in excess of 1000 items.

For your next project that needs to meet aggressive price points, while delivering high performance results, call on Patton. We're ready to deliver!

www.patton.com



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Industrial Computers
Ultra-Miniature Computers



EnviroNET™
Hardened Networking
Ruggedized Data & Tele Comms



MicroPak™
Converters
Interface and Media Converters



QuikConnect™
Line Drivers
Line Drivers & Short Range Modems



SmartNode™
Voice-Over-IP
More Than Just Talk

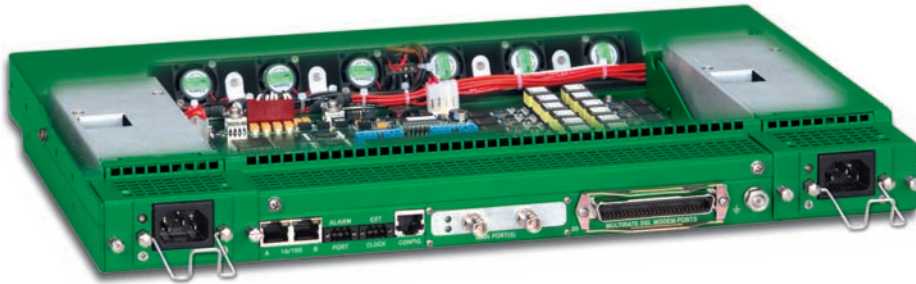


ForeFront™
WAN Aggregation
TDM & IP Aggregation

High-Speed G.SHDSL Concentrator for IP Traffic

Model 3224 ipDSLAM

The Model 3224 enables a wide variety of high speed dedicated access services by creating concentration points for routed IP traffic.



Patton's Model 3224 IPDSLAM is a cost-effective solution for dedicated Internet service delivery in situations where the business case does not support the separate deployment of high-density, chassis based solutions, service creation platforms, and routers. With support for 24 ports of up to 4.6 Mbps symmetric G.SHDSL links and numerous uplink options, the 3224's flexibility is unsurpassed.

The 3224 IPDSLAM routes IP traffic using numerous standard routing protocols while maintaining strict quality of service (QoS) by prioritizing operator configured traffic flows using standard ToS bits. VPN applications can easily be deployed with L2TP or PPTP-based tunneling of IP traffic. Assigning traffic priorities to VPNs guarantees QoS.

Extensive IP address and port filtering makes the 3224 an excellent multi-user firewall and service creation platform. Either customize firewall services to the needs of the individ-

ual users or provide a standard global firewall service. Use the filters to segregate the traffic and wholesale service to other providers without losing control of your network or the level of service that is offered.

Well thought-out solutions to common networking issues include support for NAT & NAPT for avoiding IPv4 address depletion, DHCP for value added services to SOHOs, DNS caching for quick address look-ups, SNTP for time server synchronization of edge devices, and RADIUS accounting and authentication for validation, verification and accounting of user sessions.

Optional up-link ports provide the flexibility of selecting the up-stream interface that is right for your network deployment needs. Co-locate with a DLC or use it in a building's wiring closet. Redundant, load sharing, removable power supplies provide maximum power protection. External BITS

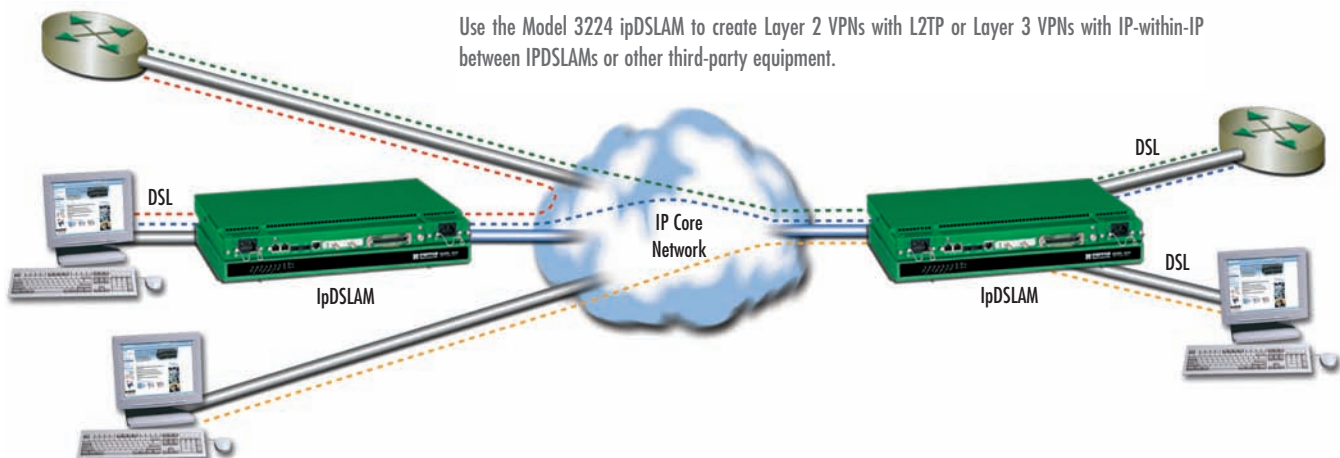
FEATURES & BENEFITS

- ✓ NAT & NAPT—Avoid address depletion
- ✓ DiffServ/ToS—QoS for all traffic flows
- ✓ IP address & port filtering—Create your own firewall
- ✓ DNS caching—Faster address lookups
- ✓ DHCP—Manage IP addressing for user LANs
- ✓ PPTP & PPPoE—Create Layer 2 tunnels
- ✓ IPsec—Create Layer 3 VPNs
- ✓ SNTP—Synchronize edge devices to time source
- ✓ RIP, OSPF & BGP—Routing flexibility
- ✓ RADIUS Accounting & Authentication—Authenticate & track users with standard tools
- ✓ Expansion modules—Adapt IPDSLAM to your network needs
- ✓ 24 G.SHDSL Ports—Symmetric service to 4.6 Mbps
- ✓ Redundant, removable power supplies—Non-stop operation

and alarm ports facilitate the deployment of the 3224 IPDSLAM in traditional central office environments.

Whether you are an ISP, ASP, or Carrier, the IPDSLAM will improve the quality and variety of your service offering while reducing your investment in value added service platforms.

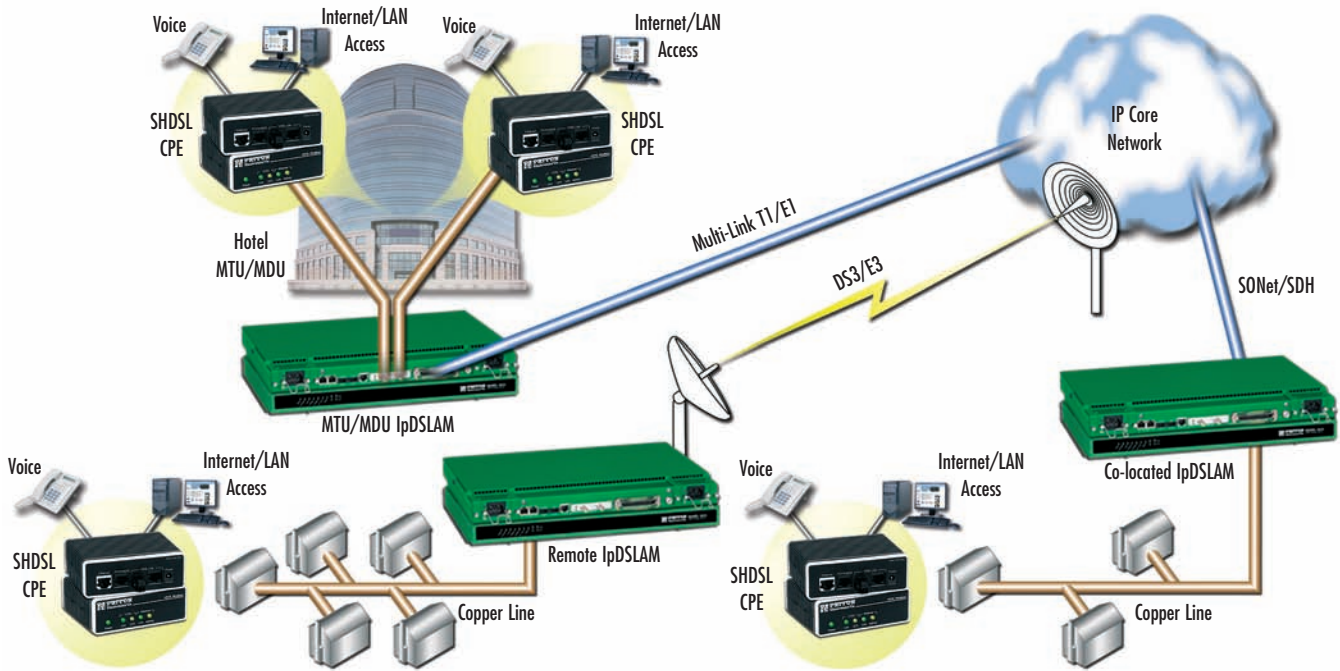
Layer 2 and layer 3 VPNs



Use the Model 3224 ipDSLAM to create Layer 2 VPNs with L2TP or Layer 3 VPNs with IP-within-IP between IPDSLAMs or other third-party equipment.

Deployment options

G.SHDSL for IP networks can be deployed in a variety of different ways: 1. In a multi-dwelling unit (MDU) or multi-tenant unit (MTU) utilizing in-building voice-grade wires; 2. In a remote POP connected to residential or community users; 3. In a co-location facility for last-mile access.



G.SHDSL DiamondLink™ Router

For your most valuable end-point connections, use Patton's DiamondLink Router. Supporting auto-sensing 10/100 Ethernet with MDI-X switching and web-based management, it's a real gem!



See page 89



I'm Tshaka, one of Patton's Support Engineers. If you're having a problem with a Patton product, I'll find the solution quickly. To buy one of these state-of-the-art ipDSLAMs, call +1 301.975.1000 or send e-mail to sales@patton.com.

SPECIFICATIONS

G.SHDSL ports: 24 ports presented on an RJ-21X 50-pin connector, each supporting data rates of Nx64 (up to 4.6 Mbps)
Egress Modules: Up-link modules include: 4 or 8 T1/E1 ports; Single unchannelized DS3/E3; DS3/E3 ATM; Single OC-3/STM-1; Single OC-3/STM-1 ATM (Refer to individual modules for specifications)
Ethernet Ports: Dual 10/100Base-T (RJ-45 connector)

WAN clocking: Internal, network receive recover (from WAN port), external BITS via 3-pin terminal block
Front Panel Indicators: LEDs for power, CPU, system, Ethernet, External clock, test mode, DSL, and Up-link Egress module
Power Supplies: Hot swap, dual-redundant universal AC/DC; AC power: 90-264 VAC (50/60 Hz); DC power: -36 to -72 VDC

Management Service: HTTP, SNMP, Telnet, Ethernet, RS-232 Console Port, SYSLOG Client, Software upgrade via FTP
Alarm Reporting: Configurable alarms; Remote SNMP Traps; Front Panel LEDs; 3-Contact Relay (3-pin terminal block)
Compliance: Safety—UL/CSA per UL1950 (METS) Canadian cMET and CS-03. EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC (EN60950),

FCC Part 15, CE Mark, CTR12, CTR13, FCC Part 68
Op. Temp.: 32–104°F (0–40°C)
Humidity: 5–90% non-condensing
Dimensions: 19.00W x 12.60D x 1.75H in. (48.25W x 32.00D x 4.44H cm)
1U high by 19 in. wide

ORDERING INFORMATION

- 3224/G/RUI: 24 SHDSL ports; 2 10/100 Ethernet ports; No up-link; redundant AC power; Forest Green
- 3224/G/R48: 24 SHDSL ports; 2 10/100 Ethernet ports; No up-link; redundant DC power; Forest Green

VDSL Access Concentrator/Switch

Model 3324

The Model 3324 provides connectivity for up to 24 users of voice and data services over existing voice-grade twisted-pair wiring.



Patton's Model 3324 VDSL Access Concentrator provides a simple and efficient method of delivering voice and high speed data services over existing copper infrastructure. The Model 3324 employs VDSL (very high bit-rate DSL), the fastest digital subscriber line technology. This technology enables carriers and service providers to provide broadband services that previously could not be provided using other forms of DSL. Using a Model 3324 VDSL Access Concentrator with Model 1058 CPEs will provide services for up to 24 users.

The Model 3324 is a fully manageable Layer 2/3 switch with 24 independently configurable VDSL ports. This feature allows service providers to differentiate their high speed data services. The Model 3324 comes standard with two auto

sensing RJ-45 100/1000BaseT Ethernet ports or an optional industry standard GBIC (Gig Fiber) uplinks.

The Model 3324DV's unique 1U chassis design includes on-board POTS/ISDN splitters for all 24 VDSL channels. This feature enables the simultaneous use of voice and data over a single 2-wire twisted pair without the additional cost and space of an external splitter panel.

For larger applications, up to four Model 3324s can be cascaded to provide a scalable VDSL solution (96 ports). The Model 3324 24-Port VDSL Access Concentrator is Patton Electronic's flagship product and is compatible with the Patton 1058 VDSL CP units.

FEATURES & BENEFITS

- ✓ 24 software selectable asymmetrical or symmetrical
- ✓ Extends Ethernet connections beyond the 328 ft limitations over a single pair of voice-grade wire
- ✓ Fully manageable Layer 2 Ethernet switch/Layer 3 switch and routing functionality
- ✓ Compact 1U design
- ✓ Built-in POTS/ISDN splitter for all 24 VDSL ports
- ✓ Local and remote testing and management capabilities
- ✓ Bandwidth management
- ✓ Dual auto-sensing RJ-45 100/1000 BaseT or GBIC for Ethernet uplink or cascading options
- ✓ Cascade up to 4 VDSL concentrators for up to 96 ports
- ✓ Compliant with ETSI, ITU, and ANSI standards



I'm Steve, one of Patton's Engineers designing ipDSLAMs. To buy one of these state-of-the-art devices, call +1 301.975.1000 or send e-mail to sales@patton.com.

PROTOCOL SPECIFICATIONS

Layer 3 Protocols

RFC 791 IP
RFC 793 TCP
RFC 768 UDP
RFC 950 ICMP
RFC 2236 IGMPv1
IP Multicasting

Ethernet Standards

IEEE 802.1d Spanning Tree
IEEE 802.1p Priority Queuing
IEEE 802.1Q VLAN Tagging

IEEE 802.3ad Port Trunking
IEEE 802.3x Flow Control
IEEE 802.3 Ethernet
IEEE 802.3u Fast Ethernet
IEEE 802.3z Gigabit Ethernet

Management Standards

RFC 2068 HTTP
RFC 1157 SNMP/V1
RFC 1213 MIB II
RFC 1493 Bridge MIB
RFC 1757 RMON

GENERAL SPECIFICATIONS

VDSL Line Interface: 24 ports presented on one RJ-21

POTS-ISDN Interface: 24 ports presented on one RJ-21

Modulation: QAM (Quadrature Amplitude Modulation)

Frequency Range: VDSL:

1–8 Mhz

POTS/ISDN: 0–120 kHz

Transmission: Software selectable symmetrical and asymmetrical line rates

Power Supply: AC: UI (85–265);

Dimensions:
1.73H x 11.22W x 16.22L in.
(4.1H x 28.5W x 41.2L cm)

Weight: 13 lbs (0.18 kg)

Operating Temp:

41–122°F (5–50°C)

Storage Temp:

–4–149°F (–20–65°C)

Humidity:

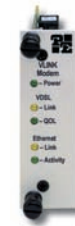
10–90% non-condensing

CPE Compatibility

The Model 3324 interoperates with Patton's 1058/CP and 1058RC/CP (see page 91).



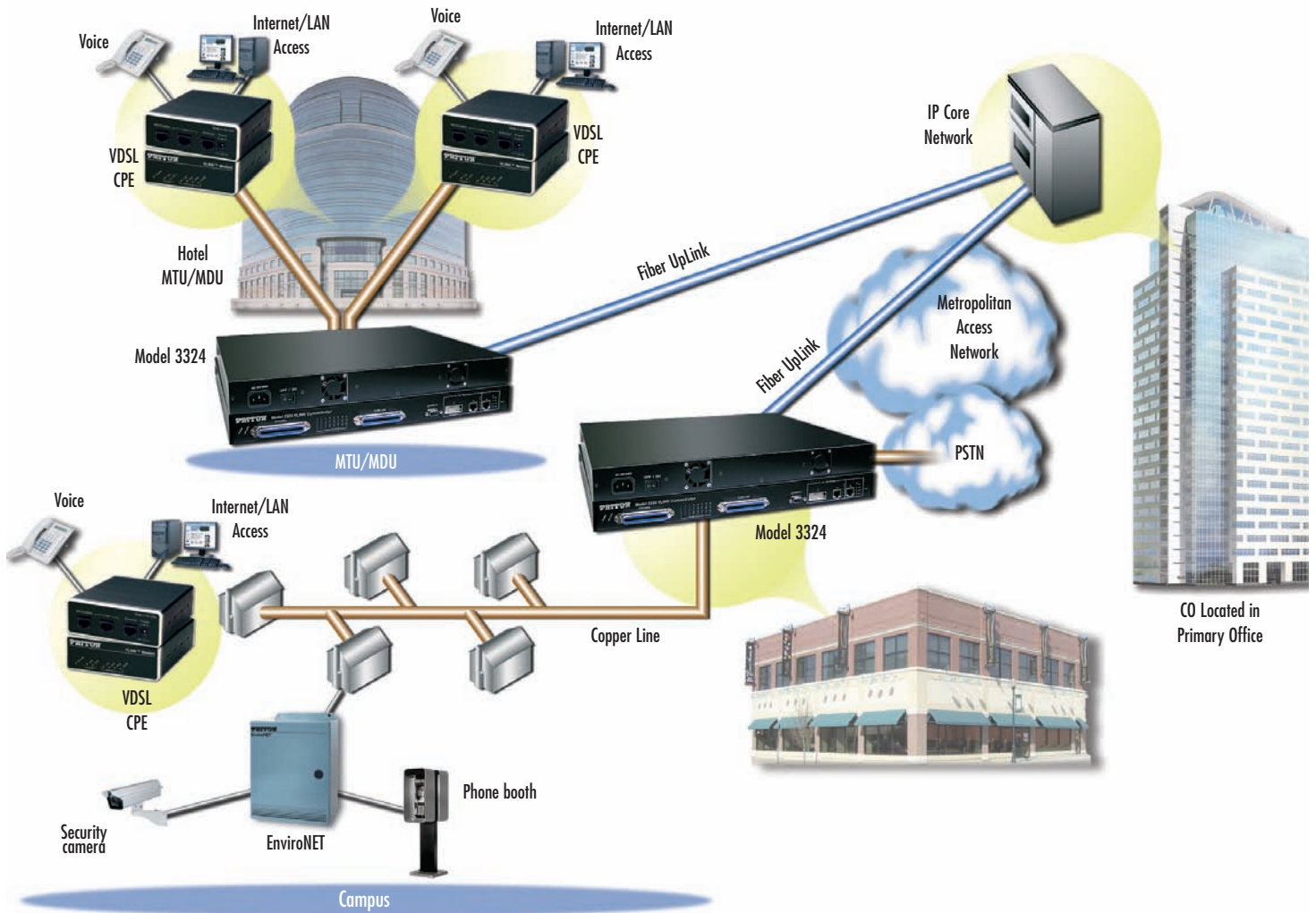
1058/CP



1058RC/CP

Voice and data services over VDSL

Using Patton's VDSL Access Concentrator at a central location, up to 24 full-service links can be routed to various room locations. The CO or ISP would provide the fiber uplink from the network to the Model 3324 location. The POTS lines delivered from the PSTN would be concentrated and delivered to the Model 3324 on an RJ-21 connector. The 3324 combines the POTS and Ethernet signals and sends them over the VDSL links to the individual rooms over existing twisted pair, voice-grade wiring. A 1058CP standalone unit is placed in each room to split the signals back into Ethernet (data) and POTS/ISDN (voice) forms for delivery to the end-user. The Model 3324 allows VDSL services on each channel to be configured at various symmetric and asymmetrical line rates to differentiate services or to increase the distance capabilities.



ORDERING INFORMATION

3324DV/GE/UI: 24-Port VDSL Data & Voice Access Concentrator — RJ-45 Autosensing 100/1000 BaseT Uplink (85–265) VAC



I'm Maria, one of Patton's Sales Coordinators. If you have questions about our products, call +1 301.975.1000 or send e-mail to sales@patton.com.



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FAST Delivery From Your AUTHORIZED DISTRIBUTOR!



Low-Cost, High-Speed G.SHDSL Modem

Model 3088 RocketLink™ G.SHDSL NTU

Use Patton's RocketLink G.SHDSL Modem for fast, dedicated, always-on access.



The Model 3088 RocketLink Modem drives profitability back into leased-line data services with standards-based G.SHDSL technology. The Model 3088 provides low cost, full-duplex network termination or extension at nx64 rates to 4.6 Mbps. The Model 3088 connects routers, switches, and other access devices, and is available in G.703/G.704, co-

directional G.703, T1/FT1, X.21, and V.35 interfaces. Plus, it is available in a rack card for the Model 1001 universal access rack.

The Model 3088 excels in manageability with built-in loop-back and pattern generators that allow quick verification of DSL lines. Additionally, with software upgradeability via the console port, the unit is ready for the next feature upgrade. Lastly, with remote console support, a centrally located unit can be used to take control of a remote unit via the console port, using an out-of-band management channel.

For true flexibility, the Model 3088 is also compatible with any of Patton's G.SHDSL modems, including the Model 3201 router and ForeFront DSL solutions.

FEATURES & BENEFITS

- ✓ Speeds to 4.6 Mbps over just a single twisted pair of wires
- ✓ Distances up to 32,800 feet (10 km)
- ✓ Software upgradeable
- ✓ G.SHDSL ITU/ETSI interoperability with third-party TDM DSLAMs
- ✓ G.703/G.704, X.21, V.35, and co-directional interfaces available
- ✓ Built-in testing and diagnostics for quick network turn-up and troubleshooting
- ✓ ForeFront plug-and-play operation

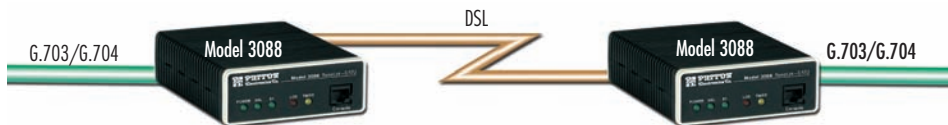
CPE for ForeFront



Using ForeFront with the Model 3088 allows deployment of hundreds of DSL circuits from a single low profile chassis. The Model 3088 can be used on the customer premise to deliver T1/E1 co-directional G.703, X.21, or V.35 interfaces.



T1/E1 extension over copper wires



Use the Model 3088 units back-to-back to extend T1 or E1 channels across copper wires. These units are ideal for local loop, Campus, and multi-dwelling/multi-tenant applications.

SPECIFICATIONS

DSL: G.991.2 ITU G.SHDSL Annex A and Annex B, G.994.1 G.hs. nx64 data rates over 2-wire full-duplex to 2.3/4.6 Mbps, symmetrical, TC-PAM encoding. Distance of 32,800 ft (10 km) at 192 kbps to 18,800 ft (5.75 km) at 2.312 Mbps.
DSL Connection: Shielded RJ-45F isolation per IEC 950

DTE Interface: G.703/G.704, V.35, X.21/V.11, T1/FT1, G.703 Co-Directional
DTE Rates: From 64 kbs to 2.3/4.6 mps in user definable increments
Diagnostics: V.54 Loops (LLB, RDL); V.52 compliant BER pattern generator and detector (511/511E)

Management: EIA-561 RJ-45 RS-232, VT-100 CLI, TELNET, Embedded WEB/HTTP, SNMP
Power Supply: External 230 VAC, Universal 90–260 VAC, or -48 VDC input
Compliance: FCC Part 15A, CE Mark, EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC

Op. Temp.: 32–122°F (0–50°C)
Humidity: 5–90%, non-condensing
Dimensions: 4.17W x 1.52Hx5.0L in. (10.6W x 3.9H x 12.7L cm)

ORDERING INFORMATION

3088/C/EU: G.SHDSL RocketLink V.35 with DB-25 interface & M/34F adapter; 100–240 VAC power

3088/D/EU: G.SHDSL RocketLink X.21 with DB-15F interface; 100–240 VAC power

3088/K/EU: G.SHDSL RocketLink G.703/G.704 with dual BNC and/or RJ-48 Interface; 100–240 VAC power

3088/T/EU: G.SHDSL RocketLink T1 with dual BNC and/or RJ-48 interface; 100–240 VAC power

G.SHDSL FRF.5/FRF.8 over ATM NTU

Model 3088FR ATM NTU

The Model 3088FR NTU combines FRF.5 and FRF.8 Frame Relay/ATM conversion with G.SHDSL technology in a compact, high-performance subscriber unit for multi-service, revenue generating, DSL deployment.



The Model 3088FR NTU combines the latest advances in high-speed DSL technology—G.SHDSL—with a potent Frame Relay and ATM core facilitating seamless connection of legacy Frame Relay devices to high-speed ATM networks. Offering Frame Relay-to-ATM conversion using FRF.5 and FRF.8 internetworking, the 3088FR provides standards-

based subscriber interfaces with a choice of synchronous serial V.35, X.21, or T1/E1 ports. The 3088FR connects seamlessly to any third-party DSLAM, or to another 3088FR for back-to-back operation.

The Patton 3088FR enables interoperable physical access with 2.3 Mbps speeds at nx64 (n=1..36) over a single G.SHDSL G.991.2 pair of wires. The 3088FR—with Annex B support—is based on the ETSI and ITU G.SHDSL G.991.2 standards.

The 3088FR boasts easy installation with console, telnet, and WWW/SNMP management options via its integrated Ethernet port.

SPECIFICATIONS

DSL: G.991.2 ITU G.SHDSL Annex A and Annex B, G.994.1 G.Handshaking, nx64 data rates over 2-wire full-duplex to 2.3 Mbps, symmetrical, TC-PAM encoding. Distance of 32,000 ft (9.8 km) at 192 kbps to 18,000 ft (5.6 km) at 2.312 Mbps.

DSL Connection: Shielded RJ-11F isolation per IEC 950, two-wire, 135-Ohm.

Ethernet Management

Connection: 10/100Base-T, auto-sensing, full/half-duplex operation, built-in MDI-X

Serial Interface: V.35—M/34E, X.21—DB15F (DCE/DTE), T1—RJ48C, E1—RJ48C and Dual BNC.

FR to ATM Support: FRF.5 (Frame Relay Network Interworking), FRF.8 (Frame Relay Service Interworking), LMI with ITU Q.933, ANSI T1.617, and Cisco LMI implementation.

Management: EIA-561 RJ-45 RS-232, VT-100 CLI, TELNET, Embedded WEB/HTTP, SNMP, Logging or SMTP on events: POST, POST errors, line & DSL.

ATM Support: UNI 3.0, 3.1, and 4.0 ATM QoS with UBR/CBR/nrt-VBR/rt-VBR

and per-VC queuing and shaping. Peak cell rate shaping on a per-VCC basis up to 32 active VCCs. I.610 OAM network management including AIS/RDI, loop-back and performance monitoring.

Frame Relay: FRF.5, FRF.8, ANSI and CCITT LMI1 with user, network and both Security: Access list determining up to 5 hosts/networks which are allowed to access management system SNMP/HTTP/TELNET

Indicators: 13 LEDs: Power, DSL Link; Sync Serial: TD, RD, CTS, DTR; LAN: TX, RX, 100M Link; Status: NS, ER, TM.

Power Supply: Internal universal 90–260 VAC input or 48 VDC input. Optional external power available.

Compliance: FCC Part 15A, FCC Part 68 (3088FR /T and /K), CE Mark, EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC, EN60950, EN55022 (CISPR 22)

Environment: Temperature: 32–122°F (0–50°C)

Humidity: 5–90%, non-condensing

Dimensions: 7.3 x 6.6 x 1.62 in. (185 x 168 x 41 mm).

FEATURES & BENEFITS

- ✓ **Frame Relay to ATM**—Connect FRADS, routers or any Frame Relay devices to high-speed ATM networks using inexpensive DSLAM ports
- ✓ **Flexible Interfaces**—V.35, X.21, or T1/E1 interface options offers flexibility for all interconnection requirements.
- ✓ **Interoperable with DSLAMs**—Take advantage of Patton reliability whether you connect back-to-back or to a third-party DSLAM.
- ✓ **LEDs & V.52/V.54 Diagnostics**—Easy-to-access toggle switches let you test the link with built-in test modes. LEDs provide clear status at-a-glance
- ✓ **WWW/SNMP Manageable**—Built-in VT-100 console port makes setup a snap, and you can use the embedded HTTP/SNMP agent to manage the Model 3088FR from anywhere in the world.

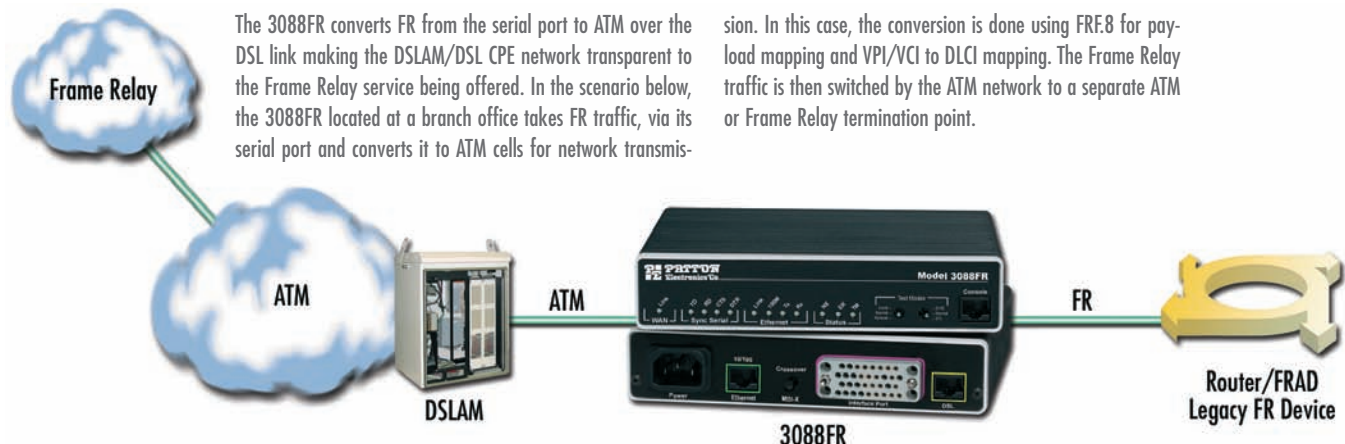
ORDERING INFORMATION

3088FR/RIC/EUI: ATM to Frame Relay NTU with V.35 interface on M/34 connector

3088FR/RID/EUI: ATM to Frame Relay NTU with X.21 interface on DB-15 connector

3088FR/RIK/EUI: ATM to Frame Relay NTU with T1/E1 interface on both a dual BNC and RJ-48C connector

Why use our 3088FR?



The 3088FR converts FR from the serial port to ATM over the DSL link making the DSLAM/DSL CPE network transparent to the Frame Relay service being offered. In the scenario below, the 3088FR located at a branch office takes FR traffic, via its serial port and converts it to ATM cells for network transmis-

sion. In this case, the conversion is done using FRF.8 for payload mapping and VPI/VCI to DLCI mapping. The Frame Relay traffic is then switched by the ATM network to a separate ATM or Frame Relay termination point.

G.SHDSL Integrated Access Device

Model 3086 ipRocketLink™ IAD

Get high speed, 2-wire, standards-based transmission, and simultaneous sync.-serial and Ethernet/IP for fast, dedicated, always-on access.

The Model 3086 redefines access and sets the new standard for customer premise equipment. Based on the ITU G.SHDSL G.991.2 standard, the Model 3086 ipRocketLink enables nx64 (to 4.6 Mbps) over a single pair of wires while combining standards-based transmission with synchronous-serial, Ethernet, and high speed IP routing — *all in one compact package.*



With Patton's FlexIP™ architecture, The Model 3086 offers V.35/X21 sync.-serial interfaces and 10/100 Ethernet ports. The sync.-serial port is user configurable for V.35 or X.21. Integrated software-selectable DCE/DTE support eliminates messy crossover cables. The Ethernet port gives access to any IP network via ATM, PPP, or Frame Relay. Both interfaces can be simultaneously selected with user-defined bandwidth for each port. The 3086 boasts

easy installation with DIP switch, Telnet, and Web/SNMP management. It provides bridging and routing functionality along with advanced IP features like NAT and firewall, and optional IPSec-based VPN. As part of Patton's family of ipDSL products, the Model 3086 offers a complete, managed, end-to-end system when used with Patton's central-site access concentrators.

FEATURES & BENEFITS

- ✓ nx64 speeds to 4.6 Mbps
- ✓ User selectable DCE/DTE V.35/X.21
- ✓ Built-in Ethernet/IP router — *standard*
- ✓ Patton's FlexIP lets users split the bandwidth to use both the serial and the Ethernet interfaces at the same time!
- ✓ Get ATM, PPP, and Frame Relay
- ✓ Interoperable with third-party DSLAMS
- ✓ LEDs and full V.52/V.54 diagnostics
- ✓ Web/SNMP manageable from anywhere in the world via the Internet
- ✓ Powerful routing features like NAT/NAPT, firewall, and DHCP

ORDERING INFORMATION

G.SHDSL IAD router

3086/RIC/UI: Ethernet V.35 M34F port, IP Access Feature Set, and internal AC power supply

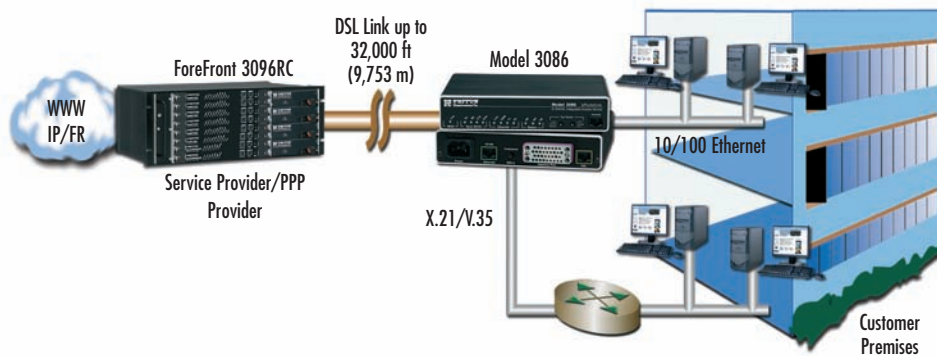
3086/RICA/X: Ethernet V.35 DB-25 port, IP Access Feature Set, and internal AC power supply

3086/RID/X: Ethernet X.21 DB-15F port, IP Access Feature Set, and internal AC power supply

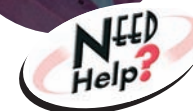
3086/RICD/X: Ethernet Selectable X.21/V.35 on DB-25F port, IP Access Feature Set, and internal AC power supply

3086/RIK/X: Ethernet T1/E1 D&I port, IP Access Feature Set, and internal AC power supply

IP/FR and TDM Data Access application



I'm Dave, Patton's Manager of US Technical Support. If you do not find what you need at www.patton.com or in this catalog, or if you have technical questions or comments, please call me at +1 301.975.1007. You can also send e-mail to puckett@patton.com.



SPECIFICATIONS

DSL: G.991.2 ITU G.SHDSL Annex A and Annex B, G.994.1 G.hs. nx64 data rates over 2-wire full-duplex to 2.3/4.6 Mbps, symmetrical, TC-PAM encoding, Distance of 32,000 ft (9.8 km) at 192 kbps to 18,000 ft (5.6 km) at 2.312 Mbps.

DSL Connection: Shielded RJ-11F isolation per IEC 950

Ethernet Connection: 10/100Base-T, Auto-Sensing, Full/Half-Duplex operation

Management: EIA-561 RJ-45 RS-232, VT-100 CLI, TELNET, Embedded WEB/HTTP, SNMP, Logging or SMTP on events: POST, POST errors, line/DSL, PPP/DHCP, IP MPOA AAL5 and Bridged encapsulation RFC 2684 and RFC 1577 iPoATM, LLC/VC Mux support.

ATM Support: UNI 3.0, 3.1, and 4.0 ATM QoS with UBR/CBR/nrt-VBR/r-VBR and per-VC queuing and shaping.

Peak cell rate shaping on a per-VCC basis up to 32 active VCCs
I.610 OAM network management including AIS/RDI, loop-back and performance monitoring.

Protocol: Enhanced ILM1 4.0 for auto-configuration of ATM PVCs, IP (RFC 741), TCP (RFC 793), UDP (RFC 768), ICMP (RFC 950), ARP (RFC 826), IP Router with RIP (RFC 1058), RIPv2 (RFC 2453), OSPF (RFC 2328) Integrated DHCP Server (RFC

2131). Selectable IP leases and MAC/IP pairings. DHCP relay agent (RFC 2132/RFC 1542) with 8 address pools. DNS Relay, IGMP v1 and v2, IP-in-IP (RFC-2003) encapsulation, Ethernet Bridging.

NAT/NAPT with integrated application support, MultiNat with 1:1 mapping, Many:1, Many:Many mapping, NAT Port/IP redirection and mapping.

Security: DoS Detection/protection, Intrusion detection, Logging of session,

blocking and intrusion events and Real-Time alerts, Password protected system management with a username/password for console and virtual terminal, Packet filtering firewall for controlled access to and from LAN/WAN, Support for 255 rules in 32 filter sets, 16 individual connection profiles, Access list determining up to 5 hosts/networks which are allowed to access management system SNMP/HTTP/TELNET

Power Supply: External universal 90–260 VAC input or -48 VDC
Compliance: FCC Part 15A, CE Mark, EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC

Op. Temp.: 32–122°F (0–50°C)

Humidity: 5–90%, non-condensing
Dimensions: 4.17W x 1.52Hx5.0L in. (10.6W x3.9H x12.7L cm)

ipRocketLink Serial G.SHDSL
Model 3087 3-Point DSL, Serial, Ethernet Bridge/Router

The Model 3087 is a low-cost G.SHDSL Serial Bridge/Router supporting speeds up to 2.3 Mbps over two wires.



The Model 3087 ipRocketLink bridge/router redefines access and sets the new standard for customer premise equipment. Based on European Telecommunications Standardization Institute (ETSI) and International Telecommunications Union (ITU) G.SHDSL G.991.2 standard, the Patton 3087 ipRocketLink enables 2.3 Mbps speeds at nx64 (n=1..36) over a single pair of wires while combining standards based transmission with concurrent synchronous-serial, Ethernet, and high-speed IP routing/bridging... all in one compact package. With Patton's FlexIPTM architecture, the Model 3087 offers V.35, X.21, or T1/E1 Sync-Serial interfaces and a 10/100

Ethernet port. Integrated software selectable DCE/DTE support eliminates messy crossover cables. The Ethernet port enables access to any IP network via ATM, PPP, or Frame Relay. Both interfaces can be simultaneously selected with user-defined bandwidth for each port.

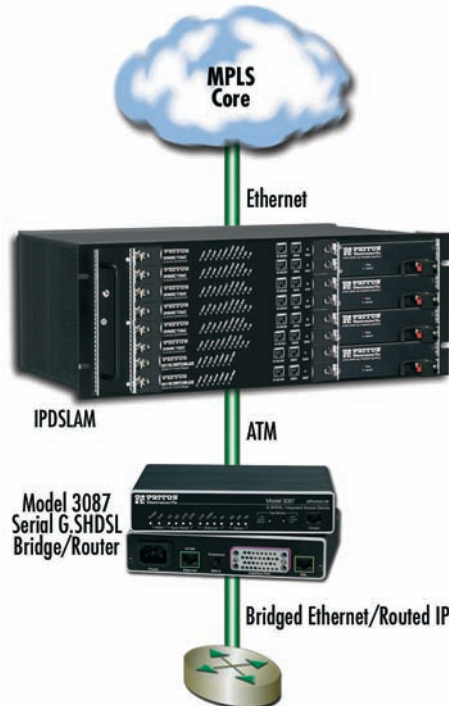
Combining ease-of-use with a full suite of LAN/WAN routing features, the Model 3087 provides selectable bridging or routing functionality along with advanced IP features such as NAT/NAPT, DNS relay, and DHCP server and relay. Numerous firewall features include the ability to filter by IP address and by IP port, support for Intrusion Detection (IDS), and the capability of "blacklisting" offending traffic flows likewise come standard with the unit.

Configurable FR/PPP/IP WAN protocols allow a wide range of choices when connecting equipment via common WAN services. The IPLink supports the latest version of PPP/BCP, transparently negotiating the passing of VLAN traffic.

Application diagram

In a traditional ATM DSLAM network, the traffic from the CPE into the core network stays ATM. In an IPDSLAM network, the CPE ATM traffic is converted to Ethernet/IP at the IPDSLAM.

Therefore, in a traditional DSLAM network, when a user has a router with a serial port such as V.35, X.21 or G.703/G.704, the DSL CPE must support Frame Relay to ATM Internetworking (FRE/5/8). IPDSLAMs typically do not support terminating frame relay traffic. For this reason the Model 3087 is an ideal solution. It supports terminating Frame Relay or PPP from an attached router on the serial port. It then routes or bridges this traffic to the IPDSLAM so that when it gets converted to Ethernet, the traffic can be terminated directly on a BRAS, Ethernet Switch, or MPLS LER.



FEATURES & BENEFITS

- ✓ nx64 Rates to 2.3 Mbps—With multiple full-duplex symmetric rates available, users select the bandwidth option they need.
- ✓ Low-Cost Fixed Interfaces—Multiple interface options to choose from: T1/E1 (G.703/G.704), X.21, and V.35.
- ✓ Firewall Support—IDS with blacklisting. ACL support for IP and MAC based filtering.
- ✓ Avoid CES—Route or bridge PPP or Frame Relay traffic
- ✓ NetLink Plug-and-Play—Just plug them in and the link comes up in seconds. With G.Handshake, the CPE unit auto-bauds to rate set at CO.

SPECIFICATIONS

DSL: G.991.2 ITU G.SHDSL Annex A & Annex B, G.994.1 G.hs. nx64 data rates over 2-wire full-duplex to 2.3 Mbps, symmetrical, TC-PAM encoding.
Distances: 32,000 ft (9.8 km) at 192 kbps to 18,000 ft (5.6 km) at 2.312 Mbps.
DSL Connection: Shielded RJ-11F isolation per IEC 950
Ethernet Connection: 10/100Base-T, auto-sensing, full/half-duplex operation, built-in MDI-X
Serial Interface: V.35—M/34E, X.21—DB15F (DCE/DTE), T1—RJ48C, E1—RJ48C, and dual BNC
Management: EIA-561 RJ-45 RS-232, VT-100 CLI, TELNET, Embedded WEB/HTTP, SNMP, Logging or SMTP on events: POST, POST errors, line/DSL, PPP/DHCP, IP MPOA AALS & bridged encapsulation RFC 2684 & RFC 1577 IPoATM, LLC/VC Mux support.
ATM Support: UNI 3.1, and 4.0 ATM QoS with UBR/CBR/nrt-VBR/rt-VBR and per-VC queuing and shaping. • Peak cell rate shaping on a per-VCC basis up to 32 active VCCs • I.610 OAM network management including AIS/RDI, loop-back and performance monitoring.
Protocol: Enhanced LMI 4.0 for auto-configuration of ATM PVCs, IP (RFC 741), TCP (RFC 793), UDP (RFC 768), ICMP (RFC 950), ARP (RFC 826), IP Router with RIP (RFC 1058), RIPv2 (RFC 2453), OSPF (RFC 2328) Integrated DHCP Server (RFC 2131). Selectable IP leases and MAC/IP pairings. DHCP relay agent (RFC 2132/RFC 1542) with 8 address pools. DNS Relay.
**IGMP v1 and v2, IP-in-IP (RFC-2003) encapsulation, Ethernet Bridging. NAT/NAPT with integrated application support, MultiNat with 1:1 mapping, Many:1, Many:Many mapping, NAT Port/IP redirection and mapping. Frame Relay with ANSI and CCITT LMI support including user, network, and both configuration. PPP/PCP and PPP/BCP. Security: DoS Detection/protection. Intrusion detection, Logging of session, blocking and intrusion events and Real-Time alerts, Password protected system management with a username/password for console and virtual terminal, Packet filtering firewall for controlled access to and from LAN/WAN. Support for 255 rules in 32 filter sets. 16 individual connection profiles. Access list determining up to 5 hosts/networks which are allowed to access management system SNMP/HTTP/TELNET
Power Supply: Internal universal 90–260 VAC input or 48 VDC input. Optional external power available.
Compliance: FCC Part 15A, CE Mark, EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC, EN60950, EN55022 (CISPR 22)
Environment: Temp.: 32–122°F (0–50°C); Humidity: 5–90%, non-condensing
Dimensions: 7.3 x 6.6 x 1.62 inch (185 x 168 x 41mm).**

ORDERING INFORMATION

- Serial G.SHDSL Bridge/Router**
3087/RIC/EUI: V.35 port (M34 connector); external UI power supply
3087/RID/EUI: X.21 port (DB15 connector); external UI power supply
3087/RIK/EUI: G.703/G.704 port (BNC & RJ45 connector); external UI power supply
3087/RIC/E48: V.35 port (M34 connector); external 48-VDC power
3087/RID/E48: X.21 port (DB15 connector); external 48-VDC power
3087/RIK/E48: G.703/G.704 port (BNC & RJ45 connector); external 48-VDC power

G.SHDSL FRF.5/FRF.8 Over ATM IAD

Model 3086FR IpRocketLink™ ATM IAD

Combines FRF.5 and FRF.8 Frame Relay/ATM conversion with G.SHDSL technology in a compact, high performance subscriber unit for multi-service, revenue generating, DSL deployment.



The Patton Model 3086FR IAD combines the latest advances in high speed DSL technology, G.SHDSL, with a potent IP, FR, PPP and ATM core facilitating simultaneous connection of legacy Frame Relay devices as well as routed IP services to high speed ATM networks.

ORDERING INFORMATION

Model 3086FR G.SHDSL IAD, FRF-5 & FRF-8

3086FR/RIK/48: V.35 (M34) + ETH, 48 VDC

3086FR/RIC/EUI: V.35/M34 + ETH; Ext Pwr 120–220 VAC PS

3086FR/RICA/EUI: V.35/DB25 + ETH; Ext Pwr 120–220 VAC

3086FR/RID/EUI: X.21/DB15 + ETH; Ext Pwr 120–220 VAC

Based on the ETSI and ITU G.SHDSL G.991.2 standard, the 3086FR enables 2.3 Mbps speeds at nx64 (n=1..36) over a single pair of wires. The 3086FR boasts a dual subscriber interface with a standard 10/100 Ethernet and a choice of Synchronous-Serial V.35, X.21 or T1/E1 ports. Together, these interfaces can be concurrently configured for FR-to-ATM conversion using FRF.5 and FRF.8, as well as IP routing or Ethernet bridging—all in one compact package.

The 3086FR boasts easy installation with console, Telnet, and WWW/SNMP management. It provides bridging and routing functionality, along with advanced IP features such as DHCP and Firewall (IDS, Filtering, NAT).

3086FR/RIK/48: G.703/G.704 + ETH; Ext Pwr 48 VDC (3rd party compatible)

3086FR/RIT/48: T1 + ETH; Ext Pwr 48 VDC (3rd party compatible)

3086FR/RIT/EUI: T1 + ETH; Ext Pwr 120–220 VAC (3rd party compatible)

FEATURES & BENEFITS

- ✓ **Frame Relay to ATM Conversion**—Connect FRADS, routers or any Frame Relay devices to high speed ATM core networks using inexpensive DSLAM ports
- ✓ **Built-in Ethernet/IP Router Standard**—With Patton's FlexIP architecture, route from any to any port using FR, PPP, Ethernet, and ATM
- ✓ **Firewall**—The 3086FR comes standard with Intrusion Detection (IDS), Access Control Lists (ACL), IP & port filtering and NAT/PAT
- ✓ **Interoperable with Third-Party DSLAMs**—Take advantage of Patton feature richness to deploy multiple revenue generating services over any third-party DSLAM

SPECIFICATIONS

DSL: G.991.2 ITU G.SHDSL Annex A and Annex B, G.994.1 G.Handshaking, nx64 data rates over 2-wire full-duplex to 2.3 Mbps, symmetrical, TC-PAM encoding.

Distance of 32,000 ft (9.8 km) at 192 kbps to 18,000 ft (5.6 km) at 2.312 Mbps.

DSL Connection: Shielded RJ-11F isolation per IEC 950, two-wire, 135-Ohm

Ethernet Connection:

10/100Base-T, auto-sensing, full/half-duplex operation, built-in MDI-X

Serial Interface: V.35—M/34F, X.21—DB15F (DCE/DTE), T1—RJ48C, E1—RJ48C and Dual BNC

FR to ATM Support: FRF.5 (Frame Relay Network Interworking), FRF.8 (Frame Relay Service Interworking), LMI with ITU Q.933, ANSI T1.617, and Cisco LMI implementation.

Management: EIA-561 RJ-45 RS-232, VT-100 CLI, TELNET, Embedded WEB/HTTP, SNMP, Logging or SMTP on events: POST, POST errors, line/DSL, PPP/DHCP, IP MPOA AAL5 and Bridged encapsulation RFC 2684 and RFC 1577 IPoATM, LLC/VC Mux support.

ATM Support: UNI 3.0, 3.1, and 4.0 ATM QoS with UBR/CBR/nrt-VBR/rt-VBR and per-VC queuing and shaping. Peak cell rate shaping on a per-VC basis up to 32 active VCs I.610 OAM network management including AIS/RDI, loop-back and performance monitoring.

Protocol: Enhanced LMI 4.0 for auto-configuration of ATM PVCs, IP (RFC 741), TCP (RFC 793), UDP (RFC 768), ICMP

(RFC 950), ARP (RFC 826), IP Router with RIP (RFC 1058), RIPv2 (RFC 2453), OSPF (RFC 2328) Integrated relay agent (RFC 2132/RFC 1542) with 8 address pools, DNS Relay, IGMP v1 and v2, IP-in-IP (RFC-2003) encapsulation, Ethernet Bridging, NAT/NAPT with integrated application support, MultiNat with 1:1 mapping, Many:1, Many:Many mapping, NAT Port/IP redirection and mapping, Security: DoS Detection/protection, Intrusion detection, Logging of session, blocking and intrusion events and Real-Time alerts, Password protected system management with a username/password for console and virtual terminal, Packet filtering firewall for controlled access to and from LAN/WAN, Support for 255 rules in 32 filter sets, 16 individual connection profiles, Access list determining up to 5 hosts/networks which are allowed to access management system SNMP/HTTP/TELNET

Power Supply: Internal universal 90–260 VAC input or 48 VDC input. Optional external power available.

Compliance: FCC Part 15A, FCC Part 68 (3086FR/RIT and /RIK), CE Mark, EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC, EN60950, EN55022 (CISPR 22)

Temp.: 32–122°F (0–50°C)

Humidity: 5–90%, non-condensing

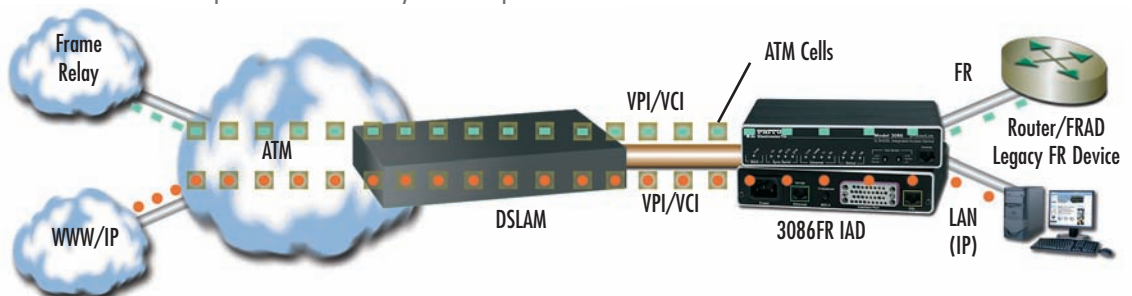
Dimensions: 7.3" x 6.6" x 1.62" (185mm x 168mm x 41mm).

Application—FR and IP traffic over ATM

The 3086FR converts Frame Relay traffic from the serial port into ATM format for transmission over the DSL link. This protocol mapping function makes the DSLAM/DSL CPE network transparent to the Frame Relay service connected to the serial port. Simultaneously, the 3086FR provides a full-service routed or bridged connection between the LAN (connected to the 10/100 Ethernet port) and the supporting DSLAM/ATM network (connected via the G.SHDSL interface).

In the scenario illustrated at right, the 3086FR is located at a branch office and encapsulates FR frames received at the serial port into ATM cells for transmission over the G.SHDSL link. In this example, the conversion is done using the procedures specified in the FRF.5 Implementation Agreement. Simultaneously, the 3086FR routes (or bridges) traffic from the Ethernet LAN to the G.SHDSL port, also encapsulated into ATM

cells. Traffic from the Serial and Ethernet ports is sent over the DSL link. Traffic from each port is delivered on its own ATM virtual circuit, as defined by a unique VPI/VCI combination. This mapping allows the core ATM network to switch the IP traffic to the Internet via a core router. Since the 3086FR supports PPPoE and PPPoA, the traffic can even pass through an authentication server. Finally, the ATM network switches the frame relay traffic to a separate ATM or Frame-Relay termination point.



G.SHDSL High-Speed Routers

Models 3201 & 3241 DiamondLink™

High speed networking to deliver IP access via G.SHDSL technology.

As the cost-per-port for access is collapsing under continuous downward pressure, service providers are looking for proven, flexible, easy-to-use and powerful solutions. Digital subscriber line (DSL) technology transforms traditional inexpensive copper lines into high speed data connections and delivers the access guaranteed.

DSL is particularly valuable as it addresses the immediate needs of business and consumers alike. For high speed Internet access and LAN-to-LAN internetworking, DSL has proven to be cost-effective and quickly provisioned.

The 3201 & 3241 G.SHDSL routers offer standards-based DSL that supports the fundamental and advanced access requirements needed in the market today. These needs are:

- Provide a routed packet-based CPE with IP centric services and functionality.



- Support compatibility with the ability to connect to standard DSLAMs using G.SHDSL.
- Utilize the preferred management method for ISP/CLEC/Carrier environments with the ability to manage devices from any workstation or PC across the Internet.

FEATURES & BENEFITS

- ✓ G.SHDSL speeds to 4.6 Mbps over just a single twisted pair
- ✓ Distances up to 31,000 feet (9,449 m)
- ✓ G.SHDSL interoperability with third-party DSLAMS
- ✓ 10/100 Ethernet port with MDI-X switch to allow easy connection to any computer or LAN
- ✓ Web/SNMP manageable from anywhere in the world via the Internet
- ✓ Powerful routing features like NAT/NAPT, firewall, and DHCP
- ✓ Plug-and-play operation for easy deployment
- ✓ VT-100 port provides convenient local management



Typical application



SPECIFICATIONS

DSL: G.991.2 ITU G.SHDSL Annex A and Annex B, G.994.1 G.hs.mx64 data rates over 2-wire full-duplex to 2.3/4.6 Mbps, symmetrical, TC-PAM encoding, Distance of 32,000 ft (9.8 km) at 192 kbps to 18,000 ft (5.6 km) at 2.312 Mbps.

DSL Connection: Shielded RJ-11F isolation per IEC 950

Ethernet Connection: 10/100Base-T, Auto-Sensing, Full/Half-Duplex operation

Management: EIA-561 RJ-45 RS-232, VT-100 CLI, TELNET, Embedded WEB/HTTP, SNMP Logging or SMTP on events: POST, POST errors, line/DSL, PPP/DHCP, IP MPOA AAL5 and Bridged

encapsulation RFC 2684 and RFC 1577 IPoATM, LLC/VC Mux support.

ATM Support: UNI 3.0, 3.1, and 4.0 ATM QoS with UBR/CBR/nrt-VBR/rt-VBR and per-VC queuing and shaping.

Peak cell rate shaping on a per-VCC basis up to 32 active VCCs
1.610 OAM network management including AIS/RDI, loop-back and performance monitoring.

Protocol: Enhanced ILMI 4.0 for auto-configuration of ATM PVCs, IP (RFC 741), TCP (RFC 793), UDP (RFC 768), ICMP (RFC 950), ARP (RFC 826), IP Router with RIP (RFC 1058), RIPv2 (RFC 2453), OSPF (RFC 2328) Integrated DHCP Server (RFC

2131). Selectable IP leases and MAC/IP pairings. DHCP relay agent (RFC 2132/RFC 1542) with 8 address pools. DNS Relay, IGMP v1 and v2. IP-in-IP (RFC-2003) encapsulation, Ethernet Bridging.

NAT/NAPT with integrated application support, MultiNat with 1:1 mapping, Many:1, Many:Many mapping, NAT Port/IP redirection and mapping.

Security: DoS Detection/protection. Intrusion detection, Logging of session, blocking and intrusion events and Real-Time alerts, Password protected system management with a username/password for console and virtual terminal, Packet filtering firewall for controlled access to

and from LAN/WAN. Support for 255 rules in 32 filter sets, 16 individual connection profiles. Access list determining up to 5 hosts/networks which are allowed to access management system SNMP/HTTP/TELNET

Power Supply: External universal 90–260 VAC input or -48 VDC

Compliance: FCC Part 15A, CE Mark, EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC

Op. Temp.: 32–122°F (0–50°C)

Humidity: 5–90%, non-condensing
Dimensions: 4.17W x 1.52Hx5.0L in. (10.6W x3.9H x12.7L cm)

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PATTON
Electronics Co.

G.SHDSL.bis Business Router

Model 3210 ILink™ G.SHDSL.bis VPN Router

This ILink™ G.SHDSL.bis VPN Router optimizes and secures information by applying VPN encryption and QoS/CoS traffic management to G.SHDSL.bis-based broadband networks.



The ILink™ G.SHDSL.bis VPN Router is a next generation business-class G.SHDSL router that addresses both the security and the traffic prioritization needs of enterprises while providing complete broadband integration with existing DSLAM networks. VPN routers enable the secure communication between remote offices, home offices, and mobile users across insecure IP networks such as the Internet. The 3210 takes it one step further and integrates quality of service (QoS).

ILink G.SHDSL.bis VPN Routers implement a comprehensive security environment. By supporting ESP as well as AH, ILink VPN Routers provide data integrity, authentication, anti-replay and data confidentiality to any traffic flow. DES, 3DES, and AES provide standard encryption up to 256 bits. Firewall capabilities of the ILink VPN Routers include Access Control Lists (ACLs), IP address and port filtering, and protection against Denial of Service (DoS) attacks.

QoS features include ToS/DiffServ marking and the configuration of eight service class tags per IEEE 802.1p/Q. With traffic scheduling and shaping, create dedicated bandwidth guarantees, configurable burst tolerance, and policing to include excess traffic discard. IP fragmentation is configurable to help minimize jitter in traffic flows.

NAT, NAPT, DNS relay, dynDNS, and DHCP server further add to the capabilities of the ILink G.SHDSL VPN Router.

FEATURES & BENEFITS

- ✓ G.SHDSL.bis—From 192 kbps to 5.7 Mbps over 2-wire, dry copper networks.
- ✓ Versatile ATM configurations—Support PPPoE, PPPoA as well as RFC 1384/2684.
- ✓ Dual 10/100 Ethernet Ports—With Dual 10/100 Ethernet, auto-MDI ports easily connect to the LAN and a DMZ.
- ✓ Per Flow QoS—Traffic rates are set through ACLs that shape and police in ingress and egress directions.
- ✓ Stateful Firewall Inspection—Stateful firewall inspection is accomplished through ACLs that filter by source and destination IP address, IP port and protocol.
- ✓ VLAN Tagging—VLAN tagging and processing is configurable on any PVC channel or Ethernet port.
- ✓ Easy Management via an HTTP/web interface, a CLI accessible via the VT100 console or through Telnet/SSH.

ORDERING INFORMATION

3210/EU: G.SHDSL.bis VPN Router with 2 Ethernet ports, external UI power

SPECIFICATIONS

G.SHDSL port: ITU-T G.991.2 including Amendment 2, Annex A, B, E, F; ITU-T G.994.1 (G.Handshake); Classical Internet Protocol over ATM (RFC 1577/2225); PPPoE over ATM (RFC 2516); Routed IP over ATM (RFC 2684/1483); ATM QoS: UBR, CBR, and VBR-rt Support; TR-037 & ILM1 4.0 Auto-config support

LAN Ethernet Ports: Two 10/100BaseT (RJ-45 connector); auto-negotiating; half or full duplex operation with automatic MDI/MDI-X

Management: CLI via Telnet; TFTP for Software upgrade and configuration upload; SNMPv1; HTTP/web browser

Protocols: IP (RFC 741), TCP (RFC 793), UDP (RFC 768), ICMP & ICMP Redirect (RFC 792), ARP (RFC 826), IP Router with IPv4 (RFC 1058), IPv6 (RFC 2453), programmable static routes, Integrated DHCP Server (RFC 2131), DNS Relay (RFC 1631), IEEE 802.1p VLAN Tagging, NAT/NAPT (RFC 1631/2391)

Security: IPsec including AH and ESP, DES, 3DES, and AES encryption. Access

Control Lists (ACLs), IP port and address filtering both by source and destination. DoS Detection. Password protected system management with a username/ password for console and virtual terminal.

Power Supplies: External universal 90–260 VAC input or 48 VDC input. (Optional internal universal 90–260 VAC input.)

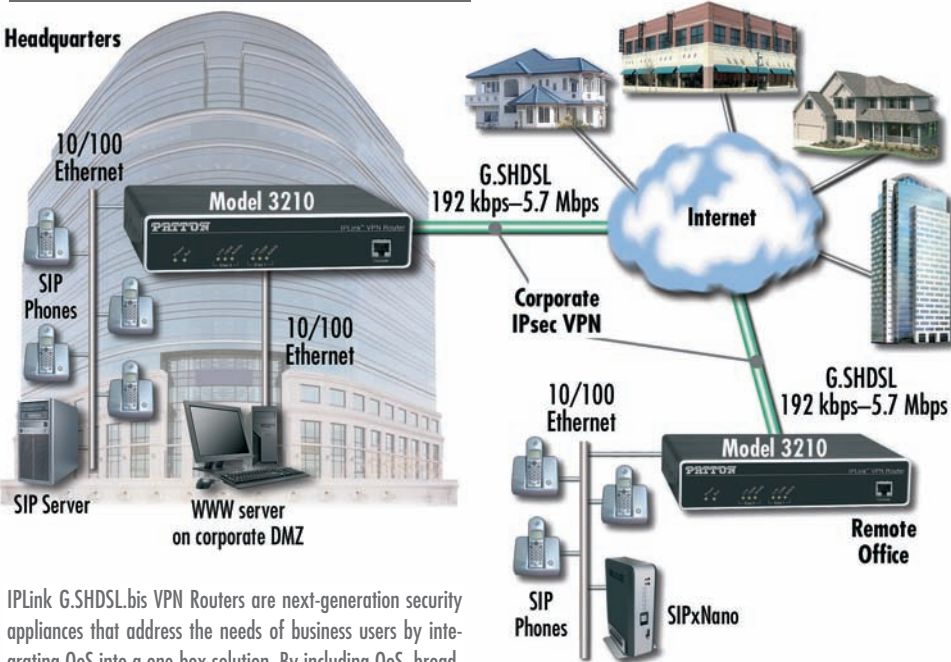
Compliance: CE Mark; Safety: UL60950-1, CSA 22.2 6095001, IEC/EN60950-1. Universal AC units are US NRTL Listed; EMC Emissions: FCC Part 15 Class A; EN55022 Class A; EMC Immunity: EN55024

Environment: Operating temp.: 0–40°C (32–104°F); Humidity: 5–90% non-condensing

Dimensions & Weight
7.3W x 1.6H x 6.1D in.
(18.5H x 4.1W x 15.5D cm)
30.5 oz./500g (models with internal power); 24.4 oz./400g (models with external power; no power supply)

Application diagram

Headquarters



ILink G.SHDSL.bis VPN Routers are next-generation security appliances that address the needs of business users by integrating QoS into a one-box solution. By including QoS, broadband connections can be put to dual-use without impacting the quality of business data flows.



VDSL Data & Voice Modems
Model 1058 Series Standalone & Rack Cards

Extend the reach of your network up to 4,656 ft (1.42 km) at 12.5 Mbps over a single voice-grade twisted-pair wire.



The Model 1058DV provides high speed Ethernet and voice connections between LANs or other network enabled devices. The 1058DV's line-sharing capabilities enable users

to download files from the Internet, surf the web, and answer e-mail messages while simultaneously talking on the phone or using a fax machine. VDSL's unparalleled performance supports these services at distances up to 4,656 ft (1.42 km) over a single pair of voice-grade wire—all at 12.5 Mbps!

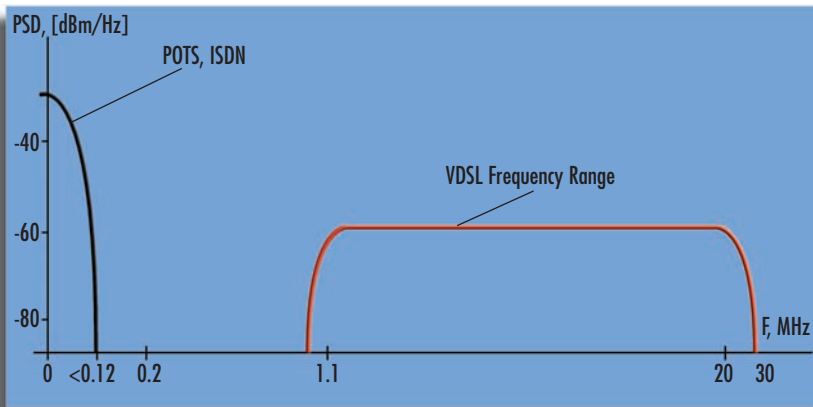
The Model 1058DV is compact, easy to install, and transparent to higher layer protocols. Plug-and-play made easy—simply make the Ethernet, voice (POTS/ISDN), VDSL link, and power connections, and you're ready to operate. The Model 1058DV's will auto-sense and configure for 10Base-T or 100Base-T, as well as full or half-duplex Ethernet operation. No configuration required!

With full service integration over an existing copper infrastructure, the Model 1058DV is an effective solution for providing data and voice services for educational facilities, corporate and government offices, military installations, industrial complexes, CLECs, and ISPs.

What is VDSL?

VDSL (very high bit-rate digital subscriber line) is the fastest DSL technology currently available. Depending on the intended applications, VDSL can be configured for symmetrical or asymmetrical operation. VDSL's high bandwidth allows for applications such as high-definition television, video-on-

demand (VOD), high quality video conferencing, medical imaging, fast Internet access, and regular voice telephone services all over a single voice-grade twisted pair. Achievable VDSL distances may vary depending on data rate, gauge/type of wire, and noise/cross-talk environment.



Frequency division multiplexing (FDM) lets one pair of wires simultaneously transport data (VDSL) and voice (POTS/ISDN) traffic. Lower frequencies are reserved for voice (POTS/ISDN); higher frequencies for data (VDSL)

SPECIFICATIONS

VDSL line interface: RJ-45 (pin 4 = ring; pin 5 = tip); optional two-position removable terminal block (supports 19–26 AWG or 0.9–0.4 mm wire)
Ethernet interface: 8-position shielded RJ-45. Auto-sensing 10/100Base-T with half or full-duplex operation
POTS/ISDN interface: RJ-45 (pin 4 = ring; pin 5 = tip)

Protocol: Transparent to high layer protocol. Supports 802.1Q VLAN tagging
Modulation: QAM (Quadrature Amplitude Modulation)
Duplexing Method: FDD (Frequency Division Duplexing)
Frequency Range: VDSL: 1–8 MHz; POTS/ISDN: 0–120 kHz
Transmission: VDSL line rate: 12.5 Mbps; Data rate: 10 Mbps full-duplex

Surge suppression: VDSL line max current surge: 20kA (8/20µs) gas tube
Power Supply: External AC and DC options: 120VAC, and universal input (UI)—100–240 VAC, or DC-48 VDC, -24 VDC, and -12 VDC
Compliance: FCC Part 15A and Part 68A & B (1058DV version only), CE Mark, EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC

Environment: Temperature: 32–122°F (0–50°C)
Humidity: Up to 90% non-condensing
Dimensions: Standalone: 1.5H x 4.13W x 3.75D in. (3.81H x 10.5W x 9.53D cm); Rack Card: 3.0H x 0.83W x 7.84D in (7.6H x 2.1W x 19.9D cm)
Weight: Standalone 0.4 lbs (0.18 kg) without power supply; Rack card: 0.3 lbs (0.14 kg) with rear card

FEATURES & BENEFITS

- ✓ Ethernet Extension—Overcome the 328 ft (100 m) limitation of Ethernet with a full-duplex 12.5 Mbps link at distances up to 4,656 ft (1.42 km).
- ✓ Auto Sensing Full-Duplex Ethernet—Auto 10 or 100 Base-T and full or half-duplex Ethernet operation.
- ✓ Transparent LAN Bridging—Passes higher layer protocols and supports 802.1Q VLAN tagging.
- ✓ Automatic Learning, Aging, and Filtering—Only allows packets with addresses outside the LAN to be forwarded.
- ✓ Line Sharing—Offer POTS/ISDN & Ethernet services over a single pair of voice-grade wire.
- ✓ CP units are compatible with Model 3324 VDSL Access Concentrator/Switch (see page 80)



24-port VDSL concentrator



Symmetric or asymmetric variable-rate VDSL

Line rates can be altered on the standalones and rack cards to differentiate services and to increase the distance of the individual links (see page 92 for line rates).

ORDERING INFORMATION

1058 Fixed Rate VDSL Ethernet Extender
1058DV/CO/EUI: CO VDSL Modem; Voice & Data; RJ-45 Line; 100–240 VAC

1058DV/CP/EUI: CP VDSL Modem; Voice & Data; RJ-45 Line; 100–240 VAC

1058 Fixed Rate VDSL Kit
1058DV/EUI-2PK: CO & CP VDSL Modem Kit; RJ-45 Line; 100–240 VAC

1058 Environmentally Hardened Fixed Rate VDSL Modem
ET1058DV/CP/UI: Extended Temp -40 to 85°C VDSL CP VDSL Modem; 100–240 VAC

EC1058DV/CP/UI: Environmentally Controlled 0 to 85°C CP VDSL Modem; 100–240 VAC

EH1058DV/CP/UI: Environmentally Hardened 0 to 50°C CP VDSL Modem; 100–240 VAC

Variable-Rate VDSL Modem

Model 1068

The Model 1068 provides variable-rate high speed connectivity of voice and data signals over a single voice-grade twisted pair.

The Patton Model 1068 VDSL Modem provides up to 16 Mbps of high speed Ethernet and voice services between LANs or other network enabled devices over a single twisted-pair. The Model 1068 is the only variable-rate asymmetrical/symmetrical standalone modem solution available today. The ability to select various asymmetrical and symmetrical rates allows the Model 1068 to satisfy a broad range of applications. Popular applications for the Model 1068 in symmetrical mode include video conferencing, interactive video, and telecommuting. The primary use for the Model 1068 in asymmetrical mode is delivering Internet service to residential customers.

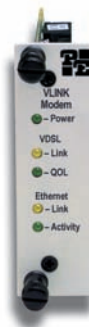
The 1068DV features a built-in POTS/ISDN splitter and line sharing capabilities that allow for simultaneous use of voice and data services. This means that end-users can download files from the Internet, surf the WWW, and answer e-mail messages while talking on the phone or faxing documents.

The Model 1068s are sold in pairs and require one unit for the local site, or *central office*, and one unit for the remote site (*customer premise*) for proper operation. Model 1068 standalone units are ideal for low density point-to-point applications.



For high density applications, the standalone units can be used with the Model 1068 rack cards and Patton's 1001 Rack System to provide a concentrated VDSL solution. If you want to take your network and voice connections farther and faster over existing copper and eliminate the expense of fiber, Patton's Variable Rate VDSL modems are the products for you!

Just plug it in, power it on, and play!



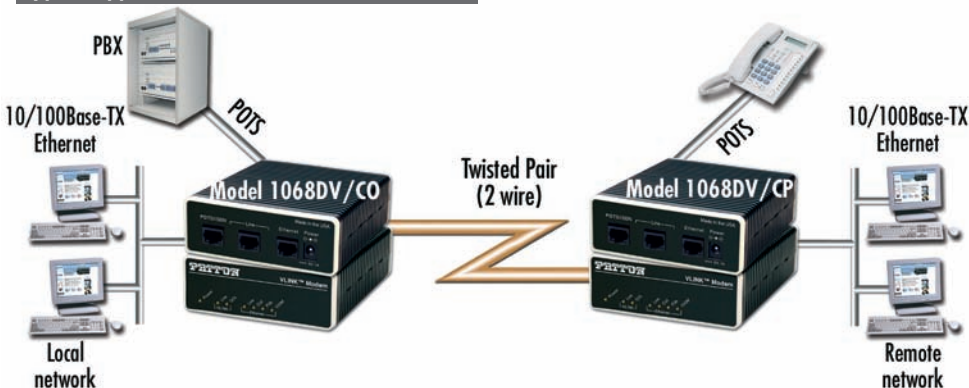
FEATURES & BENEFITS

- ✓ Low cost plug-and-play solution for campus-wide network extension and delivery of last-mile ISP services over Ethernet
- ✓ Extends Ethernet distances up to 1 mile (1.61 km) over 2-wire 24-AWG unconditioned lines
- ✓ Switch selectable asymmetrical or symmetrical line rates up to 16.67 Mbps
- ✓ Auto-sensing 10Base-T or 100Base-TX
- ✓ Supports full- or half-duplex Ethernet
- ✓ Transparent LAN bridging (Passes 802.1Q (VLAN) packets)
- ✓ Automatic learning, aging, and filtering source address table
- ✓ Standalone and rack mounted versions
- ✓ CP units are compatible with Model 3324 VDSL Access Concentrator/Switch (see page 80)

Symmetric or asymmetric variable-rate VDSL

Line rates can be altered on the standalones and rack cards to differentiate services and to increase the distance of the individual links.

Typical application



SPECIFICATIONS

VDSL Line Interface: RJ-45 or terminal block
Ethernet Interface: Shielded RJ-45
POTS-ISDN Interface: RJ-45 (pin 4 = ring, pin 5 = tip)

Modulation: QAM (Quadrature Amplitude Modulation)
Frequency Range: VDSL: 1–8 MHz
POTS/ISDN: 0–120 kHz
Transmission: Switch selectable asymmetrical and symmetrical line rates up to 16.67 Mbps

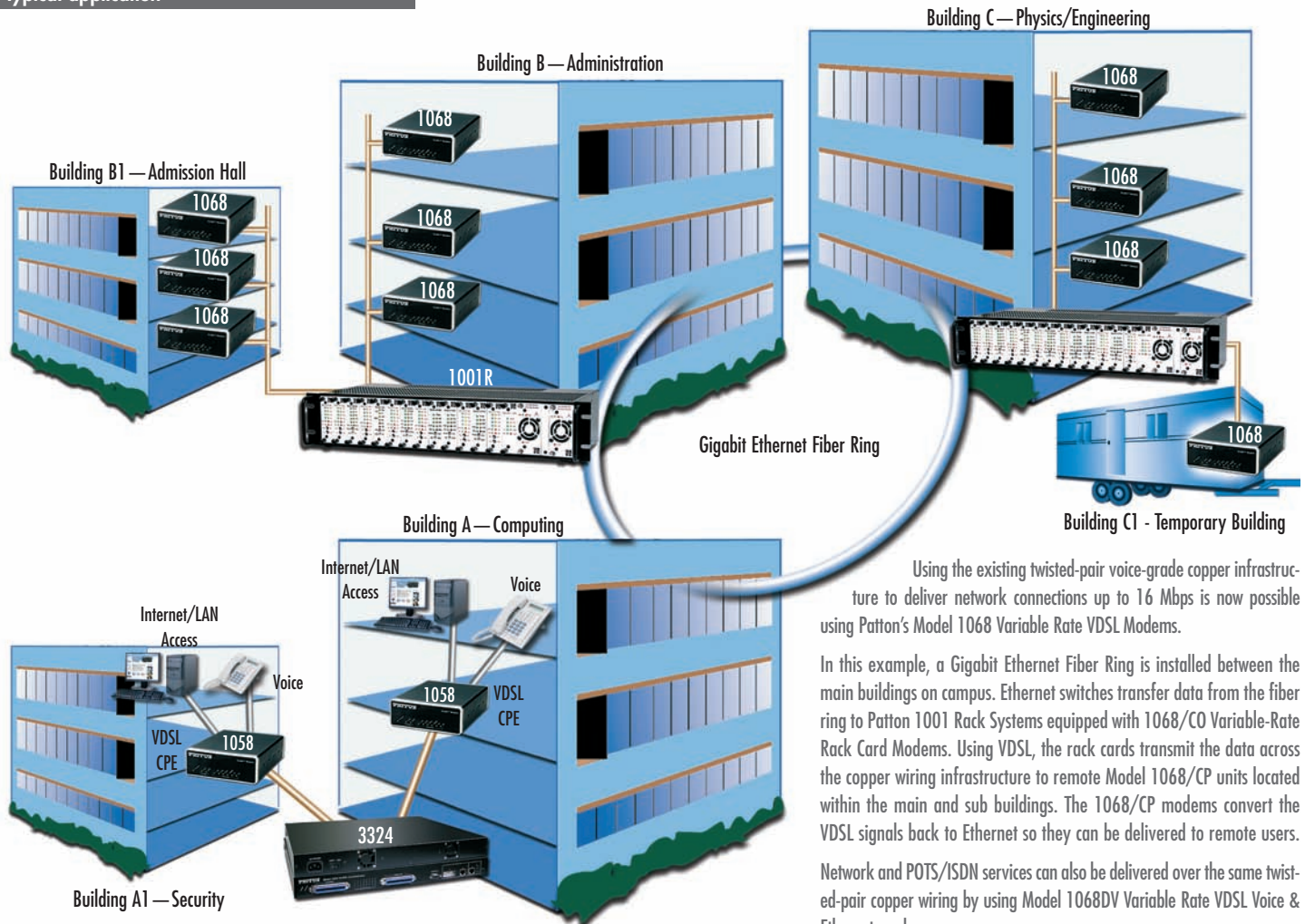
Surge suppression: VDSL 20kA (8/20ms) gas tube
Power Supply: External AC: UI (100–240); DC: -48, -24, and -12 VDC (DC optional)

Dimensions: 1.5H x 4.13W x 3.75D in. (3.81H x 10.5W x 9.53D cm)
Weight: 0.4 lbs (0.18 kg) without power supply

Asymmetric		
Line Rates		Distance in ft (m)
Upstream (Mbps)	Downstream (Mbps)	26 AWG (0.4 mm)
1.56	4.17	6,000 (1,829)
1.56	9.38	5,500 (1,676)
2.34	16.67	5,000 (1,524)

Symmetric		
Line Rates		Distance in ft (m)
Upstream (Mbps)	Downstream (Mbps)	26 AWG (0.4 mm)
6.25	6.25	4,500 (1,372)
9.38	9.38	4,150 (1,265)
12.50	12.50	4,000 (1,220)
16.67	16.67	3,300 (1,006)

Typical application



Using the existing twisted-pair voice-grade copper infrastructure to deliver network connections up to 16 Mbps is now possible using Patton's Model 1068 Variable Rate VDSL Modems.

In this example, a Gigabit Ethernet Fiber Ring is installed between the main buildings on campus. Ethernet switches transfer data from the fiber ring to Patton 1001 Rack Systems equipped with 1068/CO Variable-Rate Rack Card Modems. Using VDSL, the rack cards transmit the data across the copper wiring infrastructure to remote Model 1068/CP units located within the main and sub buildings. The 1068/CP modems convert the VDSL signals back to Ethernet so they can be delivered to remote users.

Network and POTS/ISDN services can also be delivered over the same twisted-pair copper wiring by using Model 1068DV Variable Rate VDSL Voice & Ethernet modems.

ORDERING INFORMATION

1068 Multi-Rate VDSL Modem

1068DV/CO/EU: CO VDSL Modem; RJ-45 Line; 100–240 VAC

1068DV/CP/EU: CP VDSL Modem; RJ-45 Line; 100–240 VAC

1068DV/CO/TB45/EU: CO VDSL Modem; Terminal Block & RJ-45 Line; 100–240 VAC

1068DV/CP/TB45/EU: CP VDSL Modem; Terminal Block & RJ-45 Line; 100–240 VAC

1068 Multi-Rate VDSL Kit

1068DV/EU-2PK: CO & CP VDSL Modem Kit; RJ-45 Line; 100–240 VAC

1068DV/TB45/EU-2PK: CO & CP VDSL Modem Kit; Terminal Block & RJ45 Line; 100–240 VAC

1068 Environmentally Hardened Multi-Rate VDSL Modem

E11068DV/CP/UI: Extended Temp -40 to 85°C CP VDSL Modem; 100–240 VAC

EC1068DV/CP/UI: Environmentally Controlled 0 to 85°C CP VDSL Modem; 100–240 VAC

EH1068DV/CP/UI: Environmentally Hardened 0 to 50°C CP VDSL Modem; 100–240 VAC

1068 Rack Card

1068DVRC/CP: RJ-45F & Terminal Block

1068DVRC/CO: RJ-45F & Terminal Block

The Model 1068 rack cards plug into the Model 1001 rack system (see page 110)



I'm Jose, Patton's Technical Solutions Manager for Latin America. If you have any questions about products or applications using these technologies, please call me at +1 301.975.1000, x142, or send e-mail to jose@patton.com.



ISDL DACS Provides Quad T1/E1 & 24 ISDL Ports

Model 3092

The Patton 3092 ISDL DACS provides 24 ISDL ports, each supporting 64/128/144 kbps dedicated connections.



The Model 3092 ISDL Digital Access and Cross-Connect System (DACS) is the efficient, rack-mountable solution for ILECs/PTTs expanding their access services via ISDL dedicated links. The Model 3092 combines ISDL ports for concentration to multiple TDM WAN ports with total flexibility in mapping the ISDL channels and WAN time slots. The Model 3092 is extremely reliable due to its convection cooling (with no fans or other moving parts to fail) and dual-redundant power supplies.

The Model 3092 ISDL DACS links up 24 ISDL circuits to multiple T1/E1 WAN ports with completely flexible any-to-any nx64

grooming. Each 64/128/144-kbps ISDL port offers user selectable nx64 data rates. User data is then groomed to any channel within the system—including another DSL port! Completely transparent to data, the provider can offer multiple services (ATM/IP/FR) to each user. The entire system is easily managed through its integrated SNMP/HTTP-based network management system (NMS). Using standards-based ISDL, the Model 3092 is compatible with third-party ISDL modems.

With its hassle-free operation, convenient end-to-end setup, high-density and unsurpassed reliability, the Model 3092 ISDL DACS is ready to get your customers up to speed.

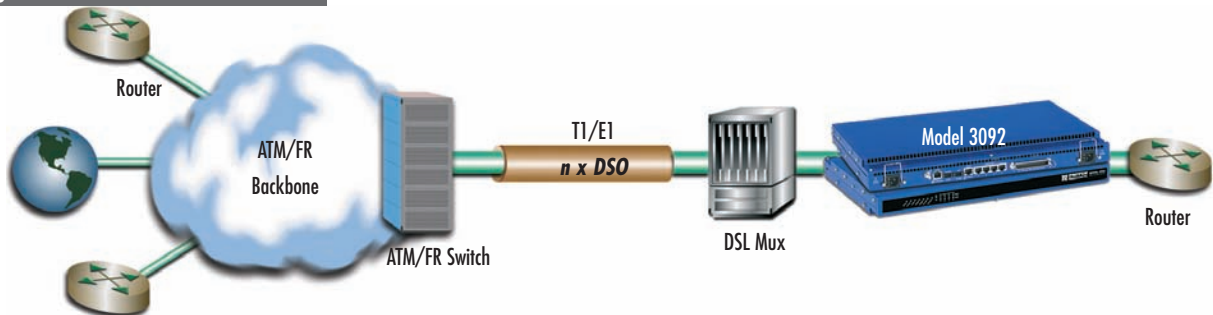
FEATURES & BENEFITS

- ✓ Grooms 24 ISDL connections to any WAN timeslot or other ISDL timeslot
- ✓ Four T1/E1 WAN uplink ports connect to TDM backbone network connections
- ✓ Multiple, configurable alarms reporting via remote SNMP traps, front panel LEDs, 3-contact relay, and NMS pages
- ✓ SNMP/HTTP network management capabilities enable you to configure the Model 3092 and the remote ISDL modems from any location in the world.
- ✓ Compact 1U chassis' convection cooled design allows stacking with no fans or other moving parts to fail
- ✓ Dual-redundant power supplies provide for high reliability with dual load-sharing power supplies.

Refer to page 92 for detailed DISTANCE information and compatible ISDL CPE units.



Application diagram



SPECIFICATIONS

ISDL ports: 24 ports (RJ-21X 50-pin connector), each port 64/128/144 kbps

WAN ports: 4 WAN ports: E1 (HDB3/AMI line coding), T1 (AMI/B8ZS line coding); connects to ATM/FR/DDN/IP backbone networks

Ethernet Port: One 10/100Base-T (RJ-45 connector)

ISDL Modems: Patton 1092A and 1082, Motorola UTA-220, and RAD ASM-31

Front Panel Indicators: LEDs for power, CPU, system, Ethernet, External clock, test mode, DSL, and WAN ports frame and error status

WAN Clocking: Internal, Network (from E1/T1 WAN port), External BITS (Building Integrated Timing Supply) Clock Source via 3-pin terminal block

ISDL Clocking: Provides clocking to the remote ISDL NTUs/Modems

Power Supplies: Dual-redundant universal AC/DC (fixed); AC power: 100–240VAC (60/60 Hz); DC power: -40 to -72VDC

Management Services: HTTP, SNMP, TELNET, Ethernet, RS-232 Console Port, SYSLOG Client, Remote Software Upgrade via FTP

Alarm Reporting: Configurable alarms; Remote SNMP Traps; Front Panel LEDs; 3-Contact Relay (3-pin terminal block)

Compliance: Safety: UL/CSA per UL1950 (METS) Canadian cMET and CS-03, EMC Directive 89/336/EEC, Low-Voltage Directive 73/23/EEC (EN 60950), FCC Part 15, CE Mark, CTR12, CTR13, FCC Part 68.

Environment: Operating temperature: 0–40°C (32–104°F); Humidity: 5–90% non-condensing
Dimensions: 19.00 W x 12.60 D x 1.75 H in. (48.25 W x 32 D x 4.44 H cm)

ORDERING INFORMATION

3092/24/RUI: 24 Port ISDL DACS with 4 T1/E1 WAN ports and Redundant AC supplies, *Cobalt Blue* color

3092/24/R48: 24 Port ISDL DACS with 4 T1/E1 WAN ports and Redundant DC supplies, *Cobalt Blue* color

3092/24/U48: 24 Port ISDL DACS with 4 T1/E1 WAN ports and one AC and one DC supply, *Cobalt Blue* color

KiloModem™ 2B1Q Encoding, 2 or 4-wire Baseband Modem

Model 1092A

Make campus LAN and WAN connections using only two wires!

The Model 1092A KiloModem supports point-to-point, sync or async communication over either 2 or 4 twisted-pair (two wires). The Model 1092A is an excellent choice for high speed leased-line Internet links, LAN interconnection, or campus networks. The Model 1092A uses replaceable QuikConnect™ interface modules, which allow connection to a variety of interfaces. Local analog, remote digital loopback test modes, and V.52 BERT pattern generator are built into the Model 1092. Rack cards are also available.



See Pg 134

FEATURES & BENEFITS

- ✓ Multiple full-duplex symmetric rates (32, 56, 64, or 128 kbps)—users select the bandwidth option they need
- ✓ Speeds to 128 kbps
- ✓ Distances up to 10 miles (17 km)
- ✓ Standalone (QuikConnect) and rackmount versions
- ✓ SNMP network management—including in-band management of remote units, plus advanced diagnostics and statistics.
- ✓ Front panel status indicators
- ✓ Transparent to DLCs broad compatibility
- ✓ Long-reach IDSL

ORDERING INFORMATION

Base units

1092A/A/UI: IDSL Standalone, V.24

1092A/B/UI: IDSL Standalone, RS-422

1092A/C/UI: IDSL Standalone, V.35

1092A/D/UI: IDSL Standalone, X.215

1092A/F/UI: IDSL Standalone, 64Kbps G.703

1092A/I/UI: IDSL Standalone, Ethernet

1092A/14/UI: IDSL Standalone, 4 port hub

1092A/J0/UI: IDSL Standalone, FXO Voice/Data module

1092A/JS/UI: IDSL Standalone, FXS Voice/Data module

1092A/UI: IDSL Standalone

Rack cards

1092ARC/A/B: IDSL Rack Card, V.24

1092ARC/A/I: IDSL Rack Card, V.35

1092ARC/B/B: IDSL Rack Card, RS-530

1092ARC/C/IA: IDSL Rack Card, Ethernet

1092ARC/C/O: IDSL Rack Card, 64Kbps G.703

1092ARC/D/V: IDSL Rack Card, X.21

Note: Model 1092 rack cards plug into the Model 1001 rack system (see page 132)

Typical application

Patton's Model 1092A supports both 2-wire and 4-wire operation. Standalone units can be used back-to-back or with the Model 1001 rack system for long-range point-to-point links. When used with the Model 3092, 64/128/144 kbps IDSL circuits can be concentrated on high speed egress ports.



Distances for 2-wire operation shown.
4-wire distances are better.

Data Rate (kbps)	Wire Gauge (AWG/mm)			
	19 (.9mm)	22 (.6mm)	24 (.5mm)	26 (.4mm)
128	10.8 (17.4)	7.2 (11.6)	5.0 (8.1)	3.4 (5.5)
64	10.8 (17.4)	7.2 (11.6)	5.0 (8.1)	3.4 (5.5)
56	10.8 (17.4)	7.2 (11.6)	5.0 (8.1)	3.4 (5.5)
32	10.8 (17.4)	7.2 (11.6)	5.0 (8.1)	3.4 (5.5)
0 - 38.4	10.8 (17.4)	7.2 (11.6)	5.0 (8.1)	3.4 (5.5)

SPECIFICATIONS

Transmission Format: Synchronous
Clocking: Internal, external or receive recover
RTS/CTS Delay: no delay, 4–8 ms, or 33–58 ms

LED Status Indicators: TD, RD, CTS, CD, DTR, NS (no signal), ER (error), and TM (test mode)
Isolation: 1500V RMS
DTE Interface: V.24/RS-232, V.35, X.21, G.703, Data+Voice and Ethernet Bridge interface modules

Diagnostics: LAL, RDL, V.52 compliant BERT pattern (511/511E pattern) generator and detector
Power: 100–240 VAC, 50/60 Hz (universal input); 48 VDC (option), 5 watts

IDSL Modems with V.35, X.21, or 10Base-T (Ethernet) Interfaces

Model 1082

The 1082 Series are high speed, AC powered short-range modems that are able to operate synchronously or asynchronously—full duplex—over a single twisted-pair.

The Model 1082 supports data rates to 128 kbps (synchronous) or 38.4 kbps (asynchronous). It is capable of point-to-point distances up to 5 miles (8 km) using 24 AWG wire.

The Model 1082 Series supports internal, external, or receive loopback clocking in synchronous mode. Data rates and asynchronous data format may be configured locally using DIP switches.

Model 1082/C provides a V.35 interface on an M/34 female connector. Model 1082/D is configured with an X.21 interface on a DB-15 female connector.

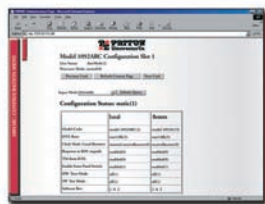


Line connection is made by an RJ-45 jack. Standard versions of the Model 1082 Series are powered by a 100–240 VAC (universal) supply. The DC power supply option supports any DC input between 36–72 VDC.

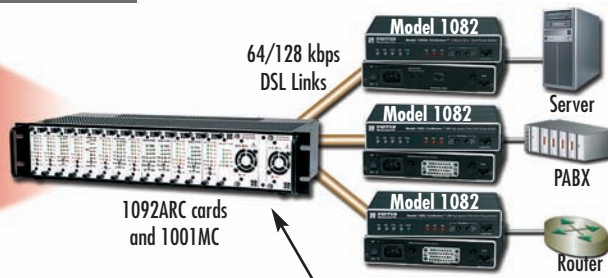
FEATURES & BENEFITS

- ✓ Synchronous data rates: 19.2, 32, 56, 64, 128 & 144 kbps (1082/144 models); Asynchronous data rates: 0–38.4 kbps
- ✓ Full-duplex operation over a single twisted pair (2-wires)
- ✓ Point-to-point distances up to 5 miles (8 km) (all data rates) on 24 AWG twisted pair
- ✓ Internal, external, or receive recovered clocking options (Model 1082/1 only)
- ✓ LED indicators for TM, ER, NS, DSL (Models 1082 C & D), 10Base-T (Model 1082/1), and Status (Model 1082/1)
- ✓ V.35 and X.21 interfaces (Models 1082 C & D); Ethernet Interface (Model 1082/1)
- ✓ Multi-rate symmetric DSL
- ✓ Interoperable with popular Patton Models 3092 and 1092A
- ✓ SNMP manageable with 3092 or a 1092ARC in a 1001 Rack equipped with a 1001MC SNMP agent rack card

Typical applications



Web-based SNMP/HTTP network management provides central site and remote modem configuration and management



Access Rack
See Page 134

IDSL Concentrators and Access Servers
See Page 94



ORDERING INFORMATION

- 1082/C/48:** IDSL modem; V.35 interface & -48 VDC power
- 1082/C/UI:** IDSL modem; V.35 interface & 100–253 VAC power
- 1082/D/48:** IDSL modem; X.21 interface & -48 VDC power
- 1082/D/UI:** IDSL modem; X.21 interface & 100–253 VAC power
- 1082/F/48:** IDSL modem; 64/128k G.703 interface & -48 VDC power
- 1082/F/UI:** IDSL modem; 64/128k G.703 & 100–253 VAC power
- 1082/I/48:** IDSL modem; Ethernet interface & -48 VDC power
- 1082/I/UI:** IDSL modem; Ethernet interface & 100–253 VAC power

SPECIFICATIONS

Transmission Format: Synchronous or asynchronous

Transmission Line: Single unconditioned twisted pair

Clocking: Internal, external or receive loopback

Distance: Distance, max. all data rates—10.1 miles (16.4km) on 19 AWG (0.9mm) wire; 7.2 miles (11.5 km) on 22 AWG (0.64mm) wire; 5.0 (8 km) on 24 AWG (0.5mm) wire; 3.4 (5.5 km) on 26 AWG (0.4mm) wire

Data Rates: Synchronous 19.2, 32, 56, 64 & 128 kbps; Asynchronous 0–38.4 kbps

Connectors: RJ-45 on line side; RJ-45, M/34 female or DB-15 female on serial interface side.

Diagnostics: V.52 compliant bit error rate pattern (511/511E pattern) generator and detector with error injection mode; Local Line Loopback and Remote Digital Loopback, activated by front panel switch or via serial interface

Power: 100–253 VAC, 50–60 Hz (universal input option); 48 VDC (option), 5 watts.

Temperature Range: 32–122°F (0–50°C)

Humidity: 5–95% non-condensing

Dimensions: 4.7 x 1.52 x 5.0 in. (18.5 x 16.8 x 4.1 cm)

Weight: 0.58 lbs.

Line Interface: Transformer coupled 1500 VAC isolation

High-Speed Serial Extender & RS-232 Serial Extender
Models 1053AF & 1052AF

These miniature high-speed digital modems offer multi-rate Async/Sync while transparently passing modem control signals. Both 2-wire full-duplex modems uses 2B1Q modulation for superior noise immunity.



The 1053AF and 1052AF are long-range, powered, digital modems that operate synchronously or asynchronously at full duplex over a single twisted pair. The 1053AF operates at multi-rate async/sync speeds up to 115.2/128 kbps; the 1052AF at speeds up to 38.4/128 kbps. Both modems utilize 2B1Q modulation for superior signal strength, even in the noisiest environments. RS-232 serial connections with

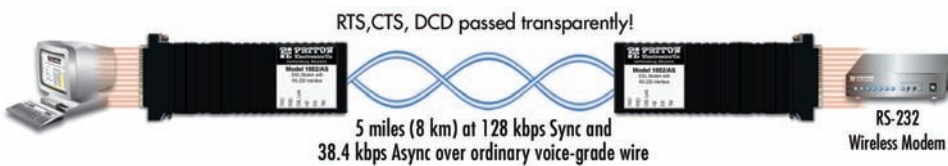
speeds of 128 kbps can now be extended to distances over 5 miles (8 km) without the use of repeaters! Using ordinary voice-grade wire, the serial extenders provide a cost-effective solution for high speed, dedicated, end-to-end connections with synchronous line rates up to 128 kbps and asynchronous line rates up to 115.2 kbps (1053AF) or 38.4 kbps (1052AF) that include RTS, CTS and DCD modem signals. The modems' miniature size allow for a direct connection to your transmission device's serial port. Two 8-position DIP switches enable configuration of asynchronous or synchronous line rate settings. Additionally, LEDs are conveniently located on the side of the modems to provide at-a-glance status indication of the unit.

FEATURES & BENEFITS

- ✓ Multi-Rate Speeds — **1053AF:** Full-duplex synchronous rates to 128 kbps and asynchronous rates to 115.2 kbps
1052AF: Full-duplex synchronous rates to 128 kbps and asynchronous rates to 38.4 kbps.
- ✓ Extends serial devices up to 5 miles (8 km) over ordinary grade twisted pair
- ✓ Noise Immunity — Uses 2B1Q for improved performance in noisy environments.
- ✓ Pass RS-232 Control Signals — Transparently passes CTS, RTS, and DCD over the 2-wire line.
- ✓ Miniature size for direct connections to your serial port
- ✓ Long Reach — Industry leading distances of over 26,000 feet (8 km) without repeaters.
- ✓ Power Options — Universal AC power (90–260 VAC) as well as -12, -24, & -48 VDC.

Application diagram

The Model 1053AF and Model 1052AF offer premium performance using the most common, inexpensive cabling infrastructure in the world, voice-grade telephone wire. Using 2B1Q modulation a serial port can be extended to distances of over 5 miles (8 km).



SPECIFICATIONS

- Clocking:** Internal, external, or receive recover.
- Line Coding:** 2B1Q conforming to ANSI T1.601 and ETSI ETR-080 standards.
- Line Interface:** RJ-45; Two-wire twisted-pair using pins 4 & 5; Transformer coupled 1500 VRMS isolation
- Maximum Line Distance for All Data Rates:** 10.1 miles (16.4 km) on 19 AWG (0.9 mm) wire • 7.2 miles (11.5 km) on 22 AWG (0.64 mm) wire • 5.0 (8 km) on 24 AWG (0.5 mm) wire • 3.4 (5.5 km) on 26 AWG (0.4 mm) wire
- Serial Interface:** DB-25 Female or DB-9 Female depending on model ordered.
- Serial Data Rates:**
1083AF: Synchronous: 2, 56, 64, and 128 kbps • Asynchronous: 38.4, 57.6, 76.8, and 115.2 kbps
1052AF: Synchronous: 32, 56, 64, and 128 kbps • Asynchronous: 0–38.4 kbps.
- LED Indicators:** TXD, RXD, Link, NS (no signal), ER (CRC error)
- Power Supplies:** External wall-mount power supply with universal 90–260 VAC input or -12, -24, and -48 VDC input
- Dimensions:** 5.18L x 1.69W x 0.75H in. (13.16L x 4.29W x 1.91H cm)
- Weight:** 2.01 lbs. (<1.0 kg)
- Compliance:** EMC: FCC Part 15, sub-part B, class A (US) • EMC Directive 89/336/EEC (EU) • ICES-003 (Canada) • AZ/NZS 3548 (Australia C-Tick) • CISPR 22 (International)
- Safety:** UL 60950/CAN-ISA-C22.2 60950 (Safety—US/Canada) • EN 60950 (Safety—Europe/International)
- Operating temp.:** 32–122°F (0–50°C)
- Humidity:** 5–95% non-condensing
- Altitude:** 0–15,000 feet (0–4,572 meters)

I'm John, one of Patton's Marketing Group Managers. If you do not find what you need at www.patton.com or in this catalog, please call me at +1 301.975.1000, x160. You can also send e-mail to jgrant@patton.com.

ORDERING INFORMATION

- 1052/AF/UI: Async 38.4/Sync 128 kbps RS-232 Extender
- 1053/AF/UI: Async 115.2/Sync 128 kbps RS-232 Extender

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www.patton.com

FAST Delivery From Your AUTHORIZED DISTRIBUTOR!

