Network Termination

T1/FT1, E1/FE1 CSU/DSU Products

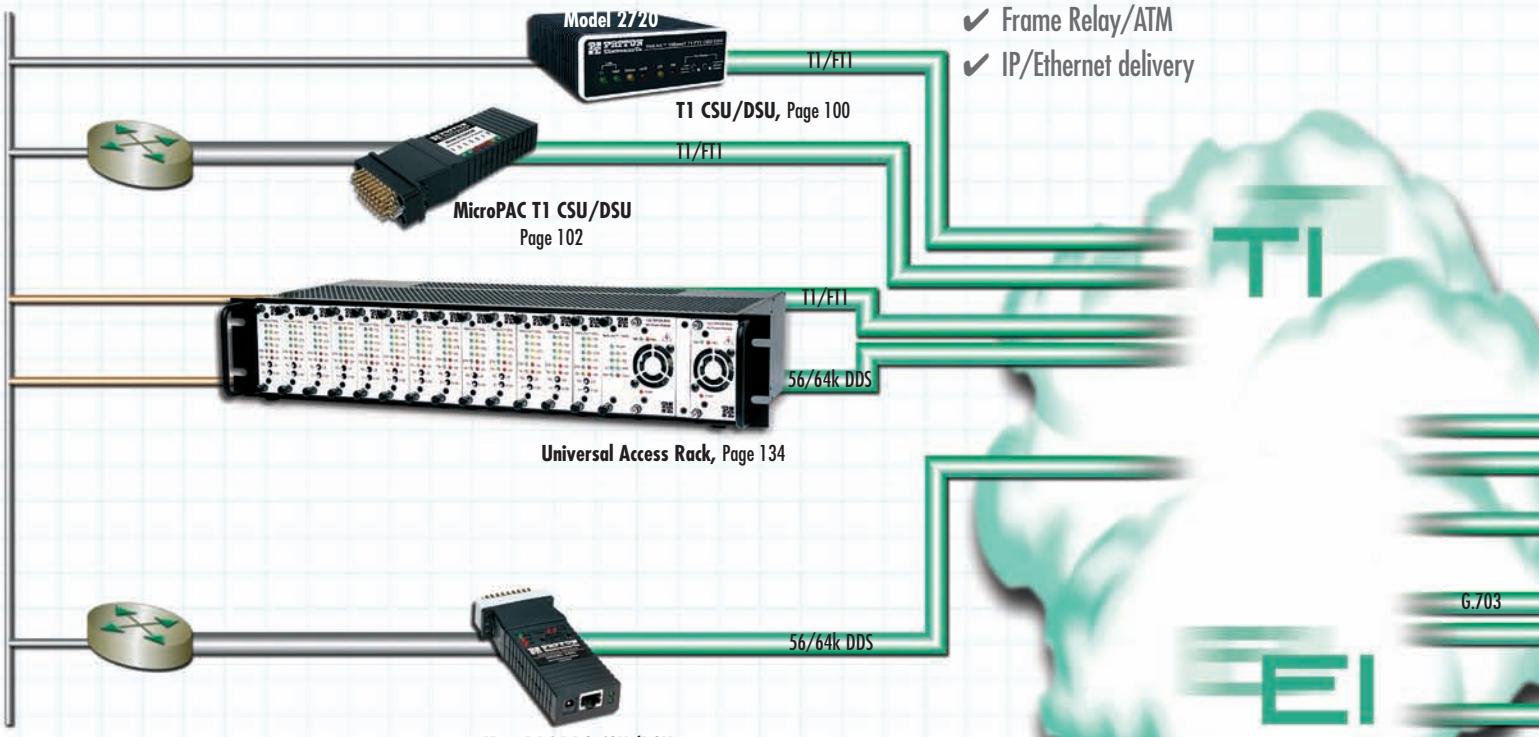
For T1/E1 network termination, Patton's products offer flexible access and connectivity for less!

- ✔ Patton products come in a variety of packages and satisfy any requirement—from miniature, full-featured units to desktop and rack card solutions.
- ✔ Whether you need to connect to X.21, V.35, EIA-530, or Ethernet—Patton has the DTE interface solution.
- ✔ Patton T1/E1 products connect your router, multiplexer, or PBX to a variety of voice or data services: from leased-line Point-to-Point, to Frame Relay, to Internet access, all products connect at full or fractional speeds.

Domestic Series
T1-Based Solutions

TERMINATING STANDARD SERVICES

- ✔ Private Leased Lines
- ✔ Frame Relay/ATM
- ✔ IP/Ethernet delivery



This router supports
T1 *and* E1

Model 2603 T1/E1, Drop & Insert Router

Both T1 and E1 CSU/DSU with full IP Routing.

Patton's new T1/E1 IPLink™ Router is a low cost and robust enterprise routing device for the global economy. This one router can be used anywhere in the world because it supports T1 and E1, as well as IP, Frame Relay, and ATM routing services.

Page 48

Access Without Excess

Patton's EtherRocket for T1/E1 IP Services.

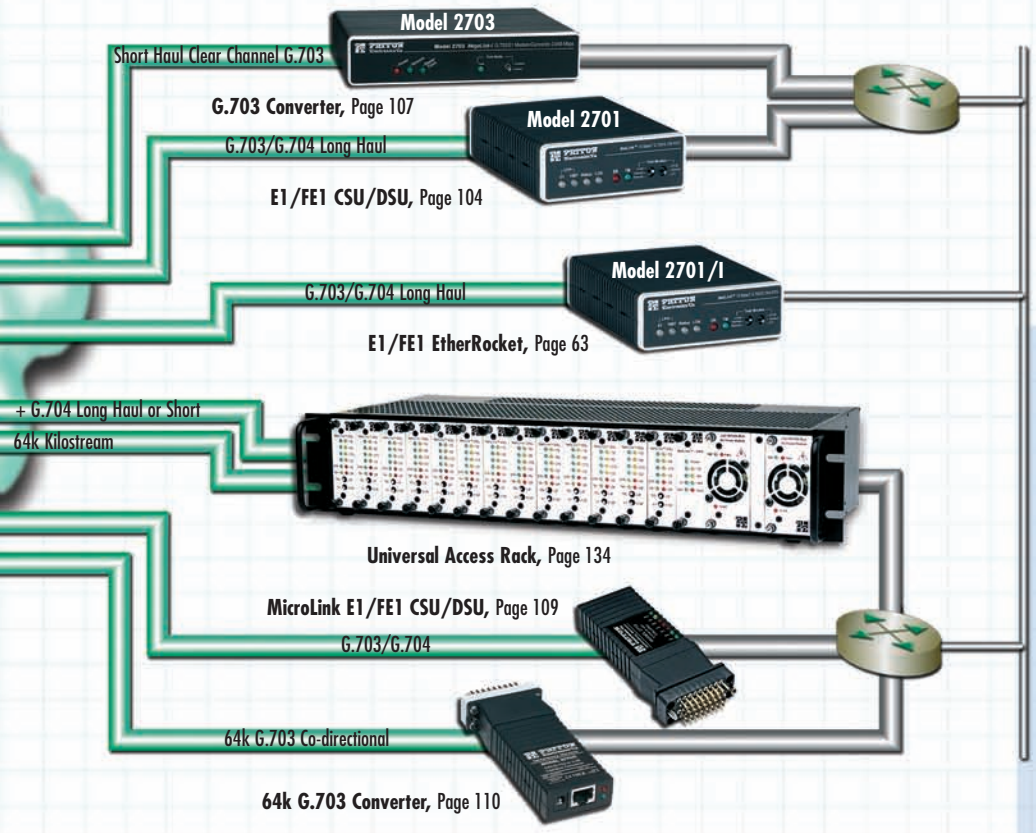
Equipped with a 10Base-T Ethernet front-end and a T1 or E1 interface, the EtherRocket with Remote Router Porting (RRP) seamlessly connects your LAN to an Internet service provider (ISP) or connects a branch office to headquarters via point-to-point leased-lines. *All without a router at the customer premises.*

In This Section

InternationalSeries
E1-Based Solutions

ACCESS CONVERSION

- ✔ Mega-Stream & Kilo-Stream
- ✔ ISDN/PBX
- ✔ IP



Multi-Megabit Inverse Mux

Patton's IPLink™ Model 2888 facilitates the bonding of up to 4 T1/E1 ports into a high-bandwidth WAN link to feed the most bandwidth hungry applications.

Page 54

Compact, T1/FT1, High Density, Low Cost CSU/DSU

Model 2720

New CSU/DSU makes it simple and affordable to connect to T1/Fractional T1 services.

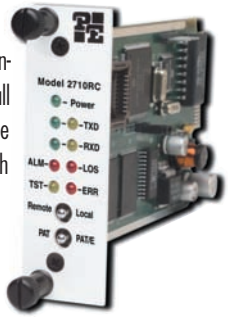
The NetLink Model 2720 Series T1/FT1 CSU/DSU provides high speed WAN connectivity in a compact full-featured standalone package.

The NetLink 2720 is an excellent choice for terminating leased lines, Frame Relay backbones, Internet access, and LAN-to-LAN services. When terminating a T1-dedicated digital circuit, the NetLink 2720 supports nx56/nx64 kbps T1 framing and converts to V.35, RS-530, or 10Base-T Ethernet interfaces.

The NetLink 2720 supports D4/ESF framing options and AMI/B8ZS/B7ZS line coding. Data rates, framing, and coding options are programmed by DIP switches or from a VT-100 terminal with menu-driven software. A full range of system and diagnostic features make setup simple and easy.

The Model 2720/I (10 Base-T Ethernet Bridge) is particularly suited for LAN-to-LAN connection without the need for routers! MAC forwarding and PPP/BCP built-in bridging provides seamless connection over the T1 link.

The PPP/BCP features also enable customers to extend a router's serial interface and connect to a remote Ethernet LAN over the T1 network.



The 2710RC is the rack card companion to the Model 2720. Offering all features found in the 2720, the 2710RC fits in a 19-inch, 2U high rack housing up to 16 rack cards.

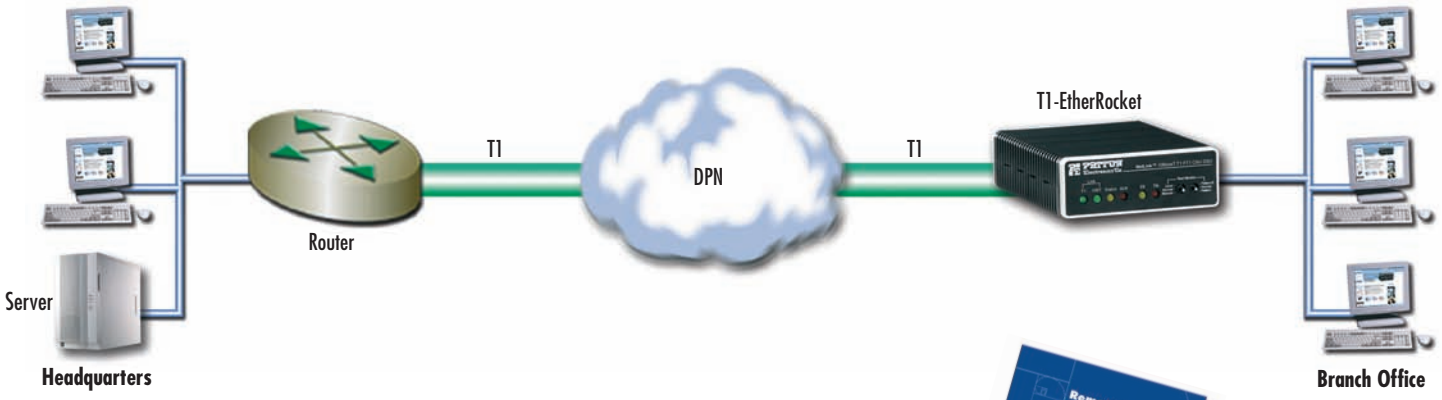
FEATURES & BENEFITS

- ✔ Terminates T1/FT1 circuits over a 4-wire RJ-48C interface
- ✔ 100–240VAC and -48VDC power options
- ✔ Connects to V.35, EIA-530, and Ethernet interfaces
- ✔ Ethernet version for LAN to LAN Bridging
- ✔ Common framed n x 56/64 kbps rates up to 1.536 Mbps
- ✔ Unstructured rates at 1.544 Mbps
- ✔ D4 or ESF framing modes
- ✔ Supports AMI or B8ZS/B7ZS line coding
- ✔ Software or DIP switch configurable
- ✔ Internal, external, or network clocking
- ✔ V.54, V.52, and CO Loop and Loop down diagnostics
- ✔ Available in Rackmount version (Model 2710RC)
- ✔ Also functions as a high speed point-to-point modem
- ✔ Made in USA

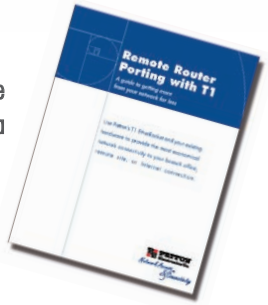
See Pg 134

RACKABLE

Connecting a branch office to headquarters using the 2720/I "EtherRocket" and remote router porting

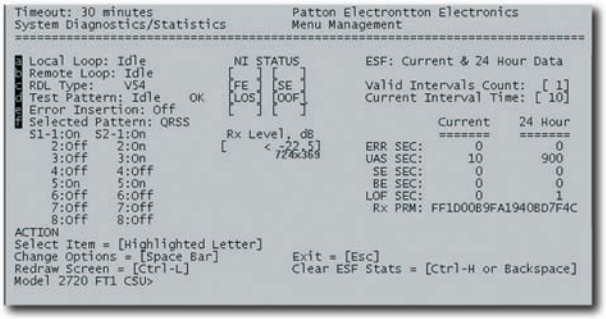


Download our *free* "Remote Router Porting with T1" position paper and learn how to use the EtherRocket to connect small or branch offices without the cost and headache of a remote router. Go to www.patton.com/support/library.shtml for your free copy.



Software management

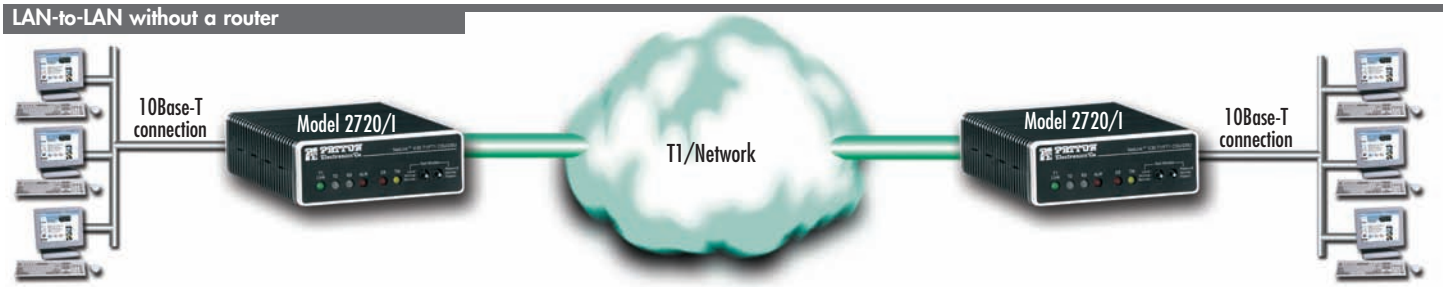
In addition to DIP switch configuration, the Models 2720 and 2710RC can be easily configured, tested, and monitored via intuitive software menus. The Model 2720 includes an RS-232 port and cable for connection to a PC or terminal. Simply start a terminal program in your PC (Hyperterminal, for example) to gain access to a complete set of configuration parameters and diagnostics. Access to configuration menus in the Model 2710RC requires the use of a Patton 1001CC module card installed in the rack. A 1001CC card can access up to 15 2710RC modems per rack.



T1 network termination on V.35 or EIA-530 for data

The Models 2720 and 2710RC T1 CSU/DSUs come with V.35 or EIA-530 for simple connection to routers or multiplexers at the customer or service provider premises. The 2720 and 2710RC connects easily to your router and T1 line and provides termination to fractional or full T1 services. The CSU/DSUs work in D4 or ESF T1 framing modes, and are transparent to any WAN protocol originating at the local router such as ATM/FR/PPP or voice services.

LAN-to-LAN without a router



In the most common installations of WAN Ethernet bridging, two LAN segments are connected with a common WAN interface such as T1. Each T1 EtherRocket connects to the local Ethernet LAN and builds a table of local hosts on that network. If an Ethernet message is not for a local host, the EtherRocket forwards it over the WAN to the remote EtherRocket. User on a LAN segment can access hosts and applications at the far end LAN as easily as if they were located on the local LAN.

SPECIFICATIONS

WAN Speed: 1.544 Mbps
WAN Connection: RJ-48C
Nominal Impedance: 100 Ohms
DTE Interface: EIA-530, V.35, 10Base-T Ethernet
Line Coding: AMI/B8ZS
Line Framing: D4/ESF/Unframed
Clock Options: Internal, external, or network
Diagnostics: Responds to CO-initiated D4 loop-up and loop-down codes, ESF line loop and payload loop FDL messages, and universal loopback de-activate messages

Transmit LBO: Selectable—0, 7.5, 15, or 22.5 dB, plus DSX-1
Standards: AT&T TR62411, TR54016, and ANSI T1.403
Dimensions:
0.78H x 2.1W x 3.5D in.
(2.0H x 5.3W x 8.9D cm)
Test Modes: Initiates and responds to V.54 and CSU remote loops; local loop Pattern Generator/Detector: User selectable 511, 2047, or QRSS
Power: Universal input (100–240 VAC), or -48VDC

ORDERING INFORMATION

2720/B/UI: Standalone T1/FT1 CSU/DSU; EIA-530 Interface (DB-25F); 90–240 VAC supply

2720/C/UI: Standalone T1/FT1 CSU/DSU; V.35 (M/34F) Interface; 90–240 VAC supply

2720/I/UI: Standalone T1/FT1 CSU/DSU; 10Base-T (RJ-45) Interface; 90–240 VAC supply

2720/B/48: Standalone T1/FT1 CSU/DSU; EIA-530 (DB-25F) Interface; 48 VDC supply

2720/C/48: Standalone T1/FT1 CSU/DSU; V.35 (M/34F) Interface; 90–240 VAC supply

2720/I/48: Standalone T1/FT1 CSU/DSU; 10Base-T (RJ-45) Interface; 90–240 VAC supply

T1/FT1 to V.35 Interface Converter/CSU/DSU with Control Port

Model 2710

Pocket-sized converter-CSU/DSU makes it simple and affordable to connect V.35 to T1 or Fractional T1 (Nx64).

The Model 2710 T1-to-V.35 interface converter/CSU/DSU connects to a 4-wire T1 circuit and plugs directly into the V.35 interface of a router, switch or multiplexer.

Connecting to an unstructured T1 circuit at 1.544 Mbps, the Model 2710 also supports nx56/64 framed connections at data rates from 128 kbps to 1.536 Mbps. In addition, the Model 2710 may be used in pairs in point-to-point applications, where it is able to connect two V.35 devices at data rates to 1.544 Mbps over distances to 6,000 ft (1.14 miles/1.82 km).

The Model 2710 supports D4/AMI or B8ZS/ESF line coding and framing, internal or network clocking, and selectable 0, 7.5, or 22.5 dB line build-out (LBO) levels. These parameters are user configurable via internal DIP switch settings, or through software commands using the Model 2710's RS-232 control port. The Model 2710 is also configurable for clear channel (1.544 Mbps) or fractional (nx56/64 kbps) operation. Fractional settings include 2, 4, 6, 8, 12, 16, and 24 channels (for example, setting the Patton 2710 at *224/256 kbps* would activate four 56/64 kbps channels).

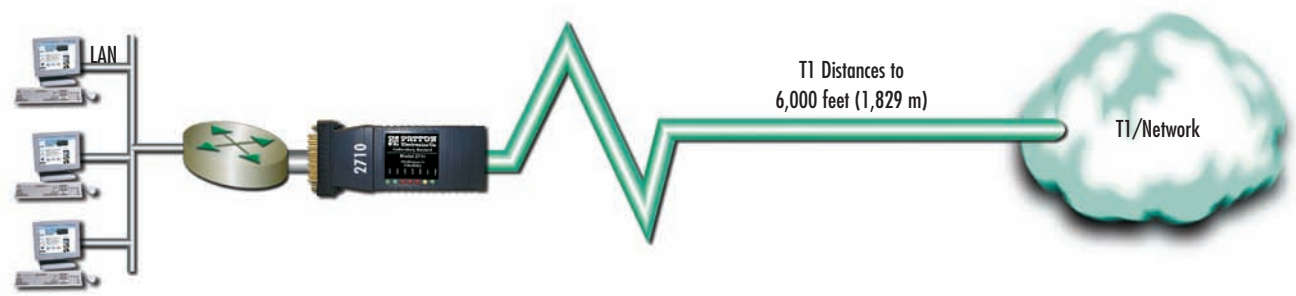
Power is supplied to the Model 2710 through an external AC power supply.

FEATURES & BENEFITS

- ✔ Plugs directly into V.35 interface of router, switch or multiplexer
- ✔ Connects to an unstructured 4-wire T1 circuit at 1.544 Mbps
- ✔ Supports n x 56/64 framed T1 connections from 64 kbps to 1.536 Mbps
- ✔ Data rates, clocking and LBO levels selected by internal DIP switches or via an RS-232 software control port
- ✔ Facilitates point-to-point campus communication up to 6,000 ft (1.14 miles/1.82 km)when used in pairs
- ✔ Supports D4/AMI or B8ZS/ESF line coding, loopback diagnostics
- ✔ Seven easy-to-read diagnostic LEDs

*I'm Natalie, Patton's Inside Sales Manager, US & Canada. Call me at **+1 301.975.1000** when you want to purchase Patton products or if you have questions about our products. You can also send e-mail to **sales@patton.com**.*

Application diagram



SPECIFICATIONS

Transmission Format: Synchronous, 4-wire
Network Connection: RJ-48C
Nominal Impedance: 100 ohms
Network Line Speed: 1.544 Mbps
Distance: Up to 6,000 feet, point-to-point (when used in pairs)

DTE Data Rates: Switch selectable nx56/64, 128 kbps–1.536 Mbps
DTE Interface: Integral V.35 (M/34 male) connector
Line Coding/Framing: AMI/B8ZS or D4/ESF
Transmit LBO: Selectable—0, 7.5, or 22.5 dB
Receive LBO: Automatic

Clocking: Internal or Network
LED Status Indicators: TXD, RXD, LOS (loss of signal), ALM (alarm), ERR (error), TST (test), PWR
Power: External AC power supply
Diagnostics: Responds to CO initiated D4 loopup and loopdown codes, ESF line loop and payload loop FDL messages, universal loopback de-activate message

Compliance: CE Marked per EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC; FCC Part 15, Class A; Canadian DOC CS 03
Standards: AT&T TR62411, ANSI T1.403, TR54016
Dimensions: 5.0 L x 2.1W x 0.81D in. (12.7L x 5.3W x 2.1D cm)
Weight: 2.02 lbs. (0.92 kg)

ORDERING INFORMATION

2710/CM/UI: T1/FT1 Nx64 with control port (V.35, M/34 male, 100–240 VAC)

2710/CM/-48: T1/FT1 Nx64 with control port (V.35, M/34 male, 48 VDC)

Note: Adapter cables are available for connecting the Model 2710 to WAN equipment that does not use a standard V.35 interface (such as the Cisco 2501 router, which uses a high density 60-pin connector).

T1/FT1 High-Density, Low Cost CSU/DSU Rack Card

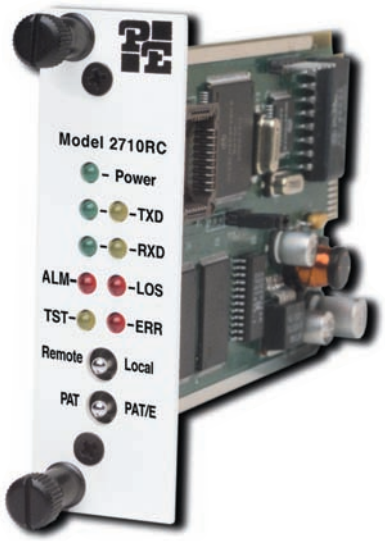
Model 2710RC

T1/Fractional-T1 CSU/DSU rack card connects to a space-saving, SNMP-manageable platform.

The NetLink-T1 Model 2710RC Series are T1/FT1 CSU/DSUs that provide high speed WAN connectivity in a rack card package. Patton's 2U (8.9-cm) redundant AC/DC rack chassis accepts up to 16 rack cards, saving valuable space in central site locations.

NetLink 2710RC is an excellent choice for terminating leased lines, Frame Relay backbones, Internet access, and LAN-to-LAN services. When terminating a T1-dedicated digital circuit, the NetLink 2710RC supports nx56 kbps and nx64 kbps framing for T1 and V.35, X.21, RS-530, or 10Base-T Ethernet interfaces.

The NetLink 2710RC supports D4/ESF framing options and AMI/B8ZS/B7ZS line coding. Data rates, framing, and coding options are programmed by DIP switches or from a VT-100 terminal with menu-driven software. The NetLink 2710RC also supports SNMP management from a NetLink Model 1001MC SNMP/HTTP rack card. A full range of system and diagnostic features make setup simple and easy.



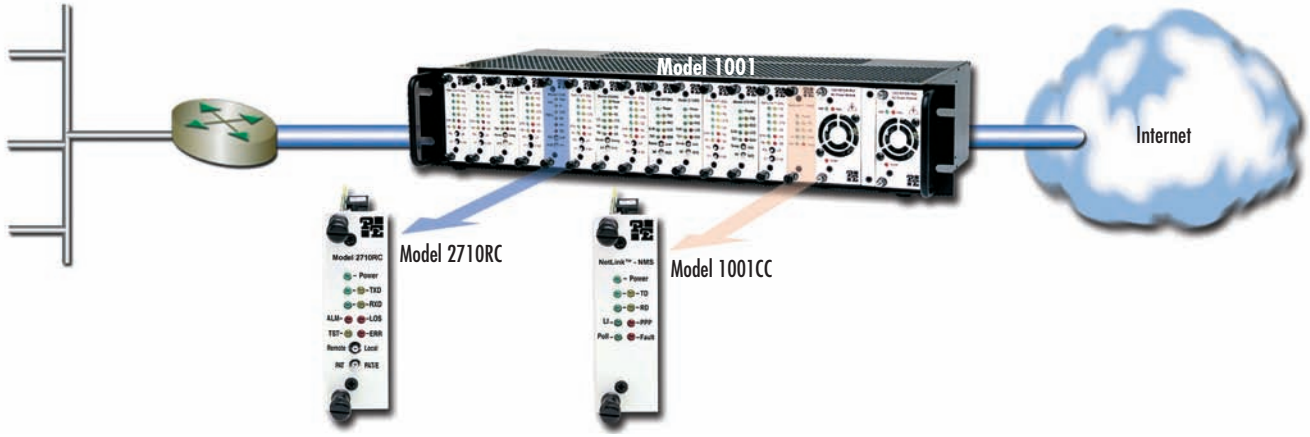
FEATURES & BENEFITS

- ✔ Terminates T1/FT1 circuits over a 4-wire RJ-48C interface
- ✔ Connects to standard CPE serial and Ethernet interfaces
- ✔ Common framed n x 56/64 kbps rates up to 1.536 Mbps
- ✔ Unstructured rates at 1.544 Mbps
- ✔ D4 or ESF framing modes
- ✔ Supports AMI or B8ZS/B7ZS line coding
- ✔ Software or DIP switch configurable
- ✔ Internal, external, or receive recover clocking
- ✔ Also functions as a high speed point-to-point modem
- ✔ Compatible with desktop models 2710 and 2720
- ✔ Made in USA

See Pg 134

RACKABLE

T1 termination application



I'm Brian, one of Patton's Product Validation Engineers who makes sure your network termination product works reliably. To buy one of these state-of-the-art devices, call ***+1 301.975.1000*** *or send e-mail to* ***sales@patton.com****.*

NEED Help?

SPECIFICATIONS

WAN Speed: 1.544 Mbps
WAN Connection: RJ-48C
Nominal Impedance: 100 Ohms
DTE Interface: EIA-530, V.35, X.21, Ethernet
Line Coding: AMI/B8ZS
Line Framing: D4/ESF/Unframed
Clock Options: Internal, external, or network
Diagnostics: Responds to CO-initiated D4 loop-up and loop-down codes, ESF line loop and payload loop FDL messages, and Universal Loopback de-activate messages
Transmit LBO: Selectable—0, 7.5, 15, or 22.5 dB, plus DSX-1
Standards: AT&T TR62411, TR54016, and ANSI T1.403
Test Modes: Initiates and responds to V.54 and CSU remote loops; local loop
Pattern Generator/Detector: User selectable 511, 2047, or QRSS
Dimensions: 0.78H x 2.1W x 3.5D in. (2.0H x 5.3W x 8.9D cm)

ORDERING INFORMATION

2710RC/B/B: Powered T1/FT1 CSU/DSU Card; EIA-530 Interface
2710RC/A/I: Powered T1/FT1 CSU/DSU Card; V.35 Interface
2710RC/D/V: Powered T1/FT1 CSU/DSU Card; X.21 Interface
2710RC/IA: Powered T1/FT1 CSU/DSU Card; 10Base-T Interface

MicroLink™ CSU/DSU

Model 2400

Tiny 56/64 kbps CSU/DSU fits into the tightest spaces!

The Model 2400 MicroLink™ supports 64 kbps Clear Channel™ *and* 56 kbps DDS sync communication over two twisted-pair wires.

Available with either an M/34 (V.35) or DB-25 (RS-232) connector, the Model 2400 plugs directly into your DTE port. Clocking can be set for internal, external, or receive recover (network). Diagnostics include CSU loop and V.54 (respond) loop.

FEATURES & BENEFITS

- ✔ Plugs directly into a router–just like an adapter cable!
- ✔ Operates over 56 kbps DDS, 64 kbps Clear Channel™, or private
- ✔ Your choice of V.35 (M/34) or RS-232 (DB-25) versions
- ✔ Selectable clocking: Internal (Master), External (DTE), or Receive Recover (Network)

SPECIFICATIONS

DDS Type: Dedicated, 56 or 64 kbps
Transmission Format: Synchronous
DTE Interface: RS-232 or V.35
Transmission Line: 4-wire, RJ-48S
Standards: AT&T 62310 compliant
Indicators: ER (error) and TM (test mode)
Max Distance: 3.4 mi. (5.4 km) on 26 AWG (0.4mm)
Connectors: DB-25 (RS-232) or M/34 (V.35)
Clocking: Internal (master), external (slave), receive recover (network), campus
Power Supply: External AC adapter
Diagnostics: V.54 loop (respond only), CSU loop
Dimensions: 3.55 x 2.1 x .78 in. (9.0 x 5.3 x 1.9 cm) RS-232 version

ORDERING INFORMATION

2400/AM/120: MicroLink (RS-232, DB-25 male, 120 VAC power)
2400/AF/120: MicroLink (RS-232, DB-25 female, 120 VAC power)
2400/CM/120: MicroLink (V.35, M/34 male, 120 VAC power)

G.703/G.704 Network Termination Unit (NTU)

Models 2701 & 2701RC

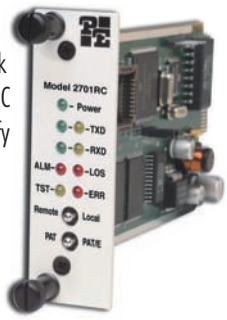
These devices, available in low-cost standalone or rack-mountable versions, terminate G.703/G.704 lines and provide E1/Fractional-E1.

One of the smallest and most economical NTUs available, the Model 2701 is designed with features usually found in more expensive units: flexible clocking modes, AMI/HDB3 coding, V.52/V.54 diagnostics, and user-selectable nx64 kbps data rates.

The NTUs terminate G.703/G.704 services for all nx64 kbps rates and connect to the customer's router, FRAD, CODEC, and switches with a V.35, X.21, EIA-530, or 10Base-T Ethernet interface.

The Model 2701 series terminates E1/FE1 services for all nx64 kbps to 2.048 Mbps rates and connects to a router, FRAD, CODEC, or LAN with V.35, X.21, EIA-530, or 10Base-T interfaces. Front panel LEDs and switches allow for instant diagnostics and service monitoring. Convenient DIP switches support quick and concise configuration of your E1 termination. AC or DC power options make installing the Model 2701 into your network infrastructure a snap.

Today's customers require low-cost network solutions that deliver high speed connections to the Internet and corporate intranets while supporting video-conferencing and many other wide-area services. The NetLink Models 2701 and 2701RC E1/Fractional E1 NTUs satisfy those needs.



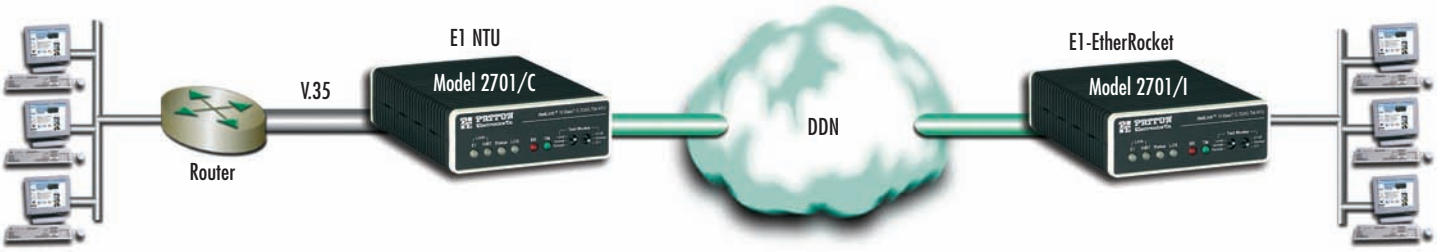
See Pg 134

FEATURES & BENEFITS

- ✔ Terminates E1/Fractional-E1 service
- ✔ nx64 kbps data rates to 2 Mbps
- ✔ X.21, V.35, EIA-530, and Ethernet bridge options
- ✔ Switch-selectable AMI or HDB3 line encoding options
- ✔ Switch-selectable DTE/DCE modes for X.21 version
- ✔ 75-ohm dual coax and 120-ohm twisted-pair G.703 connections
- ✔ Local and remote loopback diagnostics
- ✔ Internal, external and G.703 network timing
- ✔ Conforms to ONP requirements CTR 12 and CTR 13 for connection to international Telecom networks

Model 2701R version is also available in a rugged metal case for easy closet mounting

Models 2701 & 2701RC application: Connecting branch office to headquarters with 2701/I EtherRocket and remote router porting

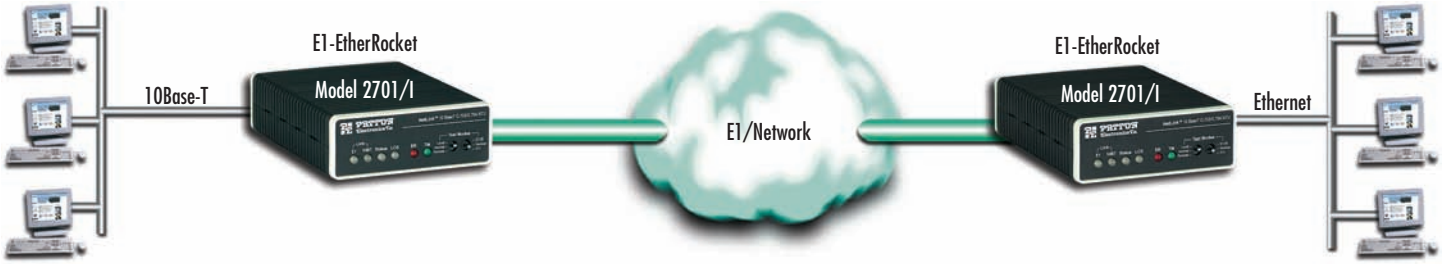


Models 2701 & 2701RC application: E1 network termination on X.21 or V.35 for data

The Model 2701/D (X.21 version) provides DTE/DCE functionality in the same standalone or rack-mount package. This added versatility supports operation in X.21 DTE applications (see diagram above) where an NTU is needed to terminate G.703/G.704 and provide X.21/V.11 data to a multiplexer.

The diagram below shows how two Patton E1-EtherRockets can be used to link two Ethernet LANs over an E1/FE1 link. Each E1 EtherRocket connects to the local Ethernet LAN and build a table of local hosts on that network. If an Ethernet message is not for a local host, the bridge forwards it over the WAN to the remote bridge. In this configuration, a user in one of the LAN segments is able to access any host and any application at the far end LAN, as easy as a local LAN connection.

Models 2701 & 2701RC application: LAN-to-LAN over E1 without a router



Check it out...No routers!

SPECIFICATIONS

Data Rate: Smooth clock 2.048 Mbps
Network Connector: RJ-48C (all versions); Dual coaxial (X.21 and Ethernet)
DTE Interface: EIA-530, X.21/V.11, V.35, or 10Base-T Ethernet
Line Coding: AMI or HDB3
Line Framing: G.703 (unframed) or G.704/G.732 (framed)
Clocking: Internal, external or receive recover
DTE Rates: nx64kbps (EIA-530, X.21/V.11, V.35); 10Mbps (10Base-T)
Indicators: E1 Link Status, TD, RD, Loss of Sync, Error, Test Mode, Ethernet Status (on 10Base-T Version)
Diagnostics: Local/remote loop, 511
Line Isolation: 1500 VRMS
Compliance: CE Mark, G.703, G.704, G.723, G.832, CTR-12 and CTR-13
Temperature: 32–122°F (0–50°C)
Rel. Humidity: 5–90% non-condensing
Dimensions:
Standalone unit
5.84L x 4.16W x 1.51H in.
(14.84L x 10.6W x 3.84H cm)
Rack card
3.0H x 0.83W x 7.84D in.
(7.6H x 2.1W x 19.0D cm)
Weight:
Standalone unit: 2.225 lbs (1.02 kg)
Rack card: 0.31 lbs (0.14 kg)

ORDERING INFORMATION

Standalone NTU, Universal 100–240 VAC Supply

2701/B/UI: EIA-530 (DB-25F) interface
2701/C/UI: V.35 (M/34F) interface
2701/D/UI: X.21 (DB-15F) interface
2701/I/UI: 10Base-T (RJ-45F) interface

Standalone NTU, -48 VDC Supply

2701/C/48: V.35 (M/34F) interface
2701/D/48: X.21 (DB-15F) interface
2701/I/48: 10Base-T (RJ-45F) interface

Rack card NTU

2701RC/A/I: RJ-45 line and V.35 (M/34F) DTE interfaces
2701RC/B/B: RJ-45 line and RS530 (DB-25F) DTE interfaces
2701RC/D/D: Dual BNC line and X.21 (DB-15F) DTE interfaces
2701RC/D/V: RJ-45 line and X.21 (DB-15F) DTE interfaces
2701RC/C/IA: RJ-45 line and Ethernet/10Base-T (RJ-45F) interfaces

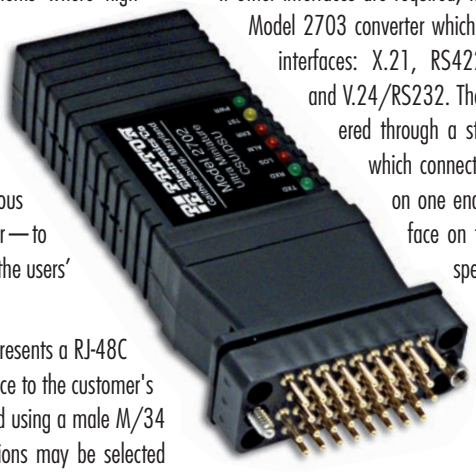
The Model 2701RC rack cards plug into the Model 1001 rack system (see page 110)

MicroPak™ G.703 Interface Converter

Model 2702

This MicroPak™ interface converter provides unstructured, clear-channel, 2-Mbps G.703 applications in a small package.

The Model 2702 fits into environments where high speed E1/G.703 services are being offered to customers with routers/FRADs and other networking devices. These G.703 interface converters convert signals from the unstructured, clear channel, synchronous line interface—delivered by the carrier—to a 2-Mbps digital interface required by the users' networking equipment.



To accomplish this, the Model 2702 presents a RJ-48C interface to the line and a V.35 interface to the customer's device. The V.35 interface is presented using a male M/34 connector. Line coding and clock options may be selected using internally accessible DIP switches.

If other interfaces are required, the user may select our Model 2703 converter which presents the following interfaces: X.21, RS422/530, V.36/RS449 and V.24/RS232. These interfaces are delivered through a standard interface cable which connects to the female DB-25 on one end and the desired interface on the other. If other DTE speeds are necessary, our Model 2094 connects Fractional E1 at nx64 speeds up to 2 Mbps.

FEATURES & BENEFITS

- ✔ Converts unframed 2-Mbps G.703 to synchronous V.35
- ✔ Integral V.35 (M/34) male connector (60-pin Cisco router adapter cable also available)
- ✔ V.54 compliant loopback diagnostics with built-in QRSS, 511 and 2047 test pattern generator
- ✔ Easy-to-read LEDs for TXD, RXD, ALM, LOS, TST, and ERR
- ✔ AMI or HDB3 line coding
- ✔ Configuration via DIP switches
- ✔ External 100–240 VAC power supply

I'm Scott, Patton's Vice President of Product Management. If you do not find the answers you need at **www.patton.com**, please call me at **+1 (301) 975-1000 x166**. You can also send e-mail to ***scott@patton.com***.

Typical Model 2702 application

ORDERING INFORMATION

2702/CM/UI: Micro-Pak Version. Clear Channel E1 Access Converter (V.35, M/34 male)

SPECIFICATIONS

Network (line) connector: 8-position RJ-45 connector
Nominal impedance: 120-ohm; 75-ohm available with Model 460 Balun
Network (line) data rate: 2.048 Mbps in accordance with ITU-T G.703
DTE interface: Integral V.35 (M/34 male)
DTE rate: 2.048 Mbps
Line encoding: Selectable for AMI or HDB3
LED indicators: Transmit data (TXD), receive data (RXD), alarm (ALM), test mode (TST), loss of sync (LOS), error (ERR)
Line framing: G.703 clear channel
Clocking: Selectable internal or network (receive recover) clock
Diagnostics: V.54 complaint loopbacks; built-in QRSS, 511 and 2047 test pattern generator and detector with performance monitoring
Standards: Fully compliant with ITU-T G.703
Approvals: FCC Part 15, Class A; CE Mark per EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC; Canadian DOC; BABT
Power supply: 100–240 VAC, 50/60 Hz universal input; -48 VDC optional (10 watts)
Dimensions: 9.0 x 5.3 x 1.9 cm (3.5 x 2.1 x 0.78 in.)
Weight: 0.11 kg (0.25 lb.)

MegaLink-I™ 2 Mbps G.703 Access Converter

Model 2703

Convenient network terminator, interface converter, and rate adapter…All in one box!

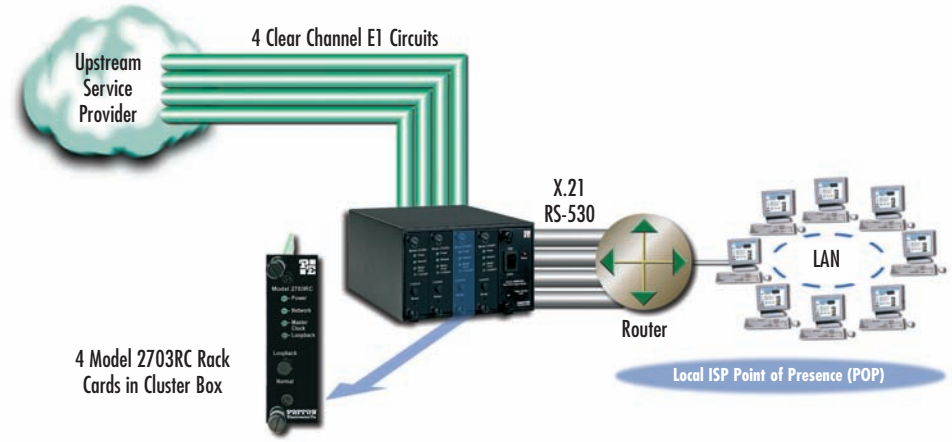
The Model 2703 MegaLink-I™ performs several tasks: network termination unit (NTU), interface converter, and rate adapter.

As an NTU, the Model 2703 receives unstructured, synchronous 2.048 Mbps data from a G.703 network and sends it to a router, bridge, multiplexer or other device.

As an interface converter, the Model 2703 accepts 120-ohm twisted pair or 75-ohm dual coax network connections (both types of interfaces are provided). Then it converts the signals to EIA-530 (V.36/RS-422), V.35 or X.21 formats (switchable) on a UD-26 connector.

As a rate converter, the Model 2703 lets a lower bandwidth device—256 kbps, 512 kbps, or 1.024 Mbps—connect to a 2.048-Mbps G.703 link. The Model 2703 supports internal, external or network (receive loop) clocking. A loopback test is built-in, and front panel LEDs monitor power, network, master clock and test loop. Several power supply options and converter cables are available, call for details.

Local ISP with multiple G.703/E1 upstream links



FEATURES & BENEFITS

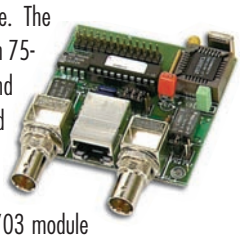
- ✔ Network data rate of 2.048 Mbps
- ✔ Four selectable DTE Data Rates
- ✔ Supports V.35, RS-530 (V.36/RS-422) or X.21 terminals
- ✔ 75-ohm and 120-ohm network terminations
- ✔ Internal, external or network (receive loop) clocking

Rack card

The Model 2703RC is a 2U (3.5-inch) high rack card version of the MegaLink-I™. Built around Patton's midplane architecture, the Model 2703RC combines a front function card with a choice of two rear interface cards (120 ohm with RS-530, or 75 ohm with X.21). The Model 2703RC fits in Patton's rack chassis or ClusterBoxes™. One AC or DC power supply card provides power to up to 16 Model 2703RC converters. The Model 2703RC incorporates all basic MegaLink-I™ features, except rate adaptation.

OEM Module

At the heart of the MegaLink-I™ is Patton's IM703 G.703/E1 interface module. The IM703 module provides both 75-ohm (dual-coax BNC) and 120-ohm (RJ-45 twisted pair) 2.048-Mbps network connections in one compact daughterboard. Patton's IM703 module is also available separately for OEM applications.



ORDERING INFORMATION

Universal interface version (UD-26)

2703/120: 120 VAC
2703/230: 230 VAC
2703/UI: 90–260 VAC
2703/DC: -48 VDC

X.21 only version (DB-15F)

2703-X.21/120: 120 VAC
2703-X.21/230: 230 VAC
2703-X.21/UI: 90–260 VAC
2703-X.21/DC: -48 VDC

Rack card

2703RC-A/A/45: V.35 (DB-25); RJ-48C
2703RC-A/A/CX: V.35 (DB-15); Dual Coax
2703RC-A/B/45: RS-422 (DB-25); RJ-48C
2703RC-A/B/CX: RS-422 (DB-25); Dual Coax
2703RC-A/C/45: X.21 (DB-15); RJ-48C
2703RC-A/C/CX: X.21 (DB-15); Dual Coax

SPECIFICATIONS

Network Interface: G.703
Network Rate: 2.048 Mbps
Network Connectors: Two BNC (75 ohm) and one modular RJ-45 connector (120 ohm)
Terminal Interface: RS-530 (V.36/RS-422), V.35 or X.21 on UD-26 (V.35 not available on rack cards)
Terminal Rate: 2.048 Mbps (all models); 1.024 Mbps, 512 kbps, 256 kbps (standalone only)
Diagnostics: Loopback test
Indicators: LEDs for power, network, master clock and loop
Clocking: Internal, external, network (receive loop)
Receiver Sensitivity: -10 dB (0 dB = 2.4V)
Power: 120/240 VAC (switch selectable), 50/60 Hz; 100—240 VAC, 50/60 Hz (universal input option); 48 VDC (optional)
Dimensions: 7.3 x 6.6 x 1.62 in. (18.5 x 16.7 x 4.1 cm)

Lowest Cost G.703 Network Termination Unit (NTU)

Model 2707

This device terminates G.703 lines and provides serial and 10Base-T interface conversion.

Today's customers require low-cost network solutions that deliver high speed connections to the Internet and Corporate Intranets while supporting videoconferencing and many other wide-area services. The NetLink Model 2707 E1 NTUs satisfies those needs.

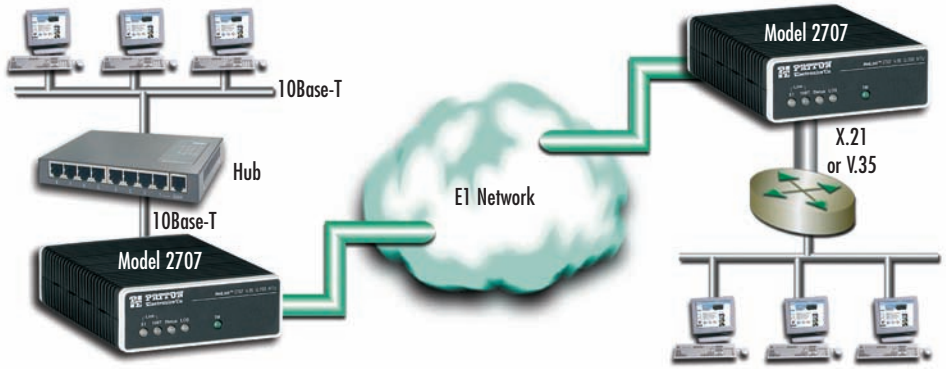
The NTUs terminate G.703 and connect to the customer's router, FRAD, CODEC, and switches with a V.35, X.21, or 10Base-T Ethernet interface.

E1 network on X.21 or V.35 for data

The Model 2707/D (X.21 version) provides DTE/DCE functionality in the same standalone or rack-mount package. This added versatility supports operation in X.21 DTE applications (see diagram above) where an NTU is needed to terminate G.703 and provide X.21/V.11 data to a multiplexer.

Our Ethernet version, the Model 2707/I offers 10Base-T bridging with PPP support. This enables customers to extend a router's serial interface and connect to a remote 10Base-T Ethernet LAN (see below). The 2707/I uses MAC learning and forwarding to provide seamless LAN-to-LAN connectivity.

E1 network on X.21 or V.35 for data



FEATURES & BENEFITS

- ✔ Terminates E1 services
- ✔ Available in low-cost standalone or rack-mountable (2707RC) versions
- ✔ 2 Mbps data and line rate
- ✔ X.21, V.35, and Ethernet bridge options
- ✔ Switch-selectable AMI or HDB3 line encoding options
- ✔ Switch-selectable DTE/DCE modes for X.21 version
- ✔ 75-ohm dual coax and 120-ohm twisted-pair G.703 connections
- ✔ Local loopback diagnostics
- ✔ Internal, external and G.703 network timing
- ✔ CE approved
- ✔ UI (100–240 VAC) 120/230 VAC & 48 VDC power options
- ✔ Conforms to ONP requirements CTR 12 for connection to international telecom networks
- ✔ 1 mile (1.6 km) distance

SPECIFICATIONS

Data Rate: Smooth Clock 2.048 Mbps
Network Connector: RJ-48C (all versions); Dual Coaxial (X.21 and Ethernet)
Line Coding: AMI or HDB3
DTE Interface: X.21/V.11, V.35, or 10Base-T Ethernet
Line Framing: G.703 (unframed)
Clocking: Internal, External or Receive Recover
Diagnostics: Local Loop
Line Isolation: 1500VRMS
Compliance: CE Mark, G.703, and CTR-12
Op. Temp.: 32–122°F (0–50°C)
Humidity: 5–90% non-condensing
Dimensions: 5.84L x 4.16W x 1.51H in. (14.84L x 10.6W x 3.84H cm)
Weight: 2.225 lbs (1.02 kg)

ORDERING INFORMATION

G.703 Interface Converter

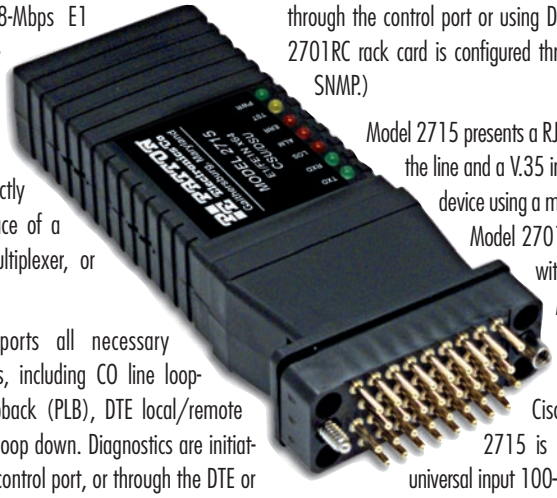
2707/C/UI: G.703 to V.35, 100–240 VAC
2707/D/UI: G.703 to X.21, 100–240 VAC
2707/I/UI: G.703 with 10Base-T interface 100–240 VAC
2707/C/48: G.703 to V.35, 48 VDC
2707/D/UI: G.703 to X.21, 48 VDC
2707/I/UI: G.703 with 10Base-T interface 48 VDC
2707RC/A/I: Access Rack Card G.703 to V.35
2707RC/D/D: Access Rack Card G.703 to X.21
2707RC/C/IA: Access Rack Card G.703 with 10Base-T interface

MicroLink-E1™ E1/FE1 Nx64 CSU/DSUs

Model 2715

Miniature NTU terminates framed or unframed 2-Mbps E1/FE1 (G.703/G.704) circuits.

The Patton Model 2715 Network Termination Unit (NTU) terminates 2.048-Mbps E1 (clear channel) and fractional E1 (nx64) 4-wire circuits. Housed in our MicroPak enclosure, the Model 2715 plugs directly into the V.35 DTE interface of a router, switch, FRAD, multiplexer, or other networking device.



The Model 2715 supports all necessary G.703/G.704 diagnostics, including CO line loopback (LLB), payload loopback (PLB), DTE local/remote loops, and V.54 loop up/loop down. Diagnostics are initiated via the Model 2715's control port, or through the DTE or line interfaces. Easily readable LED indicators include TD, RD, Loss of Sync (LOS), Alarm, Error, Test and Power.

Configuration of the Model 2715 standalone is done through the control port or using DIP switches. (The Model 2701RC rack card is configured through the control port or SNMP.)

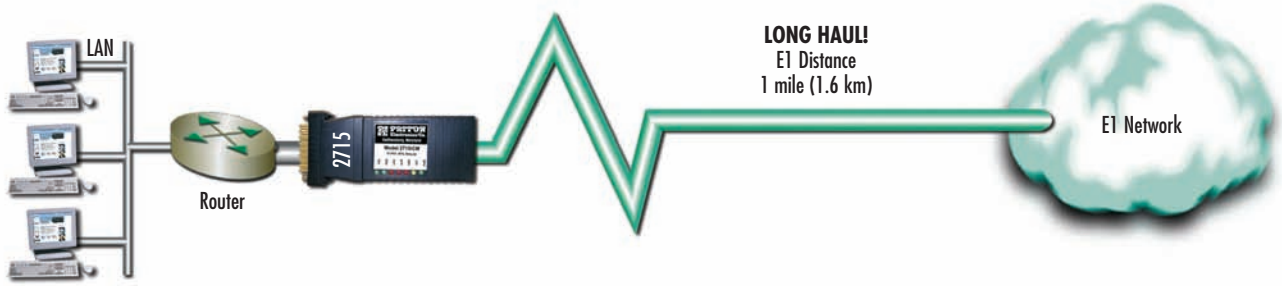
Model 2715 presents a RJ-45 120-ohm interface to the line and a V.35 interface to the customer's device using a male M/34 connector (the Model 2701RC rack card is available with a female M/34). An M/34 to DB-60 adapter cable is available for convenient connection to Cisco routers. The Model 2715 is powered by an external universal input 100–240 VAC adapter.

FEATURES & BENEFITS

- ✔ Terminates 2.048 Mbps E1 (clear channel) and FE1 (nx64) 4-wire digital services
- ✔ Built-in V.35 (M/34) male connector (DB-60 Cisco router adapter cable is available)
- ✔ Standalone (Model 2715) and rack mount cards (Model 2707RC) are available
- ✔ Diagnostics include LLB and PLB; DTE local and remote loops; V.54 loop up and loop down
- ✔ AMI or HDB3 line coding
- ✔ Configuration via DIP switches or control port
- ✔ External 100–240 VAC power supply

Rack card units available, see page 104

Typical application



Also available with DB-60 cable for Direct Connection to Cisco Routers.

SPECIFICATIONS

WAN connection: 8-position connector (RJ-45)
Nominal impedance: 100 ohm
WAN speed: 2.048 Mbps
DTE interface: Integral V.35 (M/34 male)
Line coding: E1 - AMI/HDB3
Receive LBO: Automatic
Transmit LBO: Selectable—0, 7.5, or 15 dB
Clock options: Internal, external, and network clock
Diagnostics: Respond to CO line loopback (LLB) and payload loopback (PLB) via control port and DTE initiate remote LLB and remote PLB (all loops are bi-directional with respect to the DTE); DTE local and remote l oops (bi-directional); V.54 loop-up/loop-down as detected in the data stream
Standards: G.703/704, G.732
Power: 120 VAC, 60 Hz to 5VDC 300mA wall mount transformer or UI 100–240VAC, 50 Hz to 5 VDC, 3A wall mount transformer

ORDERING INFORMATION

2715/CM/UI: MicroLink-E1™ E1/FE1 Nx64 CSU/DSU; V.35, M/34 male; 100–240 VAC power

2715/CM/48: Stand alone NTU; V.35 (M/34F) interface; -48 VDC power

Co-directional G.703 Converters

Model 2070

Plug-in access converter for G.703/64 kbps.

The Model 2070 Series interface converters allow a router—or similar WAN device—with a V.24 (RS-232), V.35 or X.21 port to connect to a G.703/64k co-directional (PCM) network.

Offering switchable internal, external or network clocking options, Model 2070 Series converters support bi-directional, synchronous communication at a data rate of 64 kbps.

The Model 2070 Series includes three variations: The Model 2070/AM plugs directly into an RS-232 DTE, and is equipped with a male DB-25 connector. The Model 2070/CM plugs directly into a V.35 DTE, and is equipped with an M/34 male connector. The Model 2070/DM plugs into an X.21 DTE, and is equipped with a male DB-15 connector at the end of a 6 ft (15.25 cm) cable. All versions come with an RJ-45 jack for 120-ohm twisted-pair network termination (termination to a 75-ohm network can be accomplished using the Patton Model 460 balun).

Model 2070 Series converters incorporate local loopback and G.703 loopback diagnostic modes. Diagnostic modes are controlled by a switch, or by the local DTE (V.24 or V.35 versions only). Rear panel LED indicators monitor test mode and synchronization. Synchronous clock jitter is attenuated in accordance with the G.823 specification. For protection against ground loops and transient surges, the Patton Model 2070 Series converters incorporate both trans-former isolation and surge protection.

Power is supplied to the Model 2070 Series converters by an external power supply. When used in a point-to-point environment, distances up to 5,250 ft (1600 m) are attainable using two 24 AWG (0.5mm) twisted pairs.

FEATURES & BENEFITS

- ✔ Bi-directionally converts V.24, X.21, or V.35 to G.703/64 kbps co-directional
- ✔ Synchronous operation at 64 kbps
- ✔ Internal, external, or network clocking options
- ✔ Point-to-point distance up to 5,250 ft (1600 m) on 24 AWG (0.5mm) twisted pair
- ✔ Complies with CCITT/ITU G.823 jitter control specifications
- ✔ Built-in surge protection and transformer isolation

ORDERING INFORMATION

2070/AM/UI: G.703/64 kbps converter (RS-232, DB-25 male, 100–240 VAC power)

2070/CM/UI: G.703/64 kbps Converter (V.35, M/34 male, 100–240 VAC power)

2070/DF/UI: G.703/64 kbps converter (X.21, DB-15 female, 100–240 VAC power)

Typical application

SPECIFICATIONS

Applications: 64k/G.703 co-directional PCM network or CSU/DTE conversion to CCITT/ITU V.24, CCITT/ITU V.35, or CCITT/ITU X.21

G.703 Interface: Symmetrically balanced pairs, 4 wire, 120 ohm terminated to female RJ-45

Operating Speed: Co-directional timing, Rx recovered: 64 kbits + 500ppm.

Clocking: Internal, External or Network Timing

G.703 Input Signal Level: 2.0V differential, into 120 Ohms, nominal.

Max. Cable Loss: 0 to -10dB

Line Encoding: AMI

Jitter Performance: CTR 14, G.823

Surge Protection: Device Response Time—100ns; Clamp Voltage—8.5V ±1V.

Isolation: 1500 VRMS isolation, transformer coupled.

Indicators: LEDs monitor TM and SYNC.

Power Requirements: 5VDC at 300mA, supplied by external transformer or on these DTE pins: pin 9 (V.24), pin KK (V.35), pin 15 (X.21)

Temperature Range: 32–140°F (0–60°C)

Dimensions: Model 2070/AM 4.90 x 2.00 x 0.73 in. (12.45 x 5.08 x 1.85 cm); Model 2070/CM & 2070/DF 3.40 x 2.00 x 0.73 in. (8.63 x 5.08 x 1.85 cm).

*I'm Martin, Patton's Sales Representative for Central/Eastern Europe. Call me at **+1 301.975.1000 x376** when you want to purchase or if you have questions about our products. You can also send e-mail to **martin@patton.com**.*

G.703/64-kbps Interface Converter

Model 2073

Standalone PCM converter supports Patton's QuikConnect™ modules.

The Patton Model 2073 KiloLink-I™ G.703/64 kbps co- directional access converter lets bridges, routers, switches, multiplexers, and other WAN hardware connect to a Kilo-Stream™ or similar G.703 circuit. Operating in either clear channel or octet timing modes, the Model 2073 offers three clocking options and seven front panel LED status indicators. Built-in transformer isolation and surge protection guard the Model 2073 and connected hardware against data line transients and ground loops. Power is provided to the Model 2073 through an internal AC power supply.

FEATURES & BENEFITS

- ✔ Switchable internal, external, or network clocking options
- ✔ Supports synchronous data rates of 9.6 to 64 kbps
- ✔ Supports asynchronous data rates of 9.6 to 19.2 kbps
- ✔ Clear channel or octet timing
- ✔ Accepts Patton QuikConnect modules
- ✔ Internal power supplies, 100–240 VAC, or -48 VDC

Typical application

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.703 Interfaces: 64 kbps, symmetrically balanced, 4-wire pair, 120-ohm terminated to a female RJ-45
DTE Interface: V.24/RS-232, V.35, X.21, G.703, Data+Voice, Ethernet Bridge
Data Rates: V.110 rate adaptation for asynchronous data rates from 50 bps to 57.6 kbps, and for synchronous data rates from 500 bps to 64 kbps
Operating Modes: 256 kbps rate co-directional timing, Rx recovered; 64 kbps+500ppm (clear channel); or with BPV for octet timing mode to communicate over a 128-kbps link (preservation of byte integrity)
Diagnostics: local analog loopback, remote digital loopback, V.52 compliant bit error rate pattern (511/511E pattern) generator and detector with error injection mode
Line Coding: AMI
Clocking: Internal, external, or network clock
G.703 Input Signal Level: 0 to -10 dB, 2V differential, nominal
Jitter Performance: CTR14, G.823
Isolation: Minimum 3000V RMS via custom transformers
Surge Protection: 600W power dissipation
Range: 0.5 mile (0.8 km)
Power: 100–240 VAC, 50/60 Hz (universal input option); 48 VDC (option); 5 watts
Dimensions: 7.3 x 6.6 x 1.62 in. (18.5 x 16.8 x 4.1 cm)
Weight: 2.02 lbs (0.92 kg)

ORDERING INFORMATION

G.703/64 kbps Interface Converter
2073/A/UI: V.24, DB-25F, 100–240 VAC power
2073/B/UI: RS-422/530, DB-25F, 100–240 VAC power
2073/C/UI: V.35, M/34F, 100–240 VAC power
2073/D/UI: X.21, DB-15, 100–240 VAC power
2073/D/UI: Ethernet, RJ-45, 100–240 VAC power