

Overview



HP 7102dl Router



HP 7203dl Router

Models

HP 7102dl Router

J8752A

HP 7203dl Router

J8753A

Introduction

The HP 7000dl Series Router provides an affordable and scalable platform for small and medium businesses as well as medium and large enterprise organizations to connect branch offices to their headquarter locations. The 7000dl Series offers a variety of WAN interface modules and supports wire-speed routing performance with integrated security and convergence capabilities to secure branch office connections edge to edge while simplifying the deployment, management, and support of routers.

Features and Benefits

Quality of Service (QoS)

- **Layer 2/3/4 QoS mechanisms:** IEEE 802.1p marking, precedence, and DiffServ priority tagging based on IP address, IP Type of Service (ToS), L3 protocol, TCP/UDP port number, and source port
- **QoS maps on Ethernet interfaces:** map IEEE 802.1p marking to Layer 3 QoS tag based on ACL settings
- **Scheduling mechanisms:** supports Weighted Fair Queuing (WFQ), FIFO, Low Latency Queuing (LLQ), and Priority Queuing (PQ)
- **Class-Based Weighted Fair Queuing (CBWFQ):** allows allocation of bandwidth to a particular class of traffic based on a percentage of total available bandwidth or maximum kbps throughput
- **Traffic shaping and QoS support for Ethernet ports:** allow the ability to apply WFQ, LLQ, and CBWFQ mechanisms to Ethernet ports based on DiffServ Code Point settings
- **Policy and shaping:** support Frame Relay Traffic Shaping (FRTS) and Frame Relay Fragmentation (FRF.12) to help reduce insertion delay across low-speed WAN links

Resiliency and high availability

- **Equal-cost multi-path (ECMP) for BGP, OSPF, and static routes:** provides the ability to load-balance traffic across multiple WAN connections
- **Multilink capability:** MLFR and MLPPP enable multiple T1/E1 ports to be aggregated and dynamically load-balanced across Frame Relay or PPP links
- **Multi-homing BGP support:** supports redundant WAN connections to multiple service providers using BGP routing protocol
- **Network monitor:** Provides performance testing and Layer 3 network connectivity monitoring for integrated IP interfaces and externally connected ADSL/cable modems; can be used to initiate a demand routing backup connection based on the status



Overview

of IP links

- **Optional redundant power supply:** provides uninterrupted power (provided by HP E600 RPS/EPS)

Layer 2 switching

- **VLAN support and tagging:** support complete IEEE 802.1Q (4,096 VLAN IDs)

Layer 3 services

- **IP multicast:** supports PIM SM, IGMPv2, and multicast stub routing
- **PIM Sparse mode:** routes IP multicast traffic using PIM Sparse mode (PIM-SM)
- **DHCP support:** acts as a DHCP server, relay, or client
- **SNTP Client/Server:**
 - **SNTP client:** obtains time settings from NTP server using SNTP
 - **SNTP server:** device will respond to SNTP client requests for time settings

Layer 3 routing

- **IP routing protocols:** supports static routes, RIP, RIPv2, OSPF, and BGP4
- **Policy-based routing:** allows users to route based upon both source and destination address
- **Route redistribution:** redistributes routes between BGP, OSPF, RIP, and static routes
- **Concurrent bridging and routing:** simultaneously bridge non-IP traffic and route IP traffic on the same interface
- **VLAN-aware bridging:** ability to preserve IEEE 802.1Q tag across Frame Relay, PPP, and HDLC WAN circuits

Standards

- **WAN protocols:** provides support for PPP, Frame Relay, IPSec, HDLC, DDR, MLPPP, MLFR, PPPoA, and PPPoE
- **Dial-on-Demand Routing (DDR):** ISDN or analog modem links activate when interesting traffic needs to be routed, helping to avoid costs associated with toll charges
- **Channelized T1/E1 support:** enables connections of up to 24 or 30 locations at 64 kbps, terminating on a single T1 or E1 WAN port on the 8xT1/E1 module

Security

- **Stateful firewall:** includes an integrated stateful firewall and a Cyber Attack Defense Engine that stops common attacks to help ensure continuous availability of critical Internet-dependent applications; the firewall also supports NAT and port-forwarding operations
- **Access control lists (ACLs):** provide IP Layer 3 filtering based on source/destination IP address/subnet and source/destination TCP/UDP port number
- **Time-based ACLs:** can be used to restrict network services (i.e., Internet access) based on time of day or day of the week
- **IPSec VPN:** optional IPSec VPN module enables site-to-site and client sessions; tunneling protocols include IPSec and GRE; encryption methods include 3DES-CBC, DES-CBC, AES-CBC, 128-bit, 192-bit, and 256-bit; hash algorithms supported are SHA-1, MD5, and manual IPSec policies; supports the ability to route traffic between tunnels (hub and spoke VPNs)
- **HTTP content filtering:** HTTP filtering can be applied to incoming or outgoing sessions on any IP interface to provide a proactive defense against Web-based threats; also, uses the WiSP protocol to communicate with Websense Enterprise server for enhanced content-filtering services
- **Policy-based routing:** allows the enforcement of packet policies and resource allocation down to individual end systems and end users
- **Network address translation (NAT) support:** provides 1:1 or 1:many NAT port translation
- **Management security:** utilizes SSHv2, secure copy, and SSL to encrypt all HTTP traffic, allowing secure access to the browser-based management GUI in the router; supports AAA systems, including authentication methods that utilize RADIUS servers or a local user database for operator and privileged mode passwords



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- **Global password encryption:** provides a global command to allow encryption of all user passwords
- **RADIUS authentication:** user authentication is performed via RADIUS to prevent unauthorized management access
- **TACACS+ AAA support:** offers full authentication, authorization, and accounting (AAA) with TACACS+
- **IEEE 802.1X supplicant:** supports IEEE 802.1X supplicant mode, where the router transmits and receives EAP requests from the authenticator to support IEEE 802.1X-enabled environments and prevent rogue networking equipment deployments

Convergence

- **VoIP support:** supports H.323 and SIP ALGs through a firewall

Ease of use

- **HP AutoSynch capability:** automatic synchronization of the internal flash and compact flash memory to help ensure that the most recent configuration and image files are stored in both locations to facilitate remote deployment, manageability, and maintenance
- **HP SafeMode capability:** allows easy recovery of configuration mishaps when modifying active configurations remotely
- **Industry-standard CLI:** utilizes a familiar command-line interface (CLI) to reduce training and certification costs
- **Link Layer Discovery Protocol (LLDP):** supported by HP PCM to enable real-time mapping of Ethernet nodes connected to the router ports
- **Compact flash port:** facilitates remote site installation by allowing the system image and configuration file to boot from externally accessible compact flash (CF) drive; can be configured to support HP AutoSynch technology to simultaneously update external CF and onboard flash with the system image and configuration file, helping to limit downtime and switchover in the event of failure
- **Dual flash images:** provides independent primary and secondary OS files for backup while upgrading
- **Firewall and VPN wizards:** the GUI provides a simplified format for configuring firewall policies and access control lists (ACLs), as well as setting up VPN tunnels; novice and expert users will find the GUI to be intuitive and easy to use
- **Central management:** supports SNMPv2/v3; can be centrally managed to archive and update configuration and software image files, and secures SNMP management through addition of authentication and encryption



Technical Specifications

HP 7102dl Router (J8752A) HP 7203dl Router (J8753A)	Ports	2 autosensing 10/100 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX); Media Type: Auto-MDIX; Duplex: half or full 2 open dl module slots 1 open dl wide module slot 1 Compact Flash port 1 VPN encryption module slot; 1000 max VPN sessions
	Physical characteristics	Dimensions 11.52(d) x 17.42(w) x 1.73(h) in. (29.26 x 44.25 x 4.39 cm) (1U height) Weight (fully loaded) 10.95 lb. (4.93 kg)
	Memory and processor	32 MB flash, 256 MB SDRAM
	Mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
	Performance	WAN throughput 210 kpps up to 8xT1/E1 lines
	Environment	Operating temperature 32°F to 122°F (0°C to 50°C)
		Operating relative humidity 0% to 95%, noncondensing
		Non-operating/Storage temperature -4° to 158° F (-20° to 70° C)
		Non-operating/Storage relative humidity 0% to 95%, noncondensing
	Electrical characteristics	Voltage 100–127 VAC/200–240 VAC
		Current 0.4 A/0.2 A
		Maximum power rating 50 W
		Frequency 50/60 Hz
		Notes Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
	Safety	CSA 22.2 No. 60950 3rd edition; CE Labeled; cUL Certified; EN 60950/IEC 60950, 3rd edition; UL Listed; AS/NZS 60950; KN 60950; GOST R MEK60950; TS 60950; UL 60950
	Emissions	FCC Rules Part 15, Subpart B Class A; CISPR 22/A2; EN 55022/A2; ICES-003; VCCI V-3/2000.04; IEC/EN 61000-3-2; IEC/EN 61000-3-3; EN 55024/A1; IEC 61000:4-2, 4-3, 4-4, 4-5, 4-6, 4-8, 4-11; BSMI CNS 13438
	Telecom Services	TBR-1; TBR-2; TBR-3; TBR-12; TBR-13; TBR-21; ITU-T G.992.1 3-year, 4-hour onsite, 13x5 coverage for hardware (UA435E) 3-year, 4-hour onsite, 24x7 coverage for hardware (UA436E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (UA437E) 3-year, 24x7 SW phone support, software updates (UF790E) 4-year, 4-hour onsite, 13x5 coverage for hardware (UR932E) 4-year, 4-hour onsite, 24x7 coverage for hardware (UR933E)



Technical Specifications

4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UR934E)

4-year, 24x7 SW phone support, software updates (UR935E)

5-year, 4-hour onsite, 13x5 coverage for hardware (UR936E)

5-year, 4-hour onsite, 24x7 coverage for hardware (UR937E)

5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UR938E)

5-year, 24x7 SW phone support, software updates (UR939E)

3 Yr 6 hr Call-to-Repair Onsite (UW341E)

4 Yr 6 hr Call-to-Repair Onsite (UW342E)

5 Yr 6 hr Call-to-Repair Onsite (UW343E)

Refer to the HP website at www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.



Accessories

Modules

HP 7100/7200 IPSec Base dl Module	J9026A
HP 7100/7200 IPSec dl Module	J8471A

Cables

HP X260 V.35 2m DTE Serial Cable	J8757A
HP X260 X.21 2m DTE Serial Cable	J8755A

EPS/RPS

HP 600 Redundant and External Power Supply	J8168A
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Router Modules

HP 1-port E1 + G.703 dl Module	J8455A
HP 2-Port E1 dl Module	J8456A
HP Analog Backup Modem Module	J8462A
HP 8-port T1/E1 Wide dl Module	J8463A
HP 1-port ADSL2 + Annex B dl Module	J8759A
HP 1-port ADSL2 + Annex A dl Module	J8459A
HP 1-port ISDN BRI S/T Backup Module	J8461A
HP 1-port ISDN BRI U Backup Module	J8460A
HP 8-port Serial Wide dl Module	J9011A
HP 2-port ISDN BRI U dl Module	J9010A
HP 2-port ISDN BRI S/T dl Module	J8457A
HP 1-port Serial dl Module	J8458A
HP 1-port T1 dl Module	J8451A
HP 1-port T1 + DSX-1 dl Module	J8452A
HP 2-port T1 dl Module	J8453A
HP 1-port E1 dl Module	J8454A



Accessory Product Details

NOTE: Details are not available for all accessories. The following specifications were available at the time of publication.

HP 7100/7200 IPSec Base dl Module (J9026A)	Physical characteristics	Dimensions	3.12(d) x 3.1(w) x 1.26(h) in. (7.92 x 7.87 x 3.2 cm)
		Weight	0.27 lb. (0.12 kg)
		Environment	Operating temperature
	Environment	Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
		Nonoperating/Storage relative humidity	0% to 95%, noncondensing
	Notes	Includes a free 10-user ProCurve VPN client license by registering on www.my.procurve.com	
Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.		

HP 7100/7200 IPsec dl Module (J8471A)	Physical characteristics	Dimensions	3.12(d) x 3.1(w) x 1.26(h) in. (7.92 x 7.87 x 3.2 cm)
		Weight	0.27 lb. (0.12 kg)
		Environment	Operating temperature
	Environment	Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
		Nonoperating/Storage relative humidity	0% to 95%, noncondensing
	Notes	Terminates IPSec VPN site-to-site and client sessions; Encryption: DES, 3DES, AES; Includes a free 10-user ProCurve VPN client license by registering on www.my.procurve.com	
Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.		



Accessory Product Details

HP X260 V.35 2m DTE Serial Cable (J8757A)	Connectivity	Connector	26-pin interface to dl serial module, V.35 DTE interface to external CSU/DSU	
		Length	6.56 ft. (2 m)	
	Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.		
HP X260 X.21 2m DTE Serial Cable (J8755A)	Connectivity	Connector	26-pin interface to dl serial module, X.21 DTE interface to external CSU/DSU	
		Length	6.56 ft. (2 m)	
	Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.		
HP 600 Redundant and External Power Supply (J8168A)	Ports	6 redundant power supply ports Restrictions: Each port can provide redundant +12 V power to a connected switch; only one port can provide power at a given time		
		2 external power supply ports Restrictions: Provides 50 VDC external PoE to up to two switch devices; provides max. of 408 W full power to one device, and half power (204 W each) if connected to two devices		
	Physical characteristics	Dimensions	12.83(d) x 17.44(w) x 1.73(h) in. (32.59 x 44.3 x 4.39 cm) (1U height)	
		Weight	11.78 lb. (5.34 kg), Fully loaded	
	Mounting	1U rack-mountable and wall-mountable enclosure using standard mounting hardware		
	Environment	Operating temperature	32°F to 131°F (0°C to 55°C)	
		Operating relative humidity	15% to 95% @ 104°F (40°C), noncondensing	
		Nonoperating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	
		Nonoperating/Storage relative humidity	15% to 95% @ 149°F (65°C), noncondensing	
		Altitude	up to 15,000 ft. (4.6 km)	
		Acoustic	Noise emission LwA=59.2 dB at virtual workspace, according to DIN 45635 T.19	
	Electrical characteristics	Description	The unit automatically adjusts to any voltage between 100-240 V and either 50 or 60 Hz	
		Voltage	100-240 VAC	
Current		9/5 A		
Maximum power rating		800 W		
RPS power		180 W		



Accessory Product Details

	PoE power	408 W
	Frequency	50/60 Hz
	Notes	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.
Safety		CSA 22.2 No. 60950; EN 60950/IEC 60950; UL 60950
Emissions		FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
Immunity	EN	EN 55024, CISPR 24
	ESD	IEC 61000-4-2; 4 kV CD, 8 kV AD
	Radiated	IEC 61000-4-3; 3 V/m
	EFT/Burst	IEC 61000-4-4; 1.0 kV (power line), 0.05 kV (signal line)
	Surge	IEC 61000-4-5; 1 kV/2 kV AC
	Conducted	IEC 61000-4-6; 3 V
	Power frequency magnetic field	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
	Voltage dips and interruptions	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods
	Harmonics	EN 61000-3-2, IEC 61000-3-2
	Flicker	EN 61000-3-3, IEC 61000-3-3
Management		Provides information via port interfaces of attached devices
Notes		Supported devices <ul style="list-style-type: none">● HP Switch 2600-PWR Series, Switch 2610 Series, Switch 2610-PWR Series, Switch 2800 Series, Switch 2810 Series, Switch 5300xl Series, Switch 3400cl Series, Switch 6400cl Series, and Secure Router 7000dl Series
Services		3-year, 4-hour onsite, 13x5 coverage for hardware (U9270E) 3-year, 4-hour onsite, 24x7 coverage for hardware (U9271E) 4-year, 4-hour onsite, 13x5 coverage for hardware (UR854E) 4-year, 4-hour onsite, 24x7 coverage for hardware (UR855E) 5-year, 4-hour onsite, 13x5 coverage for hardware (UR857E) 5-year, 4-hour onsite, 24x7 coverage for hardware (UR858E) 3 Yr 6 hr Call-to-Repair Onsite (UW371E) 4 Yr 6 hr Call-to-Repair Onsite (UW372E) 5 Yr 6 hr Call-to-Repair Onsite (UW373E)

Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.



Accessory Product Details

HP 1-port E1 / 1-port G.703 dl Module (J8455A)	Connectivity	Connector	(E1) RJ-48C,(G.703) RJ-48C,1 RJ-45 for optional backup module E1: 2.048 Mbps (30x64 kbps); FrE1: DS0 channelized (Nx56/64 kbps)
		Line code	HDB3, AMI
		Framing	FAS with optional CRC-4
	Physical characteristics	Receiver sensitivity	-30 dB
		Dimensions	4.65(d) x 3.2(w) x 1.3(h) in. (11.81 x 8.13 x 3.3 cm)
		Weight	0.16 lb. (0.07 kg)
	Environment	Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
		Nonoperating/Storage relative humidity	0% to 95%, noncondensing
Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.		

HP 2-port E1 dl Module (J8456A)	Connectivity	Connector	(2xE1) RJ-48C,1 RJ-45 for optional backup module E1: 2.048 Mbps (30x64 kbps) for each E1 interface; FrE1: DS0 channelized (Nx56/64 kbps)
		Line code	HDB3, AMI
		Framing	FAS with optional CRC-4
	Physical characteristics	Receiver sensitivity	-30 dB
		Dimensions	4.65(d) x 3.2(w) x 1.3(h) in. (11.81 x 8.13 x 3.3 cm)
		Weight	0.13 lb. (0.06 kg)
	Environment	Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
		Nonoperating/Storage relative humidity	0% to 95%, noncondensing
Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.		



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HP Analog Backup Modem Module (J8462A)	Physical characteristics	Dimensions	3.75(d) x 2.5(w) x 0.73(h) in. (9.53 x 6.35 x 1.85 cm)
	Environment	Weight	0.36 lb. (0.16 kg)
Notes	Services	Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
Notes	Services	Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
		Nonoperating/Storage relative humidity	0% to 95%, noncondensing
Notes	Services	Supports speeds from 300 bps to 33.6 kbps.	
Notes	Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	

HP 8-port T1/E1 Wide dl Module (J8463A)	Connectivity	Connector	(8xT1/E1) RJ-48C T1: 1.544 Mbps (24x64 kbps) for each T1; E1: 2.048 Mbps (30x64 kbps) for each E1; FrT1/E1: DS0 channelized (Nx64 kbps); ChT1: terminates up to 24 independent 64 kbps; ChE1: terminates up to 30 independent 64 kbps
	Physical characteristics	Line code	T1: AMI, T1: B8ZS, E1: HDB3
Environment	Services	Dimensions	6.0(d) x 8.64(w) x 0.94(h) in. (15.24 x 21.95 x 2.39 cm)
		Weight	2.93 lb. (1.32 kg)
Notes	Services	Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
Notes	Services	Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
		Nonoperating/Storage relative humidity	0% to 95%, noncondensing
Notes	Services	Supports channelized T1/E1 allowing up to 24 or 30 64 kbps independent connections terminating on a single T1 or E1 WAN port.	
Notes	Services	1-year, 24x7 software phone support, software updates (HR897E)	
Notes	Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	



Accessory Product Details

HP 1-port ADSL2 + Annex B dl Module (J8759A)	Connectivity	Connector	(ADSL) RJ-11, 1 RJ-45 for optional backup module
		Supported standard	ADSL, ADSL2, ADSL2+ for Annex B over ISDN lines Min/Max upstream rate:; ADSL: 32 kbps to 800 kbps; ADSL2: 32 kbps to 800 kbps; ADSL2+: 32 kbps to 2 Mbps; Min/Max downstream rate:; ADSL: 224 kbps to 8 Mbps; ADSL2: 224 kbps to 12 Mbps; ADSL2+: 224 kbps to 24 Mbps
	Physical characteristics	Line code	DMT
		Dimensions	4.65(d) x 3.2(w) x 1.3(h) in. (11.81 x 8.13 x 3.3 cm)
	Environment	Weight	0.18 lb. (0.08 kg)
		Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
	Services	Nonoperating/Storage relative humidity	0% to 95%, noncondensing
		Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	

HP 1-port ADSL2 + Annex A dl Module (J8459A)	Connectivity	Connector	(ADSL) RJ-11, 1 RJ-45 for optional backup module
		Supported standard	ADSL, ADSL2, ADSL2+ for Annex A over POTS lines Min/Max upstream rate:; ADSL: 32 kbps to 800 kbps; ADSL2: 32 kbps to 800 kbps; ADSL2+: 32 kbps to 2 Mbps; Min/Max downstream rate:; ADSL: 224 kbps to 8 Mbps; ADSL2: 224 kbps to 12 Mbps; ADSL2+: 224 kbps to 24 Mbps
	Physical characteristics	Line code	DMT
		Dimensions	4.65(d) x 3.2(w) x 1.3(h) in. (11.81 x 8.13 x 3.3 cm)
	Environment	Weight	0.18 lb. (0.08 kg)
		Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)



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	Nonoperating/Storage relative humidity	0% to 95%, noncondensing
Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	

HP 1-port ISDN BRI S/T Backup Module (J8461A)	Connectivity	Connector Interface	RJ-45 S/T interface support; support for 1 B channel (64 kbps)
	Physical characteristics	Dimensions	3.75(d) x 2.5(w) x 0.73(h) in. (9.53 x 6.35 x 1.85 cm)
Environment		Weight	0.4 lb. (0.18 kg)
		Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
Services	Nonoperating/Storage relative humidity		0% to 95%, noncondensing
	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.		

HP 1-port ISDN BRI U Backup Module (J8460A)	Connectivity	Connector Interface	RJ-45 U interface support; support for 1 B channel (64 kbps)
	Physical characteristics	Dimensions	3.75(d) x 2.5(w) x 0.73(h) in. (9.53 x 6.35 x 1.85 cm)
Environment		Weight	0.4 lb. (0.18 kg)
		Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
Services	Nonoperating/Storage relative humidity		0% to 95%, noncondensing
	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.		



Accessory Product Details

HP 8-port Serial Wide dl Module (J9011A)	Connectivity	Connector	(Serial) 26-pin interface
		Bit rate	Up to 10 Mbps per port to an external CSU/DSU
	Physical characteristics	Interface	V.35 or X.21 interface support
		Dimensions	8.75(d) x 6.0(w) x 1.0(h) in. (22.23 x 15.24 x 2.54 cm)
	Environment	Weight	0.54 lb. (0.24 kg)
		Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
	Notes	Nonoperating/Storage relative humidity	0% to 95%, noncondensing
		Requires the number of V.35 or X.21 serial cables needed to connect and use at the customer premises with an external CSU/DSU. Serial interfaces operate in DTE mode only. There is no internal clock.	
	Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	

HP 2-port ISDN BRI U dl Module (J9010A)	Connectivity	Connector	RJ-45, 1 RJ-45 for optional backup module
		Interface	2 ISDN BRI U interfaces, each supporting 2 B channels (128 kbps)
	Physical characteristics	Dimensions	4.44(d) x 3.20(w) x 1.29(h) in. (11.28 x 8.13 x 3.28 cm)
		Weight	0.21 lb. (0.1 kg)
	Environment	Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
		Nonoperating/Storage relative humidity	0% to 95%, noncondensing
	Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	



Accessory Product Details

HP 2-port ISDN BRI S/T dl Connectivity Module (J8457A)	Connectivity	Connector	RJ-45, 1 RJ-45 for optional backup module
		Interface	2 ISDN BRI S/T interfaces, each supporting 2 B channels (128 kbps)
Physical characteristics		Dimensions	4.44(d) x 3.20(w) x 1.29(h) in. (11.27 x 8.13 x 3.28 cm)
		Weight	0.21 lb. (0.1 kg)
Environment		Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
		Nonoperating/Storage relative humidity	0% to 95%, noncondensing
Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.		

HP 1-port Serial dl Module (J8458A)	Connectivity	Connector	(Serial) 26-pin interface, 1 RJ-45 for optional backup module
		Bit rate	Up to 10 Mbps to an external CSU/DSU
Physical characteristics		Interface	V.35 or X.21 interface support
		Dimensions	4.65(d) x 3.2(w) x 1.3(h) in. (11.81 x 8.13 x 3.3 cm)
Environment		Weight	0.11 lb. (0.05 kg)
		Operating temperature	32°F to 122°F (0°C to 50°C)
Services		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
		Nonoperating/Storage relative humidity	0% to 95%, noncondensing
Services	Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.		



Accessory Product Details

HP 1-port T1 dl Module (J8451A)	Connectivity	Connector	(T1) RJ-48C, 1 RJ-45 for optional backup module T1: 1.544 Mbps (24x64 kbps) for each T1 interface; FrT1: DS0 channelized (Nx64 kbps); AMI, B8ZS
	Physical characteristics	Line code	AMI, B8ZS
Line build out		0, -7.5, -15, -22.5 dB	
Input signal		0 to -36 dB (DS1)	
Dimensions		4.65(d) x 3.2(w) x 1.3(h) in. (11.81 x 8.13 x 3.3 cm)	
Environment	Weight	0.13 lb. (0.06 kg)	
	Operating temperature	32°F to 122°F (0°C to 50°C)	
	Operating relative humidity	0% to 95%, noncondensing	
	Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)	
Services	Nonoperating/Storage relative humidity	0% to 95%, noncondensing	
		Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	

HP 1-port T1 + DSX-1 dl Module (J8452A)	Connectivity	Connector	(T1) RJ-48C, (DSX-1) RJ-48C, 1 RJ-45 for optional backup module T1: 1.544 Mbps (24x64 kbps); FrT1: DS0 (Nx64 kbps); programmable DS0 assignment to allow DSX-1 TDM drop off to PBX
	Physical characteristics	Line code	AMI, B8ZS
Line build out		0, -7.5, -15, -22.5 dB	
Input signal		0 to -36 dB (DS1)	
Dimensions		4.65(d) x 3.2(w) x 1.3(h) in. (11.81 x 8.13 x 3.3 cm)	
Environment	Weight	0.13 lb. (0.06 kg)	
	Operating temperature	32°F to 122°F (0°C to 50°C)	
	Operating relative humidity	0% to 95%, noncondensing	
	Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)	
Services	Nonoperating/Storage relative humidity	0% to 95%, noncondensing	
		Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	



Accessory Product Details

HP 2-port T1 dl Module (J8453A)	Connectivity	Connector	(2xT1) RJ-48C, 1 RJ-45 for optional backup module T1: 1.544 Mbps (24x64 kbps) for each T1 interface; FrT1: DSO channelized (Nx64 kbps)
		Line code	AMI, B8ZS
	Physical characteristics	Line build out	0, -7.5, -15, -22.5 dB
		Input signal	0 to -36 dB (DS1)
		Dimensions	4.65(d) x 3.2(w) x 1.3(h) in. (11.81 x 8.13 x 3.3 cm)
	Environment	Weight	0.13 lb. (0.06 kg)
		Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
	Services	Nonoperating/Storage relative humidity	0% to 95%, noncondensing
Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.			

HP 1-port E1 dl Module (J8454A)	Connectivity	Connector	(E1) RJ-48C, 1 RJ-45 for optional backup module E1: 2.048 Mbps (Nx64 kbps); FrE1: DSO channelized (Nx56/64 kbps)
		Line code	HDB3, AMI
	Physical characteristics	Framing	FAS with optional CRC-4
		Receiver sensitivity	-30 dB
		Dimensions	4.65(d) x 3.2(w) x 1.3(h) in. (11.81 x 8.13 x 3.3 cm)
	Environment	Weight	0.13 lb. (0.06 kg)
		Operating temperature	32°F to 122°F (0°C to 50°C)
		Operating relative humidity	0% to 95%, noncondensing
		Nonoperating/Storage temperature	-40°F to 185°F (-40°C to 85°C)
	Services	Nonoperating/Storage relative humidity	0% to 95%, noncondensing
Refer to the HP website at: www.hp.com/networking/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.			



Accessory Product Details

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