AccessPro PC Cards

This chapter provides information on the AccessPro PC card. The information is organized into the following sections:

- Product Overview
- Standard Features
- Software Options
- Model AP-EC
- Model AP-RC
- Model AP-EBC
- Model AP-RBC
- Options

Note Documentation for the AccessPro PC card is available in two forms: on a CD-ROM called Cisco Connection Documentation, Enterprise Series and printed books. A CD and hard-copy installation documentation ship with each chassis, and a configuration note ships with each component ordered. All configuration notes are available on the CD. Additional CDs and a subscription CD update service are also available.

You can also access Cisco technical documentation on the World Wide Web URL http://www.cisco.com. For more information, see the chapter “Documentation” at the end of the catalog.

Product Overview

The AccessPro PC card is a full-featured multiprotocol router card that can be installed in an IBM or compatible PC equipped with either an ISA bus or EISA bus.

This series of PC-compatible router cards is based on Cisco 2500 series technology. The cards provide scalable wide-area connectivity and flexible full-function multiprotocol routing support. An AccessPro PC card runs autonomously using only its own processing power, expanding the capabilities of a PC server without impacting any existing applications.

Cisco Configuration Builder, an application that is available as an option, can be used to simplify configuration. The application runs in both Microsoft Windows NT and Windows environments.

The AccessPro PC cards also include built-in PC serial port emulation so that you can configure an AccessPro PC card from a PC, in lieu of the serial console port found on Cisco 2500 series products. You can select from four communications ports: COM1, COM2, COM3, or COM4. Access to the console port interface is available through the ISA bus using terminal emulation software (not provided) running on a PC.

There are currently four models of the AccessPro PC card:

- Model AP-EC—one Ethernet port and one synchronous serial port
- Model AP-RC—one Token Ring port and one synchronous serial port
- Model AP-EBC—one BRI port, two synchronous serial ports, and one Ethernet port
- Model AP-RBC—one BRI port, two synchronous serial ports, and one Token Ring port

Table 208 AccessPro PC Card Summary of Features

Characteristic	Features
Network interfaces	1 Ethernet or 1 Token Ring 1 synchronous serial (1E1T)
Ethernet interface	IEEE 802.3 10BaseT (RJ-45)
Token Ring interface	IEEE 802.5 10BaseT (RJ-45), supports unshielded twisted-pair wiring[1]
Synchronous serial interfaces	EIA/TIA-232, EIA/TIA-449, V.35, X.21 (NRZ/NRZI[2] and DTE/DCE) EIA-530 (NRZ/NRZI and DTE) All serial cables use a DB-60 chassis connector
Auxiliary port	Asynchronous serial (RJ-45, EIA/TIA-232-compatible)
PC serial port emulation	COM1, COM2, COM3, and COM4 (selectable)
Memory	4-MB Flash memory (expandable to 16 MB) 32-KB NVRAM Primary memory (DRAM SIMMs) varies with software ordered (expandable to 16 MB)
Processor type	20-MHz Motorola 68EC030
Software	Choice of feature sets: Cisco IOS Release 11.2, 11.1, 11.0, 10.3, and 10.2 feature sets (see Table 210)
Dimensions (H x L)	4.8 x 13.3" (12.2 x 33.8 cm)

1. European regulations require STP Category 3 (screen cable) wiring.
2. NRZ/NRZI = nonreturn to zero/nonreturn to zero inverted.

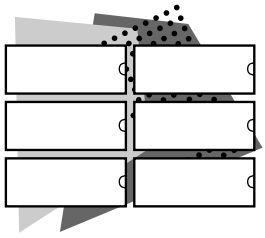
Table 209 AccessPro PC Card Environmental Specifications

Description	Specification
Power requirements	3.0A @ 5V, 0.5A @ 12V 30W maximum
Operating temperature range	32 to 104 F (0 to 40 C)
Nonoperating temperature	–40 to 185 F (–40 to 85 C)
Humidity (noncondensing)	5 to 95%

Standard Features

The AccessPro PC card includes the following features:

- One Token Ring or Ethernet port, RJ-45. Note that European regulations for Token Ring require the use of STP Category 3 wiring (screen cable).
- One synchronous serial port (DTE or DCE), up to 4 Mbps. Check with your local sales office for approved speeds based on local country regulation compliance.
- One asynchronous port, up to 38.4 kbps.
- 4-MB Flash EPROM for software upgrades. Depending on the Cisco IOS release and feature set, your AccessPro PC card might require more memory. Refer to Table 211 for the minimum memory requirements for each feature set.
- DRAM varies with the software ordered. Refer to Table 212 for the minimum memory requirements for each feature set.
- Auxiliary port cable with RJ-45 to DB-25 DCE and DTE connectors.
- Choice of feature sets, which can be upgraded.



Software Options

The AccessPro PC card supports the following software releases:

- Cisco IOS Releases 11.2, 11.1, 11.0, 10.3, and 10.2 feature sets (see Table 210)

Table 211 lists the software feature set product numbers and minimum memory requirements for Cisco IOS Releases 11.2, 11.1, 11.0, 10.3, and 10.2.

Note All models include a minimum of 4-MB Flash memory; however, depending on the Cisco IOS release feature set that you order with the system, it might require more memory. Refer to Table 211 for the minimum Flash memory required for each feature set. Refer to Table 218 for ordering information.

With the introduction of Cisco IOS Release 11.2, feature sets have been updated to make it easier to select the exact feature sets you need. Feature sets names are simplified and are more consistent across Cisco hardware platforms. In addition, you can add options to the standard feature set offerings. These options provide additional features and value based on the hardware platform selected. Cisco also continues to offer specialized feature sets for key applications.

The Cisco AccessPro PC card offers the following types of feature sets:

- Basic. The basic feature set for the hardware platform.
- Plus. The basic feature set plus additional features.
- Plus 40. The basic feature set, plus features, and 40-bit data encryption.
- Plus 56. The basic feature set, plus features, and 56-bit data encryption.

Cisco IOS images with 40-bit Data Encryption Standard (DES) support may legally be distributed to any party eligible to receive Cisco IOS software. 40-bit DES is not a cryptographically strong solution and should not be used to protect sensitive data.

Cisco IOS images with 56-bit DES are subject to International Traffic in Arms Regulations (ITAR) controls and have a limited distribution. Images to be installed outside the U.S. require an export license. Orders may be denied or subject to delays due to U.S. Government regulations. Contact your sales representative or distributor for more information, or send e-mail to export@cisco.com.

The new feature set tables use the following conventions to identify features:

- : the feature is offered in the basic feature set
- – : the feature is not offered in the feature set
- Plus: the feature is offered in the Plus feature sets
- Encrypt: the feature is offered in the Encryption feature sets

Table 210 Cisco IOS Releases 11.2, 11.1, 11.0, 10.3, and 10.2 Feature Sets—AccessPro PC Cards

	Cisco AccessPro PC Card Feature Sets																			
Features	**IP Routing**					**IP/IPX/ IBM/ APPN[1]**	**IP/IPX Routing[2]**				**Desktop (IP/IPX/Appletalk/DEC)**					**Enterprise[3]**				
Cisco IOS Release	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**
LAN Support																				
Apollo Domain	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
AppleTalk 1 and 2[4]	–	–	–	–	–	–	–	–	–	–										
Banyan VINES	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
Concurrent routing and bridging				–	–				–	–				–	–				–	–
DECnet IV	–	–	–	–	–	–	–	–	–	–										
DECnet V	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
GRE																				
Integrated routing and bridging (IRB)[5]		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
IP																				
LAN extension host																				
Multiring					–					–					–					–
Novell IPX[6]	–	–	–	–	–															
OSI	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
Source-route bridging[7]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Transparent and translational bridging[7]																				
XNS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
WAN Services																				
Combinet Packet Protocol (CPP)		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
Dialer profiles		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
Frame Relay																				
Frame Relay SVC Support (DTE)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
Frame Relay traffic shaping		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
Half bridge/half router for CPP and PPP		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
HDLC																				

	Cisco AccessPro PC Card Feature Sets																			
Features	**IP Routing**					**IP/IPX/ IBM/ APPN[1]**	**IP/IPX Routing[2]**				**Desktop (IP/IPX/Appletalk/DEC)**					**Enterprise[3]**				
Cisco IOS Release	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**
IPXWAN 2.0	–	–	–	–	–															
ISDN[8]																				
Multichassis Multilink PPP (MMP)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
PPP[9]																				
SMDS																				
Switched 56																				
Virtual Private Dial-up Network (VPDN)	–	–	–	–	–	–	–	–	–	–		–	–	–	–		–	–	–	–
X.25[10]																				
WAN Optimization																				
Bandwidth-on-demand																				
Custom and priority queuing																				
Dial backup																				
Dial-on-demand																				
Header[11], link and payload compression[12]																				
Snapshot routing																				
Weighted fair queuing				–	–				–	–				–	–				–	–
IP Routing																				
BGP																				
BGP4[13]		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
EGP																				
Enhanced IGRP																				
Enhanced IGRP Optimizations		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
ES-IS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
IGRP																				
IS-IS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
Named IP Access Control List	–	–	–	–	–	–	–	–	–	–		–	–	–	–		–	–	–	–
Network Address Translation (NAT)	Plus	–	–	–	–	–	–	–	–	–	Plus	–	–	–	–	Plus	–	–	–	–

	Cisco AccessPro PC Card Feature Sets																			
Features	**IP Routing**					**IP/IPX/ IBM/ APPN[1]**	**IP/IPX Routing[2]**				**Desktop (IP/IPX/Appletalk/DEC)**					**Enterprise[3]**				
Cisco IOS Release	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**
NHRP					–					–					–					–
On Demand Routing (ODR)		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
OSPF																				
OSPF Not-So-Stubby-Areas (NSSA)		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
OSPF On Demand Circuit (RFC 1793)		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
PIM																				
Policy-based routing				–	–				–	–				–	–					
RIP																				
RIP Version 2			–	–	–			–	–	–			–	–	–			–	–	–
Other Routing																				
AURP	–	–	–	–	–	–	–	–	–	–										
IPX RIP	–	–	–	–	–															
NLSP[14]	–	–	–	–	–					–					–					–
RTMP	–	–	–	–	–	–	–	–	–	–										
SMRP	–	–	–	–	–	–	–	–	–	–				–	–				–	–
SRTP	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
Multimedia and Quality of Service																				
Generic traffic shaping		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
Random Early Detection (RED)		–	–	–	–	–	–	–	–	–		–	–	–	–		–	–	–	–
Resource Reservation Protocol (RSVP)		–	–	–	–	–	–	–	–	–		–	–	–	–		–	–	–	–
Management																				
AutoInstall																				
Automatic modem configuration[15]			–	–	–			–	–	–			–	–	–			–	–	–
HTTP Server		–	–	–	–		–	–	–	–		–	–	–	–		–	–	–	–
RMON events and alarms[16]	Plus		–	–	–			–	–	–	Plus		–	–	–	Plus		–	–	–
RMON full	Plus	–	–	–	–	–	–	–	–	–	Plus	–	–	–	–	Plus	–	–	–	–

	Cisco AccessPro PC Card Feature Sets																			
Features	**IP Routing**					**IP/IPX/ IBM/ APPN[1]**	**IP/IPX Routing[2]**				**Desktop (IP/IPX/Appletalk/DEC)**					**Enterprise[3]**				
Cisco IOS Release	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**
SNMP																				
Telnet																				
Security																				
Access lists																				
Access security																				
Extended access lists																				
Kerberized login	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			–	–	–
Kerberos V client support	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
Lock and key		–	–	–	–	–	–	–	–	–	–	–	–	–	–			–	–	–
MD5 routing authentication				–	–				–	–				–	–				–	–
Network layer encryption (export controlled 40-bit and 56-bit DES)[17]	Encrypt	–	–	–	–	–	–	–	–	–	Encrypt	–	–	–	–	Encrypt	–	–	–	–
RADIUS			–	–	–			–	–	–			–	–	–			–	–	–
Router authentication	Encrypt	–	–	–	–	–	–	–	–	–	Encrypt	–	–	–	–	Encrypt	–	–	–	–
TACACS+[18]																				
IBM Support (Optional)																				
APPN (optional)[3]	–	–	–	–	–				–	–	–	–	–	–	–				–	–
BAN for SNA Frame Relay support	Plus			–	–				–	–	Plus			–	–				–	–
Bisync[19]	Plus			–	–				–	–	Plus			–	–				–	–
Caching and filtering	Plus										Plus									
DLSw+[20]	Plus				–					–	Plus				–					–
Downstream PU concentration (DSPU)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–				–	–
Frame Relay SNA support (RFC 1490)	Plus										Plus									
Native Client Interface Architecture (NCIA) Server	Plus	–	–	–	–		–	–	–	–	Plus	–	–	–	–		–	–	–	–
NetView Native Service Point	Plus			–	–				–	–	Plus			–	–				–	–
QLLC[19]	Plus			–	–				–	–	Plus			–	–					

	Cisco AccessPro PC Card Feature Sets																			
Features	**IP Routing**					**IP/IPX/ IBM/ APPN[1]**	**IP/IPX Routing[2]**				**Desktop (IP/IPX/Appletalk/DEC)**					**Enterprise[3]**				
Cisco IOS Release	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**
Response Time Reporter (RTR)	Plus	–	–	–	–	–	–	–	–	–	Plus	–	–	–	–		–	–	–	–
SDLC integration	Plus				–					–	Plus				–					
SDLC transport (STUN)	Plus				–					–	Plus				–					
SDLC-to-LAN conversion (SDLLC)	Plus				–					–	Plus				–					
SNA and NetBIOS WAN optimization via local acknowledgment	Plus										Plus									
SRB/RSRB[7, 21]	Plus									–	Plus									–
SRT	Plus				–					–	Plus				–					–
TG/COS	–	–	–	–	–	–	–	–	–	–	–	–	–		–					
TN3270	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
Protocol Translation																				
LAT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
Rlogin	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
Remote Node[22]																				
ARAP 1.0/2.0	–	–	–	–	–	–	–	–	–	–										
Asynchronous master interfaces				–	–				–	–				–	–				–	–
ATCP[23]	–	–	–	–	–	–	–	–	–	–					–					–
CPPP																				
CSLIP																				
DHCP					–					–					–					–
IP pooling				–	–				–	–				–	–				–	–
IPX and ARAP on virtual asynch interfaces	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–				–	–
IPXCP[11]	–	–	–	–	–															
MacIP	–	–	–	–	–	–	–	–	–	–										
NASI[24]	–	–	–	–	–			–	–	–				–	–				–	–
NetBEUI over PPP				–	–			–	–	–				–	–				–	–

	Cisco AccessPro PC Card Feature Sets																			
Features	**IP Routing**					**IP/IPX/ IBM/ APPN[1]**	**IP/IPX Routing[2]**				**Desktop (IP/IPX/Appletalk/DEC)**					**Enterprise[3]**				
Cisco IOS Release	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**	**11.2**	**11.1**	**11.0**	**10.3**	**10.2**
PPP																				
SLIP																				
Terminal Services[22]																				
LAT[25]	–	–	–			–	–	–	–	–	–	–	–	–	–					
Rlogin																				
Telnet																				
TN3270	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
X.25 PAD																				
Xremote	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					

1. IP/IPX/IBM/APPN is a new feature set in Cisco IOS Release 11.2. This feature set has no additional options. It offers a low-end APPN solution for this set of hardware platforms.
2. The IP/IPX feature set was discontinued in Cisco IOS Release 11.2. All features in this feature set prior to Cisco IOS Release 11.2 are now available in the Desktop (IP/IPX/Appletalk/DEC)/IBM feature set, except APPN which is available in IP/IPX/IBM/APPN and Enterprise/APPN.
3. Enterprise is available with APPN in a separate feature set. Use the product numbers that specify APPN. In Cisco IOS Release 11.2, APPN includes APPN Central Registration (CRR) and APPN over DLSw+.
4. AppleTalk load balancing is available in Cisco IOS Release 11.2.
5. IRB supports IP, IPX, and AppleTalk; it is supported for transparent bridging, but not for SRB; it is supported on all media-type interfaces except X.25 and ISDN bridged interfaces; and IRB and concurrent routing and bridging (CRB) cannot operate at the same time.
6. In Cisco IOS Release 11.2, the Novell IPX feature includes display SAP by name, IPX Access Control List violation logging, and plain-English IPX access lists.
7. See the feature category “IBM Support” for information about source-route bridging (SRB) in Cisco IOS Release 10.3 and later releases. In Cisco IOS Release 11.2, SRB /RSRB and translational bridging are fast switched. This enhancement is on by default, but can be disabled.
8. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization features.
9. PPP includes support for LAN protocols supported by the feature set, address negotiation, PAP and CHAP authentication, and PPP compression. Multilink PPP is available in Cisco IOS Release 11.0(4) and later releases.
10. X.25 includes X.25 switching.
11. IPX header compression (RFC 1553) is available in the feature sets that support IPX in Cisco IOS Release 11.1(1) and later releases.
12. X.25 payload compression is supported in Cisco IOS Release 10.2 and later releases. X.25 and Frame Relay payload compression are supported in Cisco IOS Release 11.0(4) and later releases.
13. BGP4 includes soft configuration, multipath support, and prefix filtering with inbound route maps.
14. NLSP is supported with the Desktop option in Cisco IOS Release 10.3(2) and later releases.
15. Automatic modem configuration is available for all features sets in Cisco IOS Release 11.1(2) and later releases. For the Enterprise feature set, automatic modem configuration is available in Cisco IOS 11.1(1) and later releases.
16. The RMON events and alarms groups are supported on all interfaces in Cisco IOS Release 11.1 and later releases. Separate enhanced RMON feature sets are also available with Cisco IOS Release 11.1. In Cisco IOS Release 11.2, RMON full is available with the plus feature sets.
17. For more details, see the description of the new data encryption options in the section “Software Options”earlier in this chapter,
18. With Cisco IOS Release 11.2, TACACS+ Single Connection and TACACS+ SENDAUTH enhancements are supported.
19. QLLC and Bisync are available in IP/IBM in Cisco IOS Release 11.0(3) and later releases, and in IP/IPX/IBM and Desktop/IBM base in Cisco IOS Release 11.0(2) and later releases.
20. Cisco IOS Release 11.2 introduces several DLSw+ enhancements available in the Plus, Plus 40, and Plus 56 feature sets. See the section “IBM Support” in the chapter “Cisco IOS Software” for more details.
21. In Cisco IOS Release 10.2, RSRB was supported in all feature sets. In Cisco IOS Release 10.3 and later releases, SRB/RSRB is supported in all feature sets.
22. Limited support on router auxiliary ports for remote node and terminal services.
23. ATCP and DHCP proxy client is supported in Cisco IOS Release 10.3(3) and later releases.
24. NASI is supported in Cisco IOS Release 11.1(2) and later releases.
25. Use of LAT requires terminal license (FR-L8-10.X= for an 8-user license or FR-L16-10.X= for a 16-user license).

Adding a feature set may require you to purchase more memory. Table 211 lists the minimum memory requirements and the product numbers for Cisco IOS Release 11.2, 11.1, 11.0 10.3, and 10.2 feature sets; Table 212 lists the requirements for Cisco IOS Release 10.0 feature sets. The minimum memory requirements listed were chosen for typical branch and remote office applications. If your network is very large or using complex routing protocols, you may need more memory. Configuration analysis and testing are encouraged.

Table 211 Cisco IOS Software Product Numbers and Minimum Memory Requirements—AccessPro PC Card

	Product Numbers and Minimum Memory Requirements										
		Cisco IOS Releases									
		11.2		11.1		11.0		10.3		10.2	
Feature Set	Product Number[1]	Flash	Total DRAM	Flash	Total DRAM	Flash	Total DRAM	Flash	Total DRAM	Flash	Total DRAM
IP	SFAPC-xx.x.x SWAPC-xx.x.x=	4 MB	2 MB	4 MB	2 MB	4 MB	2 MB	4 MB	2 MB	4 MB	2 MB
IP with IBM base	SFAPCS-xx.x.x SWAPCS-xx.x.x=	8 MB	6 MB	8 MB	6 MB	8 MB	6 MB	4 MB	6 MB	4 MB	6 MB
IP/IPX	SFAPD-xx.x.x SWAPD-xx.x.x=	8 MB	6 MB	8 MB	6 MB	4 MB	6 MB	4 MB	6 MB	4 MB	6 MB
IP/IPX with IBM base	SFAPDS-xx.x.x SWAPDS-xx.x.x=	8 MB	6 MB	8 MB	6 MB	8 MB	6 MB	8 MB	6 MB	4 MB	6 MB
Desktop	SFAPB-xx.x.x SWAPB-xx.x.x=	8 MB	6 MB	8 MB	6 MB	8 MB	6 MB	4 MB	6 MB	4 MB	6 MB
Desktop with IBM base	SFAPBS-xx.x.x SWAPBS-xx.x.x=	8 MB	6 MB	8 MB	6 MB	8 MB	6 MB	8 MB	6 MB	4 MB	6 MB
Enterprise	SFAPA-xx.x.x SWAPA-xx.x.x=	8 MB	6 MB	8 MB	6 MB	8 MB	6 MB	8 MB	6 MB	8 MB	6 MB

1. Substitute the release number for xx.x.x in the product number (for example, SWAPC-11.1.1=).

Table 212 Access Pro PC Card Minimum Memory Requirements for Cisco IOS Release 10.0

	Cisco IOS Release 10.0[1]	
Feature Set	Flash Memory	Total DRAM Memory
IP	4 MB	2 MB
IP with IBM base	–	–
IP/IPX	–	–
IP/IPX with IBM base	–	–
Desktop	4 MB	6 MB
Desktop with IBM base	–	–
Enterprise	4 MB	6 MB

1. The total DRAM memory is the total combined primary and shared DRAM memory. See Table 213.

There are two types of DRAM memory on the AccessPro PC cards: primary and shared (packet). Primary memory is used to store the operating configuration, routing tables, caches, queues, and packets. Shared memory is used to store incoming and outgoing packets. In Table 213, the physical configuration column lists the amount of fixed DRAM and DRAM SIMM memory supported. The system usage lists how the system allocates the total DRAM memory installed.

Table 213 Shared and Primary DRAM Memory—AccessPro PC Cards

Total DRAM Memory	Physical Configuration		System Usage	
	Fixed DRAM[1]	DRAM SIMM	Shared DRAM Memory	Primary DRAM Memory
2 MB	2 MB	–	1 MB	1 MB
6 MB	2 MB	4 MB	2 MB	4 MB
10 MB	2 MB	8 MB	2 MB	8 MB
18 MB	2 MB	16 MB	2 MB	16 MB

1. Fixed DRAM is soldered on the system card. AccessPro PC cards always ship with 2 MB of fixed DRAM.

Cisco IOS Feature Set Upgrades

Cisco IOS Release 11.2 for the Cisco AccessPro PC card allows software upgrades that cross multiple feature sets. This will require you to order multiple feature set licenses. The following is an example:

You have a Cisco AccessPro PC card installed in your IBM or compatible PC running the Cisco IOS Release 11.2 IP Routing feature set. You want to upgrade to the Cisco IOS Release 11.2 Enterprise Plus 56 feature set. You are crossing two feature sets: one to get from IP to Enterprise, and one to get to the Plus 56 feature set. To complete the upgrade, use the following guidelines:

- If you subscribe to SMARTnet Maintenance, you need to do the following:
  - Order FLAP-CA= (IP to Enterprise upgrade license, charged item)
  - Order FLAP-Y= (Plus 56 upgrade license, charged item)
  - Order DRAM (if you do not have the minimum required DRAM for the new feature set)
  - Download the new software feature set from CCO
- If you do not subscribe to SMARTnet Maintenance, you need to do the following:
  - Order FLAP-CA= (IP to Enterprise upgrade license, charged item)
  - Order FLAP-P=Y= (Plus 56 upgrade license, charged item)
  - Order DRAM (if you do not have the minimum required DRAM for the new feature set)
  - Order SWAPAY-11.2.1= (Cisco AccessPro Enterprise Plus 56 software on diskette, charged item)

Feature sets for Cisco IOS Releases 11.2 can be upgraded as described in Table 214.

Table 214 Cisco IOS Upgrades for Cisco IOS Release 11.2—AccessPro PC Cards

Feature Set Upgrade	Product Number[1, 2]
Plus with Enterprise with Desktop(IP/IPX/AT/DEC) with IP	FLAP-P= and SWAPAP-xx.x.x= SWAPBP-xx.x.x= SWAPCP-xx.x.x=
Plus 40 with Enterprise with Desktop(IP/IPX/AT/DEC) with IP	FLAP-W= and SWAPAW-xx.x.x= SWAPBW-xx.x.x= SWAPCW-xx.x.x=
Plus 56 with Enterprise with Desktop(IP/IPX/AT/DEC) with IP	FLAP-Y= and SWAPAY-xx.x.x= SWAPBY-xx.x.x=, or SWAPCY-xx.x.x=
IP to Desktop (IP/IPX/AT/DEC)	FLAP-CB= and SWAPB-xx.x.x=
IP to Enterprise	FLAP-CA= and SWAPA-xx.x.x=
Desktop (IP/IPX/AT/DEC) to Enterprise	FLAP-BA= and SWAPA-xx.x.x=
IP/IPX to Desktop (IP/IPX/AT/DEC)	FLAP-DB= and SWAPB-xx.x.x=
IP/IPX to Enterprise	FLAP-DA and SWAPA-xx.x.x=

1. For Cisco IOS Release 11.2, substitute the release number for xx.x.x in the product number (for example, SWAPA-11.2.1=).
2. If you subscribe to SMARTnet Maintenance, you only need to order the upgrade license (FLAP number). If you do not subscribe to SMARTnet Maintenance, you also need to order the upgrade media product number. See the example in the section "Cisco IOS Feature Set Upgrades" earlier in this chapter.

Feature sets for Cisco IOS Releases 11.1, 11.0, 10.3, and 10.2 can be upgraded as described in Table 215. To order an upgrade, you must use two product numbers; one represents the upgrade license and the other represents the software. For example, to upgrade from an IP feature set to an IP feature set with IBM base functionality, order product number FRAP-CCS= (the upgrade license) and SWAPCS-xx.x.x= (the software).

Table 215 Cisco IOS Release 11.1, 11.0, 10.3, and 10.2 Software Upgrades—AccessPro PC Card

Feature Set Upgrade	Product Number[1]
IP to IP with IBM base functionality	FRAP-CCS= and SWAPCS-xx.x.x=
IP to IP/IPX	FRAP-CD= and SWAPD-xx.x.x=
IP to IP/IPX with IBM base functionality	FRAP-CDS= and SWAPDS-xx.x.x=
IP to Desktop	FRAP-CB= and SWAPB-xx.x.x=
IP to Desktop with IBM base functionality	FRAP-CBS= and SWAPBS-xx.x.x=
IP to Enterprise	FRAP-CA= and SWAPA-xx.x.x=
IP with IBM base to IP/IPX with IBM base functionality	FRAP-CSDS= and SWAPDS-xx.x.x=
IP with IBM base to Desktop with IBM base functionality	FRAP-CSBS= and SWAPBS-xx.x.x=
IP with IBM base to Enterprise	FRAP-CSA= and SWAPA-xx.x.x=
IP/IPX to IP/IPX with IBM base functionality	FRAP-DDS= and SWAPDS-xx.x.x=
IP/IPX to Desktop	FRAP-DB= and SWAPB-xx.x.x=

Feature Set Upgrade	Product Number[1]
IP/IPX to Desktop with IBM base functionality	FRAP-DBS= and SWAPBS-xx.x.x=
IP/IPX to Enterprise	FRAP-DA= and SWAPA-xx.x.x=
IP/IPX with IBM base to Desktop with IBM base functionality	FRAP-DSBS= and SWAPBS-xx.x.x=
IP/IPX with IBM base to Enterprise	FRAP-DSA= and SWAPA-xx.x.x=
Desktop to Desktop with IBM base functionality	FRAP-BBS= and SWAPBS-xx.x.x=
Desktop to Enterprise	FRAP-BA= and SWAPA-xx.x.x=
Desktop with IBM Base to Enterprise	FRAP-BSA= and SWAPA-xx.x.x=

1. For Cisco IOS Release 11.1, 11.0, 10.3, and 10.2, substitute the release number for xx.x.x in the product number (for example, SWAPD-11.1.1=).

Table 216 lists product numbers used to upgrade Cisco IOS Release 10.0 feature sets.

Table 216 Cisco IOS Release 10.0 Software Upgrades—AccessPro PC Card

Upgrade[1]	Product Number
IP to Desktop[2]	SWAP-10.0.xCB=
IP to Enterprise[3]	SWAP-10.0.xCA=
Desktop to Enterprise[4]	SWAP-10.0.xBA=

1. A minimum of 4-MB Flash memory is required for all feature sets.
2. Requires a minimum of 2-MB DRAM.
3. Requires a minimum of 4-MB DRAM.
4. Requires a minimum of 6-MB DRAM.

Model AP-EC

The AccessPro AP-EC contains the following ports:

- RJ-45 Ethernet 10BaseT port
- 60-pin serial port for a Cisco serial interface cable
- RJ-45 auxiliary port for DTE/DCE

Figure 100 Model AP-EC AccessPro PC Card

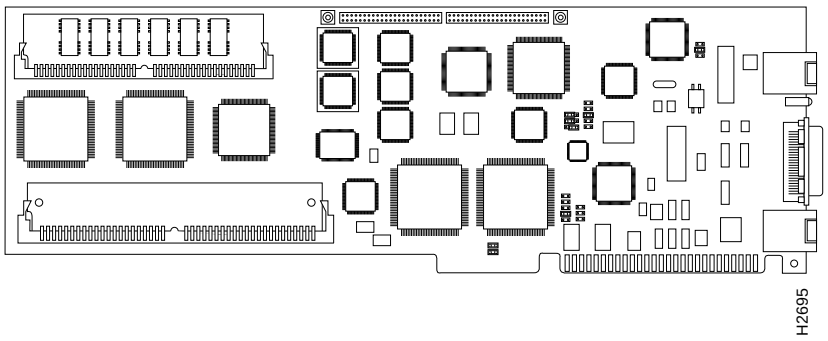
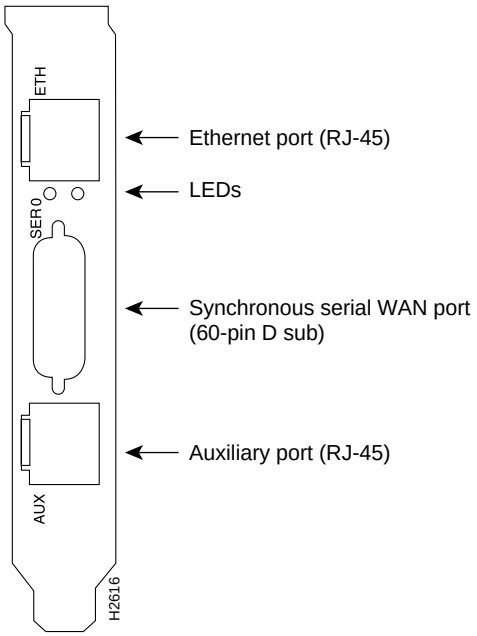


Figure 101 Model AP-EC AccessPro Rear Panel



Model AP-RC

The AccessPro AP-RC contains the following ports:

- RJ-45 Token Ring (4 or 16 Mbps)
- 60-pin serial port for a Cisco serial interface cable
- RJ-45 auxiliary port for DTE/DCE

Figure 102 Model AP-RC AccessPro PC Card

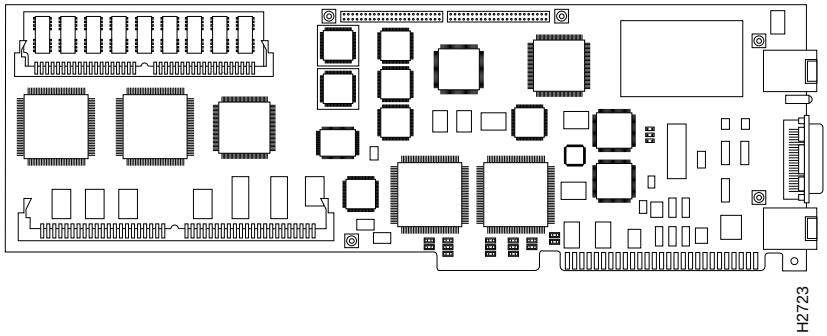
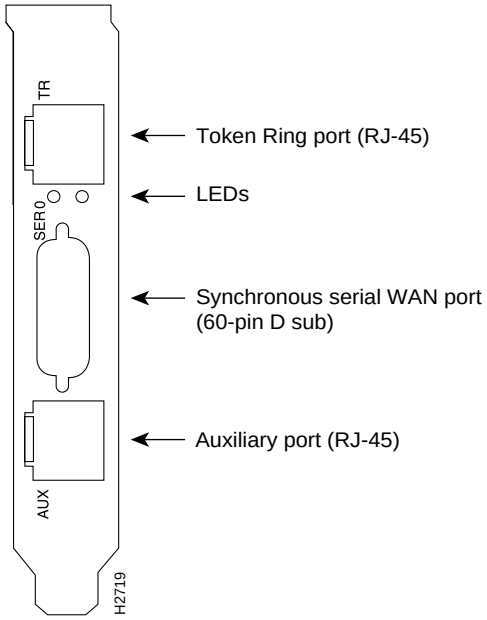


Figure 103 Model AP-RC Rear Panel



Model AP-EBC

The AccessPro AP-EBC contains the following ports:

- RJ-45 Ethernet 10BaseT port
- Two 60-pin serial ports for connection to a Cisco serial interface cable
- RJ-45 auxiliary port for DTE/DCE
- RJ-45 BRI port

Note that Model AP-EBC comprises a Model AP-EC AccessPro card with a daughter card mounted on the noncomponent side, as shown in Figure 104.

Figure 104 AccessPro Card and Daughter Card

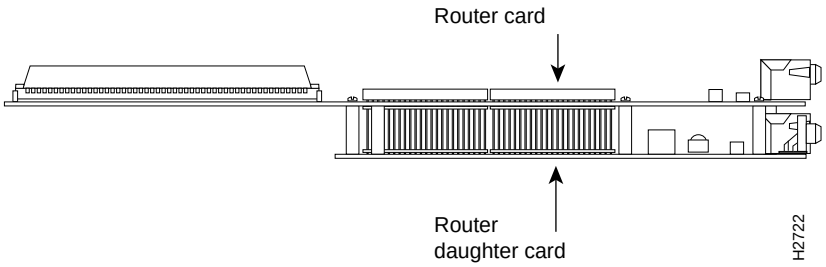
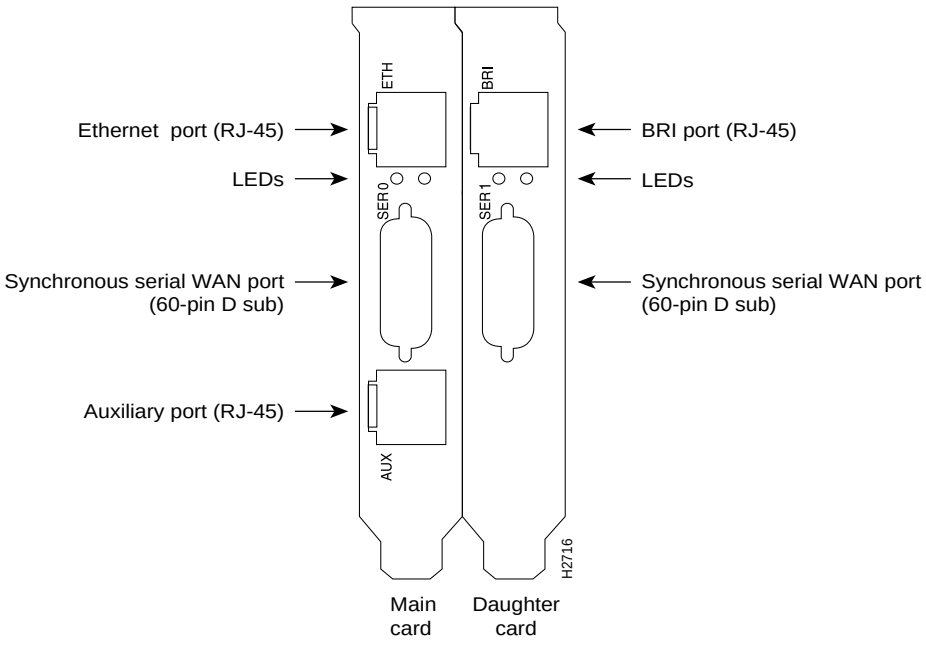


Figure 105 Model AP-EBC Rear Panel



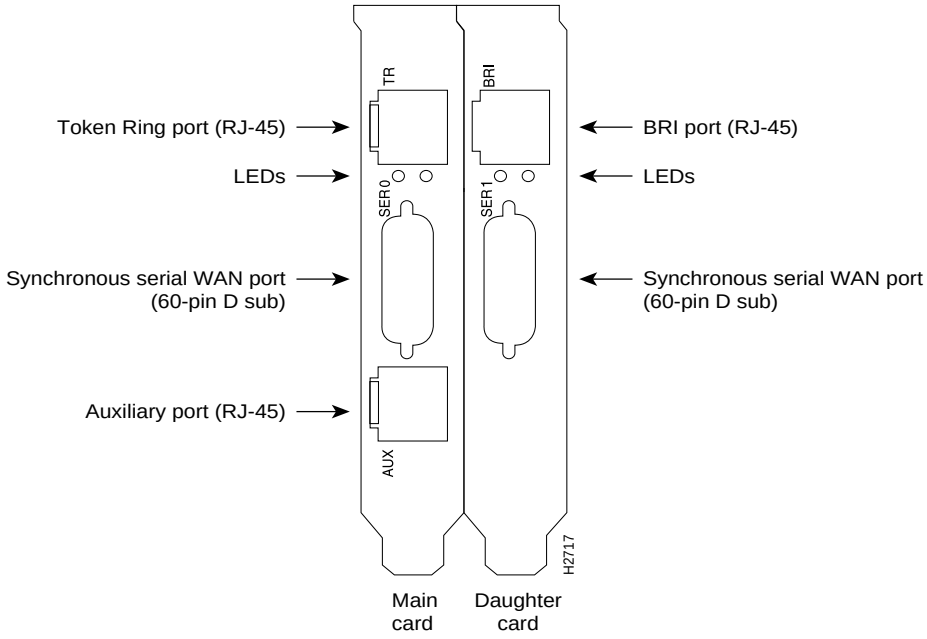
Model AP-RBC

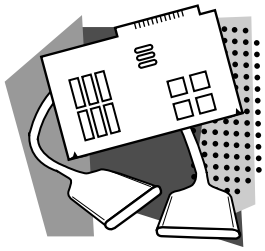
The AccessPro AP-RBC contains the following ports:

- RJ-45 Token Ring (4 or 16 Mbps)
- Two 60-pin serial ports for connection to a Cisco serial interface cable
- RJ-45 auxiliary port for DTE/DCE
- RJ-45 BRI port

Note that Model AP-RBC comprises a Model AP-RC AccessPro card with a daughter card mounted on the noncomponent side, as shown in Figure 104.

Figure 106 Model AP-RBC Rear Panel





Options

The options for the AccessPro PC card include cables, memory, and software upgrades. For cable illustrations, refer to the section “Specifications” in the chapter “Cables and Transceivers” later in this catalog. Table 217 lists the cable options, and Table 218 lists the memory options.

Table 217 AccessPro PC Card Cable Options

Cables	Product Number
EIA/TIA-232 male DTE interface, 10' (3 m)	CAB-232MT
EIA/TIA-232 female DCE interface, 10' (3 m)	CAB-232FC
EIA/TIA-449 male DTE interface, 10' (3 m)	CAB-449MT
EIA/TIA-449 female DCE interface, 10' (3 m)	CAB-449FC
EIA-530 male DTE interface, 10' (3 m)	CAB-530MT
V.35 male DTE interface, 10' (3 m)	CAB-V35MT
V.35 female DCE interface, 10' (3 m)	CAB-V35FC
X.21 male DTE interface, 10' (3 m)	CAB-X21MT
X.21 female DCE interface, 10' (3 m)	CAB-X21FC
Auxiliary/console port cable kit	ACS-2500ASYN

Table 218 AccessPro PC Card Memory Options

Description	Product Number
4-MB DRAM	MEM-1X4D
4-MB DRAM (spare)	MEM-1X4D=
8-MB DRAM	MEM-1X8D
8-MB DRAM (spare)	MEM-1X8D=
16-MB DRAM	MEM-1X16D
16-MB DRAM (spare)	MEM-1X16D=
4-MB Flash SIMM (spare)	MEM-1X4F=
4- to 8-MB Flash memory upgrade	MEM-1X8F-DFB-U[1, 2]
8-MB dual Flash bank SIMM (spare)	MEM-1X8F-DFB=[2]
16-MB dual Flash bank SIMM	MEM-1X16F-DFB
16-MB dual Flash bank SIMM (spare)	MEM-1X16F-DFB=[3]

1. Applies to Cisco IOS Release 11.x feature sets that require more than 4-MB Flash memory.
2. Dual-bank Flash memory is required because AccessPro PC cards contain only one slot for Flash memory. It can operate as either two banks of 4 MB for dual-Flash bank operation or as 8 MB contiguous.
3. Dual-bank Flash memory is required because AccessPro PC cards contain only one slot for Flash memory. It can operate as either two banks of 8 MB for dual-Flash bank operation or as 16 MB contiguous.