CISCO SYSTEMS

ORDERING GUIDE

HOW TO ORDER A CISCO AS5400HPX UNIVERSAL GATEWAY

PRODUCT OVERVIEW

The Cisco® AS5400HPX Universal Gateway offers high-density voice, wireless, fax, and data services. Cisco Any Service for Any Port for Service Providers (ASAP) architecture enables the platform to be used as both a Voice Gateway and a Network Access Server. The rich set of Cisco IOS® Software features available in the Cisco AS5400HPX Universal Gateway makes the platform versatile and deployable in a wide range of network architectures.

The Cisco AS5400HPX Universal Gateway chassis has seven slots that can take trunk cards and Universal Port digital signal processor (DSP) cards. The following feature card options allow you to customize the platform configuration to meet specific customer needs.

• The trunk card options that are available for this platform are 2CT1, 2CE1, 4CT1, 4CE1, 8CT1, 8CE1, and CT3.

• The Universal Port DSP feature card options that are available for this platform are NP108 (108 universal ports) and NP60 (60 universal ports).

This document describes how to order the Cisco AS5400HPX Universal Gateway and the relevant software licenses required for the gateway features.

BEFORE YOU BEGIN

Before you begin, have information ready as indicated by the following questions:

• Will the customer use AC or DC power supply?

• What is the ingress trunk type?

The platform supports CT1, CE1, and CT3 ingress trunks.

• What cable/connector type is required to connect the trunks?

  – Specific cable types like DB15, RJ45, BNC, etc. may be required to connect the E1/T1 trunks to the Cisco AS5400HPX Universal Gateway. The RJ45 is sometimes referred to as RJ48C.

• What trunk signaling is used?

  – The Cisco AS5400HPX Universal Gateway supports a variety of trunk signaling protocols including T1 or E1 Primary Rate Interface (PRI), Channel Associated Signaling (CAS), and E1/R2. If using E1/R2 signaling, check with your Cisco Systems® representative that the platform supports the country specific variant. A list of country variants supported is at http://www.cisco.com/en/US/products/hw/univgate/ps501/products_configuration_guide_chapter09186a008007df5b.html - wp1081171.

  – Signaling System 7 (SS7) signaling is also supported with the use of an external call agent such as the BTS10200 or the PGW2200.

• If T1 or E1 cables will be used for ingress, does the customer need the optional 8-PRI-breakout cable rack mount bracket to organize cabling?

• Which of the following kinds of calls will be terminated on the platform—Modem calls, ISDN digital calls, wireless (V.110, V.120) calls, voice calls, Voice Extensible Markup Language (VXML), etc., or a combination of the above?

- How many simultaneous sessions need to be supported?

  – The maximum number of sessions that can be supported on one chassis varies depending upon the application. The Cisco AS5400HPX Universal Gateway is designed to handle a maximum of 648 dial sessions and 480 voice sessions. Consult your Cisco representative to determine the performance and capabilities of the platform for your specific applications.

- Is the platform used along with PGW2200 or any other vendor's Signaling System 7 (SS7) controller?

  – To access the Integrated Signaling Link Terminal (SLT) feature, order the license **FR54H-SLT-LIC** (AS5400HPX Cisco IOS Software Integrated SLT License priced per platform).

- What Cisco IOS Software features are required?

  – Basic Cisco IOS Software features are present in the IP PLUS feature set

  – Applications requiring Triple Data Encryption Standard (3DES) encryption, such as SSHv2 need the IP PLUS 3DES feature set

  – Lawful Intercept is supported in IP PLUS 3DES LAWFUL INTERCEPT feature set

  – X.25, Appletalk, and other non-IP protocols are supported on the ENTERPRISE PLUS feature set

  – Enterprise applications requiring 3DES encryption will need the ENTERPRISE PLUS 3DES feature set

Feature Licenses

All orders must include one of the basic feature licenses listed in Table 1.

Table 1.   AS5400HPX Basic Feature Licenses

Part Number	Description
FR54H-DATA-LIC	Cisco AS5400HPX IOS Software Data License Per Port
FR54H-ENHVOX-LIC	Cisco AS5400HPX IOS Software Enhanced Voice License Per Port

- **FR54H-DATA-LIC**

  – The Data Only license covers all Cisco IOS Software features required for remote access and dial services. This license includes support for access VPN, ISDN remote access, and TDM switching. This license does not cover the Cisco IOS Software features required for voice services.

- **FR54H-ENHVOX-LIC**

  – The Voice Only license covers all Cisco IOS Software features required for all voice and fax relay services (voice codec, T.38 Fax Relay, H.323 and Session Initiation Protocol [SIP], Media Gateway Control Protocol [MGCP], VXML, etc). This license does not cover the Cisco IOS Software features required for basic remote access and dial services.

Consult Appendix 1 for the number of licenses that need to be ordered for various CT1, CE1, and CT3 configurations.

Optional Feature Licenses

- FR54H-SLT-LIC

  – FR54H-SLT-LIC is the feature license for the integrated SLT function on the Cisco AS5400HPX Universal Gateway. This feature pulls existing Cisco distributed Message Transfer Part (MTP) SS7 signaling architecture functions—previously available only on Cisco 26xx-based SLTs—directly onto a single Cisco AS5400HPX Universal Gateway. Like the Cisco 26xx-based SLT, the Integrated SLT on a Cisco AS5400HPX Universal Gateway backhauls upper-layer SS7 protocols across an IP network using Cisco Reliable User Datagram Protocol (RUDP), terminating the MTP1 and MTP2 layers of the SS7 protocol stack at the Media Gateway Controller (MGC).

Performance and Capacity

The performance and capacity of the Cisco AS5400HPX Universal Gateway varies for different applications. For typical voice only applications (G.711/20ms), the gateway is designed to service 480 calls at 7-10 calls/second (cps), burst traffic can be supported at up to 100 cps. Consult your Cisco representative for performance characteristics for the specific applications that you will run on the gateway.

The Cisco AS5400HPX Universal Gateway occupies two Rack Units (RUs) = 3.5 inches of rack space. The maximum power consumption of one Cisco AS5400HPX Universal Gateway is 345W in the CT3 configuration with 648 active calls. The heat dissipation is 106 W/feet 2/vert. feet, 683-1177 BTUs/hour.

ORDERING A SYSTEM

We have created easy-to-order bundle options for the most commonly used voice configurations. This saves you time and effort in configuring the Cisco AS5400HPX Universal Gateway and offers a significant pricing advantage. You could choose to have the flexibility in configuring the system and build a system using the Cisco AS5400HPX starter kit.

Ordering Bundles

Pick the appropriate bundle based on the requirements (refer to previous sections).

Each easy to order bundle contains the following products (the quantities of each vary based on the configuration):

• IP PLUS Cisco IOS Software

• Universal Port DSP card (NP60s and/or NP108s)

• Trunk feature card(s) (2CT1/2CE1/4CT1/4CE1/8CT1/8CE1)

• Enhanced Voice licenses (the number of licenses depends upon the configuration)

• Dual AC power supply

• Power cord

• 2 meter Octal cable included when configuration uses 8PRI feature cards

• Cisco AS5400HPX Universal Gateway chassis with maximum memory for boot flash, system flash, shared I/O memory, and main memory

You will have to choose:

• The Cisco IOS Software containing the features required

• The appropriate AC power cable, CT1/CE1 cables, and octal cables

• Optionally add a Dual DC Power supply

• Optionally add Data and Integrated SLT licenses

Appendix 2 contains a list of available bundles with a description of the included components.

Building a System using the Cisco AS5400HPX Starter Kit

Choose the Cisco AS5400HPX starter kit. This includes the Cisco AS5400HPX chassis with maximum memory. You should be able to configure the following:

• The appropriate power option (AC or DC) and appropriate cables

• The right Cisco IOS Software (based on features required)

- Trunk cards (maximum four per chassis); more than two 8CT1/8CE1 trunk cards will not provide you with full DSP coverage

- Universal Port DSP cards (maximum six per chassis)

Note: The total number of cards should not exceed seven per chassis.

- Required number of base feature licenses—Data or Enhanced Voice (consult Appendix 1)

- Optional licenses—Integrated SLT

- Cisco AS5400 CT1/CE1 cables

Ordering Spares

Memory

The Cisco AS5400HPX chassis comes with the maximum memory sizes shown in Table 2 and you can order spare memory as specified in the table.

Table 2.   AS5400HPX Memory Spares

Memory Type	Spare Memory Sizes	Part Numbers	Default Size
System Flash	32 MB, 64 MB	MEM-32F-AS54HPX= MEM-64F-AS54HPX=	64 MB
Boot Flash	8 MB, 16 MB	MEM-8BF-AS54HPX= MEM-16BF-AS54HPX=	16 MB
Main SDRAM	256 MB, 512 MB	MEM-256M-AS54= MEM-512M-AS54=	512 MB
Shared SDRAM	64 MB, 128 MB	MEM-64S-AS54= MEM-128S-AS54=	128 MB

Chassis and Feature Cards

Order spare chassis and feature cards as required (Table 3).

Table 3.   AS5400HPX Chassis and Feature Card Spares

Spare	Description	Part Numbers
Chassis	Cisco AS5400HPX Spare chassis;AC/DC power; Max Memory	AS5400HPX-AC= AS5400HPX-DC=
Trunk Cards	Spare CE1/CT1/CT3 trunk cards for Cisco AS5400HPX	AS54-DFC-2CT1= AS54-DFC-2CE1= AS54-DFC-4CT1= AS54-DFC-4CE1= AS54-DFC-8CT1=

Spare	Description	Part Numbers
		AS54-DFC-8CE1=
		AS54-DFC-CT3=
Universal Port DSP Cards	60, 108 Universal port DSP cards	AS54-DFC-60NP=
		AS54-DFC-108NP=

Miscellaneous Spares

You can order optional 19 or 24-inch rack mount kits (AS5400RM-19/AS5400RM-24), cables, and cable shelves.

For a complete list of all orderable parts, spares, and bundles for the Cisco AS5400HPX Universal Gateway, search for the Cisco AS5400HPX product family on the Pricing Tool at https://tools.cisco.com/qtc/pricing/MainServlet

EXAMPLE CONFIGURATIONS

This section provides some typical orders that you can use as a reference order.

Entry Level North American ISP—Voice Service

This is for a North American customer that is beginning an Internet Service Provider business. A flexible Universal Gateway beginning with eight CT1 PRI is required. As they are just starting Voice-Only service and they anticipate rapid growth.

You have determined that a single Cisco AS5400HPX with 192 universal port DSPs (allowing for growth) and the IP-Plus Cisco IOS Software, and the necessary cabling for 110V AC power are required. You have determined that PRI signaling is used.

You could use the easy-to-order bundle **AS54HPX-8T1-192AC**, which automatically contains the products shown in Table 4.

Table 4. System Configuration

Quantity	Part Number	Description
1	**AS5400HPX**	Cisco AS5400HPX Base Chassis
1	**AS54HPX-AC-RPS**	Cisco AS5400HPX Dual AC Power Supply
1	**AS54-DFC-8CT1**	Cisco AS5400 Octal T1/PRI DFC card
2	**AS54-DFC-108NP**	Cisco AS5400 108 Universal Port Cards
1	**S54CP-12303**	Cisco AS5400HPX Series Cisco IOS Software IP-Plus Feature Set
192	**FR54H-ENHVOX-LIC**	Cisco AS5400HPX Cisco IOS Software Enhanced Voice Licenses Per Port
2	**CAB-AC**	Power Cords, 110V
1	**CAB-DFC-OCTAL-2MF**	2 Meter 8 PRI DFC Cable—Female RJ45
1	**MEM-16BF-AS54HPX**	Cisco AS5400HPX 16 MB Boot Flash Upgrade
1	**MEM-512M-AS54**	Cisco AS5400 512 MB Main SDRAM Upgrade
1	**MEM-128S-AS54**	Cisco AS5400 128 MB Shared I/O Upgrade

Quantity	Part Number	Description
1	MEM-64F-AS54HPX	Cisco AS5400HPX 64 MB System Flash Upgrade

Large Indonesia ISP—Data Only

A large ISP in Indonesia wants to add capacity to existing dialup network by adding a network access server to terminate up to 16CE1s terminating at their central office.

You have determined that a single Cisco AS5400HPX with two octal CE1 trunk cards and five NP108 DSP cards and a DC power supply are required. A 1RU Octal cable patch panel is required. The signaling used is E1/R2 and you have verified that R2 country variant for Indonesia is supported and have determined that they would need the ENTERPRISE PLUS IPSEC 3DES Cisco IOS Software. You have determined that voice services may be required soon.

The two options are to configure a system using the Cisco AS5400HPX starter kit or use the easy-to-order bundle **AS54HPX-16E1-480AC** and add options for what is not present in the bundle. Enhanced voice licenses (FR54H-ENHVOX-LIC) need to be ordered when voice services are deployed.

The complete system configuration using the Cisco AS5400HPX starter kit and adding options for DC power, Cisco IOS Software upgrade, data licenses, and the cable shelf would look like this (Table 5):

Table 5. System Configuration using Starter Kit

Quantity	Part Number	Description
1	AS5400HPX	Cisco AS5400HPX Base Chassis with maximum memory
1	AS54HPX-DC-RPS	Cisco AS5400HPX Dual DC Power Supply
2	AS54-DFC-8CE1	Cisco AS5400 Octal E1/PRI DFC cards
4	AS54-DFC-108NP	Cisco AS5400 108 Universal Port Cards
1	AS54-DFC-60NP	Cisco AS5400 60 Universal Port Card
1	S54AK9-12302T	Cisco AS5400HPX Series Cisco IOS Software Enterprise Plus 3DES
480	FR54H-DATA-LIC	Cisco AS5400HPX Cisco IOS Software Data Licenses Per Port
1	DFC-CABLE-SHELVE	DFC Octal Cable Patch Panel Shelf 1 RU
2	CAB-DFC-OCTAL-2MF	2 Meter 8 PRI DFC Cables—Female RJ45
1	MEM-16BF-AS54HPX	Cisco AS5400HPX 16 MB Boot Flash Upgrade
1	MEM-512M-AS54	Cisco AS5400 512 MB Main SDRAM Upgrade
1	MEM-128S-AS54	Cisco AS5400 128 MB Shared I/O Upgrade
1	MEM-64F-AS54HPX	Cisco AS5400HPX 64 MB System Flash Upgrade

Because voice services may be deployed soon, you might consider ordering the bundle—**AS54HPX-16E1-480AC**. The pricing advantage offered by the bundle offsets the price of the extra Enhanced Voice Licenses required as an upgrade (Table 6).

Table 6. System Configuration using Easy-to-Order Bundle

Quantity	Part Number	Description
1	**AS5400HPX**	Cisco AS5400HPX Base Chassis
1	**AS54HPX-DC-RPS**	Cisco AS5400HPX Dual DC Power Supply
2	**AS54-DFC-8CE1**	Cisco AS5400 Octal E1/PRI DFC cards
4	**AS54-DFC-108NP**	Cisco AS5400 108 Universal Port Cards
1	**AS54-DFC-60NP**	Cisco AS5400 60 Universal Port Card
1	**S54AK9-12302T**	Cisco AS5400HPX Series Cisco IOS Software IP-Plus Feature Set
480	**FR54H-DATA-LIC**	Cisco AS5400HPX Cisco IOS Software Data Licenses Per Port
480	**FR54H-ENHVOX-LIC**	Cisco AS5400HPX Enhanced Voice Licenses Per Port
1	**DFC-CABLE-SHELVE**	DFC Octal Cable Patch Panel Shelf 1 RU
2	**CAB-DFC-OCTAL-2MF**	2 Meter 8 PRI DFC Cables—Female RJ45
1	**MEM-16BF-AS54HPX**	Cisco AS5400HPX 16 MB Boot Flash Upgrade
1	**MEM-512M-AS54**	Cisco AS5400 512 MB Main SDRAM Upgrade
1	**MEM-128S-AS54**	Cisco AS5400 128 MB Shared I/O Upgrade
1	**MEM-64F-AS54HPX**	Cisco AS5400HPX 64 MB System Flash Upgrade

APPENDIX 1—MANDATORY LICENSES

Ordering bundles automatically include the required licenses with your order. The rules in Tables 7, 8, and 9 help you in nonstandard configurations.

Table 7. CT1 Licensing Rules

Configuration	Number of Trunk Cards	Number of Universal Port Cards	Minimum Number of Base Licenses
2T1 with 48 ports	1 2PRI	1 NP60	48
4T1 with 96 ports	1 4PRI	1 NP108	96
7T1 with 168 ports	1 8PRI	1 NP108 and 1 NP60	168
8T1 with 192 ports	1 8PRI	2 NP108	192
11T1 with 264 ports	1 8PRI and 1 4PRI	2 NP108 and 1 NP60	264
12T1 with 288 ports	1 8PRI and 1 4PRI	3 NP108	288
16T1 with 384 ports	2 8PRI	3 NP108 and 1 NP60	384

Configuration	Number of Trunk Cards	Number of Universal Port Cards	Minimum Number of Base Licenses
Greater than 16T1	More than 2 8PRI	Fewer than 4 NP108/NP60 (incomplete DSP coverage)	Num T1s * 24

Table 8. CE1 Licensing Rules

Configuration	Number of Trunk Cards	Number of Universal Port Cards	Minimum Number of Base Licenses
2E1 with 60 ports	1 2PRI	1 NP60	60
4E1 with 120 ports	1 4PRI	1 NP108 and 1 NP60	120
7E1 with 210 ports	1 8PRI	2 NP108	210
8E1 with 240 ports	1 8PRI	2 NP108 and 1 NP60	240
10E1 with 300 ports	1 8PRI and 1 2PRI	3 NP108	300
12E1 with 360 ports	1 8PRI and 1 4PRI	3 NP108 and 1 NP60	360
14E1 with 420 ports	2 8PRI	4 NP108	420
16E1 with 480 ports	2 8PRI	4 NP108 and 1 NP60	480
Greater than 16E1s	More than 2 8PRI	Fewer than 4 NP108/NP60 (incomplete DSP coverage)	Num E1s * 30

Table 9. CT3 Licensing Rules

Configuration	Number of Universal Port Cards	Minimum Number of Base Licenses
CT3 with 60 ports	1 NP60	60
CT3 with 108 ports	1 NP108	108
CT3 with 168 ports	1 NP108 and 1 NP60	168
CT3 with 192 ports	2 NP108	192
CT3 with 264 ports	2 NP108 and 1 NP60	264
CT3 with 288 ports	3 NP108	288
CT3 with 384 ports	3 NP108 and 1 NP60	384
CT3 with 432 ports	4 NP108	432
CT3 with 480 ports	4 NP108 and 1 NP60	480
CT3 with 648 ports	6NP108	648

APPENDIX 2—EASY-TO-ORDER BUNDLES

Tables 10, 11 and 12 below provide details of easy-to-order voice bundles for different port densities.

Table 10. Low-Density Voice Bundles

Part Number	Description	Number of PRI Cards	Number of Universal Port Cards
AS54HPX-8T1-192AC	Cisco AS5400HPX; 8T1, 216 ports, Dual AC,IP+ Cisco IOS Software, 192 ENHVOX Licenses	1 8T1	2 NP108
AS54HPX-8E1-240AC	Cisco AS5400HPX; 8E1, 276 ports, Dual AC,IP+ Cisco IOS Software, 240 ENHVOX Licenses	1 8E1	2 NP108 and 1NP60
AS54HPX-2T1-48-AC	Cisco AS5400HPX; 2T1, 60 ports, Dual AC,IP+ Cisco IOS Software, 48 ENHVOX Licenses	1 2T1	1 NP60
AS54HPX-2E1-60-AC	Cisco AS5400HPX; 2E1, 60 ports, Dual AC,IP+ Cisco IOS Software, 60 ENHVOX Licenses	1 2E1	1 NP60
AS54HPX-4T1-96-AC	Cisco AS5400HPX; 4T1, 108 ports, Dual AC, IP+ Cisco IOS Software, 96 ENHVOX Licenses	1 4T1	1 NP108
AS54HPX-4E1-120-AC	Cisco AS5400HPX; 4E1, 168 ports, Dual AC, IP+ Cisco IOS Software, 120 ENHVOX Licenses	1 4E1	2 NP60

Table 11. VXML Bundles

Part Number	Description	Number of PRI Cards	Number of Universal Port Cards
AS54HPX-100-AC	Cisco AS5400HPX; Dual AC, IP+ Cisco IOS Software, 100 ENHVOX Licenses	None	None

Table 12. High-Density Voice Bundles

Part Number	Description	Number of PRI Cards	Number of Universal Port Cards
AS54HPX-16T1-384AC	Cisco AS5400HPX; 16T1, 384 ports, Dual AC, IP+ Cisco IOS Software, 384 ENHVOX Licenses	2 8T1	3 NP108 and 1 NP60
AS54HPX-16E1-480AC	Cisco AS5400HPX; 16E1, 492 ports, Dual AC, IP+ Cisco IOS Software, 480 ENHVOX Licenses	2 8E1	4 NP108 and 1 NP60