Doc. No. 78-4312-01

Installing V.110 12-Port Modules in Cisco AS5200 Universal Access Servers

Product Number: AS52-12-TA-V110

This document describes how to install and configure V.110 12-port modules in Cisco AS5200 universal access servers, and includes the following sections:

Overview

The V.110 12-port module, shown in Figure 4, includes onboard terminal adapters (TAs) that can terminate up to 12 V.110 bit rate adapted digital calls. Bit rate adaption protocols map the PC communications port speed (for example, 9600, 19200, and 38400 bps) to the faster data rate (64000 bps) of Integrated Services Digital Network (ISDN) B channels. The V.110 module supports a maximum data rate of 19200 bps on all ports simultaneously.

The V.110 rate adaption protocol is used primarily for:

- Adapting the slower asynchronous data rates (from 600 to 38400 bps) of older equipment to the faster data rate (64000 bps) of ISDN B channels
- Cellular data applications over the Global System for Mobile Telecommunications (GSM) network
- Asynchronous connectivity for European ISDN TAs

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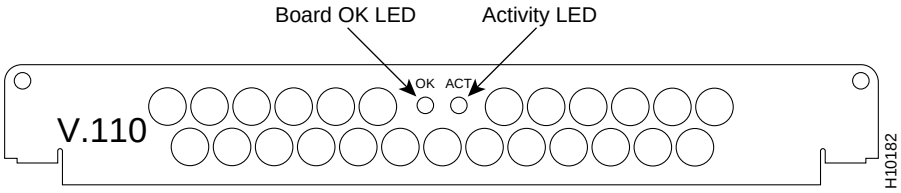
Figure 1 V.110 12-Port Module



Safety Recommendations

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Keep tools away from walk areas where you or others could fall over them.
- Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses when working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.

Safety Warnings

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, may harm you. A warning symbol precedes each safety warning.

Warning This warning symbol means *danger.* You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.

Waarschuwing Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.

Varoitus Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).

Attention Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d’avertissements figurant dans cette publication, consultez le document *Regulatory Compliance and Safety Information* (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.

Warnung Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument *Regulatory Compliance and Safety Information* (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.

Avvertenza Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento *Regulatory Compliance and Safety Information* (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.

Advarsel Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet *Regulatory Compliance and Safety Information* (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.

Aviso Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento *Regulatory Compliance and Safety Information* (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.

¡Advertencia! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado *Regulatory Compliance and Safety Information* (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.

Varning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förkommer i denna publikation i dokumentet *Regulatory Compliance and Safety Information* (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

Safety with Electricity

Follow these guidelines when working on equipment powered by electricity:

- Locate the emergency power-OFF switch in the room in which you are working. Then, if an electrical accident occurs, you can quickly shut the power OFF.

Warning Read the installation instructions before you connect the system to its power source.

Warning Ultimate disposal of this product should be handled according to all national laws and regulations.

Warning Only trained and qualified personnel should be allowed to install or replace this equipment.

Warning To ensure your safety and the safety of others, be sure the power is OFF and the power cord is unplugged before working on the router.

- Disconnect all power before doing the following:
  - Installing or removing a chassis
  - Working near power supplies

Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.

- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit. Always check.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
  - Use caution; do not become a victim yourself.
  - Turn OFF power to the system.
  - If possible, send another person to get medical aid. Otherwise, determine the condition of the victim and then call for help.
  - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic printed circuit cards are improperly handled and can result in complete or intermittent failures. Always follow ESD prevention procedures when removing and replacing cards. Ensure that the chassis is electrically connected to earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to safely channel unwanted ESD voltages to ground. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

Caution For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohm (Mohm).

Installing the V.110 12-Port Module

You must install V.110 modules in a carrier card or a dual E1/PRI card, which are not included with this kit. The carrier card, shown in Figure 2, is a wide, narrow card with two slots in which you can install up to two V.110 modules (or other supported modules). Figure 3 shows the dual E1/PRI card, which has only one slot. You can install V.110 modules with any combination of other supported modules.

Figure 2 Carrier Card

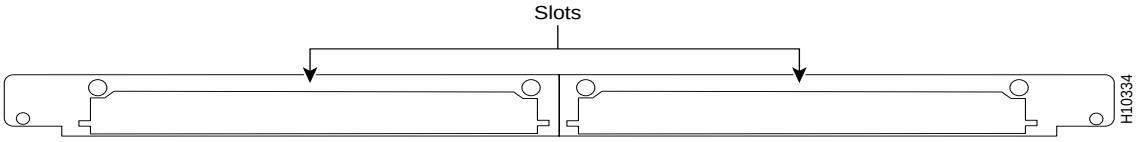
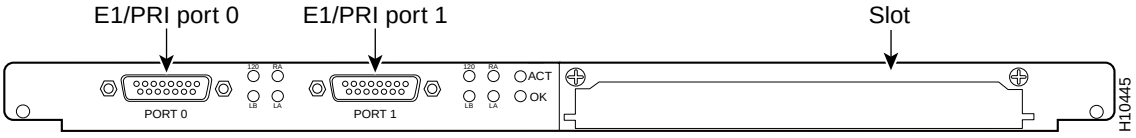


Figure 3 Dual E1/PRI Card



Required Tools

You need the following tools:

- ESD-preventive wrist strap
- Medium-size flat-blade screwdriver (1/4 inch [0.625 cm])

Installation

Refer to Figure 4 and take these steps:

Step 1 Attach an ESD-preventive wrist strap.

Step 2 Power OFF the access server.

Caution Unlike some other Cisco access servers, the modules are not hot-swappable (that is, you cannot remove or install them when the access server power is ON). Be sure to power OFF the access server before installing or removing modules. *Failure to do so can damage the access server.*

Step 3 Remove all interface cables from the rear panel of the access server.

Step 4 Remove the blank cover or module installed in the carrier card or dual E1/PRI card.

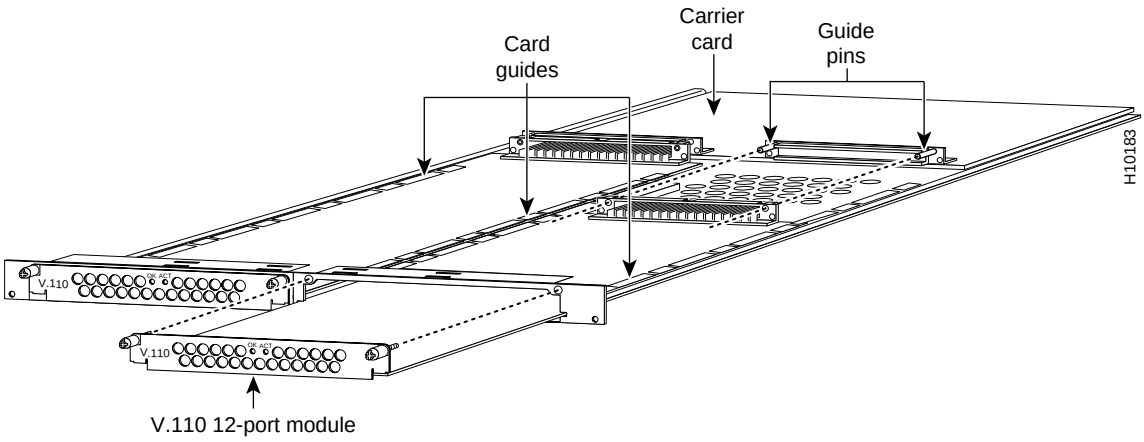
Note If the carrier card or dual E1/PRI card is already installed in the access server, you can install V.110 modules in the card without removing it from the chassis.

Step 5 Remove the V.110 module from the ESD-preventive shipping material.

Step 6 Slide the V.110 module into the carrier or dual E1/PRI card slot until it is seated completely.

Step 7 Tighten the two captive screws on the V.110 module to secure it to the carrier card or dual E1/PRI card.

Figure 4 V.110 12-Port Module Installation (Carrier Card Shown)



If you have questions or need assistance, refer to the section “Cisco Connection Online” at the end of this document. Otherwise, proceed to the next section, “Configuring the V.110 12-Port Module.”

Configuring the V.110 12-Port Module

This section describes how to configure the access server for use with a V.110 module.

If you are experienced with the Cisco IOS software, refer to the “Configuration Example” section at the end of the following task tables for a working configuration example. Or take the steps described in the following task tables to configure the access server:

- Table 1, Configuring the Asynchronous Group Interface
- Table 2, Configuring the TAs
- Table 3, Configuring the Controller

Table 1 Configuring the Asynchronous Group Interface

Step	Command	Purpose

1	`5200> enable`
	`Password:`
	`5200#`
		Enter enable mode.
		Enter the password.
		You have entered enable mode when the prompt changes to `5200#`.

2	`5200# config term`
	`Enter configuration commands, one per line. End with CNTL/Z.`
	`5200(config)#`
		Enter global configuration mode. You have entered global configuration mode when the prompt changes to `5200(config)#`.

Table 1 Configuring the Asynchronous Group Interface (Continued)

Step	Command	Purpose
3	5200(config)# **interface group-async 1** 5200(config-if)#	Place all asynchronous interfaces in a single group, so that you configure the same parameters quickly on all interfaces at one time.
4	5200(config-if)# **ip unnumbered ethernet 0**	To conserve IP addresses, configure the asynchronous interfaces as unnumbered and assign the IP address of the Ethernet interface to them.
5	5200(config-if)# **encapsulation ppp**	Enable PPP[1] to run on the set of interfaces in the group.
6	5200(config-if)# **async mode interactive**	Configure interactive mode on the asynchronous interface.
7	5200(config-if)# **ppp authentication chap pap**	Enable CHAP[2] and PAP[3] authentication on the interface.
8	5200(config-if)# **group-range 1 48** Building configuration... 5200(config-if)#	Define the group range of the interface. The number you use with the **group-range** command depends on the number of asynchronous interfaces you have on your access server. That is, if your access server has 48 asynchronous interfaces, you can specify **group-range 1 48**. If 60, specify **group-range 1 60**.

1. PPP = Point-to-Point Protocol.
2. CHAP = Challenge Handshake Authentication Protocol.
3. PAP = Password Authentication Protocol.

Table 2 Configuring the TAs

Step	Command	Purpose
1	5200(config-if)# **line 1 48** 5200(config-line)#	Enter the number of TA lines to configure. If you have 48 TAs, enter **line 1 48**. If 60, enter **line 1 60**. Note: There are 12 TA lines on each V.110 module.
2	5200(config-line)# **modem autoconfigure type cisco_v110**	Configure the TAs to use a default configuration string (chat script). A string of configuration commands is sent to the TA each time a it is reset.
3	5200(config-line)# **transport input all**	Allow all protocols to be used when connecting to the line.
4	5200(config-line)# **autoselect ppp**	Enable remote IP users running a PPP application to dial in, bypass the EXEC facility, and connect directly to the network.
5	5200(config-line)# **modem inout**	Enable both incoming and outgoing calls.
6	5200(config-line)# **rxspeed 19200**	Sets the line receive speed. Speeds faster than 19200 are not supported.
7	5200(config-line)# **txspeed 19200**	Sets the line transmit speed. Speeds faster than 19200 are not supported.
8	5200(config-line)# **flowcontrol hardware**	Enable hardware flow control.
9	5200(config-line)# **exit** 5200(config)#	Exit to global configuration mode.

Table 3 Configuring the Controller

Step	Command	Purpose
1	`5200(config)# isdn switch-type primary-5ess`	Enter your telco's switch type. The following switch types are available: primary-4ess, primary-5ess, primary-dms100, primary-net5, primary-ntt, and primary-ts014.

2	`5200(config)# controller t1 0`
	`[or]`
	`5200(config)# controller e1 0`
	`5200(config-controller)#`
		Enter controller configuration mode to configure your controller port. The controller ports are labeled 0 and 1 on the dual T1/PRI and dual E1/PRI cards.

3	`5200(config-controller)# framing esf`	Enter your telco's framing type. The following framing types are available: esf, sf, crc4, and nocrc4.
4	`5200(config-controller)# linecode b8zs`	Enter your telco's line code type. The following line code types are available: ami, b8zs, and hdb3.
5	`5200(config-controller)# clock source line primary`	Enter the clock source for the line. Configure one line as the primary or most stable clock source line. Configure the other line as the secondary clock source line.

6	`5200(config-controller)# pri-group timeslots 1-24`
	`[or]`
	`5200(config-controller)# pri-group timeslots 1-31`
		Configure all channels for ISDN. Enter **pri-group timeslots 1-24** for T1. If E1, enter **pri-group timeslots 1-31**.

7	`5200(config-controller)# controller t1 1`
	`[or]`
	`5200(config-controller)# controller e1 0`
	`5200(config-controller)# framing esf`
	`5200(config-controller)# linecode b8zs`
	`5200(config-controller)# clock source line secondary`
	`5200(config-controller)# pri-group timeslots 1-24`
	`[or]`
	`5200(config-controller)# pri-group timeslots 1-31`
		Repeats steps 2 to 6 to configure the second controller. Note that the controller number is 1, instead of 0. And the clock source is secondary, instead of primary.

8	`5200(config-controller)# end`
	`5200#`
	`%SYS-5-CONFIG_I: Configured from console by console <Return>`
	`5200#`
		Return to privileged EXEC mode.
		When this message appears, press **Return** to get the `5200#` prompt.

9	`5200# copy running-config startup-config`
	`Building configuration...`
	`[OK]`
		Save the configuration changes to NVRAM.

Configuration Example

The following example shows the output of the **show config** command for a system configured with V.110 modules. If you are experienced with the Cisco IOS software, you might find this a useful reference for configuration.

```
v110-brasil3# show config
Using 4533 out of 129016 bytes
!
version 11.2
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service udp-small-servers
no service tcp-small-servers
!
hostname v110-brasil3
!
enable password lab
!
username v110-brasil4 password 7 151E0A0E
username v110-brasil3
username ta-cs password 7 0507070D
username v110-brasil5 password 7 11051807
ip host jurai 223.255.254.254
ip host brios 223.255.254.253
isdn switch-type primary-net5
!
controller E1 0
 clock source line primary
 pri-group timeslots 1-31
!
controller E1 1
 clock source line secondary
 pri-group timeslots 1-31
!
interface Ethernet0
 ip address 89.0.22.95 255.0.0.0
 hold-queue 1000 in
 hold-queue 1000 out
!
interface Serial0
 no ip address
 shutdown
!
interface Serial1
 no ip address
 shutdown
!
interface Serial0:15
 no ip address
 no ip mroute-cache
 isdn incoming-voice modem
 no cdp enable
!
interface Serial1:15
 no ip address
 no ip mroute-cache
 isdn incoming-voice modem
 no cdp enable
!
interface Group-Async1
 description Cisco V110
 ip unnumbered Ethernet0
 no ip mroute-cache
 encapsulation ppp
```

```
 async mode interactive
 dialer in-band
 dialer idle-timeout 360000
 dialer-group 1
 no fair-queue
 no cdp enable
 ppp authentication chap
 group-range 1 60
 hold-queue 1000 in
 hold-queue 1000 out
!
no ip classless
ip route 171.69.240.90 255.255.255.255 Ethernet0
ip route 223.255.254.253 255.255.255.255 Ethernet0
!
dialer-list 1 protocol ip permit
!
line con 0
 exec-timeout 0 0
 length 36
line 1 60
 autoselect ppp
 modem InOut
 transport input all
 modem autoconfigure type cisco_v110
line aux 0
line vty 0 4
 password lab
 login
!
end

v110-brasil3#
```

This concludes the procedure for configuring the access server for use with the V.110 module. If you have questions or need assistance, refer to the next section “Cisco Connection Online.”

FCC Class B Compliance

The equipment described in this document generates and may radiate radio-frequency energy. If it is not installed in accordance with Cisco’s installation instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in part 15 of the FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the equipment to one side or the other of the television or radio.
- Move the equipment farther away from the television or radio.
- Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

Modifications to this product not authorized by Cisco Systems, Inc. could void the FCC approval and negate your authority to operate the product.

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: http://www.cisco.com
- WWW: http://www-europe.cisco.com
- WWW: http://www-china.cisco.com
- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@cisco.com.

Use this document with the *Cisco AS5200 Universal Access Server Hardware Installation Guide*, *Cisco AS5200 Universal Access Server Software Configuration Guide*, and *Regulatory Compliance and Safety Information* publications.

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