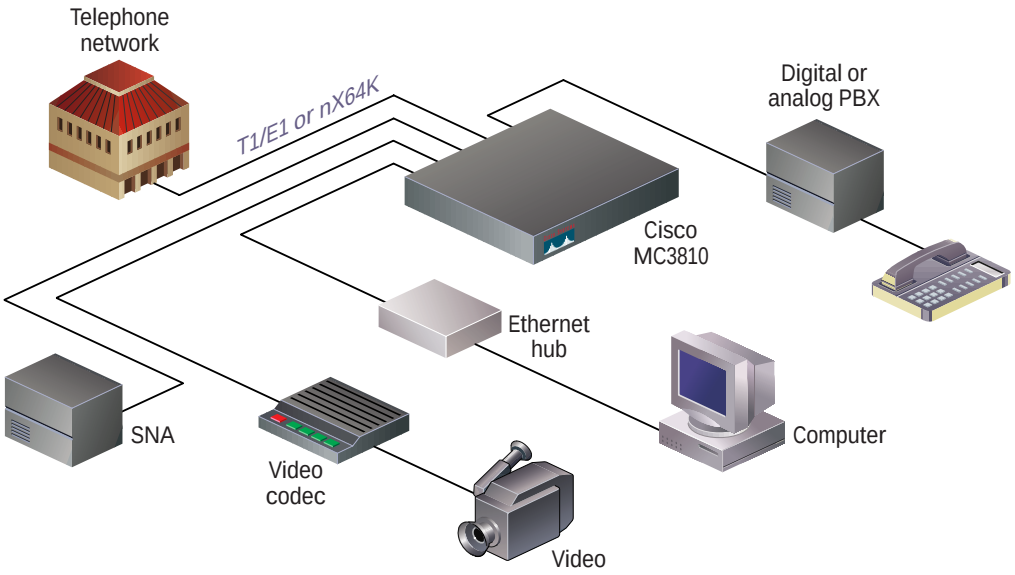
Quick Start Guide

Cisco MC3810 Series Multiservice Access Concentrators Installation and Startup



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Cisco Systems

1 Obtain Tools and Equipment

Items Included

- Cisco MC3810 multiservice access concentrator
- Rack-mount brackets, power cord, and spare set of rubber feet
- RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL)
- RJ-45-to-DB-25 female DTE adapter (labeled TERMINAL)
- RJ-45-to-DB-25 male DCE adapter (labeled MODEM)
- RJ-45-to-RJ-45 rollover console cable
- *Quick Start Guide* (this document)
- *Cisco MC3810 Series Multiservice Access Concentrators Hardware Installation Guide*
- *Cisco MC3810 Multiservice Access Concentrators Software Configuration Guide*
- *Cisco MC3810 Multiservice Access Concentrators Regulatory Compliance and Safety Information*
- *Installing and Removing Field-Replaceable Units in Cisco MC3810 Series Multiservice Access Concentrators*
- Cisco IOS release notes
- Documentation CD-ROM
- Product warranty card
- *Cisco Information Packet*
- Cisco information wallet card and sticker

Items Not Included

- Four screws for installing the chassis in a rack
- E1 channel service unit/data service unit (CSU/DSU)
- PC running terminal emulation software for administrative access
- Modem for remote administrative access
- Ethernet cable: RJ-45-to-RJ-45 straight-through
- T1/E1 cable: RJ-48-to-RJ-48 straight-through
- Cisco synchronous serial transition cable for connecting a serial port to EIA/TIA-232, EIA/TIA-449, V.35, X.21, or EIA-530
- Digital voice cable: RJ-48-to-RJ-48 rollover
- Analog voice cables, FXO or FXS: RJ-11-to-RJ-11 straight-through
- Analog voice cables, E&M: 8-conductor straight-through
- BRI S/T cables: 8-conductor straight-through and 8-conductor rollover
- CTR17 adapter for connecting E&M 4-wire per ETSI CTR17

Ordering Information

To place an order, contact Cisco Customer Service (408 526 4000 or 800 553 6387).

2 Install Chassis and Connect Cables

Front panel forward

Rear panel forward

Rear panel forward,
center-mount telco

Safety Information

Warning See the *Cisco MC3810 Series Multiservice Access Concentrators Hardware Installation Guide* for safety information you need to know before working on the Cisco MC3810.

Desktop Installation

Caution If you place the Cisco MC3810 on a desktop, do not place anything that weighs more than 10 pounds (4.5 kilograms) on top of the chassis.

Caution Do not remove the rubber feet. They provide a space for air circulation.

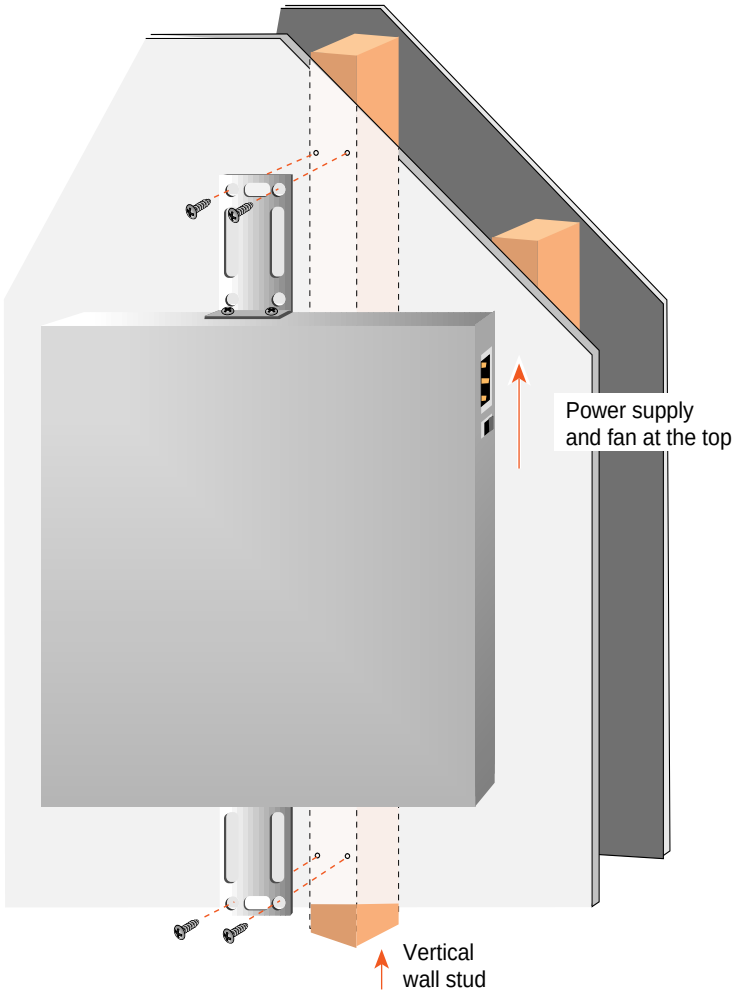
Rack-Mounting the Chassis

Step 1 Choose one of the methods shown in the above figure, and attach the mounting brackets as shown.

Note: Brackets are included. Screws are included for attaching the brackets to the chassis, but not for installing the chassis in a rack. You need four additional screws to install the chassis in a rack.

Step 2 Install the chassis in the rack.

2 Install Chassis and Connect Cables (continued)



Wall-Mounting the Chassis

Step 1 Install the smaller brackets as shown in the figure above.

Step 2 Attach the chassis to the wall.

- Position the end nearest the power cable at the top
- Align screws with a wall stud, or use wall anchors

Note: Screws for attaching the chassis to a wall are not included. You need to provide four screws suitable for your wall installation.

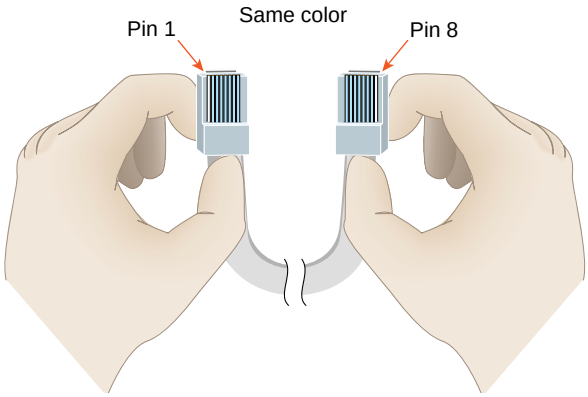
Caution Do not remove the rubber feet. They provide a space for air circulation.

2 Install Chassis and Connect Cables (continued)

Identifying Cable Types

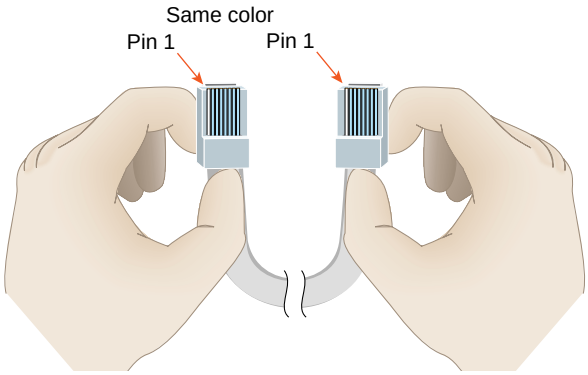
8-Conductor Rollover Cable

Hold the connectors side-by-side, with the tab at the back. The colored wires are in the opposite sequence at opposite ends of the cable. If your cable came from Cisco Systems, pin 1 is white on one plug, and pin 8 is white on the opposite plug. (A rollover cable reverses the wire connections at the opposite ends: 1 to 8, 2 to 7, 3 to 6, 4 to 5, 5 to 4, 6 to 3, 7 to 2, and 8 to 1.)



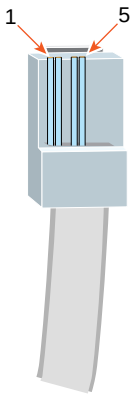
8-Conductor Straight-Through Cable

Hold the connectors side-by-side, with the tab at the back. The colored wires are in the same sequence at opposite ends of the cable. (A straight-through cable connects like-numbered pins at opposite ends: 1 to 1, 2 to 2, 3 to 3, 4 to 4, 5 to 5, 6 to 6, 7 to 7, and 8 to 8.)

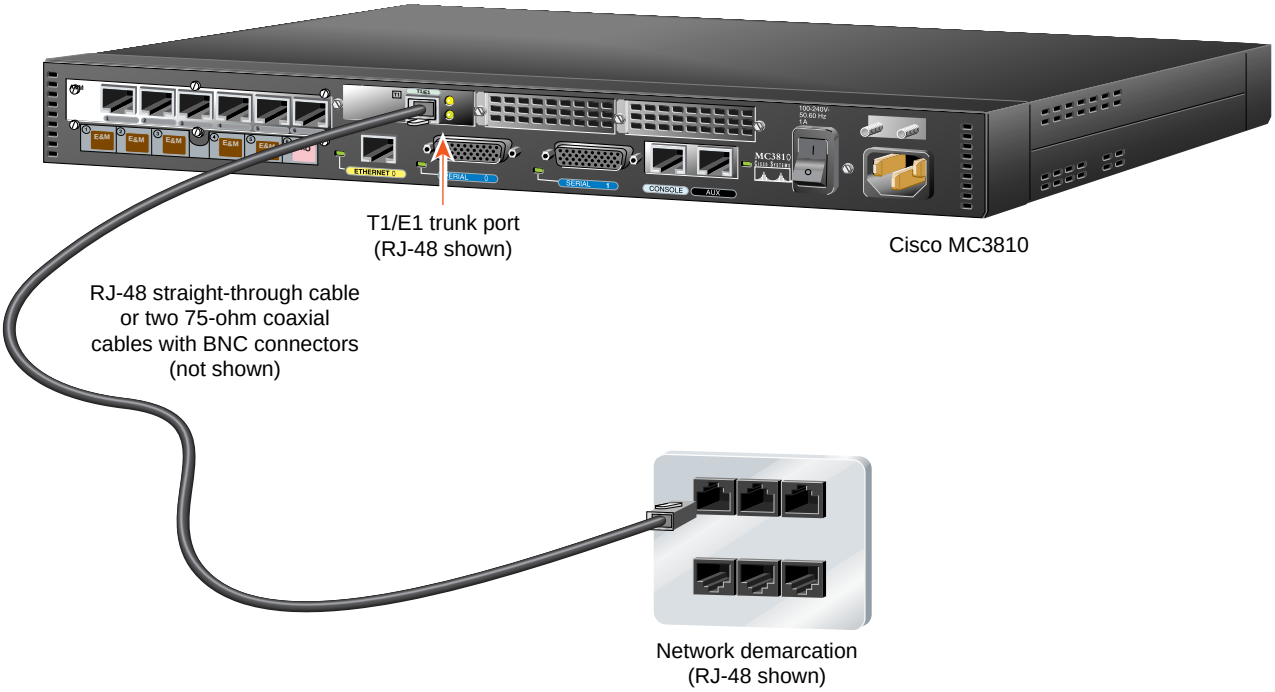


RJ-48 T1/E1 Cable

View the connector for the Cisco MC3810 port, with the tab at the back. There are wires attached to four of the pins: 1, 2, 4, and 5. (The pinout at the opposite end depends on the interface at that end.)



2 Install Chassis and Connect Cables (continued)



Connecting the T1/E1 Trunk Port to the Network

If you are using a T1/E1 network interface, connect the T1/E1 trunk port to a network demarcation device.

If the trunk port has an RJ-48 jack, use an RJ-48 straight-through cable (not included), or a special cable if required for your application.

If the trunk port has BNC connectors, use two 75-ohm coaxial cables with BNC connectors (not included).

Note: The T1/E1 trunk port, when present, has a built-in CSU/DSU for connection to a service provider's network interface.

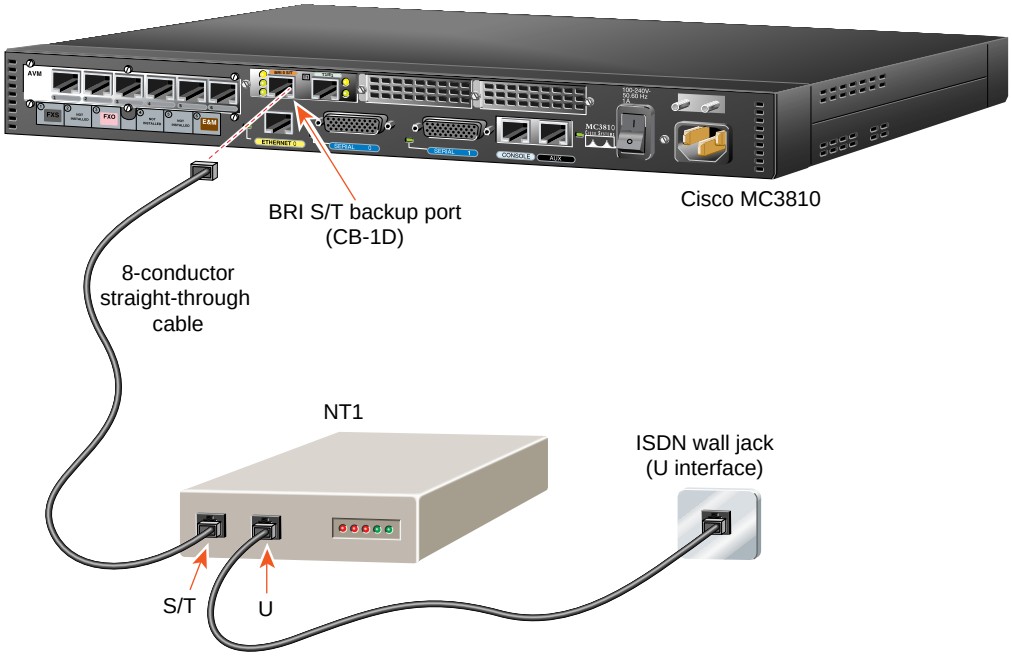
Step 1 For an RJ-48 cable—Connect one end of the cable to the RJ-48 jack labeled T1/E1 on a light-green background.

For coaxial cables—Connect one end of the cables to the BNC connectors labeled E1 on a light-green background.

Note: Be sure to make the correct transmit and receive connections for both 75-ohm cables.

Step 2 Connect the other end of the cable(s) to the network demarcation device (telco demarc or equivalent).

2 Install Chassis and Connect Cables (continued)



Connecting the BRI S/T Backup Port to the Network

If your Cisco MC3810 supports BRI S/T backup, connect the BRI S/T backup port to the ISDN network.

Use an 8-conductor straight-through cable (not included).

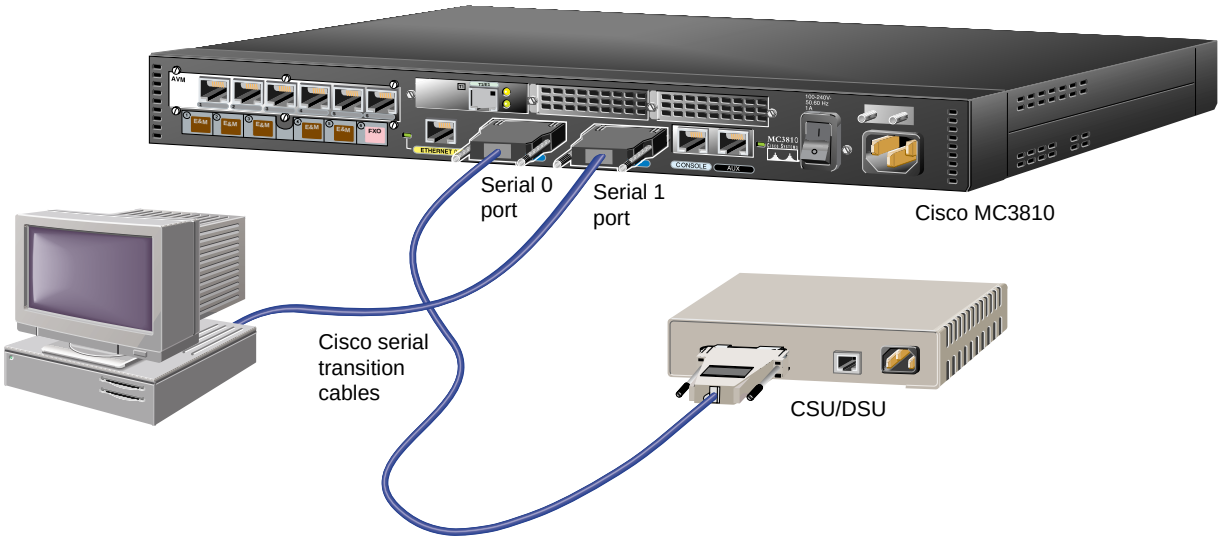
Step 1 Connect one end of the cable to the port labeled BRI 0 S/T on an orange background.

Step 2 Connect the other end of the cable to the S/T interface of the NT1.

Step 3 If the NT1 is not already connected to the ISDN network, connect the U interface of the NT1 to the ISDN wall jack (U interface).

Note: Step 3 should only be necessary in locations where the U interface is accessible to the user, such as in the United States.

2 Install Chassis and Connect Cables (continued)



Connecting Synchronous Serial Ports

You can connect the serial 0 port to a Frame Relay network or to user equipment.

You can connect the serial 1 port to user equipment.

Use one of the Cisco serial transition cables (not included). Select the cable to match both of the following parameters:

- Signaling protocol:
  - EIA/TIA-232
  - EIA/TIA-449
  - V.35
  - X.21
  - EIA-530
- Cisco MC3810 serial port operating mode:
  - DTE
  - DCE

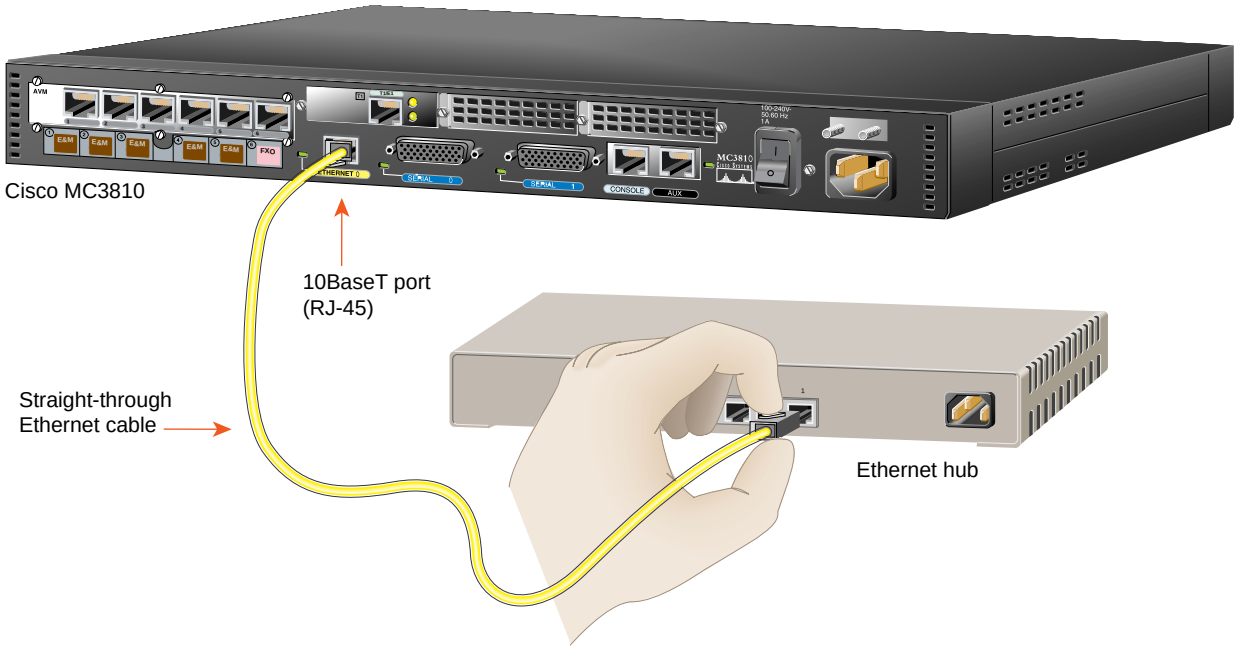
See the *Cisco MC3810 Series Multiservice Access Concentrators Hardware Installation Guide* for information about selecting these cables.

Note: Both serial ports are dark blue.

Step 1 Connect the 60-pin connector of the serial transition cable to the Cisco MC3810 serial port to be used for this interface.

Step 2 Connect the other end of the serial transition cable to the CSU/DSU, synchronous modem, or video codec.

2 Install Chassis and Connect Cables (continued)



Connecting the Ethernet Port for LAN Access

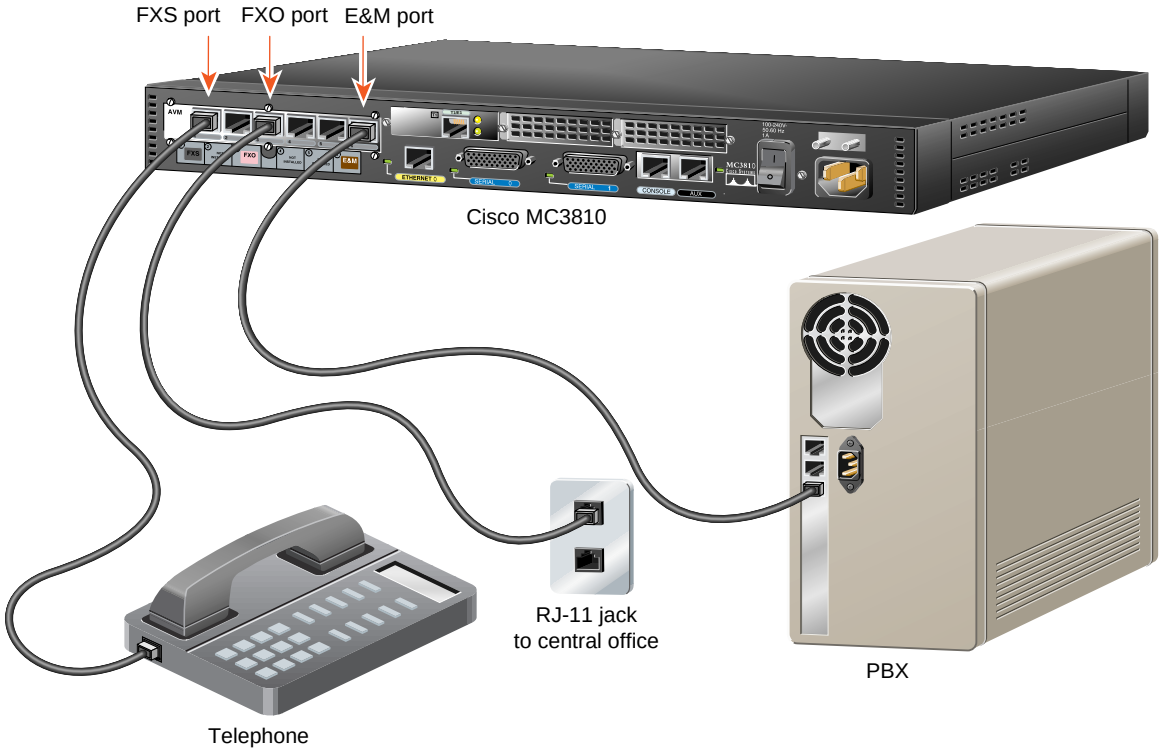
If you are using a 10BaseT Ethernet LAN, connect the Ethernet 0 port to the Ethernet hub.

Use a standard, straight-through, 10BaseT Ethernet cable (not included).

Step 1 Connect the cable to the Ethernet 0 port (yellow).

Step 2 Connect the other end of the cable to an Ethernet hub.

2 Install Chassis and Connect Cables (continued)



Connecting Analog Voice Ports

Connect analog voice ports as follows:

- FXS port—(gray) to telephone or fax equipment
- FXO port—(pink) to central office (CO) line
- E&M port—(brown) to analog PBX

Use an RJ-11-to-RJ-11 standard telephone cable (not included) for each FXO or FXS port.

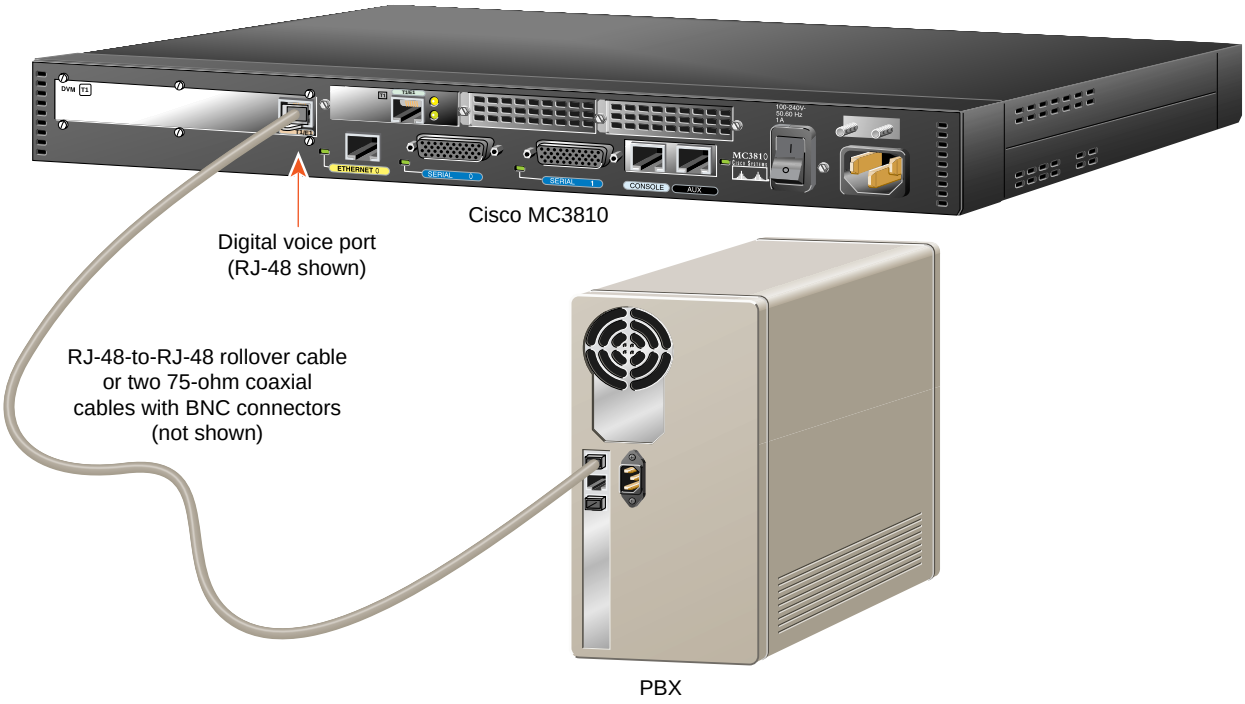
Use 8-conductor, straight-through cables with modular connectors (not included) for E&M ports. For 4-wire E&M conforming to ETSI CTR17, use a CTR17 adapter (not included) between the cable and the E&M port.

Step 1 Select the appropriate cable. (See information at left.)

Step 2 Connect one end of the cable to the FXS, FXO, or E&M port, as required.

Step 3 Connect the other end of the cable to the matching equipment or line.

2 Install Chassis and Connect Cables (continued)



Connecting the T1/E1 Digital Voice Port

If your Cisco MC3810 has a T1/E1 digital voice port, connect it to a digital PBX.

If the digital voice port has an RJ-48 jack, use an RJ-48-to-RJ-48 rollover cable (not included), or a special cable if required for your application.

If the digital voice port has BNC connectors, use two 75-ohm coaxial cables with BNC connectors (not included).

Note: For an RJ-48 connection to most PBXs, a rollover cable is required. However, some PBXs may have a connector pinout for a straight-through cable.

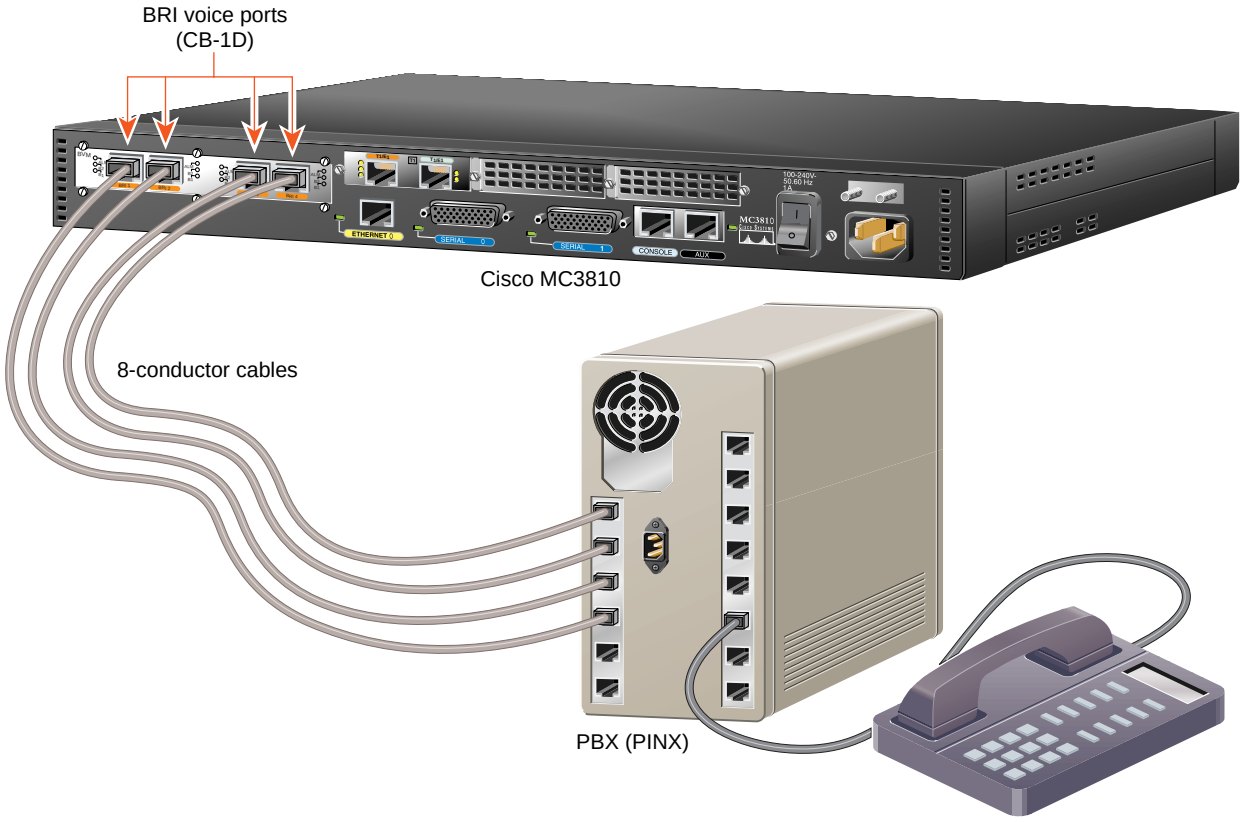
Step 1 For an RJ-48 cable—Connect one end of the cable to the RJ-48 jack labeled T1/E1 on a tan background.

For coaxial cables—Connect one end of the cables to the BNC connectors labeled E1 on a tan background.

Note: Be sure to make the correct transmit and receive connections for both 75-ohm cables.

Step 2 Connect the other end of the cable(s) to the digital PBX.

2 Install Chassis and Connect Cables (continued)



Connecting BRI S/T Voice Ports

If your Cisco MC3810 has BRI S/T voice ports, connect them to a Private Integrated Services Network Exchange (PINX).

The BRI voice ports are wired as terminal equipment (TE).

- If the PINX ports are wired as network termination (NT), use 8-conductor straight-through cables (not included).
- If the PINX ports are wired as TE, use 8-conductor rollover cables (not included).

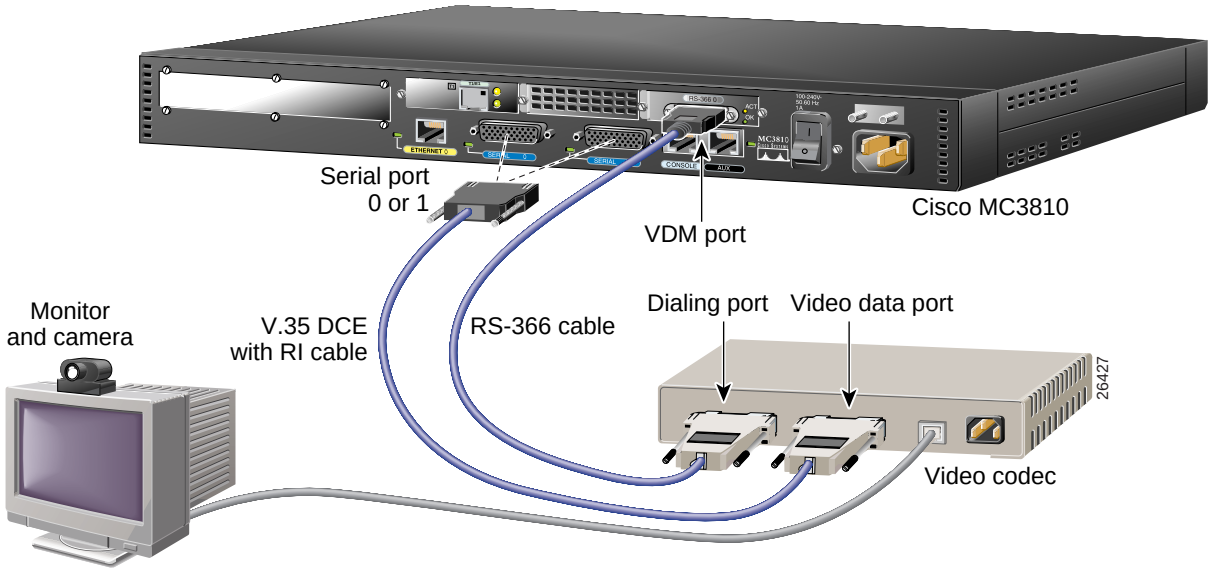
Note: The BRI voice ports are physically wired as TE. However, they can be software-configured to function as either TE or NT.

Step 1 Connect one end of each cable to the appropriate BRI S/T voice port on the BRI voice module (BVM). Ports are labeled BRI 1 through BRI 4 on an orange background.

Step 2 Connect the other end of each cable to the appropriate port on the PINX.

Note: BRI ports on the Cisco MC3810 do not require external power from the PINX when in TE mode and do not supply power to external devices when in NT mode.

2 Install Chassis and Connect Cables (continued)



Connecting Video Dialing Module

If your Cisco MC3810 has a video dialing module (VDM), connect the VDM port and one of the Cisco MC3810 serial ports to the video codec.

For the dialing interface, use an RS-366 cable with one 26-pin connector and one DB-25 connector (included with VDM).

For the video data connection, use a Cisco V.35 DCE serial transition cable with ringing indicator (RI) (included with VDM).

Note: For video conferencing, you must also set up a WAN connection through the T1/E1 trunk port. See the "Connecting the T1/E1 Trunk Port to the Network" section on page 5.

Step 1 Connect the 60-pin connector of the V.35 serial cable to the Cisco MC3810 serial port to be used for this interface.

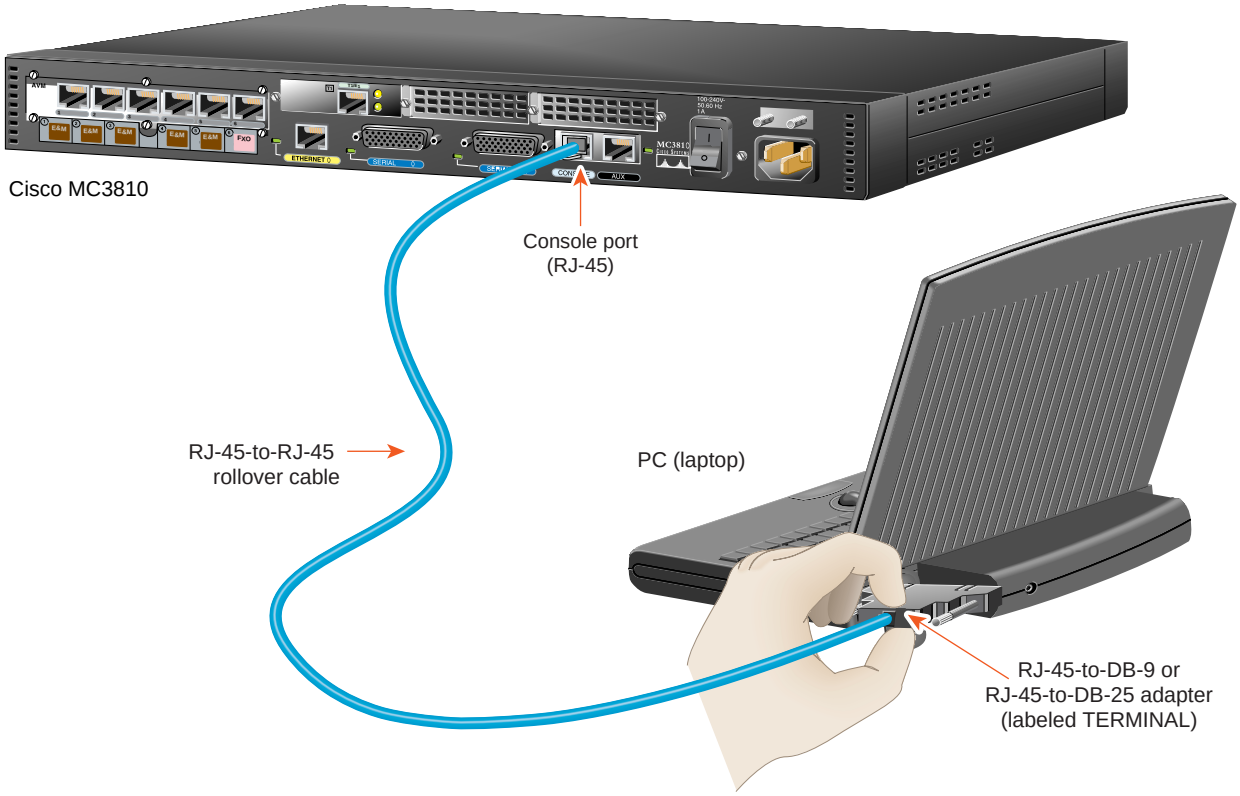
Note: Both serial ports are dark blue.

Step 2 Connect the other end of the V.35 serial cable to the video data port of the video codec.

Step 3 Connect the 26-pin connector of the RS-366 cable to the VDM port (dark blue).

Step 4 Connect the DB-25 connector of the RS-366 cable to the dialing port of the video codec.

2 Install Chassis and Connect Cables (continued)



Connecting the Console Port

Note: If you are going to configure remotely, skip this procedure and go to the next page.

If you are using a local PC or ASCII terminal to configure your Cisco MC3810, connect it to the console port.

Use the light-blue RJ-45-to-RJ-45 rollover cable (included) and a terminal adapter (included):

- RJ-45-to-DB-9 terminal adapter for a PC
- RJ-45-to-DB-25 terminal adapter for a terminal

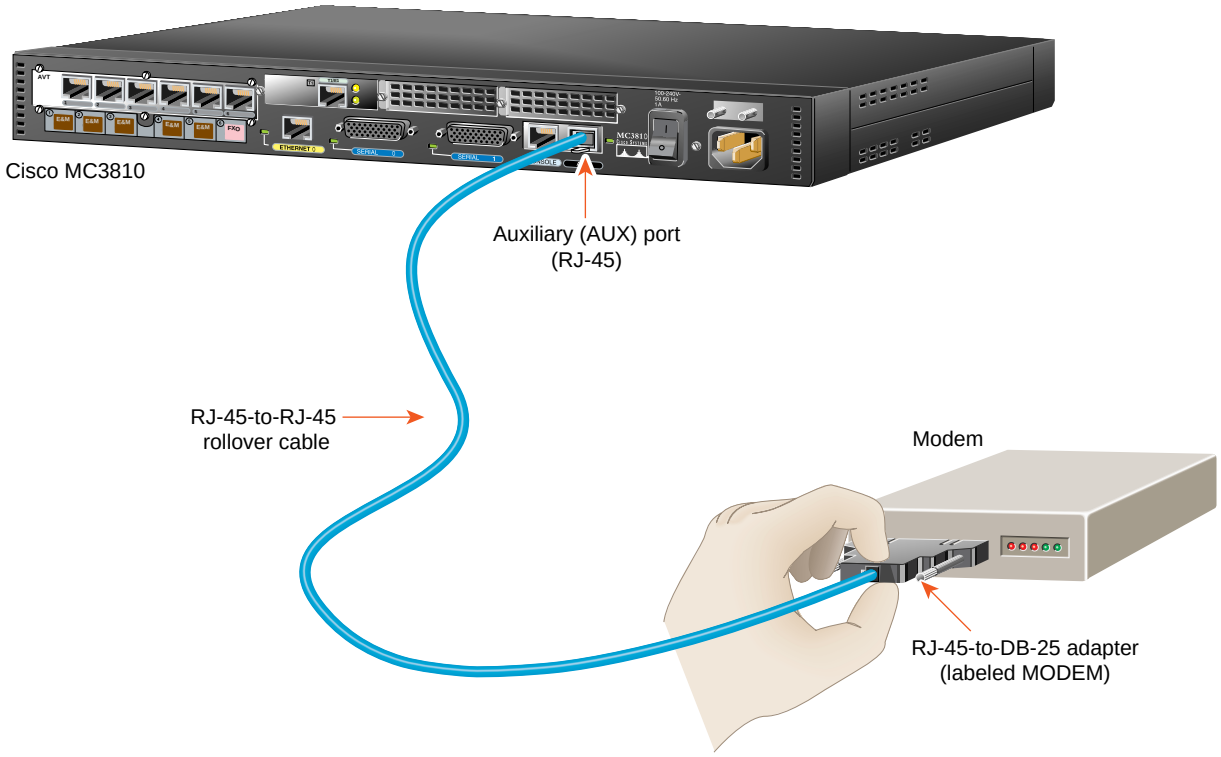
Step 1 Connect the appropriate adapter labeled TERMINAL to the communication port (usually labeled COM) on your PC or terminal.

Step 2 Connect one end of the cable to the terminal adapter.

Step 3 Connect the other end to the console port (light blue) on the Cisco MC3810.

When you are finished, continue to the “Connecting the Power Cable” section on page 15.

2 Install Chassis and Connect Cables (continued)



Connecting the Auxiliary Port

Note: If you are going to configure locally, follow the procedure on the previous page.

If you are using a remote PC or ASCII terminal to configure your Cisco MC3810, connect the modem (not included) to the auxiliary port.

Use the light-blue RJ-45-to-RJ-45 rollover cable (included) and an RJ-45-to-DB-25 modem adapter (included).

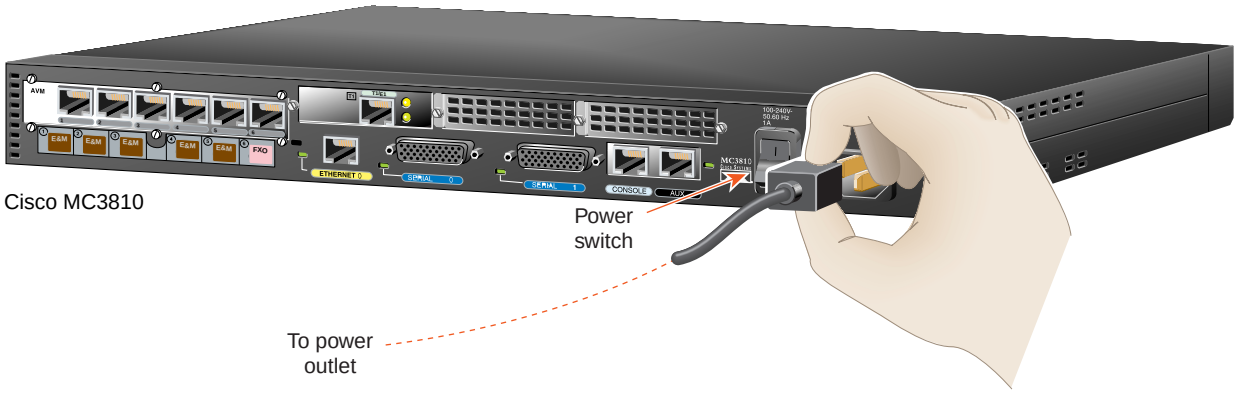
Step 1 Connect the adapter labeled MODEM to your modem.

Step 2 Connect one end of the cable to the modem adapter.

Step 3 Connect the other end of the cable to the auxiliary port (black) on the Cisco MC3810.

When you are finished, continue to the "Connecting the Power Cable" section on page 15.

2 Install Chassis and Connect Cables (continued)



Connecting the Power Cable

Note: This procedure is for AC power. If your Cisco MC3810 operates on DC power, see the Cisco MC3810 Series Multiservice Access Concentrators Hardware Installation Guide *for instructions on connecting DC power cables.*

Your AC-powered Cisco MC3810 requires the following AC power:

- 100 to 240V
- 50 to 60 Hz
- 1A
- 62W

Step 1 Connect one end of the power cord to the power connector on the rear panel of the Cisco MC3810.

Step 2 Connect the other end of the power cord to the power outlet.

When you are finished, continue to the "Get Site Information" section on page 16.

3 Get Site Information

Get This Information from Your Network Administrator

This table provides space to write down information you need to run the System Configuration Dialog (also called the setup script).

Item	Ask Your Network Administrator	Enter the Information in This Column
1	What do you want to name the Cisco MC3810 (to distinguish it from other Cisco devices on your network)?	
2	What should the encrypted enable secret password be?	
3	What should the nonencrypted enable password be?	
4	What should the password for remote console (Telnet) access be? This is referred to as the virtual terminal password (Telnet password).	
5	Do you want to configure the Cisco MC3810 for:	
	SNMP? — If so, what is the community string?	
	IP?	
	IGRP routing? — What is the IGRP autonomous system number?	
	IPX? — What are the IPX network numbers?	
	Bridging?	
6	Do you want to configure the modems for:	
	Default chat script?	
	Dial-in IP SLIP/PPP access?	
	Dynamic IP address?	
	Default IP address?	
	TCP header compression?	
	Routing updates on async lines?	
	Async IPX?	
7	Will you be using the Ethernet 0 (10BaseT) interface?	
	What is the IP address?	
	How many bits in the subnet mask?	
	Configure IPX on this interface? — IPX network number?	

4 Power Up the Cisco MC3810

Checklist for Power-Up

You are ready to power up the Cisco MC3810 if it meets these requirements:

- Securely mounted
- Power connected; Cisco RPS powered on, if used as the power source
- Interface cables connected

Power-Up Procedure

Perform this procedure to power up your Cisco MC3810 and verify that it goes through its initialization and self-test. When this is finished, the Cisco MC3810 will be ready to configure.

Step 1 Power up your terminal or PC, and configure it for 9600 baud, 8 data bits, 1 stop bit, and no parity.

Step 2 Move the Cisco MC3810 power switch to the ON position.

The green LED next to the auxiliary port should go on and the fan should operate. If this does not happen, see the power-up procedure in the *Cisco MC3810 Series Multiservice Access Concentrators Hardware Installation Guide*.

The following message is displayed at the end of the boot-up messages.

```
--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]:
```

Note: If the `rommon 1>` *prompt appears, your system has booted in ROM monitor mode. Follow the instructions in the appendix, "Booting in ROM Monitor Mode," in the* Cisco MC3810 Multiservice Access Concentrators Software Configuration Guide *before continuing with this procedure.*

Continue to Section 5, "Perform Initial Configuration."

5 Perform Initial Configuration

This section shows how to perform some basic configurations from a local or remote console, using the Cisco command-line interface. For complete configuration procedures, see the *Cisco MC3810 Series Multiservice Access Concentrators Software Configuration Guide*.

Setting the Ethernet Port IP Address

Connect the Ethernet port (yellow) to a live Ethernet connection using a standard Ethernet cable with RJ-45 connectors; then use this procedure to set an IP address for the Ethernet port. After the Ethernet port has an IP address, you can configure the Cisco MC3810 remotely through a Telnet connection.

The starting point for this procedure is the System Configuration Dialog prompt (shown also on page 16):

```
--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]:
```

To set the Ethernet port IP address, do the following:

Step	Command	Purpose
1	`Would you like to enter the initial configuration dialog? [yes/no]:` **`no`**	Terminate the System Configuration Dialog.

2	Press **Return** when you see the following prompt:
	`Would you like to terminate autoinstall? [yes]:`
	
	Several messages are displayed, ending with a line similar to the following:
	`flashfs[4]: Initialization complete.`
		Terminate autoinstall and continue setting the Ethernet IP address.

3	Press **Return**.	Bring up the `router>` prompt.
4	`router>` **`enable`**	Enable the privileged EXEC mode.
5	`router#` **`configure terminal`**	Enter global configuration mode. Note The default host name, "router," appears as part of the system prompt. To change the host name to another name such as "europa" that will then appear as the system prompt, enter **`hostname europa`** after Step 5 at the global configuration prompt—`router(config)#`.
6	`router(config)#` **`enable password`** *`password`*	Set a password for the privileged EXEC mode.
7	`router(config)#` **`interface Ethernet 0`**	Enter the interface configuration mode.
8	`router(config-if)#` **`ip address`** *`IP-address subnet-mask`*	Enter the IP address and subnet mask you want for your Ethernet port.

5 Perform Initial Configuration (continued)

Step	Command	Purpose

9	`router(config-if)# **no shutdown**`
	
	Messages similar to the following appear:
	`%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0, changed state to up`
	`%LINK-3-UPDOWN: Interface Ethernet0, changed state to up`
	`router(config-if)#`
		Activate the Ethernet port.

10	`router(config-if)# **exit**`	Return to global configuration mode.
11	`router(config)# **line vty 0 4**`	Enter line configuration mode.
12	`router(config-line)# **password** *password*`	Set a password for remote access to the Cisco MC3810.
13	`router(config-line)# **end**`	Return to privileged EXEC mode.

14	`router# **copy system:running-config nvram:startup-config**`
	
	Messages similar to the following appear:
	`Building configuration...`
	`Tablesize is 100`
	`Configure call time`
	`[OK]`
	`router#`
		Save the configuration.

Now that the Ethernet port has an IP address, you can either configure the Cisco MC3810 remotely with a Telnet connection, or you can continue using the console or auxiliary port.

Note: The rest of this quick start guide contains basic configuration instructions for the Cisco MC3810. However, there are too many possible configurations to discuss in detail in this guide. Therefore, Cisco recommends that you see the Cisco MC3810 Multiservice Access Concentrators Software Configuration Guide *for all but the most basic configurations.*

Note: For voice and video applications, a single master clock source must be established. For information about configuring synchronized clocking, see the chapter "Configuring Synchronized Clocking" in the Cisco MC3810 Series Multiservice Access Concentrators Software Configuration Guide.

5 Perform Initial Configuration (continued)

Configuring Basic Settings for Serial Ports 0 and 1

To configure basic settings for serial ports 0 and 1, do the following:

Step	Command	Purpose
1	`router> show interface serial`	Display the default configuration.
2	`router> enable`	Enable the configuration.
3	`router# configuration`	Enter configuration mode.
4	`router(config)# network-clock base-rate {56k | 64k}`	Configure the network clock base rate setting.
5	`router(config)# interface serial {0 | 1}`	Enter serial interface configuration mode.
6	`router(config-if)# clock rate network-clock rate`	Configure the serial interface phase-lock-loop clock speed. The range is 300 to 2400 kbps. There is no default.
7	`router(config-if)# no shutdown`	Activate the serial port.
8	Repeat Steps 5 through 7 to configure the other serial port.	
9	`router(config-if)# exit`	Exit interface configuration mode.
10	`router(config)# exit`	Exit configuration mode.
11	`router> show interfaces serial`	Display the serial port configuration to verify the new settings.

5 Perform Initial Configuration (continued)

Configuring T1/E1 Controller Settings for T1/E1 Ports

There can be two T1/E1 ports in a Cisco MC3810: a trunk port and a digital voice port.

The T1/E1 trunk port is physically located in the multiflex trunk module (MFT). It supports balanced T1 per ANSI T1.403, and it supports balanced and unbalanced E1 per ITU G.703. The MFT has a built-in CSU/DSU.

The T1/E1 digital voice port is physically located in the digital voice module (DVM). It supports a balanced T1 interface with a digital PBX, and it supports both balanced and unbalanced E1 interfaces with a digital PBX.

To configure the basic T1/E1 controller settings for T1/E1 ports, do the following for each T1/E1 port that is present:

Step	Command	Purpose
1	`router> configure terminal`	Enter global configuration mode.
2	`router(config)# controller {t1 | e1} number`	Enter controller configuration mode. Specify whether your controller is E1 or T1, and enter the controller number. The controller number for a T1/E1 port in the MFT must be 0. The controller number for a T1/E1 port in the DVM can be 0 (if an MFT is not installed) or 1 (if an MFT is installed).
3	`router(config-ctrl)# clock source {internal | line | loop-timed}`	Configure the controller clock source for a DS1 link. If the clock source is a network device attached to the T1/E1 port you are configuring now, select the **line** option. For any other clock source (internal or a network device attached to any other port) select the **internal** option.
4	`router(config-ctrl)# description line`	Enter a description of the controller, such as the destination or its application. The description can be up to 80 characters long.
5	Repeat Steps 2, 3, and 4 for the other T1/E1 port, if it is installed.	

When you have completed these basic settings, proceed to the appropriate section on the next page: "Configuring T1 Controller Settings" or "Configuring E1 Controller Settings" and configure the T1 or E1 controller.

Note: For instructions on loopback diagnostics, or for configuring controller channel groups, CAS voice groups, or TDM cross-connects, see the Cisco MC3810 Series Multiservice Access Concentrators Software Configuration Guide.

5 Perform Initial Configuration (continued)

Configuring T1 Controller Settings

To configure T1 controller settings, do the following in controller configuration mode:

Step	Command	Purpose
1	Configure the cable length setting by doing one of the following:	
	`router(config-ctrl)# cablelength short {133 | 266 | 399 | 533 | 655}`	Configure the cable length if the length is 655 feet or shorter.
	`router(config-ctrl)# cablelength long {gain26 | gain36} {-15db | -22.5db | -7.5db | 0db}`	Configure the cable length if the length is longer than 655 feet.
2	`router(config-ctrl)# framing {sf | esf}`	Configure the DS1 link framing format. Extended SuperFrame format (**esf**) is required for ATM traffic.
3	`router(config-ctrl)# linecode {ami | b8zs}`	Configure the line encoding format for the DS1 link. The **b8zs** setting is required for ATM traffic.
4	`router(config-ctrl)# no shutdown`	Activate the T1 controller.
5	`router(config-ctrl)# exit`	Exit controller configuration mode.
6	`router(config)# exit`	Exit configuration mode.
7	`router> show controller T1 0`	Verify the controller configuration.

Configuring E1 Controller Settings

To configure E1 controller settings, perform the following tasks in controller configuration mode:

Step	Command	Purpose
1	`router(config-ctrl)# {framing crc4 | no-crc4} [australia]`	Configure the E1 framing format. If the trunk will be connected to a device in Australia, enter the **australia** option.
2	`router(config-ctrl)# linecode {ami | hdb3}`	Configure the E1 line encoding format. The **hdb3** setting is required for ATM traffic.
3	`router(config-ctrl)# no shutdown`	Activate the E1 controller.
4	`router(config-ctrl)# exit`	Exit controller configuration mode.
5	`router(config)# exit`	Exit configuration mode.
6	`router> show controller E1 0`	Verify the controller configuration.

5 Perform Initial Configuration (continued)

Basic Voice-Port Configuration

This section has separate procedures for analog, digital, and ISDN BRI voice ports. Use the analog procedure to configure voice ports on the analog voice module (AVM). Use the digital procedure to configure voice ports on a T1 or E1 line on a digital voice module (DVM) or multiflex trunk module (MFT). Use the BRI procedure to configure voice ports on the BRI voice module (BVM).

Verifying Voice-Port Configuration

Before entering voice-port configuration mode, enter:

```
router> show voice port summary
```

This command brings up a list of the existing voice ports with their slot/port numbers, signaling types, and status.

Note: An analog voice port exists for each analog personality module (APM) installed in an AVM. ISDN BRI voice ports exist if a BVM is installed. Digital voice ports do not exist unless you have created one or more voice groups.

To see the complete current configuration of an existing voice port, enter the following command:

```
router> show voice port slot/port
```

The following table summarizes the physical and logical characteristics of the Cisco MC3810 voice ports:

Voice Interface Type	Hardware Module	Voice-Port Identification	
		Slot Number	Port Numbers
Analog	AVM	1	1–6
BRI	BVM	1–4	1–2
Digital:	MFT	0	1–24 (for T1)
To network (WAN)			1–15 and 17–31 (for E1)
Digital:	DVM	1	1–24 (for T1)
To PBX or local phone device			1–15 and 17–31 (for E1)

Note: Unlike serial port interfaces and interfaces on other Cisco products, the number 0 is not used to designate a voice port. Slot/port designations 0/0 and 1/0 are not valid; 0/1 and 1/1 are valid.

5 Perform Initial Configuration (continued)

Configuring Analog Voice Ports

To configure the basic analog voice-port settings, perform the following tasks:

Step	Command	Purpose
1	`router> configure terminal`	Enter global configuration mode.
2	`router(config)# voice-port slot/port`	Enter voice-port configuration mode, and specify the voice port you want to configure by entering the logical slot number and port number (see table on page 23). The commands entered in Steps 3 through 4 affect only the voice port you specify here. The slot number for analog voice ports on the Cisco MC3810 is always 1. The number 0 is not used for any voice port.
3	`router(config-voiceport)# codec {g729r8 | g729ar8 | g726r32 | g711alaw | g711ulaw}`	(Optional) Configure the voice-port compression mode. The **g729ar8** value is the default and is recommended. Simultaneously active on-net voice call support by compression mode: • **g729ar8**—24 calls maximum • **g729r8**—12 calls maximum Nominal data rates for compression modes: • **g729r8** and **g729ar8**—8 kbps • **g726r32**—32 kbps • **g711alaw** and **g711ulaw**—64 kbps
4	`router(config-voiceport)# connection {tie-line | plar | plar opx} string`	Configure the voice-port connection mode type. If the connection is to a PBX, use the **tie-line** option, If the connection is for Private Line Auto Ringdown (PLAR) use the **plar** option. If the connection is for PLAR Off-Premises eXtension (OPX), use the **plar-opx** option. With this option, the local voice port will provide a local response before the remote voice port receives an answer, and FXO interfaces will not answer until the remote side answers.
5	If you want to change the default signaling type for the voice port, choose one of the following:	
	`router(config-voiceport)# signal {loop-start | ground-start}`	Configure the signaling type for FXO and FXS voice ports. The default is **loop-start**.
	`router(config-voiceport)# signal {wink-start | immediate | delay-dial}`	Configure the signaling type for E&M voice ports. The default is **wink-start**.
6	`router(config-voiceport)# dial-type {pulse | dtmf}`	Change the transmit dial type if necessary (FXO and E&M ports only). The default is **dtmf**. Only FXO and FXS ports transmit dial pulses.

5 Perform Initial Configuration (continued)

Step	Command	Purpose
7	`router(config-voiceport)# cptone` *country*	Configure the voice port for the local territory's call progress tone setting. The call progress tone setting determines the settings for dialtone, busytone, and ringback tone. The default for this command is **northamerica**. For a list of supported countries, see the Cisco IOS *Voice, Video, and Home Applications Command Reference*.
8	`router(config-voiceport)# no shutdown`	Activate the voice port. You should activate only those voice ports you are planning to use.
9	Exit from voice-port configuration mode and repeat Steps 2 through 8 for the remaining analog voice ports.	

Note: If you are not going to use a voice port, shut it down to conserve bandwidth.

To configure voice-port tuning options, see the section "Configuring Voice-Port Tuning Options" in the "Configuring Voice Ports" chapter of the *Cisco MC3810 Multiservice Access Concentrators Software Configuration Guide*.

To configure dial peers, see the applicable voice service configuration section in the *Cisco MC3810 Multiservice Access Concentrators Software Configuration Guide*.

Configuring Digital Voice Ports

To configure the basic digital voice-port settings, perform the following tasks:

Step	Command	Purpose
1	`router> configure terminal`	Enter global configuration mode.
2	`router(config)# controller {t1 | e1}` *number*	Enter controller configuration mode. Specify whether your controller is E1 or T1, and enter the controller number: • 0 for voice ports on T1/E1 WAN interface (through the MFT) • 1 for voice ports on the T1/E1 interface to the local telephone device or PBX (through the DVM)
3	`router(config-controller)# mode cas`	Configure the T1/E1 line to support CAS.
4	`router(config-controller-cas)# voice-group` *channel-no* `timeslots` *timeslot-list* `type {e&m-immediate | e&m-delay | e&m-wink | e&m-melcas | fxs-ground-start | fxs-loop-start | fxs-melcas | fxo-ground-start | fxo-loop-start | fxo-melcas}`	Configure a list of timeslots to form a CAS group for the T1/E1 line. The "melcas" options are supported only on E1 and apply to the Mercury Exchange Limited (MEL) standard, used primarily in the United Kingdom. When configuring a CAS group for a T1/E1 line to a PBX, make sure that the channel numbers match the PBX channels.
5	Repeat Step 3 or 4 for each CAS group. After CAS groups are defined, exit CAS controller configuration mode.	

5 Perform Initial Configuration (continued)

Step	Command	Purpose
6	`router(config)# voice-port slot/port`	Enter voice-port configuration mode, and specify the voice port you want to configure by entering the logical slot number and port number (see table on page 23). The following commands affect only the voice port you specify here.
7	`router(config-voiceport)# dial-type {pulse | dtmf}`	Change the transmit dial type if necessary (FXO and E&M ports only). The default is **dtmf**. Only FXO and FXS ports transmit dial pulses.
8	`router(config-voiceport)# compand-type {u-law | a-law}`	Change the companding if necessary. The default is u-law (the North American mu-law ITU-T PCM encoding standard). Specify a-law to use the European a-law ITU-T PCM encoding standard.
9	`router(config-voiceport)# no shutdown`	Activate the voice port. You should activate only those voice ports you are planning to use.
10	Exit from voice-port configuration mode and repeat Steps 6 through 9 for the remaining digital voice ports.	

Note: If you are not going to use a voice port, shut it down to conserve bandwidth.

To configure voice-port tuning options, see the section "Configuring Voice-Port Tuning Options" in the "Configuring Voice Ports" chapter of the *Cisco MC3810 Multiservice Access Concentrators Software Configuration Guide*.

To configure dial peers, see the applicable voice service configuration section in the *Cisco MC3810 Multiservice Access Concentrators Software Configuration Guide*.

5 Perform Initial Configuration (continued)

Verifying Your Analog or Digital Voice-Port Configuration

You can test your analog or digital voice-port configuration by doing the following:

- Pick up the handset of an attached telephony device and check for dial tone.
- If you have dial tone, check for DTMF detection. If the dial tone stops when you dial a digit, the voice port is probably configured properly.
- Enter **show voice port** *slot/port* and **show voice port summary** to verify that the voice-port configuration is correct.
- Enter **show voice dsp** EXEC command to verify the current status of all Digital Signaling Processor (DSP) voice channels.
- Enter **show voice call summary** EXEC command to verify the call status for all voice ports.

Troubleshooting Tips

If you are having trouble connecting a call and you suspect the problem is associated with voice-port configuration, you can try to resolve the problem by performing the following:

- Ping the associated IP address to confirm connectivity. If you cannot successfully ping your destination, refer to the "Configuring IP" chapter in the Cisco IOS Release 12.0 *Network Protocols Configuration Guide, Part 1*.
- Enter **show voice port** to make sure that the voice port is enabled. You can display information for a single voice port, for all voice ports, or a summary report. If the voice port is offline, use the **no shutdown** command.
- Check the dial-peer configuration (as configured in the "Configuring Voice over Frame Relay," "Configuring Voice over ATM," or "Configuring Voice over HDLC" chapters of the *Cisco MC3810 Multiservice Access Concentrators Software Configuration Guide*).
- Check the Frame Relay, ATM, or HDLC configuration.
- Check to see if the voice network module has been correctly installed. For more information, see the *Cisco MC3810 Series Multiservice Access Concentrators Hardware Installation Guide*.

5 Perform Initial Configuration (continued)

Configuring ISDN BRI Voice Ports

To configure the basic ISDN BRI voice-port settings, perform the following tasks:

Step	Command	Purpose
1	`router> configure terminal`	Enter global configuration mode.
2	`router(config)# isdn switch-type basic-qsig`	Configure the global ISDN switch type as **basic-qsig** for the BRI voice ports. Note You can configure the ISDN switch type in either global or interface configuration mode. If you configure it here in Step 2, it specifies the switch type for all four BVM ports. If you configure it in Step 4, it specifies the switch type for a single interface. The switch type specified in Step 4 for any individual interface will override the globally specified switch type.
3	`router(config)# interface bri` *number*	Enter interface configuration mode to configure parameters for the specified BRI voice port. The number can be from 1 to 4.
4	`router(config-interface bri 1)# isdn switch-type basic-qsig`	If the service provider switch type for this BRI port is different from the global ISDN switch type, configure the interface ISDN switch type to match the service provider switch type. The interface ISDN switch type overrides the global ISDN switch type on this interface.
5	`router(config-interface bri 1)# isdn protocol-emulate {user | network}`	Configure the Layer 2 and Layer 3 port protocol emulation: • Enter **user** to configure the port as TE. This is the default. • Enter **network** to configure the port as NT. Note The term **user** is equivalent to the QSIG term **slave**. The term **network** is equivalent to the QSIG term **master**.
6	`router(config-interface bri 1)# isdn layer1-emulate {user | network}`	Configure the Layer 1 port mode emulation and the clock settings: • Enter **user** to configure the port as TE and to function as a clock slave. This is the default. • Enter **network** to configure the port as NT and to function as a clock master.
7	`router(config-interface bri 1)# [no] line-power`	Turn on or off the power supplied from an NT-configured port to a TE device. The default is **no line-power**.
8	`router(config-interface bri 1)# network-clock-priority {low | high}`	If this BRI voice port is configured as TE, and you want it to act as a clock slave and recover clock from the network NT device, set it to **high**. If this BRI voice port is configured as TE, and you do not want it to recover clock from the network NT device, set it to **low**. This command is not used if this port is configured as NT with the command **isdn layer1-emulate network**.

5 Perform Initial Configuration (continued)

Step	Command	Purpose
9	`router(config-interface bri 1)#` **`isdn overlap-receiving`**	Activate overlap signaling to the destination PBX.
10	`router(config-interface bri 1)#` **`isdn network-failure-cause`** *`cause code`*	Specify the cause code to pass to the PBX when a call cannot be placed or completed because of internal network failures. Possible values are from 1 to 127.

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DOC-MC3810-QSG=
78-4879-05