



# Preparing AXSM Cards and Lines for Communication

This chapter describes how to prepare AXSM cards and lines for physical connectivity to other switches. [Chapter 5, “Provisioning AXSM Communication Links,”](#) describes how to add ports and connections that support ATM communications across the cards and lines configured in this chapter.

This chapter provides a quickstart procedure for configuring AXSM cards and lines and describes the following:

- [Managing Firmware Version Levels for AXSM Cards](#)
- [Establishing Redundancy Between Two AXSM Cards](#)
- [Selecting and Viewing Service Class Templates](#)
- [Setting Up Lines](#)
- [Establishing Redundancy Between Two Lines with APS](#)

## Configuration Quickstart

The quickstart procedure in this section provides a summary of the tasks required to prepare AXSM cards and lines for configuration as ATM trunks and lines. This procedure is provided as an overview and as a quick reference for those who already have configured MGX 8850 and MGX 8950 switches.

	Command	Purpose
Step 1	<i>username</i> <i>&lt;password&gt;</i>	Start a configuration session.  <b>Note</b> To perform all the procedures in this quickstart procedure, you must log in as a user with GROUP1 privileges or higher.
Step 2	<b>setrev</b> <i>&lt;slot&gt;</i> <i>&lt;version&gt;</i>  Related commands: <b>dspecs</b>	Initialize AXSM cards by setting the firmware version level for each AXSM card.  See “ <a href="#">Managing Firmware Version Levels for AXSM Cards</a> ,” which appears later in this chapter.
Step 3	<b>addred</b> <i>&lt;options&gt;</i>	Define which AXSM cards are operating as redundant cards.  See “ <a href="#">Establishing Redundancy Between Two AXSM Cards</a> ,” which appears later in this chapter.

	Command	Purpose
Step 4	<b>cnfcdsct</b> < <i>sctid</i> >  Related commands: <b>dspsd</b>	Applies ATM communications parameters from a preconfigured Service Class Template (SCT) file to all communications between the card you are configuring and the other AXSM cards in the switch.  For PNNI communications, use SCT ID 2 or 4 for policing applications and use SCT ID 3 or 5 for non-policing applications. If MPLS will be used on any card link, use SCT ID 4 for policing applications and use SCT ID 5 for non-policing applications.  See <a href="#">“Selecting and Viewing Service Class Templates,”</a> which appears later in this chapter.
Step 5	<b>upln</b> < <i>bay.line</i> >  Related commands: <b>dsplns</b> <b>dspln</b> - <i>type</i> < <i>bay.line</i> >	Bring up and configure lines. This step establishes physical layer connectivity between two switches.  See <a href="#">“Setting Up Lines,”</a> which appears later in this chapter.
Step 6	<b>cnfln</b> < <i>options</i> >  Related commands: <b>dsplns</b> <b>dspln</b> - <i>type</i> < <i>bay.line</i> >	Configure lines.  See <a href="#">“Configuring SONET Lines,”</a> which appears later in this chapter.
Step 7	<b>addapsln</b> < <i>workingIndex</i> > < <i>protectIndex</i> > < <i>archmode</i> >	Configure a redundant relationship between two AXSM lines.  See <a href="#">“Establishing Redundancy Between Two Lines with APS,”</a> which appears later in this chapter.

## Managing Firmware Version Levels for AXSM Cards

The AXSM cards within the switch run two types of firmware: boot firmware and runtime firmware. The boot firmware provides the startup information the card needs. The boot firmware is installed on the board at the factory. The runtime firmware controls the operation of the card after startup. The runtime firmware file is stored on the PXM45 hard disk.

After the AXSM cards are installed in the switch, you must specify the correct runtime firmware version for each card before the switch can begin using the card. The following sections explain how to

- Locate the cards that need to have the firmware version level set
- Set the firmware version levels for cards in the switch
- Verify the firmware version levels being used by cards

## Locating Cards that Need the Firmware Version Set

When an AXSM card is installed and the firmware version needs to be set, the System Status LED on the front of the card blinks red. The **dspecds** command shows that the card status is Failed. Other events can display these symptoms, but if the AXSM card is new, the problem is probably that the firmware version number has not been set. To locate the cards that need to have the firmware version set, use the following procedure.

**Step 1** Establish a CLI management session at any access level.

**Step 2** To display a list of all the cards in the switch, enter the **dspecds** command:

```
8850_NY.7.PXM.a > dspecds
```

The following example shows the display for this command. The card state for the card in slot 2 is listed as Failed/Active. This is how a card appears when the runtime firmware version has not been selected.

```
M8850_LA.7.PXM.a > dspecds
M8850_LA                               System Rev: 02.01   Sep. 27, 2001 20:33:09 PST
Chassis Serial No: SAA03230375 Chassis Rev: B0   GMT Offset: -8
                                           Node Alarm: NONE
```

Card Slot	Front/Back Card State	Card Type	Alarm Status	Redundant Slot	Redundancy Type
01	Active/Active	AXSM_4OC12	NONE	NA	NO REDUNDANCY
02	Empty	---	---	---	---
03	Active/Active	AXSM_16T3E3	NONE	NA	NO REDUNDANCY
04	Empty	---	---	---	---
05	Active/Active	AXSME_2OC12	NONE	NA	NO REDUNDANCY
06	Active/Active	AXSM_16OC3_B	NONE	NA	NO REDUNDANCY
07	Active/Active	PXM45	NONE	08	PRIMARY SLOT
08	Standby/Active	PXM45	NONE	07	SECONDARY SLOT
09	Active/Active	RPM_PR	NONE	NA	NO REDUNDANCY
10	Empty	---	---	---	---
11	Empty	---	---	---	---
12	Empty	---	---	---	---
13	Empty	---	---	---	---
14	Empty	---	---	---	---

Note the slot number, card type, and redundancy type for each card that needs to have the firmware version set. You will need this information to activate these cards as described in the next section, “[Initializing AXSM Cards.](#)”



**Note** If any AXSM card displays the Active/Active card state, you do not have to set the runtime firmware version for that card. Also, note that the Front/Back Card State for slots 15, 16, 31, and 32 show Empty Reserved. These slots will support service modules in a future release.

## Initializing AXSM Cards

Before an AXSM card can operate, it must be initialized in a switch slot. The initialization process defines the AXSM runtime software version that will run on the card and identifies the slot in which the card operates. To initialize an AXSM card, use the following procedure.


**Note**

The PXM45 card supports a maximum of 99 lines on the switch. As you add AXSM cards, verify that the line count for all AXSM cards does not exceed this number.

**Step 1**

If you have not already done so, determine the software version number for the card by referring to the *Release Notes for Cisco MGX 8850 Software Version 2.1.60* or the *Release Notes for Cisco MGX 8950 Software Version 2.1.60*.


**Tips**

If you have trouble locating the runtime firmware version level, use the filenames on the PXM45 hard disk to determine the level. For more information, see “[Determining the Software Version Number from Filenames](#),” in [Chapter 7, “Switch Operating Procedures.”](#)

**Step 2**

Establish a configuration session using a user name with SERVICE\_GP privileges or higher.

**Step 3**

To set the firmware revision level for a card, enter the **setrev** command:

```
mgx8850a.7.PXM.a > setrev <slot> <version>
```


**Note**

Each card should be initialized only once with the **setrev** command. The only other time you should use the **setrev** command is to initialize cards after the configuration has been cleared with the **clearallnf** command.

Replace *<slot>* with the card slot number and replace *<version>* with the software version number. For example:

```
mgx8850a.7.PXM.a > setrev 1 2.1(60)
```

After you enter the **setrev** command, the System status LED blinks red until the firmware load is complete, and then it changes to non-blinking green.

**Step 4**

To verify the activation of a card for which the status was previously listed as Failed/Empty, enter the **dspcds** command. The status should change to Active/Active.

## Verifying Card Firmware Version Levels

When you are having problems with your switch, or when you have taken delivery of a new switch but delayed installation, it is wise to verify the firmware versions installed on the switch. If newer versions of this firmware are available, installing the updated firmware can prevent switch problems.

To verify the firmware versions in use on your switch, use the following procedure.

**Step 1** To display the software revision status of all the cards in a switch, enter the **dsprevs** command as follows:

```
M8850_LA.7.PXM.a > dsprevs
M8850_LA                      System Rev: 02.01   Sep. 27, 2001 20:36:15 PST
MGX8850                       Node Alarm: NONE
Physical Logical   Inserted   Cur Sw      Boot FW
Slot      Slot      Card       Revision    Revision
-----
01         01       AXSM_40C12 2.1(60)     2.1(60)
02         02       ---        ---         ---
03         03       AXSM_16T3E3 2.1(60)     2.1(60)
04         04       ---        ---         ---
05         05       AXSME_20C12 2.1(60)     2.1(60)
06         06       AXSM_16OC3_B 2.1(60)     2.1(60)
07         07       PXM45       2.1(60)     2.1(60)
08         07       PXM45       2.1(60)     2.1(60)
09         09       RPM_PR      ---         ---
10         10       ---        ---         ---
11         11       ---        ---         ---
12         12       ---        ---         ---
13         13       ---        ---         ---
14         14       ---        ---         ---
```

**Step 2** To see the software revision levels for a single card, enter the **dspversion** command as follows:

```
8850_NY.1.AXSM.a > dspversion

Image Type   Shelf Type   Card Type   Version   Built On
-----
Runtime      MGX          AXSM        2.1(0)    Feb 13 2001, 07:47:35
Boot         MGX          AXSM        2.1(0)    -
```

- Step 3** Another way to see the software revision levels for a single card is to enter the **dspcd** command as follows:

```
M8850_LA.7.PXM.a > dspcd 1
M8850_LA                      System Rev: 02.01   Sep. 27, 2001 20:38:48 PST
MGX8850                        Node Alarm: NONE
Slot Number: 1   Redundant Slot: NONE

                Front Card           Upper Card           Lower Card
                -----
Inserted Card:  AXSM_40C12           SMFIR_2_OC12        SMFIR_2_OC12
Reserved Card:  AXSM_40C12           SMFIR_2_OC12        SMFIR_2_OC12
State:           Active              Active              Active
Serial Number:   SAK0350007N         SAK0346003F         SBK0406001V
Prim SW Rev:     2.1(60)              ---                 ---
Sec SW Rev:      2.1(60)              ---                 ---
Cur SW Rev:     2.1(60)              ---                 ---
Boot FW Rev:     2.1(60)              ---                 ---
800-level Rev:
800-level Part#: 800-05774-05         800-05383-01        800-05383-01
CLEI Code:       BAA1BADAAA           0000000000          BAI9ADTAAA
Reset Reason:    On Power up
Card Alarm:      NONE
Failed Reason:   None
Miscellaneous Information:
```

Type <CR> to continue, Q<CR> to stop:

- Step 4** Using the **dsprevs** and **dspcd** commands, complete the hardware and software configuration worksheet in [Table 2-9](#), which is in the section titled “[Verifying the Hardware Configuration](#)” in [Chapter 2](#), “[Configuring General Switch Features](#).”
- Step 5** Compare the versions you noted in [Table 2-9](#) with the latest versions listed in the *Release Notes for Cisco MGX 8850 Software Version 2.1.60* or the *Release Notes for Cisco MGX 8950 Software Version 2.1.60*.
- Step 6** If the switch requires software updates, upgrade the software using the instructions in [Appendix A](#), “[Downloading and Installing Software Upgrades](#).”

## Establishing Redundancy Between Two AXSM Cards

To establish redundancy between two AXSM cards, use the following procedure.

- Step 1** Establish a configuration session using a user name with SUPER\_GP privileges or higher.
- Step 2** If you have not done so already, set the firmware version for both cards, as described earlier in “[Initializing AXSM Cards](#).”
- Step 3** Use the **dspecds** command to verify that both AXSM cards are in the “Active” state.
- Step 4** Enter the **addred** command as follows:

```
pop20one.7.PXM.a > addred <redPrimarySlotNum> <redSecondarySlotNum> <redType>
```

Replace `<redPrimarySlotNum>` with the slot number of the AXSM card that will be the primary card, and replace `<redSecondarySlotNum>` with the slot number of the secondary AXSM card. Replace `<redType>` with the number 1, which selects 1:1 Y cable redundancy. Although the online help lists other redundancy types, 1:1 Y cable redundancy is the only type supported on AXSM cards in this release.



**Note** One of the two cards can be configured before redundancy is established. If this is the case, the configured card should be specified as the primary card. Redundancy cannot be established if the secondary card has active lines. If the secondary card has active lines, you must delete all ports and down all lines before it can be specified as a secondary card.



**Tips**

If the switch displays the message, `ERR: Secondary cd is already reserved`, then lines are already in use on the specified secondary card. Use the `dnln` command to bring down these lines before re-entering the `addred` command.

**Step 5** To verify that the redundancy relationship is established, enter the `dspre` command as shown in the following example:

```
pop20two.7.PXM.a > dspre
pop20two                               System Rev: 02.01   Feb. 06, 2001 11:24:53 PST
MGX8850                               Node Alarm: NONE
Primary Primary Primary Secondary Secondary Secondary Redundancy
SlotNum Type State SlotNum Type State Type
-----
 1 AXSM Active 2 AXSM Standby 1-1
 7 PXM45 Active 8 PXM45 Standby 1-1
15 SRM-3T3 Empty Res 16 SRM-3T3 Empty Resvd 1-1
31 SRM-3T3 Empty Res 32 SRM-3T3 Empty Resvd 1-1
```

The secondary state for the card in the secondary slot changes to *Standby* only when the secondary card is ready to take over as active card. After you enter the `addred` command, the switch resets the secondary card. When you first view the redundancy status, the state may be *Empty Resvd* or *Init*. The secondary card may require one or two minutes to transition to standby.



**Note** The `dspre` command also shows the redundancy relationship between two cards.

For information on managing redundant cards, refer to “[Managing Redundant Cards](#),” in [Chapter 7](#), “[Switch Operating Procedures](#).”

## Selecting and Viewing Service Class Templates

A Service Class Template (SCT) is a collection of ATM configuration parameter settings that are stored in a single file and can be applied to multiple lines or ports. Instead of retyping configuration data for identical lines or trunks, you can specify an SCT to apply those settings to additional lines and trunks. SCT files include the following types of configuration data:

- General link parameters
- Bandwidth parameters
- COSB parameters
- Virtual circuit threshold parameters
- COSB threshold parameters

Two types of SCTs are card SCTs and port SCTs. Card SCTs define parameters that apply to all communications traffic between an AXSM card and the other AXSM cards in the switch. Port SCTs define parameters that apply to communications traffic on a single line or port. You can apply the same SCT to multiple cards or ports.

SCTs are also classified as policing or non-policing. Typically, policing SCTs are used on UNI lines at the edge of the ATM network and control traffic entering the network. Non-policing SCTs are typically used between switches within the network to reduce communications overhead. If traffic is properly controlled at the edges of an ATM network, there should be no need for policing within the network.

To enable ATM communications, you must assign a card SCT to every card and a port SCT to every port you use. The SCT files are stored in the C:\SCT\AXSM directory. Card SCT files are named AXSM\_SCT.CARD.*n*, where *n* is the SCT ID number. Similarly, port SCT files are named AXSM\_SCT.PORT.*n*. Cisco provides default SCT files for policed connections and non-policed connections.

To create additional SCT files or change the configuration of existing SCT files, you need to use Cisco WAN Manager (CWM). You cannot create or modify SCT files using the CLI.

**Note**

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SCTs can be changed with connections present. However, if the change affects services in use, the connections will be rerouted.

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**Note**

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After you create a SCT file with CWM, you must use FTP to transfer that file to the switch before you can use it. For guidelines on transferring files to the switch, see [“Copying Software Files to the Switch”](#) in [Appendix A, “Downloading and Installing Software Upgrades.”](#) Be sure to copy SCT files to the C:\SCT\AXSM directory on the switch.

---

The following sections describe how to select SCTs for cards and ports.

## Selecting a Card SCT

A card SCT defines ATM parameters that apply to communications between the card you are configuring and the other AXSM cards in the switch. You can use the same SCT for multiple cards. To select an SCT for a card, use the following procedure.

**Step 1** Establish a configuration session using a user name with GROUP1 privileges or higher.

**Step 2** Enter the following command:

```
pop20two.1.AXSM.a > cnfcdsct <scID>
```



**Note** When an AXSM card is powered up for the first time, the default card SCT file is used. You must run this command in order to use another SCT file. The default SCT file is 0.

Replace *scID* with the number of the SCT that you want to assign to the card. For PNNI communications, use SCT ID 2 or 4 for policing applications and use SCT ID 3 or 5 for non-policing applications. If MPLS will be used on any card link, use SCT ID 4 for policing applications and use SCT ID 5 for non-policing applications.



**Note** For most applications, Cisco Systems recommends using non-policing card SCTs.

**Step 3** To display the SCT assigned to a card, enter the following command:

```
pop20two.1.AXSM.a > dspcd
```

The display card report displays a row labeled “Card SCT Id,” which identifies the SCT assigned to the card.

## Selecting a Port SCT

A port SCT defines ATM parameters that apply to communications through a single port. You can use the same port SCT for multiple ports. To select an SCT for a port, use the **addport** command as described in “Adding ATM Ports” in Chapter 5, “Provisioning AXSM Communication Links.”

## Setting Up Lines

The first step in configuring AXSM lines is to define the physical lines that are connected to the switch. The following sections describe how to do the following:

- Bring up lines
- Configure lines
- Verify the configuration of lines

## Bringing Up Lines

Installing an AXSM card can add from 1 to 16 lines to your switch. You must bring up a line before you can configure the line or provision services on the line.

Before a line is brought up, or after it is brought down, the switch does not monitor the line. The AXSM port status light for the line is unlit, and all line alarms are cleared.

When you bring up a line, the switch starts monitoring the line. The AXSM port status light is green when physical layer communications are established with a remote switch. If physical layer communications problems are detected, the port status light turns red, and alarms are reported.



### Note

APS protection lines for intracard redundancy should be left down. APS automatically brings up each line at the appropriate time. For general information on APS line redundancy, see “[Planning for Card and Line Redundancy](#),” in [Chapter 1, “Preparing for Configuration](#).” For information on configuring APS lines, see “[Establishing Redundancy Between Two Lines with APS](#),” which appears later in this chapter.



### Tips

To minimize the number of alarms and failed port status lamps (which display red), keep lines down until they are ready for operation.

To bring up a line on the switch, use the following procedure.

**Step 1** Establish a configuration session using a user name with GROUP1 privileges or higher.

**Step 2** Select the card on which you want to bring up a line with the **cc** command:

```
mgx8850a.7.PXM.a > cc <slotnumber>
```

Replace *<slotnumber>* with the number of the slot in which the AXSM card is installed. Valid slot numbers are from 1 to 6 and 9 to 14. Verify your card selection by viewing the switch prompt, which should list the slot number and the AXSM card type.

**Step 3** Enter the **upln** command after the switch prompt:

```
mgx8850a.10.AXSM.a > upln <bay.line>
```

Replace *<bay>* with 1 if the line is connected to a back card in the upper bay, or replace it with 2 if the line is connected to a back card in the lower bay. Replace *<line>* with the number that corresponds to the back card port to which the line is connected. [Table 3-1](#) lists the valid bay numbers and line numbers for each AXSM card. [Figure 3-1](#) illustrates the bay and line numbers used on the MGX 8850 and MGX 8950 switches.

**Table 3-1 AXSM Card Types**

Front Card	Valid Line Numbers	Valid Bay Numbers
AXSM-16-T1E1-E	1 to 16	1, 2
AXSM-16-T3E3 AXSM-16-T3E3/B	1 to 8	1, 2
AXSM-16-T3E3-E	1 to 8	1, 2
AXSM-8-155-E	1 to 4	1, 2

**Table 3-1 AXSM Card Types (continued)**

Front Card	Valid Line Numbers	Valid Bay Numbers
AXSM-16-155 AXSM-16-155/B	1 to 8	1, 2
AXSM-2-622-E	1 to 1	1, 2
AXSM-4-622 AXSM-4-622/B	1 to 4	1, 2
AXSM-1-2488 AXSM-1-2488/B	1	1

**Step 4** Enter the following command:

```
8850_NY.7.PXM.a > dsp1ns
```

The line state column shows whether each line is up or down as shown in the following example:

```
8850_NY.7.PXM.a > dsp1ns
```

```

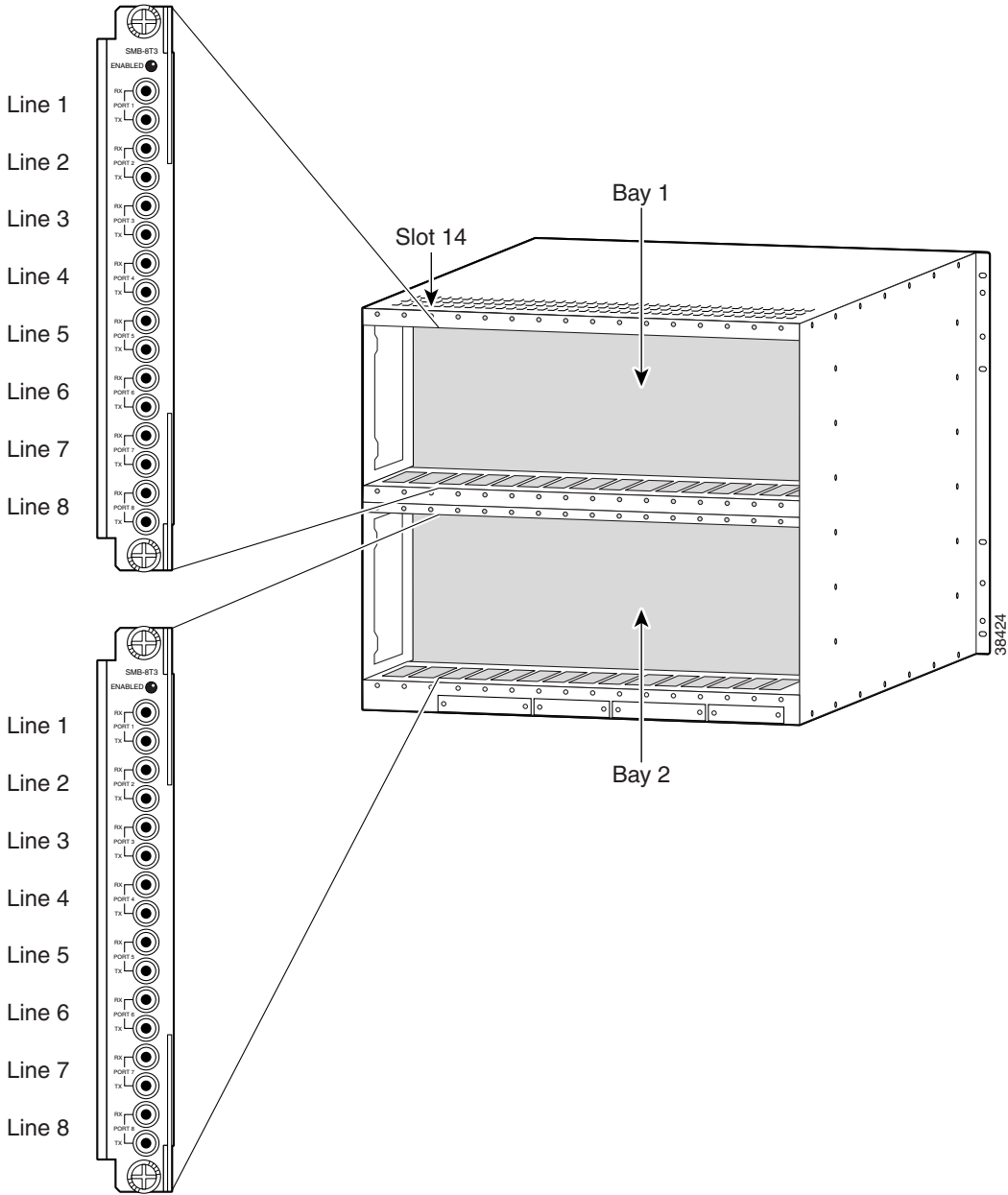
Sonet Line Line Line Frame Medium Medium
Line State Type Lpbk Scramble Line Line Alarm APS
-----
1.1 Up sonetSts12c NoLoop Enable Other ShortSMF Clear Disable
1.2 Up sonetSts12c NoLoop Enable Other ShortSMF Clear Disable
2.1 Up sonetSts12c NoLoop Enable Other ShortSMF Clear Disable
2.2 Up sonetSts12c NoLoop Enable Other ShortSMF Clear Disable

```

The line state, which is either Up or Down, represents the administrative intent for the line. For example, a line is reported as Down until an administrator brings up the line. Once the administrator brings up the line, the line state remains Up until the administrator brings the line down with the **dnln** command).

The alarm state indicates whether the line is communicating with a remote switch. When the alarm state is reported as Clear, the physical devices at each end of the line have established physical layer communications. ATM connectivity is established later when interfaces or ports are configured on the line.

Figure 3-1 Bay and Line Numbers



## Configuring SONET Lines

All line types are brought up with a default configuration. When configuring trunks between two MGX 8850 or MGX 8950 switches, you may be able to accept the defaults for each switch and thus minimize configuration time. When configuring a line to another type of device, ensure that both devices are using the same configuration parameters on the shared line.

At the physical communications level, you can configure the following options for SONET lines:

- Line type
- Line clock source

The following procedure describes how to configure SONET lines.

- 
- Step 1** Establish a configuration session using a user name with GROUP1 privileges or higher.
- Step 2** If you do not know the line number you want to configure, enter the **dsplns** command to display a list of the lines:

```
8850_NY.1.AXSM.a > dsplns
```

Remember that you cannot configure a line until you have brought it up as described in the previous section, “[Bringing Up Lines](#).”

- Step 3** To display the configuration for a line, enter the **dspln** command. For example:

```
8850_NY.1.AXSM.a > dspln -sonet 1.2
Line Number           : 1.2
Admin Status          : Up
Alarm Status          : Critical
Loopback              : NoLoop
APS enabled           : Disable
Frame Scrambling     : Enable
Number of ports      : 1
Xmt Clock source     : localTiming
Number of partitions : 1
Line Type            : sonetSts12c
Number of SPVC       : 1
Medium Type(SONET/SDH) : SONET
Number of SPVP       : 0
Medium Time Elapsed  : 528464
Number of SVC        : 0
Medium Valid Intervals : 96
Medium Line Type     : ShortSMF
```

For more information, see “[Verifying Line Configuration](#),” which appears later in this chapter.

- Step 4** To configure a SONET line, enter the following commands:

```
8850_NY.1.AXSM.a > cnfln -sonet <bay.line> -slt <LineType> -clk <clockSource>
```

[Table 3-2](#) lists the parameter descriptions for configuring SONET, DS3 and E3 lines. Be sure to use only the parameters listed for SONET lines.

- Step 5** To verify your configuration changes, enter the **dspln** command.
-

Table 3-2 Parameters for *cnfln* Command

Parameter	Line Types Supported	Description
<i>AIScBitsCheck</i>	T3	The <b>-cb</b> option defines C-bit checking. Set <i>&lt;AIScBitsCheck&gt;</i> to <b>1</b> to enable C-bit checking. Set it to <b>2</b> to ignore the C-bit.
<i>bay.line</i>	T3 E3 SONET	Replace <i>bay</i> with <b>1</b> if the line is connected to a back card in the upper bay, or replace it with <b>2</b> if the line is connected to a back card in the lower bay.  Replace <i>line</i> with the number that corresponds to the back card port to which the line is connected. <a href="#">Table 3-1</a> lists the valid line numbers for each AXSM card.
<i>clockSource</i>	T3 E3 SONET	The <b>-clk</b> option selects the source timing for transmitting messages over the line. Replace <i>&lt;clockSource&gt;</i> with <b>1</b> to use the clock signal received over this line from a remote node, or specify <b>2</b> to use the local timing defined for the local switch. For information on defining the clock source for the local switch, see <a href="#">“Managing Network Clock Sources”</a> in <a href="#">Chapter 7, “Switch Operating Procedures.”</a>
<i>LineLength</i>	T3 E3	The <b>-len</b> option specifies the length of a T3 line from the local node to a remote node in meters. Enter a value from 0 to 64000 meters.
<i>LineType</i>	SONET	Enter <b>-slt 1</b> for SONET or <b>-slt 2</b> for SDH.
<i>LineType</i>	T3	Enter <b>-lt 1</b> for ds3cbitadm or <b>-lt 2</b> for ds3cbitplcp.
<i>OOFCriteria</i>	T3	Out of Frame (OOF) alarm criteria. Replace <i>&lt;OOFCriteria&gt;</i> with <b>1</b> to select 3 out of 8 and <b>2</b> to select 3 out of 16.
<i>RcvFEACValidation</i>	T3	Replace <i>&lt;RcvFEACValidation&gt;</i> with <b>1</b> to select 4 out of 5 and <b>2</b> to select 8 out of 10.

## Turning Down a SONET Line

Use the **dnln** command to turn down a SONET line. Before you execute this command, make sure that you have deleted all connections, partitions, or ports on that line. In the following example, the user turns down the physical line 1 on an AXSM lower back card.

```
8850_NY.1.AXSM.a > dnln 1.2
```

## Configuring T3 Lines

All line types are brought up with a default configuration. When configuring trunks between two MGX 8850 or MGX 8950 switches, you may be able to accept the defaults for each switch and thus minimize configuration time. When configuring a line to another type of device, ensure that both devices are using the same configuration parameters on the shared line.

At the physical communications level, you can configure the following options for DS3 lines:

- Line type
- Line length (distance in meters)
- C-bit checking
- Line clock source
- Out of Frame alarm criteria
- RcvFEACValidation

The following procedure describes how to configure T3 lines.

---

**Step 1** Establish a configuration session using a user name with GROUP1 privileges or higher.

**Step 2** If you do not know the line number you want to configure, enter the **dsplns** command to display a list of the lines:

```
8850_LA.3.AXSM.a > dsplns
```

Remember that you cannot configure a line until you have brought it up as described in the previous section, “[Bringing Up Lines](#).”

**Step 3** To display the configuration for a line, enter the **dspln** command. For example:

```
8850_LA.3.AXSM.a > dspln -ds3 1.1
Line Number           : 1.1
Admin Status          : Up
Line Type              : ds3cbitm
Line Coding            : ds3B3ZS
Line Length(meters)   : 0
OOFCriteria           : 3Of8Bits
AIS c-Bits Check      : Check
Loopback              : NoLoop
Xmt. Clock source     : localTiming
Rcv FEAC Validation   : 4 out of 5 FEAC codes
Alarm Status          : Clear
Number of ports       : 1
Number of partitions  : 0
Number of SPVC        : 0
Number of SPVP        : 0
Number of SVC         : 0
```

For more information, see “[Verifying Line Configuration](#),” which appears later in this chapter.

**Step 4** To configure a T3 line, enter the following command:

```
8850_LA.3.AXSM.a > cnfln -ds3 <bay.line> -len <LineLength> -clk <clockSource>
-lt <LineType> -oof <OOFCriteria> -cb <AIScBitsCheck> -rfeac <RcvFEACValidation>
```

[Table 3-2](#) lists the parameter descriptions for configuring SONET, T3 and E3 lines. Be sure to use only the parameters listed for T3 lines.

**Step 5** To verify your configuration changes, enter the **dspln** command.

---

## Configuring E3 Lines

All line types are brought up with a default configuration. When configuring trunks between two MGX 8850 or MGX 8950 switches, you may be able to accept the defaults for each switch and thus minimize configuration time. When configuring a line to another type of device, ensure that both devices are using the same configuration parameters on the shared line.

At the physical communications level, you can configure the following options for E3 lines:

- Line length (distance in meters)
- Line clock source

The following procedure describes how to configure E3 lines.

- 
- Step 1** Establish a configuration session using a user name with GROUP1 privileges or higher.
- Step 2** If you do not know the line number you want to configure, enter the **dsplns** command to display a list of the lines.
- Step 3** To verify your configuration changes, enter the **dspln** command.
- ```
8850_LA.4.AXSM.a > dsplns
```
- Remember that you cannot configure a line until you have brought it up as described in the previous section, “[Bringing Up Lines](#).”
- Step 4** To configure an E3 line, enter the following command:
- ```
8850_LA.4.AXSM.a > cnfln -ds3 <bay.line> -len <LineLength> -clk <clockSource>
```
- [Table 3-2](#) lists the parameter descriptions for configuring SONET, DS3 and E3 lines. Be sure to use only the parameters listed for E3 lines.
- Step 5** To verify your configuration changes, enter the **dspln** command.
- 

## Verifying Line Configuration

To display the configuration of a line, use the following procedure.

- 
- Step 1** Establish a CLI management session at any user access level.
- Step 2** If you do not know the line number you want to view, display a list of the lines by entering the following command:
- ```
mgx8850a.10.AXSM.a > dsplns
```
- Step 3** To display the configuration of a single line, enter the following command:
- ```
mgx8850a.10.AXSM.a > dspln -type <bay.line>
```

[Table 3-3](#) describes the command parameters. The line configuration appears as follows:

```
pop2one.10.AXSM.a > dspln -sonet 2.1
Line Number           : 2.1
Admin Status          : Up
Alarm Status          : Clear
Loopback              : NoLoop
APS enabled           : Disable
Frame Scrambling      : Enable
Number of ports       : 1
Xmt Clock source      : localTiming
Number of partitions  : 1
```

```

Line Type           : sonetSts12c           Number of SPVC      : 0
Medium Type (SONET/SDH) : SONET           Number of SVC       : 4
Medium Time Elapsed  : 248198
Medium Valid Intervals : 96
Medium Line Type     : ShortSMF

```

**Table 3-3** *dspln Command Parameters*

Parameter	Description
<i>type</i>	The parameter specifies the type of line that is connected to the switch. Replace <i>&lt;type&gt;</i> with <b>-sonet</b> or <b>-ds3</b> . The <b>-ds3</b> option works for DS3 and E3 lines.
<i>bay</i>	Replace <i>&lt;bay&gt;</i> with <b>1</b> if the line is connected to a back card in the upper bay, or replace it with <b>2</b> if the line is connected to a back card in the lower bay.
<i>line</i>	Replace <i>&lt;line&gt;</i> with the number that corresponds to the back card port to which the line is connected. <a href="#">Table 3-1</a> lists the valid line numbers for each AXSM card.

## Establishing Redundancy Between Two Lines with APS

The switch supports two types of line redundancy:

- Intracard redundancy, where the working and protection lines are connected to the same card
- Intercard redundancy, where the working line is connected to the primary card, and the protection line is connected to the secondary card

The following sections describe how to add redundancy for these types of APS lines.

### Adding Intracard APS Lines

To establish redundancy between two lines on the same card, use the following procedure.

- Step 1** Establish a configuration session using a user name with GROUP1\_GP privileges or higher.
- Step 2** If you have not done so already, bring up the working line as described in “[Bringing Up Lines](#),” which appears earlier in this chapter.
- Step 3** Enter the **addapsln** command as follows:

```
pop20two.1.AXSM.a > addapsln <workingIndex> <protectIndex> <archmode>
```

Replace *<workingIndex>* with the location of the working line using the format “slot.bay.line.” For example, to specify the line on card 2, bay 1, line 2, enter 2.1.2.

Replace *<protectIndex>* with the location of the protection line, using the same format used for the working line.



**Note** For intracard redundancy, the working index and protection index must specify ports on the same card, so the slot number will always match.

Replace *<archmode>* with the option number that selects the automatic protection switching (APS) architecture mode you want to use. Table 3-4 shows the option numbers and the architecture modes they select.

**Table 3-4 APS Line Architecture Modes**

Option	Description
1	Selects 1+1 signaling (transmission on both working and protect lines) for intracard APS.
2	Selects 1:1 signaling (transmission on either the working line or the protect line) for intracard APS. <b>Note</b> Intracard APS 1:1 is not supported on AXSM-8-155/B, AXSM-4-622/B, and AXSM-1-2488/B cards.
3	Selects G.783, Annex B 1+1 signaling. This option is not supported in this release.
4	Selects y cable 1+1 signaling without k1 and k2.
5	Selects y cable 1+1 signaling without k1 and k2.

The following example shows assigns 1+1 APS redundancy to two lines on the same card:

```
pop20one.9.AXSM.a > addapsln 9.2.1 9.2.2 1
```

- Step 4** To display a list of all the APS lines on an AXSM card, enter the **dspapslns** command on the active AXSM card.
- Step 5** To display information on a specific APS line, enter the **dspapsln <slot.bay.line>** command on the active AXSM card.

For information on managing redundant APS lines, refer to “[Managing Redundant APS Lines](#),” in [Chapter 7, “Switch Operating Procedures.”](#)

## Adding Intercard APS Lines

To establish redundancy between two lines on different cards, use the following procedure.



**Note**

For intercard APS to operate properly, an APS connector must be installed between the two cards. For more information in the APS connector and how to install it, refer to either the *Cisco MGX 8850 Routing Switch Hardware Installation Guide* or the *Cisco MGX 8950 Routing Switch Hardware Installation Guide*.



**Note**

APS is not supported on AXSM-1-2488/B cards. For the AXSM-16-155/B and AXSM-4-622/B front cards, you must use /B version back cards. You can use an AXSM front card and back card in one slot and configure redundancy with an AXSM/B front card and AXSM/B back card in another slot. The switch supports APS when the front and back cards are the same revision.

- Step 1** Establish a configuration session using a user name with GROUP1\_GP privileges or higher.
- Step 2** If you have not done so already, add card redundancy as described in “[Establishing Redundancy Between Two AXSM Cards](#).”
- Step 3** If you have not done so already, bring up the working and protection lines as described in “[Bringing Up Lines](#).”
- Step 4** Verify that an APS connector is installed between the cards that host the working and protection lines by entering the **dspapsbkplane** command.
- Step 5** Enter the **addapsln** command as follows:

```
pop20one.7.PXM.a > addapsln <workingIndex> <protectIndex> <archmode>
```

Replace *<workingIndex>* with the location of the working line using the format slot.bay.line. For example, to specify the line on card 2, bay 1, line 2, enter 2.1.2.

Replace *<protectIndex>* with the location of the protection line, using the same format used for the working line.



**Note** For intercard redundancy, the working index and protection index must specify ports on different cards. Also, the working line index must identify a line on the primary card.

Replace *<archmode>* with an option number that defines the type of line redundancy you want to use. [Table 3-4](#) shows the option numbers and the types of redundancy they select.

The following example shows assigns 1+1 APS redundancy to lines on different cards:

```
pop20one.1.AXSM.a > addapsln 1.1.2 2.1.2 1
```

- Step 6** Enter the **dspapsbkplane** command on both the standby and active cards to verify that the APS connector is installed properly.



**Note** This command can show different values for each of the two cards, which indicates the APS connector is seated properly on one card, but not on the other.

- Step 7** To display the a list of all the APS lines on an AXSM card, enter the **dspapslns** command. For information on managing redundant APS lines, refer to “[Managing Redundant APS Lines](#),” in [Chapter 7, “Switch Operating Procedures.”](#)

