



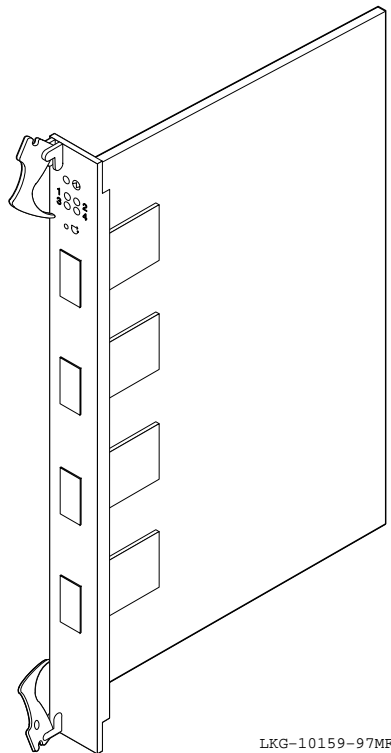
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**DIGITAL ATM 4-Port Modular Line Card  
DAGGL-BC  
June 1998**

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This document contains information critical to the use of the DIGITAL ATM 4-port modular line card (DAGGL-BC) with ports that support ATM modular PHY (modPHY) cards. Read your system documentation and this document before installing and using this line card for your connections.

**Figure 1: DIGITAL ATM 4-Port Modular Line Card (DAGGL-BC)**



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**CAUTION**

Static electricity can damage modules and electronic components. DIGITAL recommends using a grounded antistatic wrist strap and a grounded work surface when handling any modules.

## Description

The DAGGL-BC is a logic module that supports the following ATM modPHY cards:

- STS-3c (155 Mb/s) multimode fiber (MMF), DAGGM-AA
- STS-3c (155 Mb/s) single-mode fiber (SMF), DAGGS-AA
- STS-3c (155 Mb/s) unshielded twisted-pair (UTP) or STS-3c (155 Mb/s) screened twisted-pair (ScTP), DAGGU-AA
- T3 (44 Mb/s) coaxial, DAGGT-AA
- E3 (34 Mb/s) coaxial, DAGGE-AA
- E1 (2 Mb/s) short reach twisted-pair (TP), DAGE1-AA
- T1 (1.54 Mb/s) short reach twisted-pair (TP), DAGT1-AA
- ATM VP Traffic shaper card, DAGVP-AA for wide-area networking features

The line card performs ATM cell-forwarding functions among a set of connected ATM links. This line card implements four ports using the supported links provided by the ATM modPHY cards and connects these ports to the crossbar module. Refer to *DIGITAL ATM Modular PHY Cards Installation* for more information about the installation and use of ATM modPHY cards.

## Supported Firmware Versions

The line card requires firmware V2.7 release as a minimum.

### NOTE

To use firmware V2.7, your master line card *must* have one of the expanded memory options installed as described in *Installing the Expanded Memory Option* on page 6.

Check the firmware release notes to make sure that you have the latest versions of the line card images and CMM firmware (at least Version 1.92).

### NOTE

You must have CMM Version 1.92 (as a minimum) to use this firmware.

After connecting to the master line card, check the versions of the kernel and the application image using the `versions` command to determine whether a firmware upgrade is necessary.

New versions of software images for the GIGAswitch/ATM system are available on the Internet from the DIGITAL FTP site (<ftp.digital.com>). The `/pub/DEC/GIGAswitchATM` directory contains the latest release information for the GIGAswitch/ATM firmware. The `READ_ME.TXT` file in the above directory contains pointers to the latest software images and firmware release notes.

## Installing the Line Card

To install or remove the line card, follow the instructions for installing or replacing logic modules as described in your system's Installation and Service manual. That document provides you with information about the proper slot positions for the line cards, including the master line card.

Before installing the line card in your system, install the power module that you need to use as described in Installing the DC-to-DC Power Module on page 8.

## Testing the Line Card

This section helps you evaluate the results of the module self-test (MST) by identifying each light-emitting diode (LED) and describing its purpose.

Each line card contains two sets of LEDs. The LED at the top of the module is called the Module LED, the four LEDs below the Module LED (labeled 1 through 4) are called Link LEDs, and the two LEDs below each port are called Physical layer (PHY) LEDs.

The PHY LEDs display Physical layer information. Refer to *DIGITAL ATM Modular PHY Cards Installation* for information about the PHY LEDs.

The Module LED (topmost LED) displays the mode for the Link LEDs. When the Module LED is green, the four Link LEDs display the status of the lines and the type of end node (an ATM end node [UNI] or an ATM switch [NNI]) connected at the remote end. The end node information (switch versus end node) is intended to help the system manager connect cables. When the Module LED is amber, the four Link LEDs display information about self-test failures that occur when booting the line cards.

During switch initialization, the Module and Link LEDs indicate the progress of the loading procedure for the Flash and RAM with the following sequence:

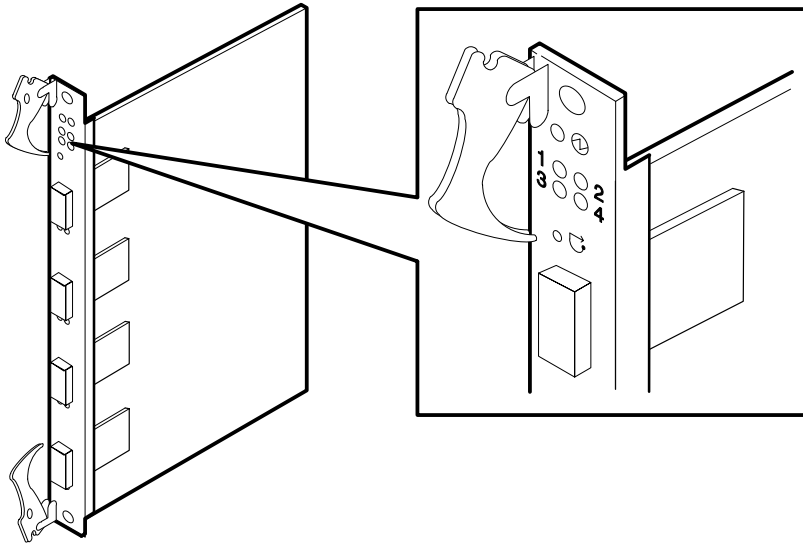
- 1 The Module LED turns amber when power is applied to the module.
- 2 The Module LED flashes green to indicate that the firmware is loading.
- 3 The Module LED flashes amber to indicate that the diagnostics are running.
- 4 The Module LED turns solid green to indicate that the firmware is executing or solid amber to indicate that an error has occurred.

The transmit line uses the upper fiber receptacle and the receive line uses the lower fiber receptacle of each port.

You can perform a simple loopback test for the ports on a line card by connecting a fiber-optic cable between two ports to see whether the left LEDs below the connected ports light up. For example, if you want to test the top two ports (1 and 2), connect the transmit line (the upper line of the port) of port 1 to the receive line (the lower line of the port) of port 2. Then, attach the receive line of port 1 to the transmit line of port 2. When you make the first connection, the LED for port 1 should light up as an indicator. When you make the second connection, the LED for port 2 should light up as an indicator.

Figure 2 shows the LEDs and Table 1 describes the meaning of each LED condition for the 4-port modular line card.

**Figure 2: LEDs for 4-Port Modular Line Card**



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**Table 1: LED Conditions**

LED Condition	Meaning
The topmost or Module LED displays the mode for the four Link LEDs as follows:	
Off	Module is powered down.
Flashing green	System initialization is in progress. The four Link LEDs display the progress of the firmware load as described in Table 2.
Flashing amber	Self-test is in progress.
Green	Self-test completed successfully. The four Link LEDs display the type of line, one for each port.
Amber	Self-test has completed and an error was detected. The four Link LEDs display diagnostic codes as described in the Using the Diagnostic LEDs section of this document.
If the Module LED is green, the Link LEDs display the following information for each line:	
Flashing green	Testing is in progress; Receive signal is present.
Solid green	Testing has completed; Receive and Transmit signals are synchronized. Line error rate is less than the threshold.
Flashing amber	Suspected remote end node is a DIGITAL switch; testing is in progress to confirm. If a loopback cable is connected between two ports on the same switch, the LEDs stay flashing amber.
Solid amber	Established that remote end is a DIGITAL switch (other than itself).

When the Module LED flashes green, it indicates that the line card is loading firmware. The four Link LEDs indicate the load progress as described in Table 2.

**Table 2: LED Indications of Firmware Load Progress**

LED 1	LED 2	LED 3	LED 4	Condition
Amber	Off	Off	Off	Bootp request timed out and response was not received.
Green	Off	Off	Off	Bootp successful and response was received.
Green	Amber	Off	Off	Kernel image download was attempted and failed.
Green	Green	Off	Off	Kernel image download succeeded.
Green	Green	Amber	Off	Application image download was attempted and failed.
Green	Green	Green	Off	Application image download succeeded.
Green	Green	Green	Amber	Decompression of application image to RAM failed; application image version does not match kernel version.
Green	Green	Green	Green	Application image has loaded from Flash to RAM.

After all the Link LEDs turn green to indicate that the application image has loaded from the Flash to the RAM, application initialization starts. The Module LED turns green and the remaining four LEDs turn off. After the application initialization is complete, the Module LED stays green and the Link LEDs indicate the link status described in Table 1.

## Using the Diagnostic LEDs

When the Module LED is amber, the four Link LEDs are used to report self-test failures when booting the line cards. The Link LEDs indicate the failures listed in Table 3.

**Table 3: LED Indications for Diagnostics**

<b>LED 1</b>	<b>LED 2</b>	<b>LED 3</b>	<b>LED 4</b>	<b>Condition</b>
Off	Off	Amber	Off	Boot ROM corrupted
Off	Amber	Off	Amber	Problem with Line 1
Off	Amber	Off	Green	Problem with Line 2
Off	Amber	Amber	Off	Problem with Line 3
Off	Amber	Amber	Amber	Problem with Line 4
Off	Off	Off	Amber	CPU fail 1
Off	Off	Off	Green	CPU fail 2
Off	Off	Amber	Amber	RAM fail
Off	Off	Green	Off	Bad UART 1
Off	Off	Green	Amber	Bad UART 2
Off	Off	Green	Green	Ethernet problem
Amber	Off	Amber	Amber	Xilinx load failed
Amber	Amber	Off	Off	Queue RAM failed
Amber	Amber	Off	Amber	Queue RAM failed
Amber	Amber	Off	Green	Cell RAM failed
Amber	Green	Off	Off	Credit RAM fail 1
Green	Off	Off	Amber	Credit RAM fail 2
Green	Off	Off	Green	Front unit load failed

## Installing the Expanded Memory Option

If you wish to expand your memory (DRAM), you can install the small outline double in-line memory module (SODIMM) option. (DAGME-AB is the 16 MB option.)

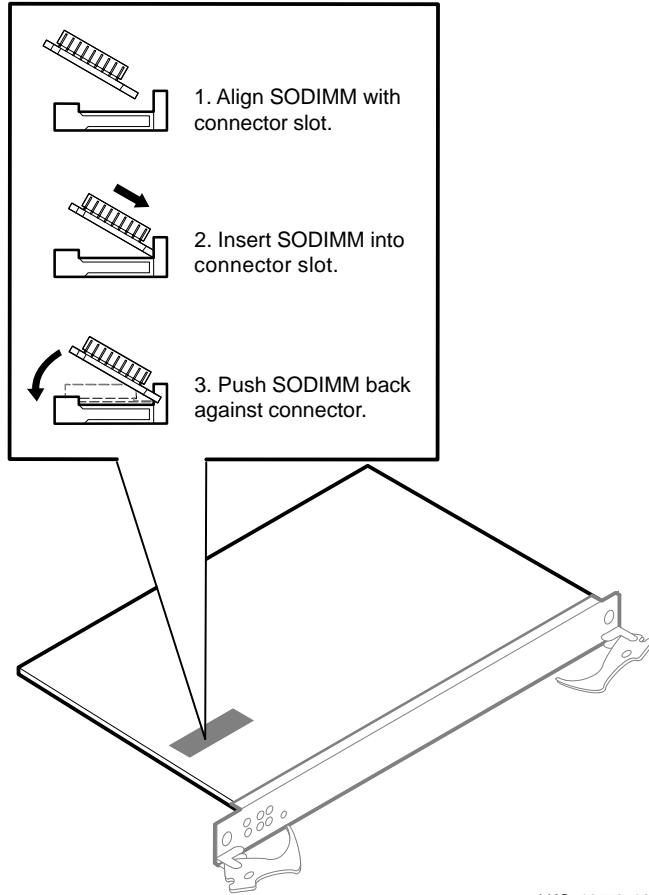
Refer to Figure 3 and the following steps to install either option.

- 1** Install the SODIMM into the socket at a 45-degree angle. Be sure that the notch on the SODIMM is positioned correctly. The notch should match up with the upper left corner of the socket on the module.
- 2** Push the SODIMM gently into the socket until it is seated evenly in the bottom of the socket.
- 3** Press the SODIMM down until the retaining clips on both sides of the socket engage.

### NOTE

Use care when installing SODIMMs. The retaining clips on the sockets break easily if the SODIMM is not seated correctly in the socket.

**Figure 3: Installing the Expanded Memory Option**



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## Removing the Expanded Memory Option

Follow these steps to remove the SODIMMs:

- 1** Press the retaining clips on both sides of the socket toward each other to disengage the SODIMM.
- 2** Pull the SODIMM gently out of the socket.

## Installing the DC-to-DC Power Module

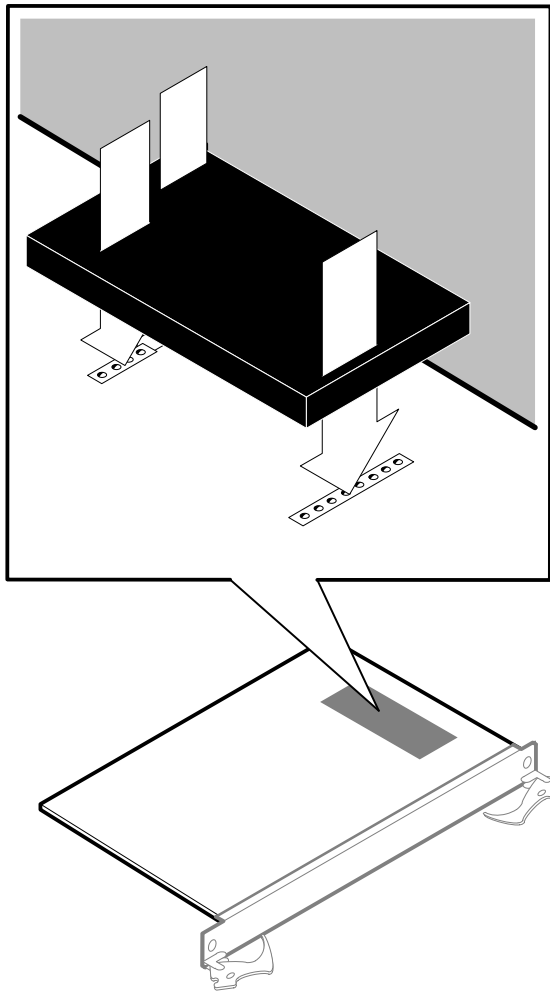
The line card uses one of two power modules, depending on the system that you are installing it in. Line cards used in the GIGAswitch/ATM 14-slot system must have the 48 V option (DAGPL-AB). Line cards used in the GIGAswitch/ATM 5-slot system must have the 5 V option (DAGPL-AA). Refer to Figure 4 (which shows the 48 V option) and follow these steps to install either power module:

- 1 Align the pins on the power module with the mating sockets on the line card. The DAGPL-AB option has one end with seven pins that are closer to the front of the line card. The DAGPL-AA option has one end with a pin offset from the others that is closer to the front of the line card.
- 2 Press the power module firmly into place while supporting the line card.

### NOTE

Be careful not to damage surrounding components when installing these power modules.

**Figure 4: Installing the DC-to-DC Power Module**



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## Removing the 48 V Power Module Option

Follow these steps to remove the 48 V power module option (DAGPL-AB):

- 1 Carefully place a thin flat blade screwdriver between the power module and the line card on the inner edge of one set of pins.
- 2 GENTLY insert the screwdriver without touching the line card surface so that the power module is eased away from the line card.

### NOTE

Do not insert the screwdriver more than 2.54 cm (1 in).

- 3 Repeat steps 1 and 2 for the other set of pins.
- 4 Gently pull the power module off the line card.

## Removing the 5 V Power Module Option

Follow these steps to remove the 5 V power module option (DAGPL-AA):

- 1 Carefully grasp the edges of the power module.
- 2 GENTLY pull the power module off the line card.

## For More Information

Refer to the *DIGITAL GIGAswitch/ATM System Installation and Service* document for safety, product specification, and regulatory information. This information is also available from the DIGITAL Network Products Home Page on the World Wide Web. It can be reached from different geographic locations using the following URLs:

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Americas	<a href="http://www.networks.digital.com/">http://www.networks.digital.com/</a>
Europe	<a href="http://www.networks.europe.digital.com/">http://www.networks.europe.digital.com/</a>
Asia Pacific	<a href="http://www.networks.digital.com.au">http://www.networks.digital.com.au</a>

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