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Issue 1 - May 1997

Installation and Operation

SpectraComm ISDN PRI Card

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Preface

Scope

This manual documents the SpectraComm PRI card, manufactured by General DataComm Industries, Inc. The card performs D-Channel signalling so that a SpectraComm 5001 Line Terminating Unit can be connected to a Primary Rate ISDN (PRI) line.

The manual is written for installers, service technicians, and users. It assumes a working knowledge of ISDN transmission service and GDC SpectraComm 5000 system components.

Revision History

This is the first issue of the manual.

Organization

This manual has three chapters and one appendix. The information is arranged as follows:

- *Chapter 1 - Introduction* describes the SC PRI card, its features, and its options. This chapter contains the Equipment List table.
- *Chapter 2 - Installation* provides directions for installing the SC PRI card in a SpectraComm Shelf and for performing configuration by means of AT commands.
- *Chapter 3 - Operation* describes the SC PRI card front panel indicators and AT commands that can be used to display information about the unit.
- *Appendix A - Technical Characteristics*

Document Conventions

Level 1 paragraph headers introduce major topics.

Level 2 paragraph headers introduce subsections of major topics.

Level 3 paragraph headers introduce subsections of secondary topics.

This typewriter font shows output that is displayed on the screen.



Notes present special instructions, helpful hints or general rules.

Related Publications

The following documents have additional information that may be helpful when using this product:

- *GDC SC 5001 Line Terminating Unit Installation and Operation* GDC 032R101-000
- *GDC SC 5034 Data Set Emulator Installation and Operation* GDC 076R106-000

GDC publication numbers (e.g., *GDC 032R101-000*) are used to track and order technical manuals. Publication numbers use the following format:

GDC NNNRnnn-000 or GDC NNNRnnn-Vnnn

- NNN identifies the product family (e.g. SC 5000)
- R denotes a technical publication
- nnn a number assigned by Technical Publications
- 000 identifies a hardware product and does not change

The Issue Number changes when a hardware manual is revised.

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- in the U.S. dial 1-800-243-1030
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Be ready with the site name and phone number, and a description of the problem. The next available support representative will promptly return your call.

Hands-on training courses are provided by GDC Educational Services. Courses range from basic data communications, modems and multiplexers, to complex network and ATM systems and are taught in Connecticut or at a customer location. To discuss educational services or receive a course schedule, call 1-800-243-1030 and follow the menu instructions.

Safety Instructions

Antistatic Precautions

Electrostatic discharge (ESD) results from the buildup of static electricity and can cause computer components to fail. Electrostatic discharge occurs when a person whose body contains a static buildup touches a computer component.

The equipment may contain static-sensitive devices that are easily damaged, so proper handling and grounding are essential. Use ESD precautionary measures when installing parts or cards, and keep the parts and cards in antistatic packaging when not in use. If possible, use antistatic floor pads and workbench pads.

When handling components or setting switch options always use an antistatic wrist strap connected to a grounded equipment frame or chassis. *If a wrist strap is not available, periodically touch an unpainted metal surface on the equipment.* Never use a conductive tool, such as a screwdriver or a paper clip, to set switches.

Safety Guidelines

The following symbols are used in this manual to draw your attention to potential hazards. A Caution indicates a hazard to equipment or data. A Warning indicates a hazard to personnel.



Caution statements identify conditions or practices that can result in damage to the equipment or in loss of data.



Warning statements identify conditions or practices that can result in personal injury or loss of life.

Always use caution and common sense. *To reduce the risk of electrical shock, do not operate any equipment with the cover removed.* Repairs must be performed by qualified service personnel only.

Glossary of Terms

Backplane Data Highway

High speed bus built into the SpectraComm Shelf backplane to support the exchange of data and timing signals between a line terminating unit and its group of data set emulators. The backplane contains four data highways. Two backplanes, and their data highways, can be connected by daisy-chain cables so that a total of 32 shelf slots are supported.

Data Set Emulator (DSE)

Term for the units in the SpectraComm 5000 system that provide DTE interface functions. Each DSE is designed to be compatible with a GDC device that can be installed as a standalone unit at a remote site. An SC 5034 DSE, for example, is compatible with remote modems, particularly those that operate in V.34 mode.

Line Terminating Unit

Term for the unit in the SpectraComm 5000 system that provides T1 network interface functions.

1 Technical Overview

Introduction

This manual documents the SpectraComm PRI card, manufactured by General DataComm Industries, Inc. The card performs D-Channel signalling so that a SpectraComm 5001 Line Terminating Unit can be connected to a Primary Rate ISDN (PRI) line.

This chapter describes the SC PRI card's function and the system in which it operates.

Description

System Components

The SC PRI card functions in a system populated with three types of device:

- **PRI card** – performs signalling functions for switching; one per system
- **Line Terminating Unit (LTU)** – performs network interface functions; one or two per system
- **Data Set Emulator (DSE)** – performs DTE interface functions; a system with one LTU can support up to 23 DTE data channels, a system with two LTUs up to 47

The devices are all built on printed circuit (pc) cards that are housed in a SpectraComm shelf. The shelf consists of 16 card slots and a backplane that enables communication between the pc cards. The backplanes of two shelves can be connected by ribbon cables so the shelves function as a single unit with 32 card slots.

PC Card

The SC PRI card conforms to the GDC SpectraComm format. It is 7" x 9.5" (17.8 cm x 24.1 cm). The rear edge of the card is occupied by two sets of edge connector fingers, separated by a DB25 connector. The fingers connect the pc card to the backplane of the SpectraComm shelf. The DB25 connector is the interface for connection of a terminal by which you configure the SC PRI card. Figures in *Chapter 2, Installation*, illustrate the outline of the pc card and the position of external connections on the SpectraComm shelf backplane.

That chapter also describes how the SC PRI card and the other pc cards in its system must be arranged in the SpectraComm shelf.

The front panel of the SC PRI card contains six LED indicators. *Chapter 3, Operation*, fully describes the functions of the indicators.

Function

The **SC PRI card** provides D-Channel signaling for an Integrated Services Digital Network Primary Rate Interface line connected to an LTU. The PRI line consists of one D channel and 23 B channels. Signals on the D channel direct the switching of the B channels, which carry data. When the PRI card is installed in conjunction with one LTU it performs its signaling on DS0 24

of the ISDN PRI line connected to that LTU. DS0s 1 through 23 are available for B channels.

A single configuration command establishes the SC PRI card's compatibility with the ISDN switch in use at the service provider's Central Office. The card can function with switch types:

4ESS
5ESS
NT
NI2

The **SpectraComm 5001 Line Terminating Unit** is the LTU compatible with the SC PRI card. It conveys channel data for a group of DSEs installed with it in the SpectraComm shelf. The shelf backplane contains four data highways, each able to support the exchange of channel data between one LTU and its group of DSEs. A DSE's DTE interface functions emulate the operation of the unit at the far end of the link. Data highway traffic is divided into timeslots that are each equivalent to a DS0 at the network interface.

The PRI card uses timeslot 24 of its assigned data highway to exchange D channel data with the LTU and DS0 24 of the PRI line. The card monitors all timeslots of its data highway for dialling signals from the DSEs. The SC PRI card relates data highway timeslots to DS0s on a one-to-one basis, timeslot 1 to DS0 1 and so on.

When an inbound call seeks connection on a DS0, the PRI directs the ringing signal to the corresponding timeslot. Provisioning of incoming calls, whether through a common number or assigning an individual number for each DS0, has to be arranged with the service provider.

The **SpectraComm 5034 Data Set Emulator** is the one DSE currently compatible with the SC PRI card. An SC 5034 DSE is the equivalent of two V.34 modems. Its two modem channels, A and B, operate independently; each supports a DTE connection and requires a DS0 on the ISDN PRI line connected to the LTU.

The DSE modem channel can perform all the functions of a V.34 modem, placing and receiving calls on the switched network. Each B channel DS0 of the ISDN PRI line serves as the equivalent of a voice frequency (VF) line between the user site and the service provider switching office. The switching office directs each B channel individually to its destination. The D channel carries the equivalent of dialling and ringing signals for all of its B channels.

SC PRI Card Installed with Two LTUs

Multiple ISDN PRI lines can be provisioned, by arrangement with the service provider, to be controlled by a single, common D channel. The PRI card supports D channel signaling for two PRI lines connected to individual LTUs. All 24 DS0s of the second PRI line are available to carry data, so 47 B channels can be supported by one D channel. As in a one-LTU installation, the D channel occupies DS0 24 of the line connected to the first LTU.

AT Commands

Once installed and configured, the SC PRI card does not need operator intervention or attention. The configuration that it requires at the time of installation is performed by means of AT commands. The LTU(s) and DSEs installed in the shelf with the PRI card must also be configured and controlled by means of AT commands.

In addition to the configuration commands, the SC PRI card accepts a command (AT SS) that causes it to send a System Status display to the terminal that issues the command. The display identifies channels by their timeslot/DS0 numbers. *Chapter 3, Operation*, includes a table that correlates the DS0 numbers to shelf slots.

Installation Environment

A standard SpectraComm shelf provides individual back panel connectors for the cards installed in it. When the SC PRI card is installed in a standard shelf it accepts AT commands from a VT100-compatible ASCII terminal that you connect to the appropriate DB25 connector for its shelf slot.

In a Remote LAN Node (RLN) system, the SpectraComm shelf is equipped with a specialized back panel that facilitates DTE interface functions under the direction of an RLN server. An SC PRI card installed in an RLN system receives its AT commands by way of the RLN server. The RLN server can be configured to configure the PRI card automatically by means of an initialization string made up of AT commands.



In some applications LTUs and DSEs are installed in conjunction with a SpectraComm Manager (SCM) card that enables them to be configured and controlled by SNMP commands or terminal interface routines. The SCM card is not compatible with the SC PRI card, and it must not be present in a shelf (or pair of shelves) that contains a PRI card.

Table 1-1 Equipment List

| Description | GDC Part No. |
|-----------------|--------------|
| GDC SC PRI Card | 076P017-001 |

2 Installation

Overview

This chapter describes the installation of the SC PRI card.

The SC PRI card is shipped pre-assembled, tested, and ready to use. There are no hardware options to be set on the SC PRI card.

The normal procedure after unpacking the unit is simply to insert it in its intended shelf slot and perform the configuration described in this chapter.

The SC PRI card should be installed in a ventilated area where the ambient temperature does not exceed 122°F (50°C). Do not install the card above other equipment that generates large amounts of heat (e.g., power supplies).

SpectraComm Shelf

A rack-mountable SpectraComm Shelf can house up to 16 plug-ins. It fits into 19- and 23-inch wide equipment racks. The backplanes of two shelves can be linked by cables so that a total of 32 card slots function as though connected to the same backplane. There are positioning requirements that govern how the SC PRI card, the LTU, and the DSEs can be arranged in the shelf. The requirements are described below, under the heading **Shelf Layout**.

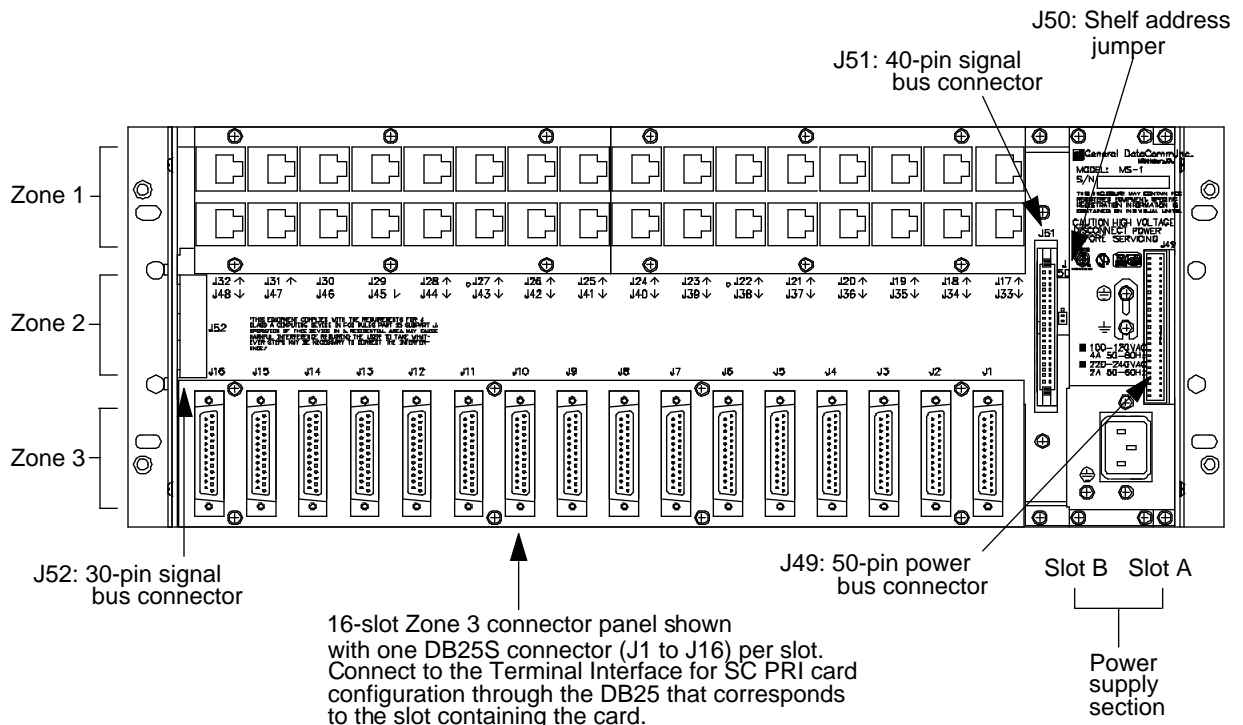


Figure 2-1 SpectraComm Shelf Back Panel

The shelf backplane contains four separate data highways. Each highway can support the transfer of data between one LTU and its DSEs. Traffic on a data highway is divided into assigned timeslots, each of which is equivalent to a DS0 at the LTU's network interface.

The shelf layout requirements are such that when the SC PRI card is to operate with two LTUs the system must occupy a pair of linked shelves. Each LTU occupies one shelf, which also holds the DSEs that are supported by the LTU. Components are divided between the two shelves in the following way:

- Shelf 1
 - SC PRI card
 - LTU responsible for supporting the D channel (D channel uses timeslot/DS0 24)
 - Up to 12 DSEs associated with that LTU (DSEs can use timeslots/DS0s 1 – 23)
- Shelf 2
 - LTU
 - Up to 12 DSEs associated with the second LTU (DSEs can use timeslots/DS0s 1 – 24)

Figure 2-1 shows the standard SpectraComm Shelf back panel. An SC PRI card employs only one back panel connector: the DB25 connector in Zone 3 serves as the DTE interface by which it receives AT commands.

Figure 2-2 shows the back panel of a SpectraComm Shelf equipped to hold the SpectraComm Remote LAN Node (RLN) system. The (get correct name) back panel distributes DTE interface signals to the components installed in the shelf slots, including the SC PRI card.

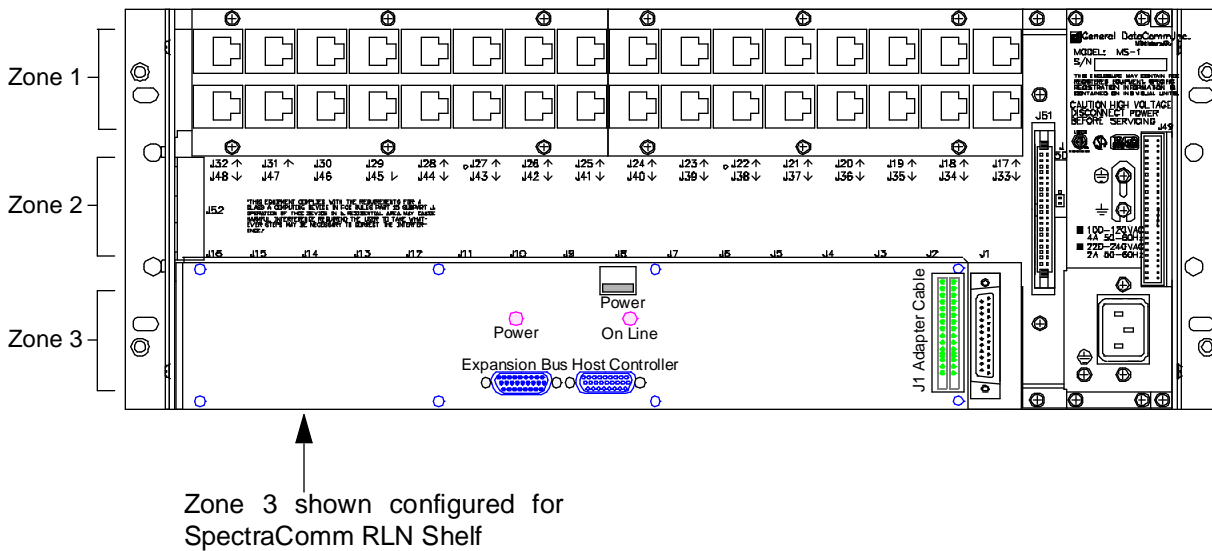


Figure 2-2 SpectraComm RLN System Shelf Back Panel

Unpacking and Handling

The SC PRI card is shipped enclosed in a corrugated box and protected by packing material. Inspect the SC PRI card when you receive it. Notify the shipper of any damage immediately.

Keep the box and packing material to use if you ever need to reship the SC PRI card.

Shelf Layout

The default configurations for the LTU(s) and DSEs require each LTU to occupy slot 16 of its shelf and the DSEs to be in slots 2 through 13. The SC PRI card should occupy slot 15 of the first shelf in the system. *Table 2-1* presents the component arrangements for the first and second shelves in a system. It also shows the timeslot/DS0 assignment for each card slot/channel in the shelves.

The default condition for the SC 5034 DSEs configures them to adopt data highway timeslot assignments determined by their physical location in the SpectraComm shelf. Timeslot/DS0 1, for example, is always channel A of the DSE in slot 2.

Table 2-1 Component Arrangement and Timeslot/DS0 Assignments – SpectraComm Shelves Used with the SC PRI Card

| Shelf Slot/DSE Channel | Timeslot/ DS0 |
|------------------------------------------|------------------|
| Slot 1 – to be left empty for RLN system | |
| Slot 2 – DSE Channel A | 1 |
| DSE Channel B | 2 |
| Slot 3 – DSE Channel A | 3 |
| DSE Channel B | 4 |
| Slot 4 – DSE Channel A | 5 |
| DSE Channel B | 6 |
| Slot 5 – DSE Channel A | 7 |
| DSE Channel B | 8 |
| Slot 6 – DSE Channel A | 9 |
| DSE Channel B | 10 |
| Slot 7 – DSE Channel A | 11 |
| DSE Channel B | 12 |
| Slot 8 – DSE Channel A | 13 |
| DSE Channel B | 14 |
| Slot 9 – DSE Channel A | 15 |
| DSE Channel B | 16 |
| Slot 10 – DSE Channel A | 17 |
| DSE Channel B | 18 |
| Slot 11 – DSE Channel A | 19 |
| DSE Channel B | 20 |
| Slot 12 – DSE Channel A | 21 |
| DSE Channel B | 22 |
| Slot 13 – DSE Channel A | 23 |
| DSE Channel B, Shelf 1 - unused | |
| DSE Channel B, Shelf 2 | 24 |
| Slot 14 – Empty | |
| Slot 15 – SC PRI card D-Channel, Shelf 1 | 24 |
| Empty, Shelf 2 | |
| Slot 16 – LTU | |

Power Up Sequence

The following events occur when the SC PRI card is inserted into the Spectracomm shelf:

1. The card automatically initiates a Power Up Test.
2. After completing the test successfully, the card monitors the timeslots of its assigned data highway(s) to identify which are in use.
3. The card establishes the D channel link with the ISDN service provider. For that purpose it uses timeslot 24 and DS0 24 of the highway it shares with the LTU in its shelf.
4. Based on the D channel signaling, the service provider's switch then provisions the data carrying B channels for the ISDN PRI line. The switch has to support a B channel for each active DSE modem channel.

You can verify that the SC PRI card is in good electrical working order by watching the front panel during the Power Up Test and the start-up of operation:

- All LEDs should light initially
- CI, RSP, and TM indicators then go out
- INS and ON indicators remain lit
- ALM indicator remains lit until the D channel is operational; blinks until all B channels are operational, then goes out.

Configuration

To configure the SC PRI card, connect a VT100-compatible terminal (or a computer running terminal emulation) to the DB-25 connector for its slot in the SpectraComm Shelf and follow the on-screen prompts.

The card's terminal port operates at 19.2 kbps asynchronous, and supports an 8/N/1 character format – 8 data bits, no parity, 1 stop bit.

There are four parameters that you must configure in the SC PRI card when you install it:

- Switch Type in use by the service provider supplying the ISDN PRI line. The card must be configured for compatibility with the switch type it exchanges D channel signaling with.
- Number of ISDN PRI lines the card is to support; either 1 or 2. Each line requires a separate LTU.
- Backplane data highway used by the LTU located in the same shelf with the SC PRI card. This is the LTU that supports the D channel for the SC PRI card on DS0 24. The card uses timeslot 24 to exchange D channel data with the LTU. The other 23 timeslots are available for B channel data.
- Backplane data highway used by the LTU located in the second shelf when the SC PRI card is configured to operate with two ISDN PRI lines. The LTU in the second shelf has all 24 DS0s and timeslots available for B channel data.

AT Commands

The SC PRI card accepts eleven AT commands. Six of those are configuration commands, three request displays from the card, and two relate to the function of downloading operating firmware to the card. *Table 2-3* lists the configuration commands, the values they accept, and their functions.

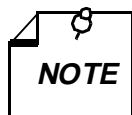
The functions of the other AT commands are described in *Chapter 3, Operation*.

AT commands can be input to the SC PRI card from a VT100-compatible terminal connected to

the Zone 3 DB25 connector for the card's shelf slot. When the card is installed as part of an RLN system the AT commands are directed to it through the RLN Access Server, using the Attachmate RLN Server software.

You can send the AT configuration commands to the SC PRI card in the form of an initialization string from the RLN manager or a command line from a terminal. Begin each initialization string or command line with the prefix AT, which alerts the card that the characters following it are commands.

You can send multiple commands to the SC PRI card in a single initialization string or command line, up to a maximum of 60 characters. The AT prefix, spaces, line feeds, and carriage returns do not count as part of the 60-character limit.



The Set to Defaults AT command (F) must always be sent by itself. Other commands included with it in a command line or initialization string are disregarded.

Each initialization string or command line must end with a carriage return (Enter key). The card does not begin processing the commands until it receives the carriage return character. Up until you press the Enter key you can make changes by backspacing and typing over.

The SC PRI card returns a result code for each initialization string or command line it receives:

OK when the line is valid

ERROR if the line contains one or more invalid commands.

The result code **ERROR** indicates that the card has rejected at least one of the commands between the AT prefix and the carriage return.

When using a terminal or terminal emulator you cannot send a new command line to the card until the result code for the previous command line is received. In the case of a terminal emulation program that ignores result codes, a three-character wait time must elapse between command lines sent to the card.

Downloading

The SC PRI card can be downloaded with new operating firmware without being removed from its installed location. The download employs the same DB-25 connector used for AT commands. The card is able to store two sets of firmware and switch between them on command.

Loading new firmware into the SC PRI card requires the GDC Download General Utility (Part No. 080Z039-201A). The utility is supplied separately.

GDC may deliver new firmware to be loaded into the card by means of several media: diskette, tape, CD ROM, or on-line TFTP transfer. However the application software file is delivered, you must prepare for the download by copying it onto your computer. The directory into which you copy the download file must also contain a copy of the download utility. When you copy the utility file to your directory from the diskette on which it is supplied, its name is `dlvfast.exe`.

The download utility runs in the DOS command-line environment, not under Windows. To perform the download, get a DOS prompt on-screen, go to the appropriate directory, and enter `dlvfast`. On-screen prompts lead you through the process once the utility is launched.

Table 2-2 AT Configuration Commands for the SC PRI Card

| Command | Configuration Values/Default | Function |
|---------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4ESS 5ESS NT NI2 | (Default 4ESS) | Switch Names of the four types with which the SC PRI card can be compatible. The name of each switch is the AT command that sets the card for compatibility with the switch. The card is compatible only with the switch type for which it was most recently configured. Does not take effect until &W command is issued. |
| DSL n | $n = 1$ or 2 (Default DSL1) | Number of lines the SC PRI card is to support. Enter 1 for a single-shelf installation with one LTU. Enter 2 for a two-shelf installation with an LTU in each shelf. Each LTU is connected to an ISDN PRI line. Does not take effect until &W command is issued. |
| DHW n | $n = 1, 2, 3,$ or 4 (Default DHW1) | Data Highway Number assigned to the LTU located in the same shelf with the SC PRI card. The card uses timeslot 24 of the specified data highway to exchange D channel data with the LTU, and DS0 24 of the line connected at the LTU to exchange D channel signaling with the service provider's switch. Does not take effect until &W command is issued. |
| SHW n | $n = 1, 2, 3,$ or 4 (must not be same value assigned to DHW n) (Default SHW2) | Second Highway Number is the highway assigned to the LTU located in the second shelf when the SC PRI card is supporting two lines. The value of this command has no effect when the card is configured to support one line (DSL1). Does not take effect until &W command is issued. |
| DU n | $n = 1$ or 2 (Default DU1) | Download Mode determines the SC PRI card's response when firmware is downloaded: DU1 configures the card to automatically unzip firmware and put it into service when the download is complete. DU2 configures the card to store newly downloaded firmware zipped and inactive until it is put into service by a U command. DU n does not have to be sent each time a download is performed. The card stays in the selected mode. Does not take effect until &W command is issued. |
| &W | | Activate Configuration commands the SC PRI card to store and begin using new configuration. Configuration changes made with the preceding five commands do not go into effect until the &W command is sent. It may either be included as the last item in a command line or initialization string, or be issued as a separate command. |
| F | | Set to defaults instructs the five configuration commands to assume their default values. This command does not require the &W; it goes into effect immediately when sent to the card. It cannot be combined with others in a command line or initialization string. |
| U | | Unzip and Execute commands the SC PRI card to unzip (decompress) stored firmware and begin using it as the active operating firmware. The command can be used to switch back and forth between the two sets of firmware as many times as needed. |

3 Operation

Overview

This chapter describes the functions of the SC PRI card front panel indicator displays and the AT commands that cause the SC PRI card to display information.

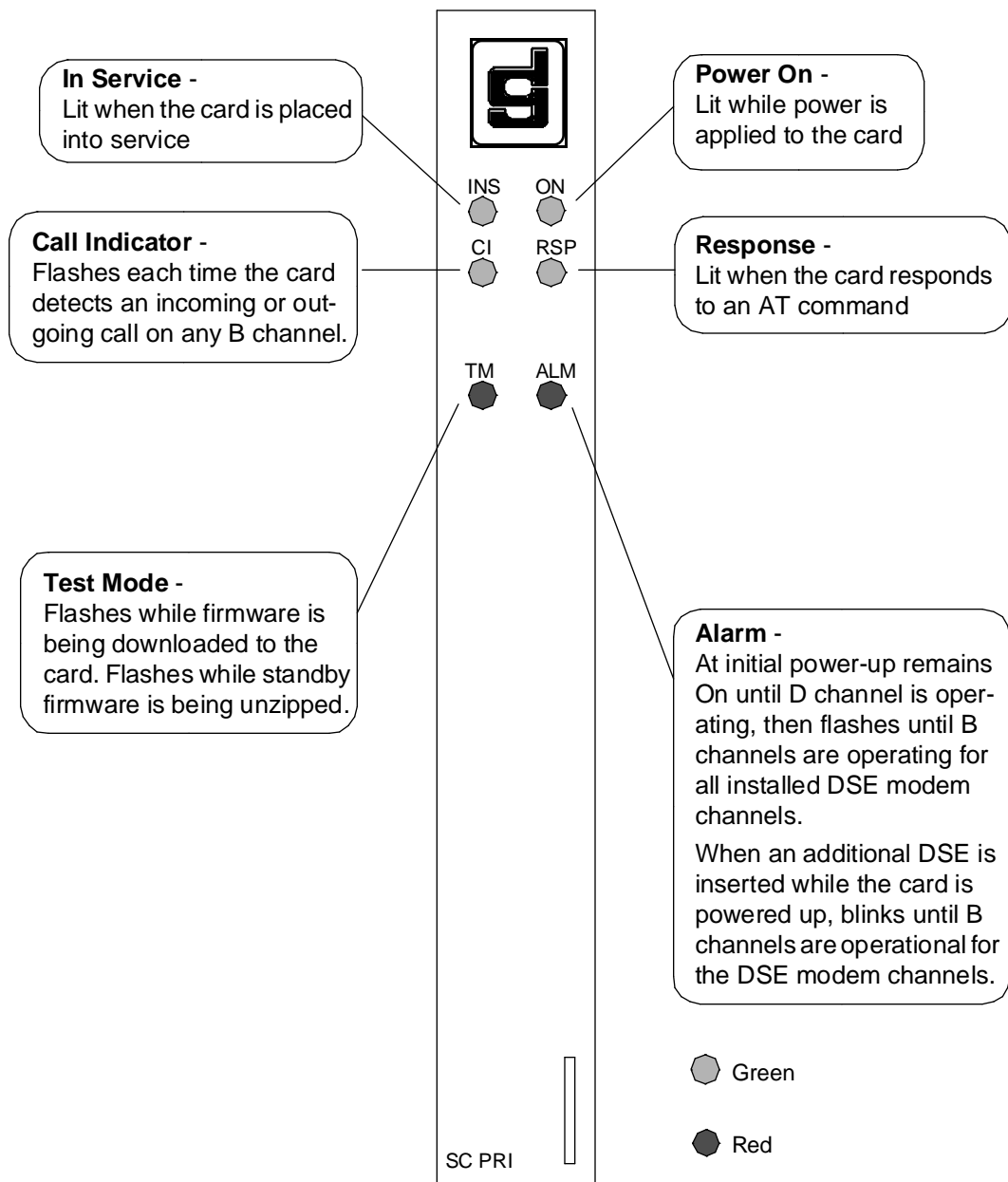


Figure 3-1 Front Panel Indicators

AT Commands

The SC PRI card accepts 11 AT commands. Six of those are configuration commands, three request displays from the card, and two relate to the function of downloading operating firmware to the card. The configuration commands are described in detail in *Chapter 2, Installation*. The use of the display and download commands is covered in the following paragraphs.

Table 3-1 lists the display and download commands, the values they accept (where applicable), and their functions.

AT commands can be input to the SC PRI card from a VT100-compatible terminal connected to the Zone 3 DB25 connector for the card's shelf slot. When the card is installed as part of an RLN system the AT commands are directed to it through the RLN Access Server, using the Attachmate RLN Server software.

To configure the SC PRI card, connect a VT100-compatible terminal (or a computer running terminal emulation) to the DB-25 connector for its slot in the SpectraComm Shelf and follow the on-screen prompts.

The card's terminal port operates at 19.2 kbps asynchronous, and supports an 8/N/1 character format – 8 data bits, no parity, 1 stop bit.

You can send multiple commands to the SC PRI card in a single initialization string or command line, up to a maximum of 60 characters. The AT prefix, spaces, line feeds, and carriage returns do not count as part of the 60-character limit.

Each initialization string or command line must end with a carriage return (Enter key). The card does not begin processing the commands until it receives the carriage return character. Up until you press the Enter key you can make changes by backspacing and typing over.

The SC PRI card returns a result code for each initialization string or command line it receives:

OK when the line is valid

ERROR if the line contains one or more invalid commands.

The result code ERROR indicates that the card has rejected every command between the AT prefix and the carriage return.

When using a terminal or terminal emulator you cannot send a new command line to the card until the result code for the previous command line is received. In the case of a terminal emulation program that ignores result codes, a three-character wait time must elapse between command lines sent to the card.

Table 3-1 AT Display Commands for the SC PRI Card

| Command | Command Type | Function |
|---------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| H | Display command | On-screen Help , instructs the card to display on-screen the definitions of the AT commands. See <i>Figure 3-2</i> for an example of the display. |
| SC | Display command | System Configuration , instructs the card to display on-screen a description of its current configuration. See <i>Figure 3-3</i> for an example of the display. |
| SS | Display command | System Status , instructs the card to display on-screen version information on its operating firmware, its serial number, and status information. See <i>Figure 3-4</i> for an example of the display. |

AT Help Command

The SC PRI card includes an AT help function. From a terminal, or terminal emulator, you can interrogate the unit for the names of the AT commands, the valid settings for each, and the result each setting produces.

To display the AT command set for the SC PRI card:

type `AT H` and press the Enter key

The result is an on-screen display, shown in *Figure 3-2*, that lists and describes the commands.

Command H (Help), preceded by AT prefix and followed by Enter. Help text display

```

ATH
The following commands are supported.
Each line must be prefaced with AT and terminated by return.

To specify a switch type, enter the switch name:
4ESS
5ESS
NT
NI2
To specify the number of lines supported by this ISDN PRI card, enter:
DSLn
(n = 1 or 2)
To specify which Data Highway contains the D-Channel, enter:
DHwn
(n = 1, 2, 3 or 4)
To specify the second Data Highway when DSL2 is entered, enter:
SHwn
(n = 1, 2, 3 or 4. but must not be equal to the DHwn setting)
To retrieve the System Status, enter:
SS
To retrieve the System Configuration, enter:
SC
To configure the actions taken after downloading new firmware, enter:
DU1 To have the newly downloaded firmware unzipped and
executed automatically.
or
DU2 To have the newly downloaded firmware remain zipped and inactive.
To unzip and execute the firmware, enter:
U
To configure the system to factory defaults, enter:
F
To Save and Activate changes, enter:
&w

To exit interactive mode, press the ESC key.

OK
AT Response Code
  
```

Figure 3-2 AT Help Display

AT SC (System Configuration) Command

To display the current settings for all configuration options:

type AT SC and press the Enter key

The result is an on-screen display that describes the current settings of all configuration parameters. The display identifies options by name and describes functional settings rather than by the AT command that was input to achieve the setting.

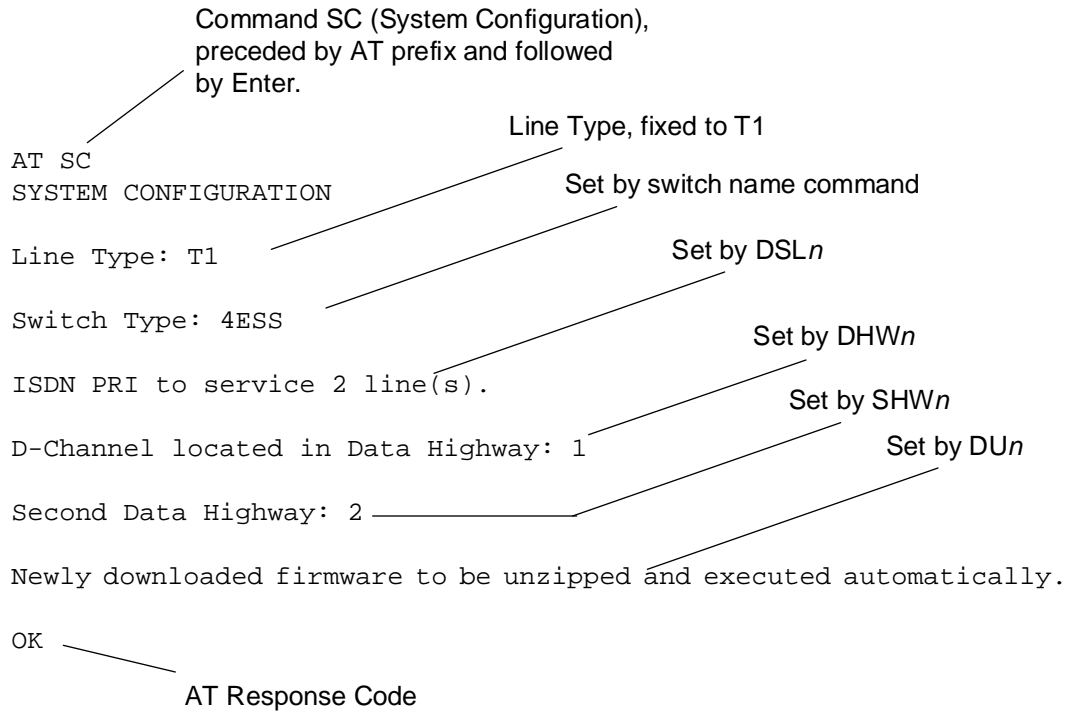
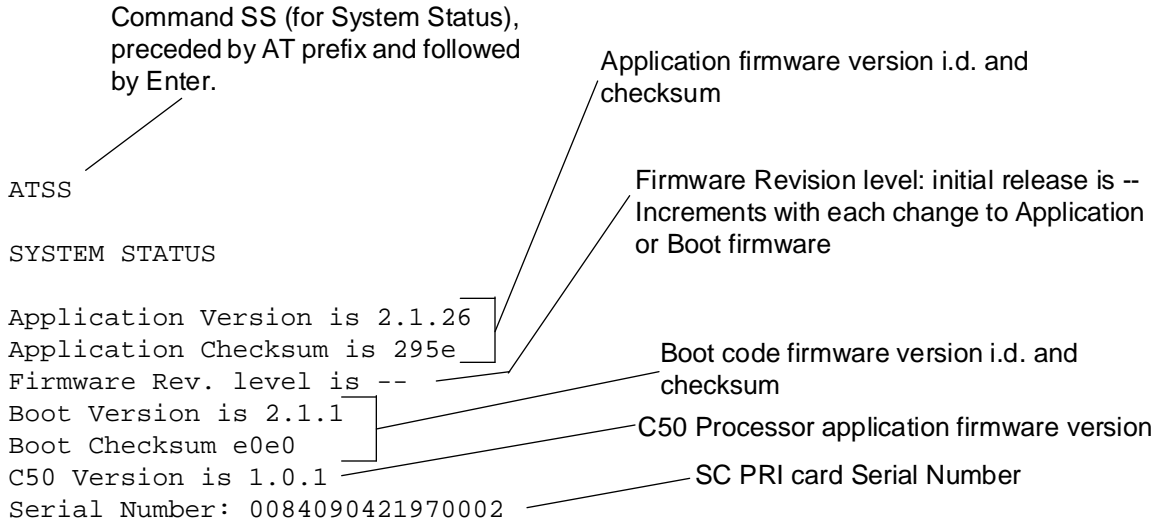


Figure 3-3 AT System Configuration Display

AT SS (System Status) Command

To display status information on-screen:
 type AT SS and press the Enter key



| | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Legend: Out of Service = 0, In Service = 1, | | | | | | | | | | | | | | | | | | | | | | | | |
| No Shelf Signals = 2, Reserved for D-channel = X | | | | | | | | | | | | | | | | | | | | | | | | |
| Channel | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| DSE | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | X |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| B-Chan | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

System Status display, Channel Status:

- Channel = data highway timeslot, network interface DS0
 (see Table 2-1 for channel to shelf slot correlations)
- DSE = 2 represents channel assigned but LTU not supplying required timing signals on the
 1 represents channel in service as a timeslot assignment on the backplane data highway
 0 represents unused timeslot on the data highway
- B-Chan = 1 represents ISDN B channel in service as a DS0 assignment at the network interface
 0 represents unused DS0 at the network interface

The first display lines shown here for DSE and for B-Chan represent the first shelf and LTU served by the SC PRI card. These are always present.
 The second lines displayed for DSE and B-Chan represent the second shelf and LTU served by the SC PRI card. They are only present when the SC PRI card is configured for two shelves and LTUs (DSL2).

Figure 3-4 AT System Status Display (Display Shown for a System with Two PRI Lines)

Table 3-2 Correlation of Shelf Slots and Channels to Timeslot/DS0 Assignments

| Timeslot/ DS0 | Shelf Slot/DSE Channel |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------|
| 1 | Slot 2 – DSE Channel A |
| 2 | DSE Channel B |
| 3 | Slot 3 – DSE Channel A |
| 4 | DSE Channel B |
| 5 | Slot 4 – DSE Channel A |
| 6 | DSE Channel B |
| 7 | Slot 5 – DSE Channel A |
| 8 | DSE Channel B |
| 9 | Slot 6 – DSE Channel A |
| 10 | DSE Channel B |
| 11 | Slot 7 – DSE Channel A |
| 12 | DSE Channel B |
| 13 | Slot 8 – DSE Channel A |
| 14 | DSE Channel B |
| 15 | Slot 9 – DSE Channel A |
| 16 | DSE Channel B |
| 17 | Slot 10 – DSE Channel A |
| 18 | DSE Channel B |
| 19 | Slot 11 – DSE Channel A |
| 20 | DSE Channel B |
| 21 | Slot 12 – DSE Channel A |
| 22 | DSE Channel B |
| 23 | Slot 13 – DSE Channel A |
| 24 | Shelf 1 – D-Channel for SC PRI card in Slot 15 (Slot 13 DSE Channel B is unused) Shelf 2 – Slot 13 DSE Channel B |

A Technical Characteristics

| Item | Specification |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Physical | |
| PC card (rackmount installation) Height Width Depth Weight Shipping weight | 0.81 in. (21 mm) 7 in. (178 mm) 9.5 in. (241 mm) 10 oz (0.28 kg) 1 lb 10 oz (0.74 kg) |
| Environmental | |
| Temperature Operating Non-operating Humidity, operating Altitude Operating Non-operating | 32° to 122°F (0° to 50°C) (Derate by 1°C/1000 ft above sea level) –40° to 185°F (–40° to 85°C) 5% to 95% without condensation 0 ft to 10,000 ft (0 m to 3,047 m) 0 ft to 40,000 ft (0 m to 12,191 m) |
| Electrical | |
| Power dissipation) Fusing | 4 W maximum Two 2.5 A, 125 V (GDC Part No. 215-201-009) One 5 A, 125 V (GDC Part No. 215-201-021) |

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