Lucent Technologies
Bell Labs Innovations

Galaxy Gateway Card

User's Guide
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Lucent Technologies
Galaxy Gateway Card

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Table of Contents

4   *Installation in a Galaxy SCF Controller System*

5   *Installation in a Galaxy Millennium Controller System*

6   *Installation in a Galaxy Vector Controller System*

7   *Installation in an EPS 4802B Battery Plant*

8   Operation

Appendix A   Technical Specifications

Appendix B   Troubleshooting

Appendix C   FTP Supported Commands

Appendix D   Telnet Supported Commands

Appendix E   Local Port Command Interface

Appendix F   Safety

Appendix G   Product Warranty

List of Figures

List of Tables

1   *Introduction*

The Product

The Galaxy Gateway Card is a data access and networking device designed to meet your plant engineering, operation, and maintenance needs when installed in a Galaxy SC, SCF, Millennium, or Vector Controller system. The Galaxy Gateway allows users to access the power plant and associated equipment using an Ethernet connection.

The Galaxy Gateway supports a web-based user interface using standard browsers such as Microsoft Internet Explorer® or Netscape® Navigator. In addition, the Galaxy Gateway provides plant alarm and control information to a distributed or centralized Network Operation Center (NOC) using the Simple Network Management Protocol (SNMP).

The enhanced surveillance capability at the user's PC (personal computer) includes power plant health assessment, performance measurement, and configuration management through an HTML-based Graphical User Interface (GUI). The Galaxy Gateway provides multi-level secured access to each device, including rectifiers, controllers, batteries, AC/DC distribution, generators, secondary distributions, and peripherals in the site.

The Galaxy Gateway communicates with the network using TCP/IP, commonly known as the Internet Protocol (IP). The Galaxy Gateway web server (Gateway card) residing in the Galaxy Controller supports HTTP (Web Browser Access), FTP, Telnet, SMTP, and SNMP application protocols. A 10Base-T (RJ-45) physical connector is used to connect the Galaxy Gateway to the network.

This Product Manual

This product manual (Select Code 193-104-106) describes the features and operation of the Galaxy Gateway (BJD) when installed in a Galaxy SC or SCF, and the Galaxy Gateway (EBW) when installed in a Galaxy Millennium or Vector Controller system. This manual is a user's guide to the product. The emphasis throughout is to provide step-by-step instructions for day-to-day use.

This section includes a list of contacts for assistance with technical support, repair and return, and other services available to customers.

Section 2 provides product information on the Galaxy Gateway, outlining its technical highlights, features and applications.

Sections 3, 4 and 5 cover installation in the various versions of the Galaxy Controller systems, providing information on installing the Galaxy Gateway card, cabling and initial configuration.

Section 6 covers the operation of the Galaxy Gateway, specifically using Telnet, FTP, HTTP web pages, and SNMP to communicate with the Galaxy Controller and/or the Galaxy Gateway.

Appendices provide technical specifications troubleshooting, Telnet supported commands, FTP supported commands, and a glossary.

Customer Assistance Contacts

Customer Training

Lucent Technologies offers customer training on many Power Systems products. For information call 1-972-284-2163. This number is answered from 8:00 a.m. until 4:30 p.m., Central Time Zone (Zone 6), Monday through Friday.

Customer Service

For customers in the United States, Canada, Puerto Rico, and the US Virgin Islands, call 1-800-THE-1PWR (1-800-843-1797). Services provided through this contact include initiating the spare parts procurement process for out of service emergencies, ordering Lucent Technologies documents, and providing other product and service information.

For other customers worldwide, call 001-972-840-0382. This number is answered from 8:00 a.m. until 4:30 p.m., Central Time Zone (Zone 6), Monday through Friday.

Technical Support

Technical support for Lucent Technologies customers is available around the world during the normal product warranty period and also while specific contractual agreements extend this service.

For customers in the United States, Canada, Puerto Rico, and the US Virgin Islands, call 1-800-CAL-RTAC (1-800-225-7822) to contact a

product specialist to answer your technical questions and assist in troubleshooting problems.

For other customers worldwide, contact your local field support center or your sales representative to discuss your specific needs.

Product Repair and Return   Repair and return service is provided for Lucent Technologies customers around the world.

For customers in the United States, Canada, Puerto Rico, and the US Virgin Islands, call 1-800-255-1402 for information on returning of products for repair.

For other customers worldwide, contact your sales representative to discuss your particular circumstances.

Warranty Service   For domestic warranty service, contact your Warranty Service Manager (WSM). For international warranty service, contact your sales representative.

On-Line Power Systems Product Manuals   For Lucent Technologies users logging in from inside the corporate firewall, the address of the "Power Systems On-Line Product Manuals" page is *http://www.cic.lucent.com/lineage.html*.

For customers logging in from outside the firewall, the address is *http://www.lucent8.com/lineage.html*. The annual subscription fee for access to this site is $25. To obtain a password, follow the instructions on-line or call 1-888-Lucent8 (1-888-582-3688). When prompted for an order number, enter or say "167-790-010."

2 *Product Overview*

Product Features

- Real time plant status and alarms

- Remote configuration and control capability

- Global access using Netscape or Microsoft Explorer

- Centralized monitoring and control via SNMP

- Access on demand - no dedicated lines required

- Multiple users' access to the site

- User-publishable web pages

- Alarm e-mail capability

- E-commence capability (for product procurement, delivery, and upgrades)

- Security and flexibility of TCP/IP

- Maximum security with multiple-level passwords

- Remote software upgrade of Galaxy Gateway and controller

- Alarm paging service

- Free software updates from our web site

Galaxy Gateway Circuit Pack

The Galaxy Gateway is an optional circuit pack for the Galaxy SC, SCF, Vector, and Millennium controllers. This card provides the necessary circuitry required for a 10Base-T Ethernet connection to the plant controller from a remote location.

Software Components

The Galaxy Gateway has four software components:

- Boot software – support for power on self test, factory test, local and remote upgrade of the other software components.

- Application software – including an HTTP web server and Telnet daemon.

- Default web pages – web pages supplied by Lucent.

- Custom web pages – customer specific web pages developed by Lucent or an external supplier.

User Interfaces

Web Pages (HTTP)

It is assumed that the user has a web browser, such as Netscape Navigator or Internet Explorer, and is familiar with it. The user may access the Galaxy Gateway by its IP address, or host name (if supported) through the browser.

The HTTP web pages server has the following main features:

- Password protection for read/write privilege for Galaxy Gateway and Galaxy Controller access

- Support for two sets of web pages: default and customized web pages, which may be upgraded through the network

- An extension to the HTML language to support transparent monitoring/control of the Galaxy Controller

- Timeout for connections that remain idle more than a user-programmed time period

Default Web Pages

These web pages are loaded into the system at the time of manufacture. They consist of the following pages:

- Security checking (logging in)

- Logging off

- Error messages

- Galaxy Gateway administration

- Galaxy controller data access/configuration pages

    – View alarms and warnings

    – Power plant data including batteries, rectifiers, and converters

    – Remote peripheral monitoring channels

    – Automatic equipment inventory information

    – Configuration of passwords, alarm thresholds, etc.

Custom Web Pages

Custom web pages can be uploaded to the Galaxy Gateway using FTP. These customer-specific web pages provide a flexible solution for viewing and configuring the many attributes provided by the Galaxy Controller and Galaxy Gateway. Customers may update these web pages at any time.

Galaxy Gateway Local Port

Using the RS-232 local port (J2), the user may log into the Galaxy Gateway, view/change network properties, and upgrade application software or web pages.

Telnet

Telnet access provides the user with access into the Galaxy Gateway or the Galaxy Controller. Once login is established; the Galaxy Gateway will support this session until the "exit" command is received or the idle timeout limit is reached. A command line interface is used to view and configure the Galaxy Gateway's internal configuration and to access the Galaxy Controller's T1.317 command set. Backup, restore, and upgrade procedures may also be performed on the connected Galaxy Controller as well as Galaxy Gateway configuration changes.

FTP

FTP is used only for upgrading Galaxy Gateway software. Application software and default and/or custom web pages can be uploaded to the Galaxy Gateway using FTP. Users can also retrieve (get) existing custom web pages from the Galaxy Gateway, make modifications, and copy (put) them back into the Galaxy Gateway.

SNMP

SNMP is used to provide centralized monitoring and control of the power system. Users can monitor system performance, receive alarm notifications, and configure the system via the SNMP interface.

Alarm Reporting   Alarm reporting for the Galaxy Gateway consists of three main features:

- PUSH – The user may specify up to three IP address alarm receiving hosts for automatic alarm capture. The host must have a capture application running at all times.

- PAGER – The user may specify up to three e-mail pager numbers where the alarm report can be sent.

- E-MAIL – The user may specify up to three e-mail addresses where the alarm report can be sent.

Alarms may be reported based upon levels of severity. The user may elect to report no alarms, all alarms, major and critical only, or critical only. Alarm reports are generated when alarms occur and when they retire.

Feature License Key   The Galaxy Gateway uses a feature key to enable optional features (including SNMP and professional web pages).

Please contact your sales representative if you need to purchase feature keys for your product.

3   *Installation in a Galaxy SC Controller System*

Introduction   This section describes the Galaxy Gateway installation and cabling procedures required. Computer and Galaxy Gateway configuration is also addressed.

Preparation   The following Network Configuration Parameters must be obtained from your Network Administrator before starting:

- IP address

- Subnet mask

- Host name

- Gateway IP address

Note: Host and Gateway are optional.

Precautions   **Note:** Before starting, make sure proper ESD precautions are observed. The ESD grounding termination point located on the front portion of the controller's hinged door can be used for providing a chassis ground potential.

1. On the LCD display panel, verify that no controller related (CTLR LED) alarms are active. If controller alarms are active, consult the controller product manual.

2. Open the controller's front door and confirm that only the green status indicators are illuminated on the basic and intelligent circuit packs. Otherwise, consult the Galaxy SC Controller J85501F-1 Product Manual (Select Code 167-790-060) for troubleshooting help.

3. Verify that the Auxiliary Port Cable Interface Assembly Backplane connector is installed on the rear of the Galaxy.

Tools/Equipment Required

Before installing and configuring the Galaxy Gateway, the following tools/equipment are required:

- Flat jeweler's screwdriver (Galaxy controller DIP switch setting)

- PC with terminal emulation program (example: HyperTerminal)

- 9 pin male serial interface cable (DB-9 male) to connect to Galaxy Gateway

- Network interface cable (CAT 5 UTP)

Unpacking the Galaxy Gateway

The Galaxy Gateway has been inspected, tested, and carefully packed before shipping. Although each circuit pack has been carefully packed, examine all components for damage as they are unpacked.

When unpacking the Galaxy Gateway:

1. Check for external damage to the shipping cartons.

2. Remove all parts from shipping cartons.

3. Use the packing list to verify that all components are present.

If damage is found, file a claim with the carrier and notify Lucent Technologies. For customers in the United States, Puerto Rico, the U.S. Virgin Islands, and Canada, call 1-800-THE-1PWR (1-800-843-1797). For international customers, call your local field support center or your sales representative to discuss your specific needs.

Identifying Components

Before you begin installing and configuring the Galaxy Gateway, make sure that the following components are present::

Item	Quantity	Description
1	1	BJD1 Galaxy Gateway circuit pack
2	1	Network Communication Card Cable Interface Assembly Backplane Module(848441960)
3	1	Galaxy Controller interface cable

Galaxy Controller Configuration	Since the physical interface for the Galaxy controller to the Galaxy Gateway is through the auxiliary port on the controller, this port must be configured so that it will communicate with the Galaxy Gateway. This port may already be configured correctly.

1. On the BJH (intelligent controller) board:

    a. Verify that SW203-1 (Position 1 on switch 203) is ENABLED.

    b. Verify that SW203-5 (Position 5 on switch 203) is ENABLED.

2. From the Front Panel Display, use the Path: Menu /Configuration/ Port.

    a. Verify that the AUX port is ENABLED for RD_WR (read/ write).

This completes the configuration (or verification) required for the Galaxy controller.

Galaxy Gateway Installation

Note: Remove power to the Intelligent controller side during the Galaxy Gateway installation.

• Disengage the BJJ intelligent controller power board, but do not remove the board completely from the guides.

Use the following procedures to install a new or replacement Galaxy Gateway.

Precautions

• Always consider personal safety before beginning any procedure.

• Be aware of the presence of battery potential in the vicinity of the controller.

• Use only insulated tools.

• Wear grounded antistatic wrist straps when handling all circuit packs. The wrist strap must be in contact with the skin and is not to be worn over clothing.

• Never hand a circuit pack from a grounded to a non-grounded person or vice-versa.

Install Gateway Card in Any of Options Slots 2 through 6

Figure 3-1: Galaxy Gateway Installation

Procedure

1. Refer to Figure 3-1.

2. Locate the area on left side of the Galaxy Controller that is designated for Intelligent Option boards. The front door is labeled OPT.2 BJ** - OPT.6 BJ**. Choose any available option slot and carefully slide the Galaxy Gateway into the slot using the top and bottom guides. Once the board is seated, lock into place by lifting the circuit pack locking lever to the full upright position.

3. On the rear of the Galaxy, locate the Intelligent Option port associated with the slot occupied by the Galaxy Gateway board, and connect the Network Communication Card Cable Interface Assembly (Backplane) Module.

Cable Connections

Galaxy Gateway

The Galaxy Gateway receives power and communications from the intelligent controller. To connect the Galaxy Gateway to the BJH intelligent controller, follow this procedure (see Figure 3-2):

1. Locate the controller interface cable assembly (4 position connector on one end and a black/red pair of wires on the other end) that is provided in the kit (Comcode 848520367)

2. Identify the black, 4-position connector and connect this end to P1 of the Network Communications Card Cable Interface Assembly.

3. Connect the red wire of the interface cable assembly to TB5-1 (Terminal Block 5, position 1) on the AUX. Port Cable Interface Assembly located on the back of the Galaxy controller.

4. Connect the black wire of the interface cable assembly to TB5-2 (Terminal Block 5, position 2) on the AUX. Port Cable Interface Assembly located on the back of the Galaxy controller.
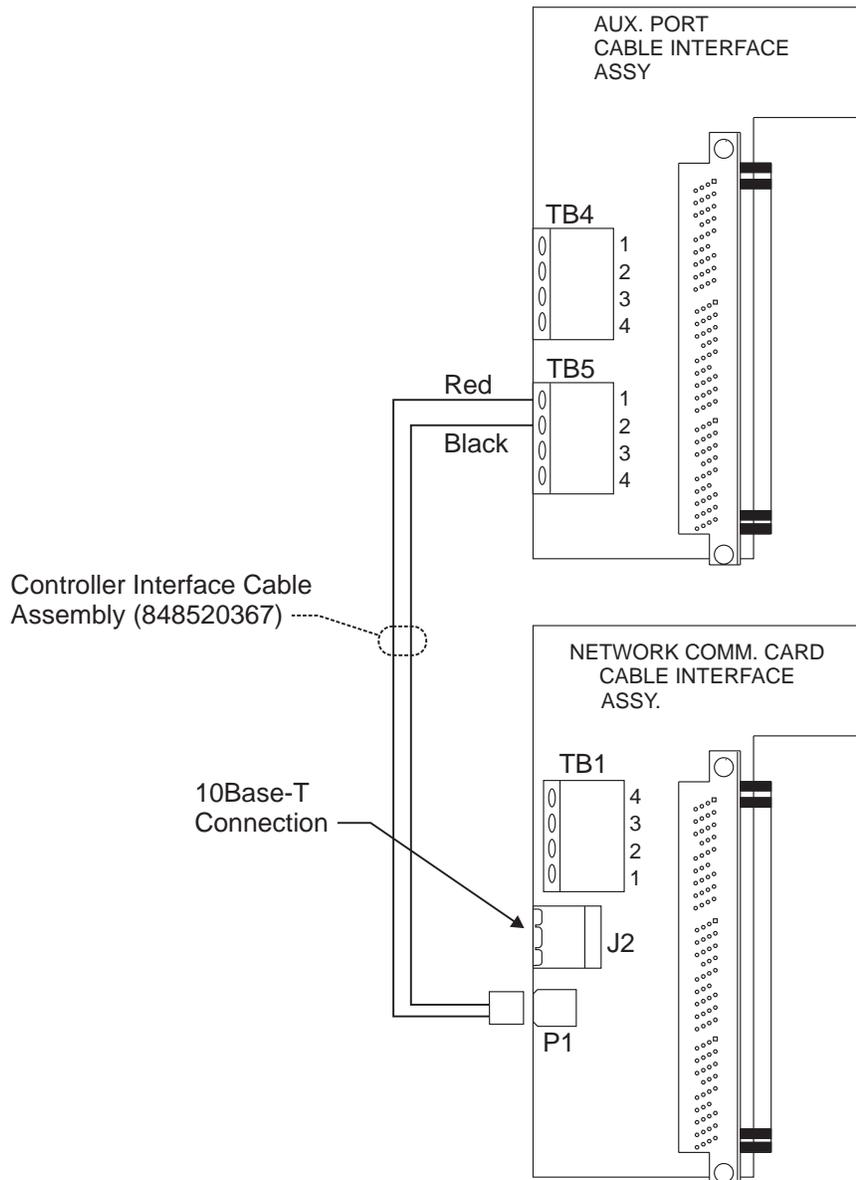
Figure 3-2: Galaxy SC Backplane Connections - Gateway/Aux Port Interface

10Base-T Network   The Galaxy Gateway has an IEEE 802.3 compliant 10Base-T network interface. Since the cable length required to connect the Galaxy Gateway to the network is variable, this cable must be supplied by the user. To connect the Galaxy Gateway to your network, follow this procedure:

1. Connect one end of the network interface cable to J2 (RJ-45 Network Interface Connector) located on the Gateway Network Communication Card Cable Interface. This is the backplane connector, located on the rear of the Galaxy controller.

2. Connect the other end to an IEEE 802.3 compatible network.

Carefully slide the BJJ power board into the slot using the top and bottom guides. Once the board is seated, lock into place by lifting the circuit pack locking lever to the full upright position. EXCEPT FOR THE GATEWAY CARD, verify that after 30-45 seconds, all Green status LEDs on the controller circuit packs are lit, and that no Yellow status LEDs are lit. The Gateway Card LEDs will be checked and verified after configuration is complete.

Configuring Network Communications

The Galaxy Gateway uses Transmission Control Protocol/Internet Protocol (TCP/IP) to communicate with the host computer on a local area network. TCP/IP is a widely used protocol that provides communication across networks of diverse computers and devices. This protocol forms the basis for the Internet. Each device or host on a TCP/IP network has its own IP address. The IP address is a 32-bit number, usually written in dot notation (e.g., 127.9.235.48). Another 32-bit number, called subnet mask (or *address mask*, *netmask*, e.g., 255.255.0.0) is used to identify the network portion and subnet portion of the IP address.

1. Connect a PC to the local port (9-pin female connector) of the Galaxy Gateway.

2. Using the built-in configuration utility, enter network configuration information. This information may have to be provided by the network administrator. The following equipment is required:

   • PC with terminal emulation program

   • Serial interface cable (DB-9 Male) for connection to the Galaxy Gateway

   To configure the Galaxy Gateway for your network, the following information is required for the Galaxy Gateway and your network:

   • IP address

   • Subnet mask

   In addition, the following optional information may be entered:

- Host name

- Default Gateway IP address

Logging In to the Galaxy Gateway

To login to the Galaxy Gateway, follow these steps:

1. Start-up the PC terminal program (Windows Terminal, Procomm, etc.) using the following communication parameters:

    Baud   : 9600
    Data   : 8
    Parity   : none
    Stop   : 1
    Handshaking: none
    Flow Control: none

2. Connect the PC to the Galaxy Gateway card's local port (RS-232) connector J2 (if it isn't already connected).

3. Press reset (SW1 – uP reset; see Figure 5-2) on the Galaxy Gateway card.

4. Wait for any diagnostic messages to pass.

5. Wait for the "ENTER PASSWORD:" command line prompt.

6. Type the Network Administrator password (default*: networkadm*).

7. Wait for the "$" prompt.

Configuring Static Network Parameters

After a valid password entry, a login header with the following format will be displayed:

```
Board Code            EBW1 1:1 or BJD1 1:1
Serial Number         99DJ09112345

Boot Block            version 1.0
Application Code      version 1.3
Default Web Pages     version 2.2
Custom Web Pages      not found

Ethernet Address      00-60-1D-00-5C-07
IP Address            not configured
Subnet Mask           not configured
Default Gateway       not configured
Host Name             not configured
```

```
For assistance type help

$
```

Typing HELP at the "$" will show all available network administration commands and command line formats.

*note: 1) commands are not case sensitive
2) for the commands that follow, ddd is a number from 0 - 255

- To set the IP Address, type:
  CHA NET1,IP=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,IP

- To set the Subnet mask, type:
  CHA NET1,SUB=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,SUB

- Optional:
  To set the Default Gateway Address, type:
  CHA NET1,GTWY=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,GTWY

- Optional:
  To set the Host Name, type:
  CHA NET1,HOST="*hostname*"
  Verify by typing:
  STA NET1,HOST

Logging Out of the Galaxy Gateway

To terminate the configuration session, enter the "bye" command. The Galaxy Gateway will notify the user if configuration is not complete. This message will have the following format:

```
NOTICE:
Default gateway may be required for network access.
Host Name may be required for network access.

Logging off...
```

Messages referencing the Gateway and Host Name are acceptable, since these parameters are optional.

Note: If the IP address or Subnet mask messages appear, for example:

```
IP Address is required for network access.
Subnet mask is required for network access.
```

then the configuration procedure must be repeated.

Post Installation
Procedures

Once configuration has been completed

1. Disconnect the serial cable from the Galaxy Gateway (J2 connector).

2. Connect the 9-pin male end of the auxiliary port cable assembly to the J2 connector on the Galaxy Gateway.

3. Press SW1 (uP reset) on the Galaxy Gateway.

4. After approximately one minute, observe the LEDs on the Galaxy Gateway.

    • Yellow STATUS LED: OFF
    • Green STATUS LED: ON
    • Link LED: ON
    • XMIT/RCV: May be blinking

    The Galaxy Gateway should be communicating over the network.

5. Secure the cables and close and secure the hinged door.

4   *Installation in a Galaxy SCF Controller System*

Introduction   This section describes the Galaxy Gateway installation and cabling procedures required. Computer and Galaxy Gateway configuration is also addressed.

Preparation   The following Network Configuration Parameters must be obtained from your Network Administrator before starting:

- IP address

- Subnet mask

- Host name

- Gateway IP address

Note: Host and Gateway are optional.

Precautions   **Note:** Before starting, make sure proper ESD precautions are observed. The ESD grounding termination point located on the front portion of the controller's hinged door can be used for providing a chassis ground potential.

1. On the LCD display panel, verify that no controller related (CTLR LED) alarms are active. If controller alarms are active, consult the controller product manual.

2. Open the controller's front door and confirm that only the green status indicators are illuminated on the basic and intelligent circuit packs. Otherwise, consult the Galaxy SCF Controller J85501F-1 Product Manual (Select Code 167-792-110) for troubleshooting help.

Tools/Equipment Required

Before installing and configuring the Galaxy Gateway, the following tools/equipment are required:

- Flat jeweler's screwdriver (Galaxy controller DIP switch setting)

- Small Phillips head screwdriver (controller service panel removal)

- PC with terminal emulation program (example: HyperTerminal)

- 9 pin male serial interface cable (DB-9 male) to connect to Galaxy Gateway

- Network interface cable (CAT 5 UTP)

Unpacking the Galaxy Gateway

The Galaxy Gateway has been inspected, tested, and carefully packed before shipping. Although each circuit pack has been carefully packed, examine all components for damage as they are unpacked.

When unpacking the Galaxy Gateway:

1. Check for external damage to the shipping cartons.

2. Remove all parts from shipping cartons.

3. Use the packing list to verify that all components are present.

If damage is found, file a claim with the carrier and notify Lucent Technologies. For customers in the United States, Puerto Rico, the U.S. Virgin Islands, and Canada, call 1-800-THE-1PWR (1-800-843-1797). For international customers, call your local field support center or your sales representative to discuss your specific needs.

Identifying Components

Before you begin installing and configuring the Galaxy Gateway, make sure that the following components are present:

Item	Quantity	Description
1	1	BJD1Galaxy Gateway circuit pack
2	1	Network Interface Cable Adaptor (RJ-45/ 4 wire cable assembly)

Note: Two 20-22 AWG wires (10") must be supplied by the user. These wires will connect the auxiliary port of the intelligent controller to the Galaxy Gateway.

Galaxy Controller Configuration

Since the serial interface for the Galaxy intelligent controller to the Galaxy Gateway is through the auxiliary port on the controller, this port must be configured so that it will communicate with the Galaxy Gateway. This port may already be configured correctly.

1. On the BJH (intelligent controller) board:

    a. Verify that SW203-1 (Position 1 on switch 203) is ENABLED.

    b. Verify that SW203-5 (Position 5 on switch 203) is ENABLED.

2. From the Front Panel Display, use the Path: Menu /Configuration/ Port.

    a. Verify that the AUX port is ENABLED for RD_WR (read/ write).

This completes the configuration (or verification) required for the Galaxy controller.

Galaxy Gateway Installation

Note: Remove power to the Intelligent controller side during the Galaxy Gateway installation.

• Disengage the BJJ intelligent controller Power board, but do not remove the board completely from the guides.

Use the following procedures to install a new or replacement Galaxy Gateway.

Precautions

• Always consider personal safety before beginning any procedure.

• Be aware of the presence of battery potential in the vicinity of the controller.

• Use only insulated tools.

• Wear grounded antistatic wrist straps when handling all circuit packs. The wrist strap must be in contact with the skin and is not to be worn over clothing.

• Never hand a circuit pack from a grounded to a non-grounded person or vice-versa.

Install Gateway Card in Options Slot 5

Figure 4-1: Galaxy Gateway Installation

Procedure

1. Refer to Figure 4-1. Locate the area on left side of the Galaxy Controller that is designated for Intelligent Option boards. The front door is labeled OPT.2 BJ** - OPT.6 BJ**.

Important! The Galaxy Gateway MUST be inserted into Options Slot 5.

2. Carefully slide the Galaxy Gateway into Options Slot 5, using the top and bottom guides. Once the board is seated, lock into place by lifting the circuit pack locking lever to the full upright position.

Cable Connections

Galaxy Gateway

The Galaxy Gateway communicates with the intelligent controller. To connect the Galaxy Gateway to the BJH intelligent controller, follow this procedure (see Figure 4-2):

(These connections are on the BLG board)

1. Using the two 20-22 AWG wires (provided by the user), strip both ends of each wire (0.25") and connect 1 wire from TB11-1

(Terminal Block 11, position 1). This is the leftmost position of the terminal block when facing controller from the front) to TB5-2 (Terminal block 5, position 2 on the AUX port connector, also labeled RXD).

2. Connect the other wire from TB11-2 (Terminal Block 11, position 2). This is the second position from the left of the terminal block when facing controller from the front) to TB5-1 (Terminal block 5, position 1 on the AUX port connector, also labeled TXD).

Note: When dressing the wires, route them so that they do not touch the Termination Resistors, used for Remote Monitoring Bus 2 and 3.
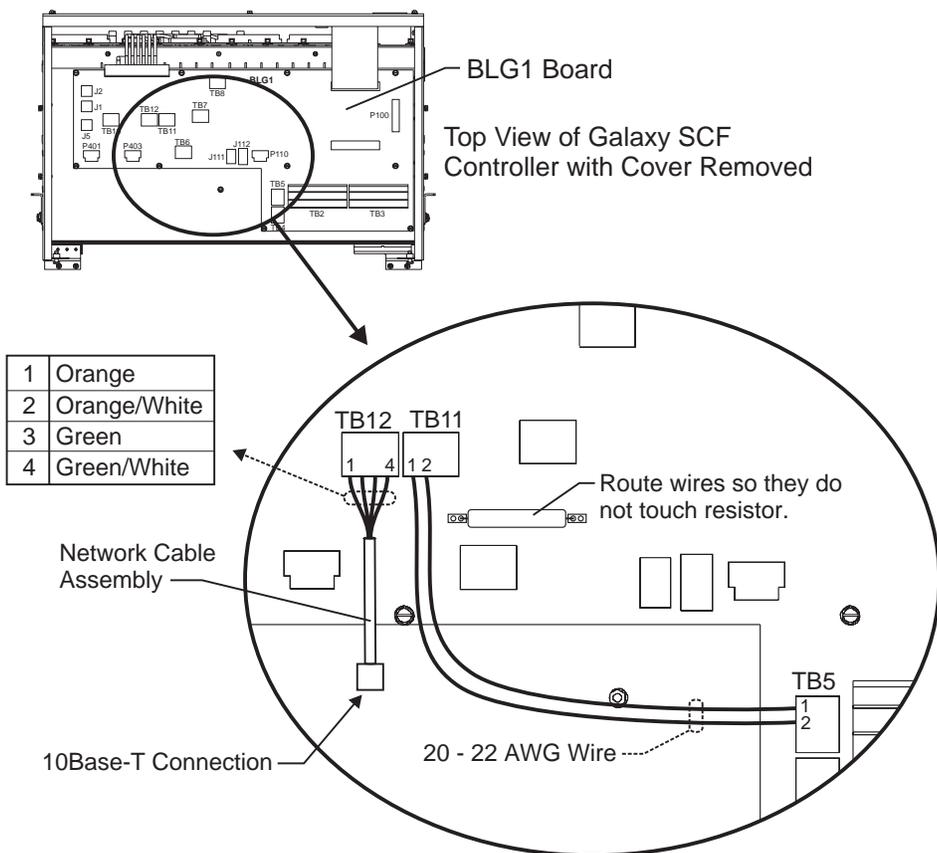
Figure 4-2: Galaxy SCF Connections- Gateway/Aux Port Interface

10Base-T Network   The Galaxy Gateway has an IEEE 802.3 compliant 10Base-T network interface. Since the cable length required to connect the Galaxy Gateway to the network is variable, this cable must be supplied by the user. To connect the Galaxy Gateway to your network, see Figure 4-2 and follow this procedure:

1. Using the supplied Network cable assembly, connect the following wires to TB12 on the Galaxy SCFs BLG board:

Wire Color	TB12 Position (1 is leftmost position, facing the BLG board from the front)
Orange	1
Orange/White	2
Green	3
Green/White	4

2. Connect the other end to an 10Base-T compatible network.

Carefully slide the BJJ power board into the slot using the top and bottom guides. Once the board is seated, lock into place by lifting the circuit pack locking lever to the full upright position. EXCEPT FOR THE GATEWAY CARD, verify that after 30-45 seconds, all Green status LEDs on the controller circuit packs are lit, and that no Yellow status LEDs are lit. The Gateway Card LEDs will be checked and verified after configuration is complete.

Configuring Network Communications

The Galaxy Gateway uses Transmission Control Protocol/Internet Protocol (TCP/IP) to communicate with the host computer on a local area network. TCP/IP is a widely used protocol that provides communication across networks of diverse computers and devices. This protocol forms the basis for the Internet. Each device or host on a TCP/IP network has its own IP address. The IP address is a 32-bit number, usually written in dot notation (e.g., 127.9.235.48). Another 32-bit number, called subnet mask (or *address mask*, *netmask*, e.g., 255.255.0.0) is used to identify the network portion and subnet portion of the IP address.

1. Connect a PC to the local port (9-pin female connector) of the Galaxy Gateway.

2. Using the built-in configuration utility, enter network configuration information. This information may have to be provided by the network administrator. The following equipment is required:

   • PC with terminal emulation program

   • Serial interface cable (DB-9 Male) for connection to the Galaxy Gateway

To configure the Galaxy Gateway for your network, the following information is required for the Galaxy Gateway and your network:

- IP address

- Subnet mask

In addition, the following optional information may be entered:

- Host name

- Default Gateway IP address

Logging In to the Galaxy Gateway

To login to the Galaxy Gateway, follow these steps:

1. Start-up the PC terminal program (Windows Terminal, Procomm, etc.) using the following communication parameters:

   ```
   Baud         : 9600
   Data         : 8
   Parity       : none
   Stop         : 1
   Handshaking: none
   Flow Control: none
   ```

2. Connect the PC to the Galaxy Gateway card's local port (RS-232) connector J2 (if it isn't already connected).

3. Press reset (SW1 – uP reset; see Figure 5-2) on the Galaxy Gateway card.

4. Wait for any diagnostic messages to pass.

5. Wait for the "ENTER PASSWORD:" command line prompt.

6. Type the Network Administrator password (default*: networkadm*).

7. Wait for the "$" prompt.

Configuring Static Network Parameters

After a valid password entry, a login header with the following format will be displayed:

```
Board Code            EBW1 1:1 or BJD1 1:1
Serial Number         99DJ09112345
```

```
Boot Block          version 1.0
Application Code    version 1.3
Default Web Pages   version 2.2
Custom Web Pages    not found

Ethernet Address    00-60-1D-00-5C-07
IP Address          not configured
Subnet Mask         not configured
Default Gateway     not configured
Host Name           not configured

For assistance type help

$
```

Typing HELP at the "$" will show all available network administration commands and command line formats.

note: 1) commands are not case sensitive
2) for the commands that follow, ddd is a number from 0 - 255

- To set the IP Address, type:
  CHA NET1,IP=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,IP

- To set the Subnet mask, type:
  CHA NET1,SUB=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,SUB

- Optional:
  To set the Default Gateway Address, type:
  CHA NET1,GTWY=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,GTWY

- Optional:
  To set the Host Name, type:
  CHA NET1,HOST=*host name*
  Verify by typing:
  STA NET1,HOST

Logging Out of the Galaxy Gateway   To terminate the configuration session, enter the "bye" command. The Galaxy Gateway will notify the user if configuration is not complete. This message will have the following format:

```
NOTICE:
Default gateway may be required for network access.
Host Name may be required for network access.

Logging off...
```

Messages referencing the Gateway and Host Name are acceptable, since these parameters are optional.

Note: If the IP address or Subnet mask messages appear, for example:

```
IP Address is required for network access.
Subnet mask is required for network access.
```

then the configuration procedure must be repeated.

Post Installation Procedures

Once configuration has been completed

1. Disconnect the serial cable from the Galaxy Gateway (J2 connector).

2. Connect the 9-pin male end of the auxiliary port cable assembly to the J2 connector on the Galaxy Gateway.

3. Press SW1 (uP reset) on the Galaxy Gateway.

4. After approximately one minute, observe the LEDs on the Galaxy Gateway.

   • Yellow STATUS LED: OFF
   • Green STATUS LED: ON
   • Link LED: ON
   • XMIT/RCV: May be blinking

   The Galaxy Gateway should be communicating over the network.

5. Secure the cables and close and secure the hinged door.

5   *Installation in a Galaxy Millennium Controller System*

Introduction

This section describes the Galaxy Gateway installation and cabling procedures required in a Millennium system. Computer and Galaxy Gateway configuration is also addressed.

Preparation

The following Network Configuration Parameters must be obtained from your Network Administrator before starting:

- IP address
- Subnet mask
- Host name
- Gateway IP address

Note: Host and Gateway are optional.

Precautions

Note: Before starting, make sure proper ESD precautions are observed. The ESD grounding termination point located on the front portion of the controller's hinged door can be used for providing a chassis ground potential.

1. On the LCD display panel, verify that no controller related (CTLR LED) alarms are active. If controller alarms are active, consult the controller product manual.

2. Open the controller's hinged door and remove the service cover (two Phillips head screws on the bottom). Confirm that only the green status indicators are illuminated on the basic and intelligent circuit packs. Otherwise, consult the Millennium Controller product manual (select code 167-792-180) for troubleshooting help.

Tools/Equipment Required

Before installing and configuring the Galaxy Gateway, the following tools/equipment are required:

- Flat jeweler's screwdriver (controller DIP switch setting)

- Small Phillips head screwdriver (controller service panel removal)

- PC with terminal emulation program (example: HyperTerminal)

- 9 pin male serial interface cable (DB-9 male) to connect to Galaxy Gateway

- Network interface cable (CAT 5 UTP)

Unpacking the Galaxy Gateway

The Galaxy Gateway has been inspected, tested, and carefully packed before shipping. Although each circuit pack has been carefully packed, examine all components for damage as they are unpacked.

When unpacking the Galaxy Gateway:

1. Check for external damage to the shipping cartons.

2. Remove all parts from shipping cartons.

3. Use the packing list to verify that all components are present.

If damage is found, file a claim with the carrier and notify Lucent Technologies. For customers in the United States, Puerto Rico, the U.S. Virgin Islands, and Canada, call 1-800-THE-1PWR (1-800-843-1797). For international customers, call your local field support center or your sales representative to discuss your specific needs.

Identifying Components

Before you begin installing and configuring the Galaxy Gateway, make sure that the following components are present:

Item	Quantity	Description
1	1	EBW Galaxy Gateway circuit pack
2	1	Black insulating cover
3	1	Galaxy Controller interface cable
4	4	Plastic mounting post
5	2	8" cable tie

Galaxy Controller Configuration

Since the physical interface for the Galaxy Controller to the Galaxy Gateway is through the auxiliary port on the controller, this port must be configured so that it will communicate with the Galaxy Gateway. This port may already be configured correctly.

1. On the BSJ (intelligent controller) board:

    a. Verify that SW203-1 (Position 1 on switch 203) is ENABLED.

    b. Verify that SW203-5 (Position 5 on switch 203) is ENABLED.

2. From the Front Panel Display, use the Path: Menu /Configuration/ Port.

    a. Verify that the AUX port is ENABLED for RD_WR (read/ write).

This completes the configuration (or verification) required for the Galaxy Controller.

Note: It is not necessary to remove power to the controller during the Galaxy Gateway installation. However, if there is some uncertainty during this operation and added precaution is desired, power may be removed from the intelligent controller board. This can be accomplished in one of two ways:

• Disconnect the power cable at P202 on the BSJ intelligent controller circuit pack.

OR

• Remove fuses 1 and 2 (Option and intelligent board power fuses, respectively), the two leftmost fuses in the fuse block located at the top left corner of the BSH basic controller circuit pack.

Galaxy Gateway Installation   Use the following procedures to install a new or replacement Galaxy Gateway.

Precautions

• Always consider personal safety before beginning any procedure.

• Be aware of the presence of battery potential in the vicinity of the controller.

• Use only insulated tools.

• Wear grounded antistatic wrist straps when handling all circuit packs. The wrist strap must be in contact with the skin and is not to be worn over clothing. Remove the fuse puller located at the top of the hinged door of the controller.

• Never hand a circuit pack from a grounded to a non-grounded person or vice-versa.
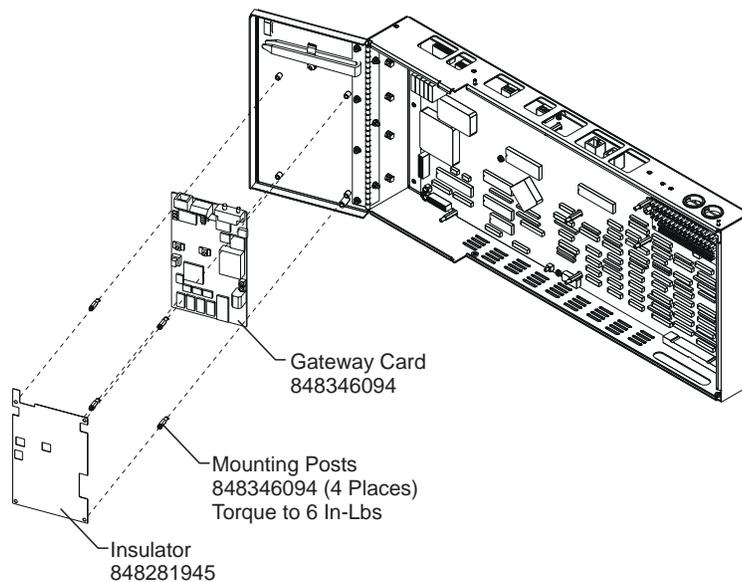
Figure 5-1: Galaxy Gateway Installation

Procedure

1. Refer to Figure 5-1.

2. Remove the fuse puller located at the top of the hinged door of the controller.

3. Locate the area on the Galaxy Millennium Controller's (J85501K-1) hinged door that is designated for the Galaxy Gateway. The area is identified by the four printed circuit board mounting standoffs.

4. Position the Galaxy Gateway over the mounting holes so that J1 (RJ-45 network interface connector) and J2 (DB-9 serial port connector) are located at the top of the access door. The component side of the circuit pack should be facing outwards.

5. Install the four plastic mounting posts. Be sure not to over-tighten as damage may occur to the board.

6. Locate the black protective cover provided in the kit. This insulator contains four round perforations that line up with the supporting standoffs previously inserted in the Galaxy Gateway circuit pack. Carefully align the holes in the insulator to the standoffs and insert the ends of the standoffs through the insulator until it is secured.

Note: Exercise caution when placing the insulator onto to the board so that contact between component surfaces and hands are at a minimum.

Cable Connections

Galaxy Gateway

The Galaxy Gateway receives power and communications from the intelligent controller. To connect the Galaxy Gateway to the BSJ intelligent controller, follow this procedure (see Figure 5-2):

1. Locate the controller interface cable assembly that is provided in the kit.

2. Identify the end with a black, 12-position connector. Route this connector through the hole in the Millennium's housing above P203 and connect this end of the cable assembly to P203 (Auxiliary Port connector) on the BSJ intelligent controller circuit pack.

3. Identify the DB-9 male (9 pin) connector of the controller interface cable assembly and route it through the hole in the controller housing above the P6 connector.

4. Identify the black, 4-position connector on the opposite end of the 12-position connector. Connect this end of the cable assembly to P1 (power connector) on the Galaxy Gateway.

   Note: Power will be applied to the Galaxy Gateway when this cable is plugged into P1.

5. After the connection to P1, wait approximately 45 seconds. The Yellow status LED should blink, indicating that the Gateway is ready to be configured.
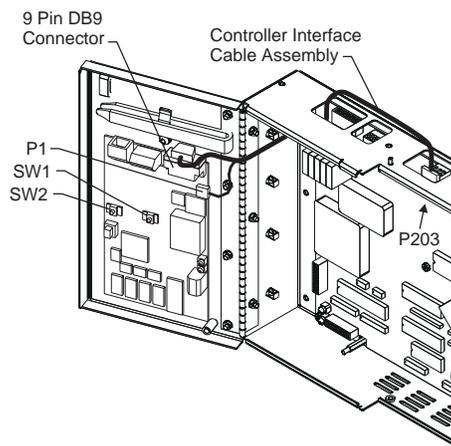
Figure 5-2: Gateway Connection to BSJ Intelligent Controller

10Base-T Network   The Galaxy Gateway has an IEEE 802.3 compliant 10Base-T network interface. Since the cable length required to connect the Galaxy Gateway to the network is variable, this cable must be supplied by the user. To connect the Galaxy Gateway to your network, follow this procedure (see Figure 5-3):

1. Connect one end of the network interface cable to J1 (RJ-45 Network Interface Connector) located at the top left on the Galaxy Gateway.

2. Route the network interface cable through the hole above the P6 connector on the controller housing.

3. Connect the other end to an IEEE 802.3 compatible network.
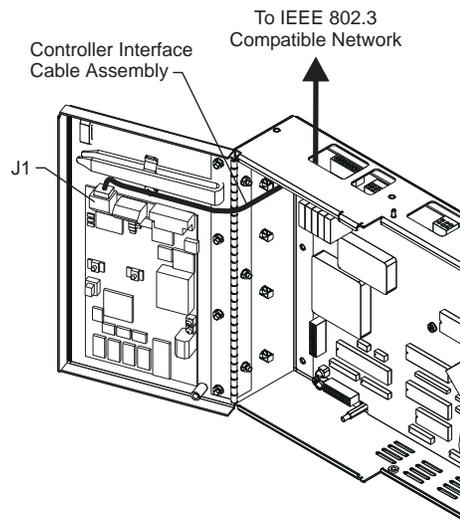
Figure 5-3: Gateway Connection to Network

Configuring Network Communications

The Galaxy Gateway uses Transmission Control Protocol/Internet Protocol (TCP/IP) to communicate with the host computer on a local area network. TCP/IP is a widely used protocol that provides communication across networks of diverse computers and devices. This protocol forms the basis for the Internet. Each device or host on a TCP/IP network has its own IP address. The IP address is a 32-bit number, usually written in dot notation (e.g., 127.9.235.48). Another 32-bit number, called subnet mask (or *address mask*, *netmask*, e.g., 255.255.0.0) is used to identify the network portion and subnet portion of the IP address.

1. Connect a PC to the local port (9-pin female connector) of the Galaxy Gateway.

2. Using the built-in configuration utility, enter network configuration information. This information may have to be provided by the network administrator. The following equipment is required:

   • PC with terminal emulation program

   • Serial interface cable (DB-9 Male) for connection to the Galaxy Gateway

   To configure the Galaxy Gateway for your network, the following information is required for the Galaxy Gateway and your network:

   • IP address

   • Subnet mask

   In addition, the following optional information may be entered:

   • Host name

   • Default Gateway IP address

Logging In to the Galaxy Gateway

To login to the Galaxy Gateway, follow these steps:

1. Start-up the PC terminal program (Windows Terminal, Procomm, etc.) using the following communication parameters:

   Baud   : 9600
   Data   : 8
   Parity   : none
   Stop   : 1
   Handshaking: none
   Flow Control: none

2. Connect the PC to the Galaxy Gateway card's local port (RS-232) connector J2 (if it isn't already connected).

3. Press reset (SW1 – uP reset; see Figure 5-2) on the Galaxy Gateway card.

4. Wait for any diagnostic messages to pass.

5. Wait for the "ENTER PASSWORD:" command line prompt.

6. Type the Network Administrator password (default*: networkadm*).

7. Wait for the "$" prompt.

Configuring Static Network Parameters

After a valid password entry, a login header with the following format will be displayed:

```
Board Code          EBW1 1:1 or BJD1 1:1
Serial Number       99DJ09112345

Boot Block          version 1.0
Application Code     version 1.3
Default Web Pages    version 2.2
Custom Web Pages     not found

Ethernet Address     00-60-1D-00-5C-07
IP Address          not configured
Subnet Mask         not configured
Default Gateway     not configured
Host Name           not configured

For assistance type help

$
```

Typing HELP at the "$" will show all available network administration commands and command line formats.

*note: 1) commands are not case sensitive
2) for the commands that follow, ddd is a number from 0 - 255

- To set the IP Address, type:
  CHA NET1,IP=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,IP

- To set the Subnet mask, type:
  CHA NET1,SUB=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,SUB

- Optional:
  To set the Default Gateway Address, type:
  CHA NET1,GTWY=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,GTWY

- Optional:
  To set the Host Name, type:
  CHA NET1,HOST=*host name*
  Verify by typing:
  STA NET1,HOST

Logging Out of the
Galaxy Gateway

To terminate the configuration session, enter the "bye" command. The Galaxy Gateway will notify the user if configuration is not complete. This message will have the following format:

```
NOTICE:
Default gateway may be required for network access.
Host Name may be required for network access.

Logging off...
```

Messages referencing the Gateway and Host Name are acceptable, since these parameters are optional.

Note: If the IP address or Subnet mask messages appear, for example:

```
IP Address is required for network access.
Subnet mask is required for network access.
```

then the configuration procedure must be repeated.

Post Installation
Procedures

Once configuration has been completed

1. Disconnect the serial cable from the Galaxy Gateway (J2 connector).

2. Connect the 9-pin male end of the auxiliary port cable assembly to the J2 connector on the Galaxy Gateway.

3. Press SW1 (uP reset) on the Galaxy Gateway.

4. After approximately one minute, observe the LEDs on the Galaxy Gateway.

    • Yellow STATUS LED: OFF
    • Green STATUS LED: ON
    • Link LED: ON
    • XMIT/RCV: May be blinking

    The Galaxy Gateway should be communicating over the network.

5. Secure the cables (cable ties provided) using the eyelets in the controller housing. The fuse puller and the Millennium Controller's service cover should now be replaced and secured. Close and secure the hinged door.

6 Installation in a Galaxy Vector Controller System

Introduction

This section describes the Galaxy Gateway installation and cabling procedures required in a Vector system. Computer and Galaxy Gateway configuration is also addressed.

Preparation

The following Network Configuration Parameters must be obtained from your Network Administrator before starting:

- IP address
- Subnet mask
- Host name
- Gateway IP address

Note: Host and Gateway are optional.

Precautions

Note: Before starting, make sure proper ESD precautions are observed. The ESD grounding termination point located on the front portion of the controller's hinged door can be used for providing a chassis ground potential.

1. On the LCD display panel, verify that no controller related (CTLR LED) alarms are active. If controller alarms are active, consult the controller product manual.

Tools/Equipment Required

Before installing and configuring the Galaxy Gateway, the following tools/equipment are required:

- Flat jeweler's screwdriver (controller DIP switch setting)

- Small Phillips head screwdriver (controller service panel removal)

- Nut driver for 6-32 nut

- PC with terminal emulation program (example: HyperTerminal)

- 9 pin male serial interface cable (DB-9 male) to connect to Galaxy Gateway

- Network interface cable (CAT 5 UTP)

Unpacking the Galaxy Gateway

The Galaxy Gateway has been inspected, tested, and carefully packed before shipping. Although each circuit pack has been carefully packed, examine all components for damage as they are unpacked.

When unpacking the Galaxy Gateway:

1. Check for external damage to the shipping cartons.

2. Remove all parts from shipping cartons.

3. Use the packing list to verify that all components are present.

If damage is found, file a claim with the carrier and notify Lucent Technologies. For customers in the United States, Puerto Rico, the U.S. Virgin Islands, and Canada, call 1-800-THE-1PWR (1-800-843-1797). For international customers, call your local field support center or your sales representative to discuss your specific needs.

Identifying Components

Before you begin installing and configuring the Galaxy Gateway, make sure that the following components are present. Note that not all parts are used in a given installation.GPS systems may have either metal or plastic doors, and Gateway installation kits contain the hardware for both types. See Figures 6-1 and 6-2.

Quantity	Comcode	Description
1	108340100	EBW Galaxy Gateway circuit pack
1	848575866	Metal mounting bracket
1	848281945	EBW1 insulator cover
1	848589859	EBW1 wrap around insulator cover
4	408456465	Standoff (HMSP-TM-10-01)
4	901351239	Nut (6-32)
4	408445146	Self adhesive standoff (SCBS-6-19A-RMS-15)
4	403801558	Standoff (LCBS-TF-12-02)
4	408450955	Hex male-female standoff (AL-517811-16 4.5mm)
4	901377366	Pan head screw (M3 x 6mm)
1	848575841	Cable assembly

Galaxy Controller Configuration

The Galaxy Vector Controller to the Galaxy Gateway must be configured so that it will communicate with the Galaxy Gateway.

1. On the BLJ3 (terminal connection) board, set DIP switch S1.3 to 1. This enables the Gateway card to communicate with the Vector Controller.

Galaxy Gateway Installation

Use the following procedures to install a new or replacement Galaxy Gateway.

Precautions

*   Always consider personal safety before beginning any procedure.

*   Be aware of the presence of battery potential in the vicinity of the controller.

*   Use only insulated tools.

*   Wear grounded antistatic wrist straps when handling all circuit packs. The wrist strap must be in contact with the skin and is not to be worn over clothing. Remove the fuse puller located at the top of the hinged door of the controller.

*   Never hand a circuit pack from a grounded to a non-grounded person or vice-versa.

Fold top of insulator over
board and snap on standoffs.

Galaxy Gateway Board
108340100

Standoff
901351239 (4 places)
Torque hand tight.

Wrap-Around Insulator
848589859

Mounting Bracket
848575866

Mount on Door

Hardware (4 nuts) Provided
901351239
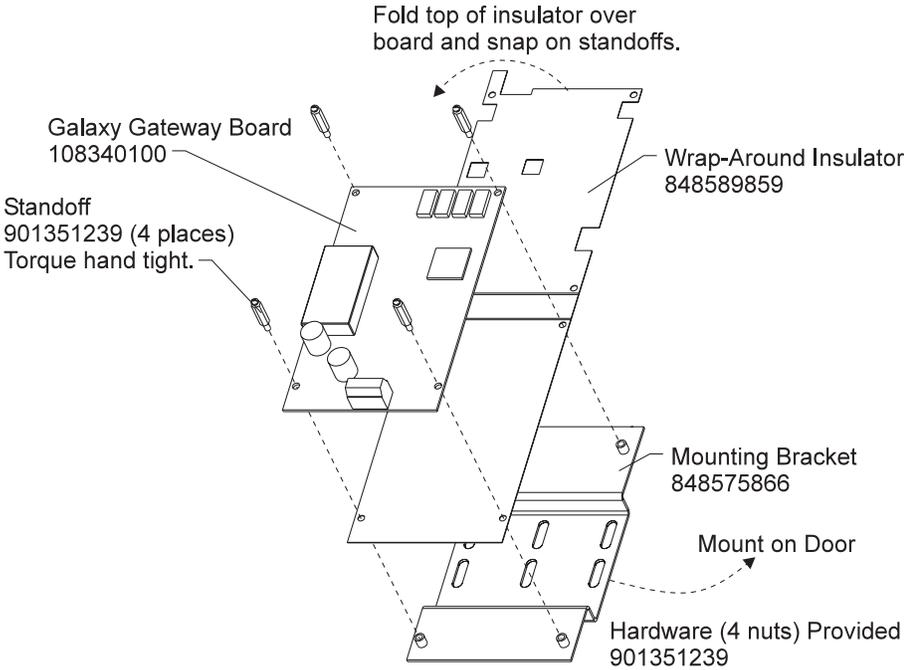
Figure 6-1: Galaxy Gateway installation for metal door
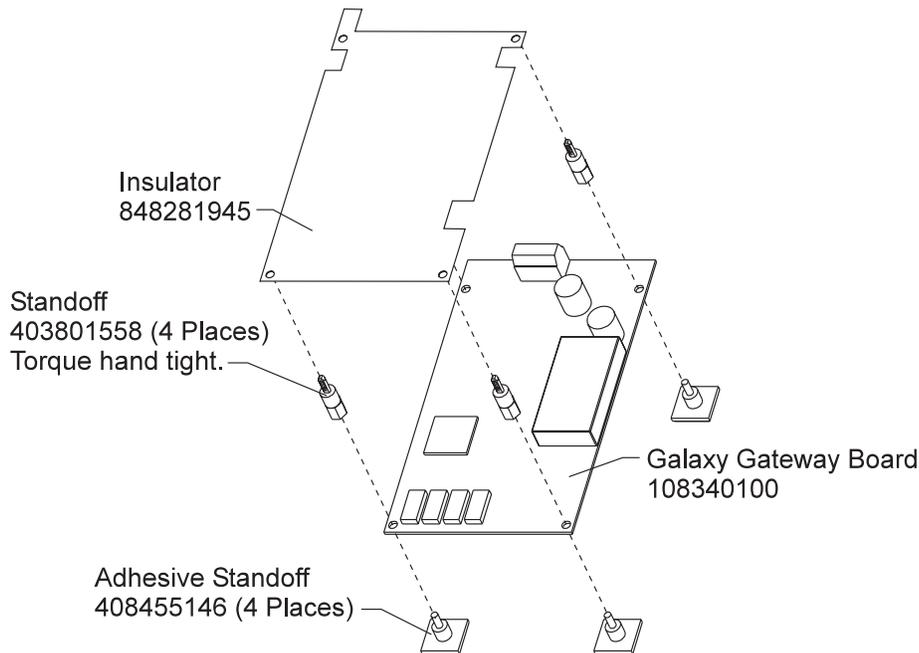
Figure 6-2: Galaxy Gateway installation for any door

Procedure

1. Refer to Figures 6-1 and 6-2. Figure 6-1 shows the hardware used for installation in plants with metal doors, which have pre-drilled holes to accommodate the bracket. Figure 6-2 shows the hardware used for installation on any style door.

2. Position the Galaxy Gateway so that J1 (RJ-45 network interface connector) and J2 (DB-9 serial port connector) are located at the bottom of the access door. The component side of the circuit pack should be facing outwards.

3. Install the four plastic mounting posts. Be sure not to over-tighten as damage may occur to the board.

4. Locate the black protective cover provided in the kit. This insulator contains four round perforations that line up with the supporting standoffs previously inserted in the Galaxy Gateway circuit pack. Carefully align the holes in the insulator to the standoffs and insert the ends of the standoffs through the insulator until it is secured.

Note: Exercise caution when placing the insulator onto to the board so that contact between component surfaces and hands are at a minimum.

Cable
Connections

Galaxy Gateway   The Galaxy Gateway receives power and communications from the
controller. To connect the Galaxy Gateway to the Vector controller,
follow this procedure (see Figure 6-2):

1. Locate the controller interface cable assembly that is provided in
    the kit.

2. Identify the DB-9 male (9 pin) connector of the controller interface
    cable assembly. Insert this connector into J2 on the EBW card. The
    other end of this cable goes to RS232 connector P4 on the BLJ3
    board of the Vector controller.

3. Identify the black, 4-position connector on the opposite end of the
    red and black leads. Connect this end of the cable assembly to P1
    (power connector) on the Galaxy Gateway. The red and black leads
    connect to posts marked BAT and DG of the BLJ3 board. One of
    the leads is protected by a fuse; connect this lead to BAT. **Note:**
    there are five connectors marked DG. Any of these may be used.

    Note: Power will be applied to the Galaxy Gateway when this cable
    is plugged into P1.

4. After the connection to P1, wait approximately 45 seconds. The
    Yellow status LED should blink, indicating that the Gateway is
    ready to be configured.

Fold top of insulator over board
and secure with pan head screws.

Wrap-Around Insulator
848589859

Galaxy Gateway Board
108340100

Standoff
408450955 (4 Places)
Torque hand tight.

Pan Head Screw (M3 x 6mm)
901377366 (4 Places)
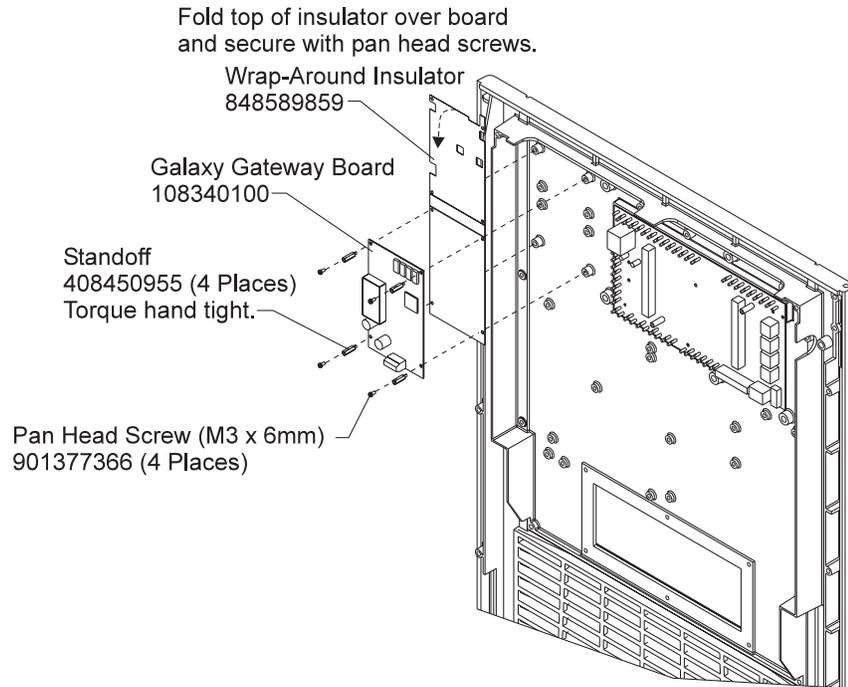
Figure 6-3: Gateway Connection to Vector Controller

10Base-T Network   The Galaxy Gateway has an IEEE 802.3 compliant 10Base-T network interface. Since the cable length required to connect the Galaxy Gateway to the network is variable, this cable must be supplied by the user. To connect the Galaxy Gateway to your network, follow this procedure (see Figure 6-4):

1. Connect one end of the network interface cable to J1 (RJ-45 Network Interface Connector), usually located at the bottom right on the Galaxy Gateway. (Other configurations are possible with the hardware shown in Figure 6-2.)

2. Connect the other end to an IEEE 802.3 compatible network.
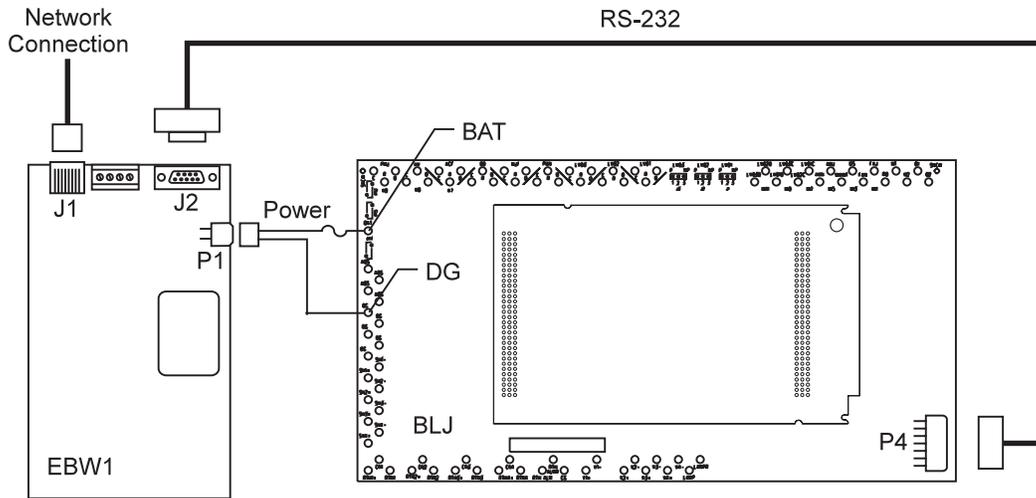
Figure 6-4: Gateway Connection to Network

Configuring Network Communications

The Galaxy Gateway uses Transmission Control Protocol/Internet Protocol (TCP/IP) to communicate with the host computer on a local area network. TCP/IP is a widely used protocol that provides communication across networks of diverse computers and devices. This protocol forms the basis for the Internet. Each device or host on a TCP/IP network has its own IP address. The IP address is a 32-bit number, usually written in dot notation (e.g., 127.9.235.48). Another 32-bit number, called subnet mask (or *address mask*, *netmask*, e.g., 255.255.0.0) is used to identify the network portion and subnet portion of the IP address.

1. Connect a PC to the local port (9-pin female connector) of the Galaxy Gateway.

2. Using the built-in configuration utility, enter network configuration information. This information may have to be provided by the network administrator. The following equipment is required:

    *   PC with terminal emulation program

    *   Serial interface cable (DB-9 Male) for connection to the Galaxy Gateway

    To configure the Galaxy Gateway for your network, the following information is required for the Galaxy Gateway and your network:

    *   IP address

• Subnet mask

In addition, the following optional information may be entered:

• Host name

• Default Gateway IP address

Logging In to the Galaxy Gateway   To login to the Galaxy Gateway, follow these steps:

1. Start-up the PC terminal program (Windows Terminal, Procomm, etc.) using the following communication parameters:

   Baud   : 9600
   Data   : 8
   Parity   : none
   Stop   : 1
   Handshaking: none
   Flow Control: none

2. Connect the PC to the Galaxy Gateway card's local port (RS-232) connector J2 (if it isn't already connected).

3. Press reset (SW1 – uP reset; see Figure 6-2) on the Galaxy Gateway card.

4. Wait for any diagnostic messages to pass.

5. Wait for the "ENTER PASSWORD:" command line prompt.

6. Type the Network Administrator password (default*: networkadm*).

7. Wait for the "$" prompt.

Configuring Static Network Parameters   After a valid password entry, a login header with the following format will be displayed:

```
Board Code          EBW1 1:1 or BJD1 1:1
Serial Number       99DJ09112345

Boot Block          version 1.0
Application Code     version 1.3
Default Web Pages    version 2.2
Custom Web Pages     not found
```

```
Ethernet Address      00-60-1D-00-5C-07
IP Address            not configured
Subnet Mask           not configured
Default Gateway       not configured
Host Name             not configured


For assistance type help

$
```

Typing HELP at the "$" will show all available network administration commands and command line formats.

note: 1) commands are not case sensitive
       2) for the commands that follow, ddd is a number from 0 - 255

- To set the IP Address, type:
  CHA NET1,IP=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,IP

- To set the Subnet mask, type:
  CHA NET1,SUB=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,SUB

- Optional:
  To set the Default Gateway Address, type:
  CHA NET1,GTWY=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,GTWY

- Optional:
  To set the Host Name, type:
  CHA NET1,HOST=*host name*
  Verify by typing:
  STA NET1,HOST

Logging Out of the Galaxy Gateway

To terminate the configuration session, enter the "bye" command. The Galaxy Gateway will notify the user if configuration is not complete. This message will have the following format:

```
NOTICE:
Default gateway may be required for network access.
Host Name may be required for network access.

Logging off...
```

Messages referencing the Gateway and Host Name are acceptable, since these parameters are optional.

Note: If the IP address or Subnet mask messages appear, for example:

```
IP Address is required for network access.
Subnet mask is required for network access.
```

then the configuration procedure must be repeated.

Post Installation Procedures

Once configuration has been completed

1. Disconnect the serial cable from the Galaxy Gateway (J2 connector).

2. Connect the 9-pin male end of the auxiliary port cable assembly to the J2 connector on the Galaxy Gateway.

3. Press SW1 (uP reset) on the Galaxy Gateway.

4. After approximately one minute, observe the LEDs on the Galaxy Gateway.

   • Yellow STATUS LED: OFF
   • Green STATUS LED: ON
   • Link LED: ON
   • XMIT/RCV: May be blinking

   The Galaxy Gateway should be communicating over the network.

5. Secure the cables using the cable clips in plant door. Close and secure the hinged door.

7 Installation in an EPS 4802B Battery Plant

Introduction   This section describes the Galaxy Gateway installation and cabling procedures required in an EPS 4802B Battery Plant that contains the basic ERIC (BNC1) and may also contain the full-featured Vector Controller. Computer and Galaxy Gateway configuration is also addressed.

Preparation   The following Network Configuration Parameters must be obtained from your Network Administrator before starting:

- IP address
- Subnet mask
- Host name
- Gateway IP address

Note: Host and Gateway are optional.

Precautions   Note: Before starting, make sure proper ESD precautions are observed. Use an ESD wrist strap.

1. On the LCD display panel, verify that no controller related (CTLR LED) alarms are active. If controller alarms are active, consult the controller product manual.

Tools/Equipment Required   Before installing and configuring the Galaxy Gateway, the following tools/equipment are required:

- Flat jeweler's screwdriver (controller DIP switch setting)

- Small Phillips head screwdriver (controller service panel removal)

- PC with terminal emulation program (example: HyperTerminal)

Unpacking the
Galaxy Gateway

The Galaxy Gateway has been inspected, tested, and carefully packed before shipping. Although each circuit pack has been carefully packed, examine all components for damage as they are unpacked.

When unpacking the Galaxy Gateway:

1. Check for external damage to the shipping cartons.

2. Remove all parts from shipping cartons.

3. Use the packing list to verify that all components are present.

If damage is found, file a claim with the carrier and notify Lucent Technologies. For customers in the United States, Puerto Rico, the U.S. Virgin Islands, and Canada, call 1-800-THE-1PWR (1-800-843-1797). For international customers, call your local field support center or your sales representative to discuss your specific needs.

Identifying
Components

The Galaxy Gateway Card is supplied as part of a kit for installation in an EPS 4802B Battery Plant. Before you begin installing and configuring the Galaxy Gateway, make sure that the following components are present:

Quantity	Description	Comcode
1	EBW1 Galaxy Gateway circuit pack	848725685
2	Galaxy Controller interface cable (only one is used, depending on Vector display)	848634994
1	Power cable (red and black wires with fuse holder)	848634994
2	Grommet - 2 pieces furnished, 2.5 inches and 1 inch	405471723
2	Adhesive mounting pads	403354574
3	Tie wraps	404051716
2	Nuts (6mm) to secure mounting tabs	901377010
2	250 Faston tabs	408335362
2	Screws M5x12mm to secure EBW1 card	901248815
1	Galaxy Gateway Card Product Manual	108728163
1	Paint piercing ground washer	848157400

Galaxy Controller Configuration

The Galaxy Vector Controller to the Galaxy Gateway must be configured so that it will communicate with the Galaxy Gateway.

1. On the BNC1 (terminal connection) board, set DIP switch SW1.3 to 1. This indicates to the Vector Controller that the Gateway card is connected.

Galaxy Gateway Installation

Use the following procedures to install a new or replacement Galaxy Gateway.

Precautions

- Always consider personal safety before beginning any procedure.

- Be aware of the presence of battery potential in the vicinity of the controller.

- Use only insulated tools.

- Wear grounded antistatic wrist straps when handling all circuit packs. The wrist strap must be in contact with the skin and is not to be worn over clothing.

- Never hand a circuit pack from a grounded to a non-grounded person or vice-versa.
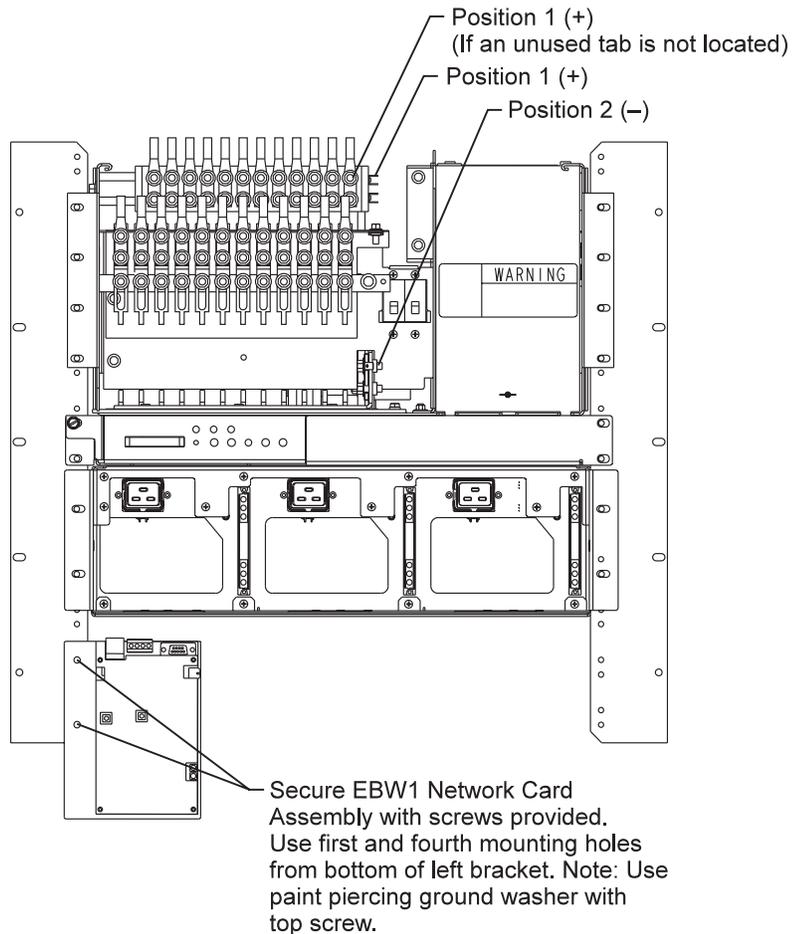
Figure 7-1: Galaxy Gateway Installation in EPS 4802B Battery Plant

Procedure　　　**Step 1:**

1. Refer to Figure 7-1.

2. Check distribution for 250 Faston mounting tabs in positions 1 and 2. If no tabs are in place, leave the system on and carefully attach the tabs furnished in the kit as follows:

3. In position 1, remove the nut, place the mounting tab over the stud and secure with the nut.

4. In position 2, place the tab over the end of the screw and secure with the nut furnished in the kit.

Step 2:

1. Secure EBW1 network card assembly as shown in Figure 7-1, using the screws provided. **Note:** Use the paint-piercing ground washer provided on the upper hole to assure a proper ground.

Step 3:

1. Refer to Figure 7-2.
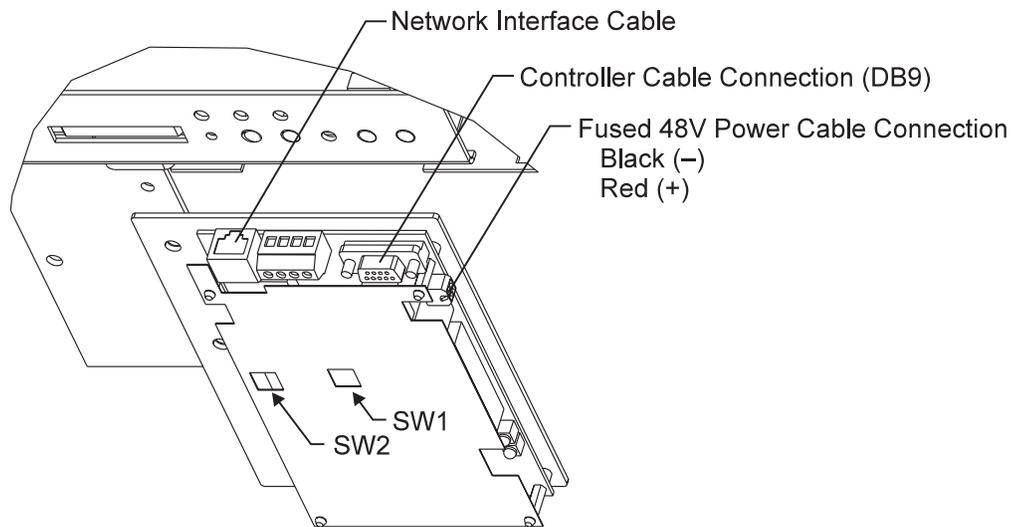
Figure 7-2: Cable connections for Gateway Card in EPS 4802B Battery Plant

2. Connect the 48V power cable to the EBW1 network card.

3. Connect the network interface cable to the EBW1 network card. Since the cable length required to connect the Galaxy Gateway to the network is variable, this cable must be supplied by the user.

4. Refer to Figure 7-3. Locate a rectangular cutout (opening for cables) on the side of the frame just above the ERIC module. Cover the lower and rear (vertical) edges of this opening with the grommet material furnished in the kit. Slide the power cable and the controller cable through this opening.

Opening for cables

Eric Module

EBW1 Network Card Assembly

Remove screw and Eric Module (BNC1 Controller) to connect the controller cable from the Network Card Assembly (EBW1.)
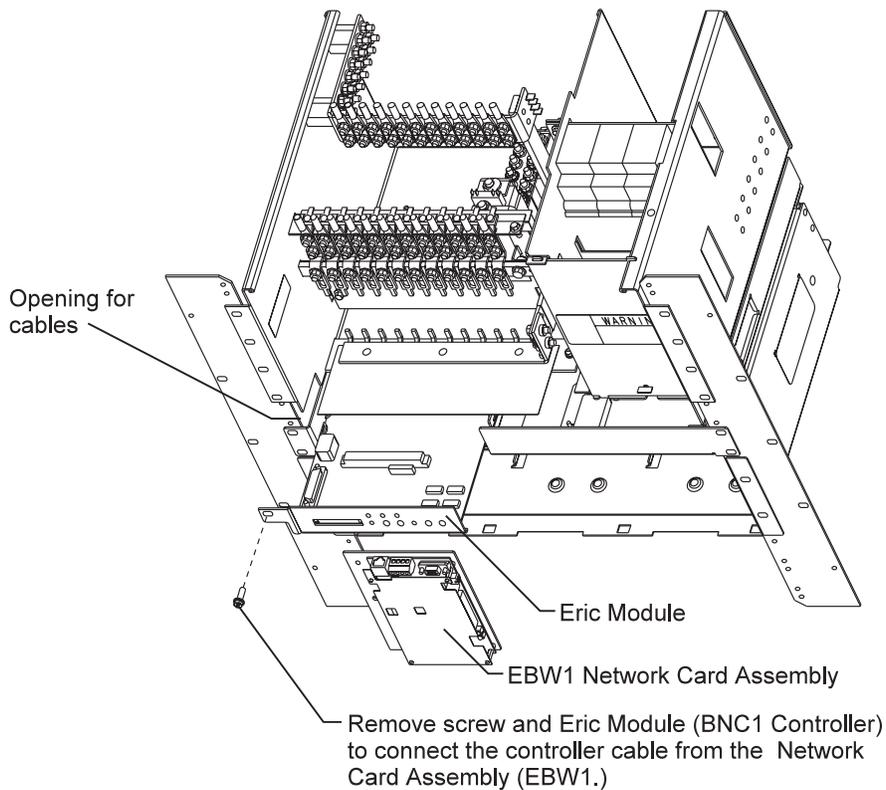
Figure 7-3: Removing the ERIC module

5. Route the power cable along the surface of the Lexan insulation. Anchor the power cable with the adhesive mounting pads and tie wraps provided.

6. Route the red wire (+) of the power cable upward along the right side of the distribution to Position 1 (see Figure 7-1). Anchor it with tie wrap provided. Do not connect the wire to the distribution at this time.

7. Route the network interface cable along the same path as the power and controller cables, all the way up and out the rectangular opening at the top of the cabinet. Connect the other end to an IEEE 802.3 compatible network.

Step 4:

1. See Figure 7-3. Remove the screw and ERIC module to allow connecting the controller cable from the EBW1 Network Card.

Step 5:

1. See Figure 7-4. Connect the controller cable to the controller connector identified on the ERIC module. **Note:** Use the correct controller cable. Two versions are furnished in the kit. Cable Assembly labeled #1 is used with Vector Controller with four-line LCD display, and Cable Assembly labeled #2 is used with Vector Controller with single-line LED display.

2. Slide the ERIC module back into place and secure it with the screw.
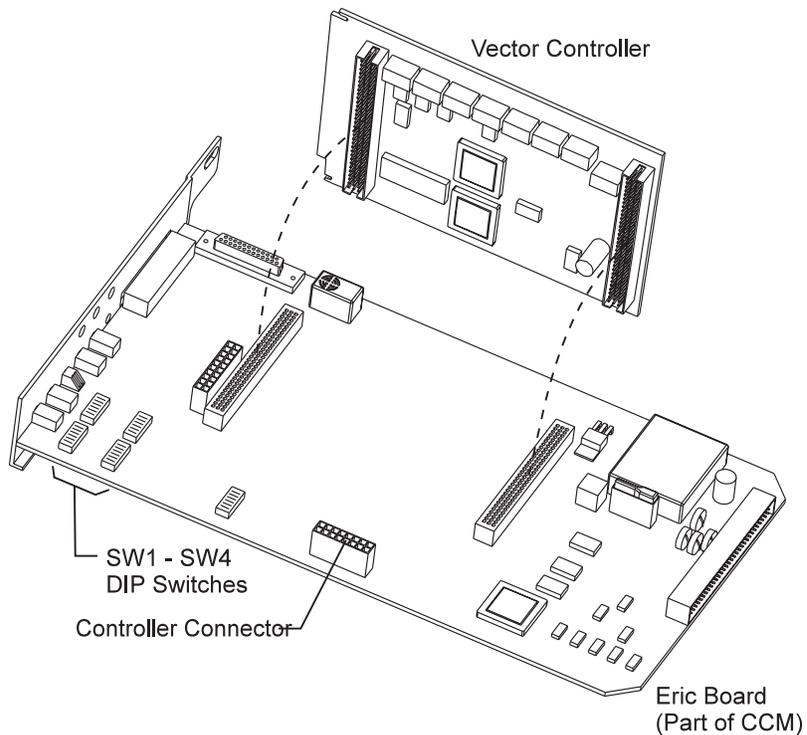
Figure 7-4: Network connector on ERIC module

Step 6:

1. Carefully connect the -48 volt power cable to distribution as follows: Slide the red (+) wire on tab at position 1 (see Figure 7-1). Then slide the black (-) wire on tab at position 2.

Configuring Network Communications

The Galaxy Gateway uses Transmission Control Protocol/Internet Protocol (TCP/IP) to communicate with the host computer on a local area network. TCP/IP is a widely used protocol that provides communication across networks of diverse computers and devices. This protocol forms the basis for the Internet. Each device or host on a TCP/IP network has its own IP address. The IP address is a 32-bit number, usually written in dot notation (e.g., 127.9.235.48). Another 32-bit number, called subnet mask (or *address mask*, *netmask*, e.g., 255.255.0.0) is used to identify the network portion and subnet portion of the IP address.

1. Connect a PC to the local port (9-pin female connector) of the Galaxy Gateway.

2. Using the built-in configuration utility, enter network configuration information. This information may have to be provided by the network administrator. The following equipment is required:

   • PC with terminal emulation program

   • Serial interface cable (DB-9 Male) for connection to the Galaxy Gateway

   To configure the Galaxy Gateway for your network, the following information is required for the Galaxy Gateway and your network:

   • IP address

   • Subnet mask

   In addition, the following optional information may be entered:

   • Host name

   • Default Gateway IP address

Logging In to the Galaxy Gateway

To login to the Galaxy Gateway, follow these steps:

1. Start-up the PC terminal program (Windows Terminal, Procomm, etc.) using the following communication parameters:

   Baud   : 9600
   Data   : 8
   Parity   : none
   Stop   : 1
   Handshaking: none
   Flow Control: none

2. Connect the PC to the Galaxy Gateway card's local port (RS-232) connector J2 (if it isn't already connected).

3. Press reset (SW1 – uP reset; see Figure 7-2) on the Galaxy Gateway card.

4. Wait for any diagnostic messages to pass.

5. Wait for the "ENTER PASSWORD:" command line prompt.

6. Type the Network Administrator password (default: *networkadm*).

7. Wait for the "$" prompt.

Configuring Static Network Parameters

After a valid password entry, a login header with the following format will be displayed:

```
Board Code          EBW1 1:1
Serial Number       99DJ09112345

Boot Block          version 1.0
Application Code    version 1.3
Default Web Pages   version 2.2
Custom Web Pages    not found

Ethernet Address    00-60-1D-00-5C-07
IP Address          not configured
Subnet Mask         not configured
Default Gateway     not configured
Host Name           not configured

For assistance type help

$
```

Typing HELP at the "$" will show all available network administration commands and command line formats.

note: 1) commands are not case sensitive
2) for the commands that follow, ddd is a number from 0 - 255

- To set the IP Address, type:
  CHA NET1,IP=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,IP

- To set the Subnet mask, type:
  CHA NET1,SUB=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,SUB

- Optional:
  To set the Default Gateway Address, type:
  CHA NET1,GTWY=*ddd.ddd.ddd.ddd*
  Verify by typing:
  STA NET1,GTWY

- Optional:
  To set the Host Name, type:
  CHA NET1,HOST=*host name*
  Verify by typing:
  STA NET1,HOST

Logging Out of the Galaxy Gateway

To terminate the configuration session, enter the "bye" command. The Galaxy Gateway will notify the user if configuration is not complete. This message will have the following format:

```
NOTICE:
Default gateway may be required for network access.
Host Name may be required for network access.

Logging off...
```

Messages referencing the Gateway and Host Name are acceptable, since these parameters are optional.

Note: If the IP address or Subnet mask messages appear, for example:

```
IP Address is required for network access.
Subnet mask is required for network access.
```

then the configuration procedure must be repeated.

Post Installation Procedures

Once configuration has been completed

1. Disconnect the serial cable from the Galaxy Gateway (J2 connector).

2. Connect the 9-pin male end of the controller cable assembly to the J2 connector on the Galaxy Gateway.

3. Press SW1 (uP reset) on the Galaxy Gateway.

4. After approximately one minute, observe the LEDs on the Galaxy Gateway.

   - Yellow STATUS LED: OFF
   - Green STATUS LED: ON
   - Link LED: ON
   - XMIT/RCV: May be blinking

   The Galaxy Gateway should be communicating over the network.

8 *Operation*

Web Browser Access (HTTP)   Using a standard web browser, such as Netscape or Internet Explorer, enter the IP address (or host name) of the Galaxy Gateway. If the IP address is valid, and the Galaxy Gateway is functioning normally, a screen will appear prompting the user to choose either the Galaxy Controller or the Galaxy Gateway (Network Card) for login. See Figure 7-1. Selecting the GALAXY destination allows the user to access and configure the Galaxy Controller.

Select a destination, enter the correct password, and click on the Submit button. (Default passwords for the Galaxy Controller are: *lineage, super-user, administrator* for the User, Super-User and Administrator logins respectively. For the Gateway (Network card), the default password is *networkadm*. Selecting the Network Card destination allows the user to access and configure the network card.

Galaxy Gateway

Please pick a destination and enter pasword

⦿ GALAXY   ○ Network Card

Password: [**********|]   [Submit]   [Reset]

Figure 7-1: Login screen. Click "Submit" to continue

Using Web Pages   The figures that follow illustrate the type of web pages users will encounter. Depending on the version purchased, the actual formats may differ slightly, but the functions will be similar.

Clicking "Submit" brings up the first interactive screen, Alarms (Figure 7-2).
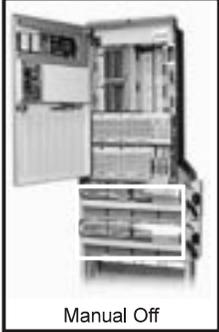
Alarms

Active Alarms

Date	Time	Severity	Description
09/22/2000	08:58	MAJ	User Event 1
01/01/1994	00:00	MIN	Battery On Discharge
01/01/1994	00:00	WRN	Password At Default
01/01/1994	00:00	WRN	Memory Backup Battery Low
01/01/1994	00:00	WRN	Energy Management Disabled
01/01/1994	00:00	WRN	Shunt Not Configured
09/21/2000	00:37	RO	Clock Changed
01/01/1994	00:36	RO	Configuration Changed

| Critical | Major | Minor | Warning | Record Only |

View Alarm History

Clear All Latched Alarms

Manual Off

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
-52.08 V 312 A
FLOAT

Figure 7-2: Alarms screen

The Alarms screen displays the currently active alarms, the dates and times of occurrence, their severity, and a description of each event. Notice the links that allow users to view alarm history and to clear latched alarms.

The left side of each screen also displays the current readings of plant voltage, current, and state (float, boost, or battery thermal protection).

The next illustration, Figure 7-3, is a Block Diagram of the logical arrangement of a set of default web page screens. These screens are accessed by clicking on the various links on each page. For instance, at the left of the screen shown in Figure 7-2, links offer access to the categories "Alarms," "Plant," "Monitoring," "Inventory," "Configuration," "Operations," and "Logoff." The illustrations in this section give examples of how to use these links to check the status of the plant and perform various functions.

```
                          ┌─────────────────┐
                          │   Login Page    │
                          └─────────────────┘
                                   │
           ┌───────────────────────┴───────────────────────┐
           ▼                                                 ▼
┌─────────────────────┐                        ┌─────────────────────┐
│  Galaxy Controller  │                        │   Galaxy Gateway    │
└─────────────────────┘                        └─────────────────────┘
           │                                                 │
        ── Alarms                                            ▼
                                              ┌─────────────────────────┐
        ── Plant ───────▶  ┌──────────────┐   │  Feature Key            │
                           │  Overview    │   │  Ethernet Address       │
                           │  Batteries   │   │  IP Address             │
                           │  Rectifiers  │   │  Subnet Mask            │
                           │  Converters  │   │  Default Gateway        │
                           │  Network     │   │  Host Name              │
                           └──────────────┘   └─────────────────────────┘

        ── Monitoring ──▶  ┌──────────────┐
                           │  Derived     │
                           │  Voltage     │
                           │  Shunt       │
        ── Inventory       │  Binary      │
                           │  Temperature │
                           │  Relay       │
                           └──────────────┘

        ── Configuration ▶ ┌─────────────────────┐
                           │  Plant              │
                           │  Alarm Thresholds   │
                           │  Disconnect Thresholds │
                           │  Passwords          │
                           │  Network            │
                           └─────────────────────┘

        ── Operations ──▶  ┌──────────────┐
                           │  Plant Mode  │
        ── Logoff          │  Alarm Test  │
                           │  Contactors  │
                           │  Rectifier   │
                           └──────────────┘
```

Figure 7-3: Block Diagram of Functions Accessible From Login Page

Screens   A user may exit the system at any time by clicking on the "Logoff" link. See Figure 7-4. Note the reminder to exit the web browser at the end of each session, so that unauthorized users cannot access the system.

Galaxy Gateway

Your session has been terminated.

Login

If you are done, you should exit your web browser!

If not, someone else may be able to access the password you entered dearlier during this session.

Figure 7-4: Logoff Screen

Examples of Screen Interactions

Clicking on the Plant or Monitoring link takes the user to the screen shown in Figure 7-5. This page allows the user to scroll down to see the items shown in Figure 7-6.

Plant Status

Contents: System Rectifier/Converter Battery Distribution Alarms & Events Communications Monitoring Administration

Voltages & Thresholds

Boost HV Shutdown	27.75
Float HV Shutdown	27.75
Boost HV Alarm	26.8
Float HV Alarm	26.8
Boost Setpoint	26.04
Float Setpoint	26.04
Present Voltage	26.04
Boost BD Threshold	27.0
Float BD Threshold	27.0
All-Rectifier-On Threshold	22.0

Currents & Capacities

Capacity	200.0
Total Rectifier Drain	2.0
Current	0.0

Manual Off

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
-52.08 V 312 A
FLOAT

Figure 7-5: Status Screen

	System
	DC Plant Controller Alarm Test Trend Busy Hour Statistic User Defined Object
Manual Off	**Rectifier/Converter**
	Rectifier Manager Rectifier Rectifier Bay Converter Plant Converter
Alarms Plant Monitoring Inventory Configuration Operations Logoff	**Battery** Boost Slope Thermal Compensation Battery Type Definition Battery Management Battery Bay Battery Section
	Distribution
TXDJ00T9 364 Roper Street -52.08 V 312 A FLOAT	DC Distribution AC Distribution Contactor Bay Interface Card
	Alarms & Events Alarm Cut-off Standard Alarm Very Low Voltage Multiple Rectifier Fail Limited Recharge Excess Rectifier Drain Engine Transfer Timeout Rectifier/Plant Inconsistency Reserve Time Low Multiple Converter Fail Battery On Discharge High Voltage High Float Voltage User Defined Event Timer Event Maintenance Reminder Connected Equipment Alarm

Figure 7-6: Status Screen (Continued)

To continue the example of how to use the links, clicking on "DC Plant" under "System" brings up the screen shown in Figure 7-7. Note the variety of information displayed about this object. This is an example of a "View" page.

Note the links under the heading of this page: "Operate," "Configure," "History," and "Statistics." Choosing "Operate" brings up the screen shown in Figure 7-8. This is an example of a page that allows the user to perform operations on the object. In this case, the user may select the plant state to be Float, Boost, or Battery Thermal Protection, and turn the rectifier restart function on or off.

Clearing Text Fields

Note: Various screens in the system contain fields in which users can enter text. To clear such a field, type the string (NONE) in upper- or lower-case letters.
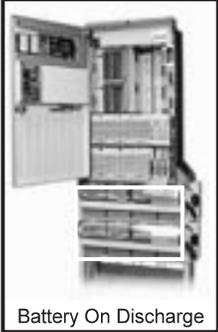
DC Plant DC1

Operate Configure History Statistics

Identifier	DC1
Description	DC Plant 1
Type	+24V DC
Voltage	+26.04 V
Current	0 A
Capacity	200 A
Total Rectifier Drain	2 A
Shunt Type	LOAD
Shunt Current	0
Shunt Voltage	150
State	FLOAT
Backup HV Threshold	26.80 V
Battery On Discharge	active
Energy Management State	off
Energy Management Enable	enable

Battery On Discharge

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
+26.04 V 0 A
FLOAT

Figure 7-7: View DC Plant DC1 Screen

Operate DC Plant DC1

State	FLOAT	○ FLOAT ○ BOOST ○ BTP
Rectifier Restart	off	○ off ○ on

submit

User Event 1

Figure 7-8: Operate DC Plant DC1 Screen

Similarly, choosing "Configure" brings up the screen shown in Figure 7-9. Drop-down windows in this screen allow the user to change various values. For instance, locate the value "Shunt Type." Clicking on the scroll arrow displays the choices shown in Figure 7-10. The user may select LOAD, BATTERY, or NONE.
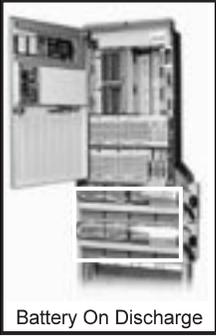
Configure DC Plant DC1

Battery On Discharge

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
+26.04 V 0 A
FLOAT

	Current Value	New Value	Hint
Description	DC Plant 1		text
Shunt Type	LOAD	▼	LOAD, BATTERY, NONE
Shunt Current	0		number
Shunt Voltage	150		1.0 to 150.0
Energy Management Enable	enable	▼	disable=0, enable=1
Rectifier Restart Enable	enable	▼	disable=0, enable=1
Rectifier Sequencing	disable	▼	disable=0, enable=1
All Rectifier On Threshold	22.00		24V: 20.0 to 25.0 48V: 40.0 to 50.0
Rectifier On Delay	10		100.0 to 60.0

Figure 7-9: Configure DC Plant DC1

Configure DC Plant DC1

	Current Value	New Value	Hint
Description	DC Plant 1		text
Shunt Type	LOAD	▼	LOAD, BATTERY, NONE
Shunt Current	0		number
Shunt Voltage	150		1.0 to 150.0
Energy Management Enable	enable	▼	disable=0, enable=1
Rectifier Restart Enable	enable	▼	disable=0, enable=1
Rectifier Sequencing	disable	▼	disable=0, enable=1
All Rectifier On Threshold	22.00		24V: 20.0 to 25.0 48V: 40.0 to 50.0
Rectifier On Delay	10		100.0 to 60.0

LOAD
BATTERY
NONE

Battery On Discharge

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
+26.04 V 0 A
FLOAT

Figure 7-10: Configuring Shunt Type

Clicking on the "Statistics" link on the DC Plant screen brings up the view displayed in Figure 7-11. Users can scroll down to see the entire display. Note that the information incudes the period covered, and both instantaneous readings and hourly averages.

DC Plant DC1 Statistics

DC Plant Voltage

Present | +26.05V
Average | 26.04V

0
min | max
26.02 | 26.05

Statistics since: 01/01/1994,00:00
Highest hourly instantaneous at: 09/22/2000,08:26
Lowest hourly instantaneous at: 09/23/2000,22:16
Highest hourly average at: 09/24/2000,08:00

DC Plant Current

Present | 0A
Average | 0A

min / max
0

Statistics since: 01/01/1994,00:00
Highest hourly instantaneous at: 09/21/2000,16:00
Lowest hourly instantaneous at: 01/01/1994,00:00
Highest hourly average at: 09/21/2000,16:00

DC Plant Total Rectifier Drain

Present | 2A
Average | 2A

Minor Communication

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
+26.04 V 0 A
FLOAT

Figure 7-11: DC Plant DC1 Statistics

Another kind of "View" screen, shown in Figure 7-12, allows interaction with the plant. On the "View Rectifier Status" screen, each rectifier's identification number (G01, G02, and so on) is a link to the screen shown in Figure 7-13. This screen, in turn, allows the user to select items labeled "Operate," "Configure," Statistics," and "Links." Selecting this last item, "Links," brings up Figure 7-14. This screen allows the user to link or unlink the rectifier to any of the events available in the scrollable list.
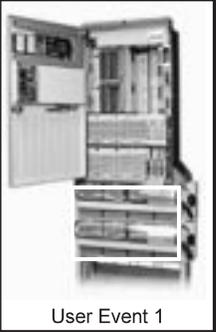
View Rectifier Status

Identifier	Description	Type	DC Current	DC Voltage	State	Rectifier Fail
G01	Rectifier 1	596B	1 A	26.20 V	ON	0
G02	Rectifier 2	596B	1 A	26.40 V	ON	0
G03	Rectifier 3	UNCONFIGURED			VACANT	0
G04	Rectifier 4	UNCONFIGURED			VACANT	0
G05	Rectifier 5	UNCONFIGURED			VACANT	0
G06	Rectifier 6	UNCONFIGURED			VACANT	0
G07	Rectifier 7	UNCONFIGURED			VACANT	0
G08	Rectifier 8	UNCONFIGURED			VACANT	0
G09	Rectifier 9	UNCONFIGURED			VACANT	0
G10	Rectifier 10	UNCONFIGURED			VACANT	0
G11	Rectifier 11	UNCONFIGURED			VACANT	0
G12	Rectifier 12	UNCONFIGURED			VACANT	0
G13	Rectifier 13	UNCONFIGURED			VACANT	0
G14	Rectifier 14	UNCONFIGURED			VACANT	0

User Event 1

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
+26.04 V 0 A
FLOAT

Figure 7-12: View Rectifier Status

Rectifier G01

Operate Configure Statistics Links

User Event 1

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
+26.04 V 0 A
FLOAT

Identifier	G01
Description	Rectifier 1
Type	596B
DC Current	1 A
DC Voltage	26.20 V
State	ON
Shunt Voltage	50
Capacity	100 A
Temperature	80.6 F
MAN Type	NONE
Use in Sequence Enable	yes
Output Breaker State	CLOSED
Rectifier Fail	inactive
AC Fail	inactive
Phase Fail or Limited Output	inactive

Figure 7-13: Individual Rectifier Screen
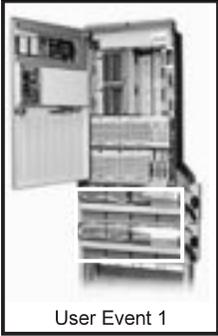
Rectifier G01 Links

Input Breaker State:

| | Unlink | Link |

The following objects are available for linking

User Defined Event	
U0001	User Event 1
Timer Event	
T01	Time Event 1
Derived Channel	
DR01	Derived Chan 1
Bay Current Monitor	
BCM0101	Current 1 Bay 1
BCM0201	Current 2 Bay 1
BCM0301	Current 3 Bay 1
BCM0401	Current 4 Bay 1
BCM0102	Current 1 Bay 2

User Event 1

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
+26.04 V 0 A
FLOAT

Figure 7-14: Rectifier Links Screen

The Configuration screen shown in Figure 7-15 allows the user to accept or change values for various parameters, including Site ID, Site Description, Float Voltage, Boost Voltage, Load Current Limit, Boost Current Limit, and Recharge Current Limit. Type in any new values desired for these items. Another parameter, Temperature Compensation, has a drop-down menu offering the choice of Enabled or Disabled. Click on "Submit New Plant Settings" when finished.
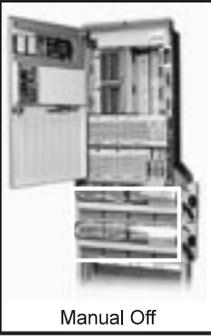
Galaxy Power System - Configuration

To configure an item in the system, first view the item you wish to change, and click the "Configure" link. Start <u>here</u>. A few of the more frequently accessed configurable items are listed below for your convenience.

Contents: <u>Plant</u> <u>Alarm Thresholds</u> <u>Disconnect Thresholds</u> <u>Security</u> <u>Network</u>

Plant

Setting	Current Value	New Value
Site ID	TXDJ00T9	
Site Description	364 Roper Street	
Float Voltage	26.04	
Boost Voltage	26.04	
Temperature Compensation	disabled	▼
Float Current Limit (%)	110	
Boost Current Limit (%)	110	
Recharge Current Limit (amps)	1000	

Submit New Plant Settings

Manual Off

<u>Alarms</u>
<u>Plant</u>
<u>Monitoring</u>
<u>Inventory</u>
<u>Configuration</u>
<u>Operations</u>
<u>Logoff</u>

TXDJ00T9
364 Roper Street
+26.04 V 0 A
FLOAT

Figure 7-15: Galaxy Power System Configuration

The History screen shown in Figure 7-16 displays current alarms and warnings. Clicking on "Events" brings up the screen shown in Figure 7-17, which displays a summary of the events that caused the warnings to be issued. These fields can be cleared by clicking on "Clear Event History."

History

Contents: <u>Events</u> <u>Rectifiers</u> <u>Battery Discharges</u> <u>Local Port</u> <u>Modem Port</u>

1/1/94 12:00	1/1/94 12:00	1/1/94 12:00	11/2/00 10:13

Sense/Control Fuse
Major Communication Fail Alarm ■
Minor Communication Fail Alarm ■
Memory Backup Battery Low
Password At Default
Processor Halt

Communication Fail Alarm

Figure 7-16: Alarm History Screen
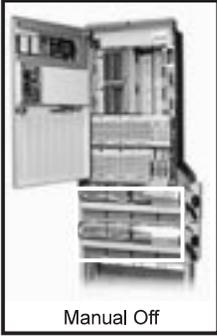
Events

Clear Standard Alarms History ▼

Clear Event History

DC1 VSF	01/01/2000	12:00 AM	RET	Sense/Control Fuse
PS1 BBL	01/01/2000	12:00 AM	WRN	Memory Backup Battery Low
DC1 MCM	01/01/2000	12:00 AM	MAJ	Major Communication Fail Alarm
DC1 CMA	01/01/2000	12:00 AM	MIN	Minor Communication Fail Alarm
DC1 VSF	01/01/2000	12:00 AM	MAJ	Sense/Control Fuse
PS1 PFD	01/01/2000	12:00 AM	WRN	Password At Default
PS1 PHT	01/01/2000	12:00 AM	RET	Processor Halt
PS1 PHT	01/01/2000	12:00 AM	RO	Processor Halt

Rectifiers

Clear Rectifier History

Battery Discharges

Clear BD History

Manual Off

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
+26.04 V 0 A
FLOAT

Figure 7-17: Events Screen

Inventory of items in the plant is displayed in the data fields of the screen shown in Figure 7-18. This screen is for information only. The user cannot change the data.
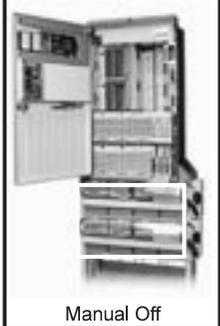
Inventory

TXDJ00T9
364 Roper Street
01/08/1998 06:47PM

Manual Off

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
+26.04 V 0 A
FLOAT

Device	Type	Description	Quantity
Bays	Not Supported		
Rectifiers	G25	25 A	1
Rectifiers	J85502B	50 A	1
Rectifiers	J85502C	125 A	1
Rectifiers	J85503A	100 A	1
Rectifiers	J87439A	200 A	1
Rectifiers	J85503C-2	400 A	1
Rectifiers	J85503B-1	200 A	1
Converters	Not Supported		
Batteries	None		
Shunt	LOAD	-	1
Contactors	BATTERY	-	2
RPMs	SHM	-	1
RPMs	VTM	-	2

Figure 7-18: Inventory Screen

The Operations screen shown in Figure 7-19 includes several drop-down menus that allow the user to keep current settings or choose

new ones for Plant Mode, Battery Test, Alarm Test, Rectifier, Converter, and Contactor. Click "Submit" to save the selection.
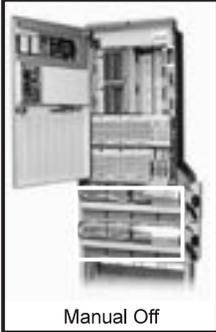
Galaxy Power System - Operations

To configure an item in the system, first view the item you wish to change, and click the "Configure" link. Start here. A few of the more frequently accessed configurable items are listed below for your convenience.

Plant Mode	Float	submit	Currently FLOAT
Battery Test	inactive	submit	Current state unknown
Alarm Test	inactive	submit	Currently inactive
Rectifier	G01	State	ON	submit
Converter	ERROR	State	ON	submit
Contactor	CN1	State	CONNECT	submit

Manual Off

Alarms
Plant
Monitoring
Inventory

Figure 7-19: Operations Screen

The Security screen shown in Figure 7-20 allows users to change passwords, security levels, and IP addresses. After changing any desired IP addresses, scroll down to find and click on the "Submit" button.
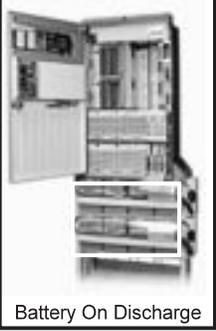
Security

Select which password you would like to change. Enter the new password twice. You must be logged in at the Administrator security level and the two entries must match for the change to be accepted.

User
User
Super-User
Administrator
Network

Submit Password

Battery On Discharge

Alarms
Plant
Monitoring
Inventory
Configuration
Operations
Logoff

TXDJ00T9
364 Roper Street
+26.04 V 0 A

Setting	Current Value	New Value
Super-user Security	disabled	
IP Address 1	1.1.1.1	
IP Address 2	1.1.1.1	
IP Address 3	1.1.1.1	
IP Address 4	1.1.1.1	
IP Address 5	1.1.1.1	

Figure 7-20: Security Screen

The last screen in this selection of examples is the Network Card Configuration screen shown in Figure 7-21. For more information on the features accessed by this screen, see the heading "Feature License Key" later in this section.

Galaxy Gateway
Network Card Configuration

Unit Serial Number	00DJ02902496
Ethernet Address	00-60-1d-05-5c-60

Setting	Current Value	New Value
Feature Key	4AB60003	
IP Address	135.107.105.247	
Subnet Mask	255.255.224.0	
Default Gateway	135.107.96.1	
Host Name	target4	
Submit Network Settings		

Upgrade Your Product
Logoff

Figure 7-21: Network Card Configuration

Screen Details

The paragraphs below provide more information on the various screens available through the Gateway Card.

Alarms

This screen provides information for both active and retired (history) alarms and warnings. The alarm information is date and time stamped and the severity levels have been color coded for easy recognition. Latched alarm events may also be cleared from this screen.

Other menu screen items provide links to other controller features.

Plant

Selecting the PLANT menu button produces the Plant Overview screen with access to the following links:

• Plant Overview
• Batteries

- Rectifiers
- Converters
- Network

This screen has plant information consisting of: Controller Date/Time, Site ID, Type of Controller, Type of Plant, Plant Status, Site Description, Software Version, Plant Voltage, who is logged in, and Temperature. Some of these fields may be blank if the attribute has not been linked to a specific item.

Monitoring

Selecting the MONITORING menu button produces a screen with access to all of the Galaxy Controller monitoring points that are present. These are:

- Derived Channels
- Voltage Channels
- Shunt Channels
- Binary Channels
- Temperature Channels
- Relay Channels

The MONITORING screen provides a complete listing of all monitoring channels. If more than one page of data is present, use the SCROLL UP/DOWN arrows on the right side of the screen for viewing.

Inventory

Selecting the INVENTORY menu button produces a screen with access to all of the Galaxy Controller inventory fields. This information is automatically populated and is based on the equipment present. If more than one page of data is present, use the SCROLL UP/DOWN arrows on the right side of the screen for viewing.

Configuration

Selecting the CONFIGURATION menu button produces a screen with access to all of the Galaxy Controller monitoring points that are present. These are:

- Plant
- Alarm thresholds
- Disconnects (Load/Battery)
- Thresholds (Alarm)
- Passwords

• Network Features

The CONFIGURATION screen provides PLANT information by default. If more than one page of data is present, use the SCROLL UP/ DOWN arrows on the right side of the screen for viewing.

A typical ALARM THRESHOLD screen shows current threshold settings, and boxes for entering new values if desired. These dual alarm thresholds may be configured for either Float or Boost Mode operation. If any changes are made, the SUBMIT NEW THRESHOLDS button at the bottom of the screen must be selected. This will change the configuration in the controller.

Note: To clear a text field, enter the string "(NONE)".

Operations

The OPERATIONS screen provides information on the following:

• Plant Mode
• Battery Test
• Alarm Test
• Rectifiers
• Converters
• Contactors

Not only is the current status displayed, but the user may exercise control on these elements. An example would be to make the Alarm Test feature active by clicking the pull-down arrow to the right of the box, and making it Active. Clicking on the SUBMIT button next to it would activate the Alarm Test.

Logoff

To log off, select the Logoff menu button and click on it. This will terminate the login session with the Galaxy Controller.

Note: *Exit the Web browser after logging off*. If not, someone MAY BE ABLE TO ACCESS THE PASSWORD that was entered earlier during the session.

Galaxy Gateway   Choosing the Galaxy Gateway selection allows the Galaxy Gateway (Network Card) configuration. Configurable/Viewable attributes include:

- Feature Key
- Ethernet Address (Read Only)
- IP Address
- Subnet Mask
- Default Gateway (Optional)
- Host Name (Optional)

To log off, select the Logoff menu button and click on it. This will terminate the login session with the Galaxy Controller.

Note: *Exit the Web browser after logging off*. If not, someone MAY BE ABLE TO ACCESS THE PASSWORD that was entered earlier during the session.

Alarm Reporting

Alarm reporting can be configured by logging in to the Galaxy Controller. Notification severity, PUSH, pager, and e-mail configuration can be programmed.

Alarm Alert Criteria

Alarm notification can be determined based on severity. All alarms, no alarms, or degrees of severity of the alarms may be reported.

Web Browser Configuration

Using a standard web browser, login in to the Galaxy Controller as a super-user or administrator and configure the Network parameters that support the Alarm Alert Criteria feature. Choose the criteria for alarm reporting and press Submit to confirm changes.

Telnet Configuration

Using a Telnet session with T1.317 commands. The commands are as follows:

cha nam1,sev=**text** –This command assigns the level(s) of alarm severities that are sent to pagers, PUSH stations, or e-mail addresses. Valid values for **text** are:

- None – no alarms are reported over the network
- CRIT – Only Critical alarms are reported over the network
- MAJ+ - Only Major or Critical alarms are reported over the network
- MIN+ - Minor, Major and Critical alarms are reported over the network

sta nam1,sev –This command displays the level(s) of alarm severities that are sent to pagers, PUSH stations, or e-mail addresses.

Alarm Push Feature

Up to three IP addresses can be configured for automatic alarm capture.

Telnet Configuration

Using a Telnet session with T1.317 commands, the commands are as follows:

cha nam1,psh**x** = *IP Address* - This command configures Push Address x to be the IP Address entered.

sta nam1,psh**x** – This command displays the configured IP address for Push Address x.

Web Browser Configuration

Using a standard web browser, login in to the Galaxy Controller as a super-user or administrator and configure the Network parameters that support the Alarm push feature. Choose the Alarm Capture Destination IP address to be configured and enter the IP address and port number. (To erase this field, enter an IP address of 0.0.0.0:1.) Press Submit to confirm changes.

E-mail

Up to three e-mail addresses (example: johndoe@ispprovider.com) may be configured for alarm reporting.

Telnet Configuration

Using a Telnet session with T1.317 commands, the commands are as follows:

cha nam1,em**x** = *E-Mail Address* - This command configures e-mail address x to be the e-mail Address entered. This address must be 35 characters or less.

sta nam1,em**x** – This command displays the configured e-mail address for e-mail address **x**.

cha nam1,msrv = *Mail Server IP Address* - This command configures the Mail server Address for e-mail. This address is an IP address.

sta nam1,msrv – This command displays the configured Mail server Address for e-mail.

Web Browser Configuration

Using a standard Web browser, login in to the Galaxy Controller as a super-user or administrator and configure the Network parameters that support the e-mail feature. Choose the e-mail address to be configured and enter the e-mail address, which must be no more than 35 characters. The Mail Server IP Address must also be entered as an IP address. (To erase this field, enter an IP address of 0.0.0.0:1.) Press Submit to confirm changes.

Pager Service   Up to three e-mail pager addresses (example: johndoe@ispprovider.com) may be configured.

Telnet Configuration

Using a Telnet session with T1.317 commands, the commands are as follows:

cha nam1,pg**x** = *Pager Address* - This command configures Pager address x. This address, an e-mail address, must be 35 characters or less.

sta nam1,pg**x** – This command displays the configured Pager address **x**.

cha nam1,msrv = *Mail Server Address* - This command configures the Mail server Address for paging/e-mail. This address is an IP address.

sta nam1,msrv – This command displays the configured Mail server Address for paging/e-mail.

Web Browser Configuration

Using a standard web browser, login in to the Galaxy Controller as a super-user or administrator and configure the Network parameters that support the e-mail pager feature. Choose the Pager address to be configured and enter the e-mail pager address. (To erase a field, clear the field and enter a space character.) Press Submit to confirm changes. The Mail Server Address must also be entered as an IP address. (To erase a field, clear the field and enter a space character.) Press Submit to confirm changes.

Feature License Key   The Galaxy Gateway uses a feature key to enable optional features. A feature license key is valid only for a certain product serial number (i.e. a particular Gateway Card). Although the Gateway performs its basic functions without a key, such additional features as professional web pages and SNMP do require a key.

The key can be obtained at any time. Please contact your sales representative if you need to purchase feature keys for your product.

The Gateway is configured with the feature key either via a T1.137 command (CHA NCC1,KEY=hhhhhhhh, where h is a hexadecimal digit 0-9, a-f), or using the Network Card Configuration web page shown in Figure 7-21.

Security

The Galaxy Gateway has been designed with multiple security features to prevent unauthorized access to both, the Galaxy Gateway and the Galaxy Controller. A password is required to configure Galaxy Gateway Network Administration tasks as well as password protection (3 levels of login, each having a unique password) when logging in to the Galaxy Controller through the Galaxy Gateway.

An optional security feature permits only specific IP addresses to access the Galaxy Gateway or Galaxy Controller.

If multiple super-users and administrators are logged in at the same time, the Galaxy Gateway will alert each super-user/administrator and inform them that other users are logged in with read/write privileges.

Connections to the Galaxy Gateway that have been idle for more than a specific time (programmable) will be terminated.

Idle Connection Timeout

Telnet Configuration

Using a Telnet session with T1.317 commands, the commands are as follows:

cha nsm1,idle=*xx* - This command sets the Galaxy Gateway's idle timeout to a number *xx* from 1 to 60 minutes. If no requests from an IP address are received for this specified time period, the login session is terminated.

sta nsm1,idle - This command displays the timeout period.

Web Browser Configuration

Using a standard web browser, login in to the Galaxy Controller as a super-user or administrator and configure the Network parameters that support the Idle Timeout feature. Enter the timeout period. (To erase a field, clear the field and enter a space character.) Press Submit to confirm changes.

Restricting IP Address Access

Telnet Configuration

Using a Telnet session with T1.317 commands, the commands are as follows:

cha nsm1,suse=x   This command enables or disables the Galaxy Gateway's ability to communicate with only specific IP addresses (maximum of 5). If x=0, then any valid IP addresses may access the Galaxy Gateway. If x=1, only IP addresses configured under super-user sources 1-5 may access the Galaxy Gateway.

sta nsm1,suse - This command displays the present state of the restricted IP address feature.

cha nsm1,susx=ddd.ddd.ddd.ddd - This feature defines super-user source x as restricted IP address ddd.ddd.ddd.ddd. (x = 1-5)

sta nsm1,susx - 7This command displays the present IP address assigned to super-user source x.

Web Browser Configuration

Using a standard web browser, login in to the Galaxy Controller as a super-user or administrator and configure the Network parameters that support the super-user source feature. Choose a super-user source and enter the IP address associated with it. (To erase a field, clear the field and enter a space character.) Press Submit to confirm changes.

Telnet

Telnet Into Galaxy

Telnet is an application layer on top of the TCP/IP protocol. From any networked computer, the user can initiate a Telnet session and connect to either a Galaxy Controller or a Galaxy Gateway on the network.

1. Initiate a Telnet session and connect to the target Galaxy Controller/ Galaxy Gateway.

    The Galaxy Gateway will respond with the following message:

    Please enter a number to select a destination:
    1. Power Plant Administration, need Galaxy Controller passwords.
    2. Network Administration, need NAP.

2. Select 1 for Galaxy Controller Power Plant Administration. Commands supported are all of the T1.317 commands used by the Galaxy Controller. For a listing of these commands, consult a

Galaxy Controller product manual and refer to the T1.317 command appendix.

3. At the prompt, enter the proper Galaxy password. The screen should look like the figure below: (This example uses the Super-User Password, and the commands entered are for Plant Voltage and Plant Warnings.)


```
Telnet - 135.107.105.251                                    _ |□|
Connect  Edit  Terminal  Help

Please select a destination:
1. Power Plant administration, need Galaxy controller password.
2. Network Administration, need NAP.
1

TECLEE CLAVE:
ENTER PASSWORD:

** sta dc1,vdc
:DC1
VDC=-51.18 V
.
** sta dc1,adc
:DC1
ADC=0 A
.
** war
PS1 PFD,01/01/1994,12:00AM,WRN,Password At Default
PS1 BBL,01/01/1994,12:00AM,WRN,Memory Backup Battery Low
.
** █
```

Galaxy Controller Backup

Note**:** A Telnet application that will allow an ASCII file transfer is required.

Once logged in as a super-user or administrator:

Type *backup A* (ASCII backup). A destination filename **must be specified** before the ENTER key is pressed.

A message will be displayed when the backup is complete.

Galaxy Controller Restore

Note**:** A Telnet application that will allow an ASCII file transfer is required.

Once logged in a super-user or administrator:

• Type Restore <Enter> and a select "A" <Enter> for ASCII transfer. Begin the restore (The controller will timeout if a file is not selected within 2 minutes.)

A "Restore Complete" message will be displayed after a successful restore.

Galaxy Controller Upgrade

Note**:** A backup is recommended before performing an upgrade. All controller configuration will be lost after an upgrade. If you wish to abort upgrade, hit any other key other than the <Enter> key. To continue the upgrade, press the <Enter> key, wait 5 seconds, press <Enter> again.

Login as administrator to perform an Upgrade:

1. Type *upgrade* <Enter>, wait five seconds, then press <Enter> again. If you wish to abort upgrade, hit any other key other than the <Enter> key. To continue the upgrade, press the <Enter> key, wait 5 seconds, press <Enter> again.

    You will be prompted with A[bort] R[aw] X[modem] H[I speed].

2. Select *R* <Enter>.

3. Select the upgrade file and begin the file transfer. Note: The controller will timeout if an "S-record" file is not selected within two minutes.

4. After the upgrade is complete, you will be prompted with "Press Return". This indicates the upgrade is complete.

Exit the Telnet session **only** after the "Press Return" message is displayed.

The controller will need to be configured. If a backup file exists, perform a restore by initiating a Telnet session again.

Telnet Into Galaxy Gateway   To initiate a Telnet session to the Galaxy Gateway:

1. Type Telnet *ddd.ddd.ddd.ddd* at the MS-DOS command line prompt or from the RUN menu screen of Windows.
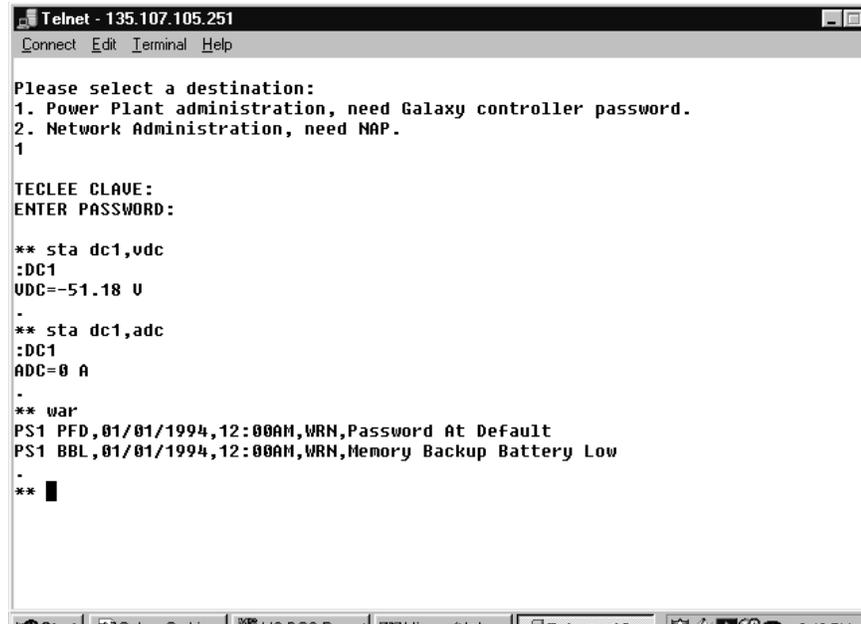
The Galaxy Gateway will respond with the following message:

Please enter a number to select a destination:

1. Power Plant administration, need Galaxy Controller passwords.
2. Network Administration, need NAP.

2. Select 2 for Galaxy Gateway Network Administration. Commands supported are ONLY the listed commands in Appendix x (upgrade, idle, reboot,network configuration, etc.)

3. When prompted, enter the correct Network Administrator password.

4. Type HELP and press ENTER for a list of supported commands. The screen should look like this: (To exit this screen, type EXIT.)
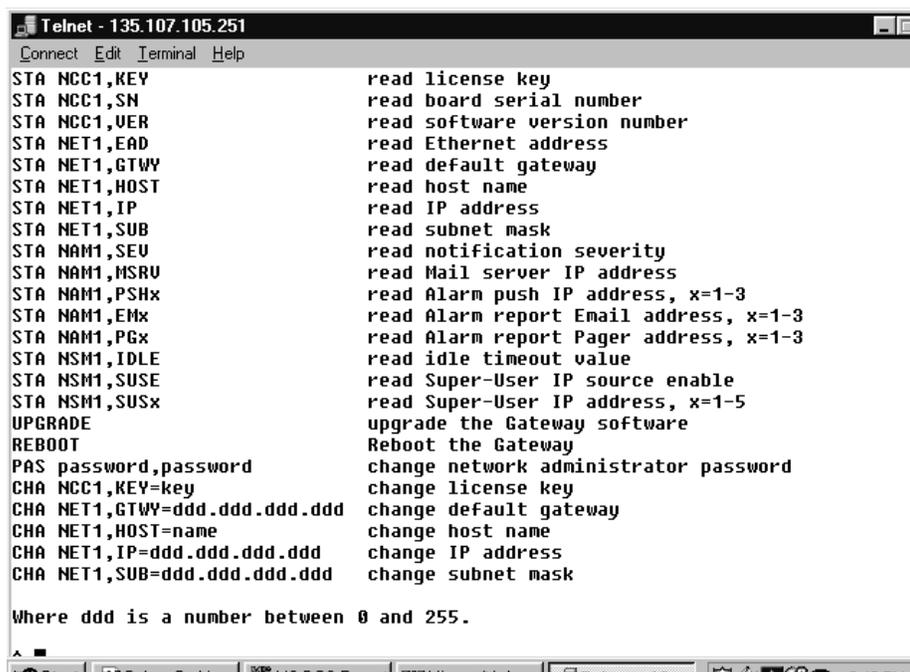
```
Telnet - 135.107.105.251
Connect  Edit  Terminal  Help
STA NCC1,KEY              read license key
STA NCC1,SN               read board serial number
STA NCC1,VER              read software version number
STA NET1,EAD              read Ethernet address
STA NET1,GTWY             read default gateway
STA NET1,HOST             read host name
STA NET1,IP               read IP address
STA NET1,SUB              read subnet mask
STA NAM1,SEV              read notification severity
STA NAM1,MSRV             read Mail server IP address
STA NAM1,PSHx             read Alarm push IP address, x=1-3
STA NAM1,EMx              read Alarm report Email address, x=1-3
STA NAM1,PGx              read Alarm report Pager address, x=1-3
STA NSM1,IDLE             read idle timeout value
STA NSM1,SUSE             read Super-User IP source enable
STA NSM1,SUSx             read Super-User IP address, x=1-5
UPGRADE                   upgrade the Gateway software
REBOOT                    Reboot the Gateway
PAS password,password     change network administrator password
CHA NCC1,KEY=key          change license key
CHA NET1,GTWY=ddd.ddd.ddd.ddd  change default gateway
CHA NET1,HOST=name        change host name
CHA NET1,IP=ddd.ddd.ddd.ddd   change IP address
CHA NET1,SUB=ddd.ddd.ddd.ddd  change subnet mask

Where ddd is a number between 0 and 255.
```

Galaxy Gateway Upgrade   Software updates are available free of charge to registered customers. Download them from our web site at http://power.lucent.com.

The Galaxy Gateway has four software components:

- The boot software – responsible for power on test, factory test, local and remote upgrade of the other software components.

- The application software – including an HTTP server and Telnet daemon.

- Default web pages – canned web pages supplied by Lucent.

- Custom web pages – customer specific web pages developed by Lucent or someone else.

FTP

FTP is used **only** for upgrading Galaxy Gateway software. Application software, default and/or custom web pages can be uploaded to the Galaxy Gateway using FTP. Users can also retrieve (get) existing custom web pages from the Galaxy Gateway, make modifications, and copy (put) them back into the Galaxy Gateway.

To use FTP, the user must first initiate a Telnet session and select Network Administration option. Enter the correct Network Administrator password and, at the prompt, type the Upgrade command. The Galaxy Gateway will now wait for the FTP session to be established.

The Galaxy Gateway has a file/directory structure as shown below:

```
/ ┬── code
  ├── default
  └── custom
```
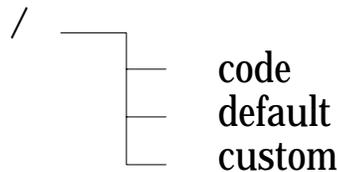
Where "/" is the root directory. Each subdirectory contains files that are necessary for the Application Software, default web pages, and custom web pages. Using an FTP client on a PC, files may be transferred to/ from these Galaxy Gateway directories. Common FTP commands used when performing file operations are:

- **ftp** – Initiate the ftp session.

- **cd** – Change directories on the Galaxy Gateway.

- **put** – Copy files from the PC running FTP to the Galaxy Gateway (The present working directory of the PC will be the source directory for the file being copied.)

- **get** – Copy files from the Galaxy Gateway to the PC running FTP (The present working directory of the PC will be the destination directory for the file being copied.)

- **bye** – Exit the FTP session and reboot the Galaxy Gateway

- **pwd** – Display the path of the current directory

- **rm** – Remove a file from a directory

- **ls** – List all files in a directory

Application Software

Using any FTP client, perform the following steps to load Application Software:

1. Change directory to the PC directory where the Application code is stored.

2. Type: *FTP xxx (xxx=host name or IP Address).*

3. Login as "guest" using the network administrator password.

4. Change directory (cd) to the **code** directory by typing: *cd code.*

5. Use the "put" command to copy the application software to the Galaxy Gateway.

   EXAMPLE: To load application software with a file name of app-g.x.x.bin, type: *put app-g.x.x.bin app.bin.*

6. Wait until the message indicating a successful file transfer is displayed.

7. Type "bye" to exit the FTP session. This command also reboots the Galaxy Gateway and begins running the application program.

Default Web Pages

Using any FTP client, perform the following steps to load default web pages:

1. Type: *FTP xxx (xxx=host name or IP Address).*

2. Login as "guest" using the "networkadm" password.

3. Change directory (cd) to the **default** directory by typing: *cd default.*

4. Use the "put" command to copy the web pages to the Galaxy Gateway.

   EXAMPLE: To load default web pages with a file name of pages-g.x.x.web, type: *put pages-g.x.x.web pages.web*

5. Verify the transfer by a message displayed indicating a successful file transfer.

6. Type "bye" to exit the FTP session. This command also reboots the Galaxy Gateway and begins running the application program, allowing Telnet and web page access.

Custom Web Pages

Using any FTP client, perform the following steps to load custom web pages into the Galaxy Gateway:

1. Type: *FTP xxx (xxx=host name or IP Address).*

2. Login as "guest" using the "networkadm" password.

3. Change directory (cd) to the **custom** directory by typing: *cd custom.*

4. Use the "put" command to copy the custom web pages to the Galaxy Gateway: *put <filename.html>*. There may be multiple *.html* files that will need to be loaded into the Gateway. If so, use the "mput" command. Example: *mput *.html*; copies all html files from the present working directory of the PC to the Galaxy Gateway.

5. Verify the transfer by a message displayed indicating a successful file transfer.

6. Before exiting, verify that the file *index.html* is loaded into the Gateway's **custom** directory. This file is required for proper custom web page operations. Type *ls*, and *index.html* should be in the list of files.

7. Type "bye" to exit the FTP session. This command also reboots the Galaxy Gateway and begins running the application program allowing Telnet and custom web page access.

Using any FTP client, perform the following steps to copy custom web pages from the Galaxy Gateway to a PC:

1. Type: *FTP xxx (xxx=host name or IP Address).*

2. Login as "guest" using the "networkadm" password.

3. Change directory (cd) to the **custom** directory by typing: *cd custom.*

4. Use the "get" command to copy the custom web pages from the Galaxy Gateway: *get <filename.html>*. For multiple files, type: *mget *.html*. The present working directory of the PC will be the destination directory for the files being copied.

5. Verify the transfer by a message displayed indicating a successful file transfer.

6. Type "bye" to exit the FTP session. This command also reboots the Galaxy Gateway and begins running the application program allowing Telnet and custom web page access.

Galaxy Gateway Local Port   If a terminal is present on startup the Galaxy Gateway Card (or if the Galaxy Gateway is RESET) will display the progress of the power on self-test. The power on self-test results are displayed in the following format:

Power on self-test pass message

```
Starting self test
DRAM              passed/failed
Boot Code         version x.x
Application Code  version x.x
Default Web Pages version x.x
Custom Web Pages  present/not found
EEPROM            passed/failed
Ethernet          passed/failed
Ethernet Address  xx-xx-xx-xx-xx-xx-xx
IP Address        xxx.xxx.xxx.xxx
Subnet Mask       xxx.xxx.xxx.xxx
Default Gateway   xxx.xxx.xxx.xxx
Host Name         hostname
```

ENTER PASSWORD:

Type the network administrator password. The Galaxy Gateway will respond with the command line prompt ($).

Application Software

Perform the following steps for loading Application software using the local port of the Galaxy Gateway:

1. With the Galaxy Gateway connected to PC, press RESET on the Galaxy Gateway and login.

2. Type *upgrade a* and press enter. A user prompt for the file transfer speed is displayed.

3. Select the menu number corresponding to the desired transfer speed and press enter.

4. A message will now indicate that it is OK to begin the file transfer.

5. If the transfer rate selected was not 9600 (default), use the terminal emulator properties to set the PC com port data rate to the selected rate.

6. Begin sending the file using the XMODEM protocol.

7. After successful transmission of the file, set the PC baud rate back to 9600 in order to communicate with the Galaxy Gateway.

8. Type *bye* to exit the command line.

9. Disconnect the serial cable from the Galaxy Gateway and PC.

10. Connect the Galaxy Controller to the Galaxy Gateway serial port.

11. Press RESET on the Galaxy Gateway. The Galaxy Gateway is now running the new Application Software.

Default Web Pages

Perform the following steps for loading default web pages using the local port of the Galaxy Gateway:

1. With the Galaxy Gateway connected to PC, press RESET on the Galaxy Gateway and login.

2. Type *upgrade w* and press enter. A user prompt for the file transfer speed is displayed.

3. Select the menu number corresponding to the desired transfer speed and press enter.

4. A message will now indicate that it is OK to begin the file transfer.

5. If the transfer rate selected was not 9600 (default), use the terminal emulator properties to set the PC com port data rate to the selected rate.

6. Begin sending the file using the XMODEM protocol.

7. After successful transmission of the file, set the PC baud rate back to 9600 in order to communicate with the Galaxy Gateway.

8. Type *bye* to exit the command line.

9. Disconnect the serial cable from the Galaxy Gateway and PC.

10. Connect the Galaxy Controller to the Galaxy Gateway serial port.

11. Press RESET on the Galaxy Gateway. The Galaxy Gateway is now running the new default web pages.

SNMP Interface   The Gateway Card also allows users to interface with the power system via the Simple Network Management Protocol (SNMP). This protocol permits control and monitoring of many power systems from a single operation center. Each of the individual power systems is controlled by a Galaxy Controller. All of the Galaxy Controllers are accessible to from the central location.

In a typical application, the operator uses a browser-style interface to interact with the system. At the highest level, the screen may display a map showing the locations of all the installations controlled by the user. This map would show which locations currently have alarm conditions. Clicking on a location's icon would allow the user to "zoom" to progressively more specific locations: for instance, a city, then a central office, then an individual power system, and so on through the components of each system. The structure of the items in the system (the Management Information Base, or MIB) may be displayed graphically as a "tree" in the browser interface. See Figure 7-22. Another screen may display current warnings and alarms. See Figure 7-23. Similar screens may display each aspect of the system.
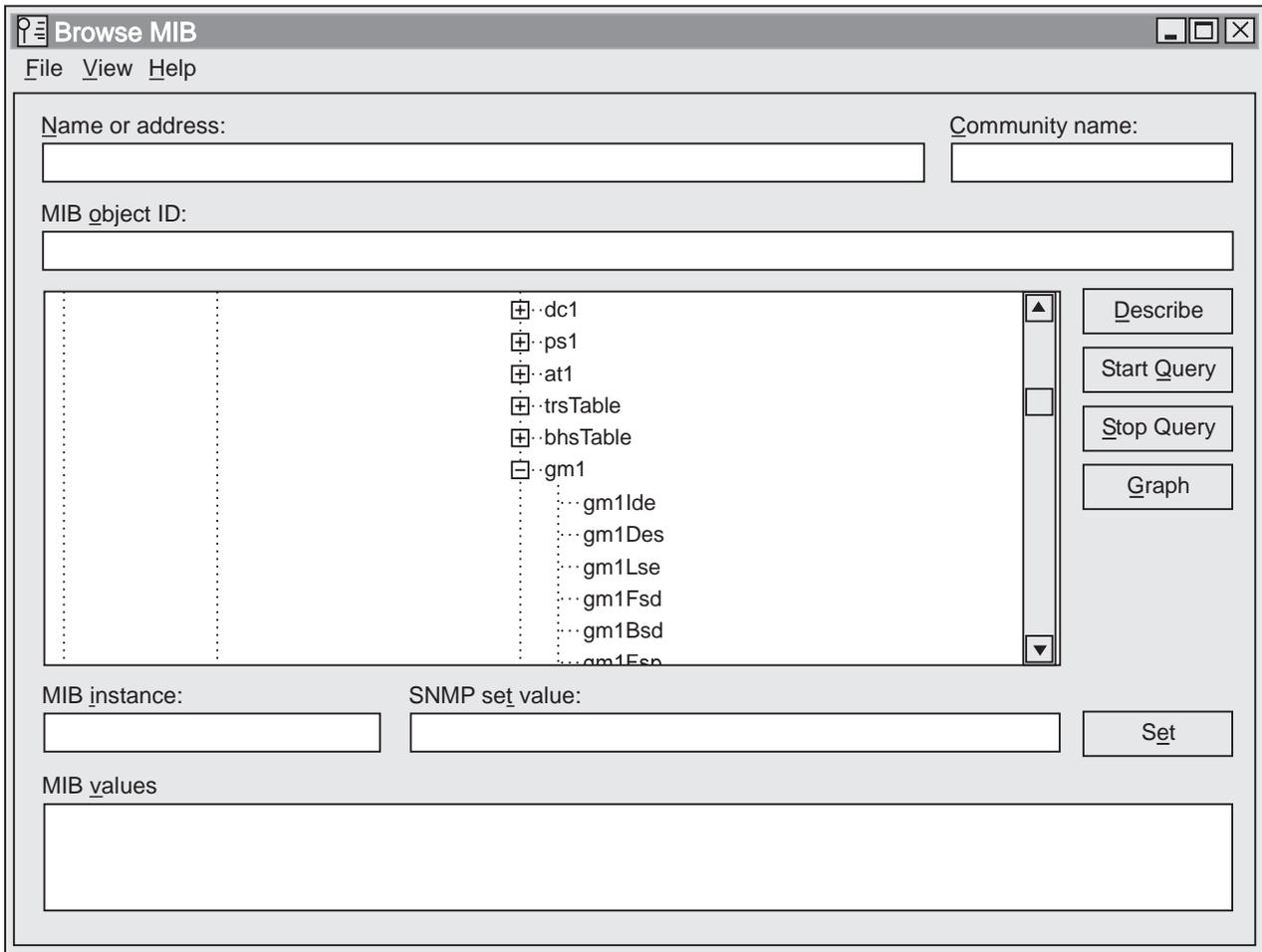
Figure 7-22: SNMP Browser Display of MIB Contents

```
⚠ All Alarms Browser                                                    _ □ ☒
File  Actions  View  Help

 Ack Cor Severity Date/Time        Source              Message
  ☑   *   Warning  Mon Oct 01 12:13:16  target7.micro.lucent.com Node down
  ☐       Minor    Mon Oct 02 12:17:44  target7.micro.lucent.com Inconsistent subnet mask 255.255.0.0 on inter
  ☐       Major    Mon Oct 02 12:18:27  target7.micro.lucent.com Battery on Discharge
  ☐       Major    Mon Oct 02 12:17:46  target7.micro.lucent.com Passwords At Default
  ☐       Major    Mon Oct 02 12:17:46  target7.micro.lucent.com Memory Backup Battery Low
  ☐       Major    Mon Oct 02 12:17:46  target7.micro.lucent.com Energy Management Disabled
  ☐       Major    Mon Oct 02 12:17:44  target7.micro.lucent.com Shunt Not Configured




 ◄                                                                         ►
7 of 36 Alarms - Critical:0 Major:5 Warning:1 Normal:0 (0 acknowledged) Filters: Source
```

Figure 7-23: SNMP Browser Display of Current Warnings and Alarms

The SNMP protocol works transparently to the user. It uses a custom Management Information Base (MIB) that includes all the objects controlled or monitored by the Galaxy Controllers: rectifiers, converters, bay interface cards (BICs), alarms, etc. These items are the T1.317 objects and attributes listed in the tables in Appendix B of each of the Galaxy Controller Product Manuals.

The Gateway sends Galaxy alarms as "traps," which are automatically transmitted to the user. An alarm, for instance, is "trapped" and included in one of three kinds of lookup table managed by the SNMP.

SNMP Configuration

Three kinds of commands are used in the SNMP system. They are used to regulate access to the system, to direct information within the system, or to update. Users may configure SNMP from a telnet command line interface using these commands. The browser interface also supports SNMP configuration.

Community String commands

The first are "Community String" commands. These function like passwords. In format, they are "CHA" (change) commands, familiar to users of the Galaxy Controllers.

The Gateway supports three different community strings. Each community string may be configured with either read-only or read-write access. An IP address may be associated with a community string to further restrict access.

CHA SNMP1,CSNx=text   change SNMP Community
                                       string name x=1-3

CHA SNMP1,CSIx=ddd.ddd.ddd.ddd   change SNMP Community IP
                                       address x=1-3. An IP address
                                       of 0.0.0.0 allows access from
                                       al IP addresses.

CHA SNMP1,CSWx=1/0   change SNMP Community
                                       write enable x=1-3

Trap commands

The second group consists of "trap" configuration commands. In SNMP parlance, a "trap" is a spontaneous message generated by the Gateway and sent to the monitoring system to provide notification of an alarm condition. Like the Community String commands, these are in the format of "CHA" (change) commands.

The gateway supports five different destinations for SNMP messages. Each destination is configured with a community string and IP address.

CHA SNMP1,TDNx=text   change SNMP Trap
                                       destination community
                                       name x=1-5

CHA SNMP1,TDIx=ddd.ddd.ddd.ddd   change SNMP Trap
                                       destination IP address
                                       x=1-5

Where ddd is a number between 0 and 255.

The SNMP agent in the Gateway is bilingual. That is, it understands and generates both SNMP V1 and V2C packets. The normal mode for the agent is to generate traps using VC2 packets. In order to provide an interface to older management systems, it is possible to configure the Gateway to generate only VC1 trap packets.

CHA SNMP1,V1T=x   x=1 enable sending V1
                                       traps
                                       x=0 disable sending V1
                                       traps

Command to update information about Galaxy objects

The third type of command is used to update the Gateway's database of objects available on the Galaxy. The format is that of "OPE" (operate) commands, familiar to users of the Galaxy Controllers. The Gateway polls the Galaxy for added/removed objects when this command is issued.

This command should be issued whenever objects (rectifiers, remote peripheral monitors, UDEs, etc.) are added to or removed from the Galaxy.

OPE SNMP1,UPD=1   update MIB with added objects

Appendix A   *Technical Specifications*

Table A-1: Technical Specifications

Application Level Protocols Supported	TCP, HTTP, FTP, TELNET, SMTP (standard version)
Compatibility	Ethernet: IEEE 802.3 TCP/IP Intranet/Internet Networks
Web Browsers	Netscape Navigator 4.0 or later Microsoft Internet Explorer 4.0 or later
Network Interface	RJ-45 (10BASE-T) Twisted Pair Ethernet
RS-232 Serial Interface	DATA RATES 9600bps - 115.2Kbps
Serial Communication Formats	Data bits: 8 Stop bits: 1 Parity: none Flow control: none
System Software	Flash ROM: software upgrades are downloaded and installed over the network connection or Galaxy Gateway serial port
Ethernet Diagnostic LEDs	Transmit Data Receive Data Link Up
Circuit Pack Diagnostic LEDs	Green Amber
Power Requirements	EBW1 or BJD1 – 18V to 72V 125mA (nominal) @ 48V
Environmental	Operating Temperature: 0 to 50°C (32 to 122°F) Storage Temperature: -40 to 85°C (-40 to 185°F)
Physical Dimensions EBW1	9.0 cm (3.54 in) x 15.2 cm (6.00 in) x 2.0 cm (.78 in)
Physical Dimensions BJD1	26.5 cm (10.44 in) x 20.6 cm (8.1 in) x 1.3 cm (.5 in)

Table A-2: Pinouts for Ethernet

Ethernet (J1)	
Pin	Function
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

Table A-3: Pinouts for RS-232 Serial Port

RS-232 Serial Port (J2)	
Pin	Function
1	NC
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	GND

Table A-4: Pinouts for Power

Power (P1)	
Pin	Function
1	PWR+
2	PWR-
3	NC
4	NC

Appendix B   *Troubleshooting*

The green and yellow status LEDs are controlled by software. Table B-1:

Table B-1: LEDs

Green only	Normal Internet operation
Yellow only	The following issues are fatal errors and the Galaxy Gateway must be replaced: • DRAM test failure • Boot block test failure • EEPROM test failure • Ethernet test failure • Ethernet address was not configured at factory • Serial number was not configured at factory • Board code was not configured at factory
Green on, Yellow blinking	• PC connected to Galaxy Gateway local RS-232 port The following issues may be resolved in the field: • Application software is not found (install; see Section 4) • Default web pages not found (install, see Section 4) • IP address not configured (configure; see Section 3) • Subnet mask not configured (configure; see Section 3))
Green on, Yellow on	One or more following issues: • Power on self-test (temporary) • Controller interface cable disconnected • Galaxy Gateway cannot communicate with controller – Galaxy intelligent controller auxiliary port not configured correctly (see Section 3, *Installation*) • 10Base-T network interface cable is disconnected or network problem exists (if LINK LED is illuminated, this item is not the problem)

Appendix C *FTP Supported Commands*

<u>ftp</u>   **<u>File Transfer Protocol</u>**

Syntax
ftp xxx   Initiates the ftp session with target IP address.

Description
FTP Session is established

<u>cd</u>   **<u>Change Directory</u>**

Syntax
cd *dir*   change directory to *dir*

Description
Once FTP has started running, cd is used to change directories on the Galaxy Gateway.

<u>put</u>   **<u>FTP File Copy Command</u>**

Syntax
put *fn*   copy *fn* from pc working directory to target directory

Description
Used to copy a file from the PC running FTP to the Galaxy Gateway.

mput   **FTP Multiple File Copy Command**

Syntax
mput *.*ext*   copy all .*ext* files from PC working directory to
                           Galaxy Gateway directory

Description
Used to copy multiple files from the PC running FTP to the Galaxy
Gateway. The user must be in the directory containing the files to be
copied.

get   **FTP File Retrieve Command**

Syntax
get *fn*   copy *fn* from Galaxy Gateway to PC working
                           directory

Description
Used to copy a file from the Galaxy Gateway to a PC. The user must be
in the directory containing the file to be copied.

mget   **FTP Multiple File Retrieval Command**

Syntax
mget *.*ext*   copy all .*ext* files from the Galaxy Gateway to PC
                           working directory

Description
Used to copy multiple files from the Galaxy Gateway to a PC running
FTP. The user must be in the directory containing the files to be copied.

bye   **FTP logoff**

Syntax
bye

Description
Used to Exit the FTP session and reboot the Galaxy Gateway.

pwd   Present Working Directory

Syntax
pwd

Description
Used to display the path of the current directory.

rm   Remove a File

Syntax
rm *filename*

Description
Used to remove a file from a directory.

ls   List all Files

Syntax
ls

Description
Used to list all files in a directory.

Appendix D   *Telnet Supported Commands*

Note: All T1.317 commands supported by the controller using a terminal emulation program are also accepted when using Telnet for access. A listing of these commands can be found in the Galaxy Controller product manuals. Network specific T1.317 commands are listed below:

Network Communication Card		Related Commands				
obj,attr	**Description**	**sta**	**cha**	**ope**	**Type**	**Range of Values**
ncc1,brd	Board code	✓			Text	up to12 characters
ncc1,sn	Serial number	✓			Text	12 characters
ncc1,key	Feature key	✓	✓		Hexadecimal	XXXXXXXX
ncc1,post	Power-self test results	✓			Text	multiple lines of text

Network Administration		Related Commands				
obj,attr	**Description**	**sta**	**cha**	**ope**	**Type**	**Range of Values**
net1,ead	Ethernet address	✓			Ethernet addr	XX-XX-XX-XX-XX-XX
net1,ip	IP address	✓	✓		IP address	ddd.ddd.ddd.ddd
net1,sub	Subnet mask	✓	✓		IP address	ddd.ddd.ddd.ddd
net1,gtwy	Default gateway	✓	✓		IP address	ddd.ddd.ddd.ddd
net1,host	Host name	✓	✓		Text	up to 15 characters

Network Alarm Management		Related Commands				
obj,attr	**Description**	**sta**	**cha**	**ope**	**Type**	**Range of Values**
nam1,sev	Notification severity	✓	✓		Text	NONE, CRIT, MAJ+, or MIN+
nam1,psh1	Push address 1	✓	✓		IP address	ddd.ddd.ddd.ddd
nam1,psh2	Push address 2	✓	✓		IP address	ddd.ddd.ddd.ddd
nam1,psh3	Push address 3	✓	✓		IP address	ddd.ddd.ddd.ddd
nam1,msrv	Mail server address	✓	✓		IP address	ddd.ddd.ddd.ddd
nam1,em1	Email address 1	✓	✓		e-mail	up to 35 characters
nam1,em2	Email address 2	✓	✓		e-mail	up to 35 characters
nam1,em3	Email address 3	✓	✓		e-mail	up to 35 characters
nam1,pg1	Pager address 1	✓	✓		e-mail	up to 35 characters
nam1,pg2	Pager address 2	✓	✓		e-mail	up to 35 characters
nam1,pg3	Pager address 3	✓	✓		e-mail	up to 35 characters

Network Security Management		Related Commands				
obj,attr	Description	sta	cha	ope	Type	Range of Values
nsm1,idle	Idle connection time-out	✓	✓		Number	1 to 60 minutes
nsm1,suse	Super-user IP source enable	✓	✓		Number	0:disable 1:enable
nsm1,sus1	Super-user IP source 1	✓	✓		IP address	ddd.ddd.ddd.ddd
nsm1,sus2	Super-user IP source 2	✓	✓		IP address	ddd.ddd.ddd.ddd
nsm1,sus3	Super-user IP source 3	✓	✓		IP address	ddd.ddd.ddd.ddd
nsm1,sus4	Super-user IP source 4	✓	✓		IP address	ddd.ddd.ddd.ddd
nsm1,sus5	Super-user IP source 5	✓	✓		IP address	ddd.ddd.ddd.ddd

Appendix E *Local Port Command Interface*

T1.317 Command Language

The command language is based on the T1.317 standard. The T1.317 standard has been adapted to the needs of a low-end controller. This section describes the commands, objects and attributes used to access measurements, configuration, and control parameters in the controller.

Objects and Attributes

The T1.317 standard organizes system parameters called attributes into groups called objects. The tables below lists the objects supported for remote access.

An object-attribute pair uniquely identifies a measurement, configuration, or control parameter. For example, the object-attribute pair "net1,ip" identifies the network IP address while the object-attribute pair "new1,sub" identifies the network subnet mask. In each of these examples "net1" identifies the network administration object and "ip" and "sub" identify IP address and subnet mask respectively. The table below summarizes the object-attribute pairs supported by the NCC along with the commands that can be used with the pair and the valid range that the attribute may have. Commands are defined in detail in the following section.

Network Communication Card		Related Commands			
obj,attr	**Description**	**sta**	**cha**	**Type**	**Range of Values**
ncc1,brd	Board code	✓		text	up to12 characters
ncc1,sn	Serial number	✓		text	12 characters
ncc1,key	Feature key	✓	✓	hexadecimal	XXXXXXXX

Network Administration		Related Commands			
obj,attr	**Description**	**sta**	**cha**	**Type**	**Range of Values**
net1,ead	Ethernet address	✓		Ethernet addr	XX-XX-XX-XX-XX-XX
net1,ip	IP address	✓	✓	IP address	ddd.ddd.ddd.ddd
net1,sub	Subnet mask	✓	✓	IP address	ddd.ddd.ddd.ddd
net1,gtwy	Default gateway	✓	✓	IP address	ddd.ddd.ddd.ddd
net1,host	Host name	✓	✓	text	up to 15 characters

Network Administrator Commands

This section describes commands the network administrator uses to configure the network interface and perform upgrades.

<u>bye</u>   <u>**Log-Off**</u>

Syntax
bye

Return
logging off...

Description
This command is used to terminate the current command line session.

<u>cha</u>   <u>**Change Value**</u>

Syntax
cha *obj,attr=value*

where: *obj,attr* is an object-attribute pair. For example, net1,ip.

Return
nothing

Description
This command is used to change system configuration parameters. A couple examples are listed below to illustrate how this command works.

cha net1,ip=135.107.96.1   - change the network IP address to 135.107.96.1

cha net1,sub=255.255.254.0   - change the network subnet mask to 255.255.254.0

help   Display Help

Syntax
help   list commands

Return
```
BYE                          log-off
CHA NCC1,KEY=key             change license key
CHA NET1,GTWY=ddd.ddd.ddd.ddd change default gateway
CHA NET1,HOST=name           change host name
CHA NET1,IP=ddd.ddd.ddd.ddd  change IP address
CHA NET1,SUB=ddd.ddd.ddd.ddd change subnet mask
PAS password,password        change network administrator password
STA NCC1,BRD                 read board code
STA NCC1,KEY                 read license key
STA NCC1,SN                  read board serial number
STA NET1,EAD                 read Ethernet address
STA NET1,GTWY                read default gateway
STA NET1,HOST                read host name
STA NET1,IP                  read IP address
STA NET1,SUB                 read subnet mask
UPGRADE A                    upgrade application code
UPGRADE W                    upgrade manufacturer web pages
```

```
Note: In the commands above ddd stands for a number between 0 and 255.
```

Description
This command is used to list the available commands to the network administrator.

pas   Change Network Administrator Password

Syntax
pas "*password*","*password*"

Return
!-223,INVALID PASSWORD   Password rejected
!-224,NEW PASSWORD MISMATCH Passwords did not match

Description
This command changes network administrator password. The password is sent twice in the command line in order to avoid mistakes. The password must have at least 6 characters but no more than 15 characters.

sta   **Report Status**

Syntax

sta *obj,att*

where: *obj,attr* is an object-attribute pair. For example, net1,ip.

Description
This command reports the value of the configuration parameters in the system. A couple examples are listed below to illustrate how this command works.

  sta net1,ip   - report network IP address

  sta net1,sub   - report network subnet mask

The command line would respond as follows for first command listed above.

```
* sta net1,ip
:NET1
IP=135.107.96.1
.
*** _
```

The "***" in the example above is the user command line prompt. The line ":NET1" indicates that the information that follows is for the plant object. The line starting with "IP" identifies the IP address. The "." line is the end-of-command identifier.

upgrade   **Upgrade Software**

Syntax
upgrade a   upgrade application code
upgrade w   upgrade default web pages

Return
See description

Description
This command initiates an upgrade. After entering this command the
Galaxy Gateway responds with a prompt similar to the following:

```
Upgrade Application Code
1 - 9600 baud
2 - 19200 baud
3 - 38400 baud
4 - 57600 baud
5 - 115200 baud
0 - cancel
Please enter choice:_
```

If you choose 0, the upgrade is cancelled and the Galaxy Gateway
returns to the command line. If one of the other options is chosen, then
the upgrade process continues.

While upgrading the application code, messages similar to the following
are displayed:

```
Please wait...begin upload at 38400 baud
Uploaded checksum...passed
Programming devices...done
Final checksum...passed
Please return to 9600 baud and press enter
```

T1.317 Error Messages   The following are error message that may be encountered while logging
into the system or entering commands:

!-112,SYNTAX ERROR	Command syntax is incorrect
!-221,EXCESSIVE LOGIN ATTEMPTS	The wrong password was entered too many times when trying to login.
!-223,INVALID PASSWORD	An attempt was made to change the password to an invalid one.
!-224,NEW PASSWORD MISMATCH	The first and second password entries did not match when attempting to change a password.
!-304,INVALID VALUE	An attempt was made to change an attribute to an invalid value.

Appendix F   *Safety*

Safety Statements

Please read and follow all safety instructions and warnings before installing, maintaining, or repairing the Galaxy Controller. Also refer to the peripheral monitoring system product manual for safety statements related to the installation and use of these devices.

The Global Power System (including the peripheral monitoring modules) is Listed by Underwriters Laboratories Inc. to the requirements of UL Subject 1801 as a controller for use with DC Power Distribution Centers for Communications Equipment. The Listing is based on the items noted below.

Install only in restricted access areas (dedicated equipment rooms, equipment closets, or the like) in accordance with articles 110-16, 110-17, and 110-18 of the U.S. National Electric Code (NEC), ANSI/ NFPA No. 70, and pursuant to applicable local codes.

This equipment is to be used in controlled environments (an area where the humidity is maintained at levels that cannot cause condensation on the equipment, the contaminating dust is controlled, and the steady-state ambient temperature is within the range specified).
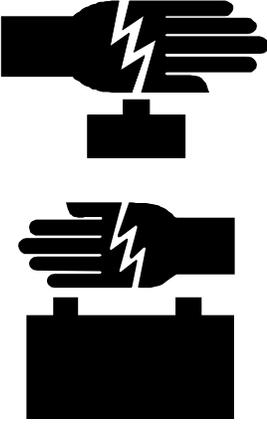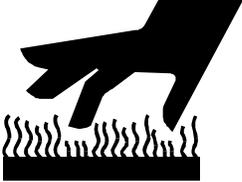
This equipment has been evaluated for use in a continuous ambient temperature of up to 50° C.
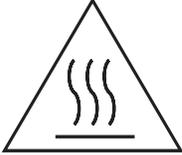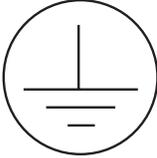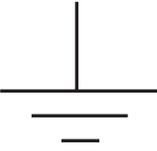
This equipment must not be installed over combustible surfaces.

This equipment is to be connected to 24Vdc or 48Vdc systems that are electrically isolated from the ac mains and are reliably earth grounded, or connected to systems where the rectifiers were evaluated to UL1950 and identified as Safety Extra Low Voltage (SELV) outputs.

Warning Statements And Safety Symbols

The symbols may sometimes be accompanied by some type of statement; e.g., "Hazardous voltage/energy inside. Risk of injury. This unit must be accessed only by qualified personnel."

⚠	This symbol identifies the need to refer to the equipment instructions for important information.
	These symbols (or equivalent) are used to identify the presence of hazardous ac mains voltage.
	This symbol is used to identify the presence of hazardous ac or dc voltages. It may also be used to warn of hazardous energy levels.
	One of these two symbols (or equivalent) may be used to identify the presence of rectifier and battery voltages. The symbol may sometimes be accompanied by some type of statement, for example: "Battery voltage present. Risk of injury due to high current. Avoid contacting conductors with uninsulated metal objects. Follow safety precautions."

	This symbol is used to identify the presence of a hot surface. It may also be accompanied by a statement explaining the hazard. A symbol like this with a lightning bolt through the hand also means that the part is or could be at hazardous voltage levels.
	This symbol may also be used to identify the presence of a hot surface. The marked item should not be touched without taking care.
	This symbol is used to identify the protective safety earth ground for the equipment.
	This symbol is used to identify other bonding points within the equipment.
	This symbol is used to identify the need for safety glasses and may sometimes be accompanied by some type of statement, for example: "Fuses can cause arcing and sparks. Risk of eye injury. Always wear safety glasses."

Precautions   When working on or using this type of equipment, the following precautions should be noted:

- This unit must be installed, serviced, and operated only by skilled and qualified personnel who have the necessary knowledge and practical experience with electrical equipment and who understand the hazards that can arise when working on this type of equipment.

- Hazardous energy and/or voltages may be present in the unit and on the interface cables that can shock or cause serious injury. Follow all safety warnings and practices when servicing this equipment.In addition to proper job training and safety procedures, the following are some basic precautions that should always be used:

  – Use **only** properly insulated tools.

  – Remove all metallic objects (key chains, glasses, rings, watches, or other jewelry).

  – Wear safety glasses.

  – Test circuits before touching.

  – Lock out and tag circuit breakers/fuses when possible to prevent accidental turn on.

  – Be aware of potential hazards before servicing equipment.

  – Identify exposed hazardous electrical potentials on connectors, wiring, etc. (note the condition of these circuits, especially wiring).

  – Use care when removing or replacing covers; avoid contacting circuits.

  – Electricity produces magnetic fields that can affect implanted electronic medical devices. The strength of the magnetic field depends on the amount of current in the circuit, as well as other conditions (such as: number of conductors, placement, and distance from the conductor). DC power and distribution systems, including the batteries, that are typically used in telecommunication utility rooms can operate at high current levels. Personnel with electronic medical devices need to be aware of their restrictions when working around electricity.

Appendix G   *Product Warranty*

A. Seller warrants to Customer only, that:

    1. As of the date title to Products passes, Seller will have the right to sell, transfer, and assign such Products and the title conveyed by Seller shall be good;

    2. Upon shipment, Seller's Manufactured Products will be free from defects in material and workmanship, and will conform to Seller's specifications or any other agreed-upon specification referenced in the order for such Product;

    3. With respect to Vendor items, Seller, to the extent permitted, does hereby assign to Customer the warranties given to Seller by its vendor of such Vendor Items, such assignment to be effective upon Customer's acceptance of such Vendor Items. With respect to Vendor items recommended by Seller in its specifications for which the vendor's warranty cannot be assigned to Customer, or if assigned, less than Sixty (60) days remain of the vendor's warranty or warranty period when the Vendor's items are shipped to Customer or when Seller submits its notice of completion of installation if installed by Seller, Seller warrants that such Vendor's Items will be free from defects in material and workmanship on the date of shipment to Customer. In such an event, the applicable Warranty Period will be sixty (60) days.

B. The Warranty Period listed below is applicable to Seller's Manufactured Products furnished pursuant to this Agreement, unless otherwise stated:

WARRANTY PERIOD

Product Type	New Product	Repaired Product or Part
Central Office Power Equipment	24 Months	6 Months

*The Warranty Period for a repaired Product or part thereof is as listed or, in the case of Products under Warranty, is the period listed or the unexpired term of the new Product Warranty Period, whichever is longer.

**The Warranty Period for Products ordered for Use in Systems or equipment Manufactured by and furnished by Seller is that of the initial Systems or equipment.

C. If, under normal and proper use during the applicable Warranty Period, a defect or nonconformity is identified in a Product and Customer notifies Seller in writing of such defect or nonconformity promptly after Customer discovers such defect or nonconformity, and follows Seller's instructions regarding return of defective or nonconforming Products, Seller shall, at its option attempt first to repair or replace such Product without charge at its facility or, if not feasible, provide a refund or credit based on the original purchase price and installation charges if installed by Seller. Where Seller has elected to repair a Seller's Manufactured Product (other than Cable and Wire Products) which has been installed by Seller and Seller ascertains that the Product is not readily returnable for repair, Seller will repair the Product at Customer's site.

With respect to Cable and Wire Products manufactured by Seller which Seller elects to repair but which are not readily returnable for repair, whether or not installed by Seller, Seller at its option, may repair the cable and Wire Products at Customer's site.

D. If Seller has elected to repair or replace a defective Product, Customer shall have the option of removing and reinstalling or having Seller remove and reinstall the defective or nonconforming Product. The cost of the removal and the reinstallation shall be borne by Customer. With respect to Cable and Wire Products, Customer has the further responsibility, at its expense, to make the Cable and Wire Products accessible for repair or replacement and to restore the site. Products returned for repair or replacement will be accepted by Seller only in accordance with its instructions and procedures for such returns. The transportation expense associated with returning such Product to Seller shall be borne by Customer. Seller shall pay

the cost of transportation of the repair or replacing Product to the destination designated by Customer within the Territory.

E. The defective or nonconforming Products or parts which are replaced shall become Seller's property.

F. If Seller determines that a Product for which warranty service is claimed is not defective or nonconforming, Customer shall pay Seller all costs of handling, inspecting, testing, and transportation and, if applicable, traveling and related expenses.

G. Seller makes no warranty with respect to defective conditions or nonconformities resulting from actions of anyone other than Seller or its subcontractors, caused by any of the following: modifications, misuse, neglect, accident, or abuse; improper wiring, repairing, splicing, alteration, installation, storage, or maintenance; use in a manner not in accordance with Seller's or vendor's specifications or operating instructions, or failure of Customer to apply previously applicable Seller modifications and corrections. In addition, Seller makes no warranty with respect to Products which have had their serial numbers or month and year of manufacture removed, altered, or with respect to expendable items, including, without limitation, fuses, light bulbs, motor brushes, and the like.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. CUSTOMER'S SOLE AND EXCLUSIVE REMEDY SHALL BE SELLER'S OBLIGATION TO REPAIR, REPLACE, CREDIT, OR REFUND AS SET FORTH ABOVE IN THIS WARRANTY.