Freeway® 3100 Hardware Installation Guide

DC 900-2002C

Protogate, Inc.

Freeway® 3100 Hardware Installation Guide: DC 900-2002C

by   Protogate, Inc.

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This Installation Guide covers the installation and configuration of the Freeway® 3100. The Freeway 3100 is a 1U-chassis version of the Freeway.

The latest version of this document is always available, in a variety of formats and compression options, from the Protogate World Wide Web server (http://www.protogate.com/support/manuals).

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Preface

Purpose of Document

This document describes the hardware installation procedures for Protogate's Freeway 3100 communications server. It is used in conjunction with the Freeway User's Guide, which describes the software installation procedure.

Intended Audience

This document should be read by computer technicians who will be installing the Freeway communications server. System administrators and system integrators may also find it useful.

Organization of Document

This document is organized into the following major sections:

Chapter 1

    is list of safety precautions to observe when working with the Freeway hardware.

Chapter 2

    is an overview of the Freeway installation procedure.

Chapter 3

    describes the hardware installation.

Chapter 4

    describes how to configure the boot parameters using the boot parameter initialization disk.

Chapter 5

    describes how to configure the boot parameters using the local console.

Appendix A

    shows the commonly used electrical interfaces.

Appendix B

    describes the LEDs on the Freeway 3100 front panel.

Protogate References

The following general product documentation list is provided to familiarize you with the available Protogate Freeway and embedded ICP products. Most of these documents are available on-line at Protogate's web site (http://www.protogate.com/).

General Product Overview Documents

Freeway 1100 Technical Overview	25-000-0419
Freeway 2000/4000/8800 Technical Overview	25-000-0374
ICP2432 Technical Overview	25-000-0420
ICP6000X Technical Overview	25-000-0522

Hardware Support Documents

Freeway 500 Hardware Installation Guide	DC-900-2000
Freeway 1100/1150 Hardware Installation Guide	DC-900-1370
Freeway 1200/1300 Hardware Installation Guide	DC-900-1537
Freeway 2000/4000 Hardware Installation Guide	DC-900-1331
Freeway 3100 Hardware Installation Guide	DC-900-2002
Freeway 3200 Hardware Installation Guide	DC-900-2003
Freeway 3400 Hardware Installation Guide	DC-900-2004
Freeway 3600 Hardware Installation Guide	DC-900-2005
Freeway 8800 Hardware Installation Guide	DC-900-1553
Freeway ICP6000R/ICP6000X Hardware Description	DC-900-1020
ICP6000(X)/ICP9000(X) Hardware Description and Theory of Operation	DC-900-0408
ICP2424 Hardware Description and Theory of Operation	DC-900-1328
ICP2432 Hardware Description and Theory of Operation	DC-900-1501
ICP2432 Electrical Interfaces (Addendum to DC-900-1501)	DC-900-1566

ICP2432 Hardware Installation Guide	DC-900-1502
ICP2432B Hardware Installation Guide	DC-900-2009

Freeway Software Installation and Configuration Support Documents

Freeway Message Switch User Guide	DC-900-1588
Freeway Release Addendum: Client Platforms	DC-900-1555
Freeway User Guide	DC-900-1333
Freeway Loopback Test Procedures	DC-900-1533

Embedded ICP Software Installation and Programming Support Documents

ICP2432 User Guide for Digital UNIX	DC-900-1513
ICP2432 User Guide for OpenVMS Alpha	DC-900-1511
ICP2432 User Guide for OpenVMS Alpha (DLITE Interface)	DC-900-1516
ICP2432 User Guide for Solaris STREAMS	DC-900-1512
ICP2432 User Guide for Windows NT	DC-900-1510
ICP2432 User Guide for Windows NT (DLITE Interface)	DC-900-1514

Application Program Interface (API) Programming Support Documents

Freeway Data Link Interface Reference Guide	DC-900-1385
Freeway Transport Subsystem Interface Reference Guide	DC-900-1386
QIO/SQIO API Reference Guide	DC-900-1355

Socket Interface Programming Support Documents

Freeway Client-Server Interface Control Document	DC-900-1303

Toolkit Programming Support Documents

Freeway Server-Resident Application and Server Toolkit	DC-900-1325
Freeway Server-Resident Application and Server Toolkit Programmer Guide	DC-900-1325
OS/Impact Programmer Guide	DC-900-1030

Freeway OS/Protogate Programmer's Guide	DC-900-2008
Protocol Software Toolkit Programmer Guide	DC-900-1338
Protocol Software Toolkit Programmer's Guide (ICP2432B)	DC-900-2007

Protocol Support Documents

ADCCP NRM Programmer Guide	DC-900-1317
Asynchronous Wire Service (AWS) Programmer Guide	DC-900-1324
AUTODIN Programmer Guide	DC-908-1558
Bit-Stream Protocol Programmer Guide	DC-900-1574
BSC Programmer Guide	DC-900-1340
BSCDEMO User Guide	DC-900-1349
BSCTRAN Programmer Guide	DC-900-1406
DDCMP Programmer Guide	DC-900-1343
FMP Programmer Guide	DC-900-1339
Military/Government Protocols Programmer Guide	DC-900-1602
N/SP-STD-1200B Programmer Guide	DC-908-1359
SIO STD-1300 Programmer Guide	DC-908-1559
X.25 Call Service API Guide	DC-900-1392
X.25/HDLC Configuration Guide	DC-900-1345
X.25 Low-Level Interface	DC-900-1307

Document Conventions

The term "Freeway" refers to the Freeway 3100.

Revision History

The revision history of the Freeway 3100 Installation Guide, Protogate document DC 900-2002, is recorded below:

Table 1. Revision History

Revision	Release Date	Description
DC 900-2002PRELIM-A	January 2002	Initial Release (Preliminary)
DC 900-2002B	May 2003	Minor formatting changes
DC 900-2002C	July 2003	Updated Chapter 4

Customer Support

If you are having trouble with any Protogate product, call us at 1-858-451-0865 (U.S.) Monday through Friday between 8 a.m. and 5 p.m. Pacific time. You can also fax your questions to us at (858) 451-2865 or (877) 473-0190 any time. Please include a cover sheet addressed to "Customer Service." We are always interested in suggestions for improving our products. You can use the report form in the back of this manual to send us your recommendations.

Chapter 1. Safety Precautions

1.1. English -- Safety Precautions

Be sure to take the following safety precautions during installation and maintenance of the Freeway communications server:

*   Observe the warnings and directions printed on the Freeway server and its associated equipment.

*   Check the electrical rating label on the Freeway chassis. Be sure that the voltage and frequency of your power source match this rating.

*   The Freeway server must be plugged into a grounded, three-wire power outlet. Do not use an adapter that permits a three-wire electrical cord to be plugged into a two-wire power outlet.

*   Use appropriately rated extension cords or power strips only.

*   To ensure proper cooling, always operate the Freeway server with its covers in place. Do not cover or block any of the openings on the Freeway chassis. Do not place the unit near a heater.

*   Do not insert objects through openings in the Freeway chassis. Doing so could result in a short circuit that might cause a fire or an electric shock.

*   Do not modify the Freeway equipment in any way. Protogate, Inc. is not responsible for regulatory compliance of any Freeway communications server that has been modified. Altering the Freeway enclosure in any way other than the installation of Protogate-provided options may invalidate Freeway's safety certifications.

*   Always unplug the Freeway AC power cord before removing the top cover for servicing.

1.2. Français -- Précautions d'emploi

Nous vous prions de suivre les précautions d'emploi suivantes au cours de l'installation ou au cours de tout entretien de votre serveur de communication Freeway:

*   Respecter les avertissements et les instructions imprimées sur le serveur Freeway et les appareils qui y sont associés.

*   Vérifier les normes électriques indiquées sur une étiquette se trouvant sur le châssis Freeway. Prière de s'assurer que le voltage et la fréquence de la source d'alimentation sont compatibles avec ces normes.

*   Le serveur Freeway doit être branché dans une prise de terre à trois broches. Ne pas utiliser d'adaptateur permettant de brancher une prise mâle à trois broches dans une prise de courant à deux broches.

- N'utiliser des rallonges, fils électriques ou parasurtenseurs qu'aux normes appropriées.

- Afin de refroidir correctement le serveur Freeway, utiliser seulement celui-ci avec la housse en place. Ne pas couvrir ou bloquer les ouvertures du châssis Freeway. Ne pas placer l'appareil Freeway près d'une source de chaleur.

- Ne pas insérer d'objets par les ouvertures du châssis Freeway. Ceci risquerait de provoquer un court-circuit résultant à une décharge ou un incendie.

- Ne pas modifier l'appareil Freeway de quelque manière que ce soit. Protogate, Inc. ne pourra être tenu responsable de toute infraction aux normes d'un serveur de communication Freeway ayant été modifié. Toute altération de l'enveloppe Freeway d'une manière autre que pour l'installation d'options fournies par Protogate risque de rendre les normes de sécurité de Freeway invalides.

- Toujours débrancher le fil d'alimentation en courant alternatif de Freeway avant d'enlever la housse supérieure ou inférieure à des fins d'entretien.

1.3. Deutsch -- Sicherheitsvorkehrungen

Vergewissern Sie sich, daß die folgenden Sicherheitsmaßnahmen bei der Installation und Wartung des Freeway Kommunikations-Servers eingehalten werden:

- Lesen Sie die Anleitung und Sicherheitsregeln auf dem Freeway Server und auf dem Zubehör.

- Die Voltspannung und Frequenz der von Ihnen verwendeten Stromquelle muß mit den elektrischen Werten, die auf dem Freeway Chassis angegeben sind, übereinstimmen.

- Der Freeway Server muß an eine geerdete, dreiadrige Stromquelle angeschlossen werden. Bitte verwenden Sie keine Adapter, die den Anshluß dreiadriger Kabel an zweiadrige Stromquellen ermöglichen.

- Benutzen Sie nur den Angaben entsprechende Verlängerungskabel oder Steckdosenleisten.

- Benutzen Sie den Freeway Server nur, wenn alle Abdeckungen intakt sind und die vordere Scharniertür geschlossen ist. Blockieren Sie in keiner Weise irgendwelche Öffnungen des Freeway Chassis, und positionieren Sie den Apparat nicht in der Nähe einer Heizung.

- Stecken Sie keine Gegenstände durch die Öffnungen des Gehäuses; dies könnte einen Kurzschluß hervorrufen, der einen Brand oder einen elektrischen Schlag verursachen kann.

- Verändern Sie in keiner Weise das Freeway Zubehör. Protogate, Inc. ist nicht für abgeänderte Freeway Kommunikations-Server verantwortlich, die demzufolge den vorgeschriebenen Regeln nicht entsprechen. Jegliche Abänderungen der Freeway Anlage, mit Ausnahme der Installation von Protogate-Sonderausstattungen, können die Sicherheitsbescheinigung der Anlage ungültig werden lassen.

- Entfernen Sie immer das Freeway Stromkabel von der Stromquelle, bevor Sie die oberen oder unteren Deckel zur Wartung abnehmen.

1.4. Italiano -- Norme di sicurezza

Durante l'installazione e la manutenzione del server per le comunicazioni Freeway seguire le seguenti norme di sicurezza:

- Seguire le avvertenze e le istruzioni stampate sul server Freeway e sulle altre unità ad esso collegate;

- Controllare l'etichetta con l'indicazione del voltaggio elettrico sul telaio ed assicurarsi che voltaggio e frequenza della presa di corrente vi corrispondano;

- Il server Freeway deve essere collegato ad una spina con messa a terra, e con tre fili. Non usare un adattatore che consente di collegare un filo a tre fili in una presa a due;

- Usare solo fili e prese multiple con taratura appropriata;

- Per assicurare un raffreddamento adeguato usare sempre il server Freeway con il suo relativo coperchio. Non coprire o bloccare nessuna delle aperture del telaio di Freeway. Non collocare l'unità vicino a fonti di calore;

- Non inserire oggetti nelle aperture situate sul telaio di Freeway, perchè così facendo si rischia di provocare un corto circuito, che può generare un incendio o una scossa elettrica;

- Non modificare in nessun modo l'unità Freeway. La Protogate, Inc. non è responsabile della conformità alle norme di nessun server Freeway per le comunicazioni che sia stato modificato. L'alterazione in qualsiasi maniera del telaio di Freeway, che differisca dalle opzioni di installazione fornite dalla Protogate, può invalidare le garanzie di sicurezza;

- Prima di togliere il coperchio o la base per effettuare qualsiasi manutenzione, ogliere sempre la spina di Freeway.

Chapter 2. Getting Started

This manual describes how to install the Freeway 3100 hardware and configure the boot parameters. The following is a summary of the complete installation procedure:

1. Install the hardware as described in Chapter 3 of this manual.

2. Install the software onto the boot server as described in the Freeway User's Guide.

3. If you are using the boot parameter initialization disk, configure the boot parameters as described in Chapter 4 of this manual.

4. If you are using a local console, configure the boot parameters as described in Chapter 5 of this manual.

5. Boot the Freeway server.

6. Run the loopback test as described in the Freeway Loopback Test Procedures.

7. Customize your installation, if necessary, as described in the Freeway User's Guide.

8. Familiarize yourself with Freeway operations as described in the Freeway User's Guide.

Chapter 3. Hardware Installation

3.1. Overview

This chapter describes how to set up the Freeway communications server and connect it to the network.

1. Review the safety guidelines in the "Safety Precautions" section in Chapter 1.

2. Place your Freeway in the selected location. It can be installed in any standard 19-inch rack. It can also be set on a table top where it will occupy about three square feet. There should be room to set a monitor nearby and enough clearance to ensure that the air vents will not be blocked.

    The Freeway 3100 has an autoswitching power supply to accommodate different voltages and AC frequencies (115 or 230 VAC at 50 or 60 Hz). It must be near one grounded, three-wire electrical outlet.

    The Freeway must also be near the LAN and WAN connectors that will be plugged into it.

    Be sure the location meets the following environmental standards:

    *   Operating temperature: 41° - 122° F (5° - 50° C)
    *   Humidity: 20% - 90% (relative non-condensing)
    *   Altitude: 0 - 10,000 feet (0 - 3048 meters)
    *   Good ventilation
    *   Little or no dust

3. Check that the shipping carton includes the following:
    *   Freeway
    *   Power cord
    *   Serial Console cable (each end of the cable has both a 9-pin and a 25-pin connector)
    *   Anti-static strap
    *   Boot parameter initialization disk
    *   Freeway 3100 Hardware Installation Guide (this manual)
    *   Freeway User's Guide
    *   Freeway Server Software distribution media

    If an ICP board is installed in your Freeway 3100, the shipping carton should also include:

- Appropriate cables to connect the ICP to the data communications equipment

- Two- and three-headed loopback cables, one per Freeway ICP

- Freeway Loopback Test Procedures

- Software distribution media for an ICP protocol, with the applicable programmer's guide and other supporting documentation

  Note: You do not have to wear the anti-static strap while connecting Freeway to the network, but it should be kept with the unit for future use when you are making upgrades to the system that require access to the inside of the enclosure.

The carton may also contain other documentation. If anything is missing, contact your Protogate customer service representative at 1-858-451-0865.

  Note: Keep the original box and packing material. To avoid damage during shipment, use the original box and packing material when shipping your Freeway.

4. You must supply the following:

- Ethernet local area network (10BaseT or 100BaseT)

- Computer running IP and FTP or RSH to be used as a boot server (if the Freeway will boot over the network)

- System console to configure the boot parameters and perform the initial system boot. The system console can be either a VT100-compatible serial terminal (or terminal emulator), or a PS/2 keyboard and VGA monitor

- Cables for connecting Freeway to the LAN and WAN

- Synchronous modem for loopback testing described in the Freeway Loopback Test Procedures

5. Familiarize yourself with the Freeway's front panel. Figure 3-1 shows a front view of the Freeway 3100. See Appendix B for a description of the Freeway 3100 LED indications.

Figure 3-1. Front View, Freeway 3100 (full-width door not shown)
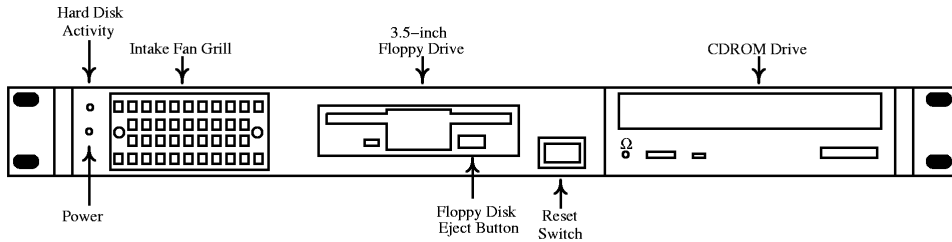
6. Familiarize yourself with the Freeway's back panel. Figure 3-2 shows the back panel of the Freeway 3100. That figure shows a Freeway 3100 with several four-port or eight-port ICP2432 boards installed. Your Freeway 3100 may have either a 2-port ICP board, a secondary ethernet, or a metal plate installed in place of the ICP boards shown.

Figure 3-2. Rear View, Freeway 3100
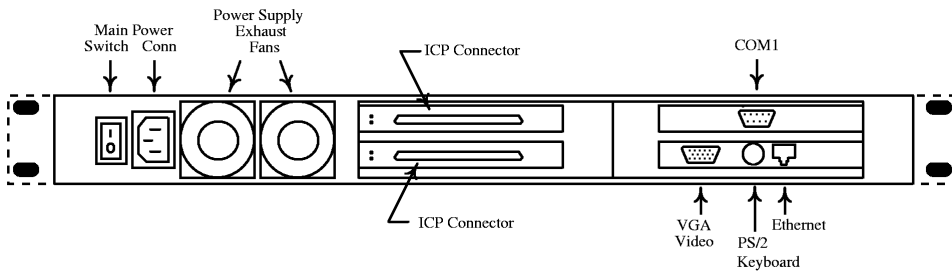
7. Make sure that the Freeway 3100 is powered off, then make the LAN connections. The Freeway's CPU board has an RJ-45 connector for twisted-pair cable complying with the 10/100BaseT specification.

> **Caution**Alert your system administrator before making connections to your LAN. To avoid a disruption of service on your LAN, carefully plan how you will make the connections. We recommend that you power off the Freeway server during cable installation and removal.

Check with your system administrator to find out what type of cable is used at your site. You may need to use a mini-hub to convert from 10/100BaseT to 10Base2 or 10Base5 (100BaseT always uses the RJ-45 connector). You can obtain the necessary equipment and cables from a computer accessory vendor.

8. Make sure that the Freeway 3100 is powered off, then connect the ICP board to your wide area network WAN.

>   **Power off Freeway completely**We recommend that you power off the Freeway server and modem during cable installation and removal. This will prevent damage to an ICP due to electrical discharge as contact is made or broken.

Figure 3-2 shows an example Freeway 3100 hardware configuration. The Freeway 3100 has two PCI slots, which can be used either by ICP2432 boards or by optional secondary Ethernet Network Interface (NIC) Cards. In this example, two four-port or eight-port ICP2432 board are installed.

The two-port ICP board has two separate 26-pin high-density connectors; port 0 is the connector nearest the power supply of the Freeway 3100 chassis and port 1 is the other connector. Both the four-port and the eight-port boards have the same 100-pin high-density connector. The four-port board uses a "quadrapus" (one-to-four) cable to attach four DB25 or DB37 connectors to the 100-pin connector. The eight-port board uses an "octopus" (one-to-eight) cable to attach eight DB25 connectors to the 100-pin connector. Port numbers are identified on the terminating ends of the quadrapus or octopus cable.

9. Plug the power cord into the power input socket on the Freeway's back panel and into an AC electrical outlet near your Freeway, making sure the voltage supplied is appropriate for the Freeway.

10. Perform the software installation procedures on your boot server as described in the Freeway User's Guide.

11. Configure the boot parameters. There are two ways to do this. You can use the boot parameter initialization disk as described in Chapter 4 or you can attach a local console to your Freeway as described in Chapter 5.

Chapter 4. Configuring the Boot Parameters Using the Initialization Diskette

This chapter describes how to use a boot parameter initialization diskette to configure the boot parameters and boot your Freeway server. You can boot Freeway from a boot server attached to your IP network or from Freeway's hard or flash drive.

4.1. Assumptions

If you are booting from a boot server, it is assumed that:

1. You have performed the hardware installation procedures described in Chapter 3.

2. You know which protocol you will be installing on your boot server (for example, BSC2780/3780, FMP, or X.25). The protocol is indicated on the label of the software distribution media.

   Note: If you are installing more than one protocol, it is best to perform the software installation (described in the Freeway User's Guide) and loopback verification testing (described in the Freeway Loopback Test Procedures) for one protocol before attempting to customize your Freeway system for multiple protocols.

3. The system administrator has set up a file transfer protocol (FTP) or remote shell (RSH) user name and password on the boot server to match the FTP user name and the FTP password in the Freeway system boot parameters. The default FTP user name is **`freeway`** and the default FTP password is **`password`**.

   You can change the default FTP user name and FTP password that the Freeway uses by changing the corresponding boot parameters on the Freeway system. If you do, remember that you must also change the user name and password of the FTP account on the boot server.

4. The system administrator has assigned the following device names and addresses in the UNIX `/etc/hosts` file, the Windows NT `hosts` or `lmhosts` file, or using your VMS TCP/IP package:

   • Freeway server name and Internet address

   • Boot server name and Internet address

   • Gateway Internet address (if applicable)

4.2. Configuration Procedure

The procedure for configuring the Freeway system boot parameters is the same for UNIX, VMS, and Windows NT systems. Freeway obtains the boot parameters from local non-volatile memory during system boot. Therefore, when you configure the boot parameters in the following steps, all applicable parameters must be configured. The parameters specified in a boot parameter initialization diskette serve to supplement any already-existing parameters, so it is only necessary to specify the parameters which you wish to change. However, it is usually best to specify them all so that all the boot parameters will always be set correctly, since any boot parameters which are not set explicitly by the boot parameter diskette will be in an unknown state (whatever they were set to before).

1. The boot parameter initialization diskette is a DOS-formatted bootable floppy diskette, with an AUTOEXEC.BAT file which includes this line:

```
copy a:bootparm.txt c:bootparm.txt
```

The boot parameter initialization diskette must also contain a file of the name `bootparm.txt`, which contains lines of the form shown in Figure 4-1.

To configure the boot parameter initialization diskette, insert it into any PC. The `bootparm.txt` file, shown in Figure 4-1, can be viewed with any text editor. Edit this file to configure the boot parameters, as described in Table 4-1. Be sure to select the appropriate option to save this file as text if this is not the default format of your editor.

A missing line, or a line with a blank field after the colon, will result in the value of that specific boot parameter remaining unchanged. Any line with a single period (".") character after the colon will result in that boot parameter being cleared (set to the empty string). Any other string to the right of the colon will be used as the new value for that boot parameter. Any line which has a "#" as the first non-whitespace character will be taken as a comment line, and will have no effect on any boot parameters.

Figure 4-1. Example of the Freeway System Boot Parameters (Init Disk)

```
Boot_Device                         : fei
Processor_Number                    : 0
FTP_User_Name                       : freeway
FTP_Password                        : password
Flags                               : 0
Freeway_Server_Name                 : freeway1
Freeway_Inet_Address                : 192.168.1.193
Freeway_Subnet_Mask                 : ffffff00
Boot_Server_Name                    : bootmaster
Boot_Server_Inet_Address            : 192.168.1.2
System_Boot_Directory               : /usr/local/freeway/boot
System_Boot_File_Name               : fw486
```

```
Configuration_File_Name                 : bootcfg.pci
Secondary_Net_Interface                 :
Gateway_Inet_Address                    :
```

Table 4-1. Freeway System Boot Parameters

Boot Parameter	Description
Boot Device	To boot over Ethernet from the boot server using the primary Ethernet (on the CPU board), set the boot device to **fei** or **fei0**. To boot over Ethernet from the boot server using the secondary Ethernet board, set the boot device to **fei1**. To boot from the local disk, set the boot device to **ide=0,0**.
Processor Number	The only valid number for this parameter is 0.
FTP User Name	If booting from the boot server, Freeway uses this name to log in to its FTP (or RSH) user account. The default is **freeway**. This is not required if you are booting from the local disk.
FTP Password	If booting from the boot server, Freeway uses this password to log in to its user account. The default is **password**. This parameter is optional. If a password is given, FTP is used during system boot; if it is cleared, the remote shell (RSH) protocol is used.
Flags	This parameter specifies whether you want Freeway to: • Autoboot two seconds after system reset, seven seconds after system reset, or not at all • Force the primary boot network interface to operate at 10 megabits/second, half duplex Enter the Flags value shown in Table 4-2 that matches your configuration requirements. The default Flags value is 0. The Flags word is an inclusive "OR" of the desired bits for the individual functions.
Freeway Server Name	Enter the system name assigned by the system administrator for this Freeway.
Freeway Inet Address	Enter the Internet address assigned by the system administrator for this Freeway in decimal dot notation (for example, 192.168.1.193).
Freeway Subnet Mask	If your Freeway is located on a subnet, enter the subnet mask in hexa- decimal notation (for example, ffffff00).

Boot Parameter	Description
Boot Server Name	Enter the name assigned by the system administrator for the boot server. Optionally, you can clear this field and the software will assign the default name "bootserver." If you are booting from the local disk, this parameter is ignored.
Boot Server Inet Address	Enter the Internet address assigned by the system administrator for the boot server in decimal dot notation (for example, 192.168.1.2). If you are booting from the local disk, this parameter is ignored.
System Boot Directory	If the Freeway boot files will be stored in the home directory of the FTP (or RSH) user account, clear this field. Otherwise, enter the full path name of the boot directory. The default UNIX directory is `/usr/local/freeway/boot`. The default VMS directory is `SYS$SYSDEVICE:[FREEWAY.BOOT]`. For Windows NT versions earlier than 4.0, the default directory is `c:\freeway\boot`. For Windows NT 4.0 or later, use the alias you have set up to point to the `freeway\boot` directory. To boot from the local disk, set the system boot directory to `/ide`.
System Boot File Name	Enter the system boot file name for this Freeway. The default is `fw486`.
Configuration File Name	This parameter contains the file that Freeway uses to configure the physical devices and services. Enter the file name for your Freeway. The default is `bootcfg.pci`. For any Freeway using ICP_IP virtual ICP devices, the default is `bootcfg.ip`.
Secondary Network Interface	If the Boot Device (boot server) is an IP network device, the Secondary Network Interface parameter is unused (this is the default). If the Boot Device is the hard or flash disk, this parameter specifies the local area network device to be used after the Freeway boots. Set this parameter to **fei** to use the primary Ethernet (on the CPU board) or **fei1** to use the secondary Ethernet board.
Gateway Inet Interface	If your Freeway and boot server are on the same local network, clear this parameter (this is the default). If they are on different networks, enter the IP address of the gateway machine on the Freeway's network that provides access to the boot server's network.

Table 4-2. Flags for Freeway Reset Action

Flags Parameter Value	Boot Protocol and Reset Action
0x0000 (default)	Upon system reset, wait 7 seconds before autobooting.
0x0004	Upon system reset, display the Freeway Boot System Main Menu. Do not autoboot.
0x0008	Upon system reset, wait 2 seconds before autobooting.
0x2000	Force primary boot network interface to operate at 10 megabits/second, half duplex. The Flags word is an inclusive "OR" of the desired bits for the individual functions; for example, 0x2008 waits 2 seconds before autobooting and forces the 10 megabits/second speed.

2. Use the blank form in Figure 4-2 to write down your boot parameter configurations for future reference.

Figure 4-2. Configured Freeway System Boot Parameters (Init Disk)

```
Freeway System Boot Parameters
------------------------------
Boot Device                   : _____
Processor Number              : _____
FTP User Name                 : _____
FTP Password                  : _____
Flags                         : _____
Freeway Server Name           : _____
Freeway Inet Address          : _____
Freeway Subnet Mask           : _____
Boot Server Name              : _____
Boot Server Inet Address      : _____
System Boot Directory         : _____
System Boot File Name         : _____
Configuration File Name       : _____
Secondary Net Interface       : _____
Gateway Inet Address          : _____
```

3. Save the edited `bootparm.txt` file to the boot parameter initialization floppy disk, then remove the floppy disk from the PC.

4. Insert the initialization disk in the Freeway's floppy drive. Turn on the power. The Freeway will boot from the floppy disk, and automatically execute the autoexec.bat commands to copy the `bootparm.txt` file from the floppy to the "C:" partition of the Freeway's disk.

   After the `bootparm.txt` is copied, remove the initialization disk from the floppy drive and reboot the Freeway.

   When the Freeway boots, it will discover `bootparm.txt` in the C: DOS partition and extract the boot parameter lines from it, then delete it (it is deleted so it doesn't interfere with later changes to the boot parameters, when the Freeway is subsequently booted). The Freeway boot process performs rudimentary error checking on some of the parameters to verify that the values provided are of the correct format for the parameter type, but otherwise simply writes the parameters into the `NVRAM.txt` file exactly as provided. If an undetected error occurs (for example, a critical parameter missing or misspelled in the `bootparm.txt` file), the Freeway may fail to boot.

   If Freeway attempts to boot for several minutes (as can be detected by its beeping and accessing the hard disk), assume that there is a problem with the boot parameters or the network connection. Insert the boot parameter initialization disk in the PC again and review the boot parameters on the disk to be sure they are set correctly for your Freeway's configuration. Once set correctly, go back to the beginning of this step 4 and try again (insert the boot parameter initialization disk into the Freeway's disk drive and reboot it).

5. After the Freeway boots successfully, store the boot initialization diskette. It can be used to re-set exactly the same boot parameters again, either on the same Freeway or any other Freeway system.

> **Note:** After the initial system boot, you can telnet or rlogin to Freeway from the boot server (or from any other computer on the network) and use the Freeway Interactive Menu for Freeway operations as described in the Freeway User's Guide.

You can use the Freeway Interactive Menu to modify the boot parameters. If, however, Freeway is booted with the boot parameter initialization disk in the floppy drive, any boot parameters that were modified using the Freeway menu will be overwritten by the values in the `bootparm.txt` file.

6. Run the loopback test to check the hardware and software installation as described in the Freeway Loopback Test Procedures.

7. If Freeway will normally boot from the boot server, installation is complete. If Freeway will boot from its local disk, you must download the files from the boot server onto the local disk. Follow the instructions in the "Build Hard Disk from Boot Server" section in the Freeway User's Guide.

Chapter 5. Configuring the Boot Parameters Using the Local Console

This chapter describes how to use a local console to configure the boot parameters and boot your Freeway. You can boot Freeway from a boot server attached to your IP network or from Freeway's hard or flash drive.

5.1. Assumptions

If you are booting from a boot server, it is assumed that:

1. You have performed the hardware installation procedures described in Chapter 3.

2. You know which protocol you will be installing on your boot server (for example, BSC2780/3780, FMP, or X.25). The protocol is indicated on the label of the software distribution media.

   > **Note:** If you are installing more than one protocol, it is best to perform the software installation (described in the Freeway User's Guide) and loopback verification testing (described in the Freeway Loopback Test Procedures) for one protocol before attempting to customize your Freeway system for multiple protocols.

3. The system administrator has set up a file transfer protocol (FTP) or remote shell (RSH) user name and password on the boot server to match the FTP user name and the FTP password in the Freeway system boot parameters. The default FTP user name is **`freeway`** and the default FTP password is **`password`**.

   You can change the default FTP user name and FTP password that the Freeway uses by changing the corresponding boot parameters on the Freeway system. If you do, remember that you must also change the user name and password of the FTP account on the boot server.

4. The system administrator has assigned the following device names and addresses in the UNIX `/etc/hosts` file, the Windows NT `hosts` or `lmhosts` file, or using your VMS TCP/IP package:

   • Freeway server name and Internet address

   • Boot server name and Internet address

   • Gateway Internet address (if applicable)

5.2. Configuration Procedure

The procedure for configuring the Freeway system boot parameters is the same for UNIX, VMS, and Windows NT systems. Freeway obtains the boot parameters from local non-volatile memory during system boot. Therefore, when you configure the boot parameters in the following steps, all applicable parameters must be configured.

1. Connect a system console to your Freeway 3100. You will use this console to configure the boot parameters and perform the initial system boot. Later you can disconnect the console because you can then perform these configuration functions using telnet or rlogin through any terminal or workstation connected to the network.

   The system console can be either:

   - a VT100-compatible terminal or terminal emulator connected to the COM1 connector on the rear panel of the Freeway 3100, or

   - an ordinary "PC" VGA video monitor and PS/2 keyboard connected to the VGA and keyboard connectors on the rear panel of the Freeway 3100.

   The Freeway 3100 system determines which interface to use as its system console by probing the keyboard interface during system boot. If a keyboard is detected, then the console input is taken from that keyboard, and console output is directed to the VGA monitor. If no keyboard is detected, then console input and output is taken from (and sent to) the COM1 serial port.

   If your system console will be a VT100-compatible terminal or terminal emulator, it should be connected to Freeway using the cable supplied with your Freeway that has both a 9-pin and a 25-pin connector at each end. Connect the 9-pin connector on one end of the cable to the COM1 connector on the Freeway's back panel. For the location of this connector, see Figure 3-2; it is the connector labelled "COM1" in that figure. Connect the 25-pin connector on the other end of the cable to the VT100-compatible terminal or emulator that you want to use as a console.

2. If using a serial terminal as your system console, configure it to operate with the following communications parameters:
   - 9600 bits per second
   - 8 bits data
   - 1 stop bit
   - No parity
   - xon/xoff enabled

3. Turn the power switch on the Freeway 3100 back panel on.

4. When prompted on the console screen, press <return> within 7 seconds to prevent the autoboot attempt. The Freeway Boot System Main Menu shown in Figure 5-1 appears.

> **Note:** The Freeway Boot System Main Menu is only accessible using the local console connected to the rear of the Freeway unit. Later you can access functions to display or edit the boot parameters from any remote console using the Freeway Interactive Menu as described in the Freeway User's Guide.

Figure 5-1. Freeway Boot System Main Menu

```
                         Freeway Boot System Main Menu
                         -----------------------------

                         1) System Boot

                         2) Display Boot Parameters

                         3) Edit Boot Parameters

                         Select:
```

5. Select option 3 to edit the boot parameters. The system displays the parameters one at a time. Three actions are possible as each parameter is displayed:

- To preserve a parameter, press <return>

- To edit a parameter, type the new alpha-numeric information and press <return>

- To clear a parameter, press the period key ('.') followed by <return>

Figure 5-2 shows an example of a Freeway System Boot Parameters screen.

Figure 5-2. Example of the Freeway System Boot Parameters (Local Console)

```
             Freeway System Boot Parameters
             ------------------------------
             Boot Device                : fei
             Processor Number           : 0
             FTP User Name              : freeway
```

```
FTP Password                  : password
Flags                         : 0
Freeway Server Name           : freeway1
Freeway Inet Address          : 207.67.135.224
Freeway Subnet Mask           : ffffff00
Boot Server Name              : bootmaster
Boot Server Inet Address      : 207.67.135.198
System Boot Directory         : /usr/local/freeway/boot
System Boot File Name         : fw486
Configuration File Name       : bootcfg.pci
Secondary Net Interface       :
Gateway Inet Address          :
```

6. Configure the boot parameters as described in Table 4-1.

7. After you have entered the last parameter (Gateway Inet Interface), the screen displays:

```
            Save modifications?
            Enter 'yes <return>' to save modifications.
            Enter 'no <return>' to prevent modifications.

    If all of the parameters have been entered correctly, enter yes; otherwise, enter no.
```

If you enter **yes**, the screen displays the following message, and the system returns to the Freeway Boot System Main Menu after data storage completes:

```
            <<< Storing Data to IDE Disk >>>
```

If you enter **no**, the system returns to the Freeway Boot System Main Menu with no modifications to the boot parameters.

8. Select option 2 at the Freeway Boot System Main Menu (Figure 5-1) to review the current boot parameters. Verify that the changes you entered are correct. If the changes are incorrect, or you entered **no** to avoid storing data, select option 3 again and modify the boot parameters to their correct values.

9. Select option 1 from the Freeway Boot System Main Menu (Figure 5-1) on the Freeway console to perform the system boot.

> **Note:** After the initial system boot, you can telnet or rlogin to Freeway from the boot server (or from any other computer on the network) and use the Freeway Interactive Menu for Freeway operations as described in the Freeway User's Guide.

10. Use the blank form in Figure 5-3 to write down your boot parameter configurations for future reference.

Figure 5-3. Configured Freeway System Boot Parameters (Local Console)

```
Freeway System Boot Parameters
------------------------------
Boot Device                    : _____
Processor Number               : _____
FTP User Name                  : _____
FTP Password                   : _____
Flags                          : _____
Freeway Server Name            : _____
Freeway Inet Address           : _____
Freeway Subnet Mask            : _____
Boot Server Name               : _____
Boot Server Inet Address       : _____
System Boot Directory          : _____
System Boot File Name          : _____
Configuration File Name        : _____
Secondary Net Interface        : _____
Gateway Inet Address           : _____
```

11. Run the loopback test to check the hardware and software installation as described in the Freeway Loopback Test Procedures.

12. If Freeway will normally boot from the boot server, installation is complete. If Freeway will boot from its local disk, you must download the files from the boot server onto the local disk. Follow the instructions in the "Build Hard Disk from Boot Server" section in the Freeway User's Guide.

Appendix A. Electrical Interfaces

Table A-1 shows the commonly used electrical interfaces for WAN connections. Each link in a 2-port or 4-port ICP can be individually configured to EIA-232, EIA-449, EIA-530, or V.35. The 8-port ICP provides EIA-232 only. If you select another value for an 8-port board, it will be ignored.

> **Note:** The Freeway is always Data Terminal Equipment (DTE), while modems are Data Communications Equipment (DCE).

Table A-1. Commonly Used Electrical Interfaces

Signal Name	Source	EIA-232		EIA-530		EIA-449		V.35	
		Mnemonic	Pin	Mnemonic	Pins (A/B)	Mnemonic	Pins (A/B)	Mnemonic	Pins
Shield	-	-	1	-	1	-	1	-	A
Transmitted Data	DTE	BA	2	BA	2 / 14	SD	4 / 22		
Received Data	DCE	BB	3	BB	3 / 16	RD	6 / 24	104	R / T
Request to Send	DTE	CA	4	CA	4 / 19	RS	7 / 25	105	C
Clear to Send	DCE	CB	5	CB	5 / 13	CS	9 / 27	106	D
DCE Ready (DSR)	DCE	CC	6	CC	6 / 22	DM	11 / 29	107	E
DTE Ready (DTR)	DTE	CD	20	CD	20 / 23	TR	12 / 30	108	H
Signal Ground	-	AB	7	AB	7	SG	19	102	B
Receive Line Signal Detect (DCD)	DCE	CF	8	CF	8 / 10	RR	13 / 31	109	F
Transmit Signal Element Timing	DCE	DB	15	DB	15 / 12	ST	5 / 23	114	Y/AA

Signal Name	Source	EIA-232		EIA-530		EIA-449		V.35	
		Mnemonic	Pin	Mnemonic	Pins (A/B)	Mnemonic	Pins (A/B)	Mnemonic	Pins
Receive Signal Element Timing	DCE	DD	17	DD	17 / 9	RT	8 / 26	115	V / X
Local Loopback	DTE	LL	18	LL	18	LL	10	141	L
Remote Loopback	DTE	RL	21	RL	21	RL	14	140	N
Ring Indicator	DCE	CD	22	-	-	-	-	125	J
Transmit Signal Element Timing	DTE	DA	24	DA	24 / 11	TT	17 / 35	113	U / W
Test Mode	DCE	RM	25	TM	25	TM	18	142	NN

Appendix B. Freeway 3100 LED Panel

The front panel of the Freeway 3100, shown in Figure B-1, includes several LEDs to indicate the status of various system functions such as the power status and hard disk drive activity. These LEDs are described in this appendix.

Figure B-1. Freeway 3100 Front Panel
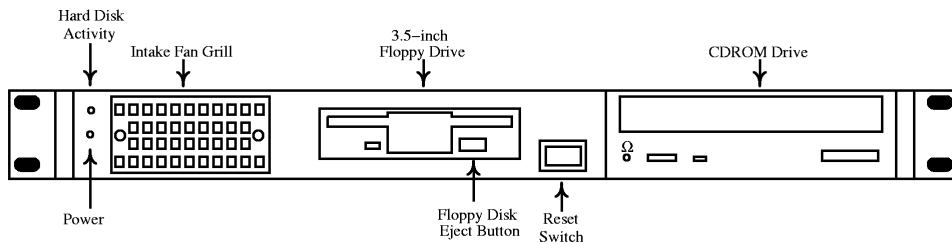
Power LED

    This LED shows whether the system is powered-on. This LED will not be lit unless the power supply switch on the back of the case is switched on, and the system has not been powered-off with the momentary power switch on the front panel.

Hard Disk (HD) LED

    This LED shows the status of the primary hard drive. The LED lights whenever the drive is accessed for read or write activity. An unlit LED indicates no activity.

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Customer Report Form

Customer Report Form

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Problem or Suggestion:

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Thank you.