DataFire *GO!* ST/V.34 and U/V.34

User's Guide

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Contents

About This Guide

Purpose

This guide provides the following:

- An introduction to the DataFire *GO!*, which describes features, the contents of the DataFire *GO!* package, requirements for operating the product, and tips to North American customers on ordering ISDN service
- Installation procedures for users of Windows 95, Windows NT, Windows 3.1*x*, and Macintosh
- Configuration information
- Information on using the product
- Information on AT commands, S registers, and result codes
- Information on upgrading the PC card
- Troubleshooting and support information

Audience

This manual is addressed to administrators who are familiar with their operating system's administration and networking procedures.

Scope

This manual provides step-by-step instructions for installing the *DataFire GO!* adapter and installing and configuring driver software.

chapter **1**

Introduction

In This Chapter

This chapter introduces the DataFire *GO!* Series PC adapters. The following topics are discussed:

Product Description

General Description

The DataFire *GO!* Series PC Card is a high performance ISDN terminal adapter and V.34 data/fax modem combination. This arrangement gives your portable office maximum freedom and versatility in data communication. From a single PC card inserted into your computer's PCMCIA socket, you can communicate

- Terminal adapter-to-terminal adapter over an ISDN line
- Modem-to-modem and fax-to-fax over an ISDN line
- Modem-to-modem and fax-to-fax over a standard telephone line

Key Features

The following are DataFire *GO!* key features:

- ISDN U and S/T interface models
- Integral ISDN terminal adapter with B channel data rates to 64 Kbps.
- Support for many ISDN switch types
- ISDN protocols: V.110, V.120, Rate Adaption Protocol, Async-to-Sync PPP, and PPP Multilink (Windows 95 only)
- User selectable V.34 data/fax modem call capability over an ISDN B-channel or analog phone line
- Auto detect of incoming ISDN CSD (circuit switched data) or V.34 calls over the ISDN line
- Integral, high-speed COM port (16550 UART)
- 300 bps to 230.4 kbps asynchronous DTE interface speed
- Hayes-compatible AT command set
- Flash EEPROM for firmware upgrades

Package Contents

Contents

Your package should include the following:

- DataFire *GO!* Series PC card
- Analog line interface
- ISDN line interface
- Telephone cable
- Termination plug and ferrite bead (S/T) model only
- Software and documentation

If Anything Is Missing

If any of these items are missing or damaged, contact your vendor first for replacement. If your vendor cannot help you, then contact Digi Technical Support. Procedures are discussed in the *Customer Information Packet.*

Requirements

General Requirements

The following are general requirements to operate the DataFire *GO!*

- Any personal computer (PC or compatible, Macintosh or Power PC, including laptops, notebooks, and portables) with an available 5 volt PCMCIA port that supports Type II PCMCIA cards (PCMCIA specification 2.1). The PC Card power requirements are 285 mA, 1.4 W.
- Basic Rate Interface (BRI) for the ISDN line
- Analog telephone line for V.34 modem data/fax calls when an ISDN line is not available.
- Data communication software installed in your computer. It must include fax software in order to use the modem's fax capability.

MLPPP Requirements

To use Multi-Link Point-to-Point Protocol (MLPPP), the DataFire *GO!* adapter must be installed on a Windows 95 system.

Ordering ISDN Service in North America

Introduction

This section provides some information on ordering ISDN service in North America, which can sometimes be confusing.

Ordering Tips

Here are some tips for ordering ISDN service in North America:

If your telephone company supports ISDN ordering codes

ISDN ordering codes are packages of ISDN line configuration features that make it easier for you to order appropriate service. If your telephone company supports these codes, order one of the following:

- EZ-ISDN-1, which supports both voice and data on two channels, plus supplementary features such as caller ID, flexible calling, call forwarding, 3-way-calling, and so forth. Your equipment may not support all of the features this line provides.
- Capability S, which supports both voice and data on two channels, and caller ID

If your telephone company does <u>not</u> supports ISDN ordering codes

If your telephone company does not support either of these ordering codes, then request the following configuration:

- Switch type: National ISDN-1 (preferred), AT&T 5ESS, or Northern Telecom DMS 100
- D channel for signaling only (no D channel packet data)
- Circuit switched data and voice (CSD/CSV) on each B channel
- Enable outgoing and incoming calls on each B channel
- Dynamic TEI
- Multipoint bus configuration
- Terminal type A (AT&T Custom switch only)
- No EKTS or other special services or features
- Calling Line ID (optional)
- RJ11 jack (preferred)

ISDN Information To Gather

Introduction

This section describes the ISDN information you need to gather from your telephone company in order to configure the DataFire *GO!*.

Information to Gather

To configure your DataFire adapter, you will need the following information from your telephone company:

- The ISDN switch type the telephone company uses
- The SPIDs (U.S. only) and directory numbers assigned to your connections

c h a p t e r **2**

Installing the PC Card

In This Chapter

This chapter includes installation procedures. Topics covered include the following:

Installation Procedures for Windows 95 Systems

Introduction

This section describes the steps to complete for successful installation:

- Enable PC Card (PCMCIA) Services
- Install Dial-Up Networking
- Insert the DataFire *GO! Series* PC Card
- Identify the Windows 95 version installed on your PC
- Install Microsoft Accelerator Pack Version 1.1 and Digi DataFire *GO!* Series Wizard
- Use the Wizard to configure the PC card.

Enable PC Card (PCMCIA) Services

Introduction

This section describes how to enable PCMCIA services.

Procedure

To enable PCMCIA services do the following:

1. Open **Control Panel** and double-click the **PC Card (PCMCIA)** icon.
2. If a dialog window appears with tabs indicating **Socket Status** and **Global Settings**, then PC Card (PCMCIA) services have already been enabled.
3. Otherwise, follow the instructions on your screen to enable PC Card (PCMCIA) services.

Install Dial-Up Networking

Introduction This section describes how to install Microsoft Dial-up Networking.

Procedure To install Dial-up Networking, do the following:

1. Double-click **My Computer**.
2. Do one of the following:
   - If there is a Dial-Up Networking folder, then Dial-Up Networking is already installed. Go to the procedure *Identifying the Window 95 Version* on page 2-3.
   - Otherwise, complete this procedure.
3. Open **Control Panel**, double-click **Add/Remove Programs**.
4. Click the **Windows Setup** tab, click **Communications**, then click **Details**.
5. Click the **Dial-Up Networking** check box, then click **OK**.
6. Click **OK** again, and follow the instructions on your screen.

Identifying the Window 95 Version

Introduction This section describes how to identify the version of Windows 95 that you are using. The installation procedures differ slightly, depending on the version of Windows 95 installed.

Procedure

1. Click on the **My Computer** icon (located on the desktop) with the right mouse button.
2. Select **Properties**.
3. The **General** page indicates the Windows 95 version. Note the version number so that you can follow the correct installation procedure.

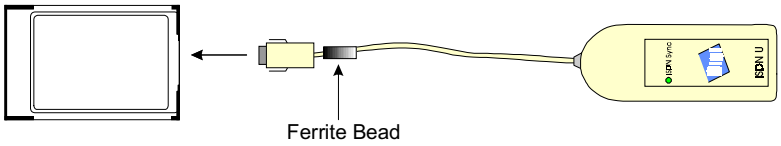
Inserting the PC Card

Introduction

This section describes how to physically install the DataFire *GO!* adapter.

Procedure

1. Connect the ISDN U or S/T line interface to the PC Card 15 pin connector as shown.



Note: The ferrite bead must be in place for S/T models only.

2. Make sure the top of the card (with the Digi logo) is UP; then insert the 68 pin connector end of the PC Card into the empty PCMCIA socket. The 68 pin connector is keyed and will not connect if inserted upside down.

Install Accelerator Pack Version 1.1 and Digi DataFire *GO!* Wizard

Windows 95 Versions 4.00.950 or 4.00.950A

1. Turn the PC on.

   Windows 95 will identify the new hardware and prompt you for a disk.

2. Make sure **Driver from disk provided by hardware manufacturer** is selected, then click **OK**.

3. Insert **Windows 95 Digi DataFire *GO!* Series Wizard Disk 1 of 2** into your floppy drive. This disk contains the files required to configure Windows 95 to operate with the PC Card.

4. Select **a:** from the drop-down menu, then click **OK**.

5. When prompted, insert **Windows 95 Digi DataFire *GO!* Series Wizard Disk 2 of 2** and click **OK**.

6. Windows 95 will finish copying files, and then will create a driver information database.

7. One of the following **New Hardware Found** windows will appear, depending on the driver you selected:

   - **Digi DataFire *GO!* Series ST ISDN V.34 (Modem)**
   - **Digi DataFire *GO!* Series U ISDN V.34 (Modem)**

8. Another **New Hardware Found** window will appear: **Digi DataFire *GO!* Series ISDN V.34 (CXP)**.

9. A third **New Hardware Found** window will appear: **Digi DataFire *GO!* Series ISDN V.34 (Net)**.

10. The installation software will now automatically run the **Windows 95 Digi DataFire *GO!* Series Wizard**.

11. Ensure that all configured devices show up in the **Windows 95 Digi DataFire *GO!* Series Wizard**. If they do not, see *Troubleshooting Windows 95 Installation* on page 8-2.

12. Go to *Use the Wizard to Configure the PC Card* described on page 2-8.

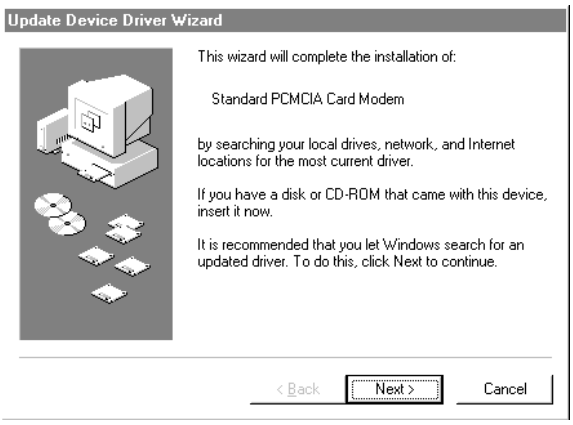
If You Are Running Windows 95 Version 4.00.950B (OSR2)

1. Turn the PC on.

   Windows 95 will display a window indicating that it is **Building driver information database**; a **New Hardware Found** window will also appear.

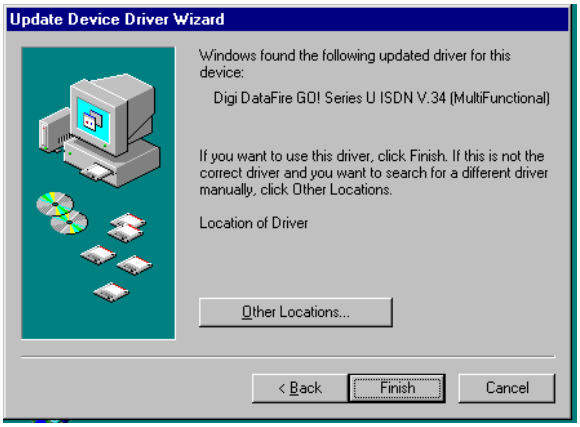
2. Insert **Windows 95 Digi DataFire *GO!* Series Wizard Disk 1 of 2** into your floppy drive. This disk contains the files required to configure Windows 95 to operate with the PC Card.

   An **Update Device Driver Wizard** will indicate that it has found a **Standard PCMCIA Modem**.



3. Click **Next**.

   Windows 95 will search the a:\ drive for the correct INF file, then the Update Device Driver Wizard will indicate that it has found **Digi DataFire *GO!* Series ISDN V.34 (MultiFunctional)**.



4. Click **Finish**.

   Windows 95 will begin looking for files and will prompt you to insert a disk.

5. Click **OK**.

6. Select **a:** from the drop-down menu, and click **OK**.

   Windows 95 will copy files from Disk 1 to your hard drive.

7. When prompted, insert **Windows 95 Digi DataFire *GO!* Series Wizard Disk 2 of 2** and click **OK**.

   Windows 95 will finish copying files, and then will build a driver information database.

   - A **New Hardware Found** window will appear: **Digi DataFire *GO!* ISDN V.34 (Modem)**.
   - Another **New Hardware Found** window will appear: **Digi DataFire *GO!* Series ISDN V.34 (CXP**).
   - A third **New Hardware Found** window will appear: **Digi DataFire *GO!* Series ISDN V.34 (Net**).
   - The installation software will now automatically run the **Windows 95 Digi DataFire *GO!* Series Wizard**.

Use the Wizard to Configure the PC Card

Note: If your ISDN line is already installed and you have the configuration information provided by your telephone company, you may go ahead and follow the instructions to configure the PC Card. Otherwise, click **Cancel**.

Procedure

1. Enter a profile name in the first window. (Your location is a good choice—home, office, and so forth.) Click **Next**.
2. Select your **Switch Type**. Click **Next**.
3. Enter the required telephone number or numbers provided by your telephone company.

   Note: North American users: The SPIDs will be entered automatically when you enter telephone numbers. If you have a second telephone number to enter, click the **Logical Terminal 2** box, then enter the number. Verify that the SPIDs entered in the Wizard are the same as those supplied by your telephone company. If different, enter the correct ones. Click **Finish**.

   The Wizard displays the following window:
   New Configuration Has Been Applied
4. Click **OK**.
5. If you are prompted for a Windows 95 disk after the Wizard closes, Click **OK**. ***Do not insert a Windows 95 floppy disk or CD-ROM***.
6. If you are prompted for any of the following files, click **Skip File.** If you are prompted for another Windows 95 disk, click **OK**, but do not insert a disk:
   - secur32.dll
   - svrapi.dll
   - ndis.vxd
   - ndis2sup.vxd
   - ndishlp.sys
   - protman.dos

- protman.exe
- vnetbios.vxd

7. Restart Windows 95.
8. Windows 95 PC Card installation is complete. Go to *Connecting the PC Card* on page 3-1 to connect the PC card to an analog or ISDN line.

Installation Procedure for Windows NT 4.0

Procedure

1. Insert the PC Card into an empty PCMCIA socket. Make sure the top of the card (with the Digi logo) is UP; then insert the 68 pin connector end of the PC Card into the socket. The 68 pin connector is keyed and will not connect if inserted upside down.
2. Boot your PC.
3. Open **Control Panel**, double-click **Modems**, click **Add**.

   The **Install New Modem** window will appear.
4. Select **Don't detect my modem; I will select it from a list**. Click **Next**.
5. Select **Have Disk**.

   The **Install From Disk** screen will appear.
6. Insert the **Windows NT 4.0 Digi DataFire *GO!* Series Wizard** disk and click **OK**.

   Windows NT will load the INF file and install the PC Card as **Digi International DataFire *GO!* Series ISDN V.34**.
7. Click **Next**.
8. Select the COM Port you want to apply the PC Card to.
9. Click **Next**.
10. Click **Finish**.

    The Modem Properties screen will appear.
11. Click **Close**.
12. Go to *Connecting the PC Card* on page 3-1.

Installation Procedure for Windows 3.1x and Macintosh

Procedure

1. Insert the PC Card into an empty PCMCIA socket. Make sure the top of the card (with the Digi logo) is UP; then insert the 68 pin connector end of the PC Card into the socket. The 68 pin connector is keyed and will not connect if inserted upside down.
2. Go to *Connecting the PC Card* on page 3-1.

chapter **3**

Connecting the PC Card

In This Chapter

This chapter discusses how to connect your PC card to the ISDN or analog line.

Connection Procedure

Note: Your DataFire *GO!* Series PC Card is shipped with two line Interfaces: V.34 analog and ISDN**.** Be sure to use the correct interface.

Note: Before you connect the PC card and ISDN line interface to your ISDN line, you must configure the PC Card for ISDN. These instructions are in the following chapter.

1. The 15 pin I/O connector is keyed with the pins on bottom; it will not insert upside down. Orient the connector appropriately, then insert it into the 15 pin I/O receptacle in the PC card.
2. If you are using the ISDN line interface, connect one end of the telephone cable to the ISDN wall jack.

   Connect the telephone cable to the ISDN line interface only *after* you have configured the terminal adapter. Once you have configured the PC Card for ISDN, you will not need to do so again unless you change ISDN lines or change your existing ISDN line configuration.
3. If you are using the analog line interface, connect the RJ11 telephone cable to the RJ11 jack. Connect the other end of the telephone cable to the analog wall jack.

Note: Do not connect the telephone cable to the ISDN Line Interface until the PC Card has been configured for ISDN. This restriction does not apply to the V.34 Analog Line InterfaceV.34 Line

Note: For DataFire U cards, do NOT connect an NT1 device to the PC Card, interface, or telephone line. The PC Card has a built-in NT1 device; connecting an additional NT1 device can damage the PC Card.

chapter **4**

Configuring the PC Card

In This Chapter

You must configure the PC Card to match your ISDN line configuration. You can use the Digi DataFire *GO!* Series Wizard, a configuration wizard that simplifies configuration (recommended), or you can use AT commands and the terminal window of your data communication software. Instructions for each method are included in this section.

If your computer is a Macintosh, you must use AT commands to configure the PC Card.

This chapter discusses the following topics:

Windows 95 Wizard

Introduction

This section describes how to use the Windows 95 Configuration Wizard.

Using the Wizard

Using the Wizard, you can:

- Modify an existing configuration
- Create a new configuration
- Remove an old configuration
- View diagnostic information

Modifying an Existing Configuration

1. Run the Wizard. You can access the Wizard via the **Start Menu**, under **Programs / DataFire / Digi DataFire *GO!* Series Wizard**. The application file itself (**`cfgwiz32.exe`**) is located in your Windows 95 system folder.

2. Change or modify your switch type and telephone number(s), as required.
3. Click **Apply Now**.

   The Wizard will display the following window: **New Configuration Has Been Applied**.
4. Click **OK**.

Creating a New Configuration

1. Make sure you have the configuration information from your service provider at hand.
2. Run the Wizard. You can access the Wizard via the **Start Menu**, under **Programs / DataFire / Digi DataFire *GO!* Series Wizard**. The application file itself (**`cfgwiz32.exe`**) is located in your Windows system folder.
3. Click **New**.

   The New Location Wizard will run.

4. Enter a profile name in the first window (Your location is a good choice—home, office, and so forth.) and then click **Next**.
5. Select your **Switch Type** and then click **Next**.
6. Enter the required telephone number or numbers provided by your telephone company. If you have a second telephone number to enter, click the **Logical Terminal 2** box, then enter the number. Click **Finish**.
7. To activate the current settings, make sure the check box is checked, then click **Finish**. To save the settings without changing the current settings, un-check the check box, then click **Finish**.
8. If you have chosen to apply the new settings, the Wizard will display the following window:

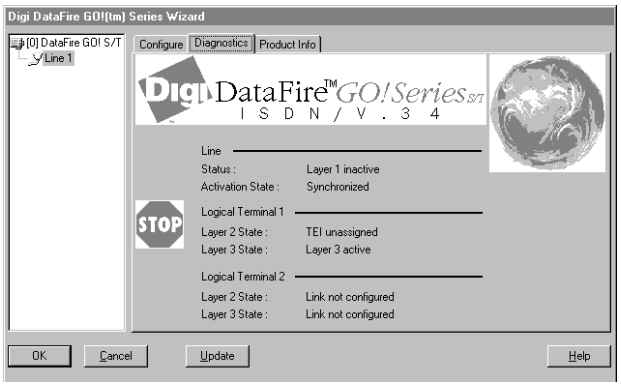
   New Configuration Has Been Applied.
9. Click **OK**.

Removing a Profile

1. Select the profile you wish to remove.
2. Click **Remove**.

Diagnostics: General

The Diagnostics tab provides useful ISDN troubleshooting information. Use the **Update** button to refresh the information.



Line Status Indicator

A Line Status Indicator is located at the bottom of the **Configure** tab and at the left center of the **Diagnostics** tab. It shows the current ISDN line condition:

Go!
Communications are normal and the PC Card is ready to place and receive calls.

Yield
If the Yield indicator remains ON longer than 30 seconds, the PC Card may not be configured properly. Verify your switch type and SPID settings under the Configure tab. Re-enter them if they are incorrect.

Stop
The PC Card has a problem communicating with the ISDN line. Recheck your connections. There may be a bad phone cable, the phone cable may not be connected to your ISDN line or connected at all, or you may have the connected the analog line interface instead of the ISDN line interface.

?
ISDN line status is not available because communication cannot be established between the adapter and driver.

Line Status Diagnostic Information

The Diagnostics tab also provides detailed information on ISDN Line Status:

Layer 1 inactive:
The PC card has a problem communicating with the ISDN line. Re-check your connections. There may be a bad phone cable, or the cable may not be connected to your ISDN line.

Layer 1 active:
A physical connection is established and communications are normal.

Layer 2 active for all configured links:
The switches are communicating, the data interface layer is loaded and running normally.

Layer 3 active for all configured links:
The PC Card is ready to place and receive calls.

Windows NT 4.0 Wizard

Introduction

This section describes how to use the Windows NT 4.0 Wizard.

Procedure

1. Make sure you have installed the PC Card.
2. Make sure you have the configuration information from your service provider at hand (switch type, SPIDs, and ISDN telephone numbers).
3. Insert the PC Card into your PCMCIA socket and connect the ISDN interface. Do not connect the ISDN line yet.
4. Insert the **Windows NT 4.0 Digi DataFire *GO!* Series Wizard** disk into your floppy disk drive.
5. Run **`Setup.exe`** to install the ISDN configuration application to your hard drive.
6. Follow the instructions as they appear on your screen. Once the application is installed to your hard drive, the wizard will run and let you configure the PC Card or you may click **Cancel** and configure the PC Card later.

   The driver is installed.

   Note: Now you can connect the ISDN telephone line to the Interface. The LED on the interface should turn red, then yellow, then solid green. When the LED turns solid green, the PC Card is ready to place and receive ISDN or modem calls over the ISDN line.

Location Profile

When you enter a profile name (your location is a good choice—home, office, and so on), your ISDN configuration information (Switch Type, SPID(s), and DN(s)) is saved under this name. This allows you to save and restore the different ISDN configurations necessary if you make ISDN connections from different locations. To open an existing configuration, simply enter the profile name in the **I am dialing from** window.

Note: If you use AT command instead of the Wizard to configure the card, the Write Profile to Memory AT command (&Wn) does not save switch type, SPID, or DN.

PC Wizard and Windows 3.1x

Introduction

This section describes how to use the Windows 3.1 PC Wizard.

Procedure

1. Make sure you have installed the PC Card.
2. Make sure you have the configuration information from your service provider at hand (switch type, SPIDs, and ISDN telephone numbers).
3. Insert the PC Card into your PCMCIA socket and connect the ISDN interface. Do not connect the ISDN line yet.
4. Insert the **Windows 3.1x PC Wizard Installation Utility** disk into your floppy disk drive.
5. Run **`Install.exe`** to install PC Wizard.
6. Follow the instructions as they appear on your screen. Once the application is installed to your hard drive, PC Wizard will run and let you configure the PC Card.

   The installation process installs the application file to the directory **`C:\Pcwizard\bin\Pcwizard.exe`** You may want to create an icon for this file for access later.

   Note: Now you can connect the ISDN telephone line to the Interface. The LED on the interface should turn red, then yellow, then solid green. As long as the LED turns solid green, the PC Card is ready to place and receive ISDN or modem calls over the ISDN line.

Location Profile

When you enter a profile name (your location is a good choice—home, office, and so on), your ISDN configuration information (Switch Type, SPID(s), and DN(s)) is saved under this name. This allows you to save and restore the different ISDN configurations necessary if you make ISDN connections from different locations. To open an existing configuration, simply use the **Location** drop-down menu.

Note: If you use AT command instead of the Wizard to configure the card, the Write Profile to Memory AT command (&Wn) does not save switch type, SPID, or DN.

Using AT Commands to Configure the PC Card

Introduction

You can also configure the PC Card by entering the appropriate AT commands in the terminal window of your data communication software.

If your computer is a Macintosh, you must use AT commands to configure the PC Card. Ignore this section if you used one of the configuration Wizards to configure the PC Card.

Procedure

1. Make sure you have installed the DataFire *GO!* Series PC Card.
2. Make sure you have the configuration information from your service provider at hand.
3. If you have not already installed your data communication software, install it now according to the instructions in its documentation.
4. Run your data communication software and go to the modem setup or modem settings window.
5. Replace the initialization string with **`AT&F.`**
6. Set the baud rate (serial port rate) to **`115.2 kbps`**.
7. Set flow control to **`RTS/CTS`** or **`Hardware`** (hardware flow control).
8. Make sure the COM port and IRQ settings are the same as those the modem is set to. If you are unsure, refer to System Properties in Windows 95 (double click the System icon) or refer to Microsoft Diagnostics in Windows 3.x (type **`msd`** at the **`c:`** prompt). Refer to your communication software documentation if necessary.
9. Now go to the terminal screen terminal screen (terminal mode) in your data communication software.
10. Enter **`AT`**
    - If you receive the **`OK`** response, go on.
    - If nothing happens, re-check your connections, make sure your computer is ON, make sure you have the correct COM port selected, then enter the command again. If nothing happens now, go to *Troubleshooting and Support* on page 8-1.
11. To configure the switch type enter one of the following:
    - Enter **`AT!C0=0`** if you are using AT&T 5ESS.
    - Enter **`AT!C0=1`** if you are using Northern Telecom DMS 100.
    - Enter **`AT!C0=32`** if you are using National ISDN (default)
    - Enter **`AT!CO=4`** if you are using Euro ISDN (ETSI)

12. To configure SPIDs, enter `AT!C2="n"` where *n* equals the SPID 1 number provided by your telephone company.

13. To configure DN**,** enter `AT!N1="n"` where *n* equals the DN 1 number provided by your telephone company.

14. To configure SPID**,** enter `AT!C6="n"` where *n* equals the SPID 2 number provided by your telephone company.

15. To configure DN**,** enter `AT!N2="n"` where *n* equals the DN 2 number provided by your telephone company.

16. Enter **`AT%Z1`** to restart the terminal adapter and load the line configuration.

Note: Now you can connect the ISDN telephone line to the Interface. The interface LED should turn red, then yellow, then solid green. The LED may go so quickly from red to green that you might not see the yellow LED. As long as the LED turns solid green, the PC Card is ready to place and receive ISDN or modem calls over the ISDN line.

chapter **5**

Using the PC Card

In This Chapter

This chapter discusses the following topics:

Using Windows 95 Dial-Up Networking

Before Creating a Dial-Up Networking Connection

Before you create a new dial-up networking connection, you will need to contact your network system administrator or ISP, as appropriate, for the correct configuration options to be selected under **Server Types** and **Scripting**, as these options are application-specific. When you have this information at hand, you can create a dial-up networking connection.

Procedure

1. Click **My Computer**, then click **Dial-Up Networking** to open the Dial-Up Networking folder.
2. Click the **Make New Connection** icon or select **Connections** and **Make New Connection** from the menu bar.
3. Enter a name for the connection or use the default (My Connection).
4. Under **Select a Modem**, select the appropriate PC Card interface for your application. The three devices and their uses are:
   - **DATAFIRE GO LINE 0** - used to make single B channel ISDN calls at 64 kbps or 56 kbps, using PPP. Also used to make the first of two B channel calls when using Multi-Link Point-to-Point Protocol (MLPPP). Select this device if your connection requires PPP or MLPPP. The device you are calling must support synchronous PPP.
   - **DATAFIRE *GO* LINE 1 -** used to establish a second ISDN B channel for MLPPP. This interface is used only with the DATAFIRE *GO* - LINE 0 interface and is configured elsewhere. Do NOT select this interface as the primary dial interface!
   - **DIGI DATAFIRE *GO!* ISDN V.34 (MODEM)** - used to make ISDN V.120, V.110, or V.34 modem-over-ISDN calls. Also used for V.34 modem calls when using the PC Card on an analog line.
5. Click **Next** to enter the telephone number you are going to call, and then **Finish** to complete the New Connection.

   Windows 95 will add a **New Connection** icon to the Dial-Up Networking folder. However, additional configuration is required before you can place the call. This configuration is dependent on the ISDN protocol and dial services used.
6. Highlight the **New Connection** icon and select **File**, **Properties** from the menu bar.
7. The configuration options found under the **Server Types** and **Scripting** tabs are application-specific. If you have not already done so, contact your network system administrator or ISP, as appropriate, for instructions on how you should set these options. Using this information, configure **Server Types** and **Scripting**.

8. To complete your connection configuration, select the appropriate protocol setting and configure it as described below:

   56 KBPS OR 64 KBPS PPP OVER ISDN - Used when connecting one B channel to a host network supporting synchronous PPP.

   - Set **Primary Device** as **`DATAFIRE-GO-LINE 0`**
   - Click **Configure** and set **Speed Preference** to **`64K Data`**, **`56k Data`**, or **`56K Voice`**. 64k Data is the most common speed. Select 56k Data if your service provider does not support 64k connections. Select 56k Voice to make 56k data calls using Voice Bearer capability.
   - You can use the **Only Connect at this Speed** option box *only* if you have selected 64k Data or 56k Data. If you leave this box unchecked (default–recommended), and you have selected 64k Data, calls will be attempted first at 64 kbps, then, if the call fails at this speed, a call attempt is made at 56 kbps. If this fails, a call attempt is made at 56k Voice. If you have selected 56k Data and leave the box unchecked, calls are attempted first at 56k Data, then, if the call fails, at 56k Voice. Calls are not re-attempted due to normal network disconnects or busy indications. If you check the box, calls are attempted only at 64k Data or 56k Data, according to your Speed Preference. This option does not apply to 56K Voice option settings.

   112K OR 128K MLPPP OVER ISDN - used when connecting two B channels to a host network supporting multi-channel synchronous PPP. If you are going to use Multi-Link PPP, select this protocol setting

   - Set **Primary Device** as **`DATAFIRE-GO x-LINE 0`**
   - Click **Configure** and set **Speed Preference** to **`64K Data`**, **`56k Data`**, or **`56K Voice`**. 64k Data is the most common speed. Select 56k Data if your service provider does not support 64k connections. Select 56k Voice to make 56k data calls using Voice Bearer capability.
   - You can use the **Only Connect at this Speed** option box only if you have selected 64k Data or 56k Data. If you leave this box unchecked (default–recommended), and you have selected 64k Data, calls will be attempted first at 64 kbps, then, if the call fails at this speed, a call attempt is made at 56 kbps. If this fails, a call attempt is made at 56k Voice. If you have selected 56k Data and leave the box unchecked, calls are attempted first at 56k Data, then, if the call fails, at 56k Voice. Calls are not re-attempted due to normal network disconnects or busy indications. If you check the box, calls are attempted only at 64k Data or 56k Data, according to your Speed Preference. This option does not apply to 56K Voice option settings.

9. Click **Settings** under **Set Additional Devices**.

10. Click **Use Additional Devices**, then click **Add**.

11. Select **DATAFIRE-GO *x*-LINE 1** as the device and enter the phone number for the second channel to dial. This number will likely be the same number configured in the new connection profile.

    56K OR 64K V.120 OVER ISDN - Used when connecting one B channel to a host network requiring V.120 error correction protocol. This is a common B channel protocol found in most ISDN terminal adapters and in other switched digital devices. V.120 is transparent to user data and can be used to transmit async PPP and other data protocols over ISDN.

    - Set **Primary Device** as **DIGI DATAFIRE *GO!* ISDN V.34 (MODEM)**
    - Click **Configure**, **Connection**, and **Advanced**.
    - The **Extra Settings** field requires commands to set the PC Card to 56k or 64k V.120:
    - For 56k V.120 enter **%A2=2%A4=1**
    - For 64k V.120 enter **%A2=2%A4=0**

    All other options in **Modem Properties** are application-specific.

    - **V.34 MODEM-OVER-ISDN** - Used when connecting from your ISDN line to a host network having only analog modem service.
    - Uncheck the **Use Country Code and Area Code** option. If you are dialing long distance, you must enter the complete phone number in the phone number field.
    - Insert the dial modifier character **M** at the beginning of the phone number.
    - Set Primary Device as **DIGI DATAFIRE *GO!* ISDN V.34 (MODEM)**

    No modem configuration is necessary unless required by your application.

    - **V.34 MODEM-OVER-ANALOG** - Used when connecting from your analog line to a host network having V.34 analog or digital service.
    - Set Primary Device as **DIGI DATAFIRE *GO!* ISDN V.34 (MODEM)**

    No modem configuration is necessary unless required by your application.

Placing a Dial-Up Networking Call

Procedure

1. Make sure your PC Card is setup for ISDN or analog (modem), as required—make sure the appropriate interface is connected to the appropriate wall jack.
2. Make sure your application is configured to connect via Windows 95 Dial-Up Networking.
3. Run your application.

Using the AT Command Interface

Introduction

This section applies to

- Windows 95 if or when you are NOT using Dial-Up Networking for Internet access or remote LAN access
- All other operating systems (Windows NT, Windows 3.1x, Macintosh).

PC Card operation over an analog line or over an ISDN line is straightforward and identical to the user–your data communications software simply sends the required commands via the AT command interface. Only rarely will you need to enter AT commands yourself. Refer to your software documentation for instructions on how to operate it. Before you use your software with the DataFire *GO!* Series PC Card, you will need to enter some information and confirm or change a few settings.

This section discusses the following:

- Software Setup (Step 1)
- Placing and Receiving Calls Over ISDN **(Step 2)**
- Protocol and Line Speed Settings
- Changing Option Setting
- Saving a Configuration

Step 1: software setup

1. Make sure you have your DataFire *GO!* Series PC Card set up for analog (modem) or ISDN use (appropriate interface connected to the appropriate wall jack).

Note: You do not need to remove the PC Card from the PCMCIA socket in order to change interfaces. The PC Card can be "hotswitched"—you can change interfaces while the PC Card is in the socket. To remove the interface, squeeze the release tabs on the I/O connector and pull gently.

2. If you have not already installed your data communication software, install it now according to the instructions in its documentation.

3. Run your data communication software and go to the modem setup or modem settings window. If you have more than one software program that you are going to use—for example, if you have one program for an online service and another for routine data and fax communications–make sure you configure each according to these instructions.

4. Find the Initialization String in the setup or settings window. Delete the string located there and enter **AT&F** in its place. This command will load the following factory defaults:
   - **%A2=5**
     Uses Point-to-Point Protocol (ISDN only)
   - **%A4=0**
     Line speed = 64 kbps (ISDN only)
   - **N1**
     modem connects at highest speed supported by both modems
   - **\N7**
     Auto reliable V42/MNP data compression (data is compressed)
   - **E1**
     Echo ON (commands displayed in terminal window)
   - **Q0**
     Result codes enabled (connection results displayed)
   - **V1**
     Verbose responses (connection results displayed as words)
   - **&C1**
     DCD normal
   - **&D2**
     DTR disconnect
   - **&K3**
     Hardware (RTS/CTS) flow control
   - **S0=1**
     Auto-answer ON (answers calls automatically)

Notes: These default settings should be sufficient for most applications.

If your application requires other specific settings (such as a different protocol or line speed), refer to the ISDN Options section in this manual. If your application uses the different settings routinely, then add the required commands after **AT&F**. Otherwise, enter them separately as needed in your terminal window.

The AT&F init string works for both analog and ISDN calls. Adding additional ISDN commands to the init string will not affect performance over an analog line.

5. Set the baud rate (serial port rate or DTE speed) to **115.2 kbps**.
6. Set flow control to **RTS/CTS** or **hardware**.

7. Make sure the COM port and IRQ settings are the same as those the modem is set to. If you are unsure, refer to **System Properties** in Windows 95 (double click the System icon, click on the device manager tab, then double-click the DataFire icon) or refer to Microsoft Diagnostics in Windows 3.x (type **`msd`** at the **`c:`** prompt). Refer to your data communication software documentation if necessary.

Step 2: Place and Receive Calls

After you have configured the PC Card and your data communication software, all you need to do is simply follow the instructions in your data communication software documentation to place and receive calls or send and receive faxes.

Analog (Modem) Calls Over an Analog Line

If you are connected to an analog line, make sure the interface LED is red, then place your calls as required. The LED will turn green when the call is connected.

ISDN Calls Over an ISDN Line

If you are connected to an ISDN line, make sure the interface LED is green, then place your calls as required.

Note: For the S/T adapter, connect the terminating plug between the ISDN wall jack and the telephone cable (recommended) or between the telephone cable and the ISDN S/T interface.

Analog (Modem) Calls Over an ISDN Line

There are two methods by which you can place and receive analog data or fax calls over the ISDN line. If you need to place and receive both analog and ISDN calls, you need only to use the `M` dial modifier (discussed below) to place analog calls; incoming analog calls are answered automatically. This is the default configuration.

If you want to place and receive analog (modem) calls only, you can configure the PC Card to place and receive analog calls only over ISDN. *In this configuration the PC Card will not send or receive ISDN calls.*

To Place an Analog Call over ISDN

Note: These instructions do not apply to fax calls; they apply only to analog data calls. Fax calls over ISDN are automatically placed as analog calls.

a. Make sure you have the DataFire *GO!* Series PC Card connected to the ISDN interface and to your ISDN line**.** In its default ISDN configuration, the PC Card will place and receive both ISDN and analog calls.

b. Run your data communication software.

c. Make sure the LED is solid green.

d. Place an **M** in front of the number you wish to call. This dial modifier will route the call to the modem instead of to the termi-

nal adapter, and then over one of the ISDN channels**.**

To configure the PC Card to send and receive only modem calls over ISDN:

Note: You cannot specify pause commands to pause dialing when making analog calls over ISDN.

With the PC Card set up for ISDN, go to the terminal window of your data communication software and enter **`AT%O1`**.

This will configure the PC Card as a modem; it will send and receive analog calls over the ISDN**,** but will not send or receive ISDN calls until you enter **`AT%O0`** When the PC Card is configured as modem-over-ISDN, you do not need to place an **M** in front of the phone number you intend to dial.

You need do nothing to receive analog calls over the ISDN line; by default, analog calls over the ISDN line are automatically routed to the modem. When receiving an analog call over ISDN, the DataFire *GO!* Series PC Card operates as an analog modem.

Protocol and Line Speed Settings (ISDN)

The DataFire *GO!* Series PC Card supports a variety of ISDN options. In most cases, the factory defaults and initialization strings will take care of your needs. In some cases you may need to change your Protocol or ISDN Line Speed.

Note: These options are separate from the line configuration settings. When you make changes to the ISDN configuration, you must save and restart the terminal adapter. However, you do not need to do so for the option settings discussed in this section—they are dynamic and are implemented immediately when you press the **<Enter>** key.

ISDN Protocols

Most terminal adapters and other network ISDN equipment support multiple ISDN protocols. *The prot*ocol you use must be supported by the remote terminal adapter (the one you will be communicating with*),* and each terminal adapter–yours and the remote–must be set to the same protocol.

The following table will assist you in making your selection. In many cases, your Internet Service Provider (ISP) or network administrator will specify a protocol for you.

Protocol	Description	Data Rate	AT Command
MLPPP (Windows 95 only.)	A point-to-point protocol that uses both B channels to maintain a single link at double the data rate of a single channel connection.	128 or 112 kbps	No AT command: invoked through Dial-Up Networking
Async-to-Sync PPP (default)	Default. A protocol popular with ISPs.	64 or 56 kbps	%A2=5
V.110	Standard U.K. and European ISDN rate adaption protocol	64 or 56 kbps	%A2=1
V.120	Standard U.S. ISDN rate adaption protocol.	64 or 56 kbps	%A2=2
V.120 with Data Compression	Enables the V.120 protocol with V.42b data compression.	64 or 56 kbps	%A2=7

Using the V.110 Protocol

Whenever you use the V.110 protocol, you must also enter **ATN0**.

ISDN Line Speed

The DataFire *GO!* Series PC Card terminal adapter is set by default for **64 kbps (`AT%A4=0`)**. If your service provider or the remote terminal adapter does not support this rate, select **56 kbps (`AT%A4=1`)**. Instructions on changing the option follow.

Changing Option Settings

If you need to change your protocol or line speed, do the following:

1. Make sure your PC Card is setup for ISDN, and your data communication software is configured.
2. Go to the terminal window in your data communication software.
3. Enter the appropriate AT command or commands listed in the previous two sections. The new settings will be implemented immediately.

Saving a User Profile

The DataFire *GO!* Series PC Card can store up to four saved user profiles. Most users will probably not need them; the factory default settings and recommended initialization strings should handle most of your communication needs. Occasional changes can be entered via AT commands.

However, if you routinely use different configurations, you should use the commands discussed in this section to save the setups that vary from your basic configuration and setup. You may, for example, have several connections that each have a different line speed or protocol or require options other than those loaded by the factory profile. Instead of entering each option separately each time you change a setup or configuration, you can save and recall them.

To store a profile:

1. Make sure your DataFire *GO! Series* PC Card is installed.
2. Setup the configuration you want to save.
3. Go to the terminal window in your data communication software.
4. Enter **AT&W*n*** where ***n*** equals the number you wish to use to designate the profile (0, 1, 2, or 3 only).

To reset the PC Card and recall a profile:

1. Make sure your DataFire *GO!* Series PC Card is installed**.**
2. Go to the terminal window in your data communication software.
3. Enter **ATZ*n*,** where ***n*** equals the profile number you wish to recall (0, 1, 2, or 3 only). This resets the PC Card and loads your new user profile.

Doubling Your DTE Speed

You can double your DTE speed by entering the appropriate AT command. However, this will result in an increase in throughput only in the following instances:

- You are running V.120 with Data Compression
- Your application software has a maximum DTE Rate of 57.6 kbps or less.

  For example, if your application DTE speed is set for 115.2 kbps and you have enabled DTE Rate Doubling, your actual DTE rate will be 230.4 kbps; if your application DTE speed is set for 57.6 kbps, your actual DTE rate will be 115.2 kbps.

To enable DTE Rate Doubling:

1. Set your application DTE speed to its maximum rate, up to 115.2 kbps.
2. In your terminal window, enter **`AT~M1`**
3. To disable DTE Rate Doubling, enter **`AT~M2`**

Note: The DTE Rate Doubling AT command will increase DTE speed only to a maximum of 230.4 kbps.

chapter **6**

AT Commands, S Registers, and Result Codes

In This Chapter

This chapter discusses AT command, S registers, and result codes. Most user will rarely need to refer to this information. This chapter discusses the following topics:

Using AT Commands

Introduction

AT commands are very simple to use. There are a few rules you must follow regarding their use, but once you know these rules you will find that AT commands are the easiest way to implement certain little-used features or options. In most cases, though, the initialization strings in your data communication software are all you need.

Rules and Tips

- You must enter the commands in the terminal window of your data communication software.
- To verify that your data communication software it talking to the PC card, and in AT command mode, enter AT. You should receive the OK response. If not, your software and card are not talking. If a call is in progress, enter +++. This is the escape command. It returns your terminal to AT command mode.
- To enter an AT command, you must always type the letters **AT** in front of the command. The letters indicate **AT**TENTION: COMMAND TO FOLLOW. You must enter these letters in the same case, upper or lower. Do not enter them in a combination of upper and lower cases: **At** and **aT** will not work.
- You can enter up to 255 characters on a command line. If you enter more than 255 characters, you will receive an **ERROR** response when you press the Enter key, even if you have deleted the excess characters with the backspace key. Spaces do not count toward the 255 character limit.
- If you need to edit an AT command, use the backspace key.
- To re-execute the last command, type **A/** instead of **AT**.
- If the command is accepted and processed, you will receive the **OK** response. If it is not accepted, you will receive the **ERROR** response.
- The PC card processes commands in the sequence received and executes them immediately, with the exception of the AT! commands, which take effect only at power up or after the AT%Z1 command has been issued.
- If a data call is in progress and you need to enter AT commands, type **+++** This is the “escape to command mode” command. It returns the DataFire *GO! Series* PC Card to AT command mode so that you can enter AT commands. This will not affect the call in progress.

General AT Commands

Introduction

This section discusses commands common to both modem and terminal adapter use. If implemented while the DataFire *GO!* Series PC Card is configured as a modem, the commands will affect the V.34 modem only; if implemented while the PC Card is configured as an ISDN terminal adapter, the commands will affect the terminal adapter only. Command defaults are listed in **boldface** type.

Table 6-1: General AT Commands

Command Name	AT CMD	Description
Answer mode	A	Go off hook and attempt to handshake in answer mode. (attempt to answer an incoming call.)
Hang up	H	Disconnect a call.
Echo commands	E0	Echo off.
	E1	Echo on.
Request product status	I0	Request product code.
	I1	Request checksum calculation. Answer displayed in five hex digits.
	I2	Perform ROM checksum and compare to stored checksum
	I3	Request product and revision level.
	I9	Request product information.
	I10	Request current ISDN line configuration.
Return online	O	Return to data mode from online command mode.
Return result codes	**Q0**	Result codes returned.
	Q1	Result codes not returned.
	Q2	Result codes returned in originate mode only.
Verbose mode	V0	Numeric responses enabled.
	V1	Verbose responses enabled.
Connection results	**W0**	Carrier and protocol result codes disabled.
	W1	Carrier and protocol result codes disabled.
	W2	Negotiation result codes reported in 1-line format.

Table 6-1: General AT Commands

Result codes	X0	Result codes 0-4 enabled. No network tones monitored on analog calls.
	X1	All result codes enabled. No network tones monitored on analog calls.
	X2	All result codes enabled. Dial tone is monitored on analog calls
	X3	All result codes enabled. Busy tone is monitored on analog calls.
	X4	All result codes enabled. Dial tone and busy tone are monitored on analog calls.
Recall user configuration	Z0	Reset and recall user profile 0.
	Z1	Reset and recall user profile 1.
	Z2	Reset and recall user profile 2.
	Z3	Reset and recall user profile 3.
DTE rate doubling	~M1	Enables DTE rate doubling.
	~M2	Disables DTE rate doubling.
Display/clear fatal error	/E	Display last fatal error.
	/E=0	Clear last fatal error.
Carrier detect option	&C0	Always on.
	&C1	On during data call connection.
DTR options	&D0	DTR is ignored.
	&D1	Force unit into command mode when DTR drops. Do not drop data call.
	&D2	Hang up when DTR is dropped. Answer only when DTR is high.
	&D3	Same as &D2, plus reset the unit.
Load factory configuration	&F0	Restore all commands and S registers to factory settings except for ISDN network settings.
Flow control	&K0	Local flow control off.
	&K3	Hardware flow control (RTS/CTS)
	&K4	DTE XON/XOFF flow control. Flow control characters to and from DTE only.
	&K8	Unidirectional flow control. Flow control characters to DTE only.
	&K12	DTE/DCE XON/XOFF flow control. Flow control characters to and from DTE and DCE.

Table 6-1: General AT Commands

DSR option	**&S0**	DSR always on.
	&S1	DSR off in command mode. On when originating call and answer tone or valid carrier is detected. On when handshaking, when answering a call.
View active and stored profile	&V0	Display active profile and stored profile 0.
	&V1	Display stored profile 1.
	&V2	Display stored profile 2.
	&V3	Display stored profile 3.
	&V4	Display stored phone numbers.
Write profile to memory	&W0	Store user profile 0 in non-volatile memory.
	&W1	Store user profile 1 in non-volatile memory.
	&W2	Store user profile 2 in non-volatile memory.
	&W3	Store user profile 3 in non-volatile memory.
Recall configuration on power up.	**&Y0**	Recall user profile 0 on power up.
	&Y1	Recall user profile 1 on power up.
	&Y2	Recall user profile 2 on power up.
	&Y3	Recall user profile 3 on power up.
Stored number commands	&Z*n*=”*x*”	Store telephone number *x* (0-40 characters, 0-9, #,*) in position *n* (0-4)
	&Z*n*	Display stored telephone number *n*.
Flash upgrade	%FAPPS	Start the flash upgrade sequence. Upgrade code, except boot sector.
	%FBOOT	Start the flash upgrade sequence. Upgrade code, including boot sequence.

Modem AT Commands

Introduction

This section discusses commands specific to modem and facsimile configuration and use. These commands can be implemented when the PC Card is configured as a modem (the V.34 modem interface is attached) or when the PC Card is configured for modem-over-ISDN (the ISDN interface is attached and the`%O1` command has been entered). Command defaults are listed in **boldface** type.

Table 6-2: Modem AT Commands

Command Name	AT CMD	Description
Bell/CCITT	**B0**	Use CCITT modulation scheme.
	B1	Use Bell modulation scheme.
Dial command and modifiers	D	Dial
	S*n*	Dial stored number *n* (0-9)
	0-9, #, *	Digits accepted by the command.
	P	Subsequent numbers are pulse dialed.
	T	Subsequent numbers are tone dialed.
	R	Dial the call in answer mode.
	W	Wait for dial tone using S7 timeout.
	,	Delay by S8 time before proceeding with next digit.
	!	Go on hook for.5 seconds and then off hook for.5 seconds before continuing.
	@	Wait for five seconds in silence before continuing.
	;	Go to command mode after number is dialed. Characters after this command are treated as AT commands.
	L	Redial last number.
Speaker control	M0	Speaker always off.
	M1	Speaker on until handshake is complete.
	M2	Speaker always on.
	M3	Same as M1, except speaker is off when dialing.

Table 6-2: Modem AT Commands

Handshaking	N0	Set connection speed to value in S register S37
	N1	If S37 < > 254, handshaking is at highest speed supported by both modems. If S37=255, handshaking is at highest speed supported by both modems and DTE.
	N2	Same as N1, except V.34 is disabled.
Return online	O0	Return to data mode from online command mode.
	O1	Same as O0, except force a retrain for connections>=2400.
Long space disconnect	**Y0**	Disabled.
	Y1	Enabled.
Load factory configuration	&F0	V.42 factory defaults.
Guard tone	**&G0**	No guard tone.
	&G1	550 Hz guard tone.
	&G2	1800 Hz guard tone.
Break mode control	**&I0**	In sequence break, non-expedited, non-destructive.
	&I1	Immediate break without buffering by either modem
	&I2	Expedited/destructive break. Data buffers at both ends are cleared.
Error control fallback character	**&N0**	Disable fallback control character
	&N1	Enable fallback control character
Test commands	&T0	Terminate test
	&T1	Initiate local analog loopback
	&T3	Initiate local digital loopback
	&T4	Allow remote digital loopback
	&T5	Disallow remote digital loopback
	&T6	Online remote digital loopback
	&T7	Remote digital loopback with self test
	&T8	Local analog loopback with self test
Data compression	&U0	Data compression disabled.
	&U1	Data compression enabled.
Auto reliable fallback character	%A*n*	*n*=0-127 ASCII
Line signal level option	%L0	Return received line signal level in dB
	%L1	Return data pump's line status report

Table 6-2: Modem AT Commands

Ignore keyboard abort on answer	**%Q0**	Disabled.
	%Q1	Enabled.
Error correction maximum block size	\A0	Maximum block size for error correction is 64 characters.
	\A1	Maximum block size for error correction is 128 characters.
	\A2	Maximum block size for error correction is 192 characters.
	\A3	Maximum block size for error correction is 256 characters.
Send break	\B*n*	Send a break to remote modem *n* x 100 ms where *n*=0-9. When *n*=0, a default 300 millisecond break will be sent.
Data buffering during error-corrected link negotiation	**\C0**	Do not buffer data during error-corrected link negotiations, and do not recognize the fallback character specified by the %A command.
	\C1	Buffer all data until 128 characters are received. Do not recognize the fallback character.
	\C2	Buffer all data until 128 characters are received or until fallback character has been received.
Modem-to-modem flow control during normal connect	**\G0**	No modem-to-modem flow control.
	\G1	Use XON/XOFF modem-to-modem flow control.
Auto DTE speed adjust	**\J0**	Serial port rate is not adjusted to the connection rate.
	\J1	Serial port rate is adjusted to the connection rate.
Break handling	\K1	Expedited and destructive break.
	\K3	Immediate break without buffering.
	\K5	In sequence break.
Operational mode	\N0	Buffered or normal async mode.
	\N1	Direct mode.
	\N2	Reliable MNP
	\N3	Auto-reliable MNP
	\N4	Reliable V42
	\N5	Auto-reliable V42
	\N6	Reliable V42/MNP
	\N7	Auto-reliable V42/MNP

Table 6-2: Modem AT Commands

Identify service class	+FCLASS=?	0=PC card configured as a data modem.
		1=PC card configured as a Class 1 FAX modem
		2=PC card configured as a Class 2 FAX modem.

ISDN AT Commands

Introduction

This section discusses commands specific to ISDN configuration and use. These commands can only be implemented when the PC Card is configured for ISDN**.**

Command defaults are listed in **boldface** type.

Table 6-3: ISDN AT Commands

Command Name	AT Cmd	Description
Dial command and modifiers	D	Dial
	S*n*	Dial stored number *n* (0-9
	0-9,#,*	Digits
	P,T,W	Ignored dial modifiers
	M	Dial modem call over ISDN
Recall User Configuration	Z0	Reset and recall user profile 0
	Z1	Reset and recall user profile 1
	Z2	Reset and recall user profile 2
	Z3	Reset and recall user profile 3
Load factory configuration	&F0	Restore all commands and S registers to factory settings except for ISDN network settings.
Rate Adaption Protocol	%A2=0	No protocol, clear channel.
	%A2=2	V.120
	%A2=5	Async-to-sync PPP
	%A2=7	V.120 with data compression
Bearer CapabilitySelect	**%A4=0**	CSD calls = 64Kbp**s**
	%A4=1	CSD calls = 56Kbps
Modem-Over- ISDN	**%O0**	ISDN Data
	%O1	Modem-Over-ISDN
Global Reset	%Z1	Reset hardware and set registers back to selected power up profile.
Switch Type	!C0=0	AT&T 5ESS
	!C0=1	Northern Telecom DMS-100
	!C0=32	National ISDN
	!C0=4	Euro ISDN (ETSI)
First SPID	!C2="*n*"	SPID identifier (*n* = string of up to 20 characters)
First Directory Number	!N1="*n*"	First directory number (*n* = string of up to 20 characters; 0-9,#,*,A-D)
Second SPID	!C6="*n*"	SPID identifier (*n* = string of up to 20 characters)
Second Directory Number	!N2="*n*"	Second directory number (*n* = string of up to 20 characters; 0-9,#,*,A-D)
B1-Channel Provisioning	!C4=0	CSD (Circuit Switched Data)
	!C4=1	Voice mode
	!C4=2	CSD and Voice mode

Table 6-3: ISDN AT Commands

B2-Channel Provisioning	!C5=0	CSD (Circuit Switched Data)
	!C5=1	Voice mode
	!C5=2	CSD and Voice mode

S Registers

Introduction

The DataFire *GO!* Series PC Card supports a limited set of S registers. The S registers contain operational and configuration information.

The contents of an S register can be written by issuing the **ATS*n*=x** command where *n* = 0-8, 10-12, 18, 25, and 37.

Attempts to write invalid values to any valid S register will cause the **ERROR** message to be displayed. Attempts to write values to non-existent S registers will not have an effect on the DataFire *GO! Series* PC Card.

You can display the contents of an S register by typing **ATS*n*?** command where *n* = 0-8, 10-12, 18, 25, and 37. Command defaults are listed in **boldface** type.

Table 6-4: S Registers

Reg	Description	Operation	Values	Default	Type
0	Ring to answer on	0 = No auto answer	0-255	1	Storable
		1-255 = Number of rings before answer			
1	Ring count	Read Only	0-255	-	Non-Storable
2	Escape character	0-127 = valid escape characters.	0-255	43H (+)	Storable
		Chars > 127 disable escape char detect			
3	Carriage return	Configurable carriage return character	0-127	13H	Non-Storable
4	Line feed	Configurable line feed character	0-127	10H	Non-Storable
5	Back space	Configurable back space character	0-255	8	Non-Storable
6	Dial tone wait time	Wait Time For Dial Tone or Before Dialing. Value in seconds	2-255	2	Storable
7	Connection wait time	Wait time between end of dialing and carrier detect. Value in seconds.	0-255	30	Storable
8	Pause time for (,) dial modifier	Duration for pause (,) dial modifier	0-255 s	2	Storable
10	Delay between lost carrier and hang up	1 - 255 in.1 second increments	1-125 s	14	Storable
11	DTMF Tone Duration and Silence Time Between Tones	50 - 255 in 1 ms increments (55 - 255 ms)	50-255	95	Storable

Table 6-4: S Registers

12	Escape prompt delay	Guard time in 20 msec increments before and after receipt of valid escape char sequence. (0-5.1 s)	0-255	50	Storable
18	Test timer	Amount of time elapsed before test is terminated. Value in seconds	0-255	0	Storable
25	DTR detection	Time to detect DTR transitions in.01 s or 1 s increments.	0-255	5	Storable
37	Desired DCE speed	0=Last AT command speed		0	Storable
		1=300 (Bell 103			
		2=300 (Bell 103			
		3=300 (Bell 103			
		4=reserved			
		5=1200			
		6=2400			
		7=V.32 4800			
		8=reserved			
		9=V.32 9600 w/TCM			
		10=V.32 9600 w/o TCM			
		11=300 (V.21)			
		12=1200 (V.23)			
		13=reserved			
		14=reserved			
		15=V.32 bis 4800			
		16=V.32 bis 7200			
		17=V.32 bis 9600			
		18=V.32 bis 12000			
		19=V.32 bis 14400			
		20=V.34 2400			
		21=V.34 4800			
		22=V.34 7200			
		23=V.34 9600			
		24=V.34 12000			
		25=V.34 14400			
		26=V.34 16800			
		27=V.34 19200			
		28=V.34 21600			
		29=V.34 24000			
		30=V.34 26400			
		31=V.34 28800			
		32=V.34+ 31200			
		33=V.34+ 33600			
		34 to 254=reserved			
		255=Last AT command speed			

Result Codes

Introduction

Result codes are determined by several commands. The Qn command (Return Result Codes) determines whether result codes are returned or not. The X*n* command enables result codes and determines which network tones, if any, are monitored on analog calls. The Vn command determines whether result codes are displayed by numbers (numeric) or by descriptive words (verbose). The Wn command (Connection Results) determines whether Carrier and Protocol result codes are enabled or disabled.

By default, the PC Card returns result codes (Q0), enables all result codes and monitors dial tone and busy tone on analog calls (X4), displays result codes in verbose format (V1), and disables Carrier and Protocol result codes. For more information, review these commands in the General AT commands section.

Table 6-5: Result Codes

Numeric	Verbose
0	OK
1	CONNECT
2	RING
3	NO CARRIER
4	ERROR
5	CONNECT 1200
6	NO DIALTONE
7	BUSY
10	CONNECT 2400
11	CONNECT 4800
12	CONNECT 9600
13	CONNECT 14400
14	CONNECT 19200
15	CONNECT 38400
16	CONNECT 57600
17	CONNECT 115200
	CARRIER 300
	CARRIER 1200
	CARRIER 2400
	CARRIER 4800
	CARRIER 7200
	CARRIER 9600
	CARRIER 12000
	CARRIER 14400
	CARRIER 16800
	CARRIER 19200
	CARRIER 21600
	CARRIER 24000
	CARRIER 26400
	CARRIER 28800
	CARRIER 31200
	CARRIER 33600
	PROTOCOL: NONE
	PROTOCOL: V42
	PROTOCOL: V42BIS
	PROTOCOL: MNP REL*

Note: Carrier and protocol result messages are enabled only with the W1 command. These messages are displayed in verbose mode only.

* This PROTOCOL message will include the MNP level of the connection, e.g. PROTOCOL: MNP REL 5

T

Table 6-6: ISDN Result Codes

Numeric	Verbose
0	OK
1	CONNECT
2	RING
3	NO CARRIER
4	ERROR
5	CONNECT 1200
6	NO DIALTONE
7	BUSY
10	CONNECT 2400
11	CONNECT 4800
12	CONNECT 9600
14	CONNECT 19200
18	CONNECT 57600
20	CONNECT 115200
28	CONNECT 38400
	CARRIER 56000
	CARRIER 64000
	PROTOCOL: V120
	PROTOCOL: PPP
	PROTOCOL: V120 COMPRESSION

Note: Carrier and protocol messages are enabled with the W1 command. These messages are displayed in verbose mode only.

chapter 7

Upgrading the PC Card

Introduction

The DataFire *GO! Series* PC Card has a flash EEPROM capability that lets you easily upgrade the built-in firmware to add new features as they become available. When available, upgrades are posted on the Digi BBS, WWW page, and FTP site.

Upgrading Your PC Card

When a new firmware flash file is developed, it will be posted on the Digi WWW page and BBS. See the *Troubleshooting and Support* chapter for the web site address. Follow the procedures posted on the web page to download the firmware flash file. You can also download the file from the Digi BBS. Instructions are included in the *Customer Information Packet*.

1. Copy the firmware flash file to a separate directory on your hard disk drive.
2. If there is an accompanying **`readme.txt`** file, read it now. It will contain any changes made to the download procedures after this manual went to print, as well as details on the nature of the upgrade and instructions on unzipping the file (if zipped).
3. Run your data communication software, make sure it is set to **`115,200 bps`** baud rate, serial port speed), **`hardware`** flow control, **`8`** data bits, **`N`** parity, **`1`** stop bit, and then go to the terminal window. (Although we recommend 115,200 kbps, the download procedure will run at slower rates.)

4. Make sure the DataFire *GO! Series* PC Card is connected to your computer and that your software is ready to communicate with the PC Card. (Enter **AT** in your terminal window. If **OK** is displayed, go on to the next step.)

5. Enter **AT%FAPPS** Your terminal window will display the following:

```
AT%FAPPS Application Upgrade

FLASH PROGRAM RAM VERSION x.x

Erase and re-program flash eprom contents
(y/n)?
```

6. Type **y** to erase the existing flash EEPROM flash contents. The flash memory will be erased and the your screen will display the following:

```
*** WARNING ***
Erasing Flash Memory

Flash Eprom Upgrade Procedure

Ready for ASCII download
CTS (hardware) flow control
```

7. Use the Send Text File command in your data communication software to select and send the flash firmware file from your hard drive to the flash EEPROM chip in the DataFire *GO! Series* PC Card. *You must send the file as a text file.* This command may have a different name in some communication software packages. Consult your software documentation if in doubt. The < and > characters will be displayed in a sweeping back and forth motion as the EEPROM is upgraded. The upgrade will take 5 to 10 minutes, depending on your computer and software, and will be followed by a 20 second pause. When the update is complete, your terminal window will display the following:

```
Code update successful

OK

Now you must exit from your terminal communi-
cation program and re-enter the program again
for PCMCIA UART initialization.
```

8. Close your data communication program, then run it again. Verify the new firmware revision by entering **ATI9** in your terminal window. The new software revision and software release date will appear at the bottom of the display. Your upgraded DataFire *GO! Series* PC Card is ready to use.

chapter **8**

Troubleshooting and Support

In This Chapter

This Chapter discusses troubleshooting. It covers the following topics:

Troubleshooting Windows 95 Installation

Introduction

This section discusses the most common problems, and their solutions, you are likely to experience during installation under Windows 95.

Symptoms and Actions

Windows 95 prompts you to restart before installation is complete.

Windows 95 has detected a possible resource conflict. Restart Windows and the resource conflict will attempt to be resolved. If the conflict is resolved, Windows will complete the installation.

After the GO! card is detected and files copied from the installation source, the Modem, CXP, and Net devices are not detected and the configuration Wizard is not started.

This is a resource conflict. Do the following:

a. Open **Control Panel** and double click on the **System** icon.

b. Select the **Device Manager** tab.

c. Find the **Digi DataFire GO! Series** device under **Modem** or **Multifunction**. If there is an exclamation mark (!) or a red X through the icon, a resource conflict has been encountered.

d. Restart Windows 95. If Windows 95 resolves the conflict when you restart, then Windows 95 will detect the **Modem**, **CXP** and **Net** devices and complete the installation.

If restarting Windows 95 does not resolve the conflict, the problem may be that there are not enough free resources available for the PC Card. Follow the procedure below to free-up resources for the PC Card.

a. Make a backup copy of **`config.sys`** (found in the root directory, usually **`c:\`**) and **`system.ini`** (found in your windows directory, usually **`c:\windows`** or **`c:\win95`**).

b. Start Notepad. Open the file **`config.sys`**. If a reference to **`EMM386.SYS`** with the **`\x`** switch is in the **`config.sys`** file, it must be modified to free-up resources. The following is an example:

Original:

```
EMM386.SYS NOEMS \I=B000-BFFF \X=C000-CFFF
```

Changed Version:

```
EMM386.SYS NOEMS \I=B000-BFFF
```

c. Save **`config.sys`**.

d. Open **`system.ini`**.

If a reference to **`EMMEXCLUDE`** exists in the **`system.ini`** file, it must be modified to free-up resources. Here is an example:

```
;EMMEXCLUDE=
```

If any of the following references exist in the system.ini file, comment them out by placing a **`;`** (semi-colon) before each line:

```
;COM1AutoAssign=
;COM2AutoAssign=
;COM3AutoAssign=
;COM4AutoAssign=
;COM1Base=
;COM2Base=
;COM3Base=
;COM4Base=
;COM1IRQ=
;COM2IRQ=
;COM3IRQ=
;COM4IRQ=
```

e. Save **`system.ini`**

f. Close Notepad and restart Windows. If the conflict is resolved, Windows 95 will detect the **Modem**, **CXP**, and **Net** devices and complete the installation.

Windows prompts you for CIS.SCP.

Insert **Windows 95 Digi DataFire GO! Series Wizard Disk 2 of 2**. Type **`a:\`** for the path to this file. Click **OK**. The installation will continue.

Troubleshooting Other Problems

Introduction

This section discusses the most common problems you are likely to experience, and their solutions. In many cases, a problem will be caused either by a loose connection or, if ISDN, by an incorrect switch, SPID, or DN setting.

The PC Card does not respond to commands sent by your data communication software (if you are using a terminal window to enter AT commands, there is no "OK" response when you enter an AT command).

Make sure your data communications software is configured for the COM port assigned to the PC Card. (Some software programs require a Save and a Restart if a COM port setting is changed.)

If you are running Windows 95:

a. Open the **System** folder in **Control Panel.**

b. Click on the Device Manager tab.

c. Expand the Modem icon.

d. Click on Digi International PC Card ISDN V.34

e. Select Properties

The **Modem** tab will indicate the current COM port setting. Make sure your software is set to this COM port.

If you are running Windows 3.1x:

a. Access the Control Panel Ports option by clicking the **Main**, **Control Panel**, and **Ports** icons.

b. Make sure your software is set to the indicated COM Port.

c. Make sure the COM port I/O address, and IRQ assigned to the PC Card do not conflict with existing devices.

If you are running Windows 95:

a. Access **Digi International DataFire GO! Series ISDN V.34** as described above. Select **Properties**. The **Resources** tab will indicate the current IRQ and I/O settings, as well as any conflicts with other resources.

b. If the **Resources** tab indicates a conflict, refer to your Windows 95 documentation to resolve the conflict.

If you are running Windows 3.1x:

a. Access the Control Panel Ports option by clicking the **Main**, **Control Panel**, and **Ports** icons.

b. Under **Ports** you can specify advanced settings that determine the base I/O port address and the interrupt request line (IRQ) used by Windows to send information to a COM (serial) port.

(If the PC Card does not respond to AT commands you have

entered manually), make sure you place **AT** in front of the command. The letters must each be in the same case, upper or lower: **AT** or **at**.

The terminal window in your data communication software displays double characters—for example, you type AT and the window displays AATT:

Disable Local Echo in your data communication software. By default, the PC Card will echo characters to the terminal window.

The PC Card will not place or answer modem calls using the analog line interface.

Check your connections first. Make sure the PC Card analog line interface is securely connected to the DataFire *GO! Series* PC Card in your computer, and the telephone line connected correctly to the interface and the correct wall jack. The call status LED on the analog line interface will be red if it is properly connected.

For outgoing calls:

Make sure dial tone is present on the analog line. Use a standard single line telephone to verify dial tone is present. By default, the DataFire *GO! Series* PC Card will not dial if it does not detect a dial tone. Variations in dial tone frequency and cadence may occasionally cause problems.

You can set the DataFire *GO! Series* PC Card to ignore dial tone and "blind dial" a number by entering **ATX1** This may be useful in applications where dial tone is not standard—PABX dial tone, for example.

By default, the DataFire *GO! Series* PC Card will wait two seconds to detect dial tone. This can be extended by entering **ATS6=*x*** where ***x*** equals the seconds to wait for dial tone. This may be useful if stutter dial tone is heard momentarily before steady dial tone. Stutter dial tone is common on telephone lines with voice mail services. You must give the DataFire *GO! Series* PC Card time to detect steady dial tone.

For incoming calls:

Make sure auto-answer is ON by entering `ATS0=1` in your terminal window. This is the default setting for the DataFire *GO! Series* PC Card. You can answer calls manually by entering `ATA` after the "RING" message is displayed in your terminal window.

Make sure DTR is being asserted by your data communication software or disable DTR disconnect on the DataFire *GO! Series* PC Card by entering **AT&D0**.

The PC Card will not place or answer ISDN calls (including modem-over-ISDN).

a. Make sure the ISDN line interface is correctly connected to the DataFire *GO! Series* PC Card. The ISDN Sync LED will be red when ISDN line is not attached.

b. Make sure the ISDN line interface is connected to your ISDN telephone line. You cannot make ISDN or modem-over-ISDN calls if you are connected to an analog telephone line or analog line interface.

c. Check the ISDN Sync LED on the interface. If it is not green, the PC card is not synchronized with the ISDN line. Enter **ATI10** to view network information. Compare the responses with the information provided to you by your telephone company. If there are differences, re-enter the correct information.

Note: For S/T models, if the previous step fails, connect the termination plug between the ISDN wall jack and the telephone cable (recommended) or between the telephone cable and the ISDN interface.

d. For ISDN calls, make sure the data channel protocol matches the one used by the remote device.

e. If a "NO CARRIER" message is displayed in your terminal window immediately after dialing an ISDN number, the ISDN line may not be configured to allow ISDN circuit-switched data calls. Contact your local telephone company. If there is a delay before receiving a "NO CARRIER" message, then either the remote ISDN device did not answer, or the B channel data protocols do not match.

f. When dialing modem-over-ISDN calls, make sure you use the M dial modifier—**`ATDM`**, for example.

g. If a "NO CARRIER" message is displayed immediately after dialing an analog modem telephone number using ATDM, the ISDN line may not be configured to allow ISDN circuit-switched voice calls. Contact your local telephone company. If there is a delay before receiving the "NO CARRIER" message, the remote device did not answer or it was not V.34 compatible.

Digi Support Services

World Wide Web Server

World Wide Web product information, manuals, new product announcements, programs, application stories and more can be obtained through the World Wide Web.

You can access our web page at **`http://www.dgii.com`**.

Internet FTP Server

The Digi anonymous FTP server provides you with access to Digi drivers and related installation information.

You can access the server at **`ftp://www.dgii.com/drivers`**. If prompted for a name and password, log in as **`anonymous`** and enter your E-mail address as your password.

Customer Information Packet

The *Customer Information Packet* included with your PC Card contains all the information you need to contact Digi Customer Service and Technical Support.

Appendix **A**

U.K. Specific Configuration Information

S Registers

To use the DataFire S/T/V.34 in the U.K., set S registers to the following values:

S Register	Setting
6	4 or 5.
11	70 to 255

Make/Break Ratios

Use the AT&P1 command to specify the appropriate make/break ratio for the U.K. (33%/67%)

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