

V.92/56K Internal Modem Cards

User Manual

P/N.PMICA52000-51

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Regulatory Statements

FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/television technician for help.

Notice 1:

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2:

Shielded interface cables, if any, must be used in order to comply with the emission limits.

FCC Requirement

This equipment complies with Part 68 of the FCC rules. On the base unit of this equipment is a label that contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. If requested, this information must be given to telephone company.

The REN is useful in determining the quantity of devices you may connect to your telephone line and still have all of those devices ring when your telephone number is called. In most, but not all area, the sum of the REN of all devices connected to one line should not exceed five (5). To be certain of the number of devices you may connect to your line, as determined by the REN, you should contact your local telephone company to determine the maximum number of REN for your calling area.

If your equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complain with the FCC. Your telephone company may make changes in its facilities, equipments, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

The equipment may not be used on coin service by the telephone company. Connection to party lines is subject to state tariffs.

About this Manual

Purpose

This user's manual gives you all the information you need to install and operate the card properly.

Manual Structure

This user's manual consists of five chapters and one appendix:

Chapter 1 Getting Started

This chapter tells you what items are contained in the package and things that you need to check before you proceed with the installation of the card.

Chapter 2 Card Overview

This chapter gives you all the necessary information that you need to know about the card, such as its features, layout, and the card components.

Chapter 3 Hardware Setup

This chapter contains step-by-step procedure on how to install the card and other necessary peripherals, configure the card under different operating systems, and verify the card installation.

Chapter 4 Communication Software

This chapter gives tips on how to configure your modem card Communication software.

Chapter 5 AT Commands

This chapter guides you on how to use the AT commands that will allow you to directly control fax/modem activities.

Appendix A Troubleshooting

This appendix gives tips on how to resolve the common problems that you might encounter when using the modem card.

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1. Getting Started

Congratulations on your purchase of this ITU V.92 56K standard Data/Fax modem card. This card features the latest innovation in high-speed modem design, making electronic communication faster and easier. This manual guides you on how to install and properly use the card in order to take full advantage of its features. An appendix about troubleshooting is also included to help you fix minor problems that you might encounter while using the card.

1.1 Package Contents

Make sure that you have the following items:

- Modem card
- Telephone cable
- Quick start guide
- CD-Title with Application Software and manual

If any of the items is damaged or missing, contact your dealer immediately.

1.2 System Requirements

Before you proceed, make sure that your system meets the following requirements:

- Pentium Based (above) IBM-compatible PC system with an empty PCI slot
- At least 16 MB memory
- Windows 95/Windows 98/Windows ME/Windows NT 4.0 /Windows 2000/Windows XP operation system

2. Card Overview

Before you proceed with the installation, it is necessary that you have enough information about the modem card.

This chapter tells you all you need to know about the modem card.

2.1 Specifications

Data Modem Operation

- Line Speed: 300 ~ 56000bps
- Standard Compatibility: ITU V.92, ITU V.90, ITU V.34, V.32, V.32bis, V.23, V.22bis, V.22A/B, V.21 and Bell 103, 102
- Error Correction: ITU-T V.42, MNP2-4
- Data Compression: ITU-T V.42bis, V.44, MNP5
- Flow Control: XON/XOFF
- Comment Set: Enhanced AT command set

Fax Operation

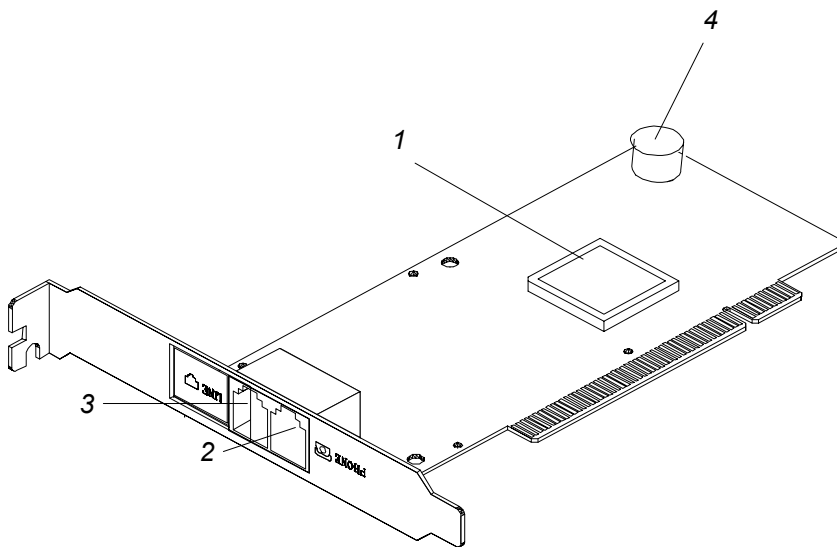
- Line Speed: 2400 ~ 14400bps
- Standard Compatibility: Group 3 with T.30 protocol over ITU-T V.17, V.21 Ch2, V.27ter, V.29
- EIA-578 Service Class I Compatible

General Features

- Line Interface: Dual RJ-11 jacks for line
- DTE Interface: 32bits PCI interface.
- Temperature:
 - Operating: +10° ~ +50°C

-
- Non-operating: -20° ~ +60°C
 - Humidity:
 - Operating: 20% ~ 80% RH
 - Non-operating: 20% ~ 80% RH
 - Dimensions: 120mm (L) x 70mm (W) x 19mm (H)

2.2 Card Layout



- | | | | |
|---|------------|---|----------------|
| 1 | Modem Chip | 2 | Telephone Port |
| 3 | Line Port | 4 | Buzzer |

Prepare to install the card. See Chapter 3.

3. Hardware Setup

This chapter contains detailed instructions on how to install and configure the modem card, as well as how to verify if your installation is correct. We recommend that you follow the steps accordingly to avoid future problems.

3.1 ESD Precautions

Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other system components. Always observe the following precautions before you install any system component.

1. Do not remove a component from its protective packaging until you are ready to install it.
2. Wear a wrist grounding strap and attach it to a metal part of the system unit before handling components. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.

3.2 Installing the Card

1. Turn off the system and unplug your system from the power supply.
2. Remove the system cover. Refer to your housing manual for instructions.
3. Locate an empty PCI slot on the system board.
4. Check your modem card model.
5. The modem card is preset PnP configuration (Plug and Play). In most cases, the default settings guarantee that the card will work properly.

-
6. Align the golden fingers of the card to the empty PCI slot on the system board. Insert then press the card into the slot. Make sure that the card is properly seated.

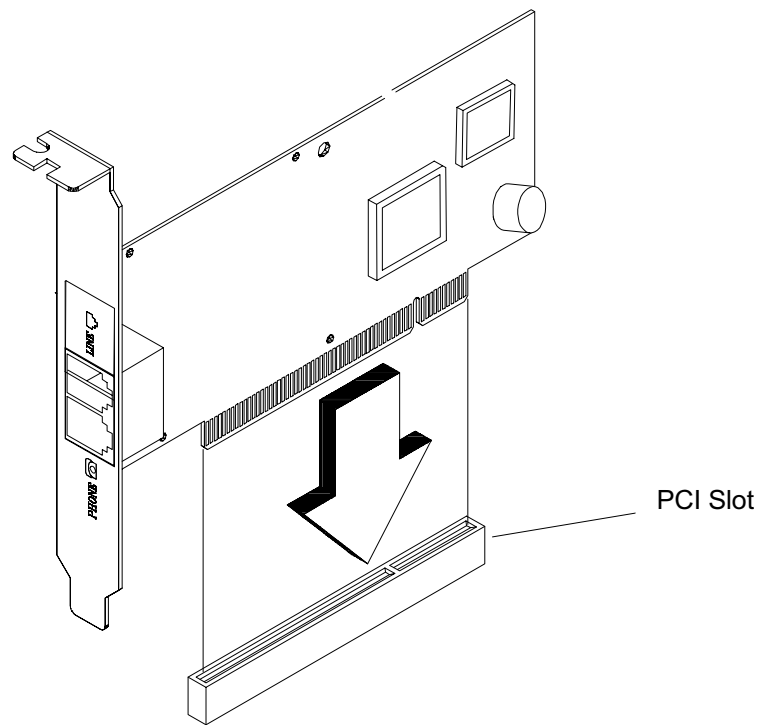


Figure 3-1 Installing the Card

7. Replace the system cover.

3.3 Connecting the Telephone Line and Telephone Set

To connect your card to the telephone line and telephone set:

1. Locate an available RJ-11 modular jack telephone outlet.
2. Insert one end of the modular cord that came with your card into the RJ-11 modular jack marked LINE on the card. Then plug the other end into the modular jack on wall outlet. See Figure 3-2.
3. Plug the RJ-11 jack of the telephone set into the RJ-11 jack marked PHONE on the card. See Figure 3-2.
4. In model ver:2, you only need to insert a modular cord that came with your card into the RJ-11 modular jack marked line on the card. Then plug the other end into the modular jack on wall outlet.



After you have connected the telephone set, lift your telephone handset and check for a dial tone.

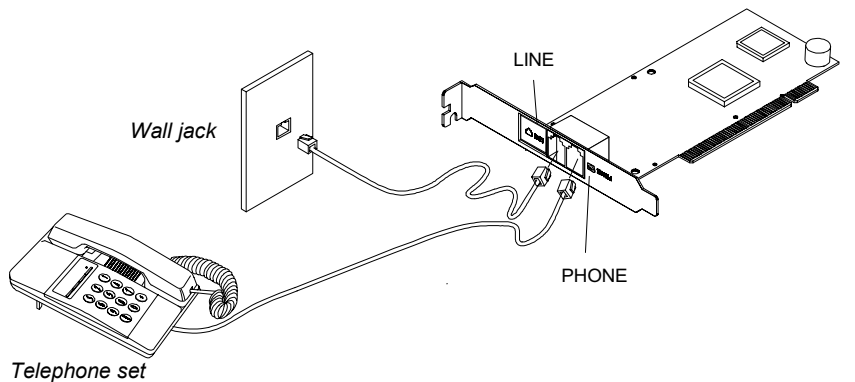


Figure 3-2 Connecting Peripherals

3.4 Configuring the card on Win9X/WinME

As we mentioned in section 3.2, after you plug the modem card in the PCI slot. Windows 9X/ME will automatically detect your hardware when you first install it. To install the driver for your modem card, please follow the procedures below:

1. Turn on your computer. As the Windows 9X/ME operating system boots up, it displays a New Hardware Found dialog box on your screen for a few seconds with the identifier name (PCI Communication Device or something similar)of your modem.
2. In the New Hardware Found dialog box, you have three choices to install a driver. The default choice is for the driver to be installed from a disk provided by hardware manufacturer. Highlight this selection if it is not already highlighted and click OK.
3. Make D:\Driver the default drive for the source location.

-
4. Windows 9X/ME will auto-detect the correct files and copy them onto your disk.

3.5 Configuring the card on WinNT/Win2K

Before you install the modem, please make sure that the modem has not been previously installed. If it has been installed, it is necessary to run the uninstall procedure below.

Run Setup.exe: This will start the Modem Board Installation Wizard.

From the opening screen click on "Next"

Select the proper driver name, normally only one will be shown.

Click on "Next", then the top of icon will show "the modem driver was installed successfully."

Click on "Finish"

3.6 Uninstall Your Modem on Win9X/WinME

When using Win9X/WinME it is necessary to fully uninstall the modem before attempting to reinstall the modem. This requires two simple steps.

Uninstall the modem:

Double Click on "Computer" Icon → Double Click on "Control Panel" Icon → Double Click on "Modems" Icon

Select modem name to uninstall

Click on "Remove"

Verify the operation by clicking "Yes" Close all open windows

Uninstall the “PCI Modem Emulator”:

Double Click on “My Computer” Icon→Double Click on “Control Panel” Icon→Double Click on “System” Icon

Click on “Device Manager” Tab

Double Click on “HSFMODEM” or “PCI Communication Device ”

Select the “PCI Modem Emulator”

Click on “Remove”

Close all open windows

3.7 Uninstall Your Modem on WinNT/Win2K

When using WinNT/Win2000 it is necessary to fully uninstall the modem before attempting to reinstall the modem. This requires two simple steps.

Uninstall the modem:

Double Click on “My Computer” Icon→Double Click on “Control Panel” Icon→Double Click on “Modems” Icon

Select modem name to uninstall

Click on “Remove”

Verify the operation by clicking “Yes”

Click on “Close”

Uninstall the COM Port and drivers files:

Double Click on Add/Remove Programs, select the modem name to uninstall.

In modem Board Uninstallation Wizard select the modem name to uninstall

Click on "Next"

Click on "Finish"

Close all open windows

3.8 Testing Your Modem Installation

To test if you have installed the modem properly:

1. Perform the software function that puts your system in Terminal mode.

- For Windows 9X/ME/NT/2K: Use the HyperTerminal program.

In Terminal mode, a cursor appears on the screen, allowing you to send commands directly to the modem.

2. To check if your system and modem are functioning properly, type:

AT&F

If the software COM port and IRQ settings match the modem card hardware settings, the modem should respond OK.

If any of the following screen problems occur, refer to Appendix A for troubleshooting tips.

- The characters you type do not appear
- No OK message appears
- Double characters appear

After you have successfully installed the card, your next step is to configure the Communication software.

For details, see Chapter 4.

4. Communication Software

This chapter gives you tips on how to configure your communication software.

4.1 Installing the Communication Software

The card package comes with a Communication software disk and manual. To install the Communication software, simply insert the disk into the appropriate drive and run the setup execution program (.EXE file) contained in the disk.

4.2 Tips on Configuring the Communication Software

This modem card uses the most up-to-date industry and commercially popular standards to ensure functional compatibility with most communication software. During initial setup of the communication software, it will normally prompt you to define the type of fax/modem that you are currently using. The following list guides you on how to select the proper device type.



The device type only defines the protocol by which your software will communicate with your fax/modem and does not set nor limit the speed.

1. For modem device type, choose Hayes V.32 or Hayes compatible 2400 Baud modem.
2. For the Baud rate, choose any speed between 38,400 to 115,200. Your fax/modem will automatically adjust to the optimum transmission speed after successfully connecting with a remote fax/modem.

-
3. Many communication software use the modem response to control program flow. Make sure that the software is set to recognize a CONNECT 56000 response. If this does not work, set the program to simply recognize just the CONNECT response without any baud rate information.
 4. There are three flow controls: none, hardware (CTS/RTS), and software (XON/XOFF). Set your software to use either hardware or software flow control. If set to none, the communication software will not be able to detect a buffer overflow and result in transmission errors.
 5. For fax device type, choose TR29 Class 1.
 6. For fax speed, choose *automatic* or *fastest speed*. Your fax/modem will automatically adjust to the optimum transmission speed after successfully connecting with a remote fax machine or another fax./modem.
 7. Make sure that you have correctly set all the other parameters required by the software to operate successfully.
 8. Refer to your Communication software manual for details.

You are now ready to do fax/modem communication. See Chapter 5 for details.

5. AT Commands

The modem will respond to the commands detailed below. Parameters applicable to each command are listed with the command description. The defaults shown for each configuration command are those used in the factory profile 0.

5.1 Standard “AT” Commands

A/ Re-execute command.

A Go off-hook and attempt to answer a call.

E0 Turn off command echo.

E1 Turn on command echo.

H0 Initiate a hang-up sequence.

H1 If on-hook, go off-hook and enter command mode.

I 0 Report product code.

I 1 Compute and report checksum.

I 2 Compute checksum and report result of comparison to programmed checksum.

I 3 Report firmware revision, model, and interface type.

I 4 Report response programmed by an OEM.

I 5 Report the country code parameter.

I 6 Report modem data pump model and code revision.

L0 Set low speaker volume.

L1 Set low speaker volume.

L2 Set medium speaker volume.

L3 Set high speaker volume.

M0 Turn speaker off.

M1 Turn speaker on during handshaking and turn speaker off while receiving carrier.

M2 Turn speaker on during handshaking and while receiving carrier.

M3 Turn speaker off during dialing and receiving carrier and turn speaker on

during answering.

N0 Turn off automode detection.

N1 Turn on automode detection.

O0 Go on-line.

O1 Go on-line and initiate a retrain sequence.

P Force pulse dialing.

Q0 Allow result codes to DTE.

Q1 Inhibit result codes to DTE.

Sn Select S-Register as default.

Sn? Return the value of S-Register n.

=v Set default S-Register to value v.

? Return the value of default S-Register.

T Force DTMF dialing.

V0 Report short form (terse) result codes.

V1 Report long form (verbose) result codes.

W0 Report DTE speed in EC mode.

W1 Report line speed, EC protocol and DTE speed.

W2 Report DCE speed in EC mode.

X0 Report basic call progress result codes, i.e., OK, CONNECT, RING, NO

CARRIER (also, for busy, if enabled, and dial tone detected), NO

ANSWER and ERROR.

X1 Report basic call progress result codes and connections speeds (OK,CONNECT, RING, NO CARRIER (also, for busy, if enabled, and dial tone not detected), NO ANSWER, CONNECT XXXX, and ERROR.

X2 Report basic call progress result codes and connections speeds, i.e.,OK, CONNECT, RING, NO CARRIER (also, for busy, if enabled, and dial tone not detected), NO ANSWER, CONNECT XXXX, and ERROR.

X3 Report basic call progress result codes and connection rate, i.e., OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT XXXX,BUSY and ERROR.

X4 Report all call progress result codes and connection rate, i.e., OK,CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT XXXX,BUSY, NO DIAL TONE and ERROR.

Z Restore stored profile 0 after warm reset.

&C0 Force RLSD active regardless of the carrier state.

&C1 Allow RLSD to follow the carrier state.

&D0 Interpret DTR ON-to-OFF transition per &Qn:

&Q0, &Q5, &Q6 The modem ignores DTR.

&Q1, &Q4 The modem hangs up.

&Q2, &Q3 The modem hangs up.

&D1 Interpret DTR ON-to-OFF transition per &Qn:

&Q0, &Q1, &Q4, &Q5, &Q6 Asynchronous escape.

&Q2, &Q3 The modem hangs up.

&D2 Interpret DTR On-to-OFF transition per &Qn:

&Q0 thru &Q6 The modem hangs up.

&F0 Restore factory configuration 0.

&G0 Disable guard tone.

&G1 Disable guard tone.

&G2 Enable 1800 Hz guard tone.

&K0 Disable DTE/DCE flow control.

&K1 Enable RTS/CTS DTE/DCE flow control.

&K2 Enable XON/XOFF DTE/DCE flow control.

&K3 Enable both RTS/CTS and XON/XOFF flow control.

&M0 Select direct asynchronous mode.

&P0 Set 10 pps pulse dial with 39% / 61% make/break.

&P1 Set 10 pps pulse dial with 33% / 67% make/break.

&P2 Set 20 pps pulse dial with 39% / 61% make/break.

&P3 Set 20 pps pulse dial with 33% / 67% make/break.

&Q0 Select direct asynchronous mode.

&Q5 Modem negotiates an error corrected link.

&Q6 Select asynchronous operation in normal mode.

&T0 Terminate any test in progress.

&T1 Initiate local analog loopback.

&V Display current configurations.

&W Store the active profile in NVRAM profile 0.

%E0 Disable line quality monitor and auto retrain.

%E1 Enable line quality monitor and auto retrain.

%L Return received line signal level.

%Q Report the line signal quality.

\N0 Select normal speed buffered mode.

\N2 Select reliable link mode.

\N3 Select auto reliable mode.

\N4 Force LAPM mode.

\N5 Force MNP mode.

AT Commands

5-5



AT+PCW

Defines the actions to be taken upon detection of call waiting

Values:

0 – user decision (default)

1 – Hang up

2 – Ignore call waiting

AT+PMH

Controls whether or not initiation of MOH procedures are enabled during V.92 operation

Values:

0 – Enable (default)

1 – Disable

AT+PMHT

Controls whether or not the modem will grant or deny a MOH request as well as setting the Modem-on-Hold-Timeout.

Values:

0 – Deny V.92 MOH Requests (default)

1~12 – Grant 10 seconds – 16 minutes timeout.

13 – Grant indefinite time

AT+PMHR

If in hold state, displays the current hold timeout.

If not in hold state, initiates OGC and displays the server's hold timeout.

AT+PMHF

If entered when call waiting arrives, performs the operations required to accept the call waiting (e.g. flash)

5.2 Modem's S-registers

Register Function	Range / unit	Default
S0 Number of Rings to Auto-Answer	0-255 / rings	0
S1 Ring Counter	0-255 / rings	0
S2 Escape Character	0-255 / decimal	43
S3 Carriage Return Character	0-127 / decimal	13
S4 Line Feed Character	0-127 / decimal	10
S5 Backspace Character	0-32 / ASCII	8
S6 Wait Time for Dial Tone Before Bling	2-255 / seconds	4 Dialing
S7 Wait Timer for Carrier after Dial, for 1-255 / seconds for Dial Tone after "W" Dial Modifier	1-255 / seconds	50 Silence, or
S8 Pause Time for Dial Delay	0-255 / seconds	2
S9 Carrier Detect Response Time	1-255 / seconds	6
S10 Lost Carrier to Hang Up Delay	1-255 / seconds	14
S11 DTMF Tone Duration	50-255/milliseconds	95
S12 Escape Code Guard Time	0-255 / seconds	50
S13 Reserved		
S14 General Bit Mapped Options		138
S15 Reserved		
S16 General Bit Mapped Test Options	0	

AT Commands

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Register Function	Range/Unit	Default
S17 Reserved		
S18 Test Timer	0-255 / seconds	0
S19 Reserved		
S20 Reserved		
S21 V.24/General Bit Mapped Options		52
S22 Speaker/Results Bit Mapped Options		119
S23 General Bit Mapped Options		55
S24 Sleep Inactivity Timer	0-255 / seconds	0
S25 Delay To DTR	0-255 / seconds	5
S26 RTS to CTS Delay	0-255 / seconds	1
S27 Bit Mapped Option		73
S28 Bit Mapped Options		0
S29 Flash Dial Modifier Time	0-255 / ms	70
S30 Disconnect Inactivity Timer	0-255 / seconds	0
S31 Bit Mapped Options		6
S32 XON Character	0-255 / decimal	17
S33 XOFF Character	0-255 / decimal	19
S34-S36 Reserved		
S37 Desired Line Connection Speed		0
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Register Function	Range/Unit	Default
S38 Reserved		
S39 Flow Control		3
S40 Reserved		

Troubleshooting

This appendix contains information that will help you solve some of the common problems you might encounter while using the modem card. For further assistance, contact your dealer.

Modem does not respond to AT commands

- There may be a COM port/IRQ conflict. Reconfigure the modem COM port address and IRQ line.
- Make sure that you have set the correct COM port and IRQ in the communications software.
- Make sure the system is in Terminal mode of your communications software.
- Reset the modem to its factory defaults by typing `AT&F`.

Double characters display on your monitor

- Both your modem and software local echoes are on. Turn off your modem local echo by typing the `ATE0` command.

Modem cannot dial and "NO DIALTONE" message appears on the monitor

- Check the phone cord connection. Make sure that the jack on the modem labeled Line is connected to an analog phone wall jack.
- The modem cannot recognize the dial tone. This is typical in some corporate PBXs. Use the `ATX1` command in your setup string to enable Blind Dial.

Both modems exchange carrier signals but fail to establish a connection

- Place the call again. The telephone company routes every call differently each time you call.
- Try calling a different modem to check if your modem is working.

The modem does not answer an incoming call

- Auto-answer function is disabled. Enable the function through software program or by sending the ATSO=1 command to your modem in terminal mode.

The modem disconnects while online

- This may be caused by line interference. Retry the connection by dialing the numbers several times.
- An incoming call may have broken the connection if the Call-waiting feature is enabled. Disable Call-waiting and try again.

Garbage characters display on the monitor

- Set your modem to the same word length, parity, and stop bits as the remote modem.
- Make sure that your software and modem are set to the same flow control setting.
- The software may not be set for correct terminal emulation. Configure the software to correct type. ANSI terminal emulation is the most commonly used.
- Type the AT&F1 command to load the template that enables hardware flow control as other optimal settings.

Your communication software is reporting many cyclic redundancy check (CRC) errors and low characters per second (CPS)

- You might have experienced noise on the phone line. Place the call again. The phone company routes call differently each time you call.
- Type the `AT&F1` command to load the template that enables the hardware flow control as other optimal settings.
- Lower the serial port rate in your communication software to 38,400 bps or 19,200 bps.
- Try a different file transfer protocol (do not use the XMODEM if other protocols are available).

You cannot run the fax and communications software at the same time

- Communication devices can be accessed by only one application at a time.
- In Windows O.S., you can open data and fax communications at the same time, but they cannot use the same modem at the same time.