3ComImpact™ IQ External ISDN Modem Help

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Introduction

The 3ComImpact™ IQ External ISDN Modem is an external, standalone Basic Rate ISDN modem for connection with digital telephone services from local telephone companies in North America. It is designed for users who require high-speed access to the Internet, Intranet, on-line information services, or corporate local area networks (LAN).

The ISDN modem allows transmission of data at speeds of up to 128 Kbps over digital ISDN connections with the highest reliability and error-free performance possible. With Stac compression and a high-speed serial port, the ISDN modem allows you to get transmission speeds of up to 230.4 Kbps. ISDN technology reduces call setup times by more than 50% compared to V. fast/V.34 analog modem setup times; connection is established in 3 seconds.

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Running the SPID Wizard

The SPID Wizard automatically detects the switch type and configures the SPID(s). You will need the telephone number(s) your telephone company assigned to your ISDN line.

1. Double-click the 3ComImpact IQ globe icon to run the SPID Wizard configuration program.

   NOTE: SPID Wizard automatically runs when you are configuring the ISDN modem for the first time or if you connect the ISDN modem to a different ISDN line

2. Enter the first telephone number for your ISDN line.

3. Click *Next*.

   A dialog box appears, indicating that the ISDN modem is detecting the SPID for telephone number one. After the SPID is configured, the dialog box for a second telephone number appears.

4. If you have a second telephone number for your ISDN line, enter it, and then click *Next*. If you do not have a second telephone number for your ISDN line, leave the field incomplete, and then click *Done*.

   After the switch type and SPID(s) are configured, the Configuration dialog box appears. You may want to change the default settings for **voice call routing**, **Multilink PPP** and **B channel rate**.

Voice Call Routing

If you plan to use the ISDN modem's phone ports, you will want to assign telephone number(s) to the analog ports. By default, calls to and from both ISDN telephone numbers ring the devices connected to both ports simultaneously.

For example, if the first telephone number is configured as 908 555 1212 and only the Phone Port 1 box is checked, then calls to 908 555 1212 will only ring the device attached to Phone Port 1.

A typical scenario is a fax machine connected to one phone port and an analog telephone connected to the other phone port. In this case, it is likely you will want one telephone number associated with just the analog telephone and the other telephone number associated with just the fax machine.

To configure this scenario:

1. From within the Number 1 group box, check the box labeled Phone Port 1 and clear the box labeled Phone Port 2.

2. From within the Number 2 group box, clear the box labeled Phone Port 1 and check the box labeled Phone Port 2.

3. Click *Update*.

Configuring Multilink PPP

Multilink PPP aggregates the two 56 Kbps or 64 Kbps ISDN B channels, creating a virtual single digital connection of up to 128 Kbps.

With Multilink PPP enabled (default), when you place a call using PPP, the two 56 Kbps or 64 Kbps B channels will be linked to form a single 112 Kbps or 128 Kbps channel.

To enable or disable Multilink PPP:

1. Click inside the Multilink check box in the PPP area to check it (enable) or clear it (disable).

2. Click the Update button to download the change to your ISDN modem's S register.

Although this is not generally the case, your Internet Service Provider may require an Endpoint Identifier Class and an Endpoint Identifier. The Endpoint Identifier Class is configured using **S register 82**. The Endpoint Identifier is configured using **S register 83**.

Configuring B Channel Rate

By default, the connection speed is 56 Kbps.   Check with your telephone company to determine the connection speed they require.

To change the connection speed to 64 Kbps:

1. Select the radio button labeled 64 Kbps.

2. Click the Update button to download the change to your ISDN modem's S register.

Verifying the Configuration.

Check the status bar located toward the bottom of the Configuration dialog box to verify correct configuration. If the ISDN parameters were configured, the status bar fields will appear as shown here.

- Layer 1: UP

- SPID 1: Init (if required)

- TEI 1: Number from 64 to 126

- SPID 2: Init (if required)

- TEI 2: Number from 64 to 126 (if required)

NOTE: The TEI number(s) are not configured by the user. The TEI number(s) are provided by the telephone company for informational purposes only.

Set Up Using Windows 95

The instructions in the following sections assume that Windows 95, Microsoft Plus has already been installed.

Setting up the ISDN modem using Windows 95 Plug and Play

Setting up a remote connection using Windows 95

Running Windows 95 Internet Setup Wizard

Setting up the ISDN Modem Using Windows 95 Plug and Play

1. Reboot your PC with the ISDN modem powered up and physically connected to your PC. The New Hardware dialog box appears.

2. Select the *Driver from disk provided by hardware manufacturer* option to allow Windows 95 to detect the 3C882 ISDN modem.

3. Insert the *3ComImpact IQ DOS & Windows Installation Diagnostic Utilities* diskette into an available floppy drive.

4. Click *OK*. The Select Device dialog box appears.

5. Select *3ComImpact IQ* and then click *OK*.

   If you are planning to run your computer at the maximum 230.4 Kbps baud rate, you must set up the driver that allows a maximum 230.4 Kbps baud rate. To do so, go on to step 6.

   Otherwise, if you plan to run your computer at baud rates up to 115.2 Kbps, the process is complete. You can verify that the ISDN modem is installed by double-clicking the Modems icon located in the Control Panel. The Modems Properties dialog box appears. The 3ComImpact IQ modem should be listed.

6. From the Control Panel dialog box, double click on the icon Modems. The Modems Properties dialog box appears.

7. Click *Add*. The Install New Modem dialog box appears.

8. Check the box to prevent automatic detection of the 3ComImpact IQ ISDN modem.

9. Click *Next*. The dialog box listing modem manufacturers and modem models appears.

10. From the Manufacturers list box, select *3COM*. From the Models list box, select *3ComImpact IQ 240K*. Click *Next*.

11. Select the appropriate COM port. Click *Next*. A dialog box indicates successful setup.

12. Click *Finish*.

Setting Up a Connection Using Windows 95

Once you have added the ISDN modem driver to Windows 95, you are now ready to set up a connection to which you can place calls. If you want to connect to the Internet, you can easily do so by running the Internet Setup Wizard. For other remote connections, do the following:

1. From the *Start* menu, select *Programs*, then *Accessories*, and then *Dial-Up Networking*. The Dial-Up Networking dialog box appears.

2. Double-click the icon *Make New Connection*.

3. Enter a name for this connection.

4. Select *3ComImpact IQ* for baud rates up to 115.2 Kbps. For a baud rate up to 230.4 Kbps, select *3ComImpact IQ 230K*.

5. Click *Configure*. The 3ComImpact IQ dialog box appears.

6. Select the appropriate COM port.

7. Select the maximum COM port speed.

8. Click *OK*.

9. Click *Next*. A dialog box appears that lets you enter the telephone number of the computer you want to call.

10. Enter the country code (if necessary), area code, and phone number of the destination you want to call.

11. Click *Next*.

12. Click *Finish*. The icon representing the Dial-Up Networking connection you just created appears in the Dial-Up Networking folder.

To place a call, double-click the connection icon for the destination you want to call. A connection dialog box appears. Click *Connect*.

Running the Windows 95 Internet Setup Wizard

The Internet Setup Wizard walks you through each step required to set up your PC for Internet access. During this procedure, the Wizard prompts you to enter information. Ensure that you have the following information available prior to using the Internet Wizard utility.

Obtain the following information from your Internet service provider:

- Name of your service provider

- Access number

- User name

- Password

- IP address (if any)

- Subnet mask (if any)

- Domain Name Service (DNS) server and alternate DNS server

    If you want to send and receive mail through the Internet, you will also need the following information:

    - Email address

    - Address of Internet mail server

To set up a connection using the Internet Setup Wizard:

1. From the Windows 95 *Start* menu, select *Programs* then *Accessories*, then *Internet Tools* and finally *Internet Setup Wizard* to view the main dialog box.

2. Click *Next* to view the Connection Type dialog box.

3. Select *Connect Using My Phone Line*. Click *Next* to view the Connection Method dialog box.

4. Select the second choice to connect to the Internet using an Internet service provider.

5. Click *Next*. If this is the first time you are running the Internet Set Up Wizard, the Installing Files dialog box appears. Click *Next*. The Choose Modem dialog box appears.

6. Select *3ComImpact IQ* for baud rates up to 115.2 Kbps. For a baud rate up to 230.4 Kbps, select *3ComImpact IQ 230K*.

7. Click *Next* to view the Service Provider dialog box.

8. Enter the name of your Internet service provider. Click *Next* to view the Phone Number dialog box.

9. Enter the country code (if necessary), area code, and phone number of the destination you want to call. Click *Next* to view the User Name and Password dialog box.

10. Enter your User name and Password for your Internet access account. Press *Next* to view the IP Address dialog box.

11. If your Internet service provider automatically assigns an IP Address, check the first option.

Otherwise, check the second option and enter the IP Address and Subnet Mask information provided by your Internet access provider. Click *Next* to view the DNS Server dialog box.

12. Enter the IP Address of your DNS Server. Click *Next* to view the Internet Mail dialog box.

13. To send and receive email through the Internet, check the box, enter your email address and the address of your Internet mail server. Click *Next*   and then click *Finish*.

Set Up Using Windows NT Remote Access Service

The following instructions assume that you have already configured the ISDN modem and Windows NT remote access service.

1. Using the File Manager, locate the Windows NT modem.inf file in the %SystemRoot%/System32/RAS directory and rename it to modem.org.

   For example, if your root directory is windows, you would look for the Windows NT modem.inf file in the following directory:

   C:\windows\System32\RAS

2. Copy the 3ComImpact IQ ISDN modem's modem.inf file to the same directory as the modem.org.

3. From the *Main* menu, select *Control Panel*, then select *Network*. The Network Settings dialog box appears.

4. From the Installed Network Software list box, select *Remote Access Service*. The Remote Access Setup dialog box appears.

5. If a modem is already configured, select it, then click *Remove*.

6. Click *Add*. The Add Port dialog box appears.

7. Choose a COM port, then click *OK*. The Remote Access Setup message box appears.

8. Click *Cancel*. The Select Modem dialog box appears.

9. Select *3ComImpact IQ* for baud rates up to 115.2 Kbps. For a baud rate up to 230.4 Kbps, select *3ComImpact IQ 230K*.

10. Specify the Port Usage. Click *OK*. The Remote Access Setup dialog box appears.

11. Click *Continue*.

12. Click *OK* to exit the Network Settings dialog box. The Network Settings Change alert box appears.

13. Click *Restart Now*.

Once your system has rebooted, you are ready to use the ISDN modem.

Advanced Configuration

Auto Answer

Baud Rate

Compression

Dynamic Bandwidth Allocation

QuickSelect Protocol Selection

QuickSelect

The QuickSelect feature automatically detects and uses the protocol required for each digital call, either V.120 or Async-Sync PPP. By default, QuickSelect is enabled.

To disable QuickSelect and use PPP for every call, send the command **ATS 71=1** to the ISDN modem.

To disable QuickSelect and use V.120 for every call, send the command **ATS 71=2** to the ISDN modem.

DBA

Dynamic Bandwidth Allocation (DBA) allows you to place or receive a voice call while a **Multilink PPP** call is active. With DBA enabled (default), if a voice call comes in or if you lift the handset to place a call while you have both B channels in use because of Multilink PPP, one of the B channels is temporarily removed from the Multilink PPP call and is used for the voice call.

Once the voice call ends, that B channel is automatically returned to the Multilink PPP call. Although throughput is reduced while the voice call is active, the reliability of the Multilink PPP call is not affected.

If you are on the receiving end of a Multilink PPP call and you place a voice call, one of the B channels will be used for the voice call but once the voice call ends, the B channel cannot be returned to the Multilink PPP call. The B channel can only be returned to the Multilink PPP call if you placed the call.

To disable DBA, send the command **ATS70=0** to the ISDN modem.

To enable DBA, send the command **ATS70=1** to the ISDN modem.

Auto Answer

When Auto Answer is disabled (the default), a RING message is delivered to the RS-232 port upon reception of an incoming data call to the ISDN modem. Enter the command

AT A to answer the incoming data call. A **CONNECT** message is then delivered to the RS-232 port upon successful connection.

If Auto Answer is enabled, the call is automatically answered after the number of rings you specify, and a CONNECT message, indicating the speed of the connection, is delivered to the RS-232 port.

To enable Auto Answer, send the command **ATS0=** (enter the number of rings before the ISDN modem answers the call) to the ISDN modem.

To disable Auto Answer, send the command ATS0=0 to the ISDN modem.

Compression

The ISDN modem automatically compresses data to improve data transfer times using the Stac compression method. The following check modes are negotiable—None, One Byte Sequence Number, and Expanded. Expanded is the preferred choice. The degree of compression depends on the type of file being transferred. For example, a text-only file compresses better than a file with graphics.

Compression is enabled (default) and will automatically be invoked unless you are running compression on your PC. If you are running compression on your PC, that compression method will be used instead of the ISDN modem's compression even if the ISDN modem's   compression is enabled.

To disable compression, send **AT%C0** to the ISDN modem.

To enable compression, send the AT%C2 to the ISDN modem.

Baud Rate

By default, the baud rate is set using Autobaud. Autobaud automatically detects the maximum data rate of your computer's COM port. Rates up to 115.2 Kbps can be detected automatically.   If you do not want the ISDN modem to automatically detect the baud rate or if you want to set the baud rate to 230.4 Kbps, use the command **AT $B** (baud rate) to set a specific baud rate.

To set the baud rate to the maximum of 230.4 Kbps, do the following:

1. Ensure that your computer's COM port and communications software support 230.4 Kbps.

2. Send the command AT $B 230400 to the ISDN modem.

3. Change the setting of your application program to 230.4 Kbps.

4. To save this setting so that the baud rate remains 230.4 Kbps in case of a power failure, send the command **AT & W** to the ISDN modem.

To return to Autobaud, send the command AT $B0 to the ISDN modem.

Placing and Receiving Calls

Placing ISDN Data Calls

Placing Multilink PPP Calls

Receiving ISDN Data Calls

Placing Voice Calls Using an Analog Phone Port

Receiving Calls Using an Analog Phone Port

Placing ISDN Data Calls

You can let your communications software send and receive calls for you, or you can use a terminal emulator to place calls manually. Software that communicates using AT commands is required to control the ISDN modem. You can enter these codes manually. However, they are often entered automatically by modem communications software.

NOTE: For Macintosh users, add &DO to the modem initialization string of your communications software.

When you place a call the B channel LED(s) flash green, then remain lit once the call is established. (If you are running Multilink PPP, one B channel flashes and then remains lit. Then, the second B channel flashes and remains lit.)

Placing Calls Automatically

If you are using standard communications software, select the 3ComImpact IQ ISDN modem. If the 3ComImpact IQ ISDN modem is not listed, select a Hayes®-compatible modem configuration and dial out through the ISDN modem.   If you are using a Hayes-compatible modem configuration, you may have to manually configure settings such as baud rate. Refer to your communications software documentation for more details.

Placing Calls Manually

You can place calls manually using AT commands. Your communications software must be in terminal emulation mode. In most situations, an initialization string is not necessary with the ISDN modem. If an initialization string is required by the communications software or server, use the Hayes default initialization string.

To place an ISDN data call manually:

1. Launch your communications software.

    Ensure your communications software is in terminal mode.

    Ensure the ISDN modem is in command mode (sometimes called local mode or terminal mode) so that it interprets your commands. When your computer is powered on, the ISDN modem automatically starts in command mode. If you have recently used the ISDN modem to make a call and have not yet disconnected, type +++ to switch to command mode.

2. Type: AT D (telephone number)   [Enter]

Correct examples of outgoing circuit-switched ISDN modem commands with dial strings are:

AT D 1 408 654 2703

ATD14086542703

Placing a Multilink PPP Call

Before you place a call, ensure that the **Multilink PPP** box on the ISDN modem Configuration screen is checked. Also, the destination you are calling must also support Multilink PPP. For example, if you are trying to dial into the Internet, your Internet Service Provider must also support Multilink PPP in order to successfully place a Multilink PPP call.

Although this is not generally the case, your Internet Service Provider may require an Endpoint Identifier Class and an Endpoint Identifier. The Endpoint Identifier Class is configured using **S register 82**. The Endpoint Identifier is configured using **S register 83**.

For automatic call placement, simply launch the call. For manual dialing, type

ATD (telephone number).

Some Internet Service Providers require you to dial two telephone numbers to place a Multilink PPP call. To dial two telephone numbers, insert the character & between the two telephone numbers.

For automatic dialing, add the following to your application's dial string:

(telephone number 1) & (telephone number 2)

For manual dialing, type the following:

ATD (telephone number 1) & (telephone number 2)

Receiving ISDN Data Calls

The ISDN modem can receive incoming circuit-switched data calls from other ISDN devices.

If Auto Answer is disabled, when a data call comes in, a **RING** message is delivered to the RS-232 port upon reception of an incoming data call to the ISDN modem. Enter the command AT A to answer the incoming data call. A **CONNECT** message is then delivered to the RS-232 port upon successful connection.

If Auto Answer is enabled, the call is automatically answered and a CONNECT message, indicating the speed of the connection, is delivered to the RS-232 port.

When receiving a call, the B channel LED flashes green, then remains lit once the call is answered. (If you are running Multilink PPP, one B channels flashes then remains lit and then the second B channel flashes then remains lit.)

Placing Voice Calls Using an Analog Phone Port

To place an outgoing call, simply take the telephone handset or external fax machine off the hook, wait for a dial tone, and dial the destination telephone number.

When you place a voice call, a B channel LED flashes amber, then remains lit once the call is established.

Receiving Voice Calls Using an Analog Phone Port

By default, incoming calls to the first telephone number for your ISDN line ring devices connected to both ports simultaneously. If you have two telephone numbers for your ISDN line, calls coming to the second telephone number also ring both devices simultaneously.   If both ports are busy, the third incoming call generates a busy signal to the far end.

When you receive a voice call, a B channel LED flashes amber, then remains lit once the call is answered.

Troubleshooting

Checking the Basics

Monitoring the LEDs

Evaluating Symptoms and Solutions

Contacting Technical Support

Checking the Basics

Before you monitor the LEDs or refer to the section on <u>symptoms and solutions</u>, check the following:

1. Verify that the cables are securely connected and not physically damaged. If damage is apparent, replace the cable.

2. Verify that the ISDN cable is properly connected to the ISDN modem and the ISDN wall jack. The ISDN modem will not operate if connected to an analog telephone wall jack. Make sure that the ISDN modem is connected directly into the ISDN wall outlet without connection to any intermediate telephone equipment (an NT1 device is not required with the ISDN modem).

3. Verify that the power cord is connected to the ISDN modem and an electrical outlet.

4. Verify that the correct ISDN telephone number and switch type were configured.

5. Verify that the SPID was configured correctly.

Monitoring LEDs

If you are experiencing operational inconsistencies, monitor the **Test**, **D channel**, and **B channel** LEDs to isolate problems.

Monitoring the Test LED

Press the reset button and observe the Test LED. During power-up self-test, the Test LED flashes.

If the LED goes off, the test has been successful.

If the Test LED flashes and remains lit for more than a few minutes, there is an internal failure. Notify your reseller that the ISDN modem has failed the self-test, and order a replacement.

Monitoring the D channel LED

Observe the D channel LED. If you are connected to a live digital ISDN line, the D channel LED remains lit for up to a few minutes after the self-test and then begins to flash. When the D channel LED flashes, it indicates that the ISDN signal is present and it is attempting to synchronize with the telephone company.

When the D channel LED goes out, it indicates that a valid communication channel has been established and you can place calls. If the D channel LED does not go out, refer to **Evaluating Symptoms and Solutions**.

Monitoring the B Channel

Attempt to place a call and observe the B channel LED(s). The B1 and B2 LEDs flash amber for a voice call or green for a data call during the call establishment phase. They then remain continuously amber or green once the connection is established. If they do not remain continuously amber or green, refer to **Evaluating Symptoms and Solutions**.

Evaluating Symptoms and Solutions

Test LED remains lit

D channel remains lit

D channel continues to flash

B channel LED(s) does not remain green

Calls cannot be placed from the equipment attached to a phone port

A connection has been established, but data cannot be sent

Upon power up, both the Test and D channel LEDs flash

Both B1 and B2 flash when the D channel lights

Two simultaneous voice calls cannot be placed

TEST LED remains lit for more than a few minutes

There has probably been an internal failure. Notify your reseller or 3Com Technical Support that the ISDN modem has failed the self-test and order a replacement.

D channel LED remains lit for more than a few minutes

There may be a poor physical connection to the local telephone company.   If the telephone wires at your site appear to be satisfactory, call your local telephone company for repair of telephone company equipment and troubleshooting assistance.

D channel LED continues to flash for more than a few minutes

If the D channel LED continues to flash for more than a few minutes, there is probably a mismatch between the settings of the ISDN line and the ISDN modem configuration.

Verify the telephone number and SPID (if required). If the D channel LED continues to flash, call your telephone company to verify the SPID and telephone number and ensure that the telephone company has configured the ISDN line properly (refer to Appendix A of the *3ComImpact IQ User Guide*).

B channel LED(s) does not remain green

If you are unable to establish a data call, the cause may be one of the following:

- There may be a problem with your computer's application software. Carefully monitor the B1 and B2 LEDs while attempting a call. These LEDs flash during call establishment and then remain green once the connection is established. If neither LED flashes, ensure that your computer is turned on and operational, and that your application software has sent an AT dial command in the proper format.

- The local or toll telephone company may be incompatible. Contact your local telephone company and have it verify that you can dial a data call to the destination telephone number.

Calls cannot be placed from analog equipment

If you cannot place a call from an analog device, the cause may be one of the following:

- There may be a problem with the configuration of your ISDN line. Call the telephone company and have it verify that your line is configured for circuit-switched voice and data service.

- Calls from that analog port may be blocked. From the Configuration window, check the Phone Port 1 and Phone Port 2 boxes which are used for voice call routing. Ensure that the correct Phone Port box for that port is checked.

A connection has been established, but data cannot be sent

If you are able to establish a data call, that is, the B1 or B2 green LED remains lit and you receive a CONNECT message, but you cannot send data, there may be an interoperability mismatch between the local and remote applications. Make sure that the local and remote data applications have communications capability and are properly configured.

Upon power up, both the TEST and D channel LEDs flash

A previous firmware download probably did not complete successfully. Download the firmware. Refer to the readme file for firmware download instructions.

Both B1 and B2 flash when the D channel lights

The ISDN modem baud rate is set to 230.4 Kbps. Ensure that your computer's COM port supports 230.4 Kbps or change the COM port setting of either your computer or the ISDN modem so that both devices are set to the same COM port rate.

Cannot place two simultaneous voice calls

Your ISDN line may only have one telephone number. Your ISDN line must have two telephone numbers to allow both analog phone ports to be used simultaneously. Check your ISDN line configuration. If you have only one telephone number, you will need a second telephone number for your ISDN line to allow two simultaneous voice calls.

Also, if you have two telephone numbers for your ISDN line and you are using one of the B channels for a data call, you will only have one voice port available.

AT Commands

Using AT Commands

AT Commands supported

Using AT Commands

Most communications software supports an AT command line initialization string. The initialization string sets up the ISDN modem to negotiate and connect with a remote modem. Before dialing, the software sends the initialization string to the ISDN modem. The communications software or server stores the initialization string and uses it each time it dials. An initialization string is usually not necessary with the ISDN modem. If an initialization string is required by the communications software or server, use the Hayes default initialization string.

Software that communicates using AT commands is required to control the ISDN modem. You can enter these codes manually. However, they are often entered automatically by modem communications software.

To use AT commands

1. Launch your communications software. Be sure your communications software is in terminal mode.

2. The ISDN modem must be in command mode (sometimes called local mode or terminal mode) so that it interprets your commands. When your computer is powered on, the ISDN modem automatically starts in command mode. If you have recently used the ISDN modem to make a call and have not yet disconnected, type +++ to switch to command mode.

3. Type:

AT <commands> [Enter]

An AT command line starts with the characters AT. The command line can accept up to 40 command characters in the line (not including the two AT characters, spaces, or [Enter]).

After completing its tasks, the ISDN modem sends a message to the screen.

AT Commands Supported

The following AT commands are supported by the ISDN modem.

A   **Answers incoming call**

%C   **Compression**

&C   **Serial port CD control**

D   **Dials an outgoing 56/64 Kbps**

DD   **Dials an outgoing switched 56 Kbps permissive connection**

&D   **DTR Control**

E   **AT command echo**

&F   **Restore factory defaults**

H   **Hang up**

I   **Identification**

O   **Enter connect state**

Q   **Result code control**

\Q   **Serial port flow control**

%R   **Read all S registers**

%S   **Serial number**

Sn?   **Read configuration register**

Sn=   **Write configuration register**

\S   **Read on-line settings**

\T   **Link inactivity timer**

V   **Result code format**

W   **Displays connection speed**

&W   **Stores configuration**

Z   **Reset**

+++   **Enter command state**

$B   **Set baud rate**

%V   **Show version number**

AT Command A

Example: AT A

Description: Answers an incoming data call.

AT Command %C

Example: AT %C2

Description: When enabled, compresses data to improve data transfer times using the Stac compression method. The following check modes are negotiable—None, One Byte Sequence Number, and Expanded. Expanded is the preferred choice.

%C2 enables compression (default).

%C0 disables compression.

AT Command &C

Example: AT &C2

Description: Serial port CD control.

&C0 forces CD to remain on at all times.

&C1 forces CD to follow the state of carrier from the remote system. CD turns on after CONNECT message is sent to host (default).

&C2 forces CD to remain on except temporarily after disconnect.

AT Command D

Example: ATD5551234

Description: Dials an outgoing 56/64 Kbps circuit-switched digital connection.

AT Command DD

Example: ATDD5551234

Description: Dials an outgoing switched 56 permissive connection.

AT Command &D

Example: AT &D0

Description: DTR control

&D0 causes ISDN modem to ignore DTR from host.

&D1 causes ISDN modem to enter command state on detecting on-off transition of DTR.

&D2 causes ISDN modem to hang up current calls upon on-off transition of DTR and prepares serial port to accept AT command at any speed (default).

AT Command E

Example: AT E0

Description: AT command echo

E0 disables the echo of AT commands back to the host computer.

E1 enables the echo of AT commands to the host computer (default).

AT Command &F

Example: AT &F

Description: Restores all factory default settings.

AT Command H

Example: AT H

Description: Hangs up the current connections.

AT Command I

Example: AT I0

Description:

I0 displays the model number.

I1 displays the flash memory checksum.

I2 computes and compares the flash memory checksum to a prestored value.

I3 displays the product name and release number.

AT Command O

Example: AT O

Description: Causes the ISDN modem to go out of command mode into on-line mode.

AT Command Q

Example: AT Q0

Description: Result code control

Q0 enables the output of result codes (default).

Q1 disables the output of result codes.

Q2 disables the output of result codes in answer mode only.

AT Command \Q

Example: AT \Q1

Description: Serial port flow control

\Q0 disables flow control.

\Q1 enables bidirectional XON/XOFF software flow control.

\Q3 enables bidirectional RTS/CTS hardware flow control (default).

AT Command %R

Example: AT %R

Description: Provides an output list of all S registers.

AT Command %S

Example: AT %S

Description: Displays ISDN modem's serial number.

AT Command Sn?

Example: AT S60?

Description: Reads a specific S register setting.

AT Command Sn=

Example: AT S60=64

Description: Writes to a specific S register.

AT Command \S

Example: AT \S

Description: Reads the status of any parameters that have been modified through AT commands and provides call status information.

AT Command \T

Example: AT \T1

Description: Link inactivity timer

\T0 disables inactivity timer (default).

\Tn link inactivity timer in minutes. The ISDN modem automatically disconnects the call if no activity is sensed within n (n = 0–255) minutes.

AT Command V

Example: AT V0

Description: Result code format

V0 enables short form result codes.

V1 enables long form result codes (default).

AT Command W

Example: AT W1

Description: Displays connection speed

W0 displays COM port rate only (default)
W1 displays COM port rate and ISDN data rate
W2 displays ISDN data rate only

AT Command &W

Example: AT &W

Description: Stores the configuration of all S registers that are not part of the ISDN   modem initial configuration set.

AT Command Z

Example: AT Z

Description: Disconnects all calls in progress and performs a complete ISDN   modem system reset.

AT Command +++

Description: Causes ISDN   modem to enter the command state if it is currently in the on-line state.

AT Command $B

Example: AT $B 115200 (to set a specific rate)
AT $B0 (to enable autobaud)

Description: Set baud rate

0 — Autobaud up to 115200 bps (default).

Other settings are 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, and 230400.

AT Command %V

Example: AT %V

Description: Displays ISDN   modem firmware version.

S Registers

The following S registers are supported by the ISDN modem.

S0	**Auto Answer**
S50*	**ISDN Switch Signaling Type**
S51*	**Phone #1**
S52*	**Phone #1 Service Profile ID (SPID)**
S53*	**Phone #2** (if required by ISDN service provider)
S54*	**Phone #2 SPID** (if required by ISDN service provider)
S55	**Terminal Endpoint Identifier (TEI) 1**
S56	**TEI 2**
S57	**Terminal Initialization State (SPID 1)**
S58	**Terminal Initialization State (SPID 2)**
S59	**U interface status**
S60*	**B Channel Data Rate**
S61	**Outgoing Call Type**
S63*	**Voice Call Routing**
S65	**ISDN Caller ID for voice calls for phone port 1**
S66	**ISDN Caller ID for voice calls for phone port 2**
S67	**ISDN Caller ID for data calls**
S70*	**Dynamic Bandwidth Allocation (DBA)**
S71	**B Channel Protocol**
S73	**V.120 Frame Type**
S74	**V.120 Maximum Frame Size**
S75	**Connection Delay**
S80*	**Multilink PPP**
S82*	**Multilink PPP Endpoint Identifier Class**
S83*	**Multilink PPP Endpoint Identifier**
S84	**Challenge Handshake Authentication Protocol**

NOTE: The values of these S registers are stored in non-volatile memory and will not be cleared or returned to the default value if the ISDN modem is powered down.

S0   Auto Answer

Incoming call is automatically answered.

0 — Disabled (default)

x — Enter the number of rings before the ISDN modem automatically answers the call.

S50   ISDN Switch Signaling Type

Defines the ISDN Switch Signaling Type

0 — Unknown (default)

1 — AT&T 5ESS Custom

3 — NI-1/AT&T 5ESS

6 — NI-1/NTI DMS 100 or Siemens EWSD

S51 Phone #1

Enter the value of Phone #1

S52 Phone #1 Service Profile ID (SPID)

Enter the value of Phone #1 Service Profile ID (SPID)

S53   Phone #2 (if required by ISDN service provider)

Enter the value of Phone #2 (if required by your carrier)

S54   Phone #2 SPID (if required by ISDN service provider)

Enter the value of Phone #2 Service Profile ID (SPID) (if required by your carrier)

S55 Terminal Endpoint Identifier (TEI) 1

Stores the first TEI assigned by the switch. A value of 255 indicates no TEI has been assigned. This field is read-only.

S56 TEI 2

Stores the second TEI assigned by the second telephone number assigned to your ISDN line. A value of 255 indicates no TEI has been assigned. This field is read-only.

S57   Terminal Initialization State (SPID 1)

Indicates the status of the first TEI using SPID 1. This field is read-only.

0 — ISDN   modem has not attempted initialization

1 — ISDN   modem has initialized successfully using SPID 1

2 — ISDN   modem has failed initialization using SPID 1

S58   Terminal Initialization State (SPID 2)

Indicates the status of the second TEI using SPID 2. This information is provided only if your carrier requires a second directory number. This field is read-only.

0 — ISDN   modem has not attempted initialization

1 — ISDN   modem has initialized successfully using SPID 2

2 — ISDN   modem has failed initialization using SPID 2

S59   U interface status

This field is read-only.

0 — ISDN U interface is not synchronized with the switch

1 — ISDN U interface is synchronized and ready

S60   B Channel Data Rate

Select the B Channel Data Rate

56 — 56 Kbps (default)

64 — 64 Kbps

S61   Outgoing Call Type

Select the Outgoing Call Type

0 — Follow dial modifiers (default)

1 — Switched 56 Permissive

2 — ISDN

S63   Voice Call Routing

Voice Call Routing

0 — Calls to either analog port are blocked

  1 — Phone #1 to Phone port 1 only; Phone #2 calls blocked

  2 — Phone #1 to Phone port 2 only; Phone #2 calls blocked

  3 — Phone #1 to Phone port 1 or 2 ; Phone #2 calls blocked

  4 — Phone #1 calls blocked; Phone #2 to Phone port 1 only

  5 — Phone #1 to Phone port 1 only; Phone #2 to Phone port 1 only

  6 — Phone #1 to Phone port 2 only; Phone #2 to Phone port 1 only

  7 — Phone #1 to Phone port 1 or 2; Phone #2 to Phone port 1 only

  8 — Phone #1 calls blocked; Phone #2 to Phone port 2 only

  9 — Phone #1 to Phone port 1only; Phone #2 to Phone port 2 only

10 — Phone #1 to Phone port 2 only; Phone #2 to Phone port 2 only

11 — Phone #1 to Phone port 1 or 2; Phone #2 Phone port 2 only

12 — Phone #1 calls blocked; Phone #2 to Phone port 1 or 2

13 — Phone #1 to Phone port 1only; Phone #2 to Phone port 1 or 2

14 — Phone #1 to Phone port 2 only; Phone #2 to Phone port 1 or 2

15 — Phone #1 to Phone port 1 or 2; Phone #2 to Phone port 1 or 2 (default)

S65   ISDN Caller ID for voice calls for phone port 1

Displays the phone number of an incoming voice call over phone port 1. This field is read-only.

S66   ISDN Caller ID for voice calls over phone port 2

Displays the phone number of an incoming voice call over phone port 2. This field is read-only.

S67   ISDN Caller ID for data calls

Displays the phone number of an incoming data call. This field is read-only.

S70   Dynamic Bandwidth Allocation (DBA)

Enable or disable Dynamic Bandwidth Allocation.

0 — DBA disabled

1 — DBA enabled (default)

S71   B Channel Protocol

Select the B Channel Protocol.

0 — QuickSelect (default)

1 — Async-Sync PPP conversion

2 — V.120

S73   V.120 Frame Type

Select the V.120 Frame Type.

0 — I frame (default)

1 — UI frame

S74   V.120 Maximum Frame Size

Select the V.120 Maximum Frame Size (range 240–256).

256 — Maximum frame size of 256 is used (default)

248 — Maximum frame size of 248 is used (for AdTran compatibility, use 253)

S75 Connection Delay

Specifies whether the ISDN   modem immediately answers a call or waits 2 seconds to answer. If you are running Windows NT, you should enable the 2 second delay by sending the command ATS75=1.

0 — No delay   (default)

1 — 2 second delay

S80   Multilink PPP

Enable or disable Multilink PPP

0 — Disable

1 — Enable (default)

S82   Multilink PPP Endpoint Identifier Class

If required, this information is provided by your Internet service provider.

1 — Locally Assigned Address

2 — Internet Protocol (IP) Address

3 — IEEE 802.1 Globally Assigned MAC Address

4 — PPP Magic-Number Block

5 — Public Switched Network Directory Number (default)

S83   Multilink PPP Endpoint Identifier

If required, this information is provided by your Internet service provider. By default, telephone number 1 is sent because the endpoint identifier class is 5. If your endpoint identifier class is not 5, obtain the identifier from your service provider and enter that information in this register.

S84   Challenge Handshake Authentication Protocol

0 — Enabled

1 — Disabled (default)

Result Codes

The following result codes are displayed by the ISDN modem.

Short Form	Long Form
0	**OK**
2	**RING**
3	**NO CARRIER**
4	**ERROR**
6	**NO DIALTONE**
7	**BUSY**
5	**CONNECT 1200**
10	**CONNECT 2400**
11	**CONNECT 4800**
12	**CONNECT 9600**
13	**CONNECT 7200**
14	**CONNECT 12000**
15	**CONNECT 14400**
16	**CONNECT 19200**
17	**CONNECT 38400**
18	**CONNECT 57600**
19	**CONNECT 115200**
20	**CONNECT 230400**
56	**CARRIER 56000**
57	**CARRIER 56000P**
64	**CARRIER 64000**

OK

Indicates that the most recent command or action was successfully completed.

RING

Indicates that an incoming call is present and no AT Answer command is outstanding.

NO CARRIER

Indicates that the most recent call attempts did not establish a call or that the physical ISDN interface is not operational.

ERROR

Indicates that the most recent command or action was not successfully completed.

NO DIALTONE

Indicates the ISDN line is either down or not initialized.

BUSY

Indicates that the most recent call attempt did not connect because the remote destination was busy.

CONNECT 1200

Indicates 1200 bps serial port connection.

CONNECT 2400

Indicates 2400 bps serial port connection.

CONNECT 4800

Indicates 4800 bps serial port connection.

CONNECT 9600

Indicates 9600 bps serial port connection.

CONNECT 7200

Indicates 7200 bps serial port connection.

CONNECT 12000

Indicates 12000 bps serial port connection.

CONNECT 14400

Indicates 14400 bps serial port connection.

CONNECT 19200

Indicates 19200 bps serial port connection.

CONNECT 38400

Indicates 38400 bps serial port connection.

CONNECT 57600

Indicates 57600 bps serial port connection.

CONNECT 115200

Indicates 115200 bps serial port connection.

CONNECT 230400

Indicates 230400 bps serial port connection.

CARRIER 56000

Indicates 56000 bps ISDN modem connection.

CARRIER 56000P

Indicates 56000 bps permissive ISDN modem connection.

CARRIER 64000

Indicates 64000 bps ISDN modem connection.

Technical Support

Contacting Technical Support

On-line Technical Services

Returning Products for Repair

On-line Technical Services

3Com Bulletin Board System

3Com World Wide Web Site

3Com FTP Site

3ComFacts

3ComForum on CompuServe

Contacting Technical Support

If you have gone through the troubleshooting tips and still have not been able to resolve the problem, contact 3Com Technical Support. In the U.S. and Canada, call (800) 876 3266.

When you call, please have the following information available:

- The serial number of your ISDN modem

- A list of symptoms including any LED status information computer display status

- The type of application software you are running and the version number

Returning Products for Repair

A product sent directly to 3Com for repair must first be assigned a Return Materials Authorization (RMA) number. A product sent to 3Com without an RMA number will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call   (800) 876 3266.

3Com Bulletin Board Service

Digital: (408) 654 2703   Analog: (408) 980 8204

3ComBBS contains patches, software, and drivers for 3Com products. This service is available seven days a week, 24 hours a day.

3Com FTP site

ftp.3Com.com

3Com FTP contains patches, software, and drivers for 3Com products. This service is available seven days a week, 24 hours a day.

World Wide Web Site

http://www.3Com.com/

This service features news and information about 3Com products, customer service and support, 3Com's latest news releases, selected articles from 3TECH™ (3Com's award-winning technical journal) and more.

3ComForum on CompuServe

3ComForum is a CompuServe-based service containing patches, software, drivers, and technical articles, as well as a messaging section for peer support.To use 3ComForum, you need a CompuServe account.

To use 3ComForum:

1. Log on to CompuServe.

2. Type go threecom.

3. Press [Return] to see the 3ComForum main menu.

3ComFacts Automated Fax Service

(408) 727 7021   (analog)

3Com Corporation's interactive fax service, 3ComFacts, provides data sheets, technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, seven days a week.