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INTRODUCTION

About Your 3Com U.S. Robotics ISDN Terminal Adapter

This 3Com U.S. Robotics ISDN Terminal Adapter allows you to take advantage of Integrated Services Digital Network, a much faster way to connect to the Internet, corporate networks, or other online services. An ISDN line can carry data, voice, and video transmissions at the same time over a single line and support multiple devices on that line.

Accordingly, an ISDN line can be used for all of your communications needs. Using your 3Com U.S. Robotics ISDN Terminal Adapter (ISDN TA), you can make or receive regular telephone calls even while you are connected to the Internet or another online service. And using other analog devices, such as your fax machine, while you are online is just as easy.

Not only are ISDN connections convenient, but they are also fast – more than twice as fast as your analog modem connection. Your ISDN TA transmits data at speeds of up to 128 Kbps with the highest reliability and error-free performance possible. With compression and a high-speed serial port, it can reach transmission speeds of up to 230.4 Kbps. And using USB, these speeds can be even higher.

ISDN TA Features

Your 3Com U.S. Robotics ISDN TA features the following.

Easy Installation and Use

- AutoSPID enables the ISDN TA to download Service Profile ID and telephone number information from the ISDN line (if available).
- SPID Wizard automatically configures your telephone company switch information and Service Profile ID numbers.
- ControlCenter, an easy-to-use graphical interface, can be used to configure the ISDN TA's parameters.
- QuickSelect™ protocol detection discerns the protocol, such as V.120 or PPP, being used by an incoming data transmission and adapts to that protocol.
- Bellcore National ISDN Ordering Codes support makes ordering a variety of feature-rich ISDN services easier.
- Plug-and-Play installation.

High Performance

- Stac™, Ascend™, and Microsoft™ compression.
- An asynchronous RS-232 data port for connecting to your computer at speeds of up to 230.4 Kbps.
- A 12 Mbps Universal Serial Bus (USB) port.

Protocols

- Multilink PPP (RFC 1990).
- PPP (RFC 1661).
- Always On/Dynamic ISDN (AO/DI).
- V.120 rate adaptation.
- Asynchronous 128K (3Com proprietary).
- Advanced Asynchronous 128K (3Com proprietary).

ISDN Standards and Interface

- Complete digital network termination (Basic Rate ISDN U interface with built-in NT1).
- Compatible with Lucent, Northern Telecom, and Siemens switches.

Security

- Password Authentication Protocol (PAP) and Challenge Handshake Protocol (CHAP) support on both single-channel and Multilink PPP calls.
- Microsoft Encrypted Password (MS-CHAP) support.
- ISDN Call Logging displays the five latest outgoing and incoming phone numbers dialed for both voice and data calls.

Voice Features

- Dynamic Voice Override allows you to place or receive voice calls while a Multilink PPP or Advanced Asynchronous 128 K transmission is active.
- Two analog ports for attaching telephone equipment, such as touch-tone telephones, fax machines, or analog modems, to the ISDN line.
- Support for a variety of supplementary voice services, such as Call Waiting, Call Forwarding, Caller ID, three-way conference calling options, and message waiting indicator.

Cost Saving Features

- Dynamic Bandwidth Allocation manages the data flow on your ISDN line's B-channels.
- Always On/Dynamic ISDN optimizes the use of your ISDN line by taking better advantage of your ISDN line's D-channel.
- TollMizer™ places data calls over a voice connection saving you the additional charge for a data call.

Upgradability

- Instant Update automatically downloads updated versions of your ISDN TA's code.

Diagnostics

- ISDN Signaling Protocol Decode.
- PPP Protocol Decode.

Warranty

- Five-year limited warranty.

Package Contents

Make sure your ISDN TA's package contains:

- 3Com U. S. Robotics ISDN Terminal Adapter
- Power cable with an AC wall adapter
- ISDN telephone cable
- USB cable
- Set of rubber feet
- *3Com U. S. Robotics ISDN Connections*[™] CD-ROM

Before You Install

To install your ISDN TA, you must have:

- ISDN service at your location. See the chapter "[Ordering ISDN Service](#)," for more information.
- An available RJ-45 or RJ-11 outlet.
- ISDN configuration information supplied by your telephone company when you order ISDN service.
- A computer that meets the system requirements described in the next section, "System Requirements."
- For IBM-compatible PC users, a straight-through RS-232 modem serial cable with one 25-pin male end and one end to match the female serial port on your computer. Or a computer that supports USB.

See the chapter "[Installing Your ISDN TA](#)," for more information about your serial cable.

- For Macintosh users, a serial cable with one 25-pin male end and one mini DIN eight-pin male serial cable. Or a computer that supports USB.

System Requirements for *Connections* CD-ROM

Note: Your ISDN TA will work with any computer that supports modem-type equipment using a serial connection. The system requirements below apply only to the software available on the *Connections* CD-ROM that came with your ISDN TA.

An IBM-compatible PC must have:

- 486 DX or Pentium® processor
- Windows® 95, 98, or NT (Windows 98 with Service Pack 1 is required to use USB.)
- 8 MB RAM
- 2 MB hard drive space (plus space for a Web browser if you don't already have one installed)
- Double-speed CD-ROM drive
- Available serial or USB port

An Apple® Macintosh® must have:

- 68030 processor (PowerPC® recommended)
- System 7.1 or higher (System 8.1 with System Enabler 1.0 or System 8.5 is required to use USB.)
- 8 MB RAM (16 MB recommended)
- Double-speed CD-ROM drive
- 3 MB hard drive space (plus space for a Web browser if you don't already have one installed)
- An available serial or USB port

INSTALLING YOUR ISDN TA

Familiarizing Yourself with Your ISDN TA

You should take a look at the front and back panels of your ISDN TA before installing it.

Front Panel



Figure 2-1 Front Panel LEDs

- **Alert** – Lights amber when there is an ISDN connection problem.

Blinks amber when code is being updated.

Blinks green when there is voice mail waiting for a telephone connected to the ISDN TA through one of the Analog Device Ports.

This LED is off when the ISDN TA is operating normally.

- **PWR** – Lights green when power is on and remains lighted as long as power is supplied to the unit.
- **B1** – Lights green when there is a data or voice transmission on B-channel 1.
- **B2** – Lights green when there is a data or voice transmission on B-channel 2.
- **SD** – Lights green when information is being transmitted from the computer to the ISDN TA.
- **RD** – Lights green when information is being transmitted from the ISDN TA to the computer.
- **DTR** – Lights green when an application is communicating with your ISDN TA.
- **CD** – Lights green when there is an active data connection between the ISDN TA and a remote site, such as an Internet Service Provider or corporate network. (When CD is lighted but B1 and B2 are not, this typically indicates that a data connection has been established over the ISDN line's D-channel in AO/DI mode.)

Back Panel



Figure 2-2 Back Panel Connectors

- **Power** – Connects the ISDN TA to the power cord and adapter, which deliver 12V DC power
- **Analog Device Ports 1 and 2** – Connect the ISDN TA to two analog devices, such as a telephone or fax machine
- **USB port** – Connects the ISDN TA to your computer’s 12 Mbps USB port (if supported on your system)
- **Config button** – Resets the ISDN TA to its factory default settings
- **RS-232 port** – Connects the ISDN TA to your computer’s serial port at rates of up to 230.4 Kbps
- **ISDN port** – Connects the ISDN TA to your ISDN outlet (like a telephone line’s wall jack)

Connecting Your ISDN TA to Your Computer

Your ISDN TA can be connected to your computer using a serial cable or a USB cable.

Using a Serial Cable

The serial port on your ISDN TA is shown in the illustration of the back panel above. It is labeled “RS-232.” You must provide the serial cable.

If you are using a Macintosh, you will need a serial cable with one 25-pin male end and one mini DIN eight-pin male end.

If you are using an IBM-compatible PC, look at the back of your computer to determine what sort of serial cable you should use.

The serial port on the back of your computer will likely be labeled “COM,” “SERIAL,” “RS-232,” or “10101.” Consult your computer’s manual if you have trouble finding a serial port.

- If the serial port on your IBM-compatible computer has nine pins, you will need a serial cable with one 25-pin male end and one nine-pin female end.
- If the serial port on your IBM-compatible computer has 25 pins, you will need a serial cable with one 25-pin male end and one 25-pin female end.

Caution: Before connecting your ISDN TA, be sure that your computer is turned off.

To install the cable:

- 1 Insert the 25-pin male end of the serial cable into the RS-232 serial port on the back of your ISDN TA, as shown below in Figure 2-3. Then tighten the connector screws.
- 2 Connect the other end of the cable to the serial port you found on the back of your computer. Then tighten the connector screws.

If you are using a Macintosh, the port will be circular and labeled

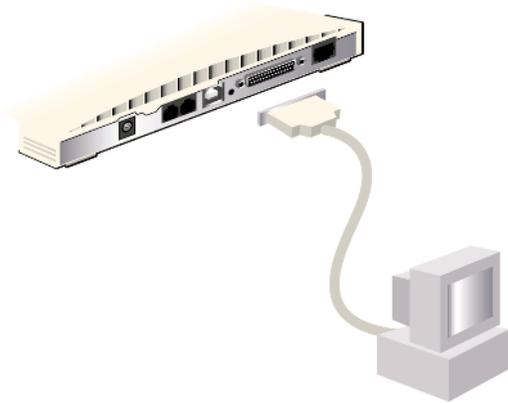


Figure 2-3 Connecting the serial cable

Using a USB Cable

Your ISDN TA came with a USB cable. To connect your ISDN TA to your computer using USB, your computer must use an operating system that supports USB CDC modem devices, such as Windows 98 with Service Pack 1 or later.

The USB port on your computer is labeled “USB” or . It is very narrow and rectangular.

To verify that you are using Windows 98 with Service Pack 1 and that USB is enabled:

- 1 Click Windows **Start**, select **Settings**, and click **Control Panel**.
- 2 Double-click the **System** icon.
- 3 The “System Properties” screen appears.

Your Windows version and service pack version information are listed under “System.”

- 4 Click the **Device Manager** tab.

If “Universal serial bus controller” appears in the list of system devices without any conflict or warning icons, then USB is configured properly.

For further information on how to enable and configure your USB port, consult your computer’s users manual or contact the manufacturer.

To install the USB cable:

- 1** Insert the six-sided end of the USB cable into the USB port on the back of your ISDN TA, as shown in Figure 2-4.
- 2** Insert the rectangular end of the cable into the port labeled “USB” or  on the back of your computer.

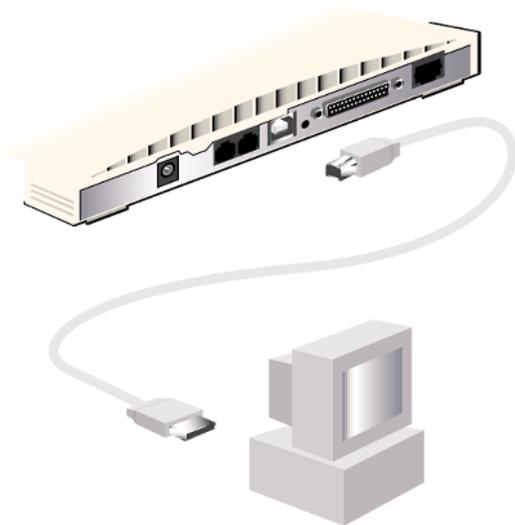


Figure 2-4 Connecting the USB cable

Connecting the ISDN Cable

Your ISDN TA comes with an RJ-45-to-RJ-11 ISDN cable.

Before you connect the cable, notice the difference between its two ends. The RJ-45 end of the cable is larger than the RJ-11 end of the cable.

To install the ISDN cable:

- 1** Connect the RJ-45 end of the ISDN cable that came with your ISDN TA to the ISDN port on the back of your ISDN TA, as shown in Figure 2-5.
- 2** Connect the RJ-11 end of the ISDN cable to the ISDN wall jack.

Caution: Never connect your ISDN TA to a standard analog telephone jack or an external NT1 device.

Note: Your phone company may have installed an RJ-45 wall outlet. The RJ-45-to-RJ-11 that came with your ISDN TA will work with the RJ-11 end plugged into the wall outlet. However, multiple phone lines are not supported through the ISDN interface.



Figure 2-5 Connecting the ISDN cable

Connecting Analog Equipment to Your ISDN TA

You can connect analog equipment (such as a touch-tone phone, answering machine, or fax machine) to your ISDN TA and use them on your ISDN line even while you are online.

Note: To find out how to set up supplementary services for these analog devices (such as Call Waiting or Caller ID), see the chapter [“Voice Features.”](#)

To install an analog device:

- 1** Insert one end of a standard phone cable (RJ-11) into one of the ports on the back of the ISDN TA labeled with the picture of a telephone, as shown in Figure 2-6.

You must provide a standard phone cable (RJ-11) for each analog device you want to install.

- 2** Insert the other end of the phone cable into the appropriate jack on the analog device, as shown in Figure 2-6.
- 3** Repeat steps 1 and 2 to connect another analog device.

Note: Two phone lines are supported through the Analog Device Ports.

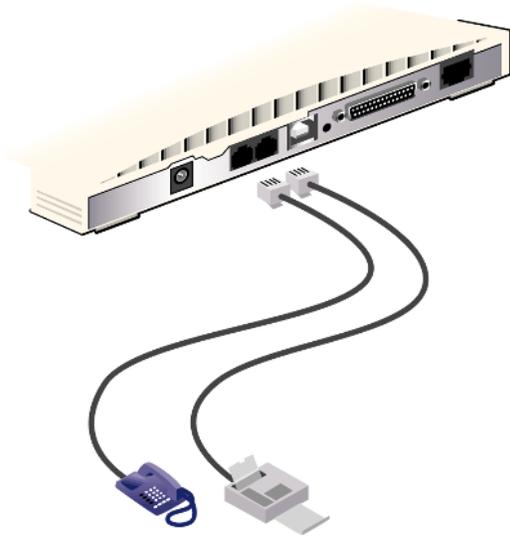


Figure 2-6 Connecting Analog Equipment

Connecting the Power Cable

To install the power cable:

- 1 Connect the power cable that came with your ISDN TA to the power connector on your ISDN TA's back panel, as shown in Figure 2-7.

Note: Use only the power cable with adapter that came with your ISDN TA.

- 2 Connect the transformer end (the end with the adapter block) into a surge protected standard wall outlet.

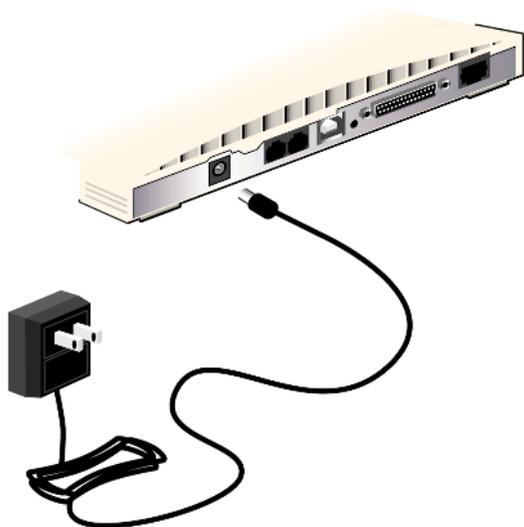


Figure 2-7 Connecting the Power Cable

INSTALLING SOFTWARE FOR YOUR ISDN TA

After Connecting Your ISDN TA

After you install the hardware for your ISDN TA, turn your computer on.

The software installation of your ISDN TA differs slightly, depending upon your operating system. The sections below describe various installations.

Note: To find out what version of Windows you are using, click **Windows Start**, select **Settings**, and click **Control Panel**. Then click the **System** icon. When the “System Properties” screen appears, click the **General** tab. Your version is listed under “System.”

Windows 95 A

- 1 When your computer starts up, it recognizes your ISDN TA, and the “New Hardware Found” screen appears, as shown in Figure 3-1.



Figure 3-1 “New Hardware Found” Windows 95 A

- 2 Insert the *Connections* CD-ROM that came with your ISDN TA. Then click **Driver from disk provided by hardware manufacturer**.
- 3 When the “Install From Disk” screen appears, click the drop-down menu beneath “Copy manufacturer’s files from.”

Select **D:**. Then click **OK**, as shown in Figure 3-2.

Note: If your CD-ROM drive uses a letter name other than “D,” select that letter instead.

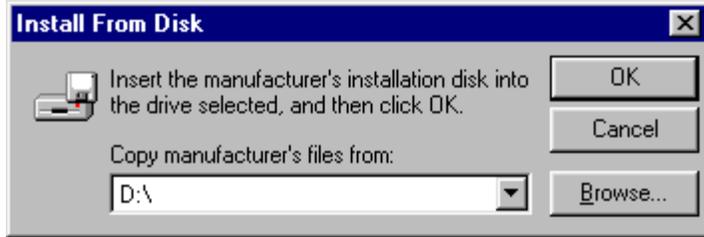


Figure 3-2 “Install From Disk” Windows 95 A

- 4 Windows takes it from there, copying the necessary files to your computer.

Windows 95 B

- 1 When your computer starts up, it recognizes your ISDN TA, and the “Update Device Driver Wizard” appears.
- 2 Insert the *Connections* CD-ROM that came with your ISDN TA. Click **Next**.
- 3 Windows searches your 3.5-inch floppy drive, then your CD-ROM drive for the proper files. When it finds them, they are copied to your computer.
- 4 Click **Finish**.

Windows 98

Note: If you are using USB, your ISDN TA may install transparently, without running the “Add New Hardware Wizard” described below.

- 1 When your computer starts up, it recognizes your ISDN TA, and the “Add New Hardware Wizard” appears.

Click **Next**.
- 2 When the next screen appears, shown in Figure 3-3, select **Search for the best driver for your device**, then click **Next**.



Figure 3-3 Search for best driver

- 3** The screen shown in Figure 3-4 appears. Click the boxes next to **CD-ROM drive** and **Specify a location** to select them.

Insert the *Connections* CD that came with your ISDN TA.

Then click the drop-down menu below “Specify a location” and select the letter name of your CD-ROM drive. Click **Next**.



Figure 3-4 Select location to search

- 4** A screen appears telling you that the drivers have been found. Click **Next**.

When the screen telling you that the drivers have been installed appears, click **Finish**.

Windows NT

- 1 Before you log on, insert the *Connections* CD that came with your ISDN TA.
- 2 Once you log on and Windows finishes starting up, click Windows **Start**, select **Settings**, and click **Control Panel**.

Then double-click the **Modem** icon.

- 3 If you have other modems or ISDN devices installed on your computer, the “Modems Properties” screen appears. Click the **Add** button. When the “Install New Modems” screen appears, click **Next**

If you do not have other modems or ISDN devices installed on your computer, the “Install New Modems” screen appears. Click **Next**.

- 4 Windows detects your ISDN TA but calls it a “Standard Modem.” Click the **Change** button.
- 5 The screen shown in Figure 3-5 appears. Click the **Have Disk** button.

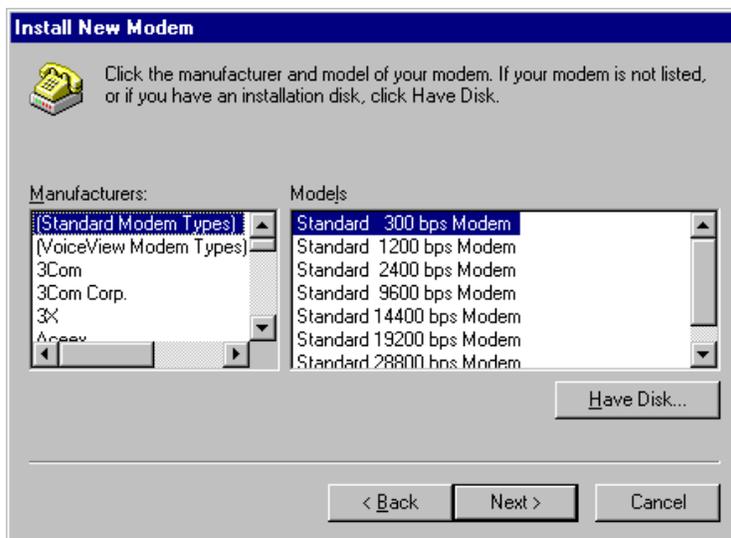


Figure 3-5 “Have Disk” screen

- 6 When the screen shown in Figure 3-6 appears, select **3Com U. S. Robotics ISDN TA EXT** by clicking it. Then click **OK**.

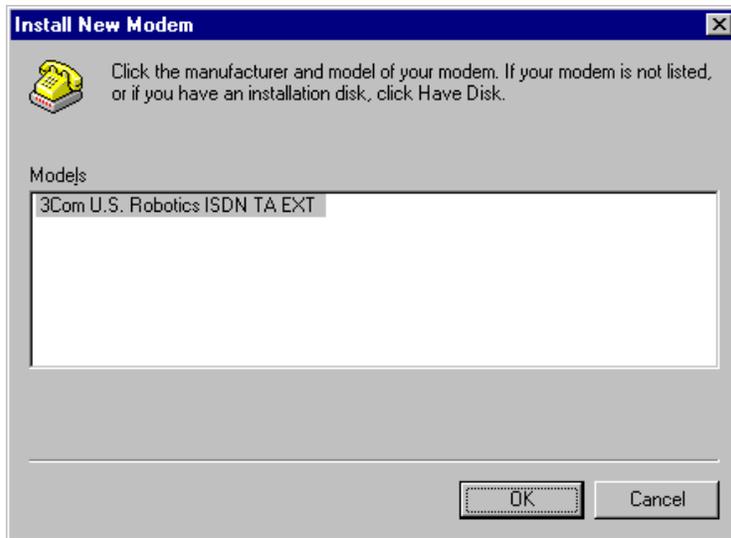


Figure 3-6 Select your ISDN TA

- 7 The first “Install New Modem” screen reappears. Click **Next**.
- 8 Windows copies the files for your ISDN TA to your computer.

Fill out the information requested on the “Location Information” screen, shown in Figure 3-7.

Click **Next**.

Then click **Finish**.

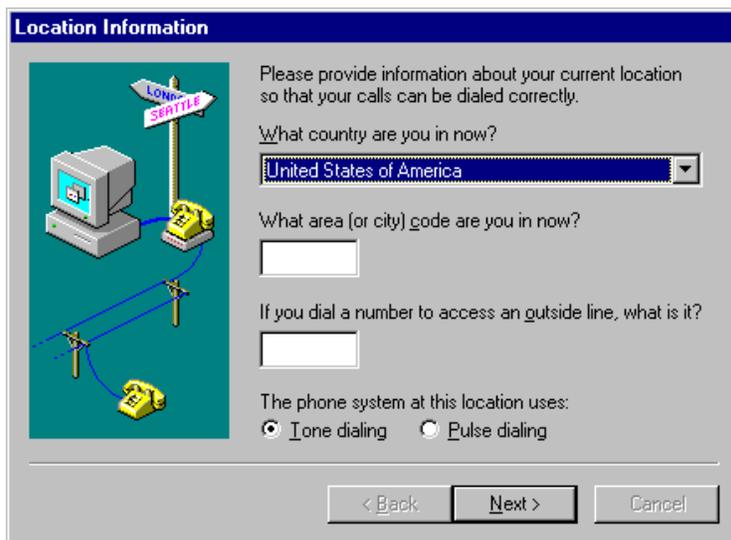


Figure 3-7 “Location Information” screen

Installing ControlCenter

Once the drivers for your ISDN TA are installed, you can install the ControlCenter software.

ControlCenter makes using your ISDN TA easier than ever by allowing you to configure many of its settings with a point-and-click graphical interface.

- 1 Close any open applications.
- 2 Insert the *Connections* CD. If *Connections* is already in your CD-ROM drive, remove it and reinsert it.
- 3 The *Connections* installer starts automatically.

If it does not start, click Windows **Start**, then **Run**. When the “Run” screen appears, type **D:\setup.exe**.

If it does not start and you are using a Macintosh, double-click the icon for your CD-ROM drive on your desktop.

Follow the onscreen instructions to install the *Connections* CD.

- 4 Once the *Connections* CD is installed, the ControlCenter installer starts automatically. When the ControlCenter “Welcome” screen appears, as shown in Figure 3-8, click **Next**.

Note: If you want to reinstall ControlCenter after this initial setup, insert the *Connections* CD. When the introductory *Connections* screen appears, click **Software**. Then click **Productivity & Utilities**, followed by the **ControlCenter** icon. Then follow the onscreen instructions to install ControlCenter.

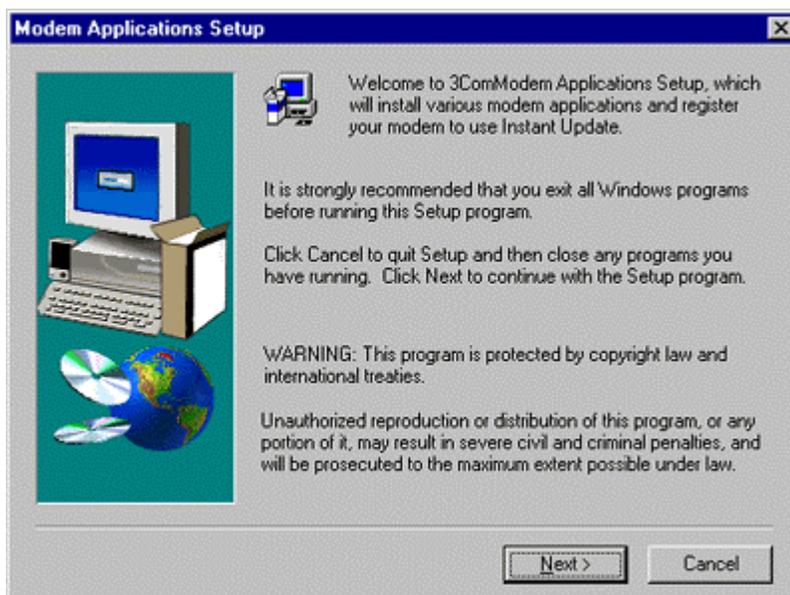


Figure 3-8 ControlCenter “Welcome” screen

- 5 The bottom of the next screen shows you the folder that the ControlCenter software will be installed to, as in Figure 3-9.

To change where ControlCenter will be saved, click **Browse** and select a new location. Be sure to remember where the software is saved.

To accept the default location, click **Next**.

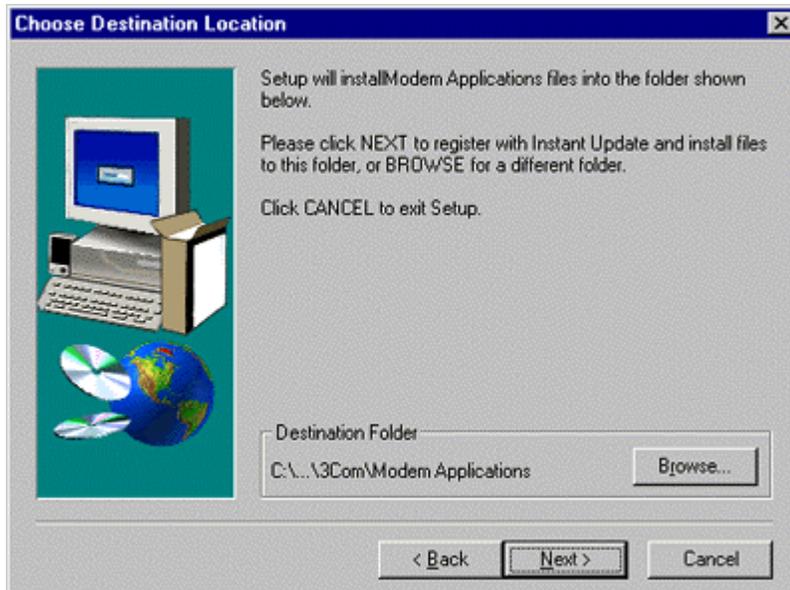


Figure 3-9 “Choose Destination Location” screen

- 6 Once you select where to save the files, you are asked where you want the program icons placed. This decision determines where you will be able to find the program in the Windows Start menu.

If you click **Next**, the icons are placed in a default folder

To choose a different location, click a folder in the “Existing Folders” list to select it, then click **Next**.

- 7 When the “Setup Complete” screen appears, you are given the option of viewing the ControlCenter Readme file and opening the ControlCenter software.

Select the options you want by clicking the box next to the items.

Note: An option is selected if a check mark appears in the box next to it.

Once you have made your selections, click **Finish**.

BASIC CONFIGURATION

Starting ControlCenter for the First Time

When you start the ControlCenter software that came with your ISDN TA, it searches your system for products that it can configure. The products it finds are listed on the left side of ControlCenter's introductory screen.

To configure your ISDN TA, click its icon.

If you are starting ControlCenter for the first time, the software attempts to automatically discern the Service Profile Identifiers (SPIDs) for your ISDN line using AutoSPID.

The SPIDs are strings of characters that identify the capabilities of your ISDN TA and line.

AutoSPID also attempts to discern the telephone numbers for your line. These numbers may also be known as Directory Numbers or DNs.

A person trying to connect to your ISDN TA to transfer data or make a call to an analog device on your ISDN line dials a one of these telephone numbers.

- If AutoSPID is successful, you are ready to make a connection using your ISDN TA. No other configuration may be necessary.
- If AutoSPID is unsuccessful (It only works with certain types of telephone company equipment.), ControlCenter's SPID Wizard, shown in Figure 4-1, appears asking you to enter your area code and the telephone numbers for your ISDN line.

The telephone numbers are provided by your telephone company when you order your ISDN service.

Once you enter the appropriate area code and telephone number information, click **Next**. The SPID Wizard then uses the information provided to discern your SPIDs.

The SPID Wizard checks that you are using the appropriate SPIDs and telephone numbers every time you open ControlCenter. It appears, as it did in this case, when it detects incorrect SPID or telephone number information.

You can also force the SPID Wizard to run at any time by clicking the **SPID Wizard** icon on the left side of the ControlCenter screen.

At this point, you are ready to make a connection using your ISDN TA. No other configuration may be necessary. Go to the chapter [“Getting Online with Your ISDN TA”](#) to set up a connection.

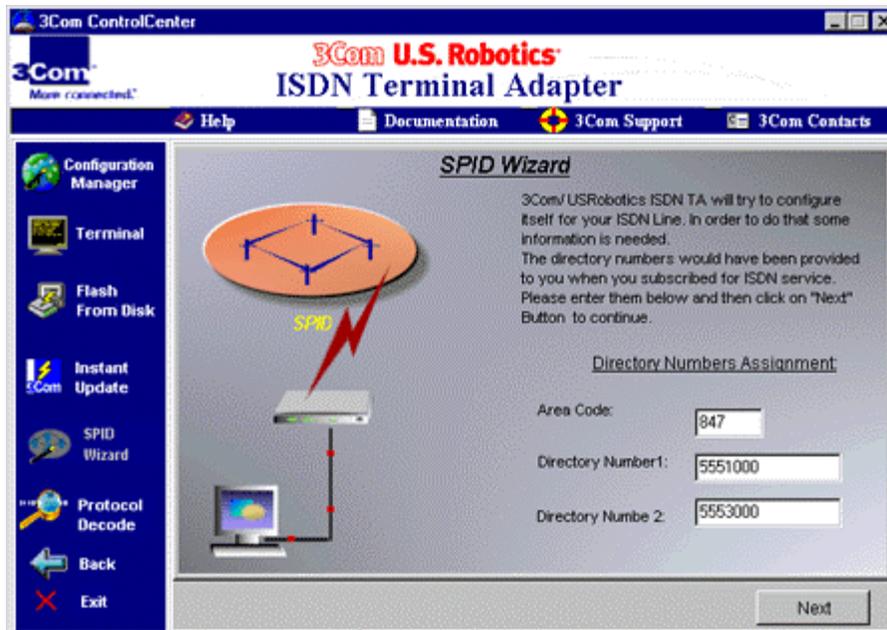


Figure 4-1 ControlCenter SPID Wizard

Basic Data and Voice Settings

After you set the SPIDs and telephone numbers as described above, the basic voice and data settings for your ISDN TA's can be adjusted.

Note: The settings described in this section have established defaults that appear in ControlCenter. Changing these defaults could alter your ISDN TA's performance.

Changing the Protocol used for Outgoing Calls

To change the protocol your ISDN TA uses to make outgoing calls:

- 1 Click the **Configuration Manager** icon on the left side of the ControlCenter screen. The screen shown in Figure 4-2 appears.

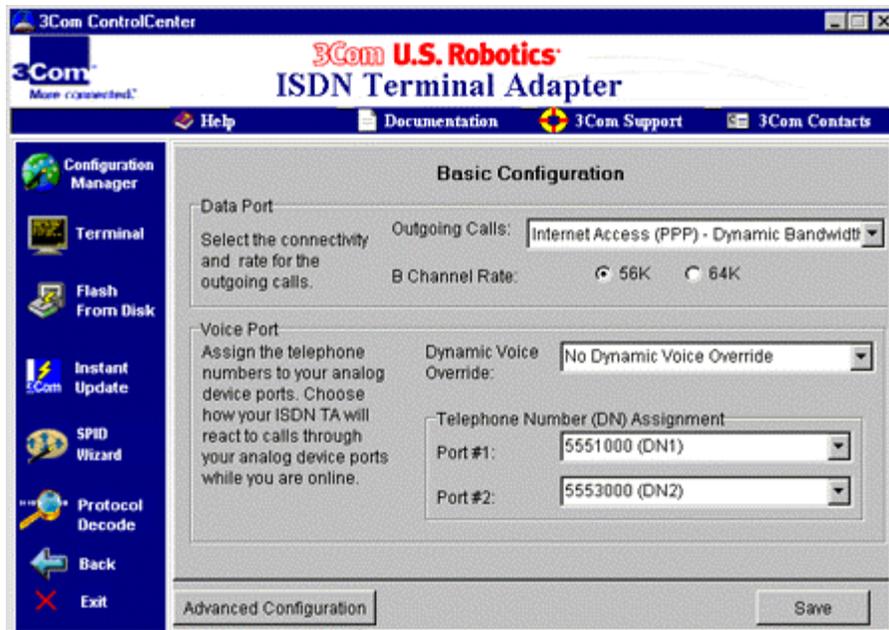


Figure 4-2 ControlCenter port setting configuration screen

2 To change the basic data settings, click the **Outgoing Calls** drop-down menu in the “Data Port” section. Options in this menu include:

- **Internet Access (PPP) Dynamic Bandwidth (DBA)** – This is the default setting. It allows your ISDN TA to use both B-channels to achieve speeds of up to 128 Kbps.

It also saves you money by automatically dropping the second B-channel whenever it is not need based on data flow. See the “[Advanced Configuration](#)” chapter for more information on configuring Dynamic Bandwidth Allocation.

- **Internet Access (PPP) 64 Kbps** – Using this setting, your ISDN TA transmits data on only one B-channel.
- **Internet Access (PPP) 128 Kbps** – Using this setting, your ISDN TA transmits data on both B-channels. It does not use Dynamic Bandwidth Allocation, but you can use analog devices connected to your ISDN TA.

Note: The second B-channel stays connected at all times.

- **V.120 Rate Adaption** – V.120 is a standard for passing asynchronous data on the ISDN B-channels, which are inherently synchronous. It is typically used when your computer will be communicating with another computer rather than with an Internet Service Provider.
- **Asynchronous 128K** – This is a 3Com U. S. Robotics proprietary channel aggregation method for achieving speeds of up to 128 Kbps.

Asynchronous 128 Kbps does **not** require PPP software or a network protocol on your computer.

However, it does require that the device you are connecting to use the same protocol.

- **Advanced Asynchronous 128K** – This is a 3Com U. S. Robotics proprietary channel aggregation method for achieving speeds of up to 128 Kbps.

Using Dynamic Bandwidth Allocation, Advanced Asynchronous 128K can manage the use of your ISDN line's B-channels, dropping a channel whenever it is not needed based on data flow.

Advanced Asynchronous 128K does **not** require PPP software or a network protocol on your computer. However, it does require that the device you are connecting to use the same protocol.

Setting Dynamic Voice Override

Dynamic Voice Override manages calls to analog devices on your ISDN line when your data connection is active.

- For outgoing calls, Dynamic Voice Override drops the traffic on one of the engaged B-channels any time you initiate a call using an analog device connected to your ISDN TA.

The data transmission continues on the other B-channel, and you can place your analog call.

When you hang up, the B-channel that was dropped automatically resumes the data transmission along with the other B-channel.

Note: Using AO/DI, you can use devices on both your Analog Device Ports at the same time and still maintain your data transmission. For more information on AO/DI, see the “[Advanced Configuration](#)” chapter.

- For incoming calls, Dynamic Voice Override causes the phone or fax machine connected to your ISDN TA to ring.

If you pick up the phone or if the fax machine accepts the call, the call is connected. The data transmission is dropped on one B-channel but continues on the other.

Note: Dynamic Voice Override for incoming calls must be supported by your ISDN line. For more information on ISDN service, see the chapter “[Ordering ISDN Service.](#)”

To adjust the Dynamic Voice Override setting:

- 1** Click the **Configuration Manager** icon on the left side of the ControlCenter screen.

- 2** Then click the **Dynamic Voice Override** drop-down menu in the “Voice Port” section.
- 3** Select **Outgoing Calls only, Incoming Calls only, Incoming and Outgoing Calls**, or **No Dynamic Voice Override**.

Setting the B-Channel Rate

Your ISDN B-channels are capable of either 56 Kbps or 64 Kbps, depending upon the way your call is routed by the telephone company.

To set your line speed:

- 1** Click the **Configuration Manager** icon on the left side of the ControlCenter screen.
- 2** In the “Data Port” section, click **56K** or **64K**.

Assigning Phone Numbers for the Analog Device Ports

The Analog Device Ports on the back of your ISDN TA can be set to receive calls to either of your ISDN line’s telephone numbers. The device will ring whenever the telephone number assigned to the port that it is plugged into is dialed.

You can also disable incoming calls to the Analog Device Ports.

To adjust your Analog Device Ports’ settings:

- 1** Click the **Configuration Manager** icon on the left side of the ControlCenter screen.
- 2** Find “Telephone Number Assignment” in the “Voice Port” section. The “Port #1” and “Port #2” drop-down menus represent the Analog Device Ports on the back of your ISDN TA.
- 3** By default, “Port #1” and “Port #2” each already have a telephone numbers assigned.
 - To change this telephone number, click the drop-down menu of the port and click the telephone number that you want assigned to that port.
 - To disable incoming calls to the Analog Device Port, click the drop-down menu of the port, then click **Disable Incoming Calls**.

ADVANCED CONFIGURATION

Changing the Data Protocols Used by Your ISDN TA

To change the data protocols used by your ISDN TA, open ControlCenter.

Click the **Configuration Manager** icon, followed by the **Advanced Configuration** button. Then click the **Data** tab.

ControlCenter's "Data" tab, shown in Figure 5-1, has two sections, "Incoming Calls" and "Outgoing Calls."

Remember: The settings in this section affect only data calls. They do not affect calls to your ISDN TA's Analog Device Ports.



Figure 5-1 ControlCenter "Data" tab

Incoming Data Calls

To set the options in the "Incoming Calls" section:

- 1 Click the **Incoming Call Protocol** drop-down menu. Then click one of the options to select what sort of calls your ISDN line will accept.

Note: When set to a protocol, your ISDN TA will accept **only** calls made using that protocol.

Options include:

- **Automatic Protocol Detect** – This is the default setting. Using this setting, your ISDN TA discerns the protocol being used by an incoming data transmission and adapts to that protocol.

- **V.120 Rate Adaption** – V.120 is a standard for passing asynchronous data on the ISDN B-channels, which are inherently synchronous. It is typically used when your computer communicates with another computer rather than with an Internet Service Provider.
- **Internet Access (PPP)** –Using this setting, your ISDN TA will accept calls that use PPP.
- **Asynchronous 128K** – This is a 3Com U. S. Robotics proprietary channel aggregation method for achieving speeds of up to 128 Kbps.

Asynchronous 128K does **not** require PPP software or a network protocol on your computer.

- **Advanced Asynchronous 128K** – This is a 3Com U. S. Robotics proprietary channel aggregation method for achieving speeds of up to 128 Kbps.

Using Dynamic Bandwidth Allocation, Advanced Asynchronous 128K can manage the use of your ISDN line’s B-channels, dropping a channel whenever it is not needed based on data flow.

- 2** Click the **Telephone Number Assignment** drop-down menu to select which of your ISDN line’s telephone numbers will be answered as data calls.

To prevent your ISDN TA from accepting any incoming calls, click the **Telephone Number Assignment** drop-down menu, then click **No Incoming Calls**.

Outgoing Data Calls

The “Outgoing Calls” section allows you to set what protocol your ISDN TA uses to make data calls, at what rate these calls are made, and whether or not you want to use the Data Over Voice (DOV) option.

To set these options:

- 1** To turn on DOV, click **Enable DOV**. A check mark appears in the box next to the item when it is selected.

DOV allows you to place data calls using a voice call type. A DOV connection will achieve a maximum rate of 56 Kbps per B-channel, but it saves you any extra charges associated with a digital connection.

Note: DOV must be supported on the device you are connecting to.

It also requires that the ISDN TA’s bearer capability be set to **3.1 KHz Audio**. For more information on bearer capability and 3.1 KHz Audio, see the “[Voice Features](#)” chapter.

- 2 To select the protocol that your ISDN TA uses to make data calls, click the **Outgoing Call Protocol**.

For more information on the options in this menu, see the “Incoming Data Calls” section above.

- 3 Set the rate at which data calls are made by clicking the **B-channel Rate** drop-down menu.

To set the rate to the maximum rate available on your B-channels, click **Automatic Rate Detect**.

To force the data call to be made at 56 Kbps, click **Fix 56Kbps Rate**.

To force the call to be made at 64 Kbps, click **Fix 64Kbps Rate**.

Adjusting Your ISDN TA's PPP Settings

To adjust your PPP settings:

- 1 Open ControlCenter.
- 2 Click the **Configuration Manager** icon.
- 3 Then click the **Advanced Configuration** button. Be sure that “Internet Access (PPP)” is selected in the “Outgoing Call Protocol” drop-down menu on this screen.
- 4 Click the **PPP Settings** button. The “PPP Settings” screen, shown in Figure 5-2, appears.

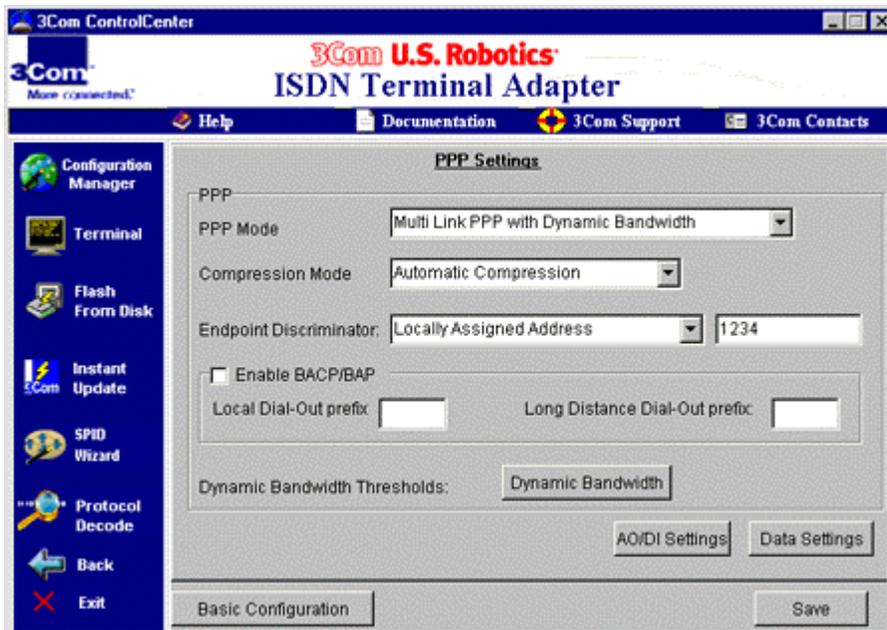


Figure 5-2 ControlCenter “PPP Settings” screen

PPP Mode

On the “PPP Settings” screen, click the **PPP Mode** drop-down menu to select what type of PPP connection your ISDN TA makes.

Options include:

- **Transparent Async/Sync PPP** – Automatically converts the asynchronous PPP from your host computer into synchronous PPP that is transmitted over the ISDN line.

If this option is selected, your ISDN TA does **not** attempt to compress the data being transferred, and only one B-channel is used.
- **Single Link PPP** – Makes a PPP connection on one of your ISDN line’s B-channels and compresses the data being transferred if necessary.
- **MultiLink PPP** – Makes a PPP connection and leaves both of your ISDN line’s B-channels turned on at all times. MultiLink PPP also compresses the data being transferred if necessary.
- **MultiLink PPP with Dynamic Bandwidth Allocation** – Makes a PPP connection on both of your ISDN line’s B-channels using Dynamic Bandwidth Allocation and compresses the data being transferred if necessary.

For more information on Dynamic Bandwidth Allocation, see the next section in this chapter, “Using Dynamic Bandwidth Allocation.”

Note: If you will be using AO/DI, PPP must be set to “MultiLink PPP with Dynamic Bandwidth Allocation.”

Compression Mode

Click the **Compression Mode** drop-down menu to select how your ISDN TA attempts to compress the data that is being transferred.

Options include:

- **Pass Through Compression** – Your ISDN TA never attempts to compress the data that is being transferred. Compression is left to your computer and the device it is connected to.
- **Automatic Compression** – While negotiating a connection, your ISDN TA checks the compression methods being used by your computer and the device it is connecting to. It then compresses the data if necessary.
- **Turbo PPP Compression** – Your ISDN TA always attempts to compress the data being transferred.

Endpoint Discriminator

The “Endpoint Discriminator” drop-down menu is set to “Automatically Assigned” by default.

Do **not** change this setting unless specifically told to do so by the person who administrates the device or network you are connecting to.

BACP/BAP

The Bandwidth Allocation Control Protocol (BACP) and Bandwidth Allocation Protocol (BAP) are used to negotiate bandwidth allocation with the server your ISDN TA is connected to.

By default, this option is enabled. (A check mark appears in the box next to “Enable BACP/BAP.”)

If BACP/BAP is not needed during a given connection, it will not be used, even if it is enabled.

There are two items listed in this section:

- **Local Dial-Out Prefix** – Any prefix that must precede the phone number returned by the server during BACP/BAP negotiation should be typed in this text box. (For example, if your ISDN TA must dial nine to get an outside line.)
- **Long Distance Dial-Out Prefix** – Any long distance prefix that must precede the phone number returned by the server during BACP/BAP negotiation should be typed in this text box.

Using Dynamic Bandwidth Allocation

Dynamic Bandwidth Allocation (DBA) monitors the data traffic on the B-channels of your ISDN line. When traffic is light, DBA turns off one of the B-channels. When traffic is heavy, it turns that B-channel on again.

In this way, DBA helps ensure that your ISDN connection is being used to its fullest potential. At the same time, it prevents the unnecessary cost of keeping two B-channels turned on even when data traffic is light enough to be handled by one.

To adjust your Dynamic Bandwidth Allocation settings:

- 1** Open ControlCenter. Click the **Configuration Manager** icon.
- 2** Click the **Advanced Configuration** button.
- 3** Click the **PPP Settings** button.

In the “PPP Mode” drop-down menu, be sure that **MultiLink PPP with Dynamic Bandwidth Allocation** is selected.

- 4** Click the **Dynamic Bandwidth** button.
- 5** Your ISDN line’s two B-channels are represented on the “B-channel Threshold Settings” screen, which is shown in Figure 5-3.

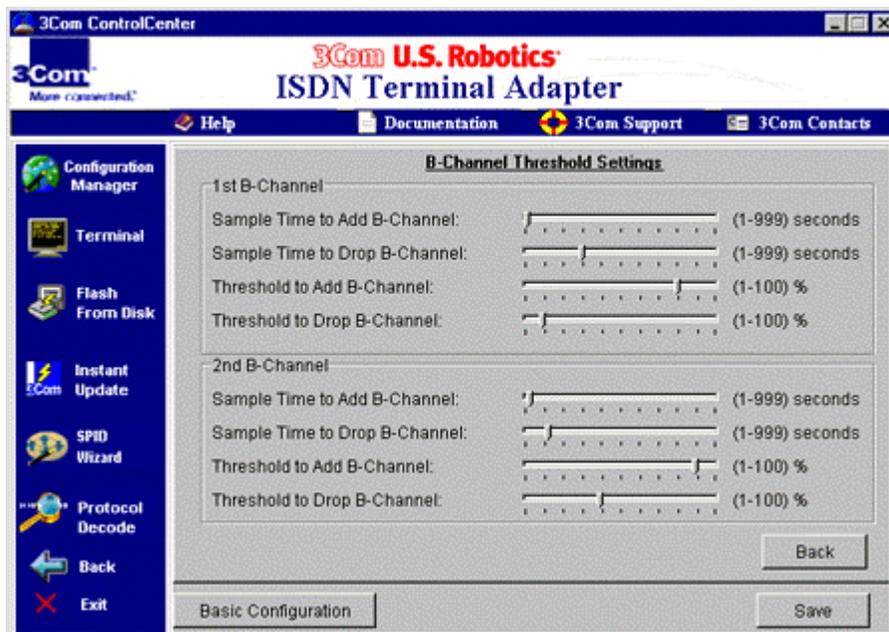


Figure 5-3 ControlCenter “B-channel Threshold Settings” screen

The settings that can be adjusted on this screen include:

- **Sample Time to Add B-channel** – Use the slide bar to adjust how often, in seconds, the other channel is checked to determine if this channel needs to be turned on.
- **Sample Time to Drop B-channel** – Use the slide bar to adjust how often, in seconds, this channel is checked to determine if it needs to be turned off.
- **Threshold to Add B-channel** – Use the slide bar to adjust what percentage of the other channel must be in use before this channel is turned on.
- **Threshold to Drop B-channel** – Use the slide bar to adjust what percentage of this channel must be in use before it is turned off.

Note: The settings for the first B-channel can only be adjusted if AO/DI is enabled. For more information on AO/DI, see the next section.

Using Always On/Dynamic ISDN

Always On/Dynamic ISDN(AO/DI) is a dial-up service designed to optimize the use of your ISDN line by sending and receiving data on the D-channel.

The D-channel is the signaling channel for an ISDN line. It carries signaling messages between your ISDN TA and the public switch. Basically, it tells the telephone company equipment to establish and tear down B-channel circuit switched connections.

These signaling messages typically do not require all of the D-channel's bandwidth. By sending and receiving data on the D-channel, your ISDN TA can take advantage of its extra capacity.

AO/DI uses a protocol known as X.25 over the D-channel to conduct low bandwidth operations, such as checking for new messages by your email program. To make an AO/DI call, an X.25 connection is established between your ISDN TA and your Internet Service Provider over the D-channel. Data from your computer is sent over this connection.

When there is too much data to be sent or received over the D-channel, one or more ISDN B-channels are engaged to provide data speeds up to 128 Kbps (or higher with compression). Dynamic Bandwidth Allocation is used to decide when to engage and disengage the B-channels. Phone numbers for the B-channels may be provided by the user. Optionally, Bandwidth Allocation Control Protocol (BACP) and Bandwidth Allocation Protocol (BAP) can be used to get the B-channel phone numbers and negotiate bandwidth allocation.

During an AO/DI connection, both Analog Device Ports can be used. Your ISDN TA can also accept one AO/DI call.

Benefits of AO/DI include:

- Since the D-channel is always available, it can provide Always On connectivity. This is ideal for applications such as email, push technologies (such as Pointcast™), and other applications that require a permanent network connection.
- Because B-channels are brought up only when they are needed to boost data throughput, B-channel connection costs are significantly reduced.
- Both Analog Device Ports can be used, even while there is an active data connection.

Setting Up AO/DI on Your ISDN TA

Note: AO/DI must be supported by your ISDN line and your Internet Service Provider. Much of the information needed to set up your ISDN TA for AO/DI is provided by your phone company. For more information, see the chapter [“Ordering ISDN Service.”](#)

Also note that AO/DI requires that you use MultiLink PPP with Dynamic Bandwidth Allocation.

To set up AO/DI:

- 1** Open ControlCenter and click the **Configuration Manager** icon.
- 2** Click the **Advanced Configuration** button, followed by the **ISDN Line** tab.

- 3 At the bottom of the “ISDN Line” screen, click **Enable AO/DI (Always On/Dynamic ISDN)** to select it. A check mark appears in the box next to the item when it is selected.
- 4 Click the **AO/DI Settings** button. The screen shown in Figure 5-4 appears.

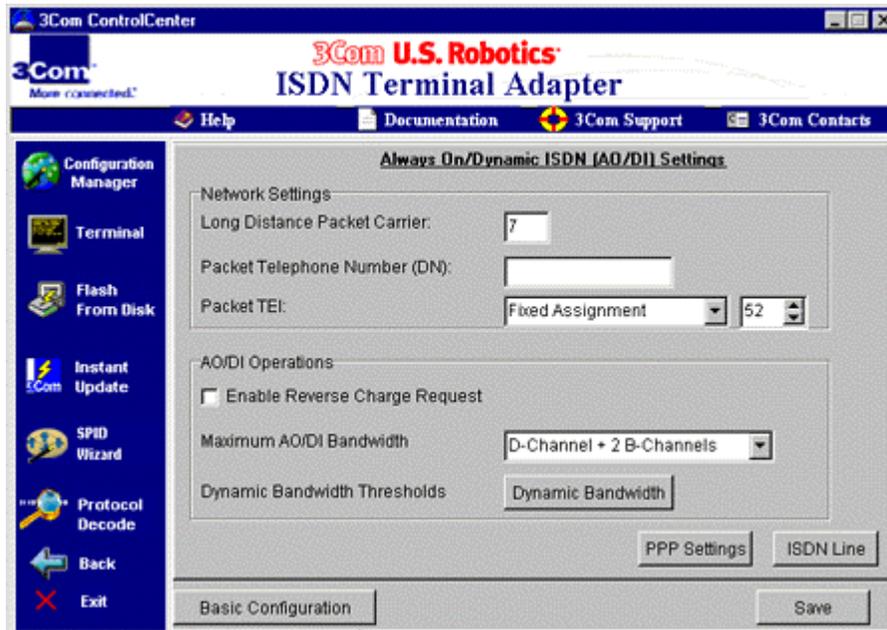


Figure 5-4 AO/DI settings screen

- 5 When you order AO/DI service, you will have to select a long distance packet (X.25) carrier for your D-channel.

You may be given a long distance carrier code for this service. If you need to set it, type the four-digit number in the “Long Distance Packet Carrier” text box in the “Network Settings” section.

Note: This code may be set automatically by the telephone company switch that your ISDN line uses. Also, you will not need to enter any code if your service provider or other online service is in your calling area. For more information, talk to your phone company’s ISDN representative when you order your line.
- 6 When you order your ISDN line with AO/DI service, you are given a third telephone number that is specifically for your D-channel’s X.25 connection.

Type that number, provided by your phone company, in the “Packet Telephone Number (DN)” text box.

The Terminal Endpoint Identifier (TEI) for your D-channel’s X.25 connection is set to 21 by default. Do **not** change this number, unless you are instructed to do so by your phone company or a 3Com Customer Service representative.

For information on dialing for an AO/DI connection, see the chapter [“Dialing, Storing Numbers, and Logging Calls.”](#)

Managing AO/DI Operations

A check box in the “AO/DI Operations” section enables or disables the Request Reverse Charge operation.

Request Reverse Charge allows you to request that the charge for an X.25 connection on your ISDN TA’s D-channel be paid by the recipient of the call.

Note: This service must be supported by the device or service provider that you are connecting to.

To enable this feature, select **Enable Request Reverse Charge**. A check mark appears in the box next to the item when it is enabled.

In the “AO/DI Operations” section, you can also set the number of B-channels being managed by AO/DI.

Click the **Maximum AO/DI Bandwidth** drop-down menu.

- If you want AO/DI to have control over only the D-channel of your ISDN line, click **D-channel Only**.
- If you want AO/DI to be able to engage one of your B-channels when necessary, click **D-channel + 1 B-channel**.
- If you want AO/DI to be able to engage both B-channels when necessary, click **D-channel + 2 B-channels**.

Using Asynchronous 128K and Advanced Asynchronous 128K

Asynchronous 128K data protocol mode bonds your ISDN line’s two B-channels together. It is a 3Com proprietary channel aggregation method for achieving speeds up to 128 Kbps.

Asynchronous 128K is similar to hardware B-channel BONDING, but it provides more features and flexibility.

During a data transmission, you can use one of the Analog Device Ports on your ISDN TA. When an analog device is used, one of the B-channels is removed from the Asynchronous 128K connection and carries the call for the Analog Device Port. After Analog Device Port’s call is dropped, the B-channel is added back to the Asynchronous 128K connection.

It assumes that error correction, if required, will be handled on an upper layer. Data is delivered to its destination with minimum delay.

Advanced Asynchronous 128K

Advanced Asynchronous 128K has the same basic functionality as Asynchronous 128K. Like Asynchronous 128K, it is also a 3Com proprietary channel aggregation method.

In this mode, your ISDN TA may compress data sent by the host, which is then decompressed before it reaches its destination. This compression allows more data to be sent over your ISDN line's B-channels (at rates higher than 128 Kbps).

When Dynamic Bandwidth Allocation is in use. Advanced Asynchronous 128K only uses one B-channel at the beginning of a connection. When there is enough data being transmitted, the second B-channel will be brought up without user intervention. DBA decides when more channels are needed. In this way, DBA can help you save money.

During a data transmission, you can use one of the Analog Device Ports on your ISDN TA. When an analog device is used, one of the B-channels carries the call for the Analog Device Port. After Analog Device Port's call is dropped, the B-channel is added back to the Advanced Asynchronous 128K connection.

Advanced Asynchronous 128K can also support an always on connection over D-channel if you are using AO/DI. A call is set up on the D-channel first. When there is more data to transfer than can be sent on this channel, one or both of your ISDN line's B-channels are brought up to provide data speeds up to 128 Kps (or higher with compression).

Once the data transfer is complete, the connection over the B-channel is dropped, and you remain connected over the D-channel. All of this happens automatically without user intervention. Because B-channels are brought up only when needed to boost data throughput, B-channel connection costs can be reduced significantly.

During an AO/DI connection, you can use both B-channels for analog connections and keep the data transmission active on the D-channel. Advanced Asynchronous 128K is ideally suited for using your ISDN TA to connect to maintain a constant connection to a backbone network.

Setting Up Asynchronous 128K

To use Asynchronous 128K:

- 1** Open ControlCenter and click the **Configuration Manager** icon.
- 2** Click the **Advanced Configuration** button.
- 3** To set the protocol for incoming calls, click the **Incoming Call Protocol** drop-down menu. Then click **Asynchronous 128K**.

To set the protocol for outgoing calls, click the **Outgoing Call Protocol** drop-down menu. Then click **Asynchronous 128K**.

Setting Up Advanced Asynchronous 128K

Advanced Asynchronous 128K uses PPP and Dynamic Bandwidth Allocation to control the number of channels to used, when those channels are brought up, and which compression method is used.

To change PPP and DBA settings see section on “Adjusting Your ISDN TA’s PPP Settings” and “Using Dynamic Bandwidth Allocation” sections of this chapter.

To use Advanced Asynchronous 128K:

- 1** Open ControlCenter and click the **Configuration Manager** icon.
- 2** Click the **Advanced Configuration** button.
- 3** To set the protocol for incoming calls, click the **Incoming Call Protocol** drop-down menu. Then click **Advanced Asynchronous 128K**.

To set the protocol for outgoing calls, click the **Outgoing Call Protocol** drop-down menu. Then click **Advanced Asynchronous 128K**.

To create an always on connection AO/DI must be turned on.

For information on dialing for an AO/DI connection, see the chapter [“Dialing, Storing Numbers, and Logging Calls.”](#)

Using Your ISDN TA on a Leased Line

A leased line is a constant, dedicated ISDN connection between you and an online service. It must be set up with your telephone company.

Leased lines are often used by small businesses scattered across multiple locations. They are also frequently used to connect employees to their corporate networks.

They can be set up with one or two B-channels. However, your ISDN TA will not support analog devices when using a leased line.

For more information about setting up a leased line, contact your telephone company.

Note: You **cannot** use the leased line mode described below to connect your ISDN TA to another device using a simple RJ-45 cable. You **must** use a leased line set up by your telephone company.

To use your ISDN TA on a leased line:

- 1** Open ControlCenter.
- 2** Click the **Configuration Manager** icon. Then click the **Advanced Configuration** button.
- 3** Click the **ISDN Line** tab.
- 4** The screen shown in Figure 5-5 appears. Click the **Switch Protocol Type** drop-down menu.

- If your leased line has only one B-channel, click **Leased Line 64 Kbps (1 B-channel)**.
- If your leased line has two B-channels, click **Leased Line 128 Kbps (2 B-channels)**.

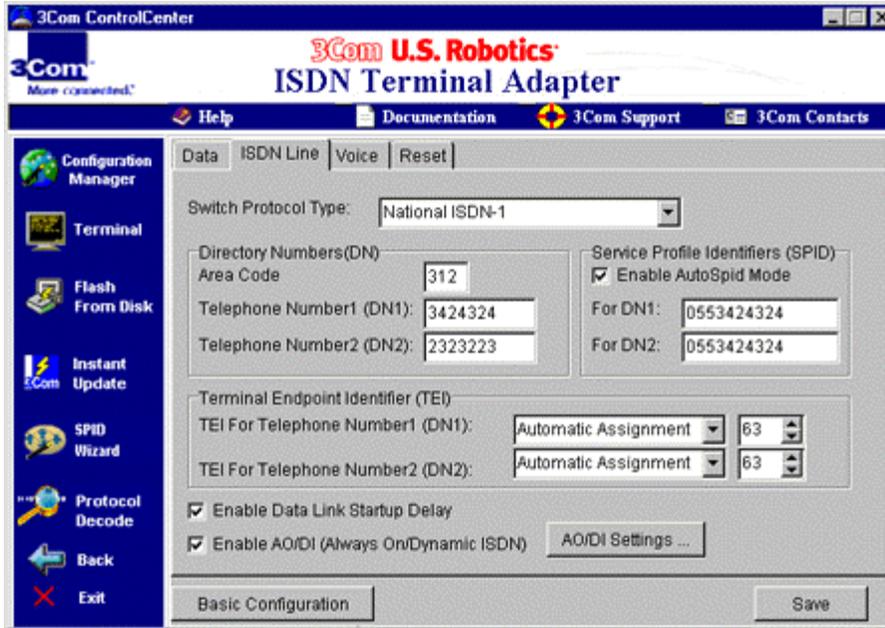


Figure 5-5 ControlCenter “ISDN Line” tab

- 5** Click the **Terminal** icon on the left side of the ControlCenter screen.
- 6** To connect to the device or service at the other end of your leased line, type **ATD** and press **Enter**.

Returning Your ISDN TA’s Settings to the Factory Defaults

Using ControlCenter, you can return your ISDN TA’s settings to several different default modes.

To reset your ISDN TA:

- 1** Open ControlCenter.
- 2** Click the **Configuration Manager** icon. Then click the **Advanced Configuration** button.
- 3** Click the **Reset** tab. The screen shown in Figure 5-6 appears.

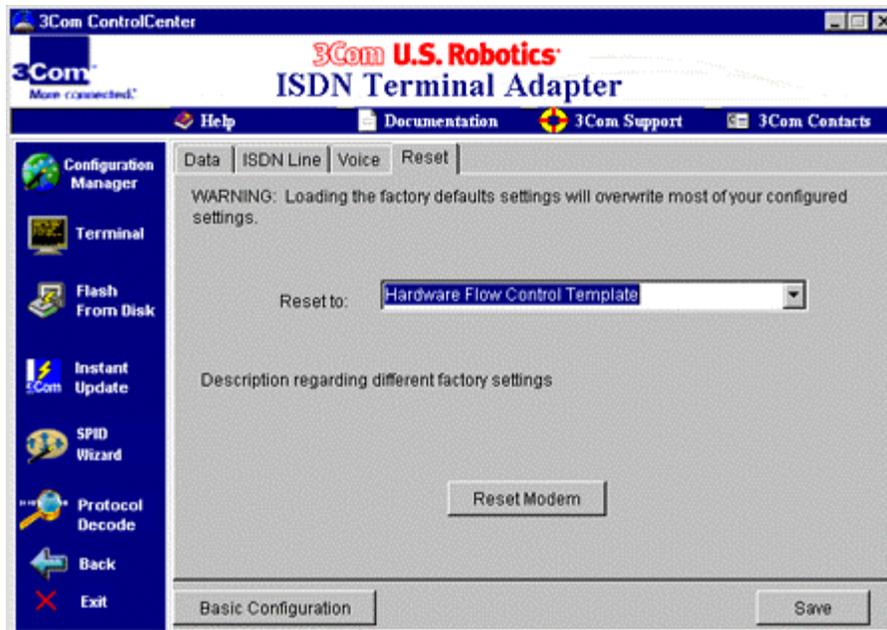


Figure 5-6 ControlCenter “Reset” tab

- 4 Click the **Factory Settings** drop-down menu. From this menu, select the default mode that you want your ISDN TA to be set to.

Options include:

- **No Hardware Flow Control Template** – Resets your ISDN TA’s basic settings with flow control turned off. **Note:** Flow control must be used any time compressed data is being transmitted.
- **Hardware Flow Control Template** – Resets your ISDN TA’s basic settings with hardware flow control turned on.
- **Software Flow Control Template** – Resets your ISDN TA’s basic settings with software flow control turned on.
- **Factory Default with ISDN Settings** – Resets your ISDN TA’s basic settings with hardware flow control turned on. This option also resets your ISDN protocol parameters but does not affect the SPIDs and telephone numbers that you set, the switch type, or the supplementary voice services settings.
- **Factory Default without ISDN Settings** – Resets your ISDN TA’s basic settings with hardware flow control turned on. This option also resets **all** your ISDN line parameters.

Note: You must run SPID Wizard after selecting this option, in order to reconfigure your ISDN TA to your ISDN line.

- 5 Once you have selected a setting, click the **Reset Modem** button.

Setting SPIDs, Telephone Numbers, and TEIs Manually

If both AutoSPID and the SPID Wizard fail to identify the SPIDs and telephone numbers for your ISDN line, these numbers can be entered manually.

Remember: The SPIDs and telephone numbers for your ISDN line should have been provided by your phone company when you ordered your ISDN service.

You also need to know the switch type being used by your ISDN line. If you do not have this information, contact your phone company.

To enter your SPIDs and telephone numbers manually:

- 1** Open ControlCenter and Click the **Configuration Manager** icon on the left side of the ControlCenter screen.
- 2** Then click the **Advanced Configuration** button, followed by the **ISDN Line** tab.
- 3** The screen shown in Figure 5-5 appears. Select the switch type provided by your phone company from the drop-down menu labeled “Switch Protocol Type.”
- 4** Enter your area code in the “Area Code” text box in the “Directory Numbers” section.

Then enter one of your telephone numbers in the “Telephone Number 1 (DN1)” text box. Enter your other telephone number in the “Telephone Number 2 (DN2)” text box.

Note: If you ordered a type of ISDN service not discussed in the chapter “Ordering ISDN Service,” you may have a different number of telephone numbers.

- 5** Enter the SPID for your first telephone number in the “For DN1” text box in the “Service Profile Identifier (SPID)” section.

Then enter the SPID for your second telephone number in the “For DN2” text box.

Also, be sure that **Enable AutoSPID Mode** is selected in the “Service Profile Identifier (SPID)” section. A check mark appears in the box next to an item when it is selected.

Setting Terminal Endpoint Identifiers

In some cases, the Terminal Endpoint Identifiers (TEI) for each telephone number must be set to a fixed number. A TEI is used by the telephone company switch to recognize requests coming from your ISDN TA.

The TEIs for your telephone numbers are provided by your phone company.

They are set on ControlCenter's "ISDN Line" tab, just as your SPIDs and telephone numbers were.

- If you were not provided with specific TEIs, leave **Automatic Assignment** set in the drop-down menus.
- If you were provided with specific Terminal Endpoint Identifiers for your telephone numbers, select **Fixed Assignment** from the "TEI for Telephone Number 1 (DN1)" and "TEI for Telephone Number 2 (DN2)" menus in the "Terminal Endpoint Identifier (TEI)" section.

Then type the TEI for each telephone number in the text boxes next to TEI drop-down menus.

VOICE FEATURES

Supported Voice Features

A variety of supplementary voice features are described below. They are for use by analog devices, such as a telephone or fax machine, operating on your ISDN line through your ISDN TA.

Note: These features require that you have the proper ISDN service established. For more information about your ISDN service, see the chapter [“Ordering ISDN Service.”](#)

Call Waiting

Call Waiting beeps when a second voice call is incoming while you are on a voice call.

As with normal telephone call waiting, you can put the first call on hold briefly and answer the second call by pressing the switch hook or the “Flash” button on your telephone.

Call Forwarding

Call Forwarding allows you to route your calls to a different phone number instead of your own.

When you order Call Forwarding, you are given three codes that typically involve dialing “*” and then a two-digit number.

These codes allow you to set the telephone number to which you want your calls forwarded, to turn the forwarding feature on, and to turn it off. They are established by your phone company.

Caller ID

Your ISDN TA is capable of generating the signal necessary for Caller ID. Thus, if you have Caller ID service established for your ISDN line, your Caller ID box or Caller ID telephone will display the telephone numbers that call you and the time that they call.

Message Waiting Indicator

If you have voice mail service for your phone line and you have messages waiting, the “Alert” LED on your ISDN TA will blink green, or the dial tone will stutter when you pick up the phone connected to your ISDN TA.

The method used to notify you of waiting messages depends upon what sort of equipment is used by your phone company.

Three-way Call Conferencing Options

This feature allows you to talk to two other people at the same time.

To use it, dial the first person as you would normally. Once connected to that person, press the switch hook or the “Flash” button on your telephone. Then dial the second person as you would normally.

Once you are connected to the second person, press the switch hook or “Flash” button again. All three of you will now be on the line.

To **drop** the person most recently added to the call, press the switch hook or “Flash” button on your phone.

To **transfer** a call, simply hang up the phone while part of a three-way conference call. The two other people will be able to continue the call.

The three-way call conferencing options also allow you to make a **consultation call**. In a consultation call, you can put one person on **hold** and call a second person. You can then end your call with the second person and return to your call with the first.

To make a consultation call, dial the first person as you would normally. Once the call is established, press the switch hook or the “Flash” button on your telephone. Then dial the second person. When you are finished with your call to the second person, hang up your phone. The phone rings immediately after you hang it up. Pick up the phone, and your call to the first person is reestablished.

Enabling Voice Features in ControlCenter

To use these supplementary voice services on an analog phone connected to your ISDN TA, first remember that you must have the proper ISDN service. These features are only supported on if you use the National ISDN Ordering Codes to set up your ISDN service.

For more information on your ISDN service, see the chapter [“Ordering ISDN Service.”](#)

These features must also be enabled on your ISDN TA using its ControlCenter software. To do so:

- 1** Open ControlCenter.
- 2** From the list of devices that appears on the left of the ControlCenter screen, select your ISDN TA by clicking it.
- 3** Click the **Configuration Manager** icon. When the screen changes, click the **Advanced Configuration** button.
- 4** Click the **Voice** tab.
- 5** The screen shown in Figure 6-1 appears. It lists a series of parameters for each of your ISDN TA’s Analog Device Ports.

If Caller ID is available on your ISDN line and you want to use it, click **Enabled** next to “Caller ID” in the proper Analog Device Port column.

- 6** Choose the Analog Device Port that you want to set up supplementary voice services on.

Make sure that **Enable** is select in the “Advanced Call Features” section. A check mark appears in the box when it is selected.

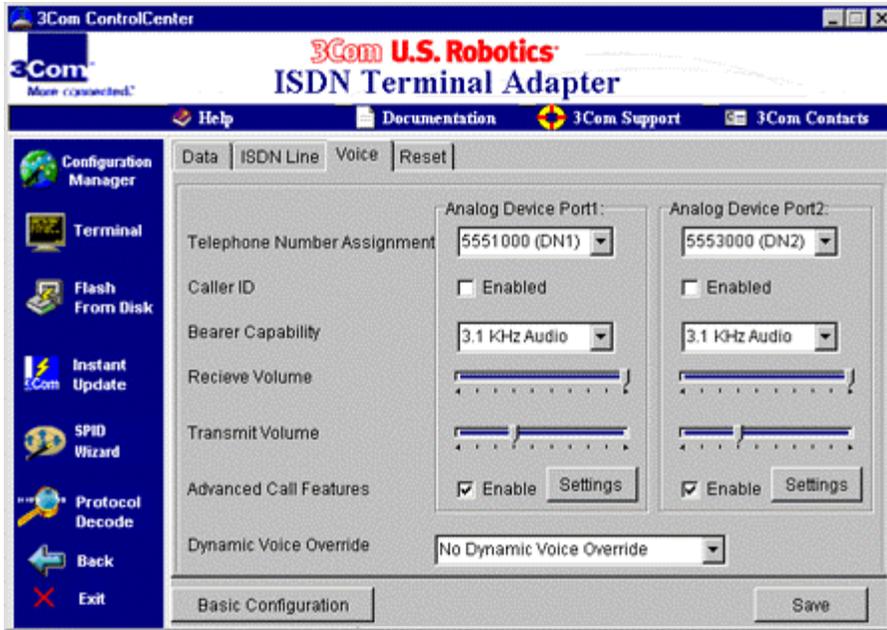


Figure 6-1 ControlCenter “Voice” tab

- 7** Click the **Settings** button next to “Enable.” The screen shown in Figure 6-2 appears.
- 8** The supplementary voice services for each Analog Device Port are listed.

Be sure that each voice service that you want to use is selected. A check mark appears in the box when it is selected.

Also be sure any code that activates the service is correct in the text box next to “Enable.”

Note: These codes are set to commonly used defaults, but particular codes are provided by your phone company.

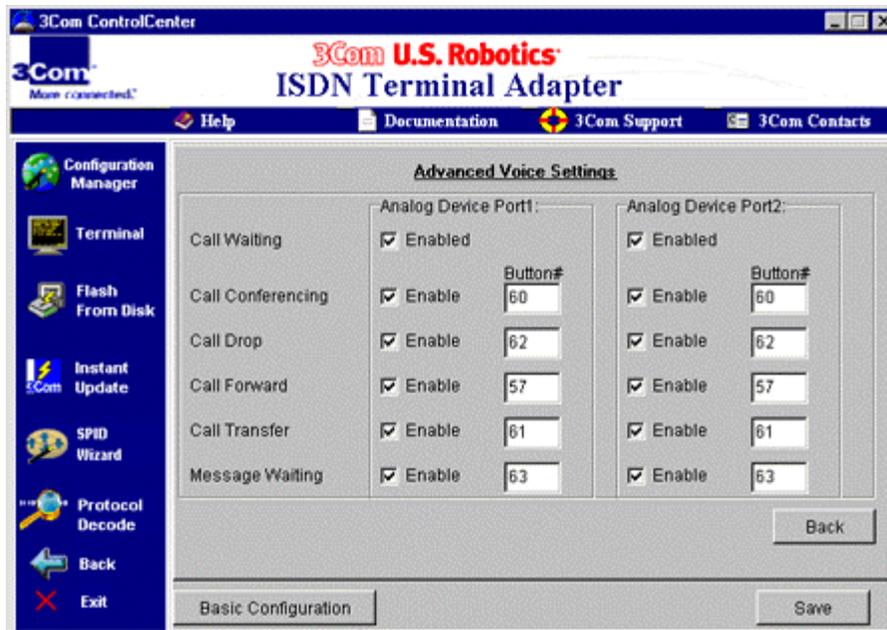


Figure 6-2 ControlCenter “Advanced Voice Settings” screen

Advanced Voice Configuration

Several other features for the Analog Device Ports can be set from the Voice tab using ControlCenter’s advanced configuration tools.

To get to ControlCenter’s Voice tab:

- 1 Open ControlCenter.
- 2 From the list of devices that appears on the left of the ControlCenter screen, select your ISDN TA by clicking it.
- 3 Click the **Modify** button. When the screen changes, click the **Advanced Configuration** button.
- 4 Click the **Voice** tab.

The screen shown in Figure 6-1 appears. It lists a series of parameters for each of your ISDN TA’s Analog Device Ports.

The following settings can be changed from this screen:

- **Telephone Number Assignment** – Use the drop-down menu under each Analog Device Port heading to set the telephone number for that port.

You can also disable incoming calls to the port by selecting **Disable Incoming Calls**.

- **Caller ID** – See the “Enabling Voice Features in ControlCenter” section of this chapter for information about this setting.

- **Bearer Capability** – Choose **Speech** in this drop-down menu if a standard telephone will be using the Analog Device Port.

Choose **3.1 KHz Audio** for a higher-quality analog connection through the port.

You may want to use 3.1 KHz Audio if a fax machine or analog modem will be using the Analog Device Port.

- **Receive Volume** – Use this slide bar to set the volume of incoming audio on the Analog Device Port (for example, the voice coming over your telephone).
- **Transmit Volume** – Use this slide bar to set the volume of outgoing audio on the Analog Device Port (for example, your voice being sent from the telephone).
- **Advanced Call Features** – See the “Enabling Voice Features in ControlCenter” section of this chapter for information about this setting.
- **Dynamic Voice Override** – Dynamic Voice Override manages calls to analog devices on your ISDN line.

For more information on this feature, see the [“Basic Configuration”](#) chapter.

GETTING ONLINE WITH YOUR ISDN TA

Windows 95 or 98

Before you can connect your ISDN TA to the Internet or to another online service (such as your company's network), you must be sure that Windows Dial-Up Networking and Dial-up TCP/IP support are installed on your computer.

To make a connection, you must also configure Dial-Up Networking for your ISDN TA.

Installing Dial-Up Networking

To install Dial-Up Networking:

- 1 Click Windows **Start**, select **Settings**, and click **Control Panel**.
- 2 Double-click the **Network** icon. The "Network" screen, shown in Figure 7-1 appears.
 - If "Dial-Up Adapter" appears in the list of network components, go to the next section of this chapter, "Installing Dial-Up TCP/IP Support."
 - If "Dial-Up Adapter" does **not** appear in the list of network components, go to step 3.

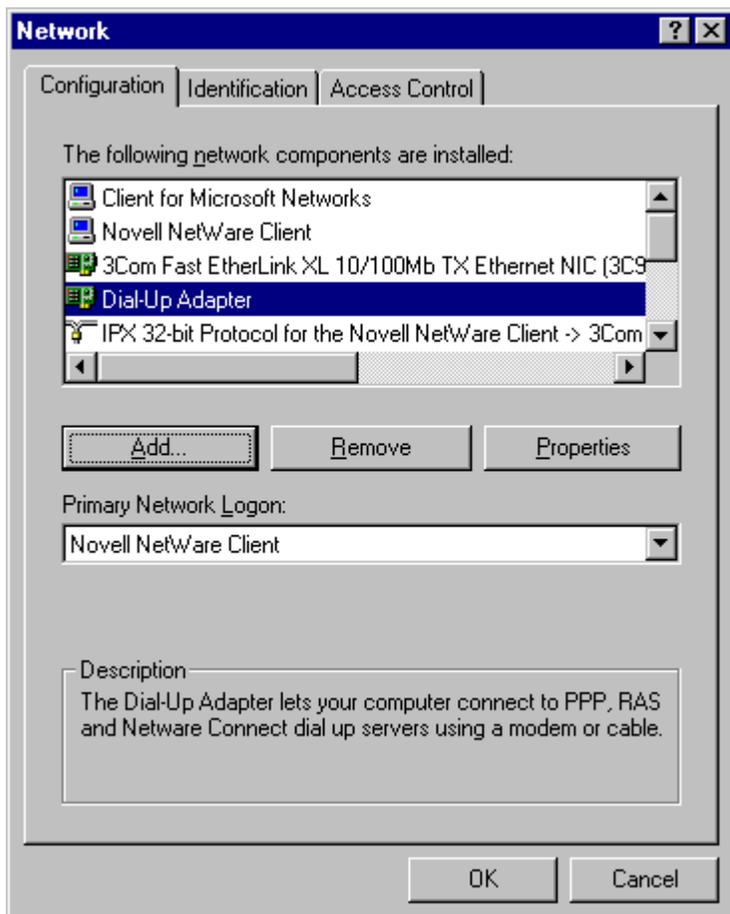


Figure 7-1 “Network” screen

- 3 If the Dial-Up Adapter is not listed, close the “Network” screen and return to the Control Panel.

Then double-click the **Add/Remove Programs** icon.

- 4 When the “Add/Remove Programs Properties” screen appears, click the **Windows Setup** tab, as shown in Figure 7-2.

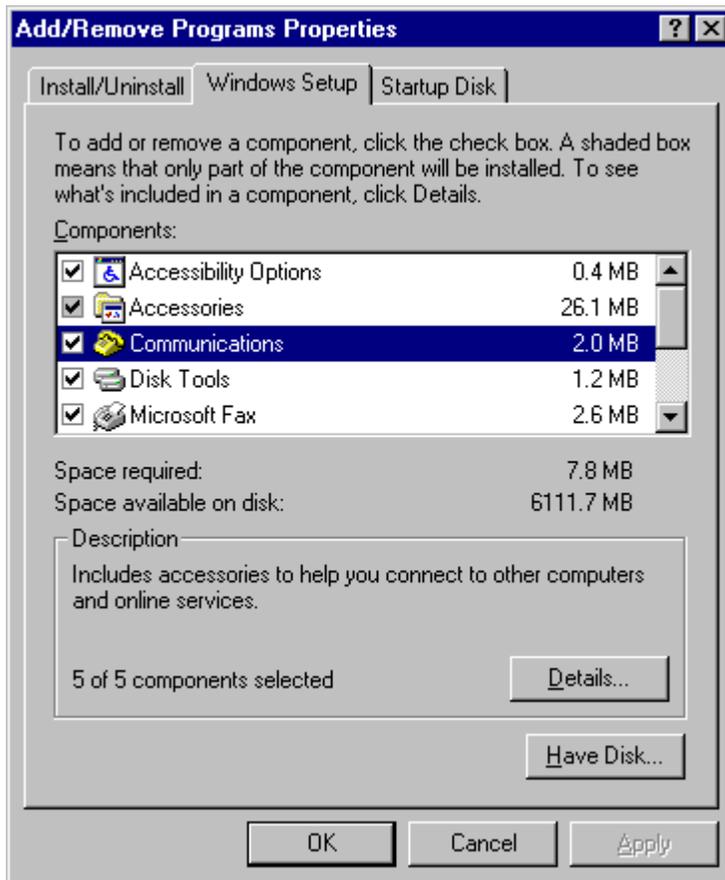


Figure 7-2 “Add/Remove Programs Properties” screen

- 5 Double-click **Communications** in the list labeled “Components.”
- 6 When the “Communications” screen appears, as shown in Figure 7-3, click the box next to **Dial-Up Networking** to select it. A check mark appears in the box when it is selected.
- 7 Click **OK**. Then click **OK** again.
- 8 Follow the onscreen directions to install Dial-Up Networking.

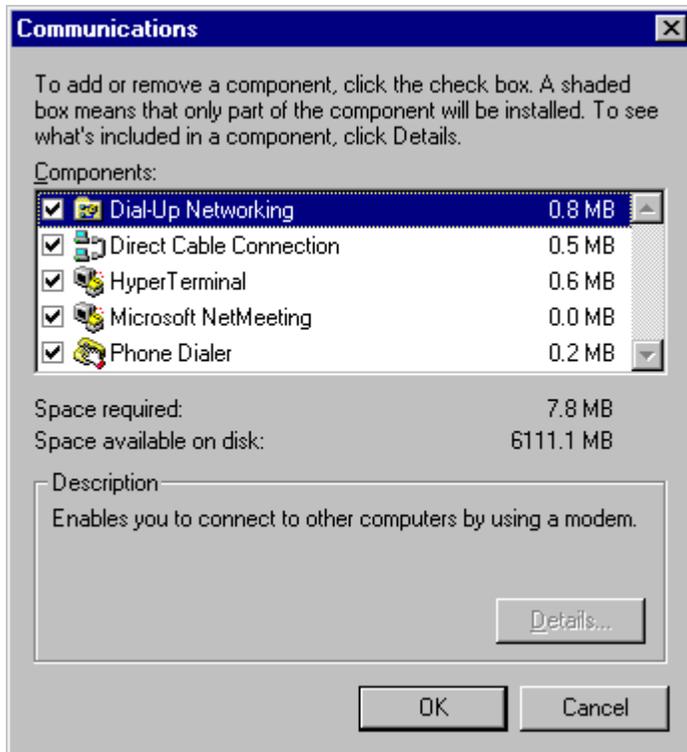


Figure 7-3 “Communications” screen

Installing Dial-Up TCP/IP Support

To install Dial-Up TCP/IP support:

- 1** Click Windows **Start**, select **Settings**, and click **Control Panel**.
- 2** Double-click the **Network** icon. The “Network” screen, shown in Figure 7-1 appears.
 - If “TCP/IP ->Dial-Up Adapter” appears in the list of network components, go to the next section of this chapter, “Connecting to Your Service Provider.”
 - If “TCP/IP -> Dial-Up Adapter” does **not** appear in the list of network components, go to step 3.
- 3** If Dial-Up TCP/IP is not installed, click the **Add** button beneath the list of components on the “Network” screen.
- 4** When the screen shown in Figure 7-4 appears, double-click **Protocol**.

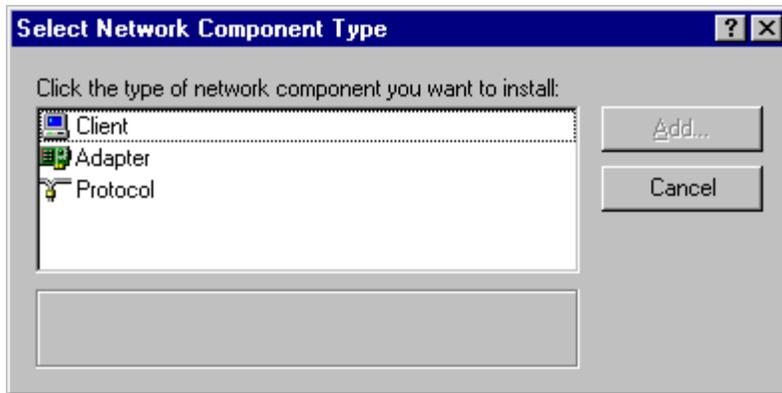


Figure 7-4 “Select Network Component Type” screen

- 5 The “Select Network Protocol” screen appears, as shown in Figure 7-5.

From the list labeled “Manufacturers,” select **Microsoft** by clicking it.

Then select **TCP/IP** from the “Network Protocols” list.

- 6 Click **OK**.

Then follow the onscreen instructions to finish installing Dial-Up TCP/IP support.

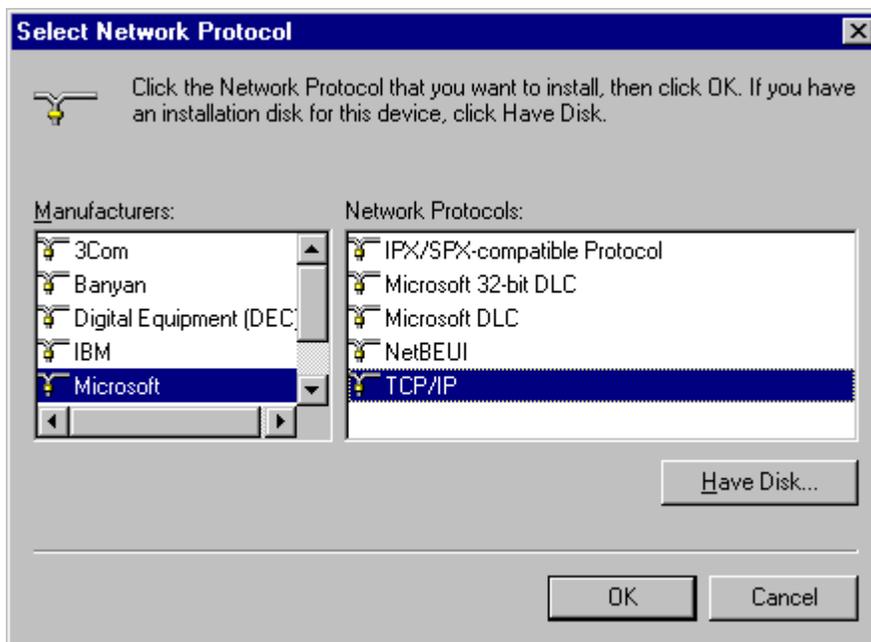


Figure 7-5 “Select Network Protocol” screen

Connecting to Your Service Provider

To create an icon that allows you to connect to your Internet Service Provider and the Internet:

- 1 Click **Start**, select **Programs** and **Accessories**, and click **Dial-Up Networking**.
- 2 When the “Dial-Up Networking” screen appears, double-click the **Make New Connection** icon.
- 3 The screen shown in Figure 7-6 appears. Select **3Com U. S. Robotics ISDN TA EXT PnP** from the “Select a modem” drop-down menu.

Note: If you are using USB, select **3Com U. S. Robotics ISDN TA EXT USB** instead.

If you want to give your connection a distinctive name, type it in the text box where “My Connection” appears. This name will appear with the connection’s icon when you use it in the future.

Then click **Next**.

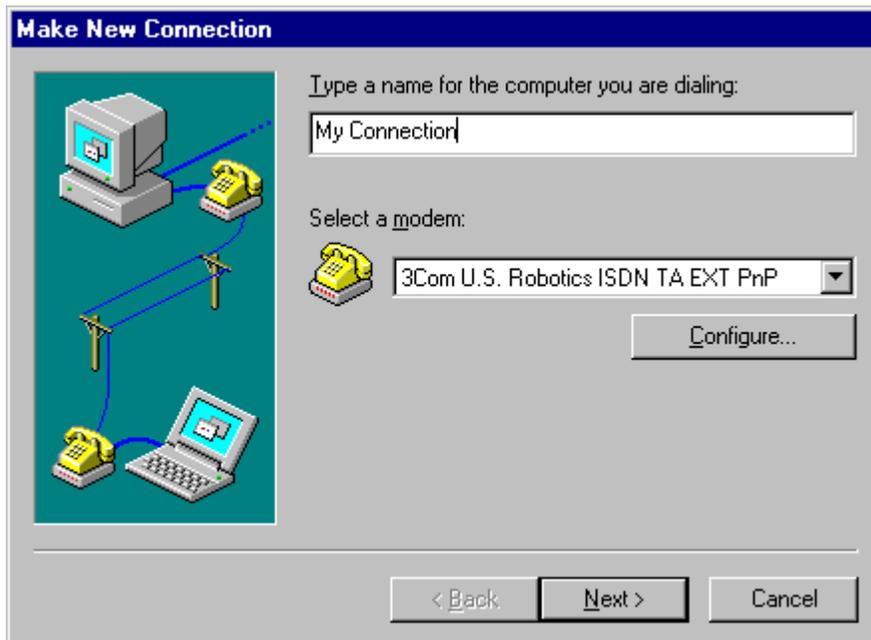


Figure 7-6 “Make New Connection” screen

- 4 When the screen shown in Figure 7-7 appears, type the phone number provided by your Internet Service Provider or other online service.

Then click **Next**, followed by **Finish**.

Note: For more information about special dialing procedures for making an AO/DI or MultiLink PPP connection, see the chapter [“Dialing, Storing Phone Numbers, and Logging Calls.”](#)

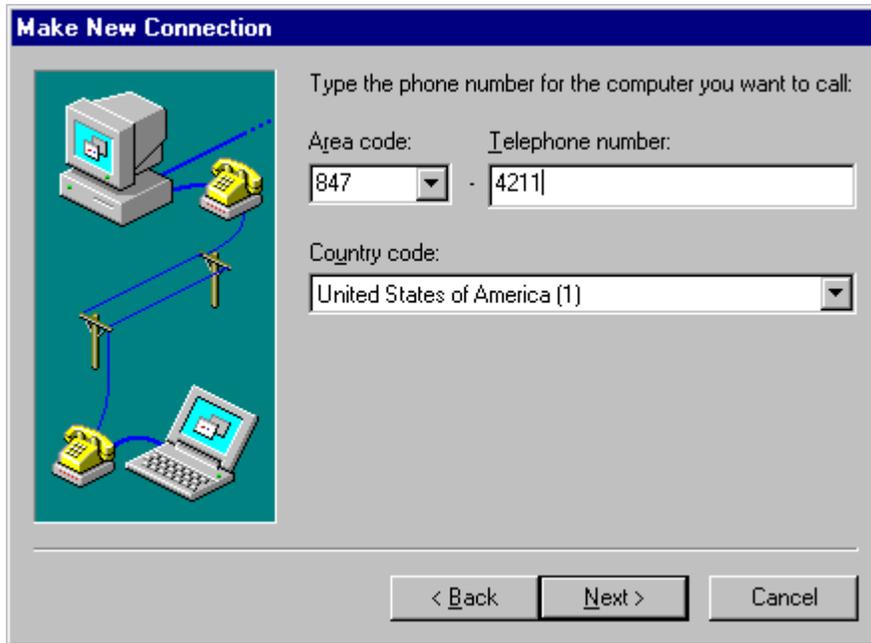


Figure 7-7 Dial-Up Networking telephone number screen

- 5 In the “Dial-Up Networking” screen where you first found the “Make New Connection” icon, an icon for the connection you just created appears.

Right-click this icon. Then click **Properties**.

- 6 Click the **Server Types** tab.

- 7 When the screen shown in Figure 7-8 appears, click the boxes next to the following items to turn them off:

- **Log on to network**
- **NetBEUI**
- **IPX/SPX Compatible**

Note: The check marks in the boxes disappear when an item is turned off.

Then click **OK**.

- 8 To connect to your service provider, double-click your connection icon in the “Dial-Up Networking” screen.

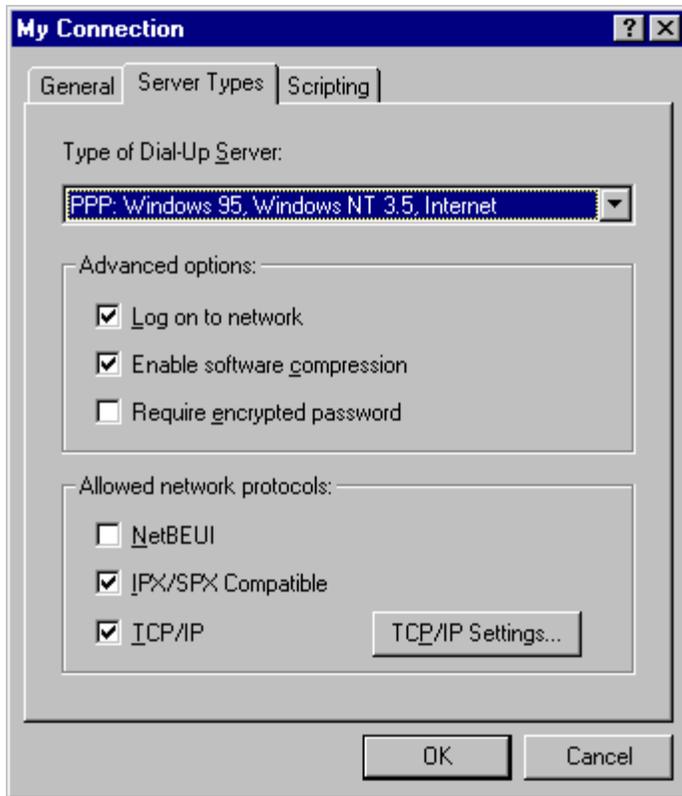


Figure 7-8 Connection properties screen

Customizing TCP/IP Settings

Your service provider may give you custom TCP/IP settings for your ISDN TA. These settings may include an IP address or Domain Name Server (DNS).

Note: If your service provider does not give you these numbers, do **not** alter these settings. Simply double-click the icon you created on the “Dial-Up Networking” screen to make your connection.

To change these settings:

- 1** Click Windows **Start**, select **Programs** and **Accessories**, and click **Dial-Up Networking**.
- 2** Right-click the icon you created for your connection. Then click **Properties**.
- 3** Click the **Server Types** tab.
- 4** Click the **TCP/IP Settings** button.
- 5** On the screen shown in Figure 7-9, set the IP address and the names server address.
 - If your service provider gave you a specific IP address, click **Specify an IP address**. Then type the address in the text box labeled “IP address.”

- If your service provider gave you a specific Domain Name Server, click **Specify name server address**. Then type the address or addresses your service provider gave you in the appropriate text boxes.
- 6** Click **OK** to close the “TCP/IP Settings” screen. Then click **OK** to close the connection properties screen.

To open your connection, double-click the icon you created for it.

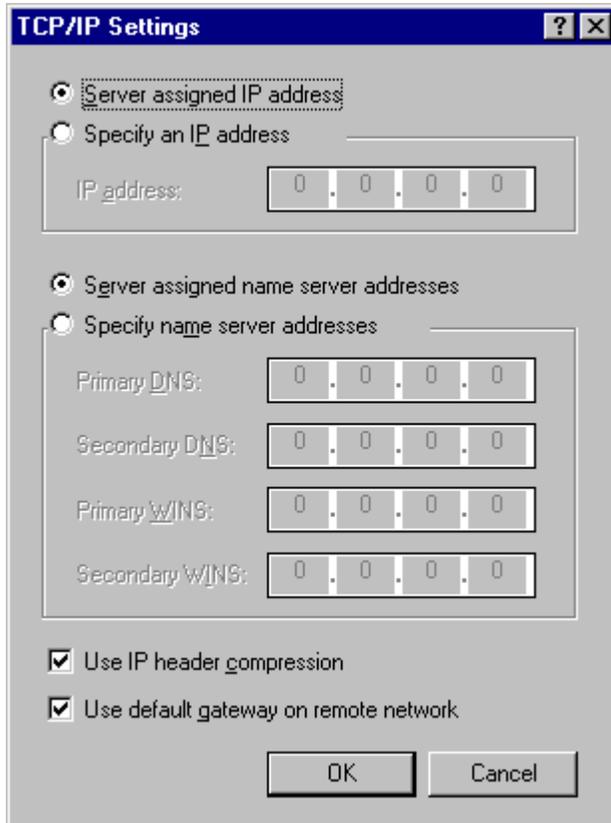


Figure 7-9 “TCP/IP Settings” screen

Windows NT 4.0

Before you can connect your ISDN TA to the Internet or to another online service (such as your company’s network), you must be sure that TCP/IP is installed and set up Remote Access Service.

Installing TCP/IP

To install TCP/IP:

- 1** Click Windows **Start**, select **Settings**, and click **Control Panel**.
- 2** Double-click the **Network** icon. Then click the **Protocol** tab.

- 3** Look for “TCP/IP Protocol Adapter” in the list of installed protocols.
 - If “TCP/IP Protocol Adapter” is listed, go to the next section, “Setting Up Remote Access Service.”
 - If “TCP/IP Protocol Adapter” is **not** listed, go to step 4.
- 4** Click the **Add** button.
- 5** Click **TCP/IP protocol** in the list of available protocols. Then click **OK**.

Setting Up Remote Access Service

To set up Remote Access Service (RAS):

- 1** Right-click the **Network Neighborhood** icon on your desktop. Then click **Properties**.
- 2** Click the **Services** tab.
- 3** Select **Remote Access Service**. Then click **Properties**.
- 4** Click the **Add** button.
- 5** Select the COM port your ISDN TA is installed on. Then click **OK**.
- 6** Select **3Com U. S. Robotics ISDN TA EXT**.
Then click **Configure**.
- 7** Select the function of your ISDN TA and click **OK**.
- 8** Click **Network**.
- 9** Select the protocols required to dial in to the server you will be connecting to.
- 10** Set “Encryption Settings” to **Allow any authentication including clear text**.
- 11** Click **Continue** to complete RAS setup.

Connecting to Your Service Provider

To create an icon that allows you to connect to your Internet Service Provider and the Internet:

- 1** Click **Start**, select **Programs** and **Accessories**, and click **Dial-Up Networking**.

Note: You may have to install Dial-Up Networking if you have never used it before. If necessary, you will be prompted to do so when you try to open Dial-Up Networking. Follow the onscreen

instructions to install it. You may have to restart Windows NT, so be sure to close any open applications before installing Dial-Up Networking.

- 2** When the “Dial-Up Networking” screen appears, click **New**.
Note: If you have never used Dial-Up Networking, the “New Phonebook Entry Wizard” appears automatically.
- 3** When the “New Phonebook Entry Wizard” appears, give your connection a name by typing it in the “Name the new phonebook entry” text box. Then click **Next**.
- 4** Select the options that apply to your connection by clicking them. Then click **Next**.
- 5** Type the phone number provided by your Internet Service Provider or other online service. Then click **Next**.

Note: For more information about special dialing procedures for making an AO/DI or MultiLink PPP connection, see the chapter [“Dialing, Storing Phone Numbers, and Logging Calls.”](#)

- 6** Click **Point-to-Point Protocol (PPP)**. Then click **Next**.
- 7** Click **None**. Then click **Next**.
- 8** If your service provider gave you a specific IP address, type it in the “My IP address” text box. Then click **Next**.
- 9** If your service provider gave you a specific Domain Name Server, type the address or addresses in the appropriate text boxes. Then click **Next**.
- 10** Click **Finish**.

Macintosh

Before you can connect your ISDN TA to the Internet or to another online service (such as your company’s network), you must configure Open Transport PPP and your TCP/IP settings.

Note: If your Macintosh uses System 8.5, you can use your Operating System’s Internet connection wizard, which will configure the settings discussed below.

Configuring Open Transport PPP

To configure Open Transport PPP:

- 1** Click the **Apple Menu**. Then select **Control Panels** and **Modem**.
- 2** When the “Modem” screen appears, click the **Connect via** drop-down menu.

Then select the port that your ISDN TA is connected to.

- 3 Click the **Modem** drop-down menu and select your ISDN TA.

Configuring TCP/IP

To configure TCP/IP:

- 1 Click the **Apple Menu**. Then select **Control Panels** and **TCP/IP**.
- 2 When the “TCP/IP” screen appears, click the **Connect via** drop-down menu and select **PPP**.
- 3 If you were provided with a Domain Name Server address by your Internet Service Provider, type it in the “Name Server addr.” text box.

If you were **not** given a Domain Name Server address, leave this box blank.

- 4 Leave all the other text boxes blank and close the “TCP/IP” screen.

Connecting to Your Service Provider

- 1 Click the **Apple Menu**. Then select **Control Panels** and **PPP**.
- 2 Click **Registered User** to select it.
- 3 Type your login name in the “Name” text box and your password in the “Password” text box.
- 4 Type the phone number that you dial to connect to your service provider or other online service in the “Number” text box.
- 5 Click **Connect**.

Note: For more information about special dialing procedures for making an AO/DI or MultiLink PPP connection, see the chapter [“Dialing, Storing Phone Numbers, and Logging Calls.”](#)

Other Operating Systems

If you are using another operating system, such as Windows 3.x, MS-DOS, UNIX, or Linux, you must install and use third-party communications or terminal software.

When you use this terminal software, you will have to use your ISDN TA’s AT Command Set to configure your ISDN TA and set up the connection to your online service.

For more information on the AT Command Set, see the chapters [“Configuring Your ISDN TA Using AT Commands”](#) and [“AT Commands and S Registers.”](#)

DIALING, STORING PHONE NUMBERS, AND LOGGING CALLS

Placing Calls Manually

You can place calls manually using your ISDN TA's AT commands. To do so:

- 1 Open ControlCenter and click the **Terminal** icon.

If you are not using ControlCenter, send AT commands to your ISDN TA by opening a different piece of communication software's terminal mode. For more information, see the software's users manual.

- 2 Type **ATD** followed by the number. Then press **Enter**. (For example, type **ATD14086542703** and press **Enter**.)

Note: If **ATDT** or **ATDP** is used, your ISDN TA will ignore the letter "T" or "P."

Dialing for MultiLink PPP

With some Internet Service Providers or other online services, making a MultiLink PPP call may require dialing two phone numbers.

- If your service provider does **not** give you multiple numbers to make a MultiLink PPP connection, simply enter the telephone number as you would normally, using your communications application, such as Windows Dial-Up Networking or third-party terminal software.
- If your service provider requires that you use multiple numbers, enter the first number as you would normally. In the same text box, type **&** followed by the second number. Then complete the connection as you would normally.

For example, type **14086542703&14086542704**. Then finish setting up your connection as usual.

Note: If you are using Windows 95 or 98, be sure that **Use country code and area code** is turned off. If you are using NT, be sure that **Use Telephony dialing properties** is turned off. These items are on the same connection properties screen as the box where you type the phone numbers.

Dialing for AO/DI Connections

To make an AO/DI connection, you will have to dial a number for your ISDN line's D-channel. You may also have to dial numbers for your ISDN line's B-channels.

- If your service provider only requires that you dial the D-channel number, type a period in front of the telephone number, then enter it as you would normally, using your communications or terminal software.

For example, type **.14085426793**. Then finish setting up your connection as usual.

Note: If you are using Windows 95 or 98, be sure that **Use country code and area code** is turned off. If you are using NT, be sure that **Use Telephony dialing properties** is turned off. These items are on the same connection properties screen as the box where you type the phone numbers.

- If your service provider requires that you dial the D-channel and the B-channels, type a period in front of the D-channel number. Then type **&**, followed by the B-channel numbers, separated by **&s**.

For example, type **.12625551212&12625331313&12623351212**. Then finish setting up your connection as usual.

Storing Phone Numbers

Your ISDN TA can store up to 10 numbers for quicker dialing. **Note:** Only use this function if you can modify your software's command to dial.

To store a number, type **AT&Zn=s** and press **Enter**.

In the place of *n*, type a number between zero and nine. This number will be the code number for the stored number. In the place of *s*, type the number that you want stored. To store the most recent number dialed, type **L** in the place of *s*.

Note: The stored number function will support the special dialing methods discussed above.

For example, type **AT&Z2=18475551212&12625551847** and press **Enter**.

To dial this stored number, simply **ATDSn** and press **Enter**. In the place of *n*, type the code number for the stored number that you want to dial.

For example, type **ATDS2** and press **Enter**.

Using Call Logging

Your ISDN TA automatically logs the five most recent incoming and outgoing data calls and calls to your ISDN TA's Analog Device Ports. It records the date, time, and number for each call. For data calls, it also records the protocol used.

To view this log, open your terminal software (In ControlCenter, click the **Terminal** icon.). Then type **ATI18** and press **Enter**.

UPDATING YOUR ISDN TA

From time to time, revised code will be released for your ISDN TA to improve the way it works and what it can do.

Using Instant Update

Instant Update can be used to check for, download, and implement these revisions, updating your ISDN TA and its software quickly and automatically.

To use Instant Update, open ControlCenter and click the **Instant Update** icon.

When you open Instant Update, the screen shown in Figure 9-1 appears.

At the top of the screen is a list of devices and software that Instant Update can be used with.

Select the device you want to set the update parameters for by clicking it. If the device you want to set is not listed, click the **Detect** button.

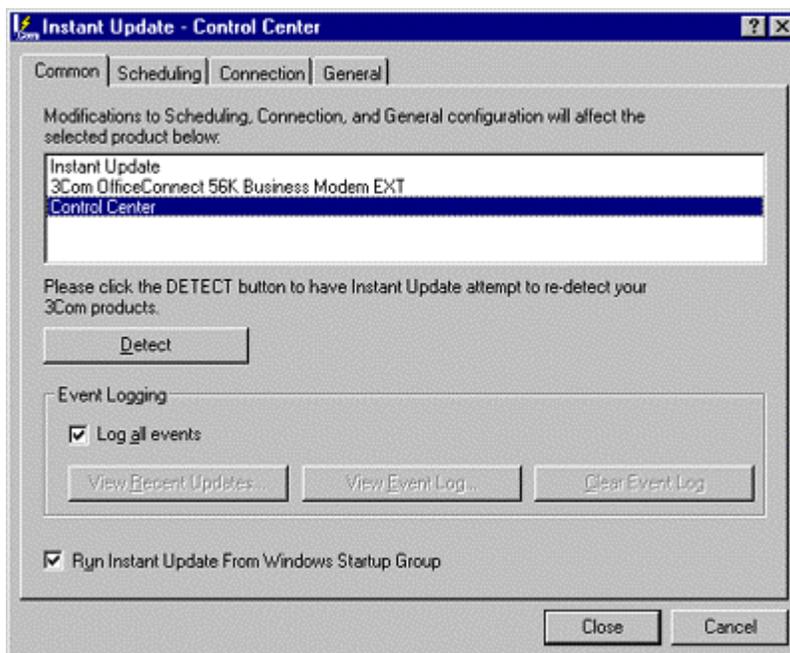


Figure 9-1 Instant Update introductory screen

This screen also allows you to record all of Instant Update's activity.

- To create this record and enable it, make sure that the box next to "Log all events" in the "Event Logging" section has a check mark in it.
- To view this record, click **View Event Log**.
- To erase this record and create a new one, click **Clear Event Log**.

Scheduling Tab

Click the **Scheduling** tab to set how often Instant Update checks for and, if available, downloads new software.

Note: For Instant Update to run automatically on the scheduled day, be sure that “Run Instant Update from the Windows Startup Group” is selected on Instant Update’s “Common” tab.

Instant Update will open and run in the background every time you turn on your computer. An icon will appear in your Windows Taskbar.

You can also have Instant Update check for new software immediately by clicking **Update Now**, as shown in Figure 9-2.

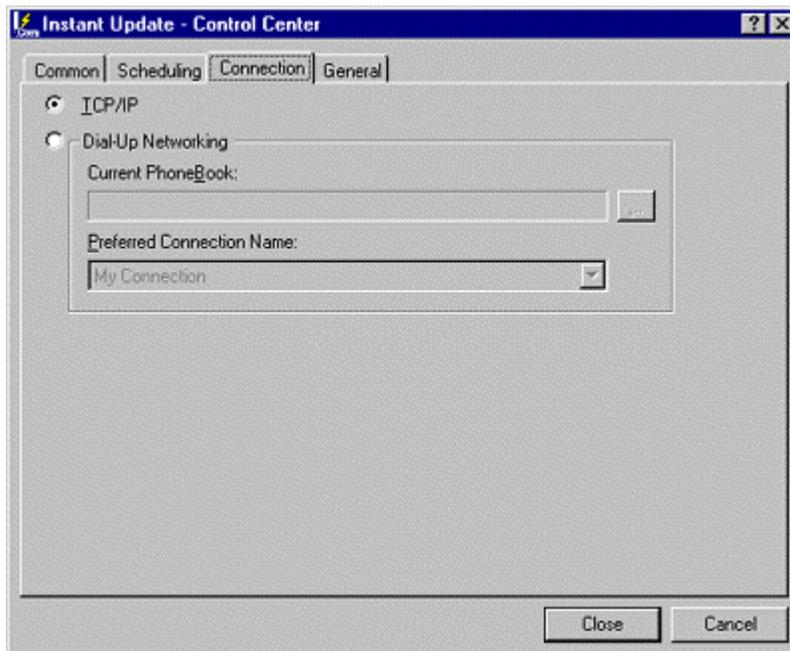


Figure 9-2 Instant Update “Scheduling” tab

Connection Tab

The **Connection** tab allows you to select which of your Dial-Up Networking connections Instant Update uses to download new code for your ISDN TA.

Select **TCP/IP** to use the default connection used by Windows (the connection that launches automatically when you open an application that requires an Internet connection).

To use a different connection, click **Dial-Up Networking**. Then select another connection from the “Preferred Connection Name” drop-down menu.

General Tab

The **General** tab allows you to enter a user name and password for logging on to computers that Instant Update contacts, other than the default 3Com site.

Do **not** enter any information on this screen unless instructed to do so by a 3Com Customer Support representative.

Flashing Your ISDN TA from Disk

To update your ISDN TA's code without using Instant Update:

1 Open ControlCenter and click the **Terminal** icon.

2 Type **ATI7** and press **Enter**.

An information screen appears. Take note of the "Code Date" of your ISDN TA.

3 Go to the 3Com U. S. Robotics Web site at <http://www.usr.com/home/online>. Then click **Upgrades/Updates**.

The site will help you find your ISDN TA and any revised code that may exist for it. Look for the newest file with the extension .xmp.

4 If the date of the code that you find is more recent than the code date of your ISDN TA, download the code that you find on the Web site.

5 Once the file has downloaded, click the **Flash From Disk** icon in ControlCenter.

6 The screen shown in Figure 3 appears. Click the ... button (the "Browse" button with an ellipse on it next to the "Flash File Path" text box).



Figure 3 “Flash From Disk” screen

- 7** Find the file that you downloaded from the Web site. Select it and click **OK**.
- 8** Then click the **Update** button.

Flashing Your ISDN TA Manually with .XMP Flash

To update your ISDN TA’s code without using ControlCenter:

- 1** Open your terminal software.
- 2** Type **ATI7** and press **Enter**.

An information screen appears. Take note of the “Code Date” of your ISDN TA.

- 3** Go to the 3Com U. S. Robotics Web site at <http://www.usr.com/home/online>. Then click **Upgrades/Updates**.

The site will help you find your ISDN TA and any revised code that may exist for it. Look for the newest file with the extension .xmp.

If the date of the code that you find is more recent than the code date of your ISDN TA, download the code that you find on the Web site.

- 4** In your terminal software, type **AT~X!** and press **Enter**.

A message appears that says, "SDL Xmodem file transfer," followed by "Yes," "No," and "Test."

- 5 Type **Y** to send the .xmp file to your ISDN TA via xmodem file transfer.

Note: If you are using a Macintosh, disable the MacBinary option in your terminal program.

USING PROTOCOL DECODE

Protocol Decode, a diagnostic tool that is a part of your ControlCenter software, reads, filters, and displays a record of the protocol information for connections made by your ISDN TA. Your ISDN TA records all the protocol messages that pass between your ISDN TA, your computer, the telephone company switch, and the device that you are connecting to.

Note: Protocol Decode does **not** report information on connections as they are happening. Instead, it displays information stored on your ISDN TA from past connections.

To use Protocol Decode, open ControlCenter and click the **Protocol Decode** icon. The screen shown in Figure 10-1 appears.



Figure 10-1 “Protocol Decode” screen

Options in the Protocol Decode application include:

- **ISDN Signaling** – Your ISDN TA tracks protocol information on your ISDN line’s D-channel. If a check mark appears in the box next to an item, that sort of information is displayed.

“Raw data” displays all the signaling messages passed along your ISDN line’s D-channel without decoding them.

“Q.921” displays messages interpreted by the Q.921 protocol.

“Q.931” displays messages interpreted by the Q.931 protocol.

- **Physical Interface** – The check boxes in this section allow you to review activity at the physical layer of your ISDN line and on-hook and off-hook activity on your ISDN TA’s Analog Device Ports.

- **PPP/LCP Decode** – The check boxes in this section allow you to select which PPP messages B-channels will be displayed.

“Network” displays PPP messages passed between your ISDN TA and the device that it is connected to

“DTE” displays PPP messages passed between your ISDN TA and your computer.

Buttons in the Protocol Decode application include:

- **Save To Disk** – Saves your ISDN TA’s Protocol Decode information to your computer or to a disk.
- **Load From Disk** – Loads saved information from your computer or from a disk.
- **Load From ISDN TA** – Transfers the information from your ISDN TA to the Protocol Decode application and displays it.
- **Reset ISDN TA Buffer** – Deletes the current information in your ISDN TA’s record.
- **Refresh** – Redisplays the information currently in the Protocol Decode, filtering it using the choices made in the check boxes.

CONFIGURING YOUR ISDN TA

USING AT COMMANDS

This chapter outlines how to configure many of the common settings for your ISDN TA using AT commands. Further descriptions of these settings, as well as methods of adjusting these settings using the ControlCenter software that came with your ISDN TA, are discussed in previous chapters.

Typing AT Commands

AT commands are used to change your ISDN TA's settings. They are sent using your communications software's terminal mode.

If you are using third-party communications software, consult the users manual for information on using terminal mode. If you are using the ControlCenter software that came with your ISDN TA, click the **Terminal** icon to reach terminal mode.

To issue a command, type it (remembering to put the "AT" in front of it) and press **Enter**. For example, type **AT*S=1**. Then press **Enter**.

The commands listed below are the only ones that do **not** require that AT precede them:

Command:	Result:
A/	Re-executes the most recent command issued
A>	Repeats the most recent command until canceled by pressing any key
+++	Returns your ISDN TA to command mode (Do not press Enter after issuing this command.)

The sections below cover many of the commands necessary to configure your ISDN TA for connection to an Internet Service Provider or other online service. They are grouped by the ATI screens that provide you with information about how the settings are currently configured.

The sections below tell you how to issue an ATI command, show you what information is displayed when the command is issued, and then tell you how to adjust the settings referred to in the ATI information.

Default settings are listed in italics.

Note: This section is not an exhaustive list of AT commands. For a full list of commands, see the "AT Commands and S Registers" chapter.

ATI12 (Switch Settings)

Type **ATI12** and press **Enter**. An information screen appears, listing your ISDN TA's switch, SPID and telephone number, and Always On/Dynamic ISDN (AO/DI) information, as shown in Figure 11-1. Settings changed on the ATI12 screen do not have to be saved to NVRAM with &W. However, before settings will take affect you must reset the ISDN TA, with ATZ!

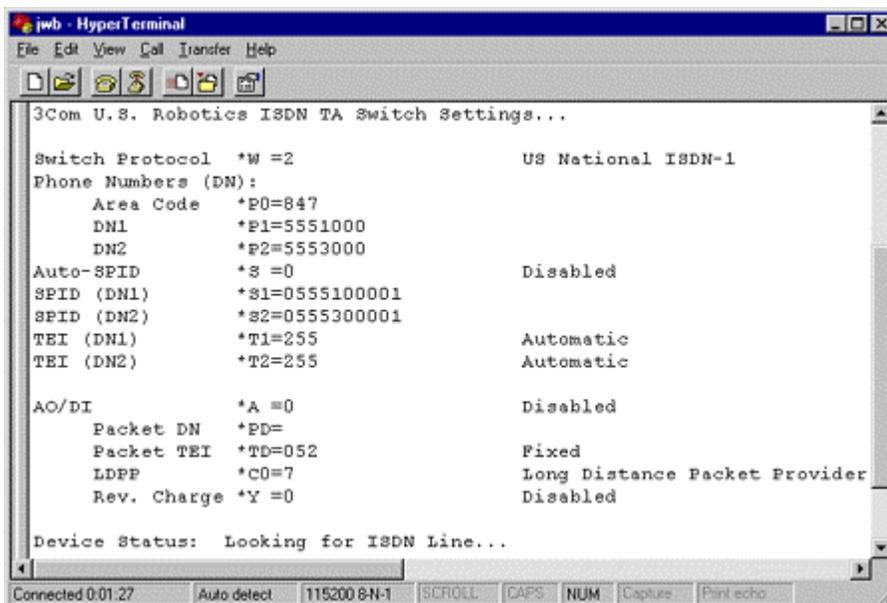


Figure 11-1 AT112 information screen

Switch Protocol

The switch protocol is set using `AT*W=n`. The switch type is supplied by your telephone company when you order your ISDN line.

Command:	Sets your switch type to:
<code>AT*W=1</code>	DMS-100 Custom
<code>AT*W=2</code>	National ISDN-1 (default)
<code>AT*W=3</code>	National ISDN-2
<code>AT*W=4</code>	SESS Custom Multipoint
<code>AT*W=5</code>	SESS Custom Point-to-Point
<code>AT*W=6</code>	Leased Line 64 Kbps (1 B-channel)
<code>AT*W=7</code>	Leased Line 128 Kbps (2 B-channels)

Telephone Numbers

The telephone numbers for your ISDN TA are set using `AT*P=n`. These numbers are supplied by your telephone company and are what people dial when they place a data call to your ISDN TA or to devices connected to your Analog Device Ports.

Command:	Follow the equal sign with:
<code>AT*P0=</code>	Area code
<code>AT*P1=</code>	Telephone number 1 (DN1)
<code>AT*P2=</code>	Telephone number 2 (DN2)

SPIDs

The Service Profile Identifiers (SPID) for your ISDN TA are set using `AT*S=`. When set to AutoSPID mode, your ISDN TA attempts to discern its SPIDs automatically.

To set AutoSPID mode:

Command:	Result:
<code>AT*S=0</code>	Disables AutoSPID
<code>AT*S=1</code>	Enables AutoSPID (default)

To set the SPIDs manually:

Command	Follow the equal sign with:
AT*S1=	SPID for telephone number 1
AT*S2=	SPID for telephone number 2

TEIs

The Terminal Endpoint Identifiers (TEI) for your ISDN TA are set using AT*T=.

Command:	Follow the equal sign with:
AT*T1=	TEI for telephone number 1 <i>If set to 255, TEI is set automatically</i>
AT*T2=	TEI for telephone number 2 <i>If set to 255, TEI is set automatically</i>

AO/DI

Always On/Dynamic ISDN allows low-bandwidth data operations to be carried on over your ISDN line's D-channel. Its settings are adjusted using a number of AT commands.

To turn AO/DI on and off:

Command:	Result:
AT*A=0	<i>Disables AO/DI (default)</i>
AT*A=1	Enables AO/DI

To set the telephone number and TEI for AO/DI:

Command:	Follow the equal sign with:
AT*PD=	Packet Telephone Number on the D-channel for AO/DI connections to your ISDN TA
AT*TD=	0-63 sets TEI to a fixed assignment 255 sets TEI automatically <i>Default setting is 21</i>

To set the long distance packet carrier code for your D-channel's X.25 connection:

Command:	Follow the equal sign with:
AT*C0=	Four-digit long distance packet carrier code

Request Reverse Charge

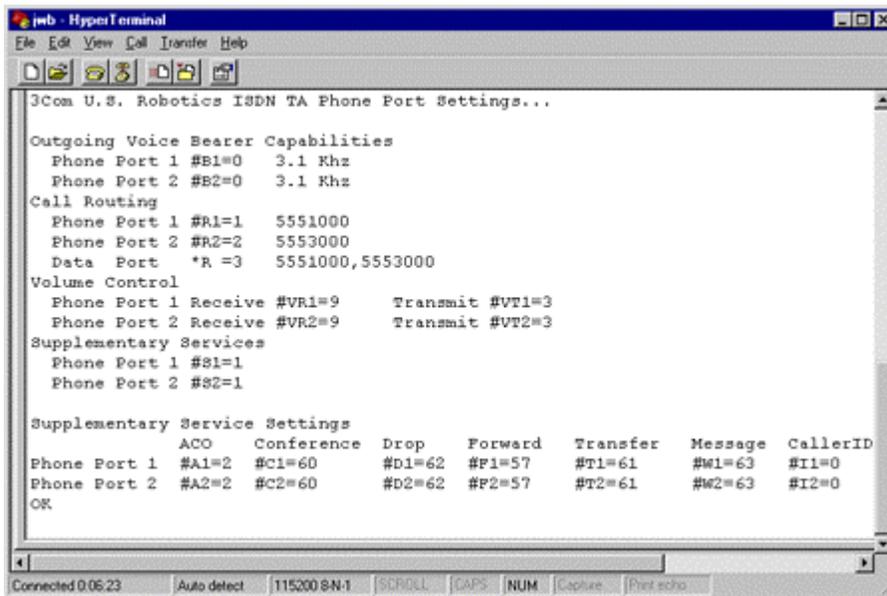
To enable and disable the Request Reverse Charge option, which allows you to request that the charge for an X.25 connection on your ISDN TA's D-channel be paid by the recipient of the call:

Command:	Result:
AT*Y=0	<i>Disable X.25 Request Reverse Charge (default)</i>
AT*Y=1	Enable X.25 Request Reverse Charge

ATI15 (Phone Port Settings)

Type **ATI15** and press **Enter**. An information screen appears, listing the settings for your ISDN TA's Analog Device Ports, as shown in Figure 11-2. There are two Analog Device Ports on the back of your ISDN TA. They are labeled 1 and 2. In all of the commands listed below, *x* represents the number of the Analog Device Port. Each of the settings can be adjusted for each port by typing the port's number in the place of *x*.

Note: Many of the options in this section require that you have the proper ISDN line type installed. For more information, see the "Ordering ISDN Service" chapter.



```
3Com U.S. Robotics ISDN TA Phone Port Settings...

Outgoing Voice Bearer Capabilities
Phone Port 1 #B1=0 3.1 Khz
Phone Port 2 #B2=0 3.1 Khz
Call Routing
Phone Port 1 #R1=1 5551000
Phone Port 2 #R2=2 5553000
Data Port *R =3 5551000,5553000
Volume Control
Phone Port 1 Receive #VR1=9 Transmit #VT1=3
Phone Port 2 Receive #VR2=9 Transmit #VT2=3
Supplementary Services
Phone Port 1 #S1=1
Phone Port 2 #S2=1

Supplementary Service Settings
ACO Conference Drop Forward Transfer Message CallerID
Phone Port 1 #A1=2 #C1=60 #D1=62 #F1=57 #T1=61 #W1=63 #I1=0
Phone Port 2 #A2=2 #C2=60 #D2=62 #F2=57 #T2=61 #W2=63 #I2=0
OK
```

Figure 11-2 ATI15 Information screen

Voice Bearer Capabilities

The outgoing voice bearer capability is set using **AT#Bx=**.

Command:	Result:
AT#Bx=0	3.1 KHz Audio (default)
AT#Bx=1	Speech

Call Routing

Which telephone number will be assigned to which Analog Device Port is set using the **AT#Rx=**. By default, the first Analog Device Port is assigned the first telephone number, and the second Analog Device Port is assigned the second telephone number.

Command:	Result:
AT#Rx=0	Disables incoming voice calls
AT#Rx=1	Set the first telephone number to the Analog Device Port <i>x</i>
AT#Rx=2	Set the second telephone number to the Analog Device

Port x

Data Call Routing

The AT*R= command determines which telephone numbers can be answered as data calls.

Command:	Result:
AT*R=0	Disables incoming data calls
AT*R=1	Telephone number 1 can be answered as a data call
AT*R=2	Telephone number 2 can be answered as a data call
AT*R=4	<i>Both telephone numbers can be answered as data calls (default)</i>
AT*R=8	Any telephone number can be answered as a data call

Volume Control

The volume of voice calls is set using AT#VRx= and AT#VTx=. The volume levels are set on a scale of one to nine, one being the lowest and nine the highest.

Receive volume:

Command:	Follow the equal sign with:
AT#VRx=	0 to mute the receive volume 1-9 to set volume on analog device port x (<i>9 is the default</i>)

Transmit volume:

Command:	Follow the equal sign with:
AT#VTx=	0 to mute the receive volume 1-9 to set volume on analog device port x (<i>9 is the default</i>)

Supplementary Voice Services

The supplementary voice services for each Analog Device Port can be universally disabled using AT#Sx=.

Command:	Result:
AT#Sx=0	Disable all supplementary voice services to Analog Device Port x
AT#Sx=1	<i>Enable any supplementary voice service that is turned on individually on Analog Device Port x (default)</i>

Call Waiting

Call Waiting (ACO) for each Analog Device Port can be turned on or off using AT#Ax=

Command:	Result:
AT#Ax=0	Disable all incoming voice calls to the given port
AT#Ax=1	Disable Call Waiting on the port

*AT#Ax=2 Enable Call Waiting on the port
(default)*

Three-way conference options

Each Analog Device Port's three-way conference options can be turned on or off using AT#Cx=. A code for three-way conferencing will be provided by your phone company when you order the service.

Command:	Follow the equal sign with:
AT#Cx=	0, disables conference options <i>60, a common code used to enable the option, is the default.</i> If your phone company uses a different two-digit number, type it after the equal sign.

Call Drop

Call Drop for each Analog Device Port can be turned on or off using AT#Dx=.

Command:	Follow the equal sign with:
AT#Dx=	0, disables call drop <i>62, a common code used to enable the option, is the default.</i> If your phone company uses a different two-digit number, type it after the equal sign.

Call Forwarding

Call Forwarding for each Analog Device Port can be turned on or off using AT#Fx=.

Command:	Follow the equal sign with:
AT#Fx=	0, disables Call Forwarding <i>57, a common code used to enable the option, is the default.</i> If your phone company uses a different two-digit number, type it after the equal sign.

Call Transfers

The call transfer options for each Analog Device Port can be turned on or off using AT#Tx=.

Command:	Follow the equal sign with:
AT#Tx=	0, disables call transfer <i>61, a common code used to enable the option, is the default.</i> If your phone company uses a different two-digit number, type it after the equal sign.

Message Waiting

The message waiting indicator for each Analog Device Port can be turned on or off using AT#Wx=. The alert LED on your ISDN TA will flash, or there will be a stutter dial tone on the phone if there is a message waiting.

Command:	Follow the equal sign with:
AT#Wx=	0, disables message waiting indicator <i>63, a common code used to enable the</i>

option, is the default. If your phone company uses a different two-digit number, type it after the equal sign.

Caller ID

The Caller ID options for each Analog Device Port can be turned on or off using AT#Ix=.

Command:	Result:
AT#Ix=0	Caller ID disabled on the port
AT#Ix=1	Caller ID enabled on the port (default)

ATI16 (Data Protocol Settings)

Type **ATI16** and press **Enter**. An information screen appears, listing your ISDN TA's data protocol settings, as shown in Figure 11-3.

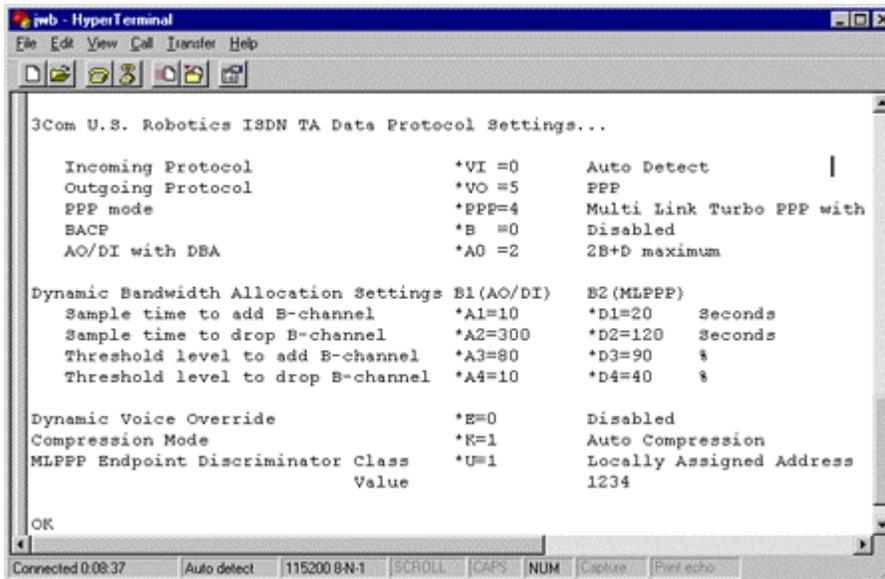


Figure 11-3 ATI16 Information screen

Incoming Protocol

The incoming data protocol is set using AT*VI=. **Note:** Unless your ISDN TA is set to **Automatic Protocol Detect**, it will only accept calls using the protocol that it is set to.

Command:	Result:
AT*VI=0	Automatic Protocol Detect (default)
AT*VI=1	V.120 Rate Adaption (Fixed)
AT*VI=5	Auto Mode PPP
AT*VI=7	Asynchronous 128K
AT*VI=8	Advanced Asynchronous 128K

Outgoing Protocol

The outgoing data protocol is set using AT*VO=.

Command:	Result:
AT*VO=1	V.120 Rate Adaption (Fixed)
AT*VO=5	<i>Auto Mode PPP (default)</i>
AT*VO=7	Asynchronous 128K
AT*VO=8	Advanced Asynchronous 128K

PPP Mode

The PPP mode is set using AT*PPP=.

Command:	Result:
AT*PPP=0	Sets all PPP-related values to their defaults
AT*PPP=1	Transparent Async-to-Sync PPP
AT*PPP=2	Single Link PPP
AT*PPP=3	128 Kbps MultiLink PPP
AT*PPP=4	<i>MultiLink PPP with DBA (default)</i>

AO/DI Channel Management

Always On/Dynamic ISDN(AO/DI) is a dial-up service designed to optimize the use of your ISDN line by sending and receiving data on the D-channel. Using Dynamic Bandwidth Allocation, it also engages and disengages the B-channels as they are needed.

The number of B-channels being managed by AO/DI is set using AT*A0=.

Command:	Result:
AT*A0=0	AO/DI can use only the D-channel
AT*A0=1	AO/DI can use only the D-channel and a maximum of one B-channel
AT*A0=2	<i>AO/DI can use the D-channel and two B-channels (default)</i>

BACP/BAP

Bandwidth Allocation Control Protocol (BACP) and Bandwidth Allocation Protocol (BAP) are used to negotiate bandwidth allocation with the server your ISDN TA is connected to. If BACP/BAP is not needed during a given connection, it will not be used, even if it is enabled.

BACP/BAP is turned on and off using AT*B=.

Command:	Result:
AT*B=0	Disable BACP/BAP
AT*B=1	<i>Enable BACP/BAP (default)</i>

BACP/BAP Dial Prefixes

To set the dialing prefixes for BACP/BAP, type AT*Cx=.

Command:	Follow equal sign with:
AT*C1=	Dial-out prefix for BACP/BAP
AT*C2=	Long distance dial-out for BACP/BAP

AO/DI Callback

With an AO/DI connection, the D-channel is connected first. When additional bandwidth is needed, BACP/BAP can request the server to call back on a B-channel, when AO/DI callback is enabled. The server must support your account with callback feature.

Note: To use AO/DI callback, BACP/BAP must be enabled using the AT*B=.

Command:	Result:
AT*C3=0	Disable AO/DI callback (default)
AT*C3=1	Enable AO/DI callback

Dynamic Bandwidth Allocation Thresholds

These settings allow you to adjust how often the B-channels are checked to see if they need to be added or dropped and what percentage of the channels must be in use before they are added or dropped.

Command:	Follow the equal sign with
AT*A1=	Sample time (1-999 seconds) to add B1-channel in AO/DI
AT*A2=	Sample time (1-999 seconds) to return to D-channel in AO/DI
AT*A3=	D-channel threshold level to add B1-channel in AO/DI (percentage)
AT*A4=	Threshold level to return to D-channel in AO/DI (percentage)
AT*D1=	Sample time (1-999 seconds) to increase bandwidth in MultiLink PPP
AT*D2=	Sample time (1-999 seconds) to decrease bandwidth in MultiLink PPP
AT*D3=	Threshold level to increase bandwidth (percentage)
AT*D4=	Threshold level to decrease bandwidth (percentage)

Dynamic Voice Override

Dynamic Voice Override (DVO) manages calls to analog devices on your ISDN line when your data connection is active.

DVO is configured using AT*E=.

Command:	Result:
AT*E=0	Disable Dynamic Voice Override
AT*E=1	Enable DVO for incoming and outgoing calls (default)
AT*E=2	Enable DVO for outgoing calls only
AT*E=3	Enable DVO for incoming calls only

Compression Mode

The PPP compression mode is set using AT*K=.

Command:	Result:
AT*K=0	Pass Through Compression
AT*K=1	Auto Compression (default)

AT*K=2 Turbo PPP Compression

MLPPP Endpoint Discriminator Class

The Endpoint Discriminator Class for MLPPP is set using AT*U=.

Command:	Result:
<i>AT*U=0</i>	<i>Automatic assignment (default)</i>
AT*U=1,xxx	Locally assigned address xxx
AT*U=2,xxx	Internet Protocol address xxx
AT*U=3,xxx	IEEE 802.1 globally assigned MAC address xxx
AT*U=4,xxx	PPP Magic Number Block xxx
AT*U=5,xxx	Public Switched Network Directory Number xxx

TROUBLESHOOTING

Note: Many of the remedies below involve changing the settings of your ISDN TA using ControlCenter. All of these settings can also be changed using AT commands and your computer's communications software. For more information, see the chapter "[Configuring Your ISDN TA Using AT Commands](#)."

When I connect to my Internet Service Provider, the B1 and B2 lights illuminate on my ISDN TA. However, my connect speed in Dial-Up Networking only shows 64 Kbps rather than 128 Kbps.

When in PPP mode, your ISDN TA only reports single B-channel connect speeds to the operating system. If the B1 and B2 lights are illuminated, you have a MultiLink connection.

If Dial-Up Networking shows that you are connected at 64 Kbps and both B1 and B2 lights are illuminated, you are connected at 128 Kbps. If Dial-Up Networking shows that you are connected at 56 Kbps and both B1 and B2 lights are illuminated, you are connected at 112 Kbps.

When I download large files, the second B-channel on my ISDN line is used, and the B2 light on my ISDN TA illuminates. Most other times, however, only my B1 light illuminates, and only one B-channel is used. How can I connect to my Internet Service Provider with two B channels all the time?

Open the ControlCenter. Then click the **Configuration Manager** icon.

When the "Basic Configuration" screen appears, click the **Outgoing Calls** drop-down menu. Then select **Internet Access (PPP) 128 Kbps**.

When someone calls my ISDN line with a voice call, one of my B-channels used for 128 Kbps data transmission is turned off and the phone connected to my ISDN TA rings. How do I prevent calls from being accepted while there is a data transmission on both B-channels?

Open ControlCenter. Then click the **Configuration Manager** icon.

When the "Basic Configuration" screen appears, click the **Dynamic Voice Override** drop-down menu. Select either **No Dynamic Voice Override** or **Outgoing Calls only**.

If you select "No Dynamic Voice Override," a B-channel will never be taken off the data transmission to make or accept a voice call.

If you select "Outgoing Calls only," a B-channel will be taken off a data transmission only when you attempt to place a voice call from a telephone connected to your ISDN TA. When a voice call is made to a telephone connected to your ISDN TA, the caller will get a busy signal.

During a 128 Kbps connection, anyone dialing one of my ISDN phone numbers (Directory Numbers) gets a busy

signal. How do I set my ISDN TA to drop one of the B-channels on the data transmission and allow the call to come through?

Open ControlCenter. Then click the **Configuration Manager** icon.

When the “Basic Configuration” screen appears, click the **Dynamic Voice Override** drop-down menu. Then select **Incoming and Outgoing Calls**.

If this does not work, have the person try calling the other phone number for your ISDN line. Dynamic Voice Override may work on only one of your phone numbers, depending upon the type of ISDN service that you use.

When I try to place a call to my Internet Service Provider, I am unable to make a connection.

- Make sure your ISDN TA is properly configured for the ISDN line by running ControlCenter. If there is a problem with the way the SPIDs and telephone numbers for your ISDN line are set up, ControlCenter’s SPID Wizard will reconfigure your ISDN TA.
- Open ControlCenter and click the **Configuration Manager** icon. When the “Basic Configuration” screen appears, verify that “Internet Access (PPP)” is selected in the “Outgoing Calls” drop-down menu. This is the most common connection protocol used by Internet Service Providers.
- Verify that the CD light on the front of your ISDN TA illuminates when you place a call to your Internet Service Provider. If the CD light does not come on after you dial, open ControlCenter and click the **Configuration Manager** icon. When the “Basic Configuration” screen appears, click **56K** next to “B-channel Rate.”
- You may need to use a special character in the number you dial (if you are using AO/DI or MultiLink PPP, for example). For more information, see the chapter [“Dialing, Storing Phone Numbers,” and Logging Calls.](#)”

When I place a call to my server, the CD light on the front of the ISDN TA illuminates. However, I cannot authenticate to the remote server.

Open ControlCenter. Then click the **Configuration Manager** icon.

Click the **Advanced Configuration** button, followed by the **Data** tab. Then click the **PPP Settings** button.

When the “PPP Settings” screen appears, click the **PPP Mode** drop-down menu. Then click **Transparent Async/Sync PPP** to select it.

The Remote Access Server that I dial does not have a hunt group, and I need to dial two phone numbers to get a 128 Kbps connection. How do I do this?

In the phone number section of your dialing program type both phone numbers separated by **&**. (for example, 5551212&5551213) Then complete your connection as usual.

If you are using Dial-Up Networking in Windows 95 or 98, turn off **Use area code and Dialing Properties**. There is **not** a check mark in the box next to the item when it is turned off. If you are using Dial-Up Networking in Windows NT 4, turn off **Use Telephony dialing properties**.

When I call to other ISDN equipment using a terminal program (such as Hyperterminal), I can't send or receive data.

V.120 or Asynchronous 128K must be used if you are using your ISDN TA with a terminal program.

Open ControlCenter and click the **Configuration Manager** icon. Verify that "V.120 Rate Adaption" or "Asynchronous 128 Kbps" is selected in the "Outgoing Calls" drop-down menu. **Note:** The device that you are connecting to must be using the same protocol that your ISDN TA is using.

If your ISDN TA will also be receiving calls in a terminal program, click the **Advanced Configuration** button. Click the **Data** tab. Then verify that "V.120 Rate Adaption" or "Asynchronous 128 Kbps" is selected in the "Incoming Call Protocol" drop-down menu.

How do I program the SPIDs for my ISDN TA without using the ControlCenter software?

You can initiate SPID Wizard from a terminal program.

Open your terminal software (such as Hyperterminal). Then type **AT*Zx,y,z** and press return.

Type this command without any spaces and let x equal your area code, y equal the first telephone number (Directory Number) for your ISDN line, and z equal the second telephone number for your ISDN line. The telephone numbers are provided by your telephone company when you order ISDN service. The SPID Wizard will try to configure your ISDN TA for your ISDN line using the telephone number information.

How do I program the SPIDs and other ISDN line information for my ISDN TA without using the ControlCenter software or the SPID Wizard?

Open a terminal program, such as Hyperterminal.

To set your switch protocol, type **AT*W=n** and press **Enter**. Type the number that corresponds to your switch type in the place of *n*, using the list below as reference.

n=1 DMS-100
n=2 National ISDN-1 (default)
n=3 National ISDN-2
n=4 5ESS Custom Multipoint
n=5 5ESS Custom Point-to-Point
n=6 Leased Line 64 kbps (1 B-channel)
n=7 Leased Line 128 kbps (2 B-channels)

To enter your area code information, type **AT*P0=xxx** and press **Enter**. In the place of *xxx*, type your area code.

To enter a telephone number for your ISDN TA, type **AT*P1=xxx** and press **Enter**. In the place of *xxx*, type one of the telephone numbers for your ISDN line. To enter a second telephone number, type **AT*P2=xxx** and press **Enter**. Type the second telephone number in the place of *xxx*.

To enter the SPID for your first telephone number, type **AT*S1=xxx** and press **Enter**. Type the SPID in the place of *xxx*. To enter the SPID for your second telephone number, type **AT*S2=xxx** and press **Enter**. Again, type the SPID in the place of *xxx*.

Once your numbers have been set, type **ATZ!** to resynchronize your ISDN TA to the telephone company's switch equipment. The alert light will turn off when the ISDN TA is properly synchronized to the telephone company switch. This may take one minute to complete.

These settings do **not** have to be saved using the &W command.

Where can I get access to Q.931 and PPP information generated by my ISDN TA?

Open ControlCenter and click the **Protocol Decode** icon. A protocol monitor program will then extract this information from your ISDN TA.

When I dial an NT Server, call back doesn't work with my ISDN TA.

Make sure the BACP/BAP is enabled.

Open ControlCenter and click the **Configuration Manager** icon. Then click the **Advanced Configuration** button.

Click the **Data** tab. Then click the **PPP Settings** button. If a check mark does not appear next to "Enable BACP/BAP," click it to select it. A check mark will appear in the box next to the item when it is selected.

When I use Asynchronous 128K, I cannot connect to other ISDN products that support BONDING.

Asynchronous 128K and Advanced Asynchronous 128K are both 3Com proprietary protocols. You must use the same type of ISDN equipment on both sides of the connection.

The supplementary voice features for my ISDN line are not working.

Your ISDN TA only supports supplementary voice features when you use a National ISDN ordering code to set up your ISDN service. If you had to order your service by switch type, these features may not work.

Also, many of the National ISDN codes only support the supplementary voice features on one of your ISDN line's phone numbers. Each of your Analog Device Ports is assigned one of your ISDN line's telephone numbers. Be sure your phone is plugged into the Analog Device Port that is assigned the phone number that supports the supplementary voice features.

Check with your phone company to find out what ISDN ordering code you are using and to find out which of your phone numbers supports the supplementary voice features.

The device I am connecting to requires Microsoft Encrypted Password. When I check the box to use the protocol in Dial-Up Networking I cannot logon to my remote server.

Your ISDN TA does support the Microsoft Encrypted Password. However, the check box in Dial-Up Networking should not be selected. The remote server you are calling will require the connection be authenticated with the Microsoft Encrypted Password. The ISDN TA will send the password using the Microsoft Encrypted Password even though the box is unchecked in Dial-Up Networking.

To turn this option off, click Windows **Start**, select **Programs** and **Accessories**, and click **Dial-Up Networking**. Right-click the icon of the connection you want to change. Then click **Properties**.

When the properties screen for your connection appears, click the **Server Types** icon. In the "Advanced Options" section, turn off **Require encrypted password** by clicking it. The check mark in the box next to the item disappears when it is turned off. Then click **OK**.

When I call an NT server using Windows 95 Dial-Up Networking, I do not get prompted for my domain when I am logging in.

In the user name text box, add a backslash and your domain in capital letters after your regular user name (for example, username\DOMAIN).

My ISDN TA is connected to my computer using a serial cable. When I try to set my modem speed in Windows to 230.4 Kbps (230,400), my ISDN TA won't dial out.

Using the 230.4 Kbps port speed with Windows requires a special serial port. Most new computer's serial ports operate at up to 115.2 Kbps. To use your ISDN TA at 230.4 Kbps, check with your computer manufacturer to see if your serial port will support that speed.

I cannot connect when I try to make an AO/DI call.

- Be sure that your Internet Service Provider supports AO/DI.
- Be sure that you put a period in front of the telephone number for your D-channel.

If you are using Windows 95 or 98 Dial-Up Networking, be sure that **Use country code and area code** is turned off. If you are using Windows NT, be sure that **Use Telephony dialing properties** is turned off. These items are on the same connection properties screens as the boxes where you type the phone numbers.

Also be sure that you are dialing the proper number with the area code and prefix if necessary.

- Be sure that AO/DI is enabled.

Open ControlCenter and click the **Configuration Manager** icon. Click the **Advanced Configuration** button. Then click the **ISDN Line** tab.

At the bottom of the "ISDN Line" screen be sure that **Enable AO/DI (Always On/Dynamic ISDN)** is selected. A check mark appears in the box next to the item when it is selected.

- Be sure that your ISDN TA is using PPP.

Open ControlCenter and click the **Configuration Manager** icon. Then click the **Advanced Configuration** button.

Click the **Outgoing Call Protocol** drop-down menu. Then click **Internet Access (PPP)**.

- If your service provider does **not** support Reverse Charge Request, be sure that it is turned off.

Open ControlCenter and click the **Configuration Manager** icon. Then click the **Advanced Configuration** button.

Click the **ISDN Line** tab. Then click the **AO/DI Settings** button.

In the "AO/DI Operations" section, turn off **Enable Reverse Charge Request**. There will **not** be a check mark in the box next to the item when it is turned off.

- If you require a long distance packet carrier for your D-channel's X.25 connection, be sure that the carrier code and packet telephone number are correct.

This information is provided by your phone company.

Open ControlCenter and click the **Configuration Manager** icon. Then click the **Advanced Configuration** button.

Click the **ISDN Line** tab. Then click the **AO/DI Settings** button.

Enter the information in the “Network Settings” section.

While making an AO/DI connection, my ISDN line’s B-channels will not engage.

Open ControlCenter and click the **Configuration Manager** icon. Click the **Advanced Configuration** button. Then click the **ISDN Line** tab.

At the bottom of the “ISDN Line” screen be sure that **Enable AO/DI (Always On/Dynamic ISDN)** is selected. A check mark appears in the box next to the item when it is selected.

Then click the **AO/DI Settings** button.

In the “AO/DI Operations” section, you can also set the number of B-channels being managed by AO/DI.

Click the **Maximum AO/DI Bandwidth** drop-down menu.

- If you want AO/DI to have control over only the D-channel of your ISDN line, click **D-channel Only**.
- If you want AO/DI to be able to engage one of your B-channels when necessary, click **D-channel + 1 B-channel**.
- If you want AO/DI to be able to engage both B-channels when necessary, click **D-channel + 2 B-channels**.

If your service provider requires that you dial a number for the D-channel as well as both B-channels, also be sure that you are dialing correctly.

Type a period in front of the D-channel number. Then type **&**, followed by the B-channel numbers, separated by **&**.

For example, type **.12625551212&12625331313&12623351212**. Then finish setting up your connection as usual.

Note: If you are using Windows 95, or 98 be sure that **Use country code and area code** is turned off. If you are using Windows NT 4 be sure that the **Use Telephony Dialing properties** is turned off. This item is on the same connection properties screen as the box where you type the phone numbers.

During an AO/DI connection, my B-channels stay up too long.

To adjust your Dynamic Bandwidth Allocation threshold settings, open ControlCenter and click the **Configuration Manager** icon. Then click the **Advanced Configuration** button.

Click the **PPP Settings** button. In the “PPP Mode” drop-down menu, be sure that **MultiLink PPP with Dynamic Bandwidth Allocation** is selected.

Then click the **Dynamic Bandwidth** button.

Your ISDN line’s two B-channels are represented on the “B-channel Threshold Settings” screen. The settings that can be adjusted include:

- **Sample Time to Add B-channel** – Use the slide bar to adjust how often, in seconds, the other channel is checked to determine if this channel needs to be turned on.
- **Sample Time to Drop B-channel** – Use the slide bar to adjust how often, in seconds, this channel is checked to determine if it needs to be turned off.
- **Threshold to Add B-channel** – Use the slide bar to adjust what percentage of the other channel must be in use before this channel is turned on.
- **Threshold to Drop B-channel** – Use the slide bar to adjust what percentage of this channel must be in use before it is turned off.

Note: The settings for the first B-channel can only be adjusted if AO/DI is enabled.

ORDERING ISDN SERVICE

Placing Your ISDN Order through 3Com

To have your ISDN order placed for you, simply call 1-800-572-3Com.

A 3Com representative will ask what services you require on your ISDN line, provide the appropriate information to your telephone company, and schedule an appointment for the installation of your ISDN line.

Placing Your Order through Your Telephone Company

To order ISDN service through your phone company, call the company and ask if they use National ISDN Ordering Codes.

- If your phone company uses National ISDN Ordering Codes, go to the “Using National ISDN Ordering Codes” section of this chapter.
- If your phone company does not use National ISDN Ordering Codes, ask what sort of ISDN switch type your line will be using. Take note of the type, then go to the “Ordering by Switch Type” section of this chapter.

Using National ISDN Ordering Codes

These codes simplify ordering ISDN service by grouping common features and capabilities in packages that can be requested by name. This means that you can order your ISDN service without discussing an incredible number of parameters one-by-one with your phone company’s ISDN representative.

Using an ordering code also ensures that the phone line will function properly with your ISDN equipment.

One of the National ISDN Ordering Codes listed below will likely meet your needs.

Note: Many other capability packages may be available for your ISDN line, and many features can be added to your package individually.

However, not all capability packages may be available from your phone company.

If you have any questions about what is included in a capability package or how to add something to that package, ask your phone company’s ISDN representative.

Ordering Codes with Supplementary Voice Services

- **EZ-ISDN 1 or IOC U** – This package carries voice and data traffic at speeds of up to 128 Kbps along two B-channels.

It allows you to use analog devices, such as a telephone or fax machine, on your ISDN line and includes Calling Number Identification for both data and voice calls.

EZ-ISDN 1 is also set up to allow supplementary voice services for one analog device on the ISDN line. Such services include Call Waiting, Call Forwarding, and three-way conference options (hold, drop, consultation call, and transfer).

Caller ID is also available for both Analog Device Ports.

- **EZ-ISDN 1A or IOC V** – This package carries voice and data traffic at speeds of up to 128 Kbps along two B-channels.

It allows you to use analog devices, such as a telephone or fax machine, on your ISDN line and includes Calling Number Identification for both data and voice calls.

EZ-ISDN 1A is also set up to allow supplementary voice services for one analog device on the ISDN line. Such services include Call Waiting, Call Forwarding, and three-way conference options.

Message waiting indicator for voice mail is also supported.

- **IOC S1** – This package may also be known as “IOC S with Additional Call Offering.” It carries voice and data traffic at speeds of up to 128 Kbps along two B-channels.

IOC S1 allows you to use analog devices, such as a telephone or fax machine, on your ISDN line. It includes Calling Number Identification for both data and voice calls, and call waiting for both directory numbers, but does not include other supplemental voice services.

Ordering Codes with Supplementary Voice Services and AO/DI

- **EZ-ISDN 3** – This package is very similar to EZ-ISDN 1. It carries voice and data traffic at speeds of up to 128 Kbps and allows you to use analog devices on your ISDN line.

It supports EZ-ISDN 1’s supplementary voice features for one directory number.

EZ-ISDN 3 also supports AO/DI, allowing you to take full advantage of your ISDN line’s often-underused D-channel.

- **EZ-ISDN 3A** – This package is very similar to EZ-ISDN 1A. It carries voice and data traffic at speeds of up to 128 Kbps and allows you to use analog devices on your ISDN line.

In addition, supports EZ-ISDN 1A’s supplementary voice features for one directory number along with message waiting indicator for voice mail.

EZ-ISDN 3A also supports AO/DI, allowing you to take full advantage of your ISDN line’s often-underused D-channel.

- **Capability package AB** – This package includes the same functionality as EZ-ISDN 3 with the addition of supplementary voice features on both directory numbers.
- **Capability package AC** – This package includes the same functionality as EZ-ISDN 3A with the addition of supplementary voice features on both directory numbers.
- **IOC X** – As with IOC S1, this package carries voice and data traffic at speeds of up to 128 Kbps along two B-channels.

It also allows you to use analog devices, such as a telephone or fax machine, on your ISDN line. It includes Calling Number Identification for both data and voice calls and Call Waiting for both directory numbers. However, additional voice services are not supported.

Unlike IOC S1, however, IOC X supports Always On/Dynamic ISDN (AO/DI), allowing you to take full advantage of your ISDN line's often-underused D-channel.

Ordering Codes without Supplementary Services Voice Services or AO/DI

- **IOC S** – This package allows for data connections of up to 128Kbps along two B-channels. It supports voice and data calls on both B-channels, as well as Calling Number Identification.

Ordering by Switch Type

If your phone company does not use National ISDN Ordering Codes, ask the phone company what type of switch you will be using. Then provide the information listed below for your switch type.

Note: The parameters listed below support voice and data traffic at speeds of up to 128 Kbps. They allow you to use two analog devices, such as a telephone or fax machine, on your ISDN line.

However, your ISDN TA does **not** support supplementary voice services when you order by switch type.

5ESS Multipoint or 5ESS Point-to-Point Switch

To order service for the 5ESS Multipoint or Point-to-Point switch, supply the following information:

Required Information:	Ask for:
Line Type	Standard National ISDN-1 line (If you are ordering for a point-to-point switch, ask for point-to-point configuration.)
Line Code	2B1Q
Interface Type	U interface, RJ-11 jack
Directory Numbers (Telephone Numbers)	2
Maximum Terminals	2 (If you are ordering for a point-to-point switch, order only 1 terminal.)
Maximum B-channels	2
Actual User	Yes
Circuit-switched Voice	Yes
Circuit-switched Voice Channel	Any
Circuit-switched Data	2
Circuit-switched Data Channel	Any
Terminal Type	A (Basic)

Display	Yes
Circuit-switched Voice Limit	2
Circuit-switched Data Limit	2
Voice or Data	Both
Call Appearance	Idle
Flexible Call Offering	No

DMS 100 Switch

To order service for the DMS 100 Switch, supply the following information:

Required Information:	Ask for:
Line Type	Standard National ISDN-1 line
Line Code	2B1Q
Interface Type	U interface, RJ-11 jack
Directory Numbers	2
Circuit-switched Option	Yes
Bearer Restriction Option	No packet mode data (NOPMD)
Protocol	Functional version 2 (PVC 2)
SPID Suffix	1
Terminal Endpoint Identifier (TEI)	Dynamic
Maximum Keys	64
Ring	No
Key System (EKTS)	No
Voice or Data	Both
Data Option	Lower layer compatibility
Flexible Call Offering	No

AT COMMANDS AND S REGISTERS

Using AT Commands

AT commands are used to change your ISDN TA's settings. They are sent using communications software's terminal mode.

If you are using third-party communications software, consult the users manual for information on using terminal mode. If you are using the ControlCenter software that came with your ISDN TA, click the **Terminal** icon to reach terminal mode.

To issue a command, type it (remembering to put the "AT" in front of it) and press **Enter**. For example, type **AT*S=1**. Then press **Enter**.

To write commands to the ISDN TA's permanent memory, use the &W command.

The commands listed below are the only ones that do **not** require that AT precede them:

Command:	Result:
A/	Re-executes the most recent command issued
A>	Repeats the most recent command until canceled by pressing any key
+++	Returns your ISDN TA to command mode (Do not press Enter after issuing this command.)

Default settings are listed in italics.

Basic AT Commands

Commands:	Results:
AT\$	Help, command summary
ATA	Answer Data Call
ATDn	Dials a telephone number n=0-9 Digits to dial n=* Auxiliary tone dial digit n=# Auxiliary tone dial digit n=R Call an originate only n=. Wait for a connection n=; Remain in command mode n="" Dial alphanumeric phone numbers n=W Wait for second dial tone (X3-X7) n=@ Wait for an answer (X3-X7)
ATDn1&n2	Dial numbers n1 and n2
ATD.n1	Dial n1 for a X.25 AO/DI number
ATDL	Dial last phone number
ATSn	Dial stored number n
ATD\$	Help for dial commands
ATEn	n=0 No command echo n=1 <i>Echo command characters (default)</i>
ATFn	n=0 Online echo n=1 <i>No online echo (default)</i>
ATHn	n=0 On hook (ready to accept calls) n=2 Reject incoming calls
ATIn	Information screens

	n=0	Product code
	n=1	Flash CRC
	n=2	RAM test
	n=3	Product name
	n=4	Current settings
	n=5	NVRAM settings
	n=6	Data call statistics
	n=7	Configuration profile
	n=12	ISDN switch settings
	n=15	Phone port settings
	n=16	Data protocol settings
	n=18	Call logging
	n=*	Information screen menu
ATO		Return online
ATQn	n=0	Result codes sent
	n=1	No result codes
	n=2	<i>Verbose/Quiet on answer (default)</i>
ATVn	n=0	Numeric responses
	n=1	<i>Verbal responses</i>
ATXn	n=0	Basic result codes
	n=1	Extended result codes
	n=2-7	Advanced result codes (default=7)
ATZ		Restore configuration to NVRAM settings
ATZ!		ISDN physical layer reset

AT& Commands

Command:	Result:
AT&\$	Help, & commands
AT&An	n=0 Display basic connection result codes n=3 <i>Display extended connection result codes (default)</i>
AT&Bn	n=0 Floating DTE speed after connection n=1 <i>Fixed DTE speed after connection (default)</i>
AT&Cn	n=0 CD always on n=1 <i>ISDN TA controls CD (default)</i>
AT&Dn	n=0 Ignore DTR n=1 Online command mode on DTR off n=2 <i>Normal DTR mode (default)</i>
AT&Fn	n=0 No flow control template n=1 Hardware flow control template n=2 Software flow control template n=4 Factory default maintain ISDN settings n=5 Factory default reset ISDN settings
AT&Hn	n=0 Disable TX flow control n=1 <i>CTS TX flow contro (default)</i> n=2 Xon/Xoff Tx flow control n=3 CTS and Xon/Xoff flow control
AT&In	n=0 <i>Disable Xon/Xoff RX flow control (default)</i> n=1 Enable Xon/Xoff RX flow control n=2 Xon/Xoff characters filtered n=3 HP Enq/Ack host mode n=4 HP Enq/Ack Terminal Mode

AT&Rn	n=5	Xon/Xoff for non-ARQ Mode
	n=0	CTS follows RTS
	n=1	Ignore RTS
	n=2	<i>RTS RX flow contro(default)</i>
AT&Sn	n=0	<i>DSR always on (default)</i>
	n=1	Modem controls DSR
	n=2	Pulse DSR, CTS=CD
	n=3	Pulse DSR
	n=4	DSR=DCD
	n=5	DSR normal, CTS=CD
AT&W		Store configuration
ATZn=s		Store phone number <i>s</i> as <i>n</i>
ATZn=L		Store most recent phone number as <i>n</i>
ATZn?		Query phone number <i>n</i>

AT* Commands

Command:	Result:
AT*\$	Help, * commands
AT*A=n	AO/DI n=0 <i>Disable (default)</i> n=1 Enable
AT*A0=n	AO/DI bandwidth management n=0 D-channel only n=1 D-channel and maximum one B-channel n=2 D-channel and maximum two B-channels
AT*A1=n	Sample time (seconds) to add B-channel in AO/DI
AT*A2=n	Sample time (seconds) to return to D-channel in AO/DI
AT*A3=n	D-channel threshold level (percentage) to add B1-channel in AO/DI
AT*A4=n	Threshold level (percentage) to return to D-channel in AO/DI
AT*B=n	n=0 Enable BACP n=1 <i>Disable BACP (default)</i>
AT*C0=n	Code for long distance packet carrier
AT*C1=n	Prefix to dial outside line for BACP callback
AT*C2=n	Long distance prefix for BACP callback
AT*C3=n	n=0 Disable callback for AO/DI n=1 <i>Enable callback for AO/DI (default)</i>
AT*D1=n	Sample time (seconds) to increase bandwidth in MLPPP
AT*D2=n	Sample time (seconds) to decrease bandwidth in MLPPP
AT*D3=n	Threshold level (percentage) to increase bandwidth MLPPP
AT*D4=n	Threshold level (percentage) to decrease bandwidth in MLPPP
AT*E=n	n=0 Disable Dynamic Voice Override n=1 <i>Enable DVO for both incoming and outgoing calls (default)</i> n=2 Enable DVO for outgoing calls n=3 Enable DVO for incoming calls
AT*K=n	Compression mode in PPP n=0 Pass through compression n=1 <i>Auto compression (default)</i> n=2 Turbo PPP compression
AT*PPP=n	PPP mode n=0 Set all related PPP default values n=1 Async/Sync PPP n=2 Single link PPP

	n=3	MultiLink PPP
	n=4	<i>MultiLink PPP with Dynamic Bandwidth Allocation (default)</i>
AT*P0=n		Area code
AT*P1=n		Telephone number 1 (DN1)
AT*P2=n		Telephone number 2 (DN2)
AT*PD=n		Telephone number for X.25 on D-channel
AT*R=n		Call routing for data port
	n=0	Disable incoming data calls
	n=1	DN1
	n=2	DN2
	n=4	<i>DN1 and DN2</i>
	n=8	Any number
AT*S=n	n=0	Disable AutoSPID mode
	n=1	<i>Enable AutoSPID mode (default)</i>
AT*S1=n		SPID0
AT*S2		SPID1
AT*T1=n		Fixed TEI number for DN1
	n=255	<i>Automatic TEI assignment for DN1(default)</i>
AT*T2=n		Fixed TEI number for DN2
	n=255	<i>Automatic TEI assignment for DN2(default)</i>
AT*TD=n		Fixed TEI for X.25 on D-channel
	n=255	Automatic TEI assignment for X.25 on D-channel
AT*U=n,xxx		MLPPP Endpoint Discriminator
	n=0	<i>Automatic assignment (default)</i>
	n=1	Locally assigned address xxx
	n=2	Internet Protocol address xxx
	n=3	IEEE 802.1 Globally Assigned MAC Address xxx
	n=4	PPP Magic Number Block xxx
	n=5	Public Switched Network Directory Number xxx
AT*VI=n		Data protocol for incoming calls
	n=0	<i>Auto detect (default)</i>
	n=1	V.120 Rate Adaption
	n=5	Auto mode PPP
	n=7	Asynchronous 128K
	n=8	Advanced Asynchronous 128K with DBA
AT*VO=n	n=1	V.120 Rate Adaption
	n=5	<i>Auto mode PPP (default)</i>
	n=7	Asynchronous 128K
	n=8	Advanced Asynchronous 128K with DBA
AT*W=n	n=1	DMS-100 Custom Switch
	n=2	<i>National ISDN 1 (default)</i>
	n=3	National ISDN 2
	n=4	5ESS Custom Multipoint
	n=5	5ESS Custom Point-to-Point
	n=6	Leased Line 64 Kbps
	n=7	Leased Line 128 Kbps
AT*Zxx,yy,zz		SPID Wizard
		xx=Area code
		yy=First seven-digit telephone number (DN1)
		zz=Second seven-digit telephone number (DN2)

AT# Commands

Command:	Result:
AT#\$	Help, # commands
AT#A1=n	Call Waiting on ADP1 n=0 Disable incoming calls n=1 Disable Call Waiting n=2 <i>Call Waiting enabled (default)</i>
AT#A2=n	Call Waiting on ADP2 n=0 Disable incoming calls n=1 Disable Call Waiting n=2 <i>Call Waiting enabled (default)</i>
AT#B1=n	Voice Bearer Capability on ADP1 n=0 <i>3.1 KHz audio (default)</i> n=1 Speech
AT#B2=n	Voice Bearer Capability on ADP2 n=0 <i>3.1 KHz audio (default)</i> n=1 Speech
AT#C1=n	Call Conferencing on ADP1 n=0 Disable n=60 <i>Enabled by default, other number may be assigned by phone company to enable feature</i>
AT#C2=n	Call Conferencing on ADP2 n=0 Disable n=60 <i>Enabled by default, other number may be assigned by phone company to enable feature</i>
AT#D1=n	Call Drop on ADP1 n=0 Disable n=62 <i>Enabled by default, other number may be assigned by phone company to enable feature</i>
AT#D2=n	Call Drop on ADP2 n=0 Disable n=62 <i>Enabled by default, other number may be assigned by phone company to enable feature</i>
AT#F1=n	Call Forwarding on ADP1 n=0 Disable n=57 <i>Enabled by default, other number may be assigned by phone company to enable feature</i>
AT#F2=n	Call Forwarding on ADP2 n=0 Disable n=57 <i>Enabled by default, other number may be assigned by phone company to enable feature</i>
AT#I1=n	Caller ID on ADP1 n=0 Disable n=1 <i>Enable (default)</i>
AT#I2=n	Caller ID on ADP2 n=0 Disable n=1 <i>Enable (default)</i>
AT#R1=n	Voice call routing on ADP1 n=0 Disable incoming voice calls n=1 <i>DN1 (default)</i> n=2 DN2
AT#R2=n	Voice call routing on ADP2 n=0 Disable incoming voice calls n=1 DN1 n=2 <i>DN2 (default)</i>
AT#S1=n	Global control of all supplementary services on ADP1

	n=0	Disable all supplementary services
	n=1	Enable any services that are enabled individually (default)
AT#S2=n		Global control of all supplementary services on ADP2
	n=0	Disable all supplementary services
	n=1	Enable any services that are enabled individually (default)
AT#T1=n		Call Transfer on ADP1
	n=0	Disable
	n=61	Enabled by default, other number may be assigned by phone company to enable feature
AT#T2=n		Call Transfer on ADP2
	n=0	Disable
	n=61	Enabled by default, other number may be assigned by phone company to enable feature
AT#VR1=n		Receive volume on ADP1
	n=0	Mute receive
	n=1-9	Set volume (1=minimum, 9=maximum)
AT#VR2=n		Receive volume on ADP2
	n=0	Mute receive
	n=1-9	Set volume (1=minimum, 9=maximum)
AT#VT1=n		Transmit volume on ADP1
	n=0	Mute transmit
	n=1-9	Set volume (1=minimum, 9=maximum)
AT#VT2=n		Transmit volume on ADP2
	n=0	Mute transmit
	n=1-9	Set volume (1=minimum, 9=maximum)
AT#W1=n		Message waiting indicator on ADP1
	n=0	Disable
	n=63	Enabled by default, other number may be assigned by phone company to enable feature
AT#W2=n		Message waiting indicator on ADP2
	n=0	Disable
	n=63	Enabled by default, other number may be assigned by phone company to enable feature
AT#D=n		Date in mm:dd:yy format
AT#T=n		Time in hh:mm:ss

S Registers

Command:	Result:
ATS0	Ring to answer on
ATS1	Counts number of rings
ATS2=n	Escape code character
ATS3=n	Carriage return character
ATS4=n	Line feed character
ATS5=n	Backspace character
ATS12=n	Escape code time in 1/50s of a second
ATS13=n	n=1 Reset on DTR loss
	n=2 Originate in auto answer
	n=4 No pause before result codes
	n=8 DS0 on DTR
	n=16 DS0 on reset
	n=128 Hardware reset

ATS14=n	n=1	Escape code hang up
	n=2	Result code in originate mode only
ATS19=n		Inactivity time out in minutes
ATS22=n		Xon character
ATS23=n		Xoff character
ATS24=n		DSR pulse time in 1/50s of a second
ATS25=n		DTR recognition time in 1/10s of a second
ATS38=n		Disconnect wait time in seconds
ATS67=n	n=2	Fix connection rate for digital calls
	n=4	Connect at 64 Kbps
	n=16	Enable data link delay
ATS69=n	n=1	Disable external Plug-and-Play
	n=4	ATZ restores NVRAM settings
	n=32	Enable Data Over Voice
	n=128	Enable fast answer

CONNECT MESSAGES

Your ISDN TA reports the following messages upon connect.

AO/DI

CONNECT 9600/AODI

Asynchronous 128K

CONNECT 128000/ASYNC

Advanced Asynchronous 128K

CONNECT 128000/ADVANCED_ASYNC

PPP at 56K B-channel Rate

CONNECT 56000

PPP at 64K B-channel Rate

CONNECT 64000

V.120 at 56K B-channel Rate

CONNECT 56000/ARQ/DIGITAL/V120

V.120 at 64K B-channel Rate

CONNECT 64000/ARQ/DIGITAL/V120

SPECIFICATIONS

ISDN Terminal Adapter Specifications

- **Network Interface** – Integrated Services Digital Network (ISDN) Basic Rate telephone service provided by the telephone company
- **Physical Interface** – U (integrated NT1)
- **Physical Dimensions** –
 - Length 8.66 in. (22.0 cm)
 - Width 5.44 in. (13.8 cm)
 - Height 1.56 in. (4.0 cm)
- **Environmental Operating Range** –
 - 50° to 104° F (10° to 50° C)
 - Relative humidity of up to 95 percent noncondensing
- **Power** – 13/14 VDC at .8 amps
- **Ring Equivalence Number (REN)** – Supports up to three per Analog Device Port
- **EMI Certification** – FCC Part 15, Class B

RS-232 Port Pin Specifications

Pin #	Pin Name	Signal Direction
1	Shield Ground (GND)	--
2	Send Data (SD)	To ISDN TA
3	Receive Data (RD)	From ISDN TA
4	Request to Send (RTS)	To ISDN TA
5	Clear to Send (CTS)	From ISDN TA
6	Data Set Ready (DSR)	From ISDN TA
7	Signal Ground (GND)	--
8	Carrier Detect (CD)	From ISDN TA
18	Local Loopback	From ISDN TA
20	Data Terminal Ready (DTR)	To ISDN TA
21	Remote Loopback	To ISDN TA
22	Ring Indicator (RI)	From ISDN TA

Nine-Pin-to-25 Pin Serial Cable Specifications

DB9 Pin #	Pin Name	DB25 Pin #
1	Carrier Detect (CD)	8
2	Receive Data (RD)	3
3	Send Data (SD)	2
4	Data Terminal Ready (DTR)	20
5	Signal Ground (GND)	7
6	Data Set Ready (DSR)	6
7	Request to Send (RTS)	4
8	Clear to Send (CTS)	5
9	Ring Indicator (RI)	22
--	Shield	1

Macintosh Serial Cable Pin Specifications

8-Pin DIN Pin #	Pin Name	DB25 Pin #
1	Data Terminal Ready (DTR)	20, 4
2	Clear to Send (CTS)	5
3	Send Data (SD)	2
4,8	Signal Ground (GND)	7
5	Receive Data (RD)	3
7	Data Carrier Detect (DCD)	8

GLOSSARY

AO/DI

Always On/Dynamic ISDN. Takes advantage of your ISDN line's signaling channel (D-channel) to conduct low-bandwidth operations.

Async-Sync PPP Conversion

Asynchronous to synchronous PPP conversion. Converts asynchronous PPP into synchronous (HDLC-based) PPP that can be transported in ISDN B-channels to communications servers that have integrated ISDN BRI, PRI, or T1 access lines.

AT commands

Attention codes. Used to configure and operate your ISDN TA. These commands can be sent either automatically or manually through your communications software.

Autobaud

Automatic baud rate detection. Automatically detects the baud rate of your computer's serial port.

AutoSPID

If your telephone company supports this feature, AutoSPID automatically downloads telephone number and Service Profile ID information from the phone company switch.

BACP/BAP

Bandwidth Allocation Control Protocol and Bandwidth Allocation Protocol. Negotiate bandwidth allocation with the server your ISDN TA is connected to.

B-channel

Bearer channel. In ISDN communications, a B-channel transmits data and voice traffic at a rate of up to 64 Kbps.

BRI

Basic Rate Interface. One of two access methods to the ISDN. Each BRI consists of two 64 Kbps B-channels and one 16 Kbps D-channel for each ISDN line.

Call Drop

A supplementary voice feature that allows you to remove the last caller added to a conference.

Call Routing

Allows you to associate a specific telephone number to a specified analog port.

CHAP

Challenge Handshake Authentication Protocol. A PPP authentication protocols. An authentication protocol requests information to verify a valid user. CHAP uses encryption and may repeatedly request verification of the identity of the user any time after link establishment.

COM port

Communications port (also referred to as a serial port). Your ISDN TA's communications port allows a maximum rate of 230.4 Kbps. Note that most computers' COM ports only allow a maximum of 115.2 Kbps. However, accelerator cards can increase that rate to 230.4 Kbps.

Compression

Reducing the size of data packets without losing any information.

D-channel

The signaling channel on an ISDN line used to carry messages between your ISDN TA and the public switch.

DBA

Dynamic Bandwidth Allocation. A method of reallocating bandwidth (such as a B-channel) automatically. DBA allows you to place or receive a voice call while a MultiLink PPP call is active.

Default

Value set at the factory.

Directory Numbers

The telephone numbers for your ISDN line.

ISDN

Integrated Services Digital Network. Provides a digital telephone service that allows both data and voice communication over the same line, at significantly faster speeds than the traditional analog telephone service. Two types of lines provide access to ISDN: BRI and PRI.

ISDN Call Logging

Displays the five latest incoming and outgoing numbers from the data and analog ports. To log incoming calls, your ISDN line must support Caller ID.

ISDN Call Waiting

Allows you to place a voice or data call on hold while you answer an incoming voice call. ISDN Call Waiting requires Additional Call Offering on your ISDN line.

Kbps

Kilobits per second. The rate at which data is transmitted between communication equipment.

Layer 1

The physical layer of communication between the communication equipment. If layer 1 is down, there is no ISDN connection between the devices.

MultiLink PPP

Provides a method of combining multiple PPP connections. With a BRI line, MultiLink PPP aggregates the two 56 Kbps or 64 Kbps ISDN B-channels, creating a virtual single digital connection of up to 128 Kbps.

National ISDN

An ISDN standard to create consistency in ISDN service features across different vendors' equipment and switches for North America.

Network Terminator (NT1)

A device that terminates the ISDN line. The NT1 is built into your ISDN TA.

PAP

Password Authentication Protocol. An authentication protocol that requests information to verify a valid user. PAP requests the user's name and password for verification.

PPP

Point-to-Point Protocol. Provides a standard method of transmitting data over the Internet. PPP is used for communication between a computer and an Internet Service Provider.

PRI

Primary Rate Interface. One of two access methods to the ISDN. In North America, each PRI consists of 23 64-Kbps B-channels and one 64-Kbps D-channel.

QuickSelect

Automatically detects and uses the protocol required for a digital call.

SPID

Service Profile Identifier. If required, this number is supplied to you by the telephone company. Typically, if your ISDN line has only one telephone number, a SPID is not required.

SPID Wizard

Using your ISDN TA's telephone numbers, SPID Wizard automatically detects the type of ISDN switch that your TA is connected to and determines the Service Profile IDs.

TollMizer

Allows you to place a data call over a voice channel, saving the extra cost of the data channel. Your telephone company, ISP, and the device into which you are calling must all support this feature.

V.120

A rate adaption scheme that converts transmission rates from a range of 300 bps to 115.2 Kbps to the B-channel's 56 Kbps or 64 Kbps rate. V.120 is used for communication between two computers.

3Com Corporation
3800 Golf Rd.
Rolling Meadows, Illinois
60008

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Manufacturer's Declaration of Conformity

3COM Corporation
3800 Golf Road
Rolling Meadows, IL 60008
U.S.A.

Telephone: 847 262 5000

declares that the product 3COM US Robotics ISDN Terminal Adapter conforms to the FCC's specifications:

Part 15, Subpart B, Class B

Operation is subject to the following two conditions:

- (1) this device may not cause harmful electromagnetic interference, and
- (2) this device must accept any interference received including interference that may cause undesired operations.

FCC Notice: Radio and Television Interference

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the 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:

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

The user may find the following information prepared by the Federal Communications Commission helpful: The CIB Interference Handbook and The CIB Telephone Interference Bulletin.

These documents are available on the Internet through the FCC Compliance and Interference Bureau Home Page at <http://www.fcc.gov/cib> listed under documents. Select CIB Interference Handbook or CIB Telephone Interference Bulletin.

CAUTION: CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THIS EQUIPMENT

FCC Part 68 Statement

3COM Corporation
Model No: 3C04xx3468xx
Made in: Ireland

This equipment complies with Part 68 of the FCC Rules. On the bottom of this equipment is a label that contains, among other information, the FCC 68 registration number for this equipment. If requested, this information must be provided to the telephone company.

In addition, the telephone company may request that the following information be provided:

Type of interface: **Basic Rate ISDN**
Service Order Code (SOC): **6.0Y**
Facility Interface Code: **02IS5**
USOC: **RJ-45**

An FCC compliant, 26 AWG telephone cord with a modular plug is provided with this equipment. This device connects to the telephone network via an RJ-45 ISDN plug and jack. The plug and jack also comply with FCC part 68 rules. Be sure that the telephone line you are connecting the modem to is a standard ISDN line and not a digital (PBX), party, or coin telephone line.

If this device causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required until the problem is resolved. But, if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could effect the operation of the equipment. If this happens, the telephone

company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this device, for repair and warranty information, please refer to the Technical Support insert for repair information and the warranty section of this User Guide for warranty information.

In the event of device malfunction, all repairs should be performed by 3COM or an authorized agent. It is the responsibility of users requiring service to report the need for service to our company or to one of our authorized agents. In the event service is required, refer to the Technical Support insert for information. Service can be obtained at:

3Com Customer Repair Service
1800 W. Central Ave.
Mount Prospect, IL 60056

Fax Branding

The telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device, including fax machines, to send any message unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent, an identification of the business, or other entity, or other individual sending the message, and the telephone number of the sending machine or of such business, or other entity, or individual. (The telephone number provided may not be a 900 number or any other number for which charges exceed local or long-distance transmission charges.)

UL/c UL Listing

This Information Technology Equipment is UL and cUL listed for both the US and Canadian markets respectively.

Canadian Notice:

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled Digital Apparatus, ICES-003 of Industry Canada.

Cet appareil numérique respecte les limites de bruits radio-électriques applicables aux appareils numériques de la Classe B prescrites dans la norme sur le matériel brouilleur: Appareils Numériques, NMB-003 édictée par l'Industrie Canada

The Industry Canada (IC) label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operation, and safety requirements. Industry Canada does not guarantee the equipment will operate to the users' satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the inside wiring associated with a single-line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make electrical ground connections by themselves, but should contact the appropriate inspection authority or an electrician, as appropriate.

Warranty Information:

3COM warrants this hardware product to be free from defects in workmanship and materials, under normal use and service, for the lifetime of the product from the date of purchase from 3COM or its authorized reseller. 3COM's sole obligation under this express warranty shall be, at 3COM's option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, 3COM may, in its sole discretion, refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3COM. Replacement products may be new or reconditioned. 3COM warrants any replaced or repaired

product or part for ninety (90) days from shipment, or the remainder of the initial warranty period, whichever is longer.

YEAR 2000 WARRANTY:

In addition to the Warranty stated above, 3COM warrants that each product sold or licensed to Customer on and after January 1, 1998 that is date sensitive will continue performing properly with regard to such date data on and after January 1, 2000, provided that all other products used by Customer in connection or combination with the 3COM product, including hardware, software, and firmware, accurately exchange date data with the 3COM product, with the exception of those products identified at 3COM's Web site,

<http://www.3com.com/products/yr2000.html>

as not meeting this standard. If it appears that any product that is stated to meet this standard does not perform properly with regard to such date data on and after January 1, 2000, and Customer notifies 3COM before the later of April 1, 2000, or ninety (90) days after purchase of the product from 3COM or its authorized reseller, 3COM shall, at its option and expense, provide a software update which would effect the proper performance of such product, repair such product, deliver to Customer an equivalent product to replace such product, or if none of the foregoing is feasible, refund to Customer the purchase price paid for such product.

Any software update or replaced or repaired product will carry a Year 2000 Warranty for ninety (90) days after purchase or until April 1, 2000, whichever is later.

OBTAINING WARRANTY SERVICE:

Customer must contact a 3COM Corporate Service Center or an Authorized 3COM Service Center within the applicable warranty period to obtain warranty service authorization. Dated proof of purchase from 3COM or its authorized reseller may be required. Products returned to 3COM's Corporate Service Center must be pre-authorized by 3COM with a Service Repair Order (SRO) number marked on the outside of the package, and sent prepaid and packaged appropriately for safe shipment, and it is recommended that they be insured or sent by a method that provides for tracking of the package. The repaired or replaced item will be shipped to Customer, at 3COM's expense, not later than thirty (30) days after 3COM receives the defective product. Return the product to:

3COM
SRO# _____
Attn. Dock 15 PCD
1800 W. Central Ave.
Mt. Prospect, IL 60056

3COM shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3COM for repair, whether under warranty or not.

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GOVERNING LAW: This Limited Warranty shall be governed by the laws of the State of California, U.S.A. excluding its conflicts of laws principles and excluding the United Nations Convention on Contracts for the International Sale of Goods.