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Chapter 1. Introduction

Features

The ISDN (Integrated Services Digital Network) is the standard for carrying both data and voice simultaneously over the existing telephone network. Compared with conventional analog network, ISDN network transmits digital signal at higher speed between the central office (phone company) and the customer premises. Aside from quick connection, ISDN also provides a more reliable and stable digital connection.

The ISDN terminal adapter (TA) is an external ISDN modem providing easy and affordable access to Internet via ISDN. Either home users or SOHO (Small Office Home Office) can enjoy the higher performance of ISDN with the simplicity of a terminal adapter.

Internet and Remote Network Access

With the ISDN TA, you can connect your computer to the Internet over an ISDN line at speeds of up to 128 kbps. With virtually no delays, you can surf the Internet, access online services or utilize the network resources back at the office through remote access.

Analog Device Ports (voice models only)

Voice models (e.g. TAU400E/TAS400E/TAS403E) come with analog device ports. You can use these ports to connect regular telephones, modems or fax machines to your ISDN TA. Calls to and from these analog devices are carried over your ISDN line. This saves you the expense of installing a separate analog phone line.

Ease of Use

You can connect the ISDN terminal adapter to a serial port on your computer and easily configure the TA with terminal emulation program. You can also configure your TA by standard modem AT commands.

Package Checklist

In your ISDN terminal adapter package, you will find the following items:

- ISDN terminal adapter
- Installation CD
- RJ-45 cable (6 feet, for ISDN connection)
- RJ-11 cable (for a/b port connection on voice model only)
- Quick Installation
- RS-232 serial cable (for PC connection)
☑ Power adapter
☑ DSU (Japan only for ISDN S/T interface, optional)

**System Requirements**

- IBM PC or compatible
- 486 CPU or better
- 16 MB RAM or more
- Windows 95(OSR2) / 98 / Me / NT4.0 / 2000 / XP
- CD-ROM drive
Chapter 2. Before Installation

The installation requirements depend on the models of your ISDN TA. Refer to the table below to have a general overview of your ISDN TA model.

<table>
<thead>
<tr>
<th>Model</th>
<th>ISDN Interface</th>
<th>Voice Model (with TEL port)</th>
<th>NT1 Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAS 200E</td>
<td>S/T</td>
<td>×</td>
<td>✓</td>
</tr>
<tr>
<td>TAU 200E</td>
<td>U</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>TAS 400E/403E</td>
<td>S/T</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>TAU 400E</td>
<td>U</td>
<td>✓</td>
<td>×</td>
</tr>
</tbody>
</table>

To ensure a successful installation, please prepare the following items before proceeding.

Subscribe for an ISDN BRI (Basic Rate Interface) Line

Before using the ISDN terminal adapter, you need to subscribe for an ISDN BRI from your telephone service provider. Your line is installed by your local telephone company.

**NOTE:** For North America and Japan only, if your adapter has an S/T-interface, you need a separate network terminating device (NT1) to connect your ISDN line.

Collect Information about Your ISDN Line

Upon your subscription for an ISDN BRI Line, your ISDN service provider will supply the following information:

- ISDN central switch type
  - ISDN switch type usually depends on your geographic location.
- ISDN phone numbers
- SPIDs (Service Profile Identifiers), North America only.

Internet Access Account

To access Internet through ISDN TA, you must get an Internet access account from your local ISP (Internet Service Provider) with ISDN access service. Your ISP should provide you with the following information:

- user name and password
- dial-up ISDN number of the ISP
- TCP/IP properties: host name, domain name, domain name server address, IP address, and gateway address (some properties might not be necessary)
Terminal Emulation Program

To configure the ISDN TA, you need a terminal emulation program, such as HyperTerminal, Terminal, ProComm, etc.
Chapter 3. Connecting ISDN Terminal Adapter

Connecting Procedures
The connecting procedure depends on the type of adapter you have. Be sure to turn off your computer before proceeding. Follow the steps below to connect the cables to your adapter.

1. Terminator Setup (for models with S/T interface only)
   ISDN S/T interface can support up to 8 ISDN terminals and connect to the ISDN network via NT1 device. Only one ISDN S/T device can be set to the terminator enabled. Normally the ISDN terminal that is farthest from NT1 should have the terminator enabled.
   To setup the terminator with provided DIP switch:
   - **Single ISDN device connected to NT1**
     If the ISDN TA is the only device connected to NT1, keep the default setting to enable the terminator. (The 1 and 2 DIP switch are set to ‘ON’.)
   - **Multiple ISDN devices connected to NT1**
     If there are other ISDN devices connected to NT1, set the DIP switch (1 and 2) to ‘OFF’.

2. Connect to ISDN wall jack
   - S/T Interface
     Connect the port labeled S/T on the rear of the TA and the NT1 interface with RJ45 cable. Then insert the ISDN BRI line into the NT1 socket and the ISDN wall jack.
   - U Interface
     Plug one end of the RJ-45 cable to U port of the TA, and plug the other end to the ISDN wall jack.

**NOTE:** Please kindly be informed that even RJ-45 connector has 8 pins and RJ-11 has 4 or 6 pins, but you can still plug the cable from wall jack with RJ-11 connector into the RJ-45 jack on the U port of the TA. The U interface works as well.

3. Connect to analog devices (for models with TEL interface only)
   If your ISDN TA model comes with TEL interface, connect cables from analog devices (such as telephone, G3 fax, modem, or answering machine) to **LINE1** or **LINE2**. The RJ-11 extension cable supplied allows for two analog devices to be simultaneously connected.

**NOTE:** In the UK, an adapter is provided to convert from the UK type 103 plug to
the US RJ11 plug. The REN (Ringer Equivalence Number) drive capability or parallel ring number is 3, so you can connect up to 3 analog devices, assuming each device has a REN of 1.

Please note that the POTS analogue ports on the device, in common with most PBX, terminal adapters and fax switches, supply a reduced ring voltage. That is to say the ring voltage is lower than that provided on a standard PSTN phone line. This does mean that in very rare circumstances some analogue equipment may not be able to detect an incoming call.

4. Connect to your computer.

Connect one end of the RS-232 serial cable to the port labeled SERIAL PORT on the rear of the TA, and the other end to the appropriate serial port on your computer.

5. Connect the AC/DC adapter connector to the AC IN/DC IN jack on the rear of the TA, then plug the adapter into an AC/DC power outlet.

Connection Diagram

The diagrams below illustrate typical connection on various ISDN TA models. Refer to appropriate diagram corresponding to your model.

Option 1: For TAU400E
Option 2: TAS400E/TAS403E:

Option 3: For TAU200E
Option 4: For TAS200E
Chapter 4. Installation and Setup Under Windows 95/98/Me

This section describes detailed procedures of installation and setup as outlined below for Windows 95/98/Me users.

Step 1  Installing Driver for ISDN TA

After starting Windows, system will automatically detect the terminal adapter, you should follow the on-screen instructions to finish the driver installation.

Step 2  Configuring ISDN TA by ‘ISDN Utility Program’

Once the ISDN TA driver is installed, you will need to edit its settings according to your requirements.

Step 3  Adding Virtual Modem

You can install the ISDN TA as virtual modem according to your requirement.

Step 4  Creating Dial-Up Connection

This section will guide you through the steps of creating a Dial-Up connection. You can access Internet or remote network once the connection is established.

Step 1  Installing Driver for ISDN TA

After hardware connection, power on the ISDN TA and then your computer. Follow the step-by-step instructions below to perform installation and setup procedures.

Under Windows 95

1. Windows 95 will automatically detect the ISDN TA. Click Next.
2. Click **Other Locations**.

![Update Device Drivers Wizard](image1)

3. Click **Browse** to locate the path to the driver: **E:\Driver\Win9x** where E: is your CD-ROM drive letter. Then click **OK**.

![Select Other Location](image2)

4. Click **Finish**.

![Update Device Driver Wizard](image3)

Now, you are done with driver installation. Please proceed to ‘Step 2 Configuring ISDN TA by ‘ISDN Utility Program’ on page 14.
Under Windows 98

1. Windows will detect the ISDN TA. Click **Next**.

2. Select **Search for the best driver for your device** and then click **Next**.

3. Select **Specify a location** and click **Browse** to locate the path to the driver: D:\Driver\Win9x where D is your CD-ROM drive letter. Then click **Next**.
4. When Windows finds the driver, click **Next**.

5. Click **Finish**.

Now, you are done with driver installation. Please proceed to Step 2  Configuring ISDN TA by ‘ISDN Utility Program’ on page 14.

**Under Windows Me**

1. When prompted with **Add New Hardware Wizard**, select **Specify the location**...and then click **Next**.
2. With **Search for the best driver**... selected, check **ONLY Specify a location**. Click **Browse** to locate the path to the driver: \D:\Driver\WinMe\ where D: is your CD-ROM drive letter, then click **Next**.

![Add New Hardware Wizard](image1)

3. Windows will find the driver for this device; click **Next** to continue.

![Add New Hardware Wizard](image2)

4. Click **Finish** to complete installing the driver.

![Add New Hardware Wizard](image3)
Step 2 Configuring ISDN TA by ‘ISDN Utility Program’

The ISDN TA’s default parameters are suitable for most configurations. However, if you need to configure your ISDN TA for special-purpose requirements, refer to “Chapter 8 Using ISDN Utility Program” on page 49 for instructions.

Step 3 Adding Virtual Modem

After driver installation, an Internet PPP modem for 64K access is installed automatically. You can manually add more than one virtual modem according to your connection requirements.

1. Select Start > Settings > Control Panel > Modems.  
   Only for Windows 98/Me:  
   If this is the first time you open Dial-Up Networking, the Location Information window will appear. Enter related information and then click Close.

2. When Modem Properties window appears, click Add.

   **Note:** You should find ISDN TA(Internet PPP,64K) Modem among your modem list, which is installed during driver installation.

3. Check Don’t detect my modem; I will select it from a list and then click Next.
4. Click **Have Disk**. Insert the installation CD into your CD-ROM drive.
5. Click **Browse** to specify the path to the driver: D:\Driver\Win9x (or **WinMe** for Windows Me) where D is your CD-ROM drive letter, then click **OK**.

![Image of Install From Disk dialog box]

6. Select the modem type you require from the list and then click on **Next**.

![Image of Install New Modem dialog box]

**NOTE:**

You can add more than one virtual modems one by one manually. Each modem will automatically connect to the appropriate protocol as the modem name specified when you make a connection via the modem you selected.

The purpose of each modem type supported is described as follows:

- **The ISDN TA (Internet PPP, 64K) Modem** is used for 64K Internet Access. The used protocol in B channel is PPP.
- **The ISDN TA (Internet MLPPP, 128K) Modem** is used for 128K Internet Access. The used protocol in B channels is MultiLink PPP.
- **The ISDN TA (Internet MLPPP +BOD, 128K) Modem** is used for 128K Internet Access. The used protocols in B channels are MultiLink PPP and Bandwidth on Demand (BOD). This means you may have a voice call while 2 B channels are used by MultiLink PPP Internet Access. The modem will drop one B channel automatically and make a voice call through this free B channel. After finishing the voice call, the modem will check the data flow in used B channel and connect another B channel automatically if usage rate is high.
- **The ISDN TA (X.75 Transparent, 64K) Modem** is used for BBS Access and file transfer. The used protocol in B channel is X.75 Transparent.
- **The ISDN TA (X.75 T.70NL, 64K) Modem** is used for BBS Access and file transfer. The used protocol in B channel is X.75 T.70NL.
- **The ISDN TA (X.75 EFT, 64K) Modem** is used for BBS Access and file
transfer (EFT: Euro File Transfer). The used protocol in B channel is X.75 ISO8208.

- **The ISDN TA (Universal-1, 64K) Modem** is used for the general purpose. The protocol can be specified by using the ATBn command (Check the AT command on "Chapter 9 AT Commands & Result Codes") before making a connection. Without any ATBn setting, this Universal modem use 64K HDLC as the default protocol.

- **The ISDN TA (V.120 Async, 64K) Modem** is used for V.120 ISDN connection.

7. Link this modem to the Com port which connects to the ISDN TA. Click **Next**. For Windows 95 only, if your location information is never entered before, the **Location Information** window will appear. Enter related information and then click **Next**.

8. **Click Finish**.
9. You will return to Modems Properties window. Highlight the ISDN TA modem you just installed and click Properties to verify its configuration.

Configuring the Virtual Modem Property

10. Under General tab, set Maximum speed to 115200.
11. Click **Connection** tab and configure the parameters as the following:
   - Data bits: 8
   - Parity: None
   - Stop bits: 1

   Then click **Port Settings**.

12. Enable **Use FIFO buffers** and then click **OK**.
13. Returning to Connection tab, click Advanced tab. Select Use flow control and enable Hardware (RTS/CTS) option. Click OK.

![Advanced Connection Settings](image)

14. When returning to Connection tab, click OK. Then click Close to exit Modems Properties window.

Whenever you want to configure the properties of the ISDN modem, follow the steps:

1. Click Start > Settings > Control Panel > Modems.
2. Select the ISDN TA modem you want to configure, then click Properties.

**Step 4 Creating Dial-Up Connection**

1. From the desktop, double-click My Computer and then Dial-Up Networking.

   If Dial-Up Networking is not installed on your computer, click Start > Settings > Control Panel > Add/Remove Programs > Windows Setup > Communications, check Dial-Up Networking, then follow the on-screen instructions to proceed.

2. If this is your first connection, click Next. Otherwise, double-click Make New Connection.

3. In the Make New Connection window, type a name for this connection and select appropriate device from the list. Click Next.
4. Enter the telephone number of your ISP and then click **Next**.

![Make New Connection](image)

5. Click **Finish** and then an icon is created for this connection.

![Make New Connection](image)

**Connecting to Internet or Remote Network**

1. From the desktop, double-click **My Computer** and then **Dial-Up Networking**.
2. Double-click the icon for the connection you created for ISDN TA.
3. In the **Connect To** dialog box, enter **User name** and **Password** specified by your ISP or network administrator. Click **Connect**.
4. The server will verify your user name, password and register you on the server.

![Connecting to My Connection](image)

5. When the connection is established, the **Connected to** dialog box appears.

You are now able to use the Internet tools to access the Internet or network tool to access remote network.

With problems after connecting such as the line is dropped or you cannot access the
Internet/remote network, verify your network settings with your ISP or network administrator.
Chapter 5. Installation and Setup under Windows NT4.0

After hardware connection, turn on your computer and start Windows NT. If your Windows NT has installed the PNPISA before, Windows NT should detect an ISDN TA and request for the driver. Please check **Do not install a driver** and follow the instructions below.

**Step 1 Configuring ISDN TA by ‘ISDN Utility Program’**

The ISDN TA’s default parameters are suitable for most configurations. However, if you need to configure your ISDN TA for special-purpose requirements, refer to “Chapter 8 Using ISDN Utility Program” on page 49 for instructions.

**Step 2 Install Your ISDN TA as a Modem**

Take note of following items before proceeding:

- **Remote Access Service (RAS)**
  
  Before proceeding, it is recommended to install the RAS (also known as Dial-Up Networking). You can install it with at least one modem. Any modem will do; it is only needed to install the ISDN TA and can later be removed. Check Windows NT documentation for information on installing RAS.

- Have the information on ISP and network handy. You may be prompted for the information during installation.

Follow the steps below to install the ISDN TA as a modem:

1. Click **Start > Settings > Control Panel**. Double-click the **Modems** icon.

2. If you have installed a modem previously, the **Modem Properties** window appears; click **Add**. Otherwise, go to Step 3 directly.
3. In **Install New Modem** dialog box, check **Don't detect my modem**... and then click **Next**.
4. Click **Have Disk**. Insert the installation CD into your CD-ROM drive.

5. Click **Browse** to specify the path to the driver: `D:\Driver\NT40` where D is your CD-ROM drive letter, then click **OK**.

6. Highlight the model you want to install and click **Next**.

**NOTE:**

You can add more than one virtual modems one by one manually. Each modem will automatically connect to the appropriate protocol as the modem name specified when you make a connection via the modem you selected.

The purpose of each modem type supported is described as follows:

- **The ISDN TA (Internet PPP, 64K) Modem** is used for 64K Internet Access. The used protocol in B channel is PPP.
• **The ISDN TA (Internet MLPPP, 128K) Modem** is used for 128K Internet Access. The used protocol in B channels is MultiLink PPP.

• **The ISDN TA (Internet MLPPP +BOD, 128K) Modem** is used for 128K Internet Access. The used protocols in B channels are MultiLink PPP and Bandwidth on Demand (BOD). This means you may have a voice call while 2 B channels are used by MultiLink PPP Internet Access. The modem will drop one B channel automatically and make a voice call through this free B channel. After finishing the voice call, the modem will check the data flow in used B channel and connect another B channel automatically if usage rate is high.

• **The ISDN TA (X.75 Transparent, 64K) Modem** is used for BBS Access and file transfer. The used protocol in B channel is X.75 Transparent.

• **The ISDN TA (X.75 T.70NL, 64K) Modem** is used for BBS Access and file transfer. The used protocol in B channel is X.75 T.70NL.

• **The ISDN TA (X.75 EFT, 64K) Modem** is used for BBS Access and file transfer (EFT: Euro File Transfer). The used protocol in B channel is X.75 ISO8208.

• **The ISDN TA (Universal-1, 64K) Modem** is used for the general purpose. The protocol can be specified by using the ATBn command (Check the AT command on "Chapter 9 AT Commands & Result Codes") before making a connection. Without any ATBn setting, this Universal modem use 64K HDLC as the default protocol.

• **The ISDN TA (V.120 Async, 64K) Modem** is used for V.120 ISDN connection.

7. Highlight the COM Port the ISDN TA is connected to. Click Next.
8. Click **Finish**.

![Install New Modem](image)

9. Click **Close** to exit the **Modems Properties** window.

![Modems Properties](image)

10. When prompted to setup the modem, click **Yes**.

![Modem Setup](image)
11. In the **Add RAS Device** window, select the ISDN modem you just installed and click **OK**.

If you do not see this screen, proceed to next step directly.

![Add RAS Device](image)

12. With your ISDN modem selected, click **Configure**.

![Remote Access Setup](image)

13. Select required port usage and then click **OK**.

![Configure Port Usage](image)

14. When returning to **Remote Access Setup** window, click **Network**.

15. Different **Network Configuration** dialog box will appear according to the port usage you select in Step 13.

- Option 1: **Dial out only** is selected
  
  Check the protocol you required. If you are going to access Internet, check **TCP/IP** usually. Then click **OK**.

---

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• Option 2: **Receive calls only** or **Dial out and Receive calls** is selected

  Check your ISP to set the network settings. Also check that you have enabled **Allow any authentication including clear text**; then click **OK**. Several dialog boxes will appear according to your network settings. Follow the on-screen instructions to set the settings.

16. Click **Continue** and you are done with installation.

   If you are prompted for Windows NT files, specify the location of Windows NT files and click **Continue**.

17. When asked to restart your computer, click **Yes**.
Step 3  Configuring the Modem Property

1. Select Start > Settings > Control Panel > Modems.
2. Highlight the ISDN modem you want to configure and then click Properties.
3. Under General tab, set Maximum speed to 115200.
4. Click Connection tab and configure the parameters as the following:
   - Set Data bits to 8
   - Parity to None
   - Stop bits to 1
5. Click **Advanced** and configure the parameters as the following:

   - Check the **Use flow control** checkbox.
   - Enable **Hardware (RTS/CTS)**

**Step 4 Creating Your Dial-Up Network Connection**

1. From the desktop, double-click **My Computer** and then **Dial-Up Networking**.

2. If this is the first time you open **Dial-Up Networking**, a message box prompts you to add an entry to the phonebook. Click **OK**.

   If this is not the first time you open **Dial-Up Networking**, click **New**.

3. The **New Phonebook Entry Wizard** window appears. Enter a name for the new phonebook entry and then click **Next**.
4. Check applicable statement, then click **Next**.

5. Enter the phone number of your ISP and click **Next**.

6. Click **Finish**.
7. Click on **More** and select **Edit entry and modem properties**… from the pull down list.

8. Click **Security** tab and check **Accept any authentication including clear text** box. Then click **OK**.

9. Click **Dial** to make a connection.
10. Enter your **User name** and **Password**, then click **OK**.

![Connect to My Dial-Up Server]

The system will dial and connect to your ISP at either 128k or 64k depending on your setup. The server will verify your login name, password, and register you on the server. If connection is successfully established, you are able to use the Internet tools to access the Internet or network tool to access remote network.

When double-clicking the small icon of **Dial-Up Networking** at Windows taskbar, the **Dial-Up Networking Monitor** will show the connection status including connection speed, etc.

With problems after connecting such as the line is dropped or you cannot access the Internet/remote network, verify your network settings with your ISP or network administrator.

**Configure Dial Entry and Modem Properties**

If you need to configure more parameters for your dial entry, follow the procedures below.

1. From the desktop, double-click **My Computer** and then **Dial-Up Networking**.
2. When **Dial-Up Networking** window appears, select your dial entry from **Phonebook entry to dial** field and then click **More**.
3. Select **Edit entry and modem properties…** from the pull down list.
4. Click required tab and configure needed settings; click **OK**.
5. When returning to **Dial-Up Networking** window, click **Close** to finish configuration or click **Dial** to make a connection.
Chapter 6. Installation and Setup under Windows 2000

Step 1 Installing Driver for ISDN TA

1. When prompted with Found New Hardware Wizard, click Next to continue.

2. Select Search for a suitable driver... and click Next.
3. Check **Specify a location** and then click **Next**.

4. Insert the installation CD into your CD-ROM drive. Click **Browse** to specify the path to the driver: \D:\Driver\W2K where D is your CD-ROM drive letter, then click **OK**.

5. Windows will find the driver; click **Next**.
6. When prompted with **Digital Signature Not Found**, click **Yes**.

7. Click **Finish** to complete the installation.

---

**Step 2 Configuring ISDN TA by ‘ISDN Utility Program’**

The ISDN TA’s default parameters are suitable for most configurations. However, if you need to configure your ISDN TA for special-purpose requirements, refer to “Chapter 8 Using ISDN Utility Program” on page 49 for instructions.

**Step 3 Creating Dial-up Connection**

1. From your desktop, double-click **My Computer** and then **Network and Dial-up Connections**.
2. Double click **Make New Connection** icon. If this is the first time you make new connection, **Location Information** window will appear. Enter related information and click **OK**. Returning to **Phone And Modem Options** window, click **OK**.

3. Click **Next**.
4. Check **Dial-up to the Internet** and then click **Next**.

5. Check **I want to set up my Internet connection manually**… and click **Next**.

6. Check **I connect through a phone line and a modem** and click **Next**.
7. Uncheck **Use area code and dialing rules**. Enter the telephone number provided by your ISP and then click **Next**.

8. Enter **User name** and **Password** provided by your ISP and then click **Next**.

9. Type a name for the dial-up connection and click **Next**.
10. When prompted to set up your Internet mail account, select **No** and click **Next**.

11. Uncheck **To connect to the Internet immediately**... and click **Finish**.

12. Double-click the icon of the dial-up connection your created previously.
13. Click **Properties**.

![Properties dialog box with fields for username and password]

14. Under **General** tab, click **Configure**.

![Configure dialog box with options for phone number and other settings]
15. Click the drop-down menu of **Modem protocol** and select the protocol you need. Then click **OK**.

16. Click **OK** to return to **Connect** window. Click **Dial** to make a connection.

17. Wait for verifying username and password.
18. When the connection is complete, click **OK**.

19. You can monitor the status of connection via the following screen.

Now you are able to use the Internet tools to access the Internet or network tool to access remote network. Enjoy the Internet resource with ISDN super speed now.
Chapter 7. Installation and Setup under Windows XP

Step 1 Installing Driver for ISDN TA

1. Windows will detect the ISDN TA. Select **Install from a list or specific location (Advanced)** and click **Next**.

2. Insert the installation CD into your CD-ROM drive. With **Search for the best driver in these locations** selected, check ONLY **Include this location in the search**. Click **Browse** to specify the path to the driver: `D:\Driver\WinXP` where D is your CD-ROM drive letter, then click **Next**.
3. When compatibility warning screen appears, click **Continue Anyway**.

4. Click **Finish**.

---

**Step 2 Configuring ISDN TA by ‘ISDN Utility Program’**

The ISDN TA’s default parameters are suitable for most configurations. However, if you need to configure your ISDN TA for special-purpose requirements, refer to “Chapter 8 Using ISDN Utility Program” on page 49 for instructions.

**Step 3 Creating Dial-up Connection**

1. From your desktop, double-click **My Computer, Control Panel**, then **Network Connections**.

2. Under **Network Tasks** item, click **Create a new connection**.

3. Click **Next**.

4. Select the network connection type, e.g., **Connect to the Internet**, and then click **Next**.

5. Select **Set up my connection manually** and click **Next**.

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6. Select **Connect using a dial-up modem** and click **Next**.

7. Enter the name of your ISP and click **Next**.

8. Enter the phone number (the information should be provided by your ISP), and click **Next**.

9. Enter the **User name** and **Password** given by your ISP. Confirm your password and then click **Next**.

10. Click **Finish**.

11. When the **Connect** window pops up, click **Properties**.

**Note:** You may also access the **Connect** window by **My Computer > Control Panel > Network Connections** > double-click the icon for your dial-up connection.

12. Under **General** tab, click **Configure**.

13. Click the drop-down menu of **Modem protocol** to select the protocol you need and click **OK**.
14. Then return to the **Connect** window. Click **Dial** to make a connection. Wait for verifying username and password. When the connection is complete, you are able to use the Internet tools to access the Internet or network tool to access remote network. Enjoy the Internet resource with ISDN super speed now.
Chapter 8. Using ISDN Utility Program

The ISDN TA's default parameters are suitable for most configurations. However, you may need to configure your ISDN TA for specific requirements.

This chapter describes how to configure the ISDN TA by provided ‘ISDN Utility Program’ through terminal emulation program, such as Procom, Telex, HyperTerminal and so on.

NOTE: You should have your ISDN TA driver installed prior to configuring the ISDN TA. You may also refer to the AT commands to control the system parameters directly.

Getting Started

1. Start the terminal emulation program and select the same COM port assigned to the ISDN TA for the program.

2. Configure the parameters of your terminal emulation program as the following values:
   - Baud Rate: 115200
   - Data Bit: 8
   - Parity Check: None
   - Stop Bit: 1
   - Flow Control: RTS/CTS (Hardware)

3. Issue the following AT command at the prompt and then press enter:
   
   AT@

   The main menu of ISDN Utility Program appears.

   *************************************************** [ ISDN Utility Program ]***************************************************
   * 1. Upgrade New Firmware *
   * 2. Set System Parameter *
   * 3. Set Protocol Parameter *
   * ESC. Exit *
   *************************************************** [ ISDN Utility Program ]***************************************************

4. Select required item from the main menu and use the function keys shown at the bottom of the screen to configure your ISDN TA.

Upgrade New Firmware

After you download new firmware, you can upgrade the firmware by terminal emulation program. The interactive procedure will lead you to complete the upgrade procedure.
1. The strings below will be shown when you enter the **Upgrade New Firmware** screen:

   **Are you sure to upgrade the new firmware <Y/N>:**
   
   Press **Y** to enter upgrade procedure. If you press **N**, you will return to ISDN Utility Program.

2. The below strings will be shown on the screen:

   **ISDN TA upgrade procedure starts:**
   
   **Erase current driver <Y/N>:**
   
   Press ‘**Y**’ to continue.

   If you select ‘**N**’, you will exit this upgrade procedure and then the version number, current selected protocol and speed in B channel will be prompted. If there is no driver (firmware) in flash memory, the tool will inform you to finish the upgrade procedure.

3. The tool starts to erase the driver in flash memory and you will see the strings below:

   **Erasing ISDN driver...........(wait about 5 seconds)**
   
   **Finish erase procedure**
   
   **Waiting for new firmware through ASCII mode transmission**
   
   **If you want to exit upgrade procedure, press ‘$’ to exit now.**

   Then select the transmission type with ASCII mode (text mode) and specify the new firmware filename (with extension of ABS). For example, select **Transfer > Send Text File** and specify the filename in HyperTerminal. During the transmission, the below strings will be shown.

   **Compare S0-record OK**
   
   **Load Addr = ######**
   
   If you press ‘**$**’, you still need to return to step 2 to restart upgrade procedure.

4. Do not press any key during transferring the file; otherwise you will interrupt the normal procedure. After the file is transferred completely, the below strings will be shown on the screen:

   **Compare S5-record OK**
   
   **Finish upgrade procedure**
   
   **Press ‘N’ to exit this program and go into AT command mode.**
   
   **ISDN TA upgrade procedure starts:**
   
   **Erase current driver <Y/N>:**
   
   Select ‘**N**’ to finish upgrading and exit upgrade procedure. The version number, current selected protocol and speed in B channel will be prompted. If you select ‘**Y**’, return to step 3 to restart erasing the driver in flash memory.
Set System Parameter

The system parameter screen is shown as below.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWITCH TYPE</td>
<td>Set the country or ISDN switch type which meets your local telephone company requirement.</td>
</tr>
<tr>
<td>CODEC</td>
<td>Specify your country code upon different telecommunications standards.</td>
</tr>
<tr>
<td></td>
<td>• A_Law: for countries follow European telecommunication standards.</td>
</tr>
<tr>
<td></td>
<td>• u_Law: for countries follow the US telecommunication standards.</td>
</tr>
<tr>
<td></td>
<td>If you are using AT commands: ATCODEC=0 for a_Law and ATCODEC=1 for u_Law.</td>
</tr>
<tr>
<td>STANDBY TIME</td>
<td>Specify the time period between dialing the last digit and sending a call request. It is suggested to leave it as default.</td>
</tr>
<tr>
<td>MSN (Incoming)</td>
<td>This parameter is used for ISDN switches supporting MSN (Multiple Subscriber Number) service. MSN service is supported by some European telephone companies.</td>
</tr>
<tr>
<td></td>
<td>If you enter the number here, then the called telephone number (called party number) of the incoming call will be required to match the MSN value, otherwise no service will answer or accept this incoming call.</td>
</tr>
<tr>
<td></td>
<td>If you want to answer any incoming calls, please leave it blank.</td>
</tr>
</tbody>
</table>

Note: In the UK, using ISDN2 or ISDN2e only the significant digits of the MSN number are sent to the terminal adapter. Usually this is the last digit only e.g. if your ISDN phone number is 01234 496778 then the number to be entered in the MSN field is 8, not the full ISDN number. This means that this line will only respond to your particular ISDN phone number that ends in 8. All other numbers will be rejected. If your telecomm's company sends down the last two digits for the MSN number then you must enter both the last digits.
### Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSN (Outgoing)</td>
<td>This parameter is used to tell ISDN central switch that this call is made by this telephone number and bill to this telephone number.</td>
</tr>
<tr>
<td>SPID</td>
<td><em>For North America only.</em> Please check with your ISDN service provider if it is necessary. Enter the corresponding SPIDs (Service Profile Identifiers) specified by your ISDN service provider. Enter either one or two SPID numbers depending on your switch type for your ISDN line.</td>
</tr>
<tr>
<td>SAD</td>
<td>Abbreviation of Sub-Address. It is almost the same as MSN. It may be available or not, depending on your ISDN phone company.</td>
</tr>
</tbody>
</table>

### Notes:
For the incoming data call, the ISDN TA will get the used B channel protocol, called party number and subaddress from the SETUP packet. If there is no used B channel protocol in SETUP, TA will detect the protocol such as V.120, X.75, and HDLC in B channel automatically (Please refer to the AT&AP command for the detail.). If there are parameters set in MSN, Subaddress, and Protocol (please refer to AT&ZIr=m*n*p command), these parameters will be checked during the incoming SETUP packet's values. If the MSN values are matched (Please refer to AT&ZI? Command), then the ISDN TA will accept this call, otherwise this call will be rejected.

### Set Protocol Parameter
The protocol parameter screen is shown below.

```
*************** [ Protocol Parameter Table ] ***************

** BIT TRANSPARENT  -- Packet Size: 2000 **
** V.120 (Transparent) -- Packet Size: 506  Window Size: 7 **
** V.75 (T.30NL)     -- Packet Size: 128   Window Size: 7 **
** V.75 (ISDN200)    -- Packet Size: 1024  Window Size: 7 **

** BIT TRANSPARENT  -- Packet Size: 2000 **
** V.120 (Transparent) -- Packet Size: 506  Window Size: 7 **
** V.75 (T.30NL)     -- Packet Size: 128   Window Size: 7 **
** V.75 (ISDN200)    -- Packet Size: 1024  Window Size: 7 **

***************
```

Esc  key : exit  
Ctrl-W key : save  
Ctrl-U key : move to previous item  
Ctrl-D key : move to next item  
+,- key : select next parameter

These protocols are used in the B channel. You can set the packet size and window size to meet the requirement of remote site or for better performance. For convenience, you may store the settings for different purposes into profile 0 or profile 1. Therefore, you can select one of these profiles to speed up the configuration and usage. Please refer to the chapter of AT command set for related information.
Chapter 9. AT Commands & Result Codes

The terminal adapters support Communication interface (RS-232C). It allows applications to access the terminal adapters as an analog modem. We provide the extra AT commands to enable ISDN features such as HDLC, X.75, V.120, or Async to Sync PPP (as the list below).

The following AT Commands are provided to control the ISDN connections, line protocols and call handling. You should use these parameters to change your application setup-strings to access the terminal adapters with the correct protocol and settings.

**AT Command Set**

<table>
<thead>
<tr>
<th>Command</th>
<th>Samples</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATA</td>
<td></td>
<td>Answer an incoming call</td>
</tr>
<tr>
<td>ATBn</td>
<td></td>
<td>Select protocol of transmission in B channel</td>
</tr>
<tr>
<td>ATB0</td>
<td></td>
<td>64K HDLC</td>
</tr>
<tr>
<td>ATB20</td>
<td></td>
<td>V.120 Async.</td>
</tr>
<tr>
<td>ATB3</td>
<td></td>
<td>X.75 Transparent, the same as ATB30</td>
</tr>
<tr>
<td>ATB30</td>
<td></td>
<td>X.75 Transparent</td>
</tr>
<tr>
<td>ATB31</td>
<td></td>
<td>X.75 T.70 NL</td>
</tr>
<tr>
<td>ATB32</td>
<td></td>
<td>X.75 EuroFT</td>
</tr>
<tr>
<td>ATB4</td>
<td></td>
<td>Async PPP to Sync PPP conversion</td>
</tr>
<tr>
<td>ATB41</td>
<td></td>
<td>Async to Sync PPP conversion in MLPPP mode, compatible with Microsoft ISDN Accelerator pack</td>
</tr>
<tr>
<td>ATB42</td>
<td></td>
<td>Async to Sync PPP conversion in MLPPP mode with Bandwidth on Demand (BOD)</td>
</tr>
<tr>
<td>ATB5</td>
<td></td>
<td>Bit Transparent (This command is only used for RVS-COM’s soft-G3Fax)</td>
</tr>
<tr>
<td>ATCODEC</td>
<td></td>
<td>Set or display the codec of POTS</td>
</tr>
<tr>
<td>ATCODEC=n</td>
<td>n = 0 for A_Law</td>
<td>n = 1 for u_Law</td>
</tr>
<tr>
<td>ATCODEC?</td>
<td></td>
<td>Display the current settings</td>
</tr>
<tr>
<td>ATDn</td>
<td></td>
<td>Dial a telephone number</td>
</tr>
<tr>
<td>ATD7693007</td>
<td></td>
<td>Dial telephone number 7693007</td>
</tr>
<tr>
<td>Command</td>
<td>Samples</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>ATDL</td>
<td></td>
<td>Redial the last dial number</td>
</tr>
<tr>
<td>ATEn</td>
<td></td>
<td>Echo characters when in command mode</td>
</tr>
<tr>
<td>ATE0</td>
<td></td>
<td>Echo off</td>
</tr>
<tr>
<td>ATE1</td>
<td></td>
<td>Echo on</td>
</tr>
<tr>
<td>ATHn</td>
<td></td>
<td>On-Off Hook</td>
</tr>
<tr>
<td>ATH</td>
<td></td>
<td>On-Hook, Disconnect (same as ATH0)</td>
</tr>
<tr>
<td>ATH1</td>
<td></td>
<td>Off-Hook</td>
</tr>
<tr>
<td>ATIn</td>
<td></td>
<td>Display Driver information</td>
</tr>
<tr>
<td>ATI0</td>
<td></td>
<td>Display version number, selected protocol, connected speed (same as ATI)</td>
</tr>
<tr>
<td>ATI1</td>
<td></td>
<td>Display switch type, codec, SPIDs, standby time, MSN..</td>
</tr>
<tr>
<td>ATI2</td>
<td></td>
<td>Display the last connection status including call direction, used protocol, disconnection cause, and used time period for POTS interface.</td>
</tr>
<tr>
<td>ATI3</td>
<td></td>
<td>Display the last connection status including call direction, used protocol, speed, disconnection cause, and used time period for DATA interface.</td>
</tr>
<tr>
<td>ATO</td>
<td></td>
<td>On-Line command, switch to on-line mode from command mode</td>
</tr>
<tr>
<td>ATP</td>
<td></td>
<td>Set or display the country or switch type</td>
</tr>
<tr>
<td>ATP=n</td>
<td>n= 0 -&gt; Australia, 1 -&gt; Belgium, 2 -&gt; China, 3 -&gt; Colombia, 4 -&gt; Denmark, 5 -&gt; Dutch, 6 -&gt; Euro ISDN, 7 -&gt; Finland, 8 -&gt; France, 9 -&gt; Germany, 10 -&gt; Israel, 11 -&gt; Italy</td>
<td></td>
</tr>
</tbody>
</table>
### AT Commands & Result Codes

<table>
<thead>
<tr>
<th>Command</th>
<th>Samples</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A TP?</td>
<td>Display the country or switch type</td>
<td></td>
</tr>
<tr>
<td>ATQn</td>
<td>Return the result code</td>
<td></td>
</tr>
<tr>
<td>ATQ0</td>
<td>Return the result code</td>
<td></td>
</tr>
<tr>
<td>ATQ1</td>
<td>Does not return the result code</td>
<td></td>
</tr>
<tr>
<td>ATSr</td>
<td>Set or display the register value</td>
<td></td>
</tr>
<tr>
<td>A TS0=1</td>
<td>Set register 0 to 1, (S0=0, disable the auto-answer mode)</td>
<td></td>
</tr>
<tr>
<td>ATSr?</td>
<td>Display register r content</td>
<td></td>
</tr>
<tr>
<td>A TS1?</td>
<td>Register 1 is read only, display the ring count</td>
<td></td>
</tr>
<tr>
<td>A TS2</td>
<td>Escape code character (default S2=43, ASCII “+”)</td>
<td></td>
</tr>
<tr>
<td>A TS3</td>
<td>Carriage return character (default S3=13, representing a carriage return)</td>
<td></td>
</tr>
<tr>
<td>A TS4</td>
<td>Line feed character (default S4=10, representing “CTRL J” or the line feed character)</td>
<td></td>
</tr>
<tr>
<td>A TS5</td>
<td>Back space character (default S5=8, representing “CTRL H”)</td>
<td></td>
</tr>
<tr>
<td>A TS7</td>
<td>Wait for carries after dial (default S7=30 seconds)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>Samples</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>-&gt; Japan</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>-&gt; Korea</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>-&gt; Korea-CountrySide</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>-&gt; Singapore</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>-&gt; Slovenia</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>-&gt; South Africa</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>-&gt; Spain</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>-&gt; Sweden</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>-&gt; Swiss</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>-&gt; Taiwan</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>-&gt; U.K.</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>-&gt; USA (AT&amp;T Multi-P)</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>-&gt; USA (AT&amp;T P-T-P)</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>-&gt; USA (NI-1)</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>-&gt; USA (NI-2)</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>-&gt; USA (NTI/DMS)</td>
<td></td>
</tr>
<tr>
<td>Command</td>
<td>Samples</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>ATS12</td>
<td></td>
<td>Escape code guard time (default S12=50)</td>
</tr>
<tr>
<td>ATS25</td>
<td></td>
<td>Delay to DTR (default S25=5)</td>
</tr>
<tr>
<td>ATS30</td>
<td></td>
<td>Disconnect the connection automatically if there is no data transmission in n*10 seconds (n=0 to 255, default S30=0, it will not disconnect the connection)</td>
</tr>
</tbody>
</table>
| ATS37  |         | Send the Low Layer Compatibility (LLC) information for data call  
S37=0 for not sending LLC (default)  
S37=128 for sending LLC |
| ATS38  |         | Windows size of HDLC 56K or 64K |
| ATS39  |         | Packet size of HDLC 56K or 64K from 1 to 2048 |
| ATS40  |         | Windows size of V.120 |
| ATS41  |         | Packet size of V.120 |
| ATS44  |         | Window size of X.75 (Transparent) |
| ATS45  |         | Packet size of X.75 (Transparent) from 1 to 2048 |
| ATS46  |         | Window size of X.75 T.70 NL |
| ATS47  |         | Packet size of X.75 T.70 NL from 1 to 2048 |
| ATS50  |         | Window size of X.75 EuroFT |
| ATS51  |         | Packet size of X.75 EuroFT from 128 to 2048 |
| ATS53  |         | Average data flow from 1000 to 7000 bytes (default 4, it means 4000 bytes)  
Active the second channel if average data flow is over 4000 bytes in 10 seconds. This register is only available in MLPPP BOD mode, ATB42. |
| ATS54  |         | Time period from 5 to 20 minutes  
Disconnect the second channel if average data flow below N bytes (set by ATS53) in 5 minutes. This register is only available in MLPPP BOD mode, ATB42. |
| ATS55=n |         | Select the ring pattern for POTS 1, n=0 to 7  
pattern #  Ring ON  Ring Off  
0  0.5 second  0.5 second  
1  0.5  1.0  
2  0.5  1.5 |
### Chapter 9  AT Commands & Result Codes

<table>
<thead>
<tr>
<th>Command</th>
<th>Samples</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>2.0</td>
</tr>
<tr>
<td>ATS56=n</td>
<td>Select the ring pattern for POTS 2, n=0 to 7</td>
<td></td>
</tr>
<tr>
<td>Pattern description is the same as above.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATSPID</td>
<td>Set or display the SPID</td>
<td></td>
</tr>
<tr>
<td>ATSPID0=n</td>
<td>Set first entry of SPIDs to n</td>
<td></td>
</tr>
<tr>
<td>ATSPID1=n</td>
<td>Set second entry of SPIDs to n</td>
<td></td>
</tr>
<tr>
<td>ATSPIDm?</td>
<td>Display the m-th entry of SPID, m=0,1</td>
<td></td>
</tr>
<tr>
<td>ATSTBY</td>
<td>ATSTBY=n</td>
<td>Set the standby time n=3 to 10</td>
</tr>
<tr>
<td>ATSTBY?</td>
<td>Display setting value of the standby time</td>
<td></td>
</tr>
<tr>
<td>ATUPG</td>
<td>Download the new driver into TA, please follow the instruction shown in the screen to finish all of procedures.</td>
<td></td>
</tr>
<tr>
<td>ATVn</td>
<td>Verbose command</td>
<td></td>
</tr>
<tr>
<td>ATV0</td>
<td>Return digit result code</td>
<td></td>
</tr>
<tr>
<td>ATV1</td>
<td>Returns word result code</td>
<td></td>
</tr>
<tr>
<td>ATXn</td>
<td>Enable extended result code</td>
<td></td>
</tr>
<tr>
<td>ATX0</td>
<td>Disable the extended result code</td>
<td></td>
</tr>
<tr>
<td>ATX1</td>
<td>Enable extended result code</td>
<td></td>
</tr>
<tr>
<td>ATZ</td>
<td>Reset and store back the profile 0</td>
<td></td>
</tr>
<tr>
<td>ATZn</td>
<td>Reset and store back the profile n, n=0,1</td>
<td></td>
</tr>
<tr>
<td>AT&amp;ABn</td>
<td>Baudrate detection</td>
<td></td>
</tr>
<tr>
<td>AT&amp;AB0</td>
<td>Detect baudrate automatically, same as AT&amp;AB (default)</td>
<td></td>
</tr>
<tr>
<td>AT&amp;AB1</td>
<td>Disable auto-baudrate detection and fix to current baudrate</td>
<td></td>
</tr>
<tr>
<td>AT&amp;AB?</td>
<td>Display the current baudrate</td>
<td></td>
</tr>
<tr>
<td>AT&amp;APn</td>
<td>Incoming protocol detection</td>
<td></td>
</tr>
<tr>
<td>AT&amp;AP0</td>
<td>Disable incoming protocol auto-detection.</td>
<td></td>
</tr>
<tr>
<td>Command</td>
<td>Samples</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AT&amp;AP1</td>
<td></td>
<td>Detect incoming protocol automatically</td>
</tr>
<tr>
<td>+++</td>
<td>Escape command</td>
<td></td>
</tr>
<tr>
<td>AT&amp;Cn</td>
<td></td>
<td>Control DCD</td>
</tr>
<tr>
<td>AT&amp;C0</td>
<td></td>
<td>Keep always the DCD line ON (the same as AT&amp;C)</td>
</tr>
<tr>
<td>AT&amp;C1</td>
<td></td>
<td>DCD line is active if connected</td>
</tr>
<tr>
<td>AT&amp;Dn</td>
<td></td>
<td>Control DTR</td>
</tr>
<tr>
<td>AT&amp;D0</td>
<td></td>
<td>Ignore the DTR, assume DTR is always ON.</td>
</tr>
<tr>
<td>AT&amp;D2</td>
<td></td>
<td>DTR OFF will cause the ISDN TA to hang up</td>
</tr>
<tr>
<td>AT&amp;E</td>
<td></td>
<td>Select the line speed in the B channel</td>
</tr>
<tr>
<td>AT&amp;E0</td>
<td>64K bps</td>
<td></td>
</tr>
<tr>
<td>AT&amp;E1</td>
<td>56K bps</td>
<td></td>
</tr>
<tr>
<td>AT&amp;F</td>
<td></td>
<td>Reset registers to factory setting, default value</td>
</tr>
<tr>
<td>AT&amp;Kn</td>
<td></td>
<td>DTE/Modem Flow Control</td>
</tr>
<tr>
<td>AT&amp;K0</td>
<td></td>
<td>Disable DTE/DCE flow control</td>
</tr>
<tr>
<td>AT&amp;K3</td>
<td></td>
<td>Enable RTS/CTS DTE/DCE flow control</td>
</tr>
<tr>
<td>AT&amp;K4</td>
<td></td>
<td>Enable XON/XOFF DTE/DCE flow control</td>
</tr>
<tr>
<td>AT&amp;K6</td>
<td></td>
<td>Enable RTS/CTS and XON/XOFF DTE/DCE flow control</td>
</tr>
<tr>
<td>AT&amp;Nn</td>
<td></td>
<td>Select the voice type</td>
</tr>
<tr>
<td>AT&amp;N0</td>
<td></td>
<td>Select the SPEECH as the voice type (TAS400E default)</td>
</tr>
<tr>
<td>AT&amp;N1</td>
<td></td>
<td>Select the 3.1K Audio voice type (TAS403E default)</td>
</tr>
<tr>
<td>AT&amp;Tn</td>
<td></td>
<td>n = 0 for clearing the conformance test setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 1 for setting the loopback test for conformance test.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This command is used for PTT approval only.</td>
</tr>
<tr>
<td>AT&amp;TEST</td>
<td></td>
<td>Self-diagnostic of device</td>
</tr>
<tr>
<td>AT&amp;V</td>
<td></td>
<td>View profile</td>
</tr>
<tr>
<td>AT&amp;W</td>
<td>AT&amp;Wn</td>
<td>Write active configuration to profile n, n=0,1</td>
</tr>
<tr>
<td>AT&amp;Y</td>
<td>AT&amp;Yn</td>
<td>Load profile n when power on, n=0,1</td>
</tr>
</tbody>
</table>
| AT&ZIr=n*m*p |           | Set the called party number for screening incoming call (MSN). “n” is the local telephone number, “*” is the sub address symbol (option), if needed, “m” is
<table>
<thead>
<tr>
<th>Command</th>
<th>Samples</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT&amp;ZI?</td>
<td></td>
<td>Display the setting values, r=0,1,2 to 3</td>
</tr>
<tr>
<td>AT&amp;ZIr?</td>
<td></td>
<td>Display the setting values, r=0,1,2</td>
</tr>
<tr>
<td>AT&amp;ZO=n*m</td>
<td></td>
<td>Set the calling party number for outgoing call. “n” is the local telephone number, “*” is the sub address symbol, if needed (option), and “m” is the sub address (option). Where the r=0,1,2, the 0 for POTS 1, 1 for POTS 2, and 2 for DATA port.</td>
</tr>
<tr>
<td>AT&amp;ZO?</td>
<td></td>
<td>Display the setting values, r=0,1,2</td>
</tr>
<tr>
<td>AT&amp;ZOOr?</td>
<td></td>
<td>Display the setting values, r=0,1,2</td>
</tr>
<tr>
<td>AT#C</td>
<td></td>
<td>Caller ID setting</td>
</tr>
<tr>
<td>AT#C?</td>
<td></td>
<td>Display the current Caller ID mode</td>
</tr>
<tr>
<td>AT#C0</td>
<td></td>
<td>Disable Caller ID</td>
</tr>
<tr>
<td>AT#C1</td>
<td></td>
<td>Enable Caller ID</td>
</tr>
<tr>
<td>AT#C2</td>
<td></td>
<td>Enable to display CallerID;CallerSub; CIP;CalledID;CalledSub</td>
</tr>
<tr>
<td>AT#Tn</td>
<td></td>
<td>This command used for some ISDN central office switches, the incoming call doesn't indicate the called party number even though the MSN number had been assigned. This will cause inconvenience for the user. This command provided for the user to</td>
</tr>
</tbody>
</table>

the sub address (option). The second "+" is option. If needed, the p is the protocol indicator.

P = 0 for accepting all protocols with auto-detection

= 2 for receiving V.120 protocol only
= 3 for receiving X.75 Transparent only
= 4 for receiving X.75 T.70NL only
= 5 for receiving X.75 EFT (Euro File Transfer) only
= 6 for receiving HDLC (such as PPP…) only

Where the r=0,1, to 3, the 0 for POTS 1, 1 for POTS 2, and 2 to 3 for DATA port. The maximum length of MSN is 18 digits and 8 digits for subaddress.

For example, if you want to set a MSN with a specific protocol (X.75 Transparent) for incoming call, you may enter this command as AT&ZI2=81722043**3 (no subaddress).
<table>
<thead>
<tr>
<th>Command</th>
<th>Samples</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT#T0=0</td>
<td>Disable Ring on POTS1</td>
<td></td>
</tr>
<tr>
<td>AT#T0=1</td>
<td>Enable RING on POTS1</td>
<td></td>
</tr>
<tr>
<td>AT#T1=0</td>
<td>Disable Ring on POTS2</td>
<td></td>
</tr>
<tr>
<td>AT#T1=1</td>
<td>Enable RING on POTS2</td>
<td></td>
</tr>
<tr>
<td>AT#T0?</td>
<td>View the setting on POTS1</td>
<td></td>
</tr>
<tr>
<td>AT#T1?</td>
<td>View the setting on POTS2</td>
<td></td>
</tr>
<tr>
<td>A/</td>
<td>Repeat the last AT command</td>
<td></td>
</tr>
<tr>
<td>AT@</td>
<td>To configure the switch type, codec, SPID, MSN by an user-friendly interface</td>
<td></td>
</tr>
</tbody>
</table>

### TAS403E Specific AT Commands Set

<table>
<thead>
<tr>
<th>Command</th>
<th>Samples</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATCIDr=n</td>
<td>Caller ID on analog port control. Where r=0 or 1, the 0 for POTS1, 1 for POTS2. Where n =0 : disable Caller ID function. =1 : enable FSK signal based Caller ID (default) =2 : enable FSK (V.23) signal based Caller ID =10 : enable DTMF signal based Caller ID for Denmark The setting is auto saved into EEPROM.</td>
<td></td>
</tr>
<tr>
<td>ATCIDr?</td>
<td>Show current setting, r=0 or 1</td>
<td></td>
</tr>
<tr>
<td>ATCWr=n</td>
<td>Commands for enable/disable Call Waiting functions. Where r=0 or 1, the 0 for POTS1, 1 for POTS2. Where n =0 : disable Call Waiting Function. =1 : enable Call Waiting Function. (default) This setting can be saved to profile 0 or 1, by AT&amp;W</td>
<td></td>
</tr>
</tbody>
</table>
## Chapter 9  AT Commands & Result Codes

<table>
<thead>
<tr>
<th>Command</th>
<th>Samples</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATCWr?</td>
<td></td>
<td>Show current setting, r=0, 1</td>
</tr>
</tbody>
</table>

## Result Code List

<table>
<thead>
<tr>
<th>Result Code</th>
<th>Result String</th>
<th>ATX0</th>
<th>ATX1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>OK</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>1</td>
<td>CONNECT</td>
<td>o</td>
<td>x</td>
</tr>
<tr>
<td>2</td>
<td>RING</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>3</td>
<td>NO CARRIER</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>4</td>
<td>ERROR</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>7</td>
<td>BUSY</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>8</td>
<td>NO ANSWER</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>82</td>
<td>CONNECT 56000/V120 ASYNC.</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>84</td>
<td>CONNECT 56000/X.75 TRANS.</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>85</td>
<td>CONNECT 56000/X.75 T.70NL</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>86</td>
<td>CONNECT 56000/X.75 EuroFT.</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>87</td>
<td>CONNECT 56000/HDLC</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>88</td>
<td>CONNECT 56000/Async. to Sync. PPP</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>89</td>
<td>CONNECT 56000/Async. to Sync. MLPPP</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>90</td>
<td>CONNECT 112000/Async. to Sync. MLPPP</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>92</td>
<td>CONNECT 64000/V120 ASYNC.</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>94</td>
<td>CONNECT 64000/X.75 TRANS.</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>95</td>
<td>CONNECT 64000/X.75 T.70NL</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>96</td>
<td>CONNECT 64000/X.75 EuroFT.</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>97</td>
<td>CONNECT 64000/HDLC</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>98</td>
<td>CONNECT 64000/Async. to Sync. PPP</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>99</td>
<td>CONNECT 64000/Async. to Sync. MLPPP</td>
<td>x</td>
<td>o</td>
</tr>
<tr>
<td>100</td>
<td>CONNECT 128000/Async. to Sync. MLPPP</td>
<td>x</td>
<td>o</td>
</tr>
</tbody>
</table>
Chapter 10. Supplementary Service (TAS403E)

In TAS403E device, we provide the supplementary service and others. You may connect analog phone or device to a/b (POTS) port and get the following functions.

**Note:** The following features depend on the service items provided by your telephone service provider and whether you have applied. Contact your service provider for more information.

1. **making a call**
   
   You may make call as usual.

2. **receiving a call**
   
   Incoming call will be accepted and forwarded to A/B (POTS) port if you do not set any MSN to filter incoming call or the correct telephone number of incoming call (same as MSN setting). Then you will get a RING signal, you can pick up the handset to have a conversation with remote partner.

3. **feature phone function**
   
   a. **Hold/Retrieve a call**
      
      You can hold a talk for a moment and retrieve it back again. Have a call now and want to hold the call.
      
      ➢ Press flash key to get HOLD.
      
      If you want to retrieve it back,
      
      ➢ Press flash key again to RETRIEVE call back to start conversation.

   b. **Suspend/Resume a call**
      
      You can suspend current call and move to other place to pick up the call again. Have a call now and want to enable this function.
      
      Procedure:
      
      ➢ Press “**4**” 4 digits with continual 1 to 4 digits of CALL-IDENTITY and “#” at the end in the keypad of phone to enable suspend this call.
      
      For examples, CALL-IDENTITY is 1234
      
      “**4*1234#”
      
      ➢ Hang up the phone.
      
      ➢ Then you may go to other place and have an ISDN device with analog function which connecting to the same ISDN line.
      
      ➢ Press “**5**” 4 digits with the same CALL-IDENTITY and “#” at the end as suspend a call to pick up the phone and talk again.
For examples, CALL-IDENTITY is 1234

```
**5*1234#`
```

It is a good feature to move around with the same call.

c. **Explicit Call Transfer**

You can transfer voice call to another partner. Have a call now and want to get this function.

Procedure:

- Press the FLASH key to get a HOLD function.
- Make a call
- Press “**6#” to transfer the first call to the second call.
- Hang up the phone.

d. **3-Way Conference**

It is good feature to have a 3-way conference with other two partners. You may have a talk now, hold the talk, make another call and join two partners in the same call. Have a call now and want to make a 3-way conference.

Procedure:

- Press the flash key to get a HOLD function.
- Make an outgoing call successfully.
- Tell partner that you will start 3-way conference and press “**7#”.

**OR**

Press “3” to make 3-way conference.

*These two methods are depended on local ISDN switch provider.*

If you want to terminate this 3-way conference,

- Tell partner that you will terminate 3-way conference and press “**8#”.

**OR**

Hang up the phone.
Appendix A  Specifications

✔ **ISDN Interface:**

1. **U Interface (TAU400E/TAU200E)**
   - Line: two-wire, full duplex
   - Line Code: 2B1Q
   - Connector: RJ-45 * 1

2. **S/T Interface (TAS400E/TAS403E/TAS200E)**
   - Line: four-wire, full duplex
   - Line code: AMI
   - Connector: RJ-45 * 1

   Support Japan DSU (for Japan model type only)

✔ **Data Port Interface:**

- Physical interface: RS-232
- Data Rate: Async. Up to 230.4kbps
- Connector: DB9 (TAS model) or DB25 (TAU model) female * 1

✔ **Analog Interface:** (for TAS(U)400E/TAS403E only)

- Analog port: two R-interface port
- power feeding: 25V, 25mA
- Ring Signal: 20Hz, 56Vrms
- REN: 3
- Dialing method: Tone, Pulse
- Connector: RJ-11 * 2

✔ **LED Indicators:**

1. Power status lamp: PWR
2. Analog phone status lamp: T1, T2 (for TAS(U)400E/TAS403E only)
3. ISDN line status lamp: LK
4. Carrier detector lamp: CD
5. Data port receiving data lamp: RD
6. Data port transmitting data lamp: SD
7. Multi-channels status lamp MP  
8. Auto answer status lamp AA

**Power Adapter:**

Input voltage 120Vac/Vdc or 230Vac

**D Channel Signaling Protocol Compatibility**
1. AT&T 5ESS, Nortel DMS-100
2. US NI-1 & NI-2
3. ETSI, French Deltas, German Deltas
4. Japan INS-64

**B Channel Protocol Compatibility**
1. Voice (for TAS(U)400E/TAS403E only)
2. Data (56K, 64K, 112K or 128K HDLC)
3. V.120
4. X.75
5. Async. PPP to Sync. PPP conversion
6. MultiLink PPP
7. MultiLink PPP with Bandwidth on demand (BOD)
8. B channel protocol auto-detection for V.120, X.75, HDLC for incoming call

The specification is subjected to change without notice. All brand and product names are acknowledged as trademarks of their respective companies.
Appendix B  CAPI20 Interface

With CAPI interface, you can use any ISDN application such as RVS-COM, ZOC that requires a CAPI driver. For example, you can get Soft-G3Fax, Telephony, File Transfer functions through RVS-COM.

For your convenience, CAPI drivers are included in the installation CD. Before you install this CAPI20 device driver, the ISDN TA should be installed and configured as described in previous chapters.

This section will describe the CAPI installation and configuration using Windows 95/XP as example. For other operation system, the install process and the interface of CAPI will be somewhat different, but the function is the same.

Installing CAPI20 Driver for Windows 95
You may follow these steps to install CAPI20 device driver:

1. Insert the installation CD into your CD-ROM drive.
2. Click Start > Settings > Control Panel > Add New Hardware.
3. When wizard appears, click Next.
4. Select No to prevent Windows from searching for your new hardware and click Next.
5. Highlight Other devices and click Next.
6. Click Have Disk.
7. Click Browse to locate the driver: x:\TA\CAPI\Win95 and then click OK.
8. The model of the hardware will list. Click Next.
9. Click Finish to compete the installation.
10. When prompted to restart your computer, click Yes.

Installing CAPI20 Driver for Windows XP

1. Click Start > Settings > Control Panel > Add Hardware.
2. When Add Hardware Wizard window appears, click Next.
3. Wait while the wizard searches, then follow the on-screen instructions as below: Select Yes, I have already connected… and click Next.
   Select Add a new hardware device from the list and click Next.
   Select Install the hardware… and click Next.
Select **Network adapters** from the list and click **Next**.

4. Click **Have Disk**. Then click **Browse** to locate the CAPI driver \x:\TA\CAPI\WinXP and click **OK**.

5. Select **ISDN Adapter (UART Active)** and click **Next**.

6. Click **Next** to start installation. A couple of compatibility warning messages may appear; click **Continue Anyway** to proceed.

7. Click **Finish** to complete the CAPI installation.

### Configuring CAPI20 for Windows 95

1. Click **Start > Settings > Control Panel > System > Device Manager > ISDNLink > ISDN TA CAPI Driver > Properties**.

2. In the properties of this CAPI driver, click **Setting** tab. You can set the system parameters including **Switch Type** and **SPID** which is available according to the **Switch Type** you select.

3. Click **POTS Setting** to configure your POTS setting. You can set **Dial Standby sec**, **Codec**, **Call Type (Voice)**, **MSN** and **SAD** (subaddress) for POTS ports. For more information, please refer to “Set System Parameter” on page 51. If you check the **Enable** option for POT port, it means the analog devices connected to POTS ports will not receive any incoming call (no ring tone) if the called party number (telephone number) does not match **MSN** and/or **SAD** settings.
**ISDN Monitor**

Whenever you start Windows 95, the ISDN Monitor is launched automatically with its icon located on the right side of the taskbar.

**NOTE:** If the icon of ISDN Monitor is not displayed, from the taskbar click **Start** and **Run** to open the **Run** dialog box. Type **linksts** in the dialog box and click **OK** to start up ISDN Monitor.

If you see the symbol appearing inside the icon as a stop sign, this means the device driver cannot reach the ISDN terminal adapter. You should check the power and cable of ISDN external adapter for first step troubleshooting.

If you see tiny Z signs over the icon, this means there is no CAPI application running which requires the CAPI20 device driver. At this time, you can access your ISDN TA through COM port such as COM2 directly.

Right-click the ISDN Monitor icon and the menu is displayed. You may execute following functions from the menu:

![Menu Options](image)

**Upgrade Firmware**

Before upgrading the firmware, please make sure there is no user accessing this device. Also, close any ISDN application that is running. Then specify the new firmware file name and its directory by selecting **Choose File** and start the upgrade action by clicking **Upgrade**. When upgrade is finished, manually restart your computer to use the new firmware. It is easier and user-friendly to upgrade firmware than using AT command set.
**Linetest**

When entering the ISDN line tester window, click **Start**. You will be prompted to input your **ISDN Telephone Number** for doing a loopback test from your site to ISDN switch and back to your site. This function is to check the ISDN line installation and TA configuration.

![Linetest window](image)

**Log**

If you start a CAPI20 application, the stop and Z signs will be off and will function as ISDN monitor which can record the D, B1, B2, and CAPI messages in the ISDN line and CAPI driver.

![Log window](image)

**Note:** If you use RVS-COM as CAPI20 application, please install the ISDN CAPI adapter (access the ISDN device through CAPI interface), not the ISDN terminal adapter (which accesses the ISDN device through physical COM port).
Uninstall the CAPI20 Device Driver

If you wish to remove the CAPI device driver from your system, you may follow these steps to uninstall CAPI20 device driver:

1. Exit (close) the ISDN Monitor.

   To enable this function, move your cursor to this icon and click the right button of mouse. Select the Exit function.

2. Run the remove program (e.g., SWP95.EXE for Windows 95; SWP2000.EXE for Windows 2000) located in the CAPI directory on the installation CD. This will completely remove the ISDN drivers from your PC.

3. Finally reboot your windows for the changes to take effect.
Appendix C  Glossary

AT commands
ATtention Codes. AT commands are used to configure and operate the ISDN modem. These commands can be sent either automatically or manually through your communications software.

B Channel
An ISDN communication channel that bears or carries voice, circuit, or packet conversations at 64 kbps.

BRI
Basic Rate Interface. A kind of ISDN line contains two B channels, each with 64 kbps for data and voice transmission, and a single D channel (16 kbps) which is used for signaling and call progress messages.

CAPI
Common ISDN Application Programming Interface. It is a standard interface installed on your PC which takes control of various ISDN services, such as voicemail, Eurofile transfer, fax, telephony, etc. Users can use the applications based on this standard interface to handle the communication over ISDN connections.

D-Channel
An ISDN communication channel used for sending information between the ISDN equipment and the ISDN central office switch at 16 kbps.

G3 FAX
Group 3 FAX. It is a type of FAX transmission most common in use today. Group 3 can be supported over ISDN by an application making a voice-type call to a remote FAX machine.

ISDN
Integrated Services Digital Network. ISDN provides a digital telephone service which allows both data and voice communication over the same telephone line and at higher speed than the traditional POTs service.

MSN
Multiple Subscriber Number. The MSN service is provided by your ISDN service provider. It allows you to have several phone numbers for your ISDN line. You can assign different numbers to the various features (virtual devices) that your TA can provide.

Multi-link PPP
Allows you to combine two or more B-channels into a single, faster PPP connection. With Multi-link PPP, you can have a 128 Kbps PPP connection over a Basic Rate ISDN line.

NT1 Device
Network Termination 1 Device. A device that connects to your ISDN hardware and also works as a converter between an ISDN U-interface and an ISDN S/T-Interface. An NT1 converts a line from a 2-wire to a 4-wire connection. Some ISDN adapters have an NT1 already built into them, therefore spare users the expense of external NT1 device.

With a S/T outlet interface, you need an NT1 device connecting to the ISDN switch. In the UK, and in many European countries, the NT1 device is supplied by the telephone company.

**POTS**

Plain Old Telephone Service. Also known as analog telephone service, it is the basic telephone service used to access the public switched network.

**PPP**

Point-to-Point Protocol. PPP provides a standard method of transmitting data through the Internet. PPP is used for communication between a computer and an Internet service provider.

**S/T-interface**

A four-wire ISDN interface. The S/T interface is the part of an ISDN line that connects to the terminal equipment.

**SPID**

Service Profile Identifier. It is a set of numbers assigned to your ISDN line by your phone company and is applicable to North America only. The central office switch use SPIDS as unique identification numbers for each ISDN line, so it can determine where to send calls and signals. Typically, if your ISDN line has only one telephone number, a SPID is not required.

**TA**

Terminal Adapter. A device that connects a PC or other equipment to an ISDN line.

**U-interface**

A two-wire ISDN interface. The U interface is the most common ISDN interface and extends from the central office.