

Chapter 1 Introduction

The proliferation of PCs and LANs with bandwidth intensive applications has generated a powerful demand for high-speed connections. The worldwide standardization of ISDN, combined in many countries with its growing availability and falling cost make it a natural choice for enhancing data throughput.

ISDNLINK™TA-200 terminal adapters provide high-performance solutions for **Internet access, file transfer, remote access service, and running existing modem applications** through the ISDN network.

ISDNLINK™ TA-200 External Terminal Adapters

There are two ISDN interface options of ISDNLINK™ external TA (Terminal Adapter): ST or U interface. If you purchased the ST interface terminal adapters (TA-200ST and TA-200ST-D), you need an ISDN NT1 device to connect to the ISDN exchange (the NT1 box should normally be provided by your phone company). If you purchased the U interface terminal adapters (TA-200U and TA-200U-D), they can directly connect to the ISDN switch. The TA-200ST and TA-200U devices support two a/b (POTS) analog ports with connection through a supplied RJ-11 extension cable (in the UK adapters are supplied for the standard BT connections). The TA-200ST-D and TA-200U-D models provide the data port connection without a/b (POTS) ports.

All of the current analog devices, including telephone set, G3 fax, answering machine, modem, and PBX trunk line can be connected to the a/b port (RJ-11 jack/POTS ports)¹. The data transmission rate can be up to 64 Kbps while a normal analog communication is taking place on on-line, or up to 128 Kbps through Multilink PPP connection using both digital lines.

Why ISDN?

The ISDN (Integrated Services Digital Network) is the standard for carrying both data and voice simultaneously. ISDN BRI (Basic Rate Interface) line provides two B-Channels for voice or data transmission. Each B-Channel can provide data transmission of up to 64 Kbps. The ISDN network uses the same transmission lines as the existing analog telephone network, but uses a digital signal and higher bandwidth between the central office (telephone company) and the customer. ISDN is not only much faster than standard modems; it also provides an extremely reliable and stable digital connection.

¹ Please note that the POTS analogue ports on the TA200 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.

The ISDN network can set up a connection in about 3 seconds. This is much quicker than the PSTN network. This feature alone can result in great timesaving in the long term.

Why High Speed Analog Modems Can Not Compete With ISDN Digital Connections?

“The high speed modem can run at 28.8 Kbps and will move data at ISDN-type speeds when you consider data compression”. This assumes a noise-free telephone line and that the data is easily compressed. Unfortunately, many image files cannot be compressed easily, and many telephone lines are far from ideal. ISDN always operates at its rated speed. Also, ISDN cards can also use data compression technology to multiply its raw data transmission speed.

Telephone monopolies allowing, ISDN will inevitably replace the existing analog telephone network. The conversion is being driven by applications such as telecommuting, home working, remote LAN access, video conferencing and access to the Internet. Today, ISDN is available almost everywhere so all users can should be able to get the benefits from ISDN now.

Chapter 2 Before Installation

Before installation of the ISDNLINK™ external TA-200 terminal adapter, you need to check the package contents and ensure that you have an ISDN BRI line installed. If you are using the TA-200ST(-D) device you will also require an NT1 termination device (should be provided by your telephone company). If you intend to use the terminal adapter for Internet access then you must also have an Internet access account from a service provider.

You can now start to install and configure your ISDNLINK™ TA-200 terminal adapter.

Package Checklist

In your ISDNLINK™ external TA-200 package, you will find the following contents.

- | | |
|------------------------------|-------------------------------------|
| ◆ ISDNLINK™ terminal adapter | 1 set |
| ◆ RJ-45 cable | 1 piece (6 feet) |
| ◆ RJ-11 extension cable | 1 piece (TA-200ST and TA-200U only) |
| ◆ RS-232 cable | 1 piece |
| ◆ Power adapter | 1 piece |
| ◆ Installation disk | 1 piece |
| ◆ User's manual | 1 piece |
| ◆ RJ11-BTS adapter | 2 piece phone adapter (UK only) |

ISDN BRI Line

Before using the ISDNLINK™ TA-200 terminal adapter, you need to get an ISDN BRI (Basic Rate Interface) line from your local telephone company. Sometimes, your ISP may, upon your request, order an ISDN BRI line for you when you apply for an ISDN Internet access account.

For the US you will also need to obtain from your ISDN telephone company details concerning the ISDN central switch type and SPID (Service Profile Identifier) number.

What is SPID?

SPID stands for Service Profile ID. The SPID is applicable to the USA only. SPIDs are a series of numbers that informs the central office switch (your local telephone exchange) which services and features to provide to the ISDN device. The generic SPID format comprises 14 digits. The first 10 digits are the main telephone number on the terminal. The last 4 digits are dependent on the number of terminals on the

interface and the services they support.

NT1 Connection

The ISDN U-loop is terminated by NT1 device at the customer premises. The connection between the NT1 and Terminal Adapter (TA) is called point "T". The NT1 drives a 4-conductor S/T-bus, which may be expanded, to 8 conductors to provide for emergency power. If your ISDN product with a S/T outlet interface, you need an NT1 device connect to the ISDN switch. ISDNLINK™ ST adapter needs an NT1 device to connect to the ISDN switch, but ISDNLINK™U adapter does not require NT1 device. In the UK, and in many European countries, your telephone company supplies an NT1 device. Therefore the ST adapter are required for these countries.

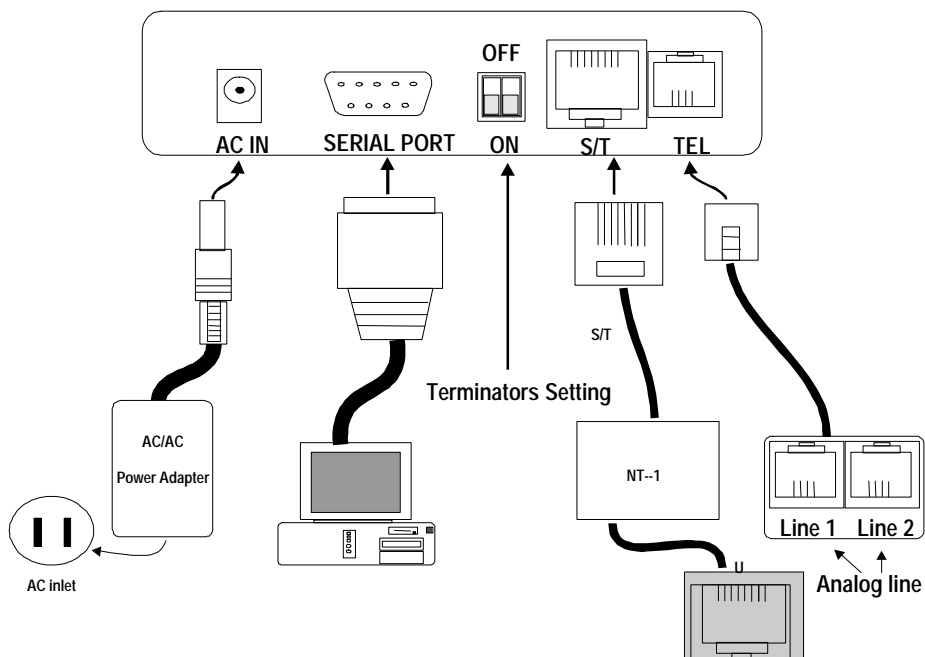
Internet Access Account

If you want to use ISDNLINK™TA-200 adapter to connect to the Internet, you must get an Internet access account from an ISP (Internet Service Provider) around your location. You must also confirm with your ISP that they support ISDN access (either single channel 64K or 128K MLP).

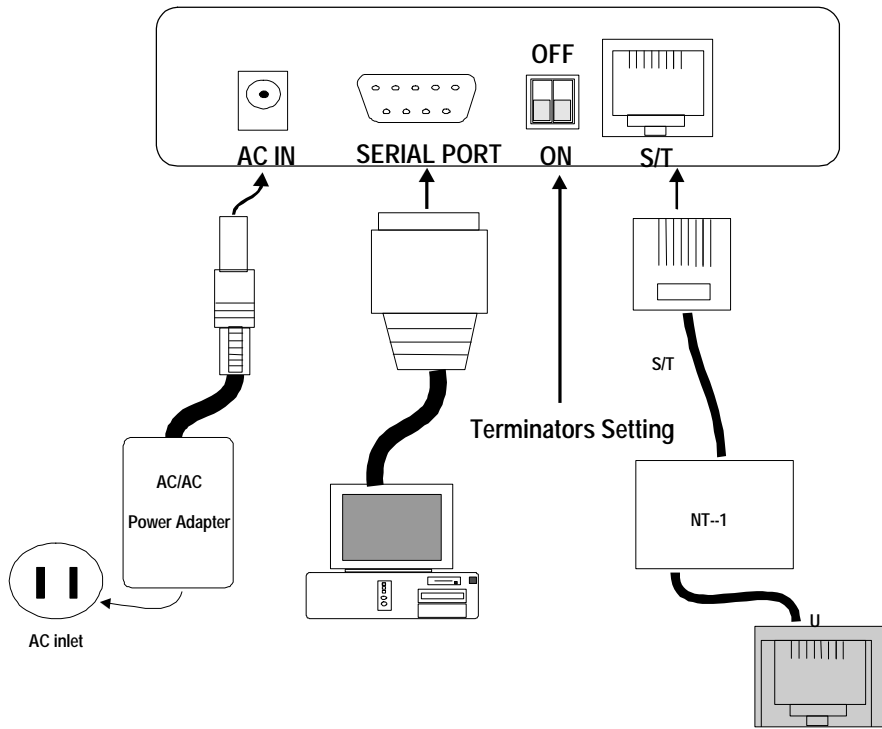
Environment Setup

1. Please refer to the following pictures of the ST interface of the TA-200ST and TA-200ST-D, and the U interface of the TA-200U terminal adapter for the appropriate cable and device connections. You can get more detailed information from the following section.

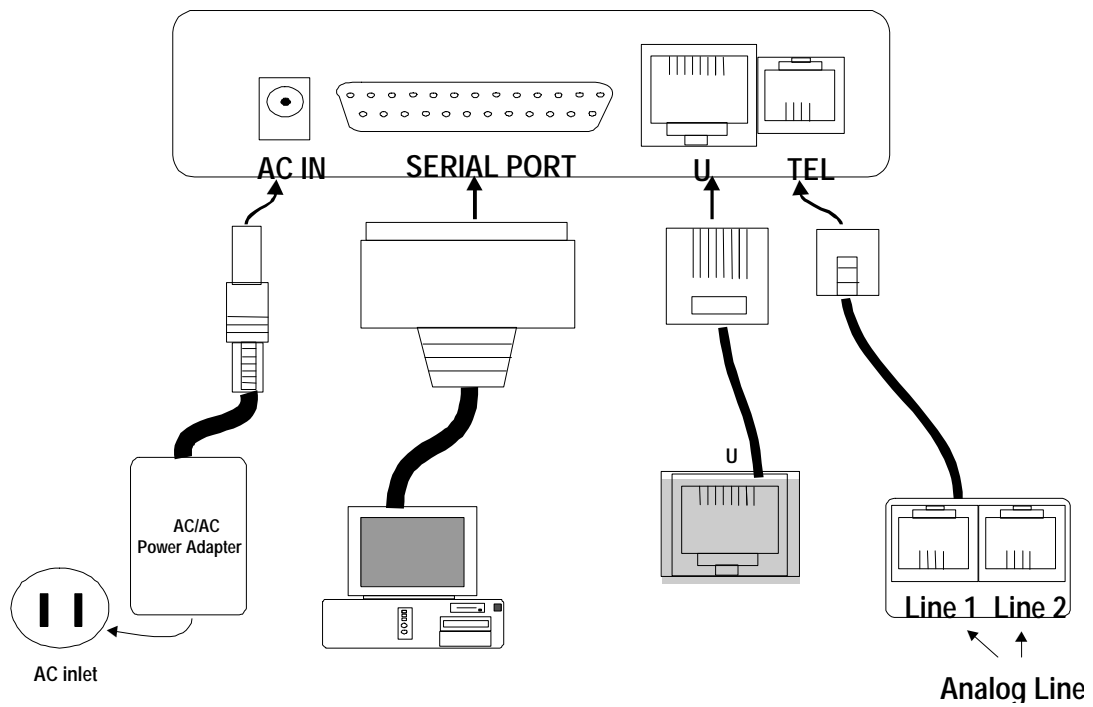
TA-200ST



TA-200ST-D



TA-200U



2. Terminator setup of ISDNLINK™“ST” interface terminal adapter

- ✦ Please jump to the next section (3.) if you are the user of U interface terminal adapter, TA-200U or TA-200U-D.

The ISDN S/T interface can support up to 8 ISDN terminals and through a single NT1 device for connection to the ISDN line. Only one ISDN S/T device should have the terminator enabled. This is normally the ISDN terminal, which is the furthest from NT1.

The ISDNLINK™ST interface terminal adapters (TA-200ST and TA-200ST-D) have DIP switches on the back of the device for the terminator setup. The default setting of ISDNLINK™TA is with the terminator enabled (The positions “1” and “2” of DIP switch are set to “ON”). If there is any other ISDN device connected to the NT1, and you do not require ISDNLINK™TA as terminator, then please set the DIP switch “1” and “2” to “OFF”.

3. Analog device connection

The TA-200ST (TA-200U) supports a/b (POTS) connection through RJ-11 jack (adapters supplied in the UK). You can use this POTS port to connect to standard analog phone devices. **The RJ-11 extension cable supplied allows for two analog devices to be simultaneously connected.** Users can connect the analog telephone set, G3 fax, modem, or answering machine directly on the TA back plane or through RJ-11 extension cable with the standard RJ-11 connection. In the UK an adapter is supplied to convert from the UK type 103 plug to the US RJ-11 plug. The REN (Ringer Equivalence Number) drive capability or parallel ring number is 3 for a/b analog interface connection².

4. ISDN connection

Connect the ISDNLINK™S/T interface TA and NT1 with the RJ-45 cable supplied and connect the other end of the cable to the ISDN BRI line NT1 socket.

OR

If you have the U interface models (not in Europe) directly insert the RJ-45 connector cable into the ISDN BRI line and the other end of the cable into the RJ-45 jack on the ISDNLINK™U interface TA. Please note that even though the RJ-45 connector has 8 pins and RJ-11 has 4 or 6 pins you can still plug the cable from the wall jack with RJ-11 connector into RJ-45 jack on the ISDNLINK™U interface TA.

² Please note that the POTS analogue ports on the TA200 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.

5. Serial and power connection

Use the gray serial cable supplied to connect between the 9 pin D connector on the back of the adapter to a spare serial port connector on the rear of your computer. The supplied cable has both 9 pin and 25 pin connectors so it can be used with either size connector on your PC. You should then also connect the power lead from the power supply and then plug the power supply into your main power.

Now, your TA-200 adapter is ready for installation.

Chapter 3 Installation

After you have setup your ISDN line as described in Chapter 2 you can now, turn on your computer power ON and start the driver installation. The ISDNLINK™ TA-200 terminal adapters are communicated with by the PC as a standard modem. This means that the terminal adapter will operate on any computer or operating system, which supports standard modem operation (including **MAC, UNIX and PC**). Below shows installation of the TA-200 using Microsoft Windows 31, 95, and NT.

How to Configure TA-200

Your TA-200 adapter should have been supplied to you correctly setup for your particular country and environment for immediate operation. There should be no need to alter the configuration of the device. However if you need to alter some of the advanced settings of the TA then basic setup and configuration can be done through any terminal program including ProComm, Telex, HyperTerminal and so on. To alter the setup then configure your terminal program with the following setting values.

| | |
|----------------------|---------------------|
| Baud Rate: | Up to 115200 |
| Data Bit: | 8 |
| Parity Check: | None |
| Stop Bit: | 1 |
| Flow Control: | RTS/CTS |

Then, on the terminal screen enter the AT command, **AT@**. A menu should then appear allowing you to alter your ISDN TA settings. Please note, if you are familiar with AT command set then you may refer to Chapter 4 for details on the necessary AT commands to allow you to control these system parameters directly.

After entering AT@, the following screen is shown below.

```

***** ISDN Utility Program *****
*                               *
*      1. Upgrade New Firmware   *
*      2. Set System Parameter  *
*      3. Set Protocol Parameter *
*      ESC. Exit                 *
*****
Please select one item :

```

Please see the appropriate section below which describes each menu item.

Upgrade New Firmware

1. From time to time ASUSCOM may issue updated and improved versions of the TA-200 firmware in the form of a data file. Using this option allows the end user to upgrade the firmware using the supplied firmware file. Please note you must have a valid firmware upgrade file before proceeding with this procedure. The user then follows a simple procedure as described below.

Are you sure to upgrade the new firmware <Y/N>:_

If you press “Y”, this ISDN Utility Program will exit automatically and go into upgrade procedure (2.). If you press “N”, then it returns to the ISDN Utility Program.

2. The following prompts then appear.

**ISDN TA upgrade procedure starts:
Erase current driver <Y/N>:_**

If you press “Y”, then go to step (3.). If you press “N”, you will exit this upgrade procedure and the current version number, selected protocol and speed of B channel will be printed on the screen. If there is no driver (firmware) in flash memory, it will inform you to proceed with the upgrade procedure.

3. Once the TA starts to erase the driver in flash memory the following messages are displayed.

**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.**

From the terminal program now select transmission with ASCII mode (text mode) and specify the new firmware file, e.g. if you use HyperTerminal in Windows 95 then choose Transfer → Send Text File → and then input the file name and located directory of the new firmware. During the file transmission the following message is shown.

**Compare S0-record OK
Load Addr = #####**

If you press “\$” then the programme returns to step 2 to restart the upgrade procedure.

4. After file is transferred completely, the following message is shown.

**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>:_**

Press “**N**” to finish and exit upgrade procedure and then the version number, current selected protocol and speed in B channel will be shown. If you press “**Y**” then the program returns to step 2 to restart the upgrade procedure.

Set System Parameter

The system parameter screen is shown below.

```
*****[ System Parameter Table ]*****
* SWITCH TYPE:                                     *
* CODEC:                STANDBY TIME:             *
*=====Msn and Subaddress for Incoming call ===== *
* MSN (POTS-1):         SAD(POTS-1):              *
* MSN (POTS-2):         SAD(POTS-2):              *
* MSN (DATA-1):         SAD(DATA-1):              *
* MSN (DATA-2):         SAD(DATA-2):              *
* MSN (DATA-3):         SAD(DATA-3):              *
* MSN (DATA-4):         SAD(DATA-4):              *
*=====Msn and Subaddress for Outgoing call ===== *
* MSN (POTS-1):         SAD(POTS-1):              *
* MSN (POTS-2):         SAD(POTS-2):              *
* MSN (DATA):           SAD(DATA):                *
*===== *
* SPID-1:                SPID2:                  *
*****
Esc key: Exit          Ctrl-U key: move to previous item
Ctrl-W key: Save      Ctrl-D key: move to next item
+, - key: Select next parameter  Ctrl-L key: move cursor left
Ctrl-E key: Delete character  Ctrl-R key: move cursor right
```

SWITCH TYPE Set the country or ISDN switch type, which is suitable for your local telephone company (this setting should have been preset before the adapter was supplied). Please also refer to the ATP command.

CODEC Countries that conform to the European telecommunication standard should choose A-Law. Countries that follow the US telecommunication standard should choose U-law. ATCODEC=0 for A_Law and ATCODEC=1 for U_Law. Please refer to the ATCODEC command.

STANDBY TIME A time period between dialing the last digit and sending a call request, please just leave it as default. Please refer to the ATSTBY command.

MSN (Incoming) MSN parameter is used for ISDN systems supporting the MSN (Multiple Subscriber Number) service. MSN service is supported by

some of the European telephone companies. If you enter your MSN number then the telephone number of caller will be required to match the MSN value³. If there is no match then the appropriate line will not answer or accept this incoming call. If you want to answer any incoming calls, please leave it with blank. Please refer to the AT&ZI command.

MSN (Outgoing) This Parameter is used for telling the ISDN exchange which number made the call. This allows you to configure your system so that you can get individual call charge bills for particular phone numbers. Please refer to the AT&ZO command.

SPID SPID parameters are only required in some areas of the USA. Please check with your telephone company if it is necessary. Please refer to the ATSPID command.

SAD Abbreviation for Sub-ADdress.

Notes:

For an incoming data call the TA-200 will get the B channel protocol, called party number and subaddress from the ISDN layer 3 SETUP packet. If there is no protocol type assigned in the incoming SETUP packet the TA-200 will automatically detect the protocol type (e.g. V.120, X.75, or HDLC, etc. - please refer to the AT&AP command). If the TA-200 has the parameter values for MSN, Subaddress, and Protocol (please refer to the AT&ZIr=m*n*p command), then these parameter value(s) will be used to check the compatibility between the incoming SETUP packet's value. If the MSN values are matched (please refer AT&ZI? command), then TA-200 will accept the incoming call, otherwise it will be rejected.

Set Protocol Parameter

The protocol parameter screen is shown as below.

```
*****[ Protocol Parameter Table ]***** *
*===== Profile 0 =====*
* BIT TRANSPARENT -- Packet Size : 2048 *
* HDLC -- Packet Size : 1024 *
* V.120 -- Packet Size : 256 Window Size : 7 *
* X.75 (Transparent) -- Packet Size : 2048 Window Size : 7 *
* X.75 (T.90NL) -- Packet Size : 128 Window Size : 7 *
* X.75 (ISO8208) -- Packet Size : 1024 Window Size : 7 *
*===== Profile 1 =====*
```

³ In the UK, using I SDN2 or I SDN2e 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 I SDN phone number is 01234 496778 then the number to be entered in the MSN field is 8, not the full I SDN number. This means that this line will only respond to your particular I SDN phone number that ends in 8. All other numbers will be rejected. If your telecomms company sends down the last two digits for the MSN number then you must enter both the last digits.

```

-- Packet Size : 2048
* HDLC -- Packet *
* V.120 Size : 256 Window Size : 7
* X.75 (Transparent) -- Packet Window Size : 7 *
-- Packet Size : 128 *
* X.75 (ISO8208) Size : 1024 Window Size : 7
*****
key: Exit
Ctrl-W
Ctrl-U key: move to previous item
key: move to next item
+, -

```

These protocols are used in the B channel and are used to set the packet size and window size to meet the remote site configuration for connection compatibility or better performance. For convenience you may store different settings into profiles 0 or 1. You can select either of these profiles to speed up the configuration and usage. Please refer to Chapter 4 for details of the AT command set and related information.

Installation for Windows 3.1 Environment

Installing and Configuring the Drivers

Run any terminal program such as Terminal, ProComm ...and configure the parameters as follows.

```

Baud Rate: Up to 115200
Data Bit: 8
Parity Check: None
Stop Bit: 1
Flow Control: RTS/CTS

```

If you need to alter the default settings then please refer to the above section (**How to Configure TA-200**). Please note, the set values of Country or switch type, SPID0 and SPID1, CODEC, MSN, and Outgoing telephone number will be stored in the adapter and will not alter until customer changes them using the AT@ configuration screen.

Application Environment Setup

The ISDNLINK™TA-200 terminal adapter provides operation using standard AT commands through the COM port interface on you computer. It is therefore a simple matter to set up existing application software to the appropriate COM ports to communicate with ISDNLINK™ TA-200 terminal adapter. If you use TRUMPET to connect to Internet, you should add the AT command (ATB4) before TRUMPET makes a connection to Internet. You can edit the login.cmd file and add this command (ATB4) for Async-to-Sync conversion. If you do not

want to change the login.cmd file, you can dial into the ISP by manual login (enter ATB4 or ATB41 first, and then ATD#####).

Installation for Windows 95 Environment

The TA-200ST is a Windows 95 PnP compatible device so Windows 95 will prompt a message and request you to install the driver when boot up. When requested insert the installation disk into the floppy drive and select the option for Hardware Vendor providing device driver. If your Windows 95 is OSR2 version, you will see the screen shown below. Windows 95 will then automatically process the driver installation procedure and install an "ISDN TA (Async. to Sync. PPP, 64K) Modem" for Internet access. (Please note that this modem is really just a 'standard' modem but modem properties set to 115K baud and the initialization command ATB4 set in the advanced settings. All the TA-200 modem drivers are basically the same but with different initialization commands.)



Installing and Configuring the Drivers

1. Run any terminal program such as Terminal, ProComm ... and configure the parameters as follows.

| | |
|----------------------|---------------------|
| Baud Rate: | Up to 115200 |
| Data Bit: | 8 |
| Parity Check: | None |
| Stop Bit: | 1 |
| Flow Control: | RTS/CTS |

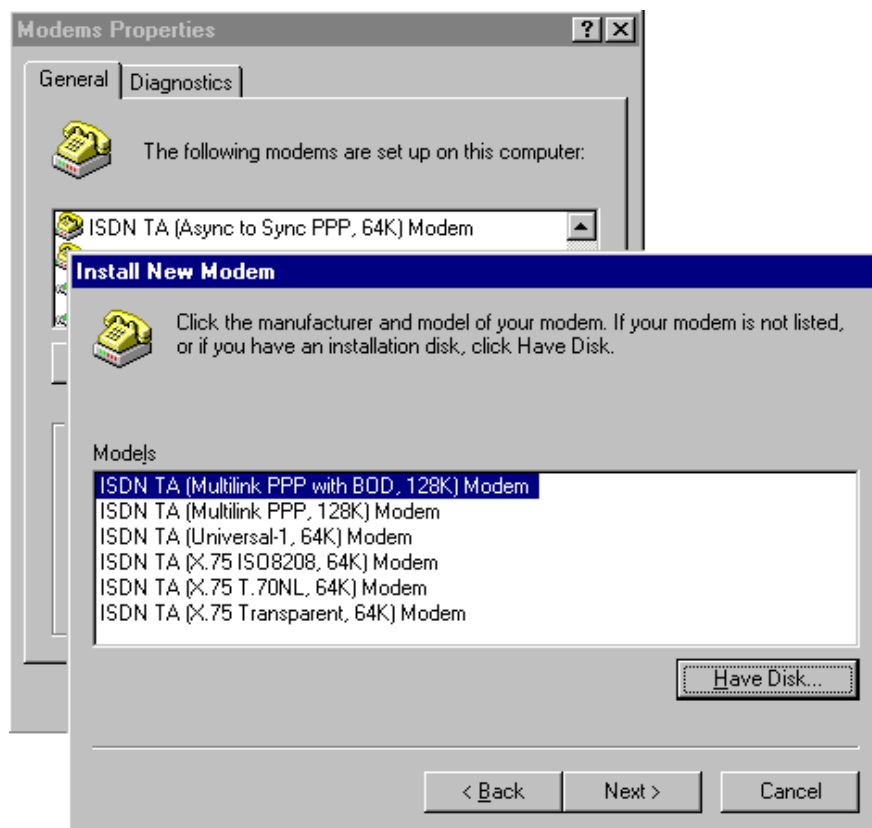
If you need to alter the default settings then please refer to the above section (**How to Configure TA-200**). Please note, the set values of Country or switch type, SPID0 and SPID1, CODEC, MSN, and Outgoing telephone number will be stored in the adapter and will not alter until the customer changes them using the AT@

configuration screen.

2. Install ASUSCOM ISDN modems.

Please use the following steps to add proprietary virtual modems in Windows 95.

- 1) Select Start → Settings → Control panel → Modems → Add → Check “do not detect my modem, I will select it from a list”.
- 2) Click “Have Disk”, and browse to the modem sub-directory on the TA-200 installation diskette such as A:\MODEM. Select the mdmasuta.inf file.



- 3) Select the modem type that you require from the list shown (as described below) and then click on Next, link this modem to the Com port which connects to the TA-200 terminal adapter.

You should manually add in turn the modem types that you require. Each modem will automatically issue the appropriate protocol command to ISDNLINK™ TA-200 terminal adapter when you use it to make a connection. The purpose of each modem type explained as follows:

- **The ISDN TA (Async to Sync PPP, 64K) or (Internet PPP, 64K) modem** is used for 64K Internet Access, and the protocol in B channel is Async.-to-Sync. PPP conversion.
- **The ISDN TA (MultiLink PPP, 128K) or (Internet MLPPP, 128K) modem**

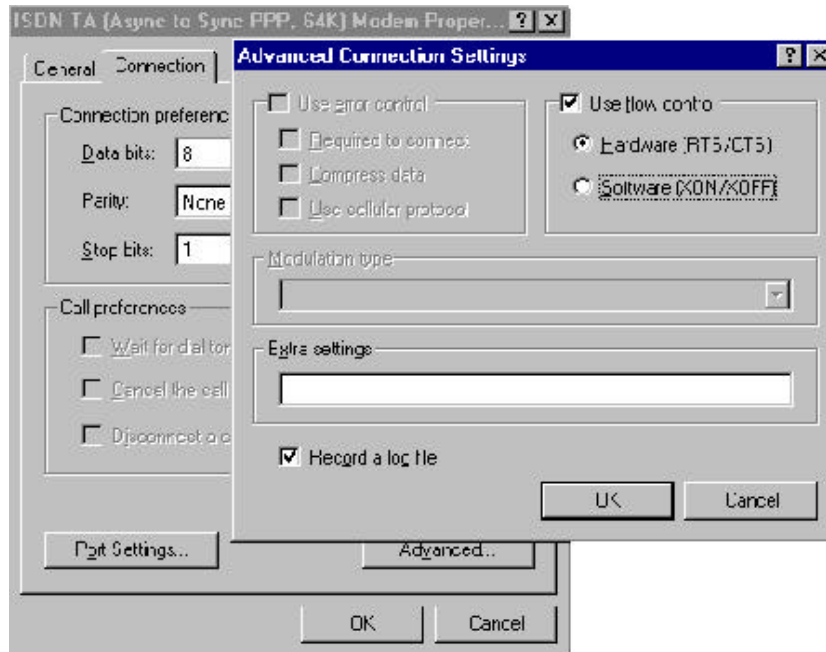
is used for 128K Internet Access, and the protocol in B channels is MultiLink PPP.

- **The ISDN TA (MultiLink PPP with BOD, 128K) or (Internet MLPPP with BOD, 128K) modem** is used for 128K Internet Access, and the protocols in B channels are MultiLink PPP with Bandwidth on Demand (BOD). Through BOD capability, you can have a voice call while 2B channels are used by MultiLink PPP Internet Access. The ISDN driver will then drop one B channel and make the voice call through this B channel. After finished the voice call, the ISDN driver will count the data flow used in the B channel and bundle another B channel back if the usage rate is high.

Initially the ISDN driver will only make a single 64K connection. It will then monitor the data traffic in this channel. If it is higher than the setting value (default is 4K bytes/second) for a preset time (see the AT commands S53 and S54) then the driver will setup another 64K call for 128K connection. Please refer to the ATS53 and ATS54 commands.

- **The ISDN TA (X.75 Transparent, 64K) modem** is used for BBS Access and file transfer, and the 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, and the protocols in the B channel are X.75 and T.70NL.
- **The ISDN TA (X.75 ISO8208, 64K) or (X.75 EFT, 64K) modem** is used for BBS Access and file transfer (EFT: Euro File Transfer), and the protocols in the B channel are X.75 and ISO8208.
- **The ISDN TA (Universal-1, 64K) modem is the multi-purpose modem** but the protocol used in the B channel must be assigned through the ATBn command (see the Modems/Advanced/ Extra Settings) before making a connection. The Universal modem chooses the HDLC as the default protocol in B channel.

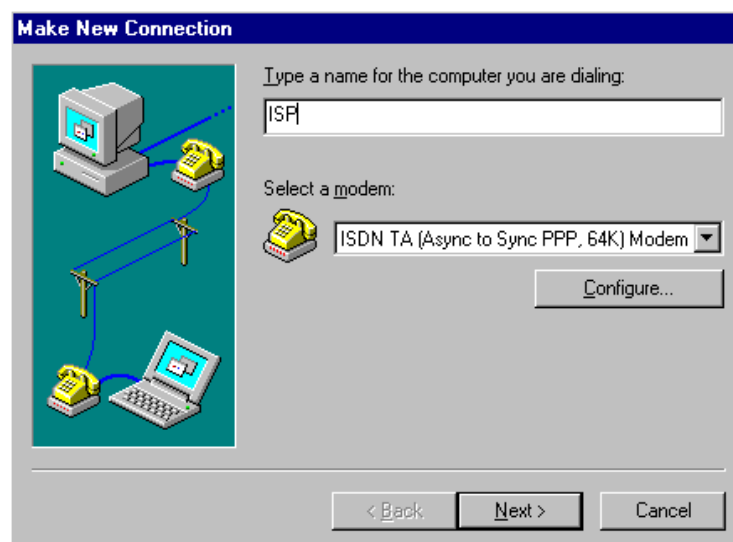
Please now check (and modify if necessary) the default modem setting pertaining to each of the ISDN modems. Select Start → Settings → Control panel → Modems → ISDN modem, Properties → Connection, set Data bit to 8, Parity to None, and Stop bits to 1. Select to use FIFO buffers in Port Settings tab and select flow control, RTS/CTS in Advanced tab. ISDN modem, Properties → General, set Maximun speed to 115200.



Configure the Dial-Up Networking to Access Internet

Now you have correctly installed the relevant modem drivers you are ready to access the Internet through the Windows 95 Dial-Up Networking. You can make a new connection from the following steps.

Select Start → Programs → Accessories → Dial-Up Networking → Make New Connection, then choose the appropriate configuration for 64K or 128K connection.



64K Access for Windows 95

1. Select the ISDN TA (Async to Sync PPP, 64K) MODEM as shown above.

2. For the other fields such as Server Type, please input the values provided by your ISP. Ensure that you enter a valid ISDN connection telephone number for your ISP, remember that many ISP use a different number for normal modem and ISDN access.

These setup procedures should give you connection speeds of 64Kbps.

128K/MLP Access for Windows 95

1. On the New Connection select the “ISDN TA (MultiLink PPP, 128K) Modem” or “ISDN TA (MultiLink PPP with BOD, 128K) Modem”.
2. For the other fields such as Server Type, please input the values provided by your ISP. Ensure that you enter a valid ISDN connection telephone number for your ISP, remember that many ISP use the different number for normal modem and ISDN access.

These setup procedures should give you connection speeds of 128Kbps. Before make the 128K connection, please confirm that your ISP supports 128K or not. Some ISP don't or may levy an extra charge for this service.

Accessing the Outside World Using Dial-Up Networking

Now you have crated a dial-up connection you are now ready to make a connection with your ISP server. Open Dial-Up Networking icon, and then select the name configured above in the folder and click “Dial”. The system should then dial and connect to your ISP at either 64K or 128K depending on how you setup the call. The server will verify your login name, password, and register you on the server.

If you double-click the small icon of Dial-Up Networking at the right-bottom of the Windows, the Dial-Up Networking Monitor shows your connection status including connection speed, server type, etc. You are now ready to use the Internet tools to access the Internet or network tool to access remote network.

If you find problems after connecting such as the line is dropped or you cannot access the Internet, or you cannot access your remote network, please go back to check your network settings with your ISP or network administrator.

Install the CAPI20 device drive

With the CAPI2 interface you can use any CAPI application such as RVS-COM, ZOC to access TA-200 as if it were an internal ISDN card. You can therefore use the Soft-G3Fax, Telephony, File Transfer ...functions supplied by the RVS-COM package. Before you install the CAPI20 device driver, the TA-200 should be correctly installed and configured by Windows 95 as described above. Please refer Appendix B for further information.

Installation for Windows NT 4.0 Environment

Installing and Configuring the Drivers

1. Run any terminal program such as Terminal, ProComm ... and configure the parameters as follows.

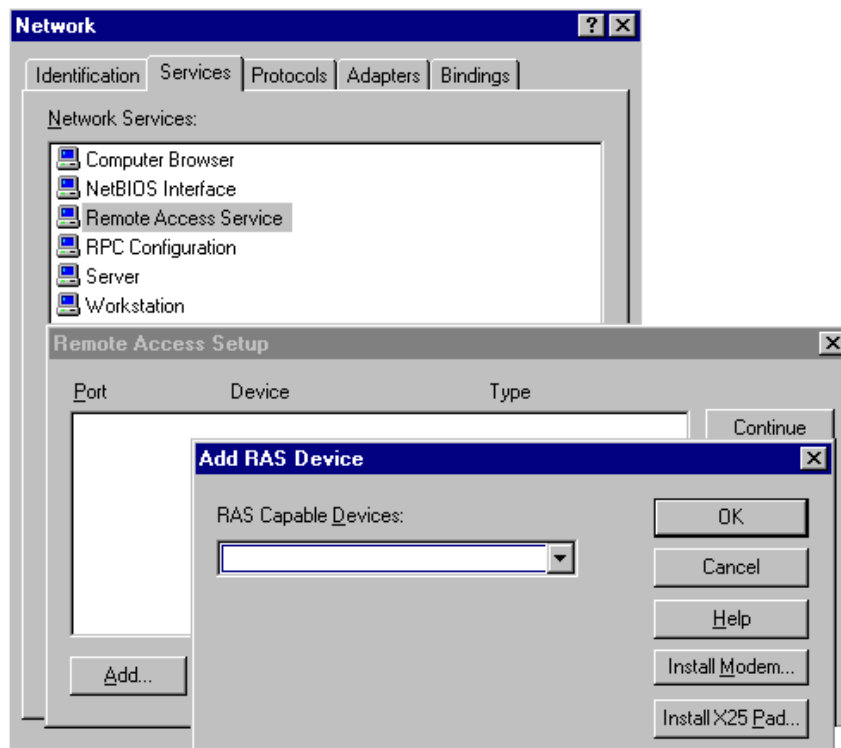
Baud Rate: Up to 115200
Data Bit: 8
Parity Check: None
Stop Bit: 1
Flow Control: RTS/CTS

If you need to alter the default settings then please refer to the above section (**How to Configure TA-200**). Please note, the set values of Country or switch type, SPID0 and SPID1, CODEC, MSN, and Outgoing telephone number will be stored in the adapter and will not alter until the customer changes them using the AT@ configuration screen.

2. **Install ASUSCOM ISDN modems for Dial-up Networking and RAS.**

Please use the following steps to add the virtual modems under Windows NT.

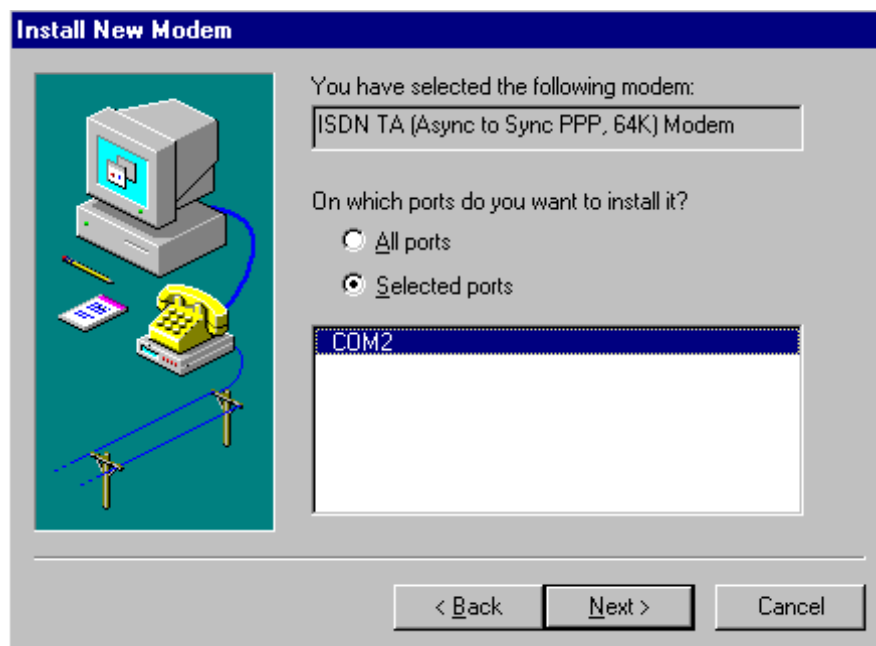
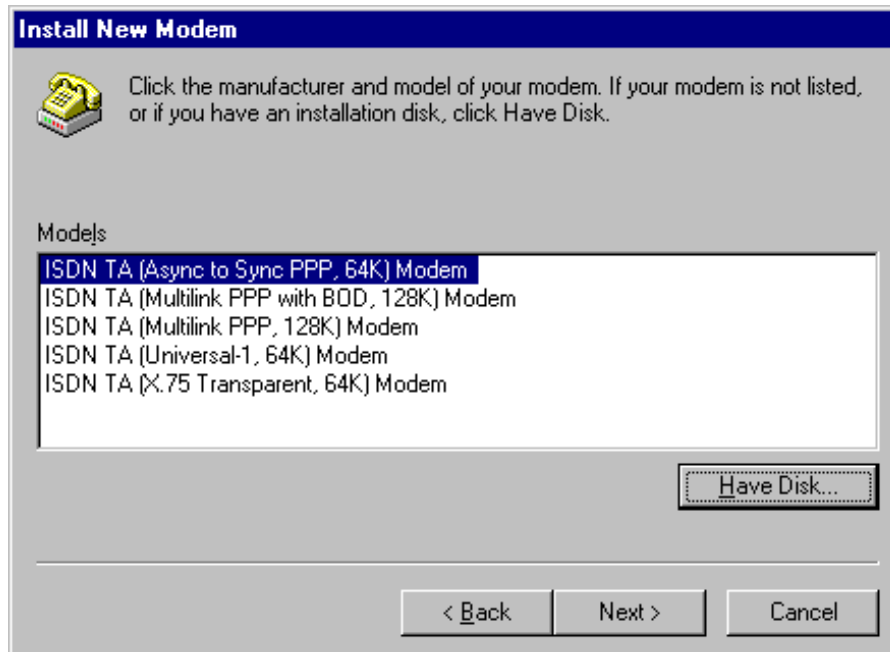
- 1) Select Start → Settings → Control panel → Network → Services → Remote Access Service, Properties → Add → Install Modem → Check **“do not detect my modem, I will select it from a list”**. Click “Next”.



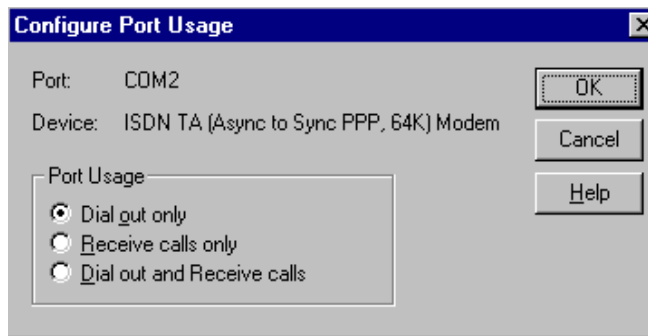
- 2) Click “Have Disk”, and browse to the modem sub-directory (A:\MODEM) on the

TA-200 installation diskette. Select the mdmasuta.inf file.

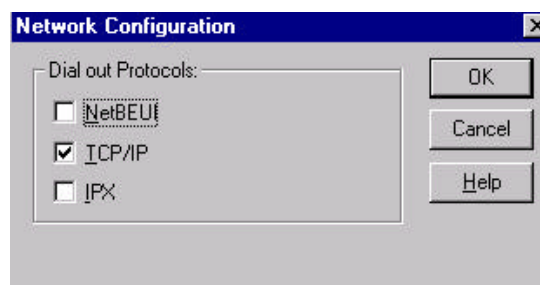
- 3) Select the modem type that you require from the list shown (as described below) and then click on Next, link this modem to the Com port which connects to TA-200 terminal adapter.



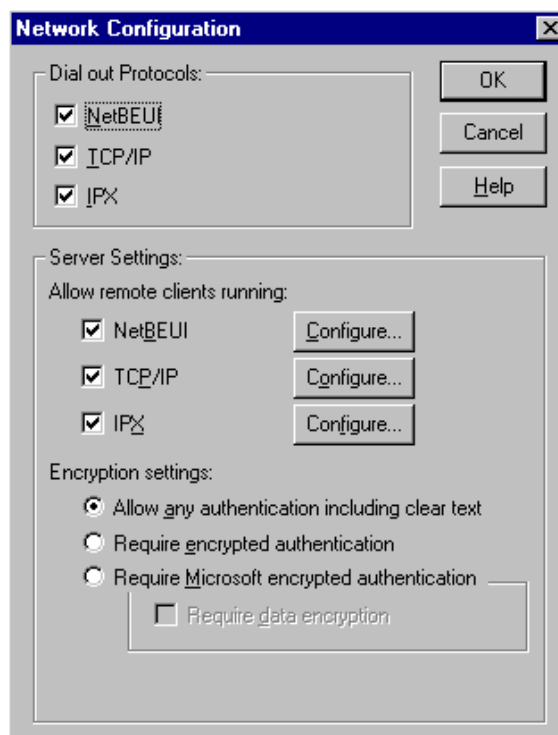
- 4) After you install the desired modem, select the virtual modem in the RAS Capable Devices field. Click "OK".
- 5) Select this virtual modem and click the Configure Tab to set the parameter (Port Usage) to this ISDN1port for "Dial out only", "Receive calls only", or "Dial out and Receive calls" then click OK.



- 6) If you check “Dial out only” and then click the network tab, you will get a window like below, check the protocol you want. If you are going to access Internet, check “TCP/IP” usually.



- 7) If you check “Receive calls”, or “Dial out and Receive calls” and then click the network tab, you will get a window like below. Please check your ISP or network administrator for TCP/IP settings. Also check that you have enabled, “allow any authentication including clear text”, in the Security settings. Then click OK.



- 8) Click “Continue” and the RAS installation is finished. Please remember to restart your computer to take effect of these settings.

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

- **The ISDN TA (Async to Sync PPP, 64K) or (Internet PPP, 64K) modem** is used for 64K Internet Access, and the protocol in B channel is Async.-to-Sync. PPP conversion.
- **The ISDN TA (MultiLink PPP, 128K) or (Internet MLPPP, 128K) modem** is used for 128K Internet Access, and the protocol in B channels is MultiLink PPP.
- **The ISDN TA (MultiLink PPP with BOD, 128K) or (Internet MLPPP with BOD, 128K) modem** is used for 128K Internet Access, and the protocols in B channels are MultiLink PPP with Bandwidth on Demand (BOD). Through BOD capability, you can have a voice call while 2B channels are used by MultiLink PPP Internet Access. The ISDN driver will then drop one B channel and make the voice call through this B channel. After finished the voice call, the ISDN driver will count the data flow used in the B channel and bundle another B channel back if the usage rate is high.

Initially the ISDN driver will only make a single 64K connection. It will then monitor the data traffic in this channel. If it is higher than the setting value (default is 4K bytes/second) for a preset time (see the AT commands S53 and S54) then the driver will setup another 64K call for 128K connection. Please refer to the ATS53 and ATS54 commands.

- **The ISDN TA (X.75 Transparent, 64K) modem** is used for BBS Access and file transfer, and the 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, and the protocols in the B channel are X.75 and T.70NL.
- **The ISDN TA (X.75 ISO8208, 64K) or (X.75 EFT, 64K) modem** is used for BBS Access and file transfer (EFT: Euro File Transfer), and the protocols in the B channel are X.75 and ISO8208.
- **The ISDN TA (Universal-1, 64K) modem is the multi-purpose modem** but the protocol used in the B channel must be assigned through the ATBn command (see the Modems/Advanced/ Extra Settings) before making a connection. The Universal modem chooses the HDLC as the default protocol in B channel.

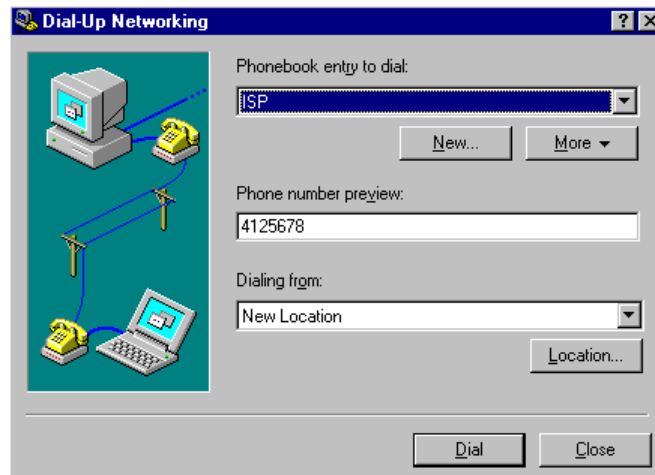
Please now check (and modify if necessary) the default modem setting pertaining to each of the modems. Select Start → Settings → Control panel → Modems → ISDN modem, Properties → General, set Maximum speed to 115200, Connection, set Data bit to 8, Parity to None, Stop bits to 1, and check Use flow control, RTS/CTS in Advanced tab.

Configure the Dial-Up Networking to access Internet.

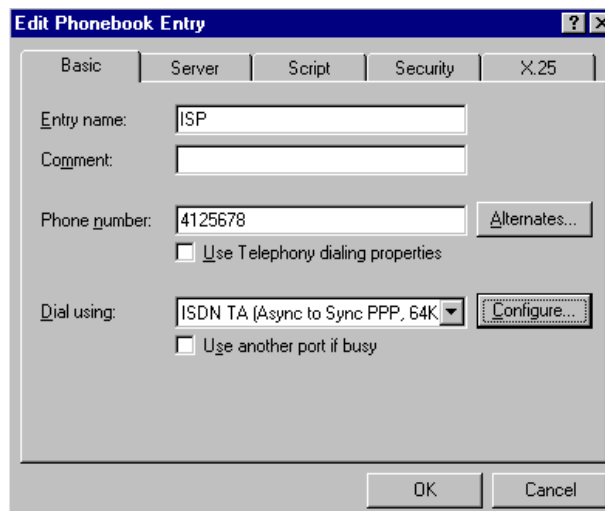
You are now ready to configure your dial-up networking for Internet access.

64K Access for Windows NT 4.0

1. Select Start → Programs → Accessories → Dial-Up Networking. And then enter the name of the new Dial-Up account and click “Next >”. Enter the server type details for your ISP. Click “Next >”. Enter the phone number of ISP and click “Next”. Click “Finish”. You will get a window like below.

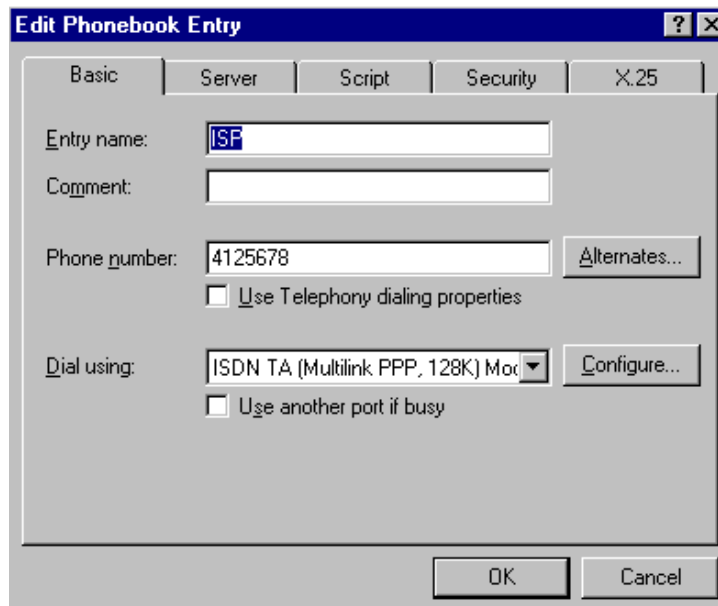


2. To configure the parameters for dialing and server settings, click on the “More” button and select the item you want to change from the pull down list. Then Click “Dial” to make a connection with the ISP server over ISDN. By comparison with Windows95 Dial-up Networking, these parameters (phone number, dial using port, server type, and security) are located in the item “Edit entry and modem properties..” when you click on the “More” button. In the Dial using field, select the “**ISDN TA (Async to Sync PPP, 64K Modem)**” for Internet Access. In the “Security” sub-window, check that you have enabled “Accept any authentication including clear text”. **Please note that this virtual modem must be configured in RAS for dial out, otherwise you can not use it.**



128K/MLP Access for Windows NT 4.0

1. First of all check that your ISP does provide 128K connection to the internet.
2. Then select Start → Programs → Accessories → Dial-Up Networking and then enter the name of the new Dial-Up account and click “Next >”. Enter the server type details for your ISP. Click “Next >”. Enter the phone number of the ISP and click “Next”. Click “Finish”.
3. To configure server settings or dialing properties, click on the “More” button and select the item you want to change from the pull down list. And then Click “Dial” to make a connection with the server over ISDN. To compare with Windows95 Dial-up Networking, these parameters (phone number, dial using port, server type, and security) are located in the item “Edit entry and modem properties..” when you click on the “More” button. In the Dial using field, select the “ISDN TA (MultiLink PPP, 128K) Modem” or “ISDN TA (MultiLink PPP with BOD, 128K) Modem” for Internet Access. In the “Security” sub-window, check that you have enabled “Accept any authentication including clear text”. **Please note that this virtual modem must be configured in RAS with “dial out” capability, otherwise you can not use it.**



Accessing the Outside World Using Dial-Up Networking

You are now ready to make a connection with your ISP server. Click the Dial-Up Networking icon, and select the name configured above in the phone book entry and then click “Dial”. The system should then dial and connect to your ISP at either 128k or 64k depending on how you setup the call. The server will verify your login name, password, and register you on the server.

If you double-click the small icon of Dial-Up Networking at the right-bottom of the Windows, the Dial-Up Networking Monitor shows your connection status including connection speed, server type, etc. You are now ready to use the Internet tools to

access the Internet or network tool to access remote network.

If you find problems after connecting such as the line is dropped or you cannot access the Internet, or you cannot access your remote network, please go back to check your network settings with your ISP or network administrator.

Self-diagnosis of Device

There are two ways to diagnose the TA-200 system. The first one use is to use the AT&TEST command to check the return string as described in Chapter 4. If you have the TA-200 with POTS ports then another method to test the TA is to use an analog telephone set attached to the a/b (POTS) port of TA-200 device as follows.

1. Take the phone Off-Hook.
2. Press FLASH or RECALL key on you phone or tap the hook switch on the phone for about 0.3 to 0.6 second. You will see the T1 or T2 LED flash with a 0.4 second ON cycle (0.2 off, 0.2 on).
3. Press * 0 # (three digits). If the TA-200 device is working fine then the T1 and T2 LED's will flash in a 1 second cycle (0.5 ON, 0.5 OFF) and you will also hear the dial tone. If the TA-200ST device does not work okay then the T1 and T2 LED's will flash with a very fast 0.1 second ON and 0.1 second OFF cycle and you will hear the busy tone.

Chapter 4 Provided AT Command Set

The ISDNLINK™TA-200 terminal adapters support the communication interface (RS-232C) and allow applications to access the adapters as a standard analog modem. Extra AT commands are provided to enable ISDN features such as HDLC, X.75, V.120, or Async to Sync PPP (see command list given below). You may also contact <http://www.asuscom.com.tw> for more information and download the latest driver.

The following AT Commands are provided to allow control of the ISDN connections, line protocols and call handling. You should change your application setup-strings using these parameters to access ISDNLINK™ TA-200 terminal adapter with the correct protocol and settings.

AT Command Set

| Command | Samples | Description |
|---------|-----------|--|
| ATA | | Answer an incoming call |
| ATBn | | Select protocol of transmission in B channel |
| | ATB0 | 64K HDLC (default) |
| | ATB11 | V.110 Async. User rate = 1200 bps (option) |
| | ATB12 | V.110 Async. User rate = 2400 bps (option) |
| | ATB13 | V.110 Async. User rate = 4800 bps (option) |
| | ATB14 | V.110 Async. User rate = 9600 bps (option) |
| | ATB15 | V.110 Async. User rate = 19200 bps (option) |
| | ATB16 | V.110 Async. User rate = 38400 bps (option) |
| | ATB20 | V.120 Async. |
| | ATB3 | X.75 Transparent, the same as ATB30 |
| | ATB30 | X.75 Transparent |
| | ATB31 | X.75 T.70 NL |
| | ATB32 | X.75 ISO 8208 |
| | ATB4 | Async PPP to Sync PPP conversion |
| | ATB41 | Async to Sync PPP conversion in ML PPP mode, compatible with Microsoft ISDN Accelerator pack |
| | ATB42 | Async to Sync PPP conversion in ML-PPP mode with Bandwidth on Demand (BOD) |
| | ATB5 | Bit Transparency (This command is only used for RVS-COM's soft-G3Fax) |
| ATCODEC | | Set or display the codec of POTS |
| | ATCODEC=n | n = 0 for A_Law n = 1 for u_Law |
| | ATCODEC? | Display the current settings |
| ATDSr | | Speed dial, dial saved telephone number, r=0,1 |

| | | |
|----------|------|--|
| ATDYaNb# | | Y is the type of number, N is the identification of numbering plan and # is the telephone number. A = 0 unknown (default) 1 international number 2 national number 3 network specific number 4 subscriber number 6 abbreviated number b= 0 unknown (default) 1 ISDN/Telephony numbering plan 3 data number plan 4 telex numbering plan 8 national standard numbering plan 9 private numbering plan |
| ATDL | | Redial the last dial number |
| ATEn | | Echo characters when in command mode |
| | ATE0 | Echo off |
| | ATE1 | Echo on (default) |
| ATHn | | On-Off Hook |
| | ATH | On-Hook, Disconnect (same as ATH0) |
| | ATH1 | Off-Hook |
| ATIn | | Display Driver information |
| | ATI0 | Display version number, selected protocol, connected speed (same as ATI) |
| | ATI1 | Display switch type, codec, SPIDs, standby time, MSN.. |
| | ATI2 | Display the last connection status including call direction, used protocol, speed, disconnection cause, and used time period for POTS interface. |
| | ATI3 | Display the last connection status including call direction, used protocol, speed, disconnection cause, and used time period for DATA interface. |
| | ATI4 | Display the manufacture name, ASUSCOM |
| | ATI5 | Display the model name, TA-200 |
| | ATI6 | Display the firmware version |
| ATO | | On-Line command, switch to on-line mode from command mode |
| ATP | | Set or display the country or switch type |

| | | |
|------|--------|---|
| | ATP=n | n= 0 -> Australia 1 -> Belgium 2 -> China 3 -> Colombia 4 -> Denmark 5 -> Dutch 6 -> Euro ISDN 7 -> Finland 8 -> France 9 -> Germany 10 -> Israel 11 -> Italy 12 -> Japan 13 -> Korea 14 -> Korea-CountrySide 15 -> Singapore 16 -> Slovenia 17 -> South Africa 18 -> Spain 19 -> Sweden 20 -> Swiss 21 -> Taiwan 22 -> U.K. 23 -> USA (AT&T Multi-P) 24 -> USA (AT&T P-T-P) 25 -> USA (NI-1) 26 -> USA (NI-2) 27 -> USA (NTI/DMS) |
| | ATP? | Display the country or switch type |
| ATQn | | Return the result code |
| | ATQ0 | Return the result code (default) |
| | ATQ1 | Does not return the result code |
| ATSr | | Set or display the register value |
| | ATS0=1 | Set register 0 to 1, (S0=0 default, disable the auto-answer mode) |
| | ATSr? | Display register r content |
| | ATS1? | Register 1 is read only, display the ring count |
| | ATS2 | Escape code character (default S2=43, ASCII "+") |
| | ATS3 | Carriage return character (default S3=13, representing a carriage return) |
| | ATS4 | Line feed character (default S4=10, representing "CTRL J" or the line feed character) |
| | ATS5 | Back space character (default S5=8, representing "CTRL H") |
| | ATS7 | Wait for carries after dial (default S7=30 seconds) |
| | ATS12 | Escape code guard time (default S12=50) |
| | ATS25 | Delay to DTR (default S25=5) |
| | ATS30 | 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) |
| | 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 (default 7) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|--|---------------|---------|----------|---|------------|------------|---|-----|-----|---|-----|-----|---|-----|-----|---|-----|---------------|---|-----|-----|---|-----|-----|---|-----|-----|
| ATS39 | Packet size of HDLC 56K or 64K from 1 to 2048 (default 1024) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS40 | Windows size of V.120 (default 7) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS41 | Packet size of V.120 (default 256) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS44 | Window size of X.75 (Transparent) (default 2) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS45 | Packet size of X.75 (Transparent) from 1 to 2048 (default 2048) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS46 | Window size of X.75 T.70 NL (default 2) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS47 | Packet size of X.75 T.70 NL from 1 to 2048 (default 128) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS50 | Window size of X.75 ISO 8208 (default 2) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS51 | Packet size of X.75 ISO 8208 from 128 to 2048 (default 1024) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 ML-PPP BOD mode, ATB42. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS54 | Time period from 1 to 16 minutes (default 5) Disconnect the second channel if average data flow below N bytes (set by ATS53) in 5 minutes. This register is only available in ML_PPP BOD mode, ATB42. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS55=n | Select the ring pattern for POTS 1, n=0 to 7 <table border="1"> <thead> <tr> <th>pattern #</th> <th>Ring ON</th> <th>Ring Off</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0.5 second</td> <td>0.5 second</td> </tr> <tr> <td>1</td> <td>0.5</td> <td>1.0</td> </tr> <tr> <td>2</td> <td>0.5</td> <td>1.5</td> </tr> <tr> <td>3</td> <td>1.0</td> <td>1.0</td> </tr> <tr> <td>4</td> <td>1.0</td> <td>2.0 (default)</td> </tr> <tr> <td>5</td> <td>1.0</td> <td>3.0</td> </tr> <tr> <td>6</td> <td>2.0</td> <td>2.0</td> </tr> <tr> <td>7</td> <td>2.0</td> <td>3.0</td> </tr> </tbody> </table> | pattern # | Ring ON | Ring Off | 0 | 0.5 second | 0.5 second | 1 | 0.5 | 1.0 | 2 | 0.5 | 1.5 | 3 | 1.0 | 1.0 | 4 | 1.0 | 2.0 (default) | 5 | 1.0 | 3.0 | 6 | 2.0 | 2.0 | 7 | 2.0 | 3.0 |
| pattern # | Ring ON | Ring Off | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0.5 second | 0.5 second | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0.5 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0.5 | 1.5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1.0 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1.0 | 2.0 (default) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 1.0 | 3.0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 2.0 | 2.0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 2.0 | 3.0 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS56=n | Select the ring pattern for POTS 2, n=0 to 7 Pattern description is the same as above. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATS57=n | n's value from 1 to 7 (Kbytes) For dropping the second B channel if the data flow is less than "S57" Kbytes in average during "S54" minutes. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATSPID | Set or display the SPID | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATSPID0=n | Set first entry of SPIDs to n | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATSPID1=n | Set second entry of SPIDs to n | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATSPIDm? | Display the m-th entry of SPID, m=0,1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATSTBY | ATSTBY=n Set the standby time n=3 to 10 (default 3) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ATSTBY? Display setting value of the standby time | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATUPG | Download the new driver into TA, please follow the instruction shown in the screen to finish all of procedures. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATVn | Verbose command | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ATV0 Return digit result code | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ATV1 Returns word result code (default) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATXn | Enable extended result code | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ATX0 Disable the extended result code | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ATX1 Enable extended result code (default) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATZ | Reset and store back the profile 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ATZn Reset and store back the profile n, n=0,1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | |
|---------|--------|---|
| +++ | | Escape command (default) |
| AT&ABn | | Baud rate detection |
| | AT&AB0 | Detect baud rate automatically, same as AT&B (default) |
| | AT&AB1 | Disable auto-baud rate detection and fix to current baud rate |
| | AT&AB? | Display the current baud rate |
| AT&APn | | Incoming protocol detection |
| | AT&AP0 | Disable incoming protocol auto-detection |
| | AT&AP1 | Detect incoming protocol automatically (default) |
| | AT&AP? | Display the current setting |
| AT&Cn | | Control DCD |
| | AT&C0 | Keep always the DCD line ON (the same as AT&C) |
| | AT&C1 | DCD line is active if connected (default) |
| AT&Dn | | Control DTR |
| | AT&D0 | Ignore the DTR, assume DTR always ON |
| | AT&D2 | DTR OFF will cause the ISDN TA to hang up (default) |
| AT&E | | Select the line speed in the B channel |
| | AT&E0 | 64K bps (default) |
| | AT&E1 | 56K bps |
| AT&F | | Reset registers to factory setting, default value |
| AT&Kn | | DTE/Modem Flow Control |
| | AT&K0 | Disable DTE/DCE flow control |
| | AT&K3 | Enable RTS/CTS DTE/DCE flow control (Default) |
| | AT&K4 | Enable XON/XOFF DTE/DCE flow control |
| | AT&K6 | Enable RTS/CTS and XON/XOFF DTE/DCE flow control |
| AT&Nn | | Select the voice type |
| | AT&N0 | Select the SPEECH as voice type (default) |
| | AT&N1 | Select the 3.1K Audio voice type |
| AT&Tn | | n = 0 for clearing the conformance test setting (default) n = 1 for setting the loop back test for conformance test. This command is used for PTT approval only. |
| AT&TEST | | Self-diagnosis of device |
| AT&V | | View profile |
| AT&W | AT&Wn | Write active configuration to profile n, n=0,1 |
| AT&Y | AT&Yn | Load profile n when power on, n=0,1 |

| | | |
|--------------|-------------------|---|
| AT&ZIr=n*m*p | | <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 the sub address (option). The second “*” is option. If needed, the p is the protocol indicator.</p> <p>P = 0 for accepting all protocols with auto-detection (default) = 1 for receiving V.110 protocol only (option) = 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</p> <p>Where the r=0,1, to 5, the 0 for POTS 1, 1 for POTS 2, and 2 to 5 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).</p> |
| | AT&ZI? AT&ZIr? | Display the setting values, r=0,1,2 to 5 |
| AT&ZO=nnnn | | This command is auto-dial for DTR signal function save telephone number, nnnn is the telephone number you want to auto-dial out. |
| AT&ZO=r*n*m | | 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. |
| | AT&ZO? AT&ZO? | Display the setting values, r=0,1,2 |
| AT&Zr=n*m | | Save telephone number, r=0, 1 for DTR dialing Where 'n' is telephone number, '*' is the sub address symbol, if needed (option) then 'm' is the subaddress, the maximum length of n is 18 digits and 8 digits for subaddress. |
| AT&Zr? | | Where r=0,1, display current saved telephone number 0,1 |
| AT#C | | Caller ID setting |
| | AT#C? | Display the current Caller ID mode |
| | AT#C0 | Disable Caller ID (default) |
| | AT#C1 | Enable Caller ID |
| | AT#C2 | Enable to display CallerID; CallerSub; CIP; CalledID; CalledSub |
| AT#Tn=m | | Disable ringing function if MSN field empty |
| | AT#T0=0 | Disable to ring the analog device connected to POTS1 when there is no called party number in incoming call |
| | AT#T0=1 | Ring the analog device connected to POTS1 when there is no called party number in the incoming call. (default) |
| | AT#T1=0 | Disable to ring the analog device connected to POTS2 when there is no called party number in incoming call. |
| | AT#T1=1 | Ring the analog device connected to POTS2 when there is no called party number in the Incoming call. (default) |

| | | |
|--------|--|--|
| AT\$Dn | | n=0 disable DTR dialing (Default) n=1 enable DTR dialing (If DTR on, dial the saved telephone number 0 automatically which is saved by AT&Zr=n*m command where r=0 or 1. If DTR off, disconnect the call). This setting can be saved into profile 0 or 1 by AT&W0 or AT&W1. |
| A/ | | Repeat the last AT command |
| AT@ | | To configure the switch type, codec, SPID, MSN by an user-friendly interface |

Result Code List

| Result Code | Result String | ATX0 | ATX1 |
|-------------|--------------------------------------|------|------|
| 0 | OK | o | o |
| 1 | CONNECT | o | x |
| 2 | RING | o | o |
| 3 | NO CARRIER | o | o |
| 4 | ERROR | o | o |
| 7 | BUSY | o | o |
| 8 | NO ANSWER | o | o |
| 71 | CONNECT 1200/V110 ASYNC. | x | o |
| 72 | CONNECT 2400/V110 ASYNC. | x | o |
| 73 | CONNECT 4800/V110 ASYNC. | x | o |
| 74 | CONNECT 9600/V110 ASYNC. | x | o |
| 75 | CONNECT 19200/V110 ASYNC. | x | o |
| 76 | CONNECT 38400/V110 ASYNC. | x | o |
| 82 | CONNECT 56000/V120 ASYNC. | x | o |
| 83 | CONNECT 56000/V120 SYNC. | X | o |
| 84 | CONNECT 56000/X.75 TRANS. | X | o |
| 85 | CONNECT 56000/X.75 T.70NL | x | o |
| 86 | CONNECT 56000/X.75 EuroFT. | X | o |
| 87 | CONNECT 56000/HDLC | x | o |
| 88 | CONNECT 56000/Async. to Sync. PPP | x | o |
| 89 | CONNECT 56000/Async. to Sync. MLPPP | x | o |
| 90 | CONNECT 112000/Async. to Sync. MLPPP | x | o |
| 92 | CONNECT 64000/V120 ASYNC. | x | o |
| 93 | CONNECT 64000/V120 SYNC. | x | o |
| 94 | CONNECT 64000/X.75 TRANS. | x | o |
| 95 | CONNECT 64000/X.75 T.70NL | x | o |
| 96 | CONNECT 64000/X.75 EuroFT. | x | o |
| 97 | CONNECT 64000/HDLC | x | o |
| 98 | CONNECT 64000/Async. to Sync. PPP | x | o |
| 99 | CONNECT 64000/Async. to Sync. MLPPP | x | o |
| 100 | CONNECT 128000/Async. to Sync. MLPPP | x | o |

Appendix A Specifications

☑ ISDN Interface:

1. U Interface (TA-200U & TA-200U-D)

| | |
|-----------|-----------------------|
| Line | two-wire, full duplex |
| Line Code | 2B1Q |
| Connector | RJ-45 x 1 |

2. S/T Interface (TA-200ST & TA-200ST-D)

| | |
|-----------|------------------------|
| Line | four-wire, full duplex |
| Line code | AMI |
| Connector | RJ-45 x 1 |

☑ Data Port Interface:

| | |
|--------------------|---|
| Physical interface | RS-232 |
| Data Rate | Async. Up to 230.4kbps |
| Connector | DB9 (TA-200ST) or DB25 (TA-200U) female x 1 |
| PnP | Microsoft Windows PnP Compatible |

☑ Analog Interface:

| | |
|----------------|----------------------|
| Analog port | Two R-interface port |
| Power feeding | 25V, 25mA |
| Ring Signal | 20Hz, 56Vrms |
| REN | 3 |
| Dialing method | Tone, Pulse |
| Connector | RJ-11 x 2 |

☑ LED Indicators:

| | |
|-------------------------------------|--------|
| 1. Power status lamp | PWR |
| 2. Analog phone status lamp | T1, T2 |
| 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 power | 12Vac, 1Amp |
|-------------|-------------|

☑ **D Channel Signaling Protocol Compatibility**

1. Euro-ISDN DSS1, 1TR6
2. US NI-1, NI-2, AT&T 5ESS, Nortel DMS-100
3. Japan INS-64

☑ **B Channel Protocol Compatibility**

1. Voice (TA-200ST & TA-200U)
2. PPP, MLPPP, BOD (Bandwidth-On -Demand)
3. HDLC, X.75 (Transparent, T.70NL, EuroFT), V.120

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

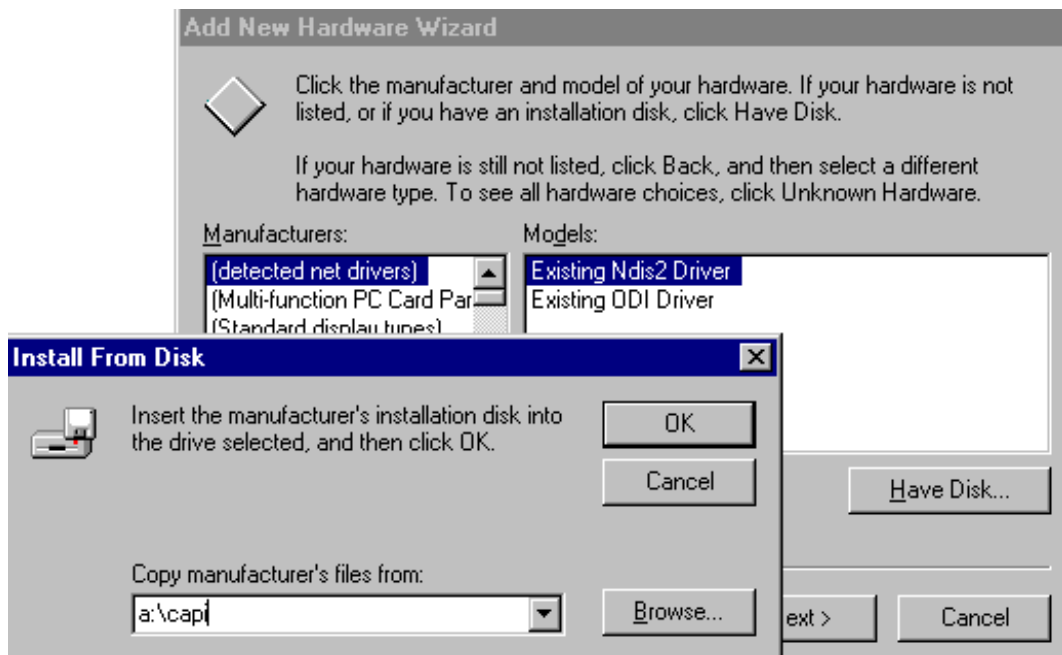
Installation of the CAPI20 Device Drive in Windows 95

With this interface, you can use any CAPI application such as RVS-COM or ZOC to access the TA-200 as if it were an internal INK™ you can use features such as Soft-G3Fax, Telephony, File Transfer through your ISDN adapter. Before you install this CAPI20 device driver you must ensure that the TA-200

To install the CAPI20 device driver please follow these steps:

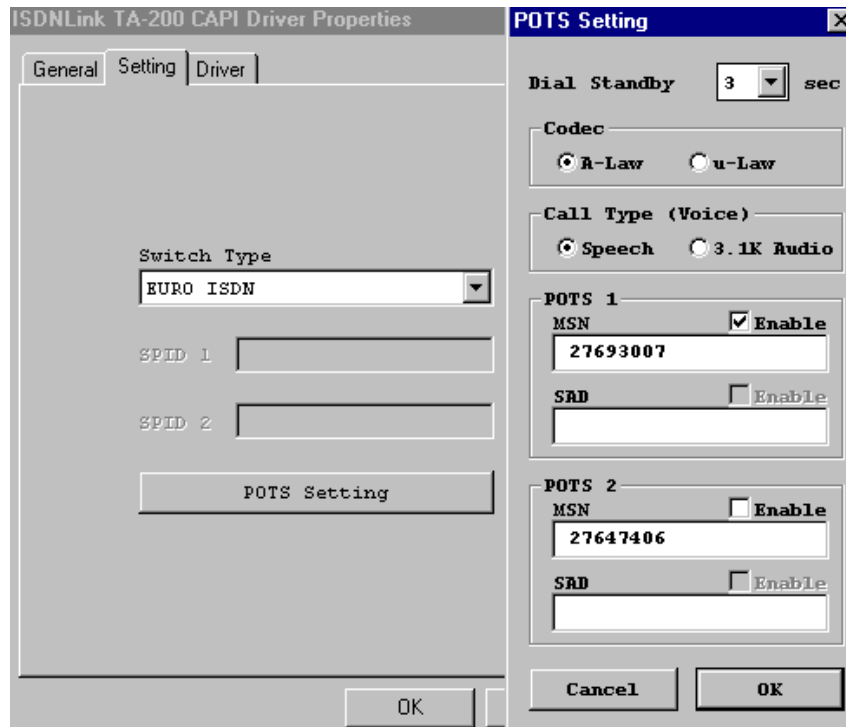
1. Insert the installation disk into the floppy drive.
2. Go to ControlPanel → AddNewHardware → select NO (do not want Windows to search for your new hardware) → OtherDevice → HaveDisk → Input A:\CAPI to install the CAPI20 device driver.





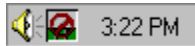
3. Reboot to enable the CAPI20 device driver. After you restart your windows system, you will see the CAPI driver in ControlPanel → System → DeviceManager → ISDNLink → ISDNLink TA-200 CAPI device driver.
4. Configure the TA-200. In the properties of the CAPI driver (found in Device Manager, as above item 3), you can set the TA-200 system parameters including switch type, SPID, Standby Time, CODEC, Voice Call Type, MSN and SAD (subaddress) for POTS ports. The MSN and SAD are used to identify who makes this call so your telephony service provider can charge you based on this number. If you also check the **“ENABLE”**, 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 settings⁴.



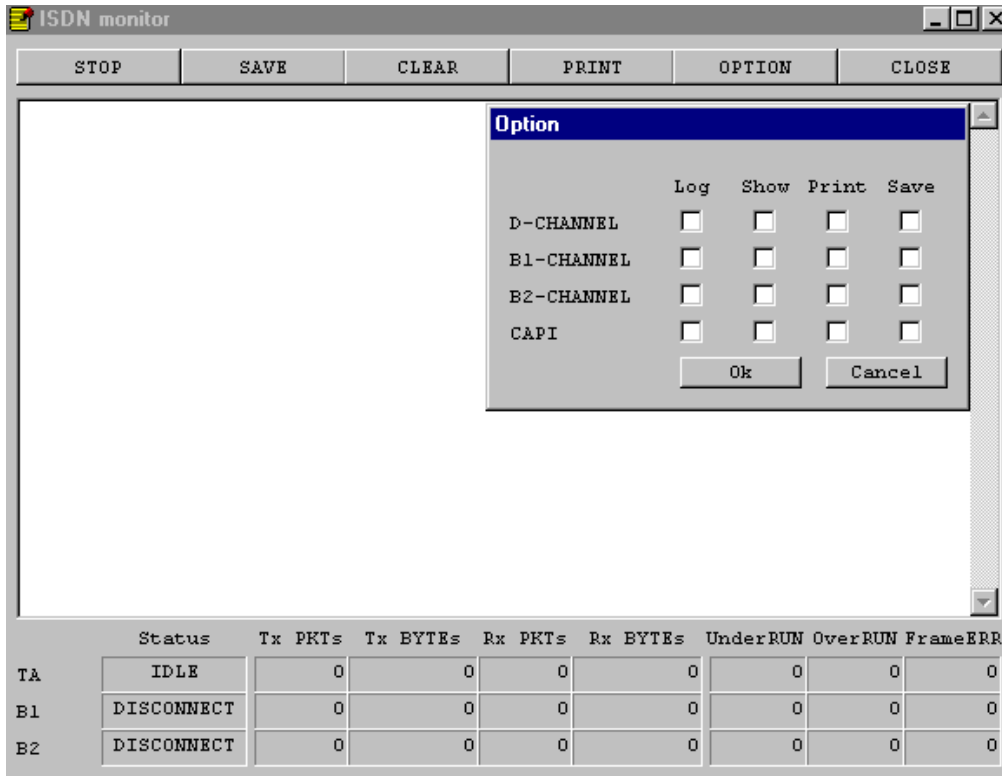
ISDN Monitor (LOG)

After you restart Windows95 the ISDN Monitor is executed automatically and should appear in the system tray button right of your screen. If you see the symbol appearing inside the icon as a stop sign this means the device driver can not reach ISDN terminal adapter. You should check the power and cable of ISDN external adapter.



If you see a (tiny) Z sign, this means there is no CAPI application running which requires the CAPI20 device driver. With no CAPI application running you can access the TA-200 through COM port (e.g. COM2) directly. If you start a CAPI20 application, the stop and Z signs will be off and will function as an ISDN monitor which can record the D, B1, B2, and CAPI messages in the ISDN line and CAPI driver. Please note, whilst CAPI applications are running you cannot access the TA-200 via your com port. To enable this function, move your cursor to this icon and click the right button of mouse. Select the LOG function.

⁴ In the UK, using I SDN2 or I SDN2e 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 I SDN phone number is 01234 496778 then the number to be entered in the MSN field is 8, not the full I SDN number. This means that this line will only respond to your particular I SDN phone number that ends in 8. All other numbers will be rejected. If you telecomms company sends down the last two digits for the MSN number then you must enter both the last digits.



LINETEST function

To enable this function, please move cursor to the ISDN monitor icon and click the right button and select the Linetest function, then input **your own ISDN telephone number**. LINETEST will do the loop back test which test from your site to the ISDN switch, then back to your site. LINETEST is used to check the ISDN line installation and TA configuration.

Upgrade Function

To enable this function, please move cursor to the ISDN monitor icon and click the right button and select the Upgrade function. Please make sure there is no user accessing this device. Then specify the new firmware file name and its directory by selecting "Choose" and start the upgrade action by selecting the "Upgrade". This procedure for upgrading the device firmware is similar to using the AT@ command details above.

Notes: 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 in Windows 95

Please follow these steps to uninstall CAPI20 device driver:

1. Remove the ISDN TA CAPI driver from the ControlPanel → System → Device Manager, ISDNLink, ISDNLink TA-200 CAPI driver
2. Remove the ISDNLink TA-200 CAPI driver from the ControlPanel → AddRemove Software → ISDNLink TA-200 CAPI driver
3. Restart your Windows system