ISDN T/A 128

IEA128-ST / IEA128-U

External ISDN Terminal Adapter

Trademarks

Revision

The information in this manual is subject to change without notice.
User's manual for PLANET ISDN T/A 128, models,
IEA128-STDV, IEA128-STD, IEA128-UDV, IEA128-UD
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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.

ISDN T/A 128 IEA128 terminal adapters provide high-performance solutions for Internet access, file transfer, remote access service, and running existing modem applications through the ISDN network.

ISDN T/A 128 IEA128 External Terminal Adapters

There are two ISDN interface options of ISDN T/A 128 external TA (Terminal Adapter), ST and U interface. If you purchased the ST interface terminal adapters (IEA128-STDV and IEA128-STD), you need an ISDN NT1 device connect to the ISDN switch. If you purchased the U interface terminal adapters (IEA128-UDV and IEA128-UD), they can directly connect to the ISDN switch. IEA128-STDV and IEA128-UDV support up to 2 a/b (POTS) analog ports connection through our RJ-11 extension cable. The models of IEA128-STD and IEA128-UD provide the data port connection without a/b (POTS) supported.

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). The data transmission rate can up to 64 Kbps while analog communication on-line, or up to 128 Kbps through Multilink PPP connection.

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, and 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 using a digital signal and higher bandwidth between the central office (phone company) and the customer. Aside from four times faster than a standard 28.8 Kbps modem, ISDN also provides an extremely reliable and stable digital connection.

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 time savings in the longer 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. Of course, ISDN terminal adapter 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 Internet access, telecommuting, home-working, remote LAN access, and video

conferencing. 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 ISDN T/A 128 external IEA128 terminal adapter, you need to check the package contents, apply an ISDN BRI line, prepare a NT1 device (for IEA128-STDV and IEA128-STD), and get an Internet access account (if Internet access is required).

After you prepared the above items, you can start your environment setup before installation ISDN T/A 128 IEA128 terminal adapter.

Package Checklist

In your ISDN T/A 128 external IEA128 package, you will find the following contents.

- ISDN T/A 128 terminal adapter 1 set
- RJ-45 cable 1 piece (6 feet)
- RJ-11 extension cable 1 piece (IEA128-STDV and IEA128-UDV only)
- RS-232 cable 1 piece
- Power adapter 1 piece
- Installation disk 1 piece
- User's manual 1 piece

ISDN BRI Line

Before running the ISDN T/A 128 IEA128 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 an ISDN Internet access account.

You should get the subscriber information from your ISDN telephone company, who may inform you about your ISDN central switch type and SPID (Service Profile Identifier) number, when you are in the US country.

What is SPID?

SPID stands for Service Profile ID. The SPID is applicable to the US country only. SPIDs are a series of numbers that informs the central office switch which services and features to provide to an 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. The S/T interface terminal adapter needs an NT1 device to connect to the ISDN switch, but U interface terminal adapter does not require NT1 device. In the European countries, an NT1 device is supplied by your telephone company, therefore the S/T interface terminal adapters (IEA128-STDV and IEA128-STD) are required for these countries.

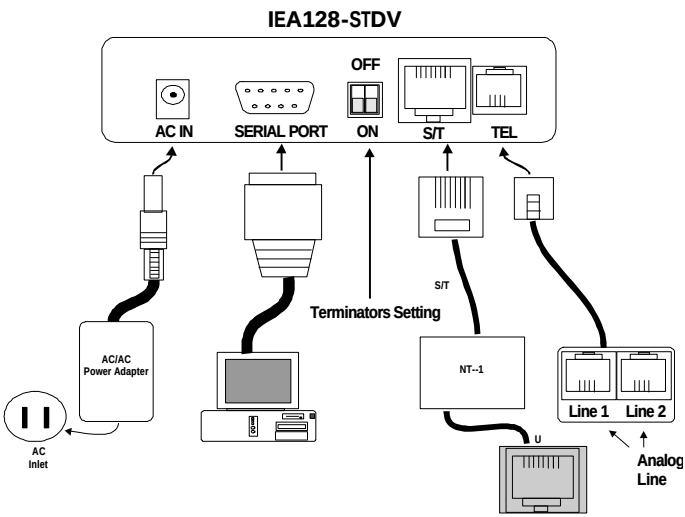
Internet Access Account

If you want to use ISDN T/A 128 IEA128 terminal adapter to connect the Internet, you need get an Internet access account from ISP (Internet Service Provider) in your country. You must also confirm with your ISP that they support ISDN access (either single channel 64K or 128K MLP).

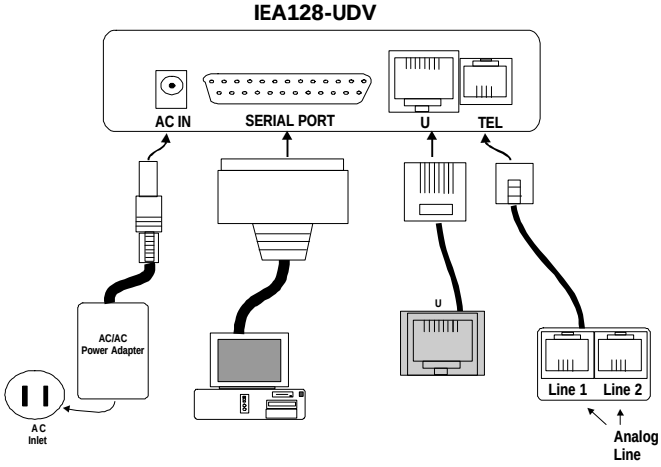
Environment Setup

1. **Please refer the following pictures of IEA128-STDV (S/T interface) and IEA128-UDV (U interface) terminal adapter for the appropriate cable and device connections. You can get more detailed information from the following section.**

IEA128-STDV



IEA128-UDV



2. Terminator setup of ISDN T/A 128 "ST" interface terminal adapter

> ☞ Please jump to the next section (**3.**) if you are the user of U interface terminal adapter, IEA128-UDV or IEA128-UD.

ISDN S/T interface can support up to 8 ISDN terminals and through NT1 device connecting to the ISDN network. One and only one ISDN S/T device should have the terminator enabled. Normally the ISDN terminal which is the farthest from NT1 should have the terminator enabled.

ISDN T/A 128 ST interface terminal adapters (IEA128-STDV and IEA128-STD) provide the DIP switch for the terminator setup. The default setting of ISDN T/A 128 TA with 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

ISDN T/A 128 TA as terminator, then please set the DIP switch "**1**" and "**2**" to "OFF". You can open the cover at back plane of ISDN T/A 128 S/T interface TA to find the DIP switch.

3. Analog device connection

IEA128-STDV (or IEA128-UDV) support a/b (POTS) connection through RJ-11 jack, it can connect to the current analog devices. If you have one analog device, just directly connect to the RJ-11 jack on the back plane of IEA128 terminal adapter. **The RJ-11 extension cable is used for two analog devices connection.** Users can connect the analog telephone set, G3 fax, modem, or answering machine directly on the T/A 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 connection.

4. ISDN connection

Connect the ISDN T/A 128 S/T interface TA and NT1 with RJ-45 cable connector, and insert the ISDN BRI line into the correct NT1 socket.

OR

Directly Insert the ISDN BRI line with the RJ-45 connector cable into the RJ-45 jack on the ISDN T/A 128 U interface TA. 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 cable from wall jack with RJ-11 connector into RJ-45 jack on the ISDN T/A 128 U interface TA. The ISDN T/A 128 TA will still work correctly.

Now, your ISDN PC environment is ready for installation. The IEA128-STDV (or IEA128-STD) attaches to the ISDN ST interface from NT1 and

the IEA128-UDV (or IEA128-UD) attaches to the ISDN U interface directly with ISDN switch.

Chapter 3 Installation

After you setup your ISDN environment as Chapter **2** described. Now, turn on your computer and start the driver installation. ISDN T/A 128 IEA128 terminal adapters support many OS environments, please read the appropriate installation section for your PC system. We give the examples of installation in Microsoft Windows 31, 95, and NT for reference.

How to Configure IEA128

We provide an user-friendly configuration tool through every terminal program such as Procom, Telex, Hyperterminal and so on. To configure the terminal program as following setting values.

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

And then enter an AT command, **AT**@, and follow the instruction on the screen to configure your ISDN TA. If you are very familiar with AT command set, you may refer the Chapter 4 for AT command 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 after you choose the item.

Upgrade New Firmware

1. The interactive procedure will lead you to complete the upgrade procedure. The below strings will be shown on the screen.

```
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 back to ISDN Utility Program.

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

```
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, then the current version number, selected protocol and speed of B channel will be prompted on the screen. If there is no driver (firmware) in flash memory, it will inform you to process the upgrade procedure.

3. Start to erase the driver in flash memory and you will see the below strings.

```
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 's' to exit now.
```

From terminal program, select transmission with ASCII mode (text mode) and specify the new firmware file, eg. if you use HyperTerminal of Windows 95, choose Transfer -> Send Text File -> then input the file name and located directory of new firmware. During the transmission, the below strings will be shown.

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

If you press '$', return to step 2 to restart upgrade procedure.

4. After 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>:_
```

Press '**N**' to finish and exit upgrade procedure and the version number, current selected protocol and speed in B channel will be prompted. If you press '**Y**', return to step 2 to restart 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 may meet your local telephone company requirement. Please refer ATP command.

CODEC Countries follow the European telecommunication standard may choose A-Law. Countries follow the US telecommunication standard may choose μ-law. ATCODEC=0 for A_Law and ATCODEC=1 for μ_Law. Please refer 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 ATSTBY command.

MSN (Incoming) MSN parameter is used for ISDN switches supporting MSN (Multiple Subscriber Number) service. MSN service is supported by some European telephone companies. If you fill the number, then the telephone number of caller will be required to match the MSN value, otherwise there is no service will answer or accept this incoming call. If you want to answer any incoming calls, please leave it with blank. Please refer AT&ZI command.

MSN (Outgoing) Parameter is used for telling ISDN central switch that this call is made by this telephone number and bill to this telephone number. Please refer AT&ZO command.

SPID SPID parameters may only required for some US area, please check with your telephone company if it is necessary. Please refer ATSPID command.

SAD Abbreviation of Sub-ADdress.

Notes:

For the incoming data call, IEA128 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, IEA128 will automatically detect the protocol type among V.120, X.75, or HDLC, etc.

(please refer AT&AP command). If the IEA128 has the parameter values of the MSN, Subaddress, and Protocol (please refer AT&ZIr=m*n*p command), these parameter value(s) will be used the compatibility check between the incoming SETUP packet' s value. If the MSN values are matched (please refer AT&ZI? command), then IEA128 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 ========================                     *
* 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                *
******************************************************************************    *
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 remote site configuration for connection compatibility or better performance. For the 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 the chapter 4 of AT command set for related information.

Installation for Windows 3.1 Environment

You can install the ISDN T/A 128 IEA128 terminal adapter with ISDN

connection through physical COM port.

Installing and Configuring the Drivers

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

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

Please refer the above section (**How to Configure IEA128**) to configure the system parameters of IEA128. Be noted, the setting values of Country or switch type, SPID0 and SPID1, CODEC, MSN, and Outgoing telephone number will be stored until customer changes these.

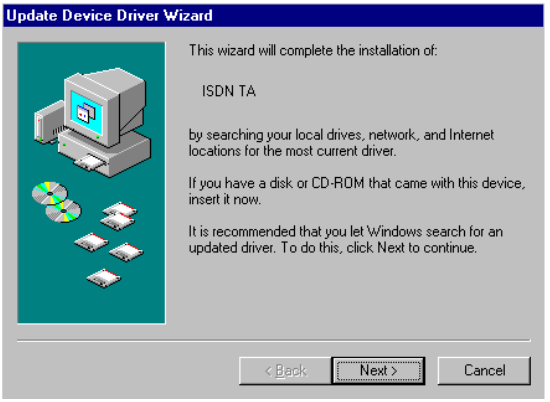
Application Environment Setup

The ISDN T/A 128 IEA128 terminal adapter provides COM port interface through RS-232C connector. Therefore current modem users need set up your application software to the appropriate COM ports to communicate with ISDN T/A 128 IEA128 terminal adapter. If you use TRUMPET to connect to Internet, you should add an AT command (ATB4) before TRUMPET makes a connection to Internet. You can edit the login.cmd file and add this command (ATB4) into it for this Async-to-Sync. conversion function. If you do not want to change the login.cmd file, you can dial into ISP by manual login (enter ATB4 or ATB41 first, and then ATD#######).

Installation for Windows 95 Environment

IEA128-STDV is a Windows 95 PnP compatible device, Windows 95 will prompt a message and request you to install the driver when boot up.

Insert the installation disk into floppy drive and select to install it from Hardware Vendor providing device driver. If your Windows 95 is an OSR2 version, you will see the below screen and insert the installation disk into floppy drive. The Windows 95 will automatically process the other steps and setup an "ISDN TA (Async. to Sync. PPP, 64K) Modem" for Internet access.



Installing and Configuring the Drivers

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

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

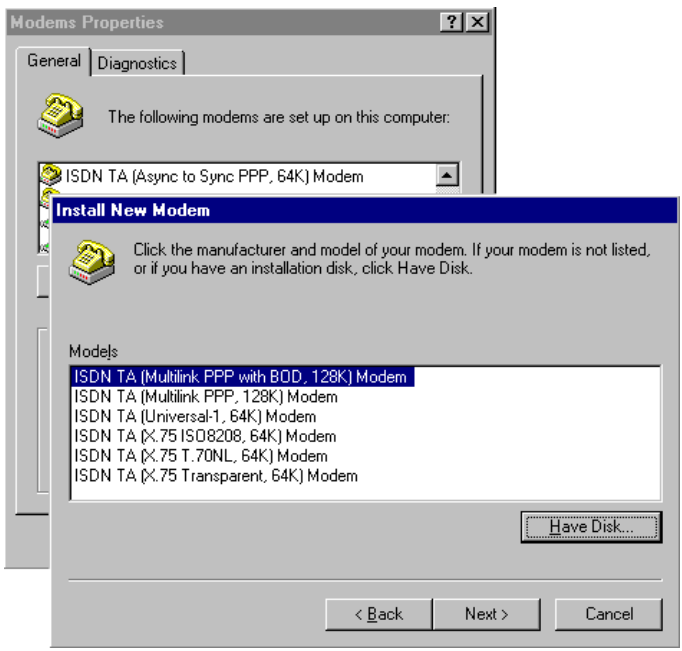
Please refer the above section (**How to Configure IEA128**) to configure the system parameters of IEA128. Be noted, the setting values of Country or switch type, SPID0 and SPID1, CODEC, MSN, and Outgoing telephone number will be stored until customer changes these.

2. Install external ISDN modems.

Adding virtual modems connecting with IEA128 terminal adapter. 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 IEA128 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 IEA128 terminal adapter.

These modems are added one by one manually in turn. Each modem will automatically issue the appropriate protocol command to ISDN T/A 128 IEA128 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 and 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 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 in used B channel and bundle another B channel back if usage rate is high.

  But when the connection start to setup, the ISDN driver will only make a 64K connection and count the data traffic in this channel, if it is higher than the setting value (default is 4K bytes/second) for a while, ISDN driver will setup

another 64K call for 128K connection. Please refer 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.

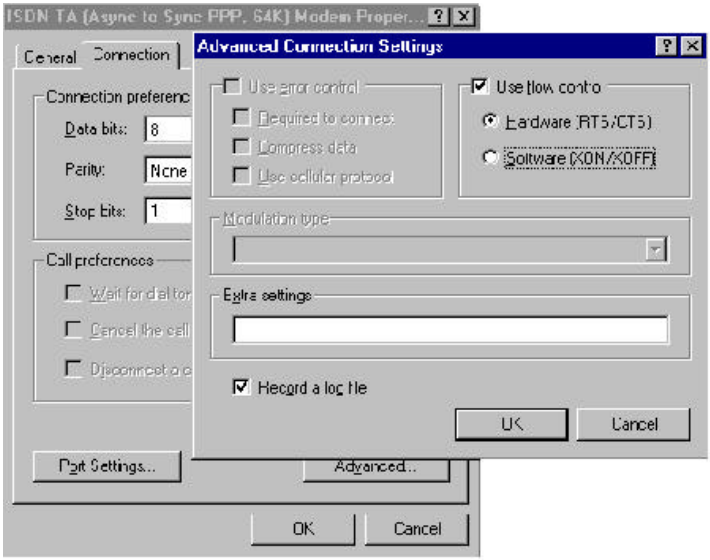
- **The ISDN TA (X.75 T.70NL, 64K) modem** is used for BBS Access and file transfer, and the protocola in B channel are X.75 and T.70NL.

- **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 B channel are X.75 and ISO8208.

- **The ISDN TA (Universal-1, 64K) modem is the multi-purpose modem** but the protocol used in B channel must be assigned through ATBn command (see the Modems/Advanced/ Extra Settings) before making a connection. The Universal modem choose the HDLC as 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.

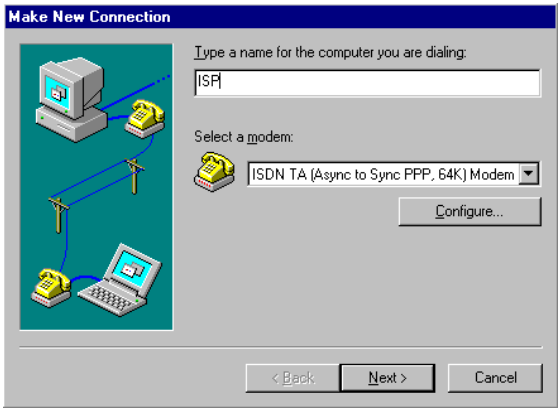
a.



Configure the Dial-Up Networking to Access Internet

Now, you have the capability 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 which is connection to IEA128 as picture above.

2. 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 different number for normal modem and ISDN access.

These setup procedures should give your 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. 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 different number for normal modem and ISDN access.

These setup procedures should give your connection speeds of 128Kbps. Before make the 128K connection, please confirm that your ISP supports 128K or not, some ISP don't or even they do often need extra charge compare with the 64K connection.

Accessing the Outside World Using Dial-Up Networking

You are now done with the configuration process and should be ready to make a connection with your server. Click the Dial-Up Networking icon, and 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 this interface, you can use any CAPI application such as RVS-COM, ZOC to access IEA128 as internal card. Therefore, you can get Soft-G3Fax, Telephony, File Transfer **…**functions through the RVS-COM, our CAPI driver, and IEA128. Before install the CAPI20 device driver, the IEA128 should be installed and configured by Windows 95 as above section described. 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, ProCom….. and configure the parameters as followed.

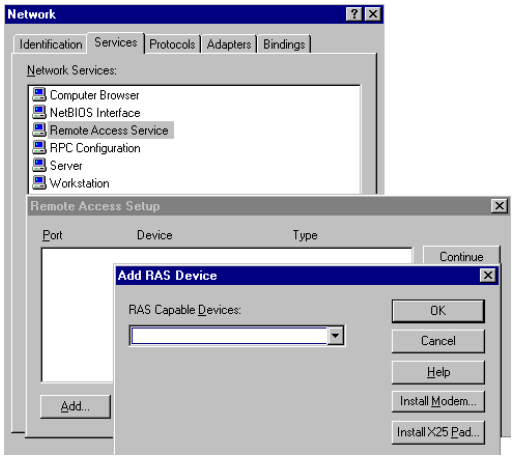
Baud Rate:	Up to 115200
Data Bit:	8
Parity Check:	None
Stop Bit:	1
Flow Control:	RTS/CTS

Please refer the above section (How to Configure IEA128) to configure the system parameters of IEA128. Be noted, the setting values of Country or switch type, SPID0 and SPID1, CODEC, MSN, and Outgoing telephone number will be stored until customer changes these.

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

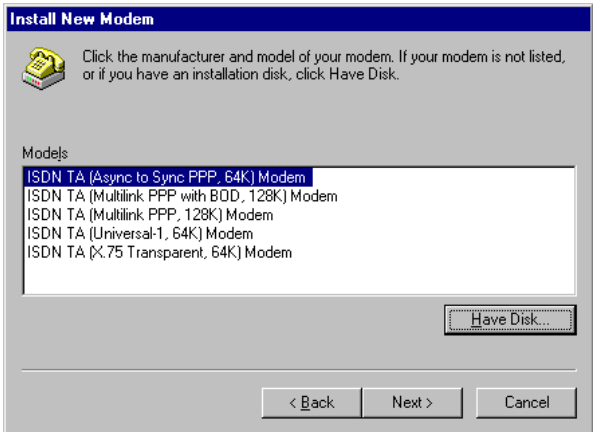
Adding virtual modems connecting with IEA128 terminal adapter. Please use the following steps to add proprietary virtual modems in Windows NT.

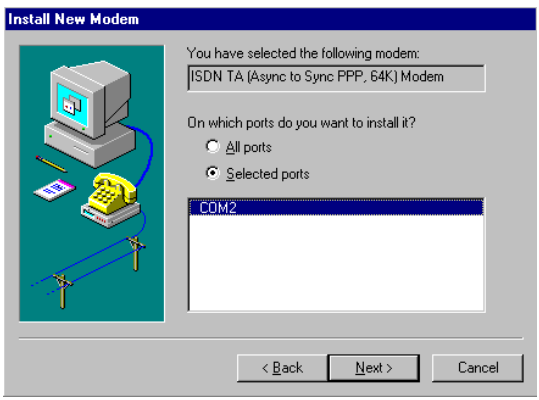
1) Select Start -> Settings -> Control panel -> Network -> Services -> Remote Access Service, Properties -> Add -> Install Modem -> Check **"do not detect my modem, I will select it from a list"**. Click "Next".



2) Click “Have Disk”, and browse to the modem sub-directory (A:\MODEM) on the IEA128 installation diskette. Select the mdmasuta.inf file.

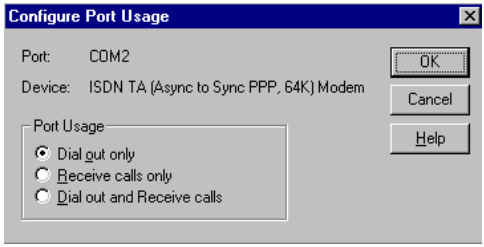
3) Select the modem type that you require from the list shown (as described below) and then click on Next, link this modem to the Com port which connects to IEA128 terminal adapter.



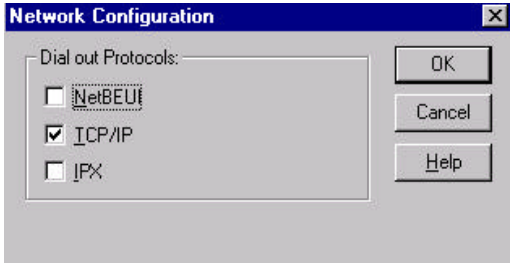


4) After you install the desired modem, select the virtual modem in the RAS Capable Devices field. Click “OK”.

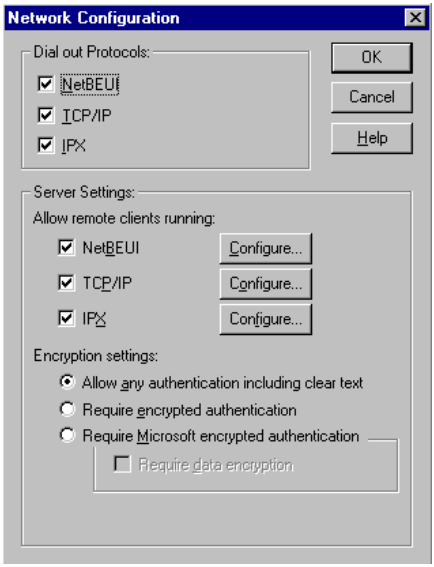
5) Select this virtual modem and click the Configure Tab to set the parameter (Port Usage) to this ISDN1port for “Dial out only”, “ Receive calls only”, or “Dial out and Receive calls” then click OK.



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 you have installed the RAS. Please remember to restart your computer to take effect of these settings.

The purpose of each modem type supported is 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 and 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 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 in used B channel and bundle another B channel back if usage rate is high.

But when the connection start to setup, the ISDN driver will only make a 64K connection and count the data traffic in this channel, if it is higher than the setting value (default is 4K bytes/second) for a while, ISDN driver will setup another 64K call for 128K connection. Please refer 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 protocol in 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 B channel are X.75 and ISO8208.

- **The ISDN TA (Universal-1, 64K) modem is the multi-purpose modem** but the protocol used in B channel must be assigned through ATBn command (see the Modems/Advanced /Extra Settings) before making a connection. The Universal modem choose the HDLC as

default protocol in B channel.

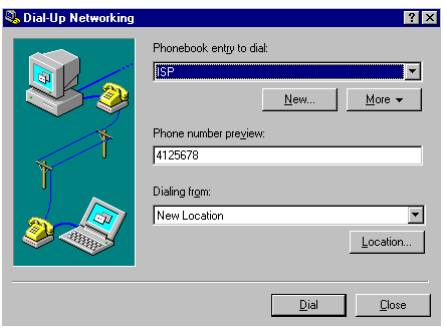
Please now check (and modify if necessary) the default modem setting pertaining to each of the modems. Select Start -> Settings -> Control panel -> Modems -> ISDN modem, Properties -> General, set Maximun speed to 115200, Connection, set Data bit to 8, Parity to None, Stop bits to 1, and check Use flow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

Configure the Dial-Up Networking to access Internet.

Now, you have the capability to access the Internet through the Windows NT4.0 Dial-Up Networking.

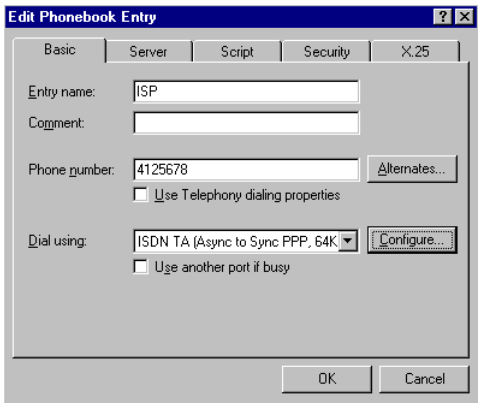
64K Access for Windows NT 4.0

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 dial using, 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 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 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”. **Be noticed that this virtual modem must be configured in RAS for dial out, otherwise you can not use it.**

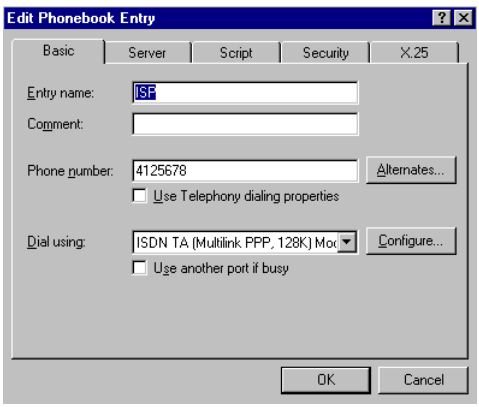


128K/MLP Access for Windows NT 4.0

1. Check the ISP. Does ISP provide 128K connection to customer?

2. If yes, 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”.

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 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 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”. **Be noticed 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 done with the configuration process and should be ready to make a connection with your server. Click the Dial-Up Networking icon, and select the name configured above in the phone book entry and 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.

Chapter 4 Provided AT Command Set

The ISDN T/A 128™ IEA128 terminal adapters support the communication interface (RS-232C), it allows the applications access ISDN T/A 128™ IEA128 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 (see list below). Please contact http://www.planet.com.tw (or ftp://ftp.planet.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 ISDN T/A 128™ IEA128 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
ATDs		Dial a telephone number
	ATD4121234	Dial telephone number 4121234
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.
	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 5 to 20 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 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.
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&AT (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, default)
	AT&C1	DCD line is active if connected
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-diagnostic 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		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 = 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 ¡)Konly 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).
	AT&ZI? AT&ZIr?	Display the setting values, r=0,1,2 to 5
AT&ZOr=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&ZOr?	Display the setting values, r=0,1,2
AT%Sn		Serial mode setting, n=0, 1
	AT%S0	Automatic speed mode (Default) such as 300, 1200, 2400, 4800, 9600, 19200, 38400, 56700, or 115200 bps
	AT%S1	set DTE to 230400 bps mode
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

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 (IEA128-UDV & IEA128-UD)
   - Line: two-wire, full duplex
   - Line Code: 2B1Q
   - Connector: RJ-45 x 1
2. S/T Interface (IEA128-STDV & IEA128-STD)
   - 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 (IEA128-STDV) or DB25 (IEA128-U) 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 (IEA128-STDV & IEA128-UDV)
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.

Appendix B CAPI20 Interface

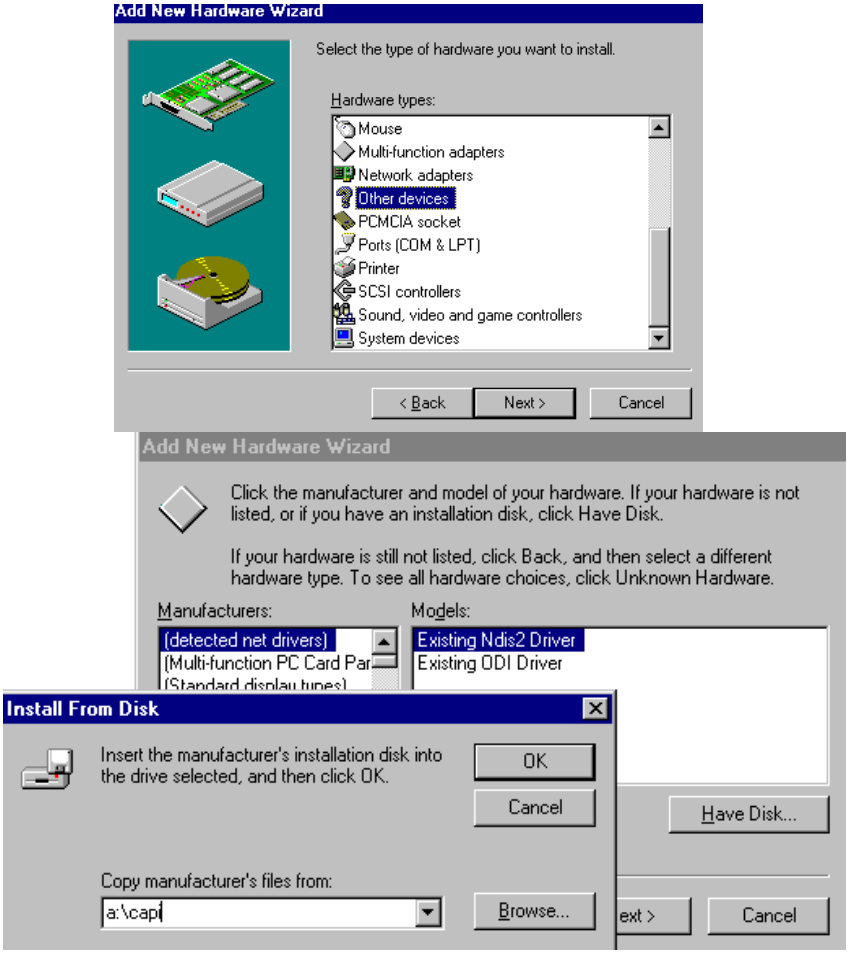
Installation of the CAPI20 Device Drive in Windows 95

With this interface, you can use any CAPI application such as RVS-COM, ZOC to access IEA128 as internal card. Therefore, you can get Soft-G3Fax, Telephony, File Transfer **...**functions through the RVS-COM, our CAPI driver, and IEA128. Before you install this CAPI20 device driver, the IEA128 should be installed and configured in Windows as the Installation description in Chapter 3.

You may follow these steps to install CAPI20 device driver:

1. Insert installation disk into floppy drive.

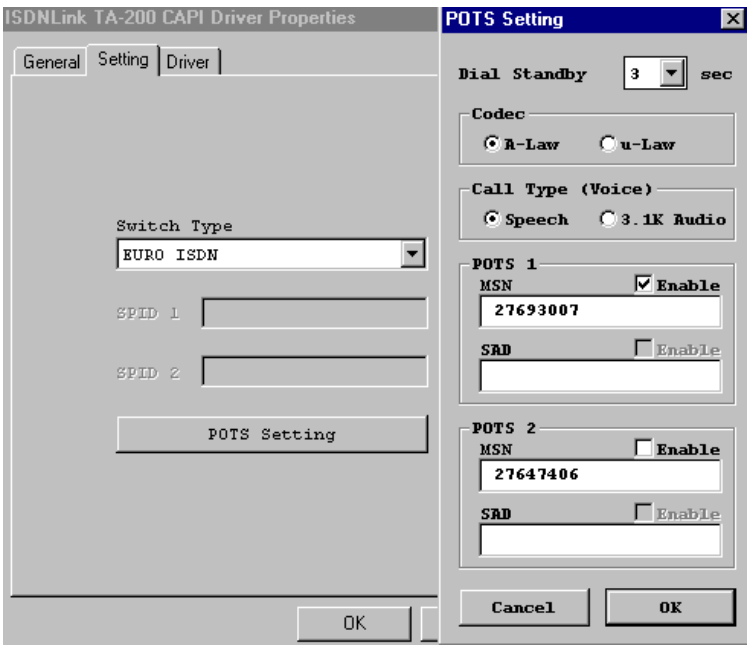
2. Go to ControlPanel -> AddNewHardware -> select NO (do not want Windows to search for your new hardware) -> OtherDevice -> HaveDisk -> Input A:\CAPI to install the CAPI20 device driver.



3. Reboot to enable CAPI20 device driver. After you restart your windows system, you will see the CAPI driver in ControlPanel -> System -> DeviceManager -> ISDN T/A 128 -> ISDN T/A 128 IEA128

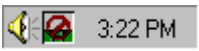
CAPI device driver.

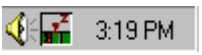
4. Configure the IEA128. In the properties of this CAPI driver (found in Device Manager, as above item 3), you can set the IEA128 system parameters including switch type, SPID, Standby Time, CODEC, Voice Call Type, MSN and SAD (subaddress) for POTS ports. The MSN and SAD are used to identify who makes this call and PTT (Telephony service provider) will send the bill to 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 settings.



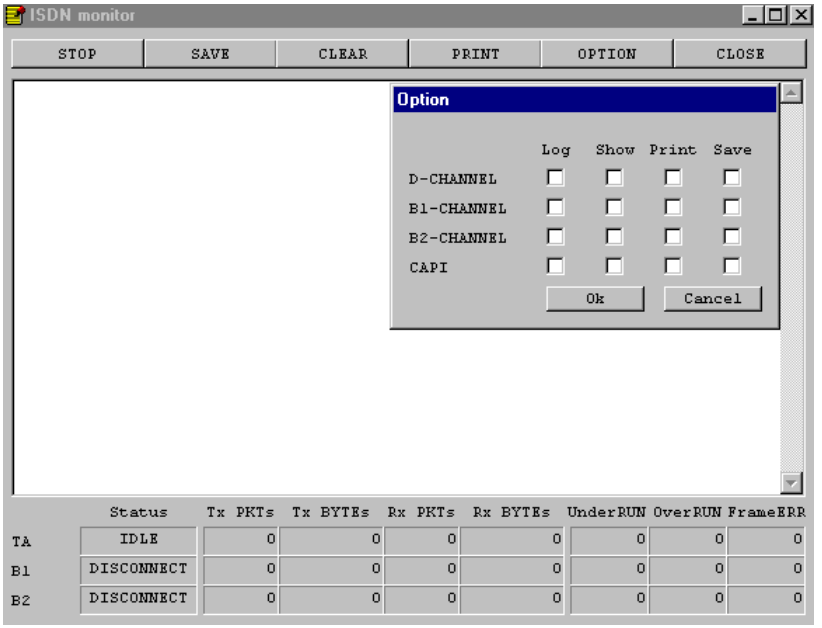
ISDN Monitor (LOG)

After restart Windows95, the ISDN Monitor will be executed automatically and 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 for first step troubleshooting.





If you see a (tiny) Z sign, this means there is no CAPI application running which requires the CAPI20 device driver. At this time, you can access IEA128 through COM port such as COM2 directly. If you start a CAPI20 application, the stop and Z signs will be off and will unction as ISDN monitor which can record the D, B1, B2, and CAPI messages in the ISDN line and CAPI driver. To enable this function, move cursor to this icon and click the right button of mouse. Select the LOG function.



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. And then specify the new firmware file name and its directory by selecting "Choose" and start the upgrade action by selecting the "Upgrade". It is more easier and user-friendly to

upgrade firmware than using AT command set.

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

You may follow these steps to uninstall CAPI20 device driver:

1. Remove the ISDN TA CAPI driver from the ControlPanel -> System ->Device Manager, ISDN T/A 128, ISDN T/A 128 IEA128 CAPI driver

2. Remove the ISDN T/A 128 IEA128 CAPI driver from the ControlPanel -> AddRemove Software -> ISDN T/A 128 IEA128 CAPI driver

3. Restart your Windows system

EMIEA128