

TA717E/TA128

ISDN Terminal Adapter

User's Guide

Rev. 1
July 1998

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Important Safety Instructions

1. Please read and understand all instructions in this manual.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water.
5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the unit.
6. Slots and openings in the case are provided for ventilation, to protect this product from overheating. These openings must not be blocked or covered. This product should never be placed on or near a radiator or heat source. In addition, this product should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should be operated only from the type of power source provided. If you are not sure of the type of power supply to your home, please consult your dealer or local power company.
8. The power cord must be connected to a properly wired and grounded outlet. This product is equipped with a Frame Ground to provide grounding protection. Make sure it is well connected to the earth ground.
9. To reduce the risk of electric shock, do not disassemble this product. Instead, take it to a qualified service center or return it to your dealer when service or repair work is required. Dismounting this product voids the warranty.
10. Avoid using a telephone (except a cordless type) during an electrical storm. There may be a remote risk of shock from lightning.
11. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
12. Never plug a non-ISDN line (e.g. analog telephone line) into the "S/T" interface of this product. Doing so will damage the unit.

1. Introduction

Thank you for purchasing this product. Much research and development has gone in to the design and manufacture of the TA717E/TA128 to make it a truly exceptional performer with a wide range of functions. The TA717E/TA128 is an ISDN Basic Rate terminal adapter (TA) which provides high performance solutions to access the Internet, on-line information services, remote office LANs or other remote systems. In addition to the data service, through the standard POTS analog interface, the user can connect TA717E/TA128 with an existing telephone, G3 fax or modem. A typical TA717E/TA128 application is shown in Figure 1-1.

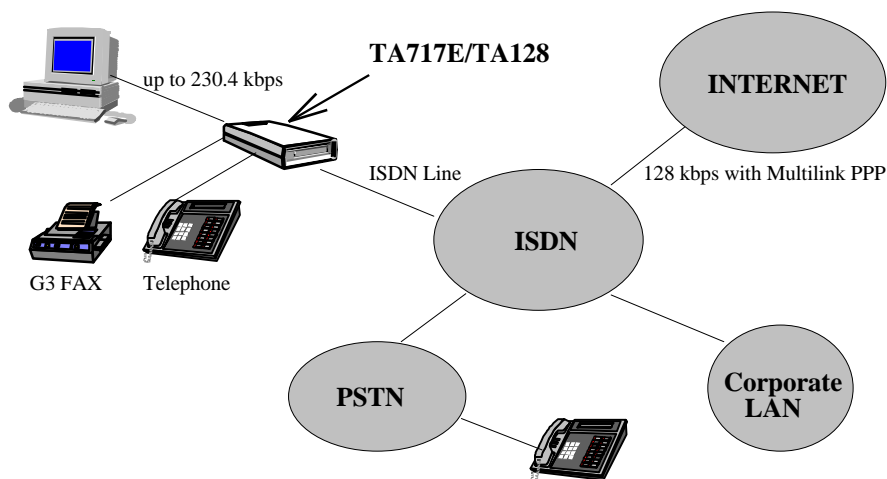


Figure 1-1 Internet and remote network access with the TA717E/TA128

1.1 Features

The TA717E/TA128 has the following main features:

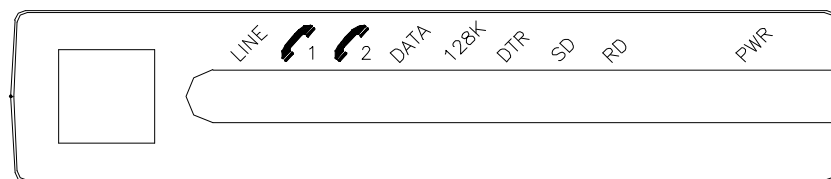
- **128kbps Multilink PPP (MP) high speed data communication**
Multilink PPP (RFC1717) protocol bundles two B channels to allow fast access to the Internet with up to 128 kbps data throughput.
- **Dynamic bandwidth allocation feature**
Bandwidth allocation control protocol (BACP) standards implemented within the TA717E/TA128 automatically adjust data call rates based on the throughput of data traffic. In addition, this feature allows you to receive incoming or place outgoing voice calls in the middle of a data transmission.
- **Calling line identification security**
Screens out unauthorized incoming calls based on caller number.
- **Various protocols supported**
B channel protocols: V.110, V.120, PPP/Multilink PPP
D channel protocol support: X25 on LAPD
- **230.4kbps high speed serial data port with autobaud rate detection**
- **Internal call, call transfer between two analog ports, and pseudo call waiting service supported**
- **Flash download capability for easy firmware upgrades**
- **Remote configuration capability to allow diagnostic or setup from the remote site, e.g. local dealer or distributor**
- **Leased line support**

Note: X.25 services might not be available in some areas, please contact your local ISDN service provider.

1.2 Physical Description

This section describes the physical appearance of the TA717E/TA128.

1.2.1 Front Panel



The LED functions are described as follows:

ISDN Line Status:

LINE: This LED indicates the ISDN or leased line connection status. The LED is off when the physical layer is not active. It blinks when the ISDN layer 2 is not ready, and is on when the terminal adapter is ready to establish ISDN connections.

Analog port status:



: This LED indicates the call progress status for analog port 1.



: This LED indicates the call progress status for analog port 2.

Data port status:

DATA: This LED indicates the call progress status for data port.

128K: This LED indicates the second B channel connection status for the Multilink-PPP data connection.

DTR: This is the Data Terminal Ready (DTR) LED. It is on when the DTR is active at the RS232 interface.

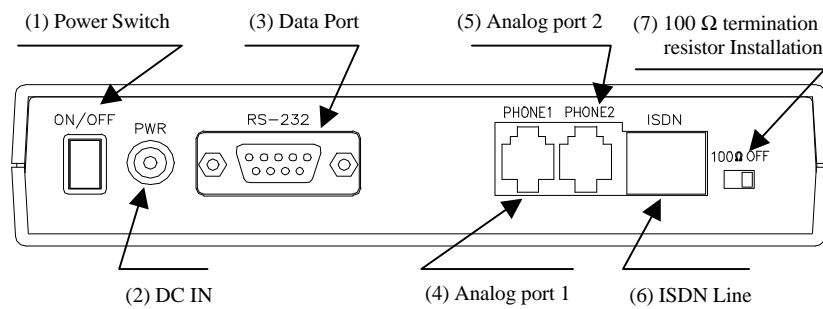
SD: Transmit Data.

RD: Receive Data.

Power status:

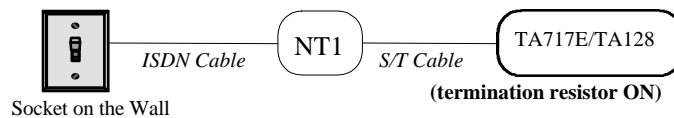
PWR: Power indicator.

1.2.2 Back Panel

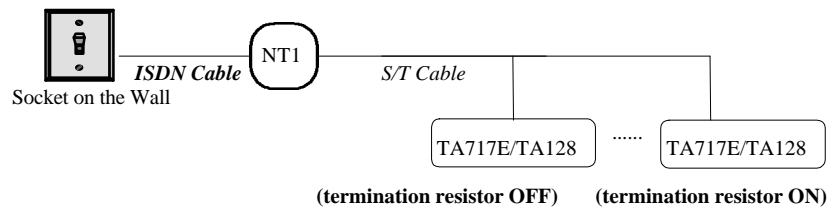


- (1) **Power Switch:** Power switch to turn on/off the terminal adapter.
- (2) **DC IN:** Connects to DC INPUT from the AC power adapter.
- (3) **Data Port:** Connects to data terminal equipment e.g. a computer.
- (4),(5) **Analog port 1 and 2:** Connects to telephones, G3 fax or modems.
- (6) **ISDN Line:** Connects to ISDN line from wall outlet.
- (7) **100 W termination resistor Installation:** Used to activate or deactivate the termination resistor inside the TA717E/TA128.

Case 1 : standalone TA717E/TA128



Case 2: TA717E/TA128 with other S/T interface ISDN devices



Note: In the above S/T interface multipoint configuration, only the last termination resistor in the last (farthest) ISDN device is ON.

2. Installation

Package Contents

Before installation, please check the package contents. The complete package should include:

- 1 One TA717E/TA128 unit (including holder)
- 1 One power cable with an AC wall transformer
- 1 One serial cable
- 1 One RJ-45 cable
- 1 TA717E/TA128 User's Manual

Note: After unpacking the unit, please inspect it for possible shipping damage. If damage is found or suspected, do not install the TA717E/TA128, rather, contact your local dealer.

2.1 Installation

This section describes installation of the TA717E/TA128 series. Please try to read and understand all of these instructions before installation. If you encounter any problem then please call your dealer for advice.

1. Turn off the TA717E/TA128 and the computer.
2. Connect the RS232 cable to the TA717E/TA128 port marked RS-232, and connect the other end to the appropriate COM port on your computer.
3. Connect one end of the power adapter to the power jack marked PWR on the back panel of the TA717E/TA128, and connect the other end into the wall electrical outlet.

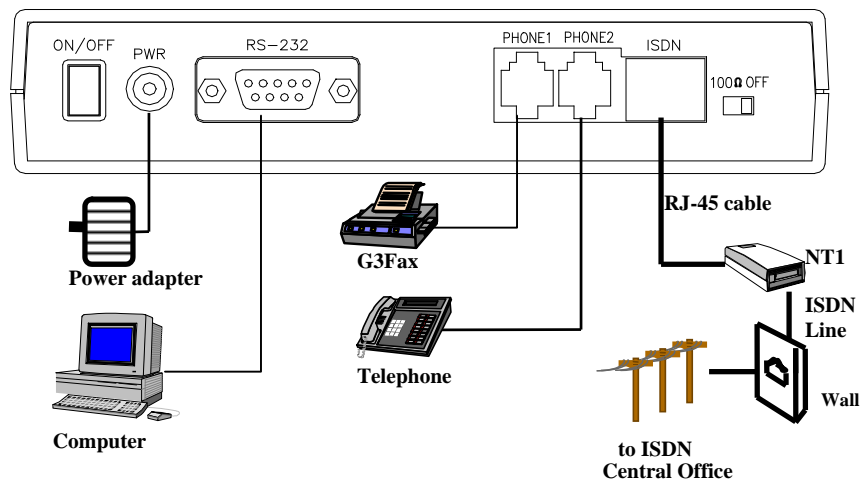
Note: Do not use any power adapter other than the one supplied with this unit.

Using other power adapters may cause serious damage to the TA717E/TA128 and will void the warranty.

4. Use the telephone cable supplied to connect the jack labeled “**ISDN**” to the ISDN NT1.

! WARNING !

Never plug non-ISDN line into the TA717E/TA128 “**ISDN**” socket. Doing so could cause damage to the TA717E/TA128, and will void the warranty.



5. Connect the desired analog devices (telephone, fax or modem) to the jacks labeled PHONE 1 or PHONE 2.
6. Turn on the TA717E/TA128. The indicator LEDs on the front panel will flash momentarily as the unit undergoes a power-on-self-test diagnostic routine. If all self tests are OK, the LEDs will be in the normal state and the terminal adapter is ready for use.
7. If for some reason there is a problem, then please turn off the power once more and check the cabling security. If nothing appears wrong but the unit still has a problem, please contact your local dealer for advice.

3. Basic Operations

This chapter introduces the basic operations of ISDN connection: voice calls and data calls. After connecting to the ISDN line, you can start operating the TA717E/TA128.

Once you have placed an ISDN call, the LINE LED will be ON indicating the TA717E/TA128 is synchronized with the ISDN network. If the LINE LED remains OFF or blinking, please check your ISDN line connection. If the connection seems secure, but the LINE LED is still OFF or blinking, please contact your dealer.

3.1 Local address, Sub-address, and Multiple Subscriber Numbers (MSN)

Normally you will get one basic local telephone number upon your ISDN service subscription. Thanks to the Multiple Subscriber Number (MSN) service provided by the ISDN network, you may subscribe extra telephone numbers for the same ISDN line from your ISDN service provider. For the TA717E/TA128, you may assign up to three local telephone numbers for both data and analog ports. Each directory number may consist of a local address field and/or a sub-address field. Local address can be up to 20 digits and sub-address can be up to 15 digits.

e.g.

AT!N0=0357749912/314	; data port	local address : 0357749912 sub address : 314
AT!N2=0357749913	; analog port 1	local address : 0357749913
AT!N3=0357749914/316	; analog port 2	local address : 0357749914 sub address : 316

The digit “.” is used to delimit a local address field and a sub-address field. For a detailed description of how to save local addresses, please refer to Chapter 5 “AT Command” for details.

3.2 Receiving Incoming Calls

In general, when one incoming call arrives with a specified number, only the ports configured with that specified number will answer the call.

Local Address Comparison

When one incoming call arrives without a specified number, the TA717E/TA128 will decide to answer this call depending on the Global Receiving option setting. If the Global Receiving option is enabled, TA717E/TA128 will answer the call.

Otherwise, this call may be ignored. This Global Receiving option can be configured by “AT%A6” for data port, “AT!A2” for analog port 1 and “AT!B2” for analog port 2 via AT commands.

e.g. AT!A2=1 ; Global Receiving option is enabled for analog port 1

The following tables explain the receiving criteria of the TA717E/TA128 for each analog port and data port:

Global Receiving Enabled:

	Incoming Call WITHOUT called party address	Incoming Call WITH called party address
Local address NOT stored	»İ	»İ
Local address stored	»İ	»Ê

Global Receiving Disabled:

	Incoming Call WITHOUT called party address	Incoming Call WITH called party address
Local address NOT stored	»İ	X
Local address stored	X	»Ê

»İ : Receive, X : Not Receive, »Ê : Receive if two addresses are the same

Sub-address Comparison

In addition to the local address checking, if a sub-address field is also included in the incoming call message, then the following table will be applied:

	Incoming Call WITHOUT called party sub-address	Incoming Call WITH called party sub- address
Local sub-address NOT stored	» I	X
Local sub-address stored	» I	» E

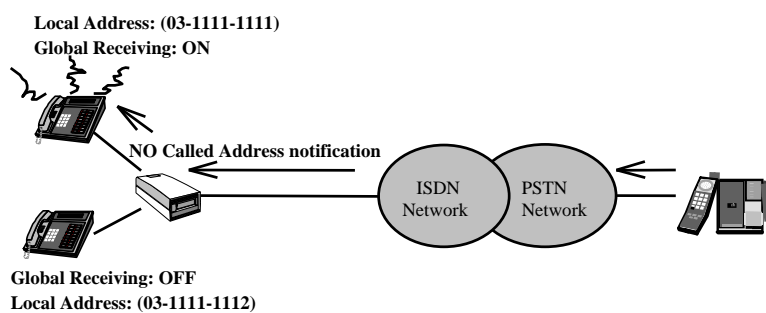
»**I** : Receive, X : Not Receive, »**E** : Receive if two sub-addresses are the same

e.g Two local telephone numbers have been subscribed as follows :

Basic number: 03-1111-1111

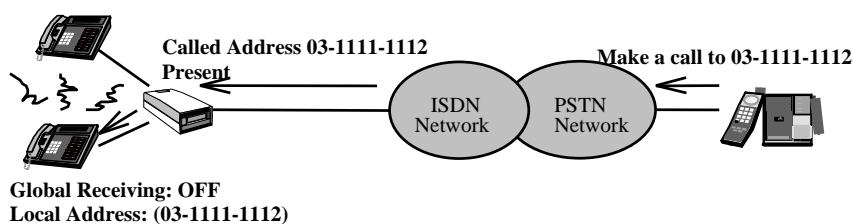
Additional **Dial-in** number: 03-1111-1112

Case 1:



Case 2 :

Local Address: (03-1111-1111)
Global Receiving: ON

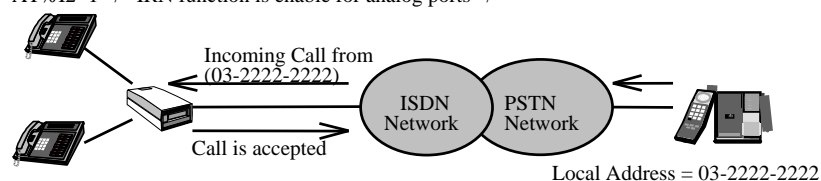


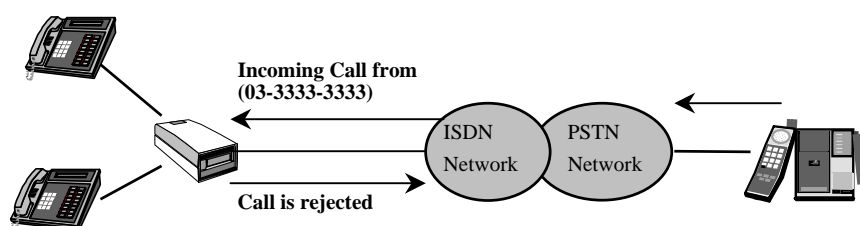
Calling Line Identification Security

In addition to the above call acceptance/address checks. The TA717E/TA128 supports incoming caller directory number comparison with a set of identifying registered numbers (IRN). If the incoming caller number were not one of the registered memory numbers stored within the TA717E/TA128, then this call would be rejected. The TA717E/TA128 provides 10 IRNs registered in memory numbers 10~19 for the data port, and 10 IRNs registered in memory numbers 20~29 for the two analog ports. This calling line identification function can be enabled or disabled by the AT command “AT%I” register. And “AT&Z” command can be used to store telephone numbers to memory number from 0 ~ 29.

e.g.

20th memory number = 03-2222-2222
21th ~ 29th memory number = empty
AT%I2=1 /* IRN function is enable for analog ports */





3.3 Analog Ports Operation

The TA717E/TA128 supports standard DTMF (or push button) analog telephones, answering machines, fax machines, or other analog telephone devices. The TA717E/TA128 does **NOT** support pulse dialing (rotary) telephones.

3.3.1 Outgoing Calls

To place a voice call, simply place a call as you would if the phone were connected to a standard telephone line.

The digit “#” is used to signal the end of the dialing sequence. If “#” is not appended, the TA717E/TA128 will start dialing after 5 seconds by default.

To place modem/G3 fax calls, first configure the analog port with AT command “AT!A0” for analog port 1 or “AT!B0” for analog port 2.

	Outgoing Call Type
AT!A0=1 (analog port 1) AT!B0=1 (analog port 2)	G2/G3 fax call
AT!A0=2 AT!B0=2	Modem calls
AT!A0=3 AT!B0=3	Voice call

3.3.2 Incoming Calls

For the analog ports of the TA717E/TA128, you may connect to analog telephone, G2/G3 fax machines or modems respectively. To ensure the connected device responds to the corresponding incoming call, select which incoming call types you want to receive by using AT commands “AT!A1” or “AT!B1”:

	Incoming Call Type
AT!A1=1 (analog port 1) AT!B1=1 (analog port 2)	G2/G3 fax or modem call only
AT!A1=2 AT!B1=2	G2/G3 fax, modem or voice calls
AT!A1=3 AT!B1=3	Voice call only

3.3.3 Analog Port Receive Preference

You can assign which analog port has preference over the other to answer the incoming call by AT command “AT!S0”

	<i>n</i>
AT!S0= <i>n</i>	0: No preference (default) 1: Analog port 1 prefers 2: Analog port 2 prefers

3.3.4 Internal Call/Internal Call Transfer

Since the TA717E/TA128 supports two analog ports, it allows internal call between the two analog ports. The TA717E/TA128 also provides internal call transfer function. You can transfer the current call to another analog port without subscribing to any supplementary service.

Internal Call Connection

To place an internal call, simply flash the hook and press “0” digit when you hear a short dial tone. Then the other analog port will start ringing. Pick up the phone connected to the other analog port, and the two sides can now start a conversation.

Internal Call Transfer

Similar to internal calls, just flash the hook and press “0” digit when you hear a short dial tone. You may hang up the phone directly or wait until the other port answers the call. Once the other analog port answers the call and the transferring analog port hangs up the phone, the call transfer is complete.

3.4 Data Port Operation

3.4.1 Outgoing Calls

To place an ISDN data call, first verify your data port setting, and then place the data call with **AT** commands (or V.25bis, X.28 commands).

Users can save up to 30 sets of directory numbers for memory dialing. And users can call these stored directory numbers (0~29) with AT or V.25bis commands.

e.g. ATDS=12 /* AT command to dial 12th memory number */

Protocol Supports

AT Command Sets to select protocol		Protocol
AT%A1=0 (Circuit Switched Call Type)	AT%A2=1	V.110
	AT%A2=2	V.120
	AT%A2=3	Asynchronous-synchronous PPP
	AT%A2=4	Multilink PPP
AT%A1=1 (Packet Switched Call Type)		X.25 on LAPD

3.4.2 Incoming Calls

If the auto answer is disabled in register S0, a RING message, associated with the caller number, is delivered to the data port upon reception of an incoming data call to the TA717E/TA128.

e.g. RING
3-1111-1111

If the auto answer is enabled, the call is automatically answered and a CONNECT message, indicating the speed of the connection, is delivered to the data port.

e.g. CONNECT 38400

3.4.3 Flow Control Mechanism

TA717E/TA128 supports two kind of local flow control mechanisms between the TA717E/TA128 and the DTE. These take effect only after a data call has been established:

- Software flow control: XON/XOFF
- Hardware flow control: RTS/CTS

AT Command	value	Description
AT&K <i>n</i>	0	No flow control
	3	Bi-directional RTS/CTS flow control (default)
	4	Bi-directional Xon/Xoff flow control

e.g. AT&K3, where hardware flow control is enabled

3.4.4 Multilink PPP and Dynamic Bandwidth Control

The TA717E/TA128 supports Multilink PPP, which allows two B channels to be virtually linked, allowing a maximum digital connection of 128kbps. Note that both your Internet Service Provider or the one that you are dialing up must support Multilink PPP.

By default, the TA717E/TA128 dials the same number for both Multilink PPP channels. If a different telephone number is required to establish a second Multilink PPP channel, send the dial command

“**ATD**<1st_number>&<2nd_number>”.

e.g.

Destination directory number 1: 03-1111-1111

Destination directory number 2: 03-1111-2222

“**ATD 03 1111 1111 & 03 1111-2222**”

Dynamic Bandwidth Control Feature

Changing bandwidth dynamically during a multilink connection is referred to as Bandwidth On Demand (BOD). TA717E/TA128 implements Bandwidth Allocation Control Protocol (BACP/BAP) to support BOD. BACP allows you to place or receive a voice call while a Multilink PPP call is active, which is also referred as *Resource* BOD. It can also dynamically add or drop a B channel, dependent on the traffic load, which is referred as *Throughput* BOD. This feature provides end-users with a lot of convenience and saves their money.

Bandwidth Control - Resource BOD	AT command		Description
BOD for voice calls	AT!P1=0	disable	Voice calls will not take off bandwidth from multilink PPP connections
	AT!P1=1 (default)	enable	One of the multilink PPP connections will be removed, and is used for incoming or outgoing voice call.

Bandwidth Control - Throughput BOD	AT command	Value	Description
------------------------------------	------------	-------	-------------

BOD for throughput condition (add bandwidth)	AT!P2= <i>n</i>	0~127 kbps	Throughput threshold to add 2nd channel (default: 48kbps).
	AT!P3= <i>n</i>	0~255 unit: 10 seconds	Throughput threshold continuous time to add 2nd channel. (default: 3)
BOD for throughput condition (drop bandwidth)	AT!P4= <i>n</i>	0~127 kbps	Throughput threshold to drop 2nd channel (default: 20kbps).
	AT!P5= <i>n</i>	0~255 unit: 10 seconds	Throughput threshold continuous time to drop 2nd channel. (default: 6)

e.g.

AT!P2 = 50
AT!P3 = 2
AT!P4 = 25
AT!P5 = 1

If the system throughput remains over 50 kbps for a continuous time of 20 seconds, TA717E/TA128 will automatically add the second B channel link. After two B channels are utilized, if the system throughput drops below 25 kbps and remains at the same throughput over 10 seconds, TA717E/TA128 will automatically drop one B channel.

Multilink Endpoint Identifier

Some Internet Service Providers may require the implementation of a multilink endpoint identifier. "AT!P6" stores the multilink endpoint identifier class and "AT!P7" stores the actual multilink endpoint identifier.

AT command	Value	Description
AT! P6= <i>n</i>	0	null class
	1	Locally Assigned Address
	2	Internet Protocol Address
	3	IEEE 802.1 Globally Assigned MAC Address
	4	PPP Magic-Number Block
	5 (default)	Public Switch Network Directory Number Address
AT!P7=<string>	<i>d1.d2....dn</i>	Multilink PPP Endpoint Identifier <i>dn</i> : 0 ~ 255, where <i>n</i> : 1 ~ 20

e.g.

AT!P6=3

AT!P7=139.175.10.12 where the length of endpoint identifier is 4.

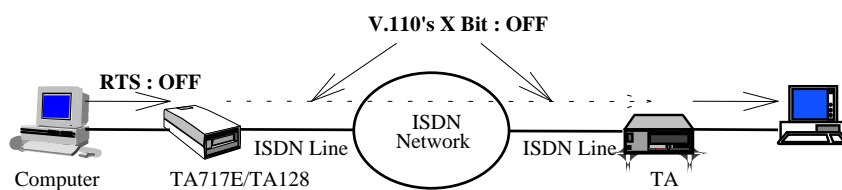
In most cases, this option is not required, therefore these commands do not have to be changed. If a multilink endpoint identifier is required, then these values will be provided by your internet service provider.

3.4.5 V.110 Data Call

The line speed of V.110 data call can be configured by “AT%S1” :

AT command	value	Description
AT%S1= <i>n</i>	0 (default)	Line speed is the same as DTE/DCE speed if DTE/DCE speed below 38400 bps(57600 bps in Japan), otherwise line speed is 38400 bps (57600 bps in Japan)
	2	1200 bps
	3	2400 bps
	4	4800 bps
	5	9600 bps
	6	19200 bps
	7	38400 bps
	8	57600 bps

The flow control mechanism is required if the DTE/DCE speed is higher than the line speed. For the V.110 protocol, remote flow control is also implemented through the X bit of the V.110 frame. When local hardware flow control is applied and RTS is detected to be LOW, TA717E/TA128 will turn off its X bit in the transmitted V.110 frame. If the remote terminal adapter also supports a remote flow control mechanism, and detects the received X bit to be LOW, then the remote terminal adapter will drop CTS to disable receiving characters from the remote DTE.



3.5 Packet switched data - X.25 on D

TA717E/TA128 supports two types of X.25 on D data service: Permanent Virtual Circuit (PVC) and Switched Virtual Circuit. Before using X.25 on D data calls, determine the type of service (PVC or SVC) you are subscribed to and make sure the corresponding parameters is properly assigned.

AT command	value	Description
%B5= <i>n</i>	<i>n</i> = 0 1	Virtual Circuit (VC) type selection Switched Virtual Circuit (SVC) (default) Permanent Virtual Circuit (PVC)

e.g. AT%B5 = 0

For each X.25 data call, the Logical Channel Group Number (LCGN) in association with the Logical Channel Number (LCN) is treated as an unique identifier for various calls. The !X registers are used to partition logical channels into three parts for incoming only, outgoing only or two way services.

AT command	value	Description
!X4= <i>n</i>	<i>n</i> = 0 ~ 255	Count of logical channels for PVC
!X5= <i>n</i>	<i>n</i> = 0 ~ 255	Count of incoming logical channels for SVC
!X6= <i>n</i>	<i>n</i> = 0 ~ 255	Count of two-way logical channels for SVC
!X7= <i>n</i>	<i>n</i> = 0 ~ 255	Count of outgoing logical channels for SVC
!X8= <i>n</i>	<i>n</i> = 0 ~ 15	LCGN for PVC
!X9= <i>n</i>	<i>n</i> = 0 ~ 15	LCGN for incoming logical channels
!X10= <i>n</i>	<i>n</i> = 0 ~ 15	LCGN for two-way logical channels
!X11= <i>n</i>	<i>n</i> = 0 ~ 15	LCGN for outgoing logical channels

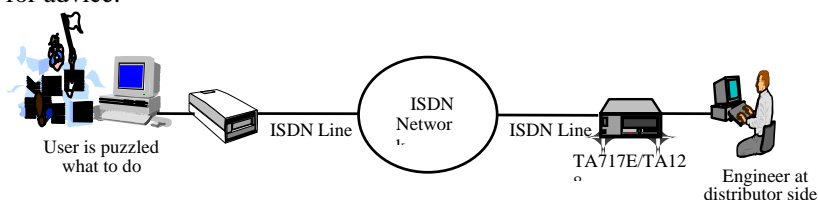
Note: X.25 services might not be available in some areas, please contact your local ISDN service provider.

For PVC type, the logical channel number is configured by AT%B6. And the TEI value (assigned at subscription time by your switch company) has to be configured correctly.

AT command	value	Description
%B6= <i>n</i>	1~ value of !X4	PVC Logical Channel Number e.g. AT%B6=1
!D0 = <i>n</i>	0 ~ 63	Fixed TEI value for X.25 on D protocol e.g. AT!D0=3

3.6 Remote configuration

If you have trouble in configuring your TA717E/TA128, or don't know what is wrong with your configuration; TA717E/TA128 remote function will allow your dealer, or distributor to remotely configure to your equipments. Please call them for advice.



After the remote configuration is enabled on your TA717E/TA128 with AT!R0 command, then your TA717E/TA128 is ready to allow remote configuration from the remote side. In addition, you can set up password authentication for the incoming client. If the password is correct, then the TA717E/TA128 can be configured by the remote side. By default, the password string is empty, i.e. no password will be checked.

AT Command	value	Description
AT!R0= <i>n</i>	0	Disable remote configuration function (default)
	1	Enable remote configuration

AT Command	value	Description
AT!R1= <i>string</i>	<empty> ASCII strings	No password check (default) Remote configuration password. The length can be up to 8 characters. And the string is <i>not</i> case-sensitive.

e.g. AT!R1=MYPASSWD is same as AT!R1= mypasswd

Note: Before starting the remote configuration, the TA717E/TA128 at the remote side must be configured to V.120 call type and its own remote configuration function must be disabled.

3.7 Upgrading to New Firmware

The TA717E/TA128 has flash download capability to allow new firmware upgrades. Please check with your distributor for new firmware release information.

To upgrade your TA's firmware, you have to prepare a computer with any communication program that supports the X-modem protocol. Then follows the steps below to upgrade to new firmware:

1. **AT command:** Type the AT command "AT**". After several interactive confirmation messages are exchanged, the upload prompt string appears. Use the X-modem protocol to upload the new firmware to the Terminal Adapter.

TA717E/TA128 displays the following message:

```
=====
ISDN Terminal Adapter
FLASH ROM downloader Ver 1.07
=====
```

Download new Firmware (Y/N) ?

F Type 'Y' to confirm

Then, TA717E/TA128 displays the following message to request confirmation:

!!!!!!!!!!!! Warning !!!!!!!!!!!!!!!

> Download will erase old F/W <

Do you really want to do (y/n) ?

F Type 'y' to confirm

After erasing the contents of the Flash ROM, TA717E/TA128 will prompt:

Flash ROM: Intel 28F400B

Flash ROM Erasing

Please upload new firmware by X-MODEM Protocol

F Start the **upload** function of the X-MODEM protocol

If the new firmware is uploaded successfully, TA717E/TA128 will show the following message:

***** **Download complete** *****

Please hit a key to restart TA.

After any key is hit, the TA717E/TA128 will restart automatically. And you have completed the firmware upgrades.

4. Internet Access

This Chapter introduces the procedures to set up Windows 95/98, and Windows NT drivers for Internet access.

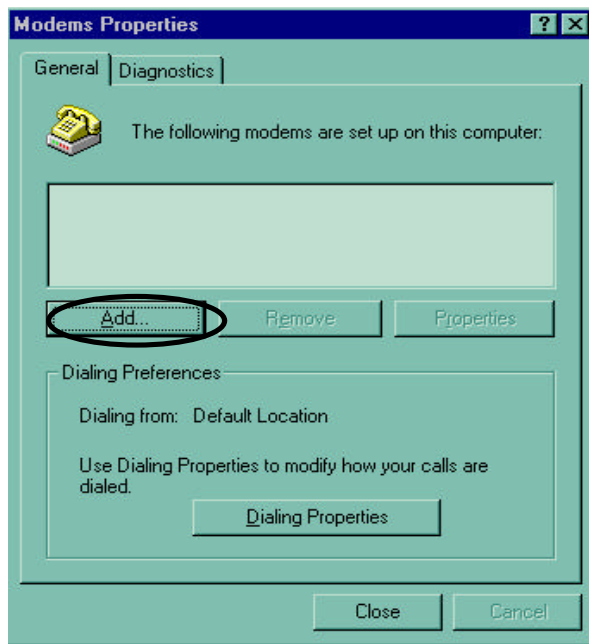
4.1 Under Windows 95/98

4.1.1 Install INF file

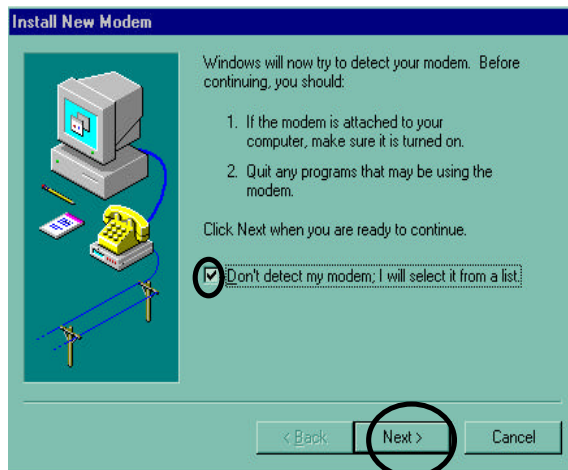
- Connect the TA717E/TA128 to the COM port of your PC and turn the power on.
- Click 'Start'.
- Point your mouse to 'Settings' and click 'Control Panel'.



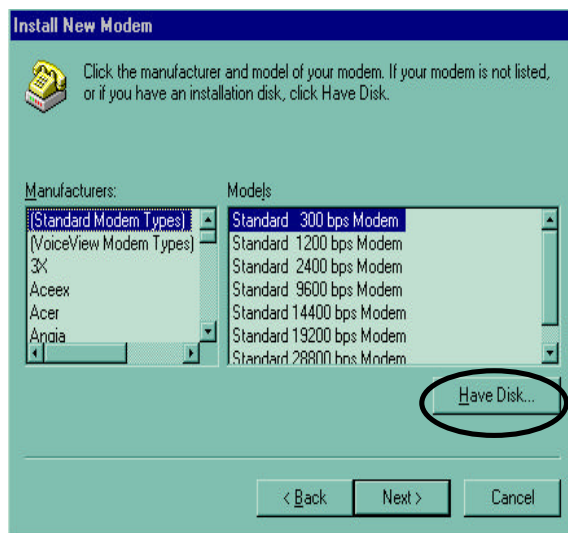
- (1) Double click
"Modem" icon.



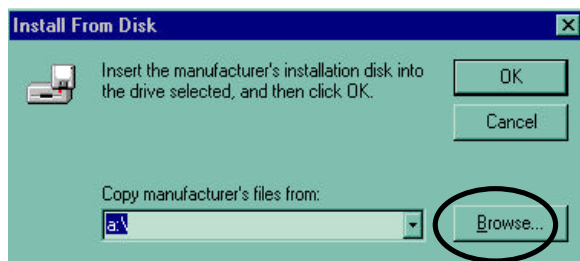
- (2) Click “Add..” button to add new terminal adapter.



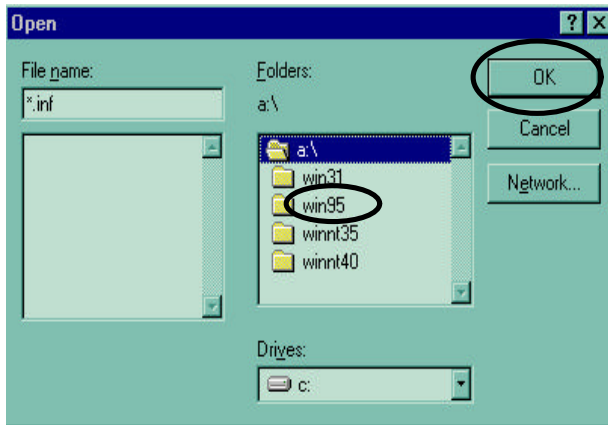
- (3) Please click on the box “Don't detect my modem; I will select it from a list.” Then click “Next>” button to continue.



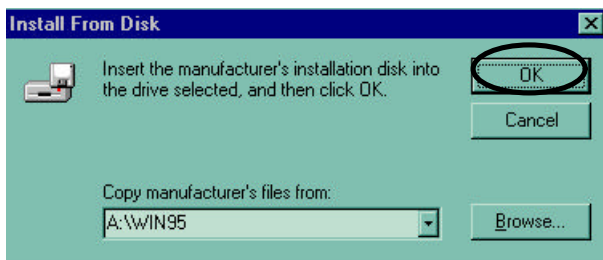
(4) Click “Have Disk..” button.



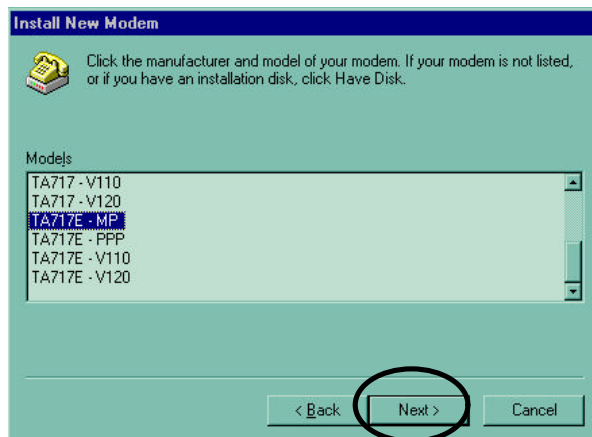
(5) Insert Installation diskette into the right drive.(e.g. A:\) Then click the “Browse...” button.



(6) Select the Win95 directory and click "OK".



(7) Click "OK".



(8) A list of models are shown in the window.

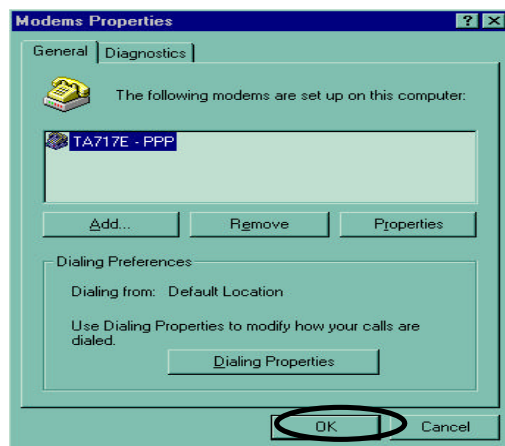
Select "*TA717E-PPP*" or "*TA128-PPP*" for 64kbps Internet access.
or
Select "*TA717E-MP*" or "*TA128-MP*" for 128kbps Internet access.
Then click "Next>".



- (9) Select the COM port which connects to the TA717E. Then click “Next>” to continue.



- (10) Click “Finish” to complete the INF file installation.



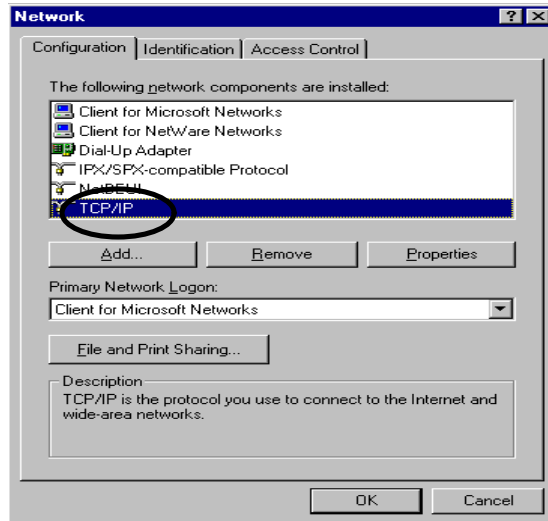
- (11) ‘TA717E-PPP’ is set up on your Win95. Click “Close” button to finish the installation. If you would like to use the MultiLink PPP feature to access the Internet, please follow the steps above and change to select “TA717E-MP” at step (8).



- (12) Then 'TA717E-MP' will be set up on your Win95. Click "Close" button to Finish installation.

4.1.2 Check Windows 95 Network Setting

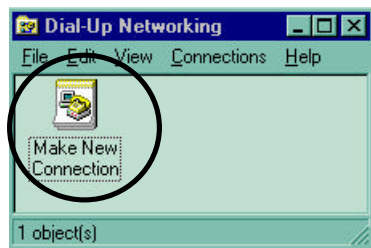
After completing the installation of the INF file, please make sure you have Windows 95 TCP/IP stack on your computer.



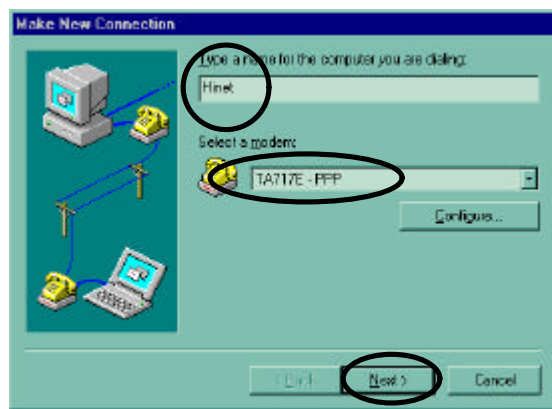
- (1) Click 'Start'.
- (2) Point your mouse to 'Settings' and click 'Control Panel'.
- (3) Double click 'Network' icon.
- (4) Check if TCP/IP network component is already installed. If not, please install your TCP/IP component before proceed to the next step.

4.1.3 Windows 95 Dial-Up Networking Configuration

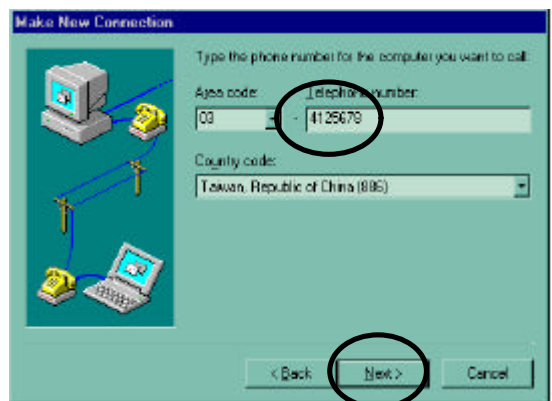
- Double click 'My Computer' icon.
- Double click 'Dial-Up Networking' icon.



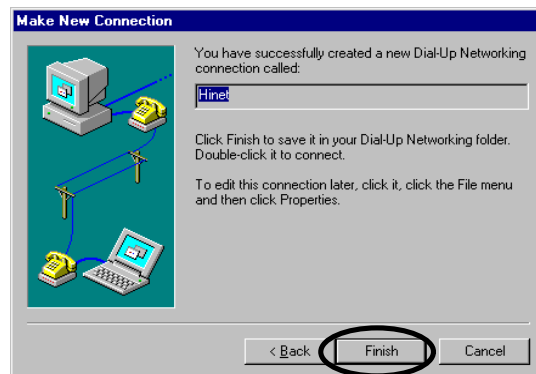
- (1) Double click 'Make New Connection' icon.



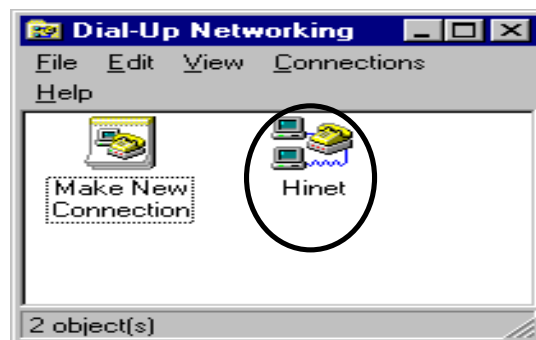
- (2) Type the name of the Internet Service Provider and select a modem, such as 'TA717E-PPP' or 'TA717E-MP'. Then click 'Next>' button.



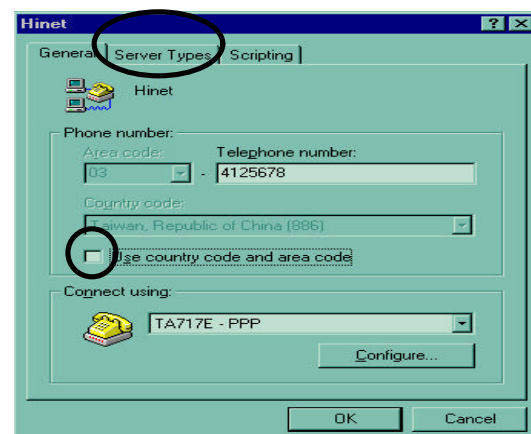
- (3) Input the phone number of your Internet Service Provider, then click 'Next>' button.



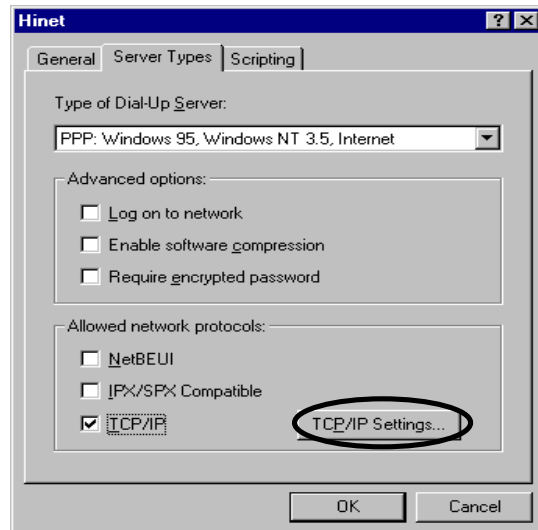
- (4) Click 'Finish'. Then you have successfully created a new Dial-Up connection to your ISP.



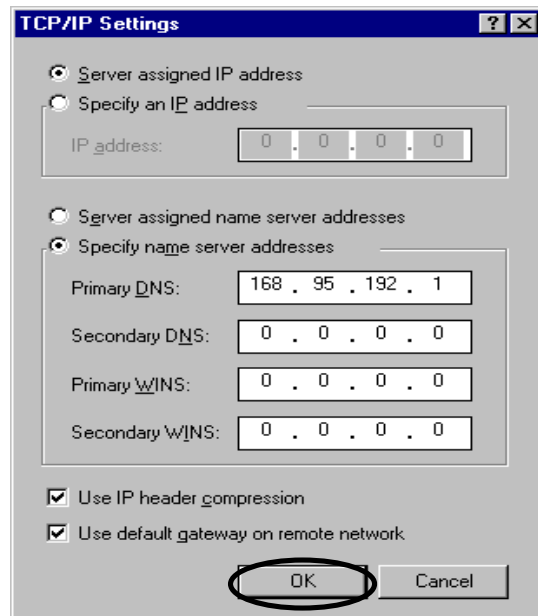
- (5) Click the RIGHT mouse button on 'your ISP' icon, then point to 'Properties' and click.



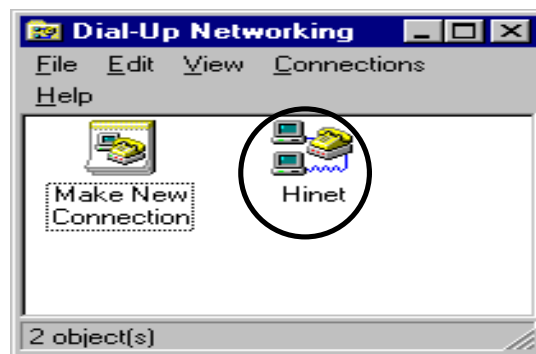
- (6) If your ISP doesn't require the country code and area code, make sure the check box is disabled. Then click 'Server Type' button.



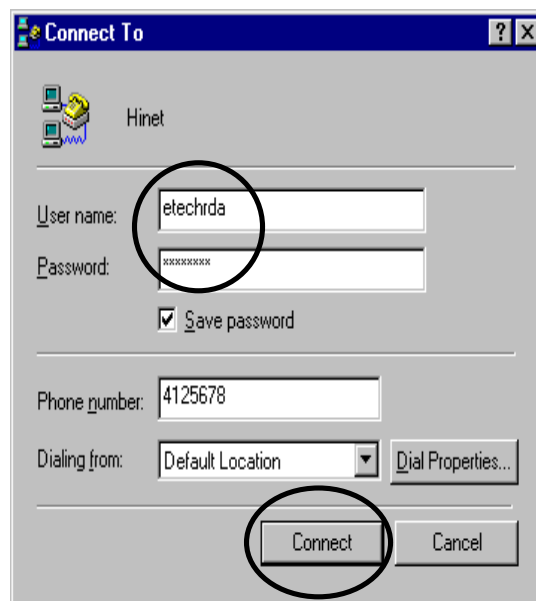
- (7) Select 'PPP: Windows 95, Windows NT 3.5, Internet' and only check 'TCP/IP' box. Then click 'TCP/IP Settings...' button.



- (8) If your ISP dynamically assigns one IP address to you, please check 'Server assigned IP address' radio button. Otherwise, check 'Specify an IP address' radio button and then enter your own IP address. Check 'Specify name server addresses' radio button and then enter the addresses of Domain Name Servers. Obtain the DNS numbers from your ISP. Click 'OK' button to finish the TCP/IP settings.



- (9) Double click '*your ISP*' icon to make a connection to your ISP.



- (10) Enter 'User name' and 'Password', click on 'Save password', then click 'Connect' button to access your ISP.

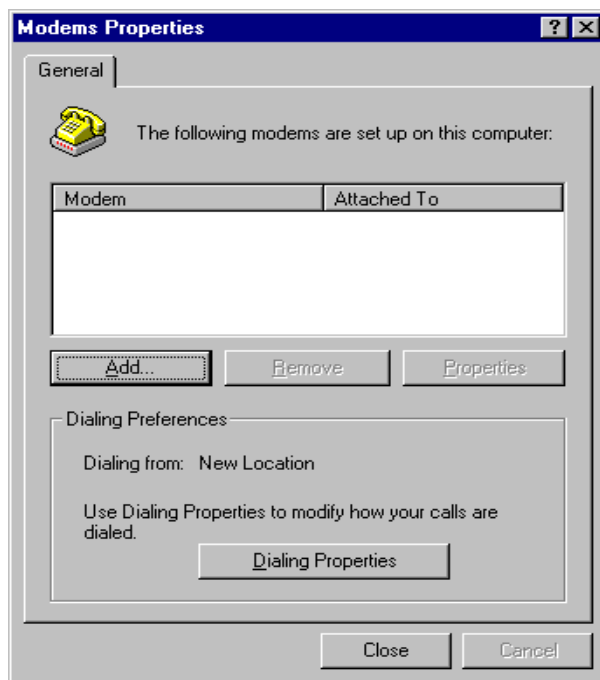
After you connect to the ISP, you can access WWW with Netscape, or Microsoft Internet Explorer. Moreover, you can use various TCP/IP applications like FTP, Gopher, News, e-Mail, etc..

4.2 Under Windows NT 4.0

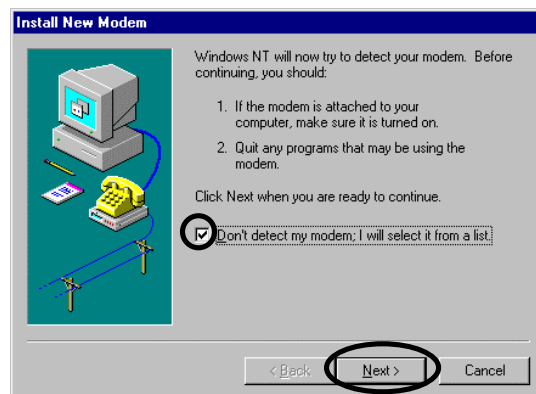
Make sure the 'Remote Access Service' has been installed on your Windows NT. If not, please install it before proceeding to the sections below.

4.2.1 Install INF file

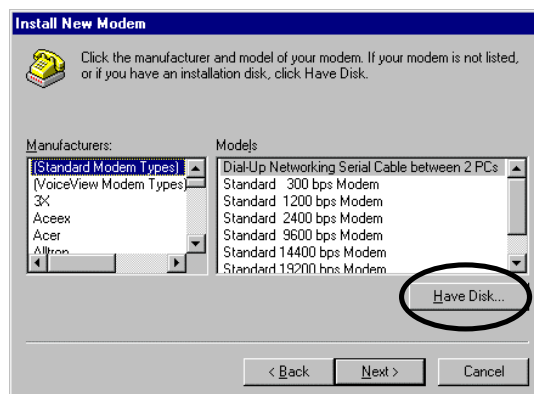
- Connect your TA717E/TA128 to the COM port of your PC and turn the power on.
- Click 'Start'.
- Point your mouse to 'Settings' and click 'Control Panel'.
- Double click the Modem icon of the Control Panel.



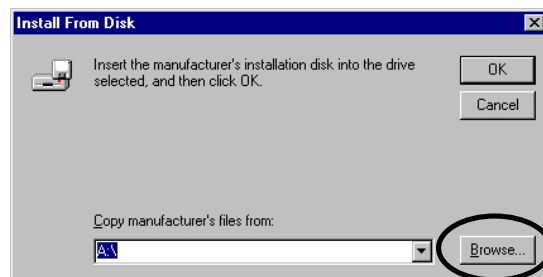
(1) Click 'Add' button to add new terminal adapters.



- (2) Check the box 'Don't detect my modem, I will select it from a list'. Then click 'Next>' button.



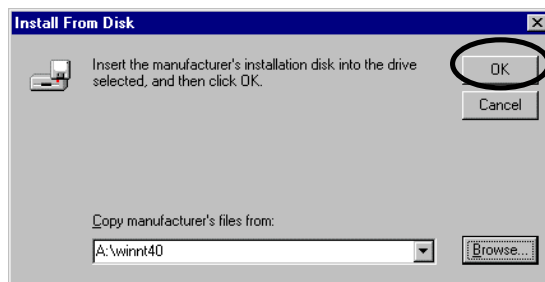
- (3) Click 'Have Disk...' button.



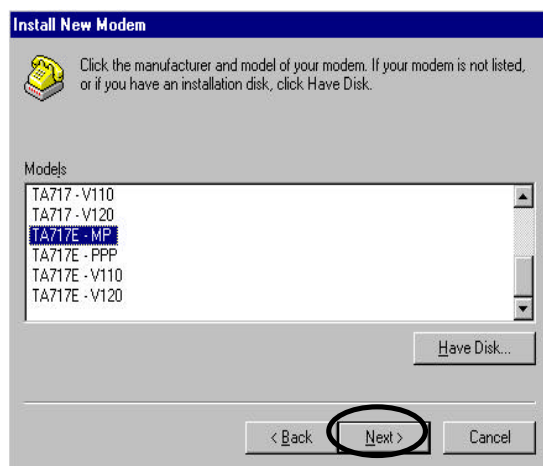
- (4) Insert the installation diskette into the right drive. (e.g. A:\) Then click 'Browse...' button.



(5) Select the 'winnt40' directory and click 'Open' button.



(6) Click 'OK' button.



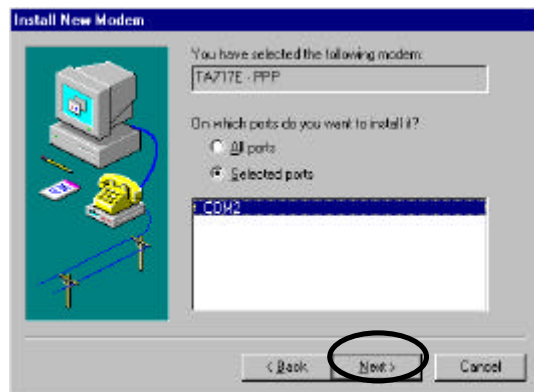
(7) A list of models are shown in the window. Select 'TA717E-PPP' for 64kbps Internet access.

or

Select 'TA717E-MP' for 128kbps Internet access.

Then click 'Next>'.

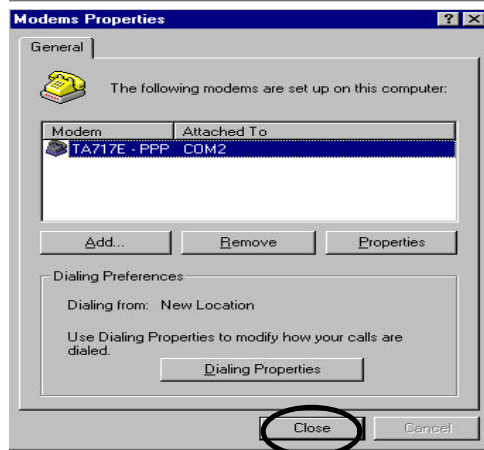
(For access speed, please check with your ISP).



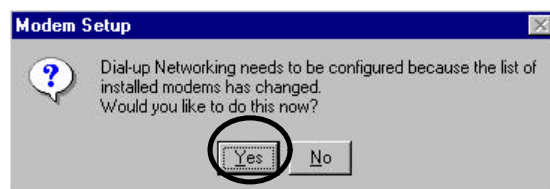
(8) Select the COM port which connects to the TA717E. Then click 'Next>' to continue.



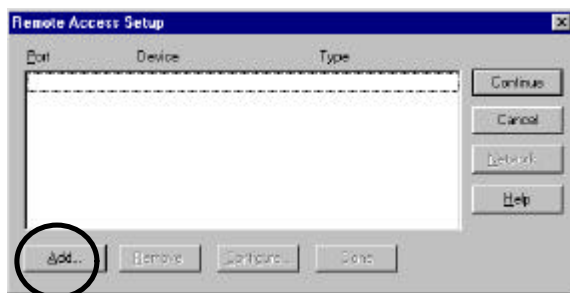
(9) 'TA717E-PPP' modem type has been set up successfully. Click 'Finish' button.



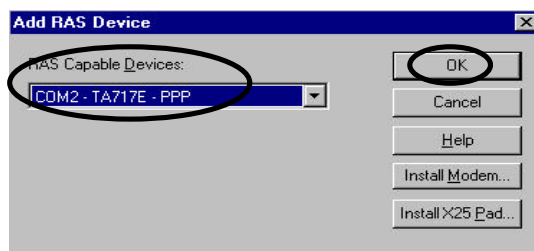
(10) 'TA717E-PPP' is set up on your WinNT. Click 'Close' button to finish the installation. If you would like to use the MultiLink PPP feature to access the Internet, please follow the previous steps and change to select 'TA717E-MP' at step (7).



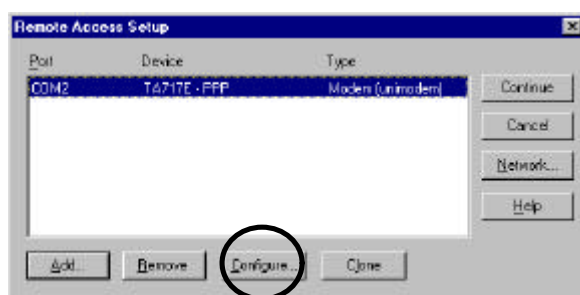
(11) Click 'Yes' button.



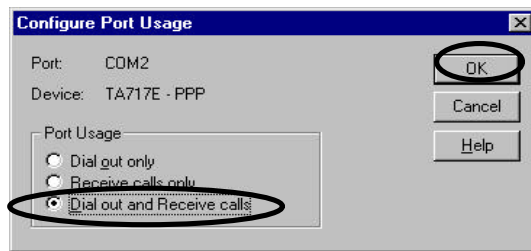
(12) If the COM port which connects to the TA717E is already used by other adapter. Please remove it first. Otherwise, click 'Add...' button.



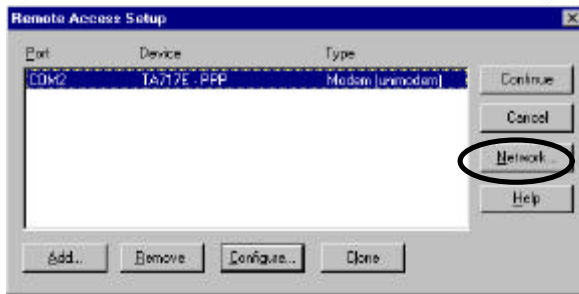
(13) Select 'COM2 - TA717E - PPP'. Then click 'OK' button.



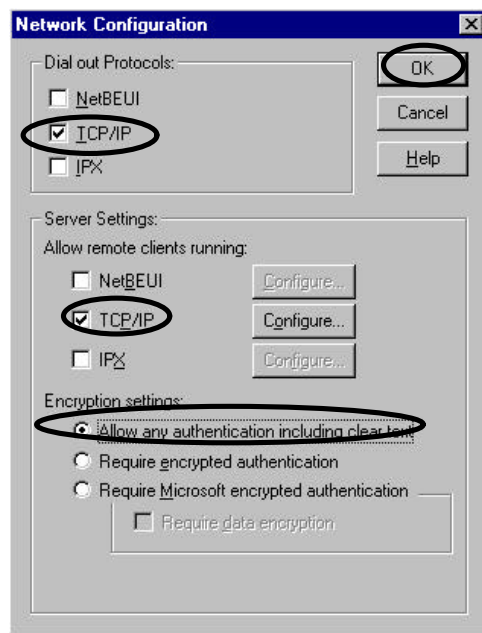
(14) Click 'Configure...' button.



(15) Check the radio box 'Dial out and Receive calls'. And click 'OK' to continue.



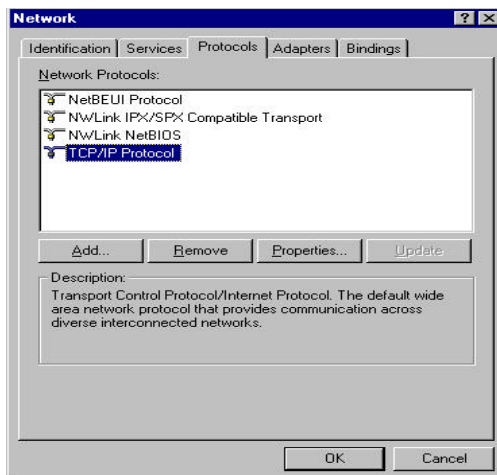
(16) Click 'Network...' button.



(17) Only check the box 'TCP/IP' and the radio box 'Allow any authentication including clear text'. Click 'OK' button to finish the Network Configuration. Then click 'Continue' button in the 'Remote Access Setup' window. After the Remote Access Service Setup completes, Winnt will be restarted.

4.2.2 Check Windows NT Network Setting

After completing the installation of the INF file, please make sure you have Windows NT TCP/IP stack on your computer.



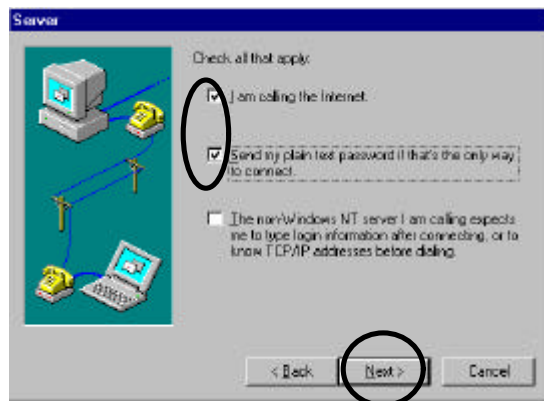
- (1) Click 'Start'.
- (2) Point your mouse to 'Settings' and click 'Control Panel'.
- (3) Double click 'Network' icon.
- (4) Check to see if TCP/IP network component is already installed. If not, please install your TCP/IP component before proceeding to the next section.

4.2.3 Windows NT Dial-Up Networking Configuration

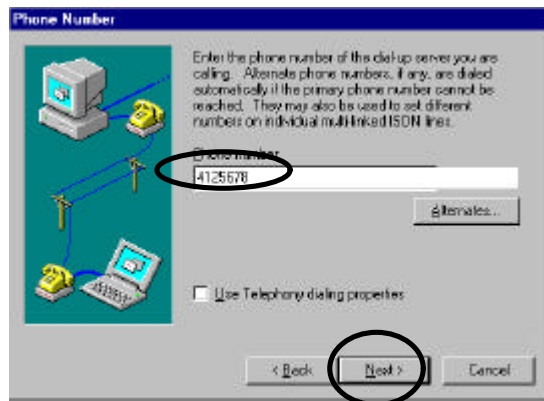
- Double click the 'Dial-Up Networking' icon of the 'My Computer'.



- (1) Please fill out the name of the new phonebook entry, such as 'Hinet'. Then click 'Next>' button.



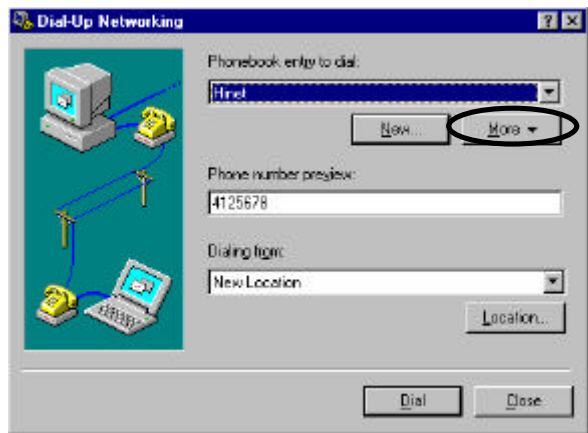
(2) Check the box 'I am calling the Internet' and the box 'Send my plain text password if that's the only way to connect'. Then click 'Next>' button.



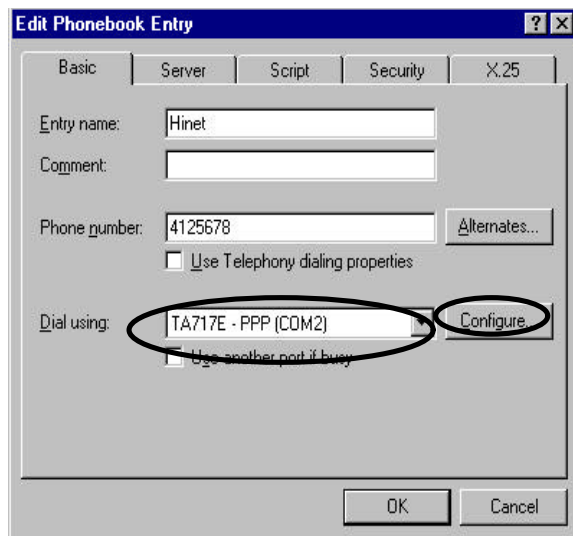
(3) Please fill out the phone number of your ISP. Then click 'Next>' button.



(4) One new phonebook entry has been created. Click 'Finish' button to save this new phonebook entry.



(5) Click 'More' button. And point to 'Edit entry and Modem properties' item.



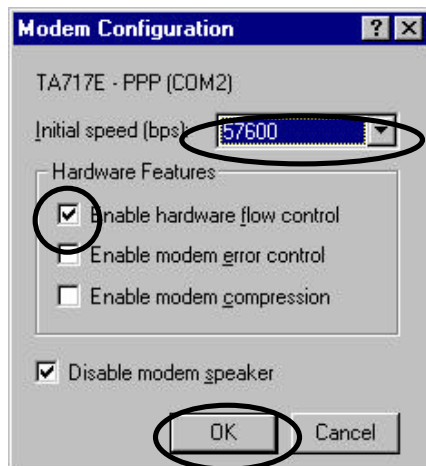
(6) Make sure the information is correct in the Basic menu.

If you want to access the Internet with 64kbps, please select 'TA717E-PPP'.

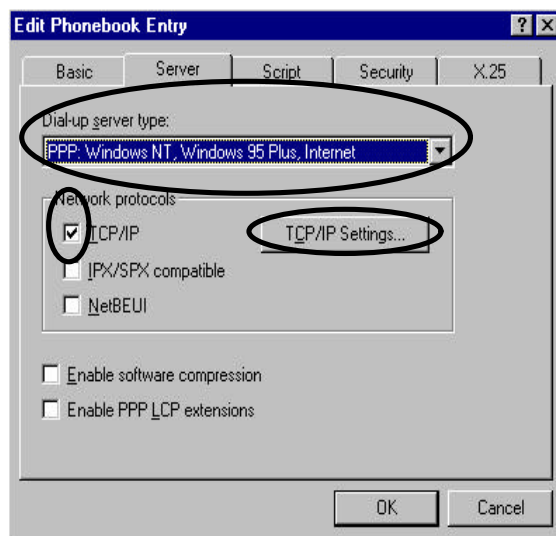
or

If you want to access Internet with 128kbps, please select 'TA717E-MP'.

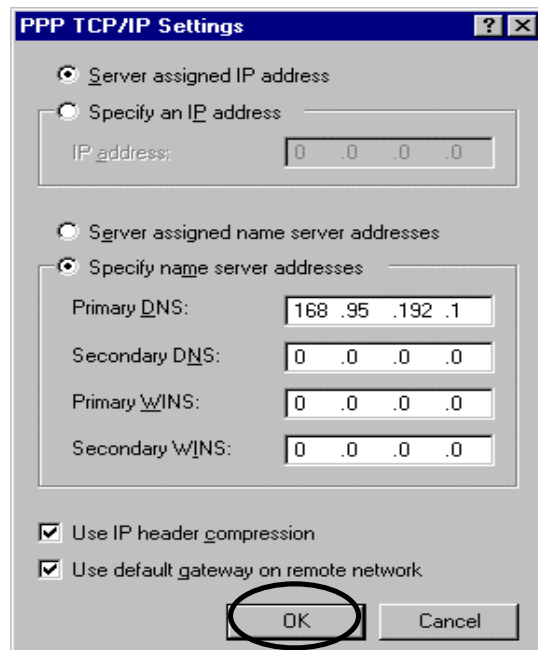
Click 'Configure' button.



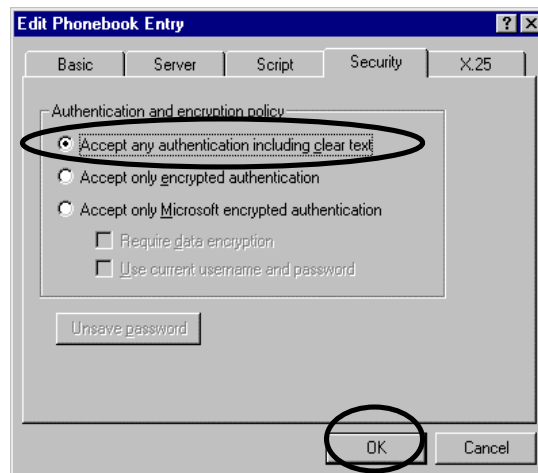
(7) Select the initial speed and check the box 'Enable hardware flow control' and the box 'Disable modem speaker'. Click 'OK' to continue.



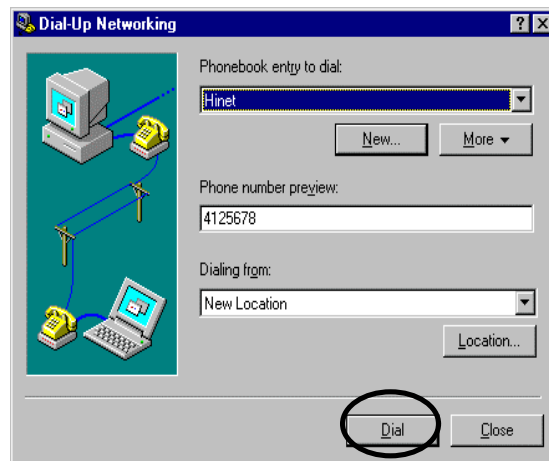
(8) Click 'Server' menu in 'Edit Phonebook Entry' window. Select 'PPP: Windows NT, Windows 95 Plus, Internet' from the Dial-Up server type list. Check the box 'TCP/IP'. You may check the box 'Enable software compression'. It is up to you. Then click 'TCP/IP Settings' button.



- (9) Fill out your IP address and the addresses of the domain name servers. Get this information from your ISP. Click 'OK' to continue.



- (10) Click 'Security' menu in 'Edit Phonebook Entry' window. Only check the radio box 'Accept any authentication including clear text'. Click 'OK' button to finish the configuration of phonebook entry.



(11) Click 'Dial' button.



(12) Please fill out your User name and your Password. Leave the Domain field blank. Then click the 'OK' button to connect to your ISP. After the call is connected, you may use the browser to access the Internet. Moreover, you can use various TCP/IP applications like FTP, Gopher, News, e-mail, etc..

5. AT Command Set

This chapter describes detailed procedures for operating the terminal adapter using the AT command set. Note that AT commands can be used for asynchronous DTEs only.

5.1 To Start Using AT Commands

Make sure the hardware is ready and the AT command set is selected.

*Type **AT** and press [Enter]*

The message “**OK**” will be displayed. This indicates that the DTE and the TA717E/TA128 are communicating. If there is no message displayed, please check whether the settings for DTE match with the adapter's settings (data bits, stop bits and parity).

“AT” must be entered in uppercase or lowercase letters, but not in a combination of uppercase and lowercase, such as “At”. As for the characters that follow “AT” can be any mix of uppercase and lowercase letters.

You can group several commands into one command line with the prefix “AT”, for example:

“ATQ0V1”

The TA717E/TA128 accepts up to 256 characters in one command line. Except for certain commands that change the functional states of the TA717E/TA128 after they are invoked, most commands can be preceded or followed by others.

Note : When the error command has been detected within a command line, the preceding commands in the command line have been executed successfully, and the successors will not be executed.

“A/” is used to repeat the previous command line such as redialing a previously dialed telephone number. A/ takes the place of AT and no carriage return is required. The previous command still remains in the command buffer until either

the next command is entered or the TA717E/TA128 is turned off. If the previous command line does not exist, an “OK” message will be displayed.

“?” allows user to query the contents of parameters (registers). With visible parameters (registers), querying status command can be used (e.g. AT&K? or AT%A0?).

The TA717E/TA128 contains three sets of configuration options:

active profile : It holds the current settings and is used by the TA717E/TA128 for all operations and functions.

user-defined profile : For the most suitable active configuration, it can be saved in a user-defined profile, and recalled on power-up or loaded back into the active profile at any time. There is two user-defined profile available, referred to as user-defined profile 0 and user-defined profile 1.

Note : The active profile is lost when the TA717E/TA128 loses power. The user-defined profile is loaded into the active profile according to the &Y setting when the TA717E/TA128 is plugged-in.

Factory profiles: These are permanently stored in the nonvolatile memory and can be loaded into the active profile via the command ‘AT&F’. The TA717E/TA128 has five factory profiles, which is suitable for a certain type of data call. In addition to the settings related to data call, there is one default factory profile at shipment time. You can reload this default factory profile to reset all parameters in TA717E/TA128 (e.g. analog port settings). Please refer to Appendix B for details.

5.2 Basic AT Commands

Command	Option	Description
A		Answer an incoming data call. e.g. <i>ATA</i>
D <i>number</i> DP <i>number</i> DT <i>number</i>	number : [addr] [addr]/[subaddr] [num1]&[num2]	Dial a number to place outgoing data calls if sub-address field is required if two numbers is required for Multilink PPP calls Note : addr : up to 20 digits sub-addr : up to 15 digits, digit : 0 ~ 9 e.g. <i>ATD 35774991</i>

		<i>ATD 35774991 / 222</i> <i>ATD 34567 & 34568</i>
DL		redial the last dial number e.g. <i>ATDL</i>
DS= <i>n</i>	<i>n</i> : 0 ~ 29	Dial a stored number <i>n</i> e.g. <i>ATDS=3</i>
En	<i>n</i> = 0 1 (default)	Command Echo Disabled Enabled e.g. <i>ATE1</i>
H		Hang up a call e.g. <i>ATH</i>
In	<i>n</i> = 0 2 3 9 100 102 103 109	Product Information display product identification code] display ROM checksum (fixed for each display firmware version firmware version) display ROM checksum] display product identification code] display ROM checksum (varies for each display firmware version firmware version) display ROM checksum] e.g. <i>ATI0</i>
O		Back to 'On-Line' state from the 'Escape' state e.g. <i>ATO</i>
Qn	<i>n</i> = 0 (default) 1	Result code control Enable the output of result codes Disable the output of result codes e.g. <i>ATQ0</i>
Vn	<i>n</i> = 0 1 (default)	Result code format Messages are displayed in digits. Messages are displayed in words. e.g. <i>ATV1</i>
Wn	<i>n</i> = 0 (default) 2	Connect message control Connect message is displayed with user speed. Connect messages is displayed with line speed.. e.g. <i>ATW0</i>
Xn	<i>n</i> = 0 1 2 3 (default) 4	Extended result code selection Basic result code Extended result code 1 Extended result code 2 Extended result code 3 Extended result code 4

		e.g. <i>ATX3</i>
Zn	<i>n</i> = 0 1	Load User-Defined Profile then reset the TA Load user-defined profile 0 as active profile. Load user-defined profile 1 as active profile. e.g. <i>ATZ0</i>
+++		escape sequence to enter 'Command' state if it is currently in the On-line state
&Cn	<i>n</i> = 0 1 (default) 4	Data Carrier Detect (DCD) Control DCD always ON. DCD goes ON upon a data call connection. DCD goes ON upon a data call connection. And DCD will track the status of RTS at the remote side for V.110 data connection. e.g. <i>AT&C1</i>
&Dn	<i>n</i> = 0 2 (default) 4	DTR Control Ignore the status transition of DTR. Hang up call upon ON-to-OFF transition on DTR. Hang up current call upon ON-to-OFF transition on DTR. And dial the stored phone number (configured by AT command "\$Z") upon OFF-to-ON transition on DTR. e.g. <i>AT&D2</i>
&Fn	<i>n</i> = 0 1 2 3 5	Load Factory-Set Profile as Active Profile Default factory setting at shipment time Asynchronous V.110 Asynchronous-synchronous PPP Multilink PPP X.25 on D e.g. <i>AT&F2</i>
&Kn	<i>n</i> = 0 3 (default) 4	Flow Control Setting No flow control Bi-directional RTS/CTS hardware flow control Bi-directional XON/XOFF software flow control e.g. <i>AT&K3</i>
&Rn	<i>n</i> = 0 (default) 1	CTS control CTS signal follows RTS signal CTS always ON e.g. <i>AT&R0</i>
&Sn	<i>n</i> = 0 (default) 1 4	DSR control DSR always ON DSR signal goes ON upon a call is connected DSR signal goes ON upon a call is connected. And DSR will track the status of DTR at remote side for

		V.110 data connection. e.g. <i>AT&S1</i>
&Tn	n = 0 1 2 3 4	Loop back test control Terminate the test in progress. Perform a local loopback test to verify the TA717E/TA128 status and DTE/DCE connection status. Perform a local loopback test to verify DTE/DCE connection status. Perform a remote loopback test to verify peer-to-peer connection status. Perform the self-test operation. e.g. <i>AT&T2</i>
&Vn	n = 0 1 2 3 4	View the contents of the active profile Data port configuration settings Analog port 1 configuration setting Analog port 2 configuration setting Memory numbers lists System parameters e.g. <i>AT&V0</i>
&Wn	n = 0 1	Store Active Profile as User-Defined Profile Store Active Profile as User-Defined Profile 0 Store Active Profile as User-Defined Profile 1 e.g. <i>AT&W0</i>
&Yn	n = 0 (default) 1	Select Profile to load as active profile upon powerup or reset Select User-Defined Profile 0 Select User-Defined Profile 1 Note : If the selected User-defined profile is corrupted in non-volatile memory, default factory profile 0 will be loaded. e.g. <i>AT&Y0</i>
&Zn= <num>	n = 0 ~ 29 num = addr[/subaddr]	Store telephone number to n-th memory number Note : addr : up to 20 digits sub-addr : up to 15 digits, digit : 0 ~ 9 e.g. <i>AT&Z0=5774991/ 123</i>

5.3 Extended AT Commands

Command	Option	Description
\$Hn		On-line help

	$n = 0$ 1 2	Display descriptions of standard AT command. Display description of S registers. Display description of common registers and extended AT commands e.g. <i>AT\$H2</i> .
\$I		Check the terminal adapter setting and reinitialize the terminal adapter. e.g. <i>AT\$I</i>
\$Zn	$n = 0 \sim 29$ (default : 0)	Designate n-th memory number to dial when &D4 (108/1 mode) takes effect. e.g. <i>AT\$Z0</i>
**		Start firmware download operation for feature upgrade e.g. <i>AT**</i>
%A0= n	$n = 0$ 1 (default) 2	Data call acceptance control No incoming call is allowed. Incoming calls are allowed; The adapter will accept only incoming calls with the same call type/protocol as the data port. Incoming calls are allowed; The adapter will attempt to auto-convert to the same call type/protocol of the incoming calls, and accept the incoming call. e.g. <i>AT%A0=1</i>
%A1= n	$n = 0$ (default) 1	Data call type selection Circuit-Switched Data (CSD) type Packet-Switched Data (PSD) type . e.g. <i>AT%A1=0</i>
%A2= n	$n = 1$ 2 3 (default) 4	CSD call type/protocol selection V.110 . V.120 Asynchronous-Synchronous PPP Multilink PPP Note : This register takes effect when %A1=0 e.g. <i>AT%A1=0%A2=4</i>
%A4= n	$n = 0$ (default) 1	Charge Information Display Control Disable charge information display Enable charge information display e.g. <i>AT%A4=1</i>
%A6= n	$n = 0$ 1 (default)	Global receiving function for data port Disable global receiving function Enable global receiving function e.g. <i>AT%A6=1</i>

%B1= <i>n</i>	<i>n</i> = 1 ~ 7 (default : 2)	Window size for X.25 on D e.g. <i>AT%B1=2</i>
%B3= <i>n</i>	<i>n</i> = 7 (default) 8	Maximum packet size for X.25 on D 128 bytes 256 bytes e.g. <i>AT%B3=7</i>
%B5= <i>n</i>	<i>n</i> = 0 (default) 1	Virtual Circuit (VC) type selection Switched Virtual Circuit (SVC) Permanent Virtual Circuit (PVC) e.g. <i>AT%B5=0</i>
%B6= <i>n</i>	<i>n</i> = 1 ~ the value of !X4	PVC Logical Channel Number This register takes effect only when %B5=1 and !X4 greater than 0. e.g. <i>AT%B6=1</i>
%C0= <i>n</i>	<i>n</i> = 0 (default) 1 2	Command type selection AT command X.28 command V.25 bis command Note : To switch from AT command to another command type (e.g. X.28 command), new command type will be active after reset the adapter by “AT\$I” command. e.g. <i>AT%C0=2\$I</i>
%D0= <i>n</i>	<i>n</i> = 0 (default) 1	Number of data bits 8 bit 7 bit e.g. <i>AT%D0=0</i>
%D1= <i>n</i>	<i>n</i> = 0 (default) 1	Number of stop bits 1 bit 2 bit e.g. <i>AT%D1=0</i>
%D2= <i>n</i>	<i>n</i> = 0 (default) 1 2 3 4	Parity setting NONE Odd Even Space Mark Note : Space and Mark options are not available if %D0 = 0 e.g. <i>AT%D2=0</i>
%I0= <i>n</i>	<i>n</i> = 0 (default)	Calling line identification (IRN) for data port. disable.

	1	enable. If caller ID from the incoming call is not one of the memory numbers range from 10 to 19, this call is rejected. e.g. <i>AT%I0=0</i>
%I2= <i>n</i>	<i>n</i> = 0 (default) 1	Calling line identification (IRN) for two analog ports. disable. enable. If caller ID from the incoming call is not one of the memory numbers range from 20 to 29, this call is rejected. e.g. <i>AT%I2=0</i>
%L4= <i>n</i>	<i>n</i> = 0 (default) 1 ~ 255 unit: 0.05 second	Idle timer for X.25 on D Idle timer is disabled This register is used to define the duration of an idle interval between successive characters received from the DTE that, when exceeded, will force the adapter to send any characters contained in the buffer to the remote DTE. e.g. <i>AT%L4=0</i>
%S0 = <i>n</i>	<i>n</i> = 1 2 3 4 5 6 7 8 9 10 11 12 13	DTE/DCE speed (user rate) 600 bps 1200 bps 2400 bps 4800 bps 9600 bps 19200 bps 38400 bps 48000 bps 56000 bps 64000 bps 57600 bps 115200 bps 230400 bps e.g. <i>AT%S0=12</i>
%S1 = <i>n</i>	<i>n</i> = 0 (default) 1 2 3 4 5 6	Line speed Line speed is the same as DTE speed if DTE speed below 38.4 kbps(57.6k bps in Japan), otherwise line speed is 38.4 kbps (57.6k bps in Japan) 600 bps 1200 bps 2400 bps 4800 bps 9600 bps 19200 bps

	7 8	38400 bps 57600 bps This register is only available for asynchronous V.110 data call to configure the line speed. e.g. <i>AT%SI=7</i>
!A[m] registers - Setting for Analog Port 1		
!B[m] registers - Setting for Analog Port 2		
!A0 = n !B0 = n	<i>n</i> = 0 1 2 (default) 3	Type of outgoing voice calls for analog ports Outgoing call is barred G2/G3 FAX Telephone or modem Telephone e.g. <i>AT!A0=3</i> ; analog port 1 : Telephone <i>AT!B0=1</i> ; analog port 2 : G2/G3 fax
!A1 = n !B1 = n	<i>n</i> = 0 1 2 (default) 3	Type of incoming voice calls for analog ports Incoming call receive is barred FAX/Modem receive only Telephone or FAX/Modem receive Telephone receive only e.g. <i>AT!A1=3</i> ; analog port 1 : Telephone
!A2 = n !B2 = n	<i>n</i> = 0 1 (default)	Global receiving control for analog ports Disable Global receiving function Enable Global receiving function e.g. <i>AT!B2=1</i> ; analog port 2 : enable
!A8 = n !B8 = n	<i>n</i> = 0 (default) 1 ~ 40 unit : 1 seconds	Internal call transfer back timer for analog ports disable the timer. When an internal call is being transferred to the other analog port. The call will be transferred back to the original port if no one answers the call before this no-answer timer timeout. e.g. <i>AT!A8=0</i>
!A9 = n !B9 = n	<i>n</i> = 1 ~ 15 (default : 5) unit : 1 seconds	Inter-digit timer for analog ports This register is used to configure interval timer between dialing digits. If this timer timeout before pressing next digit. The terminal adapter will initiate the voice call with collected digits. e.g. <i>AT!A9=0</i>
!A10 = n !B10 = n	<i>n</i> = 0 (default) 1	Pseudo call waiting for analog ports disable pseudo call waiting function enable pseudo call waiting function e.g. <i>AT!A10=0</i>
!C0 = n	<i>n</i> = 0	Switch type National ISDN

	1 2	AT&T 5E6 AT&T 5E8 Custom Note : !C registers (!C0,!C2,!C6) are required in USA only. In versions of the adapter sold in Japan, Taiwan and Europe, the !C registers are not operative.
!C2 = <spid>, !C6 = <spid>	<i>spid</i> : stream of ASCII character, up to 15 characters	Service Profile ID (SPID) 1 and 2 e.g. <i>AT!C2=025774991</i> <i>AT!C6=025774992</i>
!D0 = <i>n</i>	<i>n</i> = 0 ~ 63	Fixed TEI value for X.25 on LAPD Note : This register is used for X.25 PVC type data call only. The value of TEI is assigned by your ISDN service provider at subscription time. e.g. <i>AT!D0=3</i>
!L0 = <i>n</i>	<i>n</i> = 0 (default) 1	ISDN Dial-up or Leased Line selection ISDN Dial-up mode Leased Line mode e.g. <i>AT!L0=0</i>
!L1 = <i>n</i>	<i>n</i> = 0 1 (default) 2	Channel selection for data port at leased line mode Both B1 and B2 channels B1 channel B2 channel e.g. <i>AT!L1=1</i>
!N0 = <num>	<i>num</i> = addr[/subaddr]	Store local directory number for data port Note : addr : up to 20 digits sub-addr : up to 15 digits, digit : 0 ~ 9 e.g. <i>AT!N0=5774991/123</i>
!N2 = <num>	<i>num</i> = addr[/subaddr]	Store local directory number for analog port 1 e.g. <i>AT!N2=5774991/123</i>
!N3 = <num>	<i>num</i> = addr[/subaddr]	Store local directory number for analog port 2 e.g. <i>AT!N3=5774991/123</i>
!P1 = <i>n</i>	<i>n</i> = 0 1 (default)	BOD for voice calls (resource BOD) for Multilink PPP Disable resource BOD function Enable resource BOD function Note : Please refer to Chapter 3 for details e.g. <i>AT!P1=1</i>
!P2 = <i>n</i>		Throughput threshold to add 2nd channel

!P3 = <i>n</i>	<i>n</i> = 0 ~ 127 (default : 48) unit : kbps <i>n</i> = 0 ~ 255 (default : 3) unit : 10 seconds	(throughput BOD) for Multilink PPP Throughput continuation time to add 2nd channel (throughput BOD) for Multilink PPP e.g. AT!P2=48 !P3=3
!P4 = <i>n</i> !P5 = <i>n</i>	<i>n</i> = 0 ~ 127 (default : 20) unit : kbps <i>n</i> = 0 ~ 255 (default : 6) unit : 10 seconds	Throughput threshold to drop 2nd channel (throughput BOD) for Multilink PPP Throughput continuation time to drop 2nd channel (throughput BOD) for Multilink PPP e.g. AT!P4=20 !P5=6
!P6 = <i>n</i> !P7 = < <i>id</i> >	<i>n</i> = 0 1 2 3 4 5 (default) <i>id</i> = <i>d1.d2.....dn</i> <i>dn</i> : 0 ~ 255 <i>n</i> : 1 ~ 20	Multilink PPP Endpoint Identifier Class null class Locally Assigned Address Internet Protocol Address IEEE 802.1 Globally Assigned MAC Address PPP Magic-Number Block Public Switch Network Directory Number Address Multilink PPP Endpoint Identifier e.g. AT!P6=0 AT!P7=139.175.10.12
!R0 = <i>n</i>	<i>n</i> = 0 (default) 1	Remote configuration function Disable remote configuration function Enable remote configuration function e.g. AT!R0=1
!R1 = < <i>passwd</i> >	< <i>passwd</i> > = strings of ASCII characters, up to 8 characters.	Password for remote configuration function Note : The password is not case-sensitive. Therefore, 'abcd' is the same as "ABCD" e.g. AT!R1= <i>password</i>
!S0 = <i>n</i>	<i>n</i> = 0 (default) 1 2	Analog Ports Receive Preference No preference Analog port 1 prefers Analog port 2 prefers e.g. AT!S0=1
!X registers - D-channel X.25 Parameters		
!X4= <i>n</i>	<i>n</i> = 0 -- 255	Count of logical channels for PVCs

!X5= <i>n</i>	<i>n</i> = 0 -- 255	Count of incoming logical channels for SVCs
!X6= <i>n</i>	<i>n</i> = 0 -- 255	Count of two-way logical channels for SVCs
!X7= <i>n</i>	<i>n</i> = 0 -- 255	Count of outgoing logical channels for SVCs
!X8= <i>n</i>	<i>n</i> = 0 -- 15	LCGN for PVCs
!X9= <i>n</i>	<i>n</i> = 0 -- 15	LCGN for incoming logical channels
!X10= <i>n</i>	<i>n</i> = 0 -- 15	LCGN for two-way logical channels
!X11= <i>n</i>	<i>n</i> = 0 -- 15	LCGN for outgoing logical channels

5.4 Messages

The TA717E/TA128 sends various messages to the DTE in response to commands. Messages may be displayed in words or digits, or they may be disabled, depending on the settings of the “Q” and “V” commands. In addition, the following table also lists the result messages for different settings of the “X” command.

Digit Code	Word Message	x0	x1	x2	x3	x4	Description
0	OK	1	1	1	1	1	Command received OK.
1	CONNECT	1					Connection made.
2	RING	1	1	1	1	1	Incoming call detected.
3	NO CARRIER	1	1	1	1	1	Call attempt can't complete or connection is disconnected.
4	ERROR	1	1	1	1	1	Command not recognized or too long.
5	CONNECT 1200		1	1	1	1	Connection made at 1200 bps.
7	BUSY				1	1	Dialed number busy.
10	CONNECT 2400		1	1	1	1	Connection made at 2400 bps.
11	CONNECT 4800		1	1	1	1	Connection made at 4800 bps.
12	CONNECT 9600		1	1	1	1	Connection made at 9600 bps.
14	CONNECT 19200		1	1	1	1	Connection made at 19200 bps.
28	CONNECT 38400		1	1	1	1	Connection made at 38400 bps.

18	CONNECT 57600		1	1	1	1	Connection made at 57600 bps.
19	CONNECT 64000		1	1	1	1	Connection made at 64000 bps.
33	CONNECT 115200		1	1	1	1	Connection made at 115200 bps.
34	CONNECT 230400		1	1	1	1	Connection made at 230400 bps.

5.5 Registers

5.5.1 S - Registers

The **S**-registers are value registers used to configure various local operating characteristics for the DTE.

register	Option	Description
S0 = <i>n</i>	<i>n</i> = 0 ~ 255 (default : 1)	Numbers of rings to answer an incoming call. 0 : auto-answer mode is disabled. e.g. <i>ATS0=1</i>
S2 = <i>n</i>	<i>n</i> = 0 ~ 255 (default : 43)	Escape character Escape sequence function is disabled if S2 value greater than 127. e.g. <i>ATS2=43</i>
S3 = <i>n</i>	<i>n</i> = 0 ~ 127 (default : 13)	Carriage return character e.g. <i>ATS3=13</i>
S4 = <i>n</i>	<i>n</i> = 0 ~ 127 (default : 10)	Line feed character e.g. <i>ATS4=10</i>
S5 = <i>n</i>	<i>n</i> = 0 ~ 32, or 127 (default : 8)	Backspace character e.g. <i>ATS5=8</i>
S7 = <i>n</i>	<i>n</i> = 0 ~ 255 (default : 30) unit : 1 second	Wait for connection timer e.g. <i>ATS7=30</i>
S18 = <i>n</i>	<i>n</i> = 0 ~ 255 (default : 0) unit : 1 second	Test timer 0 : test will continue infinitively until stopped manually e.g. <i>ATS18=10</i>
S25 = <i>n</i>	<i>n</i> = 0 ~ 255 (default : 5) unit : 1/100 second	DTR detect time e.g. <i>ATS25=5</i>

5.6 Configuration Error Messages

If you attempt to save an invalid configuration or have reinitialized a port using an invalid configuration, an error message with the format shown below may appear:

CONFIG ERR: n

where n is error code.

The errors represented by different values of “n” are described in the table below. Note that values of “n” may be combined to form further error codes, e.g., the error code “24” (the sum of 8 and 16) indicates that the invalid configuration contains both a baud rate error (code 8) and a command type error (code 16).

Code	Type	Description
1	State Error	A call is in progress; system cannot be reinitialized.
2	DTE Mode Error	Invalid DTE operating mode.
4	Data Port Type Error	Data port type is not consistent with DTE mode.
8	Baud Rate Error	Baud rate and DTE operating mode (or call type) conflict. For example, 64Kbps is not valid for asynchronous mode.
16	Command Type Error	PAD commands are only valid for PSD calls and AT commands are only valid for asynchronous mode.
32	PVC LCN Error	Before a PVC call is set up, a logical channel must be selected using LCN (Logical Channel Number). This message indicates LCN is not within range of user's subscription.

6. PAD Command Set

In addition to the AT command set, the TA717E/TA128 provides another operational interface: PAD (Packet Assembler/Disassembler) or X.28 command set. With PAD commands, you can handle PSD (Packet Switched Data) calls using the X.25 protocol.

6.1 Operations with PAD Commands

To select PAD Commands mode, please type the following AT commands:

AT&F5%C0=1\$

To Start Using PAD Command, type

<Enter>

A prompt ‘*’ appears on the DTE to indicate that the TA717E/TA128 is ready for PAD commands.

Escape Command Mode

After a data call is established, the TA717E/TA128 is at ‘On-Line’ state. you can leave this “On-Line” state and enter the “Escape-Command-Mode” state by typing the recall character (*Ctrl-P*) which is defined in the PAD parameter 1. In the “Escape-Command-Mode” state, only one command is allowed. After this command is completed, the TA717E/TA128 will return to the “On-Line” state or to the final state required by the execution of the PAD command (e.g., after the CLR command, the TA717E/TA128 will enter into the “Command-Mode” state).

6.2 PAD (X.28) Commands

PAD Selection : Place an X.25 packet switched data (PSD) call	
Format	[facility request codes-] <address> [Dcall user data] [] : optional
Remark	<p>[facility request codes-] : comprise of a set of facility request codes, separated by comma (,) and ended with a hyphen (-).</p> <p><address> : up to 20 digits (0 through 9, # and *) representing the phone number of the remote side.</p> <p>[call user data]: preceded by an uppercase character "D" and up to 12 characters or 124 characters in conjunction with the fast select facilities.</p> <p>e.g. To place an outgoing call (window size 2, packet size 256) with phone number 774991 and a call user data field containing the string "HELLO WORLD", enter the following command:</p> <p style="text-align: center;"><i>W2,P8-774991DHELLO WORLD</i></p>

Facilities

CUG (Closed User Group selection):

Format: **G**<CUG number>

CUGOA (Closed User Group with Outgoing Access selection)

Format: **O**<CUG number> where <CUG number> : 0 ~ 9999.

Network User Identification (NUI)

Format: **N**<NUI string> where <NUI string> : ASCII codes in the range of 33 to 126 with up to 16 characters.

Fast Select with no Restriction on Response

Format: **F**

Fast Select with Restriction on Response

Format: **Q**

Reverse Charge

Format: **R**

Packet Size Parameter Negotiation for Flow Control

Query PAD Parameters (X.3 Parameters)	
Format	PAR?<parameter ID 1>,<parameter ID 2>...,<parameter ID n>
Remark	<p>If no parameter ID is designated in the query command, then it applies implicitly to all parameters.</p> <p>e.g.</p> <p>PAR? 1, 2, 4 , query the values of parameter 1, 2 and 4</p> <p>PAR? , query the values of all parameters</p>

Set PAD Parameters (X.3 Parameters)	
Format	SET<parameter ID 1>:<value_1>,...,<parameter ID n>:<value_n>
Remark	e.g. <div style="margin-left: 40px;">SET 4:10 , set parameter 4 to 10</div> <div style="margin-left: 40px;">SET 4:10, 5:0 , set parameter 4 to 10, parameter 5 to 0</div>

Set PAD Parameters and then Query the Values (X.3 Parameters)	
Format	SET?<parameter ID 1>:<value_1>,...,<parameter ID n>:<value_n>
Remark	e.g. SET? 4:10 , set parameter 4 to 10, and query the value

Load User-Defined Profile as Active Profile	
Format	PROF <profile id> , where profile id = 0 or 1
Remark	e.g. PROF 1 , load user-defined profile 1

Save the Active Profile into the Designated User-Defined Profile.	
Format	SAVE <profile id> , where profile id = 0 or 1
Remark	e.g. SAVE 1 , Save to user-defined profile 1

Clear a Data Call	
Format	CLR [clear user data] [] : optional
Remark	[clear user data]: up to 124 characters.

	e.g. CLR
--	----------

Send a Reset Packet	
Format	RESET
Remark	e.g. RESET

Send an Interrupt Packet	
Format	INT
Remark	e.g. INT

Request Status Information	
Format	STAT
Remark	e.g. STAT

Return to AT Command Mode	
Format	AT
Remark	e.g. AT

6.3 X.29 Commands

The X.29 command set provides a procedure for the exchange of control information and user data between a PAD and a packet mode DTE or between two PADs. The following commands are available only when an X.25 data call is established and the TA717E/TA128 is in the Escape Command Mode state.

Query Remote PAD Parameters (X.3 Parameters)	
Format	RPAR?<parameter ID 1>,<parameter ID 2>...,<parameter ID n>
Remark	If no parameter ID is designated in the query command, then it applies implicitly to all parameters. e.g. RPAR? 1, 2, 4 , query the values of parameter 1, 2 and 4 RPAR? , query the values of all parameters
Set Remote PAD Parameters (X.3 Parameters)	
Format	RSET<parameter ID 1>:<value_1>,...,<parameter ID n>:<value_n>
Remark	e.g. RSET 4:10 , set parameter 4 to 10 RSET 4:10, 5:0 , set parameter 4 to 10, and parameter 5 to 0

Set Remote PAD Parameters and then query the value (X.3 Parameters)	
Format	RSET?<parameter ID <i>l</i> >:<value_1>,...,<parameter ID <i>n</i> >:<value_n>
Remark	e.g. RSET? 4:10 , set parameter 4 to 10, and query the value

Invitation to Clear a Data Call : request the remote PAD to clear a X.25 call	
Format	ICLR
Remark	e.g. ICLR

6.4 PAD Parameters (X.3 Parameters)

Parameter	Value	Description
1	0	Recall Character Disable recall function
	1 (default)	Enable recall function. DLE (Ctrl-p) : recall character
2	0	Data Echo Disable data echo at "On-line" state
	1 (default)	Enable data echo at "On-line" state
3	0	Forwarding Character Disable forwarding function
	2 (default)	Enable forwarding function. CR : forwarding character
4	0 (default)	Idle Timer Delay Disable idle timer delay function
	1~255	Enable idle timer delay function. unit : 0.05 second e.g. set 4:20 ; idle timer = 20 * 0.05 = 1 second
5	0	PAD to DTE Flow Control Disable flow control
	1	XON/XOFF software flow control
	4 (default)	RTS/CTS hardware flow control
6	0	PAD Service Messages Control No service message will be transmitted to the DTE
	1 (default)	Service messages will be transmitted in the standard format e.g. set 6 : 1
7	0 (default)	Operation on received BREAK signal No action
	2	Reset a data call
	8	Escape from the "On-Line" state into the "Escape-Command-Mode" state
	21	Send an interrupt packet to remote DTE and discard output to local DTE before receiving acknowledgment of

		interrupt from remote DTE
8	0 (default) 1	Discard Output Normal data delivery Discard output to DTE
9	0	Padding after CR (Read Only) Disable
10	0	Line Folding (Read Only) Disable
11	4 3 12 13 14 15 19 16 17 18 20 21 22	Binary Speed of DTE (Read Only) 600 bps 1200 bps 2400 bps 4800 bps 9600 bps 19200 bps 38400 bps 48000 bps 56000 bps 64000 bps 57600 bps 115200 bps 230400 bps
12	0 1 4 (default)	DTE to PAD Flow Control Disable flow control XON/XOFF software flow control RTS/CTS hardware flow control
13	0	LF Insertion after CR (Read Only) Disable
14	0	Padding after LF (Read Only) Disable
15	0	Editing function at "On-Line" state (Read Only) Disable
16	0 8 (default)	Character Delete Disable character delete function Enable character delete function. 8 : delete character
17	0 24 (default)	Line Delete Disable line delete function Enable line delete function. 24 : line delete character
18	0 18 (default)	Line Display Disable line display function Enable line display function. 18 : line display character
19		Editing PAD Service Signals

	0 2 (default)	No editing PAD service signal sent to DTE. Editing service signals for display terminals
20	0	Echo Mask (Read Only) Disable
21	0	Parity Treatment (Read Only) Disable
22	0	Page Wait (Read Only) Disable

6.5 Extended Parameters

The parameters described above are standard PAD parameters described in the ITU (CCITT) X.3 recommendations. The following parameters (parameters 71-81) are a proprietary set of extended parameters.

Parameter	Value	Description
71	0 (default) 1	Select VC (Virtual Circuit) Type SVC (Switched Virtual Circuit) PVC (Permanent Virtual Circuit)
72	1~ value of parameter 74	Select PVC (Permanent Virtual Circuit) Logical Channel
73	0 ~ 63	Fixed TEI for X.25 data calls on D
Logical Channel Group Number (LCGN) and Logical Channel Number (LCN)		
74	0-255	Count of logical channels for permanent virtual circuit.
75	0-255	Count of incoming logical channels
76	0-255	Count of two-way logical channels
77	0-255	Count of outgoing logical channels
78	0-15	LCGN for PVC
79	0-15	LCGN for incoming logical channels
80	0-15	LCGN for two-way logical channels
81	0-15	LCGN for outgoing logical channels

6.6 PAD Service Signals

The PAD receives commands from the DTE, and sends service signals (messages) to the DTE after execution. All the service signals are defined in the ITU (CCITT) X.28 recommendation.

Service Signal	Response to Command	Description
RESET		Indicates reset of a virtual call; may be initiated by network or remote side.
CLR		Indicates call clearing initiated by network or remote side. (extended format shown in table below).
CLR CONF	CLR	Confirms call clearing initiated by CLR command.
COM	PAD selection	Indicates call connected.
ERR		Indicates error with PAD command.
ENGAGED	STAT	Response to status PAD command when a call has been established.
FREE	STAT	Response to status PAD command when a call is not established.
PAR	PAR? SET?	List of designated parameters with their current value or INV(unknown parameter ID or the value is out of range).
*		Prompt to indicate that the user can issue new command.
CLR PAD	ICLR	Confirms call clearing initiated by ICLR command

Extended COM service signal

It is partitioned into four portions:

- *Remote DTE address*
- *Facility block:* A list of facility requests preceded by the pattern "FAC:". All the facilities are indicated by the character shown in the section above entitled "Facilities.". If no facility is requested, the facility block is omitted.
- *Call user data block:* This field shows the call user data in the packet of incoming call requests. If there is no call user data, this block is omitted.
- *Pattern of "COM"*

Extended CLR Service Signal

The extended CLR service signals indicate the reason that a call is cleared.

Service Signal	Description
CLR OOC	Remote DTE is engaged by another call.
CLR NC	Network cannot handle call request because errors have occurred.
CLR INV	DTE has initiated an invalid facility request.
CLR NA	User cannot access to the designated DTE; for example, local DTE

	and remote DTE are not in the same closed user group.
CLR ERR	Procedure errors detected in local DTE.
CLR RPE	Procedure errors detected in remote DTE.
CLR NP	Called address is not assigned to any DTE.
CLR DER	Remote DTE is out of order.
CLR DTE	Call cleared normally by remote DTE.
CLR RNA	Reverse charging refused; remote DTE may not subscribe to network reverse charging acceptance.
CLR ID	Environment of remote DTE is incompatible for call.
CLR FNA	Fast selection refused; user does not subscribe to fast selection.
CLR ROO	Cannot be routed as requested in the PAD selection command.
CLR PAD	Call Cleared normally by ICLR command.

7. V.25bis Command Set

7.1 Operations with V.25bis Commands

To operate the terminal adapter using the V.25bis commands, the following procedures describe how to perform these tasks.

Step 1: Change the command mode into V.25bis command by typing the following command:

AT%C0=2

Step 2: Reset the TA717E/TA128 by typing in the following command:

AT\$I

The TA717E/TA128 can now be operated with V.25bis command sets.

7.2 V.25bis Commands

Call Request with Number Provided	
Format	CRN <i>phone number</i>
Remark	<i>phone number</i> is the remote telephone number, a string of 0~9,*,# e.g. CRN 774991

Call Request with Memory Address Provided	
Format	CRS <i>n</i>
Remark	<i>n</i> : 0 ~ 29 corresponding to the TA717E/TA128's thirty memory numbers e.g. CRS 5

Store Phone Number into the Designated Memory Address	
Format	PRN <i>n</i> ; <i>phone number</i>
Remark	<i>n</i> : 0 ~ 29 corresponding to the TA717E/TA128's thirty memory numbers e.g. PRN 5 ; 774991
List All Phone Numbers Stored in Memory.	

Format	RLN
--------	-----

Disregard Incoming Call : disable auto-answer mode

Format	DIC
Remark	e.g. DIC

Connect Incoming Call : enable auto-answer mode

Format	CIC
Remark	e.g. CIC

Help

Format	HLP
Remark	e.g. HLP

Return to AT command Mode

Format	AT
Remark	e.g. AT

7.3 Messages

The TA717E/TA128 provides some messages that respond to commands.

Message	Respond to	Description
VAL	all valid commands	VALid command. Command entered was valid.
INV	all invalid commands	INValid command. Command entered was invalid.
CFI	CRN CRS	Call Failure Indication. For unknown reason, call failed to connect.
CFIAB	CRN CRS	Call Failure Indication ABort call. The terminal adapter aborts a call if no answer is received from the remote number within a preset time period.
CFIET	CRN CRS	Call Failure Indication Engaged Tone. Call failed to connect because remote number's line was busy.
CFINS	CRS	Call Failure Indication Number Not Stored. Memory address indicated by the CRSn command does not contain a telephone number.
CFICB	CRN CRS	Call Failure Indication DCE Busy. A dialing command was entered after an incoming call had appeared but

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		before the adapter had answered the call.
CNX	CRN CRS	Connection established with remote number.
INC		INcoming Call has appeared.
DNX		Disconnect.
LSN	RLN	List of Stored Number. When the "RLN" command is invoked, each of the phone numbers stored in memory will be listed. Each number will be preceded by the letters "LSN".

8. Feature Phone Services

In addition to standard telephone voice services, the TA717E/TA128 supports various convenient telephone features. Using a standard telephone, a user can enjoy features such as intercom, call transfer between two analog ports, and pseudo call waiting service.

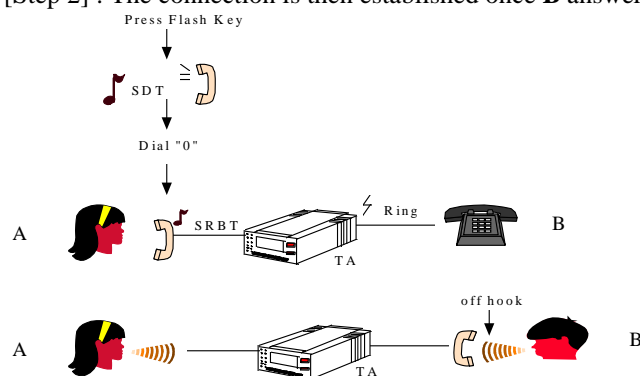
8.1 Internal Call Services

Since the TA717E/TA128 supports two analog ports, the TA717E/TA128 can function as a small PBX to allow internal calls between two analog ports. In addition, the TA717E/TA128 also provides an internal call transfer function to transfer the current call to another analog port.

8.1.1 Intercom

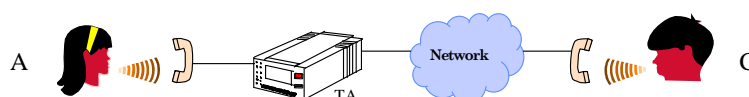
[Step 1] : User **A** presses the flash key and hears the Second Dial Tone (SDT). Before the SDT timer expires, **A** presses the digit “0” to make an internal call to **B**. The telephone on the other side, **B**, starts to ring and a Second Ring Back Tone (SRBT) can be heard by **A**.

[Step 2] : The connection is then established once **B** answers the call.

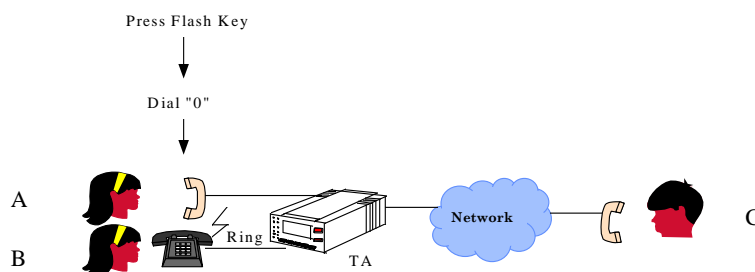


8.1.2 Internal Call Transfer

[Step 1] : **A** has a conversation with **C**.



[Step 2] : **A** presses the flash key and dials the digit “0”. The telephone on the other side, **B**, starts to ring, and the Second Ring Back Tone (SRBT) can be heard by **A**. There is two ways to transfer the call. One way is to transfer before **B** answers the call ([step 3.1]). The other way is to transfer after **B** answers the call ([step 3.2]).



[Step 3.1] : **A** hangs up the call and the TA717E/TA128 transfers the call to **B**. At this moment, the TA717E/TA128 starts a timer, the Internal Call Transfer Back Timer (which is programmable by **!A8** or **!B8**). If **B** does not answer the call before this timer expires, the TA717E/TA128 switches the call back to **A** and **A**'s phone starts to ring.

[Step 3.2] : **B** answers the call and **A** is in connection with **B**. After **A** hangs up the call, **B** is connected to **C**.

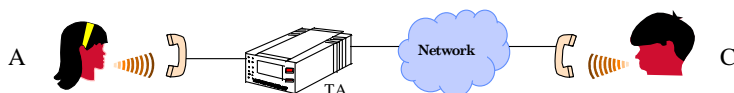
Note: If the internal call transfer timer is set to zero, then the TA717E/TA128 will not transfer the call back to the original analog port once the call has been transferred.

8.2 Pseudo Call Waiting Service

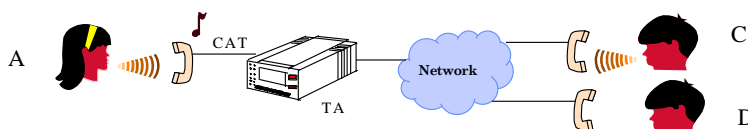
A user can enable the pseudo call waiting feature (by **!A10** or **!B10**) and enjoy call waiting services without subscribing any ISDN supplementary service.

The user can place the current call on hold, and accept another incoming call. Afterwards, you can switch back and forth between the two calls. Steps to activate this feature are the same as ones used for normal call waiting service.

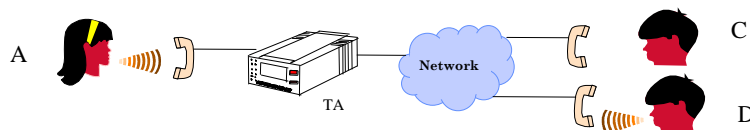
[Step 1] : **A** has a conversation with **C**.



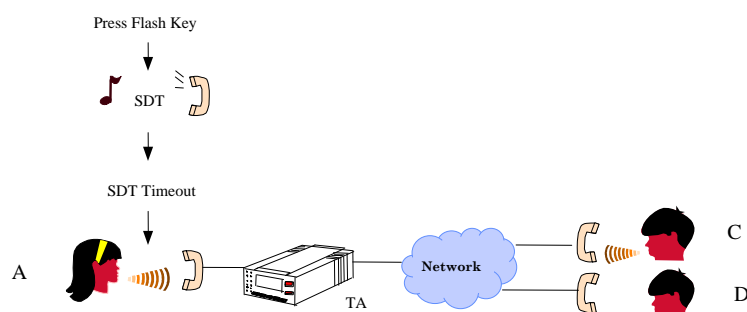
[Step 2] : When **A** receives another incoming call from **D**, **A** will hear a Call Alerting Tone (CAT).



[Step 3] : **A** can place the current call on hold by pressing the flash key, and then **A** can have a conversation with **D**.



[Step 4] : Afterwards, **A** can switch back and forth between **C** and **D** by pressing the flash key, and **A** will hear a special dialing tone, which is referred to as Second Dial Tone (SDT), for a short period of time. After that, the conversation with **A** will be switched from one to the other by the TA717E/TA128.



9. Leased Line Operation

The TA717E/TA128 supports leased line operations as well as ISDN dial-up lines. This chapter describes leased line operations.

9.1 Configuration

To use the TA717E/TA128 to communicate over a leased line, please follow the procedures below:

1. **Check cable connection** : First check if the leased line cable is properly connected to the line jack labeled “**ISDN**” on the back panel of the TA717E/TA128.
2. **Configure communication parameters** : Determine the protocol and speed with which you wish to communicate with the remote side. Then configure your TA717E/TA128 by entering the appropriate AT commands, and save into TA717E/TA128 nonvolatile memory.

e.g. “**AT&F2&W0&Y0**”

3. **Select channel** : Select the desired channel for data port by using the AT command “**AT!L1**”. You can select either the B1 or the B2 channel.

e.g. “**AT!L1 = 1**” to select B1 channel

4. **Enable leased line mode** : Enter the AT command

“**AT!L0=1**”

5. **Reset the terminal adapter** : Reboot the TA717E/TA128, then the TA717E/TA128 will be in leased line mode.
6. **Activate data transfer operation**: Enter the AT command **ATD** *any number* or **ATA** as if you are using the same procedure to make/answer a data call.

Your TA717E/TA128 will now automatically attempt to establish a connection with the remote side.

e.g. **“ATD111”**

9.2 Operation Mode from Leased Line to ISDN Dial-up Line

To terminate the leased line connection and return the TA717E/TA128 to standard ISDN dial-up mode, perform the following steps:

1. Unplug the leased line cable from the terminal adapter's line jack or type “+++” followed by **“ATH”** command. The TA717E/TA128 is then forced back to command mode.
2. Enter the AT command **“AT!L0=0”** to select ISDN Dial-Up mode.
3. Reboot the TA717E/TA128 and connect the ISDN line cable back to the line jack marked ISDN.

10. Troubleshooting

This chapter provides guidelines to help you isolate, diagnose, and resolve problems with your terminal adapter.

10.1 What to Check First

Check to see if all of the cables are properly connected.

If your TA717E/TA128 does not operate properly, first check to see that all of the cables connecting the TA717E/TA128 to the DTE, ISDN line and power source is connected properly.

Check the internal functionality of the terminal adapter.

If the cables are connected properly, you must next check whether the internal functions of the TA717E/TA128 are operating normally by entering the following AT command:

AT&T4<CR>

The message shown below should appear:

ROM	OK
EEPROM	OK
ISDN INTERFACE	OK
Analog Port 1	OK
Analog Port 2	OK
Data Port	OK

If the resulting message is not the same as this, please call your local distributor or dealer to solve the problem.

Check the configuration setting.

Next, make sure you have the correct configuration setting. Refer to Chapter 3 of this manual that describe how to configure the TA717E/TA128 to make sure the current port configuration corresponds to the type of call you wish to make.

10.2 Operational Error

If the TA717E/TA128 still does not work properly, refer to the problems and solutions described in this section.

Data Terminal Equipment (DTE) cannot communicate with the TA717E/TA128.

- F Make sure the DTE data settings (e.g. data length, stop bits, speed, synchronous/asynchronous type) matches the TA717E/TA128 configuration. Please refer to Chapter 5 for details.
- F Make sure the software running on the terminal works correctly.

AT commands are entered and the terminal adapter shows no response or echo.

- F Check the AT command Echo (E) and Quiet Mode Control (Q) setting. If echo is disabled and message display is suppressed, there will be no response or echo from the terminal adapter.
- F Make sure the terminal adapter is in command mode. If the terminal adapter is in leased line mode (query by entering the AT command "AT!L0? "), unplug the leased line cable from the jack, and the terminal adapter will be forced back to command mode.

The TA717E/TA128 cannot establish a link to the network switch.

- F Ensure the ISDN cable is connected properly.
- F Make sure your ISDN line is still alive. Pick up the handset of the analog phone connected to the TA717E/TA128 and try to make an outgoing call. Check whether the **D** LED is lit. If the **D** LED is off, your ISDN line may be dead. Contact your service provider.

- F We recommend storing local directory numbers into the nonvolatile memory. Local directory numbers are obtained at subscription time.
- F If the TA717E/TA128 is connected to an ISDN line in a multipoint configuration (two or more devices connected to the same ISDN line), make sure that only the network switch and one Terminal Equipment (TE) on the S/T bus have 100 ohm line termination. There may be only one 100 ohm line termination resistor connected to the ISDN line. Then check whether the ISDN line cable is damaged.
- F If you use X.25 for data calls, make sure the LCGN is properly configured. The LCGN value is obtained at subscription time. Note that the LCGN for a PVC is different from that of a SVC.
- F If you use the X.25 data call with fixed TEI option, make sure the fixed TEI value has been configured and stored into nonvolatile memory. The fixed TEI value is obtained at subscription time.
- F If you use the X.25 data call with fixed TEI option, make sure there is no other TE on the same BRI line using the same fixed TEI value as your TA717E/TA128.

The TA717E/TA128 cannot receive incoming calls.

- F Check if the local directory numbers are saved into the TA717E/TA128.
- F Check to see if the IRN function is enabled. If this function is enabled, the memory number index ranges 10 to 19 are used for data port filtering; and memory ranges 20 to 29 are used for the two analog ports filtering. Please check to see if the number of the incoming call is from one of the memory number ranges.
- F For data calls, please make sure both sides have selected the same protocols. For voice calls, check if “!A1” or “!B1” register is disabled.

Data calls do not automatically answer.

- F Check that the rings to answer command S0 is set to a non-zero value. Also, if the ring count is set too high, the calling side may run out of time and terminate the call.

Unusual characters shown on the terminal screen after a connection is established.

- F Check the communication settings of your communication software or terminal. The most common settings are 7-E-1 (7 data bits, even parity, 1 stop bit) or 8-N-1 (8 data bits, no parity, 1 stop bit). Another possibility is that the speeds between local and remote stations are mismatched.
- F Perform the loop back tests to verify the local DTE connection and the end-to-end circuit quality. Refer to the section on AT Command Set “&T” for further information.

Data is partially lost.

- F Data loss may occur when the TA717E/TA128 is transmitting and receiving high speed (greater than 9600 bps) packet switched data. Make sure that both the DTE and the TA717E/TA128 apply the same flow control (e.g. hardware or software flow control). Refer to the section on AT Command Set “&K” for further information.

Appendix A : Specifications

ISDN Interface

- “S/T” interface Basic Rate Interface
- Conforms to I.430

Data Interface

- Port Number: 1
- Electrical Interface: EIA232 (DB9 connector)
- Associated Dialing Interface:
 - ISDN AT extension command set
 - V.25bis command set
 - X.28 PAD command set
 - DTR assertion (108/1)

Data Rates

- Asynchronous (bps):
 - 600,1200,2400,4800,9600,19.2k,38.4k,57.6k,115.2k,230.4k

ISDN Line Speed (bps) :

- 600,1200,2400,4800,9600,19.2k,38.4k,48k,56k,64k,128k

Protocol Support:

Circuit-Switched Data

- Async-to-Sync PPP
- Multilink PPP(128kbps) with BACP/BAP capability
- V.110
- V.120

Packet-Switched Data

- X.25 on D
- PAD function is included: ITU-T X.3, X.28, X.29

Analog Interface

Port Number: 2

Services support: Intercom, and pseudo call waiting

Configuration and Maintenance

Main address: up to 3 sets (for 1 data port, 2 analog ports)
up to 20 characters for each set

Sub-address: up to 15 characters

Memory numbers (short-cut dialing): up to 30 sets

Identification of registered numbers: up to 20 sets

Flash download capability for easy firmware upgrade

Remote configuration support

Leased Line Operation Support

Test Features

Self-test

Local/Remote Loopback

Dimensions

156(W) x 211.5(D) x 33(H) mm

Power Requirement

Input: 12V DC with a power adapter 100VAC ~ 230VAC $\pm 10\%$ 50/60Hz

Environment

Operating Temperature: 0°C ~ 40°C

Storage Temperature: -40°C ~ 70°C

Humidity: up to 90% RH non-condensing

Appendix B :

Factory-set Profiles

Details on the six factory-set profiles stored in the adapter are presented in the following tables. Parameters common to all six profiles are listed in Table B.6.

Table B.1: Factory-Set Profile 0 (default factory profile at shipment time)

Parameters	Default setting	AT Command
Data Port Settings		
Service Type	PPP	%A1=0%A2=3
Command Type	AT commands	%C0=0
Flow Control	RTS/CTS Hardware	&K3
DTE Speed	38400 bps	%S0=7
Analog Ports Settings		
Outgoing Call Type	Audio call (telephone/modem)	!A0(!B0)=2
Incoming Call Type	Telephone/Modem/Fax	!A1(!B1)=2
Global Receiving Function	Enable	!A2(!B2)=1
Internal Call Transfer Back Timer	Disable	!A8(!B8)=0
Inter-digit Timer	5 seconds	!A9(!B9)=5
Pseudo Call Waiting	Disable	!A10(!B10)=0
IRN Function	Disable	%I2=0
Receive Preference	No preference	!S0=0
System Parameters		
Remote Configuration Password	<empty>	!R1=
Line Mode	ISDN Dial Up Line	!L0=0
Channel Used at Leased Line Mode	B1	!L1=1
Line Speed for V.110 connection	Adapted to DTE speed	%S1=0
Multilink PPP Parameters		
Resource BOD	Enable	!P1=1
Threshold to Add Channel	48 kbps	!P2=48
Continuation Time to Add Channel	30 seconds	!P3=3
Threshold to Drop Channel	20 kbps	!P4=20
Continuation Time to Drop Channel	60 seconds	!P5=6

X.25 on D Parameters		
Window Size	2	%B1=2
Maximum Packet Size	128	%B3=7
Virtual Circuit Type	SVC	%B5=0
Idle Timer	Disable	%L4=0

Table B.2: Factory-Set Profile 1 (V.110, Asynchronous)

Parameters	Profile Default setting
Service Type	V.110
Command Type	AT commands
Flow Control	RTS/CTS Hardware
Line Speed	Adapted to DTE speed

Table B.3: Factory-Set Profile 2 (Async-to-Sync PPP, Asynchronous)

Parameters	Default setting
Service Type	Async-to-Sync PPP
Command Type	AT commands
Flow Control	RTS/CTS Hardware

Table B.4: Factory-Set Profile 3 (Multilink PPP, Asynchronous RS232)

Parameters	Default setting
Service Type	Multilink PPP
Command Type	AT commands
Flow Control	RTS/CTS Hardware
Resource BOD	Enable
Threshold to Add Channel	48 kbps
Continuation Time to Add Channel	30 seconds
Threshold to Drop Channel	20 kbps
Continuation Time to Drop Channel	60 seconds

Table B.5: Factory-Set Profile 5 (D channel X.25, Asynchronous)

Parameters	Default setting
Service Type	X.25 on D
Command Type	AT commands
Flow Control	RTS/CTS Hardware
Window Size	2
Maximum Packet Size	128
Virtual Circuit Type	SVC
Idle Timer	Disable

Table B.6 : Common Parameters for Factory-Set Profile 0 ~ 5

Parameters	Default setting	AT command
Command Echo	Enable	E1
Result Code Display	Enable	Q0
Result Code Format	Displayed in Words	V1
Connect Message Display	DTE Speed	W0
Extended Result Code	Extended Code 3	X3
DTR	Normal	&D2
DCD	Normal	&C1
DSR	Forced ON	&S0
CTS	Normal	&R0
Memory Number for 108/1	0	\$Z0
Data Call Acceptance	Same Call Type Only	%A0=1
Charge Display	Disable	%A4=0
Global Receiving Function	Enable	%A6=1
Data Bits	8	%D0=0
Stop bit	1	%D1=0
Parity	None	%D2=0
IRN Function	Disable	%I0=0
Remote Configuration	Disable	!R0=0
Auto Answer	ON	S0=1
Escape Character	+	S2=43
Carriage Return Character	CR	S3=13
Line Feed Character	LF	S4=10
Backspace Character	BS	S5=8
Wait for Connection	30 seconds	S7=30
Test Timer	test indefinitely	S18=0
DTR Change Detect Time	0.05 second	S25=5

Appendix C : AT Command Summary

Command	Description
A	Answer an incoming data call
A/	Repeat previous command
D	Dial
E	Command echo
H	Hang up a data call
I	Product Information
O	Return on-line state
Q	Message control
V	Form of message
W	Form of Connect message
X	Extended Result Code
Z	Load user-defined profile and reinitialize system
+++	Escape sequence
&C	DCD (Data Carrier Detect) control
&D	DTR (Data Terminal Ready) control
&F	Load factory-set profile and reinitialize system
&K	Flow control
&R	CTS (Clear to Send) control
&S	DSR (Data Set Ready) control
&T	Loop back test
&V	View environment setting
&W	Store active profile
&Y	Select active profile for hardware power-up
&Z=	Store phone number
\$H	On line help
\$I	Reinitialize system

\$Z	Select phone number for 108/1 mode
**	Firmware download
?	Query registers or parameters
\$n=	Configure operating characteristics for DTE
%A0=	Data call acceptance control
%A1=	Data call type selection
%A2=	CSD call type selection (B channel protocols)
%A4=	Charging information display control
%A6=	Global receiving function for data port
%B1=	X.25 window size selection
%B3=	Maximum X.25 packet size
%B5=	SVC/PVC selection
%B6=	PVC logical channel number selection
%C0=	Command type selection
%D0=	Data length
%D1=	Stop bit
%D2=	Parity
%I0=	IRN function control for data port
%I2=	IRN function control for two analog ports
%L4=	Idle timer delay (for PSD on D call only)
%S0=	DTE/DCE speed
%S1=	Line speed
!A0=,!B0=	Outgoing voice call type selection
!A1=,!B1=	Incoming voice call type selection
!A2=,!B2=	Global receiving function for analog ports
!A8=,!B8=	Internal call transfer timer
!A9=,!B9=	Interval timer between dialing digits
!A10=,!B10=	Pseudo call waiting selection
!C0=	Switch type selection
!C2=	SPID for CSV call
!C6=	SPID for CSD call
!D0=	TEI selection
!L0=	Dial-up or leased line operation selection
!L1=	Data channel configuration at leased line mode
!N0=	Set directory numbers for data port
!N2=	Set directory numbers for analog port 1

!N3=	Set directory numbers for analog port 2
!P1=	Voice call bandwidth on demand
!P2=	MLPPP throughput threshold to add 2nd channel
!P3=	MLPPP throughput threshold continuous time to add 2nd channel
!P4=	MLPPP throughput threshold to drop 2nd channel
!P5=	MLPPP throughput threshold continuous time to drop 2nd channel
!P6=	MLPPP endpoint identifier class
!P7=	MLPPP endpoint identifier
!R0=	Remote configuration function
!R1=	Password for remote configuration function
!S0=	Analog port receive preference
!X4=	Number of logical channels for PVC
!X5=	Number of incoming logical channels for SVC
!X6=	Number of two-way logical channels for SVC
!X7=	Number of outgoing logical channels for SVC
!X8=	LCGN for PVC
!X9=	LCGN for incoming logical channels
!X10=	LCGN for two-way logical channels
!X11=	LCGN for outgoing logical channels

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