

INSTRUCTIONS MANUAL  
FEDERAL COMMUNICATIONS COMMISSION  
INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

CAUTION:

To assure continued FCC compliance:

- (1) Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

FCC Label Compliance Statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

# Technical Reference for ZyXEL omni.net series

*omni.net LCD Plus*

*omni.net LCD+M*

*omni.net LCD*

*omni.net Plus*

*omni.net D*

## ISDN Terminal Adapters

**ZyXEL**

TOTAL INTERNET ACCESS SOLUTIONS

*ZyXEL Communications Corporation*

## ZyXEL ISDN Terminal Adapters

*omni.net LCD Plus*

*omni.net LCD +M*

*omni.net LCD*

*omni.net Plus*

*omni.net D*

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## The Declarations of CE Marking

The omni series has been approved for connection to the Public Switched Telecommunication Network using interfaces compatible with ITU-TSS recommendation I.420 (Basic Rate ISDN user access). The omni series complies with the following directives:

1. The Council Directive 89/336/EEC of 3 May 1992 on the approximation of the laws of the Member States relation to Electro Magnetic Compatibility. (EMC Directive)
2. Council Directive 91/263/EEC of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunication terminal equipment. (The Telecom Terminal Equipment Directive)
3. 93/68/EEC of 22 July 1993 amending the Directives 89/336/EEC, 91/263 /EEC and 92/31/EEC.(Marking Directive)
4. Council Directive 73/23/EEC and 93/68/EEC of 26 Dec 1996 on the harmonization of the laws of the Member States relation to electrical equipment designed for use within certain voltage limits.
5. The Council Directive 92/31/EEC of 28 April 1992 amending directive on the approximation of the laws of the member states relating to Electro Magnetic Compatibility.

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## Preface

Thank you for purchasing our ZyXEL omni.net ISDN Terminal Adapter (TA).

### **About ZyXEL omni.net series ISDN Terminal Adapters**

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This manual describes the features and provides installation and configuration instructions for the ZyXEL omni.net series products.

The data rate of any one of these omni.net series TA can reach 128 kilobits per second (Kbps). With this high-performance speed, Plus additional functions, such as LCD display (omni.net LCD, omni.net LCD+M and omni.net LCD Plus) or built-in 56K modem (omni.net LCD+M), ZyXEL omni.net TA can help you download text, graphics, music and video faster and easier, as well as make it easy for you to manage the cost of communications- not only for home computer users, but also for SOHO (small-office/home-office) users and corporate telecommuters. The characteristics of each model is as shown below:

**ZyXEL omni.net LCD Plus** is one of omni.net LCD series products. This device owns all the features and functions omni.net LCD has. Besides, it is equipped with an Universal Serial Bus (USB) interface.

**ZyXEL omni.net LCD+M** is one of omni.net LCD series products. This device has not only the LCD display and four operation keys, but also includes an internal fax/modem.

**ZyXEL omni.net LCD** is one of omni.net LCD series products. This device is the first ISDN terminal adapter in the communication industry to provide a control panel equipped with a 20 x 2 LCD display and four menu keys for easy configuration and detailed status monitoring.

**ZyXEL omni.net Plus** provides 128Kbps data rate, also includes multi-link and additional functions for phone line connection.

**ZyXEL omni.net D** provides 128Kbps data rate.

## **How to Use This Manual**

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In the following manual, “omni.net ISDN TA” and “omni.net LCD Plus/LCD+M/LCD/Plus/D” are used to refer to these omni.net series devices if the features and the instructions can be applied to all them. “Omni.net LCD Plus/LCD+M/LCD” represents the omni.net LCD Plus, the omni.net LCD+M and the omni.net LCD+M models which are omni.net LCD series products. “ZyXEL omni.net Plus/D” represents the omni.net Plus and the omni.net D models. Otherwise, the model will be described specifically if the features and the instructions of the device can only be applied to that single model.

This technical reference is cataloged into 6 feature oriented parts, namely, Introduction, ISDN Function, Voice Features, Data Function, Internal Fax/Modem Function, Diagnostics & Firmware Update, and Appendices.

## **Other References**

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To quickly learn how to install and configure your omni.net LCD Plus/LCD+M/LCD, please refer to the *ZyXEL omni.net LCD Series Quick Start Guide*; and for ZyXEL omni.net Plus/D, please refer to the *ZyXEL omni.net Plus/D Quick Start Guide*.



# **Part I**

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## **Introduction**

# Chapter 1

## Introduction

This chapter introduces the features and specifications for the ZyXEL omni.net series products, and provides instructions for installing your ZyXEL omni.net ISDN TA

### Key Features

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#### Speed and Compatibility

- Plug and Play support for Win95/98/NT environment.
- Full compatibility with both ISDN and remote PSTN via ISDN.
- 112Kbps/128Kbps channel bundling: MLP, and Multilink PPP(RFC1990).
- Multiple signaling protocol compatibility with the following network switches: DSS1 (for Europe), NI-1 and DMS-100 (for USA)
- Supports X.75, V.110, V.120, and PPP Async-to-Sync Conversion B Channel protocols.
- B-Channel speeds of 56Kbps (in-band Signaling) and 64Kbps (out-of-band Signaling).
- High-speed 460.8 Kbps DTE serial port.
- V.42bis data compression over ISDN using the X.75, V.120, and Bundle protocols.
- STAC data compression using PPP/MP to provide:
  - High-speed Web browsing
  - Fast downloading of video and high-quality graphics

### ***Technical Reference for ZyXEL omni.net series***

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- Two application program interfaces including ZyXEL ISDN AT Commands and CAPI 2.0.
- Built-in 56K modem that can communicate with other analog Modem/Fax through an ISDN line. (for omni.net LCD+M only)
- Universal Serial Bus (USB) interface. (for omni.net LCD Plus only)

### **Intelligent Features**

- Automatic ISDN/analog call detection.
- Automatic dial-in and dial-out B-channel protocol detection.
- Supplementary Service for USA NI-1, DMS-100 switches and European DSS1 switch, including call waiting, call hold/retrieve, three-way conferencing, call forwarding, etc.
- Feature Phone operation, including call back, broker, and three-way conferencing, etc.
- Two analog telephone ports with metering pulse function.
- Callback security with password protection.
- Flash EPROM memory for easy firmware upgrades.
- Provides FSK/DTMF Caller ID signal on analog ports.

## Specifications

<b>Status Display</b>	Status LED, 20 x 2 LCD panel (for omni.net LCD series only)
<b>Flow Control</b>	Software XON/XOFF or hardware CTS/RTS
<b>Configuration Setting</b>	Software programmable with nonvolatile memory for profile storage
<b>Diagnostics</b>	Self and loopback tests
<b>Line Interface</b>	RJ-45
<b>DTE Interface</b>	DB-25 connector
<b>Weight</b>	omni.net LCD:448g; omni.net LCD+M:557g; omni.net LCD Plus :455g omni.net Plus:379g; omni.net D:358g
<b>Dimensions</b>	Omni.net LCD Plus/LCD+M/LCD: 192mm (W) x 42.5mm (H) x 145.6mm(L) omni.net Plus/D: 183mm (W) x 36.5mm (H) x 135.0mm(L)

Table 1. Specifications

**Technical Reference for ZyXEL omni.net series**

In the following table, you will find a summary of the key features that apply to your ISDN TA.

**Key Features Summary**

Feature	omni.net D	omni.net Plus	omni.net LCD	omni.net LCD+M	omni.net LCD Plus
B-channel Data Rate	64Kbps	64Kbps	64Kbps	64Kbps	64Kbps
B-channel Protocols	PPP, V.120, V.110, X.75	PPP, V.120, V.110, X.75	PPP, V.120, V.110, X.75	PPP, V.120, V.110, X.75	PPP, V.120, V.110, X.75
128Kbps B-channel Bundling	PPP-MP, MLP	PPP-MP, MLP	PPP-MP, MLP	PPP-MP, MLP	PPP-MP, MLP
Status Indicator Type	8 LED	10 LED	8 LED LCD Panel	8 LED LCD Panel	8 LED LCD Panel
Front Panel Control and Monitoring	—	—	YES 20x2 LCD Panel	YES 20x2 LCD Panel	YES 20x2 LCD Panel
Hi/fn LZS (Stac) Compression	YES	YES	YES	YES	YES
Multi-Auto for Dial-in and Dial-out	YES	YES	YES	YES	YES
Bandwidth-On-Demand, BACP	YES	YES	YES	YES	YES
Call Bumping	—	YES	YES	YES	YES
Asynchronous Speed on Serial Port	460.8Kbps	460.8Kbps	460.8Kbps	460.8Kbps	460.8Kbps
Number of Analog (POTS) Ports	—	2	2	2	2
REN	—	3	3	3	3
Caller ID on analog port support	—	YES	YES	YES	YES
Feature Phone	—	YES	YES	YES	YES
Supplementary Service	—	YES	YES	YES	YES
Synchronous Mode	—	—	YES	YES	YES

## **USB Connector**

The omni.net LCD Plus is an USB(Universal Serial Bus)-based ISDN TA, providing a USB connector on the back panel of the device.

Before using USB-based ISDN TA, make sure to have the USB device driver and the port driver installed in your computer. To install the drivers, use the USB cable that comes with your omni.net package to connect your device with your computer. Plug the USB connector into your computer while your computer is turned on. The plug and Play function of the operating system will first detect if its driver has been installed. If not, Windows will prompt you for the USB device driver, then the port driver. (For more information about connecting your device, please see the *ZyXEL omni.net LCD series Quick Start Guide*)

## Appendix D Serial Port Interface

### EIA-232D 25 Pin Serial Port Interface

Pin #	Description	ITU-TSS Signal Name	EIA Signal Name	Signal Description	Signal Direction DTE - DCE
1	GND	101	AA	Protective Ground	↔
2	TXD	103	BA	Transmitted Data	→
3	RXD	104	BB	Received Data	←
4	RTS	105	CA	Request To Send	→
5	CTS	106	CB	Clear To Send	←
6	DSR	107	CC	Data Set Ready	←
7	GND	102	AB	Signal Ground	↔
8	DCD	109	CF	Data Carrier Detected	←
15	Clock Source: DCE	114	DB	Transmit Clock Signal	←
17	Sync RX Clock	115	DD	Synchronous Receive Clock.	←
18	LA/LBK	141		Local Analog Loopback Test.	→
20	DTR	108/2 108/1	CD	Data Terminal Ready. Connect DCE to line.	→
21	RD/LBK	140		Remote Digital Loop Test.	→

**Technical Reference for ZyXEL omni.net series**

22	RI	125	CE	Ring Indicator	←
<b>Pin #</b>		<b>ITU-TSS</b>	<b>EIA</b>		
<b>Description</b>		<b>Signal Name</b>	<b>Signal Name</b>	<b>Signal Description</b>	<b>Signal Direction</b> DTE - DCE
24	Clock Source: DTE	113	DA	Transmit Clock Signal	→
25	TI	142		Test Indicator.	←

Table 88. EIA-232D 25 Pin Serial Port Interface

**Async. Hardware Flow Control Cable Connection**

<b>Modem (DCE) DB25</b>	<b>Signal</b>	<b>to PC (DTE) DB 9</b>	<b>to DCE (Null) DB25</b>	<b>To MAC Mini 8</b>	<b>to Next 68,040 Mini 8</b>
2	TXD	3	3	3	3
3	RXD	2	2	5	5
4	RTS	7	5	1	6
5	CTS	8	4	2	8
6	DSR	6	20		
7	Ground	5	7	4,8	4
8	CD (DCD)	1	20		2
20	DTR	4	6,8	1	1
22	RI	9			

Table 89. Async. Hardware Flow Control Cable Connection