



WAN Analyzer Card PCMCIA TI/EI Getting Started Guide

© 2007, WildPackets, Inc. All rights reserved. Information in this document is subject to change without notice. No part of this document may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopying, for any purpose, without the express written permission of WildPackets, Inc.

AiroPeek SE, AiroPeek NX, AiroPeek VX, EtherPeek SE, EtherPeek NX, EtherPeek VX, Gigabit Analyzer Card (GAC), GigaPeek NX, iNetTools, NAX, NetDoppler, NetSense, Network Calculator, Omni³, Omni Capture Engine, Omni Desktop Engine, Omni DNX Engine, OmniEngine Desktop, OmniEngine Enterprise, OmniEngine Manager, OmniEngine Workgroup, Omni Management Console, Omni PacketGrabber, Omni Virtual Network Service, OmniPeek, OmniPeek Enterprise, OmniPeek Enterprise Connect, OmniPeek Personal, OmniPeek Workgroup, OmniPeek Workgroup Pro, OmniPeek Personal, Omnipliance, OmniSpectrum, PacketGrabber, Peek DNX, ProConvert, ProtoSpecs, RFGripper, RMONGripper, WAN Analyzer Card (WAC), WANPeek NX, WildPackets, WildPackets Academy, and WildPackets OmniAnalysis Platform are trademarks of WildPackets, Inc. All other trademarks are the property of their respective holders.

WildPackets, Inc. reserves the right to make changes in the product design without reservation and without notification to its users.

Contacting WildPackets

Mailing Address

WildPackets, Inc.
1340 Treat Blvd., Suite 500
Walnut Creek, CA 94597

Voice/Fax

8 AM - 5 PM (PST)
(925) 937-3200
(800) 466-2447 (US only)
Fax: (925) 937-3211

info@wildpackets.com

Sales

sales@wildpackets.com

Web

<http://www.wildpackets.com>

Technical Support

<http://www.wildpackets.com/support>

Resources

See <http://www.wildpackets.com/support/resources> for white papers, tutorials, technical briefs and more.

Professional Services

WildPackets offers a full spectrum of professional services, available onsite or remote, to help customers make the most of their network infrastructure investment. The WildPackets Professional Services team stands ready to partner with you to maximize your network performance and to minimize your network downtime. WildPackets technical instructors, network systems engineers, and custom software developers can help you design, build, manage, and secure a better network for your business.

See <http://www.wildpackets.com/services> for course catalog, current public course scheduling, web-delivered courses, and consulting services.

WildPackets Academy
(800) 466-2447
training@wildpackets.com

Product Support and Maintenance

WildPackets Maintenance Programs ensure that you grow along with our products as new features and enhancements are added and that your usage is fully supported by our Technical Services staff.

Enhanced support services are available with remote or onsite consulting. Developer support is also available for customers adding custom enhancements to WildPackets products.

All Maintenance inquiries and purchases can be accommodated by contacting sales@wildpackets.com.

Developer Community

To join the WildPackets Developer Network and gain access to product plugins, plugin wizards, and API documentation, please visit <http://wpsdn.wildpackets.com>.

About WildPackets, Inc.

Since 1990, WildPackets has been developing innovative, high-quality, easy-to-use and valuable solutions to maintain the health and integrity of critical data-in-motion. From the desktop to the datacenter, from wireless LANs to Gigabit backbones, on local segments and across distributed networks, WildPackets products enable IT organizations to quickly find and fix problems affecting mission-critical network services. WildPackets products are sold in over 60 countries through a broad network of channel and strategic partners. More than 5,000 customers across all industrial sectors, including 80% of the Fortune 1000, use WildPackets products daily to troubleshoot networks and maximize network uptime. For further information, please visit www.wildpackets.com.

20070621-E-T1E1_PCMCIA_OP50

Contents

WAN Analyzer Card PCMCIA T1/E1	I
Introduction	1
About the T1/E1 PCMCIA WAC	1
About the T1/E1 Pod	2
System requirements	2
Installing the WAC and Y cable	2
WAC and Y cable bundle contents	3
WAC and Y cable installation	3
Installing the WAC PCMCIA T1/E1 and T1/E1 Pod	4
Front and back panels of the T1/E1 pod	4
Pod bundle contents	6
WAC and T1/E1 Pod installation	6
Driver installation and upgrade	8
Setting the protocol and line provisioning for your WAN	8
WAN protocol selection	8
T1/E1 Pod configuration	9
Troubleshooting	10
LEDs on T1/E1 Pod	10
Technical specifications	11
Supported protocols and physical interfaces	11
T1/E1 Pod RJ-48 pin connections	12
Contacting WildPackets support	12

WAN Analyzer Card PCMCIA T1/E1

Congratulations on your purchase of the T1/E1 PCMCIA WAN Analyzer Card (WAC) from WildPackets! This installation guide explains how to install and configure the T1/E1 PCMCIA WAC with WildPackets software. It also includes a brief guide to troubleshooting the hardware setup.

Introduction

Two hardware bundles are available for purchase, each appropriate for use with a particular range of WAN and customer premises equipment (CPE) setups:

- **WAC and Y cable bundle** (for V.35 links between separate CSU/DSU and router)
- **Pod bundle** (for T1/E1 links to an integrated CSU/DSU/router):
 - factory-configured for T1 (North America, Japan, ROK)
 - factory-configured for E1 (Europe and rest of world)

Note Setup and configuration for T1 and E1 pods are substantially the same. Differences are noted where applicable.

About the T1/E1 PCMCIA WAC

The T1/E1 PCMCIA WAN Analyzer Card is the Wide Area Network interface for Bridge/Router, HDLC, Frame Relay, PPP, ISDN, and legacy WAN links over T1/E1 lines. Used in conjunction with WildPackets analysis software, the T1/E1 PCMCIA WAC provides capture, protocol analysis, decoding and statistics for WAN traffic.

In the WAC bundle, the card captures traffic on the V.35 serial link between the CSU/DSU and the router by means of a Y cable included in the bundle. This allows the WildPackets software to monitor, capture, and analyze the traffic passing to or from the WAN link without interfering with the network.

About the T1/E1 Pod

The T1/E1 Pod is an in-line connection allowing full duplex, non-intrusive monitoring and capture of framed and unframed T1 or E1 data links. The pod works with full and fractional T1 or E1 links. Without interrupting data flow, the T1/E1 Pod streams data for analysis from either selected channels or the entire signal.

In the Pod bundle, the T1/E1 PCMCIA WAC interprets the signals passed to it by the T1/E1 Pod. The T1/E1 Pod itself acts as a passive tap placed on the WAN side of the CSU/DSU.

System requirements

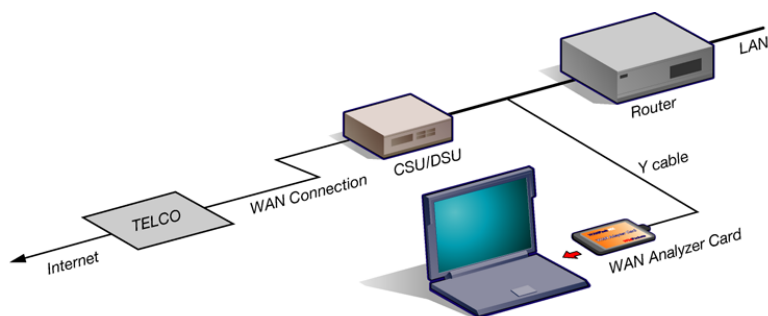
In addition to the system requirements for the WildPackets analysis software, the following is required for use of a T1/E1 PCMCIA WAC:

- a free PCMCIA slot
- (if using the T1/E1 Pod) an available serial port (COM port) with a DB-9 connection.

Note The T1/E1 PCMCIA WAC does not support sending packets over the WAN and cannot be used for network services. In order to use network services, you must have another interface installed.

Installing the WAC and Y cable

This setup is appropriate for a configuration that already includes an external CSU/DSU unit, separate from your router:



WAC and Y cable bundle contents

The T1/E1 PCMCIA WAC and Y cable bundle includes the following items:

- WildPackets software CD
- T1/E1 PCMCIA WAN Analyzer Card
- Y cable (V.35 through connection, with PCMCIA)

Note V.35 is a common high speed serial connection type. For information about Y cable options for other router-to-CSU/DSU serial connections, please see the Readme file.

WAC and Y cable installation

To install the WAC and Y cable:

1. Insert the included CD to install the WildPackets analysis software.
2. Connect the Y cable in-line between your router and the separate CSU/DSU.
3. Disconnect one end of your existing V.35 cable from either your router or your CSU/DSU.
4. Connect one V.35 end of the supplied Y cable to the free end of your V.35 cable.
5. Connect the other V.35 end of the Y cable back to the router or DSU (whichever one you disconnected in the earlier step). This restores the V.35 connection between the CSU/DSU and the router.

Note The Y cable is a passive, pass-through device. You can safely leave the Y cable in place between your router and DSU without interfering with network traffic. Even when the WAC is not connected to the Y cable or when the laptop is powered off, V.35 traffic will flow normally.

6. Attach the PCMCIA connector of the Y cable to the T1/E1 PCMCIA WAC.

Note You must install the software before you insert the T1/E1 PCMCIA WAC into the PCMCIA slot, as the the WildPackets software software installation also places the drivers required for the card on your hard drive.

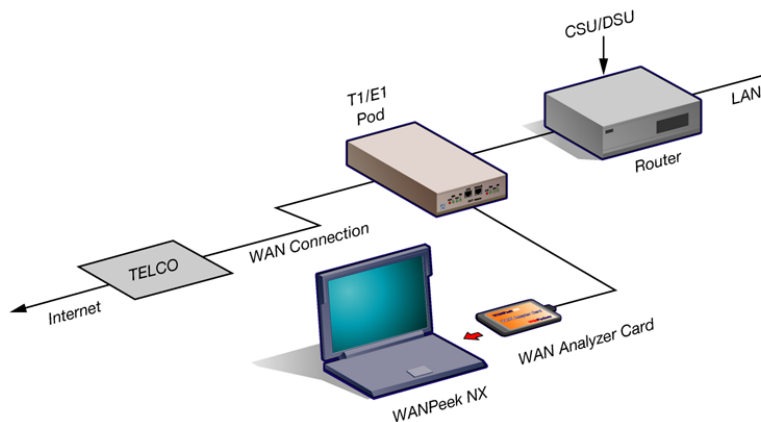
7. Insert the T1/E1 PCMCIA WAC into a free PCMCIA slot in the computer on which you installed the WildPackets software.
8. Follow the instructions for installing the driver when the **Found New Hardware Wizard** window appears.

- Configure the WAC PCMCIA T1/E1 to recognize the basic Link Layer protocol in use on your WAN (for example, PPP, Frame Relay, or X.25). You can do this from within the WildPackets software. See “WAN protocol selection” on page 16.

You are now ready to capture and analyze WAN traffic.

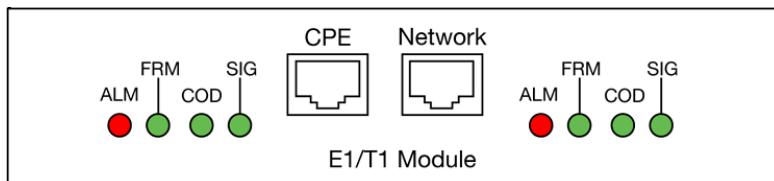
Installing the WAC PCMCIA T1/E1 and T1/E1 Pod

This setup is appropriate for configurations that already include a router with an internal CSU/DSU:



Front and back panels of the T1/E1 pod

The front panel of the T1/E1 Pod provides two RJ-48 ports to allow transparent in-line connection in a T1 or E1 data link. The port on the left is marked *CPE* (Customer Premises Equipment) and the port on the right is marked *Network* (WAN network connection). Input signals presented at one port are passed transparently to the other.



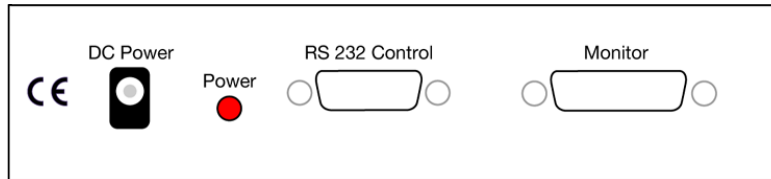
Each port has associated with it four LEDs indicating the status of the input signal at that port. The LEDs to the left of the *CPE* port respond to signals coming from your CSU. In network terms, these signals are travelling in the *to DCE* direction. The LEDs to the right of the *Network*

port respond to signals coming from the T1 or E1 network connection, travelling in the *to DTE* direction.

The following table describes the LEDs on the front panel:

LED	Description
ALM	Alarm Indicator - illuminated (RED) when Alarm Indication Signal (AIS) detected on incoming signal
FRM	Framing Indicator - illuminated (GREEN) when frame alignment achieved on incoming signal
COD	Coding Indicator - illuminated (GREEN) when correct signal coding detected on incoming signal
SIG	Signal Indicator - illuminated (GREEN) when input signal detected

The back panel of the T1/E1 Pod provides a socket for *DC Power* input and a *Power* indicator LED. The *RS 232 Control* port provides a DB-9 serial connection to the computer on which the WildPackets software is running. This connection is used to configure the T1/E1 Pod from the WildPackets software. The *Monitor* port is a DB-15 connection on which the data from the selected channels is output to the T1/E1 PCMCIA WAC and the WildPackets software for analysis. The T1/E1 Pod is supplied with an approved power supply and appropriate cables to connect into these back panel ports.



The following table describes the ports and LED on the the back panel:

Item	Description
DC Power	9V DC power input socket (for use with provided power supply)
Power	Power Indicator LED- illuminated (GREEN) when input power detected

Item	Description
RS 232 Control	9 pin D-type female connector for connection to the computer on which the WildPackets software is running.
Monitor	15 pin D-type female connector to output monitored data to T1/E1 PCMCIA WAC and the WildPackets software

Pod bundle contents

The Pod bundle includes the following items:

- WildPackets software CD
- T1/E1 PCMCIA WAC
- T1/E1 Pod
- DB-15 to PCMCIA stub cable
- DB-9 serial cable
- power supply (9v DC)
- RJ-48 cable

Note The T1/E1 Pod is shipped preconfigured for either T1 or E1 line provisioning, depending on your order.

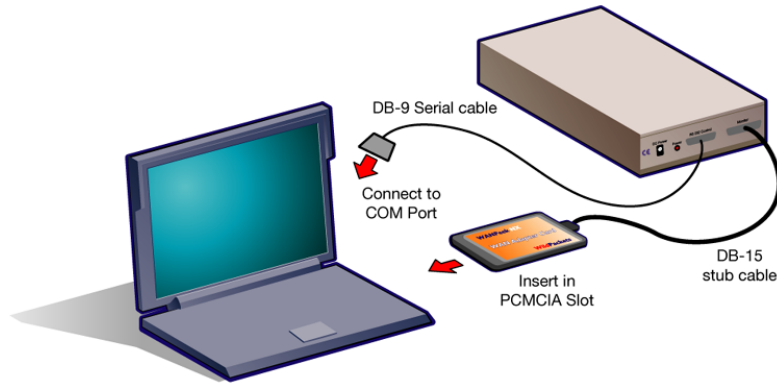
WAC and T1/E1 Pod installation

To install the WAC and T1/E1 Pod:

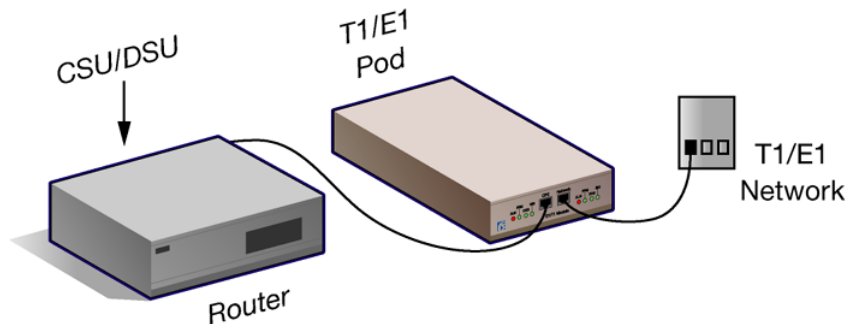
1. Insert the included CD to install the WildPackets software.
2. Connect the T1/E1 Pod to your computer.
3. On the back panel of the T1/E1 Pod, connect the DB-15 stub cable from the *Monitor* jack to the T1/E1 PCMCIA WAC.

Note Do not insert the card into the PCMCIA slot until after you have installed the the WildPackets software software. The software installation puts the drivers required by the card on the hard drive.

4. Connect the DB-9 serial cable from the *RS 232 Control* serial jack to the COM port on the laptop.



5. Connect the T1/E1 Pod in-line between your T1 or E1 network connection and your CSU/DSU.
6. On the front panel of the T1/E1 Pod, connect the *CPE* RJ-48 jack to the router containing the CSU/DSU.
7. On the front panel of the T1/E1 Pod, connect the *Network* RJ-48 jack to the T1 or E1 network connection.



8. Power on the T1/E1 Pod by connecting the 9v DC power supply into the socket marked *DC Power*.

Note There is no separate power switch. When you plug the unit into a power supply, it is powered on, as indicated by the *Power* LED.

9. Insert the T1/E1 PCMCIA WAC into a free PCMCIA slot in the computer on which you have installed the WildPackets software.
10. Follow the instructions for installing the driver when the **Found New Hardware Wizard** window appears.
11. Configure the T1/E1 PCMCIA WAC to recognize the Link Layer protocol in use on your WAN. See *WAN protocol selection* on page 8.
12. Configure the T1/E1 Pod to match your WAN line provisioning (channels and framing). See *T1/E1 Pod configuration* on page 9.

You are ready to begin using the WildPackets software to capture, monitor and analyze traffic on the WAN connection you have just defined.

Driver installation and upgrade

The T1/E1 PCMCIA WAC requires a special NDIS driver in order to be used with the WildPackets software. This driver is placed on your hard drive during the installation of the the WildPackets software software. You must install the driver in order to use the card.

For information on the installation or upgrade of the WAC driver with your operating system, see the Readme file located in the Drivers folder in the program directory or visit <http://www.wildpackets.com/support/omni/overview>.

Setting the protocol and line provisioning for your WAN

You must configure hardware and program to match the configuration of your WAN by setting the correct Link Layer protocol. If you are using the T1/E1 Pod, you must also configure the T1/E1 Pod to match the line provisioning on your WAN connection.

WAN protocol selection

The T1/E1 PCMCIA WAC can recognize many basic Link Layer WAN protocols, including PPP, Frame Relay, and X.25. Only one WAN protocol will be in use on any particular WAN. In order for the WildPackets software to correctly interpret traffic, you must set the correct protocol for your WAN connection. You should also set the correct line speed, matching the nominal raw data rate for your particular connection. You can do this from within the WildPackets software.

1. Open the **Monitor Options** or the **Capture Options** dialog.
2. Click *Adapter* in the navigation pane.
3. Select the T1/E1 PCMCIA WAC listed under *Local machine* as a *Local Area Connection*.

4. Click *WAN* in the navigation pane.
5. Choose your WAN protocol.
6. Click **OK** to accept your changes.

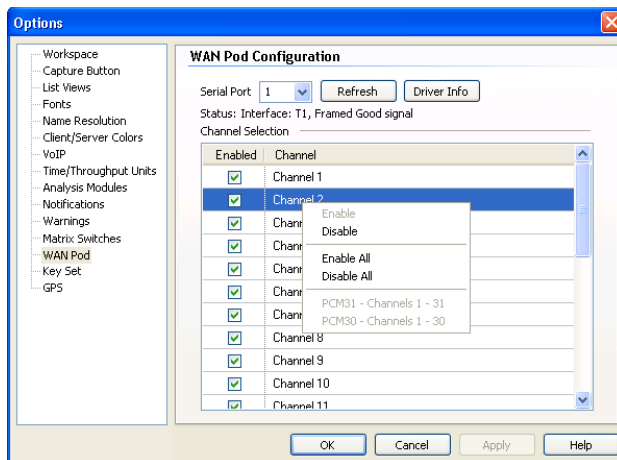
Note The WildPackets software will automatically sense the network speed appropriate to a full bandwidth implementation of the line provisioning you have specified. Alternatively, you can enter a different setting in the **Network Speed** dialog, but we recommend that you use the nominal raw line speed appropriate to your connection: for example, 1544 for full T1 or 2048 for full E1. See the Wild Packets software *User Guide* or online help for more information.

Note For a list of supported WAN protocols, see *Supported protocols and physical interfaces* on page 11.

T1/E1 Pod configuration

You must configure the T1/E1 Pod to match the line provisioning (channels and framing) used on your WAN connection. You must do this from within the WildPackets software, with the T1/E1 Pod fully connected and powered on.

1. Choose **Tools > Options...** in the WildPackets software main program window. The **Options** dialog appears.
2. Click *WAN Pod Configuration* in the navigation pane.



3. Choose the *Serial Port* you are using to communicate with the T1/E1 Pod.

4. Click the **Refresh** button to make sure you have established the connection to the T1/E1 Pod.

The *Status* information will update to show the current settings for the T1/E1 Pod (*T1* or *E1*, *Framed* or *Unframed*) and the connectivity status (*Good* or *Bad*) of the two sides of the pod (*A* and *B*). The *A* side is the *CPE* jack, connected to your CSU/DSU. The *B* side is the *Network* jack, connected to the T1/E1 line). The T1/E1 Pod automatically detects the framing in use on your T1 or E1 line.

Tip For information about the driver used to communicate with the T1/E1 Pod, click the **Driver Info** button to display the **T1/E1 Pod Support Information** dialog.

5. Select which channels the T1/E1 Pod should monitor:
 - For full T1, make sure there is a check mark in the **Enabled** column for every channel. You can right-click and choose **Enable All**.
 - For E1, you can right-click and choose either of two widely used line provisioning schemes to automatically select the correct channels: **PCM31 Channels 1 - 31**, and **PCM30 Channels 1 - 30**. (In E1 networks, Channel 0 is always included, and is therefore not shown in the *Channel Selection* pane.)
 - For Fractional T1, Fractional E1, or ISDN (other than full PRI, which uses all 24 channels of the T1), select the channels assigned to you by the organization that provisioned the line.
6. Click **OK** to accept your changes. (Click **Apply** to send your changes without closing the dialog.)

Troubleshooting

The following are some examples of how to interpret the LEDs on the T1/E1 Pod to troubleshoot potential problems.

LEDs on T1/E1 Pod

- The Signal light on the front panel is not illuminated. This could have several causes:
 - If no lights are illuminated, check that the power cord is plugged into the electrical outlet.
 - Check that the correct cables are used and that they are properly connected.
 - Check that the router (with the internal CSU/DSU) is properly configured to the correct channels.

- The Signal light on the front panel is illuminated, but the Framing light is not (when using framed T1/E1 data links).
 - Check that the router is in agreement with the carrier service agreement (line provisioning) and that the proper channels are configured.
- The Alarm light is illuminated (RED):
 - If this is the Alarm light on the *CPE* side, check the timing configuration of the router.
 - If this is the Alarm light on the *Network* side, check with the service provider for this network—something may be wrong with the T1/E1 line.

Technical specifications

Supported protocols and physical interfaces

	Supported and tested	Supported but not tested
Protocols and Decodes	Frame Relay PPP HDLC X.25	ISDN BRI and PRI Q.921 / Q.931
Physical Interface (DSU/router)	V.35	X.21 (V.11, RS.422) 15-pin D connector V.24 (RS.232C) 25-pin D connector RS.449 37-pin D connector RS.530 25-pin D connector V.35 34-pin Winchester connector
Physical Interface (from Telcos)	T1 Fractional T1	E1 E1/G703 Fractional E1 ISDN PRI and BRI

TI/EI Pod RJ-48 pin connections

RJ 48 Connector	CPE jack	Network jack
1	Tx	Rx
2	Tx	Rx
3	Rx	Tx
4	Rx	Tx

Contacting WildPackets support

Please contact WildPackets support at <http://www.wildpackets.com/support/contact> if you have any questions about the installation and use of the WildPackets hardware and software.

An RMA (Return Material Authorization) number must be obtained from WildPackets before returning hardware. Please contact WildPackets support at <http://www.wildpackets.com/support/contact> to obtain an RMA number.