



OTX Driver Installation Guide

(for OTX PCI, PCIe, PCMCIA,
and ExpressCard Adapters)

Doc. No. 1512-1-HCA-1001-1

Rev. 1.5

June 21, 2010



Copyright

© Copyright 2010, Odin TeleSystems, Inc. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written consent of Odin TeleSystems Inc., 800 East Campbell Road, Suite 334, Richardson, Texas 75081, U. S. A.

Trademarks

Odin TeleSystems, OTX, OTX Driver, Thor, Gimle, Sleipnir, Alvis, Godar, the Odin Logo, are trademarks of Odin TeleSystems Inc., which may be registered in some jurisdictions. Windows is a registered trademark of Microsoft Corporation. Linux is a registered trademark of Linus Torvalds. Other trademarks are the property of their respective companies.

Changes

The material in this document is for information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, Odin TeleSystems Inc., assumes no liability resulting from errors or omissions in this document, or from the use of the information contained herein.

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

Warranties

THE PRODUCT AND ITS DOCUMENTATION ARE PROVIDED “AS IS” AND WITHOUT WARRANTY OF ANY KIND. ODIN TELESYSTEMS EXPRESSLY DISCLAIMS ALL THE WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE. ODIN TELESYSTEMS DOES NOT WARRANT THAT THE FUNCTIONALITY OF THE PRODUCT WILL MEET ANY REQUIREMENTS, OR THAT THE OPERATIONS OF THE PRODUCT WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT DEFECTS WILL BE CORRECTED. FURTHERMORE, ODIN TELESYSTEMS DOES NOT WARRANT OR MAKE ANY REPRESENTATIONS REGARDING THE USE OF THE PRODUCT OR ITS DOCUMENTATION IN TERMS OF THEIR CORRECTNESS, ACCURACY, RELIABILITY, OR OTHERWISE. NO ORAL OR WRITTEN INFORMATION OR ADVISE GIVEN BY ODIN TELESYSTEMS OR ODIN TELESYSTEMS’ AUTHORIZED REPRESENTATIVE SHALL CREATE A WARRANTY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION MAY NOT APPLY.

UNDER NO CIRCUMSTANCE SHALL ODIN TELESYSTEMS INC., ITS OFFICERS, EMPLOYEES, OR AGENTS BE LIABLE FOR ANY INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF BUSINESS, PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT AND ITS DOCUMENTATION, EVEN IF ODIN TELESYSTEMS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL ODIN TELESYSTEMS’ LIABILITY FOR ANY REASON EXCEED THE ACTUAL PRICE PAID FOR THE PRODUCT AND ITS DOCUMENTATION. SOME JURISDICTIONS DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY.



Table of Contents

1	Abstract	4
2	System Requirements	5
3	Hardware Installation	5
3.1	Handling Instructions	5
4	OTX Driver for Windows® Based Systems	6
4.1	Distribution	6
4.2	Installation.....	6
4.3	Querying Driver Information	9
4.4	Replacing an Existing Driver with a Newer Version	12
5	Driver for Linux Based Systems.....	14
5.1	Distribution	14
5.2	Building the Linux x86 systems Driver	14
5.3	Installing the Linux x86 systems Driver	15
6	Connecting Line Interfaces.....	16
7	Testing the Functionality	18
7.1	Simple Test using ThorDemo	18
7.2	Detailed Test using the OTX T1/E1 Analyzer in BERT Testing mode	21
8	References.....	27
9	Document History	28
10	Glossary	29



1 Abstract

This document describes how to:

- Install an OTX PCI / PCI-Express (PCIe) / PCMCIA (PC Card) / ExpressCard/54 Adapters into a PC
- Install the OTX Generic Hardware Driver for the OTX Adapter

NOTE: Current version of OTX Driver is 2.42.1 (“OtxDrv2.42.1.0Wdm” for Windows and “OtxDrv2.42.1.0Linux.tar” for Linux operating systems). You can download the latest version of OTX Driver at [Odin TeleSystems support Web Site](#)

The OTX PCIe cards are plug-and-play compliant adapters allowing PCs and other PCI-Express based systems to be connected to a variety a network interfaces. Examples of OTX PCI-Express Adapters are:

- Gimle-16-PCIe: 16 T1/E1 Probe Adapter
- Alvis-PCIe: PCIe DSP Resource Board
- Godar-2-PCIe: 168 T1/126 E1 framers OC-3/STM-1 Board

The OTX ExpressCards are hot swappable and plug-and-play compliant adapters allowing laptops and other mobile devices to be connected to a variety a network interfaces. Examples of OTX ExpressCard Adapters are:

- Thor-2-ExpressCard: Dual T1/E1 ExpressCard Adapter
- Thor-4-ExpressCard: 4 T1/E1 ExpressCard Adapter

The OTX PCI cards are plug-and-play compliant adapters allowing PCs and other PCI based systems to be connected to a variety a network interfaces. Examples of OTX PCI Adapters are:

- Thor-8-PCI-Plus-2.0: Eight Access T1/E1 Adapter
- Arni-6x6-PCI-Plus: 8 FXO + 8 FXS Analog Phone Adapter
- Gimle-16-PCI-Plus: 16 T1/E1 Probe Adapter
- Vidar-5x16-PCI: PCI DSP Resource Board
- Sleipnir-1-PCI-Plus: Single T1/E1 Probe Adapter

The OTX PCMCIA cards are hot swappable and plug-and-play compliant credit-card sized adapters allowing laptops and other mobile devices to be connected to a variety a network interfaces. Examples of OTX PCMCIA Adapters are:

- Thor-2-PCMCIA: Dual T1/E1 PCMCIA Adapter
- Balder-2S-PCMCIA: Dual BRI S/T-Interface PCMCIA Adapter



2 System Requirements

It is recommended that the OTX PCI / PCI-Express / PCMCIA / ExpressCard adapter is used in a system satisfying the following requirements:

- Free PCI / PCI-Express / PCMCIA Release 2.1 / Express-Card/54 slot
- Pentium III, or later processor
- Windows 2000, Windows XP, Windows 2003 Server, Windows Vista, Windows Server 2008, Windows 7, or Linux operating system

3 Hardware Installation

3.1 Handling Instructions

The OTX PCI / PCI-Express / PCMCIA / ExpressCard card has been packaged in a sealed anti-static bag for protection during shipping and handling. Always remember to follow precautions regarding handling of electrical equipment while installing the card into a PCI / PCI-Express / PCMCIA / ExpressCard slot. Be aware of the possibility of damage to the sensitive electrical devices from static electricity discharge.

NOTE! Before installing the PCI / PCIe adapter into the PCI / PCIe slot, turn off the power on the PC.

Please wear anti-static protection devices such as a ground strap connected to a grounded equipment frame while handling the OTX PCI / PCI-Express / PCMCIA / ExpressCard adapter. Never bend the card and never use force when installing and removing the card to and from a PCI / PCI-Express / PCMCIA / ExpressCard slot.

After the card has been inserted into a PCI / PCI-Express / PCMCIA / ExpressCard slot, please continue with the driver installation.

NOTE! Do not remove PCMCIA / ExpressCard adapters after the “Found New Hardware” message and before the OTX Driver installation.

The OTX Driver installation procedure is explained the following chapter.



4 OTX Driver for Windows® Based Systems

The list of the supported operating systems is represented below:

- Windows 2000
- Windows XP
- Windows 2003 Server
- Windows Vista
- Windows Server 2008
- Windows 7

These operating systems support the Plug-and-Play (PnP) standard and the Windows Driver Model (WDM).

A Plug-and-Play compliant system automatically assigns the card the resources it required (I/O address space, memory address space, and IRQ) and configured the card accordingly. This makes the OTX Driver installation an especially easy process regardless of the system the card is used in.

The Windows Driver Model is a generic driver model that is supported by a number of Windows based Operating Systems ranging from Windows 2000 to Windows 7.

4.1 Distribution

The OTX Driver for Windows 2000, Windows XP, Windows 2003 Server, Windows Vista, Windows Server 2008, and Windows 7 distribution consists of three files:

File	Description
OtxDrv.sys	Windows Driver Model (WDM) Driver
OtxHwDll.dll	Windows Dynamic Linked Library containing the API functions for the OTX HW SDK
OtxDrv.inf	Windows Installation Script file

Table 1 The OTX Driver for Windows 2000, Windows XP, Windows 2003 Server, Windows Vista, Windows Server 2008, and Windows 7 Distribution.

The latest OTX Driver distribution for Windows based systems available at <http://odints.com/pages/support/drivers/otx/winmain.htm>.

4.2 Installation

NOTE! Before installing the OTX Driver, please disable BIOS settings like HW Prefetcher, Adjacent Cache Line Prefetch, and C1 Enhanced Mode. To disable these settings, go to the BIOS Setup when prompted at boot-time and select **Advanced Settings -> CPU** and set **HW Prefetcher, Adjacent Cache Line Prefetch, C1E Support** to **Disabled**. Please note that the BIOS settings varies from system to system and that all of these settings might not be available in on your particular

system.

After the OTX PCI / PCI-Express / PCMCIA / ExpressCard adapter has been added to a system for the first time, the operating system will detect that new hardware has been added, and will display the “Found New Hardware Wizard” to the user, as shown in Figure 1.



Figure 1 Found New Hardware Wizard.

This document uses Gimle-16-PCIe board as an example. However, the installation procedure is the same for all of the OTX PCI / PCI-Express / PCMCIA / ExpressCard adapters.

The actual dialogs displayed to the user may vary between different versions of Windows 2000, Windows XP, Windows 2003 Server, Windows Vista, Windows Server 2008, and Windows 7. However, the essence of the installation procedure is always the same as demonstrated in the example in this chapter.

Windows 2000 operating system will ask whether you want to search for the best driver or whether you want the system to display all the drivers available. In these operating systems select the recommended search option to let the operating system automatically find the best and the latest driver for the card.

In Windows 2003 Server and Windows XP the first dialog for the Add New Hardware Wizard ask you if you want to connect to Windows Update to search for software. You should choose the “No, not at this time” option (See Figure 1). Then you click “Next” button and on the second dialog you choose “Install from a list or specific location (Advanced)” (See Figure 2).

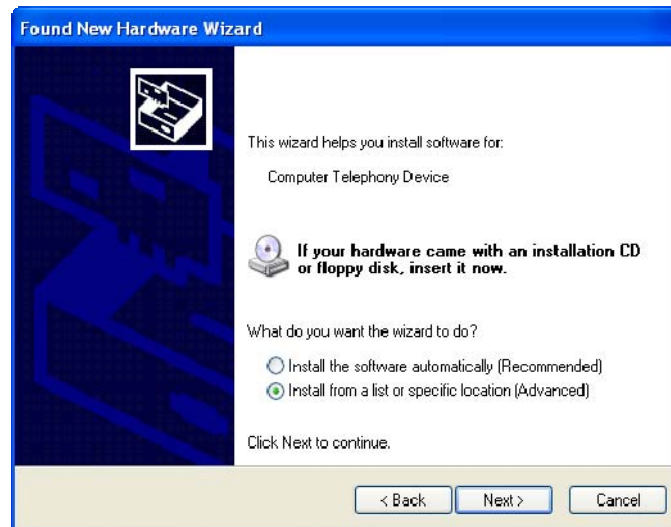


Figure 2 Driver search options.

The next dialog presented to the user the operating system will ask for the search path for the driver. If you have received the OTX Hardware Driver on an installation disk, insert the disk into the CD drive and specify the appropriate drive letter in the dialog shown in Figure 3 (or similar dialog). If you have downloaded the driver from the internet, please specify the location (folder) where you have downloaded and unpacked the driver files.



Figure 3 Specifying the search path for the OTX Driver.

Once the search path for the driver has been provided to the operating system, click “Next” button and Windows will install the driver to you system, as shown in Figure 4 (or similar dialog).

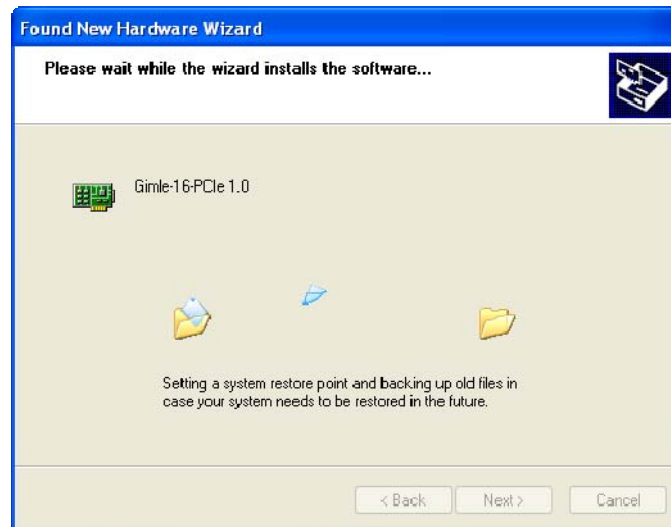


Figure 4 Installing the OTX Driver.

The driver file (OtxDrv.sys) will be copied to the Windows SYSTEM32\DRIVERS directory, the dynamic link library file (OtxHwDll.dll) will be copied to the Windows SYSTEM32 directory, and the system registry will be updated so that the system will from now on automatically use the OTX Driver for the OTX PCIe adapter. Once you see the dialog shown in Figure 5, congratulations are in order. You have successfully installed the driver for your OTX PCI-Express adapter.



Figure 5 Installation completed.

4.3 Querying Driver Information

Once both the OTX Driver has been installed and OTX PCIe card has been inserted in a PCIe slot, the card will be listed in under the Windows Device Manager (as shown in Figure 6). The device manager can be started through the System Applet in the Windows Control Panel.

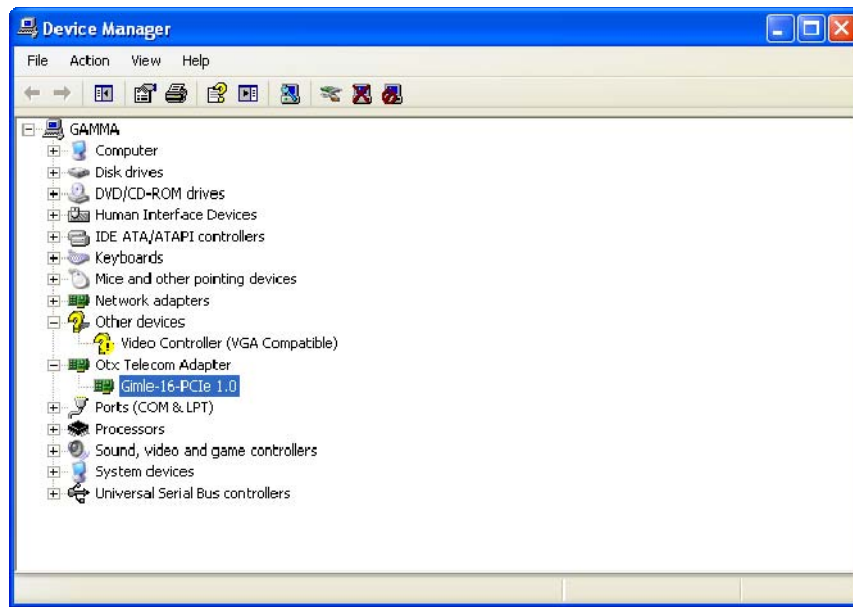


Figure 6 Installed OTX Telecom Adapters are listed as their own device type in the Windows Device Manager.

By highlighting the OTX PCI-Express adapter and by clicking the “Property” button, the user can retrieve useful information on the adapter and the driver. Under the “General” tab Windows will show the device status (See Figure 7). The device status will indicate whether the card and the driver are functioning properly.



Figure 7 Checking the status of the OTX Adapter and the OTX Driver.

By clicking the “Driver” tab and the “Driver File Details” button, one can verify the revision of the currently installed driver, as demonstrated in Figure 8 and Figure 9.



Figure 8 Checking driver information.

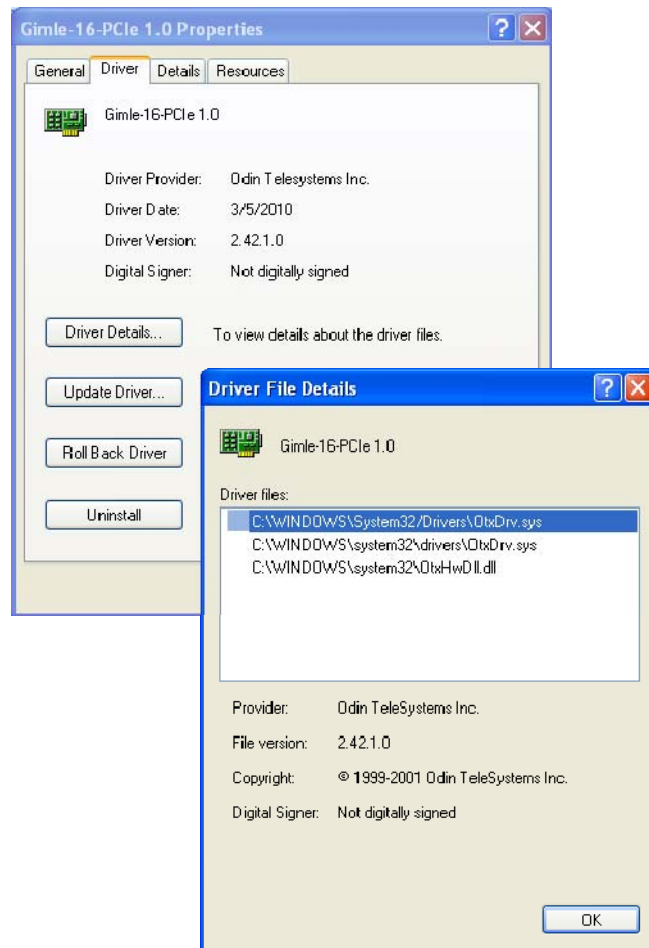


Figure 9 Checking the Revision of the installed driver.

See the OTX Adapter hardware details at the “Details” tab of the “Properties” window (See Figure 10).

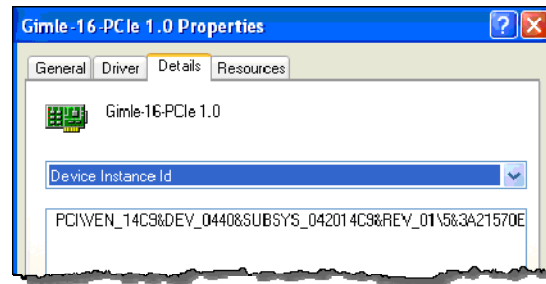


Figure 10 The OTX Adapter details.

The “Resources” tab can be used to display the resources (I/O address space, memory address space, IRQ) occupied by the OTX Adapter (See Figure 11). The resource tab will also display if resource conflicts exists with other installed hardware.

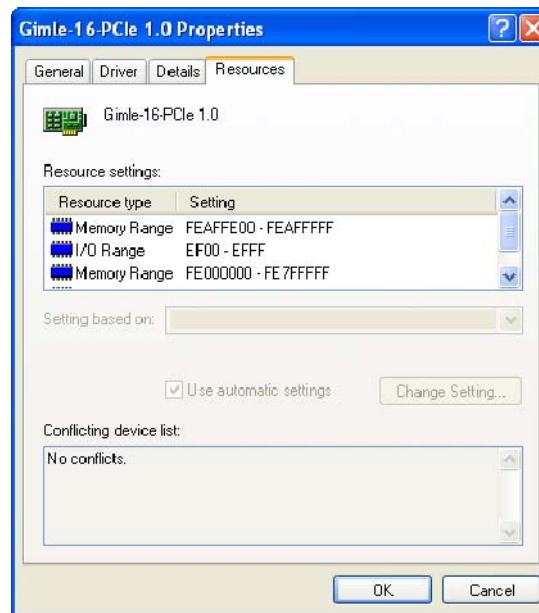


Figure 11 Resources used by the OTX Adapter.

4.4 Replacing an Existing Driver with a Newer Version

To update an exiting driver with a newer revision, perform the following steps:

1. Start System Applet from the Windows Control Panel.
2. In Device Manager, view the properties of the appropriate OTX Adapter.



3. In “Properties” Dialog, select “Driver” tab and press the “Update Driver...” Button.

You will be presented the “Update Device Driver Wizard.” Follow the steps of the update wizard. The update process and the dialogs are similar to the ones demonstrated for the “Found New Hardware Wizard” in 4.2: “Installation”.

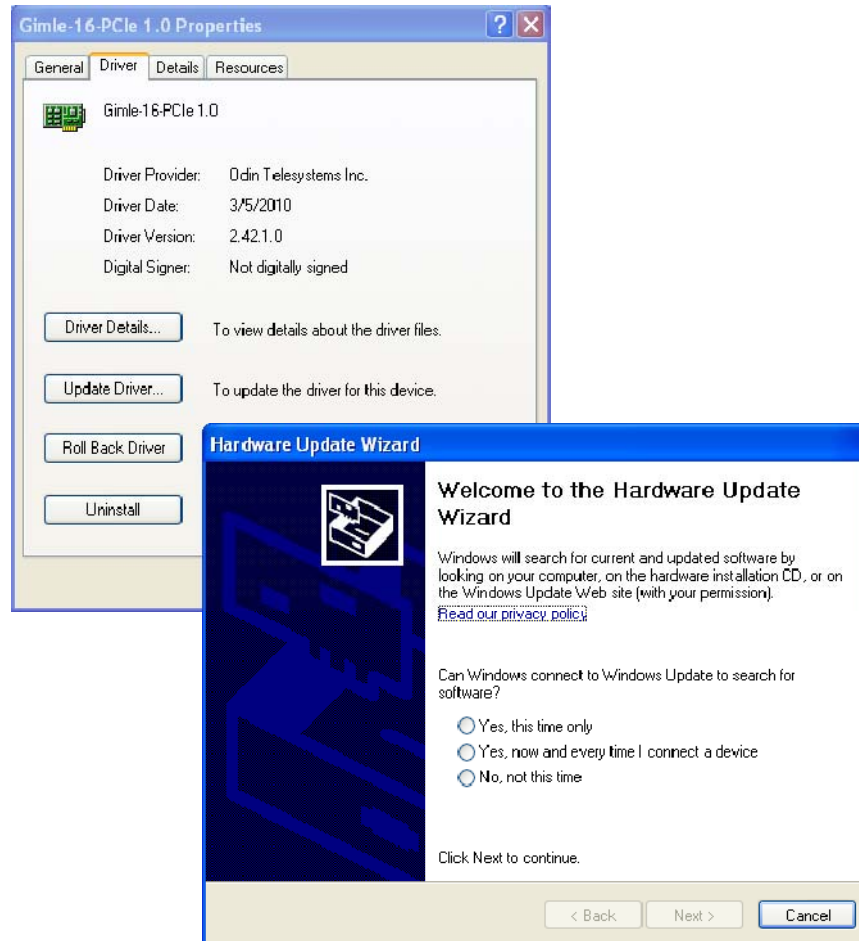


Figure 12 Updating an already installed driver.



5 Driver for Linux Based Systems

5.1 Distribution

The OTX Driver for Linux consists of a set of precompiled libraries and source files. The source files are provided for functions that may be dependant on the Linux kernel revision. The source files can be modified to work with a specific Linux kernel version.

The OTX Linux Driver is built and tested on CentOS which is based on Red Hat Enterprise Linux.

The latest OTX Driver distribution for Linux systems available at <http://odints.com/pages/support/drivers/otx/linuxmain.htm>.

5.2 Building the Linux x86 systems Driver

Before the OTX Linux x86 systems Driver can be installed, it needs to be compiled and linked.

To build the OTX Linux x86 systems Driver, perform the following steps:

1. Decompress the OTX Linux Driver package into a working directory using a command:

```
tar -zxvf OtxDrv<version>Linux.tar.gz
```

2. In your working directory, run the following command to build the OTX Linux x86 systems Driver:

```
make
```

3. The driver ("OtxDrv.ko") will produced in the directory:

```
Sys/OtxDriver/Linux/i386/uprel/2.6-ccx (x = 3 or 4)
```

"BuildDrv.txt" in OTX Linux x86 systems Driver package has more details on procedure of how to build OtxDrv and other useful information.



5.3 Installing the Linux x86 systems Driver

To install a driver you must be logged into your Linux system as root.

To install the driver, use command *insmod*:

```
/sbin/insmod Sys/OtxDriver/Linux/i386/uprel/2.6-ccx/OtxDrv.ko
```

To uninstall the driver, use command *rmmod*:

```
/sbin/rmmod OtxDrv.ko
```

Again, BuildDrv.txt in OTX Linux x86 systems Driver package has more information on installation and removal of driver.

6 Connecting Line Interfaces

The line interfaces on the OTX PCI / PCIe adapters are typically connected to a Harmonica module, as illustrated in Figure 13. The harmonica module typically has several RJ-11 connectors for the external line interfaces, handsets, external synchronization clocks, and other resources.

For more information on the particular Harmonica module, please refer to the Technical Description for the specific board.

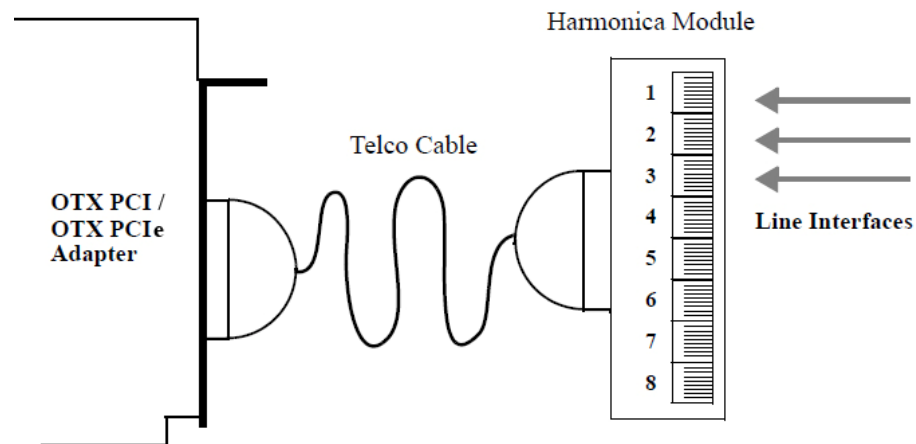


Figure 13 OTX PCI / PCIe Adapter external line interface connections.

The line interfaces on the OTX PCMCIA adapters are typically connected through dongles. The dongles contain the protection circuitry designed to protect the adapter and the PC from power surges and currency spikes possibly transported through the network interfaces. The dongles typically have one RJ-45 connector for the external line interface and one 15-pin I/O-connector for connecting to the board. A typical OTX PCMCIA configuration is shown in Figure 14.

For the specific details on the line interface connectors, please refer to the Technical Description document for the specific OTX PCMCIA Adapter.

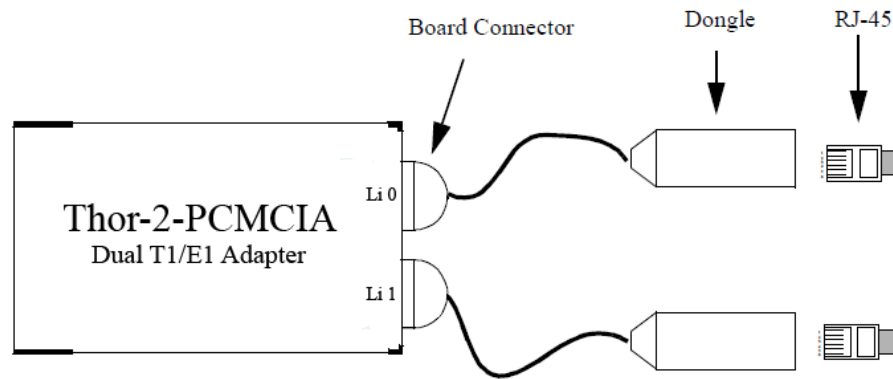


Figure 14 Example of OTX PCMCIA external line interface connections.

The line interfaces on the OTX ExpressCard adapters are connected through RJ-45 connectors located directly on the card. Please see Figure 15.

For the specific details on the line interface connectors, please refer to the Technical Description document for the specific OTX ExpressCard Adapter.

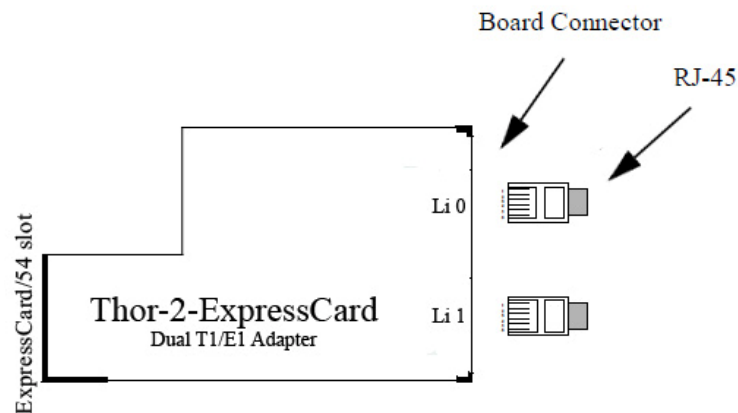


Figure 15 Example of OTX ExpressCard external link interface connections.



7 Testing the Functionality

After successful OTX Driver installation, please perform a performance test to be sure the OTX Adapter is working well.

In this chapter we will use Thor-8-PCI-Plus board (connected with a harmonica) in E1 mode as an example. However, the test procedure is the same for all of the OTX PCI / PCI-Express / PCMCIA / ExpressCard Adapters.

NOTE: The OTX T1/E1 hardware connects to the T1/E1 spans via RJ45 connectors. These connectors are either placed directly on the back of the board (like in the case of Thor-2-ExpressCard and Sleipnir-1-PCI-Plus boards), or the connector is placed in a Harmonica (like in the case of the OTX PCI/PCIE boards), or dongle (like in the case of the OTX PCMCIA boards) that connects to the OTX board via an Odin supplied cable.

There are 2 ways to test the stability of OTX Adapter:

- Using the ThorDemo console demo application;
- Using the OTX T1/E1 Analyzer BASIC in a BERT testing mode.

7.1 Simple Test using ThorDemo

The ThorDemo program is running on all OTX-compatible adapters of Odin TeleSystems. This program is supplied in the OTX HW SDK package. To perform a simple test, please follow these steps:

1. Connect two E1 spans on a harmonica connected to Thor-8-PCI-Plus-2.0 board with a RJ45 Loop Cable. For example, plug Loop Cable between Li0 and Li1.

NOTE: The RJ-45 Loop Cable is included in the Thor-8-PCI-Plus-2.0 package.

2. Download the latest version of OTX Win32 SDK from [Odin TeleSystems Support Web Site](#).
3. Unzip it.
4. Run the ThorDemo program with the following parameters (See Figure 16) to perform a diagnostic of the Thor-8-PCI-Plus board:

Demos\Thor2Pci\ThorDemo\W32\Release\ThorDemo.exe /TP /ME



```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\vk>cd C:\Documents and Settings\vk\Desktop\OtxDrvSdk2.42.1.0\Win32\Demos\Thor2Pci\ThorDemo\W32\Release

C:\Documents and Settings\vk\Desktop\OtxDrvSdk2.42.1.0\Win32\Demos\Thor2Pci\ThorDemo\W32\Release>ThorDemo /TP /ME
```

Figure 16 Run ThorDemo program on Thor-8-PCI-Plus-2.0 in E1 mode.

These parameters mean that we run demo on Thor-8-PCI-Plus board in E1 mode.

The arguments can be one of the following:

/T|T|E|4|P|S|H|I|C|R|D|K|X|Q|A - Board Type used for the demo, where:

- T** – use Thor-2-PCI-Plus Board;
- E** – use Thor-2-PCI-Express Board;
- 4** – use Thor-4-PCI-Plus Board;
- P** – use Thor-8-PCI-Plus Board;
- S** – use Sleipnir Board;
- 1** – use Thor-1-PCI-Plus Board;
- C** – use Thor-2-ExpressCard Board;
- R** – use Thor-4-ExpressCard Board;
- D** – use Alvis-4-CSI board,
- K** – use Alvis-4M-CSI board,
- X** – use Alvis-8-CSI board,
- Q** – use Alvis-8M-CSI board,
- A** – use Alvis-DMP (hosted on ASM or PCIe).

/ME – use E1 Li mode;

/MT – use T1 Li mode.

5. Input 'h' for getting help. The following window will appear (See Figure 17):



```

Cmd  Synopsis
===  =====
?    Display Help text
h    Ditto
q    Quit
@-1  Select active Li, this line is then used for subsequent commands
t    Send a HDLC fram on the current Li
e/E  Enable/Disable current Li
c    Set Clock Source
s    Display the SS7 HDLC receive status of the active Li
l    Query Line Status of both Lis
C    Query Line Status of both Lis <extended>
a    Start/Stop Sending AIS <All 1's> on current Li
A    Start/Stop Sending Remote <Yellow> alarm on current Li
f    Force Resynchronization on both Lis
b    Reset Current HDLC Receiver
B    Reset Current E1T1 device
z    Set T1E1 Line Termination
Z    Toggle front end Amplifier ON or OFF for current Li
*    Set Line Build Out <T1 mode only>
&    Read receive equalizer status
J    Set Receive Input Threshold for current Li
p    Set Loopback mode
o    Buffer 10 HDLC frames to be transmitted, then Flush the HDLC Sender
g    Get current time
m/M  Enable/Disable Monitor mode
L    Set HDLC Frame length to be transmitted
I    Measure T1/E1 span voltage for current Li
;    Set AUX LED state
'    Set SS7 Frame Filter
v    Toggle verbose HDLC reception <g_bHdlcVerbose=TRUE>
;    Toggle HDLC payload check <g_bHdlcPayloadCheck=TRUE>
+    Set number of consecutive frame to be send from the HDLC Sender
S    Set time to sleep <in ms> between transmitted HDLC Frames <0>
!    Customize transmit pulse shape for current Li
@    Set idle pattern to 0x01 <to facilitate pulse shape testing>
k/K  Turn Amp On/Off for current dongle <HMA-1079-2-1.0 dongle only>
F    Query line frequency of the current clock source
P    Report only significant Li status messages

```

Figure 17 ThorDemo Help.

6. To check the line status of Lis press 'l' (See Figure 18).

```

Line status of Li #0 is OK
Line status of Li #1 is OK
Line status of Li #2 is DOWN
Line status of Li #3 is DOWN
Line status of Li #4 is DOWN
Line status of Li #5 is DOWN
Line status of Li #6 is DOWN
Line status of Li #7 is DOWN

```

Figure 18 Line status (Li0-Li1 Loop Back).

In the normal situation, the Line status of both Li0 and Li1 should be "OK". Please move the Loop Back cable to Li2-Li3, ..., Li6-Li7 respectively. When you press 'l', you should see that the spans which have the Loop Back cable connected should have a Line status of "OK", and all unconnected spans should have a Line status of "DOWN". (See Figure 19)



```
Line status of Li #0 is DOWN
Line status of Li #1 is DOWN
Line status of Li #2 is OK
Line status of Li #3 is OK
Line status of Li #4 is DOWN
Line status of Li #5 is DOWN
Line status of Li #6 is DOWN
Line status of Li #7 is DOWN
```

Figure 19 Line status (Li2-Li3 Loop Back).

7. Move the Loop back cable back to Li0/Li1. Send an HDLC frame from Li0 by pressing 't' (See Figure 20).

If the frame is received without errors, you could see a received HDLC test message 00 01 02 03 04 05 06 07 08 09. It means that E1/T1 Layer1 interface physics is working and the OTX Driver was installed properly.

```
Sending 1 HDLC frame(s) from Li #0 <len=10> ...Done <BusyCount=0, time=0.0 seconds>.
06-02 11:54:35.428 1 HDLC Frame(s) Received, Sequence Number = 1
HdlcReceiver[1] Len=10, Fe=0x00, Sq=1: 00 01 02 03 04 05 06 07 08 09
```

Figure 20 Sending HDLC frame.

7.2 Detailed Test using the OTX T1/E1 Analyzer in BERT Testing mode

1. Download Trial version of T1/E1 Analyzer from [Odin TeleSystems support Web Site](#).
2. To install the OTX T1/E1 Analyzer run the “OTX T1/E1 Analyzer <version>.exe” file and follow the Setup Wizard steps. For more detailed information of T1/E1 Analyzer installation process, please refer to the OTX T1/E1 Analyzer Installation Guide.

NOTE: Versions of the OtxDrv and OTX T1/E1 Analyzer should be compatible. If the versions do not match you will get a warning message indicating a version mismatch.

3. In Figure 21 the “Thor-8-PCI-Plus (Board 0)” label is high-lighted (filled



blue). This means that the active scope is at the Board level. To switch all of the Li's to E1 mode click the "E1" button on the toolbar.

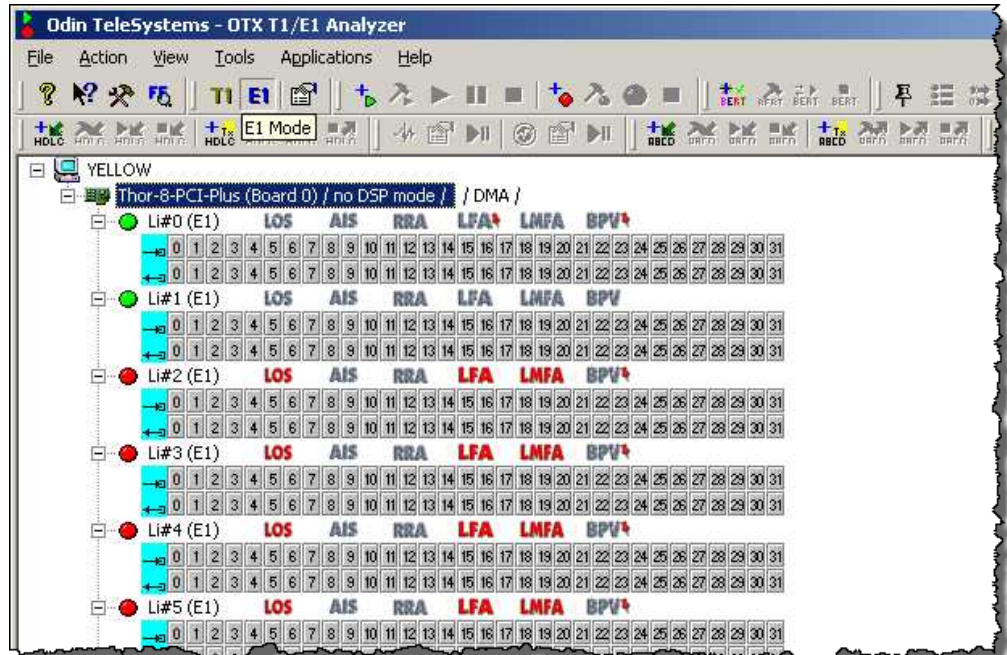


Figure 21 Select E1 Mode.

4. Select the board level as the scope of operations. Right button click on the board name and select the "Properties..." menu item. On the "Board Configurations" tab of the "T1/E1 Configuration" window set "Clock Source" option to "Master (internal)" (See Figure 22). Press "OK".

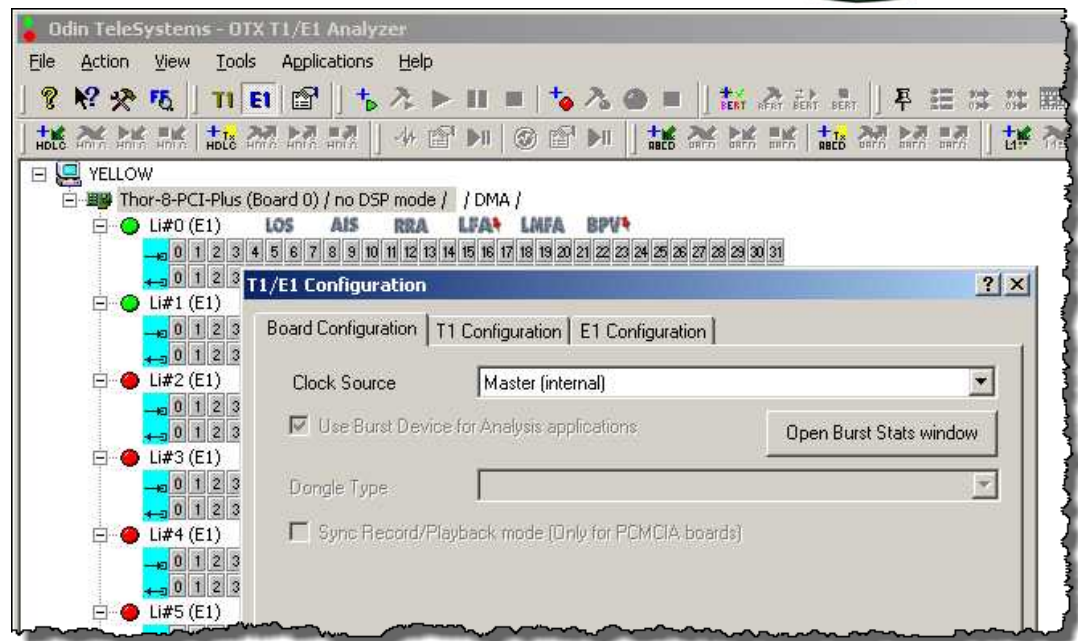


Figure 22 Setting Board Configuration.

Point your attention to the color of the LED indicator to the left of "Li#... (E1)" label. If the color is green, the line status is OK. If the color is red, the line status is DOWN (maybe because the cable is not connected or because of some other Layer 1 related problems). If the LED color is yellow there is a Layer 1 signal, but there are some problems with the configuration of Layer 1. In this case you can right button click on line interface name and select "Line Status" menu item (See Figure 23).

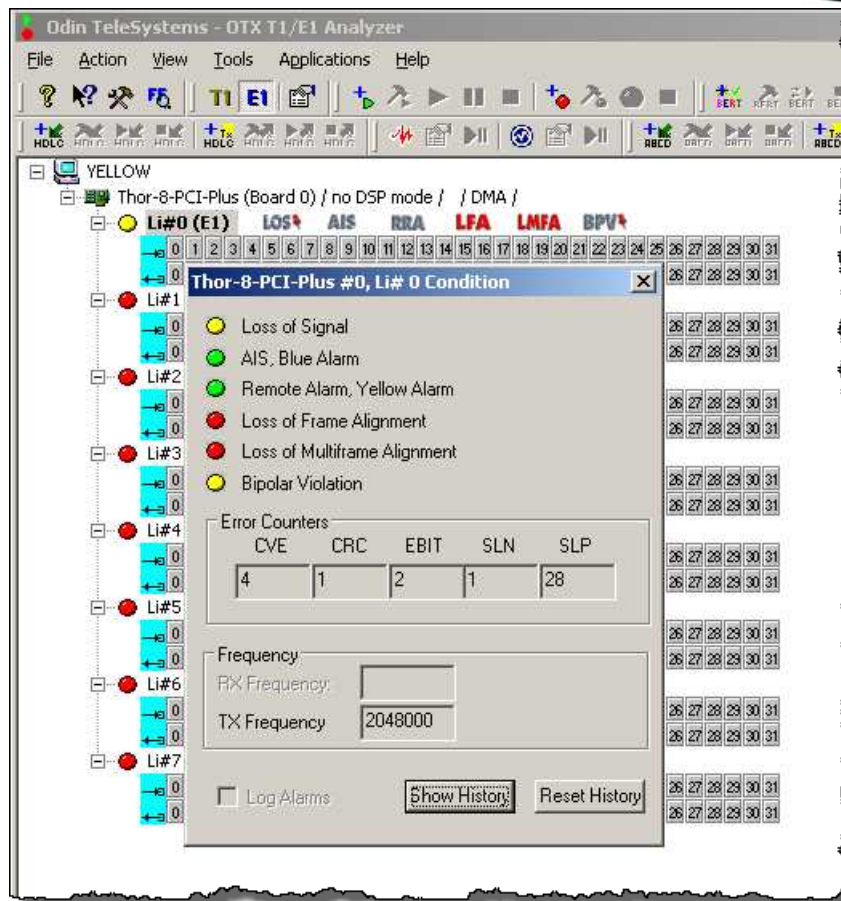


Figure 23 Line Status Condition.

- If both LED indicators (to the left of Li0 and Li1 in our example) are colored green, you can perform BERT testing. To do this set the "Li#0 (E1)" as the scope of operations and press "+BERT" icon on the toolbar ("Enable/Disable BERT." prompt) (See Figure 24).

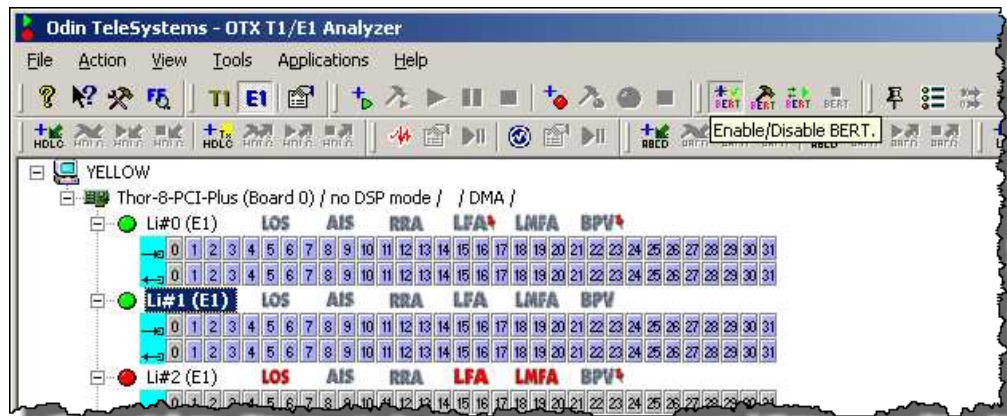


Figure 24 Enable BERT.



6. Click on the "BERT Setup" icon (icon with a "hammer") on the toolbar to setup all spans together. In the "BERT Testing" window set "Bit Pattern" option to "2¹⁵-1 (CCITT)". Then press "TS Selection" button and "Select All" button in the opened window. Press "OK" and "Save setup" (See Figure 25).

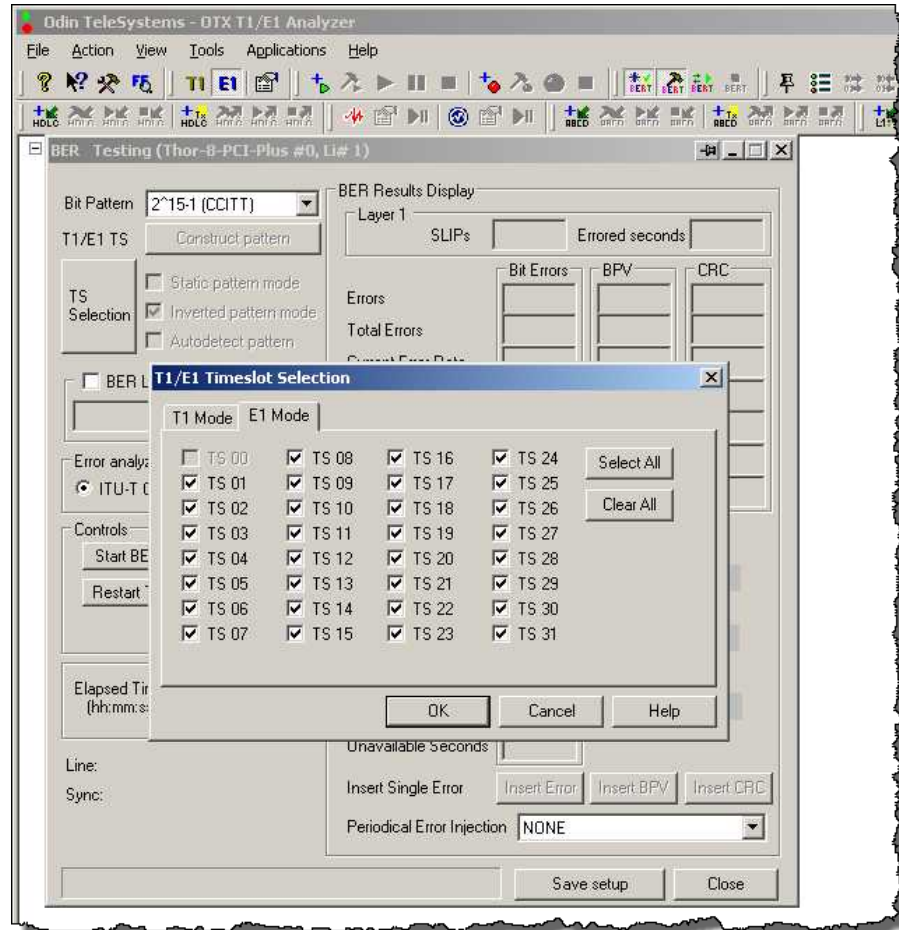


Figure 25 Configure BERT.

7. Perform the same steps for "Li#1 (E1)".
8. Select the board level as the scope of operations. Press "Start BERT" button (button with green arrows, green "play" symbol", and "Start BERT" prompt). You will see BERT statistics to the right of line interfaces. Wait a few seconds to allow BERT to synchronize both line interfaces.

If the titles to the right of line interfaces appear green after 2-4 seconds of running BERT, everything is OK (See Figure 26). Purple or red colors of the titles indicate problems.

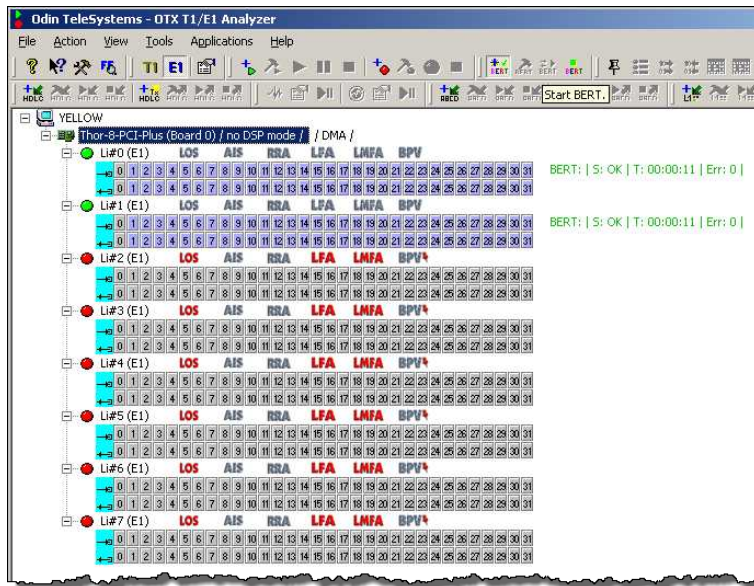


Figure 26 BERT Statistics.

For more detailed information on the OTX T1/E1 Analyzer please refer to the OTX T1/E1 Analyzer User's Guide (Odin document # 1412-1-SAA-1011-1).



8 References

- [API Reference Guide for the OTX Generic Hardware Driver](#) (Odin document # 1211-1-SDA-1006-1)
- [Programmer's Guide for OTX Hardware API](#) (Odin document # 1412-1-SAA-1006-1-1.0-P5)
- OTX T1/E1 Analyzer User's Guide (Odin document # 1412-1-SAA-1011-1)
- OTX T1/E1 Analyzer Installation Guide (Odin document # 1512-1-SAA-1011-1)



9 Document History

Rev. 1.1 April 13, 2006 Initial Version.

Rev. 1.1 May, 31, 2010 .

- Changed the title from “Installation Guide for OTX PCI Adapters” to “OTX Driver Installation Guide (for OTX PCI, PCIe, PCMCIA, and ExpressCard Adapters)”.
- Added the OTX Driver installation on OTX ExpressCard/54 adapters.
- Windows 98 and Windows NT4 are removed from Installation Guide as not supported.
- Deleted references at previous OTX PCI / PCMCIA Installation Guides.
- Added a warning concerning ExpressCard and PCMCIA HW Installation.
- Added links to OTX Windows / Linux Driver latest versions download page.

Rev. 1.2 June, 2, 2010.

- Added a Warning about ESD in Chapter 3.
- Changed Chapter 4 title to "OTX Driver for Windows® Based Systems".
- Added Overall Stability Test Chapter 7.
- Added description and Figure 15 Example of OTX ExpressCard external link interface connections.
- Added a reference to T1/E1 Analyzer User's Guide.

Rev. 1.3 June, 3, 2010.

- Updated Driver for Linux Based System Chapter 5.

Rev. 1.3 June, 9, 2010.

- Added Figure 19 Line status (Li2-Li3 Loop Back).
- Updated Figure 20 Sending HDLC frame.
- Added a reference to T1/E1 Analyzer Installation Guide.

Rev. 1.5 June, 21, 2010.

- Minor language modifications.



10 Glossary

- OTX – Odin Telecom FrameworkX
- PCI – Peripheral Component Interconnect
- PCIe – Peripheral Component Interconnect Express
- PCMCIA – Personal Computer Memory Card International Association
- WDM – Windows Driver Model
- HW – Hardware