Synway DTP Series

DTP-30C/PCIe, DTP-30C/PCIe+
DTP-60C/PCIe, DTP-60C/PCIe+
DTP-120C/PCIe, DTP-120C/PCIe+
DTP-30C/PCI, DTP-30C/PCI+
DTP-60C/PCI, DTP-60C/PCI+
DTP-120C/PCI, DTP-120C/PCI+

Digital Trunk Passive Board

Hardware Manual

Version 1.1

Synway Information Engineering Co., Ltd

www.synway.net

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Copyright Declaration

Revision History

Version	Date	Comments
Version 1.0	2009-2	Initial publication
Version 1.1	2010-3	Add the description on C-type PCI digital trunk passive boards.

Note: Please visit our website http://www.synway.net to obtain the latest version of this document.

Chapter 1 Overview

The DTP Series DTP-30C/PCIe, DTP-30C/PCIe+, DTP-60C/PCIe, DTP-60C/PCIe+, DTP-120C/PCIe and DTP-120C/PCIe+ are the digital trunk passive boards including PCIe bus, while DTP-30C/PCI, DTP-30C/PCI+, DTP-60C/PCI, DTP-60C/PCI+, DTP-120C/PCI and DTP-120C/PCI+ are the digital trunk passive boards including PCI bus. All of them can be connected parallelly with E1/T1 trunks via high impedance to obtain call information and voice signals from the line.

1.1 Functions

- Detection of calling/called party info
- A single board has 8 input ports for high-impedance parallel connection and can monitor incoming/outgoing signals to/from 4 E1/T1 ports
- Supports China SS1, SS7 (TUP, ISUP) and ISDN call state and voice signal analyses
- Supports independent-recording of incoming, outgoing and mixed-recording modes
- Supports Automatic Gain Control (AGC)
- Supports detection of standard or customized DTMF/single-tone signals
- Activity/silence detection
- The on-board lightning-proof circuit reaches the telecom standard and eliminates the damage caused by the lightning
- Each board has a unique hardware serial number written in the firmware to distinguish itself from other boards and prevent piracy. The number is available via an easy function call with applications
- The on-board authorization code identification circuit is designed for software safety. Users can apply to our company for the authorization code
- Compatible with other series of boards from Synway

1.2 Features

- **PCIe/PCI Bus Support**

  PCIe digital trunk passive boards include PCIe 1.0a bus with the single-way transmission rate up to 2.5Gb, support PCIe x1 slot; PCI digital trunk passive boards include PCI 2.2 bus, use the universal PCI design supporting 3.3V and 5V PCI slots as well as the PCI-X slot; both support the PNP (plug and play) feature which eliminates the need for jumper leads.

- **DMA Transfer Support**

  The DMA transfer of recording data does not cost any of host CPU resources, which make the board more suitable to large-capacity application systems.

- **Supports Full Range of Signaling Systems**

  Uses the uploadable signaling analysis and processing module, enabling the E1/T1 trunk monitoring under various signaling systems through software configuration without the change of hardware.

- **Various CODECs Support**

  Offers a large selection of voice CODECS, including hardware-based A-law (G.711), μ-law, IMA-ADPCM, GSM, MP3 and G.729A, software-based 16-bit linear PCM and VOX.

- **Supports WAV File**

  The recorded voice files can be edited and played by audio tools such as Cooledit.

- **High-impedance Connection**

  Simply achieved by parallel connection. Very high input impedance rules out any interruption on system operation.

- **Automatic Signal Adaptation**

  High signal-adaptation capability allows the flexible choice of an input point on the transmission line.

- **Synway's Unified SynCTI Driver Development Platform**

  Synway owns the intellectual property rights for the unified high-intelligence SynCTI driver development platform. Each system supports up to 2048 channels. All features are available via simple function calls on the driver platform, without having to understand complex call procedures.

1.3 Operation Principle

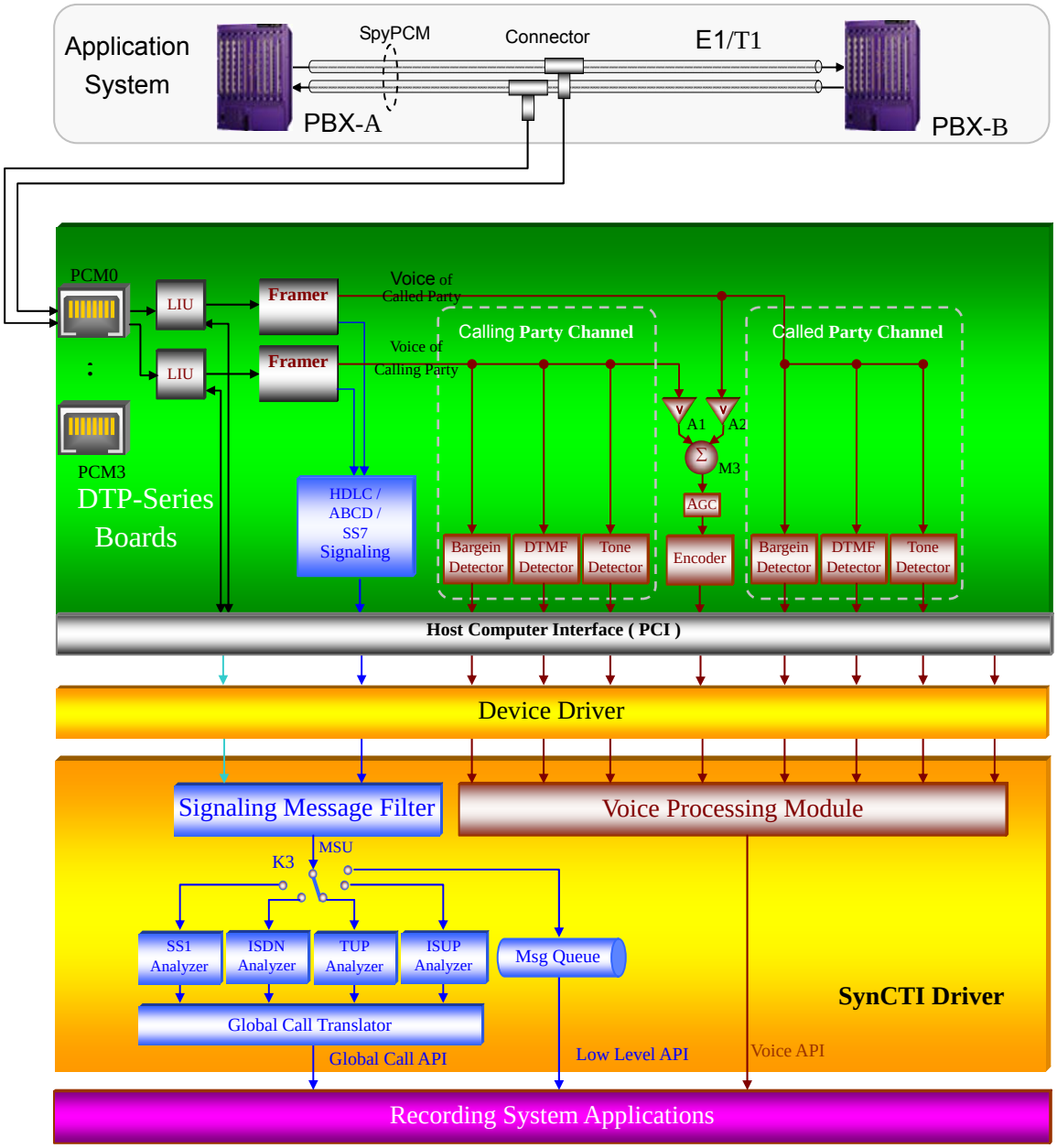

Figure 1-1 Operation Principle

Chapter 2 Installation

2.1 Hardware Structure

- **DTP-30C/PCIe Board**

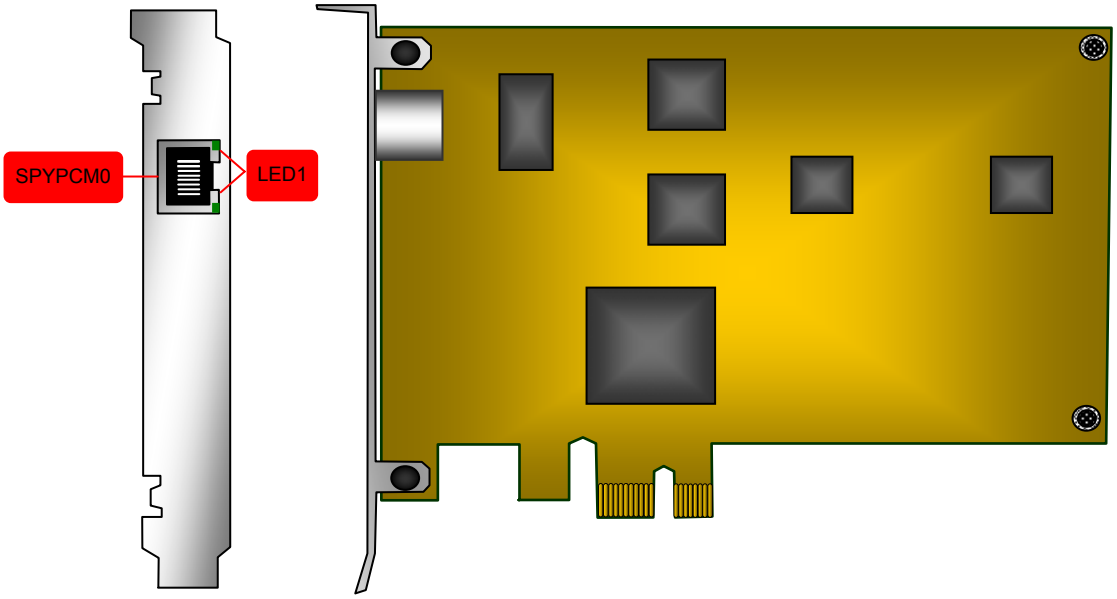

Figure 2-1 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
LED1	The synchronization indicator for the first SPYPCM

Table 2-1

- **DTP-30C/PCIe+ Board**

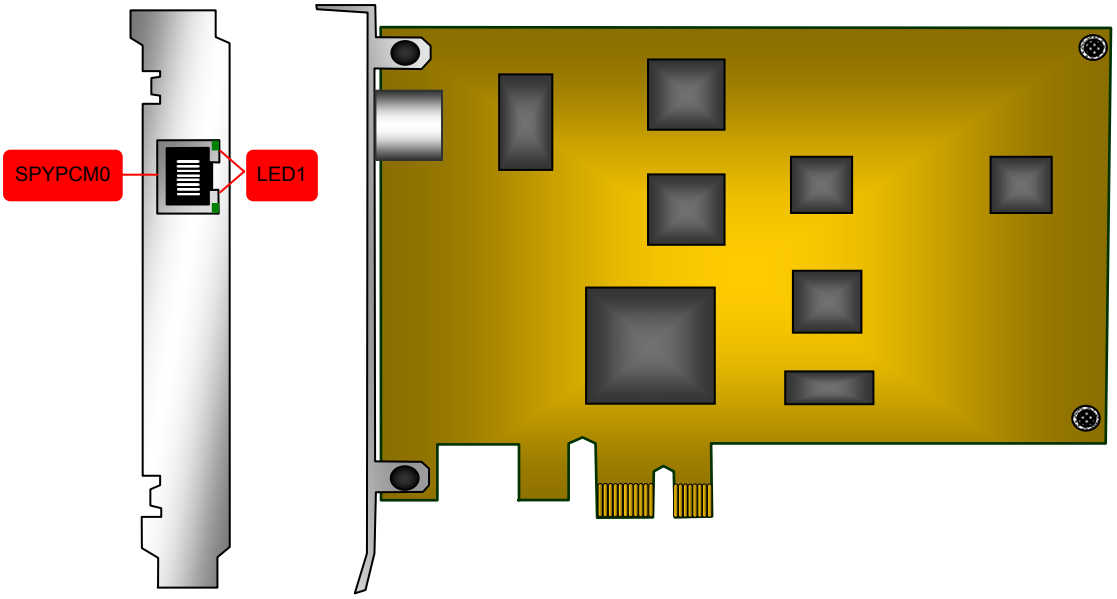

Figure 2-2 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
LED1	The synchronization indicator for the first SPYPCM

Table 2-2

- **DTP-60C/PCIe Board**

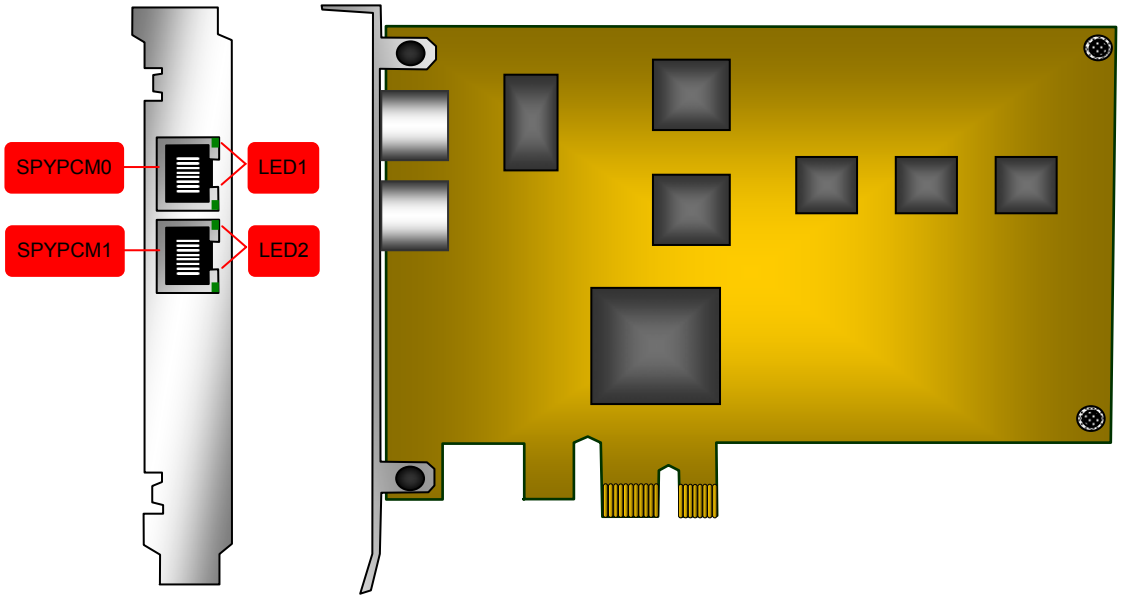

Figure 2-3 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
SPYPCM1	The input port for the second SPYPCM
LED1	The synchronization indicator for the first SPYPCM
LED2	The synchronization indicator for the second SPYPCM

Table 2-3

- **DTP-60C/PCIe+ Board**

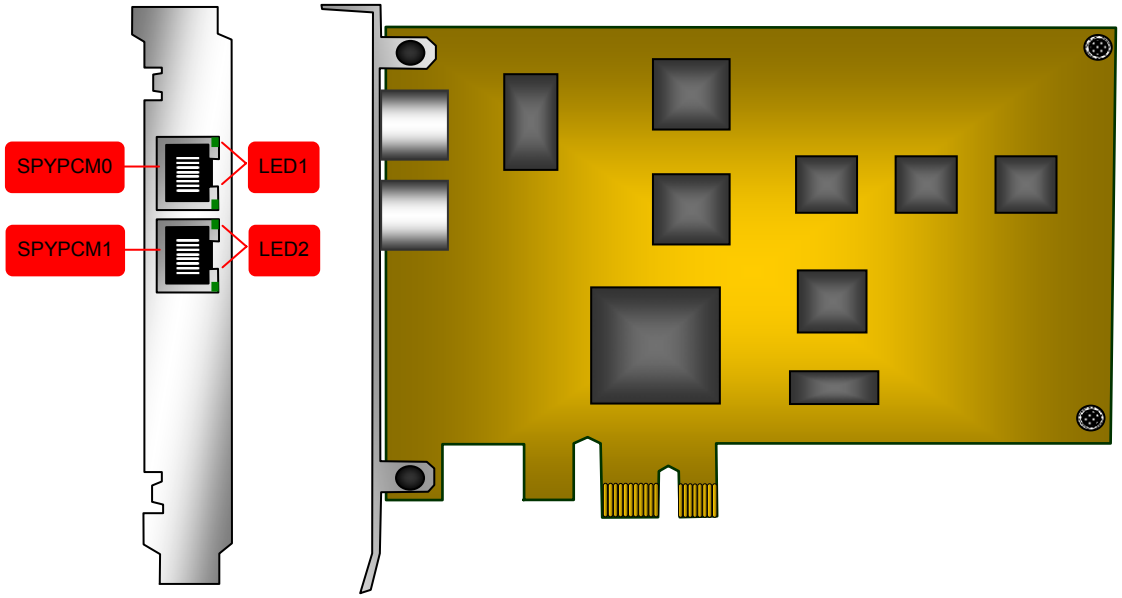

Figure 2-4 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
SPYPCM1	The input port for the second SPYPCM
LED1	The synchronization indicator for the first SPYPCM
LED2	The synchronization indicator for the second SPYPCM

Table 2-4

- **DTP-120C/PCIe Board**

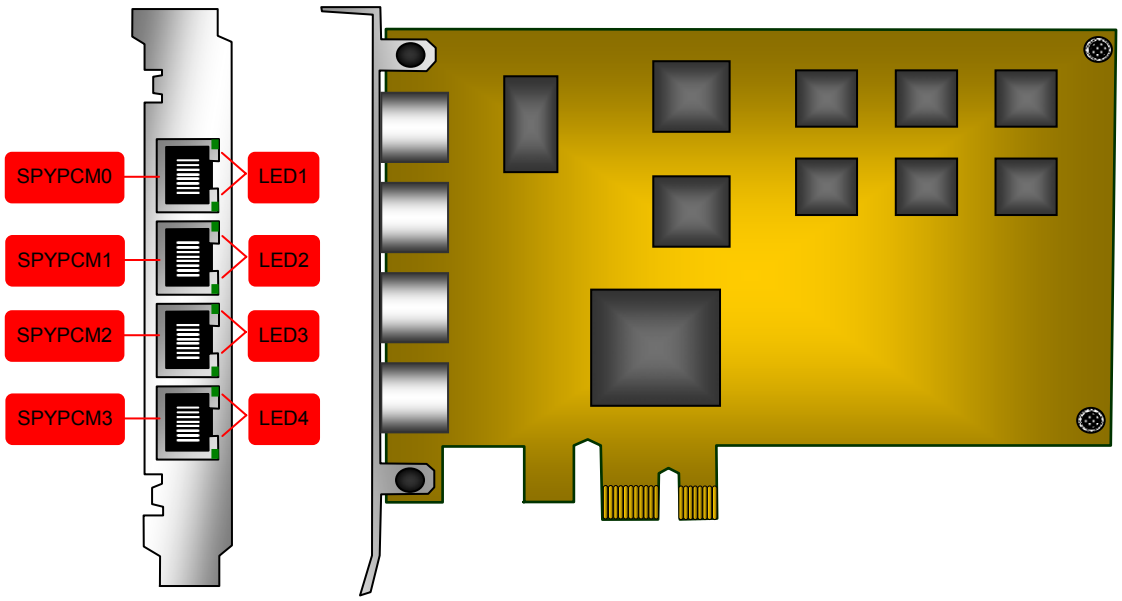

Figure 2-5 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
SPYPCM1	The input port for the second SPYPCM
SPYPCM2	The input port for the third SPYPCM
SPYPCM3	The input port for the fourth SPYPCM
LED1	The synchronization indicator for the first SPYPCM
LED2	The synchronization indicator for the second SPYPCM
LED3	The synchronization indicator for the third SPYPCM
LED4	The synchronization indicator for the fourth SPYPCM

Table 2-5

- **DTP-120C/PCIe+ Board**

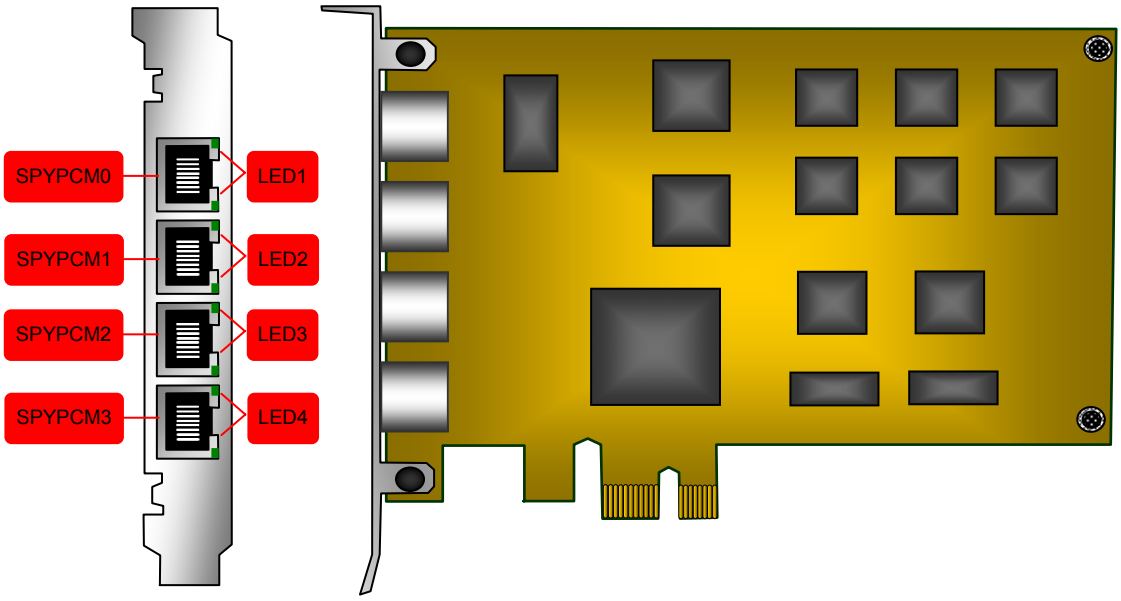

Figure 2-6 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
SPYPCM1	The input port for the second SPYPCM
SPYPCM2	The input port for the third SPYPCM
SPYPCM3	The input port for the fourth SPYPCM
LED1	The synchronization indicator for the first SPYPCM
LED2	The synchronization indicator for the second SPYPCM
LED3	The synchronization indicator for the third SPYPCM
LED4	The synchronization indicator for the fourth SPYPCM

Table 2-6

- **PCIe Digital Trunk Passive Boards**

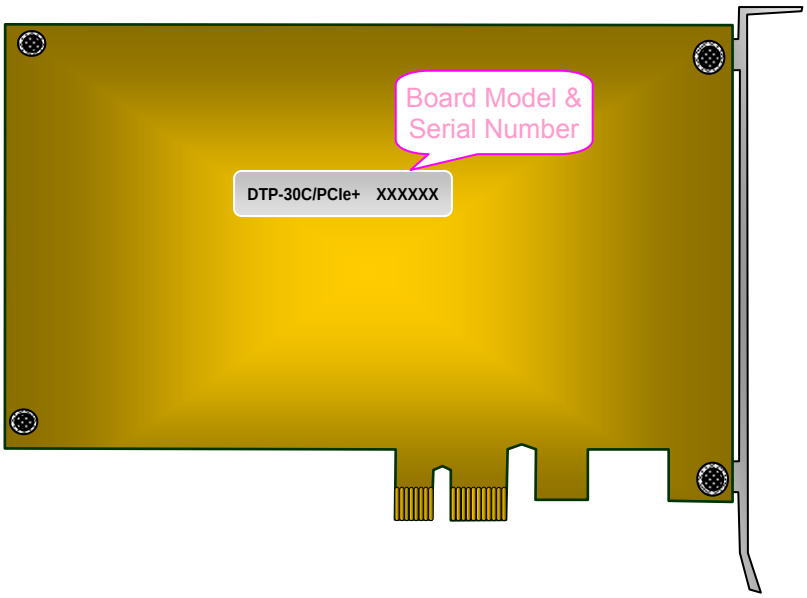

Figure 2-7 Rear View

- **DTP-30C/PCI Board**

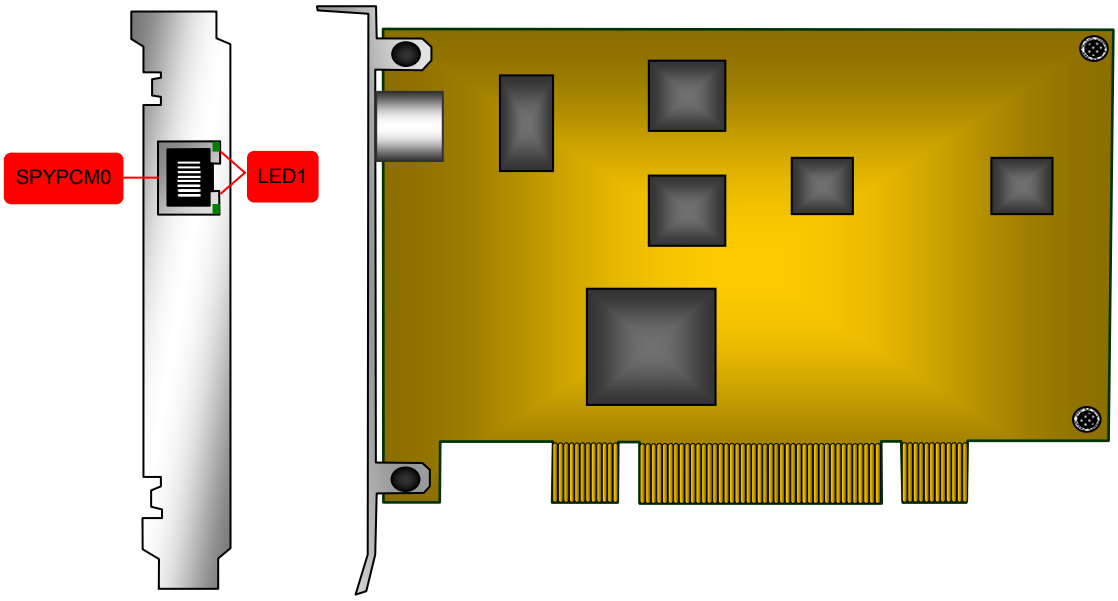

Figure 2-8 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
LED1	The synchronization indicator for the first SPYPCM

Table 2-7

- **DTP-30C/PCI+ Board**

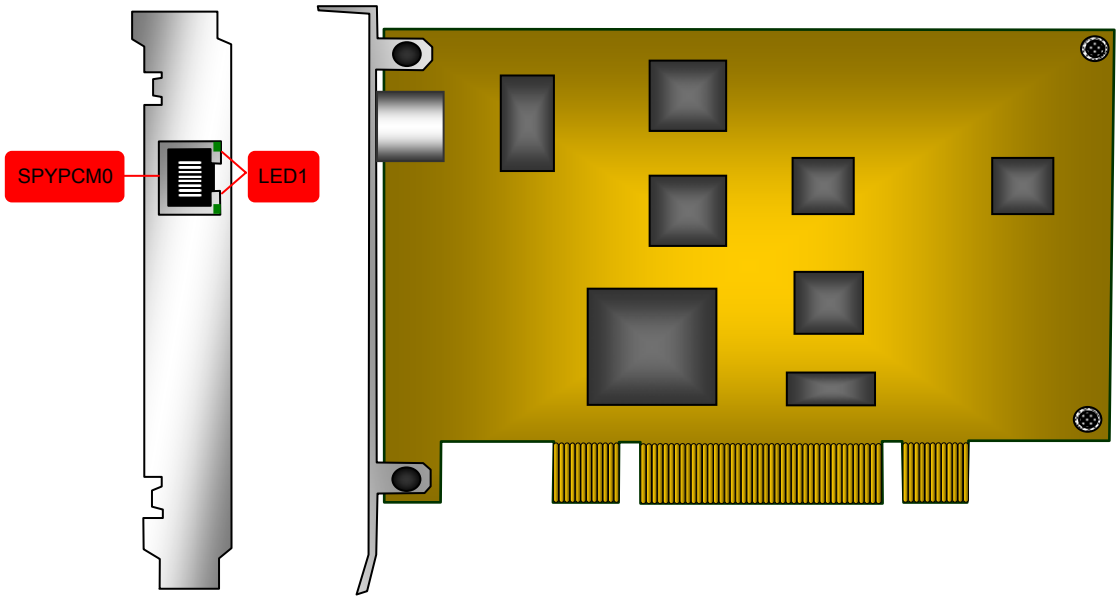

Figure 2-9 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
LED1	The synchronization indicator for the first SPYPCM

Table 2-8

- **DTP-60C/PCI Board**

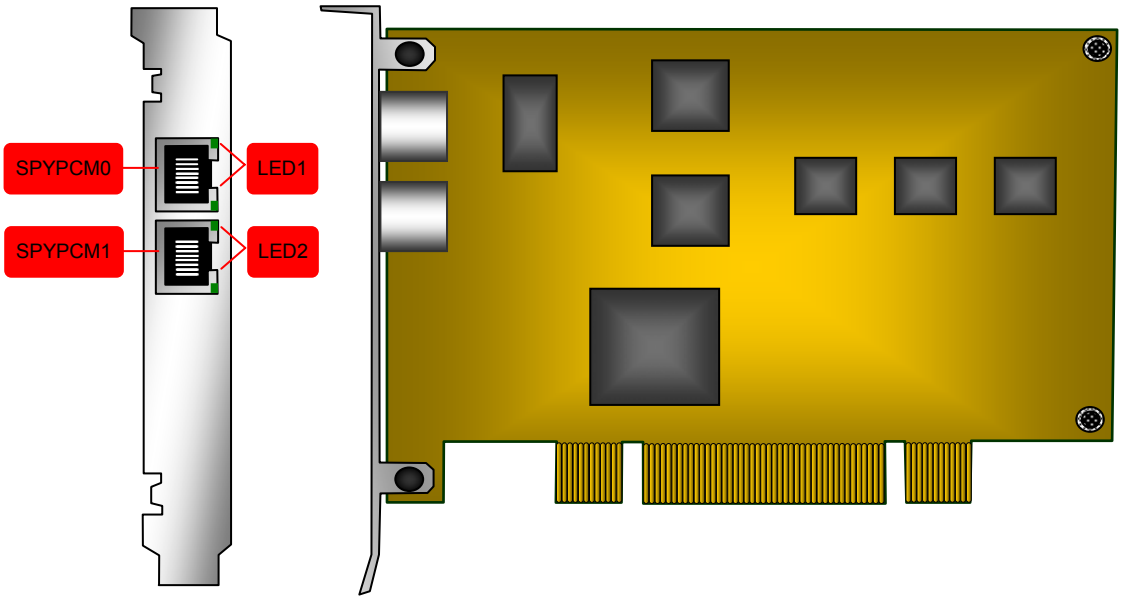

Figure 2-10 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
SPYPCM1	The input port for the second SPYPCM
LED1	The synchronization indicator for the first SPYPCM
LED2	The synchronization indicator for the second SPYPCM

Table 2-9

- **DTP-60C/PCI+ Board**

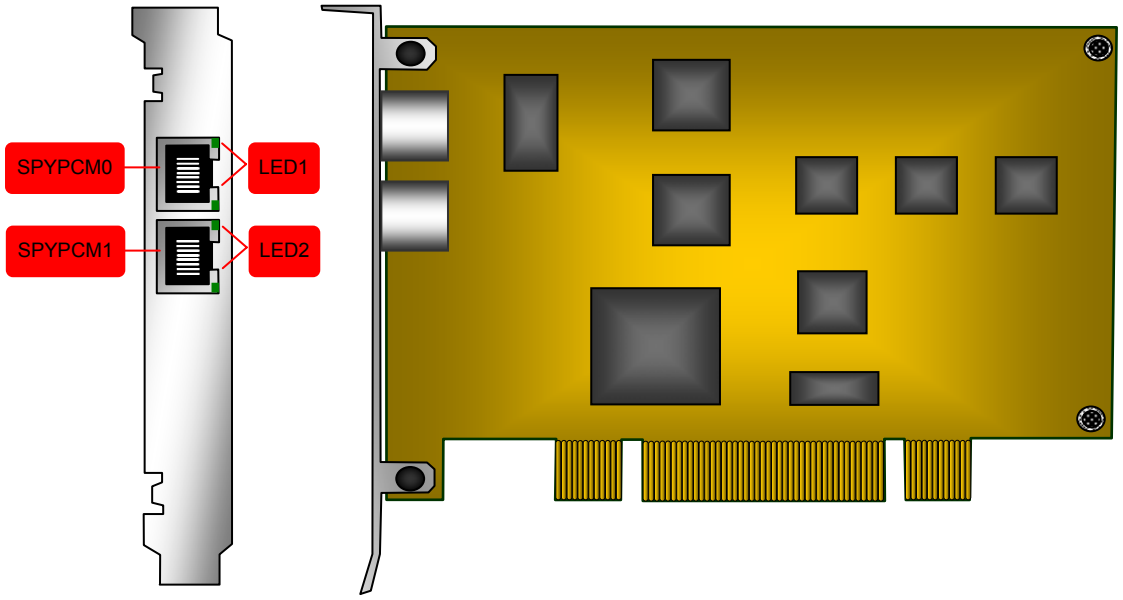

Figure 2-11 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
SPYPCM1	The input port for the second SPYPCM
LED1	The synchronization indicator for the first SPYPCM
LED2	The synchronization indicator for the second SPYPCM

Table 2-10

- **DTP-120C/PCI Board**

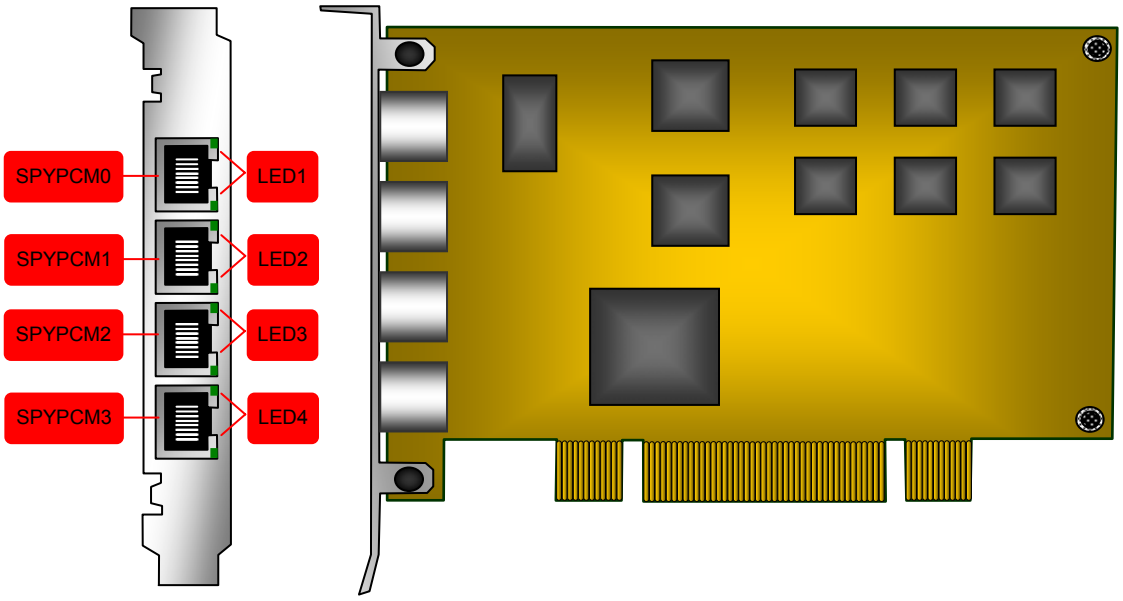

Figure 2-12 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
SPYPCM1	The input port for the second SPYPCM
SPYPCM2	The input port for the third SPYPCM
SPYPCM3	The input port for the fourth SPYPCM
LED1	The synchronization indicator for the first SPYPCM
LED2	The synchronization indicator for the second SPYPCM
LED3	The synchronization indicator for the third SPYPCM
LED4	The synchronization indicator for the fourth SPYPCM

Table 2-11

- **DTP-120C/PCI+ Board**

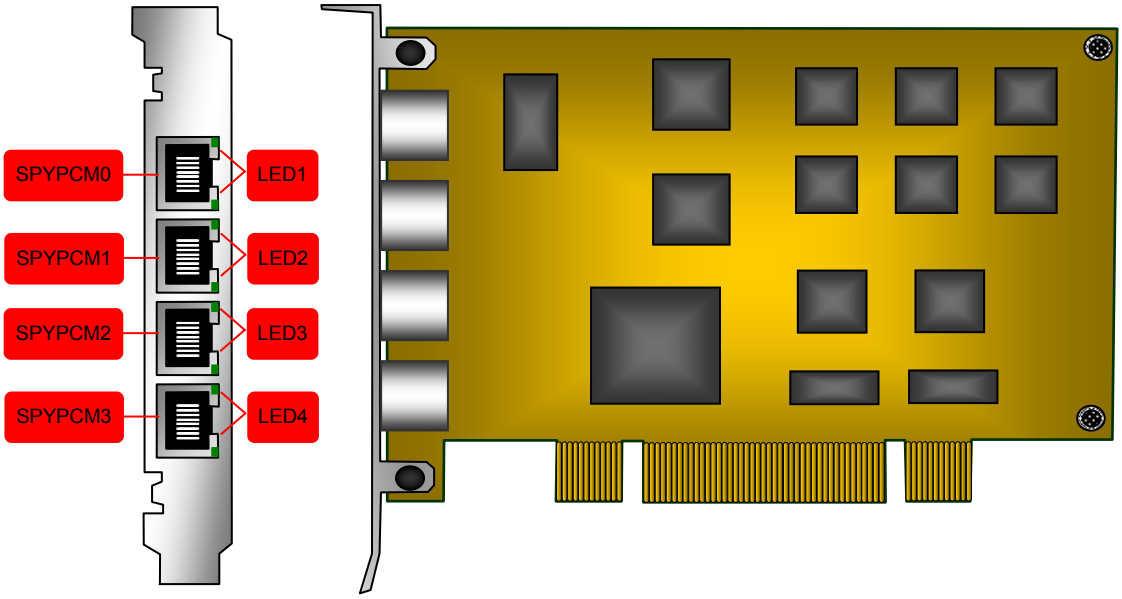

Figure 2-13 Left and Front Views

Notes	Description
SPYPCM0	The input port for the first SPYPCM
SPYPCM1	The input port for the second SPYPCM
SPYPCM2	The input port for the third SPYPCM

SPYPCM3	The input port for the fourth SPYPCM
LED1	The synchronization indicator for the first SPYPCM
LED2	The synchronization indicator for the second SPYPCM
LED3	The synchronization indicator for the third SPYPCM
LED4	The synchronization indicator for the fourth SPYPCM

Table 2-12

- **PCI Digital Trunk Passive Boards**

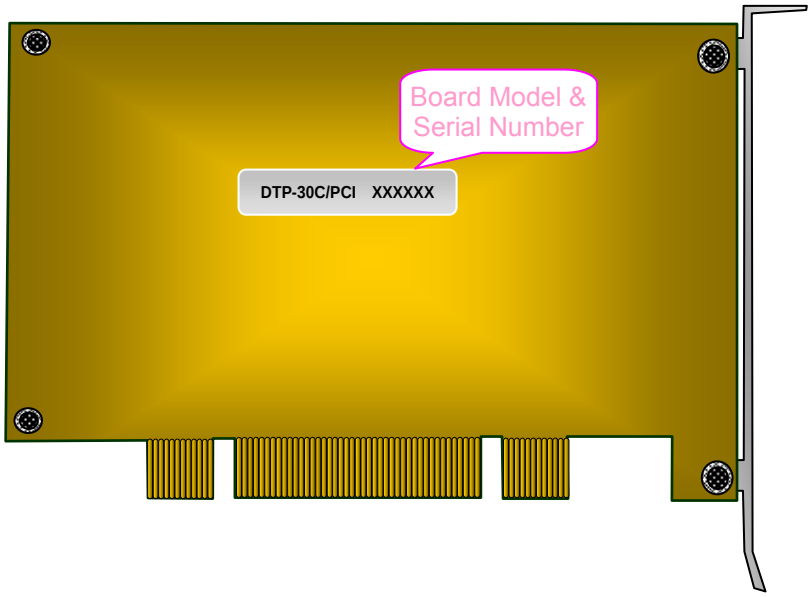

Figure 2-14 Rear View

2.2 System Requirements

Host System Requirements

CPU: 300MHz Intel® Pentium® Ⅱ or above

Memory: 256M or more

HD: Depends on individual requirements

Supported Operating Systems

- ✓ Windows 2000/2003/XP
- ✓ Linux RH7.2/RH9.0/AS4/FC4/SUSE10

2.3 Installation Procedure

Note: Always turn off the power before installation!

Step1： Properly fit the board into the PCIe/PCI slot on the chassis

Step2： Use the cable provided with the board to connect the board and external trunks (E1 or T1).

Note: There are two types of this cable. One is used to monitor the twisted-pair cables and called RJ48C Parallel Connection Line (See Figure 2-15); the other is used to monitor the coaxial cables and called RJ48C-BNC Adapter (See Figure 2-16).

Figure 2-15 RJ48C Parallel Connection Line

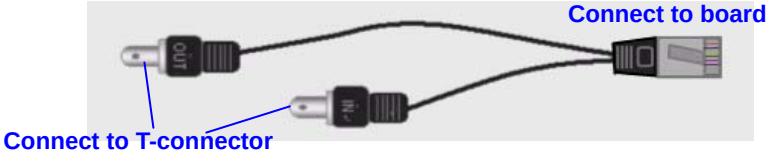

Figure 2-16 RJ48C-BNC Adapter

If the twisted-pair cable is used for the monitored PCM, connection should be established as shown in Figure 2-17. If you want to construct RJ48C lines by yourself, refer to Figure 2-18. You should pay attention that one RJ48C interface corresponds to one SpyPCM. Don't connect in such a wrong way as shown in Figure 2-19.

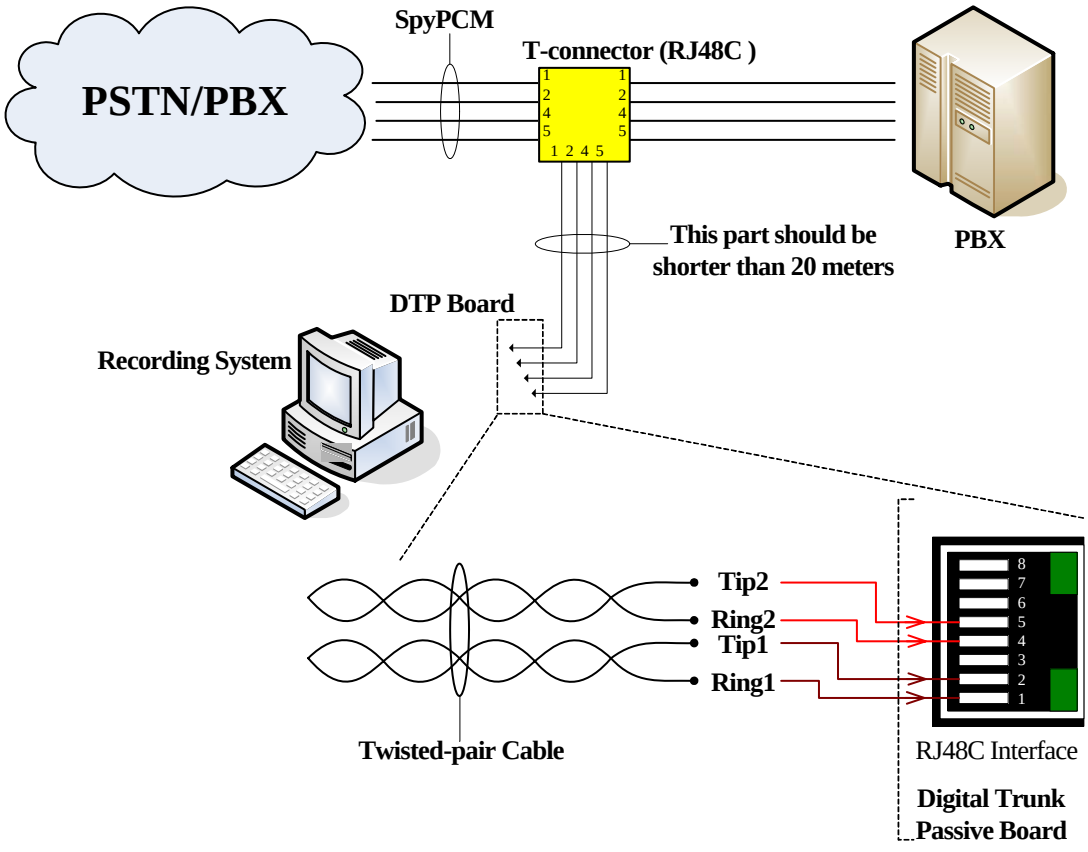

Figure 2-17 Proper Connection Using Twisted-pair Cable

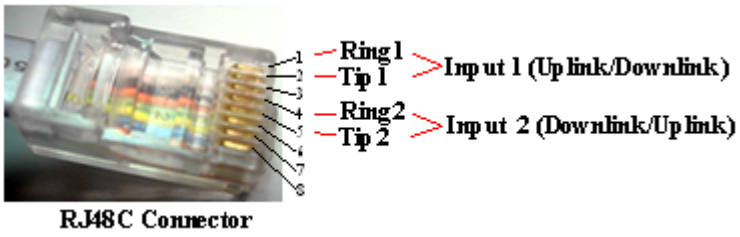

Figure 2-18 Pin Layout of RJ48C

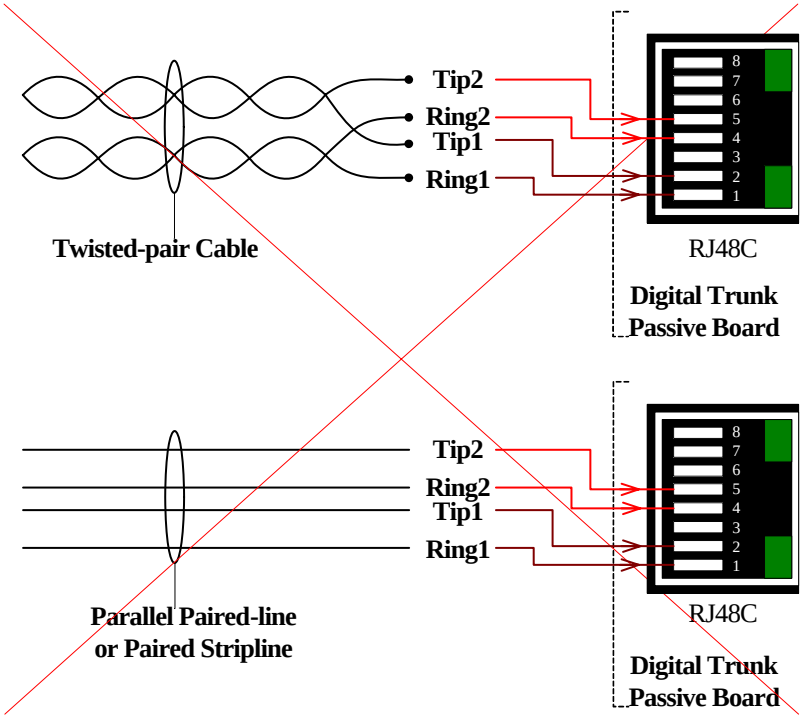

Figure 2-19 Incorrect Connections Using Twisted-pair Cable

If the coaxial cable is used for the monitored PCM, connection should be established as shown in Figure 2-20. If you want to construct the RJ48C-BNC adapter by yourself, refer to Figure 2-18. Make sure that Tip1 and Tip2 connect with the inner cores of the coaxial cable and Ring1 and Ring 2 connect with the shielding layer of the coaxial cable.

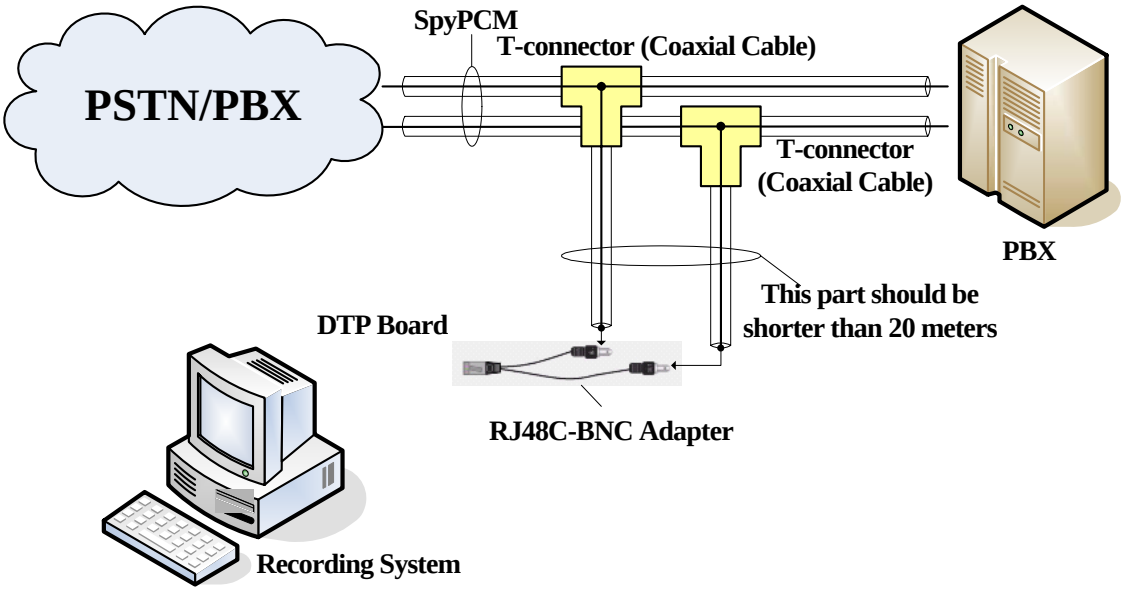

Figure 2-20 Proper Connection Using Coaxial Cable

Notes:

- You need to purchase T-connectors that match the coaxial cable interface or the twisted-pair cable interface and connect the digital trunk passive board in parallel to the monitored trunk.
- To all the board models mentioned above, each RJ48C input port can monitor only one E1, including incoming and outgoing calls. There is no restriction on which pair of inputs to monitor incoming calls and which to monitor outgoing calls.
- The T-connector can be freely positioned on the monitored trunks. However, the cable between the T-connector and our board must be limited to 20 meters (the shorter the better) for good communication on the monitored trunk. If this requirement is hard to meet in practice, you may manage to change the path of the monitored trunk and let it pass by the board. If signals through the T-connector need to travel far (over 20 meters), we recommend you use the high-impedance adaptors from Synway.

Step3： Connect to a device allowed to be monitored.

Skip this step if there is no need to 'monitor in real time'.

Although the digital trunk passive board does not possess an analog tone signal output interface for monitoring, they can use common sound cards for real-time monitoring.

Step4： Boot your computer and install the driver

Regarding driver installation, refer to the driver installation manual *SynCti_InstManual.pdf.*

Step5： Configure the operating parameters for the board

Refer to our *SynCTI Programmer's Manual* for details.

Key Tips:

- As the system is expected to run for long hours unmanned, 'energy-saving' mode should be turned off for both the CPU and the HD in CMOS or WINDOWS operating system. This is to ensure full-speed operation of the computer, or it may lead to a drop in performance or unexpected errors after running for some time.
- It is important to ground the chassis with our boards for safety reasons, according to standard industry requirements. A simple way is earthing with the third pin on the plug. No or improper grounding may cause instability in operation as well as decrease in lightning resistance.

Appendix A Technical Specifications

Dimensions

160×112mm^2 (excluding L-bracket)

Weight

≈ 110g

Environment

Operating Temperature: 0°C-55°C

Storage Temperature: -20°C-85°C

Humidity: 8%-90% non-condensing

Storage Humidity: 8%-90% non-condensing

Input/output Interface

E1 Physical Ports: compliant with G703, including 75Ω unbalanced interface and 120Ω balanced interface

T1 Physical Ports：DSX-1 and CSU line build-outs available for different extents of signal losses, including 100Ω and 110Ω balanced interfaces

Audio Specifications

CODEC:	*CCITT A/μ-Law*	*64kbps*
	IMA ADPCM	*32kbps*
	G.729A	*8kbps*
	GSM	*13.6kbps*
	MP3	*8/16kbps*

Frequency Response: 300-3400Hz (±3dB)

Automatic Gain Control (AGC): -20dB-0dB

Signaling

SS1: compliant with international GF002-9002 (DL and MFC)

SS7: compliant with Q771-Q795

DSS1: compliant with Q.933

Maximum System Capacity

Up to 8 boards concurrently per system; each board can monitor up to 4 E1/T1 trunks

Power Requirements

+3.3V DC: 1.5A

Maximum Power Consumption: ≤5W

Input interface and Impedance

Interface: RJ48C

AC Impedance: 1KΩ

Audio Encoding/Decoding

16Bit PCM	*128kbps*
8Bit PCM	*64kbps*
A-Law	*64kbps*
μ-Law	*64kbps*
VOX	*32kbps*
ADPCM	*32kbps*
GSM	*13.6kbps*
MP3	*8/16kbps*
G.729A	*8kbps*

Sampling Rate

8kHz

Safety

Lightning Resistance: Level 4

Appendix B Technical/sales Support

Thank you for choosing Synway. Please contact us should you have any inquiry regarding our products. We shall do our best to help you.

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