



**Synway DTP Series**

**SHD-30A-CT/PCI/FJ**

**SHD-60A-CT/PCI/FJ**

**Digital Trunk Passive Board**

# **Hardware Manual**

**Version 1.2**

**Synway Information Engineering Co., Ltd**

**[www.synway.net](http://www.synway.net)**

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## Revision History

Version	Date	Comments
Version 1.1	2005-4	Initial publication
Version 1.2	2006-6	Changes: Added RJ45 jacks to SHD-30A/PCI/FJ boards, and modified some improper description

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

# Chapter 1 Overview

The DTP Series SHD-30A-CT/PCI/FJ and SHD-60A-CT/PCI/FJ are digital trunk passive boards including PCI bus and can be connected to E1 trunks via high impedance for call information and voice signals.

## 1.1 Functions

- Detection of calling/called party info
- Each board has 2 or 4 high impedance input ports and can monitor incoming/outgoing signals on 1 or 2 E1 trunks simultaneously
- Supports China SS1, SS7 (TUP, ISUP) and ISDN call analysis and voice signals analysis
- Supports independent-recording of incoming, outgoing and mixed-recording modes
- Supports Automatic Gain Control (AGC)
- Supports detection of standard or customized DTMF or single-tone signals
- Activity/silence detection

## 1.2 Features

- **PCI 2.1 Bus Support**

Includes PCI 2.1 bus with burst data transmission rate up to 133 MB/s; PNP (plug and play) feature eliminates the need for jumper leads.
- **Complete Signaling-System Support**

Using loadable signal-processing modules, monitoring of E1 trunks under various signaling systems can be achieved through configuration, without making changes to the hardware.
- **Various CODECs Support**

Offers a large selection of voice CODECS, including hardware-based A-law (G.711),  $\mu$ -law, IMA-ADPCM, software-based 16-bit linear PCM, MP3 and VOX.
- **Supports WAV File**

The recorded speech 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 interruption

on system operation.

- **TDM Capability**

Includes H.100 bus, facilitating smooth connectivity to third-party boards with H.100 bus for the transfer of acquired voice signals to other devices.

- **Automatic Signal-adaptation**

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

- **Unique Hardware Serial Number**

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.

- **Authorized Code Identification Circuit**

The on-board authorized code identification circuit is designed for software safety. Users can apply to our company for the authorized code.

- **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. The functions and features can be achieved through simple function calls on the driver platform, without having to understand complex call procedures.

### 1.3 Operation Principle

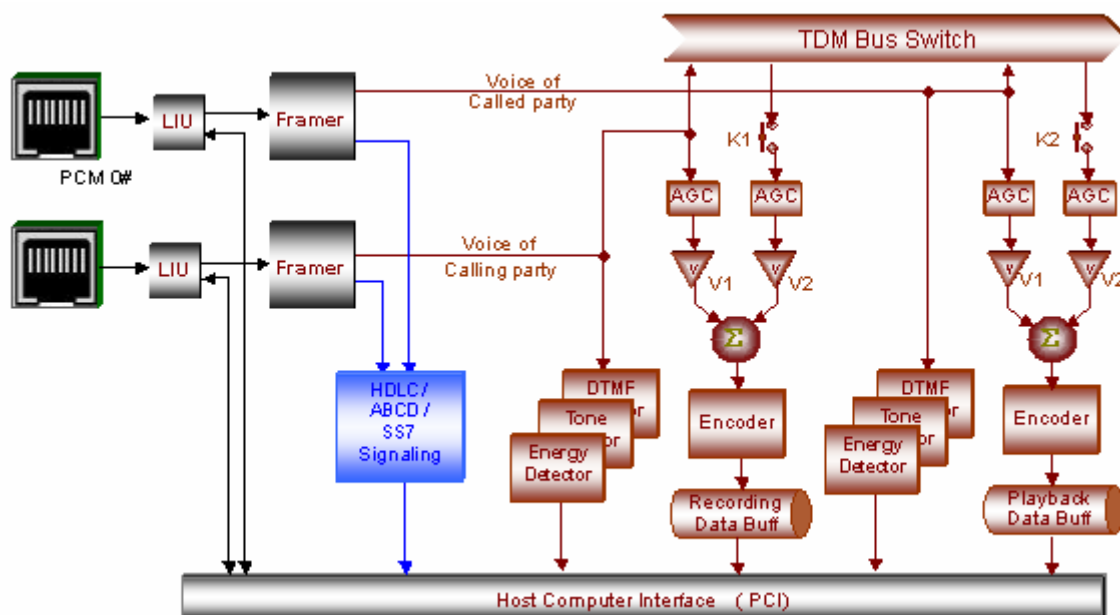


Figure 1-1 Operation Principle

# Chapter 2 Installation

## 2.1 Hardware Structure

- SHD-30A-CT/PCI/FJ board

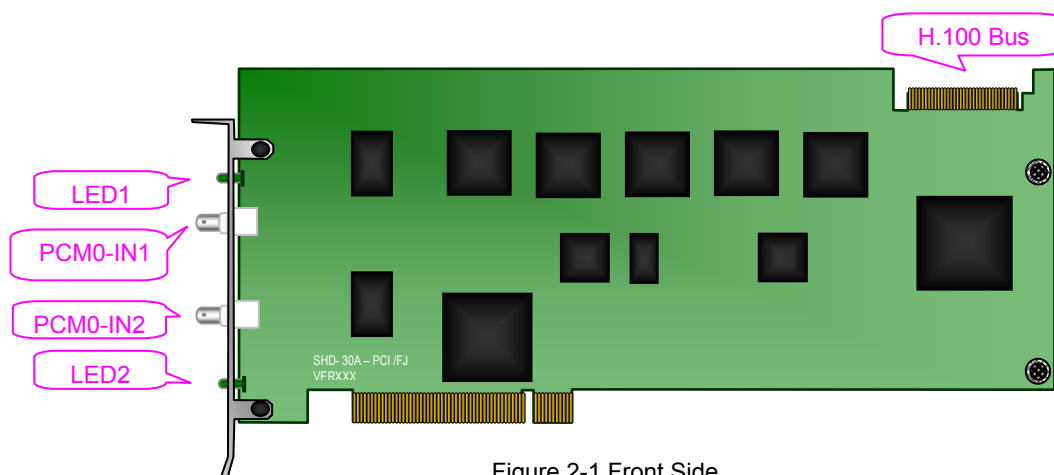


Figure 2-1 Front Side

Notes	
LED1	The synchronous light of the first input port for the first E1
PCM0-IN1	The first input port for the first E1
PCM0-IN2	The second input port for the first E1
LED2	The synchronous light of the second input port for the first E1

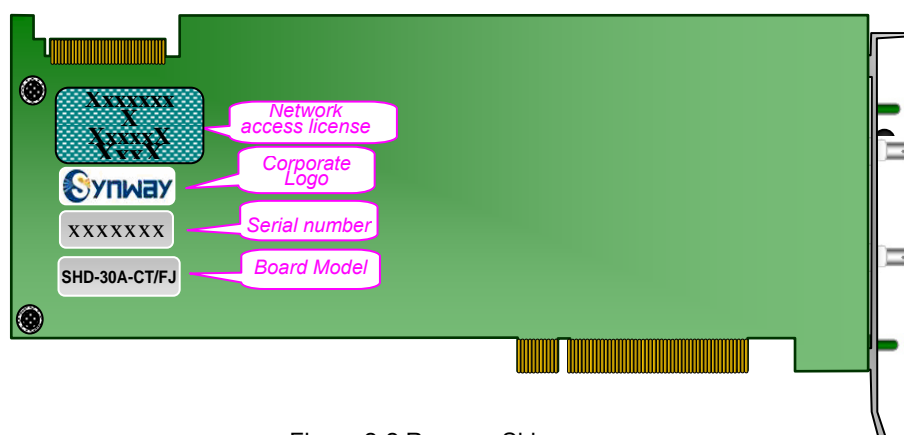


Figure 2-2 Reverse Side

- SHD-60A-CT/PCI/FJ board

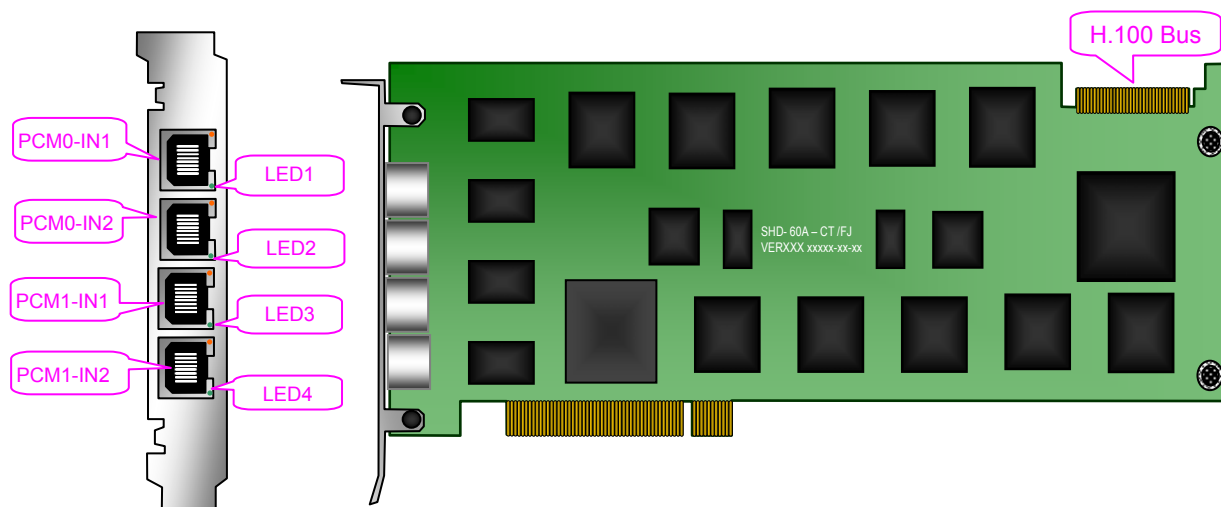


Figure 2-3 Left and Front Sides

Notes	
PCM0-IN1	The first input port for the first E1
PCM0-IN2	The second input port for the first E1
PCM1-IN1	The first input port for the second E1
PCM1-IN2	The second input port for the second E1
LED1	The synchronous light of the first input port for the first E1
LED2	The synchronous light of the second input port for the first E1
LED3	The synchronous light of the first input port for the second E1
LED4	The synchronous light of the second input port for the second E1

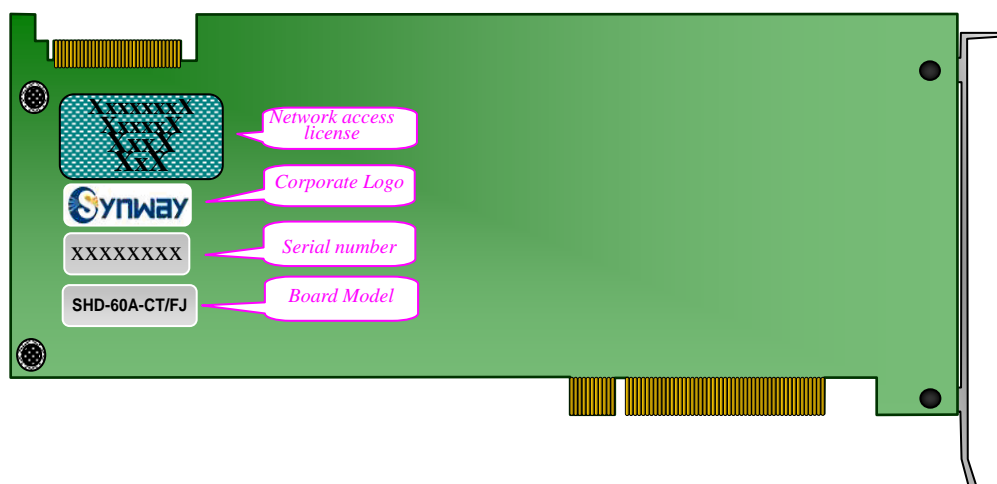


Figure 2-4 Reverse Side



**Notes:** RJ45 jacks have been added to the SHD-30A-CT/PCI/FJ boards. See Table 2-1 below for board models and the corresponding on-board interface types.

Board Model	Interface Type	Number of Interfaces	Available Accessories
SHD-30A-CT/PCI/FJ	BNC	2	Three-way T-connector
	RJ45	2	Three-way T-connector, 120 leads
SHD-60A-CT/PCI/FJ	RJ45	4	Three-way T-connector, 120 leads

Table 2-1 Board Model and Interface Type

## 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

Refer to *SynCTI Programmer's Manual.pdf*.

## 2.3 Installation Procedure

**Notes: Always turn off the power before installation!**

**Step 1: Properly fit the board into the PCI slot on the chassis**

**Step 2: Connect the board with the devices to be monitored by E1 trunks**

Connection should be established as shown in Figure 2-5.

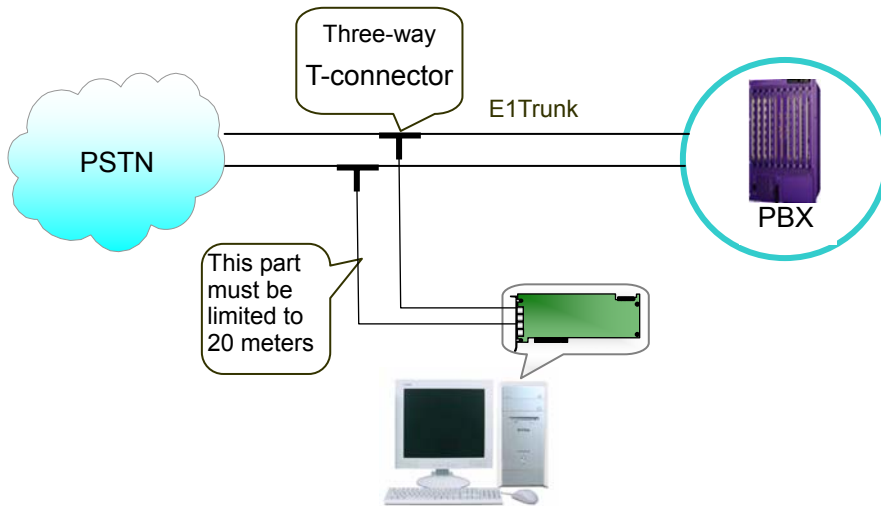


Figure 2-5 Connection of Our Board with the Device to be Monitored

**Notes:**

- ① Each pair of the input ports, be it that on the SHD-30A-CT/PCI/FJ boards or one of the two - 'PCM0-IN1, PCM0-IN2' and 'PCM1-IN1, PCM1-IN2' - on the SHD-60A-CT/PCI/FJ boards, can only monitor incoming and outgoing calls on the same one E1 trunk. Whichever port monitors the incoming calls and whichever monitors the outgoing depends on your own configuration.
- ② When the on-board interface differ in type from the E1 trunk interface, a conversion between RJ45 and BNC by a conversion interface (see Figure 2-6) is required before performing parallel connection.



Figure 2-6 Conversion between RJ45 and BNC

The following Figure 2-7 is the pin layout for RJ45.

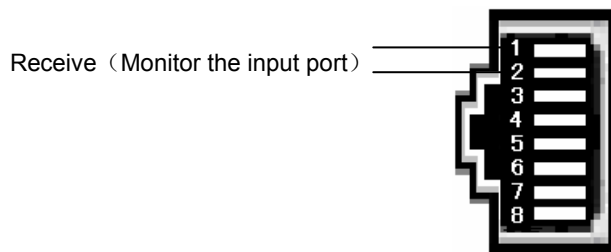


Figure 2-7 Pin Layout for RJ45

- ③ The three-way T-connector can be freely positioned on the monitored trunks. However,

the trunk 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 our board. If signals indeed have to travel far (over 20 meters) through the T-connector, we suggest using high-impedance adaptors from Synway.

**Step 3: Connect the bus cable with the H.100 bus on each board.**

Skip this step if there is no need for bus exchange between multiple boards.

**Notes:**

- ① See Figure 2-8 for correct insertion. Do not twist or insert in the opposite direction.

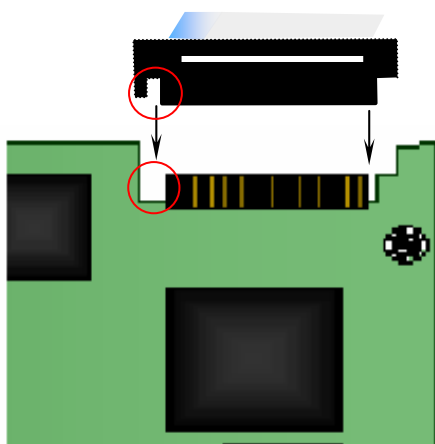


Figure 2-8 Connection of H.100 Bus

- ② There are two clock settings for our boards: When between-board bus exchange is not required, each board sets its own clock and does not have to be connected to the bus cable; otherwise, each board must be connected to the bus cable to follow the clock of the cable.
- ③ The bus cable houses stiff conducting material. Therefore, when it has been shaped, do not bend it repeatedly or violently lest it is broken.

**Step 4: Connect to a playback/monitoring device**

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

**Notes:**

- ① Although the digital trunk passive board does not possess an analog tone signal output interface for monitoring and playback, these purposes can be achieved through linking the board to a pre-installed analog board with monitoring and playback capabilities over H.100 bus.
- ② Also common sound cards can be used for playing and monitoring.

**Step 5: Boot your computer and install the driver**

Regarding driver installation, refer to *Driver Installation Manual*.

**Step 6: Configure the operating parameters for the board**

Refer to our *Programmer 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

310×115mm<sup>2</sup> (excluding L-bracket)

## Weight

≈ 250g

## Environment

Operation Temperature: 0°C-55°C

Storage Temperature: -20°C-85°C

Humidity: 8%-90% non-condensing

Storage Humidity: 8%-90% non-condensing

## Input Interface

E1 physical ports: compliant with G703

## Audio Specifications

CODEC: CCITT A/μ-Law 64kbps,

IMA ADPCM 32kbps

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 10 boards concurrently per system;  
up to 120 channels per board

## H.100 Bus Capacity

4096 channels

## Power Requirements

+5V DC: 600mA

Maximum Power Consumption: ≤8W

## Input Impedance

≥2400Ω

## Audio Encoding/Decoding

16Bit PCM 128kbps

8Bit PCM 64kbps

A-Law 64kbps

μ-Law 64kbps

VOX 32kbps

ADPCM 32kbps

GSM 13.6kbps

MP3 8kbps

## Sampling Rate

8kHz

## Safety

Lightning Resistance: Level 4

Certification: FCC; CE; CCC

## 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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