Synway CTI Series

SHN-8B-CT/PCI+

SHN-16B-CT/PCI+

SHN-32B-CT/PCI+

SHN-60B-CT/PCI+

SHN-60B-CT/PCIe+

SHN-120B-CT/PCI+

SHN-120B-CT/PCIe+

VoIP Media Processing & Signaling

Hardware Manual

Version 2.2

Synway Information Engineering Co., Ltd

www.synway.net

Contents

Copyright Declaration

Revision History

Version	Date	Comments
Version 1.0	2008-8	Initial publication
Version 2.0	2009-11	Add information on new board models SHN-8B-CT/PCI+, SHN-16B-CT/PCI+ and SHN-32B-CT/PCI+.
Version 2.1	2012-9	Add information on new board model SHN-120B-CT/PCIe+.
Version 2.2	2013-1	Add information on new board model SHN-60B-CT/PCIe+.

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

Chapter 1 Overview

The Synway CTI Series SHN-8B/16B/32B/60B/120B-CT/PCI+ and SHN-60B/120B-CT/PCIe+ are large-capacity boards for VoIP media processing and signaling, integrated with LAN interfaces, to provide such services as encoding, transmitting, parsing and receiving SIP messages, managing on-board channels and IP conversations, sending and receiving voice data over IP links, putting encoded or decoded voice data onto CT-BUS, etc. It supports the following applications: IP gateway, media server/conference server, Softswitch, IP PBX, IP call center, IP application server, IVR, large-capacity IAD (Integrated Access Device), VoIP solutions, and NGN networking equipment.

1.1 Functions

- A single board provides up to 8/16/32/60/120 channels for IP processing.
- Supports the following functions during the call: voice recording and playing, volume adjustment, dynamic CODEC change, etc.
- All channels are allowed to play and record voices simultaneously. Automatic Gain Control (AGC) support in recording operation.
- Supports call transfer and call hold during IP calls.
- Allows DTMF signal transmission and detection by any of the three methods: in-band, out-of-band (RFC2833), Signaling (SIP-INFO).
- Integrated with an independent 10M/100M compatible Ethernet interface, the board can work without costing or relying on the network card resource of the computer.
- Includes H.100 bus, compatible with MVIP, SC and ST bus, facilitating smooth connectivity to third-party boards with H.100 bus for the transfer of voice data from/to other devices.
- The flexible distributed conferencing system sets no limit on the number of simultaneous conferences and participants in each conference, allows monitoring and recording of the whole conference and each individual speaker.
- Each board has a unique hardware serial number written in the firmware to distinguish itself from other boards and prevent piracy.
- The on-board authorization code identification circuit is designed for software safety. Users can apply to our company for the authorization code.

1.2 Features

- **PCIe Bus Support (SHN-60B/120B-CT/PCIe+)**

  Developed with the design of PCIe X1, this board supports PCIe X1, X2, X4, X8 and X16 slots.

- **PCI 2.2 Bus Support (SHN-8B/16B/32B/60B/120B-CT/PCI+)**

  Includes PCI 2.2 bus with 3.3V/5V slot voltage and up to 132 MB/s burst data transmission rate; PNP (plug and play) feature eliminates the need for jumper leads.

- **DMA Read and Write**

  The use of PCI-based DMA technique for data reading and writing helps minimize the cost of the host CPU.

- **Integrated LAN**

  The board is integrated with an independent 10M/100M compatible Ethernet interface.

- **Network Protocol Processing in Hardware**

  Thanks to the powerful embedded processor on the board, such network protocols as TCP/IP, RTP/RTCP, etc. can be processed without costing any host CPU.

- **Easy Firmware Upgrade**

  Users may upgrade the on-board firmware simply using a software tool to the latest version published by Synway.

- **Multiple Programming Modes Support**

  Our driver supports three programming modes: polling mode, event callback mode and Windows message mode.

- **Various VoIP CODECs Support**

  The supported VoIP CODECs include G.711 A-Law, G.711 μ-Law, G.729A and GSM.

- **Voice CODECs Support in Recording/Playing**

  Offers a large selection of voice CODECs, including hardware-based G.711 A-Law, G.711 μ-Law, IMA-ADPCM, software-based 16-bit linear PCM, MP3 and VOX.

- **Supports WAV File**

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

- **Barge in**

Supports the Barge-in feature.

- **Highly Efficient and Real-time Call Control and Voice Processing**

  This board enables highly efficient call control, call management and voice processing; the multiple on-board DSPs used for voice processing give a nearly real-time voice effect.

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

  Synway owns the intellectual property rights for the unified high-intelligence SynCTI driver development platform. By simple API function calls on this platform, users can customize such features as call connection and call control, and perform various applications based on IP+IP or IP+TDM. Our API interfaces are highly encapsulated and exported in ANSI C style, which eliminates the need for users to consider the bottom layer IP communication details.

1.3 Operation Principle

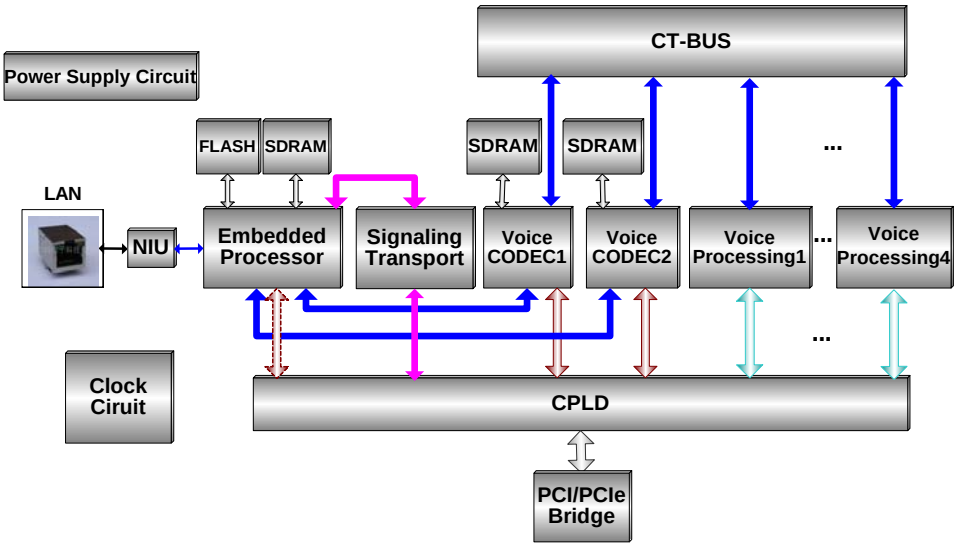

Figure 1-1 Operation Principle of SHN-120B-CT/PCI+, SHN-120B-CT/PCIe+

Note: Other board models mentioned in this file have similar operation principles.

Chapter 2 Installation

2.1 Hardware Structure

- **SHN-120B-CT/PCI+ Board**

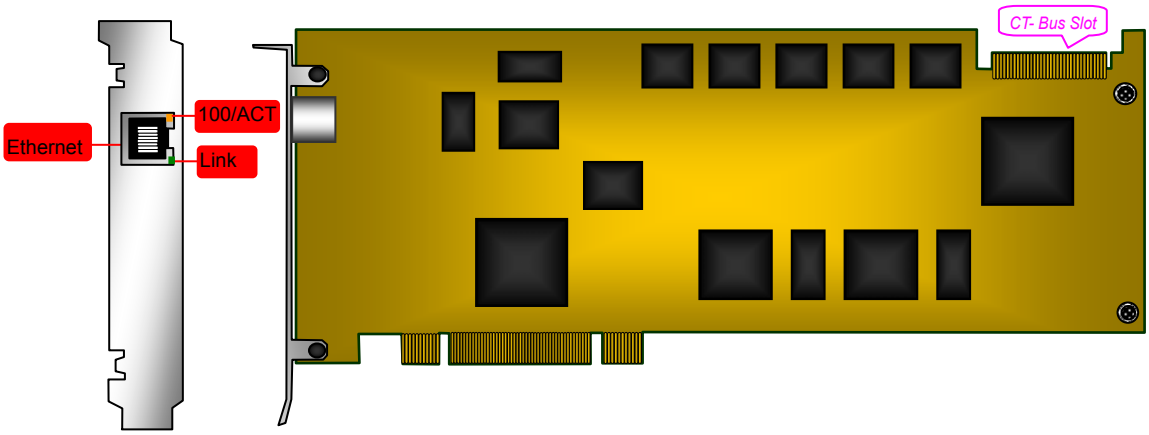

Figure 2-1 Left View & Front View

- **SHN-60B-CT/PCI+ Board**

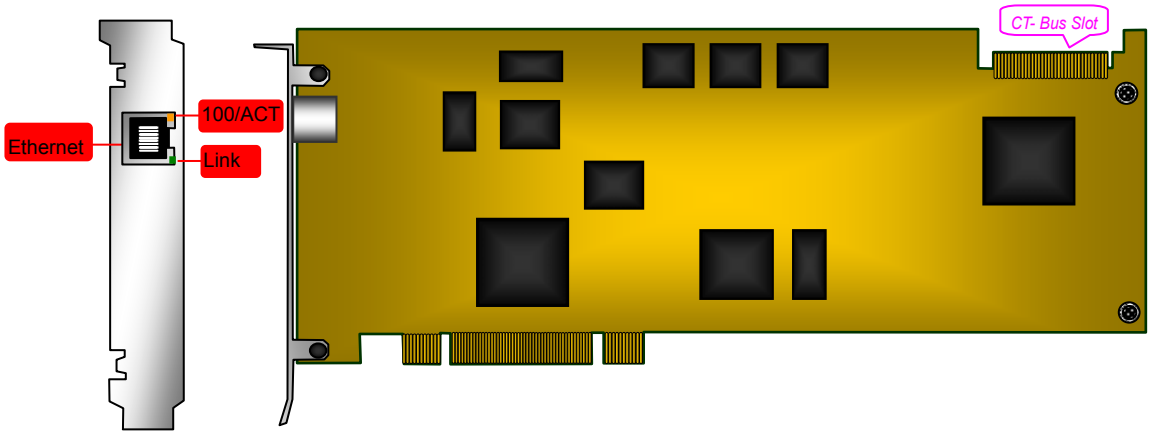

Figure 2-2 Left View & Front View

- **SHN-32B-CT/PCI+ Board**

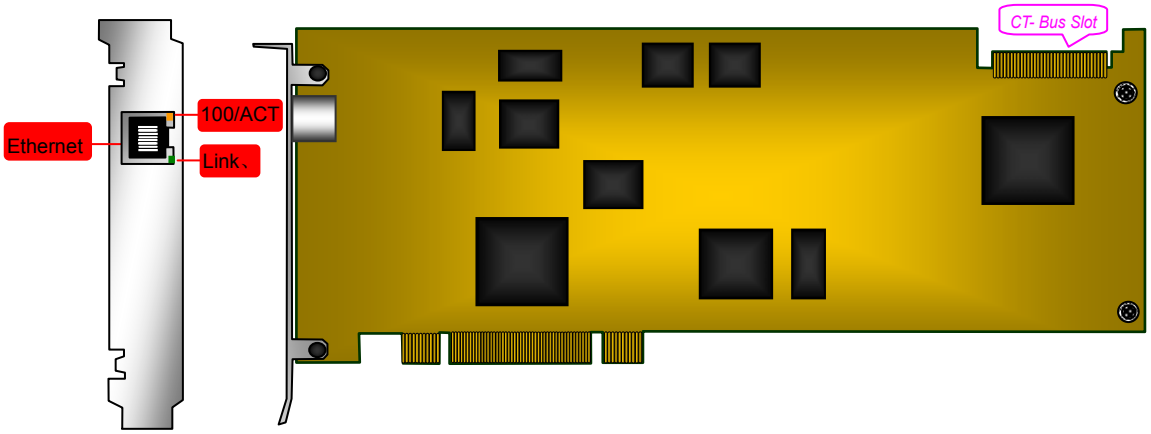

Figure 2-3 Left View & Front View

- **SHN-16B-CT/PCI+ Board**

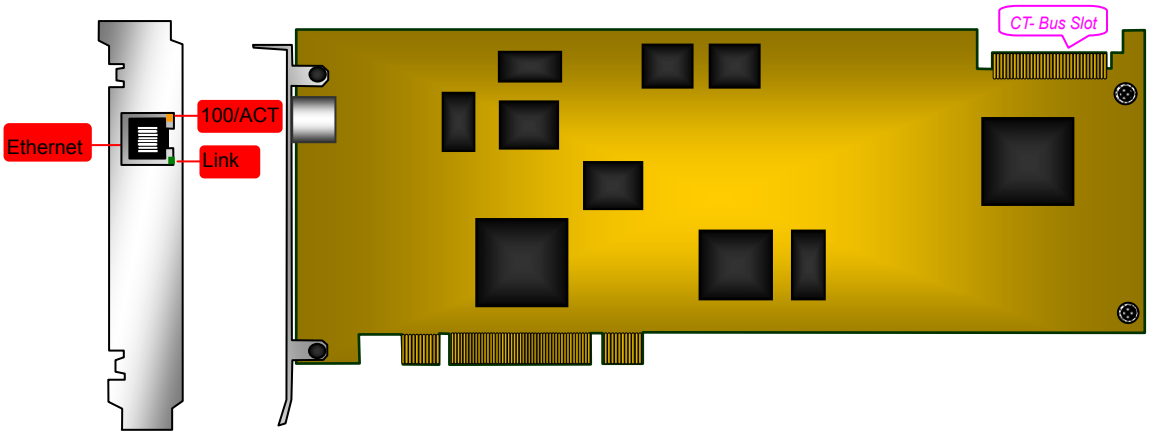

Figure 2-4 Left View & Front View

- **SHN-8B-CT/PCI+ Board**

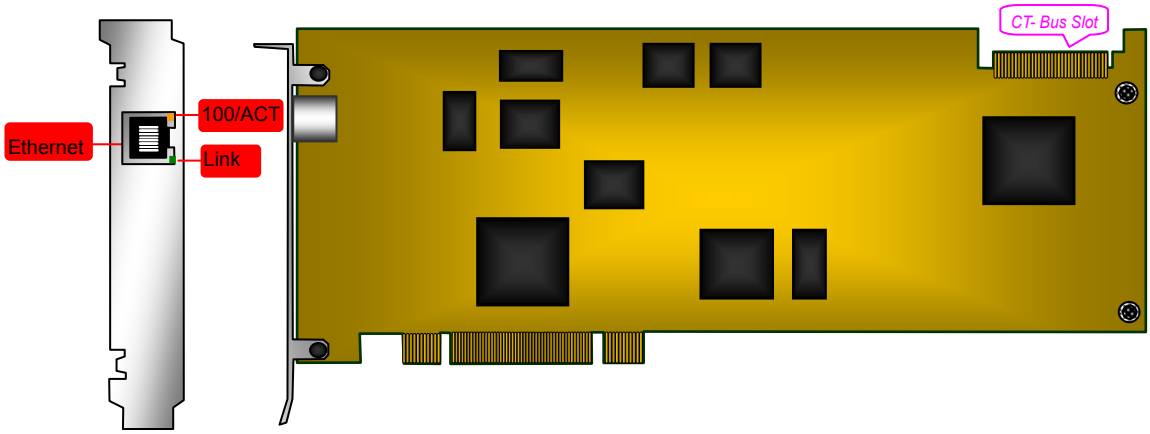

Figure 2-5 Left View & Front View

- **Rear View of SHN-8B/16B/32B/60B/120B-CT/PCI+**

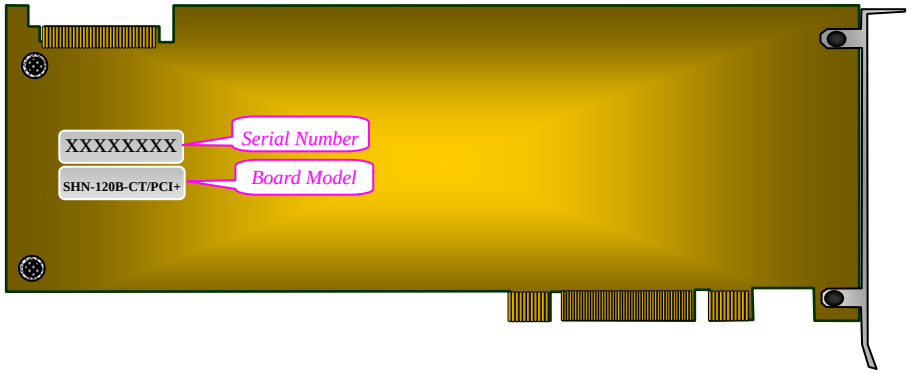

Figure 2-6 Rear View

- **SHN-60B/120B-CT/PCIe+ Board**

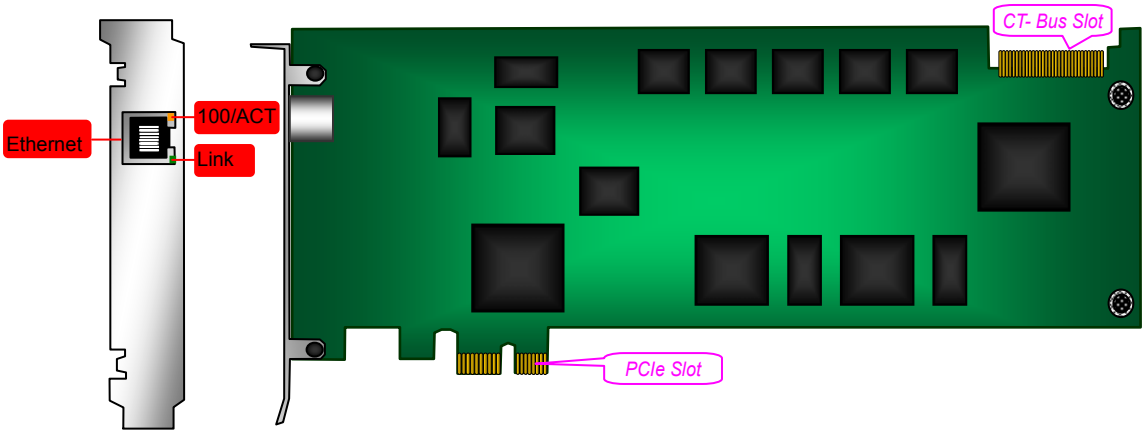

Figure 2-7 Left View & Front View

- **Rear View of SHN-60B/120B-CT/PCIe+**

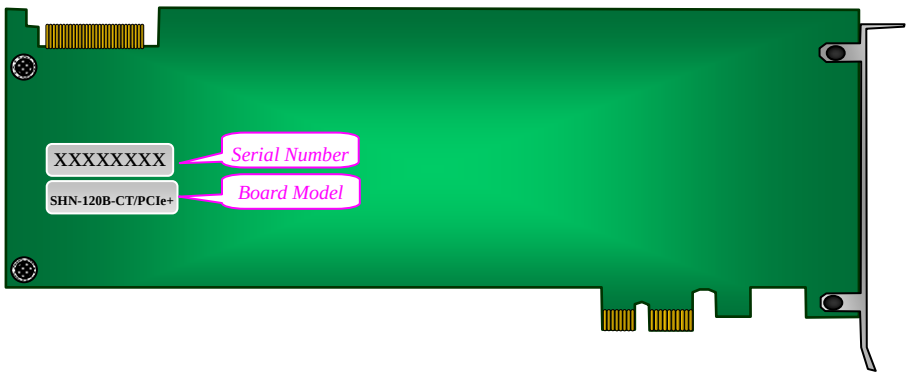

Figure 2-8 Rear View

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

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

2.3 Installation Procedure

Note: Always turn off the power before installation!

Step 1: Properly fit the required VoIP board into the PCI slot or the PCIe slot on the PC chassis.

Notes:

① For the installation of other voice boards from Synway which are used with these VoIP boards, refer to corresponding hardware manuals.

② Other necessary hardware devices (such as network card and IP phones) used to set up a whole VoIP application environment should be installed by users themselves.

Step 2: Connect H.100 bus interfaces on all boards by bus cable.

Through CT-BUS, the VoIP board can easily exchange voice data with other voice boards used with it.

Notes:

① See Figure 2-9 for correct insertion. Do not twist or insert in the opposite direction.

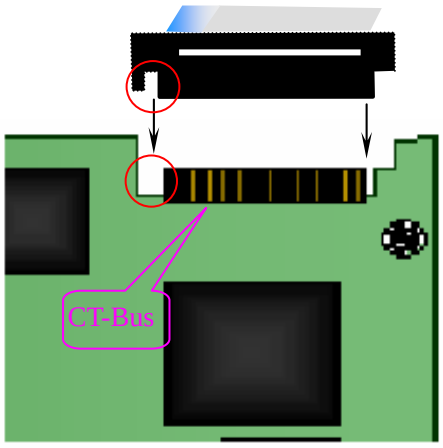

Figure 2-9 Connection of H.100 Bus

② 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 3: Boot your computer and install the driver.

Regarding driver installation, refer to *SynCTI_InstManual.pdf*.

Step 4: Connect network cable

Connect a network cable to the RJ45 jack on the board.

Step 5: Configure the operating parameters for the VoIP board

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

Key Tips:

- As the system is expected to run for long hours unmannedly, '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.
- A chassis installed with voice boards must be grounded 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^2 (excluding L-bracket)

Weight

≈ 170g

Environment

Operating temperature: 0℃—55℃

Storage temperature: -20℃—85℃

Humidity: 8%— 90% non-condensing

Storage temperature: 8%— 90% non-condensing

On-board LAN

Speed: 10/100M Compatible

Interface: RJ45

Recording/Playing Format

A-Law, μ-Law, ADPCM

Maximum System Capacity

Theoretically up to 8 VoIP boards concurrently per system

Audio CODEC

MS-GSM, G.729A, A-Law, μ-Law

Power Requirements

Maximum power consumption: ≤13W

Audio Encoding & Decoding

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

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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