Synway SSW Series

SHN-8B-CT/PCI+(SSW)

SHN-16B-CT/PCI+(SSW)

SHN-32B-CT/PCI+(SSW)

SHN-60B-CT/PCI+(SSW)

SHN-120B-CT/PCI+(SSW)

VoIP Board

Special-for-Switch

Hardware Manual

Version 1.0

Synway Information Engineering Co., Ltd

www.synway.net

Contents

Copyright Declaration

Revision History

Version	Date	Comments
Version 1.0	2012-9	Initial publication

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+(SSW) are VoIP boards with PCI bus. They are used special for UMCT switch and provide various services for developing VoIP applications.

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.
- Equipped with hot-swap circuit, supports hot swapping of boards during system running, making maintenance and backup easy.
- Compatible with other series of voice boards from Synway

1.2 Features

- **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.

- **Hot Swapping Supported**

  Both the main board and the outlet board support hot swapping, allowing users to replace and maintain the board during system running.

- **A Particular Separation Design**

  As the main board and the outlet board are designed independent from each other, when you pull out the main board or reinsert it or replace it with other boards, there is no need to reconnect lines as long as the outlet board is not changed or removed.

- **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

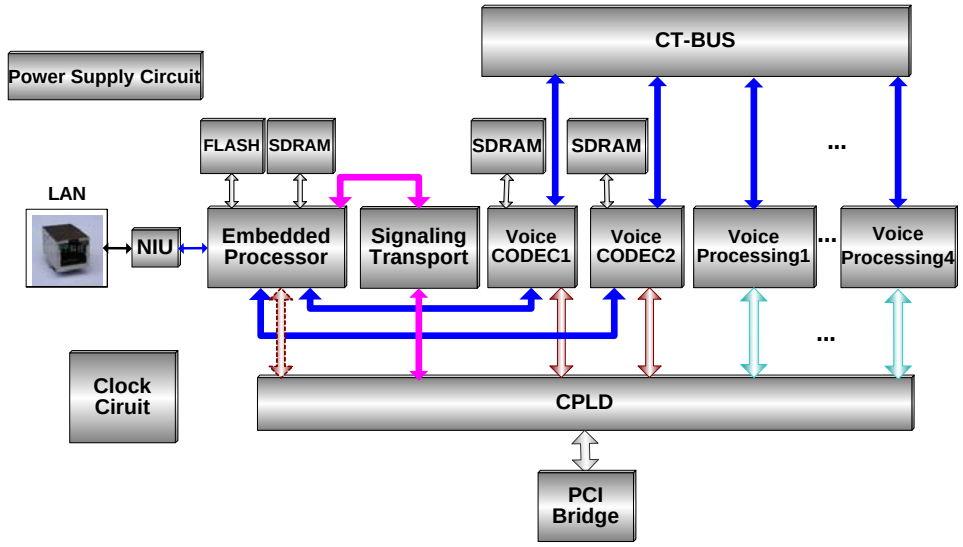

Figure 1-1 Operation Principle

Chapter 2 Installation

2.1 Hardware Structure

- **SHN-120B-CT/PCI+(SSW) Board**

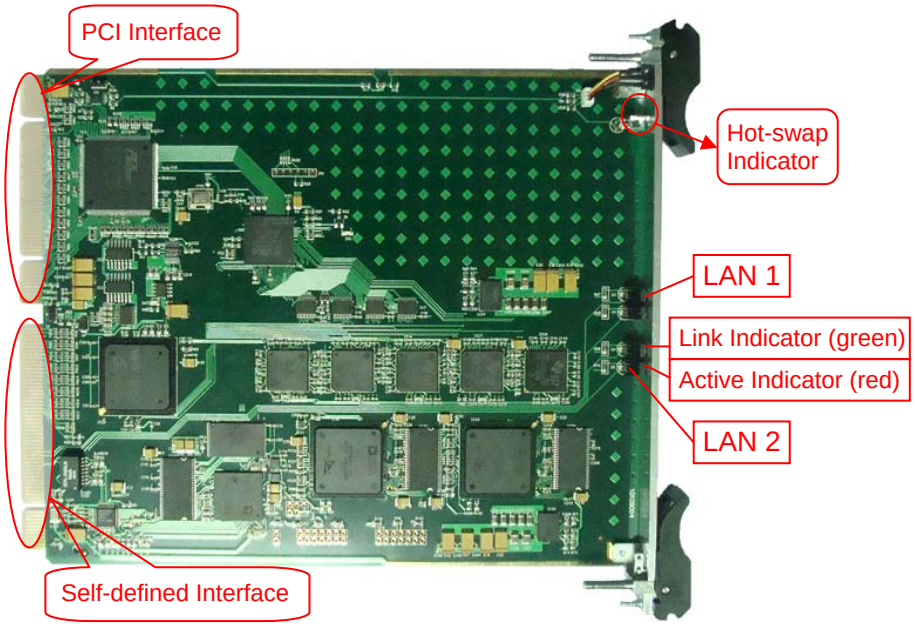

Figure 2-1 SHN-120B-CT/PCI+(SSW) Front View

- **SHN-60B-CT/PCI+(SSW) Board**

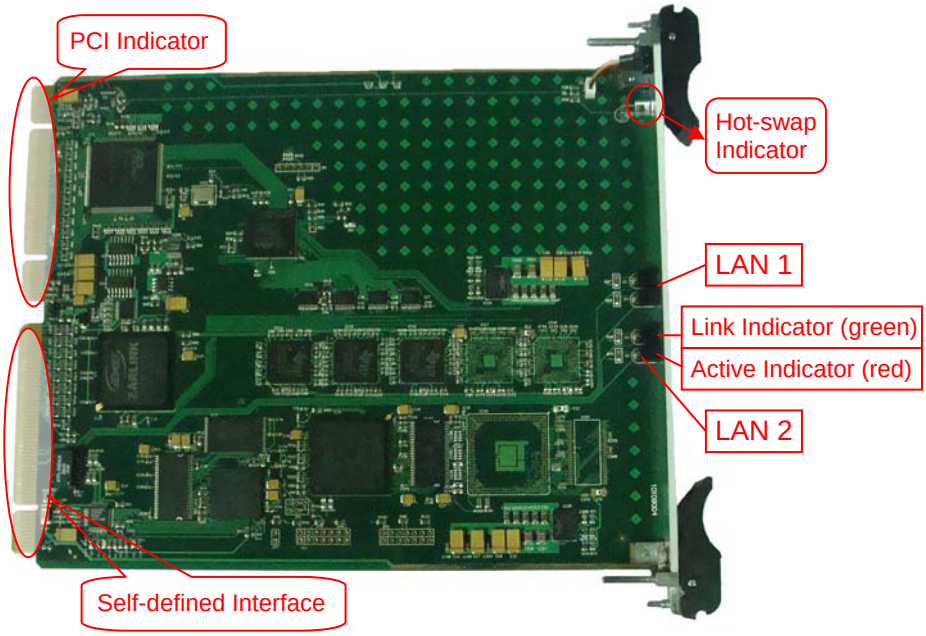

Figure 2-2 SHN-60B-CT/PCI+(SSW) Front View

- **SHN-32B-CT/PCI+(SSW) Board**

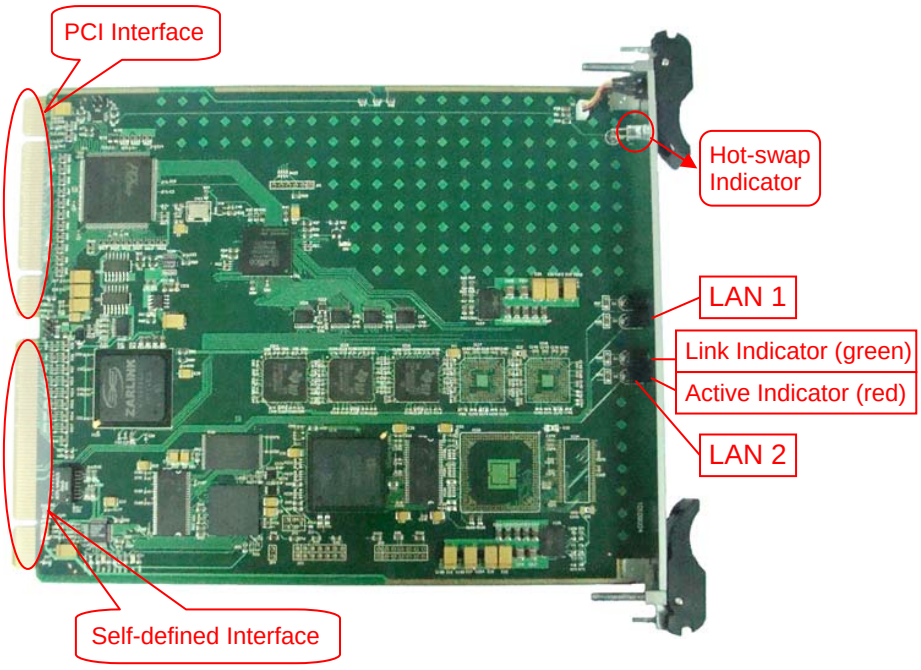

Figure 2-3 SHN-32B-CT/PCI+(SSW) Front View

- **SHN-16B-CT/PCI+(SSW) Board**

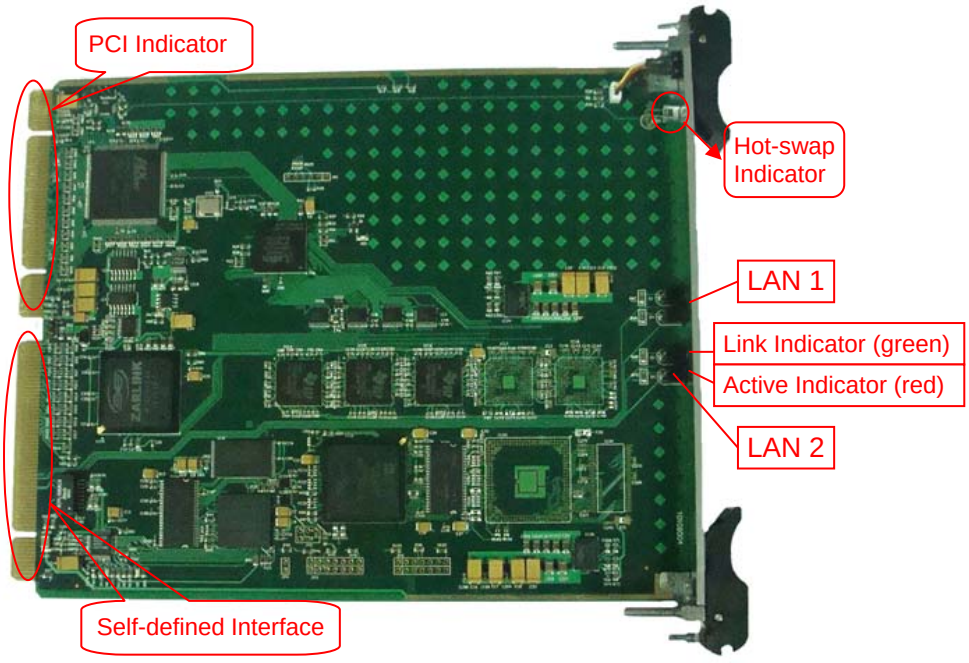

Figure 2-4 SHN-16B-CT/PCI+(SSW) Front View

- **SHN-8B-CT/PCI+(SSW) Board**

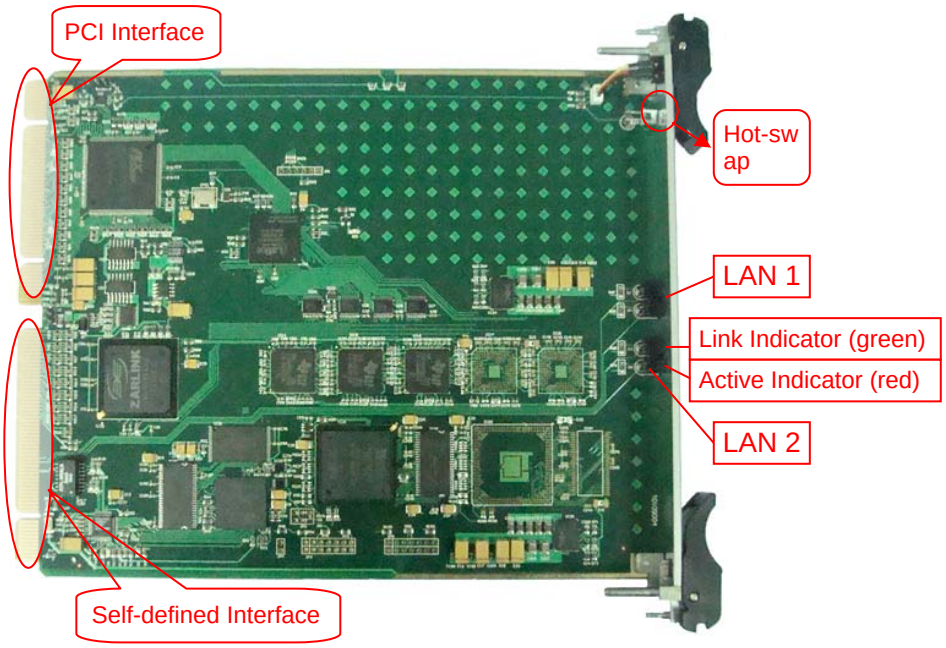

Figure 2-5 SHN-8B-CT/PCI+(SSW) (Front View)

- **Rear View**

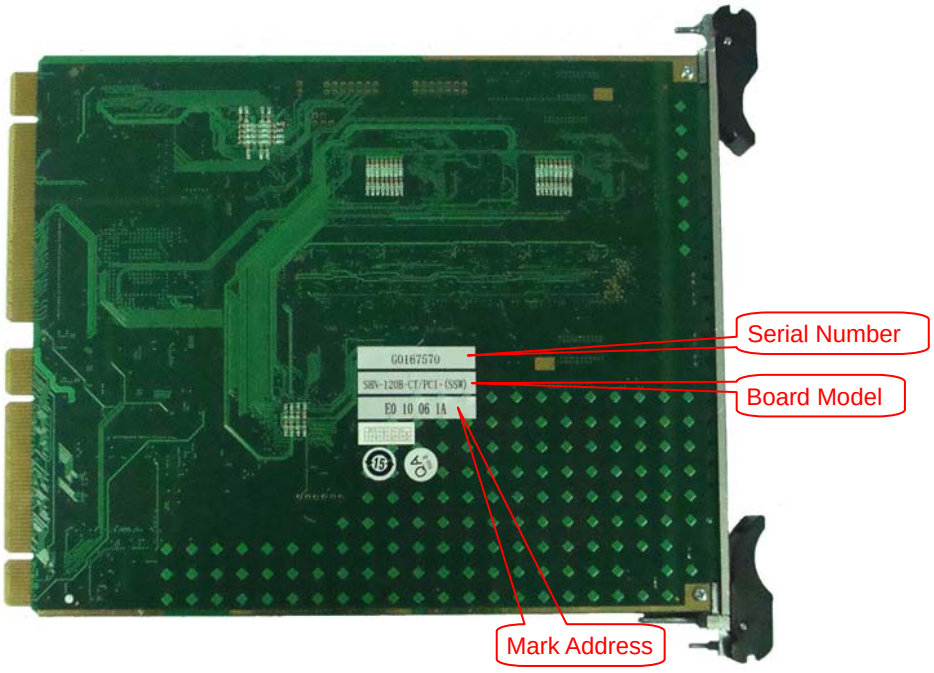

Figure 2-6 Main baord (Rear View)

- **RSN021 Outlet Board (Front View)**

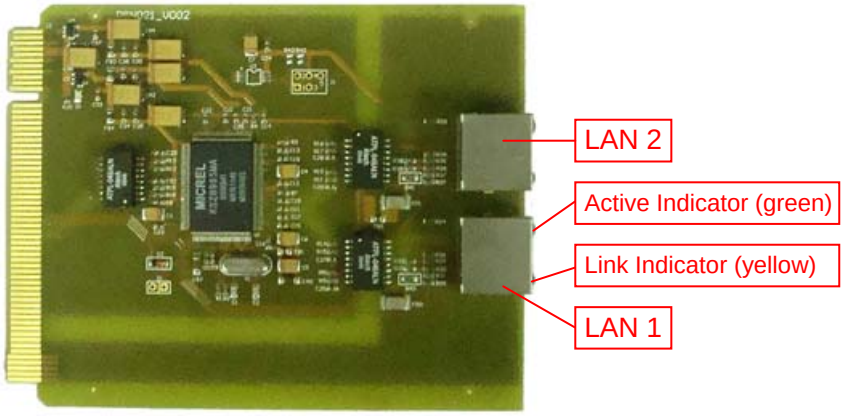

Figure 2-7 RSN021 (Front View)

- **RSN021 Outlet Board (Rear View)**

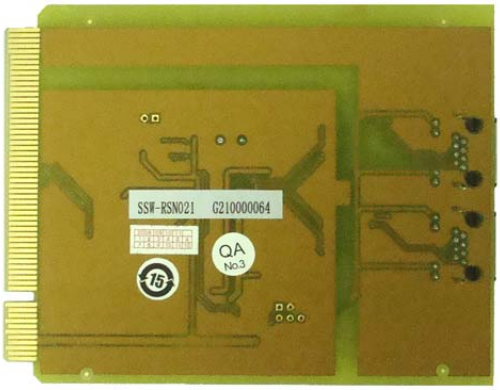

Figure 2-8 RSN021 (Rear View)

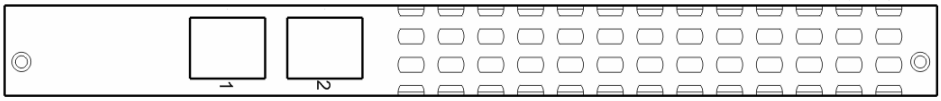

Figure 2-9 RSN021 Rear Panel (Front View)

Notes:

1) **The RSN021 outlet board is half-length.**
2) **The RSN021 outlet board is integrated with two 10M/100M compatible Ethernet interfaces and connects to the SHN board via the onboard network switch.**

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

Step 1: Properly fit the required mainboard and outlet board into the Synway PBX.

Insert the mainboard and outlet board into a pair of vacant slots on the Synway PBX.

With the mainboard completely inserted, push the upper and bottom handles inwards at the same time until a 'click' sound is heard. The board is now properly fitted.

Insert the outlet board properly into the slot on the back of PBX which corresponds to the mainboard. Push it home and then fasten the corresponding rear panel by two screws (on the upside and underside of the rear panel).

Notes:

① It is necessary to push the board home into the slot until it can go no further, and ensure that it is not inclined at an angle before applying lever action on the handles to secure it. Such problems as poor contact of boards, blue lamp always on which implies the board abnormality, or damages on connecting parts of the PBX may be caused if:

(I) Handles are used too early
(II) Handles are used while the board is inclined
(III) Force on handles is not applied evenly.

② Board is allowed to be inserted when the computer is at power on. However, as strong static electricity may lead to damages, the operator should touch a grounded conductor to discharge the static electricity on him before inserting the board.

Step 2: Connect the outlet board with network cable

RSN021 outlet board is integrated with two 10M/100M compatible Ethernet interfaces. For normal use, it is required to connect a network cable to either of the interfaces.

Step 3: Boot your computer and install the driver.

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

Step 4: Configure parameters for the digital trunk 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

Main board: 218.5×174.5mm²

RSN021: 180×115.1mm²

Weight

Main board: ≈400g

RSN021: ≈75g

Environment

Operating temperature: 0℃—55℃

Storage temperature: -20℃—85℃

Humidity: 8%—90% non-condensing

Storage humidity: 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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