



**SHR-4D/PCI
SHR-4D/PCle**

Radar Data Recording Board

Hardware Manual

Version 1.2

Synway Information Engineering Co., Ltd
www.synway.net

Contents

Contents	i
Copyright Declaration	ii
Revision History.....	iii
Chapter 1 Overview	1
1.1 Functions.....	1
1.2 Features	1
1.3 Operation Principle.....	3
Chapter 2 Installation.....	4
2.1 Hardware Structure	4
2.2 System Requirements	5
2.3 Installation Steps	5
Appendix A Technical Specifications.....	7
Appendix B Technical/sales Support.....	8

Copyright Declaration

All rights reserved; no part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, without prior written permission from Synway Information Engineering Co., Ltd (hereinafter referred to as 'Synway').

Synway reserves all rights to modify this document without prior notice. Please contact Synway for the latest version of this document before placing an order.

Synway has made every effort to ensure the accuracy of this document but does not guarantee the absence of errors. Moreover, Synway assumes no responsibility in obtaining permission and authorization of any third party patent, copyright or product involved in relation to the use of this document.

Revision History

Version	Date	Comments
Version 1.0	2005-12	Initial publication
Version 1.1	2006-6	Newly revised edition
Version 1.2	2014-5	Add description on the new board model SHR-4D/PCIe

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

Chapter 1 Overview

The SHR-4D/PCI radar data recording board (hereinafter referred to as 'radar board') includes PCI bus and provides up to 4 channels for radar data recording. This board records and digitizes radar signals through the on-board high-impedance interface circuits, allowing synchronous monitoring and immediate playback.

1.1 Functions

- High-impedance connection rules out interruption of data transmission on the line
- Supports synchronous simplex transmission per channel, independent data recording and playback
- Synchronous serial communication interfaces support digitization of data into a bit-stream record file
- Supports simultaneous data recording and playback on 4 channels

1.2 Features

- **PCI 2.1 Bus Support**

The SHR-4D/PCI board includes PCI 2.1 bus with burst data transmission rate up to 133 MB/s, and supports the PNP (plug and play) feature which eliminates the need for jumper leads.

- **PCI Express 2.0 Bus Support**

The SHR-4D/PCIe board includes PCI Express 2.0 bus and supports the PNP (plug and play) feature which eliminates the need for jumper leads.

- **Adjustable Recording/playback Rate**

Data recording rate is automatically modulated to accept input signals in the range of 300-38400 baud rate and playback rate is configurable via a function call with applications.

- **DB15 Port**

Easy parallel connection to on-board DB15 port via high impedance with a low malfunction rate, signal level complying with the RS232 standard.

- **1 to 4 Port Hi-Z Monitoring**

Flexible positioning of the access point on the communication line between radar and terminal.

The data recording and monitoring system which composes of Synway's voice boards and radar data recording boards enables voice and data communication with the airline dispatchers, providing ATC with an all-in-one solution for voice and radar data recording.

- **High Input Impedance**

Data input impedance is greater than 50KΩ, ensuring full-speed transmission of monitored signals.

- **Driver's Programming Mode**

Two modes support: Polling mode and event mode (callback mode).

- **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.

- **Driver Requirements**

Uses an independent driver, allowing share of a software platform with other SynCTI voice boards to enable simultaneous voice processing and radar data recording in a system.

- **Powerful API**

Simple programming algorithm for rich functions.

1.3 Operation Principle

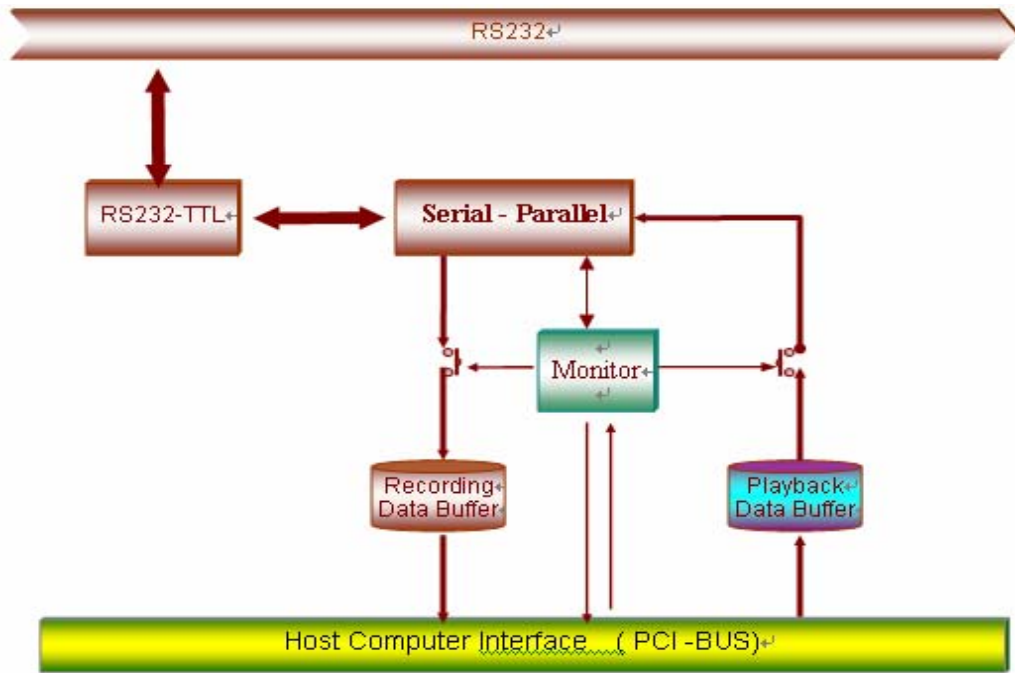


Figure 1-1 Operation Principle

Chapter 2 Installation

2.1 Hardware Structure

- SHR-4D/PCI

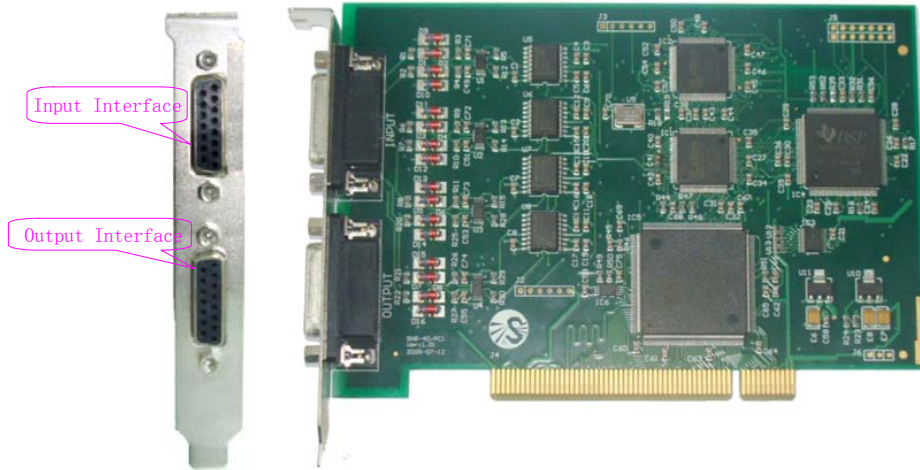


Figure 2-1 Left & Front Views

- SHR-4D/PCIe

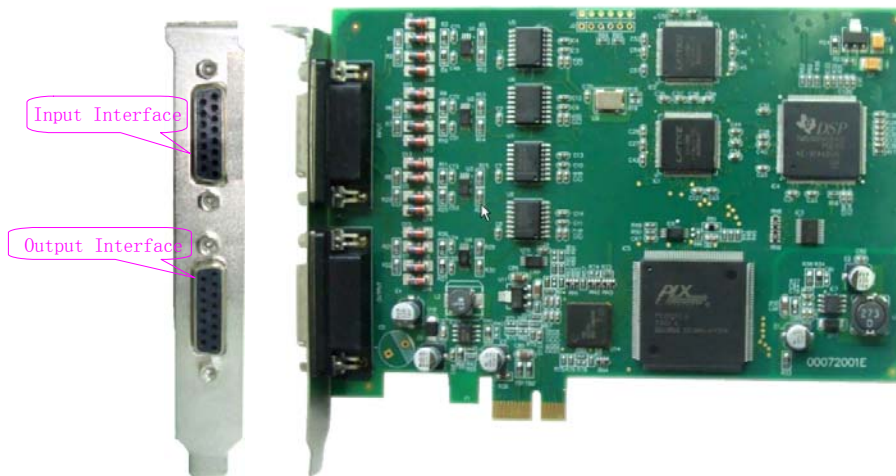


Figure 2-2 Left & Front Views

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

2.3 Installation Steps

Notes: Always turn off the power before installation!

Step 1: Insert the radar board into the PCI slot on the chassis

Step 2: Connect the radar data line to the DB15 port.

Each DB15 port connects 4 channels. See Figure 2-3, Table 2-1 and Table 2-1 below for distribution and functions of the port pins.

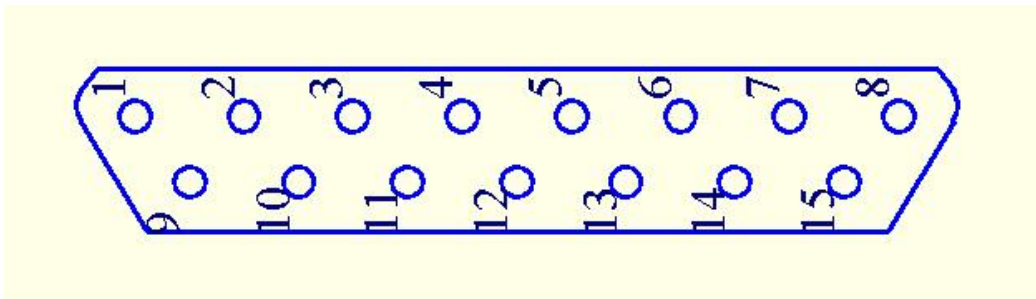


Figure 2-3 Pin Layout for DB15 Port

Input interface pins function as follows.

Channel 0		Channel 1		Channel 2		Channel 3	
Function	Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.
Data Reception	15	Data Reception	13	Data Reception	11	Data Reception	9
Clock Signal Reception	8	Clock Signal Reception	6	Clock Signal Reception	4	Clock Signal Reception	2
Signal Ground	7	Signal Ground	5	Signal Ground	3	Signal Ground	1

Table 2-1 Pin Definition for Input Interface

Output interface pins function as follows.

Channel 0		Channel 1		Channel 2		Channel 3	
Function	Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.
Data Transmission	15	Data Transmission	13	Data Transmission	11	Data Transmission	9
Clock Signal Transmission	8	Clock Signal Transmission	6	Clock Signal Transmission	4	Clock Signal Transmission	2
Signal Ground	7	Signal Ground	5	Signal Ground	3	Signal Ground	1

Table 2-2 Pin Definition for Output Interface

Notes:

- ① The rest few pins unmentioned in the above two tables stay unused.
- ② Users can construct different radar data lines with different connectors for their own practical purposes. All that is needed is to connect the leads for clock signal transmission, data transmission and signal ground in the radar data line to their corresponding ends in the DB15 port on our board.

Step 3: Connect the radar board to the radar terminal with radar data lines.

Step 4: Boot up your computer and install the driver.

Regarding driver installation, please refer to 'ShRadarInstManual_cn.pdf'.

Step 5: Set the baud rate for the radar board.

Regarding setting of baud rate, please refer to 'ShRadarInstManual_cn.pdf'.

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 radar 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

*106 *155mm² (excluding fixed slider)*

Weight

About 200g

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

Two DB15 Ports

Maximum System Capacity

Up to 10 boards concurrently per system;

up to 4 channels per board

Power Requirements

+5V DC: 600mA

-12V DC: 80mA

+12V DC: 300mA

Maximum Power Consumption: ≤5W

Input Impedance

≥50kΩ

Transmission Rate

300/600/1200/2400/4800/9600/

19200/38400 bps

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.

Headquarters

Synway Information Engineering Co., Ltd

<http://www.synway.net/>

9F, Synway D&R Center, No.3756, Nanhuan Road, Binjiang District,
Hangzhou, P.R.China, 310053

Tel: +86-571-88860561

Fax: +86-571-88850923

Technical Support

Tel: +86-571-88864579

Mobile: +86-18905817070

Email: techsupport@sanhuid.com

Email: techsupport@synway.net

MSN: synway.support@hotmail.com

Sales Department

Tel: +86-571-88860561

Tel: +86-571-88864579

Fax: +86-571-88850923

Email: sales@synway.net