

# Industrial PCI/PCI-E/PCI-104 Multi-Port Communication Board

## Introduction

SUNIX Serial Communication Boards family provides an array of PCI Express, PCI, and PCI-104 interfaces to meet your serial port expansion needs. Multi-port Serial Communication Board comes in the selection of 2, 4, 8 ports in choice of RS-232, RS-422/485 or 3-in-1 combo with DB9 or DB25 serial connectors and compatible with all major operating system for industrial applications.

## Features

- Supports 8/4/2 independent RS-232, RS-422 or RS-485 serial ports.
- Supports, Universal PCI, PCI Express, and PCI-104 bus types.
- Serial communication speeds up to 921.6Kbps.
- SUNIX AHDC/CS technology for RS-485 2-wire signal direction control.
- RS-422 and RS-485 Auto Detect and Switching technology.
- Built-in 64 byte hardware FIFO & 128K byte DMA software FIFO for high speed and reliable communications.
- Easy to install - no DIP switches or jumpers to set.
- Surge and Isolation protection for SI version.
- Support DOS, Linux, Microsoft 2000, XP, 2003, and VISTA
- Ready for the Intel and AMD 32/64-bit CPU and operation system.

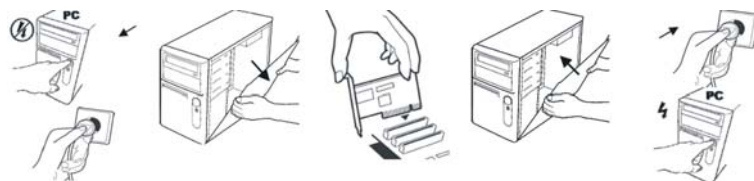
## Package List

Please check if following items are present and in good condition upon opening your package. Contact your vendor if any item is damaged or missing.

- Communication Board x 1
- Serial Cable
  - 2 ports series : DB44 Female to 2 ports DB9 or DB25 Male x 1
  - 4 ports series : DB44 Female to 4 ports DB9 or DB25 Male x 1
  - 8 ports series : Mini SCSI 68pin to 8 ports DB9 Male x 1
- Bracket
  - Standard Bracket : 121mm \* 1
  - Low Profile Bracket : 79.2mm \* 1
- SUNIX CD
- Quick Installation Guide (this document)
- User Manual

## Hardware Installation

The hardware installation of PCI / PCI-E serial boards is easy to carry out. Before inserting the card into the PCI / PCI-E bus, please follow the detailed steps given below to install the PCI / PCI-E serial board in your computer.

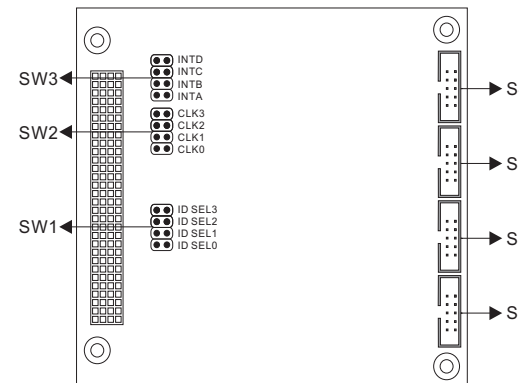


- Step 1:** Turn your PC power off, and shut off the power to any peripheral.
- Step 2:** Remove the power plug from the plug socket.
- Step 3:** Remove the cover from the computer case. If fitted
- Step 4:** If fitted Remove the metal cover plate on the rear of a free PCI slot.
- Step 5:** Insert Universal PCI / PCI-E Multi-Port Communication Board into the free PCI/PCI-E slot and screw it firmly on the bracket side.
- Step 6:** Place the cover back onto the computer.
- Step 7:** Insert the plug into the plug socket.

## PCI-104 Installation

In industrial PC motherboard, adjust the PCI-104 card in the given slot, and tight the four screw (one at each corner).

## RS-232 & RS-422/485 Drawing



## RS-232 & RS-422/485 Jumper Settings

Connectors		Jumpers	
Label	Function	Label	Function
S1	RS-232 or RS-422/485 Port 1	SW1	PCI Interrupt Select
S2	RS-232 or RS-422/485 Port 2	SW2	PCI Clock Select
S3	RS-232 or RS-422/485 Port 3	SW3	PCI ID Select
S4	RS-232 or RS-422/485 Port 4		

Module Slot	ID Select	Clock Select	Interrupt Select
1	IDSEL0	CLK0	INTA
2	IDSEL1	CLK1	INTB
3	IDSEL2	CLK2	INTC
4	IDSEL3	CLK3	INTD

## Software Installation

After installing the RS-232/42/485 Universal PCI / PCI Express Multi-Port Communication Board in your system successfully, please follow the step by step software installation guide to confirm how to install appropriate driver and configure the serial port settings.

## Driver Installation

In order to ensure proper operation of your Matrix Multi-Ports serial board, the driver will be in the CD bound with your product. You can specify the location (folder) as below :

Operation System	Driver Location
2000/XP/2003/Vista_32bit	:\\IO\\Matrix Driver\\Windows\\2K&XP&2003&Vista_32bit\\install.exe
XP/2003_64bit	:\\IO\\Matrix Driver\\Windows\\XP&2003_64bit
Linux 2.4.x	:\\IO\\Matrix Driver\\Linux\\2.4.x
Linux 2.6.x	:\\IO\\Matrix Driver\\Linux\\2.6.x
User Manual	

※ You can find the detail of the installation steps in the user manual.

## Window 2003/XP/2000 Driver Installation

- After powering on your PC, Windows 2003/XP/Vista will automatically detect the communication board.
- Please insert the driver CD in your CD/DVD-ROM drive.
- Please choose **“Search for a suitable driver for my device (recommended)”** option, and click **“Next”** again to continue.
  - P.S.1** XP 32bit, please use the folder \\Windows\\2K&XP&2003&Vista\_32bit
  - P.S.2** XP 64bit, please use the folder \\Windows\\XP&2003\_64bit
- Select CD-ROM drives and Specify a location.
  - P.S.1** XP 64bit, please click **“Continue Anyway”** to continue.
- Please choose the CD/DVD-ROM drive, and choose the path **“Windows\\2K&XP&2003&Vista\_32bit”**, and click **“Open”** to continue.
- Then click **“Next”** to continue Found New Hardware Wizard.
- Please choose **“Search for a suitable driver for my device (recommended)”** option, and click **“Next”** again to continue till finish.

## Window Vista Driver Installation

- After powering on your PC, Windows 2003/XP/Vista will automatically detect the communication board.
- Please insert the driver CD in your CD/DVD-ROM drive.
- Please click **“Locate and install driver software(recommended)”** to continue in Found New Hardware Wizard window.
- Please click **“Don’t search online”** to continue.
- Please click **“I don’t have the disc. Show me other option.”** to continue.
- Please click **“Browse my computer for drivers software(advanced)”** to continue.
- Please choose the CD/DVD-ROM drive, and choose the path **“Windows\\2K&XP&2003&Vista\_32bit”**, and click **“Open”** to continue.
- Please click **“Install this driver software anyway”** to continue.
- Then click **“Close”** to continue.

# Industrial PCI/PCI-E/PCI-104 Multi-Port Communication Board

### Linux Driver Installation

The drivers for Linux support both kernel 2.4.x and 2.6.x along with various Linux distributions. Separate packages are used for different version of kernels. Driver with suffix "2.4\_Vx.xx" supports kernel 2.4.x, and driver with suffix "2.6\_Vx.xx" supports kernel 2.6.x. The installation steps described below is showed as a general case. More detail description about installation could be found on the readme file along with the driver package.

1. Please create a directory under root, e.g /temp, do command as below.  

```
# cd /
# mkdir temp
```
2. Select a driver package according to kernel version and copy it into /temp directory, then extract and install, do commands as below.  

```
# cp matrix_2.6_Vx.xx.tgz /temp
# cd /temp
# tar xvzf matrix_2.6_Vx.xx.tgz
# cd /temp/matrix_2.6
# make clean ; make install
```
3. To load driver module, please do command as below.  

```
# modprobe sunix_matrix
```

or  

```
# insmod /temp/matrix_2.6/driver/sunix_matrix.ko
```
4. To check if driver is loaded, do as below.  

```
# lsmod | grep sunix_matrix
```
5. If want to remove driver, do command as below.  

```
# rmmod sunix_matrix
```
6. Each serial port has its file node whose name will be "ttySMX?". To create device nodes do commands as below.  

```
# cd /temp/matrix_2.6/smxmknod
# ./smxmknod
```

This will create device nodes in /dev

If there are more than two boards installed, device naming convention table as below.

Board Number	Device Name
1st board	ttySMX0 ~ ttySMX7
2nd board	ttySMX8 ~ ttySMX15
3rd board	ttySMX16 ~ ttySMX23
4th board	ttySMX24 ~ ttySMX31

7. To dump information for those serial ports, do command as below

### # smxdump

This will show the info about those serial ports, the result should be like this  
 ===== Found 6 SUNIX port, list informations below =====

```
ttySMX0 --
RS-232 (bus:2 device: 1) , base address = a000, irq = 169
ttySMX1 --
RS-232 (bus:2 device: 1) , base address = a008, irq = 169
ttySMX2 --
RS-232 (bus:2 device: 1) , base address = a010, irq = 169
ttySMX3 --
RS-232 (bus:2 device: 1) , base address = a018, irq = 169
ttySMX8 --
RS-422/485 (bus:2 device: 2) , base address = a800, irq = 177
ttySMX9 --
RS-422/485 (bus:2 device: 2) , base address = a808, irq = 177
=====
```

8. To build softlink for device node, do as below

### # snxlink

9. Use snxterm to test those installed serial ports.

### # snxterm

### Universal PCI / PCI-E / PCI-104 Board Specification

#### Function

Type	Universal PCI / PCI-Express / PCI-104 Board
Bus Transceivers	RS-232, 422 Full-Duplex, RS-485 Half-Duplex
Drivers per Line	RS-232, RS-422, RS-485 1 Driver
Receivers per Line	RS-232 1, RS-422 10, RS-485 32 Receivers

#### Hardware

IC	Matrix
Controller	16C750 Compatible UART
Bus Interface	PCI-Express Bus Spec. Revision 1.0a
Number of Ports	2, 4 or 8 Ports
Bracket	Standard 121 mm, Low Profile 79.2 mm

#### Communication

IRQ & I/O address	Assigned by BIOS / O.S.
FIFO	64 byte Hardware FIFO
Baud Rate	75bps ~ 921.6Kbps
Data bit	5, 6, 7, 8
Stop bit	1, 1.5, 2
Parity	Even, Odd, None, Mark, Space
Flow Control	None, Software, Hardware
Protection	15KV ESD Surge Protection (For RS-232) 400W Surge Protection (For RS-422/485)
Signal	232 : TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND 422 : TxD+, TxD-, RxD+, RxD-, GND 485 : 4 Wire ~ TxD+, TxD-, RxD+, RxD-, GND 2 Wire ~ Data+, Data-, GND

#### Driver Support

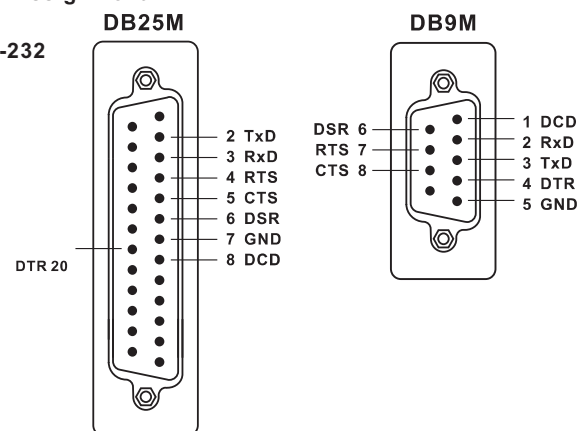
Driver Support	Microsoft Windows 2000/XP/2003/VISTA DOS, Linux 2.0x / 2.2x / 2.4x / 2.6x
----------------	--

#### Regulatory Approvals

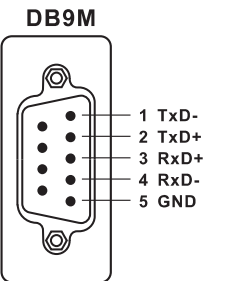
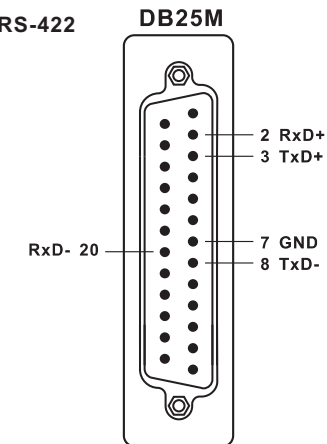
Regulatory Approvals	CE, FCC
----------------------	---------

### Pin Assignment

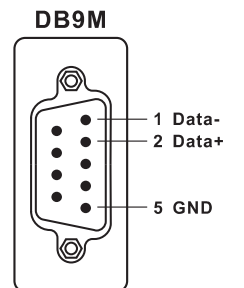
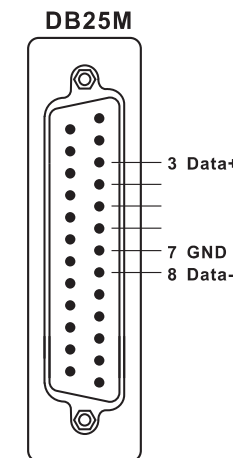
#### RS-232



#### RS-422



#### RS-485



Copyright© by SUNIX Co, LTD.  
All rights reserved.



TEL: +886-2-8913-1987  
FAX: +886-2-8913-1986

Website: www.sunix-ncci.com.tw  
E-mail: info@sunix-ncci.com.tw