771-MIO4479A0-001

Quick Installation Guide

Version 1.0

PCI Express Multi-IO RS-232 & Parallel Communication Board

Introduction

This PCI Express Multi-IO communication board provides independent high speed RS-232 serial and IEEE1284 parallel interface, is compatible with PCI Express x1, x2, x4, x8, and x16 lane Bus, allowing the board to be installed in virtually any PC system that is equipped with PCI Express slot. Majority of today's motherboard no longer come with serial and parallel port, with PCI Express Multi-IO board, users can expand two RS-232 DB9 male and one IEEE1284 DB25 female ports on your system, allowing them to connect RS-232 serial and IEEE1284 parallel devices. The new slot standard supports Windows 2000 and above, plus Linux 2.4.x and above kernel. This board is the advanced and high efficient solution for commercial and industrial automation applications

Specification

General

- Designed to meet PCI Express Base Specification Revision 1.1.
- Single-lane (or x1) PCI Express throughput supports rates of 2.5 Gbps.
- Supports x1, x2, x4, x8, x16 (lane) PCI Express Bus connector keys.
- Certified by Microsoft WHQL, CE, FCC approval.
- Support Intel® and AMD® 32/64-bit system and Linux, Microsoft Windows OS.

RS-232 Serial Interface

- Two independent RS-232 serial ports with communication speeds up to 921.6Kbps.
- High speed SUN1889 16C650 compatible UART controller on-board.
- On-chip hardware auto flow control to guarantee no data loss.
- Built-in 32 byte hardware FIFO & 128K byte DMA software FIFO.
- Built-in 15KV ESD protection for all serial signals.

IEEE1284 Parallel Interface

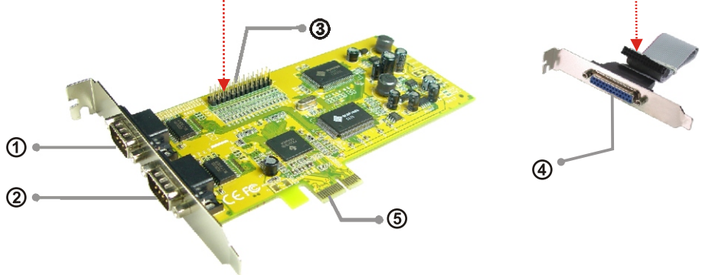
- One IEEE1284 parallel port with communication speeds up to 2.7Mbps.
- High speed SUN1888 Parallel controller on-board.
- Support IEEE 1284-1994 parallel port standard.
  ECP(Enhance Capacity Port) / EPP(Enhance Parallel Port)
  SPP(Standard Parallel Port) / BPP(Bi-direction Parallel Port)

Package List

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

1. PCI Express Multi-IO Communication Board
2. Pin Header to DB25F Connector Bracket set
3. User's Manual and Software CD ROM
4. Quick Installation Guide (this document)

Hardware Guide

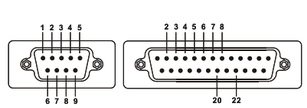


① RS-232 port 1 (COM1)
② RS-232 port 2 (COM2)
③ Pin Header to IEEE1284 Parallel Connector
④ DB25F Connector Bracket set (LPT3) *Please connect ③&④ with each other.
⑤ PCI Express one lane (x1) golden connector

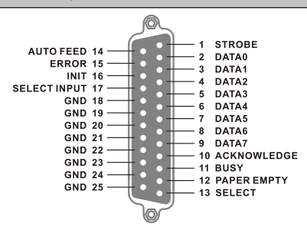
Specification

Model	PCI Express Multi-IO Communication Board
Bus Interface	PCI Express one lane (x1)
Bracket	Standard 121 mm / 2 bracket space
Driver Support	Windows 2000 / XP / 2003, Linux 2.4.x, 2.6.x
Regulatory Approvals	CE, FCC / Microsoft WHQL
Environment	Operation Temperature: 0℃ ~ 60℃ StorageTemperature: -20℃ ~ 85℃

RS-232 Communication

Number of Port	Two DB9 Male RS-232 Port
Controller	SUN1889 16C650 Compatible UART
IRQ & IO Address	Assigned by BIOS / O.S.
FIFO	32 byte hardware FIFO & 128K byte software DMA FIFO
Baud Rate	75 ~ 921,600bps
Data Bit	5, 6, 7, 8
Stop bit	1, 1.5, 2
Parity	Even, Odd, None, Mark, Space
Flow Control	None, Xon/Xoff, HardWare
Pin Assignment	TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND DB9M DB25M DCD 1 8 RxD 2 3 TxD 3 2 DTR 4 20 GND 5 7 DSR 6 6 RTS 7 4 CTS 8 5 RI 9 22 

Parallel Communication

Mode of Operation	ECP / EPP / SPP / BPP
Number of Ports	One DB25 Female Parallel Port
ControllerBracket	SUN1689 IEEE1284 Compatiable
IRQ & IO Address	Assigned by BIOS / O.S.
FIFO	32 byte hardware FIFO
Baud Rate	Maximum up to 2.7 Mbps
Pin Assignment	

Driver Installation

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

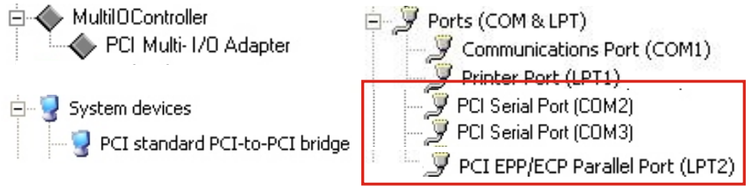
Operation System	Driver Location
Windows 2000 / XP / 2003	**:\IO\PCI IO\Win2K & XP & 2003\Setup.exe**
Linux 2.4.x, 2.6.x	**:\IO\PCI IO\Linux**
User Manual	**:\IO\PCI IO\Manual\Serial.pdf**

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

Hardware Verity

Please launch the "**Device Manager**" to verity hardware installation correctly.

Start > Controller Panel > System > Device Manager



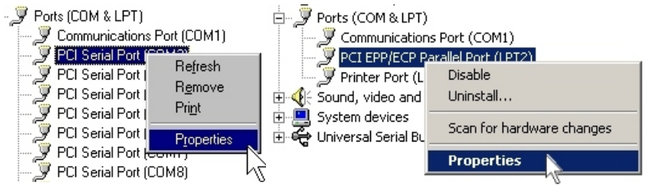
NOTE:

If you can not find or one exclamation mark on "**PCI standard PCI-to-PCI bridge**" message in the device manager (shown in above picture), please upgrade your motherboard BIOS to the latest version. If it still not work, contact your motherboard vendor asking the advanced supporting for BIOS updated.

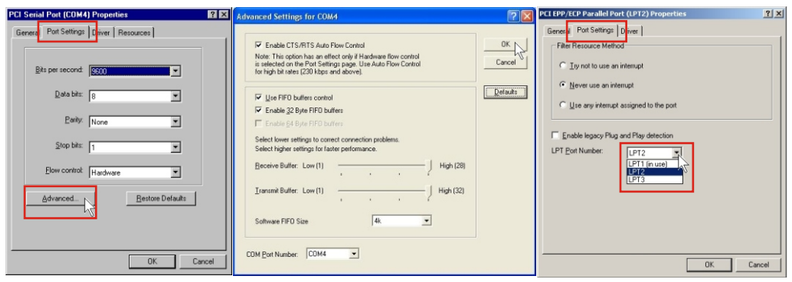
Port Setting

After installing PCI Express Multi-IO board successfully, you can modify the setting for each serial and LPT ports in device manager.

1. Right click your mouse on the COM or LPT port, and select "**Properties**".



2. Select "**Port Setting**" page to modify COM or LPT port setting.
   Serial: Select "**Advanced**" icon, you can modify serial COM port number and FIFO length.
   Parallel: Select LPT Port Number menu, you can modify LPT number as you need.



NOTE:

1. Because of PCI-Express plug-n-play role, user can NOT specify LPT port to legacy ISA 278, 378, or 3BC address and serial COM port to legacy ISA 3E8, 3F8, 2E8, or 2F8 address.

2. Each serial port supports maximum 32 bytes hardware FIFO, and you can use 0,16 or 32 4 bytes FIFO. The default value is 16 Byte FIFO buffers. DMA software allows setting between 128byte to 128K byte. The setting of the FIFO length can be configured individually for each port. Set the Receive / Transmit Buffer to higher value will get faster performance because the interrupts will be reduced, but the time for interrupt service routine will become shorter. The receive buffer over-flow will be easily happened if the CPU speed is not enough to handle. If the system is not stable, select the lower value to correct problems.

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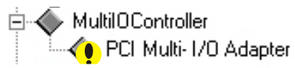
Troubleshooting

■ **If the card and devices connected to the computer do not seem to be working properly, please perform following basic troubleshooting steps:**

1. Check that all cables are correct and securely connected.
2. Make sure the devices are turned on.
3. Make sure the devices are getting the power they require.
4. If a powered repeater is connected, make sure it is turned on.
5. Make sure there is no problem with the card installation.

■ **There are some exclamation marks in device manager or serial ports.**

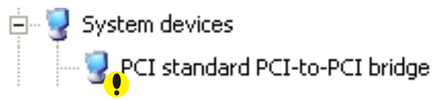
1. It caused by the wrong driver installing or hardware settings. Please turn off your computer and reinstall hardware and software.
2. If the exclamation marks on PCI Multi-I/O Adapter or COM port, please turn off your computer and reinstall hardware and software.



■ **The computer can NOT detect the PCI Express Multi-IO board.**

1. Make sure that the PCI Express cards is correctly plugged into the PCI Express slot; if not, turn off the computer and plug it in again.
2. If the PCI Express card is plugged in correctly, see if the golden connectors on the card are clean; if not, clean the connector surface.
3. If still NOT, please change another PCI Express slot on your motherboard.
4. Please entry "Device Manager" affirming "PCI standard PCI-to-PCI bridge " message appears in the sub-tree of "System device".

Start > Controller Panel > System > Device Manager



If you can not find this information or exclamation mark shown on the PCI standard PCI-to-PCI bridge, please upgrade your motherboard BIOS to the latest version. If it still not work, contact your motherboard vendor asking the advanced supporting for BIOS updated.

■ **The PCI Express Multi-IO board cannot be detected by the attached driver while installing the driver.**

It may cause by following issue:

a. The board is not installed. Please install the board in an empty PCI-Express slot.

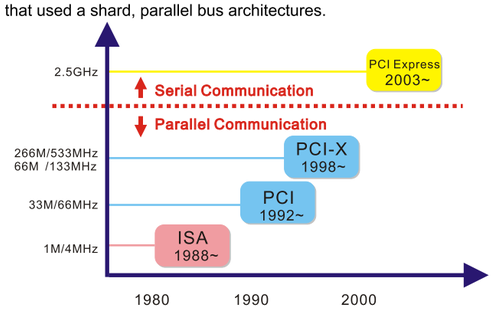
b. The board is not properly plugged into the system's PCI Express slot. If that is the case, re-plug the board in a PCI Express slot. It may also be the case that the PCI Express slot is defective. In this case, try other PCI Express slots until you find one that works.

■ **What's the system requirement.**

1. Pentium-class computer with one available x1, x4, x8 or x16 PCI Express slot.
2. Linux or Microsoft Windows 2000, XP and Sevrer2003 operation system.
3. Bulit-in CD/DVD ROM for driver installation.

■ **What's benefit of PCI Express interface?**

PCI Express is the next revolution in I/O interconnects standards that will deliver the bandwidth and features required by PCs, consumer electronics and communications devices. The architecture is a cost-effective, low-pin count, and point-to-point technologies offering maximum bandwidth, reducing cost and design complexity and enabling smaller form factors. Single-lane (or x1) PCI Express link has potential transfer rates of 2.5 Gbps by two pairs of wires connection. This differs from existent PCI Bus architectures that used a shard, parallel bus architectures.



■ **System fails to find the PCI Express serial board or COM/LPT port.**

It may cause by following issue:

a. The board is not properly plugged into the PCI slot.

b. Please clean the golden finger.

c. The PCI Express slot may defective.
Please try other slots until you find one that works.

d. The mainboard does not have available IRQ for the PCI or PCI Express serial board.
Enter the PC's BIOS and make sure an IRQ setting is available in the PCI/PnP settings.

e. The board itself might be defective. You can try another mainboard testing this board working or not.

f. Please entry "Device Manager" affirming "PCI standard PCI-to-PCI bridge" message appears in the sub-tree of "System device".

■ **The PCI Express Multi-IO board cannot be detected by the attached driver while installing IO driver.**

It may cause by following issue:

a. The board is not installed. Please install the board in an empty PCI-E slot.

b. The board is not properly plugged into the system's PCI Express slot.
If that is the case, re-plug the board in a PCI Express slot. It may also be the case that the PCI Express slot is defective. In this case, try other PCI Express slots until you find one that works.

■ **After the system rebooting, I can not see this PCI Express Multi-IO Board shown on the "PCI Device List" display.**

After rebooting (before operation system starting), system will show the following information in the PCI device list:

BUS No	Device No	Func No	Vendor ID	Device ID	Device Class	IRQ
2	9	0	1409	7168	Simple Comm. Controller	10

This indicates that this board was found. If you do not see this information, please confirm the IRQ conflicts with another adapter. Check the PCI BIOS IRQ settings and then select an available IRQ for this boards. Also the board itself might be defective. You can try another mainboard testing this board working or not.

■ **How can I select or configure between ECP, EPP, SPP, or BPP modes?**

UnderMicrosoft windows opearation system such as WinXP/2K/2003, PCI-E parallel board's LPT port will automatically communicate with the device to which it is connected and sets to that particular mode. For example if PCI-Express Multi-IO board is connected to a printer that support SPP mode, then this board will communicate with this printer and will automatically set to SPP mode. It means that this board will automatically handshakes with the device to which it is connected and configures to that mode. User does not require changing to any particular mode.

■ **My parallel device can not work on PCI-Express Multi-IO board's LPT port, but work properly when connecting on-board LPT port.**

It caused by your parallel device problem, because your device only works under legacy ISA address. Due to PCI-Express plug-n-play rule, IRQ and I/O resource are all assigned by BIOS or system. Mother-board's LPT port can remap or to ISA 278, 378, or 3BC address, but PCI-Express Multi-IO board can not. Please ask new driver for your parallel device.

■ **My serial device can not work on PCI-Express Multi-IO board's COM port, but work properly when connecting on-board COM port.**

It caused by your serial device problem, because your device only works under legacy ISA address. Due to PCI-Express plug-n-play rule, IRQ and I/O resource are all assigned by BIOS or system. Mother-board's LPT port can remap or to ISA 3F8, 3E8, 2E8, and 2F8 address, but PCI-Express Multi-IO board can not. Please ask new driver for your parallel device.

■ **Shall I set serial COM port's software DMA FIFO?**

FIFO (First-in-First-out) buffers are used to reduce the frequency of interupt processes for UART chips. The size of the buffer will determines the number of times the cards need to interrupt the computer's CPU in order to process a string of data. With larger FIFO buffer size; there is more data flow and less interruption to the CPU, therefore allowing the CPU to be free to handle other more crucial tasks.

This Serial I/O Communication Boards can provide users with up to 128K byte of FIFO buffer size for high system performance. Embedded within unique serial driver, we have added the function which allows users to assign part of the system's DRAM memory to act as the FIFO buffer for the cards. Users can also assign various size of memory depends on their requirement. With the large buffer capacity, users can have more improved performance and increased efficiency to their systems. PCI Express multi-IO board driver supports software FIFO for serial port under Windows 2000, XP and 2003 operation system

This FIFO is used to buffer data on the receive path. The size of the FIFO can be configured in the advanced property page of the driver. It allows setting between 128byte to 128K byte. The setting of the software size can be chosen individually for each port.