Solflower Serial Port Adapter

for PCI bus

User's Manual

Solflower Computer, Inc. 3511 Thomas Rd, Ste 2 Santa Clara, CA 95054 TEL: (408) 982-8680 FAX: (408) 982-8685 http://www.solflower.com

TABLE OF CONTENTS

| CHAPTER 1: GENERAL INFORMATION | .3 |
|---|----------------------------|
| INTRODUCTION PARTS INCLUDED IN THE PACKAGE SAFETY RULES BOARD SPECIFICATIONS Dimension Power Consumption Electrical Characteristic Cable Connector Pinouts | 3 3 3 3 4 4 |
| CHAPTER 2: HARDWARE INSTALLATION | 5 |
| CHAPTER 3: WINDOWS INSTALLATION | 6 |
| WINDOWS 98 INSTALLATION | 5 0 1 |
| CHAPTER 4: SERIAL PORT TESTS IN WINDOWS | 3 |
| WINSSD SERIAL DIAGNOSTICS | 3 3 |
| CHAPTER 5: LINUX INSTALLATION (KERNEL 2.4.18) | D |
| CHAPTER 6: SOLARIS INSTALLATION | 3 |
| SOFTWARE INSTALLATION22VERIFY THE INSTALLATION24SERIALDEMO IN JAVA COMMUNICATIONS API29DATA TEST PROGRAM (dt)27 | 3 4 5 7 |
| CHAPTER 7: TROUBLESHOOTING | 6 |
| APPENDIX A: 1-TO-8 SERIAL CABLE CONNECTOR PINOUTS | 7 |

CHAPTER 1: GENERAL INFORMATION

INTRODUCTION

The Solflower Serial Port Adapter is a 16 serial port PCI add-in board. The 16 serial ports can operate simultaneously with each port's error-free data rate up to 115000 bps for all 16 ports.

This document describes the hardware specification and installation of the board.

PARTS INCLUDED IN THE PACKAGE

- 1 Solflower Serial Port Adapter board.
- 2 1-to-8 serial cables.
- 1 CDROM that contents device drivers and user's manuals.

SAFETY RULES

To prevent damage to the board, do not handle the board without ESD precaution. Solflower Computer Inc. recommends user to ware an anti-static strap. Do not plug or unplug the board when your system is powered on. This board uses power supplies of 5V and +/-12V. This board is designed for in-door use only.

BOARD SPECIFICATIONS

Dimension:



Power Consumption: Maximum power rating is approximately 5 watts.

Electrical Characteristic (power supply and signal voltage):

| Input power: | -/+5V and +/-12V. |
|------------------------|------------------------------|
| Maximum input current: | 50 mA. |
| Logic input level: | 2.5-5.5V. |
| Logic output level: | 5V |
| Serial input level: | -12 to +12 V. |
| Serial output level: | -5 to +5 V. |
| Maximum data rate: | 115200 kbps each serial port |
| | |

Cable Connector Pinouts:

There are two minidin68 female connectors (U55, U56) on board which house 16 serial channels, eight serial channels for each minidin68 connector. Eight serial ports (COM5 to COM12) are accommodated in connector U55 and another eight (COM13 to COM20) are in connector U56. Each serial port utilizes one DB25 connector. Two special 1-to-8 serial cables are included. (Figure 1)





CHAPTER 2: HARDWARE INSTALLATION

Before you begin, please make sure you are electrically grounded, wearing an anti-static strap is strongly recommended, and your system is power off.

Insert the Solflower Serial Adapter board into a PCI slot. Avoid touching the on-board IC's. Make sure the board is firmly seated and the PCI connector makes fully contact with the PCI slot.

Secure the board with a screw.

Connect the two male Minidin86 connectors to the on board female connectors. Lock the connector with screws.

CHAPTER 3: WINDOWS INSTALLATION

WINDOWS 98 INSTALLATION

Any previous release of the OX16PCI954 drivers on the system must be removed before installing the new drivers. Refer to the **Removal of Card and Drivers** section. All the files for Windows can be found on the CD in \SOLFOXT\RELOC\OPT\SOLFOXT\WINDOWS.

- 1. Extract the file v4_04.zip to a temporary directory, C:\Temp\OX16PCI954, for example.
- 2. Install the card as described in chapter 2. Power up the system. Windows will detect the PCI card, start the Add New Hardware Wizard, and begin driver installation. The driver installation proceeds in three parts: the first part installs the driver for the PCI UARTs, the second part installs the driver for the PCI bridge, and the third part installs the driver for the PCI communications ports.
- 3. After new hardware is detected, the following window will appear. Click **Next** to start the driver installation for the PCI UARTs.

| Add New Hardware Wizard | |
|-------------------------|--|
| | This wizard searches for new drivers for: |
| | OX16PCI954 PCI UARTs |
| | A device driver is a software program that makes a hardware device work. |
| 8 s | |
| | |
| | |
| | |
| | < Back Next > Cancel |

4. The following window will appear. Click **Next** to start searching for a driver.

| Add New Hardware Wizard | |
|-------------------------|---|
| | What do you want Windows to do? Search for the best driver for your device. (Recommended). Display a list of all the drivers in a specific location, so you can select the driver you want. |
| | < <u>B</u> ack Next > Cancel |

- 5. In the next window, check the option Specify a location.In the textbox, enter the path where the file v4_04.exe was unzipped, then click Next.

| Add New Hardware Wizard | |
|-------------------------|---|
| | Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected locations. Click Next to start the search. □ Eloppy disk drives □ QD-ROM drive □ Microsoft Windows Update ✓ Specify a location: C\\Temp\0X16PCI954 ☑ Browse |
| | < <u>B</u> ack Next > Cancel |

6. The following window will appear. Click **Next** to continue.



7. When the driver installation is done, the next window will appear. Click **Finish**.

| Add New Hardware Wizard | |
|-------------------------|--|
| | |
| | Windows has finished installing the software that your new hardware device requires. |
| | |
| | |

8. The following window will appear. Repeat step 3 through 6 to install driver for the PCI bridge.



9. When the driver installation is done, the next window will appear. Click Finish.



10. Windows will then search, find, and install driver for the 16 PCI communications ports automatically. Wait for the process to complete.

VERIFY THE INSTALLATION

To verify the software installation, open **My Computer**, **Control Panel**, **System** (or Start, Setting, Control Panel, System). Select the **Device Manager** Tab.

Click Multi-function adapters, the OX16PCI954 PCI bridge and UARTs should appear.

Then click **Ports (COM & LPT)**, the 16 PCI communications ports (COM5 through COM20) should appear as shown in the following window.

| System Properties | | | ? × |
|-----------------------|--|----------------------------|----------------|
| General Device Manage | r Hardware Pro | ofiles Performanc | e |
| | | | |
| View devices by type | e O Vie | ew devices by <u>c</u> onr | nection |
| 🕀 🕥 Mouse | | | |
| Multi-function ac | dapters 4 DCL bridge | | |
| | 4 PCI UARTs | | |
| 🕀 🏬 Network adapte | ərs | | |
| 🖻 🍠 Ports (COM & L | PT) | | |
| | ations Port (COM | 1) | |
| Communica | ations Port (COM unications Port (C | 12) COM10) | |
| PCI Commu | unications Port (C | COM11) | |
| - 💯 PCI Commu | unications Port (C | COM12) | |
| PCI Commu | unications Port (C | COM13) | |
| PCI Commu | unications Port (C unications Port (C | COM14) | |
| PCI Commu | inications Port (C inications Port (C | COM16) | |
| - 🖉 PCI Commu | unications Port (C | COM17) | - |
| P <u>r</u> operties | Re <u>f</u> resh | R <u>e</u> move | Pri <u>n</u> t |
| | | | |
| | | OK | Cancel |

REMOVAL OF CARD AND DRIVERS

To remove the card from your system and remove its current driver:

- 1. Open My Computer, Control Panel, System (or Start, Setting, Control Panel, System).
- 2. In the System Properties window, select the Device Manager Tab.
- 3. Click Multi-function adapters, then select OX16PCI954 PCI bridge.
- 4. Click the **Remove** button.

| System Properties | ? × |
|--|-----|
| General Device Manager Hardware Profiles Performance | |
| | |
| View devices by type View devices by connection | _ |
| Computer | |
| | |
| | |
| E - B Floppy disk controllers | |
| 🗄 🚭 Hard disk controllers | |
| E - 🚱 Keyboard | |
| | |
| Multi-function adapters | |
| OX16PCI954 PCI bridge | |
| | |
| En Ports (COM & LPT) | |
| E System devices | |
| | |
| Proportion Defeate Demonstra | |
| | _ |
| | |
| OK Cano | :el |

5. In the **Confirm Device Removal** window, click the **OK** button.



- 6. Wait for the removal to finish then go back to the **System Properties** window, click **Multi-function adapters**, and select **OX16PCI954 PCI UARTs**.
- 7. Repeat step 4 and 5 to remove the OX16PCI954 PCI UARTs driver.
- 8. Shut down the computer, then remove the card by following the Hardware Installation Guide.

CHAPTER 4: SERIAL PORT TESTS IN WINDOWS

WINSSD SERIAL DIAGNOSTICS

WinSSD can be downloaded at: <u>http://www.sealevel.com/catalog/asyncsw.htm</u>. It can also be found on the CD in \SOLFOXT\RELOC\OPT\SOLFOXT\WINDOWS.

1. Start **WinSSD**. Select a COM port to test, then click **Open**.

| 🔍 WinSSD | | × |
|------------------------------|---|---|
| Port Information Loopbac | ck BERT Terminal | |
| Port COM: Den Settings | Timeouts 100 Read Interval Timeout: 100 Read Total Timeout Multiplier: 100 Read Total Timeout Constant: 100 Write Total Timeout Multiplier: 100 Write Total Timeout Constant: 100 100 100 | |
| -Error Log | | |
| Frame Errors: | 0 | |
| Parity Errors: | 0 | |
| Rx Buff O∨erfl: | 0 | |
| Tx Buff O∨erfl: | 0 | |
| | | |
| | Close Cancel He | p |

2. The following window will appear. Click **Settings** to view or change the port's properties.

| 🔫 WinSSD - COM20: 11 | 5200, 8, N, 1 | × |
|-------------------------|--|---|
| Port Information Loopba | Ck BERT Terminal Timeouts Read Interval Timeout: 100 Read Total Timeout Multiplier: 100 Read Total Timeout Constant: 100 Write Total Timeout Multiplier: 100 Write Total Timeout Constant: 100 0 0 0 0 | |
| | Close Cancel Help | |

3. The **COM Properties** window will appear. Make any necessary changes. Then Click **OK** to save the settings.

| COM20 Properties | ? × |
|---|--------------------------|
| Settings | |
| | |
| | <u>R</u> estore Defaults |
| Standard Port Settings | |
| <u>B</u> aud Rate: Assuming 1.8432MHz Crystal | 115200 |
| Number of <u>D</u> ata bits: | 8 |
| Type of <u>P</u> arity: | None |
| Number of <u>S</u> top bits: | 1 |
| Elow Control Type: | None |
| DTR function Norm | ial 🔽 |
| | |
| ОК | Cancel Apply |

4. In the **WinSSD** window, click **Loopback**. Click **Diagrams** to check the loopback connection needed for each particular connector as shown. Click **Done** to go back to the **WinSSD** window.

| Loopback Diagrams | × |
|---|---|
| DB-25 RS232 Loopback Connection | |
| Top Connect Pins: 2 to 3 (Tx to Rx) 4 to 5 to 22 (RTS to CTS to RI) 6 to 8 to 20 (DSR to DCD to DTR) Note: Pins marked in red are the data lines, Tx & Rx, and are necessary for theloopback and BERT testing. All other pins are for modem control signal tests and are not necessary to connect unless you wish to test those signals. | |
| RS-232 RS-422 RS-530 Done | |

5. If there is only a Tx and Rx loopback connection, leave the **Modem Control Test** unchecked. Otherwise, check the **Modem Control Test**, then click **Start**.

The window below shows all three loopback tests completed successfully.

| 🧠 WinSSD - COM20: 115200, 8, N, 1 | × |
|--|---|
| Port Information Loopback BERT Terminal | |
| ✓ Pattern Test 55AA55AA55AA55AA55AA55AA55AA55AA ▲ Passes: 55AA55AA55AA55AA55AA55AA55AA55AA55AA55 | |
| ✓ ASCII Test The quick brown fox jumped over the lazy dog's bac Passes: The quick brown fox jumped over the lazy dog's bac 20 / 20 | |
| ✓ Modem Control Test RTS => CTS Passes: 20 / 20 DTR => DSR 20 / 20 RTS => RI 20 / 20 DTR => DCD 20 / 20 | |
| Close Cancel Help | |

Click BERT (Bit Error Rate Test). Click Start. The following window shows a running BERT on COM20. If there is an error, it will be shown in the Port Information window.

| 🔫 WinSSD - COM20: 115200, 8, N, | 1 × |
|---|--------------------------|
| Port Information Loopback BERT | Terminal |
| Bit Error Rate Test | |
| Transmit Frames: Receive Frames: | 877 877 |
| Bytes Checked: Bit Errors: Sync Losses: | 44661 4 0 0 |
| Tx Data Rate: Rx Data Rate: | 148190 bps 148190 bps |
| Sync Status: | In Sync 🔎 🔍 |
| Test Time 000 : 00 : 52 | Reset Stats Stop |
| Close | Cancel Help |

SERIAL COMMUNICATION PROBE - SERTEST

sertest can be downloaded at: <u>http://www.iftools.com/samples.html</u>. It can also be found on the CD in \SOLFOXT\RELOC\OPT\SOLFOXT\WINDOWS.

sertest can be used to transfer data between two COM ports on a computer or even between two COM ports on two different computers.

1. Connect the two COM ports being tested. Start **sertest**. Click **File**, then select **Settings** as shown below.

| 😻 🖥 se | erial te | ster (|).560 |) | | | _ 🗆 × |
|--------------------------|---------------------|-----------|----------|----------------------|---------|-------------|----------|
| <u>F</u> ile | <u>P</u> ort | | | | | | |
| <u>S</u> e <u>A</u> t | ettings bout | | 3V | /cua0 0% t/mkv | rts/c | ts disconne | C |
| E <u>x</u> stote | (it La real O | Alt-X | |) | 515 | | |
| <u>rts</u> | | ts i O | OSR O | DCD | RI O | Speed | Rec Play |

2. Enter the paths for the input and output files, then click **OK**.

| setting opt | ional parameters | : | | × |
|-------------|------------------|------|--------|---|
| input file | C:\Temp\sertest | in | | V |
| output file | C:\Temp\sertest | .out | | |
| bufsize | | 512 | | • |
| | ОК | | Cancel | |

3. Click **Port**, then select **Open Port** as shown below.



4. Select the port being tested to open. Change other settings if needed, then click **OK**.

| setting serial par | ameters 🗙 |
|--------------------|-----------|
| Baudrate | 115200 💌 |
| Port | com13 🔽 |
| Wordlen | 8 |
| Parity | none 💌 |
| Stopbits | 1 |
| rts/cts | off |
| ОК | Cancel |

 Start another sertest. Repeat step 1 through 4 to open the other COM port. In one window click Rec, and in the other window, click Play. The following screen shows the file transfer between COM13 and COM14.

| 🗱 serial tester 0.560 | _ 🗆 🗙 |
|---|--------------|
| <u>F</u> ile <u>P</u> ort | |
| port 1N8 115200 com13 connect load 12% infile C:\Temp\axxon4.txt outfile C:\Temp\sertest.txt state [51%] SEND total 960 | - Oter |
| | Rec Play |
| | |
| 📲 serial tester 0.560 | _ 🗆 🗙 |
| Eile Port | <u>_ 🗆 ×</u> |
| imit serial tester 0.560 File Port port 1N8 115200 com14 connect load 12% infile c:\temp\axxon4.txt outfile c:\temp\sertest.txt state [51%] RECEIVE total 960 | _ 🗆 × |

CHAPTER 5: LINUX INSTALLATION (KERNEL 2.4.18)

1. Install the card as described in chapter 2. Power up the system.

2. Linux will detect the PCI card and start the Hardware Discovery Utility. Click **Configure**.

| Hardware Added |
|--|
| The following modem has been added to your system: Oxford Semiconductor LtdIQuad 16950 UART |
| You can choose to: |
| Configure the device. Ignore the device. No configuration will be added, but you will not be prompted if the device is detected on subsequent reboots. Do nothing. No configuration will be added, and the device will show up as new if it is detected on subsequent reboots. |
| Configure Ignore Do Nothing |

3. To verify the installation, use **dmesg(8)**, and the following text should appear. The 16 ports are ttyS4 through ttyS19.

```
Serial driver version 5.05c (2001-07-08) with MANY PORTS MULTIPORT SHARE IRQ
SERIAL PCI ISAPNP enabled
ttyS00 at 0x03f8 (irq = 4) is a 16550A
ttyS01 at 0x02f8 (irg = 3) is a 16550A
ttyS04 at port 0xff20 (irq = 11) is a 16C950/954
ttyS05 at port 0xff28 (irq = 11) is a 16C950/954
ttyS06 at port 0xff30 (irg = 11) is a 16C950/954
ttyS07 at port 0xff38 (irg = 11) is a 16C950/954
ttyS08 at port 0xf880 (irg = 5) is a 16C950/954
ttyS09 at port 0xf888 (irq = 5) is a 16C950/954
ttyS10 at port 0xf890 (irq = 5) is a 16C950/954
ttyS11 at port 0xf898 (irg = 5) is a 16C950/954
ttyS12 at port 0xf8a0 (irq = 5) is a 16C950/954
ttyS13 at port 0xf8a8 (irq = 5) is a 16C950/954
ttyS14 at port 0xf8b0 (irg = 5) is a 16C950/954
ttyS15 at port 0xf8b8 (irq = 5) is a 16C950/954
ttyS16 at port 0xf8c0 (irq = 5) is a 16C950/954
ttyS17 at port 0xf8c8 (irq = 5) is a 16C950/954
ttyS18 at port 0xf8d0 (irq = 5) is a 16C950/954
ttyS19 at port 0xf8d8 (irg = 5) is a 16C950/954
ttyS20 at port 0xf8e0 (irg = 5) is a 16450
ttyS21 at port 0xf8e8 (irq = 5) is a 16450
ttyS22 at port 0xf8f0 (irg = 5) is a 16450
```

ttyS23 at port 0xf8f8 (irq = 5) is a 16450

 4. To test these ports, use dt which can be downloaded at: <u>http://www.bit-net.com/~rmiller/dt.html</u>. It can also be found on the CD in /SOLFOXT/RELOC/OPT/SOLFOXT/LINUX. Here is a result of dt run on ttyS18 and ttyS19:

dt if=/dev/ttyS18 of=/dev/ttyS19 bs=8 limit=1k

Total Statistics (1655): Input device/file name: /dev/ttyS18 (device type=terminal) Type of I/O's performed: sequential (forward) Terminal characteristics: flow=xon xoff, parity=none, speed=9600 Data pattern read: 0x39c39c39 Total records processed: 128 @ 8 bytes/record (0.008 Kbytes) Total bytes transferred: 1024 (1.000 Kbytes, 0.001 Mbytes) Average transfer rates: 492 bytes/sec, 0.481 Kbytes/sec Number I/O's per second: 61.538 Total passes completed: 1/1 Total errors detected: 0/1 Total elapsed time: 00m02.08s Total system time: 00m00.00s Total user time: 00m00.00s Starting time: Wed Oct 9 14:04:17 2002 Ending time: Wed Oct 9 14:04:19 2002

Total Statistics (1654):

Output device/file name: /dev/ttyS19 (device type=terminal) Type of I/O's performed: sequential (forward) Terminal characteristics: flow=xon_xoff, parity=none, speed=9600 Data pattern written: 0x39c39c39 (read verify disabled) Total records processed: 128 @ 8 bytes/record (0.008 Kbytes) Total bytes transferred: 1024 (1.000 Kbytes, 0.001 Mbytes) Average transfer rates: 948 bytes/sec, 0.926 Kbytes/sec Number I/O's per second: 118.519 Total passes completed: 1/1 Total errors detected: 0/1 Total errors detected: 0/1 Total elapsed time: 00m01.08s Total system time: 00m00.00s Starting time: Wed Oct 9 14:04:17 2002 Ending time: Wed Oct 9 14:04:19 2002

5. A version of **sertest** for Linux is also available on the CD. Please refer to chapter 4 for more information about this test program.

CHAPTER 6: SOLARIS 8 INSTALLATION

SOFTWARE INSTALLATION

- 1. Install the card as described in chapter 2. Power up the system.
- 2. Insert the CD that came with the card. The CD should be mounted automatically. If not, in a shell, use **volcheck(1)** to mount the CD.
- 3. Use df(1) to see where the CD is mounted. It can be mounted on /cdrom/cdrom as below:

| # df –k | | | | | | |
|-----------------------|--------|------|-------|--------|------|--------------|
| Filesystem | kbytes | used | avail | capaci | ty | Mounted on |
| /vol/dev/dsk/c0t6d0/c | drom | 1612 | 1612 | 0 | 100% | /cdrom/cdrom |

- 4. Go to the directory where the CD is mounted. Use pkgadd(1) to install software for the card.
- # cd /cdrom/cdrom
 # pkgadd -d `pwd`

.. .. .

The following packages are available:

- 1 SOLFoxt OX16PCI954 UART Test and Doc Package for Solaris 8 UltraSPARC (sparc.sun4u) 1.0 REV 0.0
- 2 SOLFoxu OX16PCI954 UART Driver Package for Solaris 8 UltraSPARC (sparc.sun4u) 1.0 REV 1.0

Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]: all

Processing package instance <SOLFoxt> from </cdrom/cdrom>

5. Press the Return key to install both packages. Type *y* to answer any questions that ask if you want to continue with the installation. At the end of the installation, you should see the following message. Type *q* to end the installation process.

Installation of <SOLFoxt> was successful.

Installation of <SOLFoxu> was successful.

The following packages are available:

1 SOLFoxt OX16PCI954 UART Test and Doc Package for Solaris 8 UltraSPARC (sparc.sun4u) 1.0 REV 0.0

2 SOLFoxu OX16PCI954 UART Driver Package for Solaris 8 UltraSPARC (sparc.sun4u) 1.0 REV 1.0

Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]: q

6. Reboot the system with option -r.

VERIFY THE INSTALLATION

1. Use **dmesg(1)** to see if the 16 serial ports are installed.

ox: [ID 766547 kern.notice] OX16PCI954 UART Driver, Version 1.1 ox: [ID 600729 kern.notice] Copyright (c) 2002 by Solflower Computer, Inc. ox: [ID 588111 kern.notice] Built: Thu Dec 19 16:21:46 PST 2002 ox: IID 749261 kern.notice1 Solflower Driver Kit. Module: DRV-util. Version 1.1 ox: [ID 600729 kern.notice] Copyright (c) 2002 by Solflower Computer, Inc. ox: IID 588111 kern.noticel Built: Thu Dec 19 16:20:57 PST 2002 ox: [ID 697747 kern.notice] ox0 uart0 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox0 uart1 16550 compatible: 128 Byte FIFO ox: IID 697747 kern.noticel ox0 uart2 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox0 uart3 16550 compatible: 128 Byte FIFO ox: [ID 819724 kern.notice] PCI interrupt level 1 vec 7d8 simba: IID 370704 kern.info1 PCI-device: serial@4. ox0 genunix: [ID 936769 kern.info] ox0 is /pci@1f,0/pci@1,1/serial@4 ox: [ID 697747 kern.notice] ox1 uart0 16550 compatible: 128 Byte FIFO ox: IID 697747 kern.notice] ox1 uart1 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox1 uart2 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox1 uart3 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox1 uart4 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox1 uart5 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox1 uart6 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox1 uart7 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox1 uart8 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox1 uart9 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox1 uart10 16550 compatible: 128 Byte FIFO ox: [ID 697747 kern.notice] ox1 uart11 16550 compatible: 128 Byte FIFO ox: [ID 819724 kern.notice] PCI interrupt level 11 vec 7d9 simba: [ID 370704 kern.info] PCI-device: pci1415,1@4,1, ox1 genunix: [ID 936769 kern.info] ox1 is /pci@1f,0/pci@1,1/pci1415,1@4,1

 Use prtconf(1) to verify if the drivers for the card are attached. There should be the following two lines in the output of prtconf(1):

serial, instance #0
pci1415,1, instance #1

3. If these two lines are:

serial, instance #0 (driver not attached)
pci1415,1, instance #1 (driver not attached)

Then go to */opt/SOLFoxu/bin* and run *r_ox* to remove the drivers and *a_ox* to attach them again. Use **prtconf(1)** to verify if the drivers are attached this time.

SERIALDEMO IN JAVA COMMUNICATIONS API

The Java Communications API can be downloaded at: <u>http://java.sun.com/products/javacomm/</u>. It can also be found in */opt/SOLFoxt/solaris* after the package *SOLFoxt* is installed on the system.

1. Download and uncompress the software.

zcat javax_comm.-2_0_2-solsparc.tar.Z | tar xvf -

- 2. Install the software by following the instructions in *PlatformSpecific_Solaris.html*
- 3. Go to the directory commapi/samples/SerialDemo and compile the SerialDemo program.

4. Run the **SerialDemo** program. The 16 serial ports are /*dev/term/0* through /*dev/term/15*. The following picture shows a loopback test running on /*dev/term/15*.

| - | Serial I | Demo | | • 🗆 |
|------------------|----------------|-------------------|------|-----|
| File | | | | |
| asd [| | | | |
| | | | | |
| | | | | |
| | | | | |
| | | 1 | [| |
| Port Name: | /dev/term/15 ⊇ | Baud Rate: | 9600 | Ξ |
| Flow Control In: | None 👱 | Flow Control Out: | None | ⊻ |
| Data Bits: | 8 🗵 | Stop Bits: | 1 | ⊇ |
| Parity: | None 🖂 | | | |
| ¢ | pen Port Close | Port Send Brea | k | |

5. **SerialDemo** can also be run on two different ports, for example, /*dev/term*/7 and /*dev/term*/15. Connect these two ports and open two Serial Demo windows. Open these two ports, then type some text in one window. The text should be displayed in the other window.

DATA TEST PROGRAM (dt)

dt can be downloaded at: <u>http://www.bit-net.com/~rmiller/dt.html</u>. It can also be found in */opt/SOLFoxt/solaris* after the package *SOLFoxt* is installed on the system.

- 1. Download and uncompress the source.
- 2. Build the program.

cp Makefile.solaris Makefile # make clean; make depend; make

3. Run dt on the port(s) to be tested. For examples:

To write a 1M file to the port /dev/tty0 with the speed of 115200 bps and 64 bytes transferred each time:

dt of=/dev/tty0 bs=64 limit=1M speed=115200

If two ports /dev/tty0 and /dev/tty8 are connected together, to write to /dev/tty8 and read back from /dev/tty0:

dt if=/dev/tty0 of=/dev/tty8 dsize=128 bs=64 limit=1M speed=115200 rdelay=1 wdelay=1 enable=microdelay

4. If the first 8 ports are connected to the last 8 ports, then a script called **dts** which uses **dt** can test all the 16 ports as the following:

dts

```
/dev/tty0 -> /dev/tty8 PASSES = 3
/dev/tty0 <- /dev/tty8 PASSES = 3
/dev/tty1 -> /dev/tty9 PASSES = 3
/dev/tty1 <- /dev/tty9 PASSES = 3
/dev/tty2 -> /dev/tty10 PASSES = 3
/dev/tty2 <- /dev/tty10 PASSES = 3
/dev/tty3 -> /dev/tty11 PASSES = 3
/dev/tty3 <- /dev/tty11 PASSES = 3
/dev/tty4 -> /dev/tty12 PASSES = 3
/dev/ttv4 <- /dev/ttv12 PASSES = 3
/dev/tty5 -> /dev/tty13 PASSES = 3
/dev/tty5 <- /dev/tty13 PASSES = 3
/dev/tty6 -> /dev/tty14 PASSES = 3
/dev/tty6 <- /dev/tty14 PASSES = 3
/dev/tty7 -> /dev/tty15 PASSES = 3
/dev/tty7 <- /dev/tty15 PASSES = 3
```

CHAPTER 7: TROUBLESHOOTING

1. My system can't boot up.

Check if the board makes full contact with the PCI slot. In some case the system cannot recognize any ambiguous signals because of the bad connection. The system will be stuck for this reason.

If the system is a SPARC machine, use the Open Boot PROM to determine if the board is there. For complete documentation on the Open Boot PROM, see the *Open Boot PROM Toolkit User's Guide* and the monitor(1M) man page. This example is from an Ultra AXi system:

```
ok cd /
ok 1s
f007fbf8 SUNW,afb@le,0
f007f378 SUNW, UltraSPARC-IIi@0,0
f0066fb4 pci@1f,0
f004fe04 virtual-memory
f004f824 memory@0,0
f002dac4 aliases
f002da54 options
f002d91c openprom
f002d8b0 chosen
f002d840 packages
ok cd pci
ok pwd
/pci@lf,0
ok ls
f0067dbc pci@1
f00677b0 pci@1,1
ok cd pci@1,1
ok ls
f0090d3c pci1415,1@4,1
f0090a6c serial@4
f008929c network@1,1
f0068a80 ebus@1
ok
```

If the board is inserted properly, the *pci1415* and *serial* nodes should appear. If these nodes do not show up, try to re-insert the board.

2. The serial ports can't perform any data transfers.

The first thing to check is the cable connections. Are they connected tightly? If this still doesn't work, check if the software is installed properly. Please refer to the **Verify the Installation** section for your particular operating system. If the software is not installed properly, try to reinstall the software and reboot the system. If it still does not work, please contact Solflower Computer Inc.

3. Some ports work, but some doesn't.

Check the cable connections. Check the settings of the ports. Use the test programs that are mentioned in the software installation chapters to see if the ports can perform some basic functions such as loopback.

APPENDIX A: 1-TO-8 SERIAL CABLE CONNECTOR PINOUTS

There are two groups of signals, A and B. Each group consists of four serial channels, 0 to 3. The Minidin68 is the main connector that connects to the board.

| Signal name | Minidin68 Pin# | DB25 Pin# |
|-------------|----------------|-----------|
| CGNDA0 | | 1 |
| TXDA0 | 37 | 2 |
| RXDA0 | 36 | 3 |
| RTSA0 | 2 | 4 |
| CTSA0 | 3 | 5 |
| DSRA0 | 1 | 6 |
| SGNDA0 | 5 | 7 |
| DCDA0 | 35 | 8 |
| | | 9-19 |
| DTRA0 | 38 | 20 |
| | | 21 |
| RIA0 | 4 | 22 |
| | | 23-25 |
| | | |
| CGNDA1 | | 1 |
| TXDA1 | 41 | 2 |
| RXDA1 | 40 | 3 |
| RTSA1 | 7 | 4 |
| CTSA1 | 8 | 5 |
| DSRA1 | 6 | 6 |
| SGNDA1 | 5 | 7 |
| DCDA1 | 39 | 8 |
| | | 9-19 |
| DTRA1 | 42 | 20 |
| | | 21 |
| RIA1 | 9 | 22 |
| | | 23-25 |
| | | |
| CGNDA2 | | 1 |
| TXDA2 | 45 | 2 |
| RXDA2 | 44 | 3 |
| RTSA2 | 11 | 4 |
| CTSA2 | 12 | 5 |
| DSRA2 | 10 | 6 |
| SGNDA2 | 47 | 7 |
| DCDA2 | 43 | 8 |
| | | 9-19 |
| DTRA2 | 46 | 20 |
| | | 21 |
| RIA2 | 13 | 22 |
| | | 23-25 |

| Signal name | Mindin68 Pin# | DB25 Pin# |
|-------------|---------------|-----------|
| CGNDA3 | | 1 |
| TXDA3 | 50 | 2 |
| RXDA3 | 49 | 3 |
| RTSA3 | 15 | 4 |
| CTSA3 | 16 | 5 |
| DSRA3 | 14 | 6 |
| SGNDA3 | 47 | 7 |
| DCDA3 | 48 | 8 |
| | | 9-19 |
| DTRA3 | 51 | 20 |
| | | 21 |
| RIA3 | 17 | 22 |
| | | 23-25 |
| | | |
| CGNDB0 | | 1 |
| TXDB0 | 54 | 2 |
| RXDB0 | 53 | 3 |
| RTSB0 | 19 | 4 |
| CTSB0 | 20 | 5 |
| DSRB0 | 18 | 6 |
| SGNDB0 | 22 | 7 |
| DCDB0 | 52 | 8 |
| | | 9-19 |
| DTRB0 | 55 | 20 |
| | | 21 |
| RIB0 | 21 | 22 |
| | | 23-25 |
| | | |
| CGNDB1 | | 1 |
| TXDB1 | 58 | 2 |
| RXDB1 | 57 | 3 |
| RTSB1 | 23 | 4 |
| CTSB1 | 25 | 5 |
| DSRB1 | 24 | 6 |
| SGNDB1 | 22 | 7 |
| DCDB1 | 56 | 8 |
| | | 9-19 |
| DTRB1 | 59 | 20 |
| | | 21 |
| RIB1 | 26 | 22 |
| | | 23-25 |

| Signal name | Mindin68 Pin# | DB25 Pin# |
|-------------|---------------|-----------|
| CGNDB2 | | 1 |
| TXDB2 | 62 | 2 |
| RXDB2 | 61 | 3 |
| RTSB2 | 28 | 4 |
| CTSB2 | 29 | 5 |
| DSRB2 | 27 | 6 |
| SGNDB2 | 64 | 7 |
| DCDB2 | 60 | 8 |
| | | 9-19 |
| DTRB2 | 63 | 20 |
| | | 21 |
| RIB2 | 30 | 22 |
| | | 23-25 |
| | | |
| CGNDB3 | | 1 |
| TXDB3 | 67 | 2 |
| RXDB3 | 66 | 3 |
| RTSB3 | 32 | 4 |
| CTSB3 | 33 | 5 |
| DSRB3 | 31 | 6 |
| SGNDB3 | 64 | 7 |
| DCDB3 | 65 | 8 |
| | | 9-19 |
| DTRB3 | 68 | 20 |
| | | 21 |
| RIB3 | 34 | 22 |
| | | 23-25 |