RapidComms Adapter Installation Guide

for the

RapidComms Four Ports
RapidComms Eight Ports

Ultra High Speed Buffered PCI, PCI 3.3V and PCI-X Communication Adapter

2005, V1.1

NanoGlobes Ltd
United Kingdom

www.NanoGlobes.com

office@NanoGlobes.com

Table of Contents

1   Introduction

The RapidComms high speed buffered adapters are based on the PCI 3.0 bus specification and rely on the 3.3 Volts supply on the PCI bus connector in order to function. The RapidComms has been designed to plug into a standard PCI (32 bit) bus connector in a PC as well as PCI 3.3V and PCI-X (64 bit) bus which can be found in the latest PCs and servers. The 3.3 Volts supply on the PCI bus has been found to be present on almost all the recent PCs supporting PCI 1.2 and 2.2 specifications, however it is only specified as a compulsory supply rail as part of the PCI 2.2 and 3.0 specifications.

Making use of the 3.3Volts supply to drive the RapidComms range of adapters is in line with the trend towards the use of the lower operating voltages for the PCs and server in order to reduce the amount of heat generated and consequently increasing the reliability and life of the equipments.

The PCI bus system uses the ROM BIOS of the computer to allocate I/O, IRQ and memory resources for the RapidComms adapter cards. This means the user only needs to fit the adapter in the PC and install the required driver for a given operating system from the RapidComms disk.

2   Installation

Always ensure that the mains supply is disconnected before attempting to add or remove any adapters from a PC.

All electronic components are extremely susceptible to damage from an electro-static charge. Always touch a metal grounded object before handling PC adapters.

Please refer also to the manufacturer's guide supplied with the computer system for instructions on installing any additional hardware to the PC.

2.1   Installing the RapidComms Adapter

Switch the PC off and disconnect from the mains.

Remove the PC cover with reference to the manufacturer's instructions.

Installing RapidComms 4 port adapter:

> The RapidComms 4 port adapter card should be fitted in an available PCI, PCI 3.3V or PCI-X slot. The end bracket of the adapter should be screwed to the computer chassis.

Installing RapidComms 8 port adapter:

> Fit the main Rapidcomms4 port adapter card as explained above (port 1 to 4).
>
> Screw the end bracket of the provided small 4 port board (port 5 to 8) with its flying ribbon cable to the computer chassis next to the RapidComms 4 port adapter. Please make sure that the other end of the ribbon cable from the small 4 port board is connected to the JP1 connector on the main RapidComms 4 port adapter.

Fit the PC cover with reference to the manufacturer's instructions.

Plug mains cable and any other cables removed to facilitate installation.

3   RapidComms Communication Port Signals

3.1   RapidComms 8 Way RJ45, RS232 Port Pin Out

RapidComms 8 Way RJ45, *RS232* Port Pin Out					
Pin	Signal	I/O	Pin	Signal	I/O
1	Data Set Ready	I/P	5	Receive Data	I/P
2	Request to Send	O/P	6	(0V) Ground	---
3	Data Carrier Detect	I/P	7	Clear to Send	I/P
4	Transmit Data	O/P	8	Data Terminal ready	O/P

RapidComms Default RS232, RJ45 Port Signals

3.2   RapidComms 8-Way RJ45, *RS422 / RS485* Port Pin Out

RapidComms 8-Way RJ45, *RS422 / RS485* Port Pin Out					
Pin	Signal	I/O	Pin	Signal	I/O
1	Clear to Send + (B)	I/P	5	Receive Data - (A)	I/P
2	Clear to Send - (A)	O/P	6	Transmit Data - (A)	O/P
3	Transmit Data + (B)	O/P	7	Terminal ready + (B)	O/P
4	Receive Data + (B)	I/P	8	Terminal ready - (A)	I/P

RapidComms Default RS422 / 485, RJ45 Port Signals

3.3   Wiring Instruction for connecting Terminal to RJ45 RS232 Ports

Connecting Standard D25 male Terminal to RapidComms RJ45 Port				
TX	2	----------Cable---------	5	RX
RX	3	----------Cable---------	4	TX
GND	7	----------Cable---------	6	GND
DTR	20	----------Cable---------	7	CTS

Terminal is set for DTR flow control and RapidComms port is set to CTS flow control

3.4   Connecting PC D9 female Communications Port to Adapter RJ45 Port

Connecting PC D9 female Communications Port to RapidComms RJ45 Port				
TX	3	----------Cable---------	5	RX
RX	2	----------Cable---------	4	TX
GND	5	----------Cable---------	6	GND
DTR	4	----------Cable---------	7	CTS

COM1 / COM2 is set for DTR flow control and RapidComms port is set for CTS flow control

## 3.5   Wiring Instruction for Connecting Modem to RJ45 RS232 Ports

Typical D25 male Modem Connection to RapidComms RJ45 Port				
DCD	8	---------Cable---------	3	DCD
RX	3	---------Cable---------	5	RX
TX	2	---------Cable---------	4	TX
DTR	20	---------Cable---------	8	DTR
GND	7	---------Cable---------	6	GND
DSR	6	---------Cable---------	1	DSR
RTS	4	---------Cable---------	2	RTS
CTS	5	---------Cable---------	7	CTS

Modem Connection to RapidComms Port

Note:
This is a typical wiring guide, for more detailed instruction refer to the modem manual

3.6   Test Plug Wiring Instruction for RapidComms Ports

RJ45 PLUG

1 2 3 4 5 6 7 8
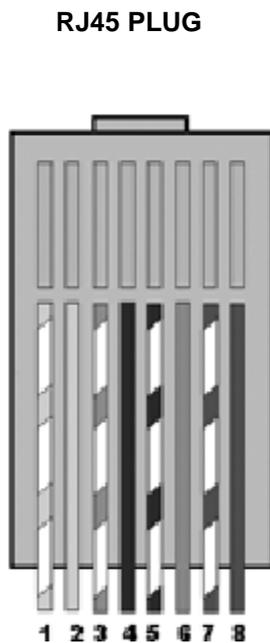
RS232 Test Plug Wiring Instruction for RJ45	
link together cables	**1 + 3 + 8 (DSR + DCD + DTR)**
	7 + 2 (CTS + RTS)
	4 + 5 (TX + RX)

Test Plug Wiring Instruction for RJ45 RS422/485	
link together cables	**3 + 4 ((TX+) + (RX+))**
	5 + 6 ((RX-) + (TX-))
	1 + 7 ((CTS+) + (DTR+))
	2 + 8 ((CTS-) + (DTR-))

Option:

There is a factory option for the RapidComms 4 port which allows pin 1 signals on the RJ45 ports to be replaced with +5 or +12 Volts supply from the PCI bus. If this option is implemented, the +5 or +12 Volts supply replaces the Data Set Ready signal on the RS232 ports and Clear to Send - signal on the RS422 / 485 ports. The option of original signal or selected supply is jumper selectable for each of the 4 ports.

The + 5 or +12 volts routing for all 4 ports is determined by the JP7 jumper settings. To divert +12 Volts to the ports, pin 1 and 2 of the JP7 must be closed. To route +5 Volts to the ports, pin 2 and 3 of the JP7 must be closed. The default is none selected.

Jumpers JP3, JP4, JP5 and JP6 allow port 1 to 4 to keep their original signal (default) or have the voltage selected by the JP7 on their pin one. When these jumpers are fitted resistors R7, R8, R9 and R10 must be removed from the adapter otherwise components on the adapter will be permanently damaged.

To divert voltage selected by JP7 to pin 1 of the port one, pin 2 and 3 of the JP3 must be connected.

To divert voltage selected by JP7 to pin 1 of the port two, pin 2 and 3 of the JP4 must be connected.

To divert voltage selected by JP7 to pin 1 of the port three, pin 2 and 3 of the JP5 must be connected.

To divert voltage selected by JP7 to pin 1 of the port four, pin 2 and 3 of the JP6 must be connected.

Please note that the above mentioned jumpers are not present on the standard RapidComms 4 port adapters.

4   Trouble Shooting

The RapidComms adapter is a PNP (Plug and Play) adapter and has no switches or jumpers to be set to make it work. The only jumpers on the RapidComms adapter (if fitted) relates to routing of +5 or +12 Volts power to pin one of the RJ45 ports and does not effect working of the RapidComms adapter.

If the RapidComms adapter has been fitted in the PC but it is not being detected by the operating system or the RapidComms installed drivers, then the following tests should be carried out.

Boot a PC under DOS using the RapidComms disk supplied. Run the RAPTEST.EXE program. If the RapidComms adapter is not detected by the RAPTEST.EXE program, try to plug the adapter in another PCI slot in the same PC making sure it is well fitted and then run the test again.

If RAPTEST.EXE does not detect the RapidComms adapter, it might be that the PC used does not have a 3.3 Volts supply on the PCI bus. Try to test the adapter in a more up to date PC. If problem persist then the RapidComms adapter is in need of repairs and should be returned to your supplier.

If the RapidComms adapter is detected by the RAPTEST.EXE program and all the ports fails the test, then you should check to see if the loopback plug you are using is a correct type for the port type you are testing. Loopback plug for the RS232 ports are different from that of the RS422/485 loopback plugs.

If the RapidComms adapter is detected by the RAPTEST.EXE program and some of the ports fails the test then you need to return the adapter to your supplier for repair.

If you place the RapidComms adapter in a PC running Windows, the operating system should detect the adapter at boot time as a new hardware added and try to install it. If Windows does not detect the adapter then either it has not been plugged in properly or the adapter is faulty.

It is important to know which type of RapidComms adapter is being tested when using the RAPTEST.EXE under DOS (RAPIDTEST.EXE does not detect the adapter if it is run under any versions of Windows and hence it is not possible to test the adapter).

If you are not sure as the type of RapidComms adapter you are testing, it is possible to determine the type of the adapter by looking and counting the number of small ICs fitted near the RJ45 terminal block. If nine small ICs are fitted near the RJ45 terminal block then the adapter is a RS422 / 485 type. If four small ICs are fitted away from the RJ45 block then the adapter is a RS232 type. The loopback plug used for testing the RS232 ports is different from the one used for testing the RS422 / RS485 ports. Please refer to section 3.6 for further information regarding the loopback plugs wiring specification.

5   RapidComms Adapter Specification

RapidComms Specification	
Controller	Half length, 5 layers, Plug and Play, Universal PCI communication sub-system compliant to PCI Local Bus specification 3.0 and PCI Power Management Specification 1.1. Up to four controllers can be plugged into PCI, PCI 3.3 Volts and PCI-X slots. RapidComms uses 3.3 Volts supply from the PCI bus.
Type and Number of Ports	**RS232:** 4 or 8 RS232 ports conforming to true EIA/TIA-232-F Standards and Interoperable with EIA/TIA-232 and EIA/TIA-562. **RS485/RS422:** 4 or 8 True full duplex RS485/RS422, short-circuit current limited. Each port on the RapidComms controller features enhanced electrostatic discharge (ESD) protection. All transmitter outputs and receiver inputs are protected to ±15kV using IEC 1000-4-2 Air-Gap Discharge, ± 8kV using IEC 1000-4-2 Contact Discharge, and ± 15kV is using the Human Body Model.
Connectors Type and Modem Signals	4 or 8 Shielded RJ45 connectors providing following signals: **RS232:** TX, RX, DTR, DSR, CTS, RTS and DCD **RS485/RS422:** TX+, TX-, RX+, RX-, CTS+,CTS-,DTR+, DTR- **Note:** The RTS signal is not connected externally in RS422/485 mode. Instead it is used as the Driver Enable signal for TX and DTR line drivers. Setting RTS low sets the Transmit and DTR line drivers to a high impedance state.
Data Rate and Format	**RS232 ports** support baud rates of 50 to 23,400 bits per second software selectable (50, 62.5, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 19200, 19200, 38400, 57600, 76800, 115200, 230400) **RS422/485 ports** support baud rates of 50 to 92,1600 bits per second software selectable (50, 62.5, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 19200, 19200, 38400, 57600, 76800, 115200, 230400, 460800, 921600) 9-bit data framing in addition to 5, 6, 7 and 8 bits. 1, 1.5 and 2 Stop bits. Odd, Even or No Parity. **Note:** It is possible to generate different set of baud rates by changing the crystal on the RapidComms adapter at the time of manufacturing. With a suitable crystal baud rates up to 10Mbps can be achieved for each port.
Working Temperature	-40 C to 105 C
Dimension	L 130mm , H 110mm,

RapidComms Specification		
Model **Numbers**	RapidComms 4 Port RS232 RapidComms 8 Port RS232 RapidComms 4 Port RS485/RS422 RapidComms 8 Port RS485/RS422 RapidComms 8 Port 4 X RS485/RS422 + 4 X RS232	**Model 1114** **Model 1118** **Model 1124** **Model 1128** **Model 1138**
	Option: 5 or 12 Volts power routing to Pin 1 of the RJ45 connectors on the first 4 ports.	**Model 1114P** **Model 1124P**
Available Options: RapidComms 4 port versions can be factory fitted with a set of jumpers which facilitate 5 or 12 Volts supply from the PCI bus to be routed to PIN 1 of the RJ45 connector on a per port bases. This optional facility permits external peripherals which are connected and obtaining their data through the RJ45 port, also obtain their power from that port. This facility is mainly desirable when RapidComms controller is used for controlling point of sales or data logging equipments.		