

# QUICK START Linux DRIVER and HARDWARE REFERENCE CARD

RocketPort 550 4 Port Quad
RocketPort 550 4 Port RJ45
RocketPort 550 8 Port Octa
RocketPort 550 8 Port RJ11
RocketPort 550 8 Port (with dedicated interface box)
RocketPort 550 16 Port (with dedicated interface box)



1. Installing Your RocketPort 550 hardware	3
2. Installing the RocketPort 550 Linux Device Driver	
software	4
3. Viewing the RocketPort 550 Port Installation	
4. Driver Removal	10
5. Application Programming	10
6. Port Names	11
7. RocketPort 550 Linux driver (re)compilation	13
8. RocketPort 550 Cable Types	
9. Technical Support	
10. Specifications	
11. Copyright and Trademarks	00
IV G	

The Linux RocketPort 550 Drivers allow application space programs to perform asynchronous communications using boards from the Comtrol RocketPort 550 range.

## 1. Installing Your RocketPort 550 hardware



Take care when you handle the RocketPort 550 PCI cards, like any electronic device, they are sensitive to static electricity. Use normal static precautions such as wearing an earth ground strap.

Power down the host PC and disconnect its mains input.

Follow the host PC instructions for access to the PC and the installation of additional cards.

You may install up to 4 RocketPort 550 PCI cards in one PC.

Ensure the front panel retaining screws are fitted.

Follow the host PC instructions for re assembly of the host PC its cabling and re-fitting of safety covers.

Re-connect the host PC mains input, power up the PC and login as root.

## 2. Installing the RocketPort 550 Linux Device Driver software

#### **NOTE**

The Comtrol Linux driver release 1.03 was developed using the RED HAT 8.0 distribution with Kernel revision 2.4.18-14.

The driver source is provided should developers wish or need to modify the driver for use with alternative Linux distributions and/or Kernels. For use with other 2.4.x kernels, a simple re-compilation (on the target system) is all that may be necessary and a 'Makefile' is provided to automate this process. Before (re)compilation, the kernel source **must** be installed.

For test purposes, the driver source was (re)compiled under Red Hat 7.3 kernel 2.4.18-3. The driver module was installed and functioned correctly.

This driver source will not (re)compile under the obsolete 2.2.x kernels. If it is wished to use the RocketPort 550 with these earlier kernels, then request a copy of the RocketPort 550 Linux driver release 1.00.

The installation media (*i.e.* what you are installing from) may be a 1.44Mb floppy diskette or a CD-ROM. Alternatively, you may have downloaded the driver from <a href="http://www.comtrol.com">http://www.comtrol.com</a>

There may be minor differences in the installation procedure depending on the installation media.

If you have downloaded the driver from <a href="http://www.comtrol.com">http://www.comtrol.com</a>, then it is suggested that you copy the 'tar' file to an MSDOS formatted floppy diskette and follow the floppy disk based installation procedure

Following download, you may need to unzip the downloaded file in order to obtain the tar file. The tar file name will be of the format relXXX.tar where XXX is the release number. E.g. XXX = 103 = release 1.03

The following assumes that you have booted Linux and logged in as root.

#### Step 1

Extract the files from the installation media. First insert the floppy diskette or CD into the relevant drive and mount the media so that the file can be accessed.

```
DISKETTE

[root@localhost root]# mount -t msdos /dev/fd0 /mnt/floppy

CD ROM

[root@localhost root]# mount /dev/cdrom /mnt/cdrom
```

#### Step 2.

Next, create a temporary directory into which the files can be extracted:

```
[root@localhost root]# cd /tmp
[root@localhost tmp]# mkdir inst_Comtrol
[root@localhost tmp]# cd inst_Comtrol
```

#### Step 3.

Then, extract the driver components from the *tar* file on the diskette or CD ROM to the temporary directory: *Note that the name of the tar file may be different.* 

```
DISKETTE

[root@localhost inst_Comtrol]# tar xvf /mnt/floppy/rel103.tar

CD ROM

[root@localhost inst_comtrol]# tar xvf /mnt/cdrom/rel103.tar

Note:The path to rel103.tar may differ on the CD ROM.
```

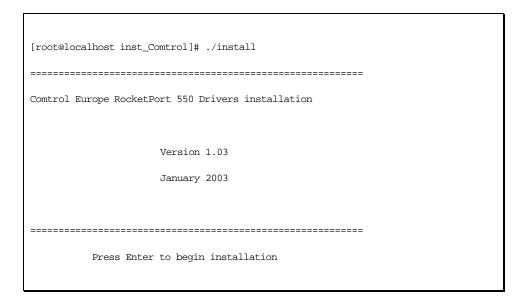
#### Step 4

Run the installation script

#### **IMPORTANT**

If your Linux kernel is not version 2.4.18-14 or your kernel configuration differs from our development system then you will need to (re)compile the RocketPort 550 driver source on your system, otherwise the Install script will display error messages and the driver will not be installed. If this is the case then follow the procedure in section 7, (Re)-compiling the RocketPort 550 Linux driver, before proceeding with installation step 4.

Run the install script from the directory into which the files were extracted:



Press enter to begin installation.

A screen of text is displayed. It contains information about the names you can select for the RocketPort 550 ports and details how the driver assigns numbers to individual ports.

```
Your system will connect to the RockPort 550 Ports through entries in the /dev/ directory. You can choose any prefix for the names, as long as it is different from names given to other devices.

For example, if you select a prefix of 'ttyA', then the RocketPort 550 Ports will be called /dev/ttyA00, /dev/ttyA01 and so on up to /dev/ttyA63

You can install up to 4 RocketPort 550 cards in a system. The device names for the first card starts with ttyA00, the second starts ttyA16, the third ttyA32, and the fourth ttyA48. If the installed cards have less than 16 ports, then there will be gaps in the numbering corresponding to the missing ports.
```

There are two names for each port, one is for communication with a modem, the other is for communication with a terminal or computer  $\frac{1}{2} \int_{\mathbb{R}^{n}} \frac{1}{2} \left( \frac{1}{2} \int_{\mathbb{R}^{n}} \frac{$ 

Usually the modem connection has a Device name like 'cuaa..' and the terminal/computer connection has a name such as 'ttyA..'

See section 6 for more information about port naming.

You are prompted to enter the Special Device name prefix for terminal ports:

Please enter the Special Device name for terminals [....]

... and for modem ports:

```
Please enter the Special Device name for modems [....]
```

The installation script now copies the driver file into the module directory and adds a command to initialisation scripts so that the driver is loaded whenever Linux is rebooted.

```
Copying files .....Done

Adding insmod command to /etc/rc... directories...Done
```

Next, you are asked if you want to load the drivers now. If you have already fitted the RocketPort 550 cards into the system (as we suggest you do), then you should choose 'Y' here.

If you have not installed the cards yet, or have other administration tasks that will need a reboot, you can say 'N' for no.

```
Do you want to install the RocketPort module now. If you don't do it now, then you will have to reboot before the serial ports can be used.

Please enter [Y]es or [N]o [.]
```

If you say Yes, and you're running on the System Console (not in X-Windows), then you'll see messages from the RocketPort 550 driver confirming that it has successfully loaded and listing any boards it detects

```
Rckt550: Direct MAJOR is 253, callout is 252.
```

Comtrol Europe RocketPort 550 Linux Drivers installation Complete

Your RocketPort 550 Linux Drivers are now installed

Remove the driver distribution media from the drive

## 3. Viewing the RocketPort 550 Port Installation

You can check that devices have been created in the */dev* directory.

```
[root@localhost inst_Comtrol]# ls -l /dev/ttyA*
crwxrwxrwx
                               254, 0 Jan 23 20:36 /dev/ttyA00
                               254, 1 Jan 23 20:36 /dev/ttyA01
crwxrwxrwx 1 root
                       root
                                      2 Jan 23 20:36 /dev/ttyA02
crwxrwxrwx 1 root
                       root
                                      3 Jan 23 20:36 /dev/ttyA03
           1 root
                                254,
crwxrwxrwx
                       root
[root@localhost inst_Comtrol]# ls -l /dev/cuaa*
                               254, 0 Jan 23 20:36 /dev/cuaa 00
crwxrwxrwx 1 root
                       root
crwxrwxrwx
           1 root
                               254, 1 Jan 23 20:36 /dev/cuaa 01
                                      2 Jan 23 20:36 /dev/cuaa 02
crwxrwxrwx 1 root
                                254,
                       root
                                254, 3 Jan 23 20:36 /dev/cuaa 03
crwxrwxrwx 1 root
                       root
 [root@localhost inst_Comtrol]#
```

#### . Changing Configurations

It is not necessary to re-install the driver if you change the number of RocketPort 555 cards in the system. Each time the system is restarted, the boards are re-scanned and the Special Device files re-created.

## 4. Driver Removal

There is generally no need to remove the device driver from the system.

If a card is no longer required, simply shutdown and power off the computer, remove the card and reboot the system. If there are no longer any installed cards then the driver will detect this condition unload itself. However, the driver files will remain installed on the system's hard disk.

At a later time the RocketPort 550 card(s) can be re-installed and the computer restarted. The drivers will detect and operate the card(s).

## 5. Application Programming

The Application Programming Interface pertaining to the RocketPort 550 Linux device driver is described in the Linux documentation for serial (tty) ports.

## 6. Port Names

The following tables show the port names given to each RocketPort 550 port if you choose the 'normal' auaa and ttyA naming.

#### **Modem Devices**

Port	First Board	Second Board	Third Board	Fourth Board
1	/dev/cuaa00	/dev/cuaa16	/dev/cuaa32	/dev/cuaa48
2	/dev/cuaa01	/dev/cuaa17	/dev/cuaa33	/dev/cuaa49
3	/dev/cuaa02	/dev/cuaa18	/dev/cuaa34	/dev/cuaa50
4	/dev/cuaa03	/dev/cuaa19	/dev/cuaa35	/dev/cuaa51
5	/dev/cuaa04	/dev/cuaa20	/dev/cuaa36	/dev/cuaa52
6	/dev/cuaa05	/dev/cuaa21	/dev/cuaa37	/dev/cuaa53
7	/dev/cuaa06	/dev/cuaa22	/dev/cuaa38	/dev/cuaa54
8	/dev/cuaa07	/dev/cuaa23	/dev/cuaa39	/dev/cuaa55
9	/dev/cuaa08	/dev/cuaa24	/dev/cuaa40	/dev/cuaa56
10	/dev/cuaa09	/dev/cuaa25	/dev/cuaa41	/dev/cuaa57
11	/dev/cuaa10	/dev/cuaa26	/dev/cuaa42	/dev/cuaa58
12	/dev/cuaa11	/dev/cuaa27	/dev/cuaa43	/dev/cuaa59
13	/dev/cuaa12	/dev/cuaa28	/dev/cuaa44	/dev/cuaa60
14	/dev/cuaa13	/dev/cuaa29	/dev/cuaa45	/dev/cuaa61
15	/dev/cuaa14	/dev/cuaa30	/dev/cuaa46	/dev/cuaa62
16	/dev/cuaa15	/dev/cuaa31	/dev/cuaa47	/dev/cuaa63

#### **Terminal Devices**

Port	First Board	Second Board	Third Board	Fourth Board
1	/dev/ttyA00	/dev/ttyA16	/dev/ttyA32	/dev/ttyA48
2	/dev/ttyA01	/dev/ttyA17	/dev/ttyA33	/dev/ttyA49
3	/dev/ttyA02	/dev/ttyA18	/dev/ttyA34	/dev/ttyA50
4	/dev/ttyA03	/dev/ttyA19	/dev/ttyA35	/dev/ttyA51
5	/dev/ttyA04	/dev/ttyA20	/dev/ttyA36	/dev/ttyA52
6	/dev/ttyA05	/dev/ttyA21	/dev/ttyA37	/dev/ttyA53
7	/dev/ttyA06	/dev/ttyA22	/dev/ttyA38	/dev/ttyA54
8	/dev/ttyA07	/dev/ttyA23	/dev/ttyA39	/dev/ttyA55
9	/dev/ttyA08	/dev/ttyA24	/dev/ttyA40	/dev/ttyA56
10	/dev/ttyA09	/dev/ttyA25	/dev/ttyA41	/dev/ttyA57
11	/dev/ttyA10	/dev/ttyA26	/dev/ttyA42	/dev/ttyA58
12	/dev/ttyA11	/dev/ttyA27	/dev/ttyA43	/dev/ttyA59
13	/dev/ttyA12	/dev/ttyA28	/dev/ttyA44	/dev/ttyA60
14	/dev/ttyA13	/dev/ttyA29	/dev/ttyA45	/dev/ttyA61
15	/dev/ttyA14	/dev/ttyA30	/dev/ttyA46	/dev/ttyA62
16	/dev/ttyA15	/dev/ttyA31	/dev/ttyA47	/dev/ttyA63

Note that the driver detects boards in a fixed order, as follows:

- All 16-port boards, in order of PCI slot.
- All 8-port RJ11 boards, in order of PCI slot.
- All 8-port Octacable boards, in order of PCI slot.
- All 8-port 'Interface' boards, in order of PCI slot. All 4-port RJ45 boards, in order of PCI slot.
- All 8-port Quadcable boards, in order of PCI slot.

Also, note that the assigned special device names are fixed as shown in the above tables.

So, the first RocketPort will start at /dev/ttyA00, the second at /dev/ttyA16 and so on, regardless of whether the RocketPorts are 4, 8 or 16 port examples.

For example, if installing, say, two 8 port RocketPorts then the first card will use device names /dev/ttyA00 to /dev/ttyA07 and the second board will use /dev/ttyA16 to /dev/ttyA23.

Of course two 16 port controllers will have sixteen contiguous device names from /dev/ttyA00.

### 7. RocketPort 550 Linux driver (re)compilation

Before compiling the RocketPort 550 driver, you must install the Linux kernel source code. Consult Linux on-line documentation and/or web hosted Linux documentation for the procedure. With the RED HAT Linux 8.0 boxed set distribution, the Linux kernel source is provided in a format ready for installation using RPM.

Following successful installation of the kernel source code, the kernel source tree root will be found at

```
/usr/src/linux2.4.xx.yy
```

where xx = sub level and yy = extra version

For example for the source distributed with the Red Hat 8.0 boxed distribution the path would be:-

/usr/src/linux2.4.18-14

This will differ for other distributions and kernels and may even differ with localised RED HAT Linux 8.0 distributions.

By way of another example, for Red Hat 7.3 boxed distribution the path would be:-

/usr/src/linux2.4.18-3

#### **Compilation procedure**

For the purposes of this example, it is assumed that the compilation is on a system with kernel revision 2.4.18-14

- Make the symbolic link
   [root@localhost root] # cd /usr/src
   [root@localhost src] # ln -s linux-2.4.18-14 linux
- Navigate to the RocketPort 550 installaton directory because this contains the Source, rckt550.c and the makefile (this document assumes that this is /tmp/inst\_comtrol. [root@localhost src] # cd /tmp/inst\_comtrol
- Perform the compilation.
   [root@localhost inst\_comtrol] # make clean
   [root@localhost inst\_comtrol] # make

If the make is successful and error free then a new rckt550.0 will be produced.

You can now use the 'install' script to install the driver, return to installation step 4.

## 8. RocketPort 550 Cable Types

RocketPort 550 4 Quad

RocketPort 550 4 RJ45

**RocketPort 550 8 OCTA** 

RocketPort 550 8 RJ11

RocketPort 550 8 Port (with dedicated interface box)

**RocketPort 550 16 Port** (with dedicated interface box)

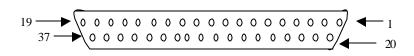
#### RocketPort 550 4 Quad Cable - 37 way D type fan out to 4 DB25 Male

DB37 p in	DB25 pin	RS232 Signal/Port	DB37 pin	DB25 pin	RS232 Signal/Port
35	2	TxD Port 0	26	2	TxD Port 2
34	3	RxD Port 0	25	3	RxD Port 2
16	4	RTS Port 0	7	4	RTS Port 2
17	5	CTS Port 0	8	5	CTS Port 2
15	6	DSR Port 0	6	6	DSR Port 2
37	7	Signal Gnd Port 0	28	7	Signal Gnd Port 2
33	8	DCD Port 0	24	8	DCD Port 2
36	20	DTR Port 0	27	20	DTR Port 2
18	22	RI Port 0	9	22	RI Port 2
12	2	TxD Port 1	3	2	TxD Port 3
11	3	RxD Port 1	2	3	RxD Port 3
30	4	RTS Port 1	21	4	RTS Port 3
31	5	CTS Port 1	22	5	CTS Port 3
29	6	DSR Port 1	20	6	DSR Port 3
14	7	Signal Gnd Port 1	5	7	Signal Gnd Port 3
10	8	DCD Port 1	1	8	DCD Port 3
13	20	DTR Port 1	4	20	DTR Port 3
32	22	RI Port 1	23	22	RI Port 3

Pin 19 of the 37 way connector is not used

Pins 1, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 23, 24 and 25 of each 25 way connector are not used.

The cable shields and connector metal bodies should be connected.

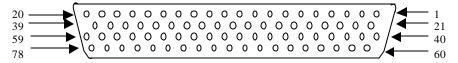


#### RocketPort 550 8 OCTA Cable - 78 way D type fan out to 8 DB25 Male

DB78 Pin	DB25 Pin	RS232 Signal/Port	DB78 Pin		RS232 Signal/Port
30	2	TxD Port 0	40	2	TxD Port 4
55	3	RxD Port 0	28	3	RxD Port 4
51	4	RTS Port 0	21	4	RTS Port 4
16	5	CTS Port 0	25	5	CTS Port 4
54	6	DSR Port 0	5	6	DSR Port 4
71	7	Signal Gnd Port 0	75	7	Signal Gnd Port 4
35	8	DCD Port 0	43	8	DCD Port 4
49	20	DTR Port 0	22	20	DTR Port 4
36	22	RI Port 0	44	22	RI Port 4
50	2	TxD Port 1	2	2	TxD Port 5
17	3	RxD Port 1	8	3	RxD Port 5
31	4	RTS Port 1	41	4	RTS Port 5
53	5	CTS Port 1	4	5	CTS Port 5
34	6	DSR Port 1	42	6	DSR Port 5
72	7	Signal Gnd Port 1	76	7	Signal Gnd Port 5
33	8	DCD Port 1	23	8	DCD Port 5
32	20	DTR Port 1	3	20	DTR Port 5
15	22	RI Port 1	24	22	RI Port 5
11	2	TxD Port 2	63	2	TxD Port 6
37	3	RxD Port 2	46	3	RxD Port 6
12	4	RTS Port 2	62	4	RTS Port 6
59	5	CTS Port 2	9	5	CTS Port 6
58	6	DSR Port 2	29	6	DSR Port 6
73	7	Signal Gnd Port 2	77	7	Signal Gnd Port 6
39	8	DCD Port 2	48	8	DCD Port 6
13	20	DTR Port 2	61	20	DTR Port 6
20	22	RI Port 2	47	22	RI Port 6
10	2	TxD Port 3	64	2	TxD Port 7
56	3	RxD Port 3	27	3	RxD Port 7
14	4	RTS Port 3	60	4	RTS Port 7
57	5	CTS Port 3	45	5	CTS Port 7
38	6	DSR Port 3	26	6	DSR Port 7
74	7	Signal Gnd Port 3	78	7	Signal Gnd Port 7
18	8	DCD Port 3	6	8	DCD Port 7
52	20	DTR Port 3	1	20	DTR Port 7
19	22	RI Port 3	7	22	RI Port 7

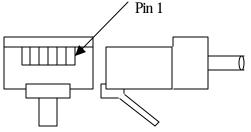
Pin 67 of the 78 way connector is not used. Pins 65, 66, 68, 69 and 70 are Signal Ground. Pins 1, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 23, 24 and 25 of each 25 way connector are not used.

The cable shields and connector metal bodies should be connected.



#### RocketPort 550 8 RJ11 Cable Pin Out

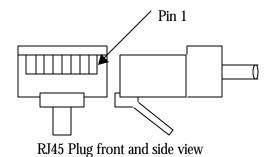
RJ11 pin	RS232 Signals
1	DTR
2	Signal Ground
3	TxD
4	RxD
5	DCD
6	CTS



RJ11 Plug front and side view

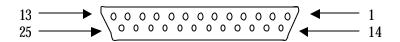
#### RocketPort 550 4 RJ45 Cable Pin Out

RJ45 pin	RS232 Signals
1	RTS
2	DTR
3	Signal Ground
4	TxD
5	RxD
6	DCD
7	DSR
8	CTS

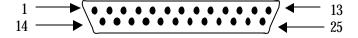


RocketPort 550 8 Port - with 8 DB25 Female RS232 dedicated interface box and

RocketPort 550 16 Port - with 16 DB25 Female RS232 dedicated interface box



**DB25 Female Interface Box Connector** 



**DB25 Male Connector** 

#### **Rocket Port Interface Box DB25 Signals**

DB25 Pin	RS232 Signal	RS422 Signal (RocketPort RS232/422 version only)	Universal Interface
2	TxD	*See note	See UI manual
3	RxD	*See note	See UI manual
4	RTS	*See note	See UI manual
5	CTS	*See note	See UI manual
6	DSR	*See note	See UI manual
7	Signal Gnd	*See note	See UI manual
8	DCD	*See note	See UI manual
20	DTR	*See note	See UI manual
15	Not used	RxD + RxD(B)	See UI manual
17	Not used	RxD- RxD(A)	See UI manual
19	Not used	TxD+ TxD(B)	See UI manual
25	Not used	TxD- TxD(A)	See UI manual

<sup>\*</sup>Note: All RS232 signals are present in RS422 mode.

The RocketPort interface box can only be used with the RocketPort 550-8 and RocketPort 550-16. These controllers have a single DB25F mounted on the backplate which connects via the RocketPort cable to the interface box. Alternatively the RocketPort 550-8 and 550-16 controllers may connect to the Comtrol Universal Interface (UI). Refer to the UI manual for connector pin-outs.

The Quad, Octa, RJ11 and RJ45 RocketPort versions do not support RS422 mode.

Pins 1, 9, 10, 11, 12, 13, 14, 21, 22, 23 and 24 of each 25 way connector are not used.

## 9. Technical Support

Comtrol has a staff of support technicians available. Telephone support is available daily, Monday through Friday (except holidays) on the US (Central Time) or UK number listed below. Before you call please have the following information available:

Item	Your System Information
RocketPort 550 model number	
RocketPort 550 serial number	
RocketPort 550 device driver version	
Interface type	
Operating system type and release	
PC make, Model and speed	
Details of other cards configured in the PC	

#### The Comtrol Corporation Headquarters are at

6655 Wedgwood Road

Suite 120 Minneapolis MN 55311-3646

USA

Phone: +1 763 494 4100
Fax: +1 763 494 8992
Email: support@comtrol.com
Web site: http://www.comtrol.com

FTP site: ftp.comtrol.com telnet: www.comtrol.com

#### The Comtrol Europe Ltd Headquarters are at

Unit 2, Avonbury Business Park

Howes Lane Bicester Oxfordshire OX26 2UA Great Britain

Phone: +44 (0) 1869 323220 Fax: +44 (0) 1869 323211 Email: support@comtrol.co.uk Web site: http://www.comtrol.co.uk

## 10. Specifications

RocketPort 550 card	Specification
Baud rate :	
RS 232 (4 RJ45 and Quad)	50 to 460.8K baud
RS 232-(8 RJ11 and Octa)	50 to 115.2K baud
RS 232/422 (8 and 16 Port with interface box)	50 to 230.4K baud
Note: Baud rate is dependant upon hardware and o	perating system configuration
Bus interface	PCI
Control by device driver	
Data bits	7 or 8
Parity	Odd, Even or None
Stop bits	1 or 2

<b>Environmental Condition</b>	Specification
Air temperature :	
System on	0 to 40°C
System off	-20 to 85°C
Humidity (non-condensing)	
System on	8 to 80%
System off	20 to 80%
Altitude	0 to 10,000 feet
MTBF	Greater than 30 years

Product	5V Current	+12V Current	-12V Current
RocketPort 550 4 Quad	210 mA	20 mA	20 mA
RocketPort 550 4 RJ45	190 mA	20 mA	20 mA
RocketPort 550 8 OCTA	140 mA	120 mA	120 mA
RocketPort 550 8 RJ11	250 mA	80 mA	80 mA
RocketPort 550 8 Port	215 mA	N/A	N/A
RocketPort 550 16 Port	300 mA	N/A	N/A

## 11. Copyright and Trademarks

#### Copyright

Copyright 2001 - 2003 Comtrol Europe Ltd

#### Trademarks

The Comtrol Europe logo and the RocketPort logo are trademarks of Comtrol Corporation.

Product names mentioned in this document may be trademarks and/or registered trademarks of their respective companies.

Red Hat is a trademark of Red Hat inc.

Microsoft, MS-DOS, MS, Windows, Windows NT, Windows 95, Windows 98, MSN, MSDN and Visual C++ are registered trademarks of Microsoft Corporation.

"Acrobat® Reader Copyright © 1987-2001 Adobe Systems Incorporated. All rights reserved. Adobe and Acrobat are trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions"

Comtrol reserves the right to make product and user guide changes without notice

Comtrol makes no representations or warranties with regard to the contents of this Quick Start Card or to the suitability of any Comtrol product for any particular purpose. Specifications are subject to change without notice. Some software or features may not be available at the time of publication. Contact your reseller for current product information.