ROCKETPORT SERIAL HUB *SOLO*

DEVICE DRIVER INSTALLATION

AND

CONFIGURATION
GUIDE

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1.0 Introduction

The RocketPort Serial Hub *Solo*

The RocketPort Serial Hub *Solo* enables communications with serial devices over a 10/100 Base-T Ethernet network. The Serial Hub *Solo* provides for remote management, configuration, and connectivity through its 10/100BASE-T Ethernet connection. The *Solo* is available in two versions :

RocketPort Serial Hub *Solo*
A standalone single port industrial/office automation version.

RocketPort Serial Hub *Embedded*
A single port OEM version. See Appendix C
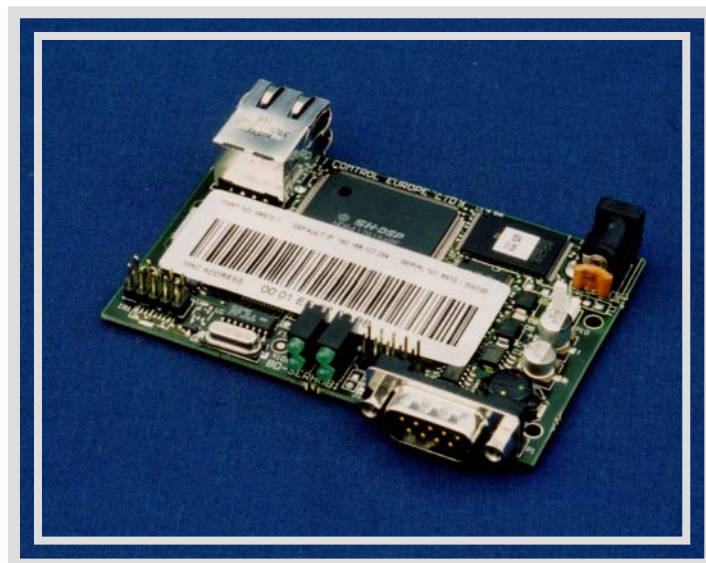
The RocketPort Serial Hub *Solo* has metal housing and powered from a plug top power supply.

The OEM RocketPort Serial Hub *Embedded*, is supplied as a PCB for Original Equipment Manufacturers to embed directly into their own products.

This Guide focuses on the RocketPort Serial Hub *Solo*

The *Solo* interface connections are :

- RJ45 10/100Mbit Ethernet connection.

- DB9M Serial port connector. The serial port supports RS232, RS422 and RS485 (2 wire) connections

The *Solo* has four LED's which indicate the following

- Ethernet TX activity
- Ethernet RX activity
- Ethernet link present
- Ethernet link speed off = 10Mb , on = 100Mbit

The DB9M pin designation and the LED designation can be found on the label fitted to the *Solo* housing.

Host device driver software, called RPSLink, is provided for Windows NT4, Windows 2000 and Windows XP that allows an application to use the *Solo's* serial port as a COM port (Win 32 API calls). A Linux driver is available that allows the *Solo* to be used just like a native TTY port.

The drivers themselves can communicate with the *Solo* across the LAN, either via TCP/IP or the MAC layer. Once configured, the network communications are transparent as far as the application software is concerned.

Alternatively, within a TCP/IP network an application may interface to the network via the SOCKETS network programming API. In this mode no host driver is necessary. This document will refer to this mode as 'Sockets Mode'.

2.0   Installing RPSLink Device Drivers

RPSLink allows the *Solo* serial port to be accessed as if it was a native Win32 COM port. Remember that the physical serial port is located on the network, not on the host motherboard or on a bus adapter card. Developers may need to fine tune applications that are sensitive to network timings.

The CD Rom supplied with the *Solo* contains the RPSLink drivers. At the time of publication of this guide, drivers are available for Windows NT4, Windows 2000, Windows XP and Linux. On the CD, the drivers exist as compressed self extract.EXE files in the following folders :

- Windows NT4   \NT4
- Windows 2000   \W2K
- Windows XP   \XP
- Linux   \Linux

The host drivers may use either MAC or IP addressing for communication with the *Solo*.

If MAC addressing is chosen then the *Solo* must be resident on the same Ethernet segment as the host PC. MAC address mode leads to slightly faster operation.

The unique digit MAC address, a*lso known as the "hardware address",* is loaded into the *Solo* during manufacture and can be found on a label attached to the base of the *Solo*. It is a 12 digit 'hexadecimal' number beginning 00 01 EE…..

The last four digits of the MAC address are unique to each *Solo*.

If IP addressing is chosen then the TCP/IP protocol suite is used for host PC to *Solo* communications. The IP address should be allocated by your system administrator.

As Comtrol Europe cannot predict your system administrator's choice, a DEFAULT IP address is loaded into the *Solo* during manufacture. In addition, a default subnet mask and gateway address are also loaded into the *Solo*.

<div style="text-align:center">

Default IP Address   : 192.168.127.254
Default Subnet Mask   : 255.255.0.0
Default Gateway   : 192.168.0.1

</div>

There are two ways in which to change the IP settings :

(1)   Using the Windows based RPSLink setup program to access a *Solo* initially configured for MAC mode operation.

(2)   Accessing the *Solo's* character based 'Red Boot' monitor program via telnet.

Either option can be used with RPSLink driver software, although option (1) is recommended and is the method explained in the 'Installing RPSLink' sections.

Option (2) is recommended if intending to use the *Solo* in 'Sockets' mode. The procedure is explained in Chapter 6.

3.0   RPSLink for Windows NT4

3.1   Installation Procedure

3.1.1.   The driver is distributed on the supplied CD ROM.

Insert the CD into the CD ROM drive.

Using explorer, navigate to the \NT4 folder.

3.1.2   Locate the self extract .EXE containing the driver.

Double Click the **self extract.EXE** file CMT0064_xxx where 'xxx' is the driver version number (eg CMT0064_112 would be driver version 1.12)

3.1.3   The confirmation dialog appears.

'**Click OK** to Extract Comtrol Europe *Solo* NT4 Host Driver'

Click 'OK'

3.1.4   The Winzip Self extract dialog appears.

The default 'Unzip to folder' is **C:\Comtrol\Installations\SoloNT4**. This is
also known as the distribution folder.

At this stage, you may choose an alternative distribution folder, simply modify
the contents of the 'Unzip to folder' edit box.

Click 'Unzip'

The files will be extracted to the distribution folder.

nn file(s) unzipped successfully.

Click 'OK'

Click 'Close'

Then close explorer.

3.1.5   The driver is installed via the Network applet.

On the Windows desktop, **Right Click** on the **Network Neighborhood** icon.

When the pop-up menu appears click **'Properties'**.

The 'Network' dialog will appear. **Click on** the **'Adapters'** tab

A list of installed adapters will now be displayed.

Click 'Add'

3.1.6   The 'Select Network Adapter' dialog will appear.

Click 'Have Disk'

3.1.7   The 'Insert Disk' dialog will appear.

In the edit box **Enter the path** to the distribution folder eg.
C:\Comtrol\Installations\SoloNT4 (or the pathname entered in the 'unzip to
folder' edit box at step 4, above)

Click 'OK'.

3.1.8   The 'Select OEM' dialog will appear.

Check that **'Comtrol Europe RPS Link'** is listed.
(If not listed then check the correct distribution folder pathname was entered in step 7)

Click 'OK'

The driver files will be installed.

3.1.9   The 'Add Device Wizard' welcome screen will appear.

Click 'NEXT'

The next two screens are 'placeholders' to allow for any future additions to the *Solo* product range.

3.1.10   The 'Add Device Wizard' serial hub type screen will appear.

There will be one product type – RPSH *Solo* (1 port)

Click 'NEXT'

3.1.11   The 'Add Device Wizard' 'number of ports' screen will appear

This will indicate 1 port.

Click 'NEXT'

3.1.12   The 'Add Device Wizard' 'COM device name' screen will appear

Select the COM name from the drop down box or type in the desired COM port name

Click 'NEXT'

3.1.13   The 'Add Device Wizard' 'network address' screen will appear

If you intend to use MAC addressing mode then **select <u>MAC</u>**.

If intending to used **IP mode** and the assigned IP parameters have *NOT* been set via the RedBoot monitor, then you should **select <u>MAC</u>**.

The IP parameters will be configured later via the Windows based setup program.

Note
If intending to (temporarily) use the default IP address or the IP parameters have already been configured via Redboot then you may select <u>I</u>P mode at this stage and enter the IP address when subsequently prompted.

Click 'NEXT'

3.1.14   The 'Add Device Wizard' 'MAC address' screen will appear.

The *Solo* MAC address can be found on a label attached to the *Solo*.
The 12 digit MAC address begins with 00 01 EE.

Enter the address into the edit box.

Click 'NEXT'

3.1.15   The 'Add Device Wizard' closing screen will appear.

Click 'FINISH'

3.1.16   The setup program device dialog will appear.

Click 'OK' to close the device screen

Click 'OK' to close the setup screen

The 'Save configuration changes and exit' dialog will appear.

Click 'Yes'

Close all windows screens and

SHUTDOWN & RESTART THE HOST PC

Note
If you intend to use the Solo *RPSLink driver in MAC address mode only, then installation is now complete.*

If you wish to use the Solo *RPSLink driver in IP mode, complete the following steps after Windows NT4 restart has completed.*

3.1.17   On the Windows desktop, **Right 'Click'** on the **Network Neighborhood icon**.
When the pop-up menu appears

Click 'Properties'

Then the 'Network' dialog will appear.

Click 'Adapters'

A list of installed adapters will now be displayed.

Highlight 'RPSLink'

Click 'Properties'

3.1.18   The RPSLink NT setup dialog will appear

Ensure that the correct RPSLink device is highlighted *(not a COM port device)*

Click 'Properties'

3.1.19   The RocketPort Serial Hub *Solo* device dialog will appear

Ensure that Network address MAC is checked.

Click 'IP Programming' tab

3.1.20   The IP programming dialog will appear

You will now enter the TCP/IP parameters and write them to the *Solo's* non-volatile memory.

Note
If you are not in MAC mode during this TCP/IP address configuration then you will receive notification via pop dialog boxes. Return to step 19 and ensure that MAC is checked. If this does not help then you are probably already in IP mode and the configuration has either been set or the defaults are being used. Click the retrieve button to find the settings and consult your network administrator.

Enter the IP address, subnet mask, and gateway into the appropriate edit boxes

Click 'Program'

When the 'Beginning Programming Device' dialog appears.

Click OK. *(You also have the option to cancel at this point)*

The parameters are written to the *Solo's* non-volatile memory.

A pop-up dialog appears reminding you that the 'IP programming is not complete until device is reset'.

Click 'OK' to dismiss the dialog

Click 'Reset'

The 'Reset entire Device' dialog will appear

Click 'OK' *(You also have the option to cancel at this point)*

The IP settings will be stored in the *Solo's* non-volatile memory

Click 'OK'

3.1.21   The RocketPort Serial Hub *Solo* device dialog will appear.

Note
If the host is simply being used as a platform for programming TCP/IP settings into a Solo *and thus it will be hosted by another PC then click OK to dismiss the dialog and then click OK again to dismiss the network applet dialog.*

If the *Solo* is to be used with this host then you must enable IP mode.

Ensure that the correct RPSLink device is highlighted *(not a COM port device)*

Click 'Properties'

The RocketPort Serial Hub *Solo* device dialog will appear

Ensure that Network address MAC is un-checked.

Check the Network address IP box.

Click 'OK'. To dismiss the RocketPort Serial Hub *Solo* device dialog box

3.1.22   The RPSLink setup dialog will appear

Click 'OK'

The 'Save configuration changes and exit' pop-up box will appear

Click 'YES' *(You also have the option to click No at this point)*

3.1.23   The Network dialog will appear

Click 'OK'

Respond to any prompts to restart Windows NT by initiating a shutdown and restart.

Power Off/On the *Solo* in order reset the unit.

Installation and configuration of the RPSLink driver to use IP address mode is now complete.

3.2   Setting RPSLink *Solo* Device Properties

The Solo device properties are accessed via the RPSLink setup program. You already accessed this during installation and so it will be summarized here.

To access right click the 'Network Neighborhood' and click on 'Properties' from the drop down menu. When the network dialog appears, click on the adapters tab.

Highlight the Comtrol Europe RPSLink entry and click the 'Properties' button.

The RPSLink NT setup dialog will appear.

Ensure that the correct RPSLink device is highlighted *(not a COM port device)* and click the 'Properties' button. The RocketPort Serial Hub *Solo* device dialog will appear.

The 'Network Address' properties were described in the installation instructions. No further comment is necessary. The remaining properties are described here.

Name Property :   This is the *Solo* device name, *eg RPS-Link#1*. This is allocated during driver installation and can normally be left alone unless you wish to change it to your own descriptive name.

Number of Ports :   For the RPSH *Solo* product this will be 1.

Keep Alive Timeout Period :   The host PC and *Solo* exchange network link status messages. If there is a break in the Ethernet link then the host and *Solo* will attempt to re-establish network communications.

If the link is re-established before the timeout expires then data that is queued within the *Solo* or within the host driver will be transferred across the network. However, there is the risk of some data loss.

The time period in seconds, that the *Solo* will attempt to re-establish network communications is set by the 'Keep Alive Timeout Period'. The Default is 120 seconds. If the timeout expires then the serial port is closed.

Note

Events that cause a loss of the network link include physical interruption of the network link (eg removing Ethernet connectors) or electrical interruptions preventing the link status messages from reaching their destination.

Interruption of power to the Solo *will cause the unit to reset and request an RPSLink control program download. The open COM port associated with the* Solo *serial port will need to closed and re-opened in order to continue serial communications.*

TCP Timeout Multiplier : This value multiplies the base time constants of two TCP protocol timers. The TCP port open timer has a base time constant of 500mS and the TCP port release timer has a base time constant of 8 seconds. A multiplier of 1 will use these time constants a multiplier of 2 will double each time constant and so on.

It does not affect MAC mode operation, only IP mode operation. The multiplier may be increased to extend the period of time before the release of the serial port in the event of a loss of TCP/IP communications.

3.3 Setting NT4 RPSLink *Solo* COM Port Properties

The *Solo* COM port properties are accessed via RPSLink setup program. You already accessed this during installation and so it will be summarized here.

To access right click the 'Network Neighborhood' and click on 'Properties' from the drop down menu. When the network dialog appears, click on the adapters tab.

Highlight the Comtrol Europe RPSLink entry and click the 'Properties' button.

The RPSLink NT setup dialog will appear.

Ensure that the correct RPSLink associated COM port is highlighted *(not the RPSLink parent device)* and click the 'Properties' button. The *Solo* COM port properties dialog will appear.

The Port Setup options are :

RS mode : Selects the serial port interface standard RS232, RS422 or RS485

Caution
The default is RS232. Do not connect the Solo *serial port to RS422 or RS485 peripherals until the RS mode has been correctly set.*

Timeout on transmit data on port close : This sets the time period that RPSLink will wait for pending data to be transmitted on receipt of a port close **(CloseHandle call).**

Wait on physical transmission before completing write : Check this box if the application expects RPSLink to return from a port write **(WriteFile Call)** only after all data has been transmitted by the *Solo* serial port.
If unchecked then RPSLink will return from a port write when the last data fragment has been cached in it's buffers.

Com name : This allows the COM name associated with the RPSLink serial port to be changed to an alternative unallocated COM name.

Click the **RTS toggle** tab to access RTS toggle mode options.

Override and lock RTS toggle mode : Select this mode to configure the *Solo* to assert and de-assert RTS in coincidence with data transmission.

RTS Toggle RTS low :   This should be normally left unchecked for operation with the *Solo*. The option exists for situations where the RTS signal is to be used to control RS485 transceiver direction with 'active low TX' direction control.

Once changes are made

Click OK.

Changes do not take affect until Windows NT is restarted.

3.4   Verifying the Installation

The RPSLink driver makes the *Solo* serial port appear as Windows COM port.

You may test the *Solo* by using Hilgreave's Hyperterminal application supplied with Windows NT4. Configure the *Solo* port as a direct connect device.

Hyperterminal is not a Comtrol Europe product so refer to Hilgreaves documentation/on-line help for instructions.

3.5   Removal of the NT4 RPSLink Driver Software

If you wish to remove the NT4 RPSLink Driver Software, follow the procedure below :

3.5.1   On the Windows desktop, **Right Click** on the **Network Neighborhood** icon. When the pop-up menu appears click 'Properties'.

    When the 'Network' dialog will appears.

    Click 'Adapters'

3.5.2   The list of installed adapters will now be displayed.

    Highlight the Comtrol Europe RPSLink entry

    Click '<u>R</u>emove'

    Click 'Yes'

    When removal is complete **Click Close** to dismiss the network dialog box

    Click 'Yes' to shutdown and restart the host PC

    Removal is complete.

4.0   RPSLink for Windows 2000

The installation description assumes that the host PC's system disk drive letter is C: and the CD-Rom drive letter is E: If your PC differs then change the drive letter as required.

If intending to use the Solo *in MAC mode follow these instructions. Remember that a MAC addressed* Solo *must reside on the same Ethernet segment as the host PC.*

If intending to use the Solo *in IP mode then follow these instructions to install the* Solo *in MAC mode and then use the RPSLink setup program to configure the required TCP/IP parameters into* Solo *non-volatile memory.*

Therefore the *Solo* must initially reside on the same segment as the configuring host PC. When IP parameters are configured into the *Solo's* non-volatile memory, it can be re-located as appropriate.

4.1   Installation Procedure

4.1.1   The driver is distributed on the supplied CD ROM

Insert the CD into the CD ROM drive. We will assume that the driver letter is E:

4.1.2   Locate the self extract.EXE containing the driver
Using explorer, navigate to E:\W2K folder

Double click the self extract.EXE file CMT0082_xxx where 'xxx' is the driver version number (eg CMT0082_110 would be driver version 1.10)

4.1.3   The confirmation dialog appears

Click OK to extract the *Solo* Windows 2000 and XP Driver

Click 'OK'

4.1.4   The Winzip Self extract dialog appears

The default 'Unzip to folder' is **C:\Comtrol\Installations\Solo2kXp**. This is also known as the distribution folder

At this stage, you may choose an alternative distribution folder, simply modify the contents of the 'Unzip to folder' edit box.

Click 'Unzip'

The files will be extracted to the distribution folder.

nn file(s) unzipped successfully.

Click 'OK'

Click 'Close'

Then close Explorer

4.1.5   The driver is installed using the 'Add/Remove Hardware Wizard'

From the Windows desktop, **Right Click** the **'My Computer icon'.**

When the pop-up menu appears

Click 'Properties'

4.1.6   The 'System Properties' dialog will appear

Click the 'Hardware tab'

Then **Click 'Hardware Wizard'**

4.1.7   The 'Hardware Wizard' welcome dialog will appear

Click 'Next'

4.1.8   The 'Choose a Hardware Task' dialog will appear

Select 'Add/Troubleshoot a device'

Click 'Next'

4.1.9   The 'Choose a Hardware Device' screen will appear

Highlight the **'Add a new device'** entry

Click 'Next'

4.1.10 The 'Find New Hardware' dialog will appear

Select 'No. I want to select the hardware from a list'

Click 'Next'

4.1.11 The 'Hardware type' screen will appear

Highlight the **'Multi-port serial adapters'** entry

Click 'Next'

4.1.12   The 'Select a Device Driver' screen will appear

Ignore the Manufacturer & Models Lists

Click 'Have Disk'

4.1.13   The 'Install from Disk' dialog will appear

Select 'Browse'

Using the browser select the path to the distribution folder.

That is the folder that contains the files unzipped from the self extract.EXE distribution file in step 4.1.4.

C:\Comtrol\Installations\Solo2kXp

Click 'Open'

Click 'OK'

4.1.14   The 'Select a device driver' screen will re-appear, this time listing the *Solo* device

Highlight the *Solo* device entry **- 'RPSH *Solo* (1port)'**

Click 'Next'

4.1.15   The 'Start hardware installation screen' will appear for the *Solo* device

Click 'Next'

When the 'Digital Signature' dialog appears.

Click 'Yes'

4.1.16   The 'Completing the Add/Remove Hardware Wizard' dialog will appear

Click 'Finish'

4.1.17   The 'System Properties' dialog will re-appear

The hardware options should still be 'in view' otherwise click the 'Hardware' tab.

Click 'Device Manager'

4.1.18   The 'Device Manager' dialog appears

Expand the **'Multi-port serial adapters'** entry and **Double Click** the device you are installing **RPSH *Solo* (1 port)** entry.

Click the **'Main Setup'** tab

4.1.19   The *Solo* properties dialog may appear

Within the 'Configuration' pane, ensure that the *Solo* is highlighted

Click 'Properties'

4.1.20   The Device properties dialog will appear

The 'Network Address' offers two options, MAC and IP.

The Solo MAC address can be found on a label attached to the base of the Solo.
The 12 digit MAC address begins with 00 01 EE. The MAC address, also known as a 'hardware address' is unique to each Solo.
All Solo's have the same default IP settings, also printed on the label attached to the device.

If you intend to use MAC address mode then Enter the address into the edit box, select MAC mode or Click on the drop down arrow to reveal the available MAC addresses.

If you intend to use IP mode *and* the IP address has *NOT* been configured then at this stage in the installation you must install the *Solo* in MAC mode as described above re-configuring for IP mode operation will be done later.

If you intend to use IP mode *and* the IP address has been previously configured then the IP address will appear in the IP edit box . In this case you may select IP mode.

Leave the remaining properties at their default values and

Click 'OK'

4.1.21   The *Solo* properties dialog will appear

Click 'OK'

The 'Would you like to add program manager menu selections for the utilities ?' dialog may appear

Select 'Yes' or 'No'

If you are using MAC mode operation then installation is complete. If using IP mode operation with previously configured IP settings then installation is complete.

Close 'Device Manager'

Close the 'Comtrol RPS link Window' if open

Close 'System Properties'

Shutdown and restart Windows 2000 for the changes to take effect. *See note below*

Power Off/On the *Solo* in order reset the unit.

Note
The Solo *must power Off/On reset while Windows 2000 is shutdown before Windows 2000 restarts.*

If you have installed the *Solo* to use MAC mode operation in preparation to program the IP settings then carry out the following steps.

4.1.22   Preparing to configure new IP settings

From the Windows desktop, **Right Click** the **'My Computer icon'**

When the pop-up menu appears

Click 'Properties

4.1.23   The 'System Properties' dialog will appear

Click 'Hardware'

Click 'Device Manager'

4.1.24   The 'Device Manager' screen appears

Expand the **'Multi-port serial adapters'** entry and **Double Click** the **RPSH Solo (1 port)** entry

Click the **'Main Setup'** tab

4.1.25   The RocketPort Serial Hub *Solo* properties dialog will appear

Within the 'Configuration' pane, ensure that the RocketPort Serial Hub *Solo* is highlighted

Click 'Properties'

4.1.26   The Device properties dialog will appear

Ensure that the MAC mode option is selected

Click 'IP Programming tab'

4.1.27   The IP programming dialog appears

If using static IP addressing then enter the :

IP address*
Subnet mask*
Gateway address*

* Note : Supplied by your System Administrator or Network Manager

- into the appropriate edit boxes.

Click 'Program'

4.1.28   The 'Begin Programming 'dialog will appear

Click 'OK'

You can Click Cancel if you need to go back to make changes

4.1.29   The IP programming is not complete until the 'Device is Reset' dialog appears

Click 'OK' to dismiss the dialog

Click 'R̲eset'

The 'Reset entire Device' dialog will appear

Click 'OK' *(You also have the option to cancel at this point)*

The IP settings will be stored in the Solo's non-volatile memory

Click 'OK'

4.1.30   The *Solo* device dialog will appear.

Note
If the host is simply being used as a platform for programming TCP/IP settings into a Solo
*and thus it will be hosted by another PC then click OK to dismiss the dialog and then click OK
again to dismiss the network applet dialog.*

If the *Solo* is to be used with this host then you must enable IP mode.

Click 'OK' to clear the device dialog.

Ensure that the correct RPSLink device is highlighted *(not a COM port)*

Click 'Properties'

The RocketPort Serial Hub *Solo* device dialog will appear

Check the Network address IP box.

Ensure that Network address MAC is un-checked.

The switching from MAC to IP addressing dialog will appear.

Click 'Yes' for a **System re-boot**.

Click 'OK'. To dismiss the RocketPort Serial Hub *Solo* device dialog box

4.1.31   The RPSLink properties dialog will appear

Click 'OK'

4.1.32   The Network dialog will appear

Click 'OK'

Installation and configuration of the RPSLink driver to use IP address mode is
now complete.

Shutdown and restart Windows 2000 for the changes to take effect. *See note below*

Power Off/On the *Solo* in order reset the unit.

Note
The Solo *must power Off/On reset while Windows 2000 is shutdown before Windows 2000
restarts.*

4.2   Setting Windows 2000 RPSLink *Solo* Device Properties

The *Solo* device properties are accessed via the RPSLink setup program. You already accessed this during installation and so it will be summarized here.

From the Windows desktop, **Right Click** the **'My Computer icon'**. When the pop-up menu appears, **Click 'Properties**.

The 'System Properties' dialog will appear **Click** the **'Hardware'** tab and then **Click** the **'Device Manager'** button

When the 'Device Manager' dialog appears. **Expand** the **'Multi-port serial adapters'** entry and **Double Click** the **'RPSH Solo (1 port)'** entry.

Click the **'Main Setup'** tab. The RocketPort Serial Hub *Solo* properties dialog will appear

Within the 'Configuration' pane, ensure that the *Solo* is highlighted

Click the **'Properties'** button.

The 'Network Address' properties were described in the installation instructions. No further comment is necessary. The remaining properties are described here.

Name Property :   This is the *Solo* device name, *eg RPSH Solo*. This is allocated during driver installation and can normally be left alone unless you wish to change it to your own descriptive name.

Number of Ports :   For the RPSH *Solo* product this will be 1.

Keep Alive Timeout Period :   The Host PC and *Solo* exchange network link status messages. If there is a break in the Ethernet link then the host and *Solo* will attempt to re-establish network communications.

If the link is re-established before the timeout expires then data that is queued within the *Solo* or within the host driver will be transferred across the network. However, there is the risk of some data loss.

The time period in seconds, that the Solo will attempt to re-establish network communications is set by the **'Keep Alive Timeout Period'**. The Default is 120 seconds. If the timeout expires then the serial port is closed.

Note
Events that cause a loss of the network link include physical interruption of the network link (eg removing Ethernet connectors) or electrical interruptions preventing the link status messages from reaching their destination.

Interruption of power to the Solo *will cause the unit to reset and request an RPSLink control program download. The open COM port associated with the* Solo *serial port will need to closed and re-opened in order to continue serial communications.*

TCP Timeout Multiplier : This value multiplies the base time constants of two TCP protocol timers. The TCP port open timer has a base time constant of 500mS and the TCP port release timer has a base time constant of 8 seconds. A multiplier of 1 will use these time constants a multiplier of 2 will double each time constant and so on.

It does not affect MAC mode operation, only IP mode operation. The multiplier may be increased to extend the period of time before the release of the serial port in the event of a loss of TCP/IP communications.

4.3   Setting the RPSLink *Solo* COM Port Properties

The *Solo* device properties are accessed via the RPSLink setup program. You already accessed this during installation and so it will be summarized here.

From the Windows desktop, **Right Click** the **'My Computer icon'.** When the pop-up menu appears, **Click 'Properties'.**

The 'System Properties' dialog will appear. **Click** the **'Hardware'** tab and then **Click** the **'Device Manager'** button.

When the 'Device Manager' dialog appears. **Expand** the **'Multi-port serial adapters'** entry and **Double Click** the **'RPSH *Solo* (1 port)' entry'**.

Click the **'Main Setup'** tab. The *Solo* properties dialog will appear

Within the 'Configuration' pane, ensure that the COM port is highlighted

Click the **'Properties'** button.

The *Solo* COM port properties dialog will appear.

The Port Setup options are :

R̲S Mode :   Selects the serial port interface standard RS232, RS422 or RS485

Caution
The default is RS232. Do not connect the Solo *serial port to RS422 or RS485 peripherals until the RS mode has been correctly set.*

O̲verride and Lock Baud Rate :   Forces the baud rate to a preferred value. This option is not used in normal operation.

T̲imeout on Transmit Data on Port Close : This sets the time period that RPSLink will wait for pending data to be transmitted on receipt of a port close **(CloseHandle call).**

Map 2 Stop Bits to 1 :   Allows use of either 2 or 1 stop bits

You can use this option to map 2 stop bits to 1 bit. If the application you are using is hard coded to use two stop bits and you are receiving framing errors, you can you can implement this option. Leave this box unchecked to enable stop bits to pass through unchanged.

Wait On Physical Transmission Before Completing Write :   Check this box if the application expects RPSLink to return from a port write **(WriteFile Call)** only after all data has been transmitted by the *Solo* serial port.

If unchecked then RPSLink will return from a port write when the last data fragment has been cached in it's buffers.

Emulate Modem Hardware Ring Signal : This Emulates a hardware Ring Indicate (RI) signal. This option is not used in normal operation.

Clone :   Applies these settings to all ports

*If this box is checked, the changes **Main Setup** category area are applied to all RPSLink ports in the system. If this box is not checked, the changes you make to the port setup apply to the selected port only*

Com Name : This allows the COM name associated with the RPSLink serial port to be changed to an alternative unallocated COM name.

RTS Toggle Options :

Click the **RTS Toggle** tab to access RTS toggle mode options.

Override and Lock RTS Toggle Mode :   Select this mode to configure the *Solo* to assert and de-assert RTS in coincidence with data transmission.

RTS Toggle RTS Low :   This should be normally left unchecked for operation with the *Solo*. The option exists for situations where the RTS signal is to be used to control RS485 transceiver direction with 'active low TX' direction control.

Once changes are made

Click 'OK'

Changes do not take affect until Windows 2000 is restarted.

4.4   Verifying the Installation

The RPSLink driver makes the *Solo* serial port appear as a Windows COM port.

You may test the *Solo* by using Hilgreave's Hyperterminal application supplied with Windows 2000. Configure the *Solo* port as a direct connect device.

Hyperterminal is not a Comtrol Europe product so refer to Hilgreaves documentation/on-line help for instructions.

4.5   Removal of the Windows 2000 RPSLink Driver Software

If you wish to remove the Windows 2000 RPSLink Driver Software, follow the procedure below :

4.5.1   On the Windows desktop, **Right Click** on the **'My Computer'** icon and **Choose 'Manage'** from the shortcut menu.

4.5.2   In the **'Tree'** panel of the 'Computer Management' window **Select 'Device Manager'**

4.5.3   Expand the **'Multi-port serial adapters'** entry to view the list.

4.5.4   **Right Click** on the *Solo* device that you wish to remove and **Select** the **'Uninstall'** menu item

4.5.5   When the **'Confirm device removal'** pop-up appears, **Click 'OK'.**

4.5.6   Close the device manager window.

5.0 RPSLink for Windows XP

Notes

The installation description assumes that the host PC's system disk drive letter is C: and the CD-Rom drive letter is E: If your PC differs then change the drive letter as required.

If intending to use the Solo *in MAC mode follow these instructions. Remember that a MAC addressed* Solo *must reside on the same Ethernet segment as the host PC.*

If intending to use the Solo *in IP mode then follow these instructions to install the* Solo *in MAC mode and then use the RPSLink setup program to configure the required TCP/IP parameters into* Solo *non-volatile memory.*

Therefore the *Solo* must initially reside on the same segment as the configuring host PC. When IP parameters are configured into the *Solo's* non-volatile memory, it can be re-located as appropriate.

5.1 Installation Procedure

5.1.1 The driver is distributed on the supplied CD ROM

Insert the CD into the CD ROM drive. We will assume that the driver letter is E:

5.1.2 Locate the self extract.EXE containing the driver
Using explorer, navigate to E:\XP folder

Double click the self extract.EXE file CMT0082_xxx where 'xxx' is the driver version number (eg CMT0082_110 would be driver version 1.10)

5.1.3 The confirmation dialog appears

'Click OK to extract *Solo* Windows 2000 and Windows XP Driver'

Click 'OK

5.1.4 The Winzip Self extract dialog appears

The default 'Unzip to folder' is **C:\Comtrol\Installations\Solo2kXp**. This is also known as the distribution folder

At this stage, you may choose an alternative distribution folder, simply modify the contents of the 'Unzip to folder' edit box.

Click 'Unzip'

The files will be extracted to the distribution folder.

nn file(s) unzipped successfully.

Click 'OK'

Click 'Close'

Then close explorer.

5.1.5   The driver is installed using the 'Add/Remove Hardware Wizard'

From the Windows desktop, **Right Click** the **'My Computer icon'**
Or, **Click 'Start',** then **Right Click 'My Computer'**

When the pop-up menu appears

Click 'Properties'

5.1.6   The 'System Properties' dialog will appear

Click the **'Hardware'** tab

Then **Click 'Add Hardware Wizard'**

5.1.7   The 'Add Hardware Wizard' welcome dialog will appear

Click 'Next'

5.1.8   The 'Add Hardware Wizard' dialog will appear

Is the hardware connected

Select 'Yes'

Click 'Next'

5.1.9   The 'Add New Hardware Device' screen will appear

Highlight the **'Add a new hardware device'** entry

Click 'Next'

5.1.10   The 'Add Hardware Wizard' screen will appear

Select 'Install the hardware that I manually select from a list'

Click 'Next'

5.1.11   The 'Hardware type' screen will appear

Highlight the **'Multi-port serial adapters'** entry

Click 'Next'

5.1.12   The 'Select a Device Driver' screen will appear

Ignore the Manufacturer & Models Lists

Click 'Have Disk'

5.1.13   The 'Install from Disk' dialog will appear

Select 'Browse'

Using the browser select the path to the distribution folder.

That is the folder that contains the files unzipped from the self extract.EXE distribution file in step 5.1.4.

C:\Comtrol\Installations\Solo2kXp

Click 'Open'

Click 'OK'

5.1.14   The 'Select a device driver' screen will re-appear, this time listing the *Solo* device

Highlight the *Solo* device entry - **'RPSH *Solo* (1 port)'**

Click 'Next'

5.1.15   The 'Start hardware installation screen' will appear for the *Solo* device

Click 'Next'

When the 'Windows Logo Testing ' dialog appears.

Click 'Continue Anyway'

Wait while the computer searches.

5.1.16 The 'Found new hardware wizard dialog ' will appear for the Comtrol RPS Link Port 0

Check 'Install from a list or specific location'

Click 'Next'

5.1.17 The 'Search for the best driver in these locations' check boxes appear

Check 'Include these locations' C:\Comtrol\Installations\Solo2kXp

Click 'Next'

When the 'Windows Logo Testing' dialog appears.

Click 'Continue anyway'

5.1.18 The 'Completing the Add/Remove Hardware Wizard' screen will appear

Click 'Finish'

Click 'Finish' again

5.1.19 The 'System Properties' dialog will re-appear

The hardware options should still be 'in view' otherwise click the 'Hardware' tab.

Click 'Device Manager'

5.1.20 The 'Device Manager' dialog appears

Expand the **'Multi-port serial adapters'** entry and **Double Click** the '**RPSH Solo (1 port)'** entry.

Click the **'Main Setup'** tab

5.1.21 The RocketPort Serial Hub *Solo* properties dialog may appear

Within the 'Configuration' pane, ensure that the *Solo* is highlighted

Click 'Properties'

5.1.22 The Device properties dialog will appear

The 'Network Address' offers two options, MAC and IP.

The Solo *MAC address can be found on a label attached to the base of the* Solo.
The 12 digit MAC address begins with 00 01 EE. The MAC address, also known as a 'hardware address' is unique to each Solo.

All Solo's *have the same default IP settings, also printed on the label attached to the device.*

If you intend to use MAC address mode then Enter the address into the edit box, select MAC mode.

If you intend to use IP mode *and* the IP address has *NOT* been configured then at this stage in the installation you must install the *Solo* in MAC mode as described above re-configuring for IP mode operation will be done later.

If you intend to use IP mode *and* the IP address has been previously configured then the IP address will appear in the IP edit box . In this case you may select IP mode.

Leave the remaining properties at their default values and

Click 'OK'

5.1.23 The RocketPort Serial Hub *Solo* properties dialog will appear

Click 'OK'

The 'Would you like to add program manager selection for the utilities' dialog may appear

Select 'Yes' or 'No'

If you are using MAC mode operation then installation is complete. If using IP mode operation with previously configured IP settings then installation is complete.

Close 'Comtrol RPS link Window'

Close 'Device Manager'

Close 'System Properties'

If you have installed the *Solo* to use MAC mode operation in preparation to program the IP settings then carry out the following steps.

5.1.24 Preparing to configure new IP settings

From the Windows desktop, **Right Click** the **'My Computer icon'**
Or, **Click 'Start',** then **Right Click 'My Computer'**

When the pop-up menu appears

Click 'Properties

5.1.25   The 'System Properties' dialog will appear

Click 'Hardware'

Click 'Device Manager'

5.1.26   The 'Device Manager' screen appears

Expand the **'Multi-port serial adapters'** entry and **Double Click** the **RPSH Solo (1 port)** entry

Click 'Main Setup'

5.1.27   The RocketPort Serial Hub *Solo* properties dialog will appear

Within the 'Configuration' pane, ensure that the RocketPort Serial Hub *Solo* is highlighted

Click 'Properties'

5.1.28   The Device properties dialog will appear

Ensure that the MAC mode option is selected

Click 'IP Programming tab'

5.1.29   The IP programming dialog appears

If using static IP addressing then enter the :

IP address*
Subnet mask*
Gateway address*

* Note : Supplied by your System Administrator or Network Manager

- into the appropriate edit boxes.

Click 'Program'

5.1.30   The 'Begin Programming 'dialog will appear

Click 'OK'

You can Click Cancel if you need to go back to make changes

5.1.31 The IP programming is not complete until the 'Device is Reset' dialog appears

Click 'OK' to dismiss the dialog

Click 'Reset'

The 'Reset entire Device' dialog will appear

Click 'OK' *(You also have the option to cancel at this point)*

The IP settings will be stored in the Solo's non-volatile memory

Click 'OK'

5.1.32 The RocketPort Serial Hub *Solo* device dialog will appear.

Note
If the host is simply being used as a platform for programming TCP/IP settings into a Solo *and thus it will be hosted by another PC then click OK to dismiss the dialog and then click OK again to dismiss the network applet dialog.*

If the *Solo* is to be used with this host then you must enable IP mode.

Ensure that the correct RPSLink device is highlighted *(not a COM port)*

Click 'Properties'

The RocketPort Serial Hub *Solo* device dialog will appear

Check the Network address IP box.

The switching from MAC to IP addressing dialog will appear

Click 'Yes' for a system re-boot

Click 'OK'. To dismiss the RocketPort Serial Hub *Solo* device dialog box

5.1.33 The RocketPort serial Hub *Solo* setup dialog will appear

Click 'OK'

5.1.34 The 'Comtrol RPS Link WindowsSetup' dialog will appear

Click 'OK'

Installation and configuration of the RPSLink driver to use IP address mode is now complete.

Shutdown and restart Windows XP for the changes to take effect. *See note below*

Power Off/On the *Solo* in order reset the unit.

Note
The Solo *must power Off/On reset while Windows XP is shutdown before Windows XP restarts.*

5.2   Setting Windows XP RPSLink *Solo* Device Properties

The *Solo* device properties are accessed via the RPSLink setup program. You already accessed this during installation and so it will be summarized here.

From the Windows desktop, **Right Click** the **'My Computer icon'**. Or, **Click 'Start',** then **Right Click 'My Computer'**

When the pop-up menu appears, **Click 'Properties**.

The 'System Properties' dialog will appear **Click** the **'Hardware'** tab and then **Click** the **'Device Manager'** button

When the 'Device Manager' dialog appears. **Expand** the **'Multi-port serial adapters'** entry and **Double Click** the **'RPSH *Solo* (1 port)'** entry.

Click the **'Main Setup'** tab. The RocketPort Serial Hub *Solo* properties dialog will appear

Within the 'Configuration' pane, ensure that the *Solo* is highlighted

Click the **'Properties'** button.

The 'Network Address' properties were described in the installation instructions. No further comment is necessary. The remaining properties are described here.

Name :   This is the *Solo* device name, *eg RPSH Solo*. This is allocated during driver installation and can normally be left alone unless you wish to change it to your own descriptive name.

Number of Ports :   For the RPSH *Solo* product this will be 1.

Keep Alive Timeout Period :   The Host PC and *Solo* exchange network link status messages. If there is a break in the Ethernet link then the host and *Solo* will attempt to re-establish network communications.

If the link is re-established before the timeout expires then data that is queued within the *Solo* or within the host driver will be transferred across the network. However, there is the risk of some data loss.

The time period in seconds, that the Solo will attempt to re-establish network communications is set by the **'Keep Alive Timeout Period'**. The Default is 120 seconds. If the timeout expires then the serial port is closed.

Note

Events that cause a loss of the network link include physical interruption of the network link (eg removing Ethernet connectors) or electrical interruptions preventing the link status messages from reaching their destination.

Interruption of power to the Solo *will cause the unit to reset and request an RPSLink control program download. The open COM port associated with the* Solo *serial port will need to closed and re-opened in order to continue serial communications.*

TCP Timeout Multiplier :   This value multiplies the base time constants of two TCP protocol timers. The TCP port open timer has a base time constant of 500mS and the TCP port release timer has a base time constant of 8 seconds. A multiplier of 1 will use these time constants a multiplier of 2 will double each time constant and so on.

It does not affect MAC mode operation, only IP mode operation. The multiplier may be increased to extend the period of time before the release of the serial port in the event of a loss of TCP/IP communications.

5.3   Setting the RPSLink *Solo* COM Port Properties

The *Solo* device properties are accessed via the RPSLink setup program. You already accessed this during installation and so it will be summarized here.

> From the Windows desktop, **Right Click** the **'My Computer'** icon, or **Click 'Start',** then **Right Click 'My Computer'.**

> When the pop-up menu appears, **Click 'Properties'**.

The 'System Properties' dialog will appear. **Click** the **'Hardware'** tab and then **Click** the **'Device Manager'** button.

When the 'Device Manager' dialog appears. **Expand** the **'Multi-port serial adapters'** entry and **Double Click** the **'RPSH *Solo* (1 port)'** entry.

Click the **'Main Setup'** tab. The RocketPort Serial Hub *Solo* properties dialog will appear

Within the 'Configuration' pane, ensure that the COM port is highlighted

Click the **'Properties'** button.

The RocketPort Serial Hub *Solo* COM port properties dialog will appear.

The Port Setup options are :

RS Mode :   Selects the serial port interface standard RS232, RS422 or RS485

Caution

The default is RS232. Do not connect the Solo *serial port to RS422 or RS485 peripherals until the RS mode has been correctly set.*

Override and Lock Baud Rate :   Forces the baud rate to a preferred value. This option is not used in normal operation.

Timeout on Transmit Data on Port Close :   This sets the time period that RPSLink will wait for pending data to be transmitted on receipt of a port close **(CloseHandle call).**

Map 2 Stop Bits to 1 :   Allows use of either 2 or 1 stop bits

You can use this option to map 2 stop bits to 1 bit. If the application you are using is hard coded to use two stop bits and you are receiving framing errors, you can you can implement this option. Leave this box unchecked to enable stop bits to pass through unchanged.

Wait On Physical Transmission Before Completing Write :   Check this box if the application expects RPSLink to return from a port write **(WriteFile Call)** only after all data has been transmitted by the *Solo* serial port.

If unchecked then RPSLink will return from a port write when the last data fragment has been cached in it's buffers.

Emulate Modem Hardware Ring Signal :   This Emulates a hardware Ring Indicate (RI) signal. This option is not used in normal operation.

Clone :   Applies these settings to all ports

If this box is checked, the changes **Main Setup** *category area are applied to all RPSLink ports in the system. If this box is not checked, the changes you make to the port setup apply to the selected port only*

Com Name :   This allows the COM name associated with the RPSLink serial port to be changed to an alternative unallocated COM name.

RTS Toggle Options :

Click the **RTS Toggle** tab to access RTS toggle mode options.

Override and Lock RTS Toggle Mode :   Select this mode to configure the *Solo* to assert and de-assert RTS in coincidence with data transmission.

RTS Toggle RTS Low :   This should be normally left unchecked for operation with the *Solo*. The option exists for situations where the RTS signal is to be used to control RS485 transceiver direction with 'active low TX' direction control.

Once changes are made

Click 'OK'

Changes do not take affect until Windows XP is restarted.

5.4   Verifying the Installation

The RPSLink driver makes the *Solo* serial port appear as a Windows COM port.

You may test the *Solo* by using Hilgreave's Hyperterminal application supplied with Windows 2000. Configure the *Solo* port as a direct connect device.

Hyperterminal is not a Comtrol Europe product so refer to Hilgreaves documentation/on-line help for instructions.

5.5   Removal of the Windows XP RPSLink Driver Software

If you wish to remove the Windows XP RPSLink Driver Software, follow the procedure below :

5.5.1   On the Windows desktop, **Right Click** on the **'My Computer'** icon, or, **Click 'Start',** then **Right Click 'My Computer'** and **Choose 'Manage'** from the shortcut menu.

5.5.2   In the **'Tree'** panel of the 'Computer Management' window **Select 'Device Manager'**

5.5.3   Expand the **'Multi-port serial adapters'** entry to view the list.

5.5.4   **Right Click** on the *Solo* device that you wish to remove and **Select** the **'Uninstall'** menu item

5.5.5   When the **'Confirm device removal'** pop-up appears, **Click OK.**

5.5.6   Close the device manager window.

6.0   Sockets Mode

The Windows based RPSLink device driver allows the LAN attached serial port to be accessed by application software as a COM port. The Linux version allows the serial port to be accessed as a TTY port.

However, it is not necessary to use RPSLink and the *Solo* can be accessed by an application using TCP/IP sockets programming interface.

Before using Sockets, you should change the default IP address of 192.168.127.254 to the IP address provided by your system administrator or network manager.

Chapter 6.0 shows you how to do this via TELNET access to the firmware resident RedBoot monitor.

6.1   SocketServer

In addition to the RedBoot Monitor, the *Solo* contains a flash resident SocketServer. An application will open a Socket's connection to the SocketServer. This connection will allow raw data to be exchanged between the application and the peripheral attached to the *Solo* serial port.

The Sockets application will *not* be able to manipulate modem control signals. However, automatic control of these signals, by the SocketServer, is supported.

6.1.1   SocketServer Startup

After power-up the *Solo* is default configured to wait 20 Seconds for an RPSLink enabled host PC to download it's control program *(remember RPSLink allows a host to access the* Solo *serial port as a COM or TTY port, depending on the operating system).*

If no RPSLink host driver is present then there can be no download and at the end of the 20 second period the *Solo* will automatically start the SocketServer.

The 20 second delay can be changed via the RedBoot Monitor.

6.2   Configuring the *Solo* Serial Port for SocketServer Use.

The *Solo* support a built-in web server, allowing web based configuration of serial port properties.

Note
Web based configuration of Solo *serial port properties is only applicable to SocketServer use and cannot be used to configure ports for RPSLink. Remember that RPSLink has it's own setup/properties configuration utility.*

6.2.1   Accessing the *Solo* Home Page.

To access the *Solo* home page. Start your web browser and enter into the address/URL box, the address of the *Solo* that you wish to configure.

For example assuming that the *Solo* is set to default IP address, then enter the address
http://192.168.127.254

6.2.2   Viewing Configuration and Status

The home page displays the 'Server Configuration', 'Connection Status', 'Serial Status' and Connection Configuration. This configuration/status information reflects configuration options selected on the configuration page and serial port status information.

The **Server Configuration** will display the :

- SocketServer version number
- IP address
- IP netmask
- IP gateway

The **Connection Status** will show :

- **Enable :**   YES/NO = SocketServer enabled/disabled for this port
- **Local :**   Local IP address, IP PORT number
- **Remote :**   Remote IP address, IP PORT number
- **Rx bytes :** Number of RX bytes received
- **TX bytes :** Number of TX bytes transmitted

The information that the **Serial Status** displays is self explanatory being the interface mode (RS232/422/485), and communications parameters.

The **Connection Configuration** displays information about the current TCP/IP connection.

Listen : The current IP PORT number which the SocketServer listens to for TCP/IP connection requests.

Connect To : The IP address: IP Port to which the SocketServer will attempt to make connection requests.

Connect When : The conditions under which the SocketServer will initiate a TCP/IP connection request

Disconnect When : The conditions under which the SocketServer will terminate an existing TCP/IP connection.

Idle Timeout : If the 'Disconnect on idle' option is selected then the idle timeout specifies the period of receive data inactivity before the disconnect is initiated.

6.2.3   Setting the SocketServer Configuration

From the home page. **Click** on the **'PORT Link'**. The edit configuration page will be displayed.

The serial configuration section allows for the configuration of :

- **Mode :**   Serial port interface mode, RS232, RS422 or RS485
- **Baud :**   Baud rate 300 baud – 115200 baud
- **Parity :**   None, Odd or Even
- **Data Bits :** 5,6,7 or 8 bits
- **Flow :**   None, RTS/CTS (RS232 only), or Xon/Xoff
- **DTR :**   OFF, ON or connected (RS232 only)

The Connection Configuration :

Enable : Check this box to enable SocketServer use of this serial port.

Listen : Check this box (default) to allow the SocketServer to listen for an incoming TCP/IP socket connection on the IP PORT NUMBER entered in the PORT box (default: 8000).

Connect To : Optionally enter an IP address and PORT number to which the SocketServer will initiate a connection.

The conditions under which the connection is to initiated is specified using the **'Connect When'** check boxes :

Connect When :

- **Always :**   The SocketServer will unconditionally attempt to connect.
- **Data :**   The SocketServer will attempt to connect when data is received at the serial port
- **DSR :**   The SocketServer will attempt to connect serial port DSR is asserted (RS232 only)
- **CD :**   The SocketServer will attempt to connect serial port CD is asserted (RS232 only)

The conditions under which the connection is terminated is specified using the **'Disconnect When'** check boxes :

Disconnect When :

- **Idle :** Terminate the connection if no data has been received for the time (in seconds) specified in the 'Idle Timer' box.
- **No DSR :** Terminate the connection when the serial port DSR is deasserted.
- **No CD :** Terminate the connection when the serial port CD is deasserted.

6.3   Serial Tunnelling

This SocketServer mode allows for raw serial data transfers to between the serial ports of two *Solo's* without host intervention *(other than to configure the mode).*

Serial Tunnelling is best explained using an example.

6.3.1   Example Configuration.

For this explanation assume that the first *Solo* is configured with the IP address of 192.168.0.10 and the second *Solo* is configured with an IP address 192.168.0.11.

Note
The serial port mode is RS232 which allows SocketServer access to the DSR and CD modem signals and control of DTR. If using serial tunnelling with the Solo serial ports set to RS422 mode then the modem signals are not available.

The first *Solo* will initiate the connection and be referred to as the **Master** and the second *Solo* that accepts the connection will be referred as the **Slave.**

Note
The terms master and slave are to help with this explanation and are not intended to indicate a fixed relationship.

Therefore the :

Master *Solo* IP address = 192.168.0.10
and
Slave *Solo* IP address = 192.168.0.11

The Master is to be configured to initiate the TCP/IP connection when the Data Set Ready signal (DSR) is asserted. The Slave is configured to assert DTR when the connection is made. This is not the only way to control the connection or disconnection.

6.3.1.1 Access the 'Master' *Solo* 'Home Page'

Start a web browser and enter the address of the master (192.168.0.10) into the 'Address/URL' box.

When the page is displayed click the PORT 1 link

6.3.1.2   Edit 'Master' *Solo* PORT 1 configuration

The configuration page will appear

Set the desired serial configuration.

For example :

- **Mode :**   RS232
- **Buad :**   9600
- **Parity :**   None
- **Data bits :** 8
- **Flow :**   None
- **DTR :**   On

Set the connection configuration :

- **Enable :**   Checked
- **Listen :**   Unchecked
- **Connect To :**   192.168.0.11 *(ie the 'slave' Solo's IP address)*
- **Connect When :** Check DSR
- **Disconnect :**   Check DSR

6.3.1.3   Save 'Master' *Solo* Configuration

Click the Save button. *(if required scroll down the page)*

6.3.1.4   Access the 'Slave' *Solo* 'Home Page'

Start a web browser and enter the address of the slave (192.168.0.11) into the 'Address/URL' box.

When the page is displayed click the PORT 1 link

6.3.1.5 Edit 'Slave' *Solo* PORT 1 Configuration

The configuration page will appear

Set the desired serial configuration.

Set the parameters to match those of the 'Master ' *Solo*, except for the DTR setting.

Set DTR : = CONNECTED

Set the connection configuration :

- **Enable :**   Checked
- **Listen :**   Checked
- **Enable on Port :** 8000
- **Connect To :**   0.0.0.0 Port 0
  (in this example the slave is not initiating the connection)
- **Connect When :** All unchecked
- **Disconnect :**   All unchecked

6.3.1.6   Save 'Slave' *Solo* Configuration

Click the Save button. *(if required scroll down the page)*

6.3.2   The Example Configuration in Operation.

With this example serial tunnelling configuration when the 'Master' *Solo* detects that it's I/P DSR signal is asserted, it will initiate a TCP/IP connection to the 'Slave' *Solo*. When the connection is established, the 'Slave' *Solo* will assert it's O/P DTR signal.

Data received by the 'Slave' *Solo* serial port will be sent to the 'Master' *Solo* and will be transmitted from it's serial port. The reverse is also true.

These operations will be performed without host intervention.

Remember that there are many connection and disconnection permutations. In the above example the so called 'Master' device controlled both connection and disconnection, but it possible for the 'Master' to connect and the 'Slave' to disconnect and so on.

7.0   Configuring IP Addresses via RedBoot

7.1   Introduction to RedBoot

The RocketPort *Solo* contains a flash resident monitor program called RedBoot. RPSLink users will not normally need to access RedBoot because all the necessary configuration should be done via the properties setup application as described in other parts of the document.

If it is not intended to use the *Solo* serial port as a LAN connected COM or TTY port, then RPSLink will not be installed and therefore it's properties/setup application will not be available.

If RPSLink is not being used then the *Solo's* serial port will be being controlled via the embedded SocketServer. Application software will access the Solo's serial port via the Sockets network programming API.

The default IP address (192.168.127.254) will probably need changing to an address assigned by your system or network manager. This can be achieved using the RedBoot configuration utility, accessed via a TELNET session.

7.2   Accessing RedBoot Using TELNET

For the purposes of this description it is assumed that the Solo has the default IP address.

It is assumed that TELNET is started from a console or terminal session.

7.2.1   Start an *Initial* TELNET Session on IP PORT 23

telnet 192.168.127.254 23

When prompted enter the password<return> or enter <return> if no password.

7.2.2   The SocketServer Sign-on Message & DM> Prompt will Appear

At the **DM>** prompt enter **reset**<cr> *(note use lower case)*

Exit this TELNET session

7.2.3   Start the 'RedBoot' TELNET session on IP PORT 9000

telnet 192.168.127.254 9000

When TELNET starts type CTRL – C

The RedBoot monitor will be entered and the **RedBoot>** prompt will appear.

To set the IP address and other parameters the 'fconfig' utility is used.

7.3   Change IP Settings via the RedBoot's 'fconfig' Command

note <cr> means press the return

At the RedBoot prompt run the 'fconfig' command

Notes on fconfig use

- *'fconfig' uses a question/answer session. User response is in bold italic, <cr> means press the return key.*

- *All entries must be terminated with a <cr>.*

- *Simply typing <cr> to a displayed setting will retain that setting.*

- *Some settings should not be changed and require only a <cr> where indicated.*

- *Settings that need to be changed must be erased using backspace before the new setting is entered.*

- *Some TELNET programs may not allow destructive backspace. In these cases use the backspace key to place the cursor at the start and overwrite the original setting.*

- *If fconfig refuses to accept a new setting then it will respond with **invalid entry*

RedBoot> **fconfig <cr>**

Run script at boot: true
type<cr>

Boot script:
.. fi lo SocketServer
.. go
Enter script, terminate with empty line

>> **fi lo SocketServer <cr>**
>> **go <cr>**
>> **<cr>**

Boot script timeout (1000ms resolution): 20 **<cr>**

Note
The boot script timeout sets the time that the *Solo* will wait for a possible RPSLink
download before running SocketServer. You may change this value.

Use BOOTP for network configuration: false ***\<cr\>***
Default Gateway IP address: 192.168.0.1 ***\<Replace with desired Gateway IP address\>\<cr\>***

Local IP Address: 192.168.127 ***\<Replace with desired local (ie SOLO) IP address\>\<cr\>***

Default server IP address: 192.168.0.210 ***\<Replace with desired default server IP address\>\<cr\>***

Subnet Mask: 255.255.0.0 ***\<Replace with desired subnet mask\>\<cr\>***

DNS server IP address: ***\<Replace with desired DNS IP address\>\<cr\>***

Set eth0 network hardware address [MAC]: false ***\<cr\>***
GDB connection port: 9000 ***\<cr\>***

Force console for special debug messages: false ***\<cr\>***
Network debug at boot time: false ***\<cr\>***

Update RedBoot non-volatile configuration – are you sure (y/n)?

y\<cr\>   (if complete and the changes are correct)
OR

n\<cr\>   (to abort the changes).

If **y\<cr\>** is entered then the messages indicating flash update are displayed. As the changes have been to the IP settings then no further prompt is issued and the TELNET session must be terminated.

8.0   Using the *Solo* under LINUX

8.1   Introduction

There are two ways to use the *Solo* under Linux.

- Install the Linux version of RPSLink and access the serial port as a TTY device.

- Using the *Solo's* embedded SocketServer and TCP/IP Sockets programming.

Note
Under Linux only 1 Port per Solo is supported. The OEM Solo (2 Port) will only function as a single port device under Linux.

The RPSLink driver allows the *Solo* serial port to be accessed as a TTY device.
When RPSLink starts it downloads a control program to the *Solo* to handle low level functionality.

RPSLink is supplied as a GZIP compressed TAR file on either CD ROM, DOS formatted floppy disk media or electronically.

Using the SocketServer does not require a host driver and so RPSLink would not be installed if it is wished to access the *Solo* via TCP/IP sockets.

On start-up the *Solo* will wait for 20 seconds before starting the SocketServer. This is to allow time for a possible host driver download of a control program. This wait period is configurable via the Solo embedded RedBoot 'fconfig' utility.

See the section on the *Solo* SocketServer for more details.

Using Telnet under Linux, allows access to the *Solo* embedded RedBoot monitor's fconfig configuration utility. See the RedBoot section for more details.

8.2   Installing RPSLink for Linux

The RPSLink driver executable module and source code are supplied. The proprietary downloaded control program binary file is supplied but not the source for this component.

The RPSLink driver was developed under RedHat Linux 8.0 with kernel release 2.4.18-14
If not installing under the same Linux kernel revision then it will be necessary to rebuild the RPSLink driver under the target kernel. This may be necessary, even if using 2.4.18-14, should the kernel configuration be different.

The correct Linux source code must be installed prior to the rebuild. See the Linux documentation for details of the kernel source code and the installation method.

8.2.1 Copy Compressed RPSLink Driver to the Linux System

Create an installation directory

Eg. mkdir -p /usr/comtrol/solo

Mount the distribution media

mount –tmsdos /dev/fd0 /mnt/floppy

or (for a CD ROM)

mount /dev/cdrom /mnt/cdrom

Copy the compressed driver file

cp /mnt/floppy/linux/rpslink.tgz /usr/comtrol/solo/rpslink.tgz

or (for a CD ROM)

cp /mnt/cdrom/linux/rpslink.tgz /usr/comtrol/solo/rpslink.tgz

8.2.2 Uncompress rpslink.tgz

cd /usr/comtrol/solo

gzip –d rpslink.tgz

This produces the tar file rpslink.tar

8.2.3 Extract the Files from rpslink.tar

tar –xvf rpslink.tar

This will create a subdirectory 'rpslinkdir' which will contain the driver files.
The extracted files include the RPSLink driver module & source code, downloadable control
program binary, utilities and a make file. A README is included which provides
detailed information and it is recommended that this file be read. The utilities require
certain Linux components to be at specific release levels and thus may not operate on all
Linux installations.

8.2.4 Install the Driver

Change working directory to access the driver files.

cd rpslinkdir

If installing on a Red Hat 8.0 with kernel 2.4.18-14 *(UK RedHat 8.0 boxed distribution)*

Then enter the following command

make install

The installation will proceed automatically. If there are no errors then proceed to step 5. If problems are encountered then the host PC Linux kernel is not release 2.4.18-14 or the kernel configuration differs substantially from that of the system under which the driver module was built by Comtrol. In these situations you will need to build a new driver module from the supplied source code.

Note : Kernel Source Code.
If running under a different distribution & kernel. For example RedHat 7.3 kernel 2.4.18-3 *(UK RedHat 7.3 boxed distribution)* then you will need to rebuild the driver. BEFORE THIS IS DONE THE KERNEL SOURCE CODE MUST BE INSTALLED. The Linux documentation should be consulted for information on this task.

Assuming that the correct kernel source code is installed then issue the commands

make clean
make
make install

8.2.5   Edit /etc/rpslink.conf to Set MAC or IP Address

RPSLink can access the *Solo* in MAC address mode or IP mode. If using MAC address mode then the *Solo* must be connected to the same LAN segment as the host PC. If using IP mode then the *Solo* can be connected to different LAN segments.

MAC address mode provides for a small increase in performance.

The file /etc/rpslink.conf is edited to set the MAC or IP address

Below is the default /etc/rpslink.conf

```
# /etc/rpslink.conf --- configuration file for RPS-Link driver


bootfile-solo      /etc/RpsLink.bin


# Ethernet address   interface   number of ports (2/4/8)    link timeout (sec)


00:01:EE:00:00:00    eth0       1                           600


# Port number (1)   RsMode (232, 422, 485, or Off)
1                  232




# IP address       number of ports (2/4/8)   link timeout (sec)
# 192.168.19.74   8                          10
# Port number (1-8)   RsMode (232, 422, 485, or Off)
# 1                  232
```

Note: The '#' character seen in /etc/rpslink.conf indicates a comment.

The bootfile-solo entry defines the path and name of the downloaded control program file. This will be /etc/RpsLink.bin by default. Under normal circumstances there is no need to edit this entry and you should not remove it.

The above configures RPSLink for one *Solo* used in MAC mode with MAC (hardware) address = 00 01 EE 00 00 00 and connected to host NIC channel 'eth0'.

The serial interface is set for RS232 and the link timeout to 600 seconds.

The link timeout defines how long the *Solo* will wait following a loss of the network connection before releasing the serial port, thus allowing time for the network to be re-established.

If using MAC mode then edit the file and replace the MAC address for the *Solo* being installed. The *Solo's* MAC address is printed on a label attached to the unit's underside. The MAC address is pre-programmed into the *Solo* at manufacture and is unique.

Additional *Solo's* can be added by editing /etc/rpslink.conf and adding further entries defining the MAC address,NIC channel & timeout as well as the port definition.

For example the /etc/rsplink.conf file below configure two *Solo's* in MAC mode.

```
# /etc/rpslink.conf --- configuration file for RPS-Link driver


bootfile-solo      /etc/RpsLink.bin


# Ethernet address   interface   number of ports (2/4/8)    link timeout (sec)


00:01:EE:02:00:01    eth0       1                          600


# Port number (1)   RsMode (232, 422, 485, or Off)
1                232



# Ethernet address   interface   number of ports (2/4/8)    link timeout (sec)


00:01:EE:02:00:02    eth0       1                          600


# Port number (1)   RsMode (232, 422, 485, or Off)
1                232



# IP address        number of ports (2/4/8)   link timeout (sec)
# 192.168.19.74  8                          10
# Port number (1-8)   RsMode (232, 422, 485, or Off)
# 1                232
```

If using the Solo in TCP/IP mode then disable the MAC mode by adding the # character to the start of the relevant entry (ie comment out the entry) remove the comment characters from the TCP/IP entries and modify the IP address address.

All Solo's are shipped with a default IP address of 192.168.127.254 .

The actual IP address to be used by the *Solo* will be allocated by the your system administrator or network manager. The rpslink.conf file will need updating with this address. Also the address must be programmed into the *Solo (if not already done so)* . This can be done via the *Solo's* embedded RedBoot monitor's fconfig command.

RedBoot is accessed via Telnet. Consult the RedBoot section for details. As an alternative you may be able to use the GUI utility program 'rpslinktool' to configure the IP address See the section describing rpslinktool.

8.2.6   Shutdown and Restart

After installing the RPSLink driver and editing /etc/rpslink.conf remember to shutdown and restart the Linux system.

Alternatively dynamically start RPSLink by using the command

/etc/rc.d/init.d/rpslink start

The driver will be loaded during boot and display a sign-on message

The first TTY device node is **/dev/ttySL0**

Subsequent *Solo* port nodes will be;

/dev/ttySL1
/dev/ttySL2

and so on…………………………………..

If problems are encountered with the *Solo* RPSLink driver loading, then consult /var/log/messages for detailed information

8.3   Using rpslinktool

This section describes the use of GUI based 'rpslinktool' to manage the RPSLink *Solo* configuration and indirectly edit /etc/rpslink.conf

It also describes it's use to write the TCP/IP parameters to the *Solo* non-volatile memory. The utility has additional features which are not explained here although they are intuitive to use.

8.3.1   Using rpslinktool to Configure the RPSLink Driver.

The rpslinktool utility is a GUI program that provides an alternative to direct editing of /etc/rpslink.conf.

In order to use it Python V1.5.2 or higher must be installed as well as Tkinter.

As rpslinktool is a GUI it is intuitive to use.

The main menu contains a number of options.

In order to update /etc/rpslink.conf, **Click the 'Config Driver' button.**

The RPSLink driver configuration dialog will appear and a list of installed *Solo's* will be displayed.

To add another *Solo* **Click the New button.**

When the 'Edit Hub Configuration appears' add

The MAC address or IP address (depending on the chosen mode)
- The link timeout
- The number or serial ports, 1 for a boxed *Solo*
- Edit the Port 0 entry and select the serial interface type (RS232, RS422, RS485).

Click the OK button.
(Note : You may have to drag the box to make the OK and CANCEL buttons visible)

The RPSLink driver configuration dialog will reappear.

Click the Save and then Quit buttons.

The driver will need to be stopped and restarted for the changes to take affect.

Note :
The rpslinktool will create a new /etc/rpslink.conf file with only pertinent entries and minimum comments.

Below is a typical /etc/rpslink.conf file produced by rpslinktool showing a configuration for three Solo's using MAC (hardware address) mode. The serial port's are set to RS232 mode.

```
# RocketPort Serial Hub Solo configuration


bootfile-solo /etc/RpsLink.bin
00:01:EE:02:00:00 eth0 1  600  0
  1 232 0


00:01:EE:02:00:01 eth0 1  600  0
  1 232 0


00:01:EE:02:00:05 eth0 1  600  0 #
  1 232 0
```

After modifying /etc/rpslink.conf, the RPSLink driver must be stopped and restarted. This may be done via a shutdown and restart of the host. Alternatively the driver can be stopped and restarted from the command line :

To stop the driver
/etc/rc.d/init.d/rpslink stop

To restart the driver
/etc/rc.d/init.d/rpslink start

8.3.2   Using rpslinktool to Manage the *Solo's* TCP/IP Parameters.

In addition to using 'rpslinktool' to edit /etc/rpslink.conf which is for the RPSLink driver's use, it is possible for 'rpslinktool' to write an IP address, subnet mask and gateway address to the *Solo* unit. That is to write the required IP parameters to the *Solo's* internal non-volatile memory.

This is an alternative to accessing the RedBoot fconfig utility for the purpose of configuring the *Solo's* IP parameters.

From the 'rpslinktool' main menu **Click the Hub IP Admin button.** The Hub IP admin dialog window appears.

In the Ethernet pane **Click the Scan button**

The MAC (hardware) address of the Solo's connected on the same Ethernet segment will appear. Highlight the *Solo* of interest and from the IP Config pane and **Click the Get button**

The current IP address, subnet mask and gateway address will be displayed.

Edit the IP address, subnet mask and gateway address as required and **Click the Set button**

Ensure that the updated SOLO remains highlighted and **Click the Reset button.**

When 'reset' has complete **Click the Load button.**

The *Solo* will be reset. The control program will download. **Click the Quit button**

The RPSLink main menu will appear.

Click the Driver Status button. Details of all the attached hubs will be displayed.

Note :
Details of other RPSLink utilities can be found in the README file.

If problems are encountered in restarting the updated *Solo*, then it may be necessary to stop and restart the driver.

From the command line.

To stop the driver
/etc/rc.d/init.d/rpslink stop

To restart the driver
/etc/rc.d/init.d/rpslink start

Alternatively the host may be shutdown and restarted.

A hard reset of the *Solo* unit can be performed by power down/power up cycle.

Appendix A Technical Support

If you need technical support, contact Comtrol Europe using one of the following methods.

Contact Method	Comtrol Europe
Email	support@comtrol.co.uk
Web site	http://www.comtrol.co.uk
Fax	+44 (0) 1 869-323-211
Phone	+44 (0) 1 869-323-220

Appendix B Serial Hub *Solo* Specifications

Hardware Specifications

The following table lists hardware specifications for the Serial Hub *Solo*.

Topic	Specification
Supply Input	+6 VDC to +27 VDC rated at 250 mA
Current consumption @ 12 VDC :	140 mA
External power supply : Line frequency Line voltage	 50 - 60 Hz 100 - 240VAC
Processor type	Hitachi SH2 DSP
Memory	16MB SDRAM/2MB flash
Baud rate/port (maximum)	115 Kbps
Ethernet host interface	10/100 Base-T
Serial interface	RS-232, RS-422, and RS-485
Serial connector types : Serial Hub Solo Serial Hub Solo Embedded	 DB9 DB9
Network default values : IP address Subnet mask Gateway	 192.168.127.254 255.255.255.0 000.000.000.0
Network protocols	TCP/IP, MAC and Telnet,
NS-Link control : Data bits Parity Stop bits	 7 or 8 Odd, Even, None 1 or 2
SNMP support	Monitoring only.
Dimensions : Serial Hub Solo Serial Hub Solo Embedded	H x W x D approximate 30 mm x 100 mm x 70 mm 20 mm x 90 mm x 70 mm
Weight (Excluding cables and external Power Supply) : Serial Hub Solo Serial Hub Solo Embedded	 220 g 42 g

Environmental Specifications

This table lists the environmental conditions.

Environmental Conditions	Value
Air temperature :	
System on (operational)	0 to 45°C
System off (storage)	-20 to 85°C
Altitude	0 to 10,000 feet
Heat output :	
Serial Hub Solo	1.7 W
Serial Hub Solo Embedded	1.7 W
Humidity (non-condensing) :	
System on (operational)	8% to 80%
System off (storage)	20% to 80%
Mean time between failures (MTBF) :	
(Excluding external Power Supply)	
Serial Hub Solo	25.0 years estimated
Serial Hub Solo Embedded	25.0 years estimated

Notices

Radio Frequency Interference (RFI)
This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures :

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and the receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Important Safety Information
To avoid contact with electrical current:

Warning

- Never install electrical wiring during an electrical storm.

- Never install the power plug in wet locations.

- Use a screwdriver and other tools with insulated handles.

Appendix C RocketPort Serial Hub *Embedded*

Embedded Specific Information

The RocketPort Serial Hub *Embedded*, 'OEM *Solo*' is a Host independent card for use in a custom housing or other products or peripherals
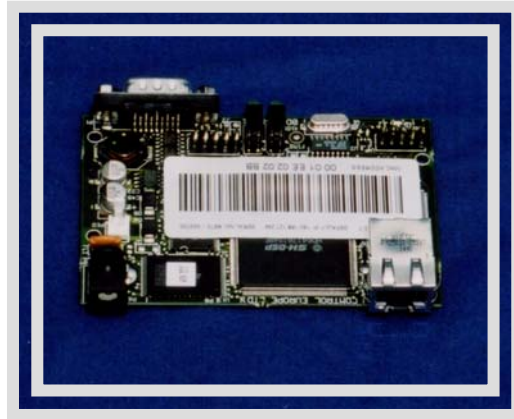
| Serial Hub Embedded Safety Information |
| --- |
| The Serial Hub Embedded consists entirely of SELV (Low Voltage) circuitry. Ensure a Creepage and Clearance distance of a minimum of 3 mm is maintained between the Serial Hub Embedded and any Mains (240V AC) or TNV (Telephone circuits). If in doubt ask a competent engineer to install the Serial Hub Embedded |

Take care when you handle the RocketPort Serial Hub Embedded, like any electronic device, it is sensitive to static electricity. Use normal static precautions such as wearing an earth ground strap.

DC-IN Connection

The DC-IN 2.1 mm Jack socket and parallel connected 2 pin header are for an input voltage in the range +6 VDC to +27 VDC and O VDC.

Note : *If the 2.1mm Jack is fitted then the centre pin is positive (+).*
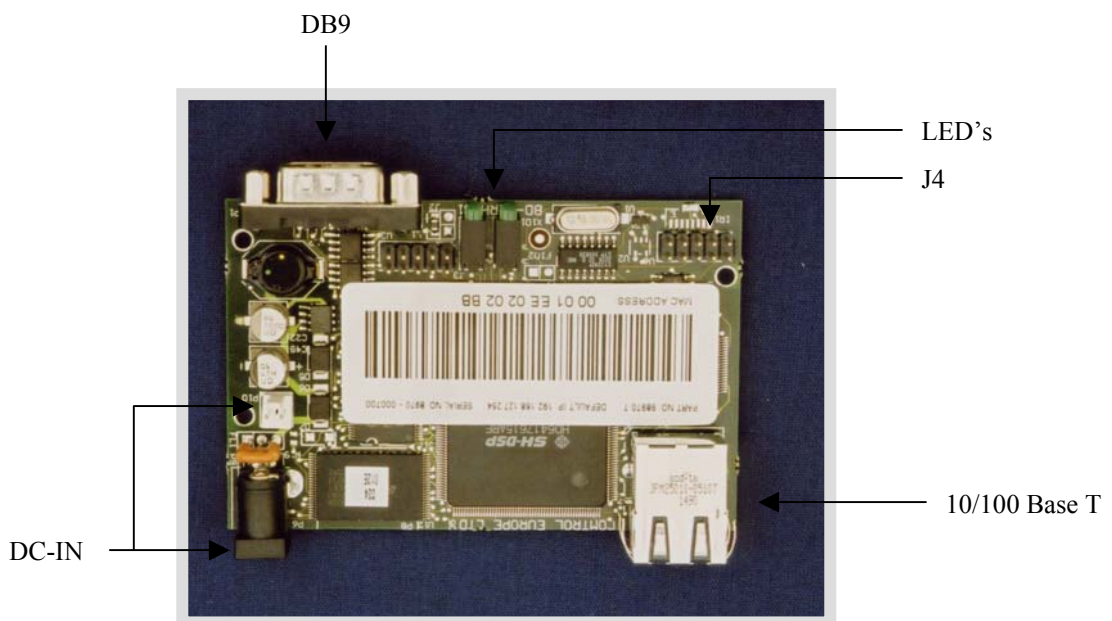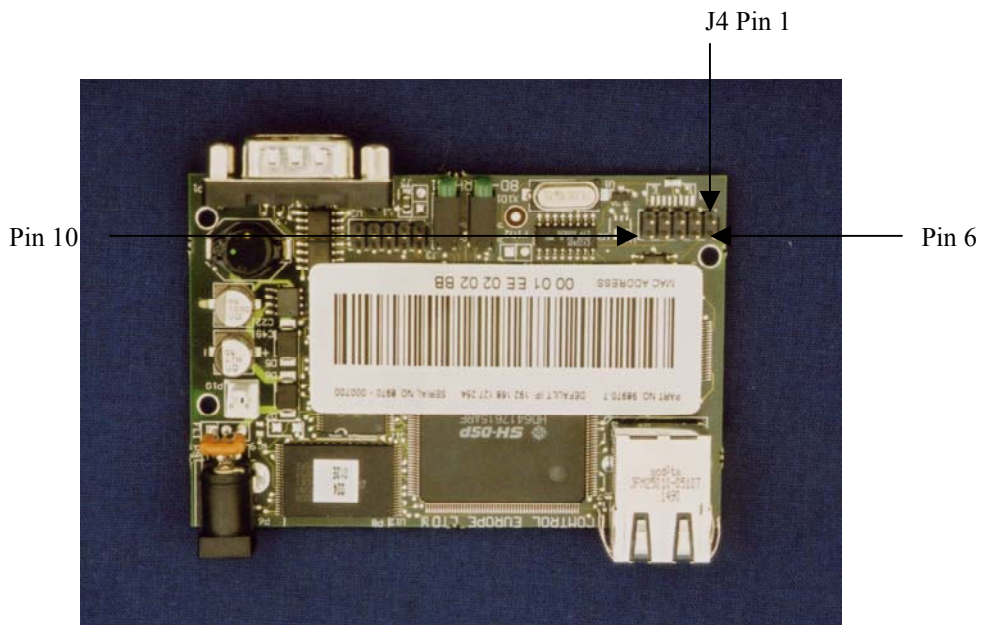

All other connectors are factory use only
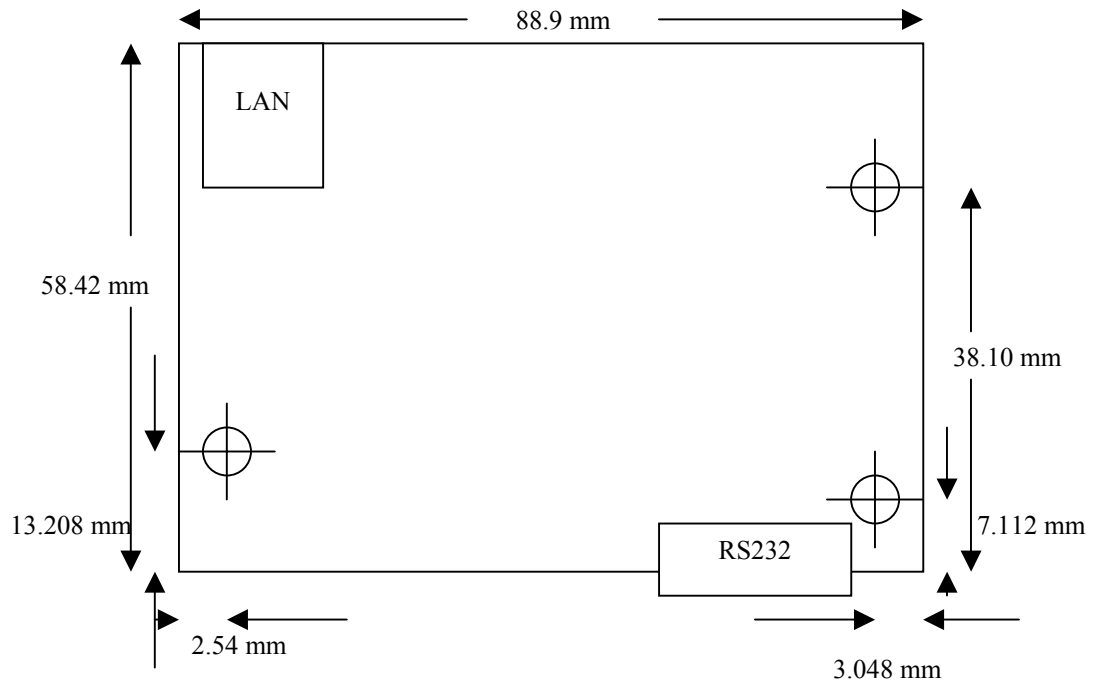
Connector RS232

The Serial Hub *Embedded* has a second Serial Port. This IDC header J4 is used during manufacture as a diagnostic control port for factory tests. It is not available for general use.

Serial Hub Embedded Connector J4

J4 Pin	RS232 Signal	DB9 Pin
1	DCD	1
2	DSR	6
3	RXD	2
4	RTS	7
5	TXD	3
6	CTS	8
7	DTR	4
8	RI	9
9	GND	5

Mounting Fixings – Component Side View

Note : Dimensions in mili metres.
Each hole is 3.048 mm clearance for M3 bolts.
Use plastic insulating washers on both sides of the PCB.