



Release Note

RIO

for

UnixWare 2.1

Overview

The RIO for UnixWare device driver at Release 1.1 will support up to four Specialix RIO host cards under UnixWare 2.1 and above.

Installation

If installing RIO on UnixWare for the first time:

Operation of RIO is as described in the RIO Guide to Installation and Operation (3rd Edition) and accompanying release notes, except as follows:

- Installation of the host card and software is different (see instructions below).
- RIOADM has been renamed "RIO".
- A number of new configuration features have been added since the manual was last updated; these are described below.

- Before installing the RIO software, the "oam" package must be installed from your UnixWare operating system installation media.

If upgrading from an earlier release of RIO for UnixWare:

- Installation of the host card and software is different (see instructions below).
- RIOADM has been renamed "RIO".
- A number of new configuration features have been added; these are described below.

Note *Chapter references given in this release note refer to the RIO Guide to Installation and Operation (3rd Edition) supplied with the product.*

Checklists for Installing RIO Host Cards

Prerequisite

Before installing the RIO software, load the "oam" package from your UnixWare operating system files.

Caution RIO will not load unless the "oam" package is installed

If you have an ISA card with an ISA machine:

1. Select a memory address using the two rotary switches on the card (see Figure 1). Insert your RIO host card(s) inside your machine. Turn on your machine.
2. Run the Device Configuration Utility (DCU) in UnixWare. Select 'Software Device Drivers' then 'Communications Cards'. Enable the RIO card by pressing the spacebar on 'RIO'. (The asterisk next to 'RIO' (*) indicates that the cards are enabled.)
Then add a new instance by pressing F5. Select a memory address and interrupt level. Exit from the DCU saving your changes.

Note The memory address you select must be the same as that selected on the host card rotary switches.

More general information on installing an ISA host card can be found in Chapter 4 (Installing the Host Card).

3. Reboot, then install the RIO software.

Installation of ISA card in your ISA machine is now complete.

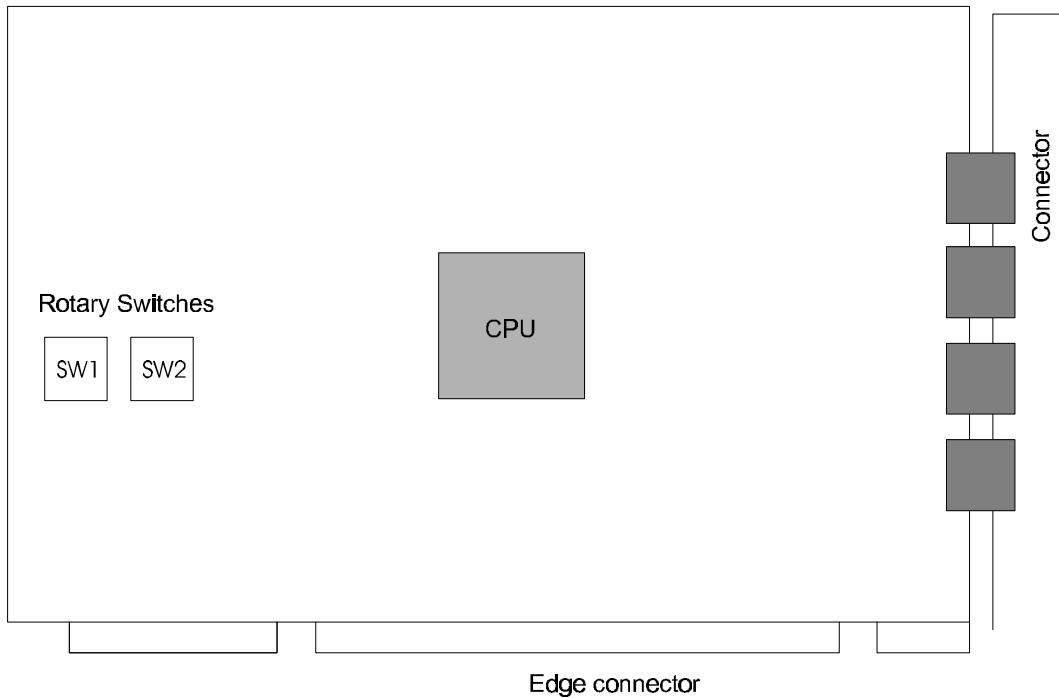


Figure 1 **ISA Card: Location of the rotary switches**

If you have an ISA card with an EISA machine:

1. Select a memory address on the two rotary switches on the card (see Figure 1). Insert the card into your machine, turn on the machine and **either:**
 - a. use the EISA Configuration Utility (ECU), select the same memory address that you set on the two rotary switches. Select an interrupt level which does not clash with other devices.
- or:

- b. use the Device Configuration Utility (DCU) in Unixware. After invoking the DCU, select `Software Device Drivers' then `Communications Cards'. Enable the RIO card by pressing the spacebar on `RIO', then add an new instance by pressing F5. Select a memory address and interrupt level. Exit from the DCU, saving your changes.

Note Continue to use the same configuration utility when making alterations to your settings

2. Reboot the machine.
3. Install the RIO software and then reboot the machine.

Installation of ISA card in an EISA machine is now complete.

If you have an EISA card with an EISA machine:

1. Insert the card into your machine. Turn on the machine and run the EISA Configuration Utility (ECU). Select a memory address and interrupt. Exit from the ECU, saving your changes.
2. Reboot your machine then install the RIO software.

Installation of the EISA card in your EISA machine is now complete.

If you have a PCI card:

1. Insert the card into your machine. Turn on the machine. (The BIOS will determine the memory address and interrupt level automatically).
2. Install the RIO software. Reboot the machine.

Installation of your PCI card is now complete.

Reconfiguring a RIO Host Card

To reconfigure a RIO Host Card, follow the instructions for configuring the type of card that you have, above.

Removing Host Cards

When removing RIO host cards from a machine, remember to update the DCU. This will free up valuable system resources.

Note If you remove all the RIO host cards from a machine, unless you intend to re-install them, you should also remove the RIO software.

Replacing Cards or RTAs: Rioadopt

If you need to exchange a faulty host card or RTA, Rioadopt will assign its configuration to the replacement unit. In fact, the configuration of any unit disconnected from the system will be saved for adoption by another unit.

RTAs will adopt the user-assigned ID name, tty numbers, and specific port settings of the RTA they replace. You can replace an RTA16 with another RTA16 or two RTA8s; you can replace two RTA8s with an RTA16.

Caution If you delete an RTA using the **Delete an RTA** option on the Config.rio Main menu, its configuration will be lost from the system.

If you replace a host card, Rioadopt will update the RIO configuration file (/etc/rio/config) with the ID number of the new host card. No user interaction is required to replace multiple host cards.

Rioadopt has three run modes, described in the table below:

Use	By running	To
Silent mode	rioadopt	Perform the adoption automatically, without user interaction. This mode of operation relies on the swap being straightforward, i.e. if the adoption is not straightforward, Rioadopt will revert to Interactive mode.
Interactive mode	rioadopt -i	Perform the adoption manually. You will be asked to select/confirm the units to be swapped. There is one situation in which you will need to run Rioadopt in this mode: If you remove multiple RTAs and install their replacements using exactly the same links, Rioadopt will see this as a straightforward adoption - each RTA will adopt the configuration of the unit it directly

Verbose mode	<code>rioadopt -v</code>	replaces. However, if you wanted to switch the configurations of two or more of these RTAs, you would need to run <code>rioadopt -i</code> from the command line. Display informational messages.
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Replacing a Card

1. Shut your operating system down and switch your machine off.
2. Disconnect all RIO link cables from the host card.
3. Remove the host card from the machine.
4. If you are installing in an EISA machine and a) have used a different slot on the motherboard, or b) have replaced an EISA host card within an ISA machine, configure the new card using the EISA Configuration Utility (ECU) supplied with the PC. To avoid resource conflicts, select the memory address and interrupt used by the card that has been removed.
5. If you are replacing an EISA host card with an ISA host card, reboot your machine and re-install the RIO device driver software. You will need to specify all the host cards installed in the machine. To avoid resource conflicts, select the addresses and interrupts that the cards are already using. When you have re-installed the driver, shut your machine down.
6. Install the replacement host card and reboot your machine.
7. Connect the RTA subsystem to the host card using the disconnected links.
8. Run `rioadopt` from the command line. The file `/etc/rio/config` will be updated with the new host id number.

Replacing an RTA

1. Disconnect the RTA to be removed.
2. Install the replacement RTA.
3. Run `rioadopt` from the command line. If you have installed the new RTA in the same location as its predecessor, `Rioadopt` will perform the adoption automatically - without requiring user interaction.

If `Rioadopt` detects too many variables, e.g. you have changed the number of ports now available, it will switch to Interactive mode and prompt you to select/confirm the units to be swapped.

Note *Currently, Rioadopt cannot perform adoption when the host card is fully configured, i.e. all 128 ports are assigned to RTAs.*

To replace an RTA in such a situation, proceed as follows:

1. Make a note of all settings and configuration data of the RTA to be replaced
2. Using Config.rio , delete the isolated RTA
3. Connect the new RTA
4. Using the information you previously noted down, configure the RTA

New Configuration Features

For users installing RIO on UnixWare for the first time, or upgrading from an earlier release of RIO, the following sections describe the new features added since the RIO Guide to Installation and Operation (3rd Edition) was updated. An overview of these features is given below.

1. Support for the RIO 16-Port RTA.
2. The “RIO” Configuration Utility includes the following new port management utilities: Show Port Settings, Show Modem Pin Settings, Port Statistics, and Port Diagnostics.
3. If you select a parallel port for configuration, using the RIO `View/edit TTY' option, only the valid configuration options will be displayed (namely lock settings, store settings, and drain settings).
4. You can now designate master/slave host cards in a Dual Host Failsafe configuration.
5. A command line option, config.rio -l (0-2), enables you to direct RIO reconfiguration messages to the console only, system logger only, or both.
6. A command line option, config.rio -o, blocks port opens on RTAs until they have been booted.

Configuring a 16-Port RTA

RTAs are configured using the “RIO” configuration program. Full details of this program are given in Chapter 7 (Configuring Ports Under UNIX SVR4 & UnixWare) of the RIO Guide to Installation and Operation.

1. Select RIO from the Sysadm Ports menu
2. A full-screen map of your RIO system will be displayed. Sixteen-port RTAs are displayed as double-lined boxes. The unit will be flashing, indicating that it is unconfigured. If your terminal doesn't support flashing characters, an asterisk will be displayed inside the box.
3. Move the cursor to the RTA using the arrow keys.
4. Press Return to display the RTA Configuration menu.
5. Select Configure RTA.
6. Enter an ID name for the RTA (31 characters maximum). The name you assign will be used to identify the unit in error/reconfiguration messages, so we recommend that you use a name related to the users or devices connected to the unit. Press return to continue.
7. The devices for the RTA's ports have not yet been created. You will now be asked to select TTY numbers for these devices. The following prompt is displayed:

```
TTY Configuration
```

```
>Use default TTY blocks (r001 - r008 and r009 - r016)<  
Select TTY blocks
```

Ports 1-8 and 9-16 are treated as separate blocks. You have the choice of using the next two available blocks of 8 TTY numbers, or you can select any two unused blocks.

If you want to use the default blocks, highlight the first option and press Return.

If you want to select alternative blocks, select the second option. A list of the available blocks will be displayed. The list may run to several pages, depending on the number of available blocks. Highlight the block required for ports 1-8 and press Return. The list will be displayed a second time. Select the block required for ports 9-16. The devices will be created for the ports, and you will be returned to the RTA Configuration menu.

Note *The Configure RTA option has been replaced by a new option: View/edit TTY.*

Port Management Features

Four new port management utilities have been added to the “RIO” View/edit TTY menu:

```
r001 / R001
TTY type   unknown<
Chars/sec 100
Force ixon No
Force -ixany Yes
Lock settings No
Store settings No
Drain settings No
Resume output(One shot)
Show port settings
Show modem pin settings
Port statistics
Port diagnostics
```

Show Port Settings

This feature will display the stty and special RIO attributes currently set for the port.

Show Modem Pin Settings

This utility displays the current status of the modem pins on the port, for example:

```
Status of modem pins for /dev/term/r001

      CD   RTS  RI   DTR  CTS  DSR
      Off  Off  Off  Off  On   On
```

These settings are updated every second.

Port Statistics

This feature enables you to gather and display statistics for individual ports. The following data is gathered:

- No. of characters transmitted
- No. of characters received
- No. of port opens
- No. of (final) port closes
- No. of ioctls called

Statistics are presented for the period since the last boot, since the last time the statistics count was reset, or since the feature was enabled. By default, it is disabled. To enable the feature, select 'Port Statistics' from the menu. The following submenu will be displayed:

```
Port statistics
Gather port statistics No<
Reset port statistics
Show port statistics
```

Select 'Gather Port Statistics' and then select 'Gather port statistics'.

To display the statistics, select 'Show port statistics':

```
Port statistics for /dev/term/r001

Characters Transmitted : nnnn
  Characters Received  : nnnn
    Port Opens        : n
      Port Closes     : n
        Ioctls        : n
```

Select 'Reset port statistics' to reset the statistic counts.

Port diagnostics

The on-line port diagnostics utility enables you to investigate port failures and misbehaviour while the system is running. Two tests can be run:

- Send data to port—data is written to the port to check output.
- External loopback—this will send and receive data on the port and compare the received data with what was sent. A loopback connector is required for this test. If you enable software flow control, the loopback connector only requires TXD (Transmit Data) and RXD (Receive Data) to be crossed. If you are using hardware flow control, RTS (Request To Send) and CTS (Clear To Send) must also be crossed.

To run the diagnostics:

Note *You should disable any port service active on the port before running the diagnostics.*

1. Select “RIO” from the Sysadm Ports menu.
2. Move the cursor to an RTA.
3. Press Return to display the RTA Management menu.
4. Select `View/edit TTY'.
5. Select a port.
6. Select `Port diagnostics'.

Note If a port service is active on the port, the diagnostics will not continue.

7. Select the test that you want to run. The following form will be displayed:

Speed [9600]	50 baud [mapped]
110 baud [mapped]	Data bits [8]
Stop bits [1]	PARENB [disabled]
PARODD [disabled]	IXON [disabled]
IXOFF [disabled]	RTSXOFF [disabled]
CTSXON [disabled]	DTRXOFF [disabled]

Note that any changes made here to stty settings will only remain effective for the duration of this test - they will be lost when the port closes.

Changes to baud rate mappings, however, will be stored across port closes.

This enables you to change the configuration of the port for the duration of the test. Note that 50 and 110 baud are, by default, mapped to 57600 and 115,200 baud respectively. You can unmap these speeds for testing purposes. The PARENB, PARODD, IXON, IXOFF, RTSXOFF, CTSXON and DTRXOFF fields correspond to the standard stty flags.

To move from one field to another, use the arrow keys. Use the spacebar to cycle the settings in a field.

8. If you have selected the loopback test, fit the loopback connector to the port to be tested. If you enabled IXON and IXOFF (software flow control), the loopback connector only needs the TXD (Transmit Data) and RXD (Receive Data) signals crossed. If you are using hardware flow control, you must cross RTS (Request To Send) and CTS (Clear To Send) as well. Pin allocations for RTA ports are given in Release Note 'RIO - Revised Port Specifications'; you should have received a copy of this release note with your product.

Note: the opto-isolated ports are described in Appendix A (Cable Specifications) of the RIO Guide to Installation and Operation.

9. When you are ready to run the test, press Return. The test will continue until a fault is detected or until halted by the user pressing Return. If a fault is detected, an error message is displayed. An explanation of the error messages is given below. In the case of intermittent faults, you may need to leave the test running for a long period of time (e.g. overnight).

Error Messages

FAILED: Timeout on read

This could indicate that the loopback connector, Link cable or power supply has been disconnected during the test, or even that the loopback connector has not been fitted to the port. Otherwise, contact Technical Support.

FAILED: Write fail

RIO is unable to write to the port. Contact Technical Support.

FAILED: Read fail

RIO is unable to read from the port. Contact Technical Support.

FAILED: Data read is different from data written

The data read from the port is different to that written to the port. Contact Technical Support.

FAILED: Topology changed or signal received

During the test, the network topology of RTAs changed or Config.rio received a signal.

Config.rio Command Line Options

These new command options enable you to modify the behaviour of RIO and are designed for use by system administrators only. Both options can also be used from the command line if necessary.

```
config.rio -b -l (0-2)
```

The -l flag defines where RIO reconfiguration/error messages are directed.

- 0 instructs RIO to output messages to the console and the system logger. You will have to configure the system logger to receive messages from RIO.
- 1 outputs messages to the console only.
- 2 outputs messages to the system logger only.

By default, messages are output to the console only.

```
config.rio -b -o
```

By default, any attempt to open a port on a RTA that is in the process of booting, or configured but not booted, will fail. This command enables port opens to be blocked until the RTA has been booted.

Troubleshooting

Question: After removing all my RIO PCI cards from the system I am unable to relink the kernel. What's wrong?

Answer: The RIO Device Driver consists of 3 modules; rio, rio_, rix_. On PCI machines the Resource Manager (resmgr) will disable the rio module when it detects that there are no RIO host cards in the system. However, since the rio_ and rix_ modules depend on the rio module, the kernel will no longer link without errors. To correct this problem edit the files /etc/conf/sdevice.d/rio_ and /etc/conf/sdevice.d/rix_ and change the second field from 'Y' to 'N'. Kernel relinks will now work. Remember to change these fields back to 'Y' when re-installing the cards.

Question: ttymon fails to present a login prompt on ports configured to monitor carrier detect (DCD).

Answer: ttymon has a bug that fails to wait for a TTY device to close before it respawns the next login prompt. Since it does this during the device close routine it will fail. ttymon attempts to respawn the login prompt a number of times and then disables the port. There is currently no way of stopping this behavior, but a port can be re-enabled by using the following commands:

```
/usr/sbin/pmadm -d -p riomon -s <svctag>
```

```
/usr/sbin/pmadm -e -p riomon -s <svctag>
```

Technical Support

If you bought your product from a registered Specialix Supplier, you must contact their Technical Support department; they are qualified to deal with your problem.

If you are a registered Specialix Supplier, and bought your product from Specialix, contact Specialix Technical Support at the offices listed below.

In addition to describing your problem, please have ready or send, as a minimum, your name, company, country, phone and fax numbers and the name of the Specialix product.

For information on repairs see the last section in this release note.

Europe

United Kingdom

Specialix Europe Ltd.
3 Wintersells Road
Byfleet Surrey KT14 7LF
UK

Telephone: +44 (0) 1932 792555 (Support)
+44 (0) 1932 792592(Main SwitchBoard)

Facsimile: +44 (0) 1932 792600

e-mail: support@specialix.co.uk

ftp site: <ftp:specialix.co.uk>. Use your e-mail address for your password.

web site: www.specialix.co.uk

if you have an internet connection please send details of your problem to Technical Support using the form shown below. You will find the form on the Specialix web site, in the 'Tech Support' area.



France

Specialix Ltd.
13 Avenue Morane - Saulnier
78140 Velizy
FRANCE

Telephone: +33 (1) 34 63 0670

Facsimile: +33 (1) 34 65 38 60

e-mail, ftp and www contact details, as for UK.

USA

Specialix Inc.
745 Camden Avenue #129
Campbell
CA95008-4146
USA

Telephone: +1 (408) 378-7919

(Freephone): +1 (800) 423-5364 (USA only)

Facsimile: +1 (408) 378-0786

US support is open from 7am Pacific (10am Eastern) time until 5pm Pacific(8pm Eastern) time.

E-mail: support@specialix.com

World Wide Web: www.specialix.com

If you have an internet connection please send details of your problem to Technical Support using the form shown previously. You will find the form on the Specialix web site, in the 'Tech Support' area.

China

Specialix Pte Ltd.
Suite A308, Long Bo Office Building
No 3 Nan Li Shi Road
Xi Cheng District
Beijing 100037
China

Telephone: +86 (0) 10 6802 4870

Facsimile: +86 (0) 10 6802 4869

Email: spx@public.bta.net.cn

Singapore

Specialix (Asia) Pte Ltd.
Yu Li Industrial Building
No 37 Lor 23 Sims Avenue #04-01/03
Singapore 388371

Telephone: +65 (0) 749 1700

Facsimile: +65 (0) 749 2003

Email: support@specialix.co.uk

Australia

Specialix Pty Ltd.
Unit 15a, 390 Eastern Valley Way
Roseville
NSW 2069
AUSTRALIA

Telephone: +61 (0) 2 417 3666

Facsimile: +61 (0) 2 417 3791

Repairs

Before sending an item for repair, you must contact your Specialix supplier. If, however, you bought your product directly from Specialix, contact Specialix at the numbers listed below.

In Europe, phone/fax: +44 1932 350990
 or e-mail: RMA@specialix.co.uk

In USA, Asia and Australia, Asia and Australia, contact the office shown in the Technical Support section.